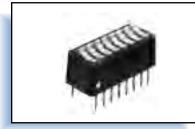
tyco



GD Series - Page A3



AD Series - Page A7



7100 Series - Page A17



MRD Series - Page A21



DR Series - Page A25

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GDH Series - Page A5



7000 Series - Page All



S Series - Page A18



DRD Series - Page A23



Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. Dimension reference p Specification to change.

Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

**DIP Switches** 

### **DIP Switch Part Number Index**

ADE02A7
ADE02SA7
ADE02SAA7
ADE03A7
ADE03SA7
ADE03SAA7
ADE04A7
ADE04SA7
ADE04SAA7
ADE05
ADE05SA7
ADE05SAA7
ADE06
ADE06SA7
ADE06SAA7
ADE07A7 ADE07SA7
ADE07SA7 ADE07SAA7
ADE08
ADE085
ADE08SAA7
ADE09
ADE09S
ADE09SAA7
ADE10A7
ADE10SA7
ADE10SAA7
ADE12A7
ADE12SA7
ADE12SAA7
ADF02A8
ADF02SA8
ADF02SAA8
ADF02SATA8
ADF02STA8
ADF02STTRA8
ADF02TA8
ADF03A8 ADF03SA8
ADF03SAA8
ADF03SAT
ADF03STA8
ADF03STTRA8
ADF03T
ADF04A8
ADF04SA8
ADF04SAA8
ADF04SATA8
ADF04STA8
ADF04STTRA8
ADF04TA8
ADF05
ADF05SA8
ADF05SAA8
ADF05SATA8
ADF05STA8
ADF05STTRA8
ADF05TA8 ADF06A8
ADF06A8 ADF06SA8
ADF06SAA8
ADF06SAT
ADF06STA8
ADF06STTRA8
ADF06TA8

ADF07A8
ADF07SA8
ADF07SAA8
ADF07SATA8
ADF07STA8
ADF07STTRA8
ADF07TA8
ADF08A8
ADF08S
ADF08SAA8
ADF08SATA8
ADF08STA8
ADF08STTRA8
ADF08TA8
ADF09
ADF09S
ADF09SAA8
ADF09SATA8
ADF09STA8
ADF09STTRA8
ADF09TA8
ADF10A8
ADF10SA8
ADF10SAA8
ADF10SATA8
ADF10STA8
ADF10STTRA8
ADF10TA8
ADF12
ADF12S
ADF12SA8 ADF12SAA8
ADF12SATA8
ADF12STA8
ADF12STTRA8
ADF12TA8
ADP02A9
ADP02SA9
ADP02SAA9
ADP04A9
ADP04SA9
ADP04SAA9
ADP05A9
ADP05S
ADP05SAA9
ADP06A9
ADP06SA9
ADP06SAA9
ADP07
ADP07S
ADP07SAA9
ADP08
ADP08SA9
ADP08SAA9
ADP09A9
ADP09SA9
ADP09SAA9
ADP10A9
ADP10SA9
ADPA02A9
ADPA02SA9
ADPA02SAA9
ADPA04A9
ADPA04SA9
ADPA04SAA9
ADPA05

1551057
ADPA05SA9
ADPA05SAA9
ADPA06A9
ADPA06SA9
ADPA06SAA9
ADPA07
ADPA07SA9
ADPA07SAA9
ADPA08A9
ADPA08SA9
ADPA08SAA9
ADPA09
ADPA09SA9
ADPA09SAA9
ADPA10A9
ADPA10SA9
ADPA10SAA9
APD10SAA9
DRD*RAEA25
DRD10CEA23
DRD10CESA23
DRD10EA23
DRD10ESA23
DRD16CEA23
DRD16CESA23
DRD16EA23
DRD16ESA23
DRMA25
DRSA25
DRWA25
GDB02
GDB04A4
GDB04SA4
GDB06A4
GDB06SA4
GDB08A4
GDB08SA4
GDB10
GDB10SA4
GDH02SA5
GDH02STRA5
GDH04SA5
GDH04STRA5
GDH06SA5
GDH06STR A5
OD HOOD HIGH MINING
GDH08SA5
GDH08STRA5
GDH10SA5
GDH10STRA5
GDP02A4
GDP02NTSA4
GDP02S
GDP02STRA4
GDP04A4
GDP04NTSA4
GDP04SA4
GDP06A4
GDP06SA4
GDP08A4
GDP08SA4
GDP08STRA4
GDP10A4
CDD10C A4

GDR02A5
GDR02SA5
GDR04A5
GDR04SA5
GDR06
GDR06SA5
GDR08
GDR08S
GDR10
GDR10SA5
GDS02A3
GDS02NTSA3
GDS02SA3
GDS02STRA3
GDS04A3
GDS04NTSA3
GDS04SA3
GDS04STRA3
GDS06A3
GDS06NTSA3
GDS06SA3
GDS06STRA3
GDS08A3
GDS08NTSA3
GDS08SA3
GDS08STRA3
GDS10A3
GDS10SA3
GDS10STRA3
MGDH04A6
MRD10A21
MRD10SA21
MRD16CA21
MRD16SA21
SLV04A18
SLV06A18
SSH02A18
SSH04A18
SSH06A18
SSH08A18
SSH10A18
SSV02A18
SSV04A18
SSV06A18
SSV08A18
SSV10A18
425166 A 15
435166A15
435469A14
435469A14
435469A14 435470A13 435626A15 435640A17
435469A14 435470A13 435626A15 435640A17 435668A17
435469A14 435470A13 435626A15 435640A17
435469
435469A14 435470A13 435626A15 435640A17 435668A17 435704A20
435469

A2

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. Dimensions Specification to change.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

GDP10S .....A4 GDP10STR .....A4

> South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

tyco Electronics

### DIP Switches, Low Profile, Slide Actuator, Through Hole and Surface Mount

### FEATURES:

- Conventional gold wiping contact system
- Available in PC and surface mount configurations
- Traditional tape seal standard
- 95% Minimum solder coverage (90/10 tin lead)
- Withstands wave soldering temperature of 245°C for 3-5 seconds
- Heat deflection temperature of 260°C for surface mount compatibility
- End stackable (GDS version)
- Auto-insertable (GDS and GDB version)
- Vacuum pick and place compatible (GDS, GDB and GDH)
- Half pitch .050" terminal spacing (GDH version)
- Available in optional tape & reel packaging
- Shipped in the off position

#### **ENVIRONMENTAL SPECIFICATIONS:**

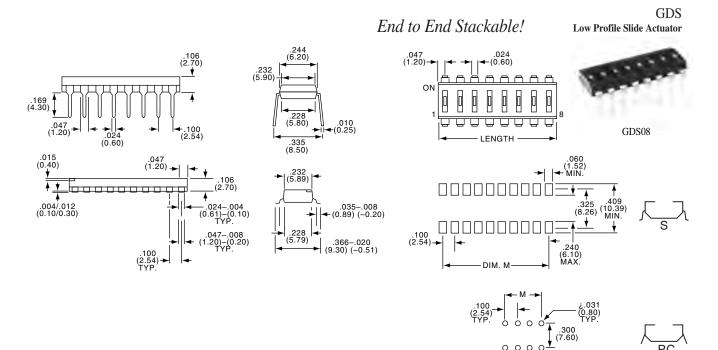
Operating Temperature	30°C to +85°C
Storage Temperature	45°C to +100°C
Solder Heat Resistance	See page M3-4

### MATERIAL SPECIFICATIONS:

Moving Contact	Gold over nickel over copper alloy
Fixed Contact	Gold over nickel over copper alloy
Base Material	PPS UL94V-0
Cover Material	PPS UL94V-0
Actuator Material	High temperature polyester/polyamide
Terminal	Tin lead plated over nickel over
	copper alloy

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating0.4 VA @ 24 VDC
Initial Contact Resistance 100 Milliohms max.
Insulation Resistance100 Megohms min. @ 250 VDC
Dielectric Strength
Life Expectancy
Operating Force



			Part	t Number				_		
PC Model		S Model		Tape &	Reel	S Model	No Tape	Poles	Length	Dim.
Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	1 0103	Dengui	М
5-1437590-5	GDS02	5-1437590-7	GDS02S	5-1437590-8	GDS02STR	5-1437590-6	GDS02NTS	2	.194(4.94)	.100(2.54)
5-1437590-9	GDS04	6-1437590-1	GDS04S	6-1437590-2	GDS04STR	6-1437590-0	GDS04NTS	4	.394(10.02)	.300(7.62)
6-1437590-3	GDS06	6-1437590-5	GDS06S	6-1437590-6	GDS06STR	6-1437590-4	GDS06NTS	6	.594(15.10)	.500(12.7)
6-1437590-7	GDS08	6-1437590-9	GDS08S	7-1437590-0	GDS08STR	6-1437590-8	GDS08NTS	8	.794(20.18)	.700(17.78)
7-1437590-1	GDS10	7-1437590-2	GDS10S	7-1437590-3	GDS10STR	_	_	10	.994(25.26)	.900(22.86)

Catalog 1308390 Issued 9-04

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Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967 A3

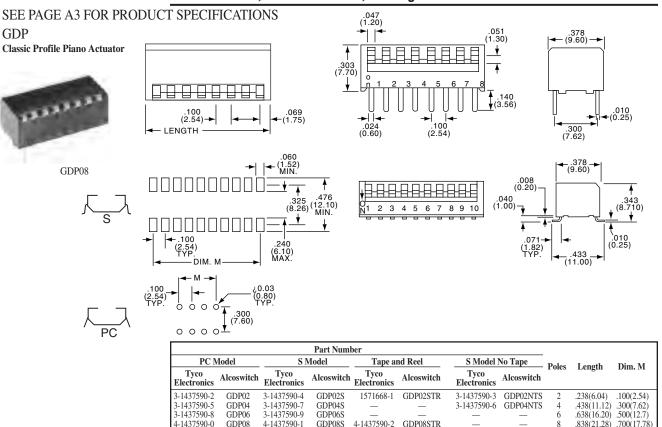
A

**GD** Series

Electronics

**GD** Series

### DIP Switches, Piano Actuator, Through Hole and Surface Mount



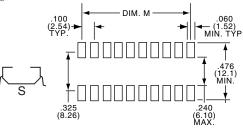
## DIP Switches, Flush Rocker Actuator, Through Hole and Surface Mount

GDP10STR

4-1437590-5

GDB Flush Rocker Actuator LENGTH

GDB08



4-1437590-3

GDP10

4 5 6

3

0

FO

.069 (1.75)

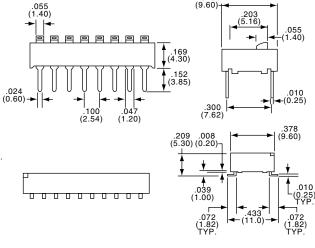
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4-1437590-4

7

8

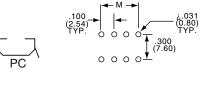
GDP10S



10

.378 (9.60)

1.038(26.36) .900(22.86)



Dimensions are in inches

	Part N	_				
PC M	lodel	S M	odel	- Poles	Length	Dim. M
Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	- roles	Lengui	Dini, M
1437590-1	GDB02	_	GDB02S	2	.238(6.04)	.100(2.54)
1437590-2	GDB04	1437590-3	GDB04S	4	.438(11.12)	.300(7.62)
1437590-4	GDB06	1437590-5	GDB06S	6	.638(16.20)	.500(12.7)
1437590-6	GDB08	1437590-7	GDB08S	8	.838(21.28)	.700(17.78)
1437590-8	GDB10	1437590-9	GDB10S	10	1.038(26.36)	.900(22.86)

Α4

Catalog 1308390 Issued 9-04

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tyco

**GD** Series

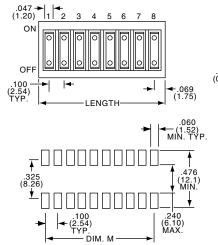
# Alcoswitch

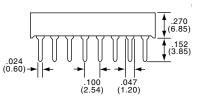
GDR08

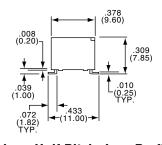


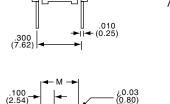
.378 · (9.60)

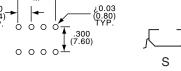
							SEE PAGE A3 FOR PRODUCT SPECIFICATIONS
	Part 1	Number		_			GDR
PC M	PC Model S Model		odel	Poles Length		Dim. M	Classic Profile
Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	- roles	Length	Dini, M	Recessed Rocker Actuator
4-1437590-6 4-1437590-8	GDR02 GDR04	4-1437590-7 4-1437590-9	GDR02S GDR04S	2	.238(6.04) .438(11.12)	.100(2.54) .300(7.62)	1100
5-1437590-0 5-1437590-2	GDR04 GDR06 GDR08	5-1437590-1 5-1437590-3	GDR043 GDR06S GDR08S	6	.438(11.12) .638(16.20) .838(21.28)	.500(12.7) .700(17.78)	101111111
5-1437590-4	GDR10	_	GDR10S	10	1.038(26.36)	.900(22.86)	



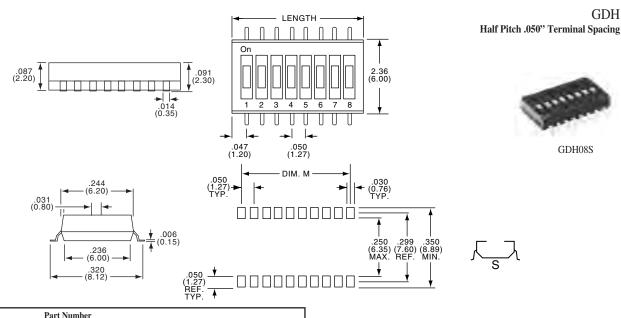








**DIP Switches, Half Pitch, Low Profile** 



	Part N					
PC M	PC Model S Model		odel	Poles	Length	Dim. M
Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	1 0103	Lungui	Dini: M
1-1437590-0 1-1437590-4 1-1437590-9 2-1437590-2 2-1437590-6	GDH02S GDH04S GDH06S GDH08S GDH10S	1-1437590-3 1-1437590-6 2-1437590-1 2-1437590-4 2-1437590-8	GDH02STR GDH04STR GDH06STR GDH08STR GDH10STR	2 4 6 8 10	.144(3.66) .244(6.20) .344(8.75) .444(11.29) .544(13.82)	$\begin{array}{c} .050(1.27)\\ .150(3.81)\\ .250(6.35)\\ .350(8.89)\\ .450(11.43)\end{array}$

Dimensions are in inches

Catalog 1308390 Issued 9-04

specified. Values in parentheses www.tycoelectronics.com

Dimensions are shown for and millimeters unless otherwise reference purposes only. Specifications subject or brackets are metric equivalents. to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

A5

Electronics

### DIP Switches, Half Pitch, Ultra Low Profile, .067" High

### MATERIAL SPECIFICATIONS:

Contacts	Copper alloy, gold plate over nickel
Case Material	High temperature polyamide, UL 94V-0
	High temperature polyester, 94V-0
Moving Contact	Copper alloy, gold plate over nickel
Fixed Contact	Copper alloy, gold plate over nickel
Terminals	Copper alloy, gold flash over nickel

### ENVIRONMENTAL SPECIFICATIONS:

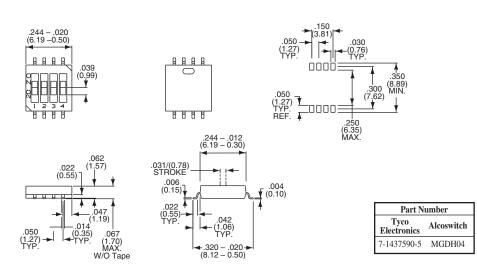
Operating Temperature	$30^{\circ}$ C to $+85^{\circ}$ C $(-22^{\circ}$ F to $+185^{\circ}$ F)
Storage Temperature	45°C to +100°C (-49°F to +212°F)

#### MGDH

Half Pitch .050" Terminal Spacing, .067" High



MGDH04



TYPICAL PERFORMANCE CHARACTERISTICS:

Insulation Resistance ......100 Megohms min. @ 100 VDC

Initial Contact Resistance ...... 100 Milliohms max.

Contact Rating .....Non-switching: 100 Milliamps @ 50 VDC Switching: 25 Milliamps @ 24 VDC

A6

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Electronics

### DIP Switches, Extended Actuator, Auto Insertable, Through Hole and Surface Mount

#### FEATURES:

- Available in PC or surface mount termination.
- · High pressure wiping contact allows aqueous or solvent cleaning without tape seal.
- Auto-insertable
- · Tape Seal version available for vacuum pick-n-place
- · Unique design can withstand vapor phase reflow or wave soldering conditions.
- · Gas tight contacts
- · Shipped in the off position

#### **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature ......-30°C to + 85°C Storage Temperature .....-45°C to + 100°C per MIL-STD202, Method 210 Cleaning.....Âqueous solution or solvent

### MATERIAL SPECIFICATIONS:

Base and Cover	PPS-UL94V-0, (Black)
Actuator	PA6T-UL94V-0, (White)
Fixed Contact/Terminal	Copper alloy plate-solder/copper
Moving Contact	Copper alloy plate-gold/nickel

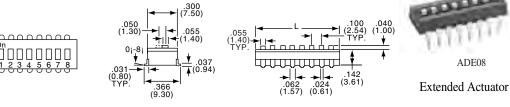
### **TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating	0.4 VA @ 20 VDC max. Max Rating Switching–100 Milliamp @ 24VDC Min Rating Switching–1 Microamp @ 1 Millivolt Max Rating Non Switching–1 Amp @ 5VDC
Initial Contact Resistance	e e i
Insulation Resistance	1,000 Megohms min. @ 100 VDC
Dielectric Strength	500 VAC
Operating Force	Less than 800 grams
	AD/R Series 1.30mm/.050" piano style 25°
Life Expectancy	1,000 Cycles
	1



ADE

ADE08



S Termination Shown

PC Te	erm.	"S" Te	erm.	"SA" Term.		"SA" Ter		No. of	Actuator	Dim.
Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Positions	Style	L		
1437586-2	ADE02	1437586-4	ADE02S	1437586-5	ADE02SA	2	Slide	.278(7.06)		
1437586-7	ADE03	1437586-8	ADE03S	_	ADE03SA	3	Slide	.378(9.60)		
1-1437586-0	ADE04	1-1437586-2	ADE04S	1-1437586-3	ADE04SA	4	Slide	.478(12.14)		
1-1437586-5	ADE05	1-1437586-7	ADE05S	_	ADE05SA	5	Slide	.578(14.68)		
1-1437586-8	ADE06	2-1437586-0	ADE06S	2-1437586-1	ADE06SA	6	Slide	.678(17.22)		
2-1437586-3	ADE07	2-1437586-5	ADE07S	_	ADE07SA	7	Slide	.778(19.76)		
2-1437586-6	ADE08	2-1437586-8	ADE08S	2-1437586-9	ADE08SA	8	Slide	.878(22.30)		
3-1437586-0	ADE09	_	ADE09S	_	ADE09SA	9	Slide	.978(24.84)		
3-1437586-2	ADE10	3-1437586-7	ADE10S	_	ADE10SA	10	Slide	1.078(27.38)		
3-1437586-8	ADE12	1571337-1	ADE12S	_	ADE12SA	12	Slide	1.278(32.51)		

See Page A9 for PC Pad Layout.

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Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

**AD Series** 

Electronics

AD Series

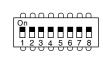
### DIP Switches, Flush Acutuator, Auto Insertable, Through Hole, and Surface Mount

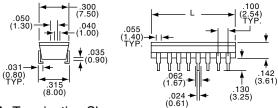
## SEE PAGE A7 FOR PRODUCT SPECIFICATIONS

**AD Series** 

A







See Page A9 for PC Pad Layout.

SA Termination Shown

5  $\wedge$ 

PC T	PC Term.		. w/Tape	No. of	Actuator	Dim.
Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Positions	Style	L
4-1437586-2	ADF02	5-1437586-0	ADF02T	2	Slide	.278(7.06)
5-1437586-1	ADF03	5-1437586-6	ADF03T	3	Slide	.378(9.60)
5-1437586-7	ADF04	6-1437586-4	ADF04T	4	Slide	.478(12.14)
6-1437586-5	ADF05	7-1437586-0	ADF05T	5	Slide	.578(14.68)
7-1437586-1	ADF06	8-1437586-0	ADF06T	6	Slide	.678(17.22)
8-1437586-1	ADF07	8-1437586-5	ADF07T	7	Slide	.778(19.76)
8-1437586-6	ADF08	9-1437586-5	ADF08T	8	Slide	.878(22.30)
9-1437586-6	ADF09	_	ADF09T	9	Slide	.978(24.84)
1437587-1	ADF10	1437587-7	ADF10T	10	Slide	1.078(27.38)
_	ADF12	1571336-1	ADF12T	12	Slide	1.278(32.51)

"S" 1	erm.	"S" Term. w	/Tape Seal	Tape &	& Reel	No. of	Actuator	Dim.
Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Positions	Style	L
4-1437586-4	ADF02S	4-1437586-8	ADF02ST	4-1437586-9	ADF02STTR	2	Slide	.278(7.06)
5-1437586-2	ADF03S	5-1437586-4	ADF03ST	5-1437586-5	ADF03STTR	3	Slide	.378(9.60)
5-1437586-9	ADF04S	6-1437586-3	ADF04ST	1437583-6	ADF04STTR	4	Slide	.478(12.14)
6-1437586-6	ADF05S	6-1437586-8	ADF05ST	6-1437586-9	ADF05STTR	5	Slide	.578(14.68)
7-1437586-5	ADF06S	7-1437586-8	ADF06ST	7-1437586-9	ADF06STTR	6	Slide	.678(17.22)
8-1437586-2	ADF07S	8-1437586-3	ADF07ST	8-1437586-4	ADF07STTR	7	Slide	.778(19.76)
8-1437586-8	ADF08S	9-1437586-1	ADF08ST	9-1437586-2	ADF08STTR	8	Slide	.878(22.30)
9-1437586-7	ADF09S	9-1437586-8	ADF09ST	9-1437586-9	ADF09STTR	9	Slide	.978(24.84)
1437587-3	ADF10S	1437587-5	ADF10ST	1437587-6	ADF10STTR	10	Slide	1.078(27.38)
1437587-8	ADF12S	_	ADF12ST	1437587-9	ADF12STTR	12	Slide	1.278(32.51)

"SA"	"SA" Term. "SA" Term. w/Tape Se		w/Tape Seal	No. of	Actuator	Dim.
Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Positions	Style	L
4-1437586-5	ADF02SA	4-1437586-6	ADF02SAT	2	Slide	.278(7.06)
5-1437586-3	ADF03SA	_	ADF03SAT	3	Slide	.378(9.60)
6-1437586-0	ADF04SA	6-1437586-1	ADF04SAT	4	Slide	.478(12.14)
_	ADF05SA	_	ADF05SAT	5	Slide	.578(14.68)
7-1437586-6	ADF06SA	7-1437586-7	ADF06SAT	6	Slide	.678(17.22)
_	ADF07SA	_	ADF07SAT	7	Slide	.778(19.76)
8-1437586-9	ADF08SA	9-1437586-0	ADF08SAT	8	Slide	.878(22.30)
_	ADF09SA	_	ADF09SAT	9	Slide	.978(24.84)
_	ADF10SA	1437587-4	ADF10SAT	10	Slide	1.078(27.38)
—	ADF12SA	—	ADF12SAT	12	Slide	1.278(32.51)

Dimensions are in inches

A8

Catalog 1308390 Issued 9-04

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Dimensions are shown for and millimeters unless otherwise specified. Values in parentheses reference purposes only. Specifications subject or brackets are metric equivalents. to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

Electronics

AD Series

Mount

# Alcoswitch

ADP



ADP04S

Piano Actuator

Lever Down Tyco

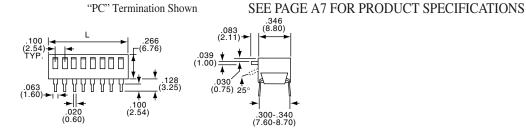
Electronics

1-1437587-1 1-1437587-5 2-1437587-0 2-1437587-2 2-1437587-5

2-1437587-6 3-1437587-0

3-1437587-3

Alco



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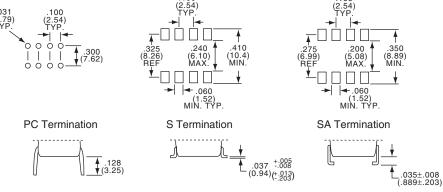
DIP Switches, Piano Acutuator, Auto Insertable, Through Hole, and Surface



					PC	·	S
	"S" /	Term	"SA"	Term.			
own "On"	Lever D	own "On"	Lever Down "On"		No. of	Actuator	Dim.
Alcoswitch	Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Positions	Style	L
ADP02	1-1437587-2	ADP02S	1-1437587-3	ADP02SA	2	Piano	.278(7.06)
ADP04	1-1437587-7	ADP04S	1-1437587-8	ADP04SA	4	Piano	.478(12.14)
ADP05	2-1437587-1	ADP05S	_	ADP05SA	5	Piano	.578(14.68)
ADP06	2-1437587-3	ADP06S	2-1437587-4	ADP06SA	6	Piano	.678(17.22)
ADP07	_	ADP07S	_	ADP07SA	7	Piano	.778(19.76)
ADP08	2-1437587-8	ADP08S	2-1437587-9	ADP08SA	8	Piano	.878(22.30)
ADP09	_	ADP09S	3-1437587-1	ADP09SA	9	Piano	.978(24.84)
ADP10	3-1437587-6	ADP10S	_	ADP10SA	10	Piano	1.078(27.38)

Lever Up "On"		"S" Term Lever Up "On"				No. of	Actuator	Dim.
Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Positions	Style	L
4-1437587-7	ADPA02	_	ADPA02S	_	ADPA02SA	2	Piano	.278(7.06)
4-1437587-8	ADPA04	5-1437587-0	ADPA04S	5-1437587-1	ADPA04SA	4	Piano	.478(12.14)
5-1437587-2	ADPA05	5-1437587-3	ADPA05S	_	ADPA05SA	5	Piano	.578(14.68)
5-1437587-4	ADPA06	5-1437587-5	ADPA06S	5-1437587-6	ADPA06SA	6	Piano	.678(17.22)
5-1437587-7	ADPA07	_	ADPA07S	_	ADPA07SA	7	Piano	.778(19.76)
5-1437587-8	ADPA08	6-1437587-0	ADPA08S	_	ADPA08SA	8	Piano	.878(22.30)
_	ADPA09	_	ADPA09S	_	ADPA09SA	9	Piano	.978(24.84)
6-1437587-1	ADPA10	—	ADPA10S	_	ADPA10SA	10	Piano	1.078(27.38)

#### TERMINATION OPTIONS



Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

tyco Electronics

### Hybrid DIP Switches, Through Hole and Surface Mount

### AUTO-INSERTABLE\* DIP SWITCH

WITH INTEGRAL RESISTORS

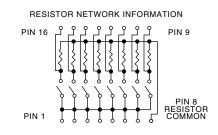
\* Flush actuator versions are auto-insertable

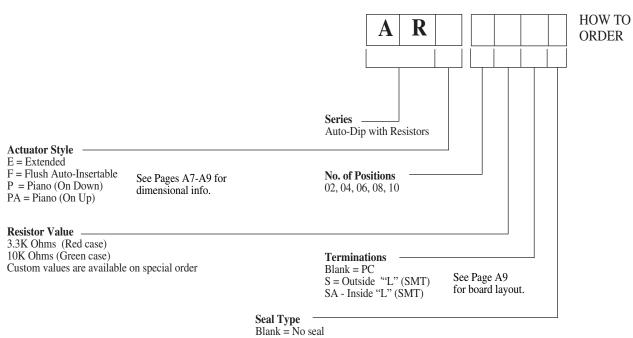
#### FEATURES:

- All the features of the AD SERIES PLUS
- Thick film pull-up resistors molded into the base of the switch.
- Replaces discrete resistor network plus DIP Switch with one component.
- Available with 3.3K ohms or 10K ohms resistors.
- Ceramic substrate allows wave soldering temperatures of 245°C for up to 30 seconds per MIL-STD 202, Method 210.
- · Custom resistor values available.
- Shipped in off position.

Rated Pwr.	Resistance	Tolerance	Max. Voltage
125 mW	3.3K Ohms (red)	±5% at 85°C	24V
125 mW	10K Ohms (green)	±5% at 85°C	24V

SEE PAGE A7 FOR PRODUCT SPECIFICATIONS





T = Tape (flush actuator only)

Example: ARF 06 10KST = Auto-Dip

Flush actuator 06 positions 10<sup>k</sup> ohms resistors Outside "L" terminations & tape seal

A10

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Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

### **DIP Switches**

Alcoswitch 7000 Series DIP switches are available in standard single pole, single throw; side actuated, single pole, single throw and multiple series versions. Contacts are made of high strength copper alloy with .000030 [0.00076] gold over .000050 [0.00127] nickel plating in contact area and legs plated to meet Tyco **Electronics Solderability** Specification 109-11-3.

The multiple series switches offer the unique feature of single pole switches coupled mechanically to provide switching of various poles simultaneously. This allows flexibility in programming.

Multipole switches are available with or without lever-actuated rockers and in a variety of configurations in addition to those listed. The maximum number of poles that can be ganged is six.

#### **Performance Characteristics**

#### **Current and Voltage Rating:**

Nonswitching - 1.5 amperes max. at 50 VDC Switching — 100 milliamperes max at 5 VDC (resistive load); 25 milliamperes max. at 24 VDC (resistive load)

#### **Contact Resistance, Dry Circuit:**

100 milliohms max. (end of life) and 50 milliohms (initial) at 50 mV open circuit, 50 milliamperes

#### Insulation Resistance:

1 x 10<sup>9</sup> ohms min. at 100 VDC (initial)

#### **Dielectric Withstanding Voltage:**

500 VDC min. at standard atmosphereic conditions

Capacitance:

#### 5 picofarads max.

**Temperature Rating:** 

Nonoperating -- -73.3°C to +105°C Operating — -55°C to +105°C

#### Vibration:

Discontinuities shall not exceed 10 microseconds when subjected to 10-2000-10 Hz transversing for 20 minutes at .060 [1.52] inches total excursion

#### Shock:

No physical damage or discontinuities greater than 10 microseconds when tested with .10 ampere current applied per Tyco Electronics Specification 109-26, Condition A

#### Humidity:

Withstands an environment of +40°C and 95% RH for 96 hours

#### **Durability:**

No physical damage or contact resistance greater than 100 milliohms up to 7000 cycles of actuation with a resistive load of 24 VDC and 25 milliamperes max. current applied

#### Terminal Strength (Bend Test):

Two (2) 45° bend cycles per MIL-STD-202, Method 211, Condition B

#### Materials

#### Housing:

Glass-filled polyester, 94V-0 rated, black

#### Rocker:

Dimensions are in inches

Thermoplastic, 94V-0 rated, white

#### Spring Contacts and Leads:

Copper alloy with .000030 [0.00076] gold over .000050 [0.00127] nickel in contact area and .000150 [0.00381] tin-lead over .000050 [0.00127] nickel on solder legs, plated to meet Tyco Electronics Solderability Specification 109-11-3.

#### **Technical Documents**

**Product Specification:** 108-7519 Instruction Sheet: 408-07779 **Application Specification:** 114-1056

Catalog 1308390 Issued 9-04

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Dimensions are shown for and millimeters unless otherwise reference purposes only. Specifications subject or brackets are metric equivalents. to change.

Electronics

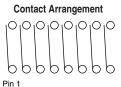
7000 Series

# DIP Switches, Piano Style Actuator

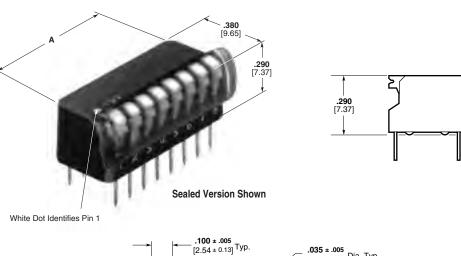


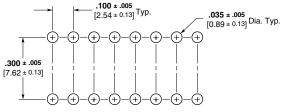
Single Pole Single Throw Side Actuated Low Profile

**Contact Lead Spacing** — .100 x .300 [2.54 x 7.62] **Lead Length** — .140 [3.56] below mounting surface



Pin 1 Note: Switches shown in open position





**Recommended PC Board Hole Pattern** 

No. of	Dii	n. A	SPST Side Actuated Par		
Switches	inch	mm	Unsealed <sup>1</sup>	Sealed	Tape Sealed
2	.280	7.11	1-435802-0	_	_
3	.380	9.65	435802-2	—	—
4	.480	12.19	435802-3	1-435802-5	—
5	.580	14.73	435802-4	1-435802-6	_
6	.680	17.27	435802-5	1-435802-7	—
7	.780	19.81	435802-6	1-435802-8	—
8	.880	22.35	435802-1	435802-9	3-435802-8
9	.980	24.89	435802-7	1-435802-9	—
10	1.080	27.43	435802-8	2-435802-0	—
11	1.180	29.97	—	2-435802-1	—
12	1.280	32.51	—	2-435802-2	—

<sup>1</sup> All switches are bottom sealed.

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

Electronics

7000 Series

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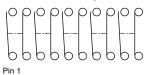
7000 Series

### DIP Switches, Extended Actuator, Single or Double Pole, Double Throw

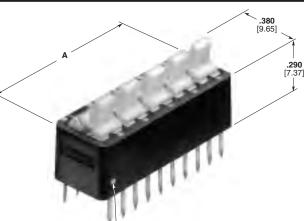
#### Multiple Single Pole Double Throw

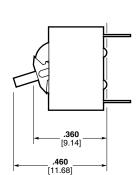
Contact Lead Spacing — .100 x .300 [2.54 x 7.62] Lead Length — .140 [3.56] below mounting surface

#### **Contact Arrangement**



Note: Switch positions are closed when rockers are down toward white dots. Switches have make-before-break circuit design.





**Extended Lever Actuator Shown** 

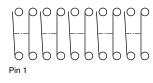
#### White Dot Identifies Pin 1

No. of	Dim. A		SPDT Part No.	
Switches	inch mm		Low Profile Actuator	Extended Lever Actuator
1	.280	7.11	435470-7	2-435470-1
2	.480	12.19	435470-1	2-435470-2
3	.680	17.27	435470-2	_
4	.880	22.35	435470-3	2-435470-4
5	1.080	27.43	_	2-435470-5
6	1.280	32.51	—	2-435470-6

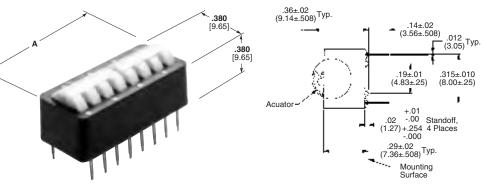
#### Double Pole Double Throw

#### Contact Lead Spacing — .100 x .300 [2.54 x 7.62] Lead Length — .140 [3.56] below mounting surface

#### **Contact Arrangement**

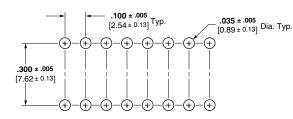


Note: Switch positions are closed when rockers are down toward white dots. Switches have make-before-break circuit design.



Low Profile Lever Actuator Shown

No. of	Dim. A		DPDT Part No.	
Switches	inch	mm	Low Profile Actuator	Extended Lever Actuator
1	.480	12.19	435470-5	3-435470-1
2	.880	22.35	435470-9	



**Recommended PC Board Hole Pattern** 

Catalog 1308390 Issued 9-04

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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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Electronics

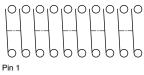
7000 Series

### DIP Switches, Extended Actuator, Multiple Pole, Single Throw

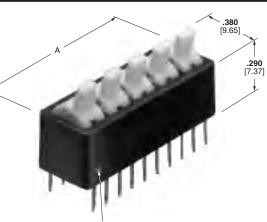
#### Multiple Double Pole Single Throw

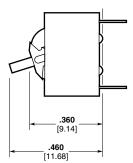
Contact Lead Spacing — .100 x .300 [2.54 x 7.62] Lead Length — .140 [3.56] below mounting surface

#### **Contact Arrangement**



Note: Switches shown in open position.





**Extended Lever Actuator Shown** 

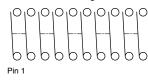
White Dot Identifies Pin 1

No. of	Dim. A		DPST Part No.		
Switches	inch	mm	Low Profile Actuator	Extended Lever Actuator	
1	.280	7.11	435469-9	2-435469-1	
2	.480	12.19	—	2-435469-2	
4	.880	22.35	435469-3	2-435469-4	
5	1.080	27.43	_	2-435469-5	
6	1.280	32.51	_	2-435469-6	

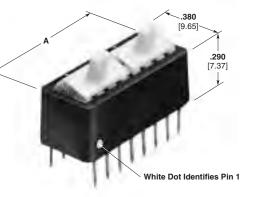
#### 4-Pole Single Throw

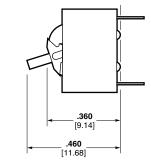
Contact Lead Spacing — .100 x .300 [2.54 x 7.62] Lead Length — .140 [3.56] below mounting surface

**Contact Arrangement** 



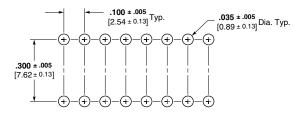
Note: Switches shown in open position.





**Extended Lever Actuator Shown** 

No. of	Dim. A		4PST Part No.		
Switches	inch	mm	Low Profile Actuator	Extended Lever Actuator	
1	.480	12.19	435469-7	3-435469-1	



#### **Recommended PC Board Hole Pattern**

Catalog 1308390 Issued 9-04

www.tycoelectronics.com or

Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

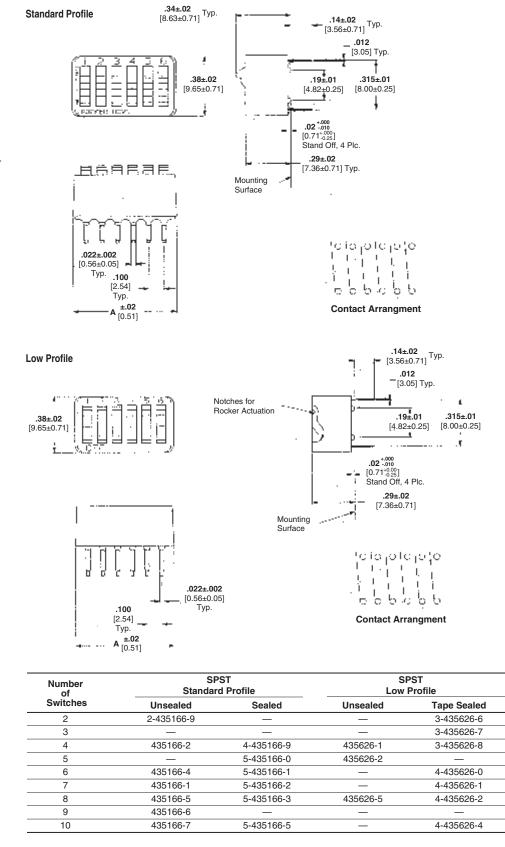
Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

tyco

7000 Series

Standard Profile

### **DIP Switches, Rocker Style Actuator**



Contact Lead Spacing -.100 x .300 [2.54 x 7.62] Lead Length - .140 [3.56] below mounting surface



Contact Lead Spacing -.100 x .300 [2.54 x 7.62] Lead Length - .140 [3.56] below mounting surface



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7100 Series

### **DIP Switches**

#### **Performance Characteristics**

#### **Current and Voltage Rating:**

Nonswitching — 1.0 amperes max. at 40 VDC Switching — 60 milliamperes max at 5 VDC (resistive load); 15 milliamperes max. at 24 VDC (resistive load)

#### Contact Resistance, Dry Circuit:

100 milliohms max. (end of life) and 50 milliohms (initial) at 50 mV open circuit, 50 milliamperes

#### Insulation Resistance:

1 x 10<sup>9</sup> ohms min. at 100 VDC (initial)

#### **Dielectric Withstanding Voltage:**

500 VDC min. at standard atmosphereic conditions

Capacitance:

5 picofarads max.

#### **Temperature Rating:**

Nonoperating — -73°C to +105°C Operating — -55°C to +105°C

#### Vibration:

Discontinuities shall not exceed 10 microseconds when subjected to 10-2000-10 Hz transversing for 20 minutes at .060 [1.52] inches total excursion

#### Shock:

No physical damage or discontinuities greater than 10 microseconds when tested with .10 ampere current applied per Tyco Electronics Specification 109-26, Condition A

#### Humidity:

Withstands an environment of +40°C and 95% RH for 96 hours

#### **Durability:**

No physical damage or contact resistance greater than 100 milliohms after 2000 cycles of actuation with a resistive load of 24 VDC and 25 milliamperes max. current applied

#### Terminal Strength (Bend Test):

Two (2) 45° bend cycles per MIL-STD-202, Method 211, Condition B

#### Materials

#### Housing:

Glass-filled polyester, 94V-0 rated, blue

#### Rocker:

Thermoplastic, 94V-0 rated, white

#### Spring Contacts and Leads:

Copper alloy with .000030 [0.00076] gold over .000050 [0.00127] nickel in contact area and .000150 [0.00381] tin-lead over .000050 [0.00127] nickel on solder legs, plated to meet Tyco Electronics Solderability Specification 109-11-3.

#### **Technical Documents**

Product Specification: 108-7532 Instruction Sheet: 408-07779 Application Specification: 114-1056

Catalog 1308390 Issued 9-04

www.tycoelectronics.com or bracket

and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

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7100 Series



Alcoswitch 7100 Series DIP

Switches are recommended

limited. These single pole,

single throw switches have

been designed for a life of

up to 2000 cycles per pole and feature contacts of

copper alloy with .000030

[0.00076] gold over nickel

plating in the contact area and legs plated to meet

Solderability Specification

109-11-3. In addition, the SPST standard and low

profile switches are also

provide protection during

soldering and cleaning

processes.

available with a top seal to

Tyco Electronics

for programming

applications where the number of cycles per pole is

A16

### Dimensions are in inches and millimeters unless otherwise



**Single Pole** Single Throw

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Pin 1

Single Pole

66

Pin 1

Single Throw Low Profile

Contact Lead Spacing -.100 x .300 [2.54 x 7.62] Lead Length — .140 [3.56] below mounting surface

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Contact Lead Spacing -

Lead Length - .140 [3.56] below mounting surface

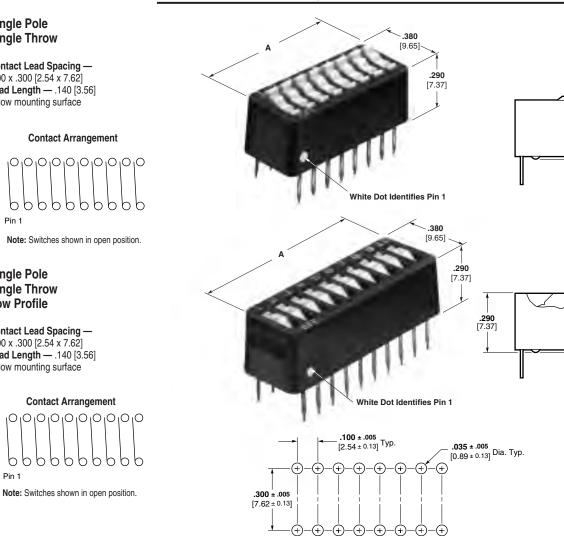
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.100 x .300 [2.54 x 7.62]

7100 Series

**.340** [8.64]

### **DIP Switches, Rocker Style Actuator**



**Recommended PC Board Hole Pattern** 

(+)-(+)-

No. of	Dir	n. A	SPST Standard Prof		SPST	Low Profile
Switches	inch	mm	Unsealed <sup>1</sup> Part No.	Sealed Part No.	Unsealed <sup>1</sup> Part No.	Tape Sealed Part No.
2	.280	7.11	2-435640-9	_	435668-1	2-435668-6
3	.380	9.65	3-435640-0	—	—	3-435668-3
4	.480	12.19	435640-2	3-435640-5	435668-3	3-435668-4
5	.580	14.73	435640-3	3-435640-6	435668-4	3-435668-5
6	.680	17.27	435640-4	3-435640-7	435668-5	2-435668-5
7	.780	19.81	435640-1	3-435640-8	—	2-435668-7
8	.880	22.35	435640-5	3-435640-9	435668-7	2-435668-8
9	.980	24.89	435640-6	4-435640-0	_	2-435668-9
10	1.080	27.43	435640-7	4-435640-1	435668-9	3-435668-0
11	1.180	29.97	_	_	_	3-435668-1
12	1.280	32.51	3-435640-2	4-435640-3	_	3-435668-2

<sup>1</sup> All switches are bottom sealed.

Catalog 1308390 Issued 9-04

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and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are in inches

Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

### Sip Switches, Low Profile, Vertical and Right Angle

#### FEATURES:

A

Series

S

- End-to-end stackable in .100" center (SSV/SLV) versions
- High pressure wiping contacts allows aqueous or solvent cleaning
- Gas tight contacts (280,000 PSI)
- Ceramic substrate allows wave soldering temperature of 245° for up to 10 seconds (SLV Version)
- 2 SIP switches take up less board space than 1 DIP switch

#### **ENVIRONMENTAL SPECIFICATIONS:**

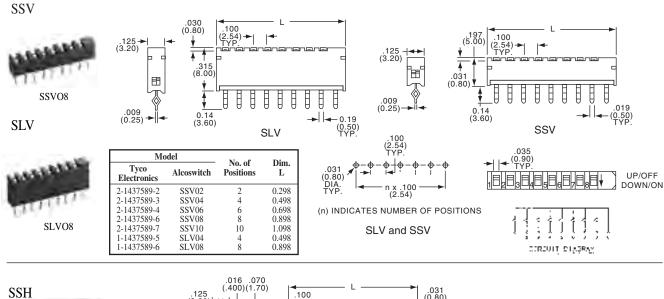
Operating Temperature30°C to +85°C
Storage Temperature45°C to +100°C
Solder Heat ResistanceWave soldering temperatures of $245^{\circ}C \pm$
5°C with switch in off position 30 seconds
when mounting on a .060" thick PCB per
MIL-STD 202, Method 210

### MATERIAL SPECIFICATIONS:

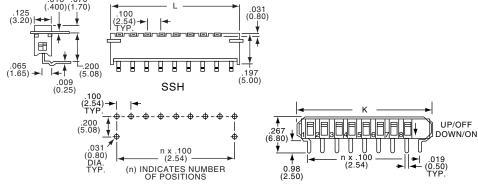
Base	PPS 94V-0/Encapsulated Ceramic (SLV/SLH)
Cover	PBT 94V-0
Contacts	Gold flashed Beryllium copper
Actuator Material	Polyamide
Terminals/Fixed Contacts	Solder coated copper alloy
Terminal Seal	Insert molded
Process Seal	Gas tight contacts

#### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	0.4 VA @ 20 VDC max.
Initial Contact Resistance	50 Milliohms max.
Insulation Resistance	100 Megohms min. @ 100 VDC
Dielectric Strength	500 VAC
Actuation Force	800 Grams max.
Actuator Travel	50°
Life Expectancy	1,000 Cycles

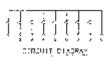






SSH

Model		No. of	D!	D:
Tyco Electronics	Alcoswitch	Positions	Dim. L	Dim. K
1-1437589-7	SSH02	2	0.298	0.338
1-1437589-8	SSH04	4	0.498	0.538
1-1437589-9	SSH06	6	0.699	0.738
2-1437589-0	SSH08	8	0.898	0.938
2-1437589-1	SSH10	10	1.098	1.138



A18

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Electronics

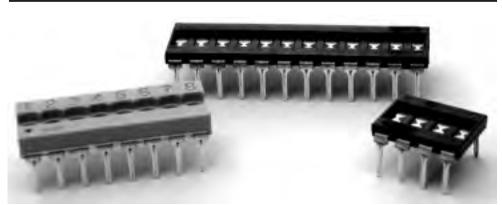
**DIP Shunts** 

# Alcoswitch

### **DIP Shunts**

Alcoswitch DIP Shunts are a highly reliable, low cost means of manually programming various types of electrical/electronic equipment. The shunt consists of a series of conductive straps packaged in a DIP configuration. The straps can be retained intact for a closed circuit or broken with a hand tool to produce an open circuit.

DIP shunts are available in 4- through 12-position configurations. All shunts can be supplied either unprogrammed or preprogrammed.



#### **Performance Characteristics**

#### **Current Rating:**

Standard Pressure — 2 amperes for +20°C rise above ambient (one conductor per shunt) Machine Insertable — 1 ampere for +20°C rise above ambient (one conductor per shunt)

#### Insulation Resistance: 1 x 10<sup>10</sup> ohms min. at 100 VDC

Dielectric Withstanding Voltage:

500 VDC min.

#### Capacitance:

2 picofarads max. between adjacent straps 5 picofarads max. across cut straps

Temperature Rating:

-55°C to +105°C

Humidity: Withstands an environment of +40°C and 95% RH for 96 hours

## Terminal Strength (Bend Test):

Two 45° bend cycles per MIL-STD-202, Method 211, Condition B Resistance to Soldering Heat: EIA-364-56A Condition C

#### Reconnection Option

Cut straps can be reconnected by soldering bridging. Solder bridging recommendations are:

- Use low temperature solder
- Use solder tip approximately 1/32 [0.79] in diameter
- Do not let solder tip come in contact with plastic material

#### Materials

Housina:

Glass-filled thermoplastic, 94V-0 rated

Metal Parts:

Copper alloy with electroplated tin finish (gold plated I/O legs are optional)

#### **Technical Documents**

Product Specifications: 108-7533 Through Hole Instruction Sheets: 408-07768 Through Hole Application Specifications: 114-1054 Through Hole A

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Catalog 1308390

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Electronics

**DIP Shunts** 

### **DIP Shunts**



**Standard Shunt Standard Pressure** 

Contact Lead Spacing -.100 x .300 [2.54 x 7.62] Lead Length — .140 [3.56] below mounting surface Housing Color — Black Programming Tool — See below

Programming Hand Tool Part No. 435862-1



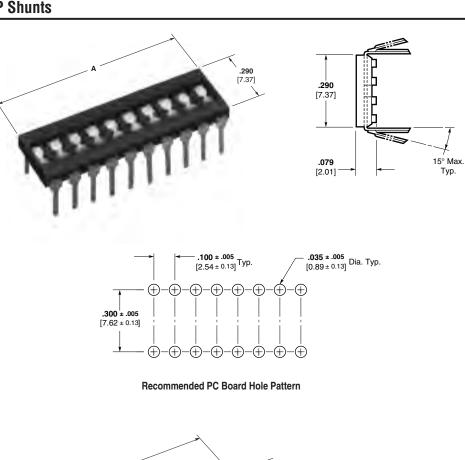
This tool provides a reliable means of programming DIP shunts. It is rugged, lightweight and dependable. No special skills are required to use this tool.

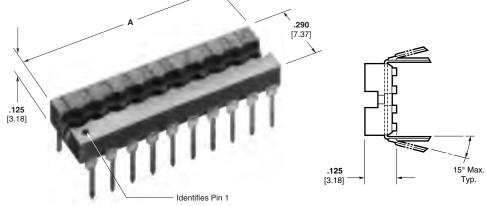
#### **Machine Insertable Shunt**

(Compatible with commercially available IC insertion equipment)

#### Contact Lead Spacing -

.100 x .300 [2.54 x 7.62] Lead Length - .140 [3.56] below mounting surface Housing Color — Gray Programming Tool — None required (5 to 10 lbs. [22.2 to 44.4 N] required to manually program each shunt position)





No. of			Standard Shunt	Machine Insertable	
Positions	inch	mm	Standard Pressure	lard Pressure Shunt	
4	.400	10.16	435704-4	—	
6	.600	15.24	435704-6	—	
7	.700	17.78	435704-7	_	
8	.800	20.32	435704-8	436860-7	
9	.900	22.86	435704-9	—	
10	1.000	25.40	1-435704-0	_	
12	1.200	30.48	1-435704-2	—	

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Electronics

### Rotary DIP Switches, Low Profile, Process Sealed, 7MM, Through Hole and Surface Mount

### FEATURES:

- 40% PCB area space savings over standard rotary dips
- 50% Lower in profile than standard rotary dips
- Hexadecimal or binary code, complement available
- Deflection temperature of 250°C for SMT reflow soldering
- Gold contacts, tin/lead terminals
- Sealed "O" ring design

#### MATERIAL SPECIFICATIONS:

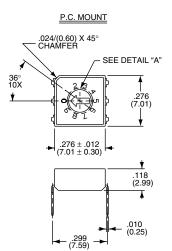
Fixed Contacts/Terminals	Brass, gold plated / tin/lead
Moving Contacts	BeCu, gold plated
Case Material	PPS UL94V-0
Rotor	Nylon UL94V-O
Cover Material	PPS UL94V-0
O-Ring	Fluoro Rubber

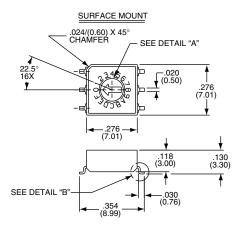
### **ENVIRONMENTAL SPECIFICATIONS:**

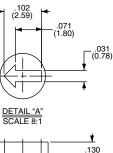
Operating Temperature10°C to +85°C
Storage Temperature45°C to +100°C
Solder Heat ResistanceMIL-STD 202F, Method 210
IR Process CapabilityEIA-364-56 Level II (250°C peak)

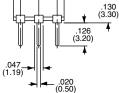
#### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	0.4 VA Max. @ 20 VDC
Initial Contact Resistance	50m Max. @ 2 VDC 10mA
Insulation Resistance	1,000 Megohms max.
Dielectric Strength	300 VAC for 1 minute
Actuator Travel	36° 10 Position, 22.5° 16 position
Operating Force	200 Grams avg.
Life Expectancy	20,000 Steps, mechanical









MRD10

MRD16C

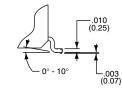


MRD10S



MRD16S

DETAIL "B" SCALE 8:1



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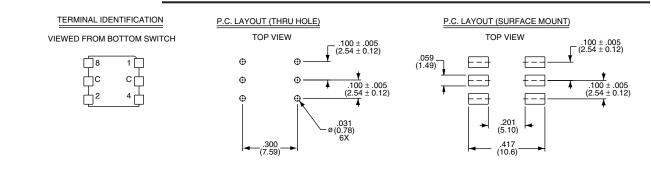
South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

tyco Electronics

MRD Series



### Rotary DIP Switches, Low Profile, Process Sealed, 7MM, Through Hole and Surface Mount



### TRUTH TABLES

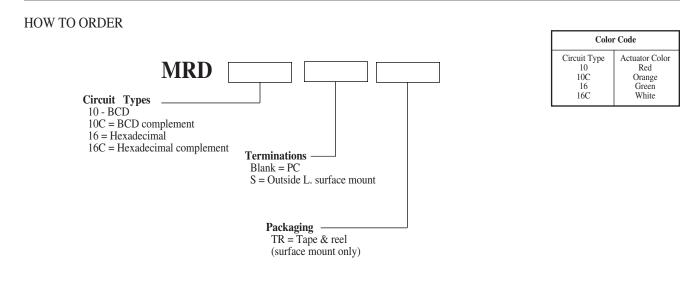
10-Po	10-Position, BCD (red actuator)												
Pos.	0	1	2	3	4	5	6	7	8	9			
С	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х			
1		Х		Х		Х		Х		Х			
2			Х	Х			Х	Х					
4					Х	Х	Х	Х					
8									Х	X			

10-Pe	10-Position, BCD Complement (orange actuator)												
Pos.	0	1	2	3	4	5	6	7	8	9			
С	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х			
1	Х		Х		Х		Х		Х				
2	Х	Х			Х	Х			Х	Х			
4	Х	Х	Х	Х					Х	Х			
8	Х	Х	Х	Х	Х	Х	Х	Х					

#### 16-Position, Hexadecimal (green actuator)

10-10	10-r ostion, riexaueciniai (green actuator)															
Pos.	0	1	2	3	4	5	6	7	8	9	Α	В	C	D	E	F
С	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
1		X		Х		X		X		X		X		Х		Х
2			Х	Х			Х	Х			Х	Х			Х	Х
4					Х	X	X	X					X	Х	X	Х
8									Х	Х	Х	Х	Х	Х	Х	Х

16-Po	16-Position Hexadecimal Complement (white actuator)															
Pos.	0	1	2	3	4	5	6	7	8	9	A	В	C	D	E	F
C	Х	Х	Х	Х	Х	X	X	X	Х	X	Х	Х	Х	Х	Х	Х
Т	Х		Х		Х		Х		Х		Х		Х		Х	
2	Х	Х			X	X			Х	X			X	Х		
4	Х	Х	Х	Х					Х	Х	Х	Х				
8	Х	Х	Х	Х	Х	X	X	X								



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Electronics

A

**DRD "E" Series** 

## Rotary Dip Switches, Process Sealed, Through Hole and Surface Mount

#### MATERIAL SPECIFICATIONS:

Contacts	Gold flashed copper alloy
Terminals	Tin lead plated brass
Base, Rotor, Case	PC, Glass filled PBT resin (blue case)
	SMT, Polymide (white case)
Movable Contact	Gold flashed copper alloy
Ball Support Plate	Copper alloy
Detent Spring	Stainless steel (spring)

#### **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature	22°F to +185°F (-30°C to +85°C)
Storage Temperature	49°F to 212°F (-45°C to +100°C)
Vibration Resistance	Subjected to vibration of 10-55hz per second with a total amplitude of .06 in. in 3 mutually perpendicular directions for 2 hours each
Shock Resistance	Will withstand 50G acceleration in 3 different planes for a period of 11 milliseconds
Salt Spray Test	Withstands an atmosphere of 5% salt water at temperature of $50^{\circ}$ C
Hydrogen Sulfide Test	Withstands an atmosphere of 15-20 PPM hydrogen sulfide gas at temperature of 40°C for 240 hours
Atmospheric Test	Withstands an atmosphere of 30-50 PPM sulfite gas at a temperature of 40°C for 240 hours
Solder Heat Resistance	Withstands 5 sec. flow solder bath of 260°C when mounted on a .06" thick PC board per MIL-STD 202, Method 210
Bubble Test	Withstands submersion in 60°C Flouriert for 1 min. without leakage

#### **TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating	0.4 VA @ 20 VDC max.
Initial Contact Resistance	50 Milliohms max. @ 2 VDC
Insulation Resistance	1,000 Megohms min. @100 VDC
Dielectric Strength	300 VAC RMS @ sea level
Operating Force	6 Ozin. nom.
SMT Operating Force	3 Ozin. nom.
Life Expectancy	20,000 Steps



DRD10E

111

DRD16CE

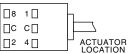
TRUTH TABLES	
Ferminal Identification (view from bottom of the switch)	

10	
С□	VIEW FROM BOTTOM OF THE SWITCH
4 🗆	

□8

□с

□2



NOTE: COMMON TERMINALS ARE CONNECTED INTERNALLY.

10-Po	10-Position, BCD (red actuator)												
Pos.	0	1	2	3	4	5	6	7	8	9			
С	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х			
1		Х		Х		Х		Х		Х			
2			Х	Х			Х	Х					
4					Х	Х	Х	Х					
8									Х	Х			

10-Po	10-Position, BCD Complement (orange actuator)												
Pos.	0	1	2	3	4	5	6	7	8	9			
Ē	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х			
1	Х		Х		Х		Х		Х				
2	Х	Х			Х	Х			Х	Х			
4	Х	Х	Х	Х					Х	Х			
8	Х	Х	Х	Х	Х	Х	Х	Х					

16-Pc	osition	, Hex	adecii	mal (b	lack a	actuat	or)									
Pos.	0	1	2	3	4	5	6	7	8	9	Α	В	C	D	Е	F
С	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	X
1		Х		Х		Х		Х		Х		Х		Х		Х
2			Х	Х			Х	Х			X	Х			Х	X
4					Х	Х	Х	Х					Х	Х	Х	X
8									Х	Х	Х	Х	Х	Х	Х	Х

16-Po	osition	n Hexa	ndecin	nal Co	omple	ment	(white	e actu	ator)							
Pos.	0	1	2	3	4	5	6	7	8	9	А	В	C	D	E	F
Ē	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
1	Х		Х		Х		Х		Х		Х		Х		Х	
2	Х	Х			Х	Х			Х	Х			Х	Х		
4	X	X	Х	X					X	X	Х	Х				
8	Х	Х	Х	Х	Х	Х	Х	Х								

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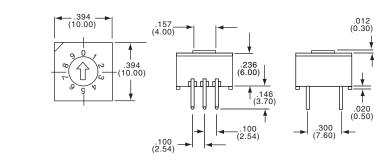
Electronics

DRD "E" Series

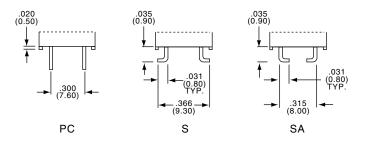
### Rotary DIP Switches, Process Sealed, Through Hole and Surface Mount

### "D" FLUSH ACTUATOR

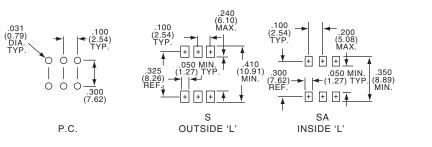
A



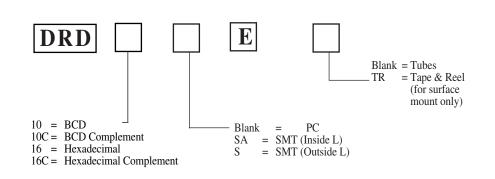
### TERMINATIONS



### LAYOUTS



#### HOW TO ORDER



A24

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Electronics

#### **DR Series**

### Rotary DIP Switches, Unsealed, Through Hole, Straight and Right-Angle

#### FEATURES:

- High pressure contacts (140K PSI) provide 20,000 Steps.
- Unique design utilizes high pressure pin-point sliding contacts to penetrate contaminants on contact surface.
- · Terminals insert molded into base.

#### MATERIAL SPECIFICATIONS:

Contacts	Gold flashed copper alloy
Terminals	Tin Lead Plated
Base, Rotor, Case	Polyester

#### TYPICAL PERFORMANCE CHARACTERISTICS:

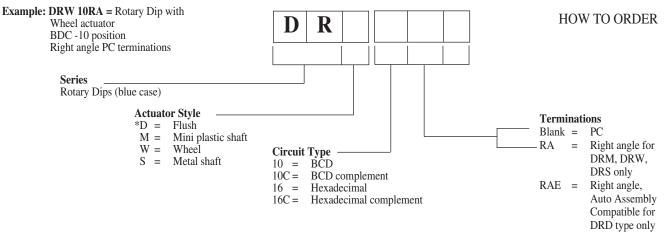


- Screwdriver, knob and shaft (plastic and steel) type actuators available in both upright and right angle versions.
- 10 And 16 position versions with both real and complement codes.

Note: Common terminals connected internally.

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature22°F to +185°F (-30°C to +85°C) Storage Temperature49°F to +212°F (-45°C to + 100°C)
Vibration ResistanceSubjected to vibration of 10-55hz per second with a total amplitude of .06 in. in 3 mutually perpendicular directions for 2 hours each
Shock ResistanceWill withstand 50G acceleration in 3 different planes for a period of 11 milliseconds
Salt Spray TestWithstands an atmosphere of 5% salt water at temperature of 50°C
Hydrogen Sulfide TestWithstands an atmosphere of 15-20 PPM hydrogen sulfide gas at temperature of 40°C for 240 hours
Atmosphere TestWithstands an atmosphere of 30-50 PPM sulfide gas at a temperature of 40°C for 240 hours
Solder Heat ResistanceWithstands 5 sec. flow solder bath of 260°C when mounted on a .06" thick PC board per MIL-STD 202, Method 210



\*DRD Available in RAE version only. For PC or SMT versions, see Pg. A24 DRD "E" Process Sealed Product.

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UK: 44-141-810-8967

Electronics

**DR Series** 

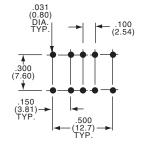
(2.54) TYP

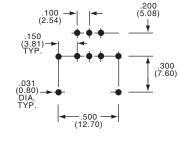
PC **RIGHT ANGLE** 

### Rotary DIP Switches, Unsealed, Through Hole, Straight and Right-Angle

.300 (7.60)

### FOOTPRINTS





S STYLE RA

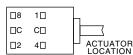
(METAL SHAFT)

S STYLE VERTICAL (METAL SHAFT)

#### TRUTH TABLES

**Terminal Identification** (view from bottom of the switch)

□8	10
□c	СП
□2	4 🗆



80

PC

.200 (5.08)

10-Pc	osition	n, BCI	) (red	actua	tor)					
Pos.	0	1	2	3	4	5	6	7	8	9
С	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
1		Х		Х		Х		Х		Х
2			Х	Х			Х	Х		
4					Х	Х	Х	Х		
8									Х	Х

# 16-Position, Hexadecimal (black actuator)

		, ·					· /									
Pos.	0	1	2	3	4	5	6	7	8	9	Α	В	С	D	Е	F
С	Х	Х	Х	Х	Х	X	Х	Х	Х	X	X	Х	Х	Х	Х	X
1		Х		Х		X		Х		X		Х		Х		X
2			Х	Х			Х	Х			X	Х			Х	X
4					Х	X	Х	Х					Х	Х	Х	X
8									Х	Х	Х	Х	Х	Х	Х	X

#### 16-Position Hexadecimal Complement (white actuator)

10-10	5311101	ппсла	uttin		mpic	ment	("1114	uctu								
Pos.	0	1	2	3	4	5	6	7	8	9	А	В	С	D	Е	F
C	X	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
ī	Х		Х		Х		Х		Х		Х		Х		Х	
2	X	Х			Х	Х			Х	Х			Х	Х		
4	Х	Х	Х	Х					Х	Х	Х	Х				
8	Х	Х	Х	Х	Х	Х	Х	Х								

A

**DR Series** 

#### 10-Position, BCD Complement (orange actuator)

Pos.	0	1	2	3	4	5	6	7	8	9
Ē	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
1	Х		Х		Х		Х		Х	
2	Х	Х			Х	Х			Х	Х
4	Х	Х	Х	Х					Х	Х
8	Х	Х	Х	Х	Х	Х	Х	Х		

A26

Catalog 1308390 Issued 9-04

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Dimensions are shown for reference purposes only. Specifications subject

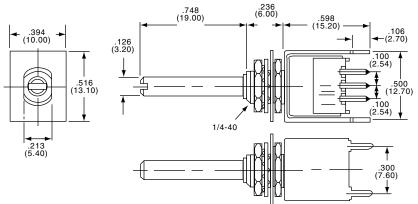


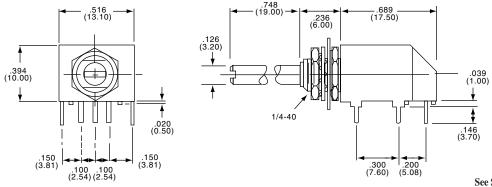
**DR Series** 

# Alcoswitch

# Rotary DIP Switches, Unsealed, Through Hole, Metal Shaft or Wheel Actuator

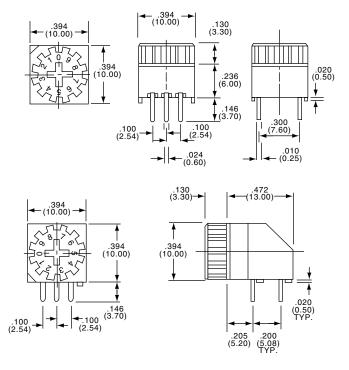
"S" METAL SHAFT ACTUATOR





See Section K for knob selection

### "W" WHEEL ACTUATOR



Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. Dimension Specification to change.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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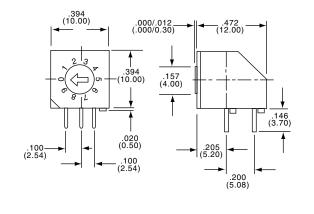
**DR Series** 

Actuator

# Alcoswitch

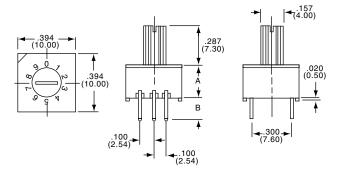
A

"D" FLUSH ACTUATOR

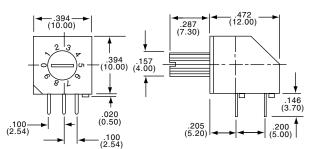


DIM.	DR	RC, *RA, RR
А	.236 (6.00)	.256 (6.50)
В	.146 (3.70)	.126 (3.20)

### "M" MINI-SHAFT ACTUATOR



Rotary DIP Switches, Unsealed, Through-Hole, Flush and Mini Shaft



DIM.	DR	RR
А	.236 (6.00)	.256 (6.50)
В	.146 (3.70)	.126 (3.20)

**DR** Series

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are shown for reference purposes only. Specifications subject

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Slide Switches

# Alcoswitch



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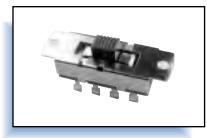
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MHS Series - Page B31



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Catalog 1308390 Issued 9-04

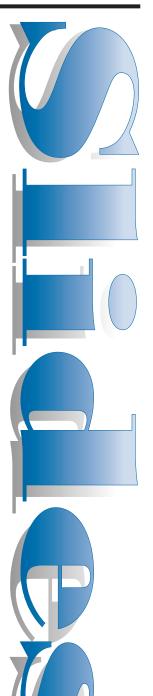
Dimensions are in inches www.tycoelectronics.com

Dimensions are shown for and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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Slide Switches

Electronics

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ASF22RGL ASF22RGS ASF22RL ASF22RL ASF22RS ASF42C ASF42G ASF42GL ASF42GS ASF42GS ASF42RC ASF42RG ASF42RG ASF42RGL ASF42RGL ASF42RGL ASF42RGS ASF42RS ASF42RS ASF42RS ASF42S ASF43 ASF43G	B8 B9 B9 B9 B9 B8 B8 B8 B8 B8 B8 B8 B8 B8 B8 B8 B8 B8
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MHS133KA MHS222	
MUS2222	B33
MHS222G	B33
MHS222GR	AB33 AB34 B33 GB33
MHS222K	B33
MHS222KG	B33
MHS222RA	B34
MHS223	B33
MHS223G	B33
MHS223GR	AB34
MUS2230K	D22
MUS222K	B33 B33
MHS223KG	ГВээ
MHS223RA	B34
MHS233	B33
MHS233G	B33
MHS233GR	AB34
MHS233K	B33
MHS233KG	B33
MHS233RA	B34
MLL1200S	B47
MLL1200ST	FRB47 B47
MLL1300S	B47
MMS12	B36
	B36
1111102221	
MMS23	B36
MMS23	B36
MMS23R	B36 B36
MMS23R	B36 B36 B37
MMS23R MMS42 MMS42R	B36 B36 B37 B37
MMS23R MMS42 MMS42R MMS43	
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MMS23R MMS42 MMS42R MMS43R MMS43R MSS1200	
MMS23R MMS42 MMS42R MMS43R MSS1200 MSS1200G	B36 B36 B37 B37 B37 B37 B37 B20 B20 B20
MMS23R MMS42 MMS42R MMS43R MSS1200 MSS1200R MSS1200R	B36 B37 B37 B37 B37 B37 B37 B20 B20 B20 B20 B20
MMS23R MMS42 MMS42R MMS43R MSS1200 MSS1200R MSS1200R	B36 B37 B37 B37 B37 B37 B37 B20 B20 B20 B20 B20
MMS23R MMS42 MMS42R MMS43R MSS1200 MSS1200R MSS1200R	B36 B37 B37 B37 B37 B37 B37 B20 B20 B20 B20 B20
MMS23R MMS42 MMS42R MMS43R MSS1200 MSS1200G MSS1200R MSS1200R MSS1200R MSS1200R	B36 B37 B37 B37 B37 B20 B20 B20 G B20 B20 B20 B20 B20 B20 B20 B20 B20 B20
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MMS23R MMS42 MMS42R MMS43R MSS12000 MSS1200R MSS1200R MSS13000 MSS1300G MSS1300R MSS1300RC	B36 B37 B37 B37 B37 B20 B20 B20 B20 B20 B20 B20 B20 B20 B20
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MMS23R MMS42 MMS42R MMS43R MSS12000 MSS1200R MSS1200R MSS13000 MSS1300R MSS1300R MSS1300R MSS1300R MSS14000 MSS1400G MSS2225	B36 B37 B37 B37 B37 B37 B20 B20 B20 B20 B20 B20 B20 B20 B20 B20
MMS23R MMS42 MMS42R MMS43R MSS1200G MSS1200R. MSS1200R MSS1200R MSS1200R MSS1300G. MSS1300G MSS1300R MSS1300C MSS1400C MSS14000 MSS14000 MSS1400 MSS1400 MSS12225 MSS22255	B36 B37 B37 B37 B37 B37 B20 B20 B20 B20 B20 B20 B20 B20 B20 B20
MMS23R MMS42 MMS42 MMS43R MSS12000 MSS1200R MSS1200R MSS1200R MSS1300R MSS1300R MSS1300R MSS1300R MSS1300R MSS1400G MSS1400G MSS2225 MSS22250	B36 B37 B37 B37 B37 B37 B37 B20 B20 B20 B20 B20 B20 B20 B20 B20 B20
MMS23R., MMS42 MMS42R., MMS43R., MSS12000, MSS12000, MSS1200R MSS1200R MSS1300G MSS1300G MSS1300R MSS1300R MSS14000, MSS1400, MSS1400, MSS1400, MSS1400, MSS1400, MSS2225, MSS2225G MSS2250G	B36 B37 B37 B37 B37 B20 B20 B20 B20 B20 B20 B20 B20 B20 B20
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MMS23R., MMS42 MMS42 MMS42R MS42R MS1200G MS51200G MS51200R MS51200R MS51300G MS51300G MS51300R MS51300R MS51400 MS51400 MS51400 MS51400 MS52250R MS5200R MS52250R MS5227 MS52250R MS52250R MS5250R MS5250R	B36 B37 B37 B37 B37 B20 B20 B20 B20 B20 B20 B20 B20 B20 B20
MMS23R MMS42 MMS42 MMS42R MMS43R MSS12000 MSS12000 MSS1200R MSS1200R MSS1200R MSS1200R MSS1200R MSS1300R MSS1300R MSS1300R MSS1300R MSS1300R MSS1400G MSS1400G MSS1400G MSS1400G MSS2250R MSS2250R MSS2250R MSS2250R MSS2250R MSS2250R MSS2250R MSS2250R MSS4200R MSS4200R MSS4200R MSS4200R MSS4200R MSS4300 MSS4300 MSS4300 MSS4300	B36 B37 B37 B37 B37 B20 B20 B20 B20 B20 B20 B20 B20 B20 B20
MMS23R MMS42 MMS42 MMS42R MMS43R MSS12000 MSS12000 MSS1200R MSS1200R MSS1200R MSS1200R MSS1200R MSS1200R MSS1300R MSS1300R MSS1300R MSS1400 MSS1400 MSS2250 MSS2250R MSS2250R MSS2250R MSS2250R MSS2250R MSS2250R MSS2250R MSS2250R MSS2250R MSS2250R MSS4200R MSS4200R MSS4200R MSS4300 MSS4300R MSS4300R	B36 B37 B37 B37 B37 B37 B20 B20 B20 B20 B20 B20 B20 B20 B20 B20
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MMS23R MMS42 MMS42 MMS42R MMS43R MS1200G MSS1200R MSS1200R MSS1200R MSS1300G MSS1300G MSS1300R MSS1300R MSS1300R MSS1300R MSS1300R MSS1300R MSS14000. MSS1400. MSS1400. MSS2250 MSS2250R MSS2300R MSS4300R MSS4300R MSS4300R MSS4300R MSS4350R	B36 B37 B37 B37 B37 B20 B20 B20 B20 B20 B20 B20 B20 B20 B20
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MMS23R., MMS42 MMS42 MMS42 MMS42R MS42R MS1200C MS51200C MS51200C MS51200R MS51200R MS51300C MS51300C MS51300C MS51300C MS51400 MS51400 MS51400 MS51400 MS52250C MS52250C MS52250C MS52250C MS52250C MS52250C MS52250C MS54200C MS54200C MS54200C MS54200C MS54300C MS54300C MS54300C MS543350C MS54350C MS56200 MS56250 MS56350C MS56350C MS56350C	B36 B37 B37 B37 B37 B20 B20 B20 B20 B20 B20 B20 B20 B20 B20
MMS23R., MMS42 MMS42 MMS42 MMS42R MS42R MS1200C MS51200C MS51200C MS51200R MS51200R MS51300C MS51300C MS51300C MS51300C MS51400 MS51400 MS51400 MS51400 MS52250C MS52250C MS52250C MS52250C MS52250C MS52250C MS52250C MS54200C MS54200C MS54200C MS54200C MS54300C MS54300C MS54300C MS543350C MS54350C MS56200 MS56250 MS56350C MS56350C MS56350C	B36 B37 B37 B37 B37 B37 B20 B20 B20 B20 B20 B20 B20 B20 B20 B20

MSSA101DG         B31           MSSA101EG         B31           MSSA101EG         B31           MSSA101EG         B31           MSSA104D         B31           MSSA104D         B31           MSSA104D         B31           MSSA104DRA         B32           MSSA104ERA         B32           MSSA114D         B30           MSSA114D         B30           MSSA114D         B30           MSSA114D         B30           MSSA1350G         B26           MSSA1350R         B26           MSSA1450         B26           MSSA1450         B26           MSSA1450R         B26           MSSA201NGRA         B32           MSSA201PGRA         B32           MSSA204PI         B31           MSSA204PI         B31           MSSA2300         B27           MSSA2350R		
MSSA101EGRA         B32           MSSA101EGRA         B32           MSSA101EGRA         B32           MSSA104D         B31           MSSA104D1         B31           MSSA104ERA         B32           MSSA104ERA         B32           MSSA104ERA         B32           MSSA111DG         B30           MSSA114E         B30           MSSA114E         B30           MSSA1350G         B26           MSSA1350R         B26           MSSA1350R         B26           MSSA1450         B26           MSSA1450         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA201PIGRA         B32           MSSA201PGRA         B32           MSSA204PI         B31           MSSA204PI         B31           MSSA204PI         B31           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA3350R         B28           MSSA	MSSA101DG	B31
MSSA101EGRA         B32           MSSA104D         B31           MSSA104D         B31           MSSA104DRA         B32           MSSA104E         B31           MSSA104E         B32           MSSA111EG         B30           MSSA111EG         B30           MSSA114D         B30           MSSA114D         B30           MSSA114D         B30           MSSA114D         B30           MSSA1350R         B26           MSSA1350R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA201NGRA         B32           MSSA204NRA         B31           MSSA204NRA         B32           MSSA204NRA         B32           MSSA211NG         B30           MSSA2350         B27           MSSA2350R         B27           MS	MSSA101DGRA	B32
MSSA104D         B31           MSSA104DRA         B32           MSSA104DRA         B32           MSSA104E         B31           MSSA104E         B31           MSSA111DG         B30           MSSA111DG         B30           MSSA114D         B30           MSSA114D         B30           MSSA1350         B26           MSSA1350R         B26           MSSA1450         B26           MSSA1450         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA201NGRA         B32           MSSA201NGRA         B32           MSSA204N         B31           MSSA204N         B31           MSSA204N         B31           MSSA204N         B31           MSSA204N         B32           MSSA214N         B30           MSSA214N         B30           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R	MSSA101EG	B31
MSSA104D1         B31           MSSA104DRA         B32           MSSA104ERA         B32           MSSA111DG         B30           MSSA111DG         B30           MSSA111DG         B30           MSSA111DG         B30           MSSA114D         B30           MSSA114D         B30           MSSA1350R         B26           MSSA1350R         B26           MSSA1450G         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA201NGRA         B32           MSSA201NGRA         B32           MSSA204N         B31           MSSA204N         B31           MSSA204NRA         B32           MSSA214N         B32           MSSA214N         B33           MSSA214N         B33           MSSA214N         B32           MSSA214N         B32           MSSA214N         B32           MSSA214N         B33           MSSA3250         B27           MSSA3250         B27           MSSA3250         B27           MSSA3350R	MSSA10IEGKA	
MSSA104DRA         B32           MSSA104ERA         B32           MSSA104ERA         B32           MSSA111DG         B30           MSSA111EG         B30           MSSA114D         B30           MSSA114D         B30           MSSA114D         B30           MSSA1350G         B26           MSSA1350R         B26           MSSA1450         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA201NGRA         B32           MSSA204N1         B31           MSSA204N1         B31           MSSA204N1         B31           MSSA204N1         B30           MSSA211NG         B30           MSSA2350G         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450R         B27           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450R <td>MSSA104D1</td> <td></td>	MSSA104D1	
MSSA104E         B31           MSSA111DG         B30           MSSA111EG         B30           MSSA114D         B30           MSSA114E         B30           MSSA1350         B26           MSSA1350R         B26           MSSA1350R         B26           MSSA1350R         B26           MSSA1450         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA201PGRA         B32           MSSA201PGRA         B32           MSSA204PI         B31           MSSA204PI         B31           MSSA204PI         B30           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450R         B27           MSSA2350R         B27           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450R	MSSA104DRA	B32
MSSA1111EG         B30           MSSA111EG         B30           MSSA114D         B30           MSSA114D         B30           MSSA11350         B26           MSSA1350R         B26           MSSA1350R         B26           MSSA1350R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA201NGRA         B32           MSSA201PGRA         B32           MSSA204NR         B31           MSSA204NR         B31           MSSA204NR         B32           MSSA204NR         B32           MSSA204NR         B30           MSSA211NG         B30           MSSA2350         B27           MSSA2350R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA350G         B28           MSSA350G         B28           MSSA3350R         B28           MSSA3350R <td>MSSA104E</td> <td>B31</td>	MSSA104E	B31
MSSA111EG         B30           MSSA114D         B30           MSSA114E         B30           MSSA1350         B26           MSSA1350R         B26           MSSA1350R         B26           MSSA1350R         B26           MSSA1350R         B26           MSSA1450G         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA201NGRA         B32           MSSA201NGRA         B32           MSSA204N1         B31           MSSA204N1         B31           MSSA204NRA         B32           MSSA204NRA         B32           MSSA214N         B30           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450R </td <td>MSSA104ERA</td> <td>B32</td>	MSSA104ERA	B32
MSSA114D         B30           MSSA11350         B26           MSSA1350RG         B26           MSSA1350RG         B26           MSSA1350RG         B26           MSSA1450R         B26           MSSA201PGRA         B32           MSSA204PNA         B31           MSSA204PRA         B32           MSSA204PRA         B32           MSSA204PRA         B32           MSSA2350         B27           MSSA2350         B27           MSSA2350R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450R         B28           MSSA345	MSSAILIDG	B30 B20
MSSA114E         B30           MSSA1350G         B26           MSSA1350R         B26           MSSA1350R         B26           MSSA1350R         B26           MSSA1450         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA201NGRA         B32           MSSA201PGRA         B32           MSSA204N1         B31           MSSA204NR         B32           MSSA204NR         B32           MSSA204NR         B32           MSSA211NG         B30           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450         B27           MSSA2450         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA350R         B28           MSSA350R         B28           MSSA350R         B28           MSSA350R         B28           MSSA350R         B28           MSSA3450R         B28           MSSA3450R	MSSATTEC	B30
MSSA1350         B26           MSSA1350R         B26           MSSA1350R         B26           MSSA1350R         B26           MSSA1350R         B26           MSSA1450         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA201NGRA         B32           MSSA201NGRA         B32           MSSA204N         B31           MSSA204N         B31           MSSA204N         B32           MSSA204N         B32           MSSA204PI         B33           MSSA204PI         B33           MSSA214N         B30           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450G         B27           MSSA2450R         B27           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450R         B29           MSSA4350R	MSSA114D	B30
MSSA1350RG         B26           MSSA1450G         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA201NGRA         B32           MSSA201NGRA         B32           MSSA201NGRA         B32           MSSA201NGRA         B32           MSSA204N1         B31           MSSA204NRA         B32           MSSA204PI         B31           MSSA204PRA         B32           MSSA214N         B30           MSSA214N         B30           MSSA2350         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450G         B27           MSSA2450G         B27           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA4350R         B29           MSSA4350R         B29           MSSA4	MSSA1350	B26
MSSA1350RG         B26           MSSA1450G         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA1450R         B26           MSSA201NGRA         B32           MSSA201NGRA         B32           MSSA201NGRA         B32           MSSA201NGRA         B32           MSSA204N1         B31           MSSA204NRA         B32           MSSA204PI         B31           MSSA204PRA         B32           MSSA214N         B30           MSSA214N         B30           MSSA2350         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450G         B27           MSSA2450G         B27           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA4350R         B29           MSSA4350R         B29           MSSA4	MSSA1350G	B26
MSSA1450         B26           MSSA1450R         B26           MSSA1450RG         B26           MSSA201NGRA         B32           MSSA201NGRA         B32           MSSA201PGRA         B32           MSSA201PGRA         B32           MSSA201PGRA         B32           MSSA201PGRA         B32           MSSA204N1         B31           MSSA204PRA         B32           MSSA204PRA         B32           MSSA204PRA         B32           MSSA21NG         B37           MSSA21NG         B37           MSSA2350         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA350G         B28           MSSA350R		
MSSA1450G         B26           MSSA1450RG         B26           MSSA201PGRA         B32           MSSA201PGRA         B32           MSSA201PGRA         B32           MSSA201PGRA         B32           MSSA204N1         B31           MSSA204NRA         B32           MSSA204PI         B31           MSSA204PRA         B32           MSSA211NG         B30           MSSA2350         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450         B27           MSSA2450         B27           MSSA2450         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA350R         B28           MSSA4350         B29           MSSA4350R         B29           MSSA4350R		B20
MSSA1450RG         B26           MSSA201NGRA         B32           MSSA201PGRA         B32           MSSA201PGRA         B32           MSSA201PGRA         B32           MSSA204N1         B31           MSSA204NRA         B32           MSSA204PRA         B32           MSSA204PRA         B32           MSSA204PRA         B32           MSSA21NG         B30           MSSA2350         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA350G         B28           MSSA350G         B28           MSSA350G         B28           MSSA350G         B28           MSSA350G         B28           MSSA350R         B28           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350	MSSA1450 MSSA1450G	B20 B26
MSSA1450RG         B26           MSSA201NGRA         B32           MSSA201PGRA         B32           MSSA201PGRA         B32           MSSA201PGRA         B32           MSSA204N1         B31           MSSA204NRA         B32           MSSA204PRA         B32           MSSA204PRA         B32           MSSA204PRA         B32           MSSA21NG         B30           MSSA2350         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA350G         B28           MSSA350G         B28           MSSA350G         B28           MSSA350G         B28           MSSA350G         B28           MSSA350R         B28           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350	MSSA1450R	B26
MSSA201PGRA         B32           MSSA201PGRA         B32           MSSA201PGRA         B32           MSSA204N1         B31           MSSA204NRA         B32           MSSA204NRA         B32           MSSA204PL         B31           MSSA204PRA         B32           MSSA211NG         B30           MSSA211NG         B30           MSSA2350G         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450         B27           MSSA2450         B27           MSSA2450         B27           MSSA2450         B27           MSSA2450         B27           MSSA2450         B27           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450         B28           MSSA3450         B28           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R         B29           MSSA4450R <td>MSSA1450RG</td> <td>B26</td>	MSSA1450RG	B26
MSSA204N         B31           MSSA204NRA         B31           MSSA204NRA         B32           MSSA204PI         B31           MSSA204PRA         B32           MSSA21ING         B30           MSSA21ING         B30           MSSA21ING         B30           MSSA21ING         B30           MSSA21NG         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450         B27           MSSA2450         B27           MSSA2450         B27           MSSA2450         B27           MSSA2450         B27           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450         B28           MSSA3450R         B28           MSSA3450R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R	M55A201NGKA	D32
MSSA204NI         B31           MSSA204NRA         B32           MSSA204PI         B31           MSSA204PI         B31           MSSA204PI         B32           MSSA211NG         B30           MSSA211NG         B30           MSSA211NG         B30           MSSA211NG         B30           MSSA2350G         B27           MSSA2350R         B27           MSSA2450         B27           MSSA2450         B27           MSSA2450G         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA350R         B28           MSSA350R         B28           MSSA350R         B28           MSSA350R         B28           MSSA350R         B28           MSSA3450R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R	MSSA201PGRA	B32
MSSA204NRA         B32           MSSA204PRA         B32           MSSA204PRA         B32           MSSA211NG         B30           MSSA211NG         B30           MSSA211NG         B30           MSSA211NG         B30           MSSA2350         B27           MSSA2350R         B27           MSSA2350RG         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA350         B28           MSSA350         B28           MSSA350         B28           MSSA350R         B28           MSSA3450R         B28           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           SIDGPC         B12           SIEGPC	MSSA204N	B31 D21
MSSA2044PRA         B32           MSSA211NG         B30           MSSA214N         B30           MSSA2150         B27           MSSA2350G         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA350R         B28           MSSA350R         B28           MSSA350R         B28           MSSA350R         B28           MSSA350R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           SSA4450R         B29           MSSA4450R         B29           SSA4450R	MSSA204NT	B32
MSSA2044PRA         B32           MSSA211NG         B30           MSSA214N         B30           MSSA2150         B27           MSSA2350G         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA350R         B28           MSSA350R         B28           MSSA350R         B28           MSSA350R         B28           MSSA350R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           SSA4450R         B29           MSSA4450R         B29           SSA4450R	MSSA204P1	B31
MSSA214N         B30           MSSA2350G         B27           MSSA2350G         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2350R         B27           MSSA2450         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA350C         B28           MSSA350G         B28           MSSA350G         B28           MSSA350R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA4350R         B28           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R	MSSA204PRA	B32
MSSA2350         B27           MSSA2350G         B27           MSSA2350RG         B27           MSSA2350RG         B27           MSSA2450G         B27           MSSA2450G         B27           MSSA2450G         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA350         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA4350R         B28           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R		B30
MSSA2350R         B27           MSSA2350RG         B27           MSSA2450         B27           MSSA2450RG         B27           MSSA2450RG         B27           MSSA2450RG         B27           MSSA2450RG         B27           MSSA3350G         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R         B29           MSSA4450R<	MSSA214N	B30
MSSA2350R         B27           MSSA2350RG         B27           MSSA2450         B27           MSSA2450RG         B27           MSSA2450RG         B27           MSSA2450RG         B27           MSSA2450RG         B27           MSSA3350G         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R         B29           MSSA4450R<	MSSA2350	B27
MSSA2450         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450RG         B27           MSSA350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA350R         B28           MSSA350R         B28           MSSA350R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R         B29           SDGPC         B12           SDEGRA         <	MSSA23500	B27 B27
MSSA2450         B27           MSSA2450G         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA2450R         B27           MSSA350G         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA350G         B28           MSSA3450         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA4350G         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450         B29           MSSA4450R         B29           MSSA4450R         B29           SIDGPC         B12           SIDGPC         B12           SIDGPC         B12           SIDGPC         B12           SIDGPC         B12           SID240RA8         B17           SD1240RA8         B17           SD1340RA0         B17           SD1340RA0         B17           SD2340RA8         B17 <td>MSSA2350RG</td> <td>B27</td>	MSSA2350RG	B27
MSSA2450G         B27           MSSA2450RG         B27           MSSA3350         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R         B29           MSA4450R         B29           MSA4450R         B29           MSA4450R         B29           SE1DGPC	MSSA2450	B27
MSSA2450RG         B27           MSSA3350G         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA3450R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R         B29           SIDGPC         B12           SIDGRA         B12           SUBGPC         B12           SUBGRA         B12           SUBGRA         B12           SUBGRA         B12           SUBGRA         B17           SDS1240RA8         B17           SDS1340RA8         B17<	MSSA2450G	B27
MSSA3350         B28           MSSA3350G         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3350R         B28           MSSA3450         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA450R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           SIDGPC         B12           SIDGRA         B12           SIDGRA         B12           SIDGPC         B12           SDGRA         B12           SDGPC         B12           SDGRA         B12           SDGPC         B12           SDS1240RA0         B17           SDS1340RA8         B17           SD1340RA8         B17           SD1340RA8         B17           SD1340RA8         B17           SD1340RA8         B17 </td <td></td> <td>B27</td>		B27
MSSA3350R         B28           MSSA3350RG         B28           MSSA3450         B28           MSSA3450R         B28           MSSA3450RG         B28           MSSA3450RG         B28           MSSA3450RG         B28           MSSA3450RG         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R         B29           SIDGPC         B12           SIDGPC         B12           SUGPC         B12           SUGPC         B12           SUGPC         B12           SUGPC         B12           SUGPC         B12           SUBA4450RA8         B17           SD1240RA8         B17 <td>MSSA2450KG</td> <td>B2/ D20</td>	MSSA2450KG	B2/ D20
MSSA3350R         B28           MSSA3350RG         B28           MSSA3450         B28           MSSA3450R         B28           MSSA3450RG         B28           MSSA3450RG         B28           MSSA3450RG         B28           MSSA3450RG         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450R         B29           SIDGPC         B12           SIDGPC         B12           SUGPC         B12           SUGPC         B12           SUGPC         B12           SUGPC         B12           SUGPC         B12           SUBA4450RA8         B17           SD1240RA8         B17 <td>MSSA3350G</td> <td>B28</td>	MSSA3350G	B28
MSSA3350RG         B28           MSSA3450G         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA3450R         B28           MSSA3450R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350RG         B29           MSSA4450R         B29           MSA4450R         B29           SUBGPC         B12           SIDGPC         B12           SIDGRA         B12           SUBGRA         B12           SDS1240RA0         B17           SD1340RA8         B17           SD1340RA8         B17           SD1340RA8	MSSA3350R	B28
MSSA3450G         B28           MSSA3450RG         B28           MSSA3450RG         B28           MSSA3450RG         B29           MSSA4350G         B29           MSSA4350RG         B29           MSSA4350RG         B29           MSSA4350RG         B29           MSSA4450R         B29           SIDGPC         B12           SIDGRA         B12           S2DGRA         B12           S2DGRA         B12           SDS1240RA8         B17           SDS1240RA8         B17           SDS1340RA0         B17           SDS2240RA8         B17           SDS1240RA8         B17           SE1DGRA	MSSA3350RG	B28
MSSA3450R         B28           MSSA3450RG         B28           MSSA4350         B29           MSSA4350R         B29           MSSA4350RG         B29           MSSA4350RG         B29           MSSA4350RG         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           SIDGPC         B12           SIDGRA         B12           SIEGPC         B12           SUBGPC         B17           SDS140RA8         B17	MSSA3450	B28
MSSA3450RG         B28           MSSA4350G         B29           MSSA4350G         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4350R         B29           MSSA4450         B29           MSSA4450         B29           MSSA4450R         B29           MSSA4450RG         B29           MSSA4450RG         B29           SIDGPC         B12           SIEGPA         B12           SUGRA         B12           S2DGRA         B12           SDS1340RA0         B17           SDS1340RA0         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SE1DGPC         B12           SE1DGPC         B12      <		B28
MSSA4350         B29           MSSA4350G         B29           MSSA4350R         B29           MSSA4350RG         B29           MSSA4350RG         B29           MSSA4450         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           SIDGPC         B12           SIDGRA         B12           SUBGPC         B12           SUBGRA         B12           S2DGPC         B12           SDS1240RA         B12           SDS1240RA8         B17           SDS1240RA8         B17           SDS1240RA8         B17           SDS1240RA0         B17           SDS240RA0         B17           SDS240RA0         B17           SDS240RA0         B17           SDS240RA8         B17           SDS240RA8         B17           SDS240RA8         B17           SDS240RA8         B17           SDS240RA8         B17           SDS240RA8         B17           SEIDGPC <td< td=""><td></td><td>B28</td></td<>		B28
MSSA4350G         B29           MSSA4350RG         B29           MSSA4350RG         B29           MSSA4450G         B29           MSSA4450R         B29           SIDGPC         B12           SIDGPC         B12           SUBGPC         B12           SUBGRA         B12           SUBGRA         B12           SUBGRA         B17           SDS1240RA8         B17           SDS1340RA8         B17           SDS2240RA0         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SE1DGPC         B12           SE1DGSMTTR         B11           SE1DGSMTTR	MSSA3450KG MSSA4350	B20 B29
MSSA4350R         B29           MSSA4350RG         B29           MSSA4450         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           MSSA4450R         B29           SIDGPC         B12           SIEGPC         B12           S2DGRA         B12           S2EGPC         B12           S2EGRA         B12           SDS1240RA0         B17           SDS1340RA8         B17           SDS1340RA8         B17           SDS2240RA8         B17           SDS2240RA8         B17           SDS2340RA0         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SELDGPC         B12           SELDGRA         B12           SELDGRA         B12           SELDGRA         B12           SELDGSMT         B11           SELGSMTR         B11           SELGSMTR         B11           SELGSMTR         B11	MSSA4350G	B29
MSSA4450         B29           MSSA4450G         B29           MSSA4450R         B29           MSSA4450R         B29           SIDGPC         B12           SIDGPC         B12           SIEGRA         B12           SIEGPC         B12           S2DGRA         B12           S2DGRA         B12           S2DGRA         B12           S2EGPC         B12           SDS1240RA0         B17           SDS1240RA0         B17           SDS1340RA8         B17           SDS1240RA8         B17           SDS2240RA8         B17           SDS2240RA8         B17           SDS2240RA0         B17           SDS2240RA0         B17           SDS2340RA0         B17           SDS2340RA0         B17           SE1DGRA         B12           SE1DGRA         B12           SE1DGRA         B12           SE1DGRA         B12           SE1GSMTT         B11           SE1GSMT         B11           SE1GGSMT         B11           SE1GSMTR         B11           SE1GSMTR         B11 </td <td>MSSA4350R</td> <td>B29</td>	MSSA4350R	B29
MSSA4450G         B29           MSSA4450RG         B29           SIDGPC         B12           SIDGRA         B12           SIEGRA         B12           SIEGRA         B12           SZEGRA         B12           SDS1240RA0         B17           SDS1340RA8         B17           SDS2240RA8         B17           SDS2340RA8         B17           SE1DGPC         B12           SE1DGRA         B12           SE1DGRA         B12           SE1DGSMTTR         B11           SE1GSMT         B11           SE1GSMT         B11           SE1GSMT         B11           SE1GSMT         B11	MSSA4350RG	B29
MSSA4450R         B29           MSSA4450RG         B29           SIDGPC         B12           SIDGRA         B12           SIDGRA         B12           SIDGRA         B12           SIDGRA         B12           SUBGPC         B12           SUBGRA         B12           S2DGPC         B12           SDS1240RA         B17           SDS1240RA8         B17           SDS1240RA8         B17           SDS1240RA8         B17           SDS1240RA8         B17           SDS2240RA0         B17           SDS2240RA0         B17           SDS2240RA8         B17           SDS2340RA0         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SE1DGPC         B12           SE1DGRA         B12           SE1DGSMTTR         B11           SE1GSMT         B11           SE1GSMT         B11           SE1GSMTT         B11           SE1GSMTT         B11           SE1GSMTTR         B11 <td>MSSA4450</td> <td>B29</td>	MSSA4450	B29
MSSA4450RG         B29           S1DGPC         B12           S1DGRA         B12           S1EGPC         B12           S2DGPC         B12           S2DGPC         B12           S2DGPC         B12           S2EGPC         B12           S2EGPC         B12           SDS1240RA0         B17           SDS1240RA0         B17           SDS1340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SE1DGSMT         B11           SE1DGSMT         B11           SE1DGSMT         B11           SE1DGSMT         B11           SE1GSMT         B11		B29 B20
S1DGPC         B12           S1DGRA         B12           S1EGRA         B12           S1EGRA         B12           S2DGPC         B12           S2DGPC         B12           S2EGRA         B12           S2EGRA         B12           S2EGRA         B12           SDS1240RA0         B17           SDS1240RA0         B17           SDS1240RA8         B17           SDS1240RA8         B17           SDS1240RA8         B17           SDS2240RA0         B17           SDS2240RA0         B17           SDS2340RA0         B12           SEIDGRA         B12           SEIDGSMT         B11           SEICSMT         B11           SEICGSMT         B	MSSA4450RG	B29
S1DGRA         B12           S1EGPC         B12           S1EGRA         B12           S2DGPC         B12           S2DGRA         B12           S2EGPC         B12           SDS1240RA0         B17           SDS1240RA8         B17           SDS1240RA8         B17           SDS1240RA8         B17           SDS1240RA8         B17           SDS1240RA8         B17           SDS1240RA8         B17           SDS2240RA0         B17           SDS2340RA0         B17           SDS2340RA0         B17           SDS2340RA8         B17           SE1DGPC         B12           SE1DGSMTTR         B11           SE1GSMTTR         B11           SE1GSMTTR         B11           SE1GSMTTR <td></td> <td></td>		
S1EGRA         B12           S2DGPC         B12           S2DGRA         B12           S2EGFC         B12           S2EGRA         B12           SDS1240RA0         B17           SDS1240RA8         B17           SDS1240RA8         B17           SDS1340RA8         B17           SDS2240RA0         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SEDGPC         B12           SEIDGRA         B12           SEIDGSMT         B11           SEIDGSMTR         B11           SEIGSMT         B11           SEIGSMT         B11           SEIGSMT         B11           SEIGSMTR         B11           SEIGSMTR         B11           SEIGSMTR         B11           SEIGSMTR         B11           SEIGSMT         B11           SEIGSMT         B11           SEIGSMT         B11           SEIGSMTR         B11           SEIGSMTR         B12 </td <td>SIDGRA</td> <td>B12</td>	SIDGRA	B12
S2DGPC         B12           S2DGRA         B12           S2EGPC         B12           SDS1240RA0         B17           SDS1240RA0         B17           SDS1340RA0         B17           SDS1340RA8         B17           SDS1340RA8         B17           SDS1340RA8         B17           SDS2240RA0         B17           SDS2240RA0         B17           SDS2340RA8         B17           SE1DGSMT         B11           SE1DGSMT         B11           SE1DGSMTR         B11           SE1GSMT         B11           SE1GSMTR         B11           SE1GSMTTR         B11           SE1GSMTTR         B11           SE1GSMTR         B11           SE1GSMTR         B11           SE1GSMTR         B11           SE1GSMT         B11           SE1GSMT         B12           SE2GPC	SIEGPC	B12
S2DGRA         B12           S2EGPC         B12           S2EGRA         B12           SDS1240RA0         B17           SDS1240RA8         B17           SDS1340RA8         B17           SDS1340RA8         B17           SDS2240RA0         B17           SDS2240RA0         B17           SDS2240RA8         B17           SDS2240RA8         B17           SDS2240RA8         B17           SDS2240RA8         B17           SDS2240RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SE1DGPC         B12           SE1DGSMT         B11           SE1DGSMTTR         B11           SE1GSMTT         B11           SE1GSMTR         B11           SE1GSMTT         B11           SE1GSMTT         B11           SE1GSMT         B11           SE1GSMT         B11           SE1GSMT         B11           SE1GSMT         B11           SE1GSMT         B12           SE2DGRA <t< td=""><td></td><td></td></t<>		
S2EGPC         B12           S2EGRA         B12           SDS1240RA0         B17           SDS1240RA0         B17           SDS1240RA0         B17           SDS1340RA8         B17           SDS2240RA0         B17           SDS2240RA0         B17           SDS2240RA0         B17           SDS2240RA8         B17           SDS2340RA8         B17           SDS2340RA0         B17           SDS2340RA0         B17           SDS2340RA0         B17           SDS2340RA0         B17           SDS2340RA0         B12           SEIDGRA         B12           SEIDGSMT         B11           SEIDGSMT         B11           SEIEGSMT         B11           SEIEGSMT         B11           SEIGSMTR         B11           SEIGSMTTR         B11           SE20GPC         B12           SE2EGRA         B		
S2EGRA         B12           SDS1240RA0         B17           SDS1240RA8         B17           SDS1340RA0         B17           SDS1340RA0         B17           SDS1340RA8         B17           SDS2240RA0         B17           SDS2240RA8         B17           SDS2240RA8         B17           SDS2340RA8         B12           SE1DGPC         B12           SE1DGSMT         B11           SE1DGSMTR         B11           SE1GSMT         B11           SE1GSMTR         B11           SE1GSMTTR         B11           SE1GSMTTR         B11           SE20GPC         B12           SE2EGPC         B12           SE2EGPC         B12           SE2EGRA         B12           SE20         B40           SL30         B40           SL50         B40           SL70         B40		
SDS1240RA8         B17           SDS1340RA0         B17           SDS1340RA8         B17           SDS1340RA8         B17           SDS2240RA0         B17           SDS2240RA8         B17           SDS2340RA8         B12           SEIDGRA         B12           SEIDGSMT         B11           SEIEGSMT         B11           SEIEGSMT         B11           SEIGSMT         B11           SEIGSMTR         B11           SEIGSMTTR         B11           SE20GPC         B12           SE2EGRA         B12           SE2EGRA         B12           SE2EGRA         B12           SE2EGRA         B12           SL20         B40           SL30         B40           SL70         B40           SL8120         B41 <td>S2EGRA</td> <td>B12</td>	S2EGRA	B12
SDS1340RA0         B17           SDS1340RA8         B17           SDS2240RA0         B17           SDS2240RA0         B17           SDS2240RA0         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SEDGPC         B12           SEIDGRA         B12           SEIDGSMT         B11           SEIEGSMT         B11           SEIEGSMT         B11           SEIEGSMT         B11           SEIEGSMT         B11           SEIEGSMTR         B11           SE20GPC         B12           SE20GPC         B12           SE20GRA         B12           SE100         B40           SL550         B40		
SDS1340RA8         B17           SDS2240RA0         B17           SDS2340RA0         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SEDGS40RA8         B17           SEDGSMTR         B12           SEIDGRA         B12           SEIDGSMTT         B11           SEIEGRA         B12           SEIEGSMT         B11           SEIOGSMT         B11           SEIOGSMT         B11           SEIOGPC         B12           SE2DGPC         B12           SE2EGRA         B12           SE1000         B40           SL220         B40           SL30         B40           SL70         B40           SL70         B40           SL20         B41           SL20         B41           SL201         B42		B17
SDS2240RA8         B17           SDS2340RA0         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SE1DGPC         B12           SE1DGRA         B12           SE1DGSMT         B11           SE1DGSMTR         B11           SE1EGRA         B12           SE1EGSMT         B11           SE1EGSMT         B11           SE1GSMTR         B11           SE1GSMTR         B11           SE1GSMTR         B11           SE20GPC         B12           SE2DGRA         B12           SE2GPC         B12           SE2GGRA         B12           SE2GGRA         B12           SE2GGRA         B12           SE2GGRA         B12           SE2GGRA         B12           SE2GGRA         B12           SE20         B40           SL330         B40           SL70         B40           SL70         B40           SL810         B41           SL81201         B42	SDS1340RA0	
SDS2240RA8         B17           SDS2340RA0         B17           SDS2340RA8         B17           SDS2340RA8         B17           SDS2340RA8         B17           SE1DGPC         B12           SE1DGRA         B12           SE1DGSMT         B11           SE1DGSMTR         B11           SE1EGRA         B12           SE1EGSMT         B11           SE1EGSMT         B11           SE1GSMTR         B11           SE1GSMTR         B11           SE1GSMTR         B11           SE20GPC         B12           SE2DGRA         B12           SE2GPC         B12           SE2GGRA         B12           SE2GGRA         B12           SE2GGRA         B12           SE2GGRA         B12           SE2GGRA         B12           SE2GGRA         B12           SE20         B40           SL330         B40           SL70         B40           SL70         B40           SL810         B41           SL81201         B42	SDS1340KA8 SDS2240RA0	
SDS2340RA0         B17           SDS2340RA8         B17           SEIDGPC         B12           SEIDGSMT         B11           SEIDGSMT         B11           SEIDGSMTR         B11           SEIEGRA         B12           SEIEGSMT         B11           SE2DGPC         B12           SE2DGPC         B12           SE2EGRA         B12           SE2EGRA         B12           SE2EGRA         B12           SE2EGRA         B12           SE2EGRA         B12           SL200         B40           SL30         B40           SL550         B40           SL660         B40           SL70         B40           SL80         B40           SL1201         B42	SDS2240RA8	B17
SE1DGPC         B12           SE1DGSMT         B11           SE1DGSMTR         B11           SE1DGSMTR         B11           SE1EGGRA         B12           SEIEGRA         B12           SEIEGRA         B12           SEIEGSMT         B11           SEIEGSMTR         B11           SEIEGSMTR         B11           SEIGSMTR         B11           SE2GGPC         B12           SE2EGPC         B12           SE2EGPC         B12           SE2EGRA         B12           SE2EGRA         B12           SE2EGRA         B12           SL20         B40           SL330         B40           SL770         B40           SL70         B40           SL120         B41           SL3120         B41	SDS2340RA0	B17
SEIDGRA         B12           SEIDGSMT         B11           SEIDGSMTR         B11           SEIEGCSMT         B12           SEIEGCSMT         B11           SEIEGSMT         B11           SE2DGPC         B12           SE2EGPC         B12           SE2EGRA         B12           SL1000         B40           SL20         B40           SL50         B40           SL50         B40           SL460         B40           SL70         B40           SL20         B41           SL20         B41           SL201         B42	SDS2340RA8	B17
SEIEGPC         B12           SEIEGPC         B12           SEIEGRA         B12           SEIEGSMT         B11           SEIEGSMT         B11           SEIEGSMT         B11           SEIEGSMT         B11           SEIGSMT         B11           SEIGSMT         B11           SEDGPC         B12           SE2EGRA         B12           SE2EGRA         B12           SE2EGRA         B12           SL20         B40           SL330         B40           SL550         B40           SL660         B40           SL70         B40           SL70         B40           SL20         B41           SL201         B42	SEIDGPC	BI2 D12
SEIEGPC         B12           SEIEGPC         B12           SEIEGRA         B12           SEIEGSMT         B11           SEIEGSMT         B11           SEIEGSMT         B11           SEIEGSMT         B11           SEIGSMT         B11           SEIGSMT         B11           SEDGPC         B12           SE2EGRA         B12           SE2EGRA         B12           SE2EGRA         B12           SL20         B40           SL330         B40           SL550         B40           SL660         B40           SL70         B40           SL70         B40           SL20         B41           SL201         B42	SEIDGRA	B12 B11
SEIEGSMTIR         B11           SEIGSMT         B11           SE2DGPC         B12           SE2DGRA         B12           SE2EGPC         B12           SE2EGRA         B12           SL1000         B40           SL20         B40           SL20         B40           SL330         B40           SL50         B40           SL40         B40           SL51         B40           SL20         B40           SL21         B41           SL21         B41           SLS1201         B42	SEIDGSMT	B11
SEIEGSMTIR         B11           SEIGSMT         B11           SE2DGPC         B12           SE2DGRA         B12           SE2EGPC         B12           SE2EGRA         B12           SL1000         B40           SL20         B40           SL20         B40           SL330         B40           SL50         B40           SL40         B40           SL51         B40           SL20         B40           SL21         B41           SL21         B41           SLS1201         B42	SE1EGPC	B12
SEIEGSMTIR         B11           SEIGSMT         B11           SE2DGPC         B12           SE2DGRA         B12           SE2EGPC         B12           SE2EGRA         B12           SL1000         B40           SL20         B40           SL20         B40           SL330         B40           SL50         B40           SL40         B40           SL51         B40           SL20         B40           SL21         B41           SL21         B41           SLS1201         B42	SE1EGRA	B12
SE1GSMT         B11           SE1GSMTTR         B11           SE2DGPC         B12           SE2DGRA         B12           SE2EGPC         B12           SE2EGRA         B12           SL200         B40           SL30         B40           SL30         B40           SL460         B40           SL30         B40           SL460         B40           SL510         B40           SL460         B40           SL70         B40           SL71         B40           SL20         B40           SL210         B40           SL3120         B41           SL31201         B42	SEIEGSMT	B11
SE1GSMTTR         B11           SE2DGRA         B12           SE2EGPC         B12           SE2EGRA         B12           SL20         B40           SL20         B40           SL30         B40           SL550         B40           SL550         B40           SL550         B40           SL70         B40           SL70         B40           SL70         B40           SL70         B40           SL70         B40           SL70         B40           SL710         B40           SL880         B40           SL8120         B41           SL81201         B42	SEIEGSMIIK	D11
SE2DGPC         B12           SE2DGRA         B12           SE2EGPC         B12           SE2EGRA         B12           SL20         B40           SL30         B40           SL50         B40           SL60         B40           SL40         B40           SL51         B40           SL520         B40           SL50         B40           SL460         B40           SL70         B40           SL70         B40           SL21         B41           SL21         B41           SL21         B42	SEIGSMIT	ын В11
SE2DGRA         B12           SE2EGPC         B12           SE2EGRA         B12           SL1000         B40           SL220         B40           SL330         B40           SL550         B40           SL660         B40           SL70         B40           SL880         B40           SL8120         B41           SL120         B41	SE2DGPC	B12
SE2EGPC         B12           SE2EGRA         B12           SL1000         B40           SL220         B40           SL550         B40           SL550         B40           SL660         B40           SL770         B40           SL880         B40           SL170         B40           SL2120         B41           SL8120         B42	SE2DGRA	B12
SE2EGRA         B12           SL1000         B40           SL220         B40           SL330         B40           SL550         B40           SL660         B40           SL770         B40           SL880         B40           SL170         B40           SL2120         B41           SL2120         B41	SE2EGPC	B12
SL 220         B40           SL 330         B40           SL 550         B40           SL 660         B40           SL 770         B40           SL 880         B40           SL S120         B41           SL S1201         B42	SE2EGRA	B12
SL660         B40           SL770         B40           SL880         B40           SL5120         B41           SLS1201         B42	SL1000	
SL660         B40           SL770         B40           SL880         B40           SL5120         B41           SLS1201         B42	SL220 SL330	
SL660         B40           SL770         B40           SL880         B40           SL5120         B41           SLS1201         B42	SL550	B40
SL770	SL660	B40
SLS120B41 SLS1201B42	SL770	B40
SLS1201B42		

SLS1211
SLS121PCB43 SLS121RAB43
SLS121RA
SLS131RA B44
SLS141PCB44
SLS141RAB44
SLS151PCB44
SLS151RAB44
SLS220B41
SLS2201B42
SLS220PCB40
SLS220FC         B40           SLS230PC         B40           SLS240PCA         B40           SLS250PC         B40           SLS250PC         B40
SLS240PCAB40
SLS250PCB40 SLS260PCB40
SLS2001C
SLSA1201
SLSA220
SLSA2201B42
SSA12B39
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SSA22GB39
SSB12B38
SSB12GB38 SSB12RB38 SSB12RGB38
SSB12RB38
SSB22GB38 SSB22RB38 SSB22RG B38
SSB22RGB38
SSB22RG
SSB42G
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SSJ12RB35
SSJ13B35
STS121PCB13
STS121RAB13
STS1300PCB14
STS1300RAB14
STS131PCB13
STS131RAB13 STS1400PCB14
STS1400PCB14 STS1400RAB14
STS1400KAB14 STS141PCB14
STS141RAB14
STS151PCB15
STS151RAB15
STS161PCB15
STS161RAB15
STS220PCB16
STS2300PCB15
STS230PCB16
STS2400PCB15
STS240PCB16 STS250PCB16
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TSS11DG1PCB18
TSS11DG1RAB19
TSS11DGPCB18
TSS11DGRAB19
TSS11EG1PCB18
TSS11EG1RAB19
TSS11EGPCB18
TSS11EGRAB19
TSS21KG1PCB18
TSS21KGPCB18 TSS21NG1PCB18
TSS21NG1PCB18 TSS21NG1RAB19
TSS21NGPCB18 TSS21NGRAB19
TSS21NGRAB19
TSS21NGRA
TSS21NGRAB19 TSS21PAGRAB19
TSS21NGRA
TSS21NGRA         B19           TSS21PAGRA         B19           TSS21PGIRA         B19           TSS21PGPC         B18           TSS21PGRA         B19           TSS21PGRA         B19           TSS21PGRA         B19           TSS21PGRA         B19           TSS21PGRA         B19
TSS21NGRA         B19           TSS21PAGRA         B19           TSS21PGIRA         B19           TSS21PGPC         B18           TSS21PGRA         B19           TSS21PGPC         B18           TSS21PGRA         B19           TSS41NGPC         B18           TSS41NGPC         B18           TSS41NGRA         B19
TSS21NGRA         B19           TSS21PAGRA         B19           TSS21PGIRA         B19           TSS21PGPC         B18           TSS21PGRA         B19           TSS41NGPC         B18           TSS41NGRA         B19           TSS41NGPC         B18           TSS41NGPA         B19           TSS41NGPA         B19           TSS41NGPA         B19           TSS41NGPA         B19           TSS41NGPA         B19           TS541NGPA         B19           TS541NGPA         B19           TS541NGPA         B19           TS541NGPA         B19           TS541NGPA         B19           TS541NGPA         B19           TS741490         B48
TSS21NGRA         B19           TSS21PAGRA         B19           TSS21PGIRA         B19           TSS21PGPC         B18           TSS21PGRA         B19           TSS21PGPC         B18           TSS21PGRA         B19           TSS41NGPC         B18           TSS41NGPC         B18           TSS41NGRA         B19
TSS21NGRA         B19           TSS21PAGRA         B19           TSS21PGIRA         B19           TSS21PGPC         B18           TSS21PGRA         B19           TSS41NGPC         B18           TSS41NGRA         B19           TSS41NGPC         B18           TSS41NGPA         B19           TSS41NGPA         B19           TSS41NGPA         B19           TSS41NGPA         B19           TSS41NGPA         B19           TS541NGPA         B19           TS541NGPA         B19           TS541NGPA         B19           TS541NGPA         B19           TS541NGPA         B19           TS541NGPA         B19           TS741490         B48

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

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Dimensions are shown for reference purposes only. Specifications subject

tyco

### Slide Switch Selection Guide

PRODUCT LINE FEATURES

- One of the broadest lines in the industry.
- One to six pole configurations.
- Current ratings from 0.4V @ 20VDC to 3A @ 115VAC.
- Miniature and sub-miniature case sizes.

- Gold or silver plating available in most series.
- Wave solderable, washable, and surface mount versions.
- Rocker (butt), shoe and bifurcated contact mechanisms.
- Vertical and RA actuator styles.

CIRCUITRY	SERIES	TERMINATION	CONTACT RATING/PLATING	ACTUATION	LIFE EXPECTANCY
SPST	TSS	P.C.	.4VA/GOLD	STANDARD/FLUSH	80K CYCLES
SPDT	MHS	P.C./RIGHT ANGLE	.4VA/GOLD:300mA/SILVER	STANDARD/BATON	15K CYCLES
	MLL	SURFACE MOUNT	0.3A @ 4 VDC/SILVER	RIGHT ANGLE	10K CYCLES
	MMS	P.C.	100MA/SILVER	STANDARD	10K CYCLES
	MSS	P.C./RIGHT ANGLE	.4VA/GOLD:300MA/SILVER	STANDARD	15K CYCLES
	MSSAH H1	P.C./RIGHT ANGLE	.4VA/GOLD	STANDARD	30K CYCLES
	MSSAH H4	P.C./RIGHT ANGLE	3A/SILVER	STANDARD	30K CYCLES
	SDS	P.C./RIGHT ANGLE	300mA @ 125VAC/SILVER	STANDARD	10K CYCLES
	SE, S	P.C./RIGHT ANGLE/SMT	.4VA/GOLD	STANDARD	6K CYCLES
	SL	P.C.	250mA/SILVER	STANDARD	6K CYCLES
	SLS	P.C./RIGHT ANGLE	250mA/SILVER	STANDARD	6K CYCLES
	SLS/A	P.C.	500mA/SILVER	STANDARD	10K CYCLES
	SSA	P.C.	100mA/SILVER:.4VA/GOLD	STANDARD	10K CYCLES
	SSB	P.C./RIGHT ANGLE	100MA/SILVER:.4VA/GOLD	STANDARD	10K CYCLES
	SSJ	P.C./RIGHT ANGLE	100mA/SILVER	STANDARD	10K CYCLES
	STS	P.C./RIGHT ANGLE	300mA/SILVER	STANDARD	10K CYCLES
	TSS	P.C./RIGHT ANGLE	.4VA/GOLD	STANDARD/FLUSH	60-80K CYCLES
SP3T	MHS	P.C./RIGHT ANGLE	300MA/SILVER:.4VA/GOLD	STANDARD/BATON	15K CYCLES
	MLL	SURFACE MOUNT	0.3A @ 4 VDC/SILVER	RIGHT ANGLE	10K CYCLES
	MSS	P.C./RIGHT ANGLE	300mA/SILVER:.4VA/GOLD	STANDARD	15K CYCLES
	MSSA	P.C./RIGHT ANGLE	300MA/SILVER:.4VA/GOLD	STANDARD	15K CYCLES
	SDS	P.C./RIGHT ANGLE	300mA @ 125VAC/SILVER	STANDARD	10K CYCLES
	SL	P.C.	250mA/SILVER	STANDARD	6K CYCLES
	SLS	P.C./RIGHT ANGLE	250MA/SILVER	STANDARD	6K CYCLES
	SSJ	P.C.	100mA/SILVER	STANDARD	10K CYCLES
	STS	P.C./RIGHT ANGLE	300mA/SILVER	STANDARD	10K CYCLES
SP4T	MSS	P.C.	300mA/SILVER:.4VA/GOLD	STANDARD	15K CYCLES
0	MSSA	P.C./RIGHT ANGLE	300mA/SILVER:.4VA/GOLD	STANDARD	15K CYCLES
	SLS	P.C./RIGHT ANGLE	250mA/SILVER	STANDARD	6K CYCLES
	STS	P.C./RIGHT ANGLE	300mA/SILVER	STANDARD	10K CYCLES
SP5T	SL	P.C.	250mA/SILVER	STANDARD	6K CYCLES
01 01	SLS	P.C./RIGHT ANGLE	250mA/SILVER	STANDARD	6K CYCLES
	STS	P.C./RIGHT ANGLE	300mA/SILVER	STANDARD	10K CYCLES
SP6T	SL	P.C.	250mA/SILVER	STANDARD	6K CYCLES
01 01	STS	P.C./RIGHT ANGLE	300mA/SILVER	STANDARD	10K CYCLES
SP7T	SL	P.C.	250mA/SILVER	STANDARD	6K CYCLES
SP8T	SL	P.C.	250mA/SILVER	STANDARD	6K CYCLES
SP10T	SL	P.C.	250mA/SILVER	STANDARD	6K CYCLES
DPST	TSS	P.C.	.4VA/GOLD	STANDARD/FLUSH	80K CYCLES
DPDT	ASE/F	P.C./RIGHT ANGLE/SMT	.4VA/GOLD:300mA SILVER	STANDARD/FLUSH	10K CYCLES
DIDI	CSS	P.C.	300mA/SILVER	BATON	15K CYCLES
	CST	P.C.	300mA/SILVER	BATON	15K CYCLES
	MHS	P.C./RIGHT ANGLE	300mA/SILVER:.4VA/GOLD	STANDARD/BATON	15K CYCLES
	MMS	P.C./RIGHT ANGLE	100mA/SILVER	STANDARD	10K CYCLES
	MSS	P.C./RIGHT ANGLE	300mA/SILVER:.4VA/GOLD	STANDARD	15K CYCLES
	MSSA21	P.C./RIGHT ANGLE	.4VA/GOLD	STANDARD	30K CYCLES
	MOOALI		.+VA GOLD		SURCIOLES

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B

Slide Switches

Slide Switches

### **Slide Switch Selection Guide**

CIRCUITRY	SERIES	TERMINATION	CONTACT RATING/PLATING	ACTUATION	LIFE EXPECTANC
DPDT	1571491	PANEL	6A/SILVER	STANDARD	5K CYCLES
	MSSA2H4	P.C./RIGHT ANGLE	3A/SILVER	STANDARD/FLUSH	30K CYCLES
	SDS	P.C./RIGHT ANGLE	300mA @ 125 VAC/SILVER	STANDARD	10K CYCLES
	SE, S	P.C./RIGHT ANGLE	.4VA/GOLD	STANDARD	10K CYCLES
	SLS	P.C.	250mA/SILVER	STANDARD	6K CYCLES
	SLS/A	P.C.	500mA/SILVER	STANDARD	10K CYCLES
	SLS/A	P.C.	100mA/SILVER:.4VA/GOLD	STANDARD	10K CYCLES
	SSB	P.C./RIGHT ANGLE	100mA/SILVER:/4VA/GOLD	STANDARD	10K CYCLES
	STS	P.C./RIGHT ANGLE	300 mA/SILVER	STANDARD	10K CYCLE
	TSS	P.C./RIGHT ANGLE	.4VA/GOLD	STANDARD/FLUSH	60-80K CYCLES
DP3T	1571490	PANEL	13A/SILVER	STANDARD	5K CYCLES
	CST	P.C.	300mA/SILVER	BATON	10K CYCLES
	MHS	P.C./RIGHT ANGLE	300mA/SILVER:.4VA/GOLD	STANDARD/BATON	15KCYCLES
	MMS	P.C./RIGHT ANGLE	100mA/SILVER	STANDARD	10K CYCLES
	MSSA	P.C./RIGHT ANGLE	300mA/SILVER:.4VA/GOLD	STANDARD	15K CYCLES
	SDS	P.C./RIGHT ANGLE	300mA @ 125 VAC	STANDARD	10K CYCLES
	SLS	P.C.	250mA/SILVER	STANDARD	6K CYCLES
	STS	P.C./RIGHT ANGLE	300mA/SILVER	STANDARD	10K CYCLES
DP4T	MSS	P.C.	300mA/SILVER:.4VA/GOLD	STANDARD	15K CYCLES
	MSSA	P.C./RIGHT ANGLE	300mA/SILVER:.4VA/GOLD	STANDARD	15K CYCLES
	SLS	P.C.	250mA/SILVER	STANDARD	6K CYCLES
	STS	P.C./RIGHT ANGLE	300mA/SILVER	STANDARD	10K CYCLES
DP5T	SLS	P.C.	250mA/SILVER	STANDARD	6K CYCLES
5.01	STS	P.C./RIGHT ANGLE	300mA/SILVER	STANDARD	10K CYCLES
DP6T	SLS	P.C.	250mA/SILVER	STANDARD	6K CYCLES
DI UI	STS	P.C./RIGHT ANGLE	300mA/SILVER	STANDARD	10K CYCLES
3P3T	MSSA	P.C./RIGHT ANGLE	300mA/SILVER: .4VA/GOLD	STANDARD	15K CYCLES
0101	SSB	P.C.	100mA/SILVER: 4VA/GOLD	STANDARD	10K CYCLES
3P4T	MSSA	P.C./RIGHT ANGLE	300mA/SILVER:.4VA/GOLD	STANDARD	15K CYCLES
4PDT	ASE/F	P.C./RIGHT ANGLE/SMT	300mA/SILVER:.4VA/GOLD	STANDARD/FLUSH	10K CYCLES
	CST	P.C.	300mA/SILVER	BATON	10K CYCLES
	MMS	P.C./RIGHT ANGLE	100mA/SILVER	STANDARD	10K CYCLES
	MSS	P.C./RIGHT ANGLE	300mA/SILVER:.4VA/GOLD	STANDARD	15K CYCLES
	SSB	P.C.	100mA/SILVER:.4VA/GOLD	STANDARD	10K CYCLES
	TSS	P.C./RIGHT ANGLE	.4VA/GOLD	STANDARD	80K CYCLES
4P3T	ASE/F	P.C./RIGHT ANGLE/SMT	300mA/SILVER	STANDARD/FLUSH	10K CYCLES
	CST	P.C.	300mA/SILVER	BATON	10K CYCLES
	MHS	P.C.	300mA/SILVER:.4VA/GOLD	STANDARD	15K CYCLES
	MMS	P.C./RIGHT ANGLE	100mA/SILVER	STANDARD	10K CYCLES
	MSS/MSSA	P.C./RIGHT ANGLE	300mA/SILVER:.4VA/GOLD	STANDARD	15L CYCLES
4P4T	MSSA	P.C./RIGHT ANGLE	300mA/SILVER:.4VA/GOLD	STANDARD	15K CYCLES
6PDT	ASE/F	P.C./RIGHT ANGLE/SMT	300mA/SILVER:.4VA/GOLD	STANDARD/FLUSH	10K CYCLES
	CST	P.C.	300mA/SILVER:.4VA/GOLD	BATON	10K CYCLES
	MSS	P.C.	300mA/SILVER:.4VA/GOLD	STANDARD	15K CYCLES
6P3T	MSS	P.C./RIGHT ANGLE	300mA/SILVER:.4VA/GOLD	STANDARD	15K CYCLES
51 51	10100	1.0./HIGHT ANGLE	SOUTHAUSTEVEN 4VA/GOED	STANDARD	ISK OTOLLS
	ı			1	1

Β4

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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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### Slide Switches, Auto-insertable, Through Hole and Surface Mount

#### FEATURES:

- Unique design allows ASE/F to withstand aqueous or solvent cleaning processes.
- High temperature anti-static plastic construction will withstand most surface mount, vapor phase reflow or wave soldering conditions.
- Three standard types: ASF – DIP package with flush actuator allows auto insertion on standard IC equipment. Standard tape seal and closed case construction provide process seal.

#### MATERIAL SPECIFICATIONS:

Contacts	Gold over nickel or
	Silver over nickel flash
Case Material	PET
Actuator Material	Nylon
Terminal	Copper alloy, terminals tin lead plate (90/10) over nickel

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature	$40^{\circ}$ F to +176°F (-40°C to +80°C)
Storage Temperature	$40^{\circ}$ F to +176°F (-40°C to +80°C)
Solder Heat Resistance	See page M3-M4
Movable Contact	Copper alloy
Terminal Seal	.Insert molded

ASFO–Open ended flush actuator without tape seal.

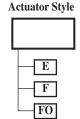
ASE-extended actuator open-ended case allows washout after process cleaning.

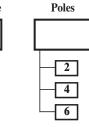
- 2, 4 and 6 pole versions available with top or side actuator.
- Bifurcated double wipe contacts provide dependable, telecom grade switching.
- Industry standard .100 x .300 pin spacing

#### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	.Gold: 0.4 VA @ 20 VDC or peak AC shorting type Silver: 300mA @ 115 VAC 28 VDC
Initial Contact Resistance	.40 Milliohms max.
Insulation Resistance	1,000 Megohms @ 500 VDC min.
Dielectric Strength	.1,000 Volts RMS @ sea level
Contact Timing	Shorting
Life Expectancy	10,000 Cycles
Actuation Force	850g±150grams
Travel	100 ±.010 [2.54±.25]

Series





ASF: Tape seal, closed (sealed) case, flush top actuator.

ASE: Open ended case, extended top or side actuator.

ASFO: Open ended case, flush top or side actuator.



ASE22R



ASF22

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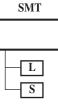
ASE62G



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# PART NUMBERING



Standard actuator color is white.

Options

R

\*\*

E= Extended actuator

Throws

2

\*3

- F= Flush actuator
- FO= Open ended without tape seal G= Gold contacts
- R= Side actuator
- \*3= Throw available in 4 pole only
- L= SMT terminal configuration
- S= SMT terminal reverse L configuration

(Refer to page B10 for pad layout)

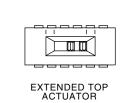
\*\*Flush side actuator "R" versions are supplied with open ended case and without tape seal.

G

Blank = Silver

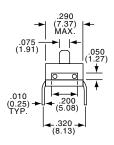
Note: For SPDT requirements, order DPDT version and use either set of contacts for SPDT switching.

### Slide Switches, Extended Actuator, Through Hole and Surface Mount



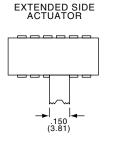
.175	A	.110
(4.44)	.150 - +	(2.79)
.050 (1.27)	++  + -020 .100 (0.51) (2.54) TYP. TYP.	.160 (4.06)

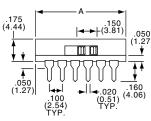
NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.

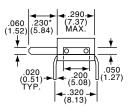


Upright, Through Hole, Extended Actuator

Tyco Electronics	Alcoswitch	Туре	Contact	Dim A
1437581-2	ASE22	DPDT	Silver	.400/10.2
1437581-4	ASE22G	DPDT	Gold	.400/10.2
1-1437581-4	ASE42	4PDT	Silver	.700/17.8
1-1437581-6	ASE42G	4PDT	Gold	.700/17.8
2-1437581-5	ASE43	4P3T	Silver	1.10/27.9
2-1437581-6	ASE43G	4P3T	Gold	1.10/27.9
3-1437581-1	ASE62	6PDT	Silver	1.00/25.4
3-1437581-3	ASE62G	6PDT	Gold	1.00/25.4







\*.105 (2.67) ASE22R, ASE22RG

.110 2.79

NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.

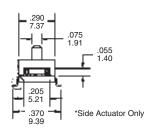
Right Angle,	Through	Hole	Extended	Actuator
Right Angle,	rmougn	more,	Extenueu	Actuator

Tyco Electronics	Alcoswitch	Туре	Contact	Dim A
1437581-8	ASE22R	DPDT	Silver	.400/10.2
1437581-9	ASE22RG	DPDT	Gold	.400/10.2
1-1437581-9	ASE42R	4PDT	Silver	.700/17.8
2-1437581-0	ASE42RG	4PDT	Gold	.700/17.8
2-1437581-9	ASE43R	4P3T	Silver	1.10/27.9
3-1437581-0	ASE43RG	4P3T	Gold	1.10/27.9
3-1437581-6	ASE62R	6PDT	Silver	1.00/25.4
3-1437581-7	ASE62RG	6PDT	Gold	1.00/25.4

.300±.005 7.62±.127 .150 r .175 -0-10-0-0-0-0-0-0-1 ■ .020±.002 .508±.051 Typ. .170±.005 4.32±.127 ╢╴ .100 2.54 .150±.005 3.81±.127 -.100±.005 2.54±.127 Typ.

L Type Surface Mount

NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.



Upright, Surface Mount "L" Type, Extended Actuator

Tyco Electronics	Alcoswitch	Туре	Contact	Dim A
1437581-5	ASE22GL	DPDT	Gold	.400/10.2
1437581-7	ASE22L	DPDT	Silver	.400/10.2
1-1437581-7	ASE42GL	4PDT	Gold	.700/17.8
1-1437581-8	ASE42L	4PDT	Silver	.700/17.8
2-1437581-7	ASE43GL	4P3T	Gold	1.10/27.9
2-1437581-8	ASE43L	4P3T	Silver	1.10/27.9
3-1437581-4	ASE62GL	6PDT	Gold	1.00/25.4
3-1437581-5	ASE62L	6PDT	Silver	1.00/25.4

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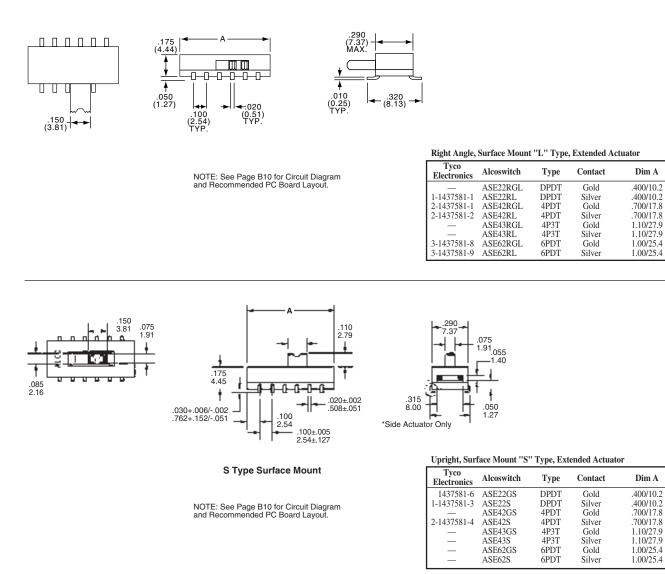
USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

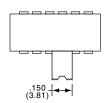
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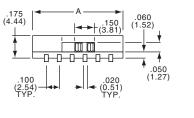
B

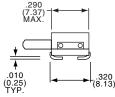
**ASE/F Series** 

### Slide Switches, Extended Actuator, Through Hole and Surface Mount









NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.

#### Right Angle, Surface Mount "S" Type, Extended Actuator

Tyco Electronics	Alcoswitch	Туре	Contact	Dim A
1-1437581-0	ASE22RGS	DPDT	Gold	.400/10.2
1-1437581-2	ASE22RS	DPDT	Silver	.400/10.2
_	ASE42RGS	4PDT	Gold	.700/17.8
2-1437581-3	ASE42RS	4PDT	Silver	.700/17.8
	ASE43RGS	4P3T	Gold	1.10/27.9
	ASE43RS	4P3T	Silver	1.10/27.9
_	ASE62RGS	6PDT	Gold	1.00/25.4
—	ASE62RS	6PDT	Silver	1.00/25.4

ASE/F Series

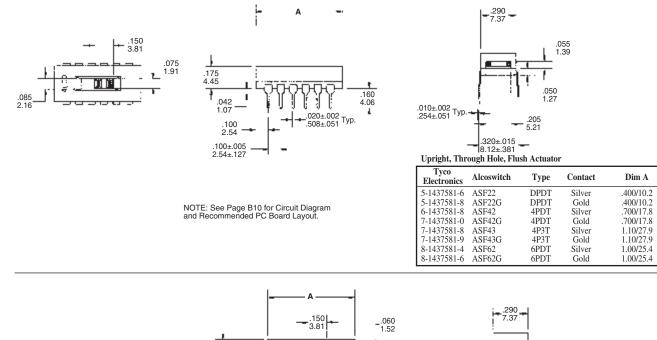
Catalog 1308390

Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

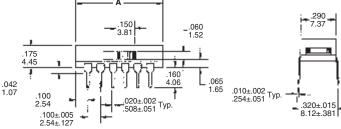
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**ASE/F Series** 

### Slide Switches, Flush Actuator, Through Hole and Surface Mount



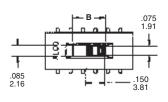


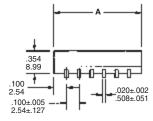


NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.

Right Angle, Through Hole, Flush Actuator

Tyco Electronics	Alcoswitch	Туре	Contact	Dim A
6-1437581-2	ASF22R	DPDT	Silver	.400/10.2
6-1437581-3	ASF22RG	DPDT	Gold	.400/10.2
7-1437581-3	ASF42R	4PDT	Silver	.700/17.8
7-1437581-4	ASF42RG	4PDT	Gold	.700/17.8
	ASF43R	4P3T	Silver	1.10/27.9
8-1437581-2	ASF43RG	4P3T	Gold	1.10/27.9
8-1437581-9	ASF62R	6PDT	Silver	1.00/25.4
9-1437581-1	ASF62RG	6PDT	Gold	1.00/25.4





L Type Surface Mount

Dimensions are in inches

NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.



#### Upright, Surface Mount "L" Type, Flush Actuator

Tyco Electronics	Alcoswitch	Туре	Contact	Dim A
5-1437581-9	ASF22GL	DPDT	Gold	.400/10.2
6-1437581-1	ASF22L	DPDT	Silver	.400/10.2
7-1437581-1	ASF42GL	4PDT	Gold	.700/17.8
7-1437581-2	ASF42L	4PDT	Silver	.700/17.8
8-1437581-0	ASF43GL	4P3T	Gold	1.10/27.9
8-1437581-1	ASF43L	4P3T	Silver	1.10/27.9
8-1437581-7	ASF62GL	6PDT	Gold	1.00/25.4
8-1437581-8	ASF62L	6PDT	Silver	1.00/25.4

B8

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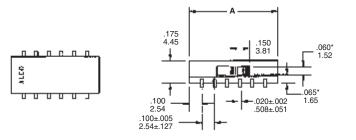
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**ASE/F Series** 

# Slide Switches, Flush Actuator, Through Hole and Surface Mount



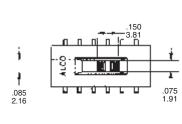
L Type Surface Mount

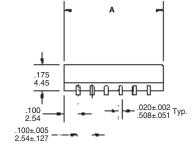
NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.



#### Right Angle, Surface Mount "L" Type, Flush Actuator

		•••		
Tyco Electronics	Alcoswitch	Туре	Contact	Dim A
6-1437581-4	ASF22RGL	DPDT	Gold	.400/10.2
l –	ASF22RL	DPDT	Silver	.400/10.2
7-1437581-5	ASF42RGL	4PDT	Gold	.700/17.8
7-1437581-6	ASF42RL	4PDT	Silver	.700/17.8
l –	ASF43RGL	4P3T	Gold	1.10/27.9
l —	ASF43RL	4P3T	Silver	1.10/27.9
9-1437581-2	ASF62RGL	6PDT	Gold	1.00/25.4
	ASF62RL	6PDT	Silver	1.00/25.4

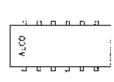


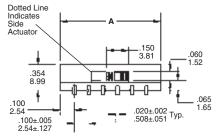


NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout. .

#### Upright, Surface Mount "S" Type, Flush Actuator

Tyco Electronics	Alcoswitch	Туре	Contact	Dim A
6-1437581-0	ASF22GS	DPDT	Gold	.400/10.2
6-1437581-7	ASF22S	DPDT	Silver	.400/10.2
_	ASF42GS	4PDT	Gold	.700/17.8
7-1437581-7	ASF42S	4PDT	Silver	.700/17.8
	ASF43GS	4P3T	Gold	1.10/27.9
8-1437581-3	ASF43S	4P3T	Silver	1.10/27.9
	ASF62GS	6PDT	Gold	1.00/25.4
9-1437581-4	ASF62S	6PDT	Silver	1.00/25.4





NOTE: See Page B10 for Circuit Diagram and Recommended PC Board Layout.



#### Right Angle, Surface Mount "S" Type, Flush Actuator

Tyco Electronics	Alcoswitch	Туре	Contact	Dim A
6-1437581-5	ASF22RGS	DPDT	Gold	.400/10.2
6-1437581-6	ASF22RS	DPDT	Silver	.400/10.2
	ASF42RGS	4PDT	Gold	.700/17.8
	ASF42RS	4PDT	Silver	.700/17.8
—	ASF43RGS	4P3T	Gold	1.10/27.9
—	ASF43RS	4P3T	Silver	1.10/27.9
9-1437581-3	ASF62RGS	6PDT	Gold	1.00/25.4
-	ASF62RS	6PDT	Silver	1.00/25.4

Catalog 1308390 Issued 9-04

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Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967 B9

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Electronics

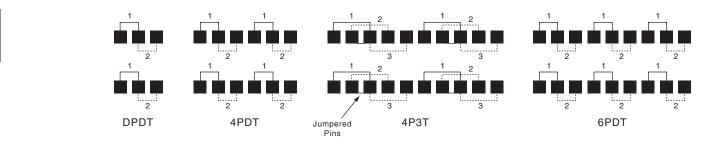
B

**ASE/F** Series

**ASE/F Series** 

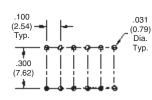
# Slide Switches, Auto-insertable, Through Hole and Surface Mount

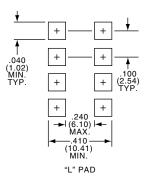
# CIRCUIT DIAGRAMS



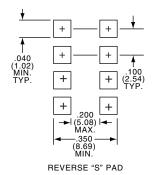
NOTE: For SPDT requirements order DPDT version and use either set of contacts for SPDT switching.

### PC LAYOUT





PAD LAYOUT



B10

Catalog 1308390 Issued 9-04

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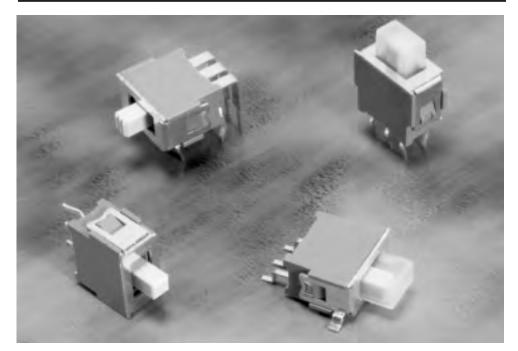
Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. Dimensions are shown for reference purposes only. Specifications subject to change.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5729-0425

# S Series Unsealed, SE Series Sealed, Through-Hole and Surface Mount

#### **Product Facts**

- n Sealed or Unsealed
- n Straight or Right-Angle
- n Through-hole or Surfacemount
- n Bulk or Tape-and-Reel packaged
- n Compact size
- n Double-pole function in a single-pole body
- **n PC retention feature**
- n High reliability contact system
- n Epoxy sealed base
- n Robust actuator for easy actuation
- n Non-shorting (break-beforemake)



# Switch, Slide, Surface Mount - SE1 SMT (Shown w/Boot)

#### **Electrical Characteristics**

Contact rating: .4 VA @ 20 VDC Max. 50mA 48V AC/DC Min. 1 micro A 20 mV AC/DC

Initial Contact Resistance: less than 50 milliohms

Final Contact Resistance: 100 milliohms max.

Insulation Resistance: 500 Megaohms @ 250 VDC

Dielectric Strength: 500 VAC between terminals and ground

Mechanical Mechanical Life: Up to 10,000 cycles @ max. load

Actuation Force: 70 to 500 grams

Materials and Finish Terminals: Tin-lead over nickel-plated phosphor bronze

Contacts: Gold over nickel plated phosphor bronze

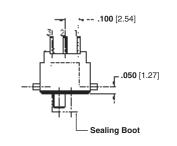
Frame: Tin over nickel plated brass

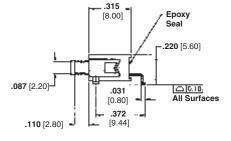
Case, Actuator, Plunger, Terminal Board: UL 94V-0 glass-filled Polyamide

#### Actuator Boot: Silicon Rubber

**Standards & Specs** 

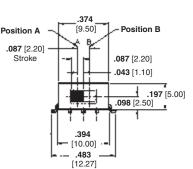
Sealed switch per IP 67

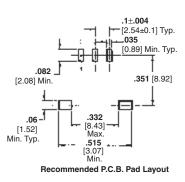




#### SMT-Sealed Part Numbers

Tyco Electronics	Alcoswitch	Function
1571004-1	SE1GSMT	On-Off
1571004-2	SE1EGSMT	On-Off-On
1571004-3	SE1DGSMT	On-None-On





#### Tape & Reel Package

Tyco Electronics	Alcoswitch	Function
1571004-4	SE1GSMTTR	On-Off
1571004-5	SE1EGSMTTR	On-Off-On
1571004-6	SE1DGSMTTR	On-None-On

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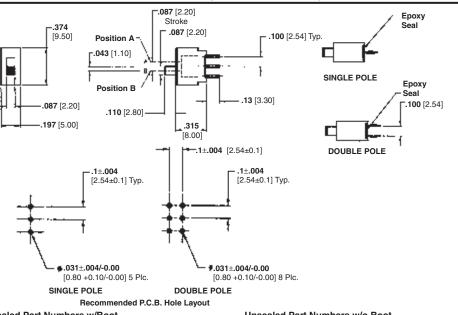
USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 B11

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

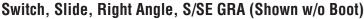
**S/SE Series** 

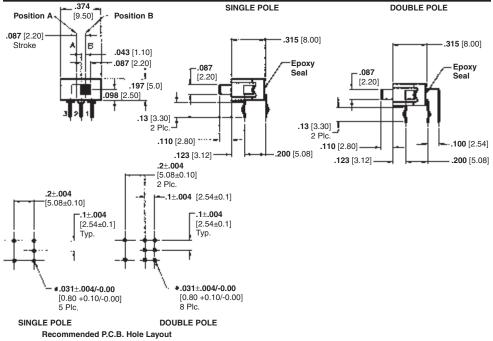
Electronics

# Switch, Slide, PC Tail, S/SE GPC (Shown w/o Boot)



Sealed Part Numbers W/Boot			Unsealed Part N	umbers w/o Bool	
Tyco Electronics	Alcoswitch	Function	Tyco Electronics	Alcoswitch	Function
1437574-9	SE1DGPC	On-None-On	1571005-1	S1DGPC	On-None-On
1-1437574-4	SE1EGPC	On-Off-On	1571005-2	S1EGPC	On-Off-On
1-1437574-6	SE2DGPC	On-None-On	1571005-3	S2DGPC	On-None-On
2-1437574-0	SE2EGPC	On-Off-On	1571005-4	S2EGPC	On-Off-On





 Sealed Part Numbers w/Boot

 Tyco
 Alcoswitch
 Function

 Electronics
 1-1437574-1
 SE1DGRA
 On-None-On

SE1EGRA

SE2DGRA

SE2EGRA

#### Unsealed Part Numbers w/o Boot

	Tyco Electronics	Alcoswitch	Function
1	1571006-1	S1DGRA	On-None-On
	1571006-2	S1EGRA	On-Off-On
	1571006-3	S2DGRA	On-None-On
	1571006-4	S2EGRA	On-Off-On

B12

Catalog 1308390 Issued 9-04

Issued 9-04 and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are in inches

1-1437574-5

1-1437574-8

2-1437574-1

Dimensions are shown for reference purposes only. Specifications subject to change.

On-Off-On

On-None-On

On-Off-On

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

tyco

### Slide Switches, Miniature, Low Profile, Economy Grade

#### MATERIAL SPECIFICATIONS:

Contacts	Silver clad copper alloy
Case Material	
Actuator Material	Polyester (UL 94HB)
Terminal Seal	Epoxy
	Silver plate copper alloy

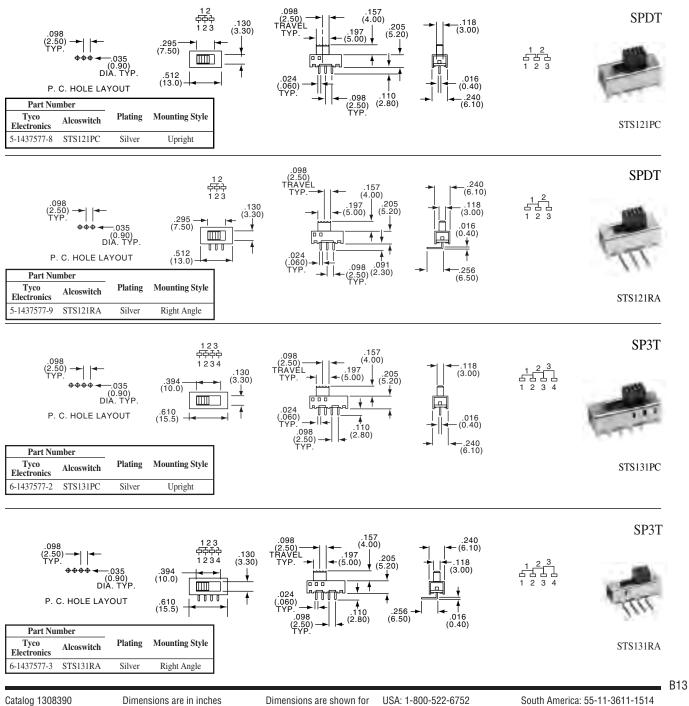
#### **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature
Storage Temperature4°F to +158°F (-20°C to +70°C)
Solder Heat ResistanceMIL-STD-202, Method 210

#### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	300 mA @ 125 VAC
Initial Contact Resistance	20 Milliohms max.
Contact Timing	Make-before-break
Insulation Resistance	100 Megohms min. @ 500 VDC
Dielectric Strength	500 VAC
Actuation Force	250 Grams, +150 Grams, -100 Grams
Actuator Travel	0.098" (2.49)
Life Expectancy	Up to 10,000 Cycles

#### NOTICE: Bifurcated contact produces double wiping, self-cleaning contacts.



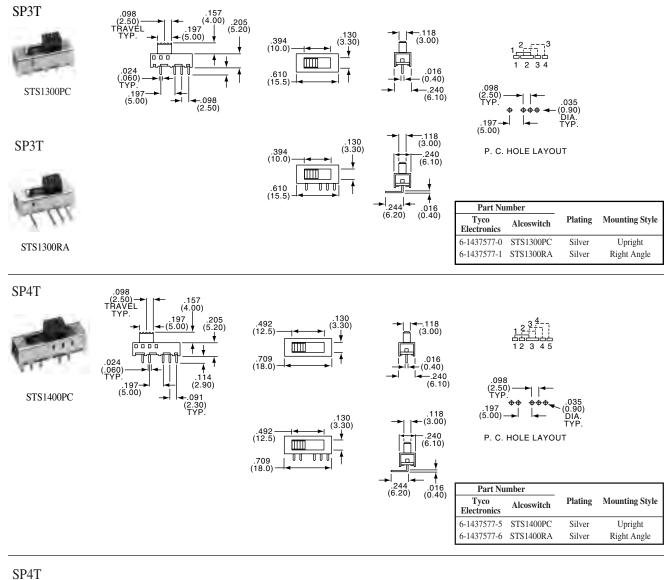
specified. Values in parentheses www.tycoelectronics.com

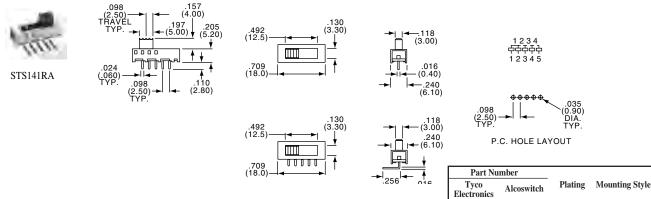
Dimensions are shown for and millimeters unless otherwise reference purposes only. Specifications subject or brackets are metric equivalents. to change.

Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

### Slide Switches, Miniature, Low Profile, Economy Grade

#### SEE PAGE B13 FOR PRODUCT SPECIFICATIONS





Dimensions are shown for

reference purposes only.

Specifications subject



6-1437577-7

6-1437577-8

STS141PC

STS141RA

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

Upright

Right Angle

Silver

Silver

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Catalog 1308390

Dimensions are in inches

and millimeters unless otherwise

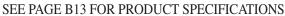
specified. Values in parentheses

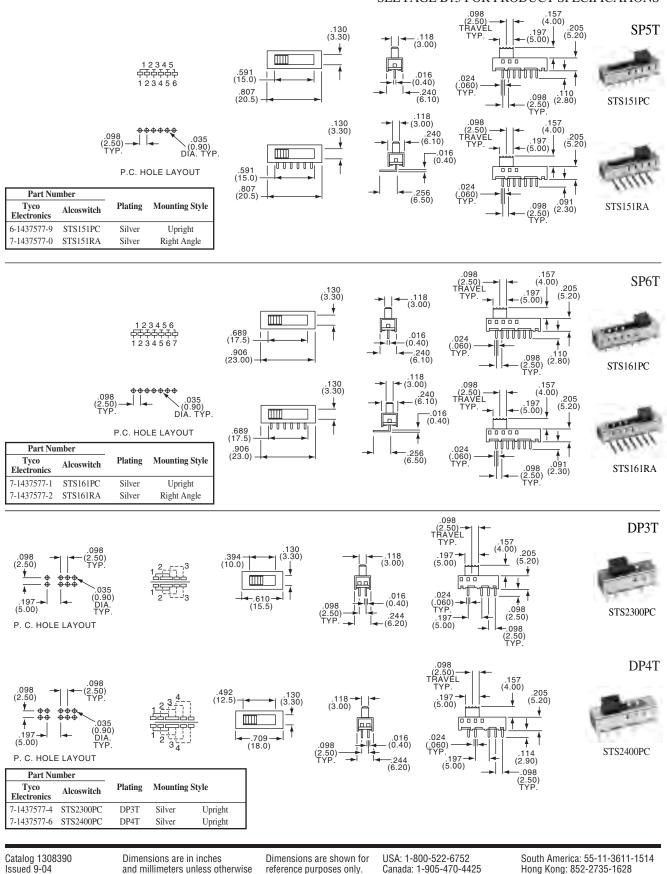
or brackets are metric equivalents. to change.

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STS Series

### Slide Switches, Miniature, Low Profile, Economy Grade





STS Series

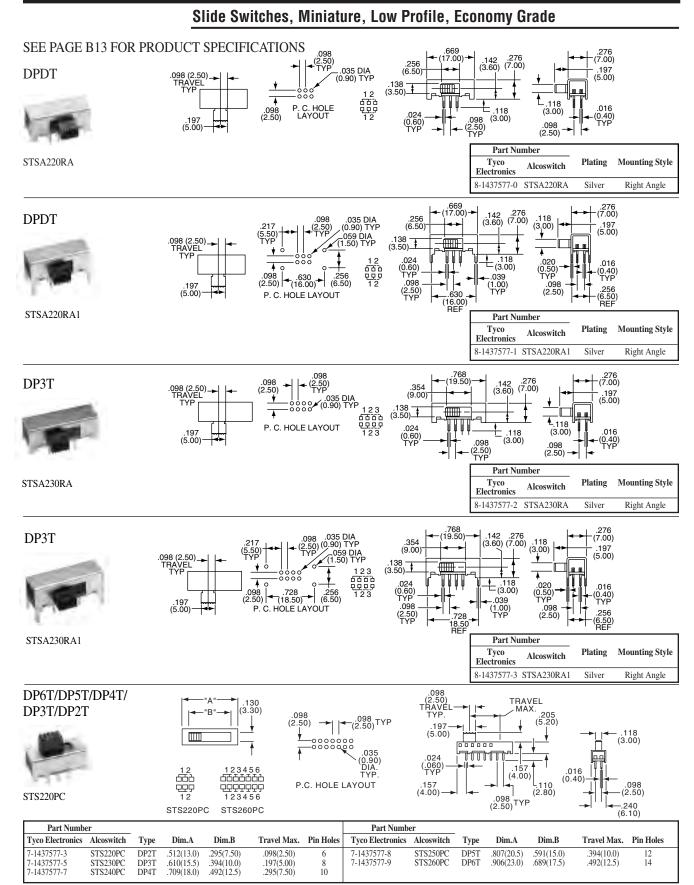
B

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and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

STS/STSA Series



B16

Catalog 1308390 Issued 9-04

specified. Values in parentheses www.tycoelectronics.com

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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

tyco

SDS Series

# Slide Switches, Instrument Grade, Decorative

#### MATERIAL SPECIFICATIONS:

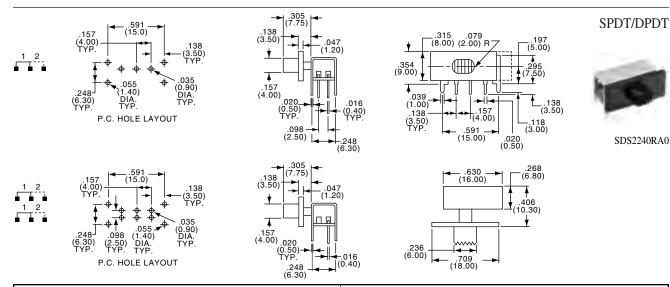
Contacts	Silver clad copper alloy
Case Material	Steel, tin plated
Actuator Material	Polycarbonate
Terminals/Fixed Contacts	Silver over nickel
Terminal Seal	Epoxy

#### **ENVIRONMENTAL SPECIFICATIONS:**

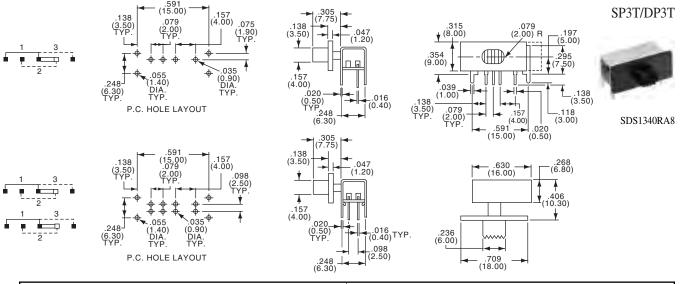
Operating Temperature $14^{\circ}F$ to $+140^{\circ}F$ ( $-10^{\circ}C$ to $+60^{\circ}C$ )
Storage Temperature $14^{\circ}F$ to $+140^{\circ}F$ ( $-10^{\circ}C$ to $+60^{\circ}C$ )
Solder Heat ResistanceMIL-STD-202, Method 210

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	300 mA @ 125 VAC
Initial Contact Resistance	20 Milliohms max.
Insulation Resistance	1,000 Megohms min. @ 500 VDC
Dielectric Strength	500 VAC
Actuation Force	0.250 Grams, +200/-150
Plunger/Actuator Travel	0.079" (2.01)
Life Expectancy	Up to 10,000 Cycles



L	Part Numb	er						Part Numb	ber					
	Tyco Electronics	Alcoswitch	Туре	_			Actuator Color	Tyco Electronics	Alcoswitch	Туре	_			Actuator Color
	1437577-2 1437577-3	SDS1240RA0 SDS1240RA8		On On	None None	On On	Black Gray	1437577-6	SDS2240RA0 SDS2240RA8	DPDT DPDT	On On	None None	On On	Black Gray



Part Numb	ber						Part Numl	ber					
Tyco Electronics	Alcoswitch	Туре				Actuator Color	Tyco Electronics	Alcoswitch	Туре	_			Actuator Color
1437577-4 1437577-5		SP3T SP3T	On On	On On	On On	Black Gray	1437577-7 —	SDS2340RA0 SDS2340RA8	DP3T DP3T	On On	On On	On On	Black Gray

Catalog 1308390 Issued 9-04

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Dimensions are in inches

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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

Electronics

**TSS Series** 

# Slide Switches, Vertical, Single or Dual Actuator

#### MATERIAL SPECIFICATIONS:

Contacts	Copper w/gold plate over nickel
Case Material	High temperature polyester (94-VO)
Actuator Material	Polyester (94-VO)
Terminals	Copper alloy tin/lead/nickel or gold/nickel
Terminal Seal	Epoxy standard: single pole, optional: double
	pole

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature	4°F to $+ 176°$	$^{\circ}F(-20^{\circ}C \text{ to } + 80^{\circ}C)$
Storage Temperature	4°F to + 176°	$^{\circ}F(-20^{\circ}C \text{ to } + 80^{\circ}C)$

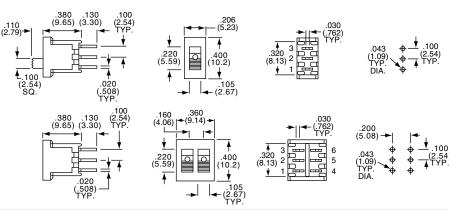
#### SPST/SPDT

亡	T
TSS11DGPC	TSS11DG1PC

SPST/SPDT (DUAL)



TSD21DDG1PC



TYPICAL PERFORMANCE CHARACTERISTICS: Contact Rating ......Gold: 0.4 VA max. @ 20 VDC or peak AC

Dielectric Strength ......1,000 Volts RMS @ sea level

Life Expectancy .....Up to 60,000-80,000 Cycles

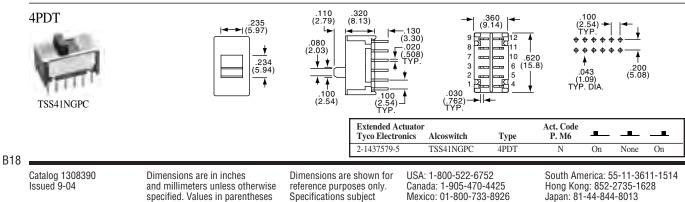
Initial Contact Resistance ......20 Millohms max. Contact Timing ......Non-shorting

Plunger/Actuator Travel ......0.120" (3.05)

Extended Actuator Tyco Electronics	Alcoswitch	Туре	Act. Code P. M6				Extended Dual Actu Tyco Electronics	ator Alcoswitch	Туре	Act. Code P. M6			
1437578-3	TSS11AGPC	SPST	А	On	None	Off	_	TSD21AAGPC	2 x SPST	А	On	None	Off
1-1437589-0	TSS11DGPC	SPDT	D	On	None	On	1437579-5	TSD21DDGPC	2 x SPDT	D	On	None	On
1-1437579-4	TSS11EGPC	SPDT	E	On	Off	On							
Flush Actuator							Flush Dual Actuator						
_	TSS11AG1PC	SPST	А	On	None	Off	_	TSD21DDG1PC	2 x SPDT	D	On	None	On
1437579-8	TSS11DG1PC	SPDT	D	On	None	On							
1-1437579-2	TSS11EG1PC	SPDT	E	On	Off	On	1						
	Note: No center terminals on "A" action switches.												

#### DPST/DPDT .130 (3.30) .380 .130 (3.30) .360 (9.14) .380 .110 (2.79)<sup>-</sup> **(**2 2.54) ГҮР. 400 .220 (5.59) .020 (.508 TYP. (2.54) SQ. TSS21NGPC TSS21PGPC

Extended Actuator Tyco Electronics	r Alcoswitch	Туре	Act. Code P. M6		∎_		Flush Actuator Tyco Electronics	Alcoswitch	Act. Code Type	P. M6			
1-1437579-6 1-1437579-9 2-1437579-3	TSS21KGPC TSS21NGPC TSS21PGPC	DPST DPDT DPDT	K N P	On On On	None None Off	Off On On	1-1437579-7 2-1437579-1	TSS21KG1PC TSS21NG1PC TSD21RG1PC	DPST DPDT DPDT	K N P	On On On	None None Off	Off On On
				No	te: No cen	ter termina	als on "K" action switch	hes.					



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reference purposes only. Specifications subject

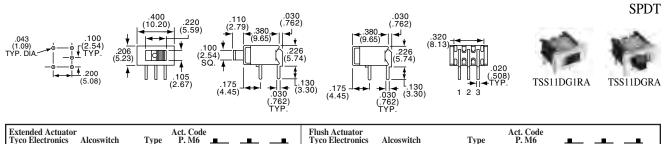
Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

# Alcoswitch

**TSS Series** 

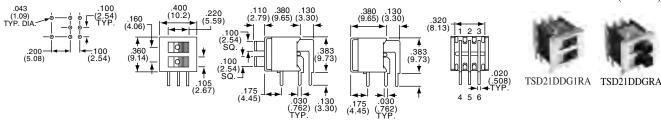
# Slide Switches, Right Angle, Single or Dual Actuator

# SEE PAGE B18 FOR PRODUCT SPECIFICATIONS

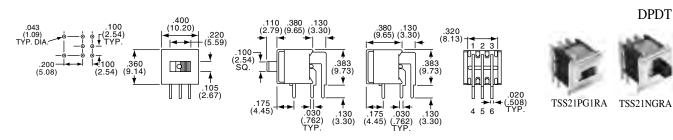


Extended Actuator Tyco Electronics	Alcoswitch	Туре	Act. Code P. M6				Flush Actuator Tyco Electronics	Alcoswitch	Туре	Act. Code P. M6			
1-1437579-1	TSS11DGRA	SPDT	D	On	None	On	1437579-9	TSS11DG1RA	SPDT	D	On	None	On
1-1437579-5	TSS11EGRA	SPDT	E	On	Off	On	1-1437579-3	TSS11EG1RA	SPDT	E	On	Off	On

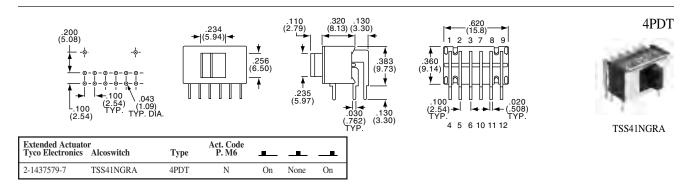




Extended Actuator Tyco Electronics Alcoswit	1 Туре	Act. Code P. M6	e 			Flush Actuator Tyco Electronics	Alcoswitch	Туре	Act. Code P. M6			
1437579-6 TSD21D		D	On	None	On	1437579-4	TSD21DDG1RA	2 x SPDT	D	On	None	On
1437579-7 TSD21E		E	On	Off	On	—	TSD21EEG1RA	2 x SPDT	E	On	Off	On



Extended Actu Tyco Electroni		Туре	Act. Code P. M6	_			Flush Actuator Tyco Electronics	Alcoswitch	Туре	Act. Code P. M6		8_	
2-1437579-0 2-1437579-4	TSS21PAGRA TSS21NGRA TSS21PGRA	SP3T DPDT DPDT	PA N P	On On On	On None Off	On On On		TSS21NG1RA TSS21PG1RA	DPDT DPDT	N P	On On	None Off	On On



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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

B19

B

Electronics

Electronics

**MSS Series** 

# Slide Switches, Instrumentation Grade

.217 (5.51)

#### MATERIAL SPECIFICATIONS:

ContactsGo	d or silver over nickel/copper alloy
Frame MaterialTin	plated steel
Terminals/Fixed ContactsGo	d or silver over nickel/over copper alloy
Terminal SealEpo	оху
Actuator MaterialPO	M-UL94HB
ENVIRONMENTAL SPEC	IFICATIONS:
Operating Temperature4°	F to $+185^{\circ}$ F ( $-20^{\circ}$ C to $+85^{\circ}$ C)
Storage Temperature40	$^{\circ}$ F to +212 $^{\circ}$ F (-40 $^{\circ}$ C to +100 $^{\circ}$ C)
Solder Heat ResistanceSee	page M3-4

.142 (3.60)

# TYPICAL PERFORMANCE CHARACTERISTICS:

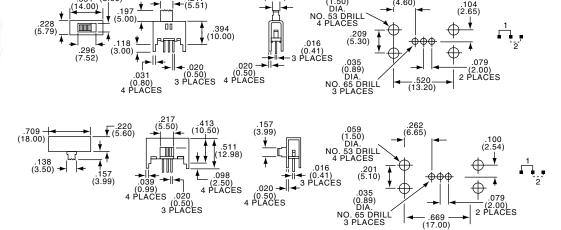
Contact Rating	Gold: 0.4 VA 20 VDC or peak AC
-	Silver: 300 mA @ 125 VAC
Initial Contact Resistance	20 Milliohms max.
Contact Timing	Make before break
Insulation Resistance	1,000 Megohms min.
Dielectric Strength	500 VAC
Actuation Force	100 to 600 Grams
Life Expectancy	Up to 15,000 Cycles
Travel	0.079" (2.01) (unless otherwise specified)

.181 (4.60)

#### SPDT







.150 (3.80) <u>♥</u>

.772 19.60)

.016 <del>►</del> (0.41) 4 PLACES

.

.433 (11.00)

.020 .118 (0.50) (3.00)

.228

.059 1.50)

Tyco Electronics	Alcoswitch	Plating	Tyco Electronics	Alcoswitch	Plating
5-1437576-0	MSS1200	Silver	5-1437576-2	MSS1200R	Silver
5-1437576-1	MSS1200G	Gold	5-1437576-3	MSS1200RG	Gold

.295

 $\oplus \oplus \oplus$ 

\_.906 (23.00)

.157 (4.00) .152 (3.85)

⊕

 $\oplus$ 

.079 (2.00) 2 PLACES

SP3T



MSS1300



MSS1300R

.984 (25.0)	$\begin{array}{c} .394 \\ (10.00) \\ .350 \\ \hline \\ .001 \\ .024 \\ .029 \\ (6.10)_{(1.00)} \end{array} $	$\begin{array}{c} & \overset{(0.59)}{\text{DIA}} & \overset{(1.50)}{\text{DIA}} & \overset{(1.52)}{\text{DIA}} & \overset{(1.52)}{\text{DIA}}$	

Tyco Electronics	Alcoswitch	Plating	Tyco Electronics	Alcoswitch	Plating	Total Actuator Travel
5-1437576-4	MSS1300	Silver	5-1437576-6	MSS1300R	Silver	.098(2.50)
5-1437576-5	MSS1300G	Gold	5-1437576-7	MSS1300RG	Gold	.098(2.50)

.059 (1.50) DIA. NO. 53 DRILL 4 PLACES \

.303 (7.70)

(0.89) ( DIA. NO. 65 DRILL

**4**.150 (3.80)

+ (0.50) 4PLACES

П

<u>مار م</u>

B20

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THREADED HOLE 4-40 2 PLACES

.323 (8.20)

.039 (0.99) 4 PLACES

24 00

.394 (10.00)

./48

.276

.335 (8.51

Dimensions are shown for reference purposes only. Specifications subject

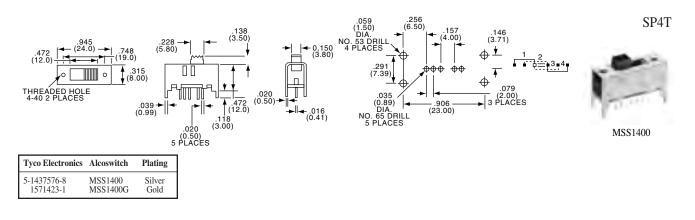
USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

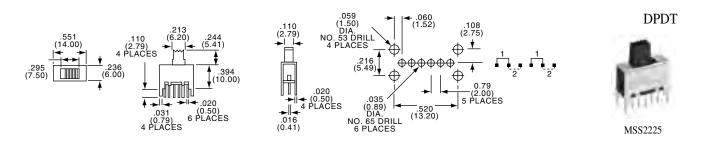
**MSS Series** 

**MSS Series** 

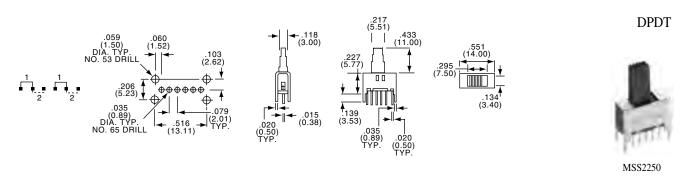
# Slide Switches, Instrumentation Grade

### SEE PAGE B20 FOR PRODUCT SPECIFICATIONS





Tyco Electronics	Alcoswitch	Plating
6-1437576-3	MSS2225	Silver
6-1437576-4	MSS2225G	Gold



Tyco Electronics	Alcoswitch	Plating
6-1437576-5	MSS2250	Silver
6-1437576-6	MSS2250G	Gold

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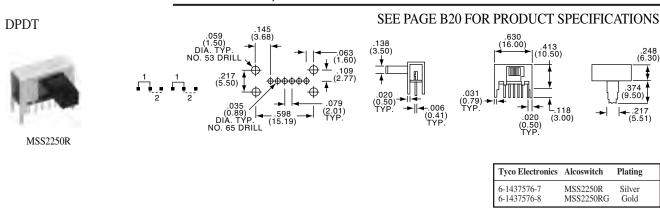
Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. Dimension Specification to change.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

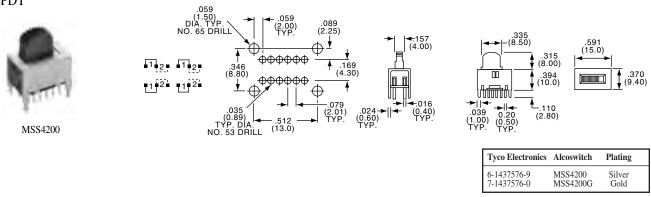
Electronics

**MSS Series** 

### Slide Switches, Instrumentation Grade



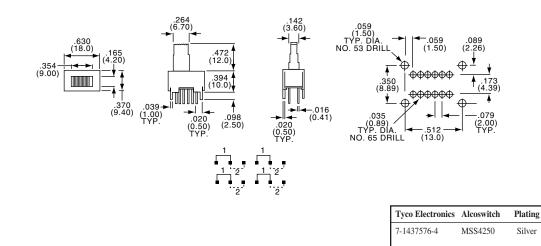




4PDT



MSS4250





B22

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tyco

**MSS Series** 

#### Slide Switches, Instrumentation Grade

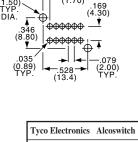
#### SEE PAGE B20 FOR PRODUCT SPECIFICATIONS





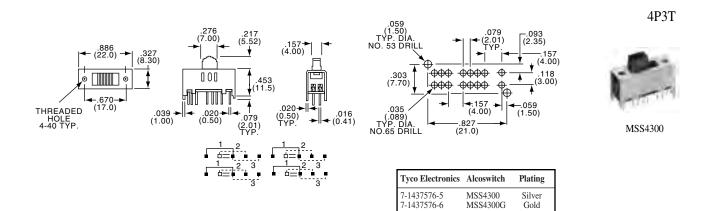
MSS4200R

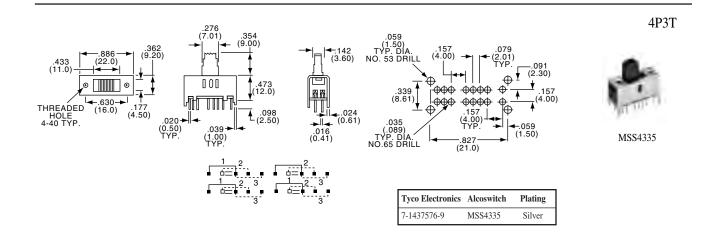




.067 (1.70)

Tyco Electronics	Alcoswitch	Plating
7-1437576-2	MSS4200R	Silver
7-1437576-3	MSS4200RG	Gold





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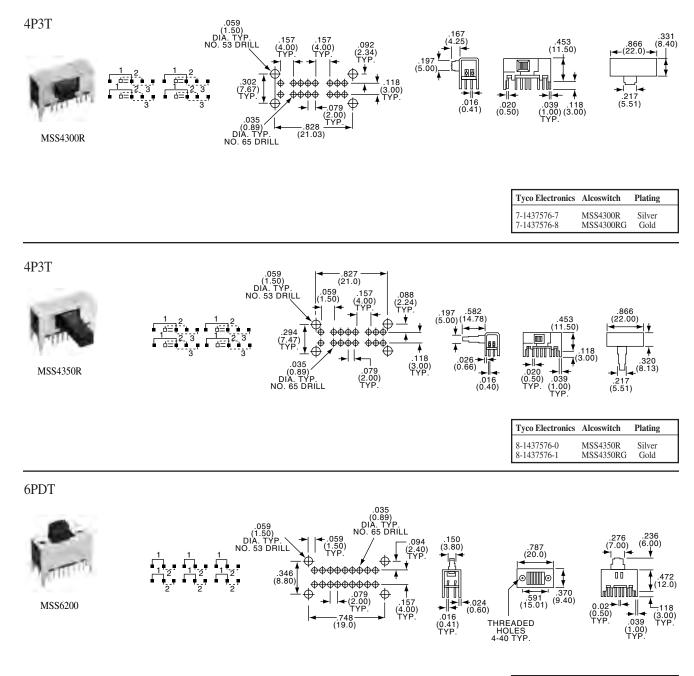
Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. Dimension Specification to change.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

**MSS Series** 

# Slide Switches, Instrumentation Grade

### SEE PAGE B20 FOR PRODUCT SPECIFICATIONS



Tyco Electronics	Alcoswitch	Plating
8-1437576-8	MSS6200	Silver
8-1437576-9	MSS6200G	Gold

B24

Catalog 1308390 Issued 9-04

www.tycoelectronics.com

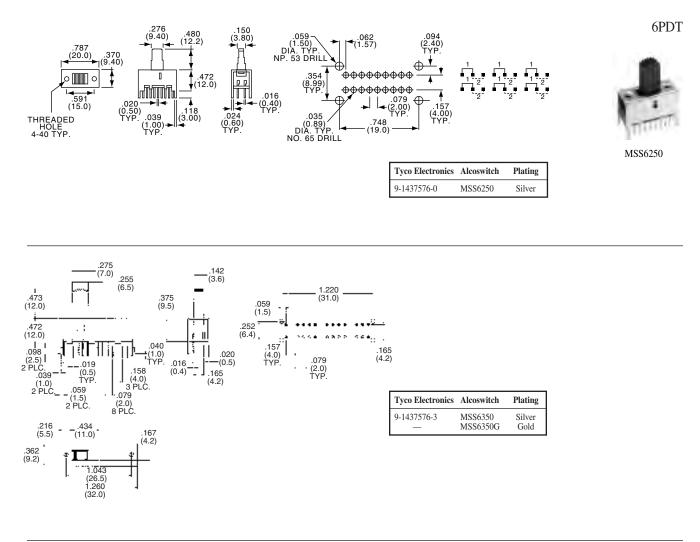
Dimensions are in inches

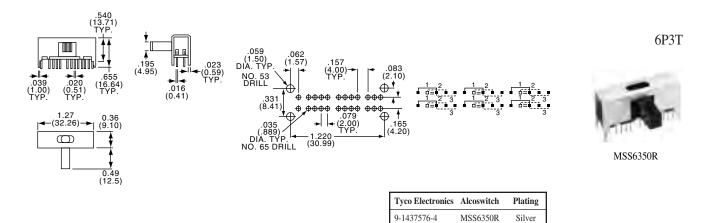
Dimensions are shown for reference purposes only. Specifications subject ents. to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

MSS Series

# Slide Switches, Instrumentation Grade

#### SEE PAGE B20 FOR PRODUCT SPECIFICATIONS





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Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

MSS6350RG

Gold

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

Electronics

# Slide Switches, Instrumentation Grade

#### MATERIAL SPECIFICATIONS:

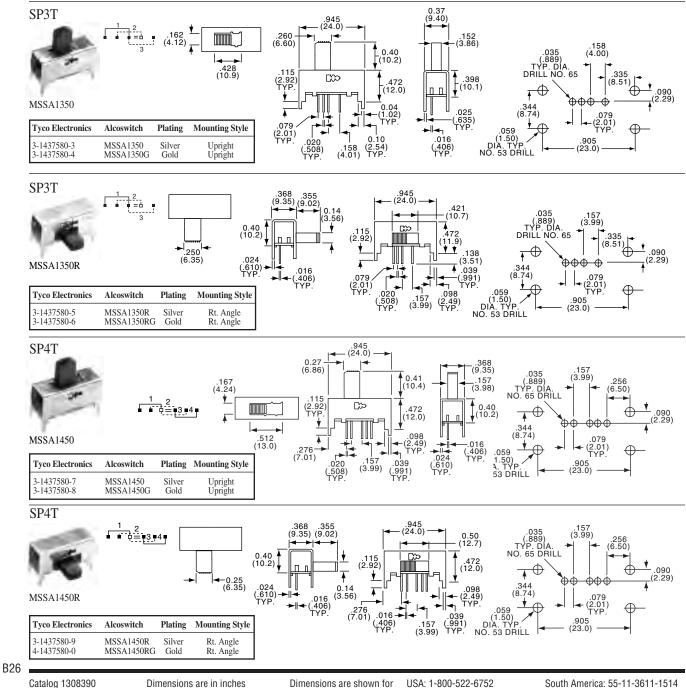
Contacts	Silver or gold over copper alloy
Case Material	Cold rolled steel
Actuator Material	Polyester UL94V-0
Terminals/Fixed Contacts	Gold or silver plate over copper alloy
Terminal Seal	Epoxy

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature4°F to +185°F (-20°C to +85°C)	
Storage Temperature $40^{\circ}$ F to $+212^{\circ}$ F ( $-40^{\circ}$ C to $+100^{\circ}$ C)	
Solder Heat ResistanceSee page M3-4	

#### TYPICAL PERFORMANCE CHARACTERISTICS: -4 D -4 ak AC

Contact Rating	Gold: 0.4 VA 20 VDC or peak
	Silver: 300 mA @ 125 VAC
Initial Contact Resistance	30 Milliohms max.
Contact Timing	Make before break
Insulation Resistance	1,000 Megohms min.
Dielectric Strength	500 Volts RMS @ sea level
Actuation Force	600±300/470 Grams average
Actuator Travel	0.079" (2.01) approximate
Life Expectancy	Up to 15,000 Cycles



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Catalog 1308390 Issued 9-04

and millimeters unless otherwise specified. Values in parentheses www.tycoelectronics.com or brackets are metric equivalents. to change.

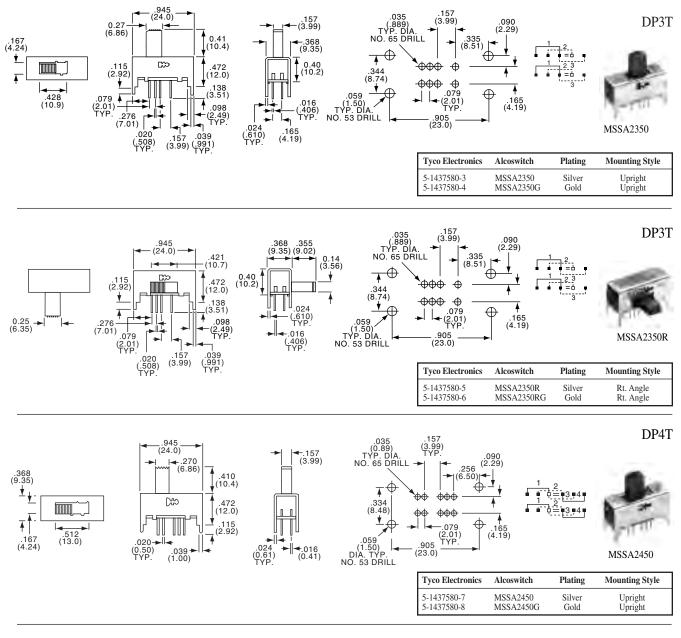
Dimensions are shown for reference purposes only. Specifications subject

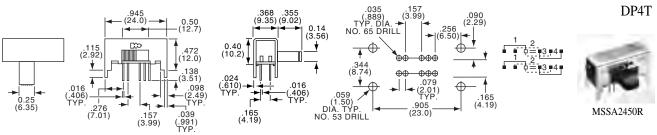
USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

**MSSA Series** 

# Slide Switches, Instrumentation Grade

SEE PAGE B26 FOR PRODUCT SPECIFICATIONS





Tyco Electronics	Alcoswitch	Plating	Mounting Style
5-1437580-9	MSSA2450R	Silver	Rt. Angle
6-1437580-0	MSSA2450RG	Gold	Rt. Angle

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

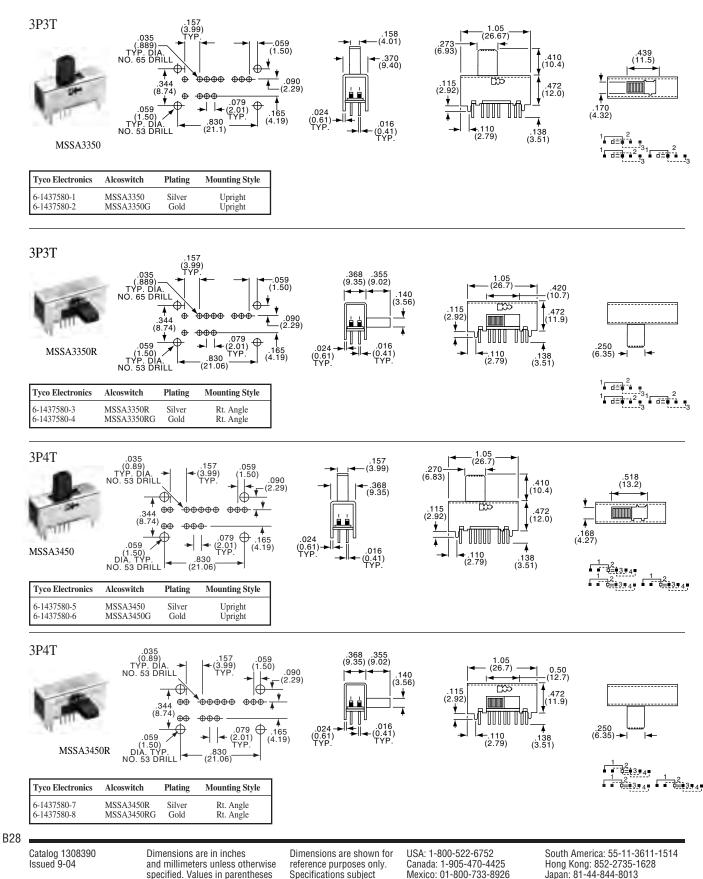
B27

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**MSSA Series** 

# Slide Switches, Instrumentation Grade

#### SEE PAGE B26 FOR PRODUCT SPECIFICATIONS



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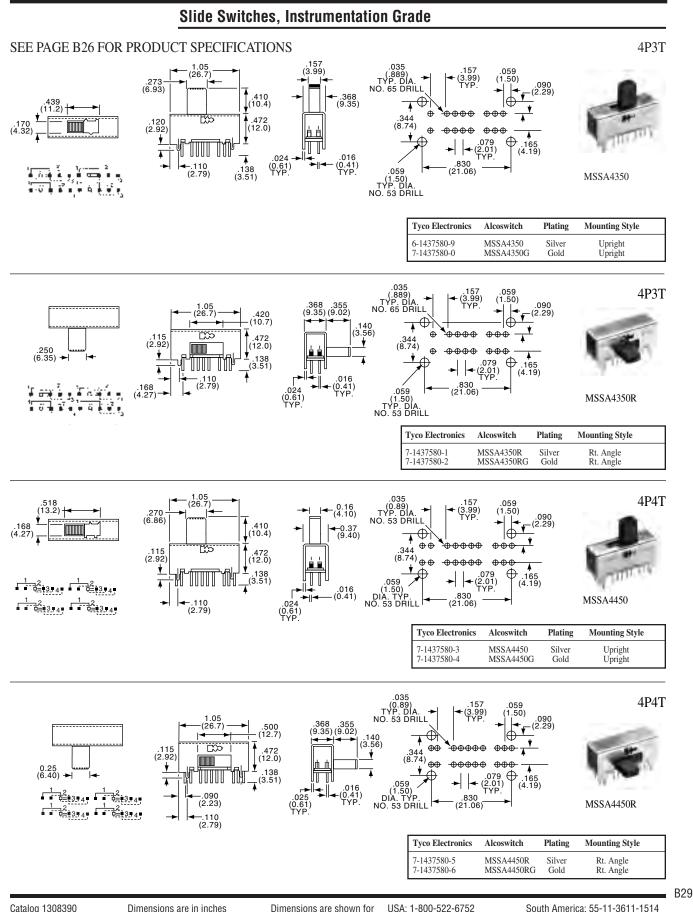
or brackets are metric equivalents. to change.

Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967



**MSSA Series** 

Alcoswitch



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specified. Values in parentheses www.tycoelectronics.com

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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

Electronics

# Slide Switches, Instrumentation Grade, .200 Terminal Spacing

#### MATERIAL SPECIFICATIONS:

Contacts	.Silver clad or gold plate
Case Material	.Polyester
Actuator Material	.Polyamide
Terminals	.Gold or silver plate
Terminal Seal	.Epoxy

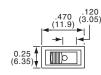
#### ENVIRONMENTAL SPECIFICATIONS:

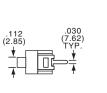
Operating Temperature4°F to +149°F (-20°C to +65°C)
Storage Temperature40°F to $+212$ °F ( $-40$ °C to $+100$ °C)
Solder Heat ResistanceSee page M3-4

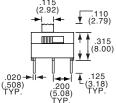
#### SPDT



MSSA114D







TYPICAL PERFORMANCE CHARACTERISTICS:

Initial Contact Resistance ......20 Milliohms max. Contact Timing ......Non-shorting

Actuation Force ......600 ±300 Grams

Contact Rating ......Gold: 0.4 VA max. 20 VDC or peak AC Silver: 3 A @ 115 VAC, 1.5A @ 230 VAC

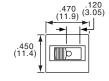


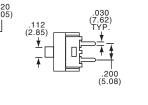
Tyco Electronics	Alcoswitch	Act. Code Pg. M5	_			Contacts
2-1437580-9 M	MSSA111DG	D	On	None	On	Gold
3-1437580-0 N	MSSA111EG	E	On	Off	On	Gold
3-1437580-1 N	MSSA114D	D	On	None	On	Silver
3-1437580-2 N	MSSA114E	E	On	Off	On	Silver

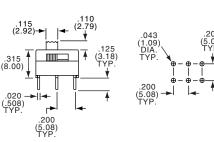
#### DPDT



MSSA214N







Tyco Electroni	cs Alcoswitch	Act. Code Pg. M5	_			Contacts
4-1437580		N	On	None	On	Gold
5-1437580		N	On	None	On	Silver

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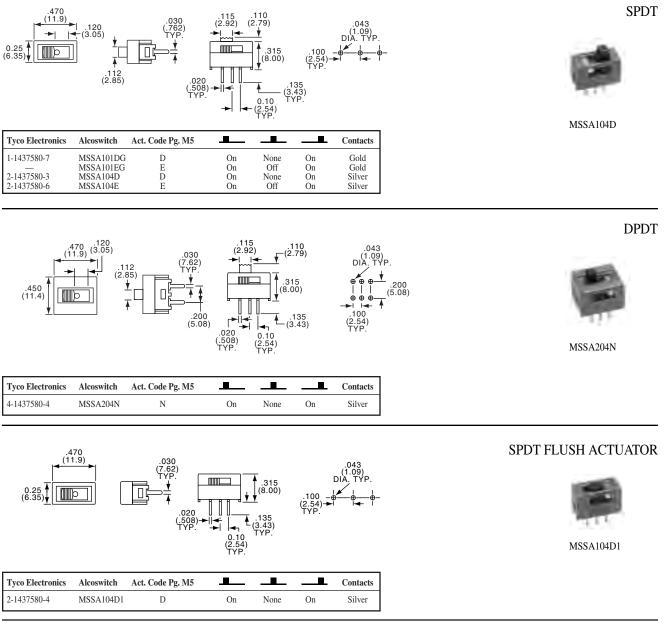
www.tycoelectronics.com

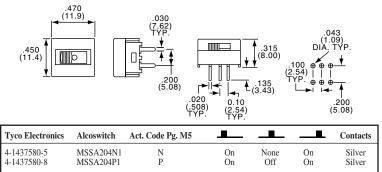
Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

# Slide Switches, Instrumentation Grade, .100 Terminal Spacing

# SEE PAGE B30 FOR PRODUCT SPECIFICATIONS





Catalog 1308390 Issued 9-04

www.tycoelectronics.com spec

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Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013

UK: 44-141-810-8967

# DPDT FLUSH ACTUATOR



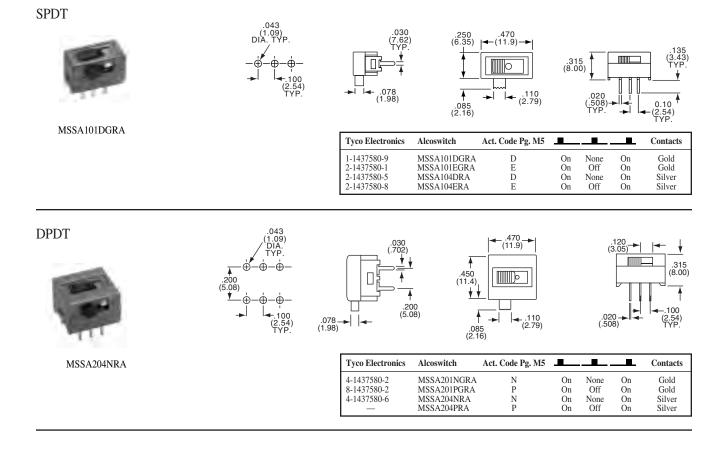
B

**MSSA-01/04 Series** 

Electronics

# Slide Switches, Instrumentation Grade, .100 Terminal Spacing

# SEE PAGE B30 FOR PRODUCT SPECIFICATIONS



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tyco

.394 (10.0)

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Baton Model

MHS Series

#### Slide Switches, Low Profile, Instrumentation Grade

#### MATERIAL SPECIFICATIONS:

Contacts	Gold or silver over nickel over Cu alloy
Frame Material	Nickel plated, Steel
Actuator Material	POM 94 HB
Terminals/Fixed Contacts	Gold or silver over nickel over Cu alloy
Terminal Seal	Epoxy

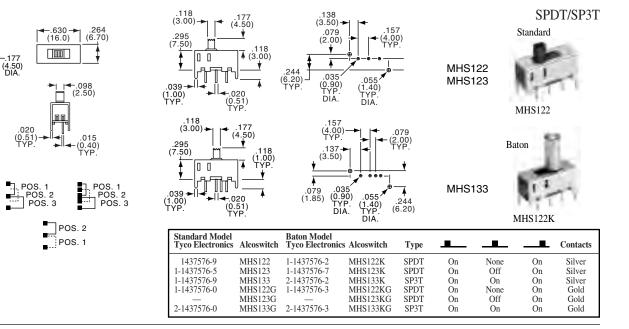
#### ENVIRONMENTAL SPECIFICATIONS:

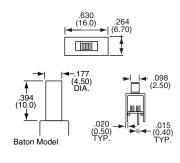
Operating Temperature4°F to +212°F (-20°C to +100°C)
Storage Temperature40°F to $+212$ °F (-40°C to $+100$ °C)
Solder Heat ResistanceSee page M3-4
Recommended CleaningNo chlorine base or Freon can be used.
Aqueous or 100% ethanol.

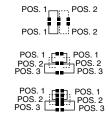
#### TYPICAL PERFORMANCE CHARACTERISTICS: Contact Rating ......Gold: 0.4 VA 20 VDC or peak AC

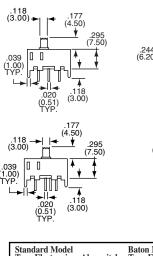
Contact Rating	Gold: 0.4 VA 20 VDC or pea
C	Silver: 300 mA @ 125 VAC
Initial Contact Resistance	20 Milliohms max.
Contact Timing	Make-before-break
Insulation Resistance	1000 Megohms min.
Dielectric Strength	500 Volts RMS @ sea level
Actuation Force	50 to 450 Grams
Actuator Travel	0.079"158" (2.01-4.01)
Life Expectancy	Up to 15,000 Cycles

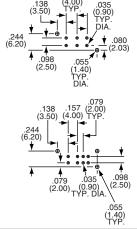
B











157

DPDT/DP3T Standard



MHS233

MHS222

MHS223

MHS233



MHS233K

Standard Model Tyco Electronics	Alcoswitch	Baton Model Tyco Electronics	Alcoswitch	Туре	_			Contacts
2-1437576-5	MHS222	2-1437576-8	MHS222K	DPDT	On	None	On	Silver
3-1437576-1	MHS223	3-1437576-4	MHS223K	DPDT	On	Off	On	Silver
3-1437576-6	MHS233	3-1437576-9	MHS233K	DP3T	On	On	On	Silver
2-1437576-6	MHS222G	2-1437576-9	MHS222KG	DPDT	On	None	On	Gold
3-1437576-2	MHS223G	_	MHS223KG	DPDT	On	Off	On	Gold
3-1437576-7	MHS233G	4-1437576-0	MHS233KG	DP3T	On	On	On	Gold

Catalog 1308390 Issued 9-04

Issued 9-04 and millimeters unless otherwise reference provide specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are in inches

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B33

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SPDT/SP3T

**MHS Series** 

# Slide Switches, Low Profile, Right Angle, Instrumentation Grade

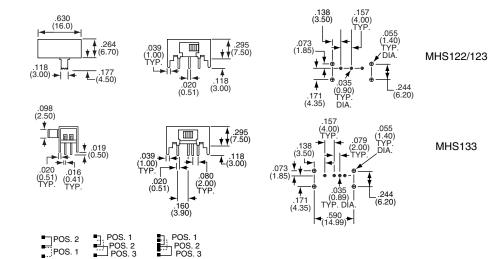
#### SEE PAGE B33 FOR PRODUCT SPECIFICATIONS



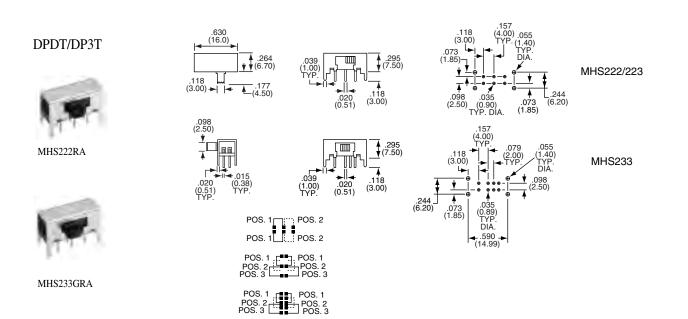


MHS122RA

MHS133GRA



Tyco Electronics	Alcoswitch	Туре				Contacts
1-1437576-4	MHS122RA	SPDT	On	None	On	Silver
1-1437576-8	MHS123RA	SPDT	On	Off	On	Silver
2-1437576-4	MHS133RA	SP3T	On	On	On	Silver
1-1437576-1	MHS122GRA	SPDT	On	None	On	Gold
1-1437576-6	MHS123GRA	SPDT	On	Off	On	Gold
2-1437576-1	MHS133GRA	SP3T	On	On	On	Gold



Tyco Electronics	Alcoswitch	Туре				Contacts
3-1437576-0	MHS222RA	DPDT	On	None	On	Silver
3-1437576-5	MHS223RA	DPDT	On	Off	On	Silver
4-1437576-1	MHS233RA	DP3T	On	On	On	Silver
2-1437576-7	MHS222GRA	DPDT	On	None	On	Gold
3-1437576-3	MHS223GRA	DPDT	On	Off	On	Gold
3-1437576-8	MHS233GRA	DP3T	On	On	On	Gold

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Catalog 1308390 Issued 9-04

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Dimensions are in inches

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

tyco

SSJ Series

# Slide Switches, Micro Size, Instrumentation Grade

### MATERIAL SPECIFICATIONS:

Contacts	Silver clad plate over copper alloy
Cover Base Material	Polyester
Actuator Material	Polyacetal
Terminals	Silver over nickel plate over copper alloy
Terminal Seal	Molded in

#### **ENVIRONMENTAL SPECIFICATIONS:**

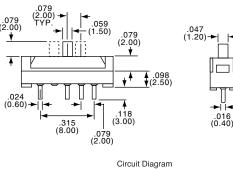
Operating Temperature	+ $14^{\circ}F$ to + $140^{\circ}F$ (- $10^{\circ}C$ to + $60^{\circ}C$ )
Storage Temperature	$4^{\circ}$ F to +140°F (-20°C to +60°C)
Solder Heat Resistance	270°C+10°C, 5 seconds per MIL-STD-202,
	Method 210

#### TYPICAL PERFORMANCE CHARACTERISTICS:

.100 Milliamps @ 12 VDC
.20 Milliohms max.
.Make before break
.100 Megohms min.
.500 Volts RMS @ sea level
.250 Grams, (+200g, -150g)
.0.079" (2.01)
.Up to 10,000 Cycles

.079 (2.00) SPDT 079 .059 (1.50) .402 (10.2) 0.79 (2.00) 0.97 62 Drill .079 (2.00) .157 (4.00) .098 PCB Hole Layout .024 .016 (0.40) .118 (3.00) SSJ12 Part Number .157 (4.00) Alcoswitch Plating Tyco Electronics Mounting Style Circuit Diagram 3-1437575-1 SSJ12 Silver Upright .402 (10.2) SPDT .100 (2.54) .047 (1.20) .157 (4.00) ¥ 038 .000 (0.97) No. 62 Drill .138 (3.50) ▲ .098 ▼(2.50) ¥₹ .079 (2.00) 3 Plcs .098 (2.50) .059 .016 (0.40)-024 ┢ (1.50)-(0.60) PCB Hole Layout → .118 (3.00) SSJ12R .079 (2.00) .157 (4.00) Circuit Diagram Part Number Tyco Electronics Alcoswitch Plating Mounting Style 3-1437575-2 SSJ12R Silver Right Angle SP3T .079 (2.00) .059 1.50) .315 (8.00) .047 (1.20)-.622 (15.8) .079 (2.00) ŧ .038 (0.97) No. 62 Drill 4 Plcs .157 (4.00) 4 





SSJ13

B35

Catalog 1308390 Issued 9-04

.079 (2.00)

PCB Hole Layout

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are shown for reference purposes only. Specifications subject

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Electronics

# Slide Switches, Micro Size, Instrumentation Grade

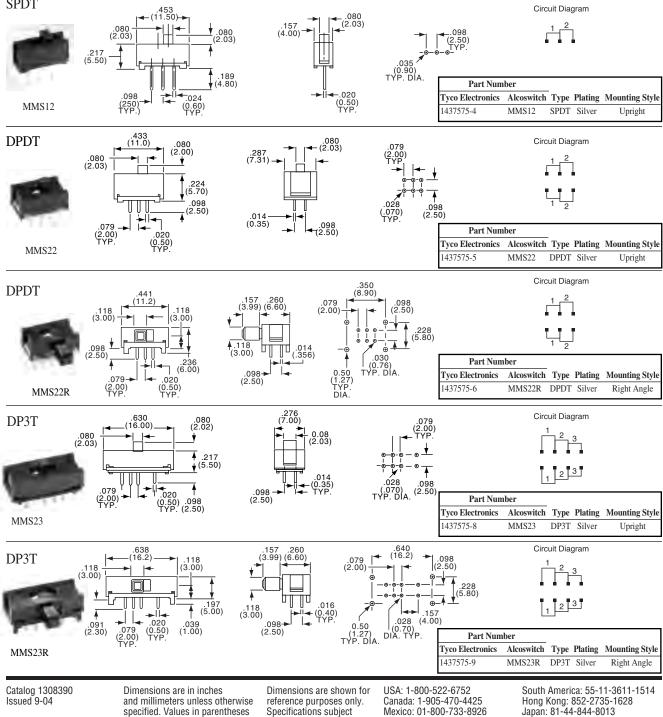
#### MATERIAL SPECIFICATIONS:

Contacts	Silver over nickel over copper alloy
Case Material	11 5
Actuator Material	Polyester UL94HB
Terminals	Silver over nickel over copper alloy
Terminal Seal	Ероху
Terminal Board	UL 94 V-O
ENVIRONMENTAL S	SPECIFICATIONS:
Operating Temperature	+ $14^{\circ}F$ to + $140^{\circ}F$ (- $10^{\circ}C$ to + $60^{\circ}C$ )
	+ $14^{\circ}$ F to + $140^{\circ}$ F (- $10^{\circ}$ C to + $60^{\circ}$ C)

#### TYPICAL PERFORMANCE CHARACTERISTICS: ak AC

Contact Rating	100 mA @ 30 VDC or pea
Initial Contact Resistance	30 Millohms max.
Contact Timing	Make before break
Insulation Resistance	100 Megohms min.
Dielectric Strength	500 VAC
Actuation Force	200 ± 150 Grams
Life Expectancy	Up to 10,000 Cycles

#### SPDT



B36

Specifications subject or brackets are metric equivalents. to change.

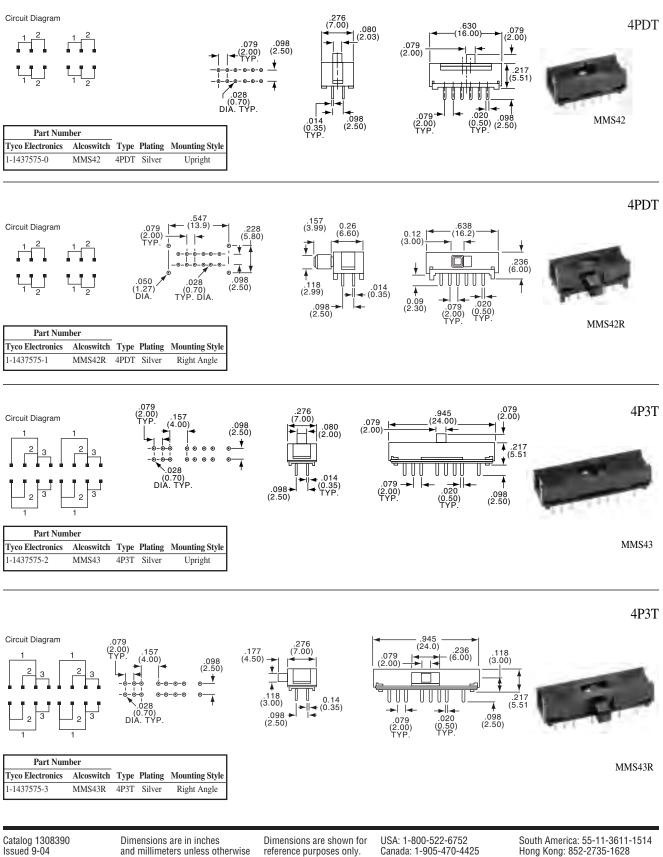
Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

MMS Series

# Alcoswitch

# Slide Switches, Micro Size, Instrumentation Grade

# SEE PAGE B36 FOR PRODUCT SPECIFICATIONS



B37

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specified. Values in parentheses

reference purposes only. Specifications subject or brackets are metric equivalents. to change.

Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

Electronics

# Slide Switches, Micro Size, Instrumentation Grade

#### MATERIAL SPECIFICATIONS:

Contacts	Gold or silver plate over nickel plate
Case Material	Steel, tin plate
Actuator Material	Polyacetal UL94HB
Terminals	Gold or silver plate over nickel plate
Terminal Seal	Ероху

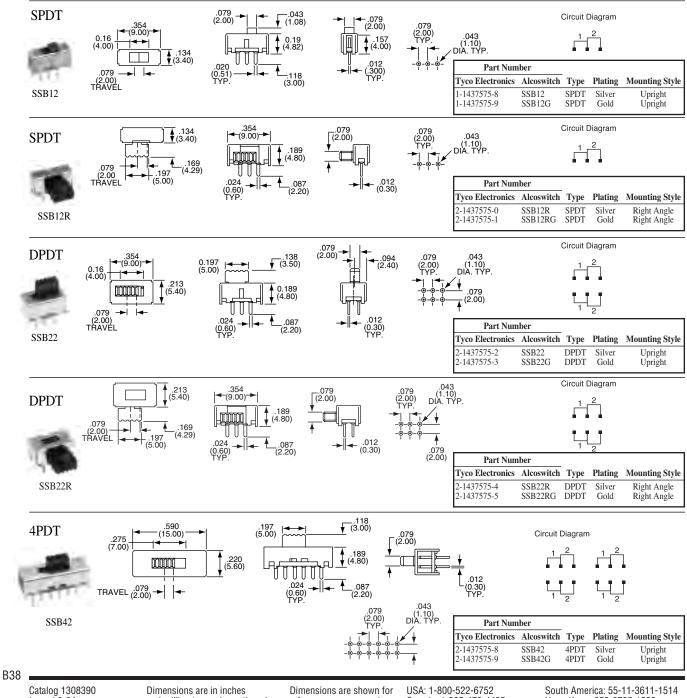
#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature4°F to +176°F (-20°C to +80°C)
Storage Temperature
Solder Heat Resistance+260°C (+500°F) for 5 seconds
per MIL-STD-202, Method 210

#### TYPICAL PERFORMANCE CHARACTERISTICS: AC

Contact Rating	Gold: 0.4 VA @ 20 VDC or peak
C C	Silver: 100 mA @ 30 VDC
Initial Contact Resistance	30 Millohms max.
Contact Timing	Make before break
Insulation Resistance	100 Megohms min.
Dielectric Strength	500 VAC
Actuation Force	250 ± 150 Grams
Life Expectancy	Up to 10,000 Cycles

..0.079" (2.01) Travel ...



Issued 9-04

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and millimeters unless otherwise reference purposes only. specified. Values in parentheses Specifications subject or brackets are metric equivalents. to change.

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tyco

#### SSA Series

# Slide Switches, Micro Size, Instrumentation Grade

### MATERIAL SPECIFICATIONS:

Contacts	Silver or gold plate
Case Material	Polyester PPS UL94VO
Actuator Material	Polyamide UL94HB
Cover Material	Polyamide UL94HB
Terminals	Silver or gold plate
Terminal Seal	Epoxy

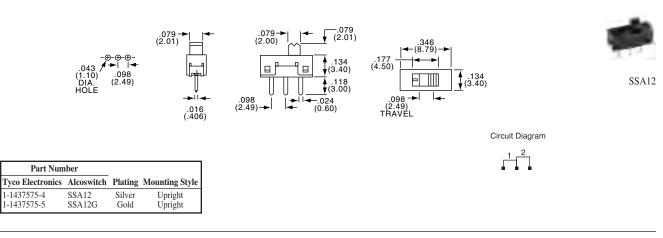
#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature $4^{\circ}F$ to $+158^{\circ}F$ ( $-20^{\circ}C$ to $+70^{\circ}C$ )
Storage Temperature $40^{\circ}$ F to +194°F (- $40^{\circ}$ C +90°C
Solder Heat Resistance
per MIL-STD-202, Method 210

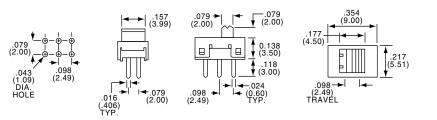
# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	Gold: 0.4 VA max. @ 20 VDC or peak AC
	Silver: 100 Milliamps @ 30 VDC
Initial Contact Resistance	30 Milliohms max.
Contact Timing	Break-Before-Make
Insulation Resistance	100 Megohms min.
Dielectric Strength	500 VAC
Actuation Force	$250 \pm 100$ Grams
Actuator Travel	0.098" (2.49)
Life Expectancy	Up to 10,000 Cycles

#### SPDT



#### DPDT





SSA22

B39

Circuit Diagram

Part Number			
Tyco Electronics	Alcoswitch	Plating	Mounting Style
1-1437575-6 1-1437575-7	SSA22 SSA22G	Silver Gold	Upright Upright

Catalog 1308390 Issued 9-04

spe www.tycoelectronics.com or b

Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. Dimension Specification to change.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967 B

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Electronics

# Slide Switches, PC Tails, Wiping Contact, Consumer Grade

#### MATERIAL SPECIFICATIONS:

.Silver plate over copper alloy
Steel
Polycarbonate
Silver plate over copper alloy
Epoxy

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature......14°F to +140°F (-10°C to +60°C) Storage Temperature......14°F to +140°F (-10°C to +60°C)

# **TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating	250 mA @ 125 VAC, 150 mA @ 12 VDC
Initial Contact Resistance	30 Milliohms max.
Contact Timing	Break before make
Insulation Resistance	500 Megohms min.
Dielectric Strength	500 VAC
Actuation Force	100-300 Grams
Actuator Travel	0.126" (3.20)
Life Expectancy	Up to 10,000 Cycles

#### 2 TO 6 POSITIONS



SLS240PCA

SLS220PC

SLS230PC

CONTACT ARRANGEMENT .....

C

Part Number

Alcoswitch

SL220

SL220 SL330

SL550

SL660

SL770

SL880

SL1000

 $\Theta \oplus \Theta \oplus \Theta$ 

<-.158 (4.01)

.040 1.02) DIA. TYP.

.353 (8.97)

.170 (4.32)

Туре

2 Positions

3 Positions

5 Positions

6 Positions

7 Positions

8 Positions

10 Positions

(7.49)

Tyco

Electronics 1437577-9

-1437577-0

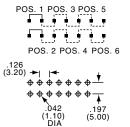
1437577-1

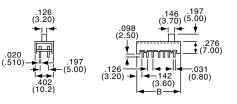
-1437577-2

-1437577-3

1437577-4

1437577-8







Part Number				
Tyco Electronics	Alcoswitch	Туре	Dim.A	Dim.B
3-1437577-9	SLS220PC	2 Positions	.272(6.91)	.535(13.59)
4-1437577-1	SLS230PC	3 Positions	.398(10.11)	.661(16.79)
4-1437577-3	SLS240PCA	4 Positions	.524(13.31)	.787(19.99)
4-1437577-5	SLS250PC	5 Positions	.650(16.51)	.913(23.19)
4-1437577-7	SLS260PC	6 Positions	.776(19.71)	1.039(26.39)

SL Series

# Slide Switches, PC Tails, Lever or Knob Actuator

.039 1.00)

016

⊢.169 (4.30)

Dim. B

.750(19.05) .910(23.1)

1.22(30.99)

1.38(35.05)

1.54(39.12)

1.70(43.18)

2.01(51.05)

(.400)

D

.026

Dim. A

.95(24.13)

1.11(28.19)

1.42(36.07)

1.58(40.13)

1.74(44.20)

1.89(48.01)

2.21(56.13)

.157 (3.99)

.110

.079+ (2.00)

#### 2 TO 10 POSITIONS



(with KSS KNOB)



SL550



B40

Catalog 1308390 Issued 9-04

and millimeters unless otherwise specified. Values in parentheses www.tycoelectronics.com

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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

.200 (5.08)

.550 (14.0) 4

.020 (0.51)

**Knob Only** 

KSS10A

KSS10B

KSS20A

KSS20B

8000000

<u>ה ה ה ה ה ה ה ה</u> ה

.157 (4.00)

Dim. C

.750(19.05)

.910(23.1)

1.22(31.1)

1.38(35.1)

1.54(39.1)

1.70(43.1)

2.01(51.5)

.340 (8.64)

.508 (12.9)

.390 (10.0)

**4**.039 (1.00)

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

.378 (9.60)

<u>\*</u>

¥

Dim. E

.500(12.70)

.500(12.70) .512(13.00)

.512(13.00)

Ð

Dim. D

.270(6.86)

.270(6.86)

.305(7.75)

.305(7.75)

- B ·

4-40 UNC-2B

Ð

.098 (2.49)

Description

Aluminum-Clear Anodize

Aluminum-Black Anodize

Aluminum-Clear Anodize

Aluminum-Black Anodize

**SLS/SL Series** 

tyco

# Slide Switches, Panel Mount, Wiping Contact, Consumer Grade

#### MATERIAL SPECIFICATIONS:

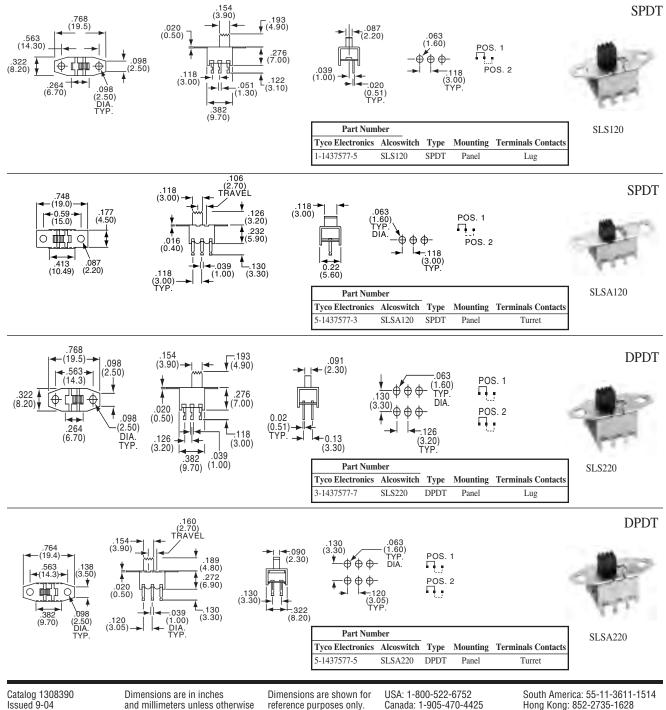
Contacts	.Silver over nickel plate copper alloy
Case Material	.Steel-zinc plated
Actuator Material	.PBT 30% glass
Terminals/Fixed Contacts	.Silver over nickel plate copper alloy
Terminal Seal	.Epoxy

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature4°F to +185°F (-20°C to +85°C)
Storage Temperature $40^{\circ}$ F to $+212^{\circ}$ F ( $-40^{\circ}$ C to $+100^{\circ}$ C)
Solder Heat Resistance+300°C (+572°F) for 5 seconds

#### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	500 mA @ 125 VAC, 200 mA @ 12 VDC
Initial Contact Resistance	30 Millohms max.
Contact Timing	Break-Before-Make
Insulation Resistance	500 Megohms min.
Dielectric Strength	500 VAC
Actuation Force	SLS: 100-300 Grams; SLSA: 220, 300 -500
	Grams
Plunger/Actuator Travel:	0.106" (2.69)
Life Expectancy	Up to 10,000 Cycles



B

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reference purposes only. Specifications subject

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Electronics

# Slide Switches, Wiping Contacts, Consumer Grade

#### MATERIAL SPECIFICATIONS:

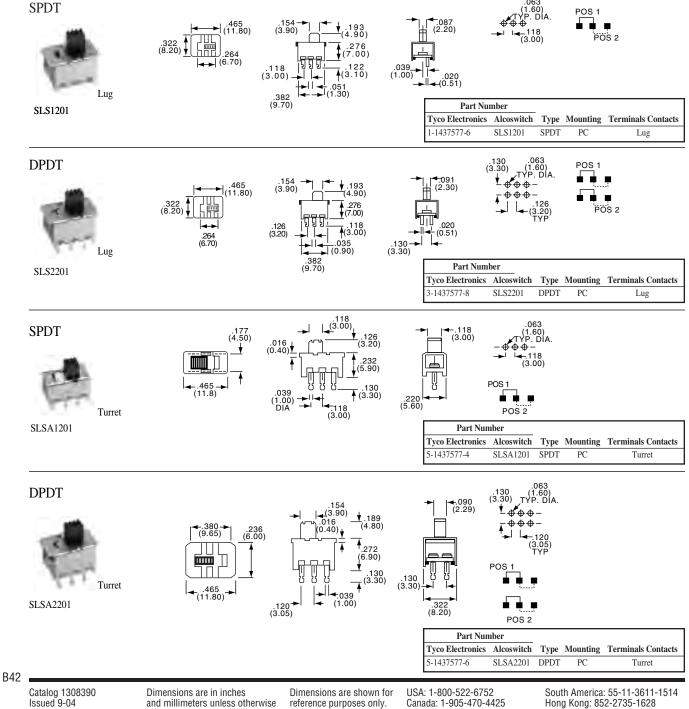
Contacts	Copper alloy-silver/nickel
Case Material	Steel-zinc plate
Actuator Material	PBT 30% Glass
Terminals/Fixed Contacts	Copper, alloy, silver/nickel plate
Terminal Seal	Epoxy

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature $4^{\circ}$ F to + $185^{\circ}$ F (- $20^{\circ}$ C to + $85^{\circ}$ C)
Storage Temperature $40^{\circ}$ F to + $212^{\circ}$ F (- $40^{\circ}$ C to + $100^{\circ}$ C)
Solder Heat Resistance+300°C (+572°F) for 5 seconds

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	.500 mA @ 125 VAC, 200 mA @ 12 VDC
Initial Contact Resistance	.30 Millohms max.
Contact Timing	Break before make
Insulation Resistance	.500 Megohms min.
Dielectric Strength	.500 VAC
Actuation Force	.350±150 Grams
Plunger/Actuator Travel:	0.106 (2.69)
Life Expectancy	.Up to 10,000 Cycles



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Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425



# Slide Switches, Miniature, Rolling Contact, Economy Grade

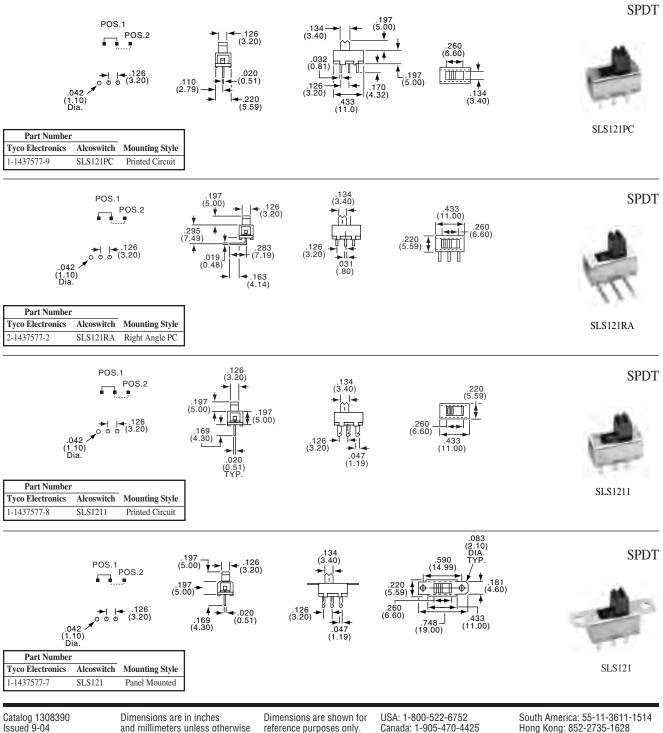
#### MATERIAL SPECIFICATIONS:

Contacts	Silver over nickel plate over copper alloy
Case Material	Tin plate over steel
Actuator Material	Polycarbonate
Terminals/Fixed Contacts	Silver over nickel plate over copper alloy

#### ENVIRONMENTAL SPECIFICATIONS:

 $\label{eq:constraint} \begin{array}{l} Operating \ Temperature.....14^\circ F \ to \ +185^\circ F \ (-10^\circ C \ to \ +85^\circ C) \\ Storage \ Temperature.....14^\circ F \ to \ +185^\circ F \ (-10^\circ C \ to \ +85^\circ C) \\ \end{array}$ 

### TYPICAL PERFORMANCE CHARACTERISTICS:



B

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and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

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Electronics

# Slide Switches, Miniature, Rolling Contact, Economy Grade

#### MATERIAL SPECIFICATIONS:

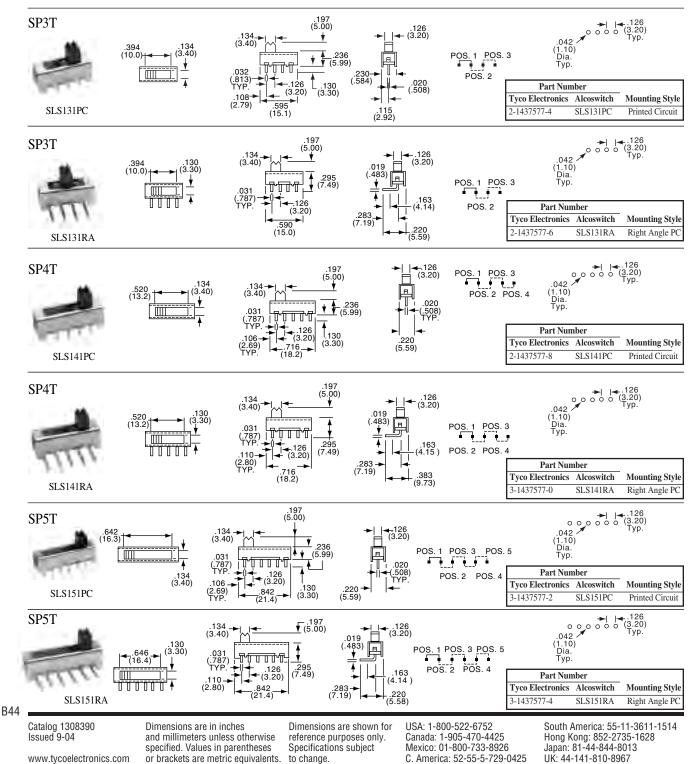
Contacts .....Silver over nickel flash over copper alloy Case Material .....Steel Actuator Material .....Polycarbonate Terminals/Fixed Contacts.....Silver over nickel over copper alloy

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature......+ $14^{\circ}F$  to + $185^{\circ}F$  (- $10^{\circ}C$  to + $85^{\circ}C$ ) Storage Temperature.....+ $14^{\circ}F$  to + $185^{\circ}F$  (- $10^{\circ}C$  to + $85^{\circ}C$ ) Solder Heat Resistance ......+ $260^{\circ}C$  for 5 seconds

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	
150mA @ 12VDC	
Initial Contact Resistance20 Millohms max.	
Contact TimingBreak-Before-Make	
Insulation Resistance>50 Megohms.	
Dielectric Strength500 Volts RMS @ sea level	
Actuation Force	
Plunger/Actuator Travel:0.260" to 0.512" (6.60-13.00)	
Life ExpectancyUp to 10,000 Cycles at no load	



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**CST** Series

## Slide Switches, Baton-Toggle, Multi Pole

#### MATERIAL SPECIFICATIONS:

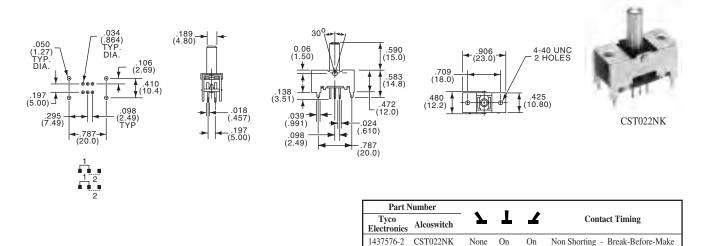
#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature	$+5^{\circ}F$ to $+131^{\circ}F$ (-15°C to $+55^{\circ}C$ )
Storage Temperature	$4^{\circ}$ F to +140° F (-20°C to +60°C)
Solder Heat Resistance	Hand: 300°C for 3 seconds
	Wave: 250°C for 5 seconds

## TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	.300 mA @ 125 VAC, 200 mA @ 12VDC
Initial Contact Resistance	.20 Milliohms max.
Contact Timing	.See table below
Insulation Resistance	.500 Megohms min.
Dielectric Strength	.500 Volts RMS @ sea level
Actuation Force	.450 ± 250 Grams
Plunger/Actuator Travel	30°
Life Expectancy	.Up to 10,000 Cycles

DPDT



DP3T .189 (4.80) .472 (12.0) 050 30 ΤÝ .106 (2.69) .709 (18.0 .197-(5.00) .138 (3.51) .405 (10.3) 0.48 (12.2 5 .583 14.8) .098 (2.49 TYP .098 (2.99) TYP. 4-40 UNC (11.07) 2 PLACES -.197 (5.00) . •-.197 (.500) 039 .195<sup>-</sup> (4.95) (991) TYP. .024-(.610) TYP. | └─.472 .197 (12.0) (5.00) .018 (.457) (20.0).787 (19.99) CST023NK Part Number L 7 **Contact Timing** Tyco 7 Alcoswitch Electronics 1437576-4 CST023NK On On On Non Shorting

Catalog 1308390 Issued 9-04

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(On) indicates momentary position.

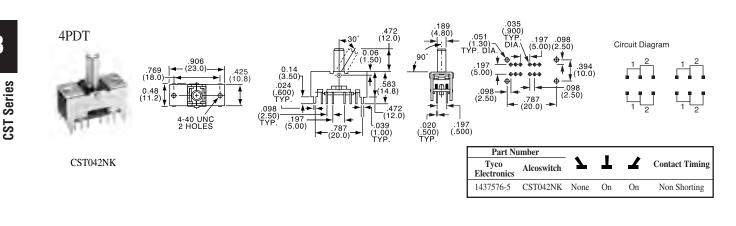
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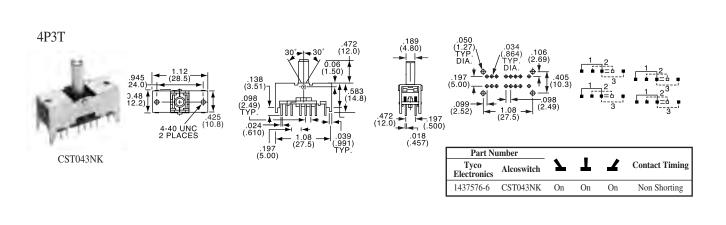
**CST** Series

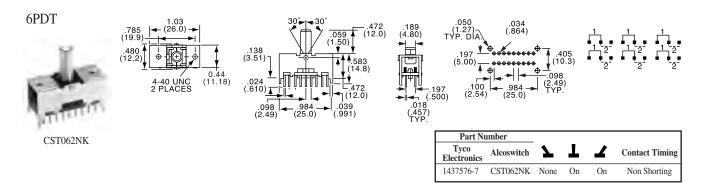
## Alcoswitch

## Slide Switches, Baton-Toggle, Multi Pole

#### SEE PAGE B45 FOR PRODUCT SPECIFICATIONS







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### Slide Switches, Miniature, Right Angle, Surface Mount

#### MATERIAL SPECIFICATIONS:

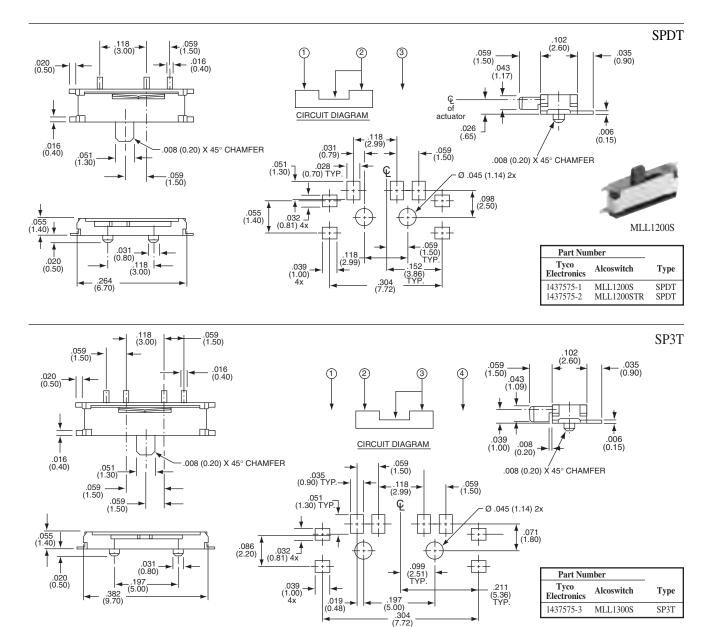
Contacts	BeCu, copper alloy, 1 micron silver plate
Case Material	40% G.F. PPS, UL94V-0
Frame	Stainless steel, silver plated
Actuator Material	Nylon, UL94HB polyamide
Terminals	Brass, copper alloy, 1 micron silver plate
Terminal Seal	Epoxy

#### ENVIRONMENTAL SPECIFICATIONS:

Humidity ......MIL-STD-202, Method 103, Condition B Moisture Resistance ......MIL-STD-202, Method 106 Thermal Shock ......MIL-STD-202, Method 107, Condition A Solder Heat Resistance ...230°C per EIA 364-56 Level 2

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	0.3 Amp, 4 VDC
Initial Contact Resistance	70 Millohms
Insulation Resistance	100 Megohms min.
Dielectric Strength	100 VAC min.
Actuation Force	175 ±100 Grams
Life Expectancy	Up to 10,000 Cycles
Travel	0.059 (1.5mm)



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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

## 13 Amp & 6 Amp, Panel Mount



#### MATERIAL SPECIFICATIONS:

Contacts	.Copper alloy, silver plate
Board	Phenolic, UL94V0
Frame	.Steel, nickel plate
Actuator Material	.Nylon, UL94V-2
Terminals	.Copper alloy, silver plate
Terminal Seal	.Epoxy

#### **ENVIRONMENTAL SEPCIFICATIONS:**

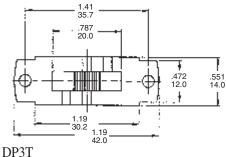
Operating Temperature ... 4°F to 149°F (-20° to +65°C) Storage Temperature .....-13°F to 158°F (-25° to +70°C) Solder Heat Resistance .. Per EIA-364-56A, Procedure 3, Condition B Solderability .....Per EIA-364-52, Class 2, Category 1, 95% minimum coverage

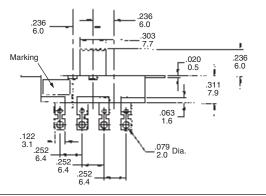
#### TYPICAL PERFORMANCE CHARACTERISTICS:

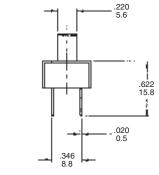
Contact Rating	13 Amp, 125 VAC or 6.5 Amp, 250 VAC
Initial Contact Resistance	50 Milliohms max.
Insulation Resistance	100 Megohms min.
Dielectric Strength	1200 VAC
Actuation Force	100-900 Grams
Life Expectancy	Up to 5000 Cycles
Travel	0.236 (6.0mm)

TYPICAL PERFORMANCE CHARACTERISTICS: Contact Rating ......6 Amp, 125 VAC or 3 Amp, 250 VAC

Initial Contact Resistance......50 Milliohms max. Insulation Resistance ......100 Megohms min. Dielectric Strength ......1800 VAC Actuation Force ......500-900 Grams Life Expectancy .....5000 Cycles Travel ......0.197 (5.0mm)







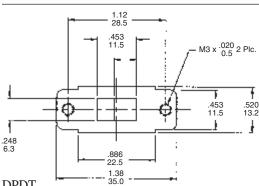
Part Number 1571490-1

#### MATERIAL SPECIFICATIONS:

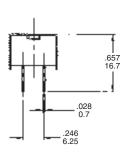
Contacts	Copper alloy, silver plate
Board	Phenolic, UL94HB
Frame	Steel, nickel plate
Actuator Material	Polycarbonate, UL94V-2
Terminals	Copper alloy, silver plate
Terminal Seal	Epoxy

#### **ENVIRONMENTAL SEPCIFICATIONS:**

Operating Temperature ...4°F to 149°F (-20° to +65°C) Storage Temperature .....-13°F to 158°F (-25° to +70°C) Solder Heat Resistance .. Per EIA-364-56A, Procedure 3, Condition B Solderability ......Per EIA-364-52, Class 2, Category 1, 95% minimum coverage



## 197 Travel .024 0.6 Marking .295 7.5 .118 .282 7.16 3.0 .282 7.16



## DPDT

#### Part Number 1571491-1

B48

Catalog 1308390 Issued 9-04

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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

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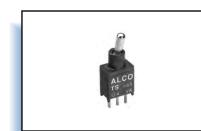
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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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tyco

**Toggle Switches** 



TST Series - Page C5



ATE Series - Page C19



AE Series - Page C35



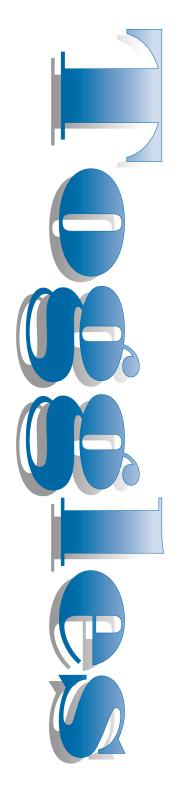
TT Series - Page C8



A Series - Page C22



MT Series - Page C43



C

Catalog 1308390 Issued 9-04

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**Toggle Switches** 

A A A A A

## **Toggle Switches Part Number Index**

A	101K	1V3	0B		••••		• • • •	••••		.C22 C22
AI	011	AB		••••	••••	••••	• • • •	••••	• • • • •	.022
AI	101 K	CO		••••	••••	••••	• • • •	••••	•••••	.C22 .C22
AI	018	.D9A	0	••••	••••	••••	• • • •	••••		.C22 .C22
AI	101K	70	ų.		••••	••••	• • • •	••••	•••••	.C22,C31
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A		1D97	4 V 2 120	Q.	•••	• • • •	• • • •	••••	• • • • •	.022,032
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A	01N	IDC	Ġ							.C22
$\Delta$ 1	101N	(D7(	<u></u>							C22
A	101N	IYC IYC IYZ	Q.							.C22
A	101N	IYZ(	2.		••••			••••		.C22
AI	101P	2V7	В.	••••	••••	••••	• • • •	••••	• • • • •	.C22 .C22 .C22,C33
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A	01P	4YC	Β.							.C22
A	015	CWO	200	)						.C22,C33 .C22 .C22 .C22 .C22
A	101S	CWZ	ZQ							.C22
A1	101S	D9A	Β.		••••					.C22 .C22,C30 .C22,C30 .C22,C30
A]	015	D9A	Q.		••••			••••		.C22,C30
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A	101S	Y9C	QU	L						.C22 .C22,C28
A	101S	YAE	5.							.C22,C28
A	015	YAC	<b>)</b> .		••••			••••		.C22
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A	103N	ID9A	١Q							.C22,C32
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**Toggle Switches** 

## Alcoswitch

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## **Toggle Switches Part Number Index**

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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	MTA206RPC. MTA206SA MTA206SA MTA206SAPC MTA206SPC MTA206TPC MTA206TA MTA206TPC MTA306D MTA306DPC MTA306EPC MTA306F	C44 C43 C43 C44 C44 C43 C43 C44 C43 C44 C43 C44 C43 C44 C43	MTG226P MTG226PA MTG306D MTG306E MTG406D MTG406N MTG406P MTG426N MTL106D MTL106E MTL206P MTL206P MTL206PA		TT11DGRA\$T1/4         C8           TT11DGRA\$T1/4         C8           TT11DGVRA1         C11           TT11DGVRAT         C11           TT11DGW2T         C13           TT11EGPC1         C10           TT11EGPC3         C8           TT11EGPC40         C8           TT11EGPC51/40         C8           TT11EGPC71/4         C8           TT11EGPC81/4         C8           TT11EGPC91/4         C8           TT11EGPC91/4         C8           TT11EGPC91/4         C8           TT11EGPC91/4         C11	TT23N6T6 TT23N7T1/4 TT23N9T1/4. TT23NRA1 TT23P2T TT23P3T TT23P6T0 TT23P6T0 TT23P7T1/4. TT23P6T1/4 TT23P9T1/4 TT41NGPC1 TT41NGPC8T1/4 TT41NGPC9T1/4	C8 C14 C15 C8 C14 C15 C8 C14 C8 C15 C10 C8 C11
$\begin{array}{llllllllllllllllllllllllllllllllllll$	MTA306H MTA406N MTA406NPC MTA406NPC MTA406PA MTA406PA MTA406PA MTA406PAC MTA406PAPC MTA8106DVRA MTA8106DVRA MTA8106EVRA MTA8106EVRA	C43 C44 C43 C43 C43 C43 C43 C44 C52 C52 C52 C53	MTL306D MTL406PA MTL406PA MTM106DPC MTM106EPC MTM106FPC MTM206NPC MTM206NPC MTM206SPC MTM306DPC MTM406NPC MTM406NPC MTM4006NPC		TT11EGRA1         C8           TT11EGRA3         C8           TT11EGRA40         C8           TT11EGRA42         C8           TT11EGRA46         C8           TT11EGRA711/4         C12           TT11EGRA711/4         C8           TT11EGRA711/4         C8           TT11EGRA711/4         C8           TT11EGRA711/4         C8           TT11EGVRA1         C11           TT11EGVRA3T         C11           TT11EGVRA3T         C13           TT11EGPC7T1/4         C8	TT41NGRA2T1/4 TT41NGRA3 TT41NGRA7T1/4 TT41NGRA9T1/4 TT41NGRW2T TT41NGRVW2T TT43NZT TT43NZT TT43NXT TT43NT1/4 TT43NYT1/4 TT43P3T TT43P7T1/4	C8 C12 C8 C13 C11 C14 C15 C14 C15 C15 C15 C14
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	MTA8106FVRA MTA8206NRA MTA8206NVRA MTA8206PVRA MTA8206PVRA MTB106D MTB106E MTB106F MTB106F MTB106G MTB206N MTB206P	C53 C54 C54 C53 C54 C53 C54 C54 C45 C45 C45 C45 C45 C45 C45 C45	MTM8106ERA MTM8106FRA MTM8206NRA MTM8206NRA MTM8206PRA MTM8206PVRA MTM8206PRA MTM8206RVRA NTM8206RVRA N11-AG N1A N1A 0	C52 C53 C52 C52 C53 C53 C53 C53 C53 C53 C53 C53 C54 C54 C54	TT11FGPC9T1/4         C11           TT11FGRA9T1/4         C12           TT11FGRA9T1/4         C8           TT11FGRA9T1/4         C8           TT11FGRA9T1/4         C8           TT13A2T         C14           TT13A4T         C8           TT13A5T         C15           TT13A6T         C8           TT13A6T         C8           TT13A6T0         C8           TT13A6T2         C15           TT13A6T2         C15           TT13A6T2         C15           TT13A9T1/4         C15           TT13A9T1/4         C16           TT13A9T1/4         C16           TT13A9T1/4         C16           TT13D2T         C14           TT13D2T1/4         C8	TT4INGWW2T. TTE11AGP071/4ES TTE11AGPC3TES TTE11AGPC9T1/4 TTE11AGPC9T1/4ES TTE11DGPC1ES TTE11DGPC3TES TTE11DGPC3TFS TTE11DGPC3T1/4ES TTE11DGPC3T1/4ES TTE11EGPC1ES	C13 C8 C18 C18 C17 C18 C17 C18 C18 C17 C18 C17 C18 C17
MTE306D         C46         TST1IDGRA2D         C5         TT21KGPC9T1/4ES         C16         TTE21NGRA1ES         C8,C17           MTE306E         C46         TST1IDGSRA1D         C5,C6         TT21NGPC1         C10         TTE21PGPCES         C17           MTE406N         C46         TST1IDGSRA1D         C5,C6         TT21NGPC1         C10         TTE21PGPCESS         C18           MTE406P         C46         TST1IDGSRABID         C5,C6         TT21NGPC1S         C16         TTE21PGPC9TI/4ES         C18           MTF106D         C47         TST1IDGVRA1D         C5,C7         TT21NGPC1T         C8         TTE23N2T         C8           MTF106F         C47         TST1IEGRA1D         C5         TT21NGPC1T1/4         C8         TTE23N2T         C8           MTF106G         C47         TST1IEGRA1D         C5         TT21NGPC2T1/4         C8         TTE23N9T1/4         C8           MTF106G         C47         TST1IEGRA1D         C5         TT21NGPC4T1/4         C8         TTE23N9T1/4         C8           MTF106G         C47         TST1IEGRA1D         C5         TT21NGPC4T1/4         C8         TTE23N9T1/4         C8           MTF106D         C47         TST1IEGRA1D         C5 <td>MTB306D MTB106D MTE106E MTE106E MTE106F MTE106G MTE106H MTE206N MTE206P MTE206P MTE206P MTE206R MTE206S</td> <td>C45 C45 C46 C46 C46 C46 C46 C46 C46 C46 C46 C46 C46 C46</td> <td>N1B           N1C           N2-AG           N35-AG           N40-AG           N43-AG           N43-AG           SPA32           SPA42           TST11DGPC1D           TST11DGPC4D</td> <td>C54,D32 C54 C54 C54 C54 C54 C54 C54 C55 C55 C55 C5C6 C5</td> <td>TT13D4T0         C8           TT13D4T1/49         C8           TT13D6T0         C8           TT13D7T1/4         C14           TT13D9T1/4         C15           TT13D9T1/4ES         C8           TT13D9T1/4ES         C8           TT13D9T1/4ES         C8           TT13D9T2TE         C8           TT13E3T         C15           TT13E3T         C15           TT13E3T         C15           TT13E9T1/4         C14           TT13E9T1/4         C15           TT12LKGPC1         C10</td> <td>TTE118GRA1ES TTE13A9T1/4 TTE13D2T TTE13D8T1/4 TTE13D9T1/4 TTE13DG2T TTE13E8T1/4 TTE21KGPC9T1/4ES TTE21NGPC1ES TTE21NGPC1ES TTE21NGPC3TES TTE21NGPC9T1/4ES</td> <td>C17 C8 C8 C8 C8 C8 C8 C8 C8 C8 C8,C17 C8,C18 C18</td>	MTB306D MTB106D MTE106E MTE106E MTE106F MTE106G MTE106H MTE206N MTE206P MTE206P MTE206P MTE206R MTE206S	C45 C45 C46 C46 C46 C46 C46 C46 C46 C46 C46 C46 C46 C46	N1B           N1C           N2-AG           N35-AG           N40-AG           N43-AG           N43-AG           SPA32           SPA42           TST11DGPC1D           TST11DGPC4D	C54,D32 C54 C54 C54 C54 C54 C54 C54 C55 C55 C55 C5C6 C5	TT13D4T0         C8           TT13D4T1/49         C8           TT13D6T0         C8           TT13D7T1/4         C14           TT13D9T1/4         C15           TT13D9T1/4ES         C8           TT13D9T1/4ES         C8           TT13D9T1/4ES         C8           TT13D9T2TE         C8           TT13E3T         C15           TT13E3T         C15           TT13E3T         C15           TT13E9T1/4         C14           TT13E9T1/4         C15           TT12LKGPC1         C10	TTE118GRA1ES TTE13A9T1/4 TTE13D2T TTE13D8T1/4 TTE13D9T1/4 TTE13DG2T TTE13E8T1/4 TTE21KGPC9T1/4ES TTE21NGPC1ES TTE21NGPC1ES TTE21NGPC3TES TTE21NGPC9T1/4ES	C17 C8 C8 C8 C8 C8 C8 C8 C8 C8 C8,C17 C8,C18 C18
	MTE306D MTE406N MTE406N MTF106D MTF106E MTF106G MTF106G MTF106G MTF106H MTF126E MTF126E MTF126E MTF126E MTF126F MTF126G MTF1266N	C46 C46 C46 C47 C47 C47 C47 C47 C47 C47 C47 C47 C47 C47 C47	TSTI IDGRA2D TSTI IDGSPCID TSTI IDGSRAID TSTI IDGSRAID TSTI IDGVRA1D TSTI IDGVRA2D TSTI IEGPCID TSTI IEGRAID TSTI IEGRA1D TSTI IEGSRA1D TSTI IEGVRAID TSTI IEGVRAID TSTI IFGPCID TSTI IFGRAID TSTI IFGRAID		TT21KGPC9T1/4ES         C16           TT21NGPC1         C8           TT21NGPC1ES         C10           TT21NGPC1T         C8           TT21NGPC1T         C8           TT21NGPC1T/4         C8           TT21NGPC11/4         C8           TT21NGPC71/4         C8           TT21NGPC71/4         C8           TT21NGPC71/4         C8           TT21NGPC971/4         C8           TT21NGPC91/4         C11           TT21NGPC91/4         C11           TT21NGPC91/4         C16           TT21NGRA1         C8	TTE21NGRA1ES TTE21PGPC3TES TTE21PGPC3TES TTE21PGPC3TES TTE21PGRA1ES TTE23N8T1/4 TTE23N8T1/4 TTE23N8T1/4 TTE23N9T1/4 TTE23P8T1/4 TTE41NGPC1 TTE41NGWU2T TTE41NGWU2T TTE43N8T1/4	C8,C17 C17 C18 C18 C18 C18 C8 

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**Toggle Switches** 

C

С3

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**Toggle Switches** 

## Toggle Switches, Poles, Throws & Functions Selection Guide

### SERIES/CURRENT RATING/PAGE NUMBER

ATE Series ......0.4VA .....Page C19 A/AE Series 0.4VA ...5 Amps......Page C22/35

TT Series	0.4VA 3 Amps	Page C8
TST Series	0.4VA	Page C5
MT Series	6 Amps	Page C43

	SPDT	DPDT	3PDT	4PDT
On - None - On 2 Position	ATE Gemini Tiny/TST Green	ATE Gemini Tiny Green	Green	Tiny Green ATE
On - Off - On 3 Position	ATE Gemini Tiny/TST Green	ATE Gemini Tiny Green	Green	Tiny Green
On - None - (On) 2 Position	ATE Gemini Tiny/TST Green	Gemini Tiny Green	Green	Tiny
(On) - Off - (On) 3 Position	ATE Gemini Green TST	ATE Gemini Green	Green	
On - Off - (On) 3 Position	Gemini Green	Gemini Green	Green	
On - On - On 3 Position		Gemini Green		Green
(On) - On - (On) 3 Positions		Gemini Green		
On - On - (On) 3 Position		Gemini Green		
On - Off 2 Position	Tiny	Tiny		

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Electronics

## Toggle Switches, Tiny, Sealed, Through Hole and Surface Mount

#### FEATURES:

- Rating 0.4VA max. at 20VAC/DC
- High temperature plastics Liquid crystal polymer (LCP)
- Specifically designed for thru-hole and surface mount applications -Tin lead plated terminals
- · Washable process sealed construction Internal actuator "O" Ring
- · Ultrasonic welded case

#### MATERIAL SPECIFICATIONS:

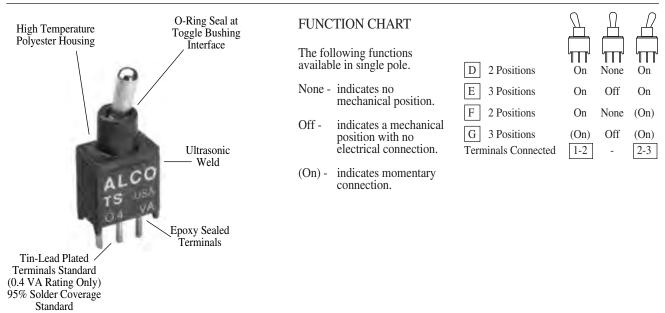
Contacts	Copper alloy with gold over nickel plate
Case Material	LCP
Actuator Material	Nickel plated brass
Terminals	Copper alloy with gold over nickel plating inside, tin plating outside
Terminal Seal	Epoxy
Support Bracket	Tin plated steel

### TYPICAL PERFORMANCE CHARACTERISTICS:

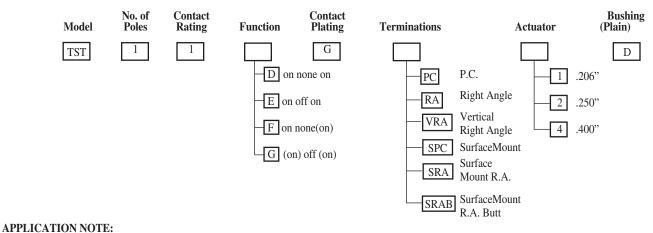
Contact Rating	0.4 VA @ 20 VAC/DC
Initial Contact Resistance	20 Milliohms max.
Contact Timing	Break-before-make
Insulation Resistance	1,000 Megohms 500 VDC min.
Dielectric Strength	1,000 Volt RMS @ sea level
Actuator Travel	22° for E and D function
	18° for F, G function
Life Expectancy	D Function: Up to 80,000 cycles
	E Function: Up to 60,000 cycles
	F, G Function: Up to 30,000 cycles

#### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature22°F to +185°F (-30°C to +85°C	)
Storage Temperature67°F to +185°F (-55°C to +85°C	)



#### PART NUMBERING MATRIX



#### For sealed pushbutton switches, see page D3 - D5

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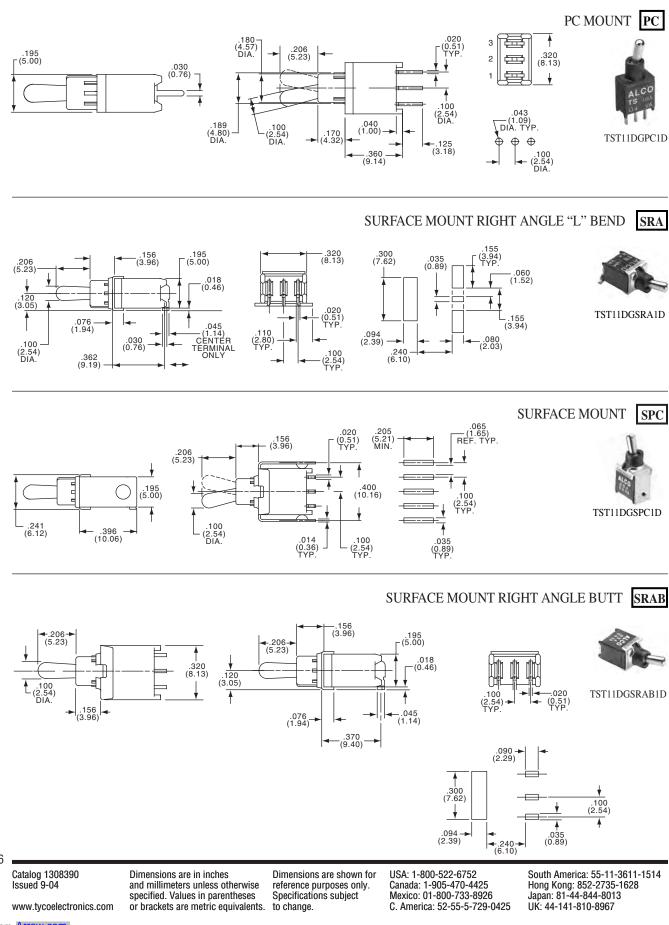
Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967 C5

**TST Series** 

## Alcoswitch

**TST Series** 

## Toggle Switches, Tiny, Sealed, Through Hole and Surface Mount



tyco

Electronics

**TST Series** 

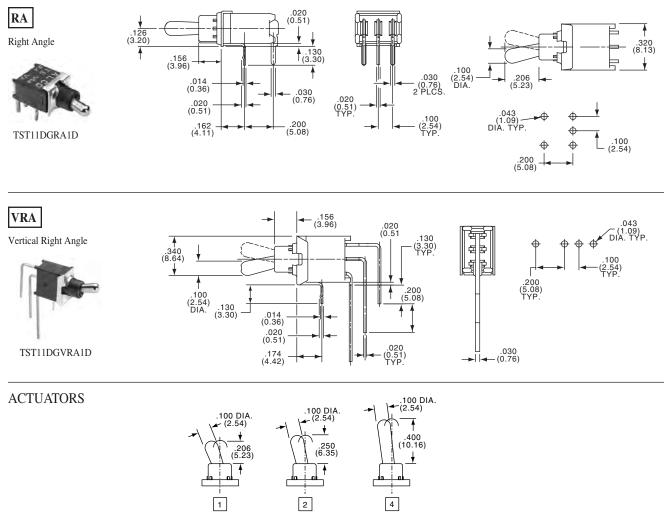
C6



**TST Series** 

## Alcoswitch





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Electronics

#### TT Series



## Alcoswitch

## Toggle Switches, Tiny, Part Number Matrix

#### MATERIAL SPECIFICATIONS:

Contacts	Gold over nickel or silver plate
Case Material	Thermoplastic 94V-0
Terminals/Fixed Contacts	Tin lead plate
Terminal Seal	Epoxy on single pole, optional
	on double pole
Process Seal	ES version only (see page C16 - C17)

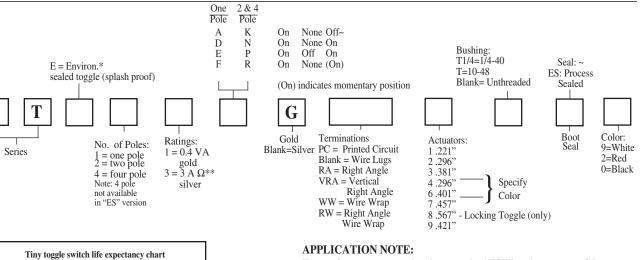
#### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature.....-22°F to +185°F (-30°C to +85°C) Solder Heat Resistance...... See page M3-4

U.L. (File E-46765).....Silver only

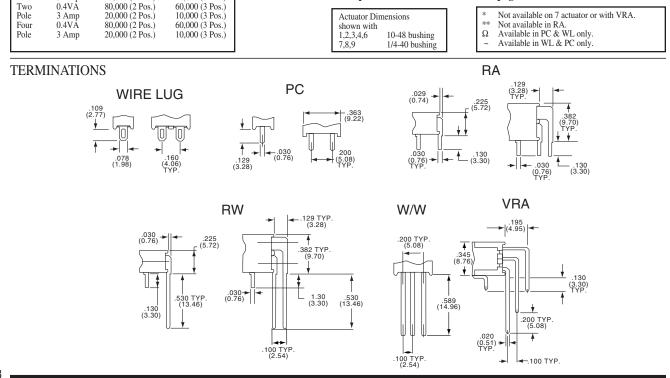
### **TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating	Gold: 0.4 VA max. @ 20 VDC or peak AC
C C	Silver (2 pos.): 3A @ 125 VAC or 28 VDC
	Silver (3 pos.): 2 A @ 125 VAC or 28 VDC
Initial Contact Resistance	20 Milliohms max.
Contact Timing	Break before Make
Insulation Resistance	1,000 Megohms 500 VDC min.
Dielectric Strength	1,000 Volts RMS @ sea level
Plunger/Actuator Travel	26°
High Torque Bushing Shoulder	Yes
Life Expectancy	See chart below
Note: Hardware included with switch	



#### **APPLICATION NOTE:**

#### For surface mount termination, use the "TST" series on page C5. For 3 pole refer to the MT Series on page C43



C8

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Т

One

Pole

0.4VA

3 Amp

80,000 (2 Pos.)

20,000 (2 Pos.)

60,000 (3 Pos.)

10,000 (3 Pos.)

Dimensions are in inches

and millimeters unless otherwise

C

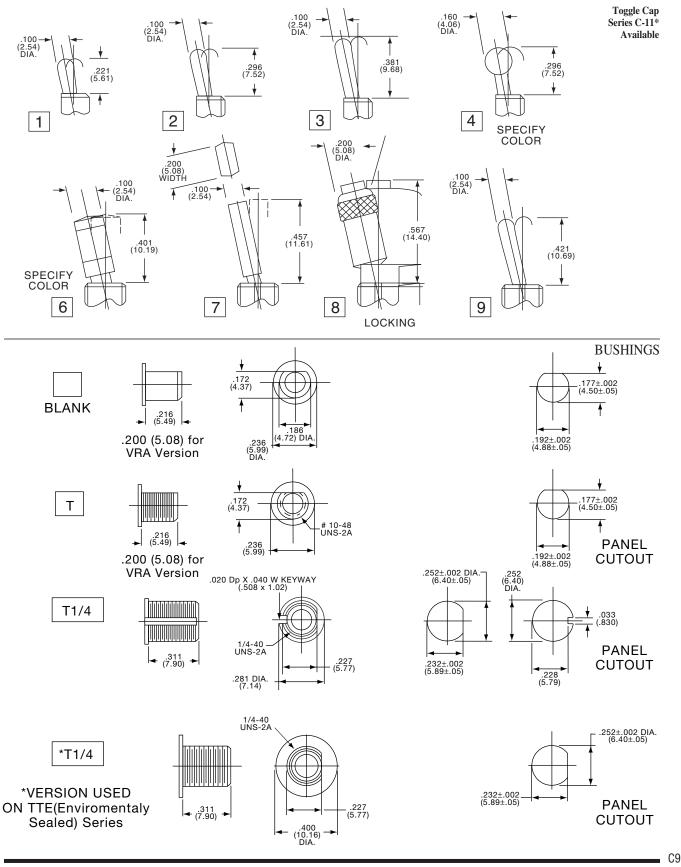
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TT Series



## Alcoswitch





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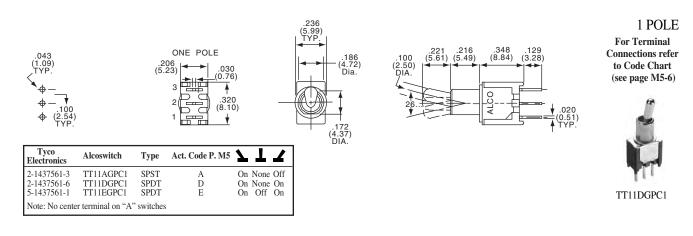
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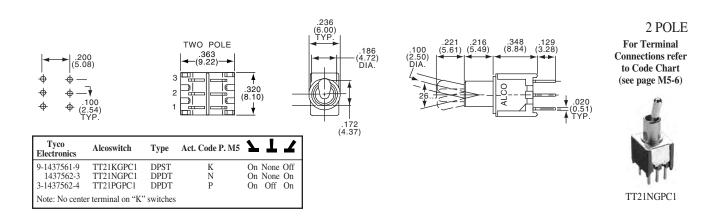
TT Series

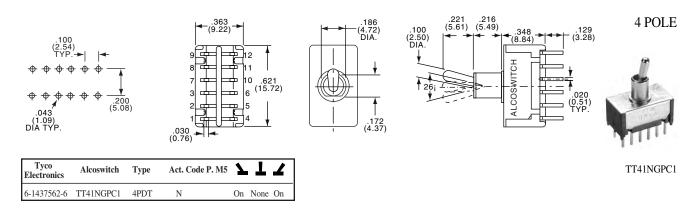


## Alcoswitch

## Toggle Switches, Tiny, Vertical, PC Mount







C

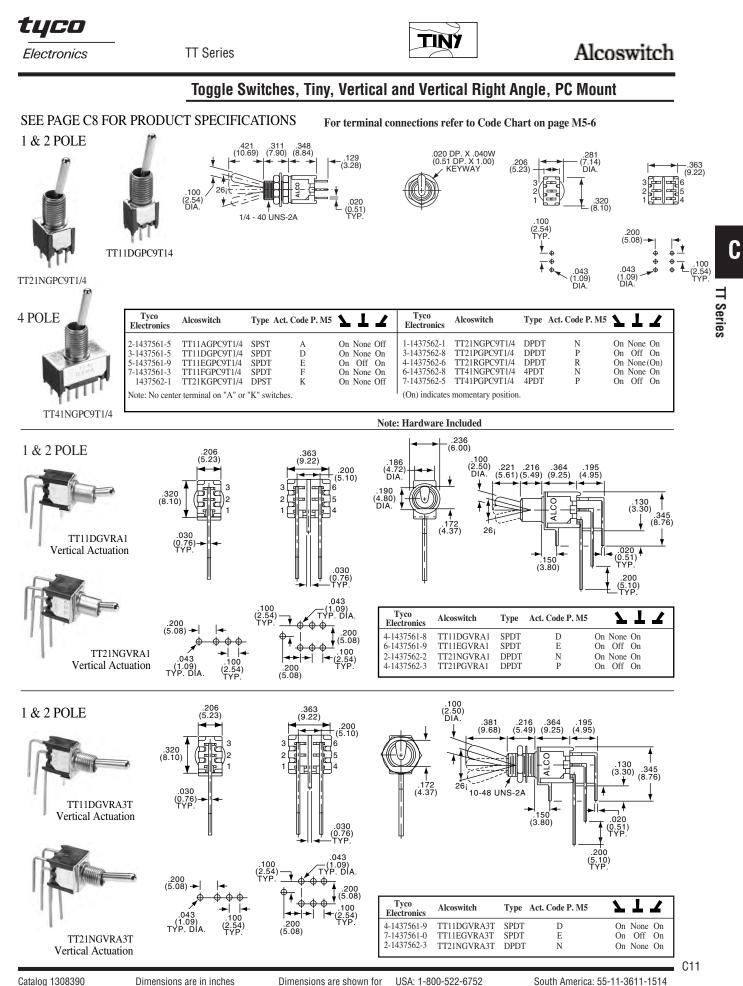
C10

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Canada: 1-905-470-4425

Mexico: 01-800-733-8926

C. America: 52-55-5-729-0425

reference purposes only.

Specifications subject

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and millimeters unless otherwise

or brackets are metric equivalents. to change.

specified. Values in parentheses

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.200 (5.08)

#### TT Series

.320 (8.10)

.0.20 (0.51)

(8.10)

.0.20 (0.51)

.206

100 (.54)



.123 Γ<sup>(3.12)</sup>

.130 (3.30)

¥

**⊦**.030 (0.76)

## Alcoswitch

## Toggle Switches, Tiny, Right Angle, Flat Actuator

.457 (11.61)

1/4-40 UNS-

.200 (5.10)

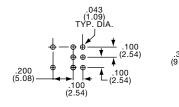
.281 (7.14)

## SEE PAGE C8 FOR PRODUCT SPECIFICATIONS

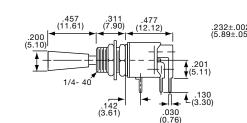
### 1 & 2 POLE FLAT

\* Refer to Page C8 for Other Options \*

TT11DGRA7T1/4 Horizontal Actuation



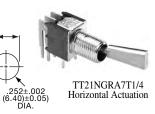
(1.09) TYP. DIA



.142 -(3.61)

.311 (7.90)

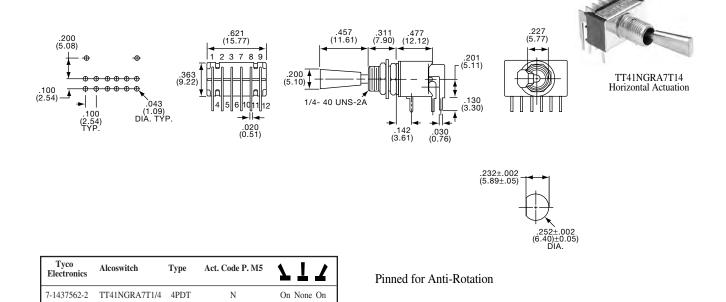
.377 (9.58)



Tyco Electronics	Alcoswitch	Туре	Act. Code P. M5	Z T Z
4-1437561-5 6-1437561-7 7-1437561-4 1-1437562-9 4-1437562-0	TT11DGRA7T1/4 TT11EGRA7T1/4 TT11FGRA7T1/4 TT21NGRA7T1/4 TT21PGRA7T1/4	SPDT SPDT DPDT DPDT DPDT (On) ind	D E F N P licates momentary po	On None On On Off On On None (On) On None On On Off On sistion

Pinned for Anti-Rotation

**4 POLE FLAT** 



#### C12

Catalog 1308390 Issued 9-04

specified. Values in parentheses www.tycoelectronics.com

Dimensions are in inches

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C

**TT Series** 

Electronics

TT Series



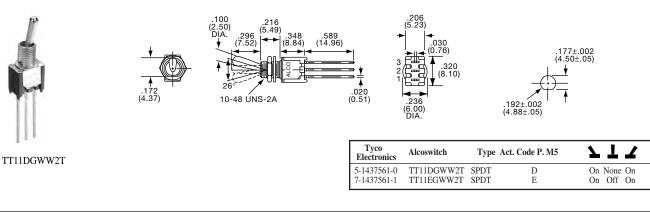
Alcoswitch

## **Toggle Switches, Tiny, Wire Wrap Termination**

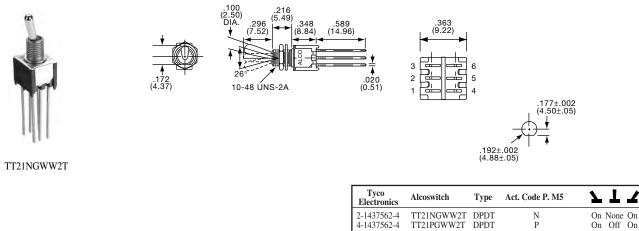
SEE PAGE C8 FOR PRODUCT SPECIFICATIONS

For terminal connections refer to Code Chart on page M5-6

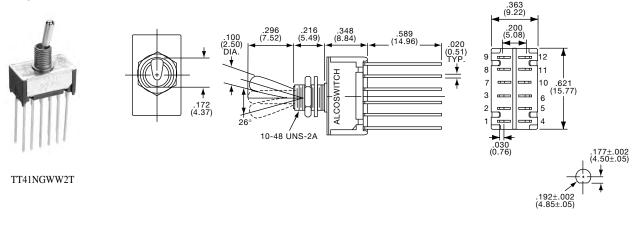
#### 1 POLE







4 POLE



2-1437562-4 4-1437562-4

Tyco Electronics	Alcoswitch	Туре	Act. Code P. M5	1 I Z
7-1437562-4	TT41NGWW2T	4PDT	Ν	On None On

DPDT

DPDT

N P

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C13

On None On On Off On

#### TT Series

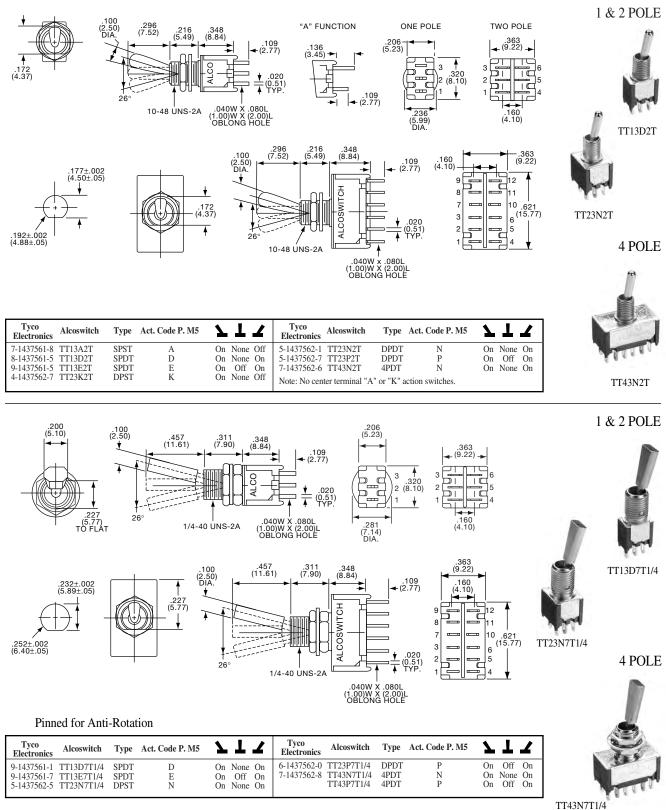


## Alcoswitch

## Toggle Switches, Tiny, Wire Lug, Round or Flat Actuators

NOTICE: Wire lug terminals accept two No. 20 AWG wires.

SEE PAGE C8 FOR PRODUCT SPECIFICATIONS For terminal connections refer to Code Chart on page M5-6



**TT Series** 

C

C14

Catalog 1308390 Issued 9-04

specified. Values in parentheses www.tycoelectronics.com or brackets are metric equivalents.

Dimensions are in inches

Dimensions are shown for and millimeters unless otherwise reference purposes only. Specifications subject to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

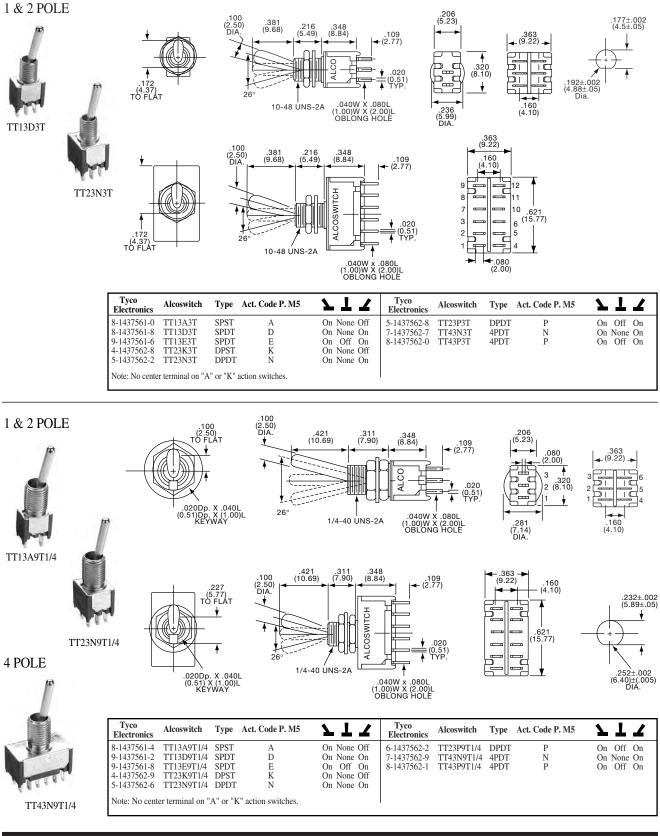
TT Series



## Toggle Switches, Tiny, Wire Lug, Long Actuators

SEE PAGE C8 FOR PRODUCT SPECIFICATIONS

For terminal connections refer to Code Chart on page M5-6



Dimensions are shown for

reference purposes only.

Specifications subject

to change.

USA: 1-800-522-6752

Canada: 1-905-470-4425 Mexico: 01-800-733-8926

C. America: 52-55-5-729-0425

Catalog 1308390 Issued 9-04

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www.tycoelectronics.com

Dimensions are in inches

and millimeters unless otherwise

specified. Values in parentheses

or brackets are metric equivalents.

C

**TT** Series

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

C15

Electronics

TT-ES Series



## **Toggle Switches, Process Sealed, Vertical**

#### MATERIAL SPECIFICATIONS:

Contacts	Gold over nickel
Inner Case Material	High temperature polyester
Outer Case Material	Polyamide
Terminals/Fixed Contacts	Tin lead plate
Terminal Seal	Epoxy
Process Seal	1 0
	case

### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	22°F to +185°F (-30°C to +85°C)
Storage Temperature	$67^{\circ}F$ to $+185^{\circ}F$ (- $55^{\circ}C$ to $+85^{\circ}C$ )
Solder Heat Resistance	See page M3-4

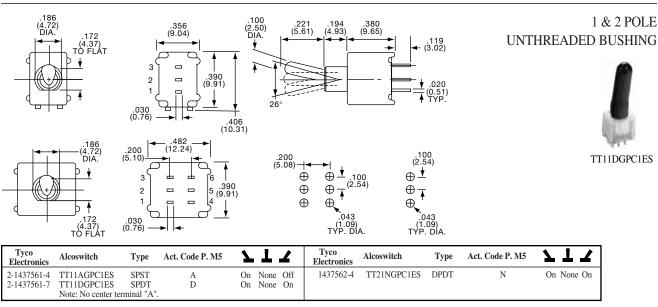
### TYPICAL PERFORMANCE CHARACTERISTICS:

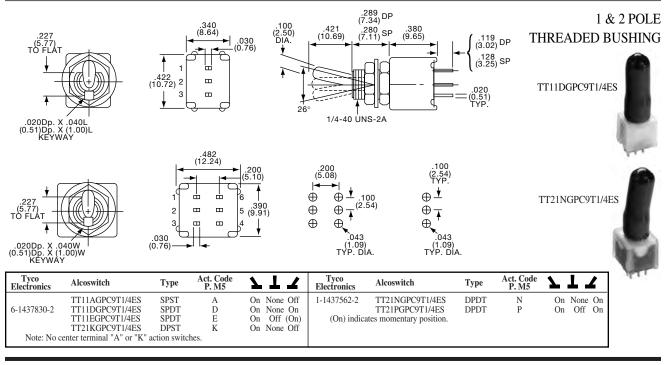
Contact Rating	0.4VA Max. @ 20 VDC or peak
e	AC
Initial Contact Resistance	20 Milliohms max.
Contact Timing	Break-before-make
Insulation Resistance	1,000 Megohms min. 500 VDC
Dielectric Strength	1,000 Volts RMS @ sea level
Plunger/Actuator Travel	
Life Expectancy	See page C8

APPLICATION NOTE: Each switch is provided with a disposable boot used only during cleaning operation.

\* Refer to Page C8 for Other Options \*

Note: Hardware included with switch





C16

Catalog 1308390 Issued 9-04

Issued 9-04 and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are in inches

Dimensions are shown for reference purposes only. Specifications subject s. to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

Electronics

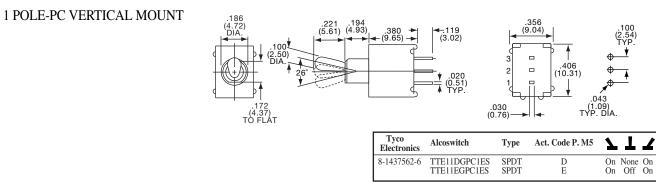
**TTE-ES** Series



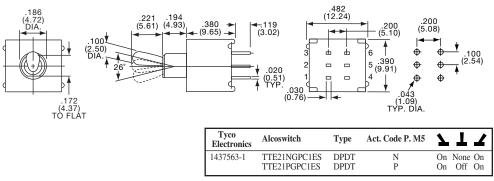
## Toggle Switches, Tiny, Enviromental and Process Sealed

SEE PAGE C16 FOR PRODUCT SPECIFICATIONS

For terminal connections refer to Code Chart on page M5-6



#### 2 POLE-PC VERTICAL MOUNT



### **1 POLE-PC RIGHT ANGLE**



TTE11DGRA1ES Horizontal Actuation

.178 (4.52) .415 172 4.37) FLAT .221 (5.61) (10.54)(10.31)\* 186 .356 (9.04) .200 (5.08) (4.72 (2.50 DIA .400 (10.1) 020 .015 (0.38) →II→ .075 .075 .075 .(1.91) .030 (0.51) TYP. ↑.120 (3.05) TO FLAT .030 (0.76)

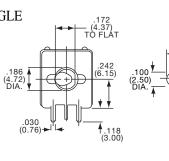
Tyco Electronics	Alcoswitch	Туре	Act. Code P. M5	7 T 7
		SPDT SPDT	D E	On None On On Off On

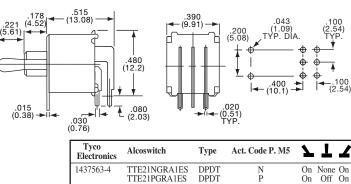
DPDT

#### 2 POLE-PC RIGHT ANGLE



TTE21NGRA1ES Horizontal Actuation





Catalog 1308390 Issued 9-04

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Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 **TTE-ES Series** 

C

C17

On Off On

South America: 55-11-3611-1514

Hong Kong: 852-2735-1628 Japan: 81-44-844-8013

UK: 44-141-810-8967

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**TTE-ES** Series

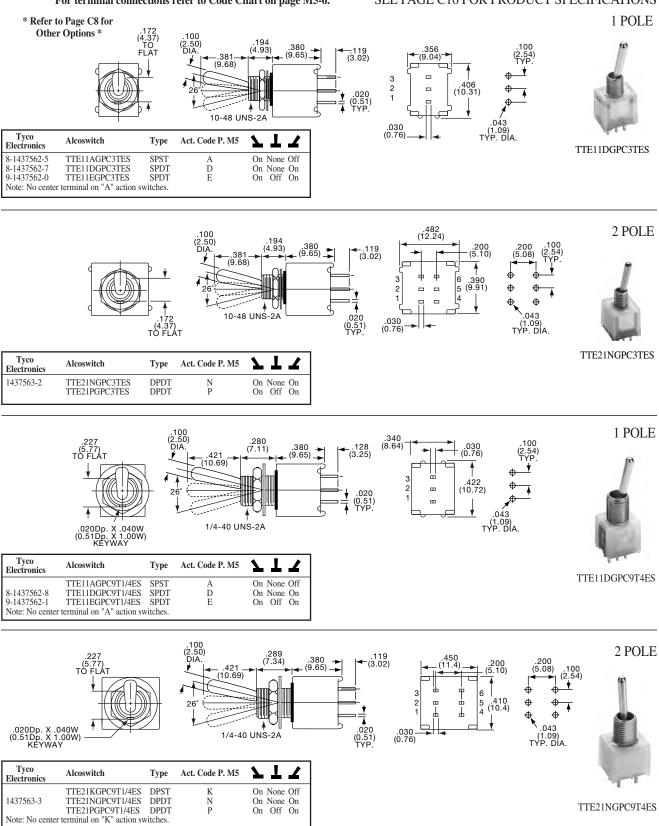


## Alcoswitch



For terminal connections refer to Code Chart on page M5-6.

SEE PAGE C16 FOR PRODUCT SPECIFICATIONS



Catalog 1308390 Issued 9-04

and millimeters unless otherwise specified. Values in parentheses www.tycoelectronics.com or brackets are metric equivalents.

Dimensions are in inches

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

Electronics

ATE Series



## Toggle Switches, Process Sealed, Vertical and Right Angle, Round Actuator

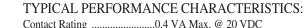
#### MATERIAL SPECIFICATIONS:

Contacts	Gold over nickel plate
Case Material	Polyester 94V-0
Actuator Material	Nickel plated copper alloy
Terminals	Phosphor bronze
Terminal Seal	Epoxy
Process Seal	Tested to MIL-STD-202, method 112
(Internal O-Ring)	test condition A and D, 85°C

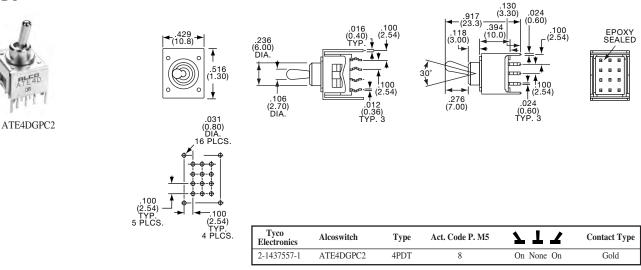
#### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	$4^{\circ}$ F to +176°F (-20°C to +80°C)
Storage Temperature	40°F to +176°F (-40°C to +80°C)

#### 4PDT



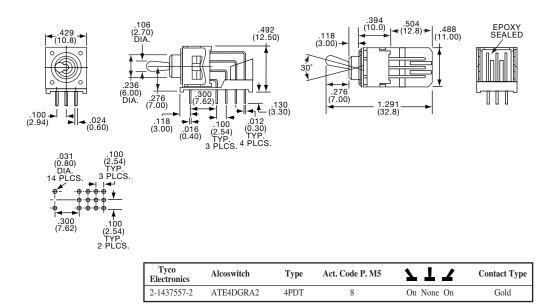
contact reating	
Initial Contact Resistance	e100 Milliohms max.
Contact Timing	Break-before-make
Insulation Resistance	
Actuation Force	
Life Expectancy	Up to 10,000 Cycles



#### 4PDT



ATE4DGRA2



Catalog 1308390 Issued 9-04

www.tycoelectronics.com

specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are in inches

Dimensions are shown for and millimeters unless otherwise reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425



.100 (2.54 TYP

032 (0.81) DIA, TYP

(0.30) TYP.

SPDT/DPDT

ATE Series

## Toggle Switches, Process Sealed, Vertical, Round or Flat Actuators

## SEE PAGE C19 FOR PRODUCT SPECIFICATIONS

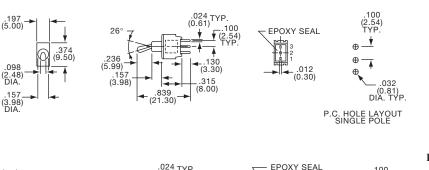
1

Ð Æ

⊕ ⊕ 4

P.C. HOLE LAYOUT DOUBLE POLE

⊕ .100 (2.54) TYP.



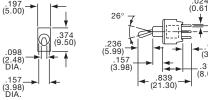
#### Extra compact double pole saves PCB real estate.



ATE1DGPC1



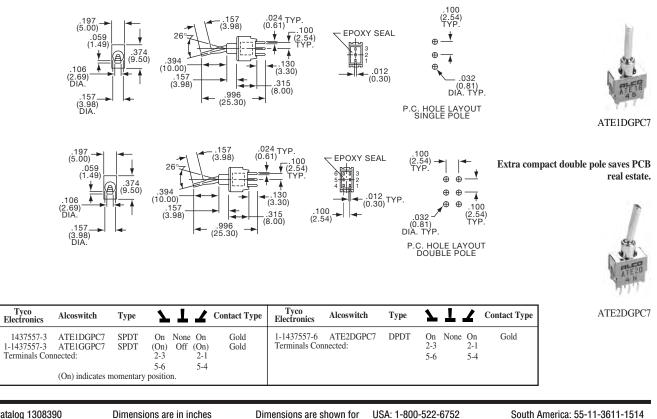
- 374 .50)	.024 (0.61) 26° (5.99) 157 (3.98) (3.98)	- 100 (2.54) TYP. 50 60 80)	EPOXY SEA 6 0 0 0 3 5 0 0 0 1 4 0 0 0 1 1



Tyco Electronics	Alcoswitch	Туре	<u> </u>	Contact Type	Tyco Electronics	Alcoswitch	Туре	7	⊥ ⊿	Contact Type
1437557-2 1437557-6 1-1437557-2 Terminals Con	ATE1DGPC1 ATE1EGPC1 ATE1FGPC1 ATE1GGPC1 mected: (On) indicates r	SPDT SPDT SPDT SPDT nomentary	On None On On Off On On None (On) (On) Off (On) 2-3 2-1 y position.		1-1437557-5 1-1437557-9 Terminals Con	ATE2DGPC1 ATE2EGPC1 nnected:	DPDT DPDT	On On 2-3 5-6	None C Off C 2- 5-	n Gold 1

.100 (2.54)

### SPDT/DPDT



C20

Catalog 1308390 Issued 9-04

specified. Values in parentheses www.tycoelectronics.com

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Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

tyco

Electronics



### Toggle Switches, Process Sealed, Right Angle, Retention Feature

### SEE PAGE C19 FOR PRODUCT SPECIFICATIONS

#### SPDT/DPDT

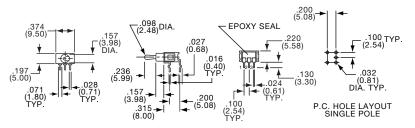


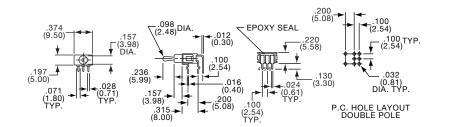
ATE1DGRA1 Horizontal Actuation

Extra compact double pole saves PCB real estate.



ATE2DGRA1 Horizontal Actuation





Tyco Electronics Alcoswite	h Type	71	. ∠	Contact Type	Tyco Electronics	Alcoswitch	Туре	7	L.	L	Contact Type
1437557-4 ATE1DG 1437557-8 ATE1EG 1-1437557-0 ATE1EG 1-1437557-4 ATE1G Terminals Connected: (On) indic	RA1 SPDT RA1 SPDT	On Of On Nor (On) Of 2-3	ne (On)	Gold Gold Gold Gold	1-1437557-7 3-1437592-7 Terminals Con	ATE2DGRA1 ATE2EGRA1 ATE2GGRA1 inected: (On) indicates n	DPDT DPDT DPDT	On (On) 2-3 5-6	Off (	On	Gold Gold Gold

#### SPDT/DPD

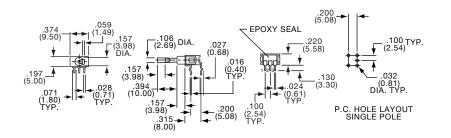


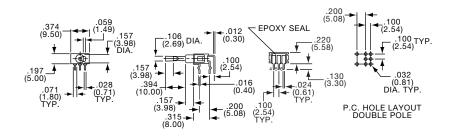
ATE1DGRA7 Horizontal Actuation

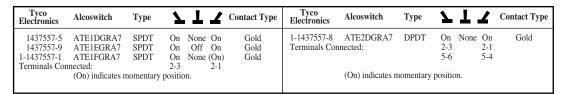
## Extra compact double pole saves PCB real estate.



ATE2DGRA7 Horizontal Actuation







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Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1 Canada Mexico C. Ame

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 C21 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013

UK: 44-141-810-8967

tuco

Electronics

**Gemini Series** 

### Toggle Switches, A Series, Part Number Matrix

#### "A" SERIES DESIGN FEATURES

- Toggle Machined brass, heavy nickel plated.
- Bushing & Frame Rigid one-piece die cast, copper flashed, heavy nickel plated.
- · Fixed Contact Welded construction.
- Terminal Seal Epoxy sealing of terminals is standard.

### MATERIAL SPECIFICATIONS:

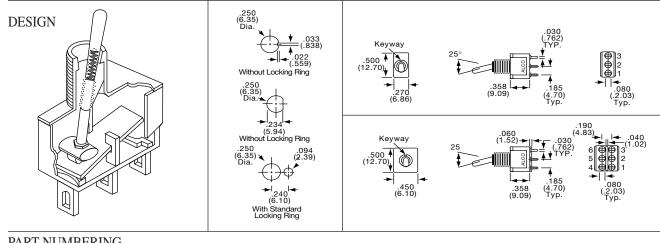
Contacts	Gold/gold flash
	Silver/tin lead
Case Material	Thermoset
Terminal Seal	Epoxy

## TYPICAL PERFORMANCE CHARACTERISTICS:

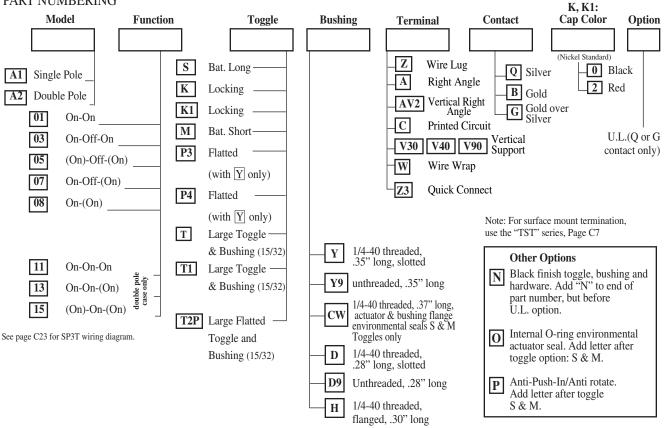
Contact Rating	Silver: 2 A @ 250 VAC or 5 A @ 125 VAC
-	Silver: 2 A @ 30 VDC
	Gold: 0.4 VA @ 20 VAC/DC max.
Insulation Resistance	1,000 Megohms min. @ 500 VDC.
Dielectric Strength	1,000 Volts RMS @ sea level initial
Electrical Life	Up to 30,000 Cycles

### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature.....-4°F to + 185°F (-20°C to + 85°C) Note: Hardware included with switch



## PART NUMBERING



C22

Catalog 1308390 Issued 9-04

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Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

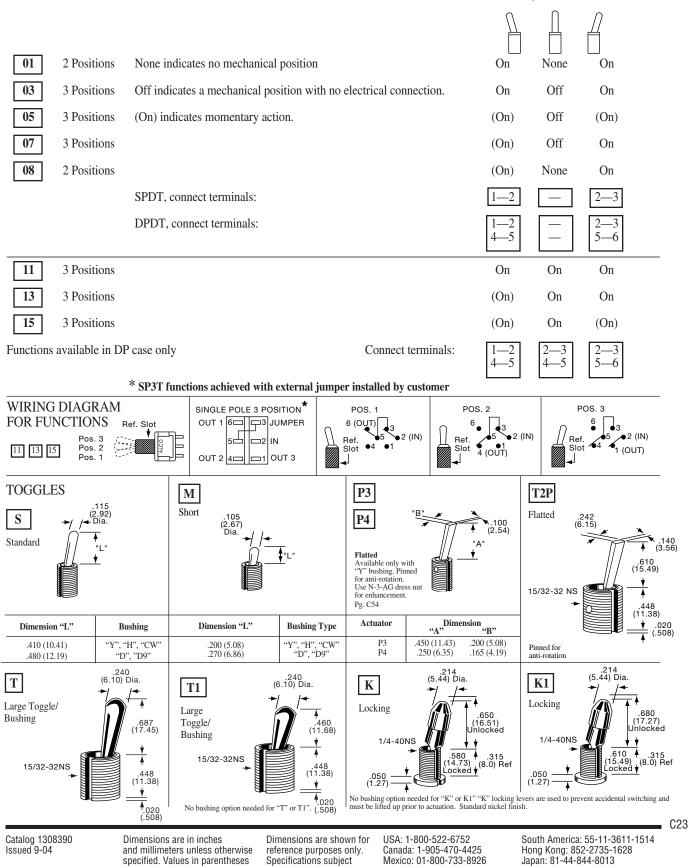


Gemini Series

### **Toggle Switches, A Series, Options**

#### **FUNCTIONS**

The following functions available in SP or DP.



Specifications subject

to change.

C. America: 52-55-5-729-0425

UK: 44-141-810-8967

C

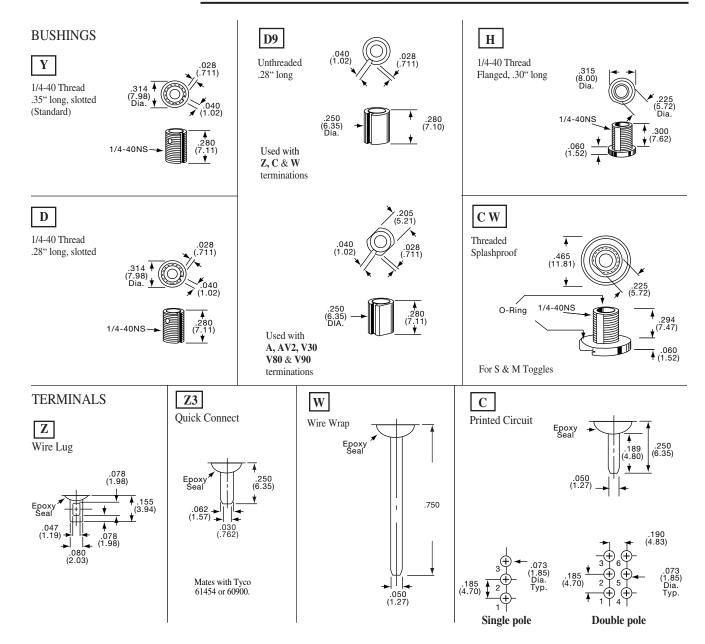
specified. Values in parentheses

or brackets are metric equivalents.

Electronics

**Gemini Series** 

### **Toggle Switches, A Series, Options**



C24

Catalog 1308390 Issued 9-04

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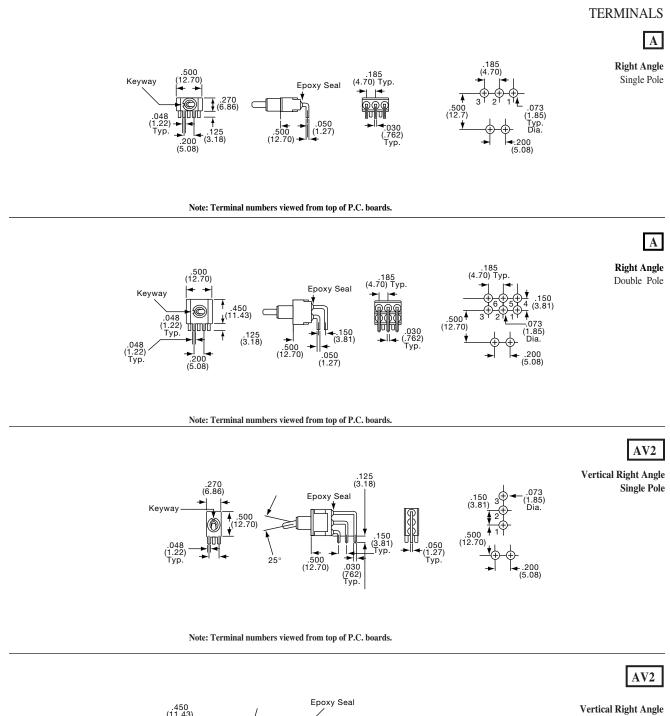
Dimensions are in inches Di and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

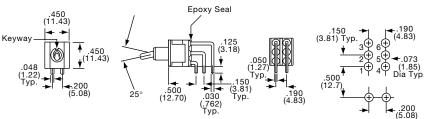
tyco

Gemini Series

### **Toggle Switches, A Series, Options**



Double Pole



Note: Terminal numbers viewed from top of P.C. boards.

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Dimensions are shown for reference purposes only. Specifications subject

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C25

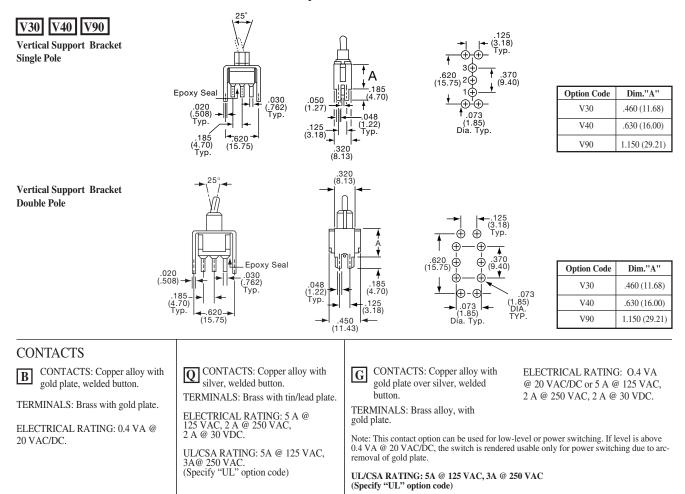
C

Electronics

Gemini Series

### **Toggle Switches, A Series, Options**

TERMINALS NOTE: Terminal numbers viewed from top of P.C. board



C26

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Electronics

**Gemini Series** 

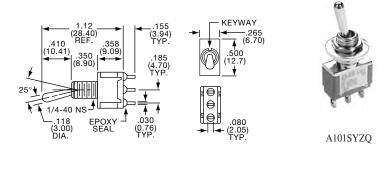
\* Refer to Pages C22-C26 for Additional Options \*

## Toggle Switches, A Series, Vertical, Wire Lug, Long Bat Actuator

SEE PAGE C22 FOR PRODUCT SPECIFICATIONS

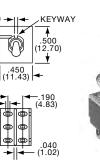
SPDT

Tyco Electronics	Alcoswitch	Туре	Act. Code P.M5	7 T T
Silver Contacts	s			
5-1437554-0	A101SYZQ	SPDT	1	On None On
7-1437554-7	A103SYZQ	SPDT	5	On Off On
9-1437554-6	A105SYZQ	SPDT	5	(On) Off (On)
1437555-9	A107SYZQ	SPDT	5	On Off (On)
2-1437555-0	A108SYZQ	SPDT	1	On None (On)
Gold Contacts	-			
4-1437554-9	A101SYZB	SPDT	1	On None On
7-1437554-6	A103SYZB	SPDT	5	On Off On
9-1437554-5	A105SYZB	SPDT	5	(On) Off (On)
	A107SYZB	SPDT	5	On Off (On)



Tyco Electronics	Alcoswitch	Туре	Act. Co	de P.M5 🔪	⊥∠
Silver Contact	ts				
4-1437555-9	A201SYZQ	DPDT	2	On None	On
6-1437555-2	A203SYZO	DPDT	6	On Off	On
7-1437555-0	A205SYZQ	DPDT	6	(On) Off	(On)
7-1437555-6	A207SYZQ	DPDT	6	On Off	(On)
8-1437555-5	A208SYZO	DPDT	2	On None	(On)
1437556-1	A211SYZQ	SP3T	11	On On	Òn
1437556-4	A213SYZQ	SP3T	11	On On	(On)
1437556-7	A215SYZQ	SP3T	11	(On) On	(On)

(1.52)	
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A201SYZQ

Catalog 1308390 Issued 9-04

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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 C27

Electronics

SPDT/DPDT

**Gemini Series** 

.118 (3.00)

.410 (10.41)

## Alcoswitch

.073
 (1.85)
 DIA. TYP.

.200

## Toggle Switches, A Series, PC Terminals, Long Bat Actuators

\* Refer to Pages C22-C26 for Additional Options \*

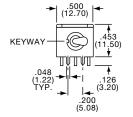
### SEE PAGE C22 FOR PRODUCT SPECIFICATIONS

.185 (4.70)

.50



A101SYAB Horizontal Actuation



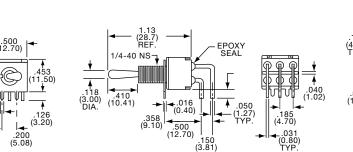
.265 (6.70)

Dimensions are in inches

Πΰ

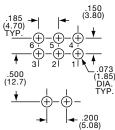
.048 (1.22

.200 (5.08)



**∢**.500 (12.71)

.050 (1.27)



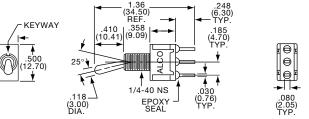
Tyco Electronics	Alcoswitch	Туре	Act. Code P.M5	アエス
Gold Contacts				
4-1437554-3	A101SYAB	SPDT	1	On None On
	A103SYAB	SPDT	5	On Off On
4-1437555-3	A201SYAB	DPDT	2	On None On
	A208SYAB	DPDT	2	On None (On)

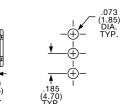
### SPDT/DPDT

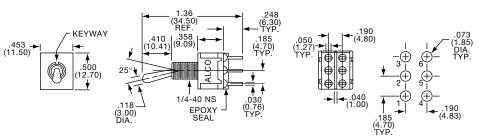


A101SYCB









Tyco Electronics	Alcoswitch	Туре	Act. Code P.M5	ZΙZ
Gold Contacts				
4-1437554-5	A101SYCB	SPDT	1	On None On
7-1437554-2	A103SYCB	SPDT	5	On Off On
1-1437555-8	A108SYCB	SPDT	1	On None (On)
4-1437555-5	A201SYCB	DPDT	2	On None On
6-1437555-0	A203SYCB	DPDT	6	On Off On
8-1437555-3	A208SYCB	DPDT	2	On None (On)

C28

Catalog 1308390 Issued 9-04

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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

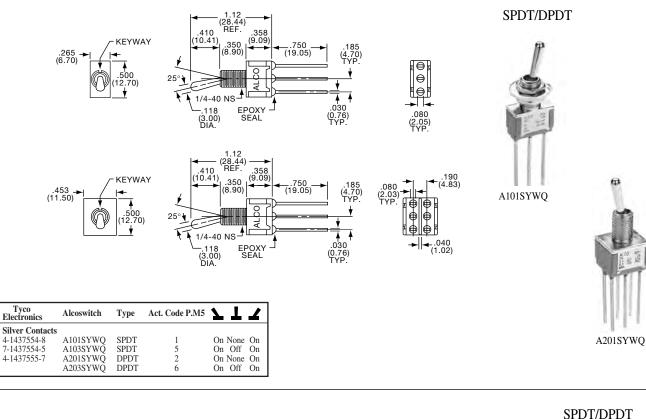
tyco

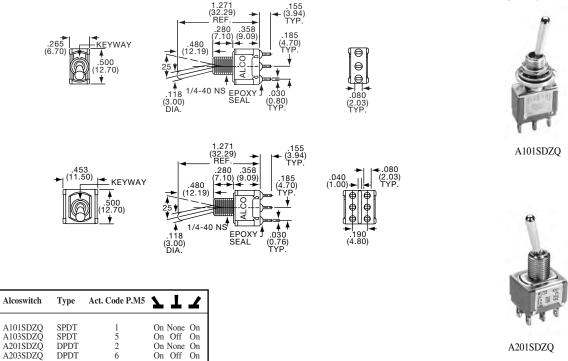
#### **Gemini Series**

### Toggle Switches, A Series, Wire Wrap or Wire Lug, Long Bat Actuators

\* Refer to Pages C22-C26 for Additional Options \*

#### SEE PAGE C22 FOR PRODUCT SPECIFICATIONS





Catalog 1308390 Issued 9-04

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Tyco Electronics

4-1437555-1

5-1437555-9

Silver Contacts 4-1437554-0 6-1437554-9

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Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013

UK: 44-141-810-8967

SPDT/DPDT

Θ



C29

**Gemini Series** 

.040 (1.02)

.270 (6.86)

.500

.453 (11.50) Keyway

.028 (0.71)

KEYWAY

.500 (12.70)

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.500

(6

.048 (1.22

.252 (6.40)

.048 (1.22)

.200-(5.08) .205 (5.21) 25

25

\* Refer to Pages C22-C26 for Additional Options \*

## Toggle Switches, A Series, PC Tail, Straight or Right Angle, Long Bat Actuator

EPOXY SEAL

.185 (4.70

.030 (0.76) TYP.

.185 (4.70) 050

050

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.190 (4.80)

.030 (0.76)

.155 (3.94)

EPOXY SEAL

1/4-40 NS ∳

.480 .280 .358 (12.19) (7.11)(9.09)

1/4-40 NS

╢

.480 .280 .358 .155 (12.19) (7.11) (9.09)(3.94)

SEE PAGE C22 FOR PRODUCT SPECIFICATIONS

SPDT



A101SDCQ

DPDT



Tyco Electronics Alcoswitch Туре Act. Code P.M5 Т  $\mathbf{r}$ 7 Silver Contacts 3-1437554-9 6-1437554-8 A101SDCQ A103SDCQ SPDT SPDT On None On On Off On 5 2 1571670-1 A201SDCQ DPDT On None On A203SDCQ A208SDCO DPDT DPDT 6 2 On Off On On None (On)

 $\Theta | \Theta$ 

→||**∢**.040 (1.00)

i elle i

A201SDCQ

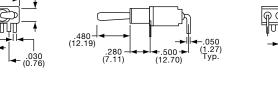
#### SPDT/DPDT

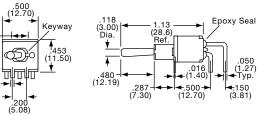


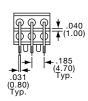
A101SD9AQ Horizontal Actuation



A201SD9AQ Horizontal Actuation







.185 (4.70) Typ.

Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Туре	Act. Code P. M5	7 T T
Silver Contacts		Gold Contacts				
3-1437554-4	A101SD9AQ	3-1437554-3	A101SD9AB	SPDT	1	On None On
6-1437554-4	A103SD9AQ		A103SD9AB	SPDT	5	On Off On
1-1437555-6	A108SD9AQ			SPDT	1	On None (On)
3-1437555-8	A201SD9AQ		A201SD9AB	DPDT	2	On None On
8-1437555-1	A208SD9AQ		A208SD9AB	DPDT	2	On None (On)

C30

Catalog 1308390 Issued 9-04

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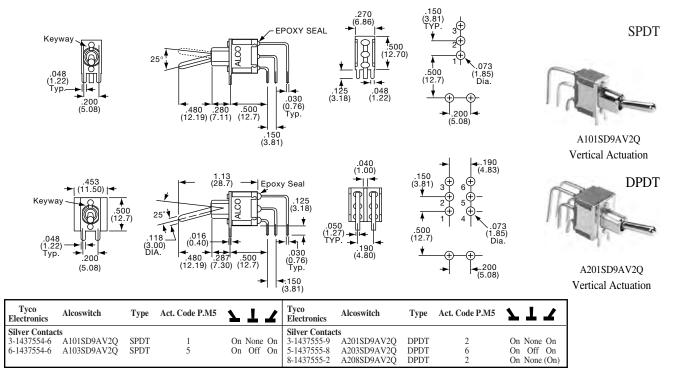


Gemini Series

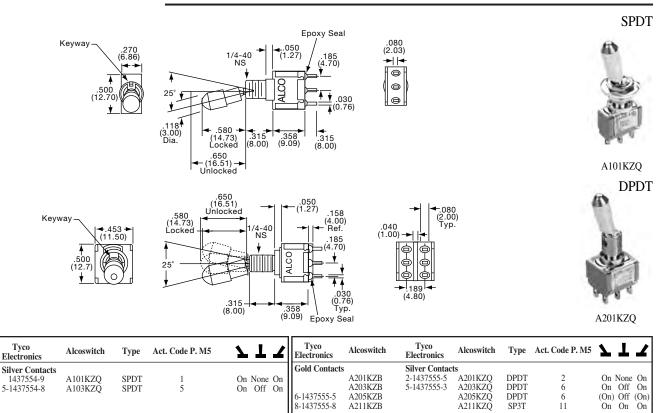
## Toggle Switches, A Series, Vertical, Right Angle, Long Bat Actuator

\* Refer to Pages C22-C26 for Additional Options \*

### SEE PAGE C22 FOR PRODUCT SPECIFICATIONS



## Toggle Switches, A Series, Wire Lug, Locking Toggle



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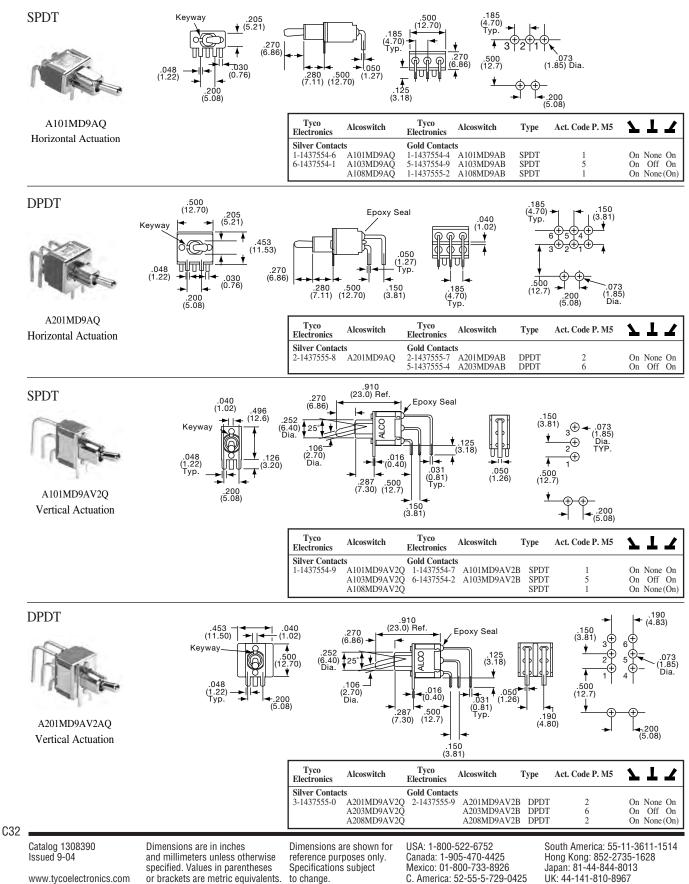
Electronics

Gemini Series

\* Refer to Pages C22-C26 for Additional Options \*

### Toggle Switches, A Series, Right Angle, Short Bat Actuators

SEE PAGE C22 FOR PRODUCT SPECIFICATIONS



C

**Gemini Series** 

SPDT

A101P3YZQ

# tyco

#### Electronics

### Toggle Switches, A Series, Vertical, Wire Lug, Flat or Long Bat Actuator

.030 (0.80) Typ.

.080 (2.03)

►||<

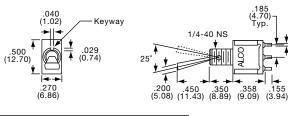
O

.185 (4.70) Typ.

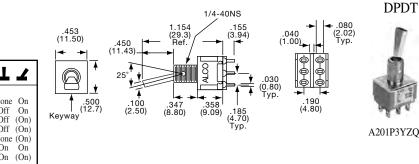
C

### SEE PAGE C22 FOR PRODUCT SPECIFICATIONS

\* Refer to Pages C22-C26 for Additional Options \*

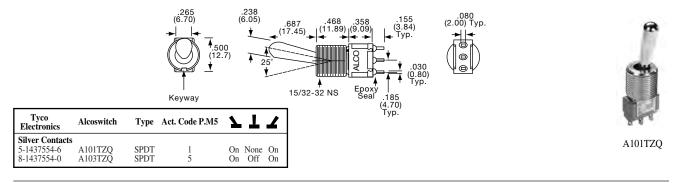


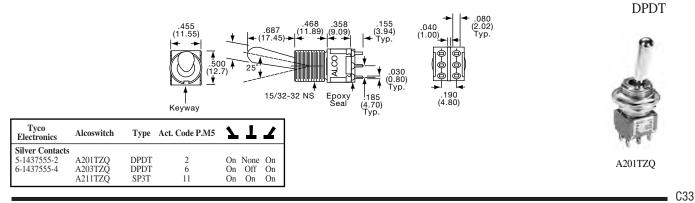
Tyco Electronics	Alcoswitch	Туре	Act. Code P.M5	<b>∠ ⊥ ∠</b>
Silver Contacts				
2-1437554-9	A101P3YZQ	SPDT	1	On None On
6-1437554-3	A103P3YZQ	SPDT	5	On Off On
8-1437554-7	A105P3YZQ	SPDT	5	(On) Off (On)
1437555-5	A107P3YZQ	SPDT	5	On Off (On)
1-1437555-5	A108P3YZQ	SPDT	1	On None (On)



Tyco Electronics	Alcoswitch	Туре	Act. Code P.M5	<b>Z T Z</b>
Silver Contacts 3-1437555-6	A201P3YZQ	DPDT	2	On None On
5-1437555-6 6-1437555-6	A203P3YZQ A205P3YZQ	DPDT DPDT	6	On Off On (On) Off (On)
7-1437555-3 8-1437555-0	A207P3YZQ A208P3YZQ	DPDT DPDT	6 2	On Off (On) On None (On)
9-1436555-3	A211P3YZQ A215P3YZQ	SP3T SP3T	11	On On On (On) On (On)

SPDT





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Gemini Series

\* Refer to Pages C22-C26 for Additional Options \*

## Toggle Switches, A Series, Wire Lug, 15/32 Bushing, Short Bat Actuator

10

### SEE PAGE C22 FOR PRODUCT SPECIFICATIONS

#### SPDT

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C

Gemini Series

(6.05) + (4.00) + (1.00) + (

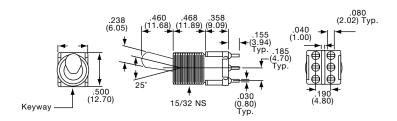
A103T1ZQ

Tyco Electronics	Alcoswitch	Туре	Act. Code P.M5	<b>Z T Z</b>
Silver Contacts				
5-1437554-4	A101T1ZQ	SPDT	1	On None On
7-1437554-9	A103T1ZQ	SPDT	5	On Off On
9-1437554-8	A105T1ZQ	SPDT	5	(On) Off (On)
	A108T1ZQ	SPDT	1	On None (On)

DPDT



A201T1ZQ



Tyco Electronics	Alcoswitch	Туре	Act. Code P.M5	<b>∠⊥∠</b>
Silver Contacts	5			
5-1437555-0	A201T1ZQ	DPDT	2	On None On
6-1437555-3	A203T1ZQ	DPDT	6	On Off On
7-1437555-1	A205T1ZQ	DPDT	6	(On) Off (On)
7-1437555-7	A207T1ZQ	DPDT	6	On Off (On)
8-1437555-6	A208T1ZQ	DPDT	2	On None (On)
1437556-2	A211T1ZQ	SP3T	11	On On On

C34

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Electronics

Gemini Series

C

**Gemini Series** 

### Toggle Switches, AE Series, Process Sealed, Part Number Matrix

#### "AE" SERIES DESIGN FEATURES

- MIL-STD-202 Method 112C Leak Test
- Toggle Machined brass, heavy nickel plated.
- Bushing & Cover Nylon, ultrasonically welded to case, with integral "O-ring", UL94VO.
- Fixed Contact Welded construction.
- Terminal Seal Epoxy sealing of terminals is standard.
- Termination Precious metal (gold or silver)/brass or copper strip with welded contact area.

#### MATERIAL SPECIFICATIONS:

Process Sealing ......"O-ring" seals will withstand wave soldering and various subsequent cleaning operations. Meets MIL-STD-202, Method 112C, Test Condition A & D, 85°C.

#### ENVIRONMENTAL SPECIFICATIONS

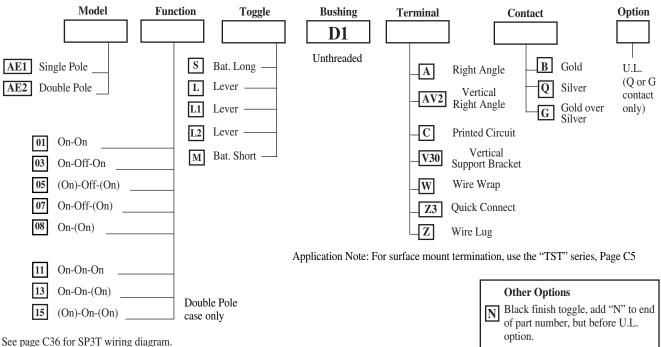
Solder Heat Resistance ......See page M3-4

#### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	Silver: 2 A @ 250 VAC or 5 A @ 125 VAC
	Silver: 2 A @ 30 VDC
	Gold: 0.4 VA @ 20 VAC/DC
Contact Resistance	30 Milliohms max. initial
Insulation Resistance	1,000 Megohms min. @ 500 VDC.
Dielectric Strength	1,000 Volts RMS @ sea level initial
Static Withstanding	15 KV per IEC 801-2
Electrical Life	Up to 30,000 Cycles
Electrical Elic	op to so,ooo eyeles

SINGLE POLE "O-RING" .03( (.7′ Epoxy Seal. DESIGN .050 .250. 260 €.600 (15.24) ⊢.250 (6.35) (6.60)(TYPICAL DIMENSIONS) 219 Epoxy Seal (5.56)060 030 185 (6.35) Dia. (4, 70).250 450 -190 (4.83) -.600-43 -250 (15.24) (6.35) DOUBLE POLE

#### PART NUMBERING



Catalog 1308390 Issued 9-04

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Hong Kong: 852-2735-1628 Japan: 81-44-844-8013

UK: 44-141-810-8967



# Alcoswitch

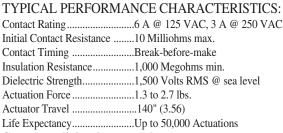
### Pushbutton Switches, Panel Mount, Wire Lug or PC Tails, 6 Amp

### MATERIAL SPECIFICATIONS:

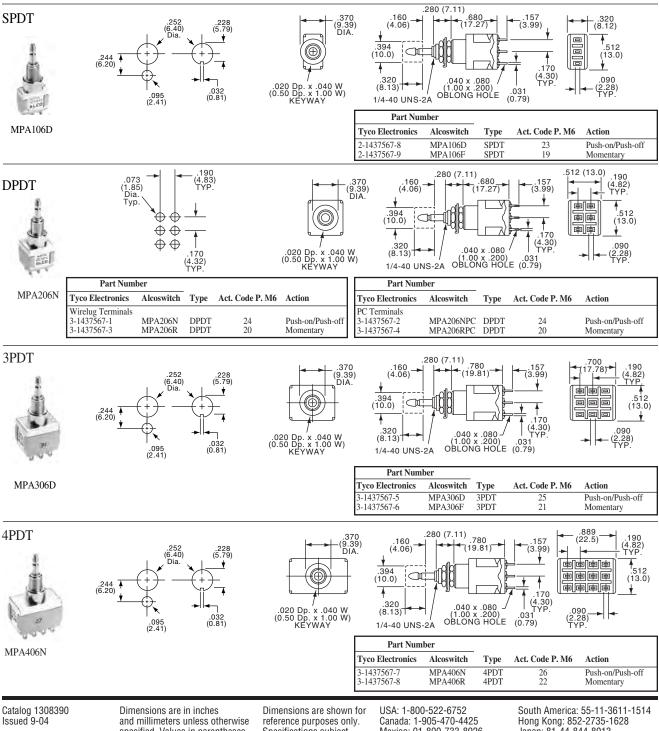
Contacts	.Silver clad copper with gold flash
Case Material	.Thermoset
Actuator Material	Nickel plated copper alloy.
Terminals	.Copper with gold flash
Terminal Seal	.Molded in

#### **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature .....-4°F to +176°F (-20°C to +80°C) Solder Heat Resistance .....See page M3-4 Note: Hardware included with switches



Cap not supplied, order separately (See Cap Model C22 and C23 on page D32.



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D22

Specifications subject

Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967





# Alcoswitch

### Pushbutton Switches, Splashproof, Panel Mount, Wire Lug, 6 Amp

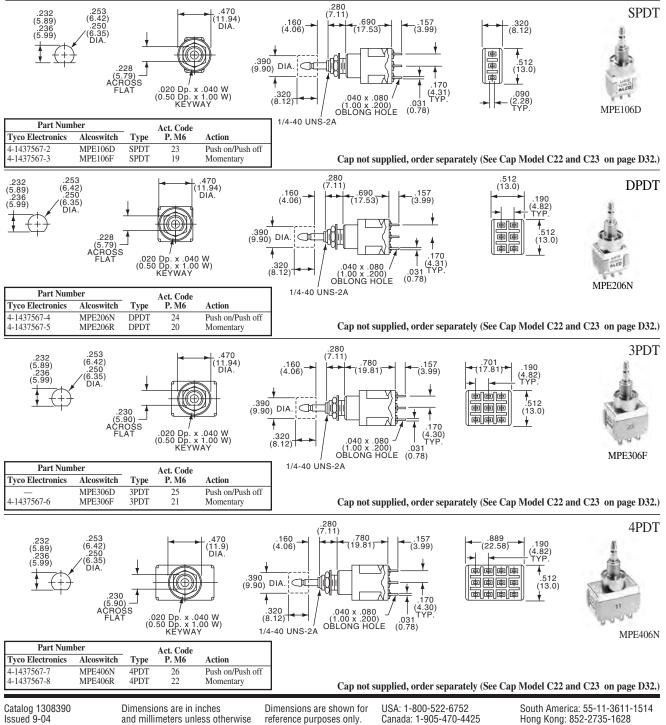
#### MATERIAL SPECIFICATIONS:

Contacts	Silver clad copper with gold flash.
Case Material	.Thermoset
Actuator Material	Nickel plated copper alloy.
Terminals	.Copper with gold flash
Terminal Seal	.Molded in

#### ENVIRONMENTAL SPECIFICATIONS:

Initial Contact Resistance ......10 Milliohms max.

# Notice: O-ring on shoulder and inside moveable shaft provides splashproof seal. Meets IP65



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Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-13 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967 D23

MPG Series

### Pushbutton Switches, 15/32 Bushing, Mustang, Wire Lug or PC Tails, 6 Amp

#### MATERIAL SPECIFICATIONS:

Contacts	Silver clad copper with gold flash
Case Material	
Terminals	Copper with gold flash finish
Terminal Seal	Molded in

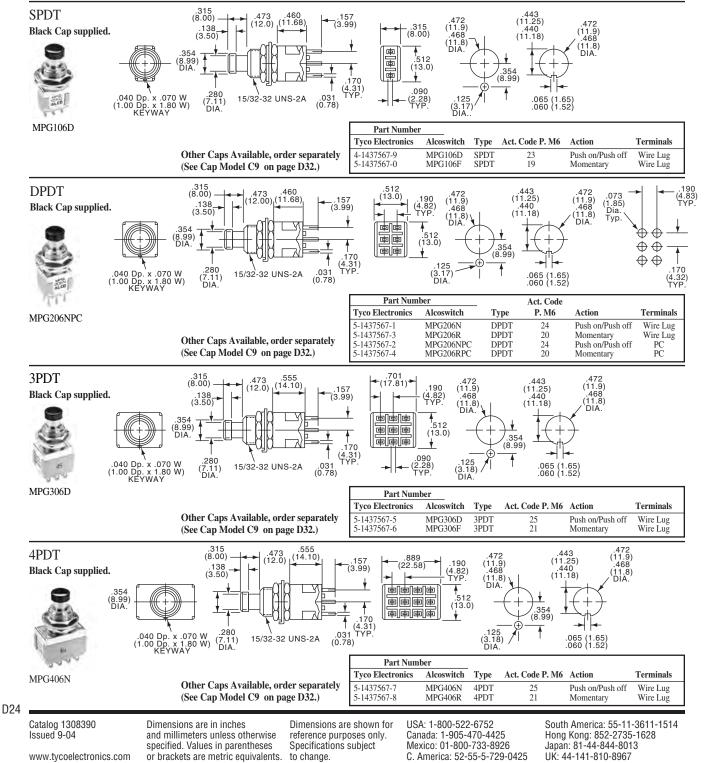
### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +176°F (-20°C to +80°C) Storage Temperature......40F to +176°F (-40°C to +80°C) Solder Heat Resistance .....See page M3-4

#### TYPICAL PERFORMANCE CHARACTERISTICS: 'AC

Contact Rating	, 3 A @ 250 V
Initial Contact Resistance10 Milliohms ma	х.
Contact TimingBreak-before-ma	ke
Insulation Resistance1,000 Megohms	min.
Dielectric Strength1,500 Volts RMS	S @ sea level
Actuation Force1.3 to 2.7 lbs.	
Actuator Travel138" (3.51)	
Life ExpectancyUp to 50,000 Act	tuations
NT ( TT 1 ) 1 1 1 1 1 1 1 1	

Note: Hardware included with switches



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# tyco

Electronics

**MPS Series** 

### Pushbutton Switches, Snap Action, Wire Lug, 3 Amp

#### MATERIAL SPECIFICATIONS:

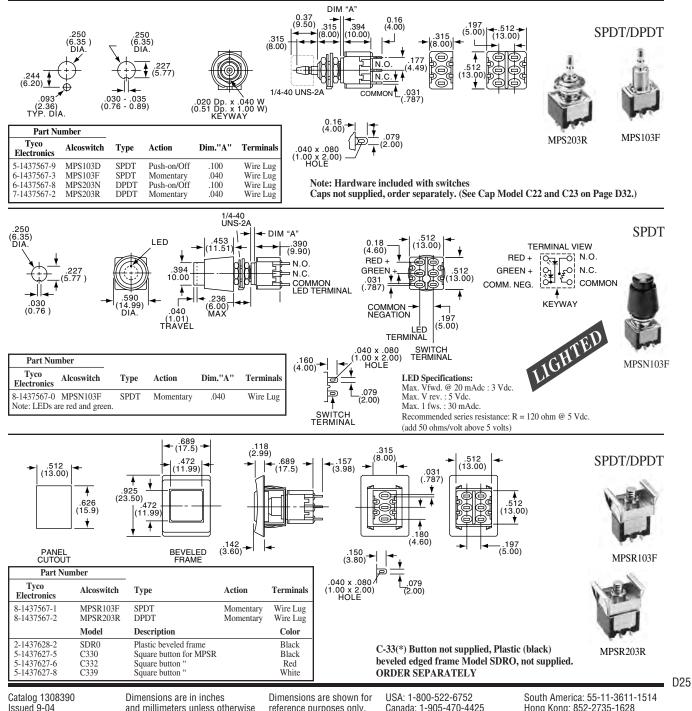
Contacts	Silver
Case Material	Epoxy resin
Actuator Material	Copper alloy, nickel plate
Terminals	Silver
Terminal Seal	Epoxy
	1 5

#### **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature+ $5^{\circ}F$ to + $158^{\circ}F$ (- $15^{\circ}C$ to + $70^{\circ}C$ )
Storage Temperature+ $5^{\circ}F$ to + $158^{\circ}F$ (- $15^{\circ}C$ to + $70^{\circ}C$ )
Solder Heat ResistanceSee page M3-4

#### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	3 A @ 115 VAC or 28 VDC
Initial Contact Resistance	10 Milliohms max.
Contact Timing	Break-before-make
Insulation Resistance	1,000 Megohms @ 500 VDC min.
Dielectric Strength	1,000 Volts RMS @ sea level
Actuation Force	Single pole - 7 to 14 oz. (200 to 400 grams)
	Double pole - 14 to 25 oz. (400 to 700 grams)
Actuator Travel	
	Push on/off .098" (2.49)
Life Expectancy	Up to 50,000 Actuations



D

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and millimeters unless otherwise reference purposes only. specified. Values in parentheses Specifications subject or brackets are metric equivalents. to change.

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Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

**MPS Series** 

.197 (5.00)

4

Dim."A"

.100

.040

.100 .040

⊢..512 (13.00)

Terminals

PC Terminals

PC Terminals

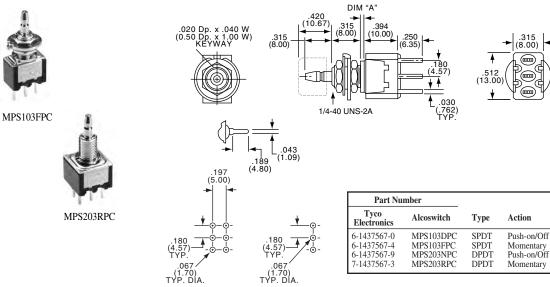
PC Terminals PC Terminals

### Pushbutton Switches, Snap Action, PC or Wire Wrap Tails, 3 Amp

### SPDT/DPDT

### SEE PAGE D25 FOR PRODUCT SPECIFICATIONS

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Caps not supplied, order separately. (See Cap Model C22 and C23 on Page D32.)

#### .197 (5.00) SPDT/DPDT DIM "A" .315 DIM (8.00) "B" .315 (8.00) 035 .665 (16.90) .520 (13.21) (0.90)134 134 (3.40)(3 .512 13.00) .642 (16.30) (@ FTT I 70) 00 .067 (1.70) TYP. DIA .081 (.79) TYP 06 .059 (1.49) TYP. DIA .059 (1.49) TYP. DIA .197 (5.00) (1.70) TYP. DIA. .043 (1.09) (1.09) TYP. . . 185 (4.80) (4.69) MPS103FPCV .252 (6.40) Part Number MPS203RPCV Тусо Dim."A" Alcoswitch Туре Action Dim."B' Terminals Electronics 6-1437567-1 6-1437567-5 MPS103DPCV MPS103FPCV SPDT Push-on/Off .080(2.03) .315(8.00) .295(7.49) .295(7.49) PC w/support SPDT Momentary .040(1.01) PC w/support MPS203RPCV .040(1.01) PC w/support DPDT 7-1437567-4 Momentary (See Cap Model C22 and C23 on Page D32.) DIM "A' SPDT/DPDT .197 (5.00) 250 ა.35) DIA 315 394 6.35) DIA. .512 (13.00) (8.00 10 .229 (5.81) .512 (13.00) 4 .093 (2.36) DIA. .032 (0.81) 1/4-40 UNS-2A 49) KEYWAY .748\_(19.00) .043 Part Number Tyco Alcoswitch Туре Action Dim."A" Terminals MPS203RWW Electronics MPS103FWW SPDT Extended PC 6-1437567-7 .040(1.01) Momentary MPS203NWW MPS203RWW .100(2.54) .040(1.01) DPDT Push-on/Off Extended PC -1437567-6 Extended PC (See Cap Model C22 and C23 on Page D32.) DPDT Momentary

D

Caps not supplied, order separately.

MPS103FWW

Caps not supplied, order separately.

D26

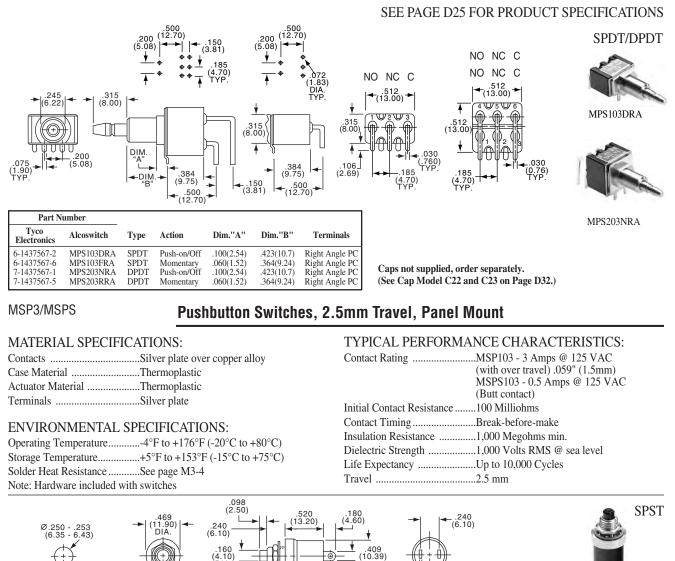
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### Pushbutton Switches, Snap Action, Right Angle, 3 Amp



.110 (2.80) TYP.

.236

.236

236

374

 .220
 (5.58) **t\_** .311

0.09 (2.30) TYP.

(7.89) DIA.

020

(0.51) TYP

Actuator Color

Black

Red

Black

Red

.020 (0.51)

1/4-40 UNS-2A

Normally Closed

Normally Open Normally Open

Normally Open

Momentary Action Bushing Length

.252 .394 (6.40) (10.00)

Π

1/4-40 UNS-2A

3 AMPS

MSP103B

MSPS103B 0.5 AMPS

Part N	lumber					
Tyco Electronics	Alcoswitch	Туре	Act. Code P. M6	Momentary Action	Bushing Length	Actuator Color
1437568-5	MSPS103B	SPST	14	Normally Closed	.245	Black
1437568-6	MSPS103C2	SPST	13	Normally Open	.245	Red
1437568-7	MSPS103C0	SPST	13	Normally Open	.245	Black

.200 (5.08)

200 (5.08) DIA.

4

Act. Code P. M6

14

13 13

13

Catalog 1308390 Issued 9-04

Part Number

Alcoswitch

MSP103B

MSP103C

MSP103C0

MSP103C2

Туре

SPST

SPST

SPST

SPST

.400 (10.16)

Tyco Electronics

8-1437567-3

8-1437567-4

8-1437567-5

8-1437567-6

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and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are in inches

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.190

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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### Pushbutton Switches, Front or Rear Entry Mount, 15/32 Bushing

### MATERIAL SPECIFICATIONS:

Contacts	Silver plate
Case Material	Thermoset
Actuator Material	Thermoplastic
Terminals	Silver plate
Terminal Seal	Epoxy

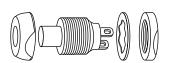
#### ENVIRONMENTAL SPECIFICATIONS:

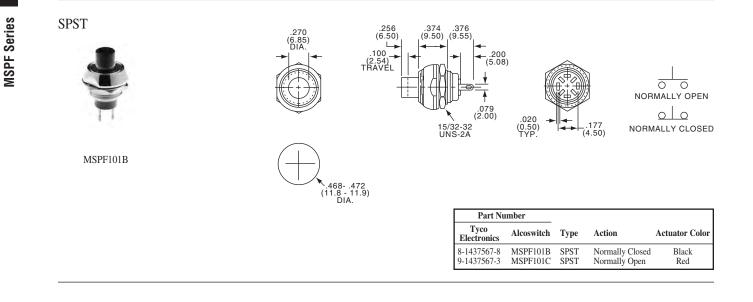
Operating Temperature4°F to +176°F (-20°C to +80°C)
Storage Temperature4F to $+176^{\circ}F(-20^{\circ}C \text{ to } +80^{\circ}C)$

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	0.5 A @ 125 VAC
Initial Contact Resistance	100 Milliohms
Contact Timing	Break-before-make
Insulation Resistance	1,000 Megohms min.
Dielectric Strength	1,000 Volts RMS @ sea level
Actuator Travel	098" (2.49)
Life Expectancy	Up to 10,000 Cycles

Application Note: Illustration shows versatile front or rear entry usage, with hardware supplied.

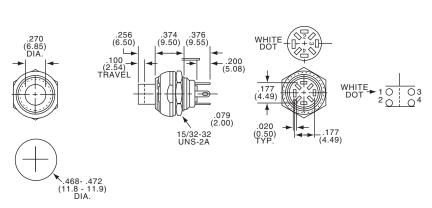




### 2 CIRCUIT



MSPF101BC



Part Nu	mber			
Tyco Electronics	Alcoswitch	Туре	Action	Actuator Color
8-1437567-9 9-1437567-0 9-1437567-1 9-1437567-2	MSPF101BC0 MSPF101BC2 MSPF101BC6 MSPF101BC9	2 Circuit 2 Circuit 2 Circuit 2 Circuit	Normally open-normally closed Normally open-normally closed Normally open-normally closed Normally open-normally closed	Black Red Blue White

D28

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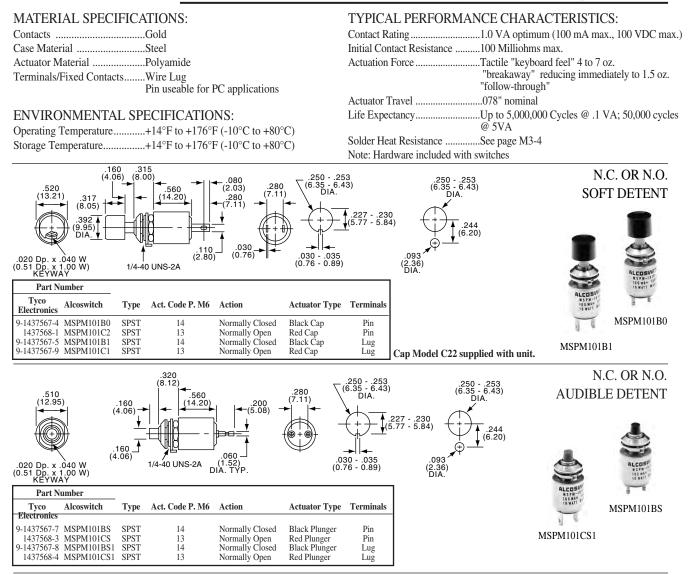
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**MSPM Series** 

# Alcoswitch

### Pushbutton Switches, Magnetic Reed, Long Life, Hermetically Sealed



### Pushbutton Switches, Push-Pull, Magnetic Reed, Long Life, Hermetically Sealed

		·	as above except): .125" (3.18) no					ForceTactile feel 5 t magnetically a	o 8 oz. "breaka	way" with
.512 (13.00 .020 Dp. x (0.51 Dp. x KEYW	0) .32 (8.1 .390 (9.90 DIA		.610 (15.50)		.200 (5.08) → 060 (1.52) IA. TYP.		50253 35 - 6.43) DIA. 	7230 7 - 5.84) (2.36) (2.36) (2.36) (2.36) (2.36) (2.36) (2.36)	N.	C. OR N.O.
	lumber								1.41.5	MSPM101CP
Tyco Electronics	Alcoswitch	Туре	Act. Code P. M6	Push	Pull	Actuator Type	Terminals		MSPM101BP	
	MSPM101BP MSPM101CP	SPST SPST	18 17	Open Closed	Closed Open	Black Cap Red Cap	Pin Pin	Cap Model C22 supplied with unit. Model C23 available, order separat		32.)
								a		

Catalog 1308390 Issued 9-04

specifie www.tycoelectronics.com or brack

Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 D29

D



D

**MSPM**, JLS Series

### **Push Switch, JLS Series**

#### MATERIAL SPECIFICATIONS:

Contacts .....Silver clad copper

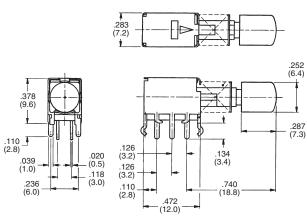
Frame	.Steel
Actuator Material	.Acetal
Terminals/Fixed Contacts	Brass, silver plate
Insulator	

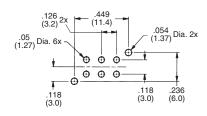
### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....+14°F to +140°F (-10°C to +60°C)

#### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	1 Amp @25 VDC
Initial Contact Resistance	100 Milliohms
Actuation Force	300±150 gms
Actuator Travel	0.091 (2.3)
Life Expectancy	Up to 10,000 cycles







Part Number			
Tyco Electronics	Alcoswitch	Act. Code P. M6	Actuator Type
1437566-8	JLS91439FKBC	Ν	Black Cap
1437566-7	JLS91439FK	Ν	Gray Cap
1437566-9	JLS91439FWC	Ν	White Cap

D30

Catalog 1308390 Issued 9-04

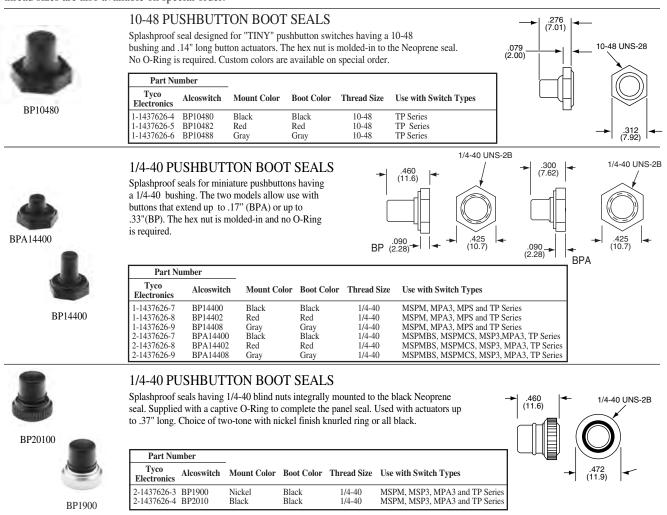
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### Pushbutton Switches, Splashproof Boot Seals

A wide selection of stock boot seals for pushbuttons are available in a variety of styles and thread sizes. ALCOSWITCH seals replace standard mounting hardware to provide environmental seal. Fabricated of Neoprene in black and optional red or gray. Custom colors and thread sizes are also available on special order.





BP15320

### 15/32-32 PUSHBUTTON BOOT SEALS

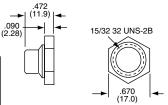
15/32-32 PUSHBUTTON BOOT SEALS

Nickel Black

Splashproof seals incorporating a molded-in hex nut for water tight and dust tight protection. Replaces standard hardware usually supplied. Recommended for large size pushbutto

Splashproof seals having 15/32-32 hex shape mounts integrally bonded onto the black Neoprene seal. Supplied with a captive O-Ring for use against the panel. Readily accepts actuators up to .38" in length. Available in two tone with nickel finish hex-

bushbutton switches with actuators extending up to .31" long.								
Part Nu	mber							
Tyco Electronics	Alcoswitch	Mount Color	Boot Color	Thread Size	Use with Switch Types			
2-1437626-0 2-1437626-1 2-1437626-2	BP15322	Black Red Gray	Black Red Gray	15/32-32 15/32-32 15/32-32	MSPF and MPG Series MSPF and MPG Series MSPF and MPG Series			



.090 (2.28)

.472 (11.9)



BP5890

Catalog 1308390 Issued 9-04

www.tycoelectronics.com

and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

mount, or all black. Part Number

Tyco

Electronics

-1437626-5

2-1437626-6

Dimensions are in inches

Dimensions are shown for reference purposes only. Specifications subject to change.

Mount Color Boot Color Thread Size

Black Black

15/32-32 15/32-32

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

Use with Switch Types

MSPF and MPG Series MSPF and MPG Series

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

. .670 -----(17.0)

**BP** Series

D

D31

15/32 32UNS-2B

Alcoswitch

BP5890

BP5900

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Accessories

### **Pushbutton Switches, Accessories**





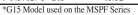
C5

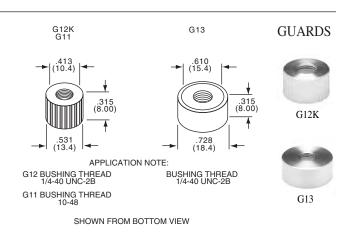
C22

CAPS

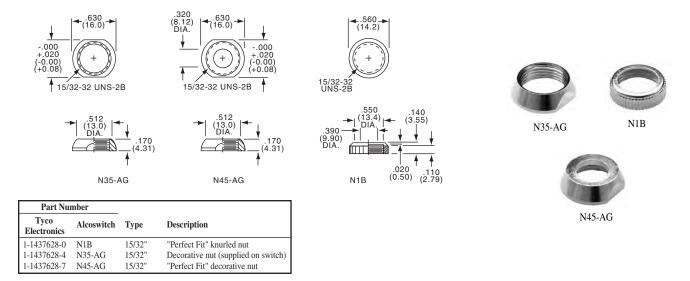
Model	ID.	Description	Use Guard	Color	"A" Diameter	B Height
C5(*)	Snapfit	Small plastic cap for MPA3 Series	-	(0), (2), (5), (9)	.195	.120
C8(*)	Snapfit	Large plastic cap for MPA3 Series	-	(0), (2), (5), (9)	.310	.160
C9(*)	Snapfit	Spare color cap for MPG Series	-	(0), (2), (6), (9)	.354	.138
C22(*)	Snapfit	MPS/MSPM/MPE/MPA6	G12	(0), (2), (3), (4), (5), (6), (9)	.394	.315
C23(*)	Snapfit	MPS/MSPM/MPE/MPA6	G13	(0), (2), (3), (4), (5), (6), (9)	.590	.394
C33(*)	Snapfit	Square button for MPSR	-	(0), (2), (6), (9)	.378SQ.	.201
(*) Specif	y color by ac	lding suffix number: (0) Black, (2) Red, (	3) Orange, (4)	Yellow, (5) Green, (6) Blue, (9) Wh	ite.	

Part Number					Can be	Used
Tyco Electronics	ics Alcoswitch Type Color		Color	Finish	with Cap	
7-1437627-6	G11A	10-48	Clear aluminum	Plain	C22	_
7-1437627-7	G11B	10-48	Black aluminum	Plain	C22	_
7-1437627-8	G11C	10-48	Chromed Brass	Plain	C22	_
8-1437627-1	G12A	1/4-40	Clear aluminum	Plain	C12	C22
8-1437627-2	G12B	1/4-40	Black aluminum	Plain	C12	C22
8-1437627-3	G12C	1/4-40	Chromed brass	Plain	C12	C22
8-1437627-4	G12KA	1/4-40	Clear aluminum	Knurled	C12	C22
8-1437627-5	G12KB	1/4-40	Black aluminum	Knurled	C12	C22
8-1437627-6	G12KC	1/4-40	Chromed brass	Knurled	C12	C22
8-1437627-7	G13A	1/4-40	Clear aluminum	Plain	C13	C23
8-1437627-8	G13B	1/4-40	Black aluminum	Plain	C13	C23
8-1437627-9	G13C	1/4-40	Chromed brass	Plain	C13	C23
9-1437627-0	G13KA	1/4-40	Clear aluminum	Knurled	C13	C23
9-1437627-1	G13KB	1/4-40	Black aluminum	Knurled	C13	C23
9-1437627-2	G13KC	1/4-40	Chromed brass	Knurled	C13	C23
9-1437627-3	G15*	15/32"	Chromed brass	Plain		





DECORATIVE HARDWARE



#### D32

Catalog 1308390 Issued 9-04

specified. Values in parentheses www.tycoelectronics.com

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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

**BP T/M Series** 

### Pushbutton Switches, Panel Seal

### FEATURES

The BP Series offers a unique means of sealing pushbutton switches, using a standard 1/4-40 threading bushing, to almost any thickness panel. Simply install the BP adaptor into a 15/32" dia. or 1/2" dia. panel opening and secure with its hex nut. The switch is then threaded into the previously mounted adaptor and tightened into place. A complete and decorative panel seal is the result of the simple process.

### MATERIALS

The flexible panel seal is custom molded of Neoprene rubber for long life, flexibility and chemical resistance. The threaded plastic adaptor is molded of ABS thermoplastic, is impact resistant and designed for ease of mounting.

#### BPM

#### For use with Miniature Pushbutton

The BPM seal adaptor accommodates all AUGAT/ALCOSWITCH MPA Series of pushbutton switches utilizing the 1/4-40 threaded bushing.



BPM15320

(LO (19.0) DIA. (19.0) (19.0) (19.0) (10.0)	SPACER $(6.35)$ $(6.60)$ $(2.03)$ $(2.03)$ $(2.03)$ $(2.03)$ $(2.03)$ $(2.03)$ $(3.00)$ $(3.$
HEX NUT	(8.99) DIA. 1/4-40 UNS-2B 15/32 UNS-2A 15/32 UNS-2A (9.53) (9.53) (9.53) (9.53) (9.53) (15.9) (15.9)

Part Number			
Tyco Alcoswitch Electronics		Color* of Seal	
3-1437626-0	BPM15320	Black	
3-1437626-1	BPM15322	Red	
3-1437626-2 BPM15328		Gray	
(*) Custom seal	colors are available	upon special request.	

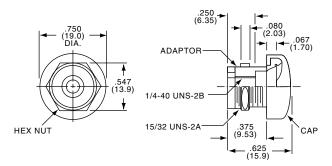
#### BPT

#### For use with Tiny Series TPF Pushbutton

The BPT seal adaptor accommodates all AUGAT/ALCOSWITCH TPF Series Tiny Pushbutton switches utilizing the 1/4-40 threading bushing.



BPT15328



Part Nu	mber		
Tyco Alcoswitch Electronics		Color* of Seal	
3-1437626-3	BPT15320	Black	
3-1437626-4	BPT15322	Red	
3-1437626-5 BPT15328		Grey	

South America: 55-11-3611-1514

Hong Kong: 852-2735-1628 Japan: 81-44-844-8013

UK: 44-141-810-8967

Catalog 1308390 Issued 9-04

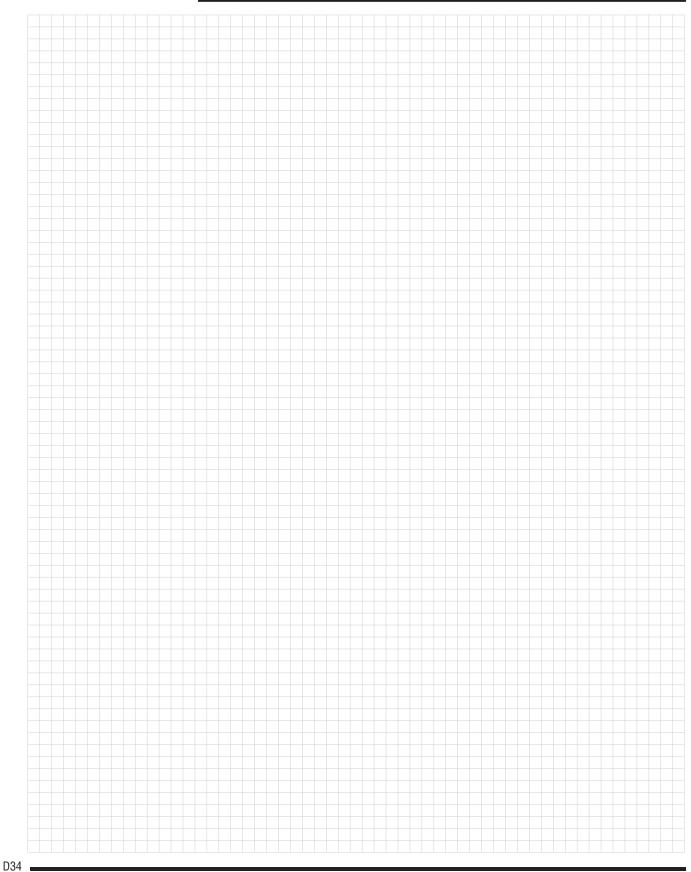
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**Engineering Notes** 



D

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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

tyco

**Pushbutton Switches** 

# Alcoswitch



TSP Series - Page D3



TP-ES Series - Page D13



MPA Series - Page D22



JLS Series - Page D29

Dimensions are in inches

and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.



TP Series - Page D6



APA Series - Page D16



MSPM Series - Page D29

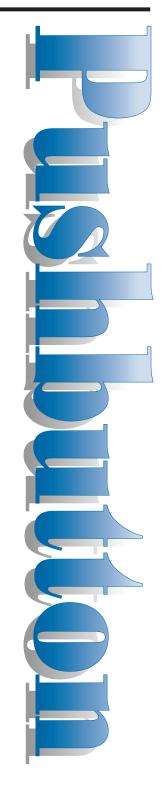


USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

BP Series - Page D31

Dimensions are shown for

reference purposes only. Specifications subject

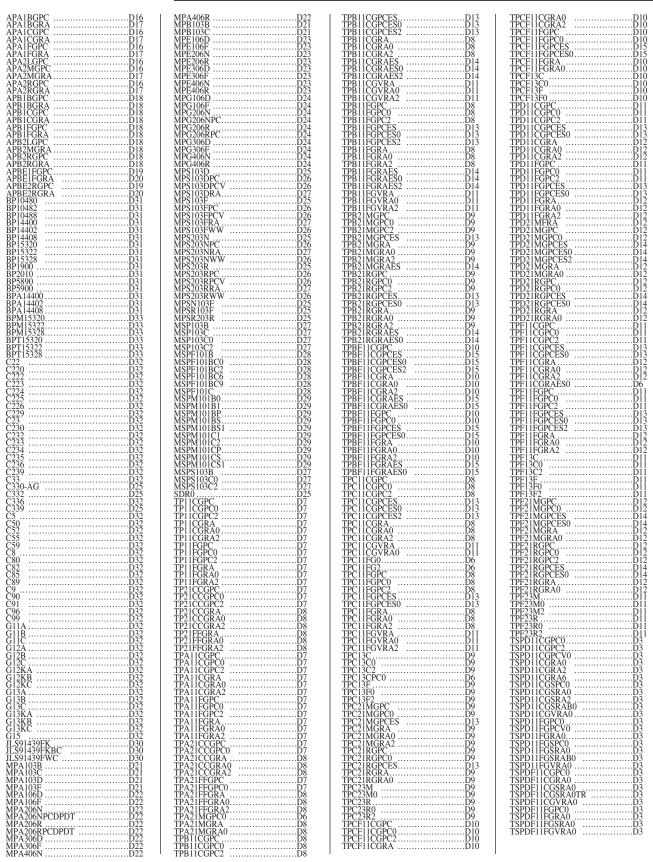


D1

Catalog 1308390 Issued 9-04

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### **Pushbutton Switches Part Number Index**



D

**Pushbutton Switches** 

D2

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### Pushbutton Switches, Tiny, Process Sealed

#### FEATURES:

- High temperature plastics liquid crystal polymer (LCP)
- Specifically designed for thru-hole and surface mount
- Tin-lead plated terminals
- Washable process sealed construction internal actuator O-ring

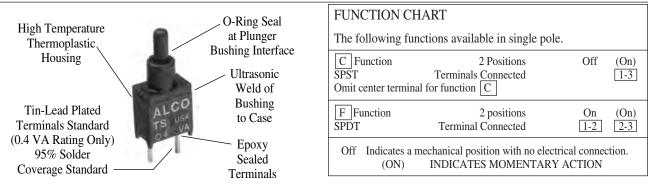
#### MATERIAL SPECIFICATIONS:

Contacts	Copper Alloy with gold over nickel plating-
Case & Bushing	Thermoplastic (LCP)
Actuator	Glass reinforced nylon
Nickel Plating Inside	Tin plating outside
Support Bracket	Tin plated steel
Terminals	Copper alloy with gold over nickel plating

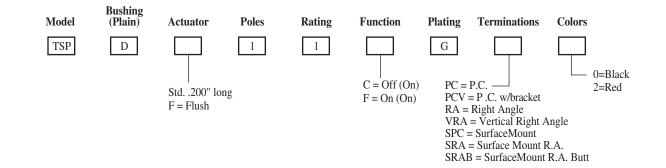
#### **ENVIRONMENTAL SPECIFICATIONS:**

#### TYPICAL PERFORMANCE CHARACTERISTICS:

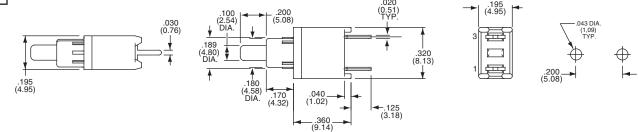
Contact Rating	0.4 VA @ 20 VAC/DC
Initial Contact Resistance	20 Milliohms max.
Insulation Resistance	1,000 Megohms @ 500 VDC min.
Terminal Seal	Epoxy
Actuator Travel	035" (0,89)
Actuator Seal	O-Ring
Dielectric Strength	C - 1000 VDC RMS @ sea level
	F - 500 VDC RMS @ sea level
Life Expectancy	C - Up to 80,000 Cycles
	F - Up to 60,000 Cycles



#### PART NUMBERING MATRIX



PC PC MOUNT



Catalog 1308390 Issued 9-04

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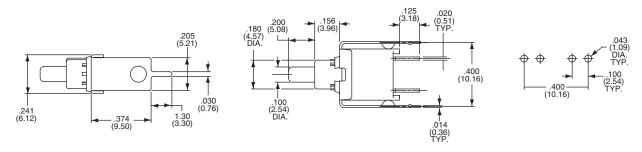
Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

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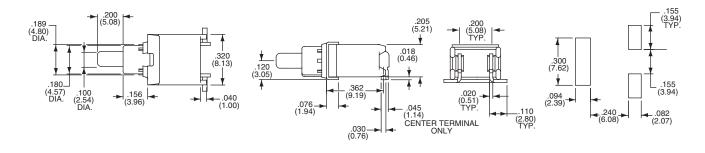
**TSP** Series

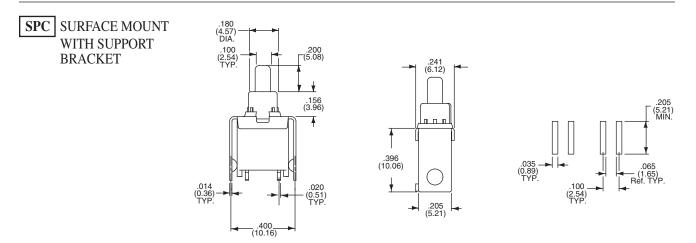
### Pushbutton Switches, Tiny, Process Sealed, Mounting Options





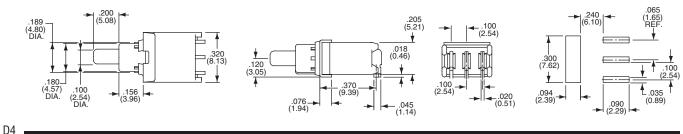
SRA SURFACE MOUNT RIGHT ANGLE "L" BEND





## SRAB SURFACE MOUNT RIGHT ANGLE BUTT

Dimensions are in inches



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and millimeters unless otherwise specified. Values in parentheses www.tycoelectronics.com

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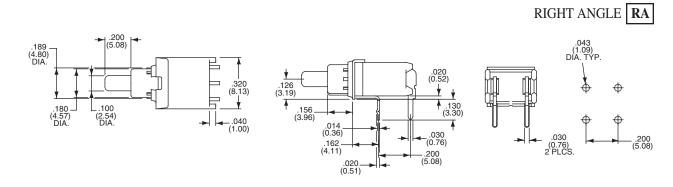
USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

D

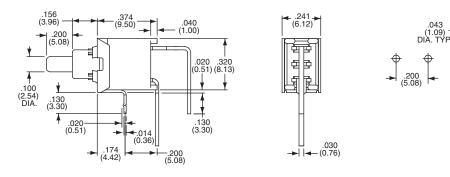
# Alcoswitch

**TSP** Series

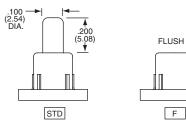
## Pushbutton Switches, Tiny, Process Sealed Options



### PC WITH VERTICAL SUPPORT BRACKET VRA



### **ACTUATORS**



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D5

Electronics

# tyco

Electronics

TP Series



### Pushbutton Switches, Tiny, Part Number Matrix

#### MATERIAL SPECIFICATIONS:

Contacts	Gold - gold plate, silver - silver plate
Case Material	High temperature polyester
Actuator Material	Polyamide
Terminals/Fixed Contacts	Tin lead plate
Terminal Seal	SP epoxy, DP epoxy optional

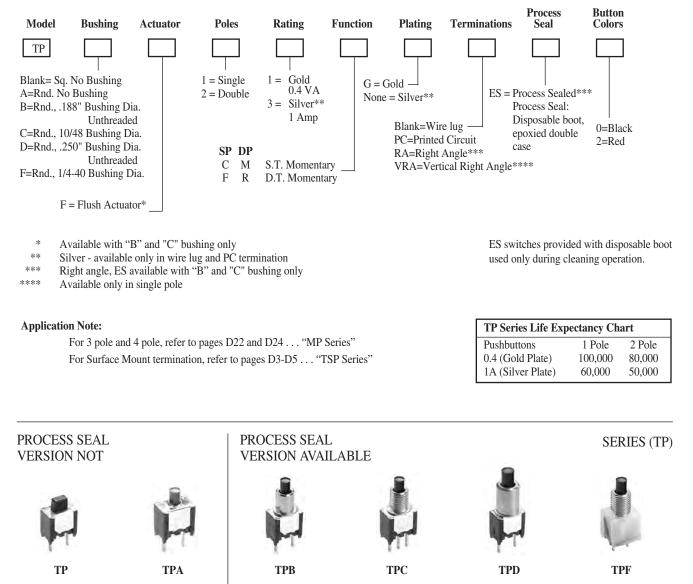
#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature	$22^{\circ}$ F to +149°F (-30°C to +65°C)
Storage Temperature	$-22^{\circ}F$ to $+149^{\circ}F$ ( $-30^{\circ}C$ to $+65^{\circ}C$ )
Solder Heat Resistance	See page M3-4

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	.Gold: 0.4 VA Max. @ 20 VDC or peak AC Silver: 1A @ 125 VAC or 28 VDC resistive
Initial Contact Resistance	.20 Milliohms max.
Contact Timing	.Break-before-make
Insulation Resistance	.1,000 Megohms @ 500VDC min.
Dielectric Strength	.1,000 Volts @ sea level
Actuation Force	.50 to 400 Grams
Plunger/Actuator Travel	030" (.762)
Life Expectancy	.See below
Note: Hardware included with s	witches

### PART NUMBERING MATRIX



D6 Catalog 1308390

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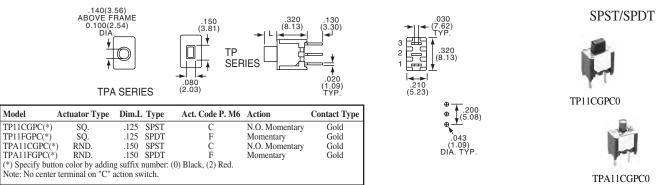
# Alcoswitch

Electronics

tyco

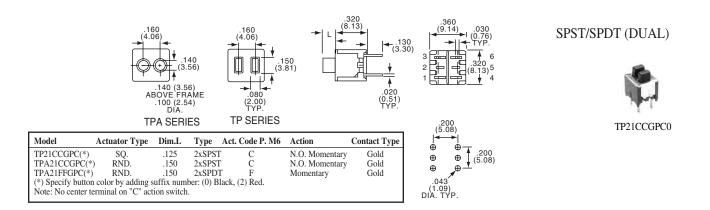
## Pushbutton Switches, Tiny, Straight or Right Angle, Single or Dual Actuators

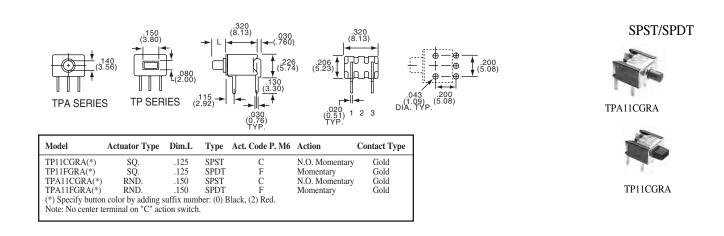
SEE PAGE D6 FOR PRODUCT SPECIFICATIONS



**TP/TPA Series** 

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Catalog 1308390 Issued 9-04

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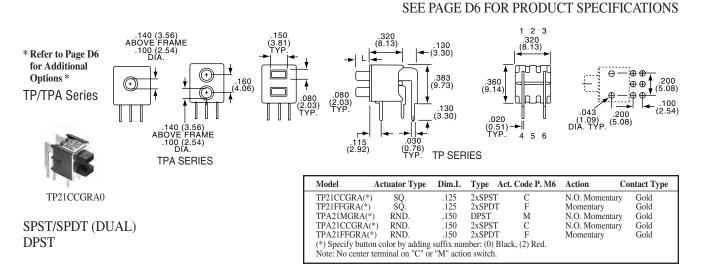
Dimensions are in inches Dimension and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

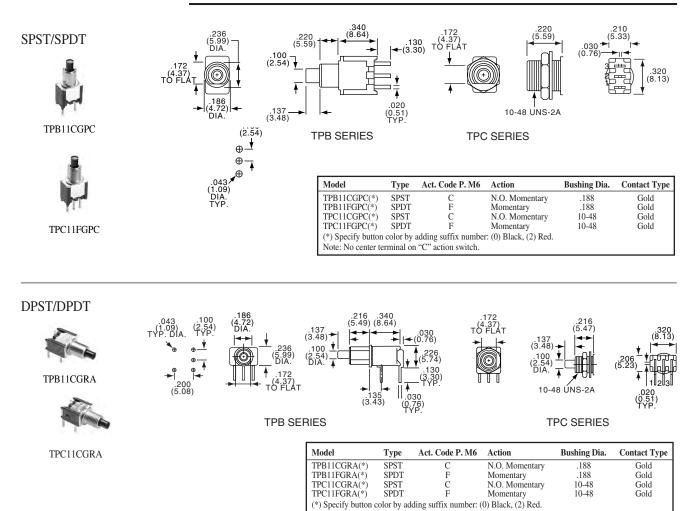




### Pushbutton Switches, Tiny, Right Angle, Single or Dual Actuators



### Pushbutton Switches, Tiny, Straight or Right Angle, Unthreaded or 10-48 Bushing



D8

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Dimensions are shown for reference purposes only. Specifications subject

Note: No center terminal on "C" action switch.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425



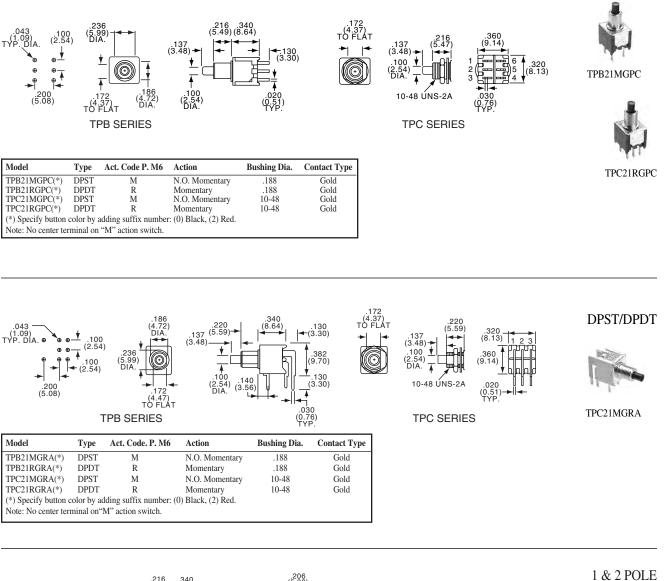
**TPB/TPC** Series



# Alcoswitch

### Pushbutton Switches, Tiny, Straight or Right Angle, Unthreaded or 10-48 Bushing

SEE PAGE D6 FOR PRODUCT SPECIFICATIONS DPST/DPDT



.206 .340 .216 (5.49) .137 (3.48)**⊣** .110 (2.79) 078 .160 .100 (2.54 DIA. .176 10-48 UNS-2B .040 W. x .080 L. (1.00 W. x 2.00 L.) OBLONG HOLE TPC23M Model Туре Act. Code P. M6 Action Contact Type TPC13C(\*) SPST N.O. Momentary Silver TPC13F(\*) SPDT F Momentary Silver TPC23M(\*) DPST М N.O. Momentary Silver TPC23R(\*) DPDT R Momentary Silver TPC13C (\*) Specify button color by adding suffix number: (0) Black, (2) Red.

Note: No center terminal on "C" or "M" action switches.

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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425



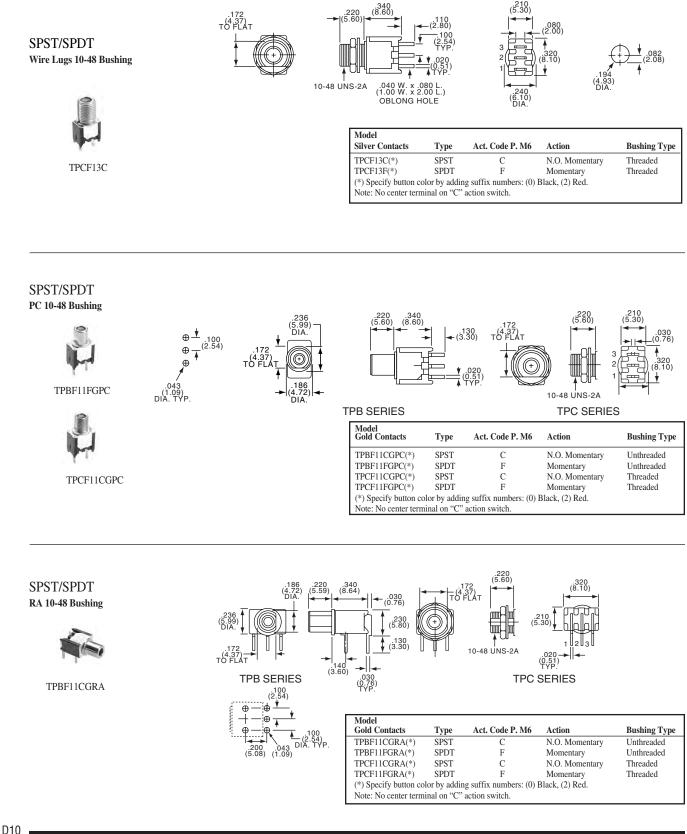
tyco



# Alcoswitch

SEE PAGE D6 FOR PRODUCT SPECIFICATIONS

### Pushbutton Switches, Tiny, Straight or Right Angle, Flush Actuator



Dimensions are in inches Dimensions are shown for and millimeters unless otherwise reference purposes only. specified. Values in parentheses Specifications subject or brackets are metric equivalents. to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

D

#### **TP** Series

SEE PAGE D6 FOR PRODUCT SPECIFICATIONS

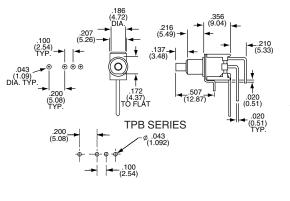
### Pushbutton Switches, Tiny, Vertical Right Angle, Unthreaded or 10-48 Bushing

10-48 UNS-2A .206 (5.23)

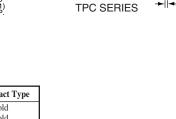
\_\_\_\_.236 ★ (5.99 DIA

.320 (8.13)

.030 (0.76) TYP.



Model	Туре	Act. Code P. M6	Action	Contact Type		
TPB11CGVRA(*)	SPST	С	N.O. Momentary	Gold		
TPB11FGVRA(*)	SPDT	F	Momentary	Gold		
TPC11CGVRA(*)	SPST	С	N.O. Momentary	Gold		
TPC11FGVRA(*)	SPDT	F	Momentary	Gold		
(*) Specify button color by adding suffix number: (0) Black, (2) Red.						
Note: No center terminal on "C" action switches.						



.100 (2.54)

.137 (3.48)

0

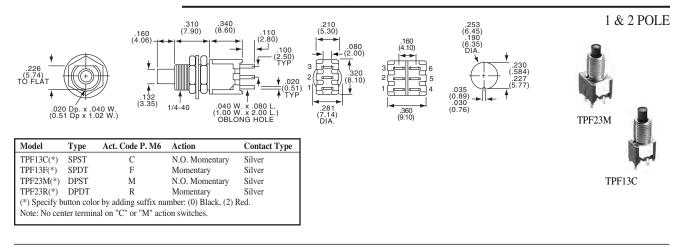
(4.37) TO EL AT

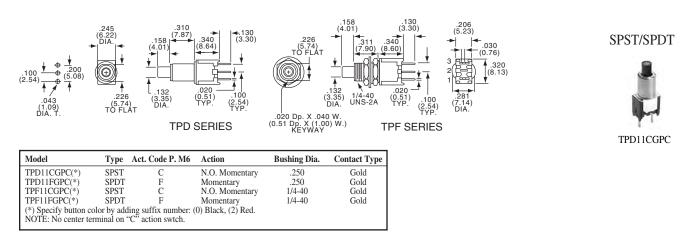


TPB11FGVRA

D







Catalog 1308390 Issued 9-04

Issued 9-04 and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are in inches

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

D

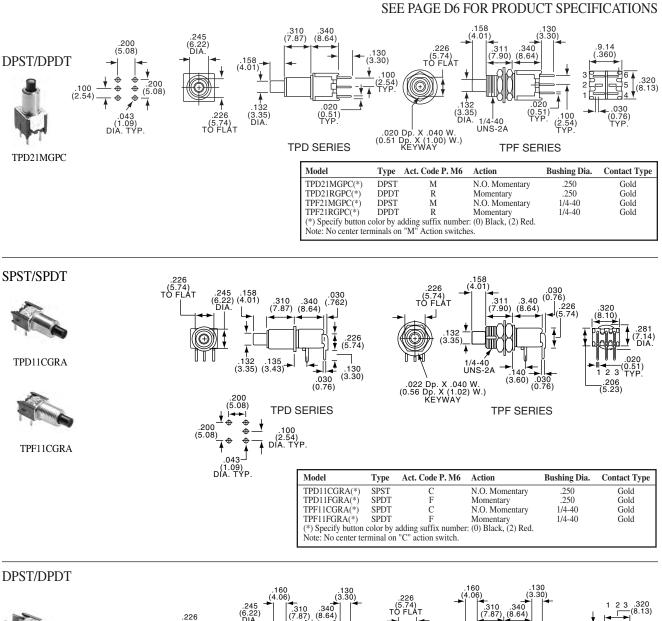
**TPD/TPF Series** 

TPD/TPF Series



# Alcoswitch

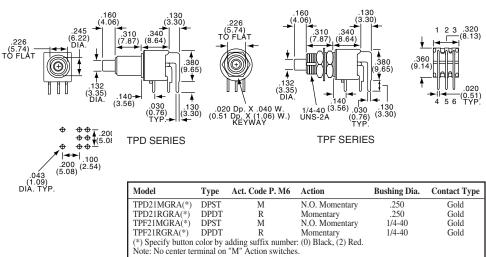
### Pushbutton Switches, Tiny, Vertical or Right Angle, Unthreaded or 1/4-40 Bushing



TPF21MGRA



TPD21MGRA



D12

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

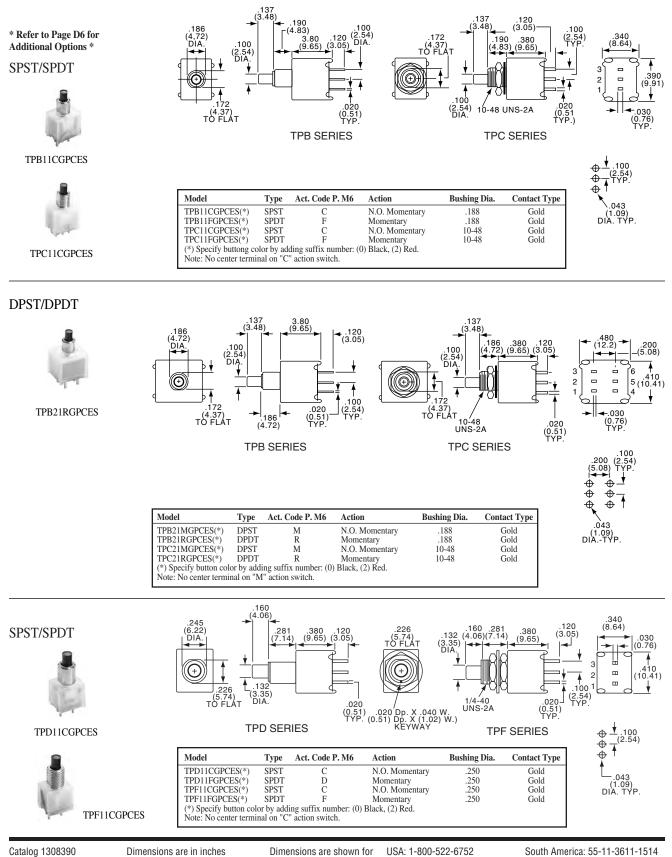
**TP-ES Series** 



# Alcoswitch

### Pushbutton Switches, Tiny, Process Sealed, Straight

### SEE PAGE D6 FOR PRODUCT SPECIFICATIONS



reference purposes only.

Specifications subject

Canada: 1-905-470-4425 Mexico: 01-800-733-8926

C. America: 52-55-5-729-0425

Catalog 1308390 Issued 9-04

www.tycoelectronics.com

and millimeters unless otherwise

or brackets are metric equivalents. to change.

specified. Values in parentheses

Hong Kong: 852-2735-1628 Japan: 81-44-844-8013

UK: 44-141-810-8967

Downloaded from Arrow.com.



# Alcoswitch

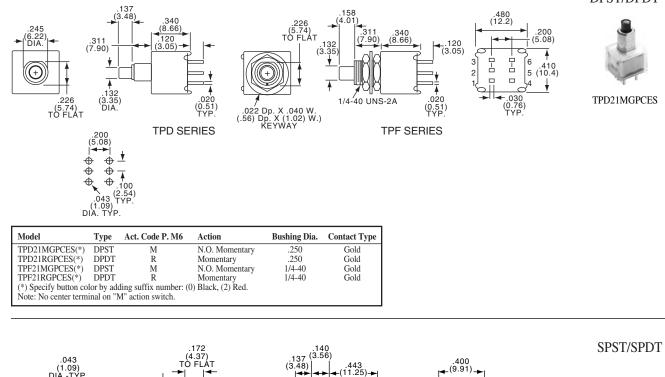
## Pushbutton Switches, Tiny, Process Sealed, Straight or Right Angle

.079 (2.01)

.030 (0.76)

### SEE PAGE D6 FOR PRODUCT SPECIFICATIONS

DPST/DPDT





TPB11CGRAES

Model	Туре	Act. Code P. M6	Action	Bushing Dia.	Contact Type	
TPB11CGRAES(*)	SPST	С	N.O. Momentary	.188	Gold	
TPB11FGRAES(*)	SPDT	F	Momentary	.188	Gold	
(*) Specify button color by adding suffix number: (0) Black, (2) Red.						
Note: No center terminal on "C" action switch.						

(<del>f</del>)

.186 (4.72) DIA.

¥

.030 (7.67)

ŧ

4

-

Æ

⊢.400 (10.16) ► .100 (2.54)

#### .172 (4.37) TO FLAT .140 (3.60) DPST/DPDT .043 (1.09 DIA .140 (3.60) .520 (13.2) DI à 1 -Φ .186 (4.72) DIA. .200 (5.08) .480 (12.2) $( \bigcirc)$ ¢ ÷ 4 .260 (6.60) ÷ ÷ 1 . .100 (2.50) DIA. \_\_\_\_\_.080 \_\_\_\_\_(2.03) \_.100 (2.54) \* . .120 (3.10) .030 - .020 (0.51) TYP. .030 .015 (.383)

ŧ

.100 (2.54) DIA.

.015 (.38)

.170 (4.32)

.118 (2.98)

Model	Туре	Act. Code P. M6	Action	Bushing Dia.	Contact Type		
TPB21MGRAES(*)	DPST	М	N.O. Momentary	.188	Gold		
TPB21RGRAES(*)	DPDT	R	Momentary	.188	Gold		
(*) Specify button color by adding suffix number: (0) Black, (2) Red.							
Note: No center terminal on "M" action switch.							

Dimensions are in inches

D14

Catalog 1308390 Issued 9-04

and millimeters unless otherwise specified. Values in parentheses www.tycoelectronics.com

Dimensions are shown for reference purposes only. Specifications subject or brackets are metric equivalents. to change.

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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

D

.200 (5.08)

4



### **TP-ES** Series



# Alcoswitch

## Pushbutton Switches, Tiny, Process Sealed, Flush Actuator, Straight or Right Angle

.340 (8.60)

.030 (0.76)

\_\_\_\_\_.090 \_\_\_\_\_(2.30)

### SEE PAGE D6 FOR PRODUCT SPECIFICATIONS

.400 (10.0) \_

SPST/SPDT



TPBF11CGRAESO

.172 -- (4.37) TO FLAT DIA .100 (2.54) .200 (5.08 .190 (4.80) .100 .030 (0.76) .120 (3.10)

TPBF Series

Model	Туре	Act. Code P. M6	Action		
TPBF11CGRAES(*)	SPST	С	N.O. Momentary		
TPBF11FGRAES(*)	SPDT	F	Momentary		
(*) Specify button color by adding suffix numbers: (0) Black (2) Red					

Note: No center terminal on "C" Action switches

.190 (4.80) .120 (3.00) 186 .120 (3.00) |◀┘ 4.72) DIA. .190 (4.80) .380 (9.70) .340 (8.60) .380 -(9.70)**→** \_ 100 (2.54) 3 .400 (10.0) 2 Å .020 (0.51) TYP. ŧ 043 10-48 UNS-2A .020 (0.51) TYP. → .030 (0.76) .172 (4.37) TO FLAT .172 (4.37) TO FLAT TPBF11CGPCES (1.09) DIA. TPBF TPCF Series Series

.180 (4.40)

.015 (0.38)

.450 ⊢(11.4)

Model	Туре	Act. Code P. M6	Action			
TPBF11CGPCES(*)	SPST	С	N.O. Momentary			
TPBF11FGPCES(*)	SPDT	F	Momentary			
TPCF11FGPCES(*)	SPDT	F	Momentary			
(*) Specify button color by adding suffix numbers: (0) Black, (2) Red.						
Note: No center terminal on "C" action switch.						

### SPST/SPDT

Catalog 1308390 Issued 9-04

www.tycoelectronics.com

Dimensions are shown for reference purposes only. Specifications subject

**APA Series** 



### Pushbutton Switches, .120 Actuator, Straight

Bushing

.130 (3.30) DIA.

### MATERIAL SPECIFICATIONS:

Contacts	.Gold plate
Case Material	.Polyester
Actuator Material	.Polyester, black
Terminal Seal	.Epoxy

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature $4^{\circ}$ F to +176°F (-20°C to +80°C)	
Storage Temperature $40^{\circ}$ F to $+176^{\circ}$ F ( $-40^{\circ}$ C to $+80^{\circ}$ C)	1

### TYPICAL PERFORMANCE CHARACTERISTICS:

0.4 VA Max. @ 20 VDC or peak AC
50 Milliohms max.
Break-before-make
1,000 Megohms @ 500 VDC min.
500 Volts RMS @ sea level
050" (1.27)
Up to 10,000 Cycles

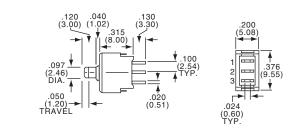
#### FOR SEALED VERSIONS SEE PAGES D19 AND D20

### SPST/SPDT



APA1BGPC



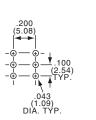


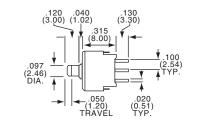
Part Nu	mber				
Tyco Electronics	Alcoswitch	Туре	Action		
1437567-2	APA1BGPC	SPST	N.C. Momentary	1-3	(—)
1437567-3	APA1CGPC	SPST	N.O. Momentary	_	(1-3)
1437567-5	APA1FGPC	SPDT	Momentary	2-3	(2-1)
Note: No cente	er terminals on "E	8" or "C"	action switches.		. ,

#### DPST/DPDT



#### APA2MGPC







Part Number					
Tyco Electronics	Alcoswitch	Туре	Action		
_	APA2LGPC		N.C. Momentary	1-3, 4-6	(—)
1437567-7	APA2MGPC	DPST	N.O. Momentary	_	(1-3, 4-6)
1437567-9	APA2RGPC	DPDT	Momentary	2-3, 5-6	(2-1, 5-4)
Note: No cent	er terminals on "L	" or "M"	action switches.		

D16

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are shown for reference purposes only. Specifications subject to change.

Bushing .130 (3.30) DIA.

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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

D



(1.09) DIA. TYF

Тусо

Electronics

1437567-4

Part Number

.100 (2.54) TYP.

Alcoswitch

APA1BGRA

APA1CGRA

1437567-6 APA1FGRA SPDT Momentary Note: No center terminals on "B" or "C" action switches.

Туре

SPST

SPST

Action

N.C. Momentary N.O. Momentary

**APA Series** 

– .130 (3.30) DIA.

-.025 (0.63)



.403 (10.23)

.229

.020 (0.51) TYP.

# Alcoswitch

### Pushbutton Switches, .120 Actuator, Right Angle

2.25 (5.72)

.024 (0.60) TYP.

₹.135 (3.43)

.100 (2.54)<sup>-</sup> TYP.

4

.122 (3.09)

.350 (8.90)

4

.023 (0.58)

.012 (0.30)

.120 .027 (3.00) (0.69)

.097

1-3

2-3

4 .050 (1.20)<sup>–</sup> TRAVEL

.125\_ (3.17)

(8.38

 $\square$ 

-.012 0.30

(—) (1-3)

(2-1)

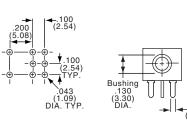
#### SPST/SPDT

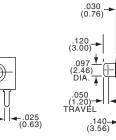


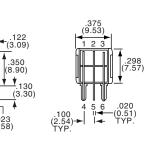
APA1FGRA

### DPST/DPDT

APA2RGRA







Part Number					
Tyco Electronics	Alcoswitch	Туре	Action		
1-1437567-0	APA2MGRA APA2RGRA er terminals on "N	DPDT		2-3, 5-6	(1-3, 4-6) (2-1, 5-4)

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

**APB** Series



### Pushbutton Switches, .157 Actuator, Vertical or Right Angle

#### MATERIAL SPECIFICATIONS:

Contacts	Gold plate
Case Material	Polyester
Actuator Material	Polyester, black
Terminal Seal	Epoxy

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature $4^{\circ}$ F to +176°F (-20°C to +80°C)	
Storage Temperature $40^{\circ}$ F to +176°F (- $40^{\circ}$ C to + $80^{\circ}$ C)	

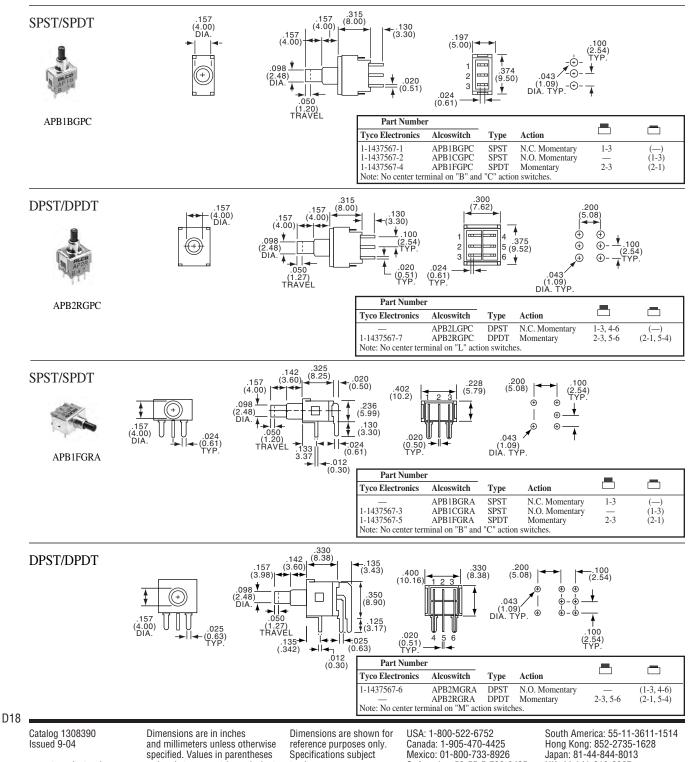
### **TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating	0.4 VA Max. @ 20 VDC or peak AC
Initial Contact Resistance	50 Milliohms max.
Contact Timing	Break-before-make
Insulation Resistance	1,000 Megohms @ 500 VDC min.
Dielectric Strength	500 Volts RMS @ sea level
Actuator Travel	0.050" (1.27)
Life Expectancy	Up to 10,000 Cycles

#### FOR SEALED VERSIONS SEE PAGES D19 AND D20

C. America: 52-55-5-729-0425

UK: 44-141-810-8967



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or brackets are metric equivalents. to change.

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.197 (5.00)

(2.4) DIA

Tyco Electronics

1-1437567-8

48

Part Number

**APBE Series** 

### Pushbutton Switches, Process Sealed, .157 Actuator, Straight, Retention Terminal

#### MATERIAL SPECIFICATIONS:

Contacts	Gold plated
Case Material	Polyester
Actuator Material	Polyester, black
Terminals/Fixed Contacts	Copper alloy
Terminal Seal	Epoxy

#### **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature $4^{\circ}$ F to +176°F (-20°C to +80°C)	
Storage Temperature40°F to +176°F (-40°C to +80°C)	

.047 (1.19) STROKE

.157 (4.00)

Туре

SPDT

(On) indicates momentary position.

.157-(4.00)

On

2-3

.098 (2.48) Dia.

ŧ

Bushing

(4.00) DIA

Alcoswitch

APBE1FGPC

Terminals Connected:

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	0.4 VA Max. @ 20 VDC or peak AC
Initial Contact Resistance	50 Milliohms max.
Insulation Resistance	500 Megohms @ 250 VDC min.
Dielectric Strength	500 Volts RMS @ sea level
Actuator Travel	0.047" (1.19)
Life Expectancy	Up to 10,000 Cycles

.032 (0.81) DIA TYP

P. C. HOLE LAYOUT SINGLE POLE

.100 (2.54 TYP

3 2

EPOXY SEAL

.012 (0.30)

.100 (2.54) TYP

-.130 (3.30)

Contact Type

Gold

.315

(On)

(2-1)

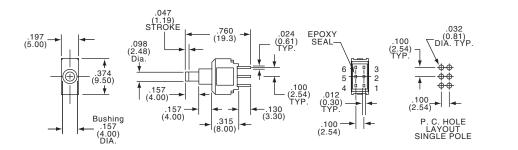
A A A
APBE1FGPC

SPDT



D

#### DPDT Extra compact double pole saves PCB real estate.



APBE2RGPC

Part Number					
Tyco Electronics	Alcoswitch	Туре			Contact Type
2-1437567-0	APBE2RGPC	DPDT	On	(On)	Gold
	Terminals Connected:		2-3 & 5-6	(2-1 & 5-4	4)
	(On) india	cates moment	ary position		

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

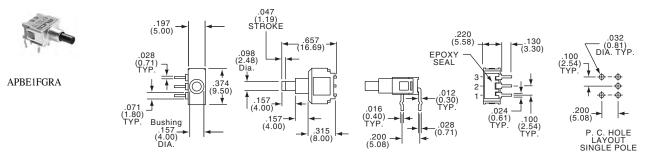
South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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### Pushbutton Switches, Process Sealed, .157 Actuator, Retention Terminal, Right Angle

### SEE PAGE D19 FOR PRODUCT SPECIFICATIONS.

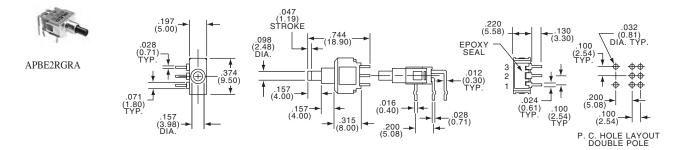
SPDT



Part Number					
Tyco Electronics	Alcoswitch	Туре			Contact Type
1-1437567-9	APBE1FGRA	SPDT	On	(On)	Gold
	Terminals Connected:		2-3	(2-1)	
	(On) indic	ates momenta	ry position.		

## DPDT

Extra compact double pole saves PCB real estate.



Part Number					
Tyco Electronics	Alcoswitch	Туре			Contact Type
2-1437567-1	APBE2RGRA Terminals Connec (On) indic	On 2-3 & 5-6 ary position.	(On) (2-1 & 5-4	Gold )	

D20

Catalog 1308390 Issued 9-04

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Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

tyco

Electronics

# Pushbutton Switches, Sub-Miniature, Panel Mount

#### **MPA3** Series

#### MATERIAL SPECIFICATIONS:

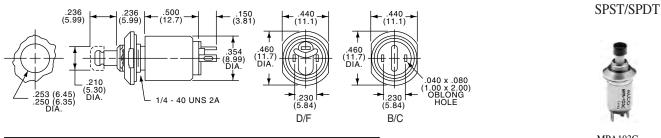
Contacts	Silver clad
Case Material	Thermoset
Actuator Material	Polyamide
Terminals	Silver plate

#### **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature......4°F to +158°F (-20°C to +70°C) Storage Temperature.....-40°F to +176°F (-40°C to +80°C) Solder Heat Resistantce ......See page M3-4

#### **TYPICAL PERFORMANCE CHARACTERISTICS:**

Contact Rating	3 A @ 125 VAC
Initial Contact Resistance	20 Milliohms max.
Contact Timing	Break-before-make
Insulation Resistance	1,000 Megohms min.
Dielectric Strength	1,000 Volts RMS @ sea level
	10 oz. SPST, 16 oz. SPDT average
Actuator Travel	100" (2.54)
Life Expectancy	Up to 10,000 Cycles
Note: Hardware included wit	h switches



100	
MPA103C	

Part Numb	er				
Tyco Electronics	Alcoswitch	Туре	Act. Code P. M6	Action	<b>Contact Rating</b>
2-1437567-4	MPA103B	SPST	14	N. C. Momentary	3 Amps
2-1437567-5	MPA103C	SPST	13	N. O. Momentary	3 Amps
2-1437567-6	MPA103D	SPDT	16	Push on/push off- (tactile)	3 Amps
2-1437567-7	MPA103F	SPDT	15	Momentary - (tactile)	3 Amps
Black Can sunnli	ed. Other co	lors av	ailable_order.sen	arately	

(See Cap C5 and C8 on Page D32.)

#### MPB Series

# Pushbutton Switches, Miniature, Over-Travel

#### MATERIAL SPECIFICATIONS:

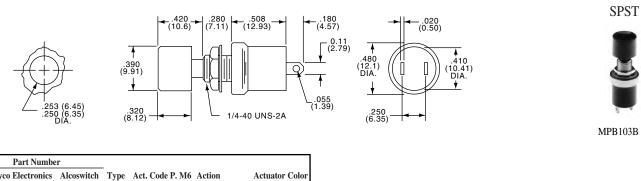
Contacts	Silver plate
Case Material	Thermoset
Actuator Material	Polyamide
Terminals	Silver plate

#### **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature	$+14^{\circ}F$ to $+140^{\circ}F$ ( $-10^{\circ}C$ to $+60^{\circ}C$ )
Storage Temperature	$+5^{\circ}F$ to $+158^{\circ}F$ (-15°C to $+70^{\circ}C$ )
Solder Heat Resistance	See page M3-4

#### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	.3 A @ 125 VAC
Initial Contact Resistance	.20 Milliohms max.
Insulation Resistance	.1,000 Megohms min.
Dielectric Strength	.1,000 Volts RMS @ sea level
Actuator Travel	100" (2.54) Overtravel .059" (1.5mm)
Life Expectancy	.20,000 Cycles
Note: Hardware included with	switches



Tyco Electronics	Alcoswitch	Туре	Act. Code P. M6	Action	Actuator Colo
3-1437567-9	MPB103B	SPST	14	N.C. Momentary	Black
4-1437567-0	MPB103C	SPST	13	N.O. Momentary	Red

Catalog 1308390 Issued 9-04

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

D

tyco

**Tactile Switches** 

# Alcoswitch



FSM Series - Page E3



Low Profile Series - Page E12



Sealed Series - Page E27



Multi-Directional Actuation - Page E30



4.9mm Series - Page E11



High Life Tactile - Page E12



Side Actuated - Page E29



Tactile Switches

Ε

E1

Catalog 1308390 Issued 9-04

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

# **Tactile Switches Part Number Index**

				-
ESM E2	ESMALA ES	ECMDA OH E7	1	
FSME3	FSM4JAE5	FSMRA 8JLE7		
FSM100E16	FSM4JAAE5	FSMRACDE8		
FSM100AE16	FSM4JARTE6	FSMRACDAE8		
FSM101E16	FSM4JLE5	FSMSME9		
FSM102E17	FSM4JRTE6	FSMSMTRE9		
FSM102AE17	FSM4JSMAE10	1571217E18		
FSM103E17	FSM4JSMAAE10	1571218E19		
FSM104E17	FSM4JSMAATR E10	1571219E20		
FSM10JE5	FSM4JSMATRE10	1571220E21		
FSM10JAE5	FSM4LPE15	1571262E29		
FSM10JAAE5	FSM4LPTRE15	1571294E22		
FSM10JLE5	FSM5JE5	1571295E24		
FSM11JE5	FSM5JAE5	1571296E23		
FSM11JAE5	FSM5JAAE5	1571297E26		
FSM11JAAE5	FSM5JLE5	1571298E25		
FSM11JLE5	FSM6JE5	1571300E27		
FSM12JE5	FSM6JAE5	1571407E28		
FSM12JAE5	FSM6JAAE5	1571514E30		
FSM12JAAE5	FSM6JARTE6	1571515E30		
	FSM6JLE5	1571625E12		
FSM12JLE5				
FSM13JE5	FSM6JRTE6	1571626E13		
FSM13JAE5	FSM6JSMAE10	1571636E14		
FSM13JAAE5	FSM6JSMAAE10			
FSM13JL	FSM6JSMAATR E10			
FSM14JE5	FSM6JSMATRE10			
FSM14JAE5	FSM7JE5			
FSM14JAAE5	FSM7JAE5			
FSM14JLE5	FSM7JAAE5			
FSM14JRTE6	FSM7JLE5			
FSM15JE5	FSM8JE5			
FSM15JAE5	FSM8JAE5			
FSM15JAAE5	FSM8JAAE5			
FSM15JLE5	FSM8JARTE6			
FSM16JE5	FSM8JLE5			
FSM16JAE5	FSM8JRTE6			
FSM16JAAE5	FSM8JSMAE10			
FSM16JLE5	FSM8JSMATRE10			
FSM17JE5	FSM9JE5			
FSM17JAE5	FSM9JAE5			
FSM17JAAE5	FSM9JAAE5			
FSM17JLE5	FSM9JLE5			
FSM18JE5	FSMCE3			
FSM18JAE5	FSMCDE8			
FSM18JAAE5	FSMCDAE8			
FSM18JLE5	FSMCTATRE11			
FSM1JE4,E5	FSMCTTRE11			
FSM1JAE5	FSMJM3.5ATR E9			
FSM1JAAE5	FSMJM4.3E9			
FSM1JLE5	FSMJM4.3ATRE9			
FSM1LPE15	FSMJM4.3TRE9			
FSM1LPAE15	FSMJM5.0ATRE9			
FSM1LPATRE15	FSMRA 1JE7			
FSM1LPTRE15	FSMRA 1JLE7			
FSM201AE16	FSMRA 2JE7			
	FSMRA 2JAE7			
FSM2JE4,E5				
FSM2JAE5	FSMRA 2JHE7			
FSM2JAAE5	FSMRA 2JLE7			
FSM2JARTE6	FSMRA 3JE7			
FSM2JLE5	FSMRA 3JLE7			
FSM2JRTE6	FSMRA 4JE7			
FSM2JSMAE10	FSMRA 4JAE7			
FSM2JSMAAE10	FSMRA 4JLE7			
FSM2JSMAATR E10	FSMRA 5JE7			
FSM2JSMATRE10	FSMRA 5JLE7			
FSM3JE5	FSMRA 6JE7			
	FSMRA 6JLE7			
FSM3JAE5				
FSM3JAAE5	FSMRA 7JE7			
FSM3JLE5	FSMRA 7JLE7			
FSM4JE5	FSMRA 8JE7			
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Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

tyco

**FSM Series** 

# Tactile Switches, .138 [3.5] x .236 [6], Through Hole

.138

.059

.039 (0.99)

.059

.039 (0.99)

# MATERIAL SPECIFICATIONS:

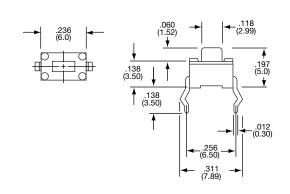
Contacts	Stainless/Silver clad plate
Case Material	Nylon
Actuator Material	PBT
Terminals/Fixed Contacts	Copper alloy, Silver/Nickel

#### **ENVIRONMENTAL SPECIFICATIONS:**

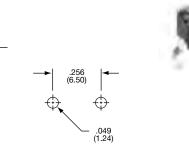
Operating Temperature40°F to +185°F (-40°C to + 85°C)
Storage Temperature
Solder Heat ResistanceSee Page M3-4

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50 mA @ 12 VDC
Initial Contact Resistance	100 Milliohms max.
Insulation Resistance	.100 Megohms min. @ 500 VDC
Dielectric Strength	500 VAC for 1 minute
Actuation Force	130±50 Grams
Actuator Travel	010"(.254)
Life Expectancy	.Up to 20,000 Cycles



Tyco Electronics	Alcoswitch	Туре	
1437565-1	FSM	SPST	Off (On) (On) indicates momentary position.



.256 (6.50)

 $\oplus$ 

.049 (1.24)



3.5 x 6mm



Tyco Electronics	Alcoswitch	Туре		
7-1437565-6	FSMC	SPST	Off (On) in d	(On)
			(On) inc	licates momentary position.

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967 E3

tyco

Electronics

**FSMJ Series** 

# Tactile Switches, .236 [6] x .236 [6], Through Hole

#### MATERIAL SPECIFICATIONS:

Contacts	Copper alloy, silver plate
Case	Polyamide
Actuator Button	Polyacetal Resin
Frame	Steel, tin plate
Terminals	Copper alloy, silver plate

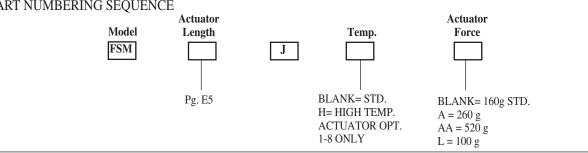
#### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature40°F to $+221°F$ ( $-40°C$ to $+105°C$ )
Storage Temperature40°F to $+221°F$ ( $-40°C$ to $+105°C$ )
Solder Heat ResistanceSee Page M3-4

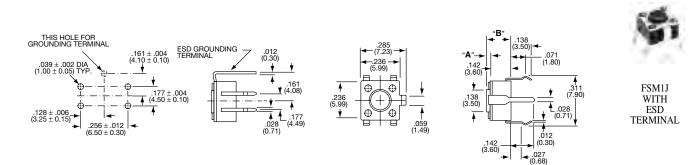
#### PART NUMBERING SEQUENCE

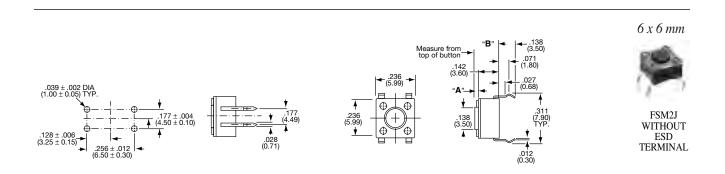
#### TYPICAL PERFORMANCE CHARACTERISTICS: Contact Rating 50 mA @ 12 VDC

Contact Rating
Initial Contact Resistance100 Milliohms max.
Insulation Resistance100 Megohms min. @ 100 VDC
Dielectric Strength500 VAC
Actuation ForceSee page E5
Actuator Travel
Electrostatic Discharge
w/ESD Ground Terminal5Kv w/no discharge
Life ExpectancyUp to 100,000 Cycles



6 x 6 mm





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**FSMJ Series** 

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

E4

**FSMJ Series** 

# Tactile Switches, .236 [6] x .236 [6], Through Hole (Continued)

Part Number         A         B         Forse         Material         Cycle           1-475555         FSML1         0.028 (0.70)         0.169 (4.30)         264.59g/         PUT         100.00           -         FSML1A         0.028 (0.70)         0.169 (4.30)         230.455g/         PUT         100.00           -         FSML1A         0.028 (0.70)         0.169 (4.30)         230.455g/         PUT         100.00           -         FSML1A         0.028 (0.70)         0.169 (4.30)         230.455g/         PUT         100.00           -         FSML1A         0.055 (1.40)         0.166 (5.00)         220.550g/         PUT         100.00           -         FSML1A         0.015 (1.40)         0.166 (5.00)         100.55g/         ACETAL         100.00           -         FSML1A         0.131 (3.40)         0.276 (7.00)         100.55g/         ACETAL         100.00           -         FSML1A         0.232 (5.50)         0.374 (9.50)         240.55g/         PUT         100.00           -         FSML1A         0.232 (5.50)         0.374 (9.50)         240.55g/         ACETAL         100.00           -         FSML1A         0.232 (5.50)         0.374 (9.50)         100.55	TYCO Electronics	ALCO	DIMEN	SIONS	Actuation	Actuator	Life
I-147956.5         PSMII         0.0281.070         0.1694.20         1696.59f         PBT         100.00           -         PSMIIA         0.0281.070         0.1694.20         2524.60g         PBT         100.000           -         PSMIIA         0.0281.070         0.1694.20         2524.60g         PBT         100.000           1.4137565.3         PSMIIA         0.0251.140         0.1696.200         1562.59f         PBT         100.000           -         PSMIIA         0.0551.140         0.1696.500         2524.60g         PBT         100.000           -         PSMIIA         0.0551.140         0.1696.500         256.59f         ACETAL         100.000           -         PSMIIA         0.0551.140         0.276 (7.00)         266.59f         ACETAL         100.000           -         PSMIIA         0.1341.340         0.276 (7.00)         266.59f         ACETAL         100.000           -         PSMIIA         0.232.590         0.3141.950         166.59f         PBT         100.000           -         PSMIIA         0.232.590         0.3141.950         166.59f         PBT         100.000           -         PSMIIA         0.232.590         0.3141.950         166.5			Α	В			
-         FSMIDA         0.028 (0.70)         0.106 (4.30)         2005/67         PET         100.000           -         FSMIDA         0.028 (0.70)         0.166 (4.30)         1005/67         PET         100.000           -         FSMIDA         0.028 (0.70)         0.166 (4.30)         1005/67         PET         100.000           -         FSMIDA         0.026 (1.00)         0.016 (5.00)         2201/67         PET         100.000           -         FSMIDA         0.055 (1.40)         0.016 (5.00)         2201/67         PET         100.000           -         FSMIDA         0.114 (1.34)         0.276 (7.00)         1201/67         ACTTAL         100.000           -         FSMIDA         0.114 (1.34)         0.276 (7.00)         100.5667         ACTTAL         100.000           -         FSMIDA         0.134 (1.30)         0.276 (7.00)         100.5667         PET         100.000           -         FSMIDA         0.124 (1.30)         0.237 (1.30)         1005/67         PET         100.000           -         FSMIDA         0.124 (1.30)         0.237 (1.30)         206.567         PET         100.000           -         FSMIDA         0.124 (1.30)         0.237 (1.30)	With Ground Terminal						
FMIIA         0.028 (0.70)         0.109 (4.30)         STALE 106 PET         100.000           21475653         FMII         0.038 (1.40)         0.106 (4.00)         102-50 PET         100.000            FMIIA         0.035 (1.40)         0.106 (5.00)         102-50 PET         100.000            FMIIA         0.035 (1.40)         0.106 (5.00)         102-50 PET         100.000            FMIIA         0.035 (1.40)         0.276 (7.00)         102-50 PET         100.000            FMIIA         0.134 (1.40)         0.276 (7.00)         102-50 PET         100.000            FMIIA         0.134 (1.40)         0.276 (7.00)         104-50 PET         100.000            FMIIA         0.221 (5.00)         0.374 (9.50)         104-50 PET         100.000            FMIIA         0.222 (5.00)         0.374 (9.50)         104-50 PET         100.000            FMIIA         0.222 (5.00)         0.374 (9.50)         104-50 PET         PET         100.000            FMIIA         0.227 (7.30)         520-100 PET         PET         100.000            FMIIA         0.126 (7.30)         0.22	1-1437565-5						
−         FMUL         0.028 (70)         0.109 (430)         100-50g7         PBT         100,000           −         FSM14         0.035 (140)         0.106 (500)         202-50g7         PBT         100,000           −         FSM14         0.035 (140)         0.106 (500)         202-50g7         PBT         100,000           −         FSM51A         0.134 (340)         0.226 (700)         100-55g7         ACETAL         100,000           −         FSM51A         0.134 (340)         0.226 (700)         202-55g7         ACETAL         100,000           −         FSM51A         0.134 (340)         0.226 (700)         202-55g7         ACETAL         100,000           −         FSM51A         0.124 (340)         0.226 (700)         502-55g7         ACETAL         100,000           −         FSM71A         0.222 (590)         0.374 (950)         202-55g7         ACETAL         100,000           −         FSM71A         0.222 (590)         0.374 (950)         202-55g7         ACETAL         100,000           −         FSM71A         0.146 (570)         0.237 (530)         106-56g7         ACETAL         100,000           −         FSM71A         0.146 (570)         0.237 (530) <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
3-147565-3         FSM31         0.055 (1/40)         0.166 (5.00)         100-K9gr         PBT         00.000           -         FSM31A         0.035 (1/40)         0.166 (5.00)         520+K9gr         PBT         100.000           -         FSM31A         0.035 (1/40)         0.166 (5.00)         520+K9gr         PBT         100.000           -         FSM31A         0.134 (1/40)         0.276 (7.00)         520+K9gr         ACETAL         100.000           -         FSM31A         0.134 (1/40)         0.276 (7.00)         520+K9gr         ACETAL         100.000           -         FSM31A         0.134 (1/40)         0.276 (7.00)         520+K9gr         PET         100.000           -         FSM51A         0.134 (1/40)         0.276 (7.00)         100+K9gr         PET         100.000           -         FSM71A         0.221 (5.90)         0.374 (9.50)         200+K9gr         ACETAL         100.000           -         FSM51A         0.146 (7.0)         0.237 (7.30)         100+K9gr         ACETAL         100.000           -         FSM91A         0.146 (7.0)         0.237 (7.30)         520+K9gr         ACETAL         100.000           -         FSM51A         0.137 (4.0)							
−         FNMIA         0.005 (1.40)         0.106 (5.00)         200±09t         PBT         100,000           −         FNMIL         0.005 (1.40)         0.106 (5.00)         100±09t         ACETAL         100,000           −         FNMIL         0.015 (1.40)         0.276 (7.00)         100±09t         ACETAL         100,000           −         FNMIA         0.114 (3.40)         0.276 (7.00)         100±09t         ACETAL         100,000           −         FNMIA         0.124 (3.40)         0.276 (7.00)         100±09t         ACETAL         100,000           −         FNMIA         0.222 (5.00)         0.374 (9.50)         100±09t         PBT         100,000           −         FNMIA         0.222 (5.00)         0.374 (9.50)         100±09t         PBT         100,000           −         FNMIA         0.221 (5.00)         0.374 (9.50)         100±09t         PBT         100,000           −         FNMIA         0.124 (5.70)         0.237 (7.30)         200±09t         ACETAL         100,000           −         FNMIA         0.146 (7.0)         0.237 (7.30)         200±09t         ACETAL         100,000           −         FNMIA         0.137 (4.00)         0.335 (6.00)<	3-1437565-3						
−         FNM3IA         0.055 (1.40)         0.196 (5.00)         550±10 gr         PET         100,000           41475644         FSM5J         0.134 (3.40)         0.276 (7.00)         100±60 gr         ACETAL         100,000           −         FSM5IA         0.134 (3.40)         0.276 (7.00)         100±60 gr         ACETAL         100,000           −         FSM5IA         0.134 (3.40)         0.276 (7.00)         100±50 gr         PET         100,000           −         FSM5IA         0.134 (3.40)         0.374 (9.50)         100±50 gr         PET         100,000           −         FSM7IA         0.222 (5.90)         0.374 (9.50)         100±50 gr         PET         100,000           −         FSM7IA         0.222 (5.90)         0.374 (9.50)         100±50 gr         ACETAL         100,000           −         FSM9IA         0.146 (5.70)         0.237 (7.30)         100±50 gr         ACETAL         100,000           −         FSM9IA         0.146 (5.70)         0.237 (7.30)         100±50 gr         ACETAL         100,000           −         FSM9IA         0.146 (5.70)         0.237 (7.30)         100±50 gr         ACETAL         100,000           −         FSM1IA         0.137	_						
41475554         FSM51         0.134 (3.40)         0.276 (7.00)         166550gf         ACETAL         100000           -         FSM51A         0.134 (3.40)         0.276 (7.00)         5310:105.0gf         ACETAL         100000           514752651         FSM51A         0.134 (3.40)         0.276 (7.10)         100:50gf         ACETAL         100:000           -         FSM71A         0.221 (5.90)         0.374 (9.50)         100:50gf         PBT         100:000           -         FSM71A         0.222 (5.90)         0.374 (9.50)         100:50gf         ACETAL         100:000           -         FSM91A         0.144 (3.70)         0.237 (7.30)         100:50gf         ACETAL         100:000           -         FSM91A         0.144 (3.70)         0.237 (7.30)         100:50gf         ACETAL         100:000           -         FSM11A         0.173 (4.40)         0.335 (8:00)         100:50gf         ACETAL         100:000           -         FSM11JA         0.370 (4.40)         0.351 (8:00)         100:50gf         ACETAL         100:000           -         FSM11JA         0.370 (4.40)         0.512 (13:00)         240:59gf         ACETAL         100:000           -         FSM11JA	_				520±100gf	PBT	
−         FSM5JA         0.134 (3.40)         0.276 (7.00)         260:50f         ACETAL         100.000           −         FSM5JA         0.134 (3.40)         0.276 (7.00)         100:50gf         ACETAL         100.000           −         FSM7JA         0.232 (5.50)         0.374 (9.50)         306:50gf         PBT         100.000           −         FSM7JA         0.232 (5.50)         0.374 (9.50)         306:50gf         PBT         100.000           −         FSM7JA         0.232 (5.70)         0.374 (9.50)         100:50gf         PBT         100.000           −         FSM9JA         0.146 (3.70)         0.287 (7.30)         100:50gf         ACETAL         100.000           −         FSM9JA         0.146 (3.70)         0.287 (7.30)         100:50gf         ACETAL         100.000           −         FSM9JA         0.146 (3.70)         0.287 (7.30)         100:50gf         ACETAL         100.000           −         FSM1JA         0.173 (4.40)         0.315 (8.00)         106:50gf         ACETAL         100.000           −         FSM1JA         0.370 (9.40)         0.512 (13.00)         106:50gf         ACETAL         100.000           −         FSM1JA         0.370 (9.40)							
−         FSM5LA         0.134 (3.40)         0.276 (7.00)         52810 (0.000)           5-147565-1         FSM7L         0.223 (5.90)         0.374 (9.50)         1065.90f         PET         100.000           −         FSM7TA         0.223 (5.90)         0.374 (9.50)         1065.90f         PET         100.000           −         FSM7TA         0.223 (5.90)         0.374 (9.50)         1065.90f         PET         100.000           −         FSM7TA         0.223 (5.90)         0.374 (9.50)         1065.90f         ACETAL         100.000           −         FSM9TA         0.146 (3.70)         0.237 (7.30)         250.190f         ACETAL         100.000           −         FSM9TA         0.146 (3.70)         0.237 (7.30)         351.100gf         ACETAL         100.000           −         FSM1TA         0.176 (4.40)         0.315 (8.00)         1065.90f         ACETAL         100.000           −         FSM1TA         0.176 (4.40)         0.315 (8.00)         105.90f         ACETAL         100.000           −         FSM1TA         0.176 (4.40)         0.315 (8.00)         105.90f         ACETAL         100.000           −         FSM1TA         0.176 (4.40)         0.315 (8.00)	4-143/565-4						
−         FSM5L         0.13 (3.40)         0.276 (7.00)         100.50gf         ACTFAL         (00.00)           −         FSM7JA         0.232 (5.50)         0.374 (9.50)         2604.50gf         PBT         (00.00)           −         FSM7JA         0.232 (5.50)         0.374 (9.50)         2604.50gf         PBT         (00.00)           −         FSM7JA         0.232 (5.50)         0.374 (9.50)         100.50gf         PBT         (00.00)           −         FSM9JA         0.146 (3.70)         0.237 (7.30)         5206 (9.00)         (7.47)         (7.00)         (7.47)         (7.00)         (7.7)         (7.00)         (7.7)         (7.00)         (7.7)         (7.00)         (7.7)         (7.00)         (7.7)         (7.00)         (7.7)         (7.00)         (7.7)         (7.00)         (7.7)         (7.00)         (7.7)         (7.00)         (7.7)         (7.00)         (7.6)	_						
5-147555-1         FSM7J         0.232 (590)         0.374 (9.59)         106/50gf         PBT         100.000           -         FSM7JA         0.232 (590)         0.374 (9.50)         520 (10)gf         PBT         100.000           7-1475565         FSM87         0.146 (3.70)         0.237 (7.30)         106/50gf         ACTAL         100.000           -         FSM7JL         0.222 (5.70)         0.374 (9.50)         106/50gf         ACTAL         100.000           -         FSM8JA         0.146 (3.70)         0.237 (7.30)         106/50gf         ACTAL         100.000           -         FSM1JA         0.173 (4.40)         0.315 (8.00)         106/50gf         ACTAL         100.000           -         FSM1JA         0.173 (4.40)         0.315 (8.00)         106/50gf         ACTAL         100.000           -         FSM1JA         0.173 (4.40)         0.312 (13.00)         206/50gf         ACTAL         100.000           -         FSM1JA         0.370 (9.40)         0.312 (13.00)         206/50gf         ACTAL         100.000           -         FSM1JA         0.370 (9.40)         0.312 (13.00)         206/50gf         ACTAL         100.000           -         FSM1JA         0.377	_						
FSMTJAA         0.232 (530)         0.374 (9.50)         S20L (b)         PBT         100.000           7-14375555         FSMBJ         0.146 (3.70)         0.237 (7.30)         160459gf         ACETAL         100.000            FSMBJA         0.146 (3.70)         0.237 (7.30)         S20L10dgf         ACETAL         100.000            FSMBJL         0.146 (3.70)         0.237 (7.30)         S20L10dgf         ACETAL         100.000            FSMBJL         0.146 (3.70)         0.237 (7.30)         100459gf         ACETAL         100.000            FSMIJA         0.173 (4.40)         0.315 (8.00)         200459gf         ACETAL         100.000            FSMIJA         0.370 (9.40)         0.512 (13.00)         200459gf         ACETAL         100.000            FSMIJA         0.370 (9.40)         0.512 (13.00)         200459gf         ACETAL         100.000            FSMIJA         0.577 (13.40)         0.669 (17.00)         200459gf         ACETAL         100.000            FSMIJA         0.527 (13.40)         0.669 (17.00)         200459gf         ACETAL         100.000            FSMIJA	5-1437565-1						
FSM7JL         0.232 (S30)         0.374 (9.50)         0.065 [e]         PBT         100.000            FSM9JA         0.146 (3.70)         0.237 (7.30)         2065 [e]         ACETAL         100.000            FSM9JA         0.146 (3.70)         0.237 (7.30)         2065 [e]         ACETAL         100.000            FSM9JA         0.146 (3.70)         0.237 (7.30)         1062 [e]         ACETAL         100.000            FSM1JA         0.173 (4.40)         0.315 (8.00)         1504 [e]         ACETAL         100.000            FSM1JA         0.173 (4.40)         0.315 (8.00)         1504 [e]         ACETAL         100.000            FSM1JA         0.370 (9.40)         0.512 (13.00)         1062 [e]         ACETAL         100.000            FSM1JA         0.370 (9.40)         0.512 (13.00)         2062 [e]         ACETAL         100.000            FSM1JA         0.370 (9.40)         0.512 (13.00)         1062 [e]         ACETAL         100.000            FSM1JA         0.370 (9.40)         0.512 (13.00)         1062 [e]         ACETAL         100.000            FSM1JA	_						
7-142555.5         FSM9J         0.146 (3.70)         0.237 (7.30)         2064S0gr         ACETAL         100.000           -         FSM9JA         0.146 (3.70)         0.237 (7.30)         2064S0gr         ACETAL         100.000           -         FSM9JA         0.146 (3.70)         0.237 (7.30)         1004S0gr         ACETAL         100.000           -         FSM111A         0.173 (4.40)         0.315 (8.00)         2064S0gr         ACETAL         100.000           -         FSM111A         0.173 (4.40)         0.315 (8.00)         2064S0gr         ACETAL         100.000           -         FSM11A         0.173 (4.40)         0.315 (8.00)         1044S0gr         ACETAL         100.000           -         FSM13A         0.370 (9.40)         0.512 (13.00)         5021600gr         ACETAL         100.000           -         FSM13A         0.370 (9.40)         0.512 (13.00)         5021600gr         ACETAL         100.000           -         FSM13A         0.527 (13.40)         0.669 (17.00)         1064S0gr         ACETAL         100.000           -         FSM13D         0.527 (13.40)         0.669 (17.00)         1064S0gr         ACETAL         100.000           -         FSM13D	—						
FSM9IA         0.146 (3.70)         0.237 (7.30)         206:Spir         ACETAL         100.000            FSM9IL         0.146 (3.70)         0.237 (7.30)         100:Sbgr         ACETAL         100.000            FSM111         0.173 (4.40)         0.315 (8.00)         164:Sbgr         ACETAL         100.000            FSM111A         0.173 (4.40)         0.315 (8.00)         Sbl:sbgr         ACETAL         100.000            FSM111A         0.173 (4.40)         0.315 (8.00)         Sbl:sbgr         ACETAL         100.000            FSM131         0.370 (9.40)         0.512 (13.00)         164:Sbgr         ACETAL         100.000            FSM13A         0.370 (9.40)         0.512 (13.00)         Sbl:sbgr         ACETAL         100.000            FSM13A         0.527 (13.40)         0.669 (17.00)         Sbl:sbgr         ACETAL         100.000            FSM13A         0.527 (13.40)         0.669 (17.00)         Sbl:sbgr         ACETAL         100.000            FSM13A         0.527 (13.40)         0.669 (17.00)         Sbl:sbgr         ACETAL         100.000            FSM13A	7 1/37565 5						
FSM91A         0.146 (3.70)         0.287 (7.30)         5020 (or set of the set of							
FSM91L         0.146 (3.70)         0.237 (7.30)         100:50g <sup>2</sup> ACETAL         100,000            FSM11JA         0.173 (4.40)         0.315 (8.00)         506:50g <sup>2</sup> ACETAL         100,000            FSM11JA         0.173 (4.40)         0.315 (8.00)         502:100 g <sup>2</sup> ACETAL         100,000            FSM13JA         0.370 (9.40)         0.512 (13.00)         166:50g <sup>2</sup> ACETAL         100,000            FSM13JA         0.370 (9.40)         0.512 (13.00)         502:100 g <sup>2</sup> ACETAL         100,000            FSM13JA         0.370 (9.40)         0.512 (13.00)         106:50g <sup>2</sup> ACETAL         100,000            FSM13JA         0.370 (9.40)         0.512 (13.00)         106:50g <sup>2</sup> ACETAL         100,000            FSM13JA         0.371 (3.40)         0.669 (17.00)         502:100 g <sup>2</sup> ACETAL         100,000            FSM17JA         0.193 (4.90)         0.333 (8.51)         264:50g <sup>2</sup> ACETAL         100,000            FSM17JA         0.193 (4.90)         0.333 (8.51)         264:50g <sup>2</sup> ACETAL         100,000	_						
FSM11JA         0.173 (440)         0.315 (8.00)         526±100gr         ACETAL         100,000            FSM11JL         0.173 (440)         0.315 (8.00)         106±50gr         ACETAL         100,000           1-437565-0         FSM13J         0.370 (9.40)         0.512 (13.00)         166±50gr         ACETAL         100,000           -         FSM13JA         0.370 (9.40)         0.512 (13.00)         526±100gr         ACETAL         100,000           -         FSM13JA         0.370 (9.40)         0.512 (13.00)         106±50gr         ACETAL         100,000           -         FSM13JA         0.527 (13.40)         0.669 (17.00)         526±100gr         ACETAL         100,000           -         FSM13JA         0.527 (13.40)         0.669 (17.00)         526±100gr         ACETAL         100,000           -         FSM13JA         0.527 (13.40)         0.659 (17.00)         506±50gr         ACETAL         100,000           -         FSM13JA         0.527 (13.40)         0.659 (17.00)         506±50gr         ACETAL         100,000           -         FSM13JA         0.33 (4.90)         0.335 (8.51)         506±100gr         ACETAL         100,000           -         F	_	FSM9JL	0.146 (3.70)	0.287 (7.30)	100±50gf	ACETAL	100,000
FSM11JL         0.173 (4.40)         0.315 (8.00)         100-50pf         ACETAL         100.000           1-143755-5.0         FSM13J         0.370 (9.40)         0.512 (13.00)         100-50pf         ACETAL         100.000            FSM13JA         0.370 (9.40)         0.512 (13.00)         200-50pf         ACETAL         100.000            FSM13JA         0.370 (9.40)         0.512 (13.00)         100-50pf         ACETAL         100.000            FSM15JA         0.527 (13.40)         0.669 (17.00)         200-50pf         ACETAL         100.000            FSM15JA         0.527 (13.40)         0.669 (17.00)         200-50pf         ACETAL         100.000            FSM15JA         0.527 (13.40)         0.669 (17.00)         100-50pf         ACETAL         100.000            FSM17JA         0.193 (4.90)         0.333 (8.51)         204-50pf         ACETAL         100.000            FSM17JA         0.193 (4.90)         0.333 (8.51)         204-50pf         PBT         100.000            FSM17JA         0.193 (4.90)         0.333 (8.51)         100-50pf         ACETAL         100.000         21437565-1         FSM2JA <td>1437565-8</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	1437565-8						
−         FSM11JL         0.173 (4.40)         0.315 (8.00)         100±50gT         ACETAL         100,000           1:1437565-1         FSM13JA         0.370 (9.40)         0.512 (13.00)         200±50gT         ACETAL         100,000           −         FSM13JA         0.370 (9.40)         0.512 (13.00)         320±100gT         ACETAL         100,000           −         FSM13JA         0.370 (9.40)         0.512 (13.00)         100±50gT         ACETAL         100,000           −         FSM15JA         0.527 (13.40)         0.669 (17.00)         320±10gT         ACETAL         100,000           −         FSM15JA         0.527 (13.40)         0.669 (17.00)         320±10gT         ACETAL         100,000           −         FSM17JA         0.193 (4.90)         0.333 (8.51)         100±50gT         ACETAL         100,000           −         FSM17JA         0.193 (4.90)         0.333 (8.51)         520±10gT         ACETAL         100,000           −         FSM17JA         0.193 (4.90)         0.333 (8.51)         100±50gT         ACETAL         100,000           −         FSM17JA         0.193 (4.90)         0.335 (8.51)         100±50gT         PETAL         100,000           2.1437565.0	_						
1-1437565-0         FSM13J         0.370 (9.40)         0.512 (13.00)         160-50gr         ACETAL         100.000           1-1437565-1         FSM13JA         0.370 (9.40)         0.512 (13.00)         520-100gr         ACETAL         100.000           -         FSM13JL         0.370 (9.40)         0.512 (13.00)         160-50gr         ACETAL         100.000           -         FSM15J         0.527 (13.40)         0.669 (17.00)         260-50gr         ACETAL         100.000           -         FSM15JA         0.527 (13.40)         0.669 (17.00)         520-100gr         ACETAL         100.000           -         FSM17JA         0.193 (4.90)         0.333 (8.51)         260-50gr         ACETAL         100.000           -         FSM17JA         0.193 (4.90)         0.333 (8.51)         200-50gr         ACETAL         100.000           -         FSM17JA         0.193 (4.90)         0.333 (8.51)         200-50gr         ACETAL         100.000           -         FSM17JA         0.193 (4.90)         0.333 (8.51)         100-50gr         ACETAL         100.000           -         FSM17JA         0.238 (0.70)         0.169 (4.30)         204-50gr         PBT         100.000         21437565.4         FSM2JA <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	_						
I-1437565-1         FSM13JA         0.370 (9.40)         0.512 (13.00)         200:50gr         ACETAL         100.000           -         FSM13JL         0.370 (9.40)         0.512 (13.00)         100:50gr         ACETAL         100.000           -         FSM15JL         0.527 (13.40)         0.669 (17.00)         160:50gr         ACETAL         100.000           -         FSM15JA         0.527 (13.40)         0.669 (17.00)         200:50gr         ACETAL         100.000           -         FSM15JL         0.527 (13.40)         0.669 (17.00)         100:50gr         ACETAL         100.000           -         FSM17JL         0.193 (4.90)         0.335 (8:51)         200:50gr         ACETAL         100.000           -         FSM17JA         0.193 (4.90)         0.335 (8:51)         200:50gr         ACETAL         100.000           -         FSM17JA         0.193 (4.90)         0.335 (8:51)         200:50gr         PBT         100.000           -         FSM17JA         0.028 (0.70)         0.169 (4.30)         260:50gr         PBT         100.000           2-1437565.0         FSM2JA         0.028 (0.70)         0.169 (4.30)         200:50gr         PBT         100.000           2-1437565.4	1-1437565-0						
-         FSM13I.         0.370 (9.40)         0.512 (13.00)         100.50gr         ACETAL         100.000           147916-1         FSM15JA         0.527 (13.40)         0.669 (17.00)         200.50gr         ACETAL         100.000           -         FSM15JA         0.527 (13.40)         0.669 (17.00)         520100gr         ACETAL         100.000           -         FSM15JL         0.527 (13.40)         0.669 (17.00)         100.50gr         ACETAL         100.000           -         FSM17JA         0.193 (4.90)         0.335 (8.51)         200-50gr         ACETAL         100.000           -         FSM17JA         0.193 (4.90)         0.335 (8.51)         520100gr         ACETAL         100.000           -         FSM17JA         0.193 (4.90)         0.335 (8.51)         50010gr         ACETAL         100.000           -         FSM17JA         0.193 (4.90)         0.335 (8.51)         50010gr         PBT         100.000           2-1437565.0         FSM2JA         0.028 (0.70)         0.169 (4.30)         260-50gr         PBT         100.000           2-1437565.4         FSM2JA         0.028 (0.70)         0.169 (4.30)         200-50gr         PBT         100.000           2-1437565.4							
FSM15J         0.527 (13.40)         0.669 (17.00)         260±50gr         ACETAL         100,000            FSM15JAA         0.527 (13.40)         0.669 (17.00)         520±100gr         ACETAL         100,000            FSM15JA         0.527 (13.40)         0.669 (17.00)         520±100gr         ACETAL         100,000            FSM17J         0.193 (4.90)         0.335 (8.51)         260±50gr         ACETAL         100,000            FSM17JA         0.193 (4.90)         0.335 (8.51)         260±50gr         ACETAL         100,000            FSM17JA         0.193 (4.90)         0.335 (8.51)         260±50gr         ACETAL         100,000            FSM17JA         0.193 (4.90)         0.335 (8.51)         260±50gr         PBT         100,000           2.1437565-0         FSM2JA         0.028 (0.70)         0.169 (4.30)         260±50gr         PBT         100,000           2.1437565-1         FSM3JA         0.028 (0.70)         0.169 (4.30)         260±50gr         PBT         100,000           2.1437565-6         FSM4JA         0.025 (1.40)         0.196 (5.00)         100±50gr         PBT         100,000           3.1437565-6 <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	_						
IAP016-1         FSM15JA         0.527 (13.40)         0.669 (17.00)         200-Stopic         ACETAL         100,000            FSM15JL         0.527 (13.40)         0.669 (17.00)         100-Stopic         ACETAL         100,000            FSM15JL         0.527 (13.40)         0.669 (17.00)         100-Stopic         ACETAL         100,000            FSM17JA         0.193 (4.90)         0.335 (8.51)         160-Stopic         ACETAL         100,000            FSM17JA         0.193 (4.90)         0.335 (8.51)         100+Stopic         ACETAL         100,000            FSM17JA         0.193 (4.90)         0.335 (8.51)         100+Stopic         ACETAL         100,000            FSM17JA         0.028 (0.70)         0.169 (4.30)         160+Stopic         PBT         100,000           -1437655-1         FSM2JA         0.028 (0.70)         0.169 (4.30)         100+Stopic         PBT         100,000           -1437565-6         FSM4JA         0.055 (1.40)         0.196 (5.00)         200+Stopic         PBT         100,000           -1437565-7         FSM4JA         0.055 (1.40)         0.196 (5.00)         200+Stopic         PBT         100,000	—						
FSM15IA         0.527 (13.40)         0.669 (17.00)         502100 gr         ACETAL         100.000            FSM15IL         0.527 (13.40)         0.669 (17.00)         100e50 gr         ACETAL         100.000            FSM17JA         0.193 (4.90)         0.335 (8.51)         260e50 gr         ACETAL         100.000            FSM17JA         0.193 (4.90)         0.335 (8.51)         520e100 gr         ACETAL         100.000            FSM17JA         0.193 (4.90)         0.335 (8.51)         520e100 gr         ACETAL         100.000            FSM17JA         0.193 (4.90)         0.335 (8.51)         520e100 gr         ACETAL         100.000           2.1437565-0         FSM2JA         0.028 (0.70)         0.169 (4.30)         160e50 gr         PBT         100.000            FSM2JA         0.028 (0.70)         0.169 (4.30)         100e50 gr         PBT         100.000           2.1437565-1         FSM4J         0.028 (0.70)         0.169 (4.30)         100e50 gr         PBT         100.000           3.1437565-5         FSM4JA         0.025 (1.40)         0.196 (5.00)         260e50 gr         PBT         100.000           -14375	147016 1						
FSM151L         0.527 (13.40)         0.0669 (17.00)         100e:50gr         ACETAL         100.000            FSM17JA         0.193 (4.90)         0.335 (6.51)         260e:50gr         ACETAL         100.000            FSM17JA         0.193 (4.90)         0.335 (6.51)         520e:100gr         ACETAL         100.000            FSM17JA         0.193 (4.90)         0.335 (6.51)         520e:100gr         ACETAL         100.000            FSM17JA         0.028 (0.70)         0.169 (4.30)         100e:50gr         PBT         100.000           2-1437565-1         FSM2JA         0.028 (0.70)         0.169 (4.30)         520e:100gr         PBT         100.000            FSM2JA         0.028 (0.70)         0.169 (4.30)         520e:100gr         PBT         100.000           -1437565-4         FSM4JA         0.025 (1.40)         0.196 (5.00)         120e:50gr         PBT         100.000           -1437565-7         FSM4JA         0.055 (1.40)         0.196 (5.00)         520e:100gr         PBT         100.000            FSM4JA         0.055 (1.40)         0.196 (5.00)         120e:100gr         PBT         100.000	14/910-1						
FSM17JA         0.193 (4.90)         0.335 (8.51)         100-s50gr         ACETAL         100,000            FSM17JA         0.193 (4.90)         0.335 (8.51)         520e100gr         ACETAL         100,000            FSM17JA         0.193 (4.90)         0.335 (8.51)         520e100gr         ACETAL         100,000            FSM17JA         0.193 (4.90)         0.335 (8.51)         520e100gr         ACETAL         100,000           2.1437565-0         FSM2JA         0.028 (0.70)         0.169 (4.30)         160e50gr         PBT         100,000           2.1437565-1         FSM2JA         0.028 (0.70)         0.169 (4.30)         520e100gr         PBT         100,000           2.1437565-6         FSM4J         0.028 (0.70)         0.169 (4.30)         100e50gr         PBT         100,000           3.1437565-6         FSM4JA         0.055 (1.40)         0.196 (5.00)         100e50gr         PBT         100,000            FSM4JA         0.055 (1.40)         0.196 (5.00)         100e50gr         PBT         100,000           3.1437565-6         FSM6JA         0.134 (3.40)         0.276 (7.00)         100e50gr         ACETAL         100,000 <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	_						
FSM17JAA         0.193 (4.90)         0.335 (8.51)         520±100gr         ACETAL         100,000           Without Ground Terminal         -         FSM17JL         0.028 (0.70)         0.169 (4.30)         160±50gr         PBT         100,000           2:1437565-0         FSM2JA         0.028 (0.70)         0.169 (4.30)         260±50gr         PBT         100,000            FSM2JAA         0.028 (0.70)         0.169 (4.30)         260±50gr         PBT         100,000           2:1437565-6         FSM2JA         0.028 (0.70)         0.169 (4.30)         200±50gr         PBT         100,000           3:1437565-6         FSM4JA         0.025 (1.40)         0.196 (5.00)         200±50gr         PBT         100,000           3:1437565-7         FSM4JA         0.055 (1.40)         0.196 (5.00)         200±50gr         PBT         100,000            FSM4JL         0.055 (1.40)         0.196 (5.00)         200±50gr         ACETAL         100,000           -41437565-5         FSM6JA         0.134 (3.40)         0.276 (7.00)         260±50gr         ACETAL         100,000            FSM6JA         0.134 (3.40)         0.276 (7.00)         200±100gr         ACETAL         100,000	_	FSM17J			160±50gf		
-         FSM17JL         0.193 (4.90)         0.335 (8.51)         100±50gr         ACETAL         100,000           Without Ground Terminal         - <t< td=""><td>—</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	—						
Without Ground Terminal         Constrained           2-1437565-0         FSM2J         0.028 (0.70)         0.169 (4.30)         160±50gf         PBT         100,000           2-1437565-1         FSM2JA         0.028 (0.70)         0.169 (4.30)         260±50gf         PBT         100,000           2-1437565-4         FSM2JL         0.028 (0.70)         0.169 (4.30)         100±50gf         PBT         100,000           3-1437565-6         FSM4J         0.055 (1.40)         0.196 (5.00)         260±50gf         PBT         100,000           3-1437565-8         FSM4JAA         0.055 (1.40)         0.196 (5.00)         260±50gf         PBT         100,000	—						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		F3MI1/JL	0.195 (4.90)	0.555 (8.51)	100±30g1	ACETAL	100,000
2-1437565-1         FSM21A         0.028 (0.70)         0.169 (4.30)         260±50gr         PBT         100,000            FSM21AA         0.028 (0.70)         0.169 (4.30)         520±100gr         PBT         100,000           2-1437565-4         FSM21A         0.028 (0.70)         0.169 (4.30)         100±50gr         PBT         100,000           3-1437565-6         FSM41A         0.055 (1.40)         0.196 (5.00)         260±50gr         PBT         100,000           3-1437565-7         FSM41A         0.055 (1.40)         0.196 (5.00)         520±100gr         PBT         100,000            FSM41A         0.055 (1.40)         0.196 (5.00)         520±100gr         PBT         100,000            FSM61A         0.134 (3.40)         0.276 (7.00)         160±50gr         ACETAL         100,000            FSM61A         0.134 (3.40)         0.276 (7.00)         100±50gr         ACETAL         100,000            FSM61A         0.134 (3.40)         0.276 (7.00)         100±50gr         PBT         100,000            FSM61A         0.232 (5.90)         0.374 (9.50)         160±50gr         PBT         100,000           51437565-3		2001 64 5					
FSM21AA         0.028 (0.70)         0.169 (4.30)         520±100gr         PBT         100,000           2-1437565-6         FSM4J         0.028 (0.70)         0.169 (4.30)         100±50gr         PBT         100,000           3-1437565-6         FSM4J         0.055 (1.40)         0.196 (5.00)         100±50gr         PBT         100,000           3-1437565-8         FSM4JA         0.055 (1.40)         0.196 (5.00)         520±100gr         PBT         100,000           -         FSM4JL         0.055 (1.40)         0.196 (5.00)         100±50gr         PBT         100,000           -         FSM6JA         0.134 (3.40)         0.276 (7.00)         160±50gr         ACETAL         100,000           -         FSM6JA         0.134 (3.40)         0.276 (7.00)         520±100gr         ACETAL         100,000           -         FSM6JA         0.134 (3.40)         0.276 (7.00)         520±100gr         ACETAL         100,000           -         FSM6JA         0.134 (3.40)         0.276 (7.00)         100±50gr         PBT         100,000           51437565-2         FSM8J         0.232 (5.90)         0.374 (9.50)         100±50gr         PBT         100,000           51437565-4         FSM8							
2-1437565-4         FSM2JL         0.028 (0.70)         0.169 (4.30)         100±50gr         PBT         100,000           3-1437565-6         FSM4JA         0.055 (1.40)         0.196 (5.00)         260±50gr         PBT         100,000           3-1437565-7         FSM4JA         0.055 (1.40)         0.196 (5.00)         520±100gr         PBT         100,000           -         FSM4JL         0.055 (1.40)         0.196 (5.00)         520±100gr         PBT         100,000           -         FSM4JL         0.055 (1.40)         0.196 (5.00)         100±50gr         ACETAL         100,000           4-1437565-6         FSM6JA         0.134 (3.40)         0.276 (7.00)         260±50gr         ACETAL         100,000           -         FSM6JA         0.134 (3.40)         0.276 (7.00)         160±50gr         ACETAL         100,000           -         FSM6JA         0.232 (5.90)         0.374 (9.50)         160±50gr         PBT         100,000           5-1437565-3         FSM8JA         0.232 (5.90)         0.374 (9.50)         520±100gr         PBT         100,000           1571376-1         FSM8JA         0.232 (5.90)         0.374 (9.50)         520±100gr         PBT         100,000           1571376-57 </td <td>2-145/505-1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	2-145/505-1						
3-1437565-6         FSM4J         0.055 (1.40)         0.196 (5.00)         160±S0gr         PBT         100,000           3-1437565-7         FSM4JA         0.055 (1.40)         0.196 (5.00)         520±100gr         PBT         100,000            FSM4JA         0.055 (1.40)         0.196 (5.00)         520±100gr         PBT         100,000           4-1437565-5         FSM6J         0.134 (3.40)         0.276 (7.00)         160±S0gr         ACETAL         100,000            FSM6JA         0.134 (3.40)         0.276 (7.00)         260±S0gr         ACETAL         100,000            FSM6JA         0.134 (3.40)         0.276 (7.00)         520±100gr         ACETAL         100,000            FSM6JL         0.134 (3.40)         0.276 (7.00)         100±S0gr         ACETAL         100,000            FSM6JL         0.134 (3.40)         0.276 (7.00)         100±S0gr         PBT         100,000           5-1437565-2         FSM8JA         0.232 (5.90)         0.374 (9.50)         100±S0gr         PBT         100,000           51437565-4         FSM8JL         0.232 (5.90)         0.374 (9.50)         100±S0gr         ACETAL         100,000           1571376-1 <td>2-1437565-4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	2-1437565-4						
3-1437565-8         FSM4JAA         0.055 (1.40)         0.196 (5.00)         520±100gf         PBT         100,000            FSM4JL         0.055 (1.40)         0.196 (5.00)         100±50gf         PBT         100,000           4+1437565-5         FSM6JA         0.134 (3.40)         0.276 (7.00)         260±50gf         ACETAL         100,000            FSM6JA         0.134 (3.40)         0.276 (7.00)         520±100gf         ACETAL         100,000            FSM6JL         0.134 (3.40)         0.276 (7.00)         100±50gf         ACETAL         100,000            FSM6JL         0.134 (3.40)         0.276 (7.00)         100±50gf         PBT         100,000           5-1437565-2         FSM8J         0.232 (5.90)         0.374 (9.50)         160±50gf         PBT         100,000           5+1437565-4         FSM8JL         0.232 (5.90)         0.374 (9.50)         520±100gf         PBT         100,000           1571376-1         FSM8JL         0.232 (5.90)         0.374 (9.50)         100±50gf         ACETAL         100,000            FSM10J         0.146 (3.70)         0.287 (7.30)         160±50gf         ACETAL         100,000							
$\begin{array}{c c c c c c c c c c c c c c c c c c c $							
4-1437565-5         FSM6J         0.134 (3.40)         0.276 (7.00)         160±50gf         ACETAL         100,000           4-1437565-6         FSM6JA         0.134 (3.40)         0.276 (7.00)         220±50gf         ACETAL         100,000           -         FSM6JA         0.134 (3.40)         0.276 (7.00)         520±100gf         ACETAL         100,000           -         FSM6JL         0.134 (3.40)         0.276 (7.00)         100±50gf         ACETAL         100,000           5-1437565-2         FSM8J         0.232 (5.90)         0.374 (9.50)         260±50gf         PBT         100,000           5-1437565-4         FSM8JA         0.232 (5.90)         0.374 (9.50)         520±100gf         PBT         100,000           1571376-1         FSM8JL         0.232 (5.90)         0.374 (9.50)         520±100gf         PBT         100,000           -         FSM10J         0.146 (3.70)         0.287 (7.30)         100±50gf         ACETAL         100,000           -         FSM10JA         0.146 (3.70)         0.287 (7.30)         260±50gf         ACETAL         100,000           -         FSM10JL         0.146 (3.70)         0.287 (7.30)         100±50gf         ACETAL         100,000           -	3-1437565-8						
4-1437565-6         FSM6JA         0.134 (3.40)         0.276 (7.00)         260±50gr         ACETAL         100,000            FSM6JAA         0.134 (3.40)         0.276 (7.00)         520±100gr         ACETAL         100,000            FSM6JL         0.134 (3.40)         0.276 (7.00)         100±50gr         ACETAL         100,000           5-1437565-2         FSM8J         0.232 (5.90)         0.374 (9.50)         160±50gr         PBT         100,000           5-1437565-3         FSM8JA         0.232 (5.90)         0.374 (9.50)         520±100gr         PBT         100,000           1571376-1         FSM8JL         0.232 (5.90)         0.374 (9.50)         100±50gr         PBT         100,000           1437565-7         FSM10J         0.146 (3.70)         0.287 (7.30)         160±50gr         ACETAL         100,000           -         FSM10JA         0.146 (3.70)         0.287 (7.30)         260±50gr         ACETAL         100,000           -         FSM10JL         0.146 (3.70)         0.287 (7.30)         160±50gr         ACETAL         100,000           -         FSM10JL         0.173 (4.40)         0.315 (8.00)         160±50gr         ACETAL         100,000           -	4 1427565 5						
FSM6JAA         0.134 (3.40)         0.276 (7.00)         520±100gf         ACETAL         100,000            FSM6JL         0.134 (3.40)         0.276 (7.00)         100±50gf         ACETAL         100,000           5-1437565-2         FSM8J         0.232 (5.90)         0.374 (9.50)         160±50gf         PBT         100,000           5-1437565-3         FSM8JA         0.232 (5.90)         0.374 (9.50)         520±100gf         PBT         100,000           5-1437565-4         FSM8JA         0.232 (5.90)         0.374 (9.50)         520±100gf         PBT         100,000           1571376-1         FSM8JL         0.232 (5.90)         0.374 (9.50)         100±50gf         ACETAL         100,000           -         FSM10JA         0.146 (3.70)         0.287 (7.30)         160±50gf         ACETAL         100,000           -         FSM10JA         0.146 (3.70)         0.287 (7.30)         520±100gf         ACETAL         100,000           -         FSM10JL         0.146 (3.70)         0.287 (7.30)         100±50gf         ACETAL         100,000           -         FSM10JL         0.173 (4.40)         0.315 (8.00)         160±50gf         ACETAL         100,000           -							
FSM6JL         0.134 (3.40)         0.276 (7.00)         100±50gr         ACETAL         100,000           5-1437565-2         FSM8J         0.232 (5.90)         0.374 (9.50)         160±50gr         PBT         100,000           5-1437565-3         FSM8JA         0.232 (5.90)         0.374 (9.50)         260±50gr         PBT         100,000           5-1437565-4         FSM8JAA         0.232 (5.90)         0.374 (9.50)         520±100gr         PBT         100,000           1571376-1         FSM8JL         0.232 (5.90)         0.374 (9.50)         100±50gr         PBT         100,000           1437565-7         FSM10J         0.146 (3.70)         0.287 (7.30)         160±50gr         ACETAL         100,000           -         FSM10JA         0.146 (3.70)         0.287 (7.30)         520±100gr         ACETAL         100,000           -         FSM10JL         0.146 (3.70)         0.287 (7.30)         500±50gr         ACETAL         100,000           -         FSM10JL         0.146 (3.70)         0.287 (7.30)         100±50gr         ACETAL         100,000           -         FSM10JL         0.173 (4.40)         0.315 (8.00)         160±50gr         ACETAL         100,000           -	_						
5-1437565-3         FSM8JA         0.232 (5.90)         0.374 (9.50)         260±50gr         PBT         100,000           5-1437565-4         FSM8JAA         0.232 (5.90)         0.374 (9.50)         520±100gr         PBT         100,000           1571376-1         FSM8JL         0.232 (5.90)         0.374 (9.50)         100±50gr         PBT         100,000           1437565-7         FSM10J         0.146 (3.70)         0.287 (7.30)         160±50gr         ACETAL         100,000           -         FSM10JA         0.146 (3.70)         0.287 (7.30)         260±50gr         ACETAL         100,000           -         FSM10JAA         0.146 (3.70)         0.287 (7.30)         206±50gr         ACETAL         100,000           -         FSM10JL         0.146 (3.70)         0.287 (7.30)         100±50gr         ACETAL         100,000           -         FSM10JL         0.173 (4.40)         0.315 (8.00)         160±50gr         ACETAL         100,000           -         FSM12JA         0.173 (4.40)         0.315 (8.00)         260±50gr         ACETAL         100,000           -         FSM12JL         0.173 (4.40)         0.315 (8.00)         100±50gr         ACETAL         100,000           - <t< td=""><td>_</td><td></td><td></td><td></td><td>100±50gf</td><td></td><td></td></t<>	_				100±50gf		
5-1437565-4         FSM8JAA         0.232 (5.90)         0.374 (9.50)         520±100gf         PBT         100,000           1571376-1         FSM8JL         0.232 (5.90)         0.374 (9.50)         100±50gf         PBT         100,000           1437565-7         FSM10J         0.146 (3.70)         0.287 (7.30)         160±50gf         ACETAL         100,000           -         FSM10JA         0.146 (3.70)         0.287 (7.30)         260±50gf         ACETAL         100,000           -         FSM10JA         0.146 (3.70)         0.287 (7.30)         520±100gf         ACETAL         100,000           -         FSM10JL         0.146 (3.70)         0.287 (7.30)         100±50gf         ACETAL         100,000           -         FSM10JL         0.146 (3.70)         0.287 (7.30)         100±50gf         ACETAL         100,000           -         FSM10JL         0.173 (4.40)         0.315 (8.00)         160±50gf         ACETAL         100,000           -         FSM12JA         0.173 (4.40)         0.315 (8.00)         520±100gf         ACETAL         100,000           -         FSM12JL         0.173 (4.40)         0.315 (8.00)         100±50gf         ACETAL         100,000           -         FSM							
1571376-1         FSM8JL         0.232 (5.90)         0.374 (9.50)         100±50gr         PBT         100,000           1437565-7         FSM10J         0.146 (3.70)         0.287 (7.30)         160±50gr         ACETAL         100,000            FSM10JA         0.146 (3.70)         0.287 (7.30)         260±50gr         ACETAL         100,000            FSM10JA         0.146 (3.70)         0.287 (7.30)         520±100gr         ACETAL         100,000            FSM10JL         0.146 (3.70)         0.287 (7.30)         100±50gr         ACETAL         100,000            FSM10JL         0.146 (3.70)         0.287 (7.30)         100±50gr         ACETAL         100,000            FSM10JL         0.146 (3.70)         0.287 (7.30)         100±50gr         ACETAL         100,000            FSM12JA         0.173 (4.40)         0.315 (8.00)         260±50gr         ACETAL         100,000            FSM12JA         0.173 (4.40)         0.315 (8.00)         50±100gr         ACETAL         100,000            FSM12JL         0.173 (4.40)         0.315 (8.00)         100±50gr         ACETAL         100,000            FSM							
1437565-7         FSM10J         0.146 (3.70)         0.287 (7.30)         160±50gr         ACETAL         100,000            FSM10JA         0.146 (3.70)         0.287 (7.30)         260±50gr         ACETAL         100,000            FSM10JA         0.146 (3.70)         0.287 (7.30)         520±100gr         ACETAL         100,000            FSM10JL         0.146 (3.70)         0.287 (7.30)         502±100gr         ACETAL         100,000            FSM10JL         0.146 (3.70)         0.287 (7.30)         100±50gr         ACETAL         100,000            FSM10JL         0.146 (3.70)         0.287 (7.30)         100±50gr         ACETAL         100,000            FSM12JL         0.173 (4.40)         0.315 (8.00)         160±50gr         ACETAL         100,000            FSM12JA         0.173 (4.40)         0.315 (8.00)         260±50gr         ACETAL         100,000            FSM12JL         0.173 (4.40)         0.315 (8.00)         100±50gr         ACETAL         100,000            FSM14JL         0.370 (9.40)         0.512 (13.00)         160±50gr         ACETAL         100,000            FSM1							
FSM10JA         0.146 (3.70)         0.287 (7.30)         260±50gf         ACETAL         100,000            FSM10JA         0.146 (3.70)         0.287 (7.30)         520±100gf         ACETAL         100,000            FSM10JL         0.146 (3.70)         0.287 (7.30)         520±100gf         ACETAL         100,000           1437565-9         FSM12J         0.173 (4.40)         0.315 (8.00)         160±50gf         ACETAL         100,000            FSM12JA         0.173 (4.40)         0.315 (8.00)         260±50gf         ACETAL         100,000            FSM12JA         0.173 (4.40)         0.315 (8.00)         260±50gf         ACETAL         100,000            FSM12JA         0.173 (4.40)         0.315 (8.00)         100±50gf         ACETAL         100,000            FSM12JL         0.173 (4.40)         0.315 (8.00)         100±50gf         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         100±50gf         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         260±50gf         ACETAL         100,000            FSM							
FSM10JAA         0.146 (3.70)         0.287 (7.30)         520±100gf         ACETAL         100,000            FSM10JL         0.146 (3.70)         0.287 (7.30)         100±50gf         ACETAL         100,000           1437565-9         FSM12J         0.173 (4.40)         0.315 (8.00)         160±50gf         ACETAL         100,000            FSM12JA         0.173 (4.40)         0.315 (8.00)         260±50gf         ACETAL         100,000            FSM12JA         0.173 (4.40)         0.315 (8.00)         520±100gf         ACETAL         100,000            FSM12JA         0.173 (4.40)         0.315 (8.00)         100±50gf         ACETAL         100,000            FSM12JL         0.173 (4.40)         0.315 (8.00)         100±50gf         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         160±50gf         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         260±50gf         ACETAL         100,000            FSM14JL         0.370 (9.40)         0.512 (13.00)         520±100gf         ACETAL         100,000				0.287 (7.30)	260±50gf		
1437565-9         FSM12J         0.173 (4.40)         0.315 (8.00)         160±50gr         ACETAL         100,000            FSM12JA         0.173 (4.40)         0.315 (8.00)         260±50gr         ACETAL         100,000            FSM12JA         0.173 (4.40)         0.315 (8.00)         260±50gr         ACETAL         100,000            FSM12JA         0.173 (4.40)         0.315 (8.00)         100±50gr         ACETAL         100,000            FSM12JL         0.173 (4.40)         0.315 (8.00)         100±50gr         ACETAL         100,000           1-1437565-2         FSM14J         0.370 (9.40)         0.512 (13.00)         160±50gr         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         260±50gr         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         260±50gr         ACETAL         100,000            FSM14JL         0.370 (9.40)         0.512 (13.00)         100±50gr         ACETAL         100,000            FSM14JL         0.370 (9.40)         0.512 (13.00)         100±50gr         ACETAL         100,000	_						
FSM12JA         0.173 (4.40)         0.315 (8.00)         260±50gr         ACETAL         100,000            FSM12JAA         0.173 (4.40)         0.315 (8.00)         520±100gr         ACETAL         100,000            FSM12JA         0.173 (4.40)         0.315 (8.00)         520±100gr         ACETAL         100,000            FSM12JL         0.173 (4.40)         0.315 (8.00)         100±50gr         ACETAL         100,000           1-1437565-2         FSM14J         0.370 (9.40)         0.512 (13.00)         160±50gr         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         260±50gr         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         520±100gr         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         100±50gr         ACETAL         100,000            FSM14JL         0.370 (9.40)         0.512 (13.00)         100±50gr         ACETAL         100,000            FSM14JL         0.370 (9.40)         0.512 (13.00)         100±50gr         ACETAL         100,000	14275(5.0						
FSM12JAA         0.173 (4.40)         0.315 (8.00)         520±100gf         ACETAL         100,000            FSM12JL         0.173 (4.40)         0.315 (8.00)         100±50gf         ACETAL         100,000           1-1437565-2         FSM14J         0.370 (9.40)         0.512 (13.00)         160±50gf         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         260±50gf         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         520±100gf         ACETAL         100,000            FSM14JL         0.370 (9.40)         0.512 (13.00)         520±100gf         ACETAL         100,000            FSM14JL         0.370 (9.40)         0.512 (13.00)         100±50gf         ACETAL         100,000            FSM14JL         0.370 (9.40)         0.512 (13.00)         100±50gf         ACETAL         100,000            FSM14JL         0.370 (9.40)         0.512 (13.00)         100±50gf         ACETAL         100,000            FSM14JL         0.527 (13.40)         0.669 (17.00)         160±50gf         ACETAL         100,000							
FSM12JL         0.173 (4.40)         0.315 (8.00)         100±50gr         ACETAL         100,000           1-1437565-2         FSM14J         0.370 (9.40)         0.512 (13.00)         160±50gr         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         260±50gr         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         260±50gr         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         520±100gr         ACETAL         100,000            FSM14JL         0.370 (9.40)         0.512 (13.00)         100±50gr         ACETAL         100,000            FSM14JL         0.370 (9.40)         0.512 (13.00)         100±50gr         ACETAL         100,000           1-1437565-3         FSM16J         0.527 (13.40)         0.669 (17.00)         160±50gr         ACETAL         100,000            FSM16JA         0.527 (13.40)         0.669 (17.00)         260±50gr         ACETAL         100,000							
1-1437565-2         FSM14J         0.370 (9.40)         0.512 (13.00)         160±50gf         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         260±50gf         ACETAL         100,000            FSM14JA         0.370 (9.40)         0.512 (13.00)         260±50gf         ACETAL         100,000            FSM14JAA         0.370 (9.40)         0.512 (13.00)         520±100gf         ACETAL         100,000            FSM14JL         0.370 (9.40)         0.512 (13.00)         100±50gf         ACETAL         100,000           1-1437565-3         FSM16J         0.527 (13.40)         0.669 (17.00)         160±50gf         ACETAL         100,000            FSM16JA         0.527 (13.40)         0.669 (17.00)         260±50gf         ACETAL         100,000	_						
FSM14JAA         0.370 (9.40)         0.512 (13.00)         520±100gf         ACETAL         100,000            FSM14JL         0.370 (9.40)         0.512 (13.00)         100±50gf         ACETAL         100,000           1-1437565-3         FSM16J         0.527 (13.40)         0.669 (17.00)         160±50gf         ACETAL         100,000            FSM16JA         0.527 (13.40)         0.669 (17.00)         260±50gf         ACETAL         100,000	1-1437565-2	FSM14J	0.370 (9.40)	0.512 (13.00)	160±50gf	ACETAL	100,000
FSM14JL         0.370 (9.40)         0.512 (13.00)         100±50gf         ACETAL         100,000           1-1437565-3         FSM16J         0.527 (13.40)         0.669 (17.00)         160±50gf         ACETAL         100,000            FSM16JA         0.527 (13.40)         0.669 (17.00)         260±50gf         ACETAL         100,000	_						
1-1437565-3         FSM16J         0.527 (13.40)         0.669 (17.00)         160±50gf         ACETAL         100,000            FSM16JA         0.527 (13.40)         0.669 (17.00)         260±50gf         ACETAL         100,000	_						
FSM16JA 0.527 (13.40) 0.669 (17.00) 260±50gf ACETAL 100,000	1-1437565.3						
100100111 0.027(15.70) 0.007(17.00) 320±100g1 ACETAL 100.000	_	FSM16JAA	0.527 (13.40)	0.669 (17.00)	520±100gf	ACETAL	100,000
- FSM16JL 0.527 (13.40) 0.669 (17.00) 100±50gf ACETAL 100,000	_				100±50gf		
1-1437565-4 FSM18J 0.193 (4.90) 0.335 (8.51) 160±50gf ACETAL 100,000	1-1437565-4			0.335 (8.51)		ACETAL	100,000
- FSM18IA 0.193 (4.90) 0.335 (8.51) 260±50gf ACETAL 100,000	—			· · · ·			
FSM18JAA         0.193 (4.90)         0.335 (8.51)         520±100gf         ACETAL         100,000            FSM18JL         0.193 (4.90)         0.335 (8.51)         100±50gf         ACETAL         100,000	—						
FSM18JL 0.193 (4.90) 0.335 (8.51) 100±50gf ACETAL 100,000		LOMITOT	0.193 (4.90)	0.333 (0.31)	100±3081	ACLIAL	100,000

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. Dimensions Specification to change.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967 E5

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tyco

Ε

**FSMJRT Series** 

**FSMJRT** Series

# Tactile Switches, .236 [6] x .236 [6], Radial Tape

#### MATERIAL SPECIFICATIONS:

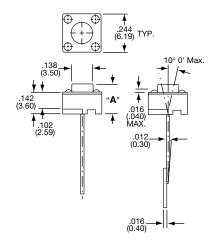
Contacts	Copper alloy, silver clad plate
Case	Nylon
Actuator Button	PBT
Cover	Steel, tin plate
Terminals	Copper alloy, silver clad plate

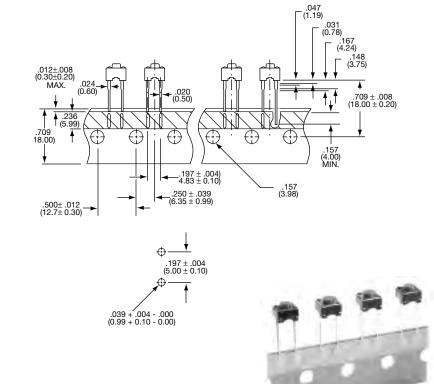
#### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	$-40^{\circ}$ F to $+221^{\circ}$ F ( $-40^{\circ}$ C to $+105^{\circ}$ C)
Storage Temperature	$40^{\circ}$ F to $+221^{\circ}$ F ( $-40^{\circ}$ C to $+105^{\circ}$ C)
Solder Heat Resistance	See Page M3-4

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	.50 mA @ 12 VDC
Initial Contact Resistance	.100 Milliohms max.
Insulation Resistance	.100 Megohms min. @ 100 VDC
Dielectric Strength	.500 VAC for 1 minute
Actuation Force	See Below
Actuator Travel	010" (,254)
Life Expectancy	.Up to 100,000 Cycles





FSM4JRT

Tyco Electronics			Actuation Force
2-1437565-6	FSM2JRT	4.3 (.169)	160 +/-50 gm
2-1437565-2	FSM2JART	4.3 (.169)	260 +/-75 gm
4-1437565-0	FSM4JRT	5.0 (.197)	160 +/-50 gm
147997-1	FSM4JART	5.0 (.197)	260 +/-75 gm
4-1437565-8	FSM6JRT	7.0 (.276)	160 +/-50 gm
1571402-1	FSM6JART	7.0 (.276)	260 +/-75 gm
147694-1	FSM8JRT	9.5 (.374)	160 +/-50 gm
147871-1	FSM8JART	9.5 (.374)	260 +/-75 gm
1571010-1	FSM14JRT	13.0 (.512)	160 +/-50 gm

E6

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

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**FSMRAJ** Series

# Tactile Switches, .236 [6] x .236 [6], Right Angle

#### MATERIAL SPECIFICATIONS:

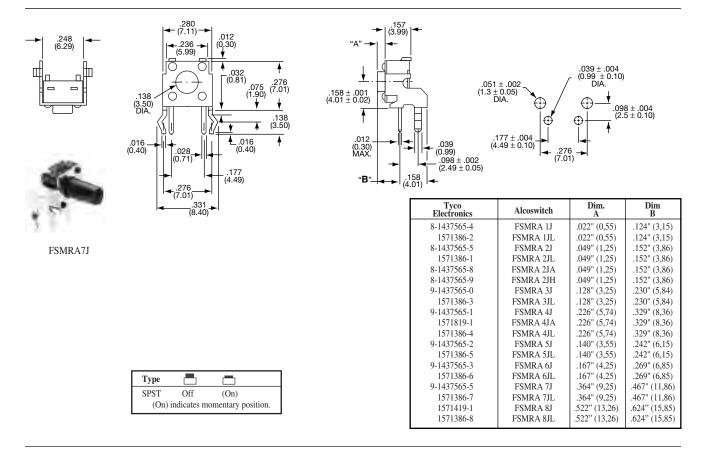
Contacts	Copper alloy, silver clad plate
Case	PBT
Actuator Button	Nylon/acetal
Frame	Steel, tin plate
Terminals	Copper alloy, silver plate

#### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature $-4^{\circ}F$ to $+185^{\circ}F$ ( $-20^{\circ}C$ to $+85^{\circ}C$ )
Storage Temperature22°F to +185°F (-30°C to +85°C)
Solder Heat ResistanceSee Page M3-4

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50 mA @ 12 VDC
Initial Contact Resistance	100 Milliohms max.
Insulation Resistance	100 Megohms min. @ 100 VDC
Dielectric Strength	500 VAC for 1 minute
Actuation Force	See Below
Actuator Travel	012" (0,3)
Life Expectancy	
	Up to 50,000 Cycles 520 GF (AA option)



#### PART NUMBERING SEQUENCE

		Actuator Length		Temperature	Actuation Force	±50g Tolerance
CONSULT FACTORY FOR OTHER OPTIONS	FSMRA ACTUATOR LENGTH DIM "A" .022" (0,56) .049" (1,24) .128" (3,25) .226" (5,74) .140" (3,55) .167" (4,24) .364" (9,24) .522" (13,26)	1 2 3 4 5 6 7 8	.124" (3,15) .152" (3,86) .230" (5,84) 220" (9,26)	LANK = STD. TEM = HIGH TEMP. MATERIAL: CA: ACTUATOR OPTIO	SE, PPS TUATOR, P	- BLANK = 160 g (STD.) A = 260 g (OPT.) AA = 520 g (OPT.) L = 100 g (OPT.) PS
Catalog 1308390	Dimensions are in inches	D	imensions are shown for	USA: 1-800-522-675	52	South America: 55-11-3611-1514

Catalog 1308390 Issued 9-04

and millimeters unless otherwise specified. Values in parentheses www.tycoelectronics.com

Dimensions are shown for reference purposes only. Specifications subject or brackets are metric equivalents. to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425



# Tactile Switches, .236 [6] x .236 [6], Square Button, Straight or Right Angle

### MATERIAL SPECIFICATIONS:

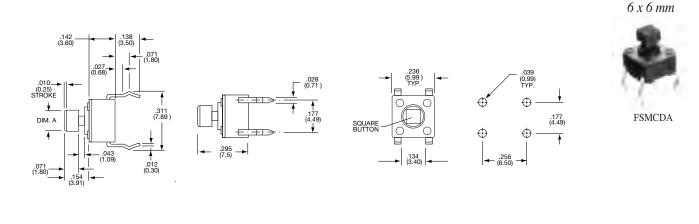
Contacts	Copper alloy, silver clad plate
Case	Nylon
Actuator Button	Polyacetal Resin
Cover	Pet film
Terminals	Copper alloy, silver plate
Frame (R/A)	Steel, tin plate

#### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	$-4^{\circ}F$ to $+185^{\circ}F$ ( $-20^{\circ}C$ to $+85^{\circ}C$ )
Storage Temperature	$-22^{\circ}F$ to $+185^{\circ}F$ ( $-30^{\circ}C$ to $+85^{\circ}C$ )
Solder Heat Resistance	.See Page M3-4

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	.50 mA @ 12 VDC
Initial Contact Resistance	.100 Milliohms Max.
Insulation Resistance	.100 Megohms min. @ 100 VDC
Dielectric Strength	.500 VAC for 1 minute
Actuation Force	.100 and 160 ±50 Grams
Actuator Travel	010"(,254)
Life Expectancy	.Up to 100,000 Cycles



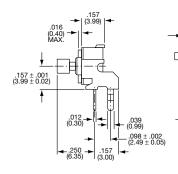
.236 (5.99)

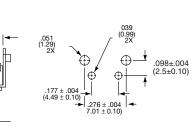
"A"

Tyco Electronics	Alcoswitch	Dim. A	Туре			Force
7-1437565-8	FSMCD	.095 (2,42)	SPST	Off	(On)	100±50g
7-1437565-9	FSMCDA	.110 (2,80)	SPST	Off	(On)	160±50g
			(On) indicat	tes momentary	position.	



ł .075 (1.90) .276 ŧ .138 .138 (3.50) .028 .016 .177 ± .004 (4.49 ± 0.10) .276 ± .004 7.01 ± 0.10) 331 ± .004 → .40 ± 0.10)







FSMRACDA

Tyco Electronics	Alcoswitch	Dim. A	Force
9-1437565-9	FSMRACD	.095 (2,42)	100±50g
1437566-1	FSMRACDA	.110 (2,80)	160±50g

E8

Catalog 1308390 Issued 9-04

and millimeters unless otherwise specified. Values in parentheses www.tycoelectronics.com

Dimensions are in inches

Dimensions are shown for reference purposes only. Specifications subject or brackets are metric equivalents. to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

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Electronics

FSMSM/JM Series

# Tactile Switches, .138 [3.5] x .236 [6], Surface Mount

#### MATERIAL SPECIFICATIONS:

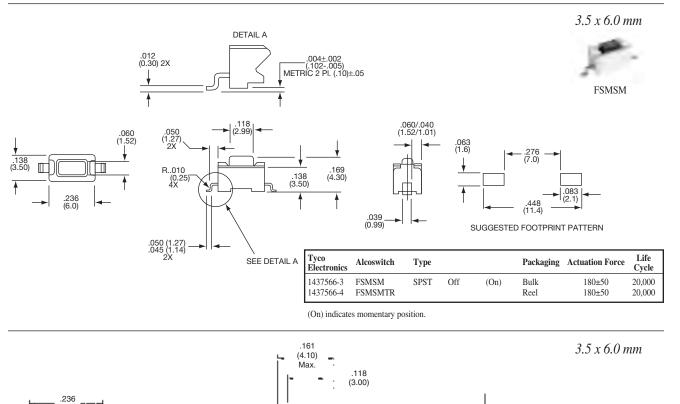
Contacts	Stainless steel, silver clad plate
Case Material	FSMSM: PPS
Actuator Material	FSMSM: Nylon
	FSMJM: PPS
Terminals	Copper alloy, silver plate or tin plate
Cover	Stainless steel

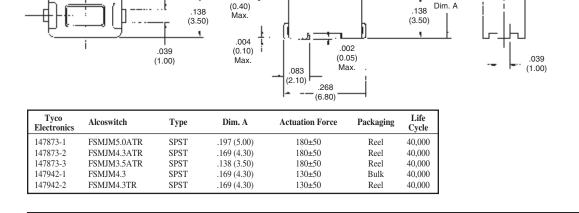
#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature40°F to +185°F (-40°C to +85°C)
Storage Temperature $40^{\circ}$ F to $+185^{\circ}$ F ( $-40^{\circ}$ C to $+85^{\circ}$ C)
Solder Heat ResistanceFSMSM IR Soldering EIA-364-56,
Procedure 5 Level 1, 215° C
FSMJM IR Soldering per EIA 364-56
Procedure 5, level 2, 464°F (240°C)

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50 mA @ 12 VDC
Initial Contact Resistance	100 Milliohms max.
Insulation Resistance	100 Megohms min. @ 500 VDC
Dielectric Strength	500 VAC for 1 minute
Actuator Travel	010"(.254)
Life Expectancy	20.000-40.000 Cvcles





Catalog 1308390 Issued 9-04

www.tycoelectronics.com or bra

(6.00)

and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are in inches

.016

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

.079 (2.00)

.299 (7.60)

i

T .087

(2.20)

E9

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tyco

# Tactile Switches, .236 [6] x .236 [6], Surface Mount

### MATERIAL SPECIFICATIONS:

Contacts	Copper alloy, silver plate
Case	PPS
Actuator Button	PPS
Cover	Steel, tin plate
Terminals	Copper alloy, silver plate

#### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature
Storage Temperature22°F to $+185$ °F (-30°C to $+85$ °C)
Solder Heat ResistanceIR Soldering EIA-364-56
Procedure 5 Level 3, 500°F (260°C)

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	.50 mA @ 12 VDC
Initial Contact Resistance	.100 Milliohms max.
Insulation Resistance	.100 Megohms min. @ 100 VDC
Dielectric Strength	.500 VAC for 1 minute
Actuation Force	.See Below
Actuator Travel	010"(.254)
Life Expectancy	.Up to 100,000 Cycles

.028 (3.25)

#### .142 (3.60) .178 (4.52) 138 3.5) DIA. .016 (0.40) 4 .031 (7.8) .394 (10.0) .236 SQ 2 4 "Δ' - .010 (0.25) TERMINAL NOS. "B' .083 (2.10) ŧ .442 **(**11.2).276 (7.0)

(3.0)

6 x 6 mm



FSMJSMA

Bulk P Part Nu		Tape & Part Ni		Actuator Length	Switch Height	Actuation Force
Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Dimension A	Dimension B	
2-1437565-7	FSM2JSMA	3-1437565-0	FSM2JSMATR	.028 (0.70)	.169 (4.30)	$160 \pm 50$ grams
4-1437565-1	FSM4JSMA	4-1437565-2	FSM4JSMATR	.055 (1.40)	.196 (5.00)	$160 \pm 50$ grams
4-1437565-9	FSM6JSMA	5-1437565-0	FSM6JSMATR	.134 (3.40)	.276 (7.00)	$160 \pm 50$ grams
2-1437565-8	FSM2JSMAA	2-1437565-9	FSM2JSMAATR	.028 (0.70)	.169 (4.30)	$260 \pm 50$ grams
1571563-1	FSM4JSML	1571563-2	FSM4JSMLTR	.055 (1.40)	.196 (5.00)	$100 \pm 50$ grams
1571563-3	FSM4JSMAA	1571563-4	FSM4JSMAATR	.055 (1.40)	.196 (5.00)	$260 \pm 50$ grams
	FSM6JSMAA	_	FSM6JSMAATR	.134 (3.40)	.276 (7.00)	$260 \pm 50$ grams
3-1437566-8	FSM8JSMA		FSM8JSMATR	.232 (5.90)	.374 (9.50)	$260 \pm 50$ grams
1571527-1	FSM2JSML	1571527-2	FSM2JSMLTR	.028 (0.70)	.169 (4.30)	$100 \pm 50$ grams

.055 (1.3)

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FSMJSMA Series

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

tyco

Electronics

**FSMCT Series** 

# Low Profile Series FSMCT Tactile Switches, .196 [5.0] x .196 [5.0], Surface Mount

#### MATERIAL SPECIFICATIONS:

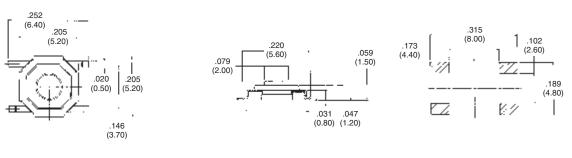
Cover	Nickel Silver
Stem/Actuator	Brass-"J" Lead
	Brass nickel plate-gullwing
Contacts:	
Moving	Stainless Steel, Silver Clad-Plate
Fixed/Terminal	Copper Alloy, Silver-Plate
Case	Nylon, UL94V-0

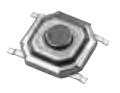
#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature Storage Temperature	· · · · · · · · · · · · · · · · · · ·
Storage Temperature	$22 10 + 163 \Gamma (-30 10 + 63 C)$
Resistance to solder heat	Per EIA-364-56A, Procedure 4 & 5,
	Level 3
Solderability	Per EIA-364-52, Class 2, Category 1,
	Temp. 473°F (245°C) max., Time 2.5
	seconds max., 95% minimum coverage.

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	20mA @ 15VDC
Initial Contact Resistance	100MilliOhms Max
Insulation Resistance	100Megaohms @ 100VDC Min.
Dielectric Strength	500 VAC for 1 minute
Actuation Travel	0.25 +0.1/-0.2
Life Expectancy	Up to 500,000 and 1,000,000 Cycles





Tyco Electronics	Alcoswitch	Туре	Force	Life Cycle
8-1437565-0	FSMCTTR	SPST	160±50	1,000,000
8-1437565-1	FSMCTATR	SPST	260±50	500,000

"J" lead option in development. Contact factory for additional information.

E11

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. Dimension Specification to change.

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# Low Profile, 6 x 6 SMT J-Lead, Extended Life

#### MATERIAL SPECIFICATIONS:

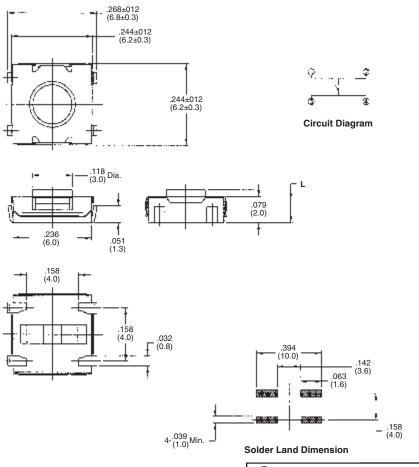
Cover	Stainless Steel
Stem/Actuator	Nylon UL94V-0
Contacts:	
Moving	Stainless Steel, Silver Clad-Plate
Fixed/Terminal	Copper Alloy, Silver-Plate
Case	Thermoplastic, UL94V-0, Black
Таре	Teflon

#### **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature	4 to +185°F (-20 to +85°C)
Storage Temperature	22 to +185°F (-30 to +85°C)
Resistance to solder heat	Per EIA-364-56A, Procedure 4 & 5,
	Level 3
Solderability	Per EIA-364-52, Class 2, Category 1,
	Temp 473°F (245°C), 95% minimum
	coverage.

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	.50mA @ 12 V DC
Initial Contact Resistance	.100MilliOhms Max
Insulation Resistance	.100Megaohms @ 100VDC Min.
Dielectric Strength	.500 VAC for 1 minute
Actuation Travel	.0.008 +/004 (.2 +/10)



S

		(4.0)	
older Land	Dimension		
Tyco Electronics	Dim L	Force	Life
1571625-1	.098 (2.5)	50gf	2,000,000
1571625-2	.098 (2.5)	50gf	2,000,000
1571625-3	.098 (2.5)	100gf	1,000,000
1571625-4	.098 (2.5)	100gf	1,000,000
1571625-5	.098 (2.5)	160gf	1,000,000
1571625-6	.098 (2.5)	160gf	1,000,000
1571625-7	.098 (2.5)	260gf	100,000
1571625-8	.098 (2.5)	260gf	100,000

E12

E

**Extended Life Series** 

Catalog 1308390 Issued 9-04

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Packaging Bulk T&R Bulk T&R Bulk T&R Bulk T&R

# Low Profile, 6 x 6 SMT, Gull Wing, Extended Life

# MATERIAL SPECIFICATIONS:

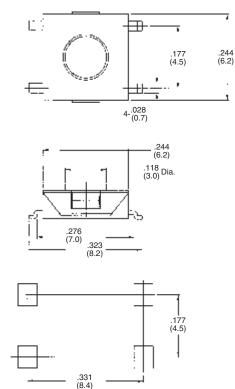
Cover	Copper Alloy, Tin Lead Plate
Stem/Actuator	Nylon UL94V-0
Contacts:	
Moving	Stainless Steel, Silver Clad-Plate
Fixed/Terminal	Copper Alloy, Silver-Plate
Case	Thermoplastic, UL94V-0, Black
Таре	

#### **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature	4 to +185°F (-20 to +85°C)
Storage Temperature	22 to +185°F (-30 to +85°C)
Resistance to solder heat	Per EIA-364-56A, Procedure 4 & 5,
	Level 3
Solderability	Per EIA-364-52, Class 2, Category 1,
·	Temp 473°F (245°C) max., time 2.5
	seconds max., 95% minimum coverage.

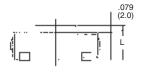
# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	.50mA @ 12 V DC
Initial Contact Resistance	.100MilliOhms Max
Insulation Resistance	.100Megaohms @ 100VDC Min.
Dielectric Strength	.500 VAC for 1 minute
Actuation Travel	.0.010 +/004 (.25 +/10)



PCB Mounting Solder Land Dimension

 $\mathcal{T}$ ψ ఫ da) Circuit Diagram



Tyco Electronics	Dim L	Force	Life	Packaging
1571626-1	.098 (2.5)	50gf	1,000,000	Bulk
1571626-2	.098 (2.5)	50gf	1,000,000	T&R
1571626-3	.098 (2.5)	100gf	1,000,000	Bulk
1571626-4	.098 (2.5)	100gf	1,000,000	T&R
1571626-5	.098 (2.5)	160gf	1,000,000	Bulk
1571626-6	.098 (2.5)	160gf	1,000,000	T&R
1571626-7	.079 (2.0)	160gf	1,000,000	Bulk
1571626-8	.079 (2.0)	160gf	1,000,000	T&R
1571626-9	.098 (2.5)	260gf	100,000	Bulk
1-1571626-0	.098 (2.5)	260gf	100,000	T&R

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

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> USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

E13

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# Low Profile, 6 x 6 SMT, Gull Wing w/ESD Terminal, Extended Life

#### MATERIAL SPECIFICATIONS:

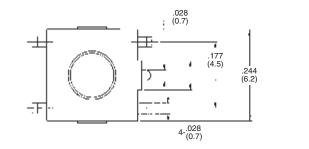
Cover	Copper Alloy, Tin Lead Plate
Stem/Actuator	Nylon UL94V-0
Contacts:	
Moving	Stainless Steel, Silver Clad-Plate
Fixed/Terminal	Copper Alloy, Silver-Plate
Case	Thermoplastic, UL94V-0, Black
Таре	Teflon

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature	4 to +185°F (-20 to +85°C)
Storage Temperature	22 to +185°F (-30 to +85°C)
Resistance to solder heat	Per EIA-364-56A, Procedure 4 & 5,
	Level 3
Solderability	Per EIA-364-52, Class 2, Category 1,
-	Temp 473°F (245°C) max., time 2.5
	seconds max., 95% minimum coverage.

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	.50mA @ 12 V DC
Initial Contact Resistance	.100MilliOhms Max
Insulation Resistance	.100Megaohms @ 100V DC Min.
Dielectric Strength	.500 VAC for 1 minute
Actuation Travel	.0.010 +/004 (.25 +/10)

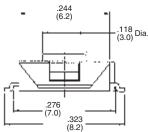




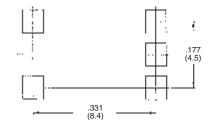


.079 (2.0)

.002 (0.1) Max.







PCB Mounting Solder Land Dimension

Tyco Electronics	Dim L	Force	Life	Packaging
1571636-1	.098 (2.5)	50gf	1,000,000	Bulk
1571636-2	.098 (2.5)	50gf	1,000,000	T&R
1571636-3	.098 (2.5)	100gf	1,000,000	Bulk
1571636-4	.098 (2.5)	100gf	1,000,000	T&R
1571636-5	.098 (2.5)	160gf	1,000,000	Bulk
1571636-6	.098 (2.5)	160gf	1,000,000	T&R
1571636-7	.079 (2.0)	160gf	1,000,000	Bulk
1571636-8	.079 (2.0)	160gf	1,000,000	T&R
1571636-9	.098 (2.5)	260gf	100,000	Bulk
1-1571636-0	.098 (2.5)	260gf	100,000	T&R

E14

Catalog 1308390 Issued 9-04

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1.c. A......

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tyco

**FSM1LP** Series

# Tactile Switches, .236 [6] x .236 [6], Low Profile, Surface Mount

#### MATERIAL SPECIFICATIONS:

Contacts	Copper Alloy, silver clad plated
Case Material	PPS
Stem	PPS
Cover	Steel, tin-plate
Terminals	Copper alloy, silver plated

#### **ENVIRONMENTAL SPECIFICATIONS:**

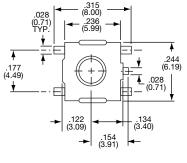
Operating Temperature	4°F to +185°F (-20°C to +85°C )
Storage Temperature	22°F to +185°F (-30°C to +85°C)
Solder Heat Resistance	IR Soldering EIA-364-56
	Procedure 5 Level 2, 464°F (240°C)

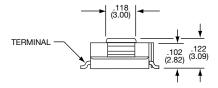
# TYPICAL PERFORMANCE CHARACTERISTICS:

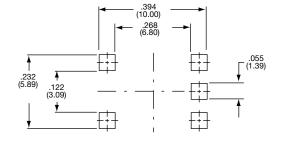
Contact Rating	50mA @ 12 VDC
Initial Contact Resistance	100 Milliohms max.
Insulation Resistance	100 Megohms min. @ 100 VDC
Dielectric Strength	500 VAC. 1 minute
Actuation Force	See Below.
Life Expectancy	Up to 100,000 Cycles

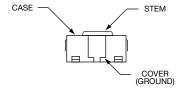


FSM1LP



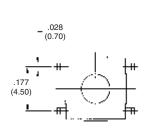


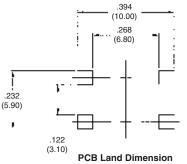


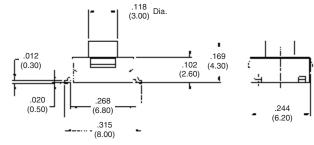


Tyco Electronics	Alcoswitch	Force	Actuator Packaging
1-1437565-6	FSM1LP	160	Bulk
1-1437565-7	FSM1LPA	260	Bulk
1-1437565-9	FSM1LPTR	160	Tape & Reel
1-1437565-8	FSM1LPATR	260	Tape & Reel
1571621-1	FSM4LP	260	Bulk
4-1437565-3	FSM4LPTR	260	Tape & Reel

FSM4LP







E15

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E15

Ε



# Tactile Switches, .472 [12] x .472 [12], Flush or Extended Actuators

#### MATERIAL SPECIFICATIONS:

Contacts	Copper alloy, silver clad plate
Case	PBT
Actuator Button	Polyacetal Resin
Cover	PET film
Terminals	Copper alloy, silver plate
Frame (R/A)	Nylon

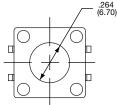
#### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	$4^{\circ}F$ to +185°F (-20°C to +85°C)
Storage Temperature	$22^{\circ}$ F to +185°F (-30°C to +85°C)
Solder Heat Resistance	See Page M3-4

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.02 (0.5)





.472 (12.00)

.492 (12.50)

.555 (14.10)

.154 (3.90)

. .138 (3.50)

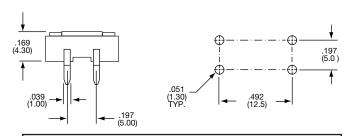
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t

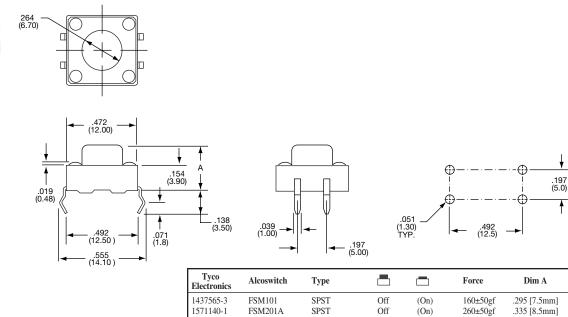
.071 (1.8)



Contact Rating	.50 mA @ 12 VDC
Initial Contact Resistance	.100 Milliohms max.
Insulation Resistance	.100 Megohms min. @100 VDC
Dielectric Strength	.500 VAC for 1 minute
Actuation Force	.See below
Actuator Travel	.0.012"(0.3)
Life Expectancy	.Up to 100,000 cycles

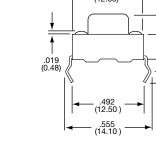


Tyco Electronics	Alcoswitch	Туре			Force
1437565-2	FSM100	SPST	Off	(On)	160±50gf
1571139-1	FSM100A	SPST	Off	(On)	260±50gf
	(On) indicates	momentary posit	ion.		



FSM201A





E16

Catalog 1308390 Issued 9-04

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Dimensions are in inches

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1571140-1

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

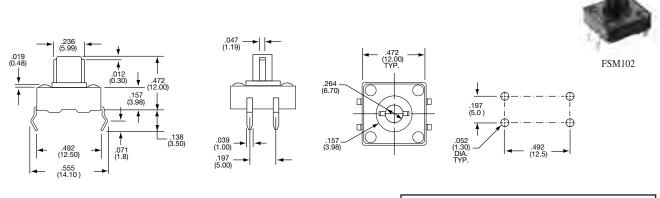
Off

(On)

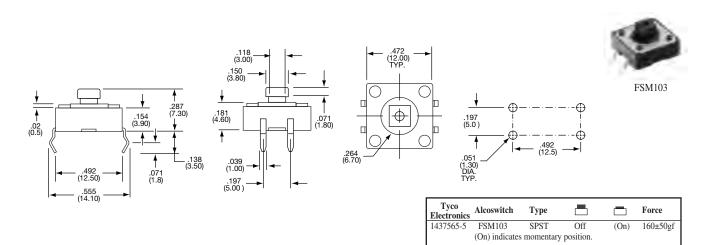
SPST

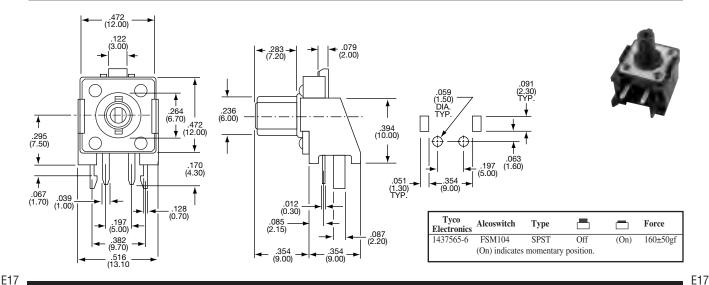
(On) indicates momentary position.

# Tactile Switches, .472 [12] x .472 [12], Vertical or Right Angle



Tyco Electronics	Alcoswitch	Туре			Force
1437565-4		SPST	Off	(On)	160±50gf
1571061-1	FSM102A	SPST	Off	(On)	260±50gf
	(On) indicates	momentar	y position.		





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and millimeters unless otherwise specified. Values in parentheses www.tycoelectronics.com

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# Tactile Switches, Sealed .472 [12] x .472 [12], Surface Mount, Projected Actuator

#### MATERIAL SPECIFICATIONS:

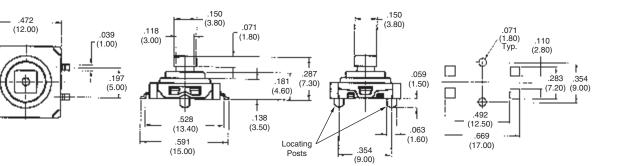
Case	Thermoplastic, UL94V-0, Black
	Thermoplastic, UL94V-0, Black
Cover	Stainless Steel
Seal	
Contact	Stainless Steel, Plating—Silver
Terminal	Copper Alloy, Plating—Silver/Nickel

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature	4 to +185°F (-20 to +70°C)
Storage Temperature	4 to +185°F (-20 to +70°C)
Resistance to solder heat	Per EIA-364-56, Procedure 4 & 5, Level 3
Solderability	Per EIA RS-186-9E
Seal	Per IP67

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50mA @ 12 V DC
Initial Contact Resistance	100MilliOhms Max
Insulation Resistance	100Megaohms @ 100VDC Min.
Dielectric Strength	500 VAC
Actuation Travel	0.014 +/008 (.35 +/20)
Life	Up to 1,000,000 Cycles





.472 (12.00)

Tyco Electronics	Locating Post	Packaging	Actuator Height	Force
1571217-1	No	Bulk	.287 (7.30)	160±70gf
1571217-2	Yes	Bulk	.287 (7.30)	160±70gf
1571217-3	No	T&R	.287 (7.30)	160±70gf
1571217-4	Yes	T&R	.287 (7.30)	160±70gf

E18

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# Tactile Switches, Sealed .472 [12] x .472 [12], Surface Mount, Flush, Actuator

# MATERIAL SPECIFICATIONS:

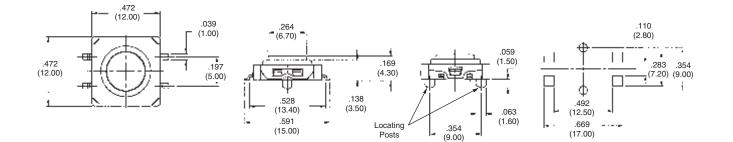
Case	Thermoplastic, UL94V-0, Black
	Thermoplastic, UL94V-0, Black
Cover	Stainless Steel
Seal	Silicone Rubber, Black
Contact	Stainless Steel, Plating—Silver
Terminal	Copper Alloy, Plating—Silver/Nickel

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature	4 to $+185^{\circ}$ F (-20 to $+85^{\circ}$ C)
Storage Temperature	4 to +185°F (-20 to +85°C)
Resistance to solder heat	Per EIA-364-56, Procedure 4 & 5, Level 3
Solderability	Per EIA RS-186-9E
Seal	Per IP67

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50mA @ 12 V DC
Initial Contact Resistance	100MilliOhms Max
Insulation Resistance	100Megaohms @ 100VDC Min.
Dielectric Strength	500 VAC
Actuation Travel	0.014 +/008 (.35 +/20)
Life	Up to 1,000,000 Cycles



Tyco Electronics	Locating Post	Packaging	Actuator Height	Force
1571218-1	No	Bulk	.169 (4.30)	160±70gf
1571218-2	Yes	Bulk	.169 (4.30)	160±70gf
1571218-3	No	T&R	.169 (4.30)	160±70gf
1571218-4	Yes	T&R	.169 (4.30)	160±70gf

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# Tactile Switches, Sealed .472 [12] x .472 [12], Thru-Hole, Projected Actuator

#### MATERIAL SPECIFICATIONS:

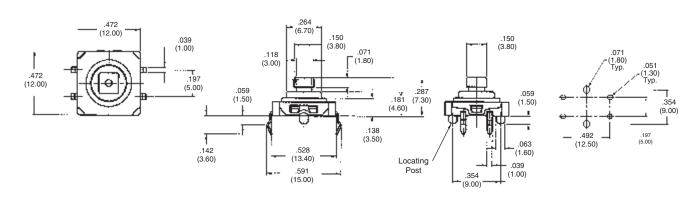
Case	Thermoplastic, UL94V-0, Black
	Thermoplastic, UL94V-0, Black
Cover	
Seal	Silicone Rubber, Black
Contact	Stainless Steel, Plating—Silver
Terminal	Copper Alloy, Plating-Silver/Nickel

#### **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature4 to +185°F (-20 to +85°C)
Storage Temperature4 to $+185^{\circ}F(-20 \text{ to } +85^{\circ}C)$
Resistance to solder heatPer EIA-364-56, Procedure 3, Test Cond. B
SolderabilityPer EIA RS-186-9E
SealPer IP67

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50mA @ 12 V DC
Initial Contact Resistance	100MilliOhms Max
Insulation Resistance	100Megaohms @ 100VDC Min.
Dielectric Strength	500 VAC
Actuation Travel	0.014 +/008 (.35 +/20)
Life	1,000,000 Cycles





Tyco Electronics	Locating Post	Packaging	Actuator Height	Force
1571219-1	No	Bulk	.287 (7.30)	160±70gf
1571219-2	Yes	Bulk	.287 (7.30)	160±70gf

E20

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# Tactile Switches, Sealed .472 [12] x .472 [12], Thru-Hole, Flush Actuator

## MATERIAL SPECIFICATIONS:

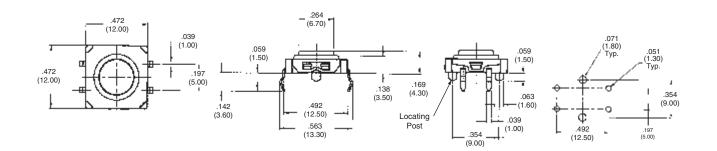
Case	Thermoplastic, UL94V-0, Black
Stem/Actuator	Thermoplastic, UL94V-0, Black
Cover	Stainless Steel
Seal	Silicone Rubber, Black
Contact	Stainless Steel, Plating—Silver
Terminal	Copper Alloy, Plating—Silver/Nickel

#### **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature4 to $+185^{\circ}F(-20 \text{ to } +85^{\circ}C)$
Storage Temperature4 to +185°F (-20 to +85°C)
Resistance to solder heatPer EIA-364-56, Procedure 3, Test Cond. B
SolderabilityPer EIA RS-186-9E
SealPer IP67

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50mA @ 12 V DC
Initial Contact Resistance	100MilliOhms Max
Insulation Resistance	100Megaohms @ 100VDC Min.
Dielectric Strength	500 VAC
Actuation Travel	0.014 +/008 (.35 +/20)
Life	1,000,000 Cycles





Tyco Electronics	Locating Post	Packaging	Actuator Height	Force
1571220-1	No	Bulk	.169 (4.30)	160±70gf
1571220-2	Yes	Bulk	.169 (4.30)	160±70gf

E21

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Ε

# Tactile Switches, Sealed .299 [7.6] x .287 [7.3], Surface Mount, Extended Actuator

#### MATERIAL SPECIFICATIONS:

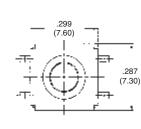
Case	Thermoplastic, UL94V-0, Black
	Thermoplastic, UL94V-0, Black
Cover	Stainless Steel
Seal	Silicone Rubber, Black
Contact	Stainless Steel, Plating—Silver
Terminal	Copper Alloy, Plating—Silver

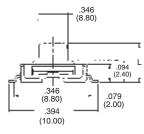
#### **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature	4 to +185°F (-20 to +85°C)
Storage Temperature	4 to +185°F (-20 to +85°C)
Resistance to solder heat	Per EIA-364-56, Procedure 4 & 5, Level 3
Solderability	Per EIA RS–186–9E
Seal	Per IP67

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50mA @ 12 V DC
Initial Contact Resistance	100MilliOhms Max
Insulation Resistance	100Megaohms @ 100VDC Min.
Dielectric Strength	500 VAC
Actuation Travel	0.014 +/008 (.35 +/20)
Life	Up to 1,000,000 Cycles









Tyco Electronics	Packaging	L	Force
1571294-1	Bulk	.169 (4.30)	160±50gf
1571294-2	T&R	.169 (4.30)	160±50gf
1571294-3	Bulk	.197 (5.00)	160±50gf
1571294-4	T&R	.197 (5.00)	160±50gf

E22

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Dimensions are shown for reference purposes only. Specifications subject

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E22

Т

.157 (4.00)

# Tactile Switches, Sealed .299 [7.6] x .287 [7.3], Surface Mount, Flush Actuator

## MATERIAL SPECIFICATIONS:

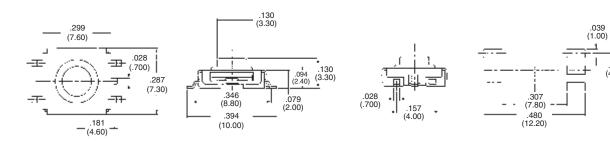
Case	Thermoplastic, UL94V-0, Black
	Thermoplastic, UL94V-0, Black
Cover	
Seal	Silicone Rubber, Black
Contact	Stainless Steel, Plating—Silver
Terminal	Copper Alloy, Plating—Silver/Nickel

#### **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature	4 to +185°F (-20 to +85°C)
Storage Temperature	4 to $+185^{\circ}F$ (-20 to $+85^{\circ}C$ )
Resistance to solder heat	Per EIA-364-56, Procedure 4 & 5, Level 3
Solderability	Per EIA RS-186-9E
Seal	Per IP67

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50mA @ 12 V DC
Initial Contact Resistance	100MilliOhms Max
Insulation Resistance	100Megaohms @ 100VDC Min.
Dielectric Strength	500 VAC
Actuation Travel	0.014 +/008 (.35 +/20)
Life	Up to 1,000,000 Cycles





Tyco Electronics	Packaging	Actuator Height	Force
1571296-1	Bulk	.130 (3.30)	160±50gf
1571296-2	T&R	.130 (3.30)	160±50gf

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tyco

Electronics

# Tactile Switches, Sealed .299 [7.6] x .287 [7.3], Thru-Hole, Extended Actuator

#### MATERIAL SPECIFICATIONS:

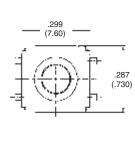
Case	Thermoplastic, UL94V-0, Black
	Thermoplastic, UL94V-0, Black
Cover	
Seal	Silicone Rubber, Black
Contact	Stainless Steel, Plating—Silver
Terminal	Copper Alloy, Plating-Silver/Nickel

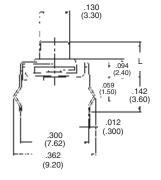
#### ENVIRONMENTAL SPECIFICATIONS:

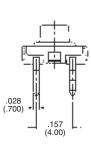
Operating Temperature	4 to +185°F (-20 to +85°C)
Storage Temperature	4 to +185°F (-20 to +85°C)
Resistance to solder heat	Per EIA-364-56, Procedure 3, Test Cond.B
Solderability	Per EIA RS-186-9E
Seal	Per IP67

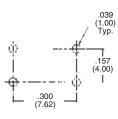
# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50mA @ 12 V DC
Initial Contact Resistance	100MilliOhms Max
Insulation Resistance	100Megaohms @ 100VDC Min.
Dielectric Strength	500 VAC
Actuation Travel	0.014 +/008 (.35 +/20)
Life	Up to 1,000,000 Cycles











Tyco Electronics	Packaging	L	Force
1571295-1	Bulk	.169 (4.30)	160±50gf
1571295-2	Bulk	.197 (5.00)	160±50gf

E24

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Ε

Sealed Tactile Switches

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Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

# Tactile Switches, Sealed .185 [4.7] x .268 [6.8], Surface Mount

## MATERIAL SPECIFICATIONS:

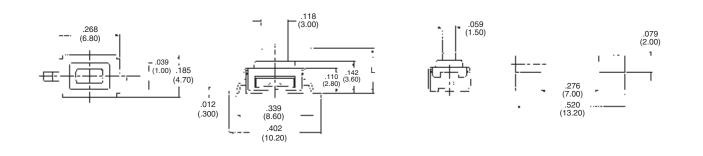
Case	Thermoplastic, UL94V-0, Black
	Thermoplastic, UL94V-0, Black
Cover	Stainless Steel
Seal	Silicone Rubber, Black
Contact	Stainless Steel, Plating—Silver
Terminal	Copper Alloy, Plating—Silver/Nickel

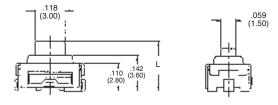
#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature	4 to +185°F (-20 to +85°C)
Storage Temperature	4 to +185°F (-20 to +85°C)
Resistance to solder heat	Per EIA-364-56, Procedure 4 & 5, Level 3
Solderability	Per EIA RS–186–9E
Seal	Per IP67

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50mA @ 12 V DC
Initial Contact Resistance	100MilliOhms Max
Insulation Resistance	100Megaohms @ 100VDC Min.
Dielectric Strength	500 VAC
Actuation Travel	0.014 +/008 (.35 +/20)
Life	Up to 50,000 Cycles







Tyco Electronics	Packaging	L	<b>Operating Force</b>	Lead Style
1571298-1	Bulk	.197 (5.00)	$130 \pm 50$ gf	Gull Wing
1571298-2	T&R	.197 (5.00)	$130 \pm 50 gf$	Gull Wing
1571299-1	Bulk	.169 (4.30)	$130 \pm 50 gf$	J Lead
1571299-2	T&R	.169 (4.30)	$130 \pm 50 gf$	J Lead
1571299-3	Bulk	.197 (5.00)	$130 \pm 50 gf$	J Lead
1571299-4	T&R	.197 (5.00)	$130 \pm 50$ gf	J Lead

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. Dimension Specification to change.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967 E25

# Tactile Switches, Sealed .185 [4.7] x .268 [6.8], Thru-Hole

### MATERIAL SPECIFICATIONS:

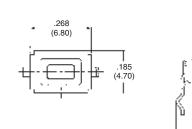
Case	Thermoplastic, UL94V-0, Black
	Thermoplastic, UL94V-0, Black
Cover	Stainless Steel
Seal	
Contact	Stainless Steel, Plating—Silver
Terminal	Copper Alloy, Plating—Silver/Nickel

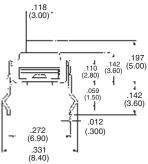
#### ENVIRONMENTAL SPECIFICATIONS:

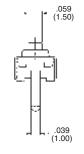
Operating Temperature4 to +185°F (-20 to +85°C)	
Storage Temperature4 to +185°F (-20 to +85°C)	
Resistance to solder heatPer EIA-364-56, Procedure 3, Test Cond. B	
SolderabilityPer EIA RS-186-9E	
SealPer IP67	

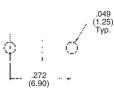
# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50mA @ 12 V DC
Initial Contact Resistance	100MilliOhms Max
Insulation Resistance	100Megaohms @ 100VDC Min.
Dielectric Strength	500 VAC
Actuation Travel	0.014 +/008 (.35 +/20)
Life	Up to 50,000 Cycles











Tyco Electronics	Packaging	Actuator Height	<b>Operating Force</b>
1571297-1	Bulk	.197 (5.00)	$130 \pm 50$ gf

E

Sealed Tactile Switches

E26 \_\_\_\_\_Cata

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Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

# Tactile Switches, Sealed Right Angle, Surface Mount

## MATERIAL SPECIFICATIONS:

Case	Thermoplastic, UL94V-0, Black
	Thermoplastic, UL94V-0, Black
Cover	Stainless Steel
Seal	Silicone Rubber, Black
Contact	Stainless Steel, Plating—Silver
Terminal	Copper Alloy, Plating-Silver/Nickel

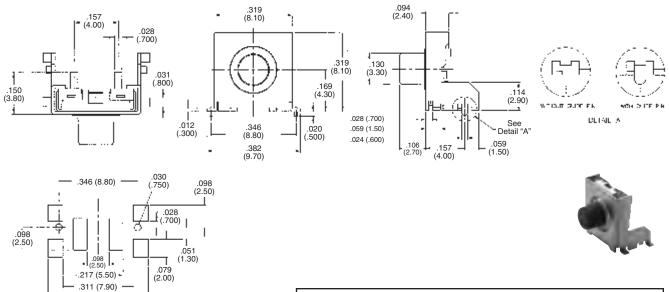
#### **ENVIRONMENTAL SPECIFICATIONS:**

.441 (11.20)

Operating Temperature	4° to +185°F (-20°to +85°C)
Storage Temperature	4° to +185°F (-20°to +85°C)
Resistance to solder heat	Per EIA-364-56, Procedure 4 & 5, Level 3
Solderabilityl	Per EIA RS–186–9E
Seal	Per IP67

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50mA @ 12 V DC
Initial Contact Resistance	100MilliOhms Max
Insulation Resistance	100Megaohms @ 100VDC Min.
Dielectric Strength	500 VAC
Actuation Travel	0.014 +/008 (.35 +/20)
Life	Up to 1,000,000 Cycles



Tyco Electronics	Packaging	Actuator Height	Operating Force	Detail A
1571300-1	Bulk	.106 (2.70)	$\begin{array}{c} 130 \pm 50 \mathrm{gf} \\ 130 \pm 50 \mathrm{gf} \end{array}$	Without Pin
1571300-2	Bulk	.106 (2.70)		With Pin

Ε

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Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

# Tactile Switches, Sealed Right Angle, Surface Mount

#### MATERIAL SPECIFICATIONS:

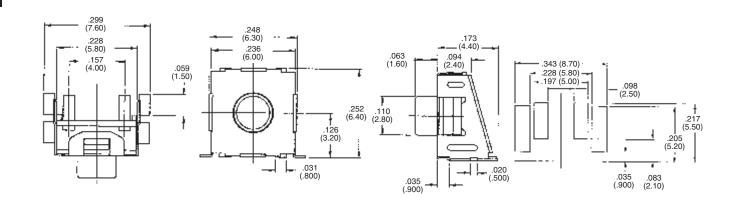
Case	Thermoplastic, UL94V-0, Black
	Thermoplastic, UL94V-0, Black
Cover	Stainless Steel
Seal	Silicone Rubber, Black
Contact	Stainless Steel, Plating—Silver
Terminal	Copper Alloy, Plating—Silver

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature4° to +185°F (-20°to +85°C)	
Storage Temperature $-4^{\circ}$ to $+185^{\circ}F$ ( $-20^{\circ}$ to $+85^{\circ}C$ )	
Resistance to solder heatPer EIA-364-56, Procedure 4 & 5, Leve	el 3
SolderabilityPer EIA RS-186-9E	
SealPer IP67	

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50mA @ 12 V DC
Initial Contact Resistance	100MilliOhms Max
Insulation Resistance	100Megaohms @ 100VDC Min.
Dielectric Strength	500 VAC
Actuation Travel	0.014 +/008 (.35 +/20)
Life	Up to 1,000,000 Cycles





Tyco Electronics	Packaging	Actuator Height	Operating Force
1571407-1	Bulk	.063 (1.60)	$260 \pm 100 \text{gf}$
1571407-2	T&R	.063 (1.60)	$260 \pm 100 \text{gf}$

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Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

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# Tactile Switches, Side Actuated, Surface Mount

## MATERIAL SPECIFICATIONS:

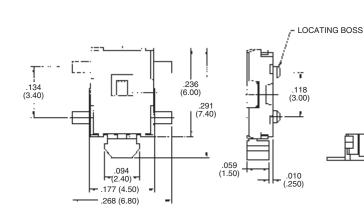
Case	Nylon 4/6, UL94V-0, Black
Stem/Actuator	-
Cover	Stainless Steel
Contact Plate	Stainless Steel, Silver Clad Over
	Nickel Plate
Terminal	Copper Alloy, Silver Over Nickel Plate
Masking Tape	Teflon

#### **ENVIRONMENTAL SPECIFICATIONS:**

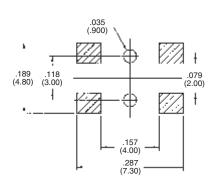
Operating Temperature	4° to +185°F (-20°to +85°C)
Storage Temperature	22° to +185°F (-30°to +85°C)
Resistance to Solder Heat	Per EIA-364-56A, procedure 4 and 5,
	Level 3
Solderability	Per EIA-364-52, Class 2, Category 1,
	Temp. 473°F (245°C) max., time 2.5 sec.
	max., 95% min. coverage.

# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	50mA @ 12 V DC
Initial Contact Resistance	100MilliOhms Max
Insulation Resistance	100Megaohms @ 100VDC Min.
Dielectric Strength	500 VAC for 1 minute
Force	160 (+70/-40gm)
Travel	30 (+.1/2mm)
Life	Up to 100,000 Cycles









Tyco Electronics	Feature	Packaging
1571262-1	W/O Boss	Bulk
1571262-2	W/O Boss	T&R
1571262-3	with Boss	Bulk
1571262-4	with Boss	T&R

Ε

Dimensions are in inches and millimeters unless otherwise	Dimensions are shown for reference purposes only.
specified. Values in parentheses	Specifications subject
or brackets are metric equivalents.	to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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Catalog 1308390 Issued 9-04

# **Multi-Directional Actuation**

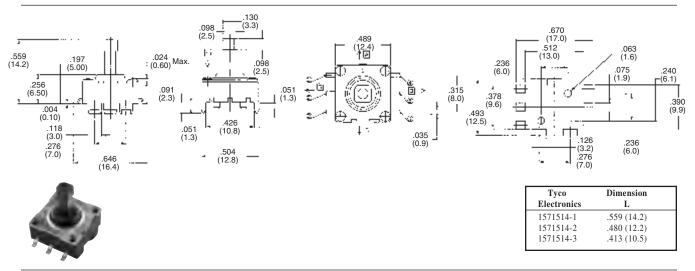
# MATERIAL SPECIFICATIONS:

In it bit it bit bott for it	101101
ContactCo	pper alloy - silver clad/nickel
Case MaterialNy	lon - UL 94-HB, Black
Actuator MaterialNy	lon - UL 94-HB, Black
Terminals/Fixed ContactCo	pper alloy - plate silver Id/nickel
ENVIRONMENTAL SPEC	CIFICATIONS
Operating Temperature12	$3^{\circ}$ to $158^{\circ}$ F (-25° to +70°C)
Storage Temperature44	$0^{\circ}$ to $185^{\circ}F$ (-40° to +85°C)
Solder Heat ResistancePe	r EIA-364-56A, Procedure 4 and

	5, Level 3
Solderability	Per EIA-364-52, Class 2 Cat. 1,
2	temp. 255° max., time 5 seconds
	max. 95% min. coverage

TYPICAL PERFORMANCE CHARACTERISTICS		
Contact Rating20mA@15VDC		
Initial Contact Resistance100 Milliohms max.		

mitiai Contact Resistance	100 WIIIIOIIIIIS IIIAX.
Insulation Resistance	100 Megohm min.
Dielectric Strength	100 VAC for 1 min.
Life Expectancy	Up to 50,000 Cycles
Actuation Force	500±150 gf (center push),
	200±100 gf (4-directional)
Actuation Travel	$\dots 0.039 (1.0) \pm 0.000 (1.0) $
	$0.315 (8.0) \pm 2^{\circ} (4 \text{-directional})$

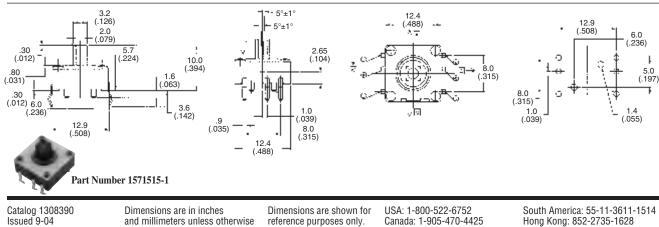


### MATERIAL SPECIFICATIONS:

Contacts	.Stainless steel, plate silver clad/nickel
Case Material	.Nylon - UL 94-HB, Black
Actuator Material	.PBT, UL 94-HB
Terminals/Fixed Contacts	.Copper alloy - plate silver/nickel
Environmental Specifications	5
Operating Temperature	13° to 158°F (-25° to +70°C)
Storage Temperature	40° to 185°F (-40° to +85°C)
Solder Heat Resistance	.Per EIA-364-56A, Procedure 3, Condition B
Solderability	Per EIA-364-52, Class 2 Cat. 1, temp. 255° max., time 5 seconds max. 95% min. coverage

# TYPICAL PERFORMANCE CHARACTERISTICS

Contact Rating	20mA@15VDC
Initial Contact Resistance	100 Milliohms max.
Insulation Resistance	100 Megohm min.
Dielectric Strength	100 VAC for 1 min.
Life Expectancy	Up to 50,000 Cycles
Actuation Force	350±100 gf (center push),
	200±70/-50 gf (4-directional)
Actuation Travel	0.010 (.25) $\pm$ .008 (.2) (center push), 0.197 (5.0) $\pm$ 1° (4-directional)
	$(1.157 (3.0) \pm 1 (4-0.000 - $



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and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

reference purposes only. Specifications subject

Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

E30

tyco Electronics

Rocker/Paddle Switches

# Alcoswitch



TRD Series - Page F3



Power Rocker Switches - Page F21



Gemini Series - Page F7



F1

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**Rocker/Paddle Switches** 

Catalog 1308390 Issued 9-04

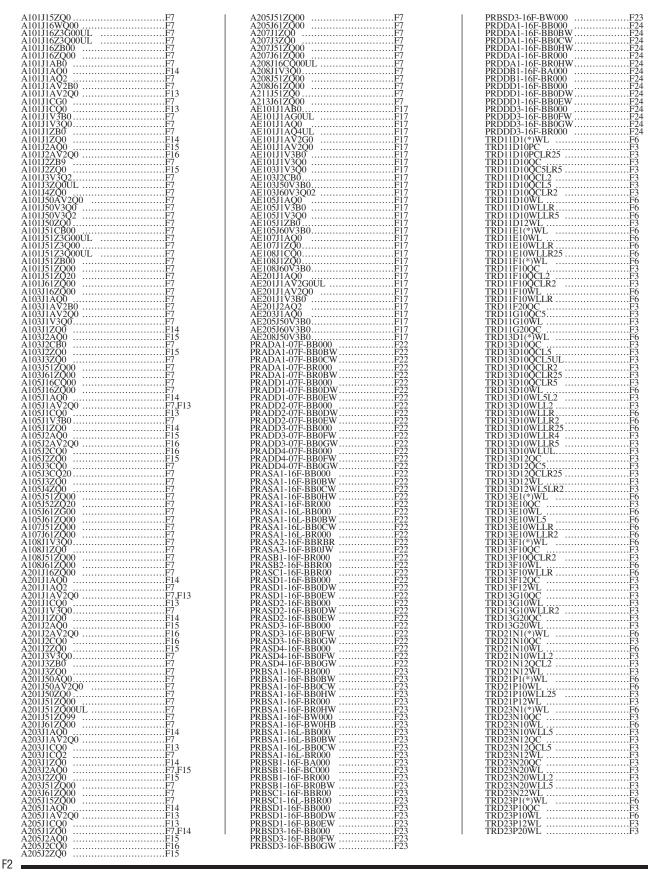
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Dimensions are in inches Dimension and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. Dimension Specification to change.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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# **Rocker/Paddle Switches Part Number Index**



Catalog 1308390 Issued 9-04

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**TRD Series** 

# Rocker/Paddle Switches, TRD Series Part Number Matrix

#### MATERIAL SPECIFICATIONS:

Movable Contacts	.Copper alloy w/silver inlay contact or
	gold plate
Terminals/Fixed Contacts	.Copper alloy w/silver inlay contact or
	gold plate
Terminal Seal	.Epoxy
Housing/Beveled Frame	.Polyamide, black matte finish

#### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature	$4^{\circ}$ F to +176°F (-20°C to +80°C)
Storage Temperature	49°F to $+199$ °F (-45°C to $+93$ °C)
Solder Heat Resistance	Meets MIL-STD-202, method 210

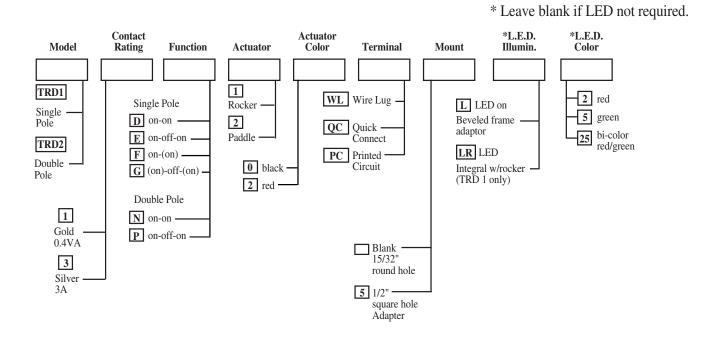
# TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	Silver: 3A max. @ 125 VAC, option 3
C	Gold: 0.4VA max. @ 20 VDC, option 1
Initial Contact Resistance	20 Milliohms max.
Static Withstanding	15KV, per IEC 801-2
Insulation Resistance	1,000 Megohms min. @ 500 VDC
Dielectric Strength	500 Volts RMS @ sea level
Electrical Life	2 Pos. 20K cycles @ full rated 3A load,
	80K @ 0.4VA, 3 pos. 10K cycles @ full
	rated 3A load, 60K @ 0.4VA

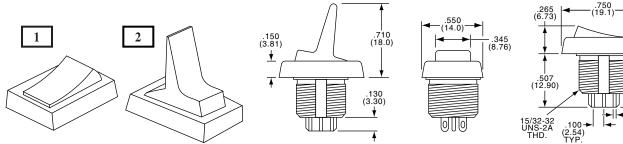
# \*NOTICE: Caution should be used when hand-soldering. Solder heat Resistance -550°-600°F for less than 5 seconds. Solder with the switch in the closed position.

UL options available, consult Tyco Electronics Product Information Center

#### HOW TO ORDER



**ACTUATORS** 



Catalog 1308390 Issued 9-04

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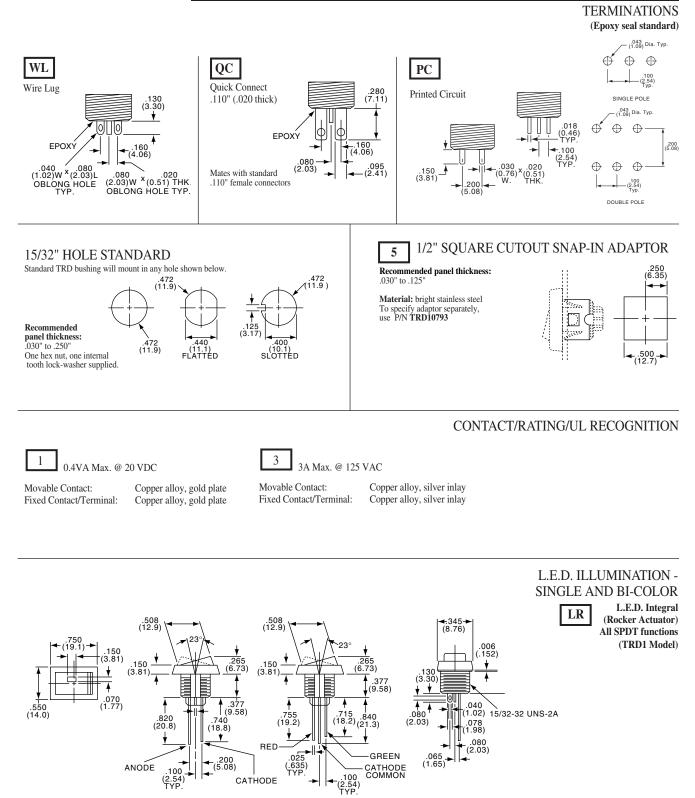
F

**TRD Series** 

TRD Series

# Alcoswitch





Standard mounting dimensions apply, L.E.D. supplied in 2 red, 5 green, or 25 red/green. L.E.D. Specifications: Max Voltage: 2.8 VDC

and millimeters unless otherwise

specified. Values in parentheses

Dimensions are in inches

Max. Forward Current: red-20mA, green-25 mA, red/green-40 mA. F4

Catalog 1308390 Issued 9-04

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Dimensions are shown for reference purposes only. Specifications subject or brackets are metric equivalents. to change.

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Electronics

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# **Rocker/Paddle Switches, TRD Series Options**

1.100 (27.9) REF.

\_.050 (1.27)



L.E.D. BEVELED FRAME ADAPTOR (Accepts rectangular L.E.D.)

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\_.550 (14.0)

.225 (5.72)

.773 (19.6)



.500 (12.7)

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.472 (12.0)

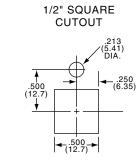
**Recommended Panel** 

Thickness: .030 to .220:

L.E.D.

.213 (5.41)

MOUNTING



**Recommended Panel** 

Thickness: .030 to .095"

Material: Nylon 6/6 Color/Finish: Black, matte

**FUNCTIONS** 

Single Pole	Double Pole	123 456	123 456	123 456
D E F G	N P	On On On (On)	None Off None Off	On On (On) (On)
SPDT Terminals	s Connected	2-3		1-2
DPDT Terminals	s Connected	2-3 5-6		1-2 4-5

None No mechanical position

- **Off** Mechanical position, no electrical connection
- (On) Momentary mechanical position, and electrical connection

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Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967 F5

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#### \* Refer to Pages F3-F5 for Other Options \*

## Rocker Switches, TRD Series Illuminated or Non-Illuminated, Wire Lug

## MATERIAL SPECIFICATIONS:

Contacts	Gold over nickel or silver plate
Case Material	Polyamide, black matte finish
Actuator Material	Polyamide
Terminals/Fixed Contacts	Copper alloy with gold or silver plate
Terminal Seal	Epoxy

#### ENVIRONMENTAL SPECIFICATIONS:

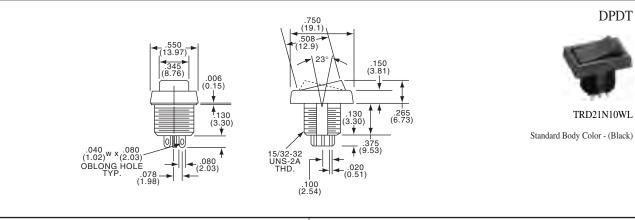
NOTE: Part numbering matrix page F3

Operating Temperature4°F to +176°F (-20°C to +8	0°C)
Storage Temperature49°F to +199°F (-45°C to +	93°C)

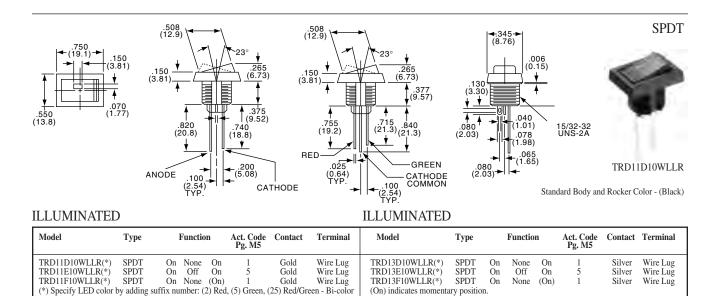
## TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	0.4 VA Max. @ 20 VDC or peak AC
c	3 A @ 125 VAC or 28 VDC (2 pos.) 2A
Initial Contact Resistance	20 Milliohms max.
Contact Timing	Break-before-make
Insulation Resistance	1,000 Megohms min.
Dielectric Strength	500 Volts RMS @ sea level
Actuator Travel	23°
Life Expectancy	2 Pos Up to 100,000 actuations
	3 Pos Up to 50,000 actuations

NOTE: When hand soldering, solder with switch in closed position. Solder temperature  $550-600^{\circ}$ F less than 5 seconds.



Model	Туре	Function	Act. Code Pg. M5	Contact	Terminal	Model Ty	уре	Function	Act. Code Pg. M5	Contact	Terminal
TRD11D1(*)WL TRD11E1(*)WL TRD11F1(*)WL TRD21N1(*)WL TRD21P1(*)WL (*) Specify rocker of	SPDT SPDT SPDT DPDT DPDT color by add	On None On On Off On On None (On) On None On On Off On ing suffix number: (0	1 5 1 2 6 ) Black (2) Re	Gold Gold Gold Gold Gold d,	Wire Lug Wire Lug Wire Lug Wire Lug Wire Lug	TRD13D1(*)WL TRD13E1(*)WL TRD13F1(*)WL TRD23N1(*)WL TRD23P1(*)WL	SPDT SPDT SPDT DPDT DPDT (On) indi	On None On On Off On On None (On) On None On On Off On cates momentary posit	1 5 1 2 6 ion.	Silver Silver Silver Silver Silver	Wire Lug Wire Lug Wire Lug Wire Lug Wire Lug



F6

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Catalog 1308390 Issued 9-04

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Dimensions are in inches

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F



## Rocker/Paddle Switches, A Series, Part Number Matrix

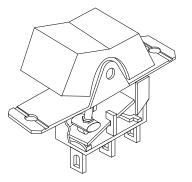
### MATERIAL SPECIFICATIONS:

Contacts/Terminals	Gold/gold flash
	Silver/tin lead
Case Material	Thermoset 94V-0
Actuator Material	Polyamide
Terminal Seal	Epoxy

#### ENVIRONMENTAL SPECIFICATIONS:

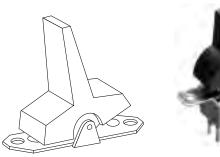
Operating Temperature4°F	to +185°F (-20°C to +85°C)
Storage Temperature49°I	$F \text{ to } +212^{\circ}F (-45^{\circ}C \text{ to } +100^{\circ}C)$

#### DESIGN

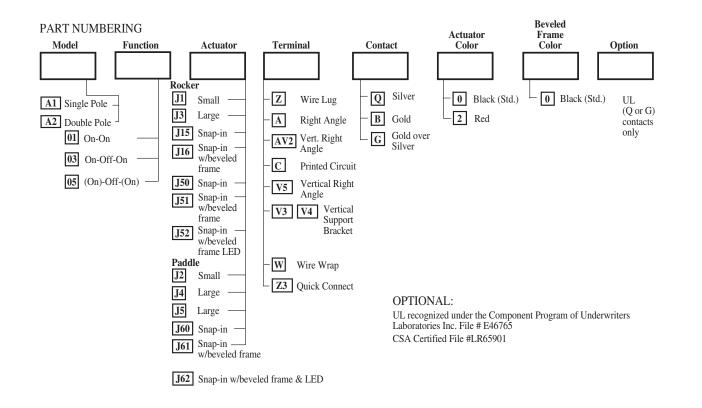


## TYPICAL PERFORMANCE CHARACTERISTICS:

Gold: 0.4 VA @ 20 AC/DC
Silver: 2 A @ 250 VAC: 5 A @ 125 VAC
Silver: 2 A @ 30 VDC
30 Milliohms max.
Break-before-make
1,000 Megohms @ 500 VDC
1,000 Volts RMS @ sea level
25°
Up to 30,000 Cycles







F

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

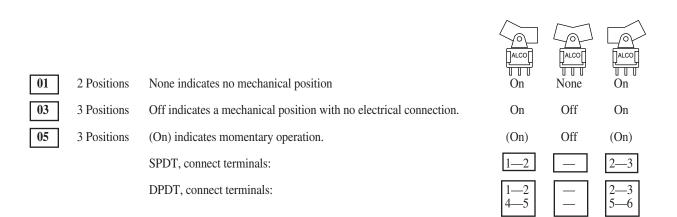
Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425



## **Rocker/Paddle Switches, A Series, Options**

#### FUNCTIONS

The following functions available in SP or DP.



# ACTUATORS

J1 Rockers Small

F

Gemini Series Rocker/Paddle Switches

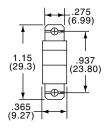


Mounting Type Standard with C or Z Terminal Type





Mounting Type Standard with C or Z Terminal Type



— .505 (12.83)

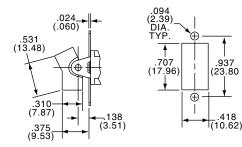
> 1.375 (34.93)

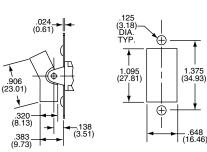
-

-

1.625 (41.28)

.595 \_ (15.11)





F8

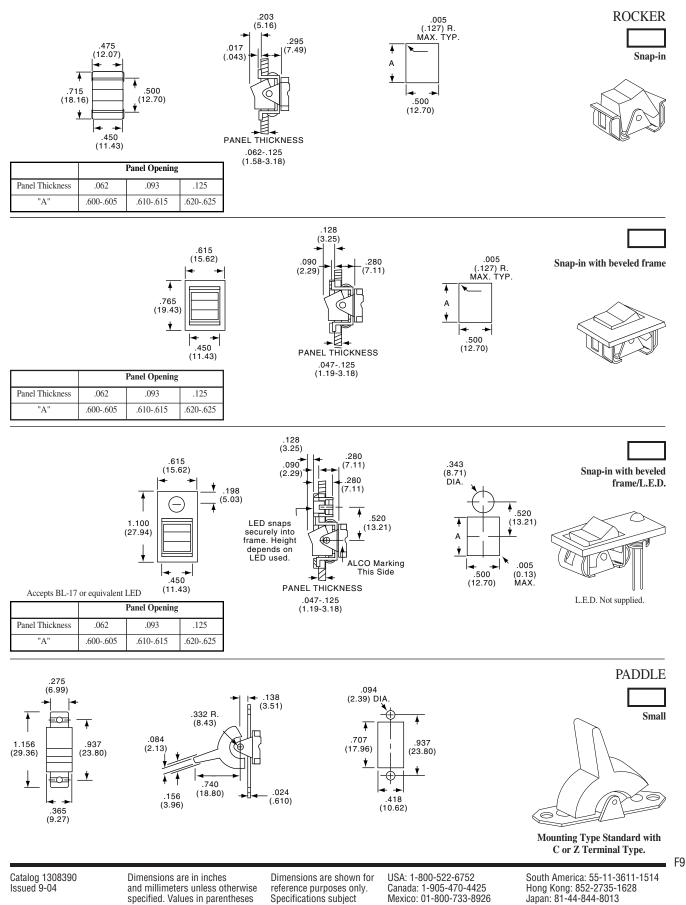
Catalog 1308390 Issued 9-04

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Electronics

# **Rocker/Paddle Switches, A Series, Options**



C. America: 52-55-5-729-0425

UK: 44-141-810-8967

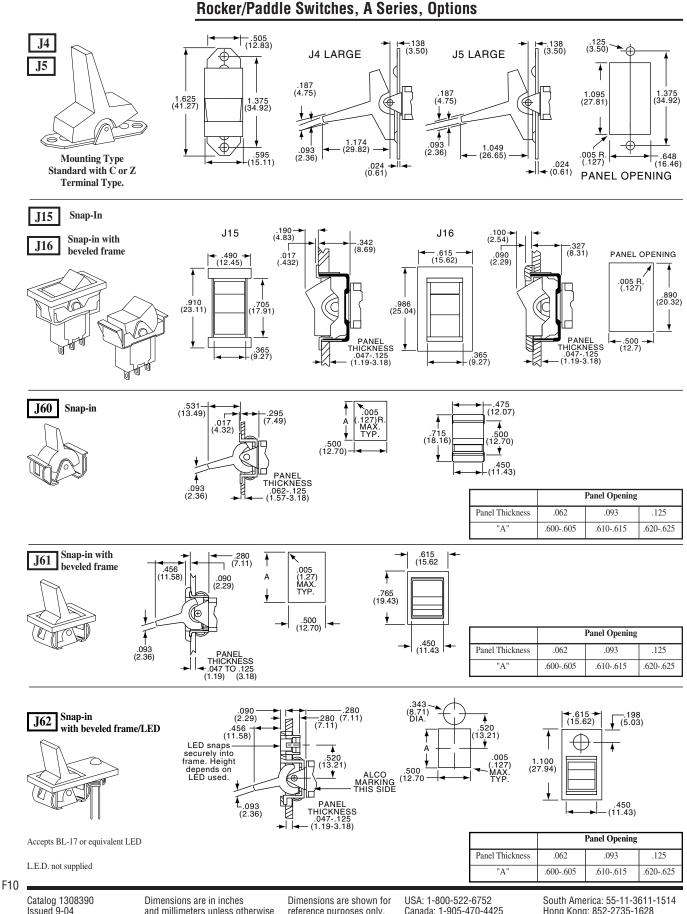
**Gemini Series Rocker/Paddle Switches** 

F

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or brackets are metric equivalents. to change.





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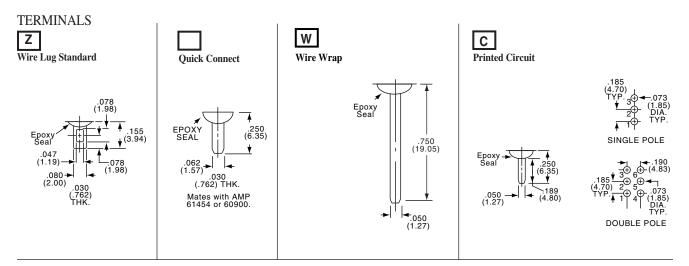
www.tycoelectronics.com

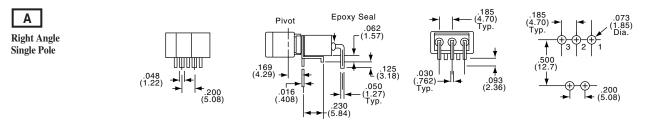
and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

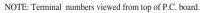
Dimensions are shown to reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425



## **Rocker/Paddle Switches, A Series, Termination Options**

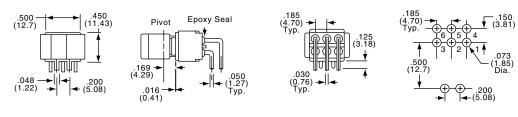






A Right Angle





NOTE: Terminal numbers viewed from top of P.C. board.

Catalog 1308390 Issued 9-04

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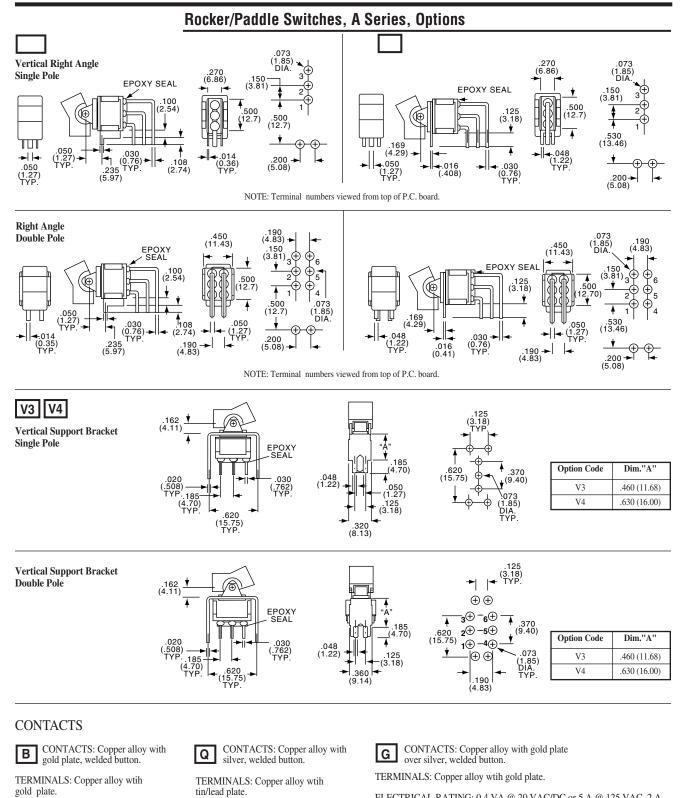
Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967 F

F11



Gemini Series Rocker/Paddle Switches



ELECTRICAL RATING: 0.4 VA @ 20 VAC/DC or 5 A @ 125 VAC, 2 A @ 250 VAC, 2 A @ 30 VDC.

Note: This contact option can be used for low-level or power switching. If level is above 0.4 VA @ 20 VAC/DC, the switch is rendered usable only for power switching due to arc-removal of gold plate.

UL/CSA RATING: 5A @ 125 VAC, 3 @ 250 VAC (Specify "UL" option code)

#### F12

Catalog 1308390 Issued 9-04

VAC/DC.

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ELECTRICAL RATING: 0.4VA @ 20

F

Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

ELECTRICAL RATING: 5 A @ 125 VAC, 2 A @ 250 VAC, 2 A @ 30 VDC. UL/CSA RATING: 5A @ 125 VAC, 3 @ 250 VAC (Specify "UL" option code)

> Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425



.073 (1.85) DIA. TYP. 7

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⊕-⊕

\_ .200 (5.08)

N

On

(On)

On

(On)

None

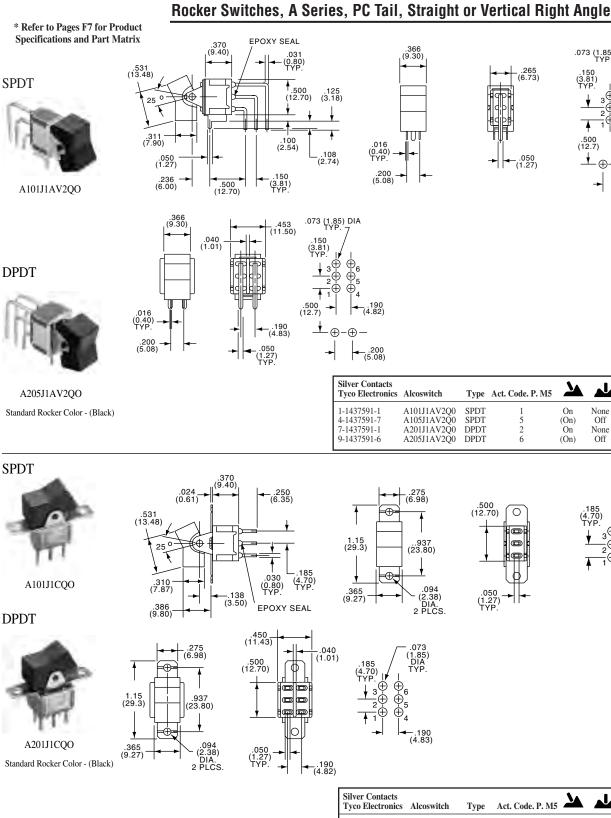
Off

None

Off

150 8.81 YP

.500



Silver Contacts Tyco Electronics	Alcoswitch	Туре	Act. Code. P. M5			▲
1-1437591-3	A101J1CQ0	SPDT	1	On	None	On
4-1437591-8	A105J1CO0	SPDT	5	(On)	Off	(On)
7-1437591-2	A201J1CO0	DPDT	2	On	None	On
_	A203J1CO0	DPDT	6	On	Off	On
—	A205J1CQ0	DPDT	6	(On)	Off	(On)

Catalog 1308390 Issued 9-04

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and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are in inches

Dimensions are shown for reference purposes only. Specifications subject

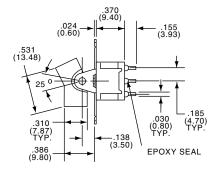
USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

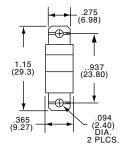
F13

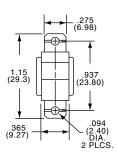
# Rocker Switches, A Series, Wire Lug or Right Angle

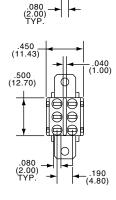
# SEE PAGE F7 FOR PRODUCT SPECIFICATIONS AND PART MATRIX

.270 (6.85)









.500 (12.70)

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 $\Theta$ 

DPDT

SPDT

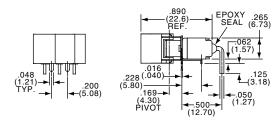


A101J1ZQO

A201J1ZQO

Standard Rocker Color - (Black)

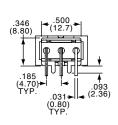
Silver Contacts Tyco Electroni		Туре А	ct. Code. P. M5			∡	Silver Contacts Tyco Electronics	Alcoswitch	Type Act. C	Code. P. M5			▲
1-1437591-7 3-1437591-8 5-1437591-0	A101J1ZQ0 A103J1ZQ0 A105J1ZQ0	SPDT	1 5 5	On On (On)	None Off Off	On On (On)	7-1437591-4 9-1437591-1 9-1437591-7	A201J1ZQ0 A203J1ZQ0 A205J1ZQ0	DPDT	2 6 6	On On (On)	None Off Off	On On (On)

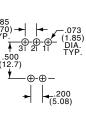


.016.

.350 · (8.89)

.350 (8.89)





.073 (1.85) DIA

18

(4.70

500 .150 (3.80)

(12.7)

⊕-⊕

-.200 (5.08)

.125 (3.18)

.048



A101J1AQO

DPDT



A201J1AQO

Standard Rocker Color - (Black)

.060 (1.52)

.531 (13.48)

25 C F

.310\_(7.87)

.169 (4.29)

Silver Contacts Tyco Electronics	Alcoswitch	Туре	Act. Code. P. M5	4		~	Silver Contacts Tyco Electronics	Alcoswitch	Type Act.	Code. P. M5	<b>\</b>		▲
1437591-8	A101J1AQ0	SPDT	1	On	None	On	6-1437591-9	A201J1AQ0	DPDT	2	On	None	On
4-1437591-6	A105J1AQ0	SPDT	5	(On)	Off	(On)	8-1437591-7	A203J1AQ0 A205J1AQ0		6 6	On (On)	Off Off	On (On)

.200 (5.08)

.185 - (4.70)

F14

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.030

.150 (3.81)

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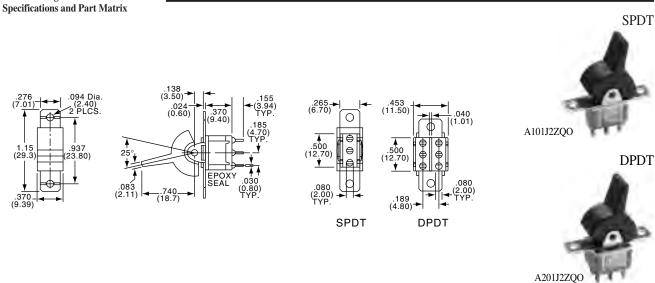
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Gemini Series Rocker/Paddle Switches

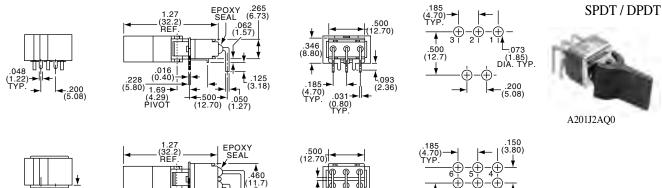
\* Refer to Pages F7 for Product

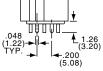
# Paddle Switches, A Series, Wire Lug or Right Angle

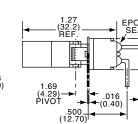


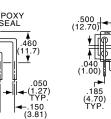
Standard Paddle Color - (Black)

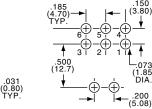
Silver Contacts Tyco Electronics	Alcoswitch	Type Act.	Code P. M5	1	T	7	Silver Contacts Tyco Electronics	Alcoswitch	Туре	Act. Code P. M5	7 T 7
1-1437591-9 4-1437591-0 5-1437591-3	A101J2ZQ0 A103J2ZQ0 A105J2ZQ0	SPDT	1 5 5	On	Off	On	7-1437591-6  9-1437591-9	A201J2ZQ0 A203J2ZQ0 A205J2ZQ0	DPDT DPDT DPDT	2 6 6	On None On On Off On (On) Off (On)











Standard Paddle Color - (Black)

Silver Contacts Tyco Electronics	Alcoswitch	TypeAct	. Code P. N	15	⊥ ∠	Silver Contacts Tyco Electronics	Alcoswitch	Туре	Act. Code P. M5	7 T T
 5-1437591-1	A101J2AQ0 A103J2AQ0 A105J2AQ0	SPDT	1 5 5	On	None On Off On Off (On)	 	A201J2AQ0 A203J2AQ0 A205J2AQ0	DPDT	2 6 6	On None On On Off On (On) Off (On)

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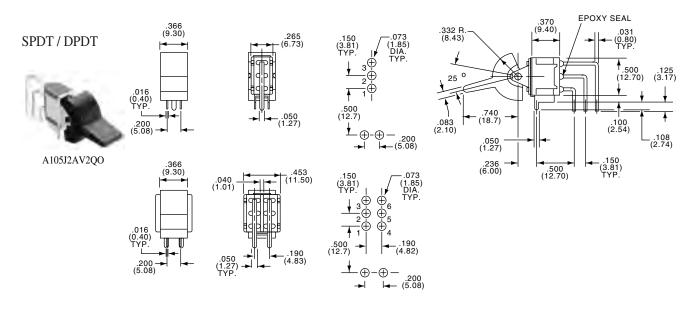
Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

F

# Paddle Switches, A Series, PC Tail, Straight or Vertical Right Angle

## SEE PAGE F7 FOR PRODUCT SPECIFICATIONS AND PART MATRIX



Standard Paddle Color - (Black)													
Silver Contacts Tyco Electronics	Alcoswitch	Туре	Act. Code P. M5	7	T	7	Silver Contacts Tyco Electronics	Alcoswitch	Туре	Act. Code P. M5	7	T	2
1-1437591-8 5-1437591-2	A101J2AV2Q0 A105J2AV2Q0				None Off		—	A201J2AV2Q0	DPDT	2	On	Non	e On

.370 (9.40)

SPDT

**Gemini Series Rocker/Paddle Switches** 

F



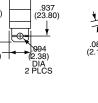
A105J2CQO

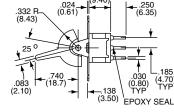
DPDT

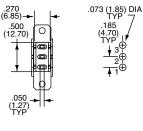


1.15 (29.3) ŧ .365 (9.27) .094 (2.38)

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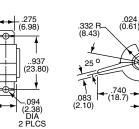


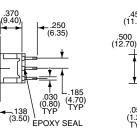




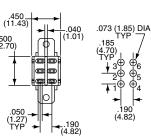
1.15 (29.3)

.365 (9.27





(4.70 TYP



185

Silver Contacts Tyco Electronics	Alcoswitch	Туре Д	Act. Code P. M5	7	T	7	Silver Contacts Tyco Electronics	Alcoswitch	Туре	Act. Code P. M5	7	T	7
_	A103J2CQ0 A105J2CQ0	SPDT SPDT	5 5				7-1437591-5 9-1437591-8	A201J2CQ0 A205J2CQ0	DPDT DPDT	2 6		None Off	

F16

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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

## Rocker/Paddle Switches, AE Series, Process Sealed, Part Number Matrix

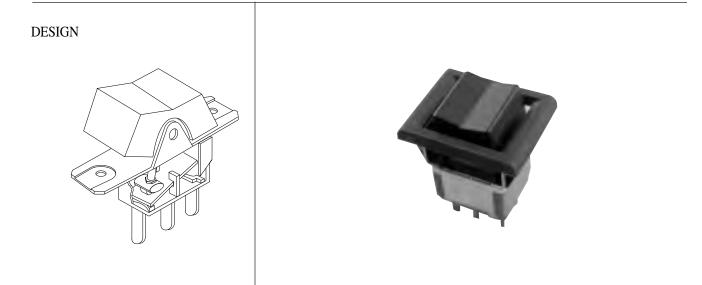
## MATERIAL SPECIFICATIONS:

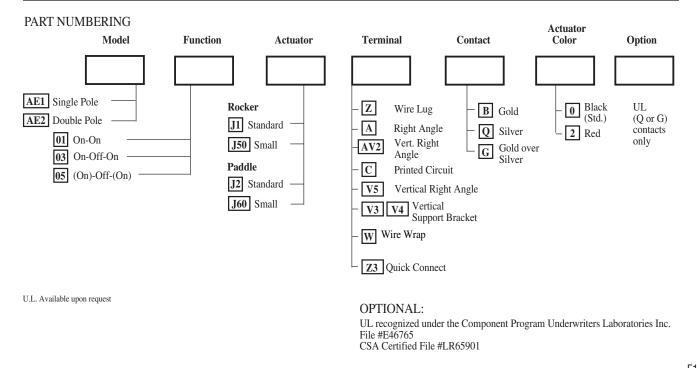
Terminal Seal	Epoxy (standard)
	Seals will withstand wave soldering and
C C	subsequent cleaning operations.
Contact/Terminals	Gold/gold flash over tin/lead
	Silver/tin lead
Case Material	Thermoplastic
Actuator Material	Polyamide

## ENVIRONMENTAL SPECIFICATIONS:

## TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	Silver: 2 A @ 250 VAC, 5 A @ 125 VAC
C C	Silver: 2 A @ 30 VDC
	Gold: 0.4 VA @ 20 VDC max.
Contact Resistance	30 Milliohms max. initial
Insulation Resistance	1,000 Megohms min. @ 500 VDC.
Dielectric Strength	1,000 Volts RMS @ sea level initial
Static Withstanding	15KV Per IEC 801-2.
Electrical Life	Up to 30,000 Cycles
Actuator Travel	25°
Contact Timing	Break before make





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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013

UK: 44-141-810-8967

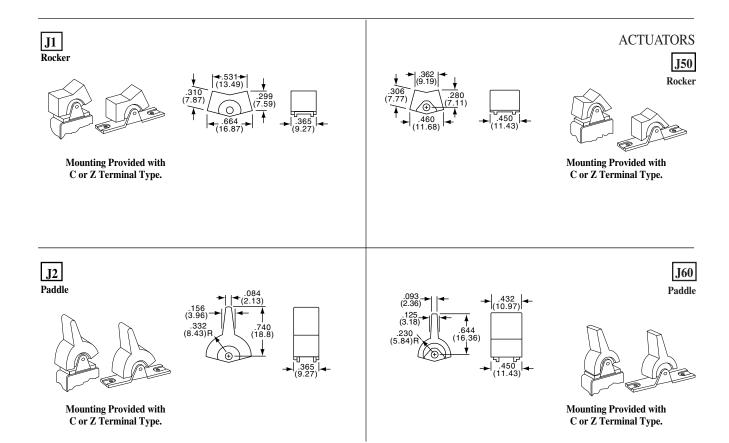


# Rocker/Paddle Switches, AE Series, Process Sealed, Options

## FUNCTIONS

The following functions available in SP or DP.

01	2 Positions	None indicates no mechanical position		ALCO U U U None	
03	3 Positions	Off indicates a mechanical position with no electrical connection.	On	Off	On
05	3 Positions	(On) indicates momentary operation	(On)	Off	(On)
		SPDT, connect terminals:	1-2	—	2—3
		DPDT, connect terminals:	$1-2 \\ 4-5$	—	2—3 5—6



F18

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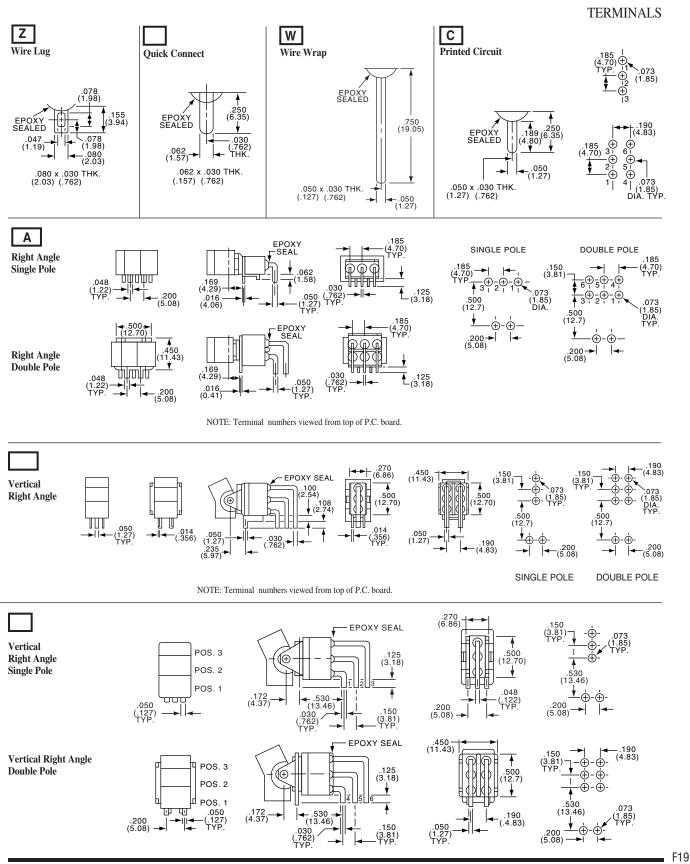
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and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are in inches

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# Rocker/Paddle Switches, AE Series, Process Sealed, Termination Options



Catalog 1308390 Issued 9-04

specified. Values in parentheses

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Dimensions are in inches

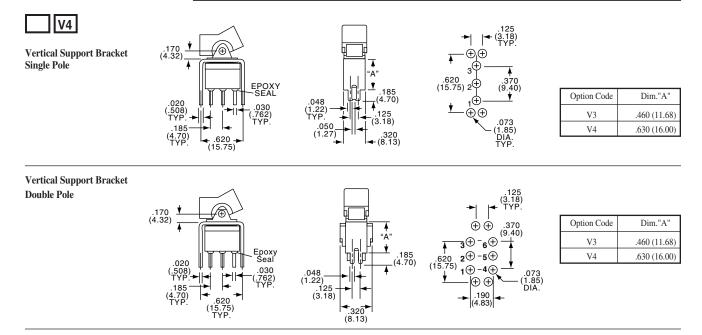
and millimeters unless otherwise

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 F



## Rocker/Paddle Switches, AE Series, Process Sealed, Options



## **CONTACTS**

CONTACTS: Copper alloy with В gold plate, welded button.

TERMINALS: Copper alloy with gold plate.

ELECTRICAL RATING: 0.4VA @ 20 VAC/DC.

CONTACTS: Copper alloy with Q silver, welded button. TERMINALS: Copper alloy with

tin/lead plate.

ELECTRICAL RATING: 5 amps @ 125 VAC, 2 amps @ 250 VAC, 2 amps @ 30 VDC. UL/CSA RATING: 5A @ 125 VAC, 3 @ 250 VAC (Specify "UL" option code)

CONTACTS: Copper alloy with gold plate over silver, G welded button.

TERMINALS: Copper alloy with gold plate.

ELECTRICAL RATING: 0.4 VA @ 20 VAC/DC or 5 amps @ 125 VAC, 2 amps @ 250 VAC, 2 amps @ 30 VDC.

Note: This contact option can be used for low-level or power switching. If level is above 0.4 VA @ 20 VAC/DC, the switch is rendered usable only for power switching due to arc-removal of gold plate.

UL/CSA RATING: 5A @ 125 VAC, 3 @ 250 VAC (Specify "UL" option code)

F

F20

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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425



# Series PRA, PRB and PRD

#### **Product Facts**

- n Full line of single or doublepole power rocker switches for three different industry compatible panel cut-out sizes
- n Easy to install snap-in mounting
- n Dust resistant
- n Dual color rocker option
- n Full-illuminated rocker option
- n LED or neon window illuminated option
- n Wide range of marking options and functions available
- ${\rm n}$  Solder lugs or .187 & .250 **FASTON** Tab terminals
- n Cost competitive

#### **Electrical Characteristics**

Current: 16A@125 VAC 1/3 HP 10A@250 VAC 1/2 HP **PRA Series Double Pole:** 7A@125 VAC 6A@250 VAC

**PRA Series Single Pole:** 6 (3)A 250V ~ 10Å 125V ~ µ 25T85

Inrush Current: 50A/3msec (capacitive load)

Contact Resistance (initial): <50m Ohms

Dielectric Strength (initial): >1000 VAC, 1 min.

Insulation Resistance (initial): >100Mohms min.

**Electrical Life Endurance:** >6000 operations Voltage drop <100 mV

#### **Mechanical Characteristics**

Operating Life Endurance: up to >100,000 operations

#### Actuating Force:

Series PRA 150g min., 650g max. Series PRB 300g min., 700g max. Series PRD 850g min., 1250g max.



## **Materials and Finish**

Housing: Nylon 6/6 UL 94V-2 Rocker: Nylon 6/6 UL 94V-2 or Polycarbonate UL 94V-2 Contact: Silver-tin Oxide Terminals, Active Contactor: Silver plated copper alloy Plunger: Nickel plated copper alloy

**Standards & Specs** 

Spring: Steel Wire

Dimensions are in inches

and millimeters unless otherwise

specified. Values in parentheses

or brackets are metric equivalents. to change.

UL Approved - File No. E46765 ENEC/VDE approval - File No. 40006757 (PRA Single Pole Series only)

F

Dimensions are shown for USA: 1-800-522-6752 reference purposes only. Specifications subject

Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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Catalog 1308390

Issued 9-04

## .51 [13.0] x .76 [19.2] Panel Cutout



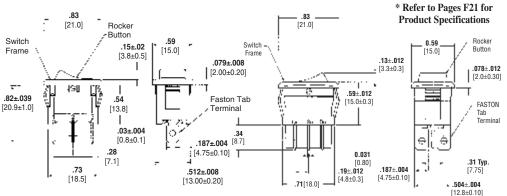
#### **Product Facts**

- n Easy to install snap-in mountina
- n Dust resistant
- n Dual color rocker option
- n Full-illuminated rocker option
- n LED or neon window illuminated option
- n Wide range of marking options and functions available
- n Solder lugs or .187 FASTON Tab terminals
- n Cost competitive

F

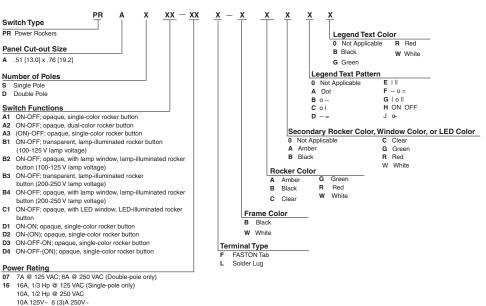
**Power Rocker Switches Series PRA** 

Single-Pole, Lamp Illuminated or Non-Illuminated Double-Pole, Non-Illuminated



Non-Illuminated Version Shown

#### Alcoswitch Part Number



#### Part No.

μ 25T85

D

A1

A2

A3

B1

B2

В3

В4

C1

D1

D2 D3

D4

07

16

Tyco Electronics	Alcoswitch		Tyco Electronics	Alcoswitch	Tyco Electronics	;
1571076-9	PRASA1-16F-BB000		1571079-7	PRASD3-16F-BB000	1571084-5	PF
1-1571076-0	PRASA1-16F-BB0BW	-	1571079-8	PRASD3-16F-BB0FW	1571086-1	PF
1-1571076-1	PRASA1-16F-BB0CW		1571079-9	PRASD3-16F-BB0GW	1571086-2	PF
1-1571076-2	PRASA1-16L-BB000		1-1571079-0	PRASD2-16F-BB000	1571086-3	PF
1-1571076-3	PRASA1-16L-BB0BW	-	1-1571079-1	PRASD2-16F-BB0DW	1571086-4	PF
1-1571076-4	PRASA1-16L-BB0CW		1-1571079-2	PRASD2-16F-BB0EW	1571086-5	PF
1-1571076-5	PRASA1-16F-BR000		1-1571079-3	PRASD4-16F-BB000	1571086-6	PF
1-1571076-6	PRASA1-16L-BR000	-	1-1571079-4	PRASD4-16F-BB0FW	1571086-7	PF
1-1571076-7	PRASA2-16F-BBRBR		1-1571079-5	PRASD4-16F-BB0GW	1571086-8	PF
2-1571076-0	PRASA1-16F-BB0HW		1571083-2	PRASC1-16F-BBR00	1571086-9	PF
2-1571076-1	PRASA3-16F-BB0JW	-	1571084-1	PRADA1-07F-BB000	1-1571086-0	PF
1571078-2	PRASB1-16F-BR000		1571084-2	PRADA1-07F-BB0BW	1-1571086-1	PF
1571078-4	PRASB2-16F-BBR00		1571084-3	PRADA1-07F-BB0CW	1-1571086-2	PF
1571079-4	PRASD1-16F-BB000	-	1571084-4	PRADA1-07F-BR000		
1571079-5	PRASD1-16F-BB0DW	-				
1571079-6	PRASD1-16F-BB0EW	-			<b>PVC</b> Waterpr	oof

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Catalog 1308390 Issued 9-04

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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 RADA1-07F-BR0BW RADD1-07F-BB000 RADD1-07F-BB0DW RADD1-07F-BB0EW RADD3-07F-BB000 RADD3-07F-BB0FW RADD3-07F-BB0GW RADD2-07F-BB000 RADD2-07F-BB0DW RADD2-07F-BB0EW RADD4-07F-BB000 RADD4-07F-BB0FW RADD4-07F-BB0GW

Alcoswitch

#### f Cover: 1571786-1

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

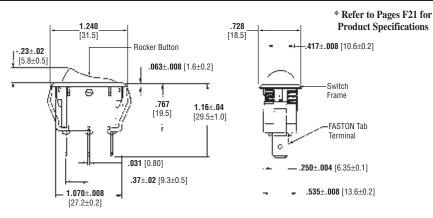
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# .54 [13.8] x 1.09 [27.6] Panel Cutout

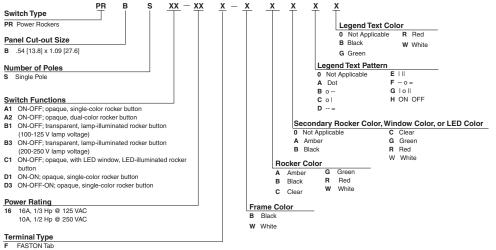


**Product Facts** 

- n Easy to install snap-in mounting
- n Dual color rocker option
- n Full-illuminated rocker option
- n Lamp window illuminated option
- n Wide range of marking options and functions available
- n Solder lugs or .250 FASTON Tab terminals
- n Cost competitive



## **Alcoswitch Part Number**



L Solder Lug

#### Part No.

Tyco Electronics	Alcoswitch		Tyco Electronics	Alcoswitch
1571087-1	PRBSC1-16F-BBR00		1571092-1	PRBSB1-16F-BR000
1571087-2	PRBSC1-16L-BBR00		1571092-2	PRBSB1-16F-BR0BW
1571091-1	PRBSA1-16F-BB000		1571092-3	PRBSB1-16F-BA000
1571091-2	PRBSA1-16F-BB0BW		1571092-4	PRBSB1-16F-BC000
1571091-3	PRBSA1-16F-BB0CW		1571094-1	PRBSD1-16F-BB000
1571091-4	PRBSA1-16L-BB000		1571094-2	PRBSD1-16F-BB0DW
1571091-5	PRBSA1-16L-BB0BW		1571094-3	PRBSD1-16F-BB0EW
1571091-6	PRBSA1-16L-BB0CW		1571094-4	PRBSD3-16F-BB000
1571091-7	PRBSA1-16F-BR000		1571094-5	PRBSD3-16F-BB0FW
1571091-8	PRBSA1-16L-BR000		1571094-6	PRBSD3-16F-BB0GW
1571091-9	PRBSA1-16F-BB0HW		1571094-7	PRBSD3-16F-BW000
1-1571091-0	PRBSA1-16F-BR0HW			
1-1571091-1	PRBSA1-16F-BW000			
1-1571091-2	PRBSA1-16F-BW0HB			
-				

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UK: 44-141-810-8967

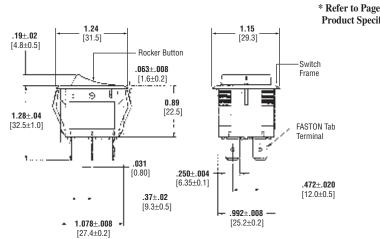
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## 1.00 [25.4] x 1.09 [27.6] Panel Cutout

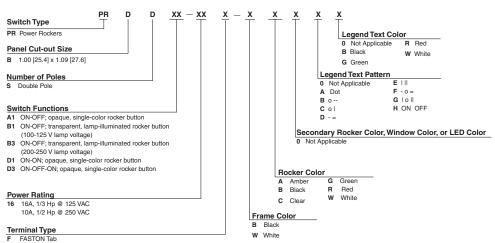


#### **Product Facts**

- n Easy to install snap-in mounting
- n Full illuminated rocker option
- n Wide range of marking options and functions available
- n FASTON .250 Tab terminals
- n Cost competitive



### **Alcoswitch Part Number**



#### Part No.

Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch
1571103-1	PRDDA1-16F-BB000	1571112-1	PRDDB1-16F-BR000
1571103-2	PRDDA1-16F-BB0BW	1571112-2	PRDDB1-16F-BA000
1571103-3	PRDDA1-16F-BB0CW	1571113-1	PRDDD1-16F-BB000
1571103-4	PRDDA1-16F-BR000	1571113-2	PRDDD1-16F-BB0DW
1571103-5	PRDDA1-16F-BB0HW	1571113-3	PRDDD1-16F-BB0EW
1571103-6	PRDDA1-16F-BR0HW	1571113-4	PRDDD3-16F-BB000
1571113-7	PRDDD3-16F-BR000	1571113-5	PRDDD3-16F-BB0FW
		1571113-6	PRDDD3-16F-BB0GW

F24

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www.tycoelectronics.com and millimeters specified. Value or brackets are

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F

\* Refer to Pages F21 for Product Specifications

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**Rotary Switches** 



MRC Series - Page G3



MRJE Series - Page G4



6000 Series - Page G5



MRJ Series - Page G4



MRJB Series - Page G4



3100 Series - page G9



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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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# **Rotary Switches Part Number Index**

MRC110G3
MRC110SG3
MRC25G3
MRC25SG3
MRC33G3
MRC33SG3
MRC42G3
MRC42SG3
MRJ112G4
MRJ26G4
MRJ34G4
MRJ43G4
MRJB112G4
MRJB26G4
MRJB34G4
MRJB43G4
MRJE112G4
MRJE26G4
MRJE34G4
MRJE43G4
435005G6
435123G6
435128G6
435167G7
435174G6
435697G7
435984G10
435986G10
435987G10
436022G10
436024G10
436028G10
436037G10
436287G11

G

G2

Catalog 1308390 Issued 9-04 www.tycoelectronics.com

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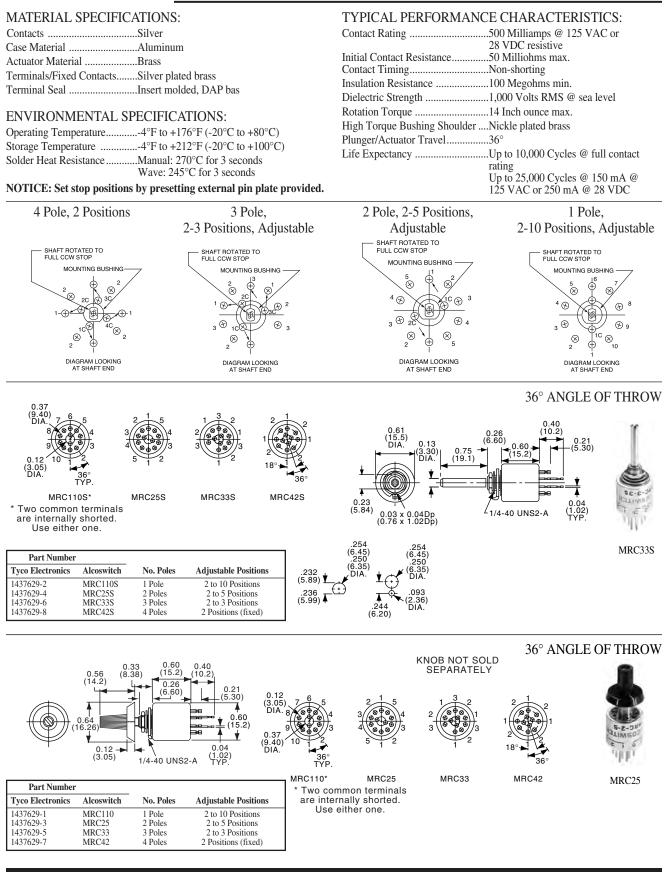
USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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## Rotary Switches, 500m Amp, Adjustable Stop, 36° Throw



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and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

Dimensions are in inches

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**MRJ Series** 

(16X)

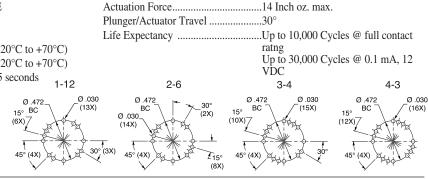
## Rotary Switches, .4VA, PC Mount, 30° Throw

#### MATERIAL SPECIFICATIONS:

Contacts	Gold plate over nickel plate
Case Material	Zinc die cast
Actuator Material	Brass
Terminals/Fixed Contacts	Gold plated
Terminal Seal	Molded-in epoxy base
Process Seal	MRJB and MRJE

### ENVIRONMENTAL SPECIFICATIONS:

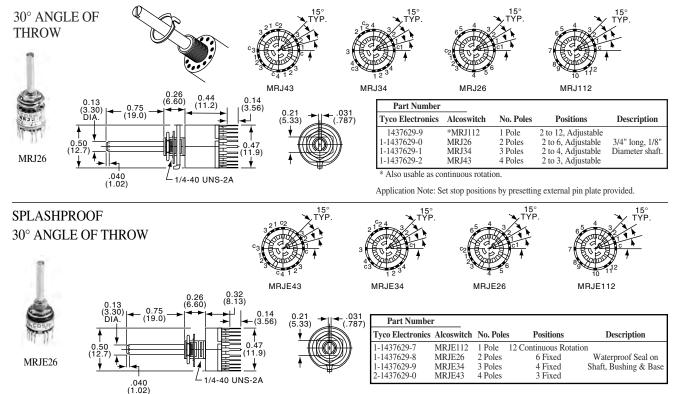
Operating Temperature4°F to +158°F (-20°C to +7	0°C)
Storage Temperature4°F to +158°F (-20°C to +7	0°C)
Solder Heat Resistance	1-12

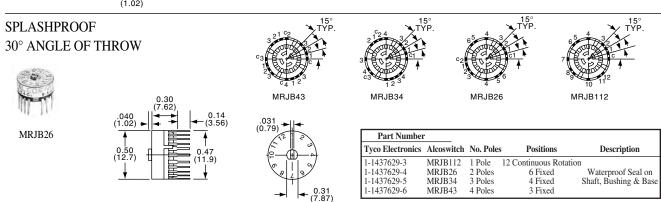


TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Timing .....Non-shorting Insulation Resistance ......10,000 Megohms min. Dielectric Strength ......1,000 Volts RMS @ sea level

Contact Rating ......0.4VA max. @ 20 VDC or peak AC





G4

Catalog 1308390 Issued 9-04

and millimeters unless otherwise specified. Values in parentheses www.tycoelectronics.com or brackets are metric equivalents.

Dimensions are in inches

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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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Alcoswitch 6000 Series Rotary Switches are used in programming electrical and mechanical circuits in machine tools, test equipment, and input data terminals. These manually operated switches are specifically designed to be mounted on a pc board and offer output capabilities which include: 8-position binary-coded octal (BC), 10-position binary-coded decimal (BCD), 16-position hexadecimal plus 10- and 16-position single pole decimal. All switches feature a small diameter and very low profile.

In addition to varied output capabilities, these versatile Alcoswitch switches can also be supplied in three different styles, allowing you to select the operation method best suited to your specific application. One version incorporates a slot which accepts a screwdriver, coin or other similar device. This particular style permits operation of the switch without sacrificing overall height. Its height of .220 [5.59] above the pc board is no greater than the usual board-mounted discrete components. The other two versions have either a bartype knob or thumbwheel for their operation. All three styles can be rotated bidirectionally.

Rugged construction, positive detent action contacts plus large, readable characters are additional features of the Alcoswitch 6000 Series PC Board Rotary Switches. All these features, coupled with a fully enclosed design for better environmental protection, provide excellent electrical and mechanical performance.

## **Rotary Switches, 6000 Series**

#### PERFORMANCE CHARACTERISTICS

Current/Voltage Rating-Signal application only. Dielectric Breakdown Voltage-500 VDC min. Insulation Resistance— 1 x 108 ohms Initial Contact Resistance— 25 milliohms (at 50 millivolts, 100 milliamperes) closed circuit Circuit Capacitance— 5 picofarads (at 100 KHz) Durability-1000 cycles **Operating Torque**-2 - 12 inch-ounces initial and after durability **Temperature Rating-Operating** - -18°C to +88°C **Storage** - -45°C to +88°C Humidity-Withstands an environment of +40°C and 95% RH for 96 hours

#### MATERIALS

Contacts— Phosphor bronze, gold over nickel plated Solder Tabs and Pins— Coded Switches — Beryllium copper, tin plated Single Pole Switches — Brass, tin plated Structural Parts — Thermoplastic

Technical Documents **Product Specification** 108-7514 **Instruction Sheet** 408-07523 **Application Specification** 114-7005

#### **Product Facts**

- n Compact design small diameter, low profile switches are ideal for pc board mounting
- <sup>n</sup> Wide choice of outputs: 8-position binary-coded octal, 10-position binarycoded decimal, 16-position hexadecimal and 10- and 16-position single pole
- versatile application styles include slotted, bar-type and thumbwheel versions for hand rotation
- Positive switching contacts have positive detent action
- All positions are easily identified by large readable characters or dots
- n Optimum reliability fully enclosed design protects contacts against contamination

Catalog 1308390 Issued 9-04

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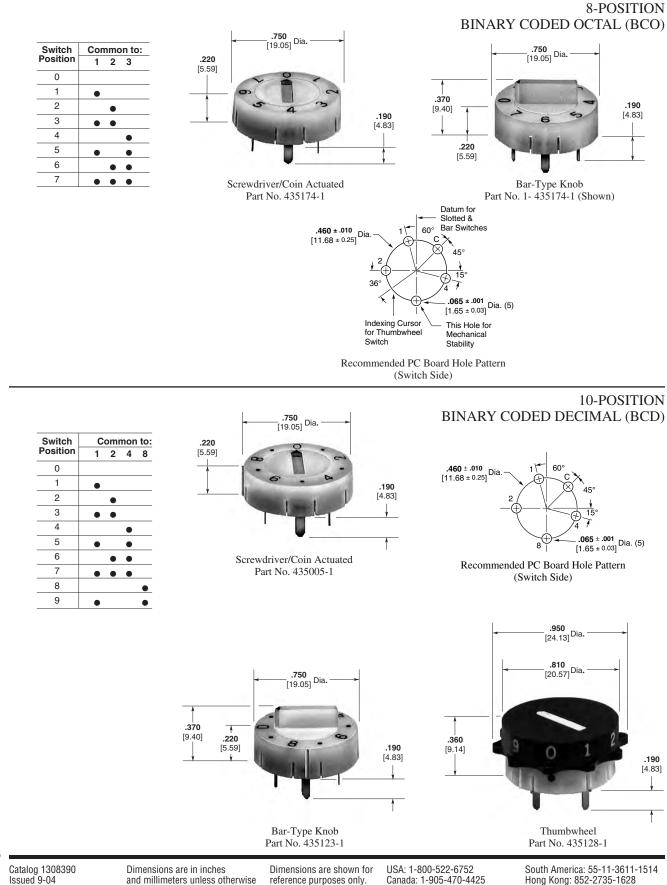
Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

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6000 Series

# Alcoswitch

## Rotary Switches, PC Mount, 8 or 10 Positions



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reference purposes only. Specifications subject

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Electronics

6000 Series

.360

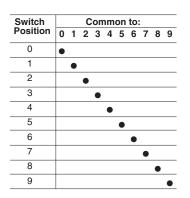
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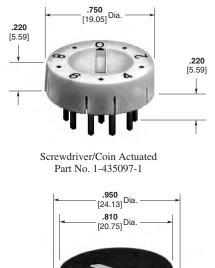
# Alcoswitch

**.190** [4.83]

# Rotary Switches, PC Mount, 10 or 16 Position







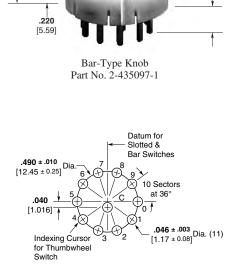
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Thumbwheel

Part No. 435097-1 (Shown)

Part No. 435097-2 (With Numbers 1 - 10)



.750 [19.05] Dia.

.370

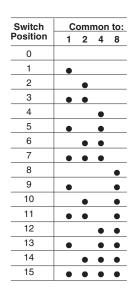
[9.40]

.190

[4.83]

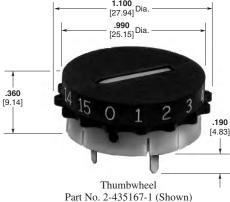
Recommended PC Board Hole Pattern (Switch Side)

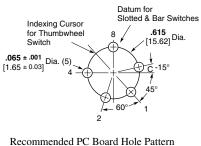






.920





(Switch Side)

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.360

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G7

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Alcoswitch Rotary Switches

programming various types

of electronic equipment. They

are specifically designed for

logic level circuitry, but are capable of controlling

electrical circuits that operate

(nonswitching) and up to 125

Positive detent action, with a

quick make/break operation,

springs as well as the detents

which form an integral part of

at current ratings of 2

milliamperes, 115 VAC

is provided by durable

stainless steel balls and

the housing. All contact

within the housing, thus

The contacts are made of

over-nickel plating.

phosphor bronze with gold-

Alcoswitch Rotary Switches

can be supplied with a variety

of options to afford complete application versatility and

adaptability. Output codes

include decimal, BCD and

BCD complement with 10,

12, 16, 24 and 32 switching

Interconnection of switches may be achieved by the use of AMPMODU receptacles. Stops supplied with the switches may be customer installed when it is desired to limit rotation to less than

positions.

360°.

surfaces are fully enclosed

greatly reducing operational

failures due to dirty contacts.

amperes, 115 VAC

(switching).

provide a highly reliable

means of manually

# 3100 Series Rotary Switches

#### PERFORMANCE CHARACTERISTICS

Circuit Current Rating-Nonswitching — 2.0 amperes at 115 VAC max. Switching (Resistive Load) — 125 milliamperes at 115 VAC max. Dielectric Withstanding Voltage-500 VDC Insulation Resistance-1 x 108 ohms min. at 100 VDC Initial Contact Resistance— 150 milliohms (input terminal to output terminal) Initial Operating Force-1/2 to 2 in.-lbs. Contact Life Expectancy— 25,000 rotations at rated load **Operating Temperature**- $-18^{\circ}$ C to  $+88^{\circ}$ C

#### MATERIALS

Housing— Polyester, black Detent Ball and Spring— Stainless steel Operating Shaft and Detent— Thermoplastic, 94V-0 rated, black Printed Circuit Board— Flame retardant, glass epoxy laminate, copper clad Contacts— Phosphor bronze, gold-over-nickel plated Hardware— Brass or corrosion resistant steel

#### TECHNICAL DOCUMENTS **Product Specification**— 108-7518 **Instruction Sheet**— 408-07936



#### **Product Facts**

- n Code flexibility switch output capabilities include decimal, BCD and BCD complement, and various other codes
- Positive switching positive detent action of stainless steel detent balls and springs assures error-free operation
- Enclosed contacts contact surfaces are better protected against dirt, dust and other environmental hazards

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and millimeters unless otherwise reference g specified. Values in parentheses Specificati om or brackets are metric equivalents. to change.

Dimensions are in inches

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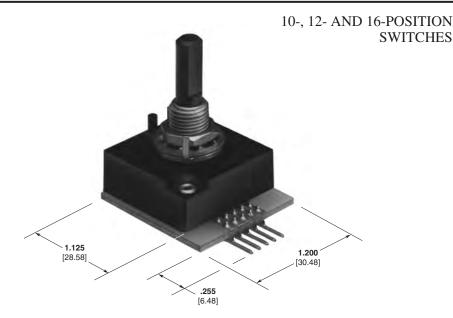
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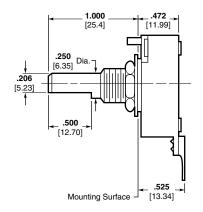
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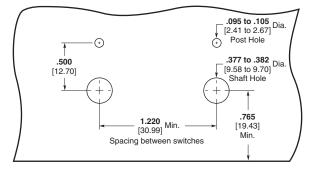
3100 Series

# Alcoswitch

# Rotary Switches, PC Mount, 10, 12 or 16 Position







Panel Cutout

G

Note: See Section K for knob selection.

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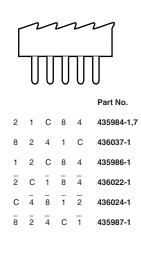
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Electronics

3100 Series

# Rotary Switches, PC Mount, 10, 12 or 16 Position

## CODING



10-Position  $36^\circ$  Throw BCD Part No. 435984-1 (Shown) Part No. 435984-7 (Right Angle) Switch Common to: Position 2 4 8 1 0 1 2 3

•

•

•

4

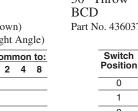
5

6

7

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12-Position 30° Throw Part No. 436037-1

0

1

2

3

4

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10

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Common to:

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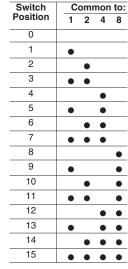
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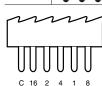
2 4 8

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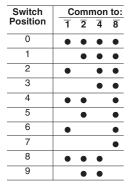
24-Position

15° Throw BCD Part No. 436028-1

Switch	Common to:					
Position	1	2	4	8	16	
0						
1	•					
2		•				
3	٠	٠				
4			•			
5	٠		•			
6		٠	•			
7	•	•	•			
8				•		
9	•			•		
10		٠		٠		
11	٠	•		•		
12			•	•		
13	•		•	•		
14		•	•	•		
15	٠	٠	٠	٠		
16					•	
17	٠				•	
18		٠			•	
19	•	•			•	
20			•		•	
21	٠		•		•	
22		•	•		•	
23	٠	•	•		•	

G **3100 Series** 

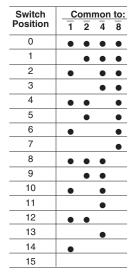
10-Position 36° Throw BCD Complement Part No. 436022-1



12-Position 30° Throw BCD Complement Part No. 436024-1

Switch	Common t			
Position	1	2	4	8
0	٠	•	•	•
1		•	•	•
2	٠		٠	•
3			•	•
4	٠	•		•
5		٠		•
6	٠			•
7				•
8	•	•	•	
9		٠	٠	
10	•		•	
11			•	

16-Position 221/2° Throw HEX Complement Part No. 435987-1



Note: See Section K for knob selection.

G10

Catalog 1308390 Issued 9-04

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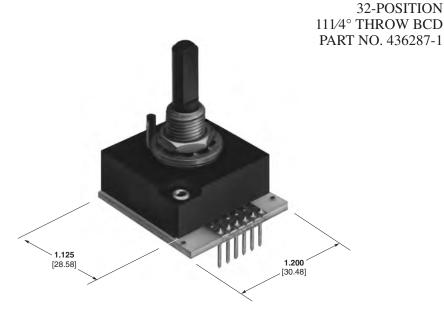
Dimensions are shown for reference purposes only. Specifications subject

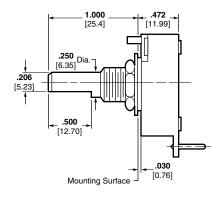
USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

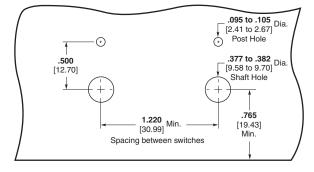
3100 Series

# **Rotary Switches, PC Mount, 32 Position**

Switch	Common to:					
Position	1	2	4	8	16	
0						
1	•					
2		•				
3	٠	•				
4			٠			
5	٠		•			
6		•	•			
7	•	٠	•			
8				•		
9	٠			•		
10		٠		•		
11	•	•		•		
12			•	•		
13	٠		•	•		
14		•	•	•		
15	٠	•	•	•		
16					•	
17	٠				•	
18		•			•	
19	٠	•			•	
20			•		•	
21	٠		•		•	
22		•	•		•	
23	•	•	•		•	
24		-	-	•	•	
25	•			•	•	
26		•		•	•	
27	•	•		•	•	
28		-	•	•	•	
29	•		•	•	•	
30		•	•	•	•	
31	•	•	•	•	•	







Panel Cutout

Note: See Section K for knob selection.

Catalog 1308390 Issued 9-04

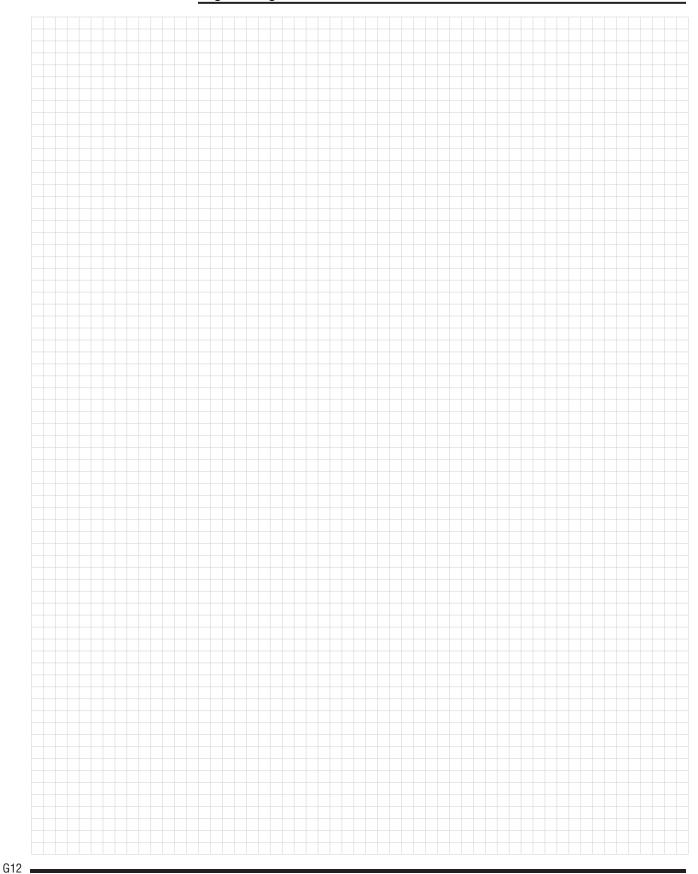
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# **Engineering Notes**



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Keylock



2SWK Series - Page H2



SKT Series - Page H3



SKF Series - Page H4

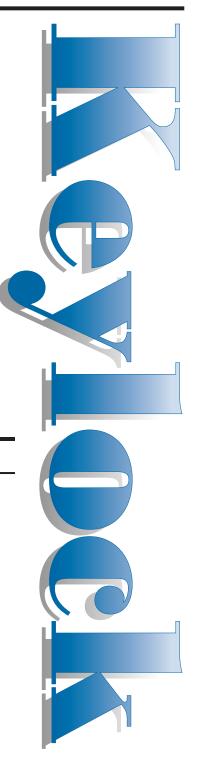


SWK Series - Page H5

## Keylock Part Number Index

2SKF131AEL01H4 2SKF132AEL01H4 2SKF133AEL01H4	
2SKF231AEL01	
2SWK131AL101H2 2SWK132AL101H2 2SWK231AL101H2	
SKF1323AEL01H4 SKT13 H3	
SKT131AEL01H3	
SKT131GAEL01H3 SKT1323AEL01H3	

SKT132AEL01	Н3
SKT132GAEL01	H3
SKT331AEL01	H3
SKT331GAEL01	H3
SKT332AEL01	H3
SKT332GAEL01	H3
SWK12	H5
SWK121F315	H5
SWK123F315	H5
SWK12F315	H5
SWK12KF315	H5
SWK1323AL101	H2



H1

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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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## Key Switches, Medium Security

## MATERIAL SPECIFICATIONS

Contacts	Silver
Cylinder Material	.Zinc alloy
Lock Body	.Zinc alloy
Key Material	.Brass
Terminals/Fixed Contacts	.Screw type
Beveled Frame Finish	.302 Stainless steel

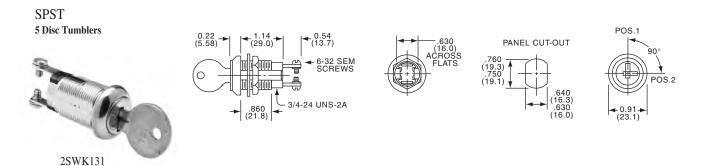
#### ENVIRONMENTAL SPECIFICATIONS

Solder Heat Resistance ......See page M3-4

# TYPICAL PERFORMANCE CHARACTERISTICS

Contact Rating	.1A at 120 VAC resistive
Initial Contact Resistance	50 Milliohms max.
Contact Timing	Non-shorting
Plunger/Actuator Travel	90°
Key Changes	25 Standard
Life Expectancy	Up to 10,000 Cycles

NOTE: All Keylocks are supplied with 2 brass keys on a ring.



Part Number						Part Num	ber				
Tyco Electronics	Alcoswitch	Туре	Pos. 1	Pos. 2	Remove Key	Tyco Electronics	Alcoswitch	Туре	Pos. 1	Pos. 2	Remove Key
1-1437597-7	2SWK131AL101	SPST	Off	On	Position 1	2-1437597-7	2SWK231AL101	SPST	Off	(On)	Position 1
2-1437597-3	2SWK132AL101	SPST	Off	On	Position 1 or 2	4-1437597-3	SWK1323AL101	Spare Key	for SWK Ser	ries	
								(On) indica	ites momenta	ry position.	

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Catalog 1308390 Issued 9-04

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tyco

SKT Series

# **2 Position Key Switch**

## MATERIAL SPECIFICATIONS

Contacts	Gold or silver plate
Cylinder Material	Zinc alloy
Lock Body	
Key Material	Brass
Terminals/Fixed Contacts	Tin lead plate
Terminal Seal	SP epoxy

### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	30°C to +85°C (-22°F to +185°F)
Storage Temperature	$\dots -30^{\circ}$ C to $+85^{\circ}$ C $(-22^{\circ}$ F to $+185^{\circ}$ F)
Solder Heat Resistance	See page M3-4

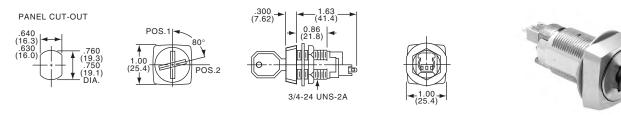
## TYPICAL PERFORMANCE CHARACTERISTICS

Contact Rating ......Gold: 0.4 VA max. @ 20 VDC or neak AC

peak AC
Silver: 3A @ 125 VAC or 28 VDC
resistive
Initial Contact Resistance20 Milliohms max.
Contact TimingNon-shorting
Insulation Resistance
Dielectric Strength1,000 Volts @ sea level
Actuator Travel80°

#### Note: All keylocks are supplied with 2 brass keys on a ring.

SPDT/DPDT 4 Disc Tumblers



SKT131

Tyco Electronics	Alcoswitch	Туре	$\bigcirc$	$\ominus$	Remove Key	Contacts
1437598-4	SKT131AEL01	SPDT	On	On	1 Only	Silver
1437598-5	SKT131GAEL01	SPDT	On	On	1 Only	Gold
1437598-7	SKT132AEL01	SPDT	On	On	1 or 2	Silver
1437598-8	SKT132GAEL01	SPDT	On	On	1 or 2	Gold
1437598-9	SKT331AEL01	DPDT	On	On	1 Only	Silver
1-1437598-0	SKT331GAEL01	DPDT	On	On	1 Only	Gold
1-1437598-1	SKT332AEL01	DPDT	On	On	1 or 2	Silver
1-1437598-3	SKT332GAEL01	DPDT	On	On	1 or 2	Gold
3-1437598-4	SK1323AEL01	Spare key for	SKT13 Series			

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H3

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Electronics

SKF Series

## **Medium Security Key Switch**

### MATERIAL SPECIFICATIONS

Contacts .....Silver Cylinder Material ....Zinc alloy Lock Body .....Brass Terminals/Fixed Contacts ...Screw type Beveled Frame Finish .....Brushed chrome

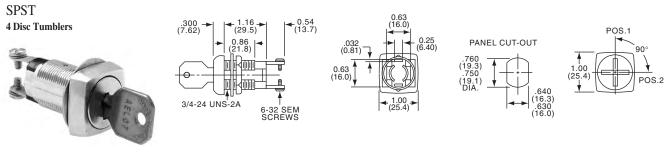
### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature  $\dots -22^{\circ}F + 185^{\circ}F (-30^{\circ}C \text{ to } +85^{\circ}C($ Storage Temperature  $\dots -22^{\circ}F + 185^{\circ}F (-30^{\circ}C \text{ to } +85^{\circ}C)$ Solder Heat Resistance  $\dots$ See page M3-4

# TYPICAL PERFORMANCE CHARACTERISTICS

Contact Rating	1 A @ 120 VAC resistive
Initial Contact Resistance	50 Milliohms max.
Contact Timing	Non-shorting
Actuator Travel	90°
Key Changes	10 Standard
Life Expectancy	Up to 10,000 Cycles

#### NOTE: All Keylocks are supplied with 2 brass keys on a ring.



SKF131

Tyco Eelctronics	Alcoswitch	Туре	Pos. 1	Pos. 2	Remove Key	Tyco Eelctronics	Alcoswitch	Туре	Pos. 1	Pos. 2	Remove Key
1437597-1 1437597-7 1-1437597-0	2SKF131AEL01 2SKF132AEL01 2SKF133AEL01	SPST	Off Off On	On On Off	Position 1 Position 1 or 2 Position 1	1-1437597-1 3-1437597-4	2SKF231AEL01 SK1323AEL01	Spare ke	Off y for SK S icates mon	(On) eries nentary positi	Position 1

H4

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Catalog 1308390

and millimeters unless otherwise reference p specified. Values in parentheses Specificati com or brackets are metric equivalents. to change.

Dimensions are in inches

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tuco

SWK 12 Series

## **High Security Key Switch**

## MATERIAL SPECIFICATIONS

Contacts	Silver
Cylinder Material	Zinc alloy
Lock Body	Zinc alloy
Actuator Material	Brass key
Terminals/Fixed Conta	ctsScrew type
Beveled Frame Finish	Polished chrome

#### ENVIRONMENTAL SPECIFICATIONS

Operating Temperatur	$e22^{\circ}F$ to $+185^{\circ}(-30^{\circ}C$ to $+85^{\circ}C)$
Storage Temperature	22°F to +185° (-30°C to +85°C)
Solder Heat Resistanc	eSee page M3-4

# TYPICAL PERFORMANCE CHARACTERISTICS

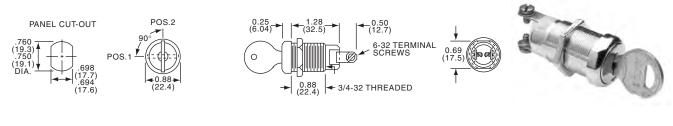
Contact Rating5A @ 115 VAC, 15A @ 24 VDC
resistive
Initial Contact Resistance 50 Milliohms max.
Contact TimingNon-shorting
Dielectric Strength

Key Changes .....25 Standard

Life Expectancy .....Up to 20,000 Cycles

#### NOTE: All Keylocks are supplied with 2 brass keys on a ring.

SPST 8 Disc Tumblers



SWK12

Remove Key
Position 1 or 2 Position 2 Position 1

Η

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Тусо

Electronics 4-1437597-0

3-1437597-6

3-1437597-8

4-1437597-2

Alcoswitch

SWK12F315

SWK121F315

SWK123F315 SWK12KF315

Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Pos. 1

On On

SPST On Off Spare key for SWK12 Series

Туре

SPST

SPST

Pos. 2

Off

Off

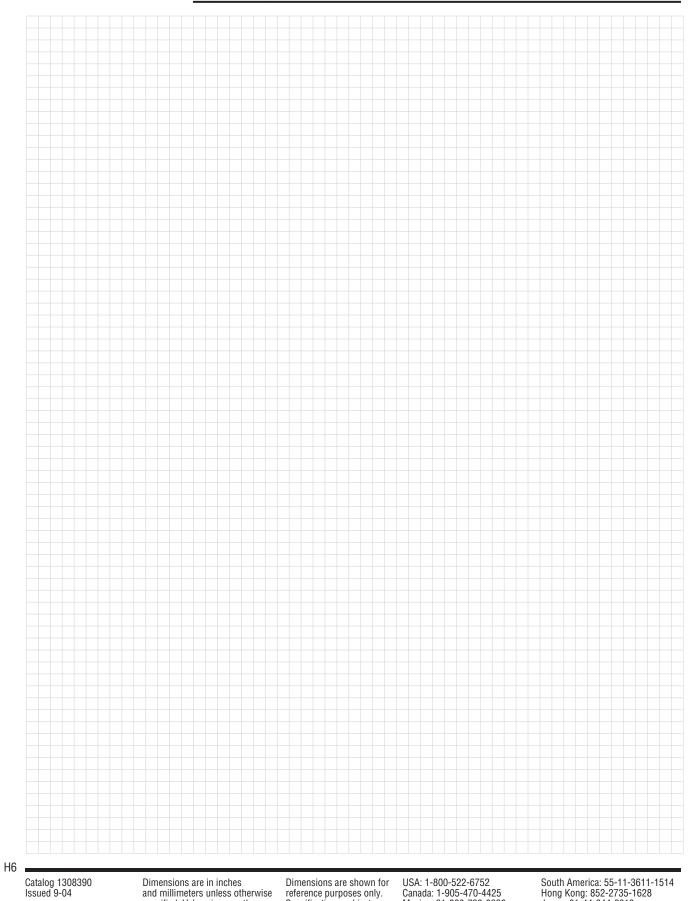
Off

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Industrial Controls

## Alcoswitch



RT Series - Page I3 22mm Mounting



RM Series - Page 15 22mm Mounting



6000 Series - Page I11 30mm Mounting



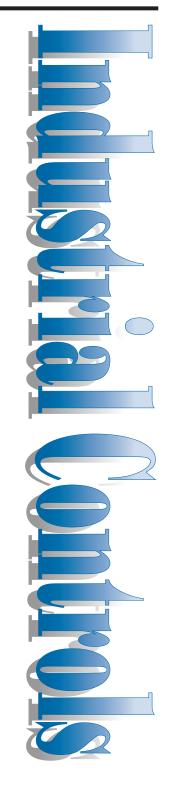
QT Series - Page I4 22mm Mounting



Block Assemblies - Page 18



164/165 Command Series - Page 116 16mm Mounting



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## **Industrial Controls Part Number Index**

385I20	
387I20	
570I6,I7,I15	
616I19	
668I19	
669I19	
755I15	
757I15 7333I20	
164EL11I16	
164EL22I16	
164EL33I16	
164EL511I16	
164EL522I16	
164EL533I16	
164EZI18	
164J0A11I17 164J0A22I17	
164J0A33I17	
164J2A11	
164J2A22I17	
164J2A33I17	
164J2B11I17	
164J2B22I17	
164J2B33I17	
164J3A22I17 164J3A33I17	
164J3C22117	
164J3C33117	
164J3E22I17	
164J3E33I17	
164J7A22I17	
164KAI17	
164P0B22I17 164P0B33I17	
164P2B11I17	
164P2B22117	
164P2B33I17	
164P3B22I17	
164P3B33I17	
164SL11I16	
164SL22I16 164SL33I16	
164SL511I16	
164SL522	
164SL533I16	
164SZI18	
164TL11I16	
164TL22	
164TL33I16 164TL511I16	
164TL522I16	
164TL533I16	
164TZI18	
165EL11I16	
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165EL511I16 165EL522I16	
165EL533I16	
165EZI18	
165J2A11I17	
165J2A22I17	
165J2A33I17	
165J2B11I17	
165J2B22I17	
165J2B33I17 165J3A22I17	
165J3A33I17	
165J3C22117	

165J3C33I17	M6653(*)406I14
165J3E22I17	M6655I15
165J3E33I17	QM010I5
165J7A22I17	QM020I5
165P2B11I17	QM120I7,I15
165P2B22I17	QM122I7,I15
165P2B33I17	QM600I6,I15
165P3B22I17	QT010I5
165P3B33I17	QT01201I4
	OT012CTCTU IA
165SL11I16	QT012STSTHI4
165SL22I16	QT020I5
165SL33I16	RM010I3
165SL511I16	RM015I3
165SL522I16	RM020I3
165SL533I16	RM030I4
165SZI18	RM0450I4
165TL11I16	RM0452I4
165TL22I16	RM0500I4
165TL33I16	RM0502I4
165TL511I16	RM0532I4
165TL522I16	RM0552I4
165TL533I16	RM0652I4
165TZI18	RM120I6
327-AGI20	RM122I6
381-AGI20	RM130I6
382-AGI20	RM145I6
5B0I6,I7,I15	RM150I6
601-AGI19	RM1652I6
618-AGI19	RM200I5
	RM201I5
64EI18	
64SI18	RM204I5
64TI18	RM205I5
671-AGI19	RM210I6
697-PLI20	RM220I6
815-AGI20	RM222I6
E1I5,I6	RM230I6
	101200 11111111111
E40 IS 10 114	DM222 I6
F40	RM232I6
F50I8,I9,I14	RM232I6 RM233I6
F50I8,I9,I14	
F50I8,I9,I14 FA0I8,I9,I14	RM23316 RM24016
F50	RM23316 RM24016 RM24316
F5018,19,114 FA018,19,114 FR018,19,114 G001113	RM23316 RM24016 RM24316 RM25015
F50	RM23316 RM24016 RM24316
F5018,19,114 FA018,19,114 FR018,19,114 G001113 M25310110	RM233
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V50	
VA0	
VR0	

Catalog 1308390

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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

12



(2)

## Pushbutton Switches, 22mm, Oil-Tight, Round

#### **FEATURES**

- Fits 7/8" (22mm) diameter holes
- Full size buttons
- Meets NEMA 1, 12 and 13
- Rugged heavy-duty metal bushing, or thermoplastic bushings for full installation
- · Matte black beveled frame finish
- IP65 protection level

- · Snap-block contacts
- 6A @ 600VAC, 6A @ 125VDC V40, V50, F40, F50 6A @ 600VAC, 4A @ 125VDC VAO, VRO, FAO, FRO
- · Easy "no tool" mounting
- · Choice of screw terminals or dual .110/.250 quick connects
- · Double-break silver contacts standard, gold plated optional
- Stackable



#### 1/8" Drill [3.17] 4 7/8" Drill [22.22] ¥ Panel Hole (4) QT/RT Models (3)

## **INSTALLATION & ASSEMBLY**

A. Engage the operator (1) into the 22.5mm dia. mounting hole.

- B. Engage metal ring (2) with operator (bayonet lock). Tighten set screws against back of panel.
- C. Snap the contact blocks (4) on the support(3).
- D. Snap the support (3) complete with contact blocks (4) on the metal ring (2).

#### A. Engage the operator and seal (1) into the 22.5mm dia. mounting hole. B. Mount back-up nut (2) on bushing and then tighten against panel.

- C. Snap the contact blocks (4) on the support (3).

..709 (18.0)

1.16 (29.5)

D. Snap the support (3) complete the contact blocks (4) onto operator (1).

RM010(\*)

RT020

UK: 44-141-810-8967

## MOMENTARY

Metal Bushings

Contact blocks not supplied, order separately. (See page I8.)

Model	Туре
RM010(*)	Flush Button
RM020(*)	Extended Button
RM015(*)	Extended Guard

(\*) Specify color by adding suffix number: (0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue, (8) Grey, (9) White. Note: Front beveled frame is black.

#### Thermoplastic Bushings (Threaded)

Contact blocks not supplied, order separately. (See page I8.)

Model	Туре
RT010(*)	Flush Button
RT020(*)	Extended Button

(\*) Specify color by adding suffix number:

(0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue, (8) Grey, (9) White. Note: Front beveled frame is black.

Catalog 1308390 Issued 9-04

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PANEL

PANEL THICKNESS

.450 (11.5)

(29

Flush Button

709

Extended Button

(18.0)

..450

.039 - .236 (.99 - 5.99)

.039 - .394

+ 1.04 (26.5) →

-1.34 (34.0)

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

RT010

**Reliant'22 Series** 



RM020(\*)

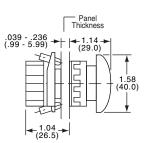
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tyco

**Button** 



RM0502



## MOMENTARY

Pushbutton Switches, 22mm, Oil-Tight, Round or Mushroom or Dual

Mushroom

Contact blocks not supplied, order separately. (See page I8.)

Tyco Electronics	Alcoswitch	Туре	Bushing
3-1437614-7	RM0502	Mushroom, Red	Metal, Bayonet
1437615-2	RT0502	Mushroom, Red	Thermoplastic, Threaded Bushing
3-1437614-6	RM0500	Mushroom, Black	Metal, Bayonet
1437615-1	RT0500	Mushroom, Black	Thermoplastic, Threaded Bushing
3-1437614-9	RM0552 RT050(*)	Mushroom, Red Mushroom	Metal, Bayonet (Wobble)

(\*) Specify color by adding suffix number:

(0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue. Note: Front beveled frame is black.

## PUSH-TO-LOCK, TWIST-RELEASE

Metal Bushings

Contact blocks not supplied, order separately. (See page I8.) Note: Use F40/V40 for N.C. contacts, and FAO/VAO for N.O. contacts.

Tyco Electronics	Alcoswitch	Туре	Arrow
4-1437614-0	RM0652	Mushroom, Red	White

Note: Front beveled frame is black.

## MAINTAINED

Contact blocks not supplied, order separately. (See page I8.) Note: Use F40/V40 for N.C. contacts and FAO/VAO for N.O. contacts.

Tyco Electronics	Alcoswitch	Туре
—	RM030(*)	Flush Button
3-1437614-4	RM0450	Mushroom, Black
3-1437614-5 3-1437614-8	RM0452 RM0532	Mushroom, Red Push-Pull, Mushroom, Red

(\*) Specify color by adding suffix number:

(0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue, (8) Grey, (9) White.

Note: Front beveled frame is black.

\*\* Note: RM0532 mushroom 35mm Dia. (1.38)

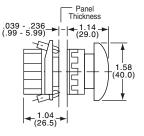
#### MOMENTARY DUAL OPERATOR\*

Threaded Thermoplastic bushing

Contact blocks not supplied, order separately. (See page I8.) Black buttons available.

Tyco Electronics	Alcoswitch	Color	Legend
1437614-9	QT01201	Green, Red	As Shown
_	QT012STSTH	Green, Red	Start & Stop Horizontal

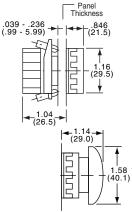
\*Not oil tight construction, not sealed; meets NEMA 1 only. Note: Front beveled frame is black.



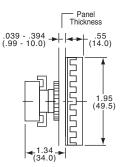
RM0652











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tyco

Reliant'22

## Pushbutton or Keylock or Selector Switches, 22mm, Oil-Tight

.039 - .236 (.99 - 5.99)

1.024 (26.0)

5

1.16 (29.5)

## MOMENTARY

Contact blocks not supplied, order separately. (See page I8.)

Model	Туре
QM010(*)	Flush Button
QM020(*)	Extended Button

(\*) Specify color by adding suffix number:

(0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue, (8) Grey, (9) White.

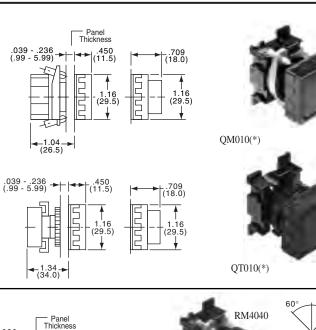
## Note: Front beveled frame is black.

Thermoplastic Bushings (Threaded) Contact blocks not supplied, order separately. (See page I8.)

Model	Туре
QT010(*)	Flush Button
QT020(*)	Extended Button

(\*) Specify color by adding suffix number: (0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue, (8) Grey, (9) White.

Note: Front beveled frame is black.



#### Metal Bushings

Contact blocks not supplied, order separately. (See page I8.)

Tyco Electronics	Alcoswitch	Action	Throw	CAM	Remove Key
7-1437614-7	RM4040	Maintained, Black	120°	1	Long Selector
7-1437614-0	RM3040	Maintained, Black	$120^{\circ}$	1	Selector
5-1437614-4	RM200	Maintained	$60^{\circ}$	1	$\bigcirc$
5-1437614-5	RM201	Maintained	60°	1	Ø
6-1437614-5	RM250	Momentary, Right	60°	1	Õ
5-1437614-6	RM204	Maintained	$120^{\circ}$	1	Ň
5-1437614-7 1437614-1	RM205 E1	Maintained Spare Key	120°	1	Ň

2 POSITION SELECTORS/KEYLOCK MAINTAINED

Note: Front beveled frame is black.

RM3040

.039-.236

F

\_\_1.04\_ (26.5) 60° Throw between

60°

positions

60

positions

60

Panel
 Thickness

1.024 (26.0)

Panel
 Thickness

1.024 (26.0)

1.16 29.5)

1.54 (39.0)

1.53 (38.9)

1.024

RM200/201 with/2 keys

60



Π

## **3 POSITION SELECTORS**

Short Handle, Metal Bushings

Contact blocks not supplied, order separately. (See page I8.)

Tyco Electronics	Alcoswitch	Action	CAM	Tyco Electronics	Alcoswitch	Action	CAM
7-1437614-1	RM3100	Maintained, Black	2	7-1437614-4	RM3700	Momentary, Right Side, Black	2
7-1437614-2	RM3120	Maintained, Black	3	7-1437614-5	RM3800	Double Momentary Black	y, 2
7-1437614-3	RM3130	Maintained, Black	4	7-1437614-6	RM3830	Double Momentary Black	y, 4

Note: Front beveled frame is black.

## Long Handle, Metal Bushings

Contact blocks not supplied, order separately. (See page H8.)

Tyco Electronics	Alcoswitch	Action	CAM	Tyco Electronics	Alcoswitch	Action	CAM
7-1437614-8	RM4100	Maintained	2	—	RM4700	Momentary, Right Side	2
_	RM4120	Maintained	3	7-1437614-9	RM4800	Double Momentary	2
_	RM4130	Maintained	4				

Note: Front beveled frame is black.

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60° Throw between

-1.04 (26.5) RM3100



15

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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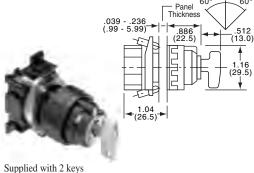
tyco

60

60

## Keylock or Pushbutton Switches, 22mm, Oil-Tight or Pilot Lights





) Metal Bushings

Contact blocks not supplied, order separately. (See page I8.)

Tyco Electronics	Alcoswitch	Action	CAM	Remove Key	Tyco Electronics	Alcoswitch	Action	CAM	Remove Key
5-1437614-8	RM210	Maintaineo	12	$\bigcirc$	6-1437614-4	RM243	Maintained	4	$\langle \! \! ( \! \! ) \rangle$
5-1437614-9	RM220	Maintaineo	1 2	$\bigotimes$	6-1437614-6	RM270	Mom. Right Side	2	$\tilde{\mathbb{O}}$
6-1437614-0	RM222	Maintained	1 3	Ø	6-1437614-7	RM272	Mom. Right Side	3	000
6-1437614-1	RM230	Maintaineo	1 2	$\otimes$	6-1437614-8	RM273	Mom. Right Side	4	
6-1437614-2	RM232	Maintained	1 3	$\otimes$	6-1437614-9	RM280	Mom. Both Sides	3 2	Ō
6-1437614-3	RM233	Maintained	14	$\otimes$	1437614-1	E1	Spare Key		
_	RM240	Maintaineo	12	Ō					

Note: Front beveled frame is black.



QM600 (RM600)

Metal Bushing



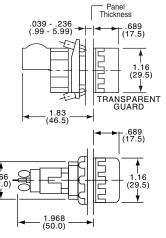
RM120(\*)

+V40/F40 used for N.C contact block.

+VA0/FA0 used for N.O.contact block.

**Application Note:** 

Threaded Thermoplastic Bushing Front lampable



Panel
 Thickness

5

...847 (21.5)

> 1.16 (29.5)

## PILOT LIGHTS (FULL VOLTAGE TYPE)

Lamps: order separately, miniature bayonet base. (See page I15.)

Lamps: use G3 1/2 on QM600(\*), use T3 1/4 on SR601(\*), RM600(\*). Custom legends available.

Model	Туре
QM600(*)	Square pilot light, metal bushing
SR601(*)	Round pilot light, plastic bushing screw turn
RM600(*)	Round pilot light, metal bushing

(\*) Specify color by adding suffix number: (2) Red, (3) Orange, (4) Yellow, (5) Green, (6) Blue, (9) White.

## ILLUMINATED/ROUND MOMENTARY/MAINTAINED

#### Metal Bushing

Contact blocks not supplied, order separately. (See page I8.) Lamp circuit isolated. Order lamp separately. (See page I15.) Lamps: Use T-3 1/4 or G3 1/2 incandescent or neon lamps.

Tyco Electronics	Alcoswitch	Action	Туре	Cam Type
_	RM120(*)	Momentary	Extended Buttor	1
_	RM122(*)	Momentary	Guarded Button	
_	+RM130(*)	Maintained	Flush Button	Puch On Duch Off
_	+RM145(*)	Maintained	Mushroom	Push-On - Push-Off See Application Note
_	RM150(*)	Momentary	Mushroom	
5-1437614-3	RM1652	Twist Release	Mushroom, Red	
Illuminated Selector	s			
_	RM650(*)	Maintained	2-Pos. Selector*	*1
_	RM653(*)	Maintained	3-Pos. Selector*	*2

When operating from line voltage use step down transformers 5BO or 570. (See page I15.) (\*) Specify color by adding suffix number: (2) Red, (4) Yellow, (5) Green, (6) Blue, (9) White. Note: RM145 and RM150 available only in red, yellow, green.

\*\*Use G3 1/2 lamps only.

Note: Front beveled frame is black.

Note. Front beveleu frame is bla

Catalog 1308390 Issued 9-04

Issued 9-04 and m specifi www.tycoelectronics.com or brai

60° Throw

between positions

Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

LAMP MODULE INCLUDED

.039 - .236 (.99 - 5.99)

35

1.102 (28.0)

> MUSHROOM BUTTON

SELECTOR

1.060

ŧ

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## Pushbutton Switches, 22mm, Oil-Tight, Round or Square Buttons

## SQUARE, MOMENTARY ILLUMINATED

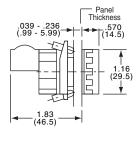
Metal Bushing

Contact blocks not supplied, order separately. (See page I8.) Lamp circuit isolated. Order lamps separately. Lamps: Use G3 1/2. (See page I15.) Custom legends available.

Model	Туре
QM122(*)	Flush Button
QM120(*)	Extended Button

When operating from line voltage use step down transformers 5BO or 570. (See page I15.) (\*) Specify color by adding suffix number: (2) Red, (4) Yellow, (5) Green, (6) Blue, (9) White.

Note: Front beveled frame is black.





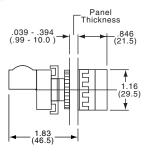
#### ROUND, MOMENTARY ILLUMINATED

#### Thermoplastic

Contact blocks not supplied, order separately. (See page I8.) Lamp circuit isolated. Order lamps separately. (See page I15.) Lamps: use T-3 1/4 or G3 1/2 incandescent or neon lamps.

RT120(*) Momentary	Extended Button

When operating from line voltage use step down transformers 5BO or 570. (See page I15.) (\*) Specify color by adding suffix number: (2) Red, (4) Yellow, (5) Green, (6) Blue, (9) White. Note: Front beveled frame is black.



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RT120(\*)





QM122(\*)



QM120(\*)

## **Standard Contact Blocks**

An almost unlimited number of circuit control options are possible using various combinations of contact blocks. 8 different "V" or "F" family modular blocks may be used with any operator in the Reliant 22, 2200 or 6000 series, depending on circuit requirements and operator design. The exclusive SNAP-BLOC design permits assembly without the use of tools – no screws or hardware to get lost. Choose either screw terminals or dual

#### Application Notes

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Electronics

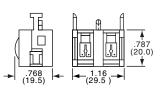
- 1. A total of 4 (2 upper and 2 lower) contact blocks may be stacked and snap-mounted in either the upper and/or lower position on the back on any Reliant 22, Series 4000 or 6000 operator.
- In order to maintain optimum insulating distances when contact blocks are stacked, wiring connections should be in same polarity for operation above 300VAC.
- 3. Blocks may be prewired and snapped into place for easier assembly.
- 4. Remove blocks by simply prying tabs. Small screwdriver is all that is necessary.

F&V Contact blocks are UL recognized. File Number E-60363 CSA LR-20785-19 CE MARK male .110"/.250" quick connect terminals. Plunger color indicates closure mode. The double break silver contacts are enclosed in a tough transparent polycarbonate housing, permitting visual inspection of contacts. Designed-in rocking action for long, reliable life; over several million operations in normal use. Operating temperature range:  $-25^{\circ}$ C to  $+60^{\circ}$ C. Storage temp.  $-40^{\circ}$ C to  $+80^{\circ}$ C.

#### ELECTRICAL CONTACT RATINGS

Condition	Function		Standard Series (600 VAC Max.)			
AC Operation		120V	300V	600V		
Inductive Loads	Make	30A	12A	6A		
	Continuous	6A	6A	6A		
.350 P.F. min.	Break	3A	1.2A	0.6A		
Resistive Loads	Make, Continuous	6A	6A	6A		
.750 P.F. min.	Carry & Break					
DC Operation						
Inductive &	Make	1.1A				
Resistive	Continuous Carry	6A	6A	6A		
Loads	Break	1.1A				





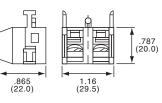
#### QUICK CONNECT

Tyco Electronics	Alcoswitch	Contacts	Plunger Color
1437612-9	F40	Normally Closed	Red
1-1437612-0	F50	Normally Open	Green
1-1437612-1	FA0	N.O. Early Make	Yellow
1-1437612-2	FR0	N.C. Late Break	Black

Note: FA0 and FR0 contacts "overlap."



V Series



#### SCREW TERMINAL

Tyco Electronics	Alcoswitch	Contacts	Plunger Color
1-1437612-3	V40	Normally Closed	Red
1-1437612-5	V50	Normally Open	Green
1-1437612-8	VA0	N.O. Early Make	Yellow
1-1437612-9	VR0	N.C. Late Break	Black

Note: "V" Series is available with gold plated contacts; order V40G, V50G, VA0G, VR0G. Note: VAO and VRO contacts "overlap."

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## Series 6000 and Reliant'22 Contact Selection

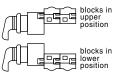
- 1. Determine how many contacts are required for the application, and what contact closure sequence is needed for each contact.
  - a. 2-Position Operators: There are only two practical possibilities for contact closure sequence. Using "O" to indicate an open and "X" to indicate a closed contact, the options are shown in the table to the right. All Reliant 22 and Series 6000 2-position selection selector and keylock operators provide these options.
  - b. 3-Position Operators: There are six practical possibilities for contact closure sequence. Using "O" to indicate an open contact, and "X" to indicate a closed contact, the options are shown in the table to the right. Four different cam types are available to provide various combinations of contact closure sequence. Cam Type 2 (see table below) provides the most popular closure sequence, and Cam Type 3 provides all six possibilities, depending on the contact block models chosen. Note that each operator has an upper and lower contact block location, and that the cam profiles are different for upper and lower locations, except for Cam Type 2.
- 2. Make a truth table similar to that shown in the example at the bottom of the page, in which each contact required by the circuit of the application is represented. Up to 12 contacts may be used for each operator, depending on the sequences required and the types of contact blocks chosen.
- 3. Refer to the contact sequence table (below). Find the cam type that will provide all of the required contact closure sequences, and note which contact block model will be needed for each circuit contact.
- 4. Now refer to the tables on pages I5-I6 for 22mm and pages I12-I13 for 30mm to find the operator model that has the cam type needed in the application and that provides the desired features with respect to action (maintained or momentary) type of actuator (lever or key), etc.

## SELECTOR & KEYLOCK OPERATORS

tuco

Electronics

ALCOSWITCH selector and keylock operators, in combination with the contact blocks listed on page I8, are designed to fulfill the circuit requirements of almost any 2- or 3- position control application. Each operator has two locations (upper and lower) into which contact blocks may be snap-mounted. Up to four contact blocks may be stacked in each location, the maximum number depending on the contact block models chosen and the contact closure sequences required. (Note: only one logic level block may be used in each location.)



## CONTACT CLOSURE SEQUENCE CHART

Contact Blocks	2-Position Operators		3-Position Opera	tors
Model	CAM Type 1 upper & lower locations	CAM Type 2 upper lower location location	CAM Type 3 upper lower location location	CAM Type 4 upper lower location location
	0 1	2 0 1 2 0 1	2 0 1 2 0 1	2 0 1 2 0 1
V40 or F40 Red	X 0	X 0 0 X 0 0	X 0 0 0 X 0	0 X X X X 0
V50 or F50 Green	0 X	0 0 X 0 0 X	0 0 X 0 0 X	X 0 0 0 0 X
VA0 or FA0 Yellow	0 X*	0 X X 0 X X	0 X X X 0 X	X 0 0 0 0 X
VR0 or FR0 Black	X 0*	X X 0 X X 0	X X 0 X X 0	0 X X X X 0

X = Closed 0 = Open \*VA0 and FA0 contacts overlap with VR0 and FR0 contacts between position of 2 position operators providing "Make Before Break" action.

Example: An "Off-On-Reset" circuit control requires a 3-position or 2-position keylock switch. The key is to be removable in the "OFF" and "ON" position and the "Reset" position must be momentary (spring return from right to center). All contacts are open in the "Off" position, and two contacts are closed in the "On" position. In the "Reset" position a third contact must close and one of the contacts

in the "on" position must open. This contact closure sequence is shown by the following truth table:

Contact Number	Off (2)	On (0)	Reset (1)
1	0	Х	Х
2	0	Х	0
3	0	0	Х

Referring to the Contact Closure Sequence Table, it is seen that cam Type 3 provides these sequences. In addition, the contact block models that should be used are given; model VA0 (or FA0 for contact No. 1, to be installed in the upper contact block location; model V40 (or F40) for contact No. 2, to be installed in the lower

contact block location; and model V50 (or F50) for contact No. 3, which may be used in either the upper or lower contact block location, behind one of the other two blocks. Reference to the operator model listings shows that model RM272 provides cam Type 3 and has desired momentary action and key removability.

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3 Pos	3 Position Operators					
2	2 0 1					
left	center	right				
0	0	Х				
Х	0	0				
0	Х	Х				
Х	Х	0				
0	Х	0				
Х	0	Х				

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Hong Kong: 852-2735-1628 Japan: 81-44-844-8013

UK: 44-141-810-8967

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Electronics

Joystick

## Joystick, 22mm

3.50 (89.0)

2

1.34 (34.0)



## 5 POSITION JOYSTICK (4 Action + Center-Off)

Metal Bushing

1.063

Maintained or momentary models, inherent design requires use of N.O. and N.C. contact blocks. Supplied with legend plate, and black knob. Contact blocks not supplied, order separately. (See page I8.)

#### Tyco Electronics Alcoswitch Description

1 yeo Electronics	Alcoswitch	Description					
1437609-2	M25310	Momentary, 3 Position	_	(ON)	OFF	(ON)	_
1437609-3	M25500	Maintained, 5 Position	ON	ON	OFF	ON	ON
1437609-4	M25510	Momentary, 5 Position	(ON)	(ON)	OFF	(ON)	(ON)
(ON) indicates momentary position							
Note: All positions are mutually evclusive and action must pass through neutral for all							

unrougn changes of operator level.

#### CONTACT ARRANGEMENT

Contact blocks should be placed as shown. All contacts are held open in neutral position. Each numbered contact closed when activated. M25310 operators require one N.O. and one N.C. contact block, and M25500 and M25510 require two N.O. and two N.C. blocks.

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## Pushbutton Switches, 30mm, Round or Mushroom Buttons

## FLUSH GUARD MOMENTARY

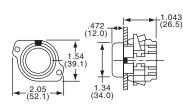
Metal Bushing

Contact blocks not supplied, order separately. (See page I8.)

Model	Special Details
M6010(*)	Momentary

(\*) Specify color by adding suffix number:

(0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue, (9) White.



.630.

1.50 (38.0)

1.043

(26.5)

(1.043)

Contact Block Holder



M6010(\*)

M6020(\*)

M6057(\*)

## EXTENDED BUTTON MOMENTARY

#### Metal Bushing

Contact blocks not supplied, order separately. (See page I8.)

Model	Special Details
M6020(*)	Momentary

(\*) Specify color by adding suffix number: (0) Black, (2) Red, (4) Yellow, (5) Green, (6) Blue, (9) White.

## MUSHROOM HEAD MOMENTARY PUSH MAINTAINED

#### Metal Bushing

Contact blocks not supplied, order separately. (See page I8.)

Tyco Electronics	Alcoswitch	Special Details	Color
—	M6057(*)	Momentary	(*)
1437610-6	M60532	Push-Pull	Red
1-1437610-3	M60652	Push-Lock/Twist To Release	Red

(\*) Specify color by adding suffix number:

(0) Black, (2) Red, (3) Orange, (4) Yellow, (5) Green, (6) Blue, (9) White.

## LARGE MUSHROOM HEAD MOMENTARY PUSH

#### Metal Bushing

Contact blocks not supplied, order separately. (See page I8.)

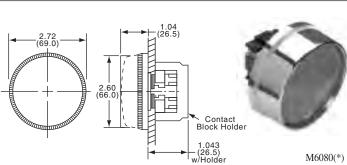
Tyco Electronics	Alcoswitch	Special Details	Color
1-1437610-2	M60582	Momentary	Red

## LARGE GUARDED MUSHROOM HEAD MOMENTARY PUSH

Metal Bushing. Heavy duty metal bushing and guard. Contact blocks not supplied, order separately. (See page I8.)

Model	Special Details
M6080(*)	Momentary

(\*) Specify color by adding suffix number: (0) Black, (2) Red, (5) Green.



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Dimensions are shown for reference purposes only. Specifications subject to change.

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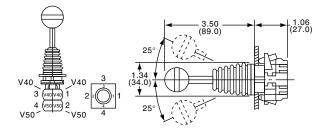
tyco

Series 6000

## Selector Switches or Joysticks, 30mm



M65510



1.51 (38.4)

1.34 (34.0)

0.91 (23.0)

POSITION

## 5-POSITION JOYSTICK (4 Active & Center-Off)

#### Metal Bushing

Maintained or momentary model with or without mechanical latch. Inherent design requires use of N.O. and N.C. Contact blocks not supplied, order separately. (See page I8.) Supplied with legend plate (1-2-3-4), black knob.

#### CONTACT ARRANGEMENT

Contact blocks should be placed as shown. All contacts are held open in neutral position. Each number contact closed when activated. Model M65310 has only two active positions, requires one N.O. and one N.C. contact block.

#### Note: All positions are mutually exclusive and action must pass through neutral for all changes of operator level.

Tyco Electronics	Alcoswitch	Action					
3-1437610-5	M65310	Momentary, No Latch		(On)	Off	(On)	
_	M65500	Maintained, No Latch	On	On	Off	On	On
3-1437610-6	M65510	Momentary, No Latch	(On)	(On)	Off	(On)	(On)
3-1437610-7	M65810	Momentary w/Latch	(On)	(On)	Off	(On)	(On)
		(On) indicates momentary position.					

## 2-POSITION SELECTOR MAINTAINED

#### Metal Bushing

1.06

Metal Bushing

N.C. N.O. H 8

읭--

N.C

CAM MOVEMENT (CAM TYPE 1)

120°

120° THROW BETWEEN POSITIONS

N.O.

-18

Contact blocks not supplied, order separately. (See page I8.) Legend plant included.

Model	Action	Lever	Position Number
M6402(*)	Maintained	Long	0 1

(\*) Specify color by adding suffix number: (0) Black, (2) Red.

## **3-POSITION SELECTOR** MAINTAINED OR MOMENTARY

#### Metal Bushing

Contact blocks not supplied, order separately. (See page I8.) Legend plate included.

Model	Action	Lever	Cam	Position Number
M6410(*)	Maintained	Long	2	2 0 1
M6412(*)	Maintained	Long	3	2 0 1
M6470(*)	Mom. 1 Side	Long	2	2 0 -1
M6480(*)	Mom. 2 Sides	Long	2	2 → 0 → 1
Indicates momentary return position				

(\*) Specify color by adding suffix number: (0) Black, (2) Red.



M6402(\*)

1.06 27.0) 38.4) 0.91 (23.0) POSITION CAM MOVEMENT (CAM TYPE 2) 60 60° THROW BETWEEN POSITIONS

#### 112

Catalog 1308390 Issued 9-04

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Dimensions are shown for reference purposes only. Specifications subject to change.

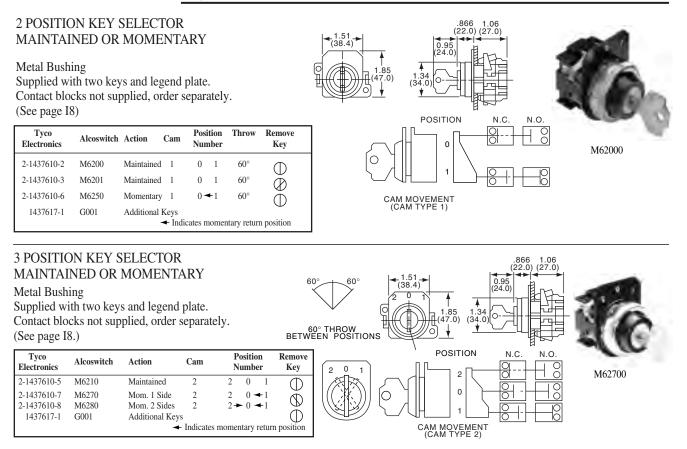
USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

tyco

Electronics

Series 6000

## Keylock or Pushbutton Switches, 30mm



1.18

1.34 (34.0)

(16.0)

.795 20.2

.669 (17.0)

(46.0)

1.69 (43.0) .669

.795

## ILLUMINATED EXTENDED BUTTON MOMENTARY

#### Metal Bushing

Lamp not supplied, order separately. (See page I15.) Uses T31/4 miniature bayonet base lamps. Lamp circuit is isolated. Contact blocks not supplied, order separately. (See page I8)

Model	Special Details	
M6120(*)406	Momentary	

(\*) Specify color by adding suffix number: (2) Red, (4) Yellow, (5) Green, (9) White.

## ILLUMINATED MUSHROOM MAINTAINED OR MOMENTARY

## Metal Bushing

Lamp not supplied, order separately. (See page 115.) Uses miniature bayonet base lamps. Lamp circuit is isolated. Contact block not supplied, order separately. (See page 18.)

Model	Special Details
M6150(*)406	Momentary
M6153(*)406	Maintained, Push-Pull

 $(\ast)$  Specify color by adding suffix number: (2) Red, (4) Yellow, (5) Green, (9) White.

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M6150(\*)406

M6120(\*)406

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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967 Series 6000

Π

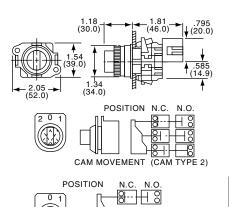
tyco

Series 6000

## Selector Switches, 30mm, Illuminated



M6650(\*)06



8-1-1---18

CAM MOVEMENT (CAM TYPE 1)

## ILLUMINATED MAINTAINED **SELECTOR**

#### Metal Bushing

use this table for guidance in selecting blocks.

Lamp not supplied, order separately. (See page I15.) G31/2 lamps. Lamp circuit is isolated. Contact blocks not supplied, order separately. (See page I8.)

Model	Number Position	Action		sition mber	
M6653(*)406	3	Maintained	2	0	1
M6650(*)406	2	Maintained		0	1

(\*) Specify color by adding suffix number: (2) Red, (4) Yellow, (5) Green.

KEY TO SELECTION OF CONTACT BLOCKS Contact closure variations depend on the contact block models chosen. For these operators listed

Model	Action		osition crator		'ositi erato		
		0	1	1	0	2	1
V40 or F40	N.C.	Х	0	Х	0	0	
V50 or F50	N.O.	0	Х	0	0	Х	
	Early						
VA0 or FA0	N.O.	0	Х	0	Х	Х	O=Open X = Closed
	Make						X = Closed
VR0 or FR0	N.C.	Х	0	Х	Х	0	
	Break						

# Series 6000

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Catalog 1308390

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## Lamps/Transformers

## LAMPS

The lamps with G31/2 bulbs fit all Reliant 22, Series 6000 illuminated operators and pilot lights. Lamps with T31/4 Bayonet Base fit all Reliant 22 and Series 6000 illuminated models (except QM120, QM122, and M6650, and M6655).

Tyco Electronics	Alcoswitch	Bulb	Rated Volts	Design Amps	MSCP	Average Rated Hours
1-1437620-5	755	T31/4	6.3	.15	.33	20,000
1-1437620-6	757	T31/4	28	.08	.62	7,500

\*Not recommended for use with green or blue lenses.



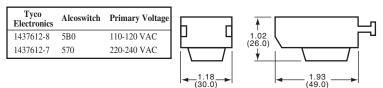
755

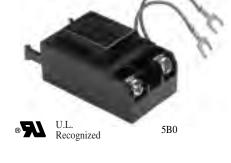


Application Note: For additional specifications, see page K10

## STEP-DOWN TRANSFORMERS AC LINE TO 6V/6.3V

Snap mount on lighted operators and QM600, T6632 and RM600 pilot lights. Spade tipped leads connect to lamp terminals on operator. Screw terminals on primary. Use 6-6.3V lamps. 0-9 to 1.35 watts. Secondary winding is energy-limited.





1/8" Drill [3.17]

> 1 7/8"

[22.22] Dia.

1/8" Drill

1-3/16" [30.16] Dia.

[3.17]

## **Panel Layouts**

## **RELIANT'22 MINIATURE MODELS**

Recommended hole mounting dimensions\*

Minimum Center-To-Center Spacing

Operator Type	A	В
Pushbuttons, Pilots	1.19/30.2	1.66/42.2
Mushroom, Selector	1.50/37.8	1.66/42.2
Others	1.94/49.3	1.94/49.3

\*Check dimensions for layouts using legend plates.

## SERIES 6000 STANDARD MODELS

Recommended hole mounting dimensions\* Minimum Center-To-Center Spacing Inches/(mm)

Operator Type	А	В
Pushbuttons, Pilots	1.88/47.8	1.97/50.0
Mushroom, Selector Large Mushroom	2.25/57.2 3.00/76.2	2.25/57.2 3.00/76.2

\*Check dimensions for layouts using legend plates.

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PANEL HOLE

PANEL HOLE

Series 6000

Π

115

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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## Pushbutton Switches, 16mm, Illuminated

## FEATURES:

Command Series Illuminated Pushbuttons are instrument-grade switches having snap-acting double break contacts, silver clad and gold plated to satisfy the requirements of logic level and power switching. Contacts are electrically independent of one another and are isolated from the lamp circuit. Tactile feel is excellent and maintained models have latching feature for visible indication of status. Uses T1-3/4 midget flanged base lamp, relampable from front of panel. Legends may be provided using printed transparent tape affixed to inner button. UL Recognized, File E-51302, CSA LR-20479

Note: Recommended panel thickness 4mm max.

## MATERIAL SPECIFICATIONS:

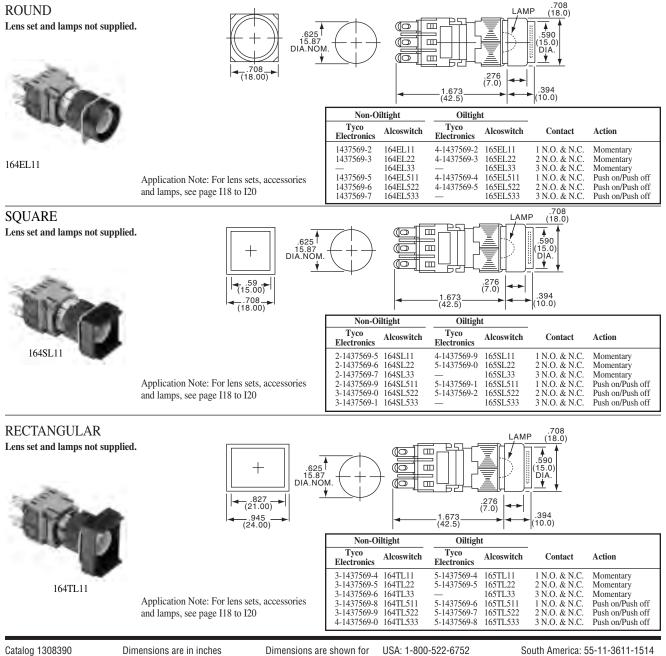
Contacts ......Gold plate over silver clad

## TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating0.4 V	A @ 20 VDC or Peak AC
5 A	@ 250 VAC or 24 VDC (Resistive)
Initial Contact Resistance20 M	lilliohms max.
Insulation Resistance100	Megohms min.
Dielectric Strength1,50	0 VAC
Life Expectancy100,	000 Operations @ rated current

## ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature	$4^{\circ}$ F to +122°F (-20°C to +50°C)
Oiltight	IP65, NEMA 1, 12 & 13
Non-oiltight	IP40



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and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change

reference purposes only. Specifications subject

Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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**Command Series** 

## Selector or Keylock Switches, 16mm

## FEATURES:

Command Series Selector & Keylock Switches are 2 & 3-position rotary types with snap-acting double break contacts. All models have 90° throw. Contacts are silver-clad and gold-plated to provide reliable operation at logic levels as well as for power switching applications. Contacts are electrically isolated from one another. Keylock types are supplied with two keys. Oiltight models meet NEMA 1, 12 & 13 requirements.

#### UL Recognized File E-51302

CSA LR-20479

## MATERIAL SPECIFICATIONS:

Contacts ......Gold plate over silver clad

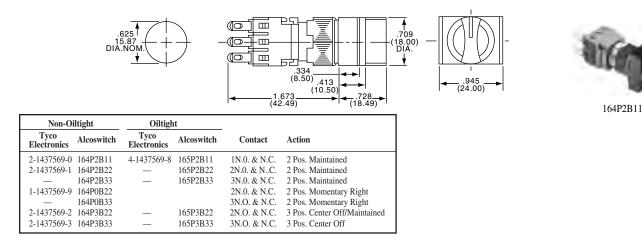
## TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating0.4 VA @ 20 VDC or Peak AC
5 A @ 250 VAC or 24 VDC (Resistive)
Initial Contact Resistance20 Milliohms max.
Insulation Resistance100 Megohms min.
Dielectric Strength1,500 VAC
Life Expectancy

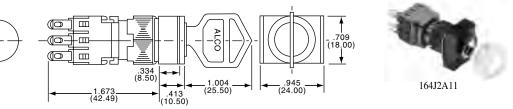
## **ENVIRONMENTAL SPECIFICATIONS:**

Operating Temperature......- $4^{\circ}$ F to +158°F (-20°C to +70°C)

#### **SELECTORS**



**KEYLOCKS** 



2 Position Keylocks 3 Position Keylocks											
Non-Oi	ltight	Oilti	ght			Non-O	iltight	Oiltig	;ht		
Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Contact	Action	Tyco Electronics	Alcoswitch	Tyco Electronics	Alcoswitch	Contact	Action
1-1437569-1	164J2A11	4-1437569-7	165J2A11	1N.O. & N.C.	Maintained, key pull left	_	164J3A22	_	165J3A22	2N.O. & N.C.	Maintained, key pull left
1-1437569-2	164J2A22	_	165J2A22	2N.O. & N.C.	Maintained, key pull left	1-1437569-5	164J3A33	_	165J3A33	3N.O. & N.C.	Maintained, key pull left
_	164J2A33	_	165J2A33	3N.O. & N.C.	Maintained, key pull left	_	164J3E22	_	165J3E22	2N.O. & N.C.	Maintained, key pull center
1-1437569-3	164J2B11	_	165J2B11	1N.O. & N.C.	Maintained, key pull both	_	164J3E33	_	165J3E33	3N.O. & N.C.	Maintained, key pull center
1-1437569-4	164J2B22	_	165J2B22	2N.O. & N.C.	Maintained, key pull both	1-1437569-6	164J3C22	_	165J3C22	2N.O. & N.C.	Maintained, key pull all
_	164J2B33	_	165J2B33	3N.O. & N.C.	Maintained, key pull both	_	164J3C33	_	165J3C33	3N.O. & N.C.	Maintained, key pull all
1437569-9	164J0A11			1N.O. & N.C.	Momentary right, key pull left	_	164J7A22	_	165J7A22	2N.O. & N.C.	Momentary right, key pull left
1-1437569-0	164J0A22			2N.O. & N.C.	Momentary right, key pull left	1-1437569-8	164KA	_	_	_	Spare Keys
_	164J0A33			3N.O. & N.C.	Momentary right, key pull left						

Catalog 1308390 Issued 9-04

specified. Values in parentheses www.tycoelectronics.com

Dimensions are in inches

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117 South America: 55-11-3611-1514

Hong Kong: 852-2735-1628 Japan: 81-44-844-8013

UK: 44-141-810-8967

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**Command Series** 

## Pilot Light Indicators or Lens Sets, 16mm

## FEATURES

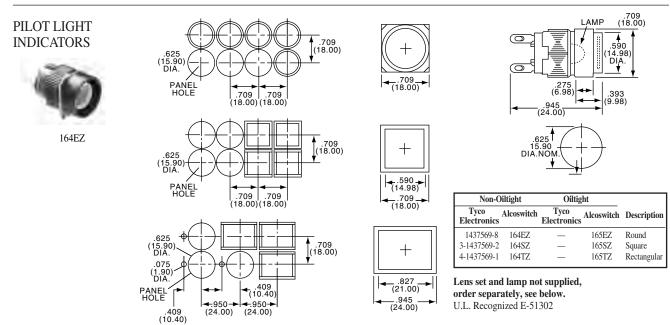
Command Series Pilot Light Indicators match the appearance of both lighted and unlighted Command Series pushbuttons. The same lens buttons are snapped into place and legends may be easily inserted. Illumination is from T - 1 3/4 midget flange based lamps, which are installed from the front panel. Lenses and lamps are ordered separately. Oiltight models meet NEMA 1, 12 & 13 requirements. UL File No. E-51302 CSA LR-20479

## TYPICAL PERFORMANCE CHARACTERISTICS:

LAMP DISSIPATION 1.2W MAX. Insulation Resistance ......100 Megohms min. Dielectric Strength ......1,500 VAC

## ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +122°F (-20°C to +50°C)

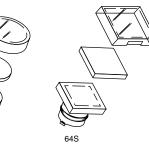


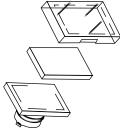
LENS SET

**Command Series** 



64E





64T

Model	Description
64E(*)	Round lens set
64S(*)	Square lens set
64T(*)	Rectangular lens set
All fit oil	tight and non-oiltight indicators.
(*) Speci	fy color by adding suffix number: (2) Red,
(3) Orang	e, (4) Yellow, (5) Green, (6) Blue, (9) White/Clear.

Application Note: Lens sets include, button, diffuser and cap.

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64E

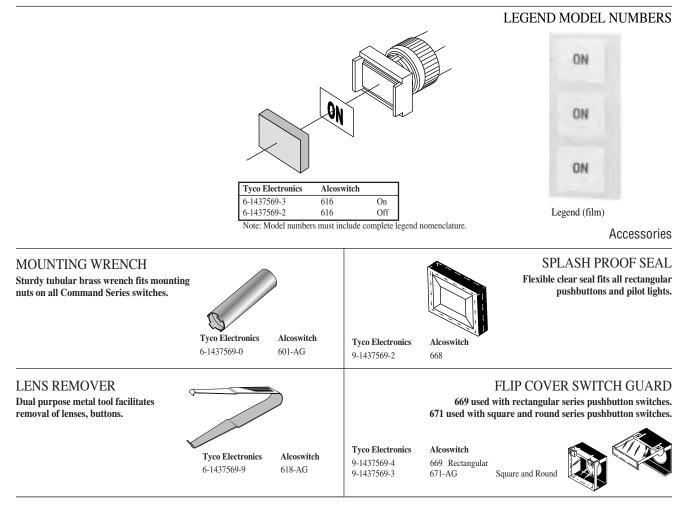
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## Accessories and Tools, 16mm

## FEATURES:

Standard Legends on Transparent Adhesive Tape are available for Illuminated Command Series switches and pilot lights. Legends are easily affixed to the translucent white button and are protected by the lens cap. The black lettering is back-lit by the lamp and the inscription is visible through the lens cap. This method of providing legends is also suitable in some applications using nonilluminated white (clear), yellow or orange lens caps.

Standard legends, listed below, are intended to be used with round, square or rectangular pushbuttons and pilot lights. Sold only in sheets of 10 identical legends.



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specified. Values in parentheses

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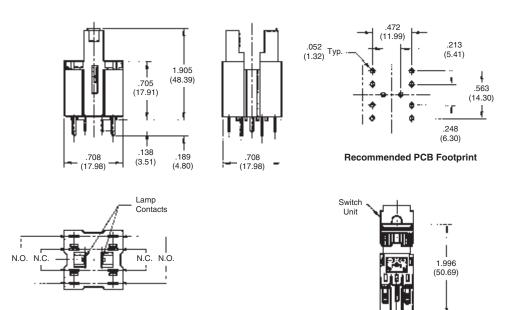
**Command Series** 

## Socket for 16mm Command Series Switches

## 697-PL



9-1437569-5



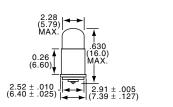
## T1 3/4 Series Midget Incandescent Lamps

Average Life ratings indicate the lamp life obtained in controlled laboratory conditions while operating lamps at the design voltage (AC) (DC will shorten life by 50%). The life of a subminiature lamp is inversely proportional to the 12th power of the applied voltage.

ALCOSWITCH subminiature lamps are a "T" class, meaning that the envelopes are made of glass tubing, the "T" number indicating the diameter of the tubing in eights of an inch.

Tyco Electronics	Alcoswitch	Rated Volts	Design Amps	Rated MSCP	Average Rated Hours
9-1437620-6	7333	5.0	.060	.05	40,000
1-1437620-8	815-AG	_	.115	.147	40,000
1437620-7	381-AG	6.3	.20	.40	50,000
1437620-8	382-AG	14.0	.08	.30	50,000
1437620-9	385	28.0	.04	.20	50,000
1-1437620-1	387	28.0	.04	.30	25,000
1437620-5	327-AG	28.0	.04	.34	7,000

#### FLANGE BASE- T1 3/4





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SH6 Series - Page J3



PICOD Series - Page J4



J

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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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J1

## **Pushwheel Switches Part Number Index**

B11LSJ9,J10
B12LJ11
B12LSJ11
B5LJ7
B5LS
B9L
B9LS
B9LS5PINJ9
DPS
DPS10J5,J11 DPS10111AKJ11
DPS10111AKJ11 DPS10131AKJ11
DPS10131ALD
DPS10137AKJ11 DPS10141AKJ11
DPS10301AKJ11
DPS10LJ11
DPS8J5,J10
DPS8111AKJ10
DPS8131AKJ10
DPS8131AKLSJ10
DPS8131AKULSJ10
DPS8131ALDJ10
DPS8137AKJ10
DPS8137AKLSJ10
DPS8137AKUJ10
DPS8137AKULSJ10
DPS8301AKJ10
DPS8301AKULSJ10
DPS8AJ10
DPS8LJ10
DPS8PJ10
DPS8PWJ10
DPS9J5,J11
DPS910AJ11 DPS910PJ11
DPS910P
DPS9131AK
DPS9131ALJ11
DPS9131ALDJ11
DPS9137AKJ11
DPS9301AKJ11
DPS9307AKJ11
DPS9LJ11
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PICOBGJ7
PICODJ4,J6,J8
PICOD111ALJ7 PICOD131AKJ7
PICOD131AKJ7
PICOD131ALDJ7
PICOD131ALULSJ7,J8
DICOD127AV I7
PICOD137AKJ7
PICOD137ALULSJ7,J8
PICOD137ALULSJ7,J8 PICOD301AKJ7
PICOD137ALULSJ7,J8 PICOD301AKJ7 PICOD301ALDJ7
PICOD137ALULSJ7,J8 PICOD301AKJ7 PICOD301ALDJ7 PICOD301ALULSJ7,J8
PICOD137ALULS

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SMCD	.J4,J6,J8
SMCD111AK	.J9
SMCD131AK	.J9
SMCD131AKLS	.J9
SMCD131ALD	.J9
SMCD137AK	.J9
SMCD301AK	.J9
SMCL	.J9
SMCPK	.J9
SP1.2	.J9, J10
SP1.5	.J11

J

Pushwheel Switches

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## Order Description and Code Tables (Wiring Diagram)

<u>DPS10 - 131 - AK</u>		
Series/types	Codes	Connections
SH6	111 = Decimal	AK = pcb short
PICOD	131 = BCD	AL = pcb long
SMCD	137 = BCD Complement	LS = solder pin
DPS8	141 = BCD + Complement	AL/D = pcb long, interrupted
DPS9	301 = Hexadecimal	AKU = pcb long downward
DPS10	307 = Hexa. Complement	ALU = pcb long downward
	400 = Switch-over	

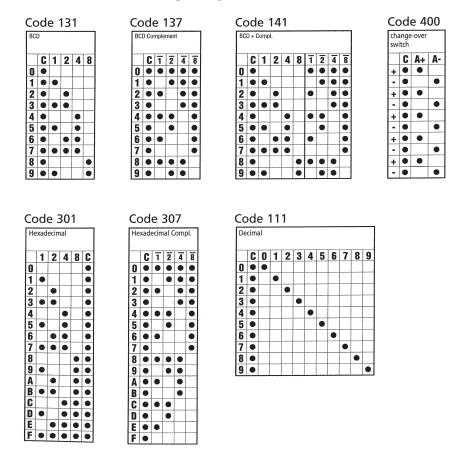
#### FACTORY ASSEMBLED GROUP

Special type numbers will be assigned for customers requiring delivery of assembled groups of code switches. These will be pre-tested, identified and individually packaged. Consult factory for details.

#### CUSTOM SWITCHES

Contact factory for information concerning the feasibility, pricing and delivery of special switches, including non-standard codes, limit stopping, special markings, PC terminals and optional colors.

## Code tables (wiring diagram)



J

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## **Specifications**

Series/Types Catalog Page			SH6 J6	PICOD J7-8	SMC-D J9
Dimensions/type of mountin	g				
panel / height x width	-		15x6 mm	15x7.62 mm	24x7.62mm
installed depth width PCB, sho	ort/long		23.5/30.8 mm	24/34.5 mm	32/42mm
insertion from the front	-		х	Х	х
insertion from the rear			Х		
Codes					
Code	switching position	printing			
111 decimal	10	0-9		Х	Х
131 BCD	10	0-9	Х	Х	Х
137 BCD complement	10	0-9	Х	Х	Х
141 BCD + complement	10	0-9			х
301 hexadecimal	16	0-9-A-F (0-15)		Х	Х
307 hexadecimal compl.	16	0-9-A-F (0-15)			
400 change-over switch	10	+,-,+,-, etc.		Х	
Electrical data					
operating voltage max.			40V	40V	40V
contact load, static max.			0.5A	0.5A	1A
contact load, dynamic (resistiv	e) max.		100mA	100mA	100mA
contact resistance type AK (measured from the supply line	e to the output)		< 100 mOhm	< 100 mOhm	< 100 mOhm
Technical data					
permissible ambient temperatu	ure		-20+80°C	-20+60°C	-20+80°C
expected life (switching cycles	)		> 10 <sup>5</sup>	> 10 <sup>5</sup>	> 10 <sup>6</sup>
actuating force approx.			4 N	3 N	4 N
weight approx.			1.5 g	2 g	4 g
digit height 10-/16-digit			3.1mm	3.1/2.4mm	4.9/3.4mm
click action (working point)			Х	Х	Х
vibration DIN EN 60068-2-6			Х	Х	Х
shock DIN EN 60068-2-27			Х	Х	х
Material					
housing: PPO UL94V-0			Х	Х	х
pc board: base material FR 4 i DIN IEC 249-2, contact surfact	respectively CEM3 e Au over Ni on C	3 Li	x	x	x
Connections					
AK: short			х	Х	х
AL: long			х	Х	х
LS: solder point			х	Х	х
AL/D: long/interrupted				Х	
ALU: long downward				x	х

J4

Catalog 1308390 Issued 9-04

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Dimensions are shown for reference purposes only. Specifications subject to change.



## **Specifications**

Series/Types Catalog Page			DPS8 J10	DPS9 J11	DPS10 J11
Dimensions/type of mountin	a				
panel / height x width	5		18x8mm	33x8mm	33x10mm
installed depth width PCB, sho	ort/long		32/41mm	39/50mm	39/50mm
insertion from the front	0		Х	Х	
insertion from the rear				Х	
Codes					
Code	switching position	printing			
111 decimal	10	0-9	Х	Х	х
131 BCD	10	0-9	Х	Х	х
137 BCD complement	10	0-9	Х	Х	х
141 BCD + complement	10	0-9	Х		
301 hexadecimal	16	0-9-A-F (0-15)	х	Х	Х
307 hexadecimal compl.	16	0-9-A-F (0-15)			
400 change-over switch	10	+,-,+,-, etc.			
Electrical data					
operating voltage max.			40V	40V	40V
contact load, static max.			1A	1A	1A
contact load, dynamic (resistiv	ve) max.		100mA	100mA	100mA
contact resistance type AK (measured from the supply line	e to the output)		< 100 mOhm	< 100 mOhm	< 100 mOhm
Technical data					
permissible ambient temperate	ure		-20+80°C	-20+80°C	-20+80°C
expected life (switching cycles	5)		> 10 <sup>6</sup>	> 106	> 10 <sup>6</sup>
actuating force approx.			4 N	4 N	4 N
weight approx.			4 g	6.5 g	7.5 g
digit height 10-/16-digit			4.9/3.4mm	6.8/4.3mm	7.0/4.3mm
click action (working point)			Х	Х	Х
vibration DIN EN 60068-2-6			Х	Х	Х
shock DIN EN 60068-2-27			Х	Х	Х
Material					
housing: PPO UL94V-0			Х	Х	Х
pc board: base material FR 4 DIN IEC 249-2, contact surfac	respectively CEM3 e Au over Ni on C	3 u	х	x	х
Connections					
AK: short			Х	х	х
AL: long			Х	х	х
LS: solder point			Х	Х	х
AKU: short downward					Х
ALU: long downward			х		

J5

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## Pushwheel Switches, Subminiature, Panel Mount, Dual Button

SH6 Series pushwheel switches are the smallest panel mounted dual pushbutton code switches available. They have a snap-action detent with an audible click. The dual-purpose finger terminals may be used for direct mounting on printed circuit boards, or wire may be soldered directly to the gold-plated conductors. The SH6 is designed for several means of panel mounting: groups of any number of switches may be snapped into panel holes of proper size and retained by the integral clips (front mounting), or groups may be held in place in a panel hole by being supported from rear when the switches are PC mounted. These reliable switches are made to the same exacting requirements as the SMCD, PICOD and DPS Series.

## MATERIAL SPECIFICATIONS

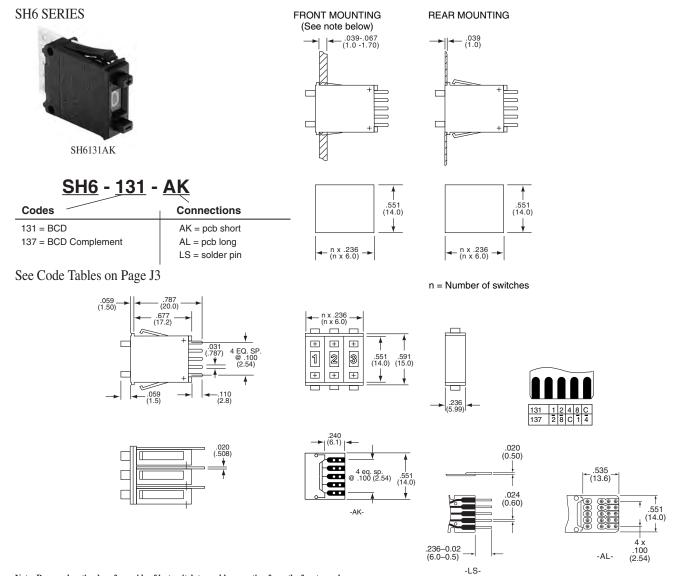
Moving Contacts	Gold-clad Ni over copper alloy
Fixed Contacts	AU over Ni
PC Board	FR4 Glass Epoxy
Molded Parts	Noryl-SE1, black matte finish
Window	•

#### TYPICAL PERFORMANCE CHARACTERISTICS

Contact Rating	0.4 VA @ 20 VDC (max.)
Contact Circuit Resistance	0.12 ohm max.

## PERFORMANCE CHARACTERISTICS

Operating Force	Approx. 11 oz.
PC Terminal Spacing	0.100"
Character Height/Color.	0.118" White
Life Expectancy	More than 10 <sup>5</sup> operations
	20°C to +80°C



Note: Remove locating lugs from side of last switch to enable mounting from the front panel.

J6

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Dimensions are in inches Dimer and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to cha

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Note: Use Card Edge Connector B5LS or B5L with AK type.

J

SH6 Series

## Pushwheel Switches, Subminiature, Panel Mount, Dual Button

The PICOD family offers small panel-mounted pushwheel code switches, ideally suited for high density applications. They are used for the controlling and programming of frequency synthesizers, counters and timers, data comparators, security encoders, weighing machines, etc. The dependable pushbutton action allows narrow 0.3 inch width on panel. Changes to higher or lower settings are accomplished rapidly by successive operation of the appropriate buttons. The featherweight PICOD is less than 0.6 inch high, yet rugged enough for hand-held and portable instruments that may be subjected to field abuse. Heavy gold plating on wiping contacts affords low contact resistance for reliable operation over long periods of service. Easy-to-read characters are viewed through dust-sealed window. Installation costs are minimized by snaptogether design – no inconvenient hardware.

## MATERIAL SPECIFICATIONS:

Fixed Contacts	1 microns AU over Ni over Cu
Moving Contacts	Gold-clad Ni over copper alloy
PC Board	FR4 Glass epoxy
Molded Parts	Noryl-SE1, Black matte finish
Window	Thermoplastic resin

#### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	0.4 VA @ 20 VDC max.
Contact Circuit Resistance	0.15 Ohm max.
Operating Force	Approx. 11 oz.
PC Terminal Spacing	0.100"
Character Height/Color	122" White (.094" for hex codes)
Life Expectancy	122" White (.094" for hex codes)More than $10^5$ operations
Operating temperature	$10^{\circ}$ C to + $60^{\circ}$ C

# Codes PICOD - 131 - AK

AK = pcb short

AL = pcb long

LS = solder pin

AL/D = pcb long, interrupted

ALU = pcb long downward

- 111 = Decimal
- 131 = BCD
- 137 = BCD Complement
- 301 = Hexadecimal
- 307 = Hexa. Complement
- 400 = Switch-over

See Code Tables on Page J3



#### ACCESSORIES

Front Mount Snap Detent	Description	Wheel Marks
PICOA PICOADP PICOBG PICOP B5LS B5L	Spacer, 0.3" wide ( End-plate pair 5 pin connector wi	with decimal point (same size as switch) th PC pins for AK types th wire lug termination for AK types

J

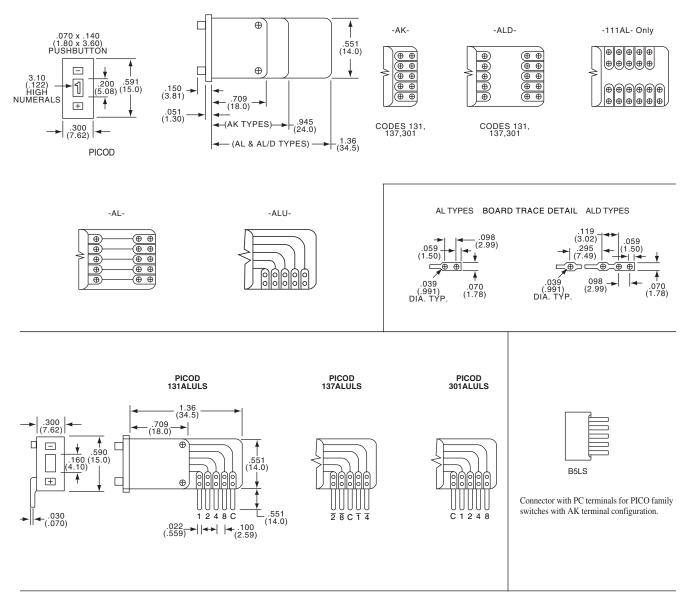
Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425



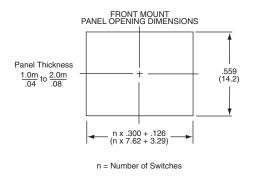
**PICOD Series** 

## **Pushwheel Switches, Options**

PICOD



PICOD



J8 🛛

Catalog 1308390 Issued 9-04

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## Pushwheel Switches, Mini, Front Mount

SMCD Series have large visible readout characters despite it's small size. This popular family is used in measurement and test instrumentation for range setting, data programming and count controlling; and in communications equipment for digital tuning. The simple, reliable bi-direction pushbutton mechanism permits rapid changes to either higher or lower numerical settings. Instrument-grade performance and long service life are enhanced by the heavy gold wiping contacts. Large readout characters are protected by dust-sealed windows. Snap-together grouping and snap-in panel mounting minimize installation time and cost. SMCD models have snap detent with slight audible click.

SMCD bi-directional code switches may be easily assembled into groups of any number. The tabs or pins of one decade section press fit into the holes in the adjacent section. Spacers and end mounting plates may be included in the same manner as desired.

Groups of SMCD switches with end plates snap into panel holes of the recommended size and are retained by plastic clips. Again, tools and additional hardware items are not required.

## MATERIAL SPECIFICATIONS:

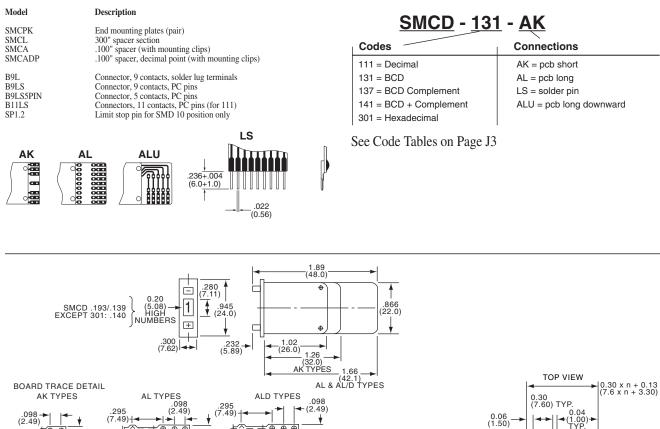
PC Board	Glass epoxy type, FR4
PC Terminals	Gold over Ni on Cu
Character Height/Color	White on black background
e e	SMC .197/.134; SMCD .193/.134
	Except 301 & SG558: .140 and
	SG557.120
Molded parts	
Housing	Black matte finish

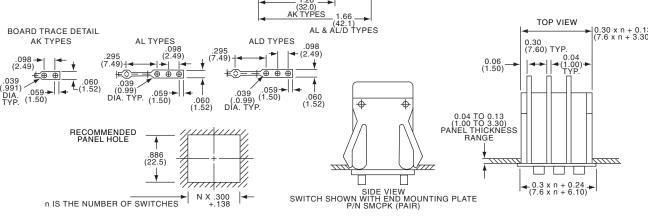
## TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating	0.4 VA @ 20 VDC or Peak AC
	0.12 Ohm max. (Total internal ckt. res.)
Mechanical Life	More than 10 <sup>6</sup> operations
Operational Force	Approx. 14 oz.

#### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature .....(-20°C to +80°C)





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Dimensions are in inches Dimensions are in inches Dimensions are in inches specified. Values in parentheses or brackets are metric equivalents. to

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## Pushwheel Switches, Mini, Rear Mount

The DPS8 Series is a compact, lower cost family of instrument grade, pushbutton code switches for numerical input applications. DPS8 models are similar in size to those of the SMCD Series and also feature a fast-snap-together assembly with conventional behind-the-panel mounting. A simple reliable bidirectional pushbutton mechanism allows rapid changes to either higher or lower numerical setting. Reliable performance in logic level circuits and long service life are provided by gold clad wiping contacts. A dust-sealed window protects the readout characters, which are larger than those of comparable thumbwheel switches. DPS8 switches have snap-action detent.

## MODULE ASSEMBLY **METHOD**

DPS bi-directional code switches may be easily assembled into groups of any number. Each switch, spacer or end-plate pair has appropriate snap-together assembly. No tools are required, little time consumed.

Groups of DPS8 switches, with end-plates mount into panel holes of the recommended size using four screws plus nuts and washers.

## MATERIAL SPECIFICATIONS

PC Board	Glass epoxy type, FR4
PC Terminal Spacing	DSP811: .079", 131,137, 141: .100"
Character Height/Color	0.193" White on black background
Housing	Noryl-SE1, Black, matte finish
Operating Force	Approx. 14 oz.

## TYPICAL PERFORMANCE CHARACTERISTICS

Contact Rating ......0.4 VA @ 20 VDC or Peak AC Contact Circuit Resistance ...0.15 ohms max. 

#### ENVIRONMENTAL SPECIFICATIONS

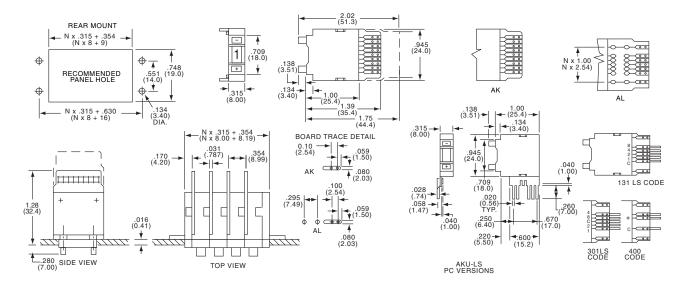
Operating Temperature  $\dots (-20^{\circ}C \text{ to } +80^{\circ}C)$ 

## ACCESSORIES

<b>Model</b>	Description
DPS8A	Spacer .157" (4mm)
DPS8L	.315" spacer section
DPS8P	End mounting plates, decorative only (pair)
DPS8PW	End mounting plates, flanged with mounting holes (pair)
B9L	Connector, 9 contacts, solder lug terminals
B9LS	Connector, 9 contacts, pc terminals
B11LS	Connector, 11 contacts, PC terminals (for Code III Switch)
SP1.2	Limit stop pin for 10 position only.

## <u>DPS8 - 131 - AK</u>

Codes	Connections	
111 = Decimal	AK = pcb short	
131 = BCD	AL = pcb long	
137 = BCD Complement	LS = solder pin	
141 = BCD + Complement	AKU = pcb short downward	
301 = Hexadecimal	ALU = pcb long downward	
See Code Tables on Page J3		



#### J10

J

**DPS8 Series** 

Catalog 1308390 Issued 9-04

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Dimensions are in inches

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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

## **Pushwheel Switches, Front Mount**

DPS9 and DPS10 dual pushbutton code switches have identical heights but differ in width. These switches provide silent, reliable state-of-the-art bi-directional operation and can directly retrofit common thumbwheel switches. The readout characters are up to 60% larger than those of comparable thumbwheels. DPS9 models have the popular .315" per section width, and DPS10 types are .395" wide.

A simple reliable dual pushbutton mechanism permits rapid change to a higher or a lower numerical setting. Gold clad wiping contacts provide dependable low-level operation and extended life expectancy. Snap-togther modular design enables fast assembly hardware. Wheel markings are protected by a dust-sealed window.

## MATERIAL SPECIFICATIONS:

PC Board	Glass epoxy type, FR4
PC Terminal Spa	cing100" Centers on integral multiples
Character Height	/ColorSee below
Housing	Noryl-SE1, Black, matte finish

#### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating0.4 VA @ 20 VDC or Peak AC
Contact Circuit Resistance0.20 Ohm max.
Mechanical LifeMore than 10 <sup>6</sup> operations
Operating ForceApprox. 16 oz.

#### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature  $\dots (-20^{\circ}C \text{ to } +80^{\circ}C)$ 

## ACCESSORIES

DPS9 Model	DPS10 M	odel Description		DPS9	DPS10
DPS910A DPS9L **DPS910P	DPS910A DPS10 DPS10L **DPS910	Spacer, 0.1 inch *Dummy switch (no el Spacer, same width as s P End mounting plate pai	witch	PANEL 1.1 OPENING (31	22 PANEL .0) OPENING (31.0)
B12L B12LS SP1.5 * Indicates switch	B12L B12LS SP1.5 mechanically	Connector, 12 contacts, Connector, 12 contacts, Limit stop pin for 10 pc operable, optionally available with wheel in	PC terminals osition switch	→ N x .315 + .354 (N x 8.00 + 9.00) ←	→ N x .393 + .354 (N x 10.00 + 9.00) ←
sold in pairs onl	y.	<u>DPS9</u> - <u>13</u>			
Series/type	es	Codes	Connections		
DPS9 DPS10		111 = Decimal 131 = BCD 137 = BCD Complement 301 = Hexadecimal	AK = pcb short AL = pcb long LS = solder pin	.236+.004 (6.0+1.0)	-S
See Code 7	Tables of	n Page J3		+  +	022 (0.56)
DP	S9	DPS10			
(8.00) (8.00) (6.81) (6.81) HIGH NUMBERS	$ \begin{array}{c c}  & 1.3 \\  & (33. \\  & (9.90) \\  & (9.90) \\  & \\  & \\  & \\  \end{array} $	(7.01) → 11 (9.90) HIGH NUMBERS ⊕ ↓	1.812 → (46.0)	1.20 30.5) N (2.54) N (2.54) N (2.54) N (2.54) N (2.54)	N (2.54) AL AK
Character hei	ght	Model DPS9 10 dig 16 dig Model DPS10 10 dig 16 dig	it .169 it .276		
Catalog 13083	90	Dimensions are in inches	Dimensions are shown		South America: 55-11-3611-1514

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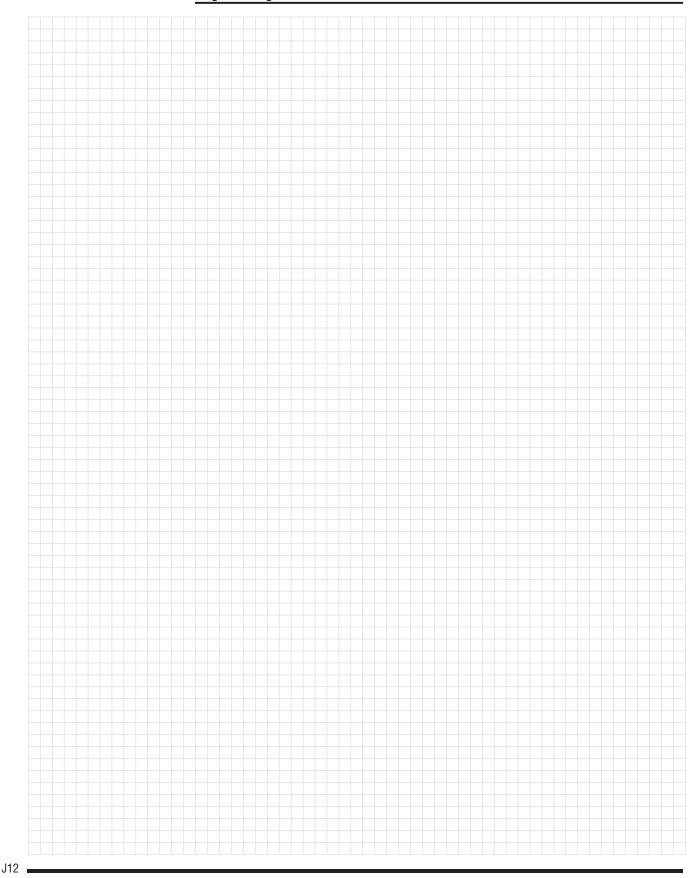
Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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**Engineering Notes** 



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tyco

Alcoknob

# Alcoswitch



K Series - Page K4



KE Series - Page K6



KN Series - Page K8



PKD Series - Page K14



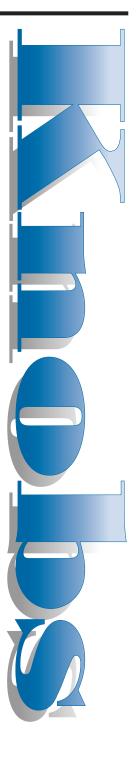
KCB Series - Page K5



KLNS Series - Page K8



PK Series - Page K13



K1

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## **Alcoknob Part Number Index**

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K900B1/4K4	
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KA500A1/8K4	
KA500B1/4K4	
KA500B1/8K4	
KA700A1/4K4	
KA700B1/4K4	
KA900A1/4K4	
KA900B1/4K4	
KAS500A1/4K4	
KAS500A1/8K4	
KAS500B1/4K4	
KAS500B1/8K4	
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KB500A1/8K5	
KB500B1/4K5	
KB500B1/8K5	
KB700A1/4K5	
KB700B1/4K5	
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KB900B1/4K5	
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KBS500A101/4K5	
KBS500A101/8K5	
KD5500D1/4 K5	
KBS500B1/4K5	
KBS500B1/8K5	
KBS500B101/4K5	
KBS500B101/8K5	
KCB500A1/4K5	
KCB500A1/8K5	
KCB500B1/4K5	
KCB500B1/8K5	
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KCB600B1/4K5	
KCB600B1/8K5	
KCD700A1/4 K5	
KCB700A1/4K5	
KCB700B1/4K5	
KCB900A1/4K5	
KCB900B1/4K5	
KCD900D1/4KJ	
KD1250A1/4K6	
KD1250B1/4K6	
KD500A1/4K6	
KD500A1/8K6	
KD500B1/4K6	
KD500B1/8K6	
KD700A1/4K6	
KD700B1/4K6	
KD/UUD1/4K0	
KD900A1/4K6	
KD900B1/4K6	
KE1250AB1/4K6	
KE500AB1/4K6	
KE500AB1/8K6	
KE700AB1/4K6	
KE900AB1/4K6	

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KE0500/1D1/4 .	•••••	120
KES700AB1/4 .		K6
KFS500B1/4		K7
KHF1250A1/4		K7
KHF700A1/4		K7
KHF900A1/4		K7
KLN1250A1/4 .		К/
KLN1250B1/4		K7
KLN500A1/8		K7
KLN500B1/8		K /
KLN500S1/4		K7
KLN700B1/4		K7
KLN700B1/8		K7
KLN900A1/4		K7
KLN900S1/4		K7
KLNS500A1/8 .		K8
KLNS500B1/4 .		K8
KLNS500B1/8 .		K8
KLNS700A1/4 .		K8
KLNS900A1/4 .		K8
KLNS900B1/4 .		K8
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		ZO
KN1250B1/4		К9
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		K9
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KN1750B1/4		Кð
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KN1751AS1/4		K8
KN1751B1/4		K8
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KN1751BA1/4 .	•••••	Кð
KN1751BS1/4		K8
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KN1755AD51/4 .		
KN1755AS1/4		K9
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KN500A1/4		K9
KN500A1/8		К9
KN500AB1/4	•••••	K9
KN500AB1/8		K9
KN500B1/4		
KN500B1/8		K9
KN500BA1/4		К0
KN500BA1/8		к9
KN501A1/4		K8
KN501 A 1/9		20
KN501A1/8	•••••	120
KN501B1/4		K8
KN501B1/8		
UNE01D 1/0	•••••	12.0
KN501BA1/8		K8
KNI5700 A 1/4		20
KN5700A1/4 KN5700B1/4	•••••	r.9
KN5700B1/4		K9
KN700A1/4	1	K0
KN7004D1/T	••••••	17.0
KN700AB1/4		
KN700B1/4		K9
KN700P A 1/4		K0
KN700BA1/4	•••••	r.9
KN701A1/4		K8
KN701B1/4		

KN701BA1/4K8
KN701BA1/8K8
KN900A1/4K9
KN900AB1/4K9
KN900B1/4K9
KN900BA1/4K9
KNS501A1/4K10
KNS501A1/8K10
KNS501B1/4K10
KNS501B1/8K10
KNS501BA1/4K10
KNS501BA1/8K10
KNS701A1/4K10
KNS701BA1/4K10
KNS701BA1/8K10
KPN500A1/4K10
KPN500A1/8K10
KPN500B1/4K10
KPN500B1/8K10
KPN700A1/4K10
KPN700B1/4K10
KPN900A1/4K10
KPN900B1/4K10
KR1K21
KR2K21
KR3K21
KS500A1/4K10
KS500A1/8K10
KS500B1/8K10
KS700A1/4K10
KS700B1/4K10
KS900A1/4K10
KS900B1/4K10
KT500A1/4K11
KT500B1/4K11
KT700A1/4K11
KT700B1/4K11
KT900A1/4K11
KT900B1/4K11
KU401B1/8K11
KU402B1/8K11
KU500B1/4K11
KU500B1/8K11
KU700B1/4K11
KUS402B1/8K11
KUS500B1/4K11
KUS500B1/8K11
KUS700B1/4K11
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PK50B1/4K12
PK70B1/4K12
PK90B1/4K12
PKA50B1/4K13
PKA50B1/8K13
PKA55B1/4K13
PKA55B1/8K13
PKA55B1/8K13 PKA70B1/4K13
PKA55B1/8K13 PKA70B1/4K13 PKA90B1/4K13
PKA55B1/8K13 PKA70B1/4K13 PKA90B1/4K13 PKAP50B1/4K13
PKA55B1/8K13 PKA70B1/4K13 PKA90B1/4K13 PKAP50B1/4K13 PKAP50B1/8K13
PKA55B1/8K13 PKA70B1/4K13 PKA90B1/4K13 PKAP50B1/4K13 PKAP50B1/8K13 PKAP70B1/4K13
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PKA55B1/8K13 PKA70B1/4K13 PKA90B1/4K13 PKAP50B1/4K13 PKAP50B1/4K13 PKAP70B1/4K13 PKB70B1/4K14 PKB90B1/4K14 PKD100B1/4K14
PKA55B1/8K13 PKA70B1/4K13 PKA90B1/4K13 PKAP50B1/4K13 PKAP50B1/8K13 PKAP70B1/4K13 PKB70B1/4K14 PKB90B1/4K14 PKD100B101/4K14 PKD100B101/4K14
PKA55B1/8K13 PKA70B1/4K13 PKA90B1/4K13 PKAP50B1/4K13 PKAP50B1/8K13 PKAP70B1/4K13 PKB70B1/4K14 PKB90B1/4K14 PKD100B101/4K14 PKD100B101/4K14 PKD60B1/4K14
PKA55B1/8       K13         PKA70B1/4       K13         PKA90B1/4       K13         PKAP50B1/4       K13         PKAP50B1/8       K13         PKAP50B1/4       K13         PKAP70B1/4       K13         PKAP50B1/4       K13         PKAP50B1/4       K14         PKB90B1/4       K14         PKD100B1/4       K14         PKD100B1/4       K14         PKD60B1/4       K14         PKD60B1/8       K14         PKD60B1/8       K14
PKA55B1/8K13 PKA70B1/4K13 PKA90B1/4K13 PKAP50B1/4K13 PKAP50B1/8K13 PKAP70B1/4K13 PKB70B1/4K14 PKB90B1/4K14 PKD100B101/4K14 PKD100B101/4K14 PKD60B1/4K14

PKD70B1/4K14
PKD70B101/4K14
PKDT100B1/4K15
PKDT100B101/4K15
PKDT60B101/8K15
PKDT70B1/4K15
PKDT70B101/4K15
PKE60B1/4K15
PKE60B1/8K15
PKE90B1/4K15
PKES120B1/4K15
PKES140B1/4K15
DVE0150D1/4
PKES150B1/4K15
PKES60B1/4K15
PKES60B1/8 K15
DVEC70D1/4 V15
PKES60B1/8K15 PKES70B1/4K15 PKES90B1/4K15
PKES90B1/4K15
PKF50B1/8K16
PKG100B1/4K17
DKC1055D1/4 K17
PKG1255B1/4K17
PKG40B1/8K16
PKG50B1/4K16
PKG50B1/8K16
1 K050D1/6K10
PKG60B1/4K17
PKG60B1/8K17
PKG70B1/4K17
PKG70B1/8K17
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PKGP100B1/4K17
DKCD70D1/4
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PKN90B1/4K18
PKNT60B1/4K18
PKNT60B1/8K18
PKNT70B1/4K18 PKNT90B1/4K18
PKNT90B1/4K18
PKS1103B101/4K18
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FK51104D1/4K19
PKS1105B101/4K19
PKS1106B1/4K19
PKS1132B1/4K19
PKS1132B101/4K19
PKS1132B51/4K19
PKS1132B91/4K19
PKS90B1/4K20
PKS90B101/4K20
PKX100B1/4K20
PKX110B1/4K20
PKX130B1/4K20
PKX50B1/4
PKX50B1/8K20
PKX60B1/4K20
PKX60B1/8K20

K2

K

Alcoknob

Catalog 1308390 Issued 9-04

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Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

tyco

Electronics

Alcoknob

## **General Knob Information**

## **SPECIFICATIONS**

## A. STANDARD KNOB TYPES

1. INSPECTION C	CRITERIA	- Normal inspection is performed without magnification while holding knob at a distance of 12 to 14 inches for a period of 5 seconds, under normal light. The following imperfections are not acceptable:
2. MATERIALS -	K Series:	Finish: visable marks or scratches, runs, or non-uniform coverage. Artwork: voids, specks, bleeding or other inconsistencies Machined aluminum alloy stock Finish: gloss anodize Setscrews: Stainless steel, type 303, hex head, cup point
	P Series:	General purpose phenolic (thermoset) (Max. Temp. 120-125°C continuous) Finish: Gloss (except PKX, matte) Insert: Brass Setscrews: Stainless steel, hex head, cup point Inlays: Skirts: Aluminum alloy, spun finish
B. CUSTOM TYPES		
1. ALUMINUM		uration - most semi-standard or custom designs can be machined. A drawing ired to provide a quotation. Non-standard shaft hole diameters are available also.

Finish - Anodizing or paint of various colors can be provided. A color chip is required to ensure proper color shade.

Artwork - alpha-numeric lettering, indicator lines, markings, etc. can be provided. Silkscreening and other processes are available.

2. PHENOLIC Configuration - most custom styles can be molded.

Colors - various custom colored standard knobs can be provided. Color chip is required.

Artwork - lettering, markings, etc. can be provided.

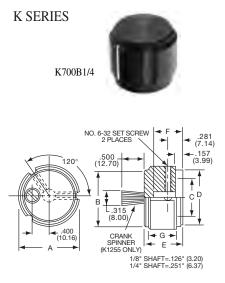
Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. Dimension Specification to change.

Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

Electronics

K Series

### **Knobs, Machined Aluminum**



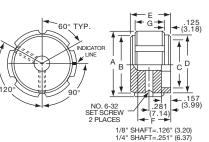
-		3 Fh	ite Design	with and	without I	ndicator L	ine		
Tyco Electronics	Alcoswitch	Color	A	В	С	D	Е	F	G
1437621-7 1437621-6 1437621-9 1437621-8	K500A1/8 K500A1/4 K500B1/8 K500B1/4	Natural Natural Black Black	.500(12.7) .500(12.7) .500(12.7) .500(12.7)	.430(10.9) .430(10.9) .430(10.9) .430(10.9)	.374(9.50) .374(9.50) .374(9.50) .374(9.50)	.430(10.9) .430(10.9) .430(10.9) .430(10.9)	.625(15.9) .625(15.9) .625(15.9) .625(15.9)	.429(10.9) .429(10.9) .429(10.9) .429(10.9)	.512(13.0) .512(13.0) .512(13.0) .512(13.0)
1-1437621-0 1-1437621-1	K700A1/4 K700B1/4	Natural Black	.740(18.8) .740(18.8)	.655(16.6) .655(16.6)	.591(15.0) .591(15.0)	.655(16.6) .655(16.6)	.625(15.9) .625(15.9)	.429(10.9) .429(10.9)	.512(13.0) .512(13.0)
1-1437621-3 1-1437621-4	K900A1/4 K900B1/4	Natural Black	.937(23.8) .937(23.8)	.817(20.8) .817(20.8)	.709(18.0) .709(18.0)	.817(20.8) .8827(20.8)	.625(15.9) .625(15.9)	.429(10.9) .429(10.9)	.512(13.0) .512(13.0)
1437621-2 1437621-3	K1250A1/4 K1250B1/4	Natural Black	1.25(31.8) 1.25(31.8)	1.11(28.2) 1.11(28.2)	.984(25.0) .984(25.0)	1.11(28.2) 1.11(28.2)	.750(19.1) .750(19.1)	.554(14.1) .554(14.1)	.630(16.00) .630(16.00)
Less Indicator 1437621-4	K1251B1/4	Black	1.25(31.8)	1.11(28.2)	.984(25.0)	1.11(28.2)	.750(19.1)	.554(14.1)	.630(16.00)
With Crank	Spinner + Les			1.11/20.20	004/05 0	1.11/20.20	750/10 1)	554/14.1	(20/1/ 00)
1437621-5	K1255AS1/4 K1255BS1/4	Natural Black	1.25(21.8) 1.25(31.8)	1.11(28.2) 1.11(28.2)	.984(25.0) .984(25.0)	$\begin{array}{c} 1.11(28.2) \\ 1.11(28.2) \end{array}$	.750(19.1) .750(19.1)	.554(14.1) .554(14.1)	.630(16.00) .630(16.00)

#### KA SERIES



., .

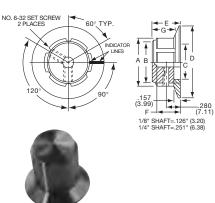
KA700B1/4



Tyco			6 Flute l	Design wi	th Indica	tor Line			
	Alcoswitch	Color	Α	В	С	D	Е	F	G
2-1437621-0	KA500A1/8	Natural	.500(12.7)	$\begin{array}{c} .430(10.9)\\ .430(10.9)\\ .430(10.9)\\ .430(10.9)\\ .430(10.9)\end{array}$	.375(9.53)	.430(10.9)	.625(15.9)	.512(13.0)	.430(10.9)
1-1437621-9	KA500A1/4	Natural	.500(12.7)		.375(9.53)	.430(10.9)	.625(15.9)	.512(13.0)	.430(10.9)
2-1437621-2	KA500B1/8	Black	.500(12.7)		.375(9.53)	.430(10.9)	.625(15.9)	.512(13.0)	430(10.9)
2-1437621-1	KA500B1/4	Black	.500(12.7)		.375(9.53)	.430(10.9)	.625(15.9)	.512(13.0)	430(10.9)
2-1437621-3	KA700A1/4	Natural	.750(19.1)	.655(16.6)	.590(15.0)	.655(16.6)	.625(15.9)	.512(13.0)	.430(10.9)
2-1437621-4	KA700B1/4	Black	.750(19.1)	.655(16.6)	.590(15.0)	.655(16.6)	.625(15.9)	.512(13.0)	.430(10.9)
2-1437621-5	KA900A1/4	Natural	.937(28.8)	.817(20.8)	.700(17.8)	.817(20.8)	.625(15.9)	.512(13.0)	.430(10.9)
2-1437621-6	KA900B1/4	Black	.937(28.8)	.817(20.8)	.700(17.8)	.817(20.8)	.625(15.9)	.512(13.0)	.430(10.9)
1-1437621-8	KA1250A1/4 KA1250B1/4	Natural Black	1.25(31.8) 1.25(31.8)	$\begin{array}{c} 1.11(28.2) \\ 1.11(28.2) \end{array}$	.985(25.0) .985(25.0)	1.11(28.2) 1.11(28.2)	.750(19.1) .750(19.1)	.630(16.0) .630(16.0)	.554(14.1) .554(14.1)

#### **KAS SERIES**





6 Flute Design with Aluminum Skirt and Indicator Lines Tyco										
Electronics	Alcoswitch	Color	Α	В	С	D	Е	F	G	
2-1437621-7 3-1437621-0	KAS500A1/8 KAS500A1/4 KAS500B1/8 KAS500B1/4	Natural Natural Black Black	.500(12.7) .500(12.7) .500(12.7) .500(12.7)	$\begin{array}{c} .430(10.9)\\ .430(10.9)\\ .430(10.9)\\ .430(10.9)\\ .430(10.9)\end{array}$	$\begin{array}{c} .380(9.65)\\ .380(9.65)\\ .380(9.65)\\ .380(9.65)\\ .380(9.65)\end{array}$	.740(18.8) .740(18.8) .740(18.8) .740(18.8)	$\begin{array}{c} .630(16.0)\\ .630(16.0)\\ .630(16.0)\\ .630(16.0)\\ .630(16.0)\end{array}$	.510(13.0) .510(13.0) .510(13.0) .510(13.0)	.430(10.9) .430(10.9) .430(10.9) .430(10.9)	
	KAS700A1/4 KAS700B1/4	Natural Black	.750(19.1) .750(19.1)	.650(16.5) .650(16.5)	.590(15.0) .590(15.0)	$\begin{array}{c} 1.14(29.0) \\ 1.14(29.0) \end{array}$	.630(16.0) .630(16.0)	.510(13.0) .510(13.0)	.430(10.9) .430(10.9)	
3-1437621-3 3-1437621-4	KAS900A1/4 KAS900B1/4	Natural Black	.940(23.9) .940(23.9)	.820(20.8) .820(20.8)	.710(18.0) .710(18.0)	$\begin{array}{c} 1.40(35.6) \\ 1.40(35.6) \end{array}$	.630(16.0) .630(16.0)	.510(13.0) .510(13.0)	.430(10.9) .430(10.9)	

K4

Catalog 1308390 Issued 9-04

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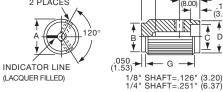
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Electronics

K Series

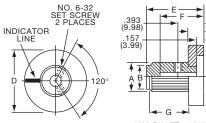
**Knobs, Machined Aluminum** NO. 6-32 SET SCREW 2 PLACES

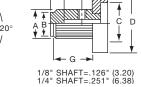


T	777	•	(8.0	← . ← .;3	18 .00)
т В - ♥					)
.050 (1.53) 1/8"		— G		3.20	)

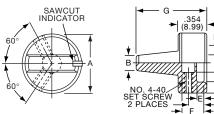
	Con	trol Kn	ob with S	traight K	nurl and	Top Line	Indicator	r	
Тусо									
Electronics	Alcoswitch	Color	Α	В	С	D	E	F	G
3-1437621-6	KB500A1/8	Natural	.500(12.7)	.433(11.0)	.394(10.0)	.472(12.0)	.787(20.0)	.630(16.0)	.610(15.5)
3-1437621-5	KB500A1/4	Natural	.500(12.7)	.433(11.0)	.394(10.0)	.472(12.0)	.787(20.0)	.630(16.0)	.610(15.5)
3-1437621-9	KB500B1/8	Black	.500(12.7)	.433(11.0)	.394(10.0)	.472(12.0)	.787(20.0)	.630(16.0)	.610(15.5)
3-1437621-8	KB500B1/4	Black	.500(12.7)	.433(11.0)	.394(10.0)	.472(12.0)	.787(20.0)	.630(16.0)	.610(15.5)
4-1437621-0	KB700A1/4	Natural	.750(19.0)	.673(17.1)	.581(15.0)	.705(17.9)	.787(20.0)	.630(16.0)	.610(15.5)
4-1437621-2	KB700B1/4	Black	.750(19.0)	.673(17.1)	.581(15.0)	.705(17.9)	.787(20.0)	.630(16.0)	.610(15.5)
4-1437621-4	KB900A1/4	Natural	.930(23.6)	.866(22.0)	.710(18.0)	.902(22.9)	.787(20.0)	.630(16.0)	.610(15.5)
4-1437621-5	KB900B1/4	Black	.930(23.6)	.866(22.0)	.710(18.0)	.902(22.9)	.787(20.0)	.630(16.0)	.610(15.5)

.236 (5.99)





		Cont	rol Knob	with Stra	aight Knu	rl and Sk	airt		
Tyco	A 1	Calar		р	C	D	Б	Б	C
Electronics	Alcoswitch	Color	A	B	U	D	E	F	G
With 0-9 Nun	ierals (36°)								
4-1437621-9	KBS500A101/8	8 Natural	.500(12.7)	.433(11.0)	.708(18.0)	1.00(25.4)	.950(24.1)	.826(21.0)	.655(16.7)
	KBS500A101/4	4 Natural	.500(12.7)	.433(11.0)	.708(18.0)	1.00(25.4)	.950(24.1)	.826(21.0)	.655(16.7)
5-1437621-3	KBS500B101/8	8 Black	.500(12.7)	.433(11.0)	.708(18.0)	1.00(25.4)	.950(24.1)	.826(21.0)	.655(16.7)
5-1437621-2	KBS500B101/4	Black	.500(12.7)	.433(11.0)	.708(18.0)	1.00(25.4)	.950(24.1)	.826(21.0)	.655(16.7)
With Indicate	or Line								
4-1437621-8	KBS500A1/8	Natural	.500(12.7)	.433(11.0)	.708(18.0)	1.00(25.4)	.950(24.1)	.826(21.0)	.655(16.7)
4-1437621-7	KBS500A1/4	Natural	.500(12.7)	.433(11.0)	.708(18.0)	1.00(25.4)	.950(24.1)	.826(21.0)	.655(16.7)
5-1437621-1	KBS500B1/8	Black	.500(12.7)	.433(11.0)	.708(18.0)	1.00(25.4)	.950(24.1)	.826(21.0)	.655(16.7)
5-1437621-0	KBS500B1/4	Black	.500(12.7)	.433(11.0)	.708(18.0)	1.00(25.4)	.950(24.1)	.826(21.0)	.655(16.7)



1/8" SHAFT=.126" (3.20) 1/4" SHAFT=.251" (6.38)
Control Knob with Sawcut Indi

		(	Control K	nob with	Control Knob with Sawcut Indicator										
Tyco	. Alexan:4ab	Calar		р	C	D	Б	Б	C						
Electronics	S Alcoswitch	Color	A	B	С	D	E	F	G						
5-1437621-7	KCB500A1/8	Natural	.500(12.7)	.197(5.08)	.374(9.50)	.126(3.20)	.118(3.00)	.335(8.51)	.750(19.1)						
5-1437621-6	KCB500A1/4	Natural	.500(12.7)	.197(5.08)	.374(9.50)	.252(6.40)	.118(3.00)	.335(8.51)	.750(19.1)						
5-1437621-9	KCB500B1/8	Black	.500(12.7)	.197(5.08)	.374(9.50)	.126(3.20)	.118(3.00)	.335(8.51)	.750(19.1)						
5-1437621-8	KCB500B1/4	Black	.500(12.7)	.197(5.08)	.374(9.50)	.252(6.40)	.118(3.00)	.335(8.51)	.750(19.1)						
6-1437621-0	KCB600A1/8	Natural	.618(15.7)	.197(5.08)	.394(10.0)	.126(3.20)	.118(3.00)	.335(8.51)	.750(19.1)						
	KCB600A1/4	Natural	.618(15.7)	.197(5.08)	.39410.0)	.252(6.40)	.118(3.00)	.335(8.51)	.750(19.1)						
6-1437621-2	KCB600B1/8	Black	.618(15.7)	.197(5.08)	.394(10.0)	.126(3.20)	.118(3.00)	.335(8.51)	.750(19.1)						
6-1437621-1	KCB600B1/4	Black	.618(15.7)	.197(5.08)	.394(10.0)	.252(6.40)	.118(3.00)	.335(8.51)	.750(19.1)						
6-1437621-3	KCB700A1/4	Natural	.746(18.8)	.197(5.08)	.512(13.0)	.250(6.35)	.118(3.00)	.335(8.51)	.898(22.8)						
6-1437621-4	KCB700B1/4	Black	.746(18.8)	.197(5.08)	.512(13.0)	.250(6.35)	.118(3.00)	.335(8.51)	.898(22.8)						
6-1437621-5	KCB900A1/4	Natural	.937(23.8)	.197(5.08)	.709(18.0)	.250(6.35)	.118(3.00)	.335(8.51)	.898(22.8)						
6-1437621-7	KCB900B1/4	Black	.937(23.8)	.197(5.08)	.709(18.0)	.250(6.35)	.118(3.00)	.335(8.51)	.898(22.8)						

Catalog 1308390	
Issued 9-04	

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**KB SERIES** 



KB500A1/4



## **KBS SERIES**



KBS500A101/4



KCB SERIES

KCB500A1/4

K

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

KCB700B1/4

Electronics

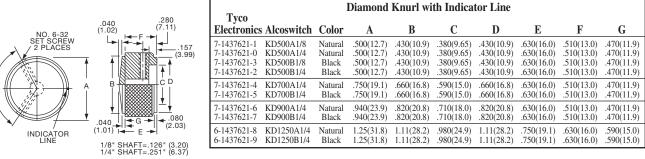
K Series

### **Knobs, Machined Aluminum**

### **KD SERIES**



KD1250B1/4



### **KE SERIES**

120



KE900AB1/4



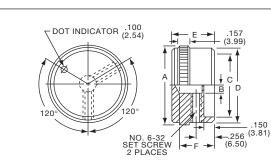
## KES SERIES



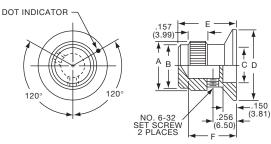
Κ

K Series

KES500AB1/4



Tyco	Knurl Grip with Top Dot Indicator Tyco									
	Alcoswitch Color	A	В	С	D	Е	F			
8-1437621-0 7-1437621-9	KE500AB1/8 KE500AB1/4	Ntl Blk. Ntl Blk.	.500(12.7) .500(12.7)	.126(3.20) .126(3.20)		.460(11.7) .460(11.7)	.625(15.9) .62515.9)	.512(13.0) .512(13.0)		
8-1437621-1	KE700AB1/4	Ntl Blk.	.740(18.8)	.251(6.38)	.630(16.0)	.708(18.0)	.625(15.9)	.512(13.0)		
8-1437621-2	KE900AB1/4	Ntl Blk.	.93(23.8)	.251(6.38)	.787(20.0)	.900(22.9)	.625(15.9)	.512(13.0)		
7-1437621-8	KE1250AB1/4	Ntl Blk.	1.25(31.8)	.251(6.38)	1.06(26.9)	1.17(29.7)	.625(15.9)	.512(13.0)		



	Knurl Grip with Dot Indicator on Skirt									
Тусо										
Electronics	Electronics Alcoswitch Color A B C D E F									
8-1437621-4	KES500AB1/8	Ntl Blk.	.500(12.7)	.460(11.7)	.382(9.70)	.750(19.1)	.625(15.9)	.512(13.0)		
8-1437621-3	KES500AB1/4	Ntl Blk.	.500(12.7)	.460(11.7)	.382(9.70)	.750(19.1)	.625(15.9)	.512(13.0)		
8-1437621-5	KES700AB1/4	Ntl Blk.	.750(19.1)	.710(18.1)	.630(16.0)	1.13(28.7)	.625(15.9)	.512(13.0)		
	KES900AB1/4	Ntl Blk.	.937(23.8)	.897(22.8)	.787(20.0)	1.44(36.6)	.625(15.9)	.512(13.0)		

K6

Catalog 1308390 Issued 9-04

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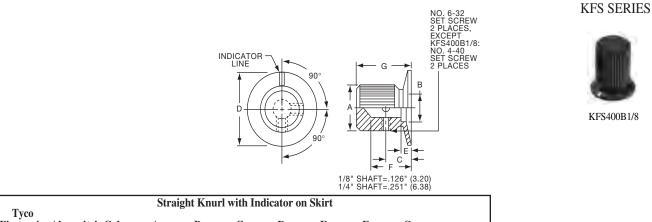
Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

tyco

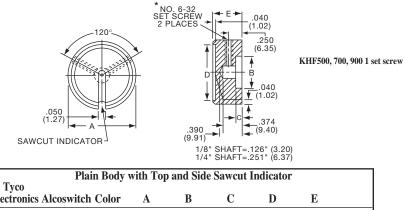
I

K Series

## **Knobs, Machined Aluminum**



Tyco									
Electronics	Alcoswitch	Color	A l	B C	D	Е	F	G	
8-1437621-6	KFS400B1/8	Black Matte	.380(9.65)	.382(9.70)	.256(6.50)	.500(12.7)	.098(2.49)	.469(11.9)	0.591(15.0)
8-1437621-8	KFS500B1/8	Black Matte	.500(12.7)	.382(9.70)	.252(6.48)	.630(16.0)	.161(4.09)	.469(11.9)	.630(16.0)
8-1437621-7	KFS500B1/4	Black Matte	.618(15.7)	.280(7.11)	.382(9.70)	1.00(25.4)	.161(4.09)	.630(16.0)	0.811(20.6)
8-1437621-9	KFS600B1/4	Black Matte	.618(15.7)	.280(7.11)	.382(9.70)	1.00(25.4)	.161(4.09)	.630(16.0)	0.811(20.6)



_	Plain Body with Top and Side Sawcut Indicator										
Tyco Electronics	Alcoswitch Co	olor	A	B	С	D	E				
9-1437621-1 9-1437621-2 9-1437621-3 *9-1437621-0	KHF500A1/4 KHF700A1/4 KHF900A1/4 KHF1250A1/4	Natural Natural Natural Natural	.500(12.7) .740(18.8) .937(23.8) 1.23(31.8)	.374(9 .590(1 .708(1 .984(2	5.0) 8.0)	.118(3.00) .118(3.00) .118(3.00) .118(3.00)	.342(8.69) .592(15.0) .779(19.8) 1.08(27.5)	.563(14.3) .563(14.3) .563(14.3) .563(14.3)			

KHF SERIES



KHF500A1/4



KHF900A1/4

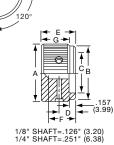
Tues			Straight Kr	nurl with To	p and Side	Indicator				
Tyco Electronics	Alcoswitch	Color	Α	B C	D	E	F	G		
9-1437621-7 9-1437621-6 9-1437621-9 9-1437621-8 1437622-1	KLN500A1/8 KLN500A1/4 KLN500B1/8 KLN500B1/4 KLN500S1/4	Natural Natural Black Black Smoke	.500(12.7) .500(12.7) .500(12.7) .500(12.7) .500(12.7)	$\begin{array}{c} 0.445(11.3)\\ 0.445(11.3)\\ 0.445(11.3)\\ 0.445(11.3)\\ 0.445(11.3)\\ 0.445(11.3)\end{array}$	.374(9.50) .374(9.50) .374(9.50) .374(9.50) .374(9.50) .374(9.50)	.281(7.14) .281(7.14) .281(7.14) .281(7.14) .281(7.14) .281(7.14)	.625(15.9) .625(15.9) .625(15.9) .625(15.9) .625(15.9) .625(15.9)	.512(13.0) .512(13.0) .512(13.0) .512(13.0) .512(13.0) .512(13.0)	.527(13.4) .527(13.4) .527(13.4) .527(13.4) .527(13.4) .527(13.4)	
1437622-2 1437622-3 1437622-4 1437622-5	KLN700A1/4 KLN700B1/4 KLN700B1/8 KLN700S1/4	Natural Black Black Smoke	.740(18.8) .740(18.8) .740(18.8) .740(18.8)	.685(17.4) .685(17.4) .685(17.4) .685(17.4)	.591(15.0) .591(15.0) .591(15.0) .591(15.0)	.281(7.14) .281(7.14) .281(7.14) .281(7.14) .281(7.14)	.625(15.9) .625(15.9) .625(15.9) .625(15.9)	.512(13.0) .512(13.0) .512(13.0) .512(13.0)	.527(13.4) .527(13.4) .527(13.4) .527(13.4)	120°
1437622-6 1437622-7 1437622-8	KLN900A1/4 KLN900B1/4 KLN900S1/4	Natural Black Smoke	.937(23.8) .937(23.8) .937(23.8)	.882(22.4) .882(22.4) .882(22.4)	0.709(18.0) 0.709(18.0) 0.709(18.0)	.281(7.14) .281(7.14) .281(7.14)	.625(15.9) .625(15.9) .625(15.9)	.512(13.0) .512(13.0) .512(13.0)	.527(13.4) .527(13.4) .527(13.4)	
9-1437621-4 9-1437621-5	KLN1250A1/4 KLN1250B1/4		1.252(31.80) 1.252(31.80)		.984(25.0) .984(25.0)	.281(7.14) .281(7.14)	.625(15.9) .625(15.9)	.512(13.0) .512(13.0)	.527(13.4) .527(13.4)	1

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USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425 IO. 6-32 T SCREW PLACES KLN500A1/4



K7

Κ

**K** Series

Electronics

K Series

## Alcoswitch

### **Knobs, Machined Aluminum**

### KLNS SERIES



KLNS500B1/8



#### **KN SERIES**

2	2.80 (7.11) (7.14)	Тусо			Straight Kn						
	B		Alcoswitch		AF		<u>D</u>	E	F	G	1.5.4.1.50
KN501A1/4		5-1437622-1 5-1437622-0	KN501A1/8 KN501A1/4	Natural Natural	.500(12.7) .500(12.7)	.445(11.3) .445(11.3)	.374(9.50) .374(9.50)	.445(11.3) .445(11.3)	.625(15.9) .625(15.9)		.456(11.58) .456(11.58)
		5-1437622-3	KN501B1/8	Black	.500(12.7)	.445(11.3)	.374(9.50)	.445(11.3)	.625(15.9)		.456(11.58)
	(2.03)	5-1437622-2	KN501B1/4	Black	.500(12.7)	.445(11.3)	.374(9.50)	.445(11.3)	.625(15.9)		.456(11.58)
NO. 6-32 SET SCREW 2 PLACES	1/8" SHAFT=.126" (3.20) 1/4" SHAFT=.251" (6.38)										
	4	6-1437622-2	KN701A1/4	Natural	.750(19.1)	.695(17.7)	.590(15.0)	695(17.7)	.625(15.9)		.456(11.58)
		6-1437622-3	KN701B1/4	Black	.750(19.1)	.695(17.7)	.590(15.0)	695(17.7)	.625(15.9)	.512(13.0)	.456(11.58)
	120°	<b>Two Toned</b> 5-1437622-5 5-1437622-4	KN501BA1/8 KN501BA1/4		.500(12.7) .500(12.7)	.445(11.3) .445(11.3)	.374(9.50) .374(9.50)	.445(11.3) .445(11.3)	.625(15.9) .625(15.9)		.456(11.58) .456(11.58)
	*	6-1437622-5 6-1437622-4	KN701BA1/8 KN701BA1/4		.750(19.1) .750(19.1)	.695(17.7) .695(17.7)	.590(15.0) .590(15.0)	695(17.7) 695(17.7)	.625(15.9) .625(15.9)		.456(11.58) .456(11.58)

SPINNER (MODEL KN-1751S ONLY)

NO. 6-32 SET SCREW 2 PLACES

20

B

1.75(44.5)

1.75(44.5)

1.75(44.5)

1.75(44.5)

1.75(44.5) 1.75(44.5)

1.75(44.5) 1.75(44.5)

A

Natural

Black Body - Top Ntl. - Blk.

Blk. - Natural

Natural

Black

Natural Black

⊢.738 (18.8)

в

▲ .157
 ▲ (3.99)
 ▲

E

1.65(41.9)

1.65(41.9)

1.65(41.9)

1.65(41.9)

1.65(41.9)1.65(41.9)

 $\begin{array}{rrr} 1.38(35.1) & 1.65(41.9) \\ 1.38(35.1) & 1.65(41.9) \end{array}$ 

F

.620(15.0) .620(15.8)

.620(15.8) .620(15.8)

.620(15.8) .620(15.8)

.620(15.8) .620(15.8)

G

F 1/4" SHAFT=.251" (6.38)

D

1.38(35.1)

1.38(35.1)

1.38(35.1)

1.38(35.1)

1.38(35.1) 1.38(35.1)

512 (13.00)

.281 (7.14)

Ċ

Straight Knurl with & without "Fingertip" Spinner

С

1.55(39.4)

1.55(39.4)

1.55(39.4)

1.55(39.4)

1.55(39.4) 1.55(39.4)

1.55(39.4) 1.55(39.4)

### **KN SERIES**



KN1751AS1/4



KN1751B1/4

Catalog 1308390 Issued 9-04

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Тусо

Less Indicator

3-1437622-2 3-1437622-6

Two Toned

3-1437622-3 3-1437622-7

3-1437622-1

3-1437622-5 3-1437622-8

With Indicator

**Electronics Alcoswitch Color** 

KN1751A1/4 KN1751B1/4

KN1751AB1/4 KN1751BA1/4

KN1750A1/4 KN1750B1/4

KN1751AS1/4 KN1751BS1/4

With Spinner/Less Indicator

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G

.508(12.9) .508(12.9)

.508(12.9) .508(12.9)

.508(12.9) .508(12.9)

.508(12.9) .508(12.9)

.480(12.2)

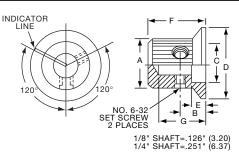
.480(12.2)

.480(12.2) .480(12.2)

.480(12.2)

.480(12.2)

.480(12.2) .480(12.2)



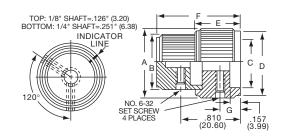
	S	traight ]	Knurl with 1	Indicator I	ine on To	p, Side and	l Skirt		
Tyco Electronics	Alcoswitch C	olor	A B	С	D	Е	F	G	
1-1437622-6 1-1437622-5 1-1437622-8 1-1437622-7	KLNS500A1/8 KLNS500A1/4 KLNS500B1/8 KLNS500B1/4	Natural Natural Black Black	.500(12.7) .500(12.7) .500(12.7) .500(12.7)	.280(7.11) .280(7.11) .280(7.11) .280(7.11)	.380(9.65) .380(9.65) .380(9.65) .380(9.65)	.750(19.0) .750(19.0) .750(19.0) .750(19.0)	.160(4.07) .160(4.07) .160(4.07) .160(4.07)	.630(16.0) .630(16.0)	.510(13.0) .510(13.0) .510(13.0) .510(13.0)
2-1437622-0 2-1437622-1	KLNS700A1/4 KLNS700B1/4	Natural Black	.750(19.0) .750(19.0)	.280(7.11) .280(7.11)	.590(14.9) .590(14.9)	1.13(28.7) 1.13(28.7)	.160(4.07) .160(4.07)		.510(13.0) .510(13.0)
2-1437622-2 2-1437622-3	KLNS900A1/4 KLNS900B1/4	Natural Black	.940(23.9) .940(23.9)	.280(7.11) .280(7.11)	.710(18.0) .710(18.0)	$\begin{array}{c} 1.40(35.5) \\ 1.40(35.5) \end{array}$	.160(4.07) .160(4.07)		.510(13.0) .510(13.0)

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K8



## **Knobs, Machined Aluminum**



Concentric Set with Straight Knurl with Indicator Lines Tyco										
Electronics Alcoswitch Color A B C D E F G										
	KN5700A1/4 KN5700B1/4	Natural Black	.750(19.1) .750(19.1)	.500(12.7) .500(12.7)		90(15.0) 90(15.0)	.700(17.8) .700(17.8)	.625(15.9) .625(15.9)	1.16(29.5) 1.16(29.5)	.281(7.14) .281(7.14)

_	

**KN SERIES** 



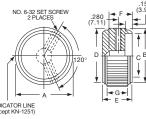
KN5700B1/4

		Stra	ight Knur Di	l with & wi ameter Di	ithout Indi nensions	cator Line			
Tyco Electronics	Alcoswitch	Color Body-Top	A	В	С	D	Е	F	G
4-1437622-3	KN500A1/8	Natural	.500(12.7)	.445(11.3)	.374(9.50)	.445(11.5)	.625(15.9)	.512(13.0)	.456(11.6)
4-1437622-2	KN500A1/4	Natural	.500(12.7)	.445(11.3)	.374(9.50)	.445(11.5)	.625(15.9)	.512(13.0)	.456(11.6)
4-1437622-7	KN500B1/8	Black	.500(12.7)	.445(11.3)	.374(9.50)	.445(11.5)	.625(15.9)	.512(13.0)	.456(11.6)
4-1437622-6	KN500B1/4	Black	.500(12.7)	.445(11.3)	.374(9.50)	.445(11.5)	.625(15.9)	.512(13.0)	.456(11.6)
5-1437622-8	KN700A1/4	Natural	.750(19.1)	.695(17.7)	.590(15.0)	.695(17.7)	.625(15.9)	.512(13.0)	.456(11.6)
6-1437622-0	KN700B1/4	Black	.750(19.1)	.695(17.7)	.590(15.0)	.695(17.7)	.625(15.9)	.512(13.0)	.456(11.6)
6-1437622-6	KN900A1/4	Natural	.949(24.1)	.894(22.7)	.696(17.7)	.894(22.7)	.625(15.9)	.512(13.0)	.456(11.6)
6-1437622-8	KN900B1/4	Black	.949(24.1)	.894(22.7)	.696(17.7)	.894(22.7)	.625(15.9)	.512(13.0)	.456(11.7)
2-1437622-5	KN1250A1/4	Natural	1.25(31.8)	1.20(30.5)	.984(25.0)	1.20(30.5)	.625(15.9)	.512(13.0)	.456(11.6)
2-1437622-7	KN1250B1/4	Black	1.25(31.8)	1.20(30.5)	.984(25.0)	1.20(30.5)	.625(15.9)	.512(13.0)	.456(11.6)
<b>Two-Toned</b> 4-1437622-5 4-1437622-4 4-1437622-9 4-1437622-8	KN500AB1/8 KN500AB1/4 KN500BA1/8 KN500BA1/4	Ntl - Blk. Ntl - Blk Blk Ntl. Blk Ntl.	.500(12.7) .500(12.7) .500(12.7) .500(12.7)	.445(11.3) .445(11.3) .445(11.3) .445(11.3)	.374(9.50) .374(9.50) .374(9.50) .374(9.50)	.445(11.5) .445(11.5) .445(11.5) .445(11.5)	.625(15.9) .625(15.9) .625(15.9) .625(15.9)	.512(13.0) .512(13.0) .512(13.0) .512(13.0)	.456(11.6) .456(11.6) .456(11.6) .456(11.6)
5-1437622-9	KN700AB1/4	Ntl - Blk	.750(19.1)	.695(17.7)	445(11.5)	.695(17.7)	.625(15.9)	.512(13.0)	.456(11.6)
6-1437622-1	KN700BA1/4	Blk Ntl.	.750(19.1)	.695(17.7)	445(11.5)	.695(17.7)	.625(15.9)	.512(13.0)	.456(11.6)
6-1437622-7	KN900AB1/4	Ntl - Blk	.949(24.1)	.89422.7)	.695(17.7)	894(22.7)	.625(15.9)	.512(13.0)	.456(11.6)
6-1437622-9	KN900BA1/4	Blk Ntl.	.949(24.1)	.894(22.7)	.695(17.7)	.894(22.7)	.625(15.9)	.512(13.0)	.456(11.7)
2-1437622-6	KN1250AB1/4	Ntl - Blk	1.25(31.8)	1.20(30.5)	.984(25.0)	1.20(30.5)	.625(15.9)	.512(13.0)	.456(11.6)
2-1437622-8	KN1250BA1/4	Blk Ntl.	1.25(31.8)	1.20(30.5)	.984(25.0)	1.20(30.5)	.625(15.9)	.512(13.0)	.456(11.6)
Less Indicator 2-1437622-9 3-1437622-0	r KN1251A1/4 KN1251B1/4	Natural Black	1.25(31.8) 1.25(31.8)	1.20(30.5) 1.20(30.5)	.984(25.0) .984(25.0)	1.25(31.7) 1.25(31.7)	.625(15.9) .625(15.9)	.512(13.0) .512(13.0)	.456(11.7) .456(11.7)

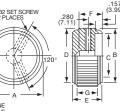


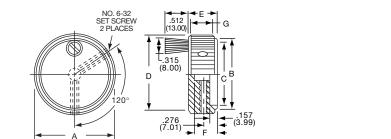


KN900BA1/4



KN500A1/4





1/4" SHAFT=.251" (6.38)

#### Straight Knurl with "Crank" Spinner

Tyco Electronics	Alcoswitch	Color Body-Top/Spin	A	В	С	D	Е	F	G
	KN1755AS1/4 KN1755BS1/4	Natural Black	1.76(44.7) 1.76(44.7)	1.56(39.5 1.56(39.5)	.138(35.0) .138(35.0)	1.65(41.8) 1.65(41.8)	.630(16.0) .630(16.0)	.512(13.0) .512(13.0)	.492(12.5) .492(12.5)
	KN1755ABS1/4 KN1755BAS1/4		1.76(44.7) 1.76(44.7)	1.56(39.5) 1.56(39.5)	1.38(35.0) 1.38(35.0)	$\begin{array}{c} 1.65(41.8) \\ 1.65(41.8) \end{array}$	.630(16.0) .630(16.0)	.512(13.0) .512(13.0)	.492(12.5) .492(12.5)

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**KN SERIES** 



KN1755BS1/4

**K** Series

K

K9

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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tyco

K Series

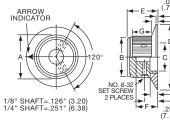
**Knobs, Machined Aluminum** 

## **KNS SERIES**









Tyco		Straig	ht Knurl v	vith Arrov	whead Ind	icator on S	Skirt		
	Alcoswitch	Color	Α	В	С	D	Е	F	G
7-1437622-3	KNS501A1/8	Natural	.500(12.7)	.445(11.3)	.370(9.40)	.750(19.1)	.625(15.9)	.512(13.0)	.428(10.9)
7-1437622-2	KNS501A1/4	Natural	.500(12.7)	.445(11.3)	.370(9.40)	.750(19.1)	.625(15.9)	.512(13.0)	.428(10.9)
7-1437622-5	KNS501B1/8	Black	.500(12.7)	.445(11.3)	.370(9.40)	.750(19.1)	.625(15.9)	.512(13.0)	.428(10.9)
7-1437622-4	KNS501B1/4	Black	.500(12.7)	.445(11.3)	.370(9.40)	.750(19.1)	.625(15.9)	.512(13.0)	.428(10.9)
7-1437622-8	KNS701A1/4	Natural	.750(19.1)	.695(17.7)	.590(15.0)	1.12(28.5)	.625(15.9)	.512(13.0)	.428(10.9)
7-1437622-9	KNS701B1/4	Black	.750(19.1)	.695(17.7)	.590(15.0)	1.12(28.5)	.625(15.9)	.512(13.0)	.428(10.9)
<b>Two-Toned</b> 7-1437622-7 7-1437622-6	Body-Top/Skirt KNS501BA1/8 KNS501BA1/4	Blk Ntl. Blk Ntl.	.500(12.7) .500(12.7)	.695(17.7) .695(17.7)	.370(9.40) .370(9.40)	.750(19.1) .750(19.1)	.625(15.9) .625(15.9)	.512(13.0) .512(13.0)	.428(10.9) .428(10.9)
8-1437622-1	KNS701BA1/8	Blk Ntl.	.750(19.1)	.695(17.7)	.590(15.0)	1.12(28.5)	.625(15.9)	.512(13.0)	.428(10.9)
8-1437622-0	KNS701BA1/4	Blk Ntl.	.750(19.1)	.695(17.7)	.590(15.0)	1.12(28.5)	.625(15.9)	.512(13.0)	.428(10.9)

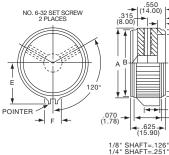
KNS701BA1/4

#### **KPN SERIES**



KPN500B1/8 .550 (14.00)

.625 (15.90)



↓ .118 ↓ (3.00) ↓ ↓			Straig	ht Knurl	with Poin	iter and I	ndicator I	Line		
	Tyco Electronics	Alcoswitch	Color Body-Top	А	В	С	D	E	F	G
			Natural Natural Black Black	.500(12.7) .500(12.7) .500(12.7) .500(12.7)	.445(11.3) .445(11.3) .445(11.3) .445(11.3)	.372(9.45) .372(9.45) .372(9.45) .372(9.45)	.445(11.3) .445(11.3) .445(11.3) .445(11.3)	.368(9.35) .368(9.35) .368(9.35) .368(9.35)	.195(4.95) .195(4.95 .195(4.95 .195(4.95	.354(8.99) .354(8.99) .354(8.99) .354(8.99)
G .480 (12.20)	9-1437622-5 9-1437622-6		Natural Black	.750(19.1) .750(19.1)	.695(17.65) .695(17.65)		.695(17.7) .695(17.7)	.515(13.1) .515(13.1)	.234(5.94) .234(5.94)	.394(10.0) .394(10.0)
(3.20) (6.38)	9-1437622-7 9-1437622-9	KPN900A1/4 KPN900B1/4	Natural Black	.937(23.8) .937(23.8)	.882(22.40) .882(22.40)		.882(22.4) .882(22.4)	.630(16.0) .630(16.0)	.276(7.01) .276(7.01)	.350(8.90) .350(8.90)

### **KS SERIES**



KS500A1/4



.031 .760) .186 120 NO. 6-32 SET SCREW 2 PLACES .160 (4.06) INDICATOR LINE —.281 (7.14) 1/4" SHAFT=.251" (6.37)

Tyco	3 Flute Design with Aluminum Skirt and Indicator Line								
Electronics	Alcoswitch	Color	Α	В	С	D	Е	F	G
1437623-2 1437623-5	KS500A1/8 KS500A1/4 KS500B1/8 KS500B1/4	Natural Natural Black Black	.500(12.7) .500(12.7) .500(12.7) .500(12.7)	.430(10.9) .430(10.9) .430(10.9) .430(10.9)	.360(9.14) .360(9.14) .360(9.14) .360(9.14)	.750(19.1) .750(19.1) .750(19.1) .750(19.1)	.620(15.8) .620(15.8) .620(15.8) .620(15.8)	.510(13.0) .510(13.0) .510(13.0) .510(13.0)	.430(10.9) .430(10.9) .430(10.9) .430(10.9)
	KS700A1/4 KS700B1/4	Natural Black	.750(19.0) .750(19.0)	.650(16.5) .650(16.5)	.590(14.9) .590(14.9)	1.12(28.4) 1.12(28.4)	.620(15.8) .620(15.8)	.510(13.0) .510(13.0)	.430(10.9) .430(10.9)
	KS900A1/4 KS900B1/4	Natural Black	.940(23.9) .940(23.9)	.820(20.8) .820(20.8)	.710(18.0) .710(18.0)	1.40(35.6) 1.40(35.6)	.620(15.8) .620(15.8)	.510(13.0) .510(13.0)	.430(10.9) .430(10.9)

K10

Catalog 1308390 Issued 9-04

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K

Тусо

1-1437623-2

1-1437623-4

1-1437623-3

1-1437623-6 1-1437623-7

1-1437623-8 1-1437623-9

**Electronics Alcoswitch Color** 

KT500A1/4

KT500B1/8 KT500B1/4

KT700A1/4 KT700B1/4

KT900A1/4 KT900B1/4

K Series

A

.500(12.7)

.500(12.7)

.500(12.7)

.740(18.8)

740(18.8)

.940(23.9)

.940(23.9)

В

NO. 6-32 SET SCREW 2 PLACES

Natural

Black

Black

Natural

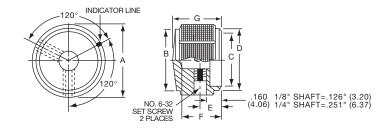
Black

Natural

Black

## Alcoswitch

## **Knobs, Machined Aluminum**



**Square Serration with Indicator Line** 

С

.375(953) .375(9.53)

.375(9.53)

.590(15.0) .590(15.0)

.710(18.0) .710(18.0)

D

.430(10.9)

.430(10.9)

.430(10.9)

.650(16.5) .650(16.5)

.816(20.7) .816(20.7)

E

.280(7.11)

.280(7.11) .280(7.11)

.280(7.11) .280(7.11)

.280(7.11) .280(7.11)

F

.510(13.0) .510(13.0) .510(13.0)

.510(13.0) .510(13.0)

.510(13.0) .510(13.0)

G

.630(16.0)

.630(16.0) .630(16.0)

.630(16.0)

.630(16.0)

.630(16.0)

.630(16.0)

WHITE INDICATOR DOT

B

.430(10.9)

.430(10.9)

.430(10.9)

.650(16.5) .650(16.5)

.816(20.7) .816(20.7)

G

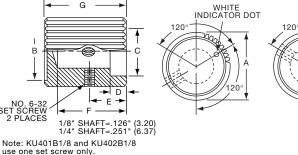


KT500A1/4

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KT700A1/4

KU	SERIES



Serrated Diamond Trim Cut with Dot Indicator											
	Alcoswitch	Color	Α	В	С	D	Е	F	G		
2-1437623-1	KU401B1/8	Black	.374(9.50)	.283(7.19)	.276(7.01)	.098(2.49)	.177(4.50)	.236(5.99)	.299(7.60		
2-1437623-2	KU402B1/8	Black	.374(9.50)	.283(7.19)	.276(7.01)	.098(2.49)	.197(5.00)	.354(8.99)	.449(11.40		
2-1437623-3	KU500B1/8	Black	.500(12.7)	.409(10.4)	.374(9.50)	.118(3.00)	.276(7.01)	.512(13.0)	.598(15.2		
	KU500B1/4	Black	.500(12.7)	.409(10.4)	.374(9.50)	.118(3.00)	.276(7.01)	.512(13.0)	.598(15.2		

Е

INDICATOR DOT 120 120 NO. 6-32 SET SCREW

Тусо	Serrated Diamond Trim Cut with Dot Indicator										
Electronics	Alcoswitch	Color	Α	В	С	D	Е	F	G		
2-1437623-9	KUS402B1/8	Black	.374(9.50)	.197(5.00)	.276(7.01)	.520(13.2)	.098(2.49)	.450(11.4)	.354(8.99)		
	KUS500B1/8 KUS500B1/4	Black Black	.500(12.7) .500(12.7)	.276(7.01 .276(7.01)	.374(9.50) .374(9.50)	.700(17.8) .700(17.8)	.118(3.00) .118(3.00)	.600(15.2) .600(15.2)	.512(13.0) .512(13.0)		
3-1437623-1	KUS700B1/4	Black	.740(18.8)	.276(7.01)	.591(15.0)	1.03(26.2)	.118(3.00)	.600(15.2)	.512(13.0)		

Note: KUS402B1/8 has #4.40 setscrew

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E

-В

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**KUS SERIES** 

KU402B1/8



KUS402B1/8



KUS700B1/4

Κ

**K** Series

Electronics

P Series

## Alcoswitch

## **Knobs, Molded Phenolic**

В

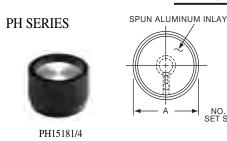
NO. 6-32 SET SCREW

С

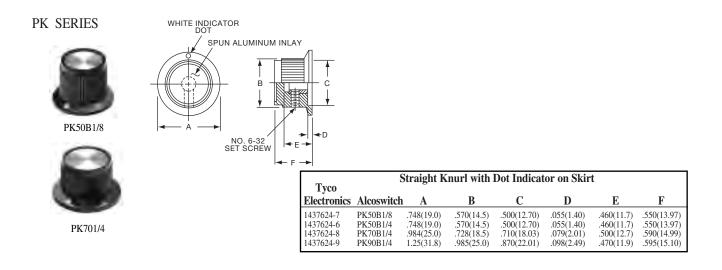
• - F

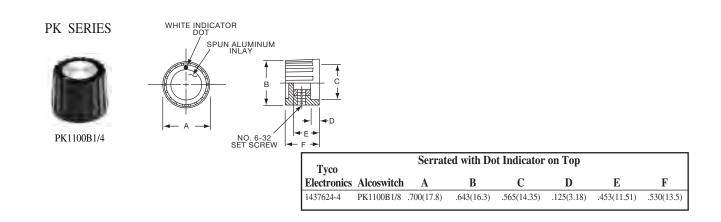
<D.→

Е⊣



Тусо	Straight Knurl Less Indicator Line Tyco								
Electronics	Alcoswitch	A	В	С	D	Е	F		
1437624-2	PH15181/4	.996(25.3)	.972(24.7)	.799(20.3)	.472(12.0)	.669(17.0)	.157(3.99)		





K

Catalog 1308390 Issued 9-04

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specified. Values in parentheses

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Electronics

1-1437624-7

PKA90B1/4

1.375(34.9)

.970(24.6)

.670(17.0)

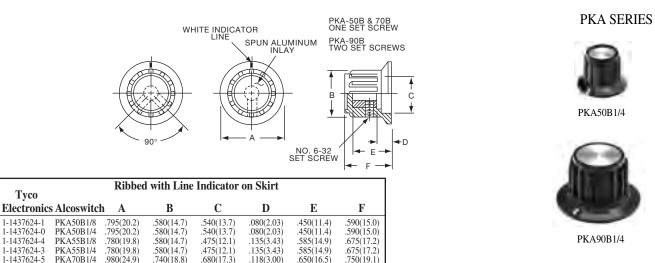
.195(4.95)

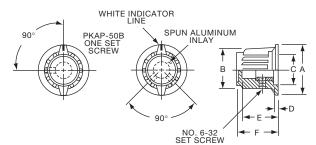
.750(19.1)

.840(21.3)

P Series

## **Knobs, Molded Phenolic**





Tyco	Ribbed with Skirt and Pointer with Indicator Line Tyco									
Electronic	s Alcoswitch A	В	С	D	Ε	F				
	PKAP50B1/4 .787(20.0) PKAP50B1/8 .787(20.0)	.693(17.6) .693(17.6)	.508(12.9)	.082(2.08) .082(2.08)	.579(14.7)	.689(17.5) .689(17.5)				
	PKAP70B1/4 .976(24.8)	.874(22.1)	.668(17.0)	.158(4.01)	.634(16.1)	.737(18.72)				

### PKAP SERIES



PKAP50B1/8



PKAP90B1/4

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tyco

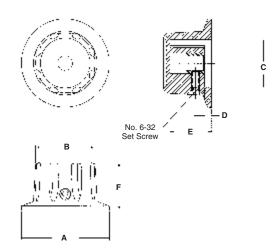
P Series

## **Knobs, Molded Phenolic**

## PKB SERIES



PKB90B1/4



Tyco	Fluted with Indicator Line On Skirt Tyco								
Electronics	Alcoswitch	A	В	С	D	Ε	F		
2-1437624-3 2-1437624-4	PKB70B1/4 PKB90B1/4		.750(19.1) 1.02(25.8)	.670(17.0) .800(20.3)	.118(3.0) .118(3.0)	.490(12.5) .705(17.9)	.600(15.2) .820(20.8)		

#### PKD SERIES



PKD60B1/4

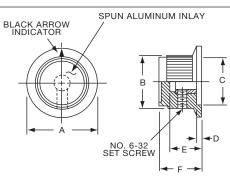


PKD100B1/4

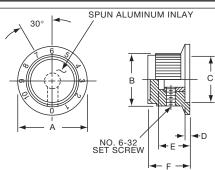
## PKD SERIES



PKD100B101/4



Straight Knurl Aluminum Skirt w/Arrow Indicator Tyco									
Electronics Alcoswitch A	В	С	D	Е	F				
2-1437624-8         PKD60B1/8         .780(19.8)           2-1437624-7         PKD60B1/4         .780(19.8)           3-1437624-1         PKD70B1/4         1.02(25.9)           2-1437624-5         PKD100B1/4         1.29(32.8)	.566(14.4) .566(14.4) .750(19.1) 1.00(25.4)	.487(12.4) .487(12.4) .700(17.8) .865(22.0)	.059(1.5) .059(1.5) .080(2.0) .050(1.3)	.492(12.5) .492(12.5) .490(12.5) .500(12.7)	.563(14.3) .563(14.3) .610(15.5) .590(15.0)				



Тусо	Straight K	nurl Skirt	w/0-10 Nu	ımerals		
Electronics Alcoswitch	Α	В	С	D	Е	F
3-1437624-0 PKD60B101/8	.780(19.8)	.566(14.4)	.487(12.4)	.059(1.5)	.492(12.5)	.563(14.3)
2-1437624-9 PKD60B101/4	.780(19.8)	.566(14.4)	.487(12.4)	.059(1.5)	.492(12.5)	.563(14.3)
3-1437624-2 PKD70B101/4	1.02(25.9)	.750(19.1)	.700(17.8)	.080(2.0)	.490(12.5)	.610(15.5)
2-1437624-6 PKD100B101/4	1.29(32.8)	1.00(25.4)	.865(22.0)	.050(1.3)	.500(12.7)	.590(15.0)

K14

K

P Series

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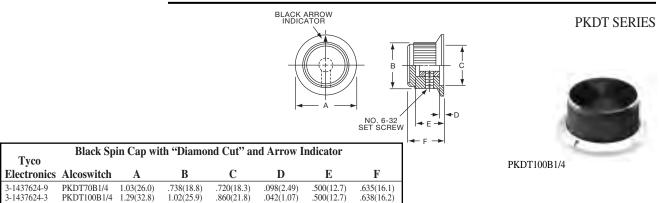
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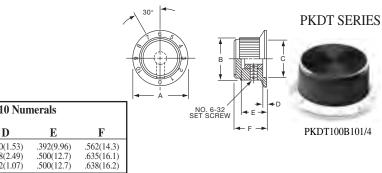
P Series



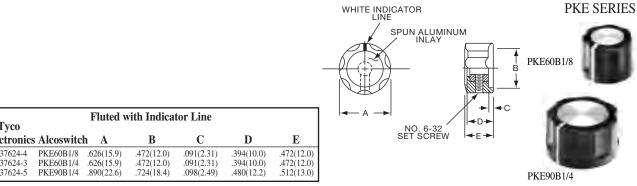
Electronics

## **Knobs, Molded Phenolic**





Тусо	<b>5</b>									
Electronics	Alcoswitch	Α	В	С	D	Е	F			
3-1437624-8 4-1437624-0 3-1437624-4	PKDT60B101/8 PKDT70B101/4 PKDT100B101/4	1.03(26.0)	.605(15.4) .738(18.8) 1.02(25.9)	.560(12.5) .720(18.3) .860(21.8)	.060(1.53) .098(2.49) .042(1.07)	.392(9.96) .500(12.7) .500(12.7)	.562(14.3 .635(16.1 .638(16.2			



Тусо	Fluted with Indicator Line Tyco										
Electronics	Alcoswite	h A	В	С	D	Е					
4-1437624-4	PKE60B1/8	.626(15.9)	.472(12.0)	.091(2.31)	.394(10.0)	.472(12.0)					
4-1437624-3	PKE60B1/4	.626(15.9)	.472(12.0)	.091(2.31)	.394(10.0)	.472(12.0)					
4-1437624-5	PKE90B1/4	.890(22.6)	.724(18.4)	.098(2.49)	.480(12.2)	.512(13.0)					

Fluted with Skirt and Indicator Line

B

618(15.7) .618(15.7)

.744(18.9) .889(22.6) 1.16(29.5)

1.37(34.9) 1.55(39.4)

Dimensions are in inches

A

.748(19.0)

.748(19.0)

.855(21.7)

1.01(25.7)

1.30(32.9)

1.50(38.1) 1.77(44.9)

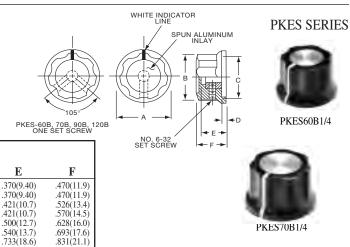
С

.460(11.7) .460(11.7)

.705(17.9)

.846(21.5) 1.02(25.9)

1.02(20.9)1.22(30.9)1.41(35.9)



Catalog 1308390 Issued 9-04

Tyco

5-1437624-1

5-1437624-0

5-1437624-2 5-1437624-3

4-1437624-6

4-1437624-7 4-1437624-8

**Electronics Alcoswitch** 

PKES60B1/8

PKES60B1/4

PKES70B1/4

PKES90B1/4

PKES120B1/4

PKES140B1/4 PKES150B1/4

specified. Values in parentheses www.tycoelectronics.com

Dimensions are shown for and millimeters unless otherwise reference purposes only. Specifications subject or brackets are metric equivalents. to change.

D

.090(2.29) .090(2.29)

.080(2.03)

.079(2.01)

.118(3.00)

.118(3.00) .118(3.00)

Е

.831(21.1)

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

Κ

Electronics

P Series

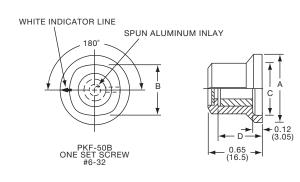
## Alcoswitch

## **Knobs, Molded Phenolic**

## PKF SERIES



PKF50B1/8

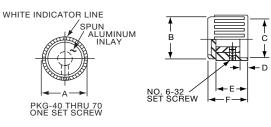


Pla Tyco	Plain Quadrate with Indicator Line & Arrow Tyco								
Electronics Alcoswitch A B C D									
5-1437624-5	PKF50B1/8	.670(17.0)	.454(11.53)	.570(14.48)	.520(13.2)				

#### PKG SERIES



PKG40B1/8



Tyco		Ribb	oed with In	dicator Lii	ne		
Electronics	Alcoswitch	Α	В	С	D	Е	F
6-1437624-0	*PKG40B1/8 PKG50B1/8 PKG50B1/4 ses #4-40 set scree	.437(11.1) .551(14.0) .551(14.0) ew	.410(10.4) .500(12.7) .500(12.7)	.304(7.72) .442(10.7) .442(10.7)	.079(2.00) .056(1.42) .056(1.42)	.385(9.78) .395(10.03) .395(10.03)	.472(12.0) .512(13.0) .512(13.0)

K16

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www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents.

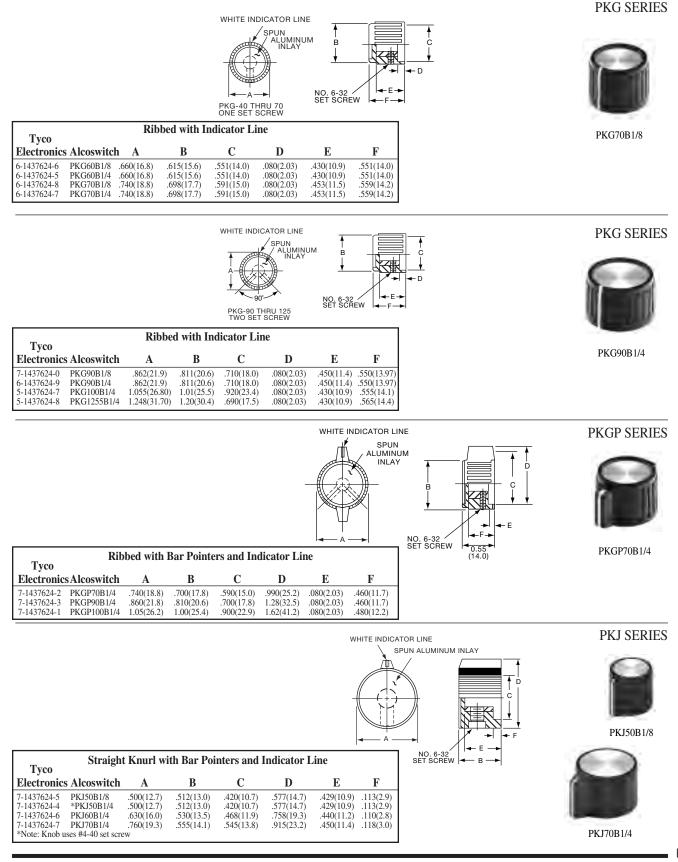
Dimensions are shown for reference purposes only. Specifications subject to change. USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

Electronics

P Series

## Alcoswitch

## **Knobs, Molded Phenolic**



Catalog 1308390 Issued 9-04

specified. Values in parentheses www.tycoelectronics.com

Dimensions are shown for Dimensions are in inches and millimeters unless otherwise reference purposes only. Specifications subject or brackets are metric equivalents. to change.

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K

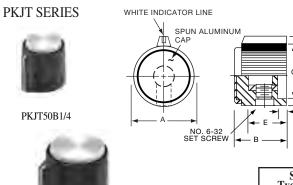
K17

Electronics

P Series

## Alcoswitch

## **Knobs, Molded Phenolic**



PKJT70B1/4

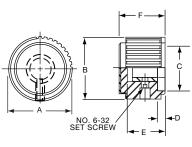
Strai Tyco	ght Knurl wi	th Bar Po	inter & Inc	licator Lin	e and Alun	ninum Spi	n Cap
Electronic	s Alcoswitch	Α	В	С	D	Е	F
7-1437624-9 7-1437624-8 8-1437624-0 8-1437624-1	PKJT50B1/8 *PKJT50B1/4 PKJT60B1/4 PKJT70B1/4	.515(13.1) .515(13.1) .640(16.3) .760(19.3)	.585(14.9) .585(14.9) .605(15.4) .625(15.9)	.350(8.89) .350(8.89) .470(11.9) .550(14.0)	.595(15.1) .595(15.1) .760(19.3) .915(23.2)	.414(10.5) .414(10.5) .445(11.3) .445(11.3)	.130(3.30) .130(3.30) .118(3.00) .118(3.00)

\*Knob uses #4-40 set screw.

#### PKNT SERIES



PKNT60B1/4

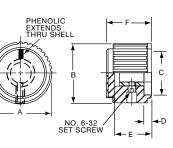


Black Spin Cap with "Diamond Cut" Less Indicator							
Electronics	Alcoswitch	Α	В	С	D	Ε	F
8-1437624-6	PKNT60B1/8	.591(15.0)	.579(14.7)	.394(10.0)	.079(2.01)	.394(10.0)	.472(11.9)
8-1437624-5	PKNT60B1/4	.591(15.0)	.579(14.7)	.394(10.0)	.079(2.01)	.394(10.0)	.472(11.9)
8-1437624-7	PKNT70B1/4	.787(19.9)	.764(19.4)	.571(14.5)	.098(2.49)	.492(12.5)	.591(14.7)
8-1437624-8	PKNT90B1/4	.984(25.0)	.957(24.3)	.748(19.0)	.098(2.49)	.591(15.0)	.689(17.5)

PKN SERIES



PKN60B1/8



Line Indicator on Natural Aluminum Spin Cap Tyco							
Electronics	Alcoswitch	Α	В	С	D	Е	F
8-1437624-2	PKN60B1/8 PKN60B1/4	.591(15.0) .591(15.0)	.579(14.7) .579(14.7))	.394(10.0) .394(10.0)	.079(2.01) .079(2.01)	.394(10.0)	.453(11.5) .453(11.5)
8-1437624-3 8-1437624-4	PKN70B1/4 PKN90B1/4	.787(20.0) .984(25.0)	.764(19.4) .957(24.3)	.571(14.5) .748(19.0)	.098(2.49) .098(2.49)	.492(12.5) .591(15.0)	.591(15.0) .689(17.5)

K18

K

P Series

Catalog 1308390 Issued 9-04

www.tycoelectronics.com or brack

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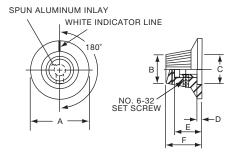
tyco

Electronics

P Series

## **Knobs, Molded Phenolic**

PKS SERIES



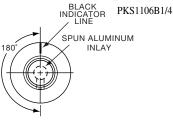
	6		
1	8	- 0	į
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PKS1104B1/4

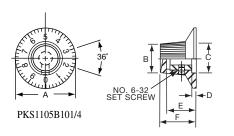
Straight Knurl with Indicator Line on Skirt Tyco							
Electronics	Alcoswitch	Α	В	С	D	Ε	F
9-1437624-5	PKS1104B1/4	1.12(28.5)	.567(14.4)	.620(15.8)	.090(2.29)	.510(12.95)	.670(17.0)

Straight Knurl Aluminum Skirt Has Line or 0-9 Numbers Tyco								
Electronics	Alcoswitch	Α	В	С	D	Е	F	Marking
9-1437624-4	PKS1103B101/4	1.17(29.6)	.571(14.5)	.620(15.7)	.098(2.49)	.516(13.1)	.670(17.0)	Numbers
9-1437624-7	PKS1106B1/4	1.17(29.6)	.571(14.5)	.618(15.7)	.098(2.49)	.516(13.1)	.670(17.0)	Line
9-1437624-6	PKS1105B101/4	1.17(29.6)	.571(14.5)	.618(15.7)	.098(2.49)	.516(13.1)	.670(17.0)	Numbers





PKS1103B101/4



F

.748(19.0)

.748(19.0)

E

.615(15.62)

.615(15.62).615(15.62).615(15.62).615(15.62)

Marking

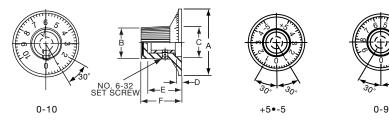
+5-0-5

0-9

.748(19.0) 0-10 .748(19.0) Indicator Line

PKS SERIES

SPUN ALUMINUM INLAY



B

.551(14.0)

.551(14.0)

.551(14.0) .551(14.0)

A



Line





PKS1132B51/4



PKS1132B91/4

South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013

UK: 44-141-810-8967

Catalog 1308390 Issued 9-04

Tyco Electronics

1437625-1

1437625-2 9-1437624-9 9-1437624-8

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\*1 Set screw 180° from indicator line.

Alcoswitch

PKS1132B51/4 1.18(30.0)

PKS1132B91/4 1.18(30.0)

PKS1132B101/41.18(30.0) \*PKS1132B1/4 1.18(30.0)

Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. to change.

Choice of Indicator Line or 0-9, 0-10, -5+5 Numerals

С

.551(14.0)

.551(14.0)

.551(14.0) .551(14.0)

Dimensions are shown for reference purposes only. Specifications subject

D

.118(30.0)

.118(30.0)

.118(30.0) .118(30.0)

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Downloaded from Arrow.com.

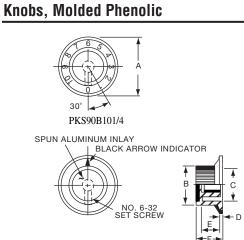
Electronics

P Series

### PKS SERIES



PKS90B1/4

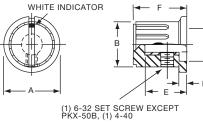


Straight Knurl with Aluminum Skirt Choice of Arrow or 1-10 Numbers Tyco								
Electronics	Alcoswitch	Α	В	С	D	Е	F	Marking
1437625-5 1437625-6	PKS90B1/4 PKS90B101/4	1.42(36.1) 1.42(36.1)	.917(23.3) .917(23.3)	.780(19.8) .780(19.8)	.065(1.65) .065(1.65)	.490(12.5) .490(12.5)	.596(15.1) .596(15.1)	Arrow Numbers

### PKX SERIES



PKX50B1/8

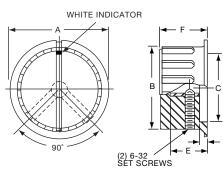


Тусо	Ribbed Body	y, Matte Fi	inish with <b>`</b>	White Squ	are Indicat	tor on Top	
Electronics	Alcoswitch	Α	В	С	D	Е	F
1-1437625-4 1-1437625-7	PKX50B1/8 PKX50B1/4 PKX60B1/8 PKX60B1/4	.590(15.0) .590(15.0) .787(20.0) .787(20.0)	.472(12.0) .472(12.0) .625(15.9) .625(15.9)	.374(9.49) .374(9.49) .472(12.0) .472(12.0)	.059(1.50) .059(1.50) .078(1.98) .078(1.98)	.463(11.76) .463(11.76) .510(13.0) .510(13.0)	.551(14.0) .551(14.0) .598(15.2) .598(15.2)

## PKX SERIES



PKX110B1/4



Tyco K	ibbed Bod	ly, Matte	Finish with	White Squ	uare Indic	ator on Toj	p
Electronics A	lcoswitch	Α	В	С	D	E	F
1-1437625-1 PK		1.17(29.7)	.970(24.6)	.780(19.81)	.114(2.90)	.570(14.48)	.674(17.12)
1-1437625-2 Pk 1-1437625-3 Pk		1.37(34.8) 1.57(40.0)	1.120(28.45) 1.308(33.22)	.940(23.88) 1.09(27.6)	.100(2.54) .118(3.00)	.527(13.38) .623(15.82)	.705(17.91) .750(19.05)

K20

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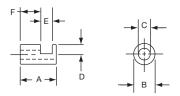
Dimensions are in inches Dimensions are shown for and millimeters unless otherwise specified. Values in parentheses or brackets are metric equivalents. reference purposes only. Specifications subject

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tyco

## **Knob Accessories**

## ACCESSORIES





KR1

Тусо	Shaft Hole Size Adaptors Tyco						
	es Alcoswitch	Α	В	С	D	Е	F
9-1437627-6 9-1437627-7 9-1437627-8	KR2 (1/4"TO3/16")		.250(6.35) .250(6.35) .248(6.30)	.128(3.25) .190(4.83) .161(4.09)	.122(3.10) .122(3.10) .122(3.10)	.217(5.51) .216(5.49) .216(5.49)	.122(3.10) .123(3.12) .123(3.12)

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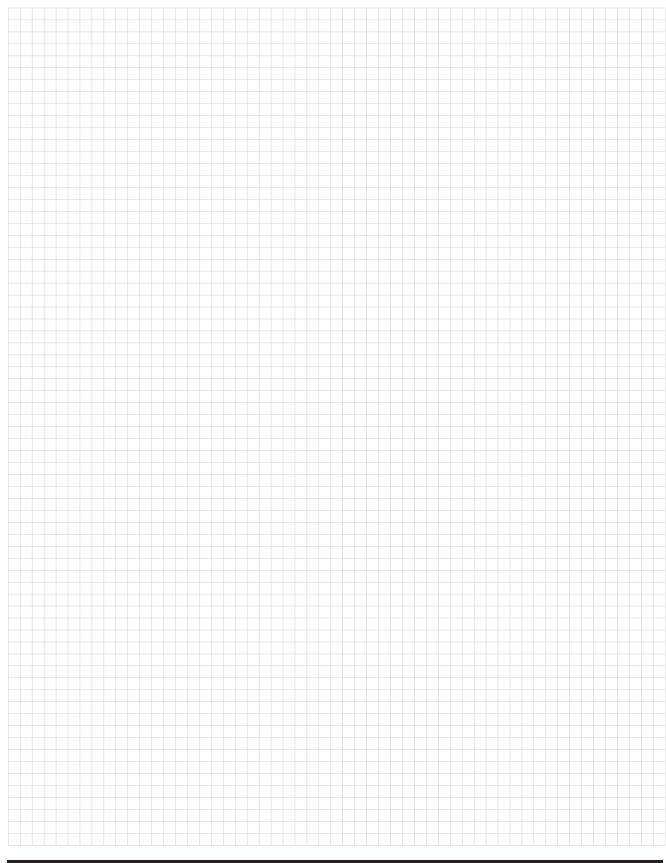
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## **Engineering Notes**



K22

K

Engineering Notes

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tyco

Microswitches



Miniature Pin Plunger - Page L3



Miniature Roller - Page L7



Miniature Lever - Page L5



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Subminiature Pin Plunger - Page L11 Subminiature Lever - Page L11



Subminiature Roller - Page L12





Subminiature Simulator Lever - Page



L1

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1478600-4L12	1478610-5L7	1478619-7L9
1478600-5L12	1478610-6L8	1478620-1L3
1478601-1L11	1478610-7L9	1478620-2L4
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1478601-3L11	1478611-2L4	1478620-4L6
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1478601-5L12	1478611-4L6	1478620-6L8
1478602-1L11	1478611-5L7	1478620-7L9
1478602-2L11	1478611-6L8	1478667-1L3
1478602-3L11	1478611-7L9	1478667-2L4
1478602-4L12	1478612-1L3	1478667-3L5
1478602-5L12	1478612-2L4	1478667-4L6
1478603-1L3	1478612-3L5	1478667-5L7
1478603-2L4	1478612-4L6	1478667-6L8
1478603-3L5	1478612-5L7	1478667-7L9
1478603-4L6	1478612-6L8	1478668-1L3
1478603-5L7	1478612-7L9	1478668-2L4
1478603-6L8	1478613-1L3	1478668-3L5
1478603-7L9	1478613-2L4	1478668-4L6
1478604-1L3	1478613-3L5	1478668-5L7
1478604-2L4	1478613-4L6	1478668-6L8
1478604-3L5	1478613-5L7	1478668-7L9
1478604-4L6	1478613-6L8	1478669-1L3
1478604-5 L7	1478613-7L9	1478669-2L4
1478604-6L8	1478614-1L3	1478669-3L5
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1478605-1L3	1478614-3L5	1478669-5L7
1478605-2L4	1478614-4L6	1478669-6L8
1478605-3L5	1478614-5L7	1478669-7L9
1478605-4L6	1478614-6L8	1478670-1L3
1478605-5L7	1478614-7L9	1478670-2L4
1478605-6L8	1478615-1L3	1478670-3L5
1478605-7L9	1478615-2L4	1478670-4L6
1478606-1L3	1478615-3L5	1478670-5L7
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1478607-1L3	1478616-3L5	1478671-5L7
1478607-2L4	1478616-4L6	1478671-6L8
1478607-3L5	1478616-5L7	1478671-7L9
1478607-4L6	1478616-6L8	1478672-1L3
1478607-5L7	1478616-7L9	1478672-2L4
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1478608-5L7	1478617-7L9	
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1478610-1L3	1478619-2L4	
1770010-1LJ	1770017-3LJ	

1478619-6       L8 $1478619-7$ L9 $1478620-1$ L3 $1478620-2$ L4 $1478620-3$ L5 $1478620-4$ L6 $1478620-5$ L7 $1478620-6$ L8 $1478620-6$ L8 $1478620-7$ L9 $1478667-1$ L3 $1478667-2$ L4 $1478667-2$ L4 $1478667-3$ L5 $1478667-4$ L6 $1478667-5$ L7 $1478667-6$ L8 $1478667-6$ L8 $1478668-1$ L3 $1478668-5$ L7 $1478668-6$ L8 $1478668-7$ L9 $1478669-1$ L3 $1478669-1$ L3 $1478669-2$ L4 $1478669-3$ L5 $1478669-6$ L8 $1478669-7$ L9 $1478669-6$ L8 $1478670-7$ L9 $1478670-7$ L9 $1478670-7$ L9<	14/8	519-5	L/
1478620-1       L3 $1478620-2$ L4 $1478620-3$ L5 $1478620-4$ L6 $1478620-5$ L7 $1478620-6$ L8 $1478620-7$ L9 $1478667-1$ L3 $1478667-2$ L4 $1478667-3$ L5 $1478667-4$ L6 $1478667-5$ L7 $1478667-6$ L8 $1478667-7$ L9 $1478667-6$ L8 $1478668-1$ L3 $1478668-5$ L7 $1478668-1$ L3 $1478668-5$ L7 $1478668-6$ L8 $1478668-6$ L8 $1478669-1$ L3 $1478669-2$ L4 $1478669-3$ L5 $1478669-4$ L6 $1478669-5$ L7 $1478669-6$ L8 $1478669-7$ L9 $1478670-1$ L3 $1478670-2$ L4 $1478670-3$ L5 $1478670-5$ L7<	1478	619-6	L8
1478620-2 $L4$ $1478620-3$ $L5$ $1478620-4$ $L6$ $1478620-5$ $L7$ $1478620-6$ $L8$ $1478620-7$ $L9$ $1478667-7$ $L9$ $1478667-2$ $L4$ $1478667-2$ $L4$ $1478667-3$ $L5$ $1478667-4$ $L6$ $1478667-5$ $L7$ $1478667-6$ $L8$ $1478667-6$ $L8$ $1478667-6$ $L8$ $1478668-1$ $L3$ $1478668-2$ $L4$ $1478668-3$ $L5$ $1478668-4$ $L6$ $1478668-5$ $L7$ $1478668-6$ $L8$ $1478669-1$ $L3$ $1478669-3$ $L5$ $1478669-4$ $L6$ $1478669-5$ $L7$ $1478669-6$ $L8$ $1478670-1$ $L3$ $1478670-2$ $L4$ $1478670-3$ $L5$ $1478670-5$ $L7$ $1478670-6$ $L8$ <th>1478</th> <th>619-7</th> <th>L9</th>	1478	619-7	L9
1478620-3 $L5$ $1478620-4$ $L6$ $1478620-5$ $L7$ $1478620-6$ $L8$ $1478620-7$ $L9$ $1478667-1$ $L3$ $1478667-2$ $L4$ $1478667-2$ $L4$ $1478667-2$ $L4$ $1478667-3$ $L5$ $1478667-4$ $L6$ $1478667-5$ $L7$ $1478667-6$ $L8$ $1478668-1$ $L3$ $1478668-2$ $L4$ $1478668-3$ $L5$ $1478668-5$ $L7$ $1478668-6$ $L8$ $1478668-6$ $L8$ $1478669-1$ $L3$ $1478669-2$ $L4$ $1478669-3$ $L5$ $1478669-4$ $L6$ $1478669-5$ $L7$ $1478669-6$ $L8$ $1478670-1$ $L3$ $1478670-3$ $L5$ $1478670-3$ $L5$ $1478670-5$ $L7$ $1478670-6$ $L8$ $1478670-7$ $L9$ <th>1478</th> <th>620-1</th> <th>L3</th>	1478	620-1	L3
1478620-4	1478	620-2	L4
1478620-4	1478	620-3	L5
1478620-6       L8 $1478667-1$ L3 $1478667-2$ L4 $1478667-2$ L4 $1478667-3$ L5 $1478667-4$ L6 $1478667-5$ L7 $1478667-6$ L8 $1478667-6$ L8 $1478667-6$ L8 $1478667-6$ L3 $1478668-6$ L3 $1478668-1$ L3 $1478668-2$ L4 $1478668-5$ L7 $1478668-6$ L8 $1478668-6$ L8 $1478668-6$ L8 $1478669-1$ L3 $1478669-2$ L4 $1478669-3$ L5 $1478669-4$ L6 $1478669-5$ L7 $1478669-6$ L8 $1478670-1$ L3 $1478670-2$ L4 $1478670-3$ L5 $1478670-6$ L8 $1478670-7$ L9 $1478670-6$ L8 $1478670-7$ L9 $1478671-3$ L5<	1478	620-4	
1478620-7       L9 $1478667-1$ L3 $1478667-2$ L4 $1478667-3$ L5 $1478667-4$ L6 $1478667-5$ L7 $1478667-6$ L8 $1478667-6$ L8 $1478667-6$ L8 $1478667-6$ L8 $1478667-6$ L9 $1478668-6$ L3 $1478668-3$ L5 $1478668-6$ L8 $1478668-6$ L8 $1478668-6$ L8 $1478668-7$ L9 $1478669-1$ L3 $1478669-2$ L4 $1478669-3$ L5 $1478669-4$ L6 $1478669-5$ L7 $1478669-6$ L8 $1478670-1$ L3 $1478670-2$ L4 $1478670-3$ L5 $1478670-4$ L6 $1478670-5$ L7 $1478670-6$ L8 $1478670-7$ L9 $1478671-3$ L5 $1478671-4$ L6<	1478	620-5	L7
1478667-1 $L3$ $1478667-2$ $L4$ $1478667-3$ $L5$ $1478667-4$ $L6$ $1478667-5$ $L7$ $1478667-6$ $L8$ $1478667-6$ $L8$ $1478667-6$ $L8$ $1478667-6$ $L3$ $1478667-6$ $L3$ $1478668-6$ $L3$ $1478668-3$ $L5$ $1478668-6$ $L8$ $1478668-6$ $L8$ $1478668-7$ $L9$ $1478668-6$ $L8$ $1478669-3$ $L5$ $1478669-4$ $L6$ $1478669-5$ $L7$ $1478669-6$ $L8$ $1478669-7$ $L9$ $1478670-1$ $L3$ $1478670-2$ $L4$ $1478670-3$ $L5$ $1478670-4$ $L6$ $1478670-5$ $L7$ $1478670-6$ $L8$ $1478671-3$ $L5$ $1478671-3$ $L5$ $1478671-3$ $L5$ $1478671-3$ $L5$ <th>1478</th> <th>620-6</th> <th>L8</th>	1478	620-6	L8
1478667-2 $L4$ $1478667-3$ $L5$ $1478667-4$ $L6$ $1478667-5$ $L7$ $1478667-6$ $L8$ $1478667-6$ $L8$ $1478667-6$ $L8$ $1478667-6$ $L8$ $1478668-7$ $L9$ $1478668-1$ $L3$ $1478668-3$ $L5$ $1478668-4$ $L6$ $1478668-6$ $L8$ $1478668-7$ $L9$ $1478668-6$ $L3$ $1478669-3$ $L5$ $1478669-4$ $L6$ $1478669-5$ $L7$ $1478669-6$ $L8$ $1478669-6$ $L8$ $1478669-6$ $L8$ $1478670-1$ $L3$ $1478670-2$ $L4$ $1478670-3$ $L5$ $1478670-4$ $L6$ $1478670-5$ $L7$ $1478670-6$ $L8$ $1478670-7$ $L9$ $1478670-7$ $L9$ $1478671-3$ $L5$ $1478671-3$ $L5$ <th>1478</th> <th>620-7</th> <th>L9</th>	1478	620-7	L9
1478667-2 $L4$ $1478667-3$ $L5$ $1478667-4$ $L6$ $1478667-5$ $L7$ $1478667-6$ $L8$ $1478667-6$ $L8$ $1478667-6$ $L8$ $1478667-6$ $L8$ $1478668-6$ $L3$ $1478668-2$ $L4$ $1478668-3$ $L5$ $1478668-4$ $L6$ $1478668-6$ $L8$ $1478668-7$ $L9$ $1478668-6$ $L8$ $1478669-1$ $L3$ $1478669-2$ $L4$ $1478669-3$ $L5$ $1478669-4$ $L6$ $1478669-5$ $L7$ $1478669-6$ $L8$ $1478670-1$ $L3$ $1478670-1$ $L3$ $1478670-3$ $L5$ $1478670-5$ $L7$ $1478670-6$ $L8$ $1478670-7$ $L9$ $1478671-3$ $L5$ $1478671-3$ $L5$ $1478671-4$ $L6$ $1478671-5$ $L7$ <th>1478</th> <th>667-1</th> <th>L3</th>	1478	667-1	L3
1478667-4	1478	667-2	
1478667-4	1478	667-3	L5
1478667-6       L8 $1478667-7$ L9 $1478668-1$ L3 $1478668-2$ L4 $1478668-3$ L5 $1478668-3$ L5 $1478668-4$ L6 $1478668-5$ L7 $1478668-6$ L8 $1478668-6$ L8 $1478668-6$ L8 $1478668-6$ L3 $1478669-6$ L4 $1478669-2$ L4 $1478669-3$ L5 $1478669-6$ L8 $1478669-6$ L8 $1478669-6$ L8 $1478669-7$ L9 $1478670-1$ L3 $1478670-2$ L4 $1478670-3$ L5 $1478670-4$ L6 $1478670-5$ L7 $1478670-6$ L8 $1478670-7$ L9 $1478671-1$ L3 $1478671-2$ L4 $1478671-3$ L5 $1478671-3$ L5 $1478671-4$ L6 $1478671-5$ L7<	1478	667-4	
1478667-7       L9 $1478668-1$ L3 $1478668-2$ L4 $1478668-3$ L5 $1478668-3$ L5 $1478668-3$ L5 $1478668-4$ L6 $1478668-5$ L7 $1478668-6$ L8 $1478668-7$ L9 $1478669-1$ L3 $1478669-2$ L4 $1478669-3$ L5 $1478669-4$ L6 $1478669-5$ L7 $1478669-6$ L8 $1478669-7$ L9 $1478670-1$ L3 $1478670-2$ L4 $1478670-3$ L5 $1478670-4$ L6 $1478670-5$ L7 $1478670-6$ L8 $1478670-7$ L9 $1478670-6$ L8 $1478671-1$ L3 $1478671-2$ L4 $1478671-3$ L5 $1478671-3$ L5 $1478671-4$ L6 $1478671-5$ L7 $1478671-6$ L8<	1478	667-5	L7
1478667-7       L9 $1478668-1$ L3 $1478668-2$ L4 $1478668-3$ L5 $1478668-3$ L5 $1478668-3$ L5 $1478668-3$ L5 $1478668-4$ L6 $1478668-5$ L7 $1478668-6$ L8 $1478668-6$ L8 $1478669-1$ L3 $1478669-2$ L4 $1478669-3$ L5 $1478669-4$ L6 $1478669-5$ L7 $1478669-6$ L8 $1478669-7$ L9 $1478670-1$ L3 $1478670-2$ L4 $1478670-3$ L5 $1478670-4$ L6 $1478670-5$ L7 $1478670-6$ L8 $1478670-7$ L9 $1478670-7$ L9 $1478671-1$ L3 $1478671-2$ L4 $1478671-3$ L5 $1478671-4$ L6 $1478671-5$ L7 $1478671-6$ L8<	1478	667-6	L8
1478668-2 $L4$ $1478668-3$ $L5$ $1478668-4$ $L6$ $1478668-5$ $L7$ $1478668-6$ $L8$ $1478668-7$ $L9$ $1478668-7$ $L9$ $1478669-1$ $L3$ $1478669-2$ $L4$ $1478669-3$ $L5$ $1478669-4$ $L6$ $1478669-5$ $L7$ $1478669-6$ $L8$ $1478669-7$ $L9$ $1478670-1$ $L3$ $1478670-2$ $L4$ $1478670-3$ $L5$ $1478670-4$ $L6$ $1478670-5$ $L7$ $1478670-6$ $L8$ $1478670-7$ $L9$ $1478670-7$ $L9$ $1478670-7$ $L9$ $1478671-1$ $L3$ $1478671-3$ $L5$ $1478671-3$ $L5$ $1478671-4$ $L6$ $1478671-5$ $L7$ $1478671-6$ $L8$ $1478671-7$ $L9$ $1478672-1$ $L3$ <th>1478</th> <th>667-7</th> <th></th>	1478	667-7	
1478668-3 $L5$ $1478668-4$ $L6$ $1478668-5$ $L7$ $1478668-6$ $L8$ $1478668-7$ $L9$ $1478669-1$ $L3$ $1478669-2$ $L4$ $1478669-3$ $L5$ $1478669-2$ $L4$ $1478669-3$ $L5$ $1478669-4$ $L6$ $1478669-5$ $L7$ $1478669-6$ $L8$ $1478669-7$ $L9$ $1478670-1$ $L3$ $1478670-2$ $L4$ $1478670-3$ $L5$ $1478670-4$ $L6$ $1478670-5$ $L7$ $1478670-6$ $L8$ $1478670-7$ $L9$ $1478670-7$ $L9$ $1478671-1$ $L3$ $1478671-3$ $L5$ $1478671-3$ $L5$ $1478671-3$ $L5$ $1478671-4$ $L6$ $1478671-5$ $L7$ $1478671-6$ $L8$ $1478671-7$ $L9$ $1478672-7$ $L9$ <th>1478</th> <th>668-1</th> <th>L3</th>	1478	668-1	L3
1478668-4	1478	668-2	L4
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1478	668-3	L5
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1478	668-4	L6
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1478	668-6	L8
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1478	668-7	L9
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1478	669-1	L3
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1478	669-2	L4
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1478	669-3	L5
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			
1478671-1       L3         1478671-2       L4         1478671-3       L5         1478671-4       L6         1478671-5       L7         1478671-6       L8         1478671-7       L9         1478672-1       L3         1478672-2       L4         1478672-3       L5         1478672-4       L6         1478672-5       L7			
1478671-2       L4         1478671-3       L5         1478671-4       L6         1478671-5       L7         1478671-6       L8         1478671-7       L9         1478672-1       L3         1478672-3       L5         1478672-4       L6         1478672-5       L7			
1478671-3			
1478671-4			
1478671-5       L7         1478671-6       L8         1478671-7       L9         1478672-1       L3         1478672-2       L4         1478672-3       L5         1478672-4       L6         1478672-5       L7         1478672-6       L8			
1478671-6       L8         1478671-7       L9         1478672-1       L3         1478672-2       L4         1478672-3       L5         1478672-4       L6         1478672-5       L7         1478672-6       L8			
1478671-7       L9         1478672-1       L3         1478672-2       L4         1478672-3       L5         1478672-4       L6         1478672-5       L7         1478672-6       L8			
1478672-1       L3         1478672-2       L4         1478672-3       L5         1478672-4       L6         1478672-5       L7         1478672-6       L8			
1478672-2			
1478672-3L5 1478672-4L6 1478672-5L7 1478672-6L8			
1478672-4L6 1478672-5L7 1478672-6L8			
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1478672-6L8			
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Microswitches

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Dimensions are shown for reference purposes only. Specifications subject

USA: 1-800-522-6752 Canada: 1-905-470-4425 Mexico: 01-800-733-8926 C. America: 52-55-5-729-0425

### **Miniature Microswitch Introduction**

Alcoswitch miniature microswitches are offered with many options to suit most typical applications.

These switches are available in a current range from 16A to .1A. Additional options available throughout the different current ratings include:

#### **Pin Plunger**

Short, normal and long lever

Short and normal roller

Simulated lever

#### SPDT, SPNO and SPNC circuitry

Within the 16A range, in addition to two different terminal options, there are three different actuation force options.

You can count on this offering of switches to be high reliability and low cost to fulfill your basic microswitch needs. Of course if you need something custom, we can offer that also. Contact your Tyco Electronics sales engineer for details.

## **Technical Information**

Amp Rating	g	16	5	0.1			
Insulation I	Resistance	Min. 100M ohm					
Contact Resistance		max 15	M ohm	Max 50M ohm			
Dielectric	Between Non-consecutive terminals		AC 2,000V	I			
Strength	Between each terminal & earth		AC 2,000V				
Operating	Speed	0.2mm/sec - 1	,000mm/sec	1mm/sec - 500mm/sec			
Max Allowe	ed Mechanical Open/close Frequencies	600 Cy	300 Cycles/min				
Shock Res	istance (without lever)	300mm/sec <sup>2</sup> (approx 30G)					
Vibration <b>R</b>	Resistance (without lever)	1.5mm 10 -	55Hz (2Hr)	1.5mm 10 - 20Hz (2Hr)			
Electrical L	ife	100,000 Operatio (max 20 Ope		1,000,000 Operations			
Mechanica	I Life	10,000,000 operations (Max 200 operations/min)					
Safety App	roval		UL/CSA/ VDE				
Operating Temperature Range		-20°C to +130°C	-30°C to +130°C RH90% Max				

terials		
	5 & 16A	.1A
Case and Cover	P.B.T Resin, UL 94 V-0	P.B.T Resin, UL 94 V-0
Movable Contactor	Brass, Sliver Plated	Phosphor Bronze
Guide Plate	Brass, Sliver Plated	Brass, Sliver Plated
Plate Spring	Beryllium Copper	Beryllium Copper
Terminal Aid	Brass	Brass
Contact	Silver Alloy	Gold Alloy
Common Terminal	Brass, Sliver Plated	Brass, Sliver Plated
Terminals	Brass, Sliver Plated	Brass
Actuator	Phenolic Resin, UL 94 V-0	Phenolic Resin, UL 94 V-0
Lever	Stainless Steel	Stainless Steel

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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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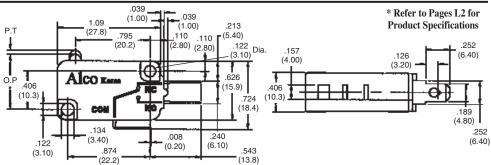
## **Miniature Pin Plunger**

Spade/Solder Type Terminal



#### **Product Facts**

- n .187 [4.75] tab with solder hole
- n Use .187 [4.75] FASTON receptacles or solder wire directly to terminal



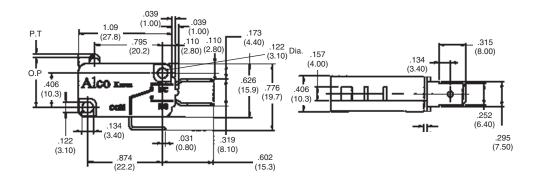
AMP	Switch Position	Operating Force	Releasing Force	Pre Travel (P.T.)	Operating Position	Over Travel	Movement Differential	Part Number
		120g	20g	1.6 m/m	14.8 ±0.4	0.8 m/m	0.4 m/m	1478603-1
	SPDT	200g	50g	[.063]	$[.582\pm.016]$	[.031]	[.016]	1478604-1
		300g	70g	[]	[]	[]	[]	1478605-1
		120g	20g	1.6 m/m	14.8 ±0.4	0.8 m/m	0.4 m/m	1478609-1
16	SPNC	200g	50g	[.063]	$[.582\pm.016]$	[.031]	[.016]	1478610-1
		300g	70g	[]	[]	[]	[]	1478611-1
		120g	20g	1.6 m/m [.063]	14.8 ±0.4 [.582±.016]	0.8 m/m	0.4 m/m	1478615-1
	SPNO	200g	50g			[.031]	[.016]	1478616-1
		300g	70g	[ ]			[ ]	1478617-1
	SPDT	_		1.6 m/m	14.8 ±0.4	0.8 m/m	0.4 m/m	1478667-1
5	SPNC	120g	20g	[.063]	[.582±.016]	[.031]	[.016]	1478668-1
	SPNO 120g	-		[]	[]	[]	[.0.0]	1478669-1
	SPDT	_		1.6 m/m	14.8 ±0.4	0.8 m/m	0.4 m/m	1478670-1
0.1 SPNC	60g	12g	[.063]	[.582±.016]	[.031]	[.016]	1478671-1	
	SPNO			[]	[	[ . e .]	[]	1478672-1

#### Spade Type Terminal



#### **Product Facts**

n .250 [6.35] tab for use with .250 [6.35] FASTON receptacles



AMP	Switch Position	Operating Force	Releasing Force	Pre Travel (P.T.)	Operating Position	Over Travel	Movement Differential	Part Number
		120g	20g				•••••	1478606-1
	SPDT	200g	50g	1.6 m/m	14.8 ±0.4	0.8 m/m		1478607-1
	300g	70g	[.063]	[.582±.016]	[.031]	[.016]	1478608-1	
		120g	20g	1.6 m/m [.063]	14.8 ±0.4	0.8 m/m [.031]	0.4 m/m [.016]	1478612-1
16	SPNC	200g	50g					1478613-1
		300g	70g		[.582±.016]			1478614-1
		120g	20g					1478618-1
SPNO	200g	50g	1.6 m/m	14.8 ±0.4	0.8 m/m [.031]	0.4 m/m [.016]	1478619-1	
	300g	70g	[.063]	[.582±.016]			1478620-1	

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L4

Microswitches

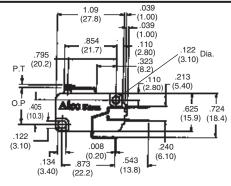
## **Miniature Short Lever**

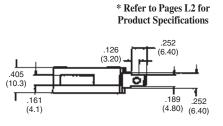
Spade/Solder Type Terminal



#### **Product Facts**

- n .187 [4.75] tab with solder hole
- n Use .187 [4.75] FASTON receptacles or solder wire directly to terminal
- n Short lever to increase operating position





AMP	Switch Position	Operating Force	Releasing Force	Pre Travel (P.T.)	Operating Position	Over Travel	Movement Differential	Part Number
		120g	20g	1.6 m/m	14.8 ±0.4	0.8 m/m	0.4 m/m	1478603-2
	SPDT	200g	50g	[.063]	[.606±.016]	[.031]	[.016]	1478604-2
		330g	70g	[]			[ ]	1478605-2
		120g	20g	1.6 m/m	14.8 ±0.4	0.8 m/m	0.4 m/m	1478609-2
16	SPNC	200g	50g	[.063]	$[.606\pm.016]$	[.031]	[.016]	1478610-2
		330g	70g	[]				1478611-2
	SPNO	120g	20g	1.6 m/m [.063]	14.8 ±0.4 [.606±.016]	0.8 m/m	0.4 m/m [.016]	1478615-2
		200g	50g			[.031]		1478616-2
		330g	70g	[]	[]	[]		1478617-2
	SPDT			1.6 m/m	14.8 ±0.4	0.8 m/m	0.4 m/m	1478667-2
5	SPNC	120g	20g	[.063]	$[.606\pm.016]$	0.8 m/m [.031]	0.4 m/m [.016]	1478668-2
	SPNO			[]	[]	[]		1478669-2
	SPDT			1.6 m/m	149.04	0.9 m/m	0.4 m/m	1478670-2
0.1		60g	12g	[.063]	14.8 ±0.4 [.606±.016]	0.8 m/m [.031]	0.4 m/m [.016]	1478671-2
	SPNO			[]	[]	[]	[0]	1478672-2

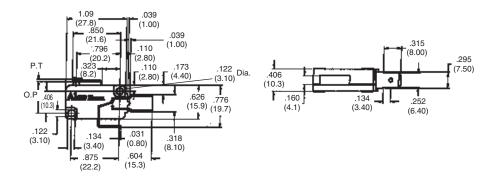
### **Spade Type Terminal**



#### **Product Facts**

n .250 [6.35] tab for use with .250 [6.35] FASTON receptacles

n Short lever to increase operating positions



AMP	Switch Position	Operating Force	Releasing Force	Pre Travel (P.T.)	Operating Position	Over Travel	Movement Differential	Part Number
		120g	20g					1478606-2
	SPDT	200g	50g	1.6 m/m	15.4 ±0.4	0.8 m/m	0.4 m/m	1478607-2
		330g	70g	[.063]	[.606±.016]	[.031]	[.016]	1478608-2
		120g	20g	1.6 m/m	15.4 ±0.4	0.8 m/m	0.4 m/m	1478612-2
16	SPNC	200g	50g					1478613-2
		330g	70g	[.063]	[.606±.016]	[.031]	[.016]	1478614-2
	SPNO	120g	20g				0.4 m/m [.016]	1478618-2
		200g	50g	1.6 m/m	15.4 ±0.4	0.8 m/m [.031]		1478619-2
		330g	70g	[.063]	[.606±.016]			1478620-2

Miniature Short Lever

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Catalog 1308390 Issued 9-04

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Microswitches

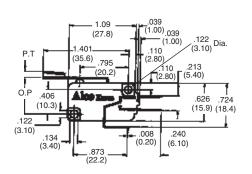
## **Miniature Normal Lever**

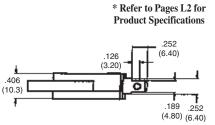
#### Spade/Solder Type Terminal



#### **Product Facts**

- n .187 [4.75] tab with solder hole
- n Use .187 [4.75] FASTON receptacles or solder wire directly to terminal
- n Lever to increase travel and operating position as well as reduce operating force





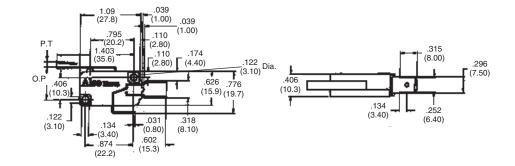
AMP	Switch Position	Operating Force	Releasing Force	Pre Travel (P.T.)	Operating Position	Over Travel	Movement Differential	Part Number
		60g	10g	4.0 m/m	15.4 ±1.4	1.3 m/m	1.2 m/m	1478603-3
	SPDT	120g	20g	[.157]	[.606±.055]	[.051]	[.047]	1478604-3
		180g	30g	[]	[]	[.00.1]		1478605-3
		60g	10g	4.0 m/m	15.4 ±1.4	1.3 m/m	1.2 m/m	1478609-3
16	SPNC	120g	20g	[.157]	[.606±.055]	[.051]	[.047]	1478610-3
		180g	30g	[	[]	[.00.1]	[.0.1]	1478611-3
	SPNO	60g	10g	4.0 m/m [.157]	15.4 ±1.4 [.606±.055]	1.3 m/m	1.2 m/m [.047]	1478615-3
		120g	20g			[.051]		1478616-3
		180g	30g	[]		[.00.1]		1478617-3
	SPDT			4.0 m/m	15.4 ±1.4	1.3 m/m	1.2 m/m	1478667-3
5	SPNC	60g	10g	[.157]	$[.606\pm.055]$	[.051]	[.047]	1478668-3
	SPNO			[]	[]	[.00.1]		1478669-3
	SPDT	-		4.0 m/m	15.4 ±1.4	1.3 m/m	1.2 m/m	1478670-3
0.1 SPNC	35g	6g	[.157]	$[.606\pm.055]$	[.051]	1.2 m/m [.047]	1478671-3	
	SPNO			[01]	[.000±.000]	[.501]	[.047]	1478672-3

#### **Spade Type Terminal**



#### **Product Facts**

- n .250 [6.35] tab for use with .250 [6.35] FASTON receptacles
- n Lever to increase travel and operating position as well as reduce operating force



AMP	Switch Position	Operating Force	Releasing Force	Pre Travel (P.T.)	Operating Position	Over Travel	Movement Differential	Part Number
		60g	10g					1478606-3
	SPDT	120g	20g	4.0 m/m	15.4 ±1.4	1.3 m/m	1.2 m/m	1478607-3
		180g	30g	[.157]	[.606±.055]	[.051]	[.047]	1478608-3
		60g	10g					1478612-3
16	SPNC	120g	20g	4.0 m/m	15.4 ±1.4	1.3 m/m	1.2 m/m	1478613-3
		180g	30g	[.157]	[.606±.055]	[.051]	[.047]	1478614-3
		60g	10g					1478618-3
	SPNO	120g	20g	4.0 m/m	15.4 ±1.4	1.3 m/m	1.2 m/m	1478619-3
		180g	30g	[.157]	[.606±.055]	[.051]	[.047]	1478620-3

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Microswitches

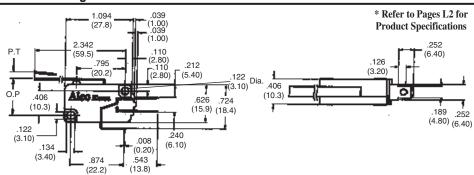
## **Miniature Long Lever**

#### Spade/Solder Type Terminal



#### **Product Facts**

- n .187 [4.75] tab with solder holes
- n Use .187 [4.75] FASTON receptacles or solder wire directly to terminal
- n Long lever to increase travel and reduce operating force



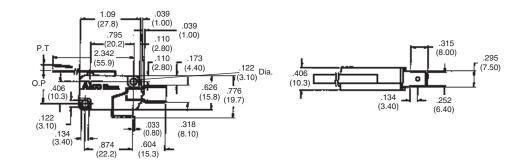
AMP	Switch Position	Operating Force	Releasing Force	Pre Travel (P.T.)	Operating Position	Over Travel	Movement Differential	Part Number
		30g	5g	7.5 m/m	15.4 ±3.0	2.6 m/m	2.4 m/m	1478603-4
	SPDT	60g	10g	[.295]	[.606±.118]	[.102]	[.094]	1478604-4
		90g	15g	1 1	[]	[]	[.001]	1478605-4
		30g	5g	7.5 m/m	15.4 ±3.0	2.6 m/m	2.4 m/m	1478609-4
16	SPNC	60g	10g	[.295]	[.606±.118]	[.102]	[.094]	1478610-4
		90g	15g	[.=00]		[]		1478611-4
		30g	5g	7.5 m/m [.295]	15.4 ±3.0 [.606±.118]	2.6 m/m	2.4 m/m [.094]	1478615-4
	SPNO	60g	10g			[.102]		1478616-4
		90g	15g	[.200]				1478617-4
	SPDT			7.5 m/m	15.4 ±3.0	2.6 m/m	2.4 m/m	1478667-4
5	SPNC	30g	5g	[.295]	$[.606\pm.118]$	[.102]	[.094]	1478668-4
	SPNO 000			[.200]	[]	[]	[.004]	1478669-4
	SPDT			7.5 m/m	15.4 ±3.0	2.6 m/m	2.4 m/m	1478670-4
0.1	SPNC	15g	3g	[.295]	$[.606\pm.118]$	[.102]	2.4 m/m [.094]	1478671-4
	SPNO			[.=00]	[]	[02]	[]	1478672-4

#### **Spade Type Terminal**



## Product Facts

- n .250 [6.35] tab for use with .250 [6.35] FASTON receptacles
- n Long lever to increase travel and reduce operating force



AMP	Switch Position	Operating Force	Releasing Force	Pre Travel (P.T.)	Operating Position	Over Travel	Movement Differential	Part Number
		30g	5g					1478606-4
	SPDT	60g	10g	7.5 m/m	15.4 ±3.0	2.6 m/m	2.4 m/m	1478607-4
		90g	15g	[.295]	[.606±.118]	8] [.102] [.09	[.094]	1478608-4
-		30g	5g					1478612-4
16	SPNC	60g	10g	7.5 m/m	15.4 ±3.0	2.6 m/m	2.4 m/m [.094]	1478613-4
		90g	15g	[.295]	[.606±.118]	[.102]		1478614-4
-	SPNO	30g	5g				2.4 m/m [.094]	1478618-4
		60g	10g	7.5 m/m	15.4 ±3.0	2.6 m/m [.102]		1478619-4
		90g	15g	[.295]	[.606±.118]			1478620-4

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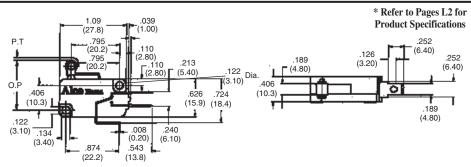
## **Miniature Short Roller**

#### Spade/Solder Type Terminal



#### **Product Facts**

- n .187 [4.75] tab with solder holes
- n Use .187 [4.75] FASTON receptacles or solder wire directly to terminal
- n Short roller to increase operating force and position



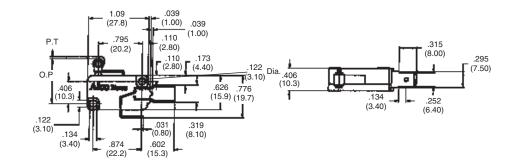
AMP	Switch Position	Operating Force	Releasing Force	Pre Travel (P.T.)	Operating Position	Over Travel	Movement Differential	Part Number
		140g	20g	1.6 m/m	20.7 ±0.8	0.8 m/m	0.4 m/m	1478603-5
	SPDT	240g	50g	[.063]	[.815±.003]	[.031]	[.016]	1478604-5
		350g	70g	[.000]	[101021000]	[]		1478605-5
		140g	20g	1.6 m/m	20.7 ±0.8	0.8 m/m	0.4 m/m	1478609-5
16		240g	50g	[.063]	[.815±.003]	[.031]	[.016]	1478610-5
		350g	70g	[.000]	[]	[]		1478611-5
		140g	20g	1.6 m/m [.063]	20.7 ±0.8 [.815±.003]	0.8 m/m	0.4 m/m [.016]	1478615-5
	SPNO	240g	50g			[.031]		1478616-5
		350g	70g			[.001]		1478617-5
	SPDT			1.6 m/m	20.7 +0.8	0.8 m/m	0.4 mm/mm	1478667-5
5	SPNC	140g	20g	[.063]	20.7 ±0.8 [.815±.003]	[.031]	0.4 m/m [.016]	1478668-5
	SPNO			[.000]	[.0102.000]	[.001]		1478669-5
	SPDT		1.6 mg/mg	007.00	0.0 m /m	0.4 mg/mg	1478670-5	
0.1		60g	12g	1.6 m/m [.063]	20.7 ±0.8 [.815±.003]	0.8 m/m [.031]	0.4 m/m [.016]	1478671-5
	SPNO			[.005]	[.010±.000]			1478672-5

#### **Spade Type Terminal**



#### **Product Facts**

- n .250 [6.35] tab for use with .250 [6.35] FASTON receptacles
- n Short roller to increase operating force and position



AMP	Switch Position	Operating Force	Releasing Force	Pre Travel (P.T.)	Operating Position	Over Travel	Movement Differential	Part Number
		140g	20g					1478606-5
	SPDT	240g	50g	1.6 m/m	20.7 ±0.8	0.8 m/m	0.4 m/m	1478607-5
		350g	70g	[.063]	[.815±.003]	[.031]	[.016]	1478608-5
		140g 20g	1478612-5					
16	SPNC	240g	50g	1.6 m/m	20.7 ±0.8	0.8 m/m	0.4 m/m	1478613-5
		350g	70g	[.063]	[.815±.003]	[.031]	[.016]	1478614-5
		140g	20g			0.8 m/m 0.4 m/m		1478618-5
	SPNO	240g	50g	1.6 m/m	20.7 ±0.8			1478619-5
		350g	70g	[.063]	[.815±.003]	[.031]	[.016]	1478620-5

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Microswitches

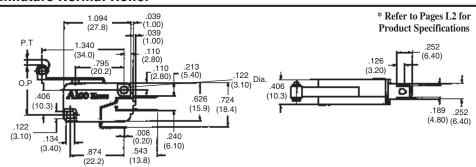
## **Miniature Normal Roller**

#### Spade/Solder Type Terminal



#### **Product Facts**

- n .187 [4.75] tab with solder hole
- n Use with .187 [4.75] FASTON receptacles or solder directly to terminal
- n Roller to increase travel and operating position as well as reduce operating force



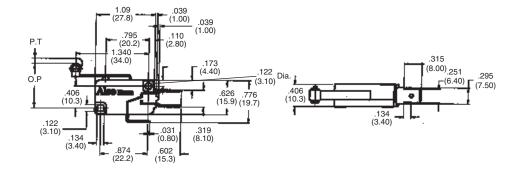
AMP	Switch Position	Operating Force	Releasing Force	Pre Travel (P.T.)	Operating Position	Over Travel	Movement Differential	Part Number
		60g	10g	4.0 m/m	20.7 ±1.6	1.3 m/m	1.2 m/m	1478603-6
	SPDT	120g	20g	[.157]	[.815±.063]	[.051]	[.047]	1478604-6
		180g	30g	[]	[]	[]	[]	1478605-6
		60g	10g	4.0 m/m	20.7 ±1.6	1.3 m/m	1.2 m/m	1478609-6
16	SPNC	120g	20g	[.157]	[.815±.063]	[.051]	[.047]	1478610-6
		180g	30g	[]	[10102.000]	[.00.1]	[.0.1]	1478611-6
		60g	10g	4.0 m/m	20.7 ±1.6	1.3 m/m	1.2 m/m [.047]	1478615-6
	SPNO	120g	20g	[.157]	[.815±.063]	[.051]		1478616-6
		180g	30g	[]	[10102.000]	[.00.1]	[.0.1]	1478617-6
	SPDT			4.0 m/m	20.7 ±1.6	1.3 m/m	1.2 m/m	1478667-6
5	SPNC	60g	10g	[.157]	[.815±.063]	1.3 m/m [.051]	1.2 m/m [.047]	1478668-6
	SPNO			[]	[10102.000]	[.00.1]	[.0.1]	1478669-6
	SPDT			4.0 m/m	20.7 ±1.6	1.2 m/m	1.2 m/m	1478670-6
0.1	SPNC	35g	6g	4.0 m/m [.157]	20.7 ±1.6 [.815±.063]	1.3 m/m [.051]	1.2 m/m [.047]	1478671-6
	SPNO			[07]	[.0.012.000]	[.001]	[]	1478672-6

#### **Spade Type Terminal**



#### **Product Facts**

- n .250 [6.35] tab for use with .250 [6.35] FASTON receptacles
- n Roller to increase travel and operating position as well as reduce operating force



AMP	Switch Position	Operating Force	Releasing Force	Pre Travel (P.T.)	Operating Position	Over Travel	Movement Differential	Part Number
		60g	10g					1478606-6
	SPDT	120g	20g	4.0 m/m	20.7 ±1.6			1478607-6
		180g	30g	[.157]	[.815±.063]	[.051]	[.047]	1478608-6
-		60g	10g				n 1.2 m/m [.047]	1478612-6
16	SPNC	120g	20g	4.0 m/m [.157]	20.7 ±1.6 [.815±.063]	1.3 m/m [.051]		1478613-6
		180g	30g					1478614-6
-		60g	10g					1478618-6
	SPNO	120g	20g	4.0 m/m	20.7 ±1.6	1.3 m/m	1.2 m/m	1478619-6
		180g	30g	[.157]	[.815±.063]	[.051]	[.047]	1478620-6

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Microswitches

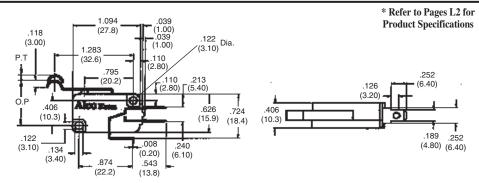
## **Miniature Simulator Lever**

#### Spade/Solder Type Terminal



#### **Product Facts**

- n .187 [4.75] tab with solder hole
- n Use .187 [4.75] FASTON receptacles or solder directly to terminal
- n Simulator lever for operating position between a roller and a lever



AMP	Switch Position	Operating Force	Releasing Force	Pre Travel (P.T.)	Operating Position	Over Travel	Movement Differential	Part Number
		60g	10g	4.0 m/m	18.6 ±1.5	1.3 m/m	1.2 m/m	1478603-7
	SPDT	120g	20g	[.157]	[.732±.059]	[.051]	[.047]	1478604-7
		180g	30g			[.0.1]	1478605-7	
		60g	10g	4.0 m/m	18.6 ±1.5	1.3 m/m	1.2 m/m	1478609-7
16	SPNC	120g	20g	[.157]	[.732±.059]	[.051]	[.047]	1478610-7
		180g	30g	[]	[012.0000]	[.00.1]	[.0.1]	1478611-7
		60g	10g	4.0 m/m	18.6 ±1.5 [.732±.059]	1.3 m/m [.051]	1.2 m/m [.047]	1478615-7
	SPNO	120g	20g	[.157]				1478616-7
		180g	30g	[]	[012.0000]	[.00.1]	[.0.1]	1478617-7
	SPDT			4.0 m/m	18.6 ±1.5	1.2 m/m	1.2 m/m	1478667-7
5	SPNC	60g	10g	[.157]	[.732±.059]	1.3 m/m [.051]	1.2 m/m [.047]	1478668-7
	SPNO	-		[.107]	[022.000]	[.001]	[.017]	1478669-7
	SPDT			4.0 m/m	18.6 ±1.5	1.2 m/m	1.0 m/m	1478670-7
0.1	SPNC	35g	6g	4.0 m/m [.157]	$[.732\pm.059]$	1.3 m/m [.051]	1.2 m/m [.047]	1478671-7
	SPNO	-		[07]	[	[.001]	[.017]	1478672-7

#### **Spade Type Terminal**



#### .039 (1.00) 1.095 .117 (3.00) (27.8).039 (1.00) .110 .795 РТ (20.2)(2.80).315 (8.00) .110 .173 .122 Dia. (2.80) (4.40) .252 .295 (6.40) (7.50) Æ O.P .626 .406 (10.3) .776 .406 (10.3) (15.9) (19.7) į. F .157 .134 F .122 .031 (0.80) (4.00) (3.40) (3.10) .318 (8.10) .134 (3.40) .604 .874 (15.3) (22.2)

#### **Product Facts**

- n .250 [6.35] tab for use with .250 [6.35] FASTON receptacles
- n Simulator lever for operating position between a roller and a lever

AMP	Switch Position	Operating Force	Releasing Force	Pre Travel (P.T.)	Operating Position	Over Travel	Movement Differential	Part Number
		60g	10g					1478606-7
	SPDT	120g	20g	4.0 m/m	18.6 ±1.5	1.3 m/m	1.2 m/m	1478607-7
		180g	30g	[.157]	[.732±.059]	[.051]	[.047]	1478608-7
	60g         10g           SPNC         120g         20g         4.0 m/m         18.6 ±1.5         1.3 m/m         1.2 m/m	1478612-7						
16		120g	20g	4.0 m/m [.157]		1.3 m/m [.051]	1.2 m/m [.047]	1478613-7
		180g	30g		[.732±.059]			1478614-7
	60g 10g		1478618-7					
	SPNO	120g	20g	4.0 m/m [.157]	18.6 ±1.5	1.3 m/m [.051]	1.2 m/m [.047]	1478619-7
		180g	30g		[.732±.059]			1478620-7

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L10

### **Subminiature Microswitches**

Alcoswitch subminiature micro switches are available with many options to fit applications with limited space and a 5 Amp or less current draw.

With the options of levers, rollers and simulator, a variety of operating forces, operating positions and travel distances are available to fit most applications. In addition to tabs and solder terminals, this line is available with PC terminals to mount directly to your PC board.

If this offering doesn't fit your application needs, contact the product information center or your Tyco sales person to discuss a custom product.

## **Technical Information**

Performar	nce Information							
Amp Ratin	g	5						
Insulation Resistance		Min. 100M ohm (at 500V DC	2)					
Contact Re	esistance	Max 50M ohm (by voltage drop, 1A 6	V-8V DC)					
	Between terminals	1000Vrms for 1 min						
Dielectric Strength	Between terminals & other exposed metal parts	1500Vrms for 1 min	1500Vrms for 1 min					
	Between terminals and earth	1500Vrms for 1 min	1500Vrms for 1 min					
Temperatu	ire Rise	30°C Max						
Terminal Strength		6kg pulling and push torque shall be ap	blied for 1min					
Allowable	Operating Speed	0.1 to 1,000 mm/sec						
		Min 30G (O.F.100g. 150g)	Contact opening max 1msec					
Shock Hes	sistance (without lever)	Min 15G (O.F. 50g)	_					
Vibration F	Resistance (without lever)	9G, 10 to 55 Hz at double amplitude (contact opening, max 1mse						
Electrical L	ife	50,000 at 20cpm						
Mechanica	l Life	500,000 at 60cpm						
Mechanica	I Repeatability	300 cpm						
Safety App	proval	UL / CSA						
Ambient Te	emperature	-25°C to +85°C						

Case and Cover	P.B.T Resin, UL94 V-0 PA 66, UL94 V-0
Case and Cover	PA 66 UI 94 V-0
Movable Contactor	
Movable Contactor	Beryllium Copper, with or without silver plating
Button	Phenolic Resin, UL94 HB or UL94V0
Common Terminal	Brass, sliver plated
Terminal (NC)	Brass
Terminal (NO)	Brass
Movable Contact	Silver alloy
Fixed Contact	Silver alloy, silver plated
Lever	Stainless Steel

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UK: 44-141-810-8967

Microswitches

TAB

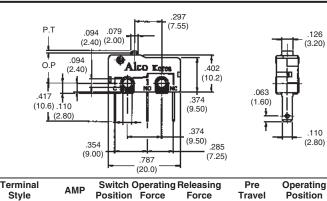
PCB

Solder

## Subminiature Pin Plunger

#### **Pin Plunger**





150g

20g

\* Refer to Pages L10 for **Product Specifications** 

126 (3.20)

.110

8.4 ±0.4

[.331±.016]

0.6 m/m

[.024]

Over

Travel

0.3 m/m

[.012]

Over

Travel

1.2 m/m

[.047]

8.8 ±0.8

[.346±.031]

Movement

Differential

0.8 m/m

[.031]

Hong Kong: 852-2735-1628 Japan: 81-44-844-8013

UK: 44-141-810-8967

Part

Number

1478600-2

1478601-2

1478602-2

Movement

Differential

0.2 m/m

[.008]

Part

Number

1478600-1

1478601-1

1478602-1

### **Product Facts**

n Available in tab, PCB or

- solder terminals
- n Versatile pin plunger option

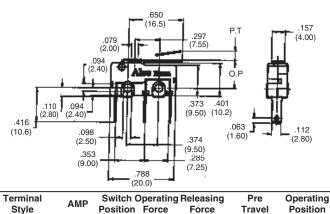
## Subminiature Normal Lever

5

SPDT

#### Normal Lever





#### **Product Facts**

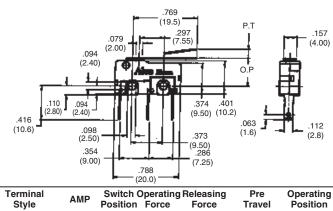
- n Available in tab, PCB or solder terminals
- Style Position Force Travel Force TAB 2.8 m/m PCB 5 SPDT 55g 3.5g [.110] **n** Lever length to reduce Solder actuation force and increase

## Subminiature Long Lever

#### Long Lever

travel





Product Facts	Terminal	AMP	Switch C	Operating	Releasing	Pre	Operating	Over	Movement	Part
$_{ m n}$ Available in tab. PCB or	Style	AIVIP	Position	Force	Force	Travel	Position	Travel	Differential	Number
solder terminals	TAB					0.5	0.0.1.0	1.0	1.0	1478600-3
	PCB	5	SPDT	45g	3.0g	3.5 m/m [.138]	8.8 ±1.2 [.346±.047]	1.6 m/m [.063]	1.0 m/m - [.039] _	1478601-3
n Long lever for increased travel and reduced force	Solder					[.100]	[.0401.047]	[.000]	[.000] =	1478602-3
li avei allu leuuleu luile										

L12

L

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**Product Facts** 

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Subminiature Microswitches

Microswitches

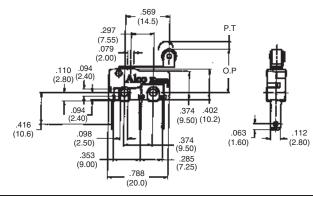
## Subminiature Roller Lever

#### **Roller Lever**

**Product Facts** 



n Available in tab, PCB or solder terminals n Roller lever for increased operating position



\* Refer to Pages L10 for **Product Specifications** 

Terminal Style	AMP	Switch Position	Operating Force	Releasing Force	Pre Travel	Operating Position		Movement Differential	
TAB					0.5 /	145.00	0.0	0.5 /	1478600-4
PCB	5	SPDT	60g	4.0g	2.5 m/m [.098]	14.5 ±0.8 [.570±.031]	0.8 m/m [.031]	0.5 m/m - [.020] -	1478601-4
Solder					[.030]	[.0701.001]	[.001]	[.020] -	1478602-4

# **Simulator Lever**



## Subminiature Simulator Lever

AMP

5

Position

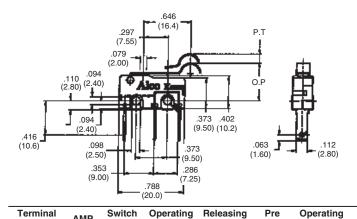
SPDT

Style

TAB

PCB

Solder



Force

40g

Force

3.0g

Travel

3.6 m/m

[.142]

Position

11.6 ±0.8

[.457±.031]

Product Facts
---------------

- n Available in tab, PCB, or solder terminals
- n Simulator lever for operating position between a roller and a lever

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L

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Over

Travel

0.8 m/m

[.031]

Movement

0.6 m/m

[.024]

**Differential Number** 

Part

1478600-5

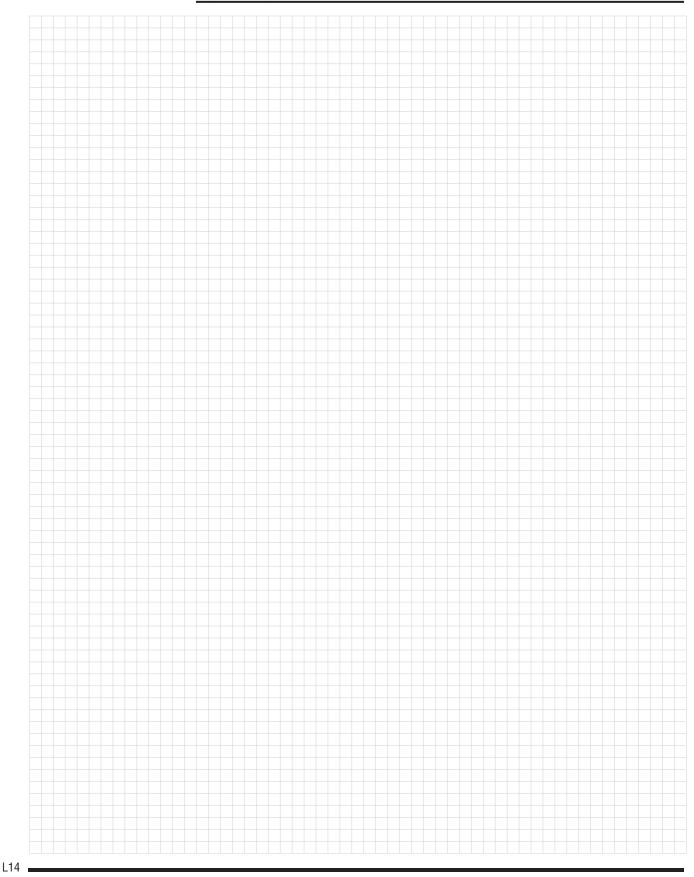
1478601-5

1478602-5



**Alcoswitch Products** 

**Engineering Notes** 



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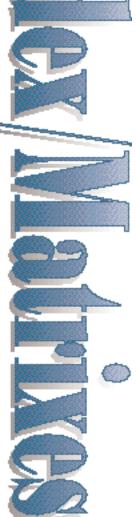
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	<b>Tyco Electronics</b> Cross <b>Reference</b>	M11 - M23	
	cs to Alcoswitch Cross Reference	M24 - M36	



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## Soldering Process Recommendation Guide

The majority of customers utilizing miniature or subminiature switches in the industry today have a great concern about the switches' capabilities during their soldering and cleaning cycles. This concern centers around the introduction of contaminates into the switch contact area which could cause the switch to experience various failure modes either immediately or during the life of the switch.

These failure modes can show in a number of manners. The following are just a few examples: high contact resistance, open contacts, low dielectric strength, and high actuation forces causing use-related malfunctions. Since most fluxes become active with the introduction of high temperatures used in all soldering techniques, the switch

must either prevent these fluxes from entering into its contact area or allow cleaning techniques to carry flux particles out. It must be understood that switch contamination can occur during any procedure: from hand soldering to Surface Mount systems for solder reflow.

We at Alcoswitch offer a wide range of switches to handle any soldering operations. However, certain soldering conditions will not apply to all switches. The following conditions and charts should help assist you in the soldering of our switches in your application. If you need additional information, please contact the factory.

### SOLDERING TYPES

#### A. WAVE SOLDERING

Top & Bottom board preheat: 200°F (93°C) for approximately 3 to 4 minutes.

Solder Temperature & Dwell Time: 500°F (260°C) for approximately 3 to 5 seconds.

#### **B. HAND SOLDERING**

1. 500°F-600°F (260°C-316°C) Utilizing a controlled 40 watt iron for 3 to 5 seconds maximum.

2. 500°F (260°C) Utilizing a controlled 30 watt iron for 10 seconds maximum.

#### C. DIP SOLDERING

- 1. Solder Temperature & Dwell Time: 500°F (260°C) for 3-5 seconds maximum.
- 2. Mounted on PCB .060" thick Solder Temperature & Dwell Time: 500°F (260°C) for 10 seconds maximum.

#### D. SURFACE MOUNT

Tyco Electronics performs testing of their Surface Mount switches in accordance with EIA-364-56, Resistance to Soldering Heat, test procedures 4 (Vapor Phase) and Procedure 5 (Infrared).

## CLEANING TYPES

- A. Solvent Wash (1.1.1 Trichlorethylene, T.M.S., T.M.C.)
- B. Vapor Degreasing
- C. Solvent Immersion
- D. Aqueous Cleaning

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## **Soldering Process Recommendation Guide**

SWITCH SERIES	SOL	DERING 1	ГҮРЕ	SURFACE MOUNT PROCESS		CLEANING PROCESSES			
	Wave	Hand	Dip*	Convection I.R.	Vapor Phase	Solvent Wash	Vapor Degrease	Solvent Immerse	Aqueous Clean
AP, AT, AS SERIES	Х	X	X			X			X
ALE, ATLE, ATE, APBE	X	X	X			X	X	X	X
ASE & F	X	X	X	X	Х	X	X	X	X
COMMAND SERIES, PC	X	X							-
COMMAND SERIES, LUGS	_	X							-
CST/CSS SERIES	X	X	X			X	X	X	X
DIP ROT.: DR, RR & RA/C	X	X	X			X	X		+
DIP ROT: DRDE SERIES	X	X	X			X	X	X	X
DIPS: AD, AR, AA/C, ATT	X	X	X	X	Х	X	X	X	X
DIPS: GD	X	X	X	X		X	X	X	X
DIPS: DTS WITH TAPE	X	X	X			X	X	X	X
DIPS: DTS, DYS W/O TAPE		X	X			X			
DIPS: S SERIES SIPS	X	X	X	X	Х	X	X	X	X
DIPS: DPU WITHOUT TAPE		X	X		21				
FSM SERIES (Unsealed)	X	X							+
FSM SERIES (Sealed)	X	X				X	X	X	X
FSM SMT TYPE (Unsealed)				X					
FSM SMT TYPE (Sealed)				X	Х	X	X	X	X
GEMINI: A SERIES	X	X	X	<u> </u>	71	X			
GEMINI: AE SERIES	X	X	X			X	X	X	X
GREEN SERIES: ALL MT VERSIONS		X	X			X	X	Λ	
GREEN SERIES: ALL MT VERSIONS PC	X	X	X			X	Λ		
GREEN SERIES: MPA-6, MPG, MPN, MPE		X	X			X	X		
GREEN SERIES: MTE	+	X	X			X	X X		
MHS SERIES	X	X	X			X	X X	X	X
MLL SERIES	X	X	<u>л</u>	X		X	X X	X X	X
MMS SERIES		X	X	Λ		X	X X		
MNIS SERIES MPA-6 SERIES		X	X			X			
MPA-0 SERIES MPB SERIES		X	X			X	X		
MPD SERIES MPN SERIES	+	X	X X			X	X X		
MPN SERIES MPS SERIES	+	X	X X			X	X X		
MRD SERIES MRD SERIES	X	X	X X	X		X	X X	X	X
MRJ SERIES MRJ SERIES	X	X	X X	Λ		X	Λ	Λ	
MRJ SEKIES MRJE/MRJB SERIES	X	X	X			X	X	X	X
MRJE/MIKJB SEKIES	Λ		Λ			Λ	Λ	Λ	
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### **Soldering Process Recommendation Guide**

SWITCH SERIES	SOL	DERING T	TYPE	SURFACE PROC	CESS		LEANING		ES
	Wave	Hand	Dip*	Convection I.R.	Vapor Phase	Solvent Wash	Vapor Degrease	Solvent Immerse	Aqueous Clean
MSP-3/MSPS SERIES		X	X						
MSP-5 SERIES		X	X			X	X		
MSPF SERIES		X	X			X	X		
MSPM SERIES		X	X			X	X		
MSS SERIES	X	X	X			X	X	X	X
MSSA SERIES	X	X	X			X	X	X	X
MSSA-01 & 04	X	X	X			X	X		
PUSHWHEELS, CARD EDGE		X							
PUSHWHEELS, PC PINS	X	X	X						
SDS SERIES	X	X	X			X	X	X	X
SES SERIES		X X	X X			X	X X	X	X
SE SERIES		X	X X			X	X X	Λ	Λ
SL SERIES									
	X	X	X			X	X		
SSA/SSJ SERIES	X		X			X	N/		
SSB SERIES	X	X	X			X	X		
STS SERIES	Х	X	X			X	X	X	X
SWK SERIES		X							
TP SERIES: ALL PC	Х								
TP SERIES: TP-ES	Х	X	X			X	X	Х	X
TP SERIES:TPC, TPD, TPF, TP-N		X	X			Х	X		
TRD	X	X	X			X			
TRD W/L.E.D.		X	X						
TSS-PC, TSS-RA	X	X				Х			
TSP, TST	X		X	Х	Х	X	X	Х	X
TT ALL PC	X	X				X			
TT-ES, TTE-ES	X	X	X			X	X	X	X
TT, TTE, TTN-WIRE LUG		X	X			X			

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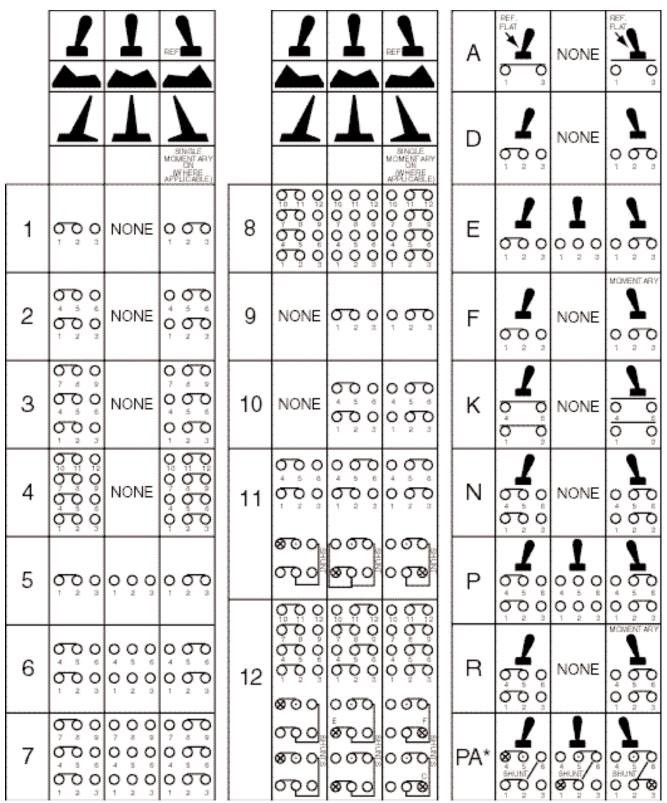
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#### Actuation Code Chart Toggles, Rockers and Paddles



Note: Three throw function achieved with external jumpers installed by customer. ⊙ In (Common)

⊗ Out

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M5 South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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#### **Actuation Code Chart Pushbuttons and Slides**

The following CODE CHARTS show schematically, the electrical contact closures of a switch relative to the actuator position. All diagrams represent a TOP view of the switch with the ALCO imprint facing and bushing slot, if any, pointing left. Terminal numbers are for reference only and may not appear on switches.

Code numbers are found throughout the catalog alongside part numbers. The same schematic may show either maintained or momentary action in some cases; momentary closures are indicated by the symbol (ON).

21

ura.

PUSH-OFF

MOMENT ARY ON

MOMENT ARY: DN

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QN

23

24

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C

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Q Q

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Dimensions are in inches

26 Pt

PUSH-ON

Ö

С

Q

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DUBH\_OF

О

TP SERIES P	USHBUTTON	3	
с	<mark>₽</mark>	NONE	
F FT		NONE	
м		NONE	
R		NONE	
TSS SERIES	SLIDE SWITC	HES	
A	<b>₩</b> ϙο <sub>3</sub>	NONE	
D		NONE	• <u>•</u>
E			• • • • • • • • • • • • • • • • • • •
к		NONE	
N		NONE	
Р			
PA			

#### PUSHBUTTONS NO

0

13

14

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PURHUCE

18

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and millimeters unless otherwise specified. Values in parentheses

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#### Glossary

- Actuation Force (Operating Force): The force required to change the actuator of a switch from one position to the other. Unit of Measure: Slides lbs., oz. or grams. Toggles and pushbuttons oz. Rotary products-torque.
- Actuator: A movable part of a switch which causes a change in the electrical configurations of the switch.

Example:	Toggle	Rocker	Slider
-	Plunger	Paddle	Shaft

- Alternate Action: See Push-Push.
- Angle of Throw: The angle or arc through which an actuator passes during actuation. Typically used to refer to the movement of toggle or rocker actuators. Unit of Measure: Degree.
- Antistatic: An antistatic device will withstand a specified potential without conducting between the actuator and any conducting element, usually the terminals or bushing. Unit of Measure: Typical value 15-20 kilovolts DC.
- **Bifurcated Contact:** A wiping movable contact consisting of two spring fingers that grip fixed contacts. Typically found in slide switches. Self-cleaning action. See Wiping Contact.
- **Bobbin Contact:** A movable contact shaped like a thread bobbin that rolls along the stationary contacts. Found only in slide switches.
- Bounce: See Contact Bounce.
- Break-Before-Make (Non-shorting, Break First): On actuation, the movable contact breaks contact with one fixed contact before making contact with another fixed contact. Contrast with make-before-break. Typical of toggle and pushbutton switches. (BBM)
- Break First: See Break-Before-Make.
- Butt Contact: A contact mechanism in which the movable contact makes contact with the fixed (stationary) contact without wiping motion between the surfaces. Typical of toggle and pushbutton switches. See Wiping Contact.
- Capacitive Load: A load in which the initial current on making (closing) of the contacts is higher than the steady state current on breaking (opening) of the contacts, the current is less than steady state. Current leads voltage in capacitive loads. See Resistive Load, Inductive Load, Power Factor and Inrush.
- Carrying Current: The maximum current that can be passed through the already closed contacts of a switch. Contrast with "Contact Rating."
- **Contact (Contact Area):** The metal surfaces that come into physical contact to complete an electrical circuit. These surfaces are found on moveable contacts (see) and terminals (see).
- **Contact Block:** A switching element which is added singly or in groups to an operator (see) to make a complete switch.

- **Contact Bounce (Bounce):** The time during switching in which electrical instability caused by the rebound of the contacts is observed. Unit of Measure: Millisecond.
- **Contact Gap:** The distance between a stationary contact and a moveable contact in the open position.
- **Contact Rating (Switching Rating):** The capacity to switch (connect or interrupt) an electrical load. Unit of Measure: Volts, amps, load characteristic (resistive, inductive, capacitive, power factor). Contrast with non-switching rating.
- **Contact Resistance:** The total resistance of the switch, comprised of the contact interface and terminals. Unit of Measure: Milliohms.
- Cycles: The number of times a switch can be actuated from one extreme position to the opposite extreme position and back to the original position.
- **Detent:** A mechanical stop that holds the contacts in a given position after the actuation force is removed or prevents the changing of contact position at less than a specified actuation force.
- **Detent Angle:** The angle or arc between detent positions in rotary switches. Unit of Measure: Degree.
- Dielectric Strength (Dielectric Withstanding Voltage, DWV, Leakage Resistance, Breakdown Voltage): The ability of an insulator to withstand a voltage without arcing across its surface. Most often applies to insulator between switch terminals and metal exposed to operator of switch. Unit of Measure: Volts RMS, Volts AC.
- Dielectric Withstanding Voltage: See Dielectric Strength.
- **DIP:** <u>D</u>ual-<u>i</u>n-Line <u>P</u>ackage refers to a component with two rows of PC terminals. The terminals are most commonly on a 0.100" pitch with 0.300" between rows.
- **Double-Break Contacts:** A contact mechanism using two sets of contacts to make or break a given circuit. This provides better power handling capacity and longer switch life. Typical of high power industrial switches. See Single-Break Contacts.
- Dry Circuit (Low Energy, Logic Level): An application in which power levels do not cause arcing, melting or softening of contacts. Typically requires gold plated contacts for reliable switch operation. Typical Definition: 0.4VA max. @ 20 VDC or peak AC.
- DWV: See Dielectric Strength.
- Electrical Life: The number of operations at a given electrical load that does not result in a degredation of any electrical or mechanical parameter beyond the standard set by the applicable end-of-life criteria. Unit of Measure: Cycles (on-off operations) (rotations).

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#### Glossary

- End of Life Criteria: Those specifications that a switch must meet at the end of its specified electrical life. Typically contact resistance and/or heat rise of contacts at full rated load at end of life.
- Environmental Seal: A seal that totally encapsulates the switch or relay providing a specified level of protection against intrusion of solids, liquids or gases into the body of the device.
- Fixed Contact (Stationary or Statis Contact): The non-moving contact. Typically integral to the end of the terminal inside the switch body.
- Flux: A material added during soldering to the metal surfaces which on heating prevents oxidation and aids the flowing of the solder.
- Gas-Tight Contact: A contact interface (movable to fixed contacts) in which the forces holding the contacts together are high enough to prevent gases from migrating between the members. This prevents static oxidation of the contact and subsequent intermittencies of high contact resistance. Typical forces are 280,000 PSI and higher.
- Gold Flash: A plating of gold typically less than 10 microinches (millionths) thick. Used only as a barrier to oxidation or corrosion of terminals to maintain solderability.
- Heat Rise: An indirect measurement of contact resistance used by rating agencies. The temperature rise over ambient of a contact set carrying a prescribed current is measured to determine whether it falls within safe limits.
- · Inductive Load: A load in which the initial current on making (closing) of the contacts is lower than the steady state. On breaking (opening) of the contacts, the current is greater than the steady state. Current lags voltage in inductive loads. Motors are the most common inductive load. See Resistive Load, Capacitive Load, Power Factor.
- Inrush: A transitory high-level of current through a contact set on making (closing). A characteristic of capacitive and some resistive loads. The inrush currents can be large and long enough to cause severe degredation of the contacts. See Resistive Load, Capacitive Load, Power Factor.
- Insert Molding: In switches and relays used to refer to terminations that are placed in the mold so that plastic is molded around the terminations. The chief benefit is an inherent seal against the intrusion of flux into the body of the device. Therefore no epoxy terminal seal is required.
- Insulation Resistance: The resistance between insulated parts measured at a specified DC voltage. Unit of Measure: Megohm.
- IP: An industrial specification used in Europe (and worldwide) to indicate the degree of protection provided by a component against accidental contact, penetration of solids or liquids into or through the component. See NEMA.

Dimensions are in inches

- Leakage Barrier: A ridge or web molded into a switch housing between terminals or contacts to increase the surface distance between them.
- Leakage Resistance: Dielectric Strength.
- Life: See Electrical Life: Mechanical Life.
- Logic Level: Refers to power levels typical of solid state electronic circuits (TTL, CMOS, etc.). For switch selection see Dry Circuit.
- Low Energy: See Dry Circuit.
- Maintained: A position (throw) of a switch which remains unchanged when actuation force is removed from switch actuator. Contrast with Momentary.
- Make-Before-Break (Shorting Contact, Make First): Movable contact makes the next circuit before breaking the first circuit. Typically found in slide switches. Contrast with Break-Before-Make (MBB).
- Make First: See Make-Before-Break.
- Mechanical Life: The number of operations of a switch without electrical load that does not result in a degredation of parameters beyond the standard set by the applicable end-oflife criteria.
- Momentary (Spring Return): A momentary switch position (throw) is held only for duration of force applied to the switch actuator.
- Movable Contact (Dynamic Contact): The contact moved by the switch actuator into and away from contact with a fixed contact thus forming the electrical circuits possible for a given device.
- N.C.: See Normally Closed.
- NEMA: National Electrical Manufacturers Association. A US Standards setting group for switch products most often applied to switches mounted in various enclosures offering specified degrees of protection against intrusion of liquids, dust, corrosive elements, etc. NEMA ratings are common in industrial or outdoor applications. See IP.
- NO: See Normally Open.
- Non-shorting: See Break-Before-Make.
- Non-switching Rating: The power carrying capacity of a switch after contact closure and end of contact bounce. Typically far higher than the contact rating (switching rating) of a switch. Unit of Measure: Volts and Amps.
- Normally Closed (NC): Normally closed contacts are closed when switch actuator is in its unactuated position (e.g., the plunger is in the resting position in the case of a pushbutton switch).
- Normally Open (NO): Normally open contacts are open when the switch actuator is in its unactuated or resting position.

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Electronics

#### Glossary

- Oil-tight: A generic term for a panel seal (see) commonly used in industrial settings. Defined by NEMA (see) and IP (see) standards.
- Operating Force: See Actuation Force.
- Operating Temperature: The range of temperature within which the device may be used. Unit of Measure: Degrees celsius or fahrenheit (C or F).
- Operator: A panel mounted mechanical device (pushbutton, selector, keylock, etc.) without contacts to which one or more contact blocks (see) may be added to make a complete switch.
- Overtravel: The distance the actuator may move between initial contact position and the extreme mechanical position of the actuator without damage to the switch. See travel. Pretravel. Unit of Measure: Inch. Degree.
- · Panel Seal: A panel seal provides a defined level of protection against penetration of liquids through which the switch and switch-to-panel interface to the rear of a panel. Unit of Measure: Inches/ft. of water.
- Pole: The number of separate circuits that can be active through a switch at any one time. A single pole switch allows one closed circuit at a time. A double pole switch allows two closed circuits, etc.
- Power Factor (PF): A measure of the inductive or capacitive character of an electrical load. Unit of Measure: 0 to 1 (e.g. 0.75)
- Process Seal: A seal that prevents damage to or contamination of the switch during the specified mechanical process. See wave solderable. Surface Moutable.
- Push-On/Push-Off: See Push-Push.
- Push-Push (Alternative Action, Push-On/Push-Off): A pushbutton switch style in which the electrical state of the switch is maintained between actuations of the plunger.
- Quick-Connect Terminals: Flat tab or blade style terminals designed to accept push-on female wire connectors (instead of soldering). The most popular sizes are: 0.250", 0.110" wide.
- Resistive load: A load in which the current and voltage are in phase. See Capacitive Load, Inductive Load, Power Factor, Inrush.
- Shorting Contact: See Make-Before-Break.
- Single Break Contacts: A contact mechanism using one set of contacts to make or break a given circuit. Typical of electronic or low power switches. See Double-Break Contacts.
- Splashproof: See panel Seal.
- Spring Return: See Momentary.

- Storage Temperature: The range of temperature within which the device may be stored. Typically this is a wider range than operating temperature. Unit of Measure: Degrees celsius or fahrenheit (C or F).
- Surface Mount Devices: Components that are compatible with surface mount PC board technology. Holes are not used for component mounting. Component leads are soldered to pads on the surface of the PC boards. For switches typically defined by surface mount terminations (e.g., J-bend, L-bend, butt, etc.) and compatibility with surface mount soldering (e.g., vapor phase reflow, infrared, etc.) and cleaning processes.
- Tactile Feel (Feedback): A mechanical signal (typically a "snap" or "click") that indicates contact closure to the operator.
- Terminal: The metal portion of the switch, exterior to the body, that is used to connect the switch to an electrical circuit. Examples: PC, wire lug, Turrett, quick-connect, wire-wrap, etc.
- Throws: Number of circuits that can be controlled by any one pole of a switch. Example: In a single pole — double throw (SPDT) switch, only one circuit may be completed at a time. However, there are two possible circuits (throws) that can be made.
- Travel: The total distance the actuator moves to change electrical position. See Pretravel. Overtravel. Unit of Measure: Inches, degrees.
- Washable: Applied to PC board mounted devices indicating compatibility with cleaning processes used after soldering. No degredation of electrical or mechanical parameters occurs.
- Wave Solderable: Indicates the device is suitable for the wave soldering and cleaning processes as supplied. See Process Seal.
- Wiping Contact: A contact mechanism in which the movable contact with the fixed contact with a wiping motion. Typical to slide and rotary switches.

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### **Alcoswitch & Tyco Electronics Power Tool Switches Application Worksheet**

Required Information
Electrical Considerations:
Voltage of Applications:Current of Application:
Circuitry Configuration: Number of Poles: Number of Throws:
Number of Operations anticipated:
Agency Approvals or Listings Desired:
Mechanical Considerations
Type of Switch (Actuator Type): q Toggle q Pushbutton q Rotary q Trigger q Other
Switch Function: (On/Off/On)   On/Off   Momentary:
Termination: <u>Q</u> Thru-Hole (PC) <u>Q</u> Surface Mount <u>Q</u> Wire Lug <u>Q</u> Quick Connect <u>Q</u> Other
Sealing Contamination Requirements:
Product Processing Considerations
Anticipated Soldering Process: Q Hand Q Wave Q SMT Q Other
Required Information For Power Tool Switches Only
Output Characteristics:
Variable Speed, Two Speed, On/Off, etc.:Reversing/Non-Reversing:
Lock-on, Lock-off, or Neither:
Hook-up wire size and configuration (i.e. stranded/solder tinned, fused, terminated, etc.) and retention force requirements (how many
pounds pull force and what directions required):
Optional Information
Electrical Considerations:
Contact Resistance Requirements: Initial: After Life Cycles:
Electrostatic Discharge: (E.S.D.) Requirements:
Contact Timing: <u>q</u> Shorting (Make-Before-Break) <u>q</u> Non Shorting (Break-Before-Make)
Other Electrical Considerations:
Mechanical Considerations
Actuation Force Requirements:
Actuator Travel Distance or Degrees of Throw:
Special Plating Requirements:   Flammability Rating:   Oxygen Index:
Special Material Requirements: % Solder Coverage:
Marking Required:
Desired Product Color Options:
Other Mechanical Considerations:
Environmental Considerations
Operating Temperature Range:
Storage Temperature Range:
Chemical Resistance Requirements:
Other Environmental Considerations:

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1-1437557-8         ATE2DGRA7         C21           1-1437558-0         MTA106D         C43           1-1437558-0         MTA106DPC         C44           1-1437558-2         MTA106E         C43           1-1437558-3         MTA106F         C43           1-1437558-4         MTA106F         C44           1-1437558-5         MTA106GPC         C44           1-1437558-7         MTA106GPC         C44           1-1437558-7         MTA106GPC         C44           1-1437558-7         MTA106GPC         C44           1-1437558-7         MTG106D         C48           1-1437559-1         MTG106D         C48           1-1437559-3         MTG106F         C48           1-1437559-3         MTG106G         C48           1-1437559-4         MTG106G         C48           1-1437559-5         MTG106H         C48           1-1437559-6         MTG126E         C49           1-1437559-7         MTG126E         C49           1-1437562-0         TT21NGPCST1/4         C8           1-1437562-2         TT21NGPCST1/4         C8           1-1437562-5         TT21NGRA1         C8           1-1437562-5         <	1-1437557-6	ATE2DGPC7	C20
1-1437557-9         ATE2EGPC1         C20           1-1437558-0         MTA106D         C43           1-1437558-1         MTA106DPC         C44           1-1437558-3         MTA106E         C43           1-1437558-3         MTA106FPC         C44           1-1437558-4         MTA106FPC         C44           1-1437558-5         MTA106GPC         C44           1-1437558-7         MTA106GPC         C44           1-1437558-8         MTA106H         C43           1-1437558-8         MTA106HC         C43           1-1437559-1         MTG106D         C48           1-1437559-2         MTG106G         C48           1-1437559-3         MTG106G         C48           1-1437559-4         MTG106G         C48           1-1437559-5         MTG106G         C48           1-1437559-6         MTG126D         C49           1-1437559-7         MTG106G         C48           1-1437562-8         TT21NGPC8T1/4         C8           1-1437562-0         TT21NGPC8T1/4         C8           1-1437562-1         TT21NGRA1         C8           1-1437562-6         TT21NGRA1         C8           1-1437562-8			
1-1437558-0         MTA106D         C43           1-1437558-1         MTA106E         C43           1-1437558-2         MTA106E         C43           1-1437558-3         MTA106FC         C44           1-1437558-4         MTA106FC         C44           1-1437558-5         MTA106GPC         C44           1-1437558-6         MTA106GPC         C44           1-1437558-9         MTA106GPC         C44           1-1437558-9         MTA106GPC         C44           1-1437559-9         MTG106D         C48           1-1437559-9         MTG106E         C48           1-1437559-9         MTG106G         C48           1-1437559-9         MTG106G         C48           1-1437559-6         MTG126D         C49           1-1437559-7         MTG126E         C49           1-1437562-0         TT21NGPCST1/4         C8           1-1437562-1         T1106PCST1/4         C8           1-1437562-2         TT21NGPCST1/4         C8           1-1437562-3         TT21NGRATES         C8           1-1437562-4         TT21NGRATI/4         C8           1-1437563-5         TTE43N8T1/4         C8           1-1437563-4 <td></td> <td></td> <td></td>			
1-1437558-2         MTA106E         C43           1-1437558-3         MTA106FPC         C44           1-1437558-5         MTA106FPC         C44           1-1437558-6         MTA106GPC         C44           1-1437558-6         MTA106GPC         C44           1-1437558-7         MTA106HPC         C44           1-1437558-8         MTA106HPC         C44           1-1437559-1         MTG106D         C48           1-1437559-2         MTG106F         C48           1-1437559-3         MTG106F         C48           1-1437559-4         MTG106G         C48           1-1437559-5         MTG106H         C48           1-1437559-8         MTG206N         C48           1-1437559-8         MTG206N         C48           1-1437559-8         MTG206N         C48           1-1437562-0         TT21NGPC8T1/4         C8           1-1437562-1         TT21NGPC9T1/4         C11           1-1437562-6         TT21NGRA1ES         C8           1-1437562-7         TT21NGRA1ES         C8           1-1437562-8         TT21NGRA1ES         C8           1-1437563-1         TTE41NGW2T         C8           1-1437563-2 <td></td> <td></td> <td></td>			
1-1437558-3         MTA106EPC         C44           1-1437558-4         MTA106FPC         C43           1-1437558-5         MTA106GPC         C44           1-1437558-7         MTA106GPC         C44           1-1437558-8         MTA106H         C43           1-1437558-9         MTA106HPC         C44           1-1437558-9         MTG106D         C48           1-1437559-1         MTG106C         C48           1-1437559-2         MTG106G         C48           1-1437559-5         MTG106G         C48           1-1437559-5         MTG106G         C48           1-1437559-5         MTG106G         C48           1-1437559-5         MTG106G         C48           1-1437559-6         MTG126D         C49           1-1437559-7         MTG126E         C49           1-1437562-0         TT21NGPCST1/4         C1           1-1437562-1         TT21NGPCST1/4         C8           1-1437562-2         TT21NGRA1ES         C8           1-1437562-3         TT21NGRA1ES         C8           1-1437563-0         TTE43N8T1/4         C8           1-1437563-1         TTE43N8T1/4         C8           1-1437563-2			-
1-1437558-4         MTA106F         C43           1-1437558-5         MTA106GPC         C44           1-1437558-6         MTA106GPC         C44           1-1437558-8         MTA106HPC         C43           1-1437558-9         MTA106HPC         C44           1-1437559-9         MTG106D         C48           1-1437559-1         MTG106E         C48           1-1437559-2         MTG106G         C48           1-1437559-5         MTG106G         C48           1-1437559-5         MTG106G         C48           1-1437559-6         MTG126D         C49           1-1437559-7         MTG126E         C49           1-1437562-8         TT21NGPC8T1/4         C8           1-1437562-1         T21NGPC9T1/4         C1           1-1437562-2         TT21NGRA1         C8           1-1437562-3         TT21NGRA11         C8           1-1437563-0         TTE41NGW2T         C8           1-1437563-1         TTE41NGW2T         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437563-4         TTE43N9T1/4         C8           1-1437564-1         TST11DGRA1D         C5           1-1437564-3			
1-1437558-6         MTA106G         C43           1-1437558-7         MTA106GPC         C44           1-1437558-8         MTA106HPC         C44           1-1437558-9         MTG106D         C48           1-1437559-2         MTG106E         C48           1-1437559-3         MTG106F         C48           1-1437559-4         MTG106G         C48           1-1437559-5         MTG106G         C48           1-1437559-7         MTG126D         C49           1-1437559-8         MTG206N         C48           1-1437559-7         MTG126E         C49           1-1437559-8         MTG206N         C48           1-1437562-0         TT21NGPCST1/4         C8           1-1437562-1         TT21NGPCST1/4         C8           1-1437562-6         TT21NGRAT1/4         C8           1-1437562-6         TT21NGRAT1/4         C8           1-1437563-7         TTE41NGW2T         C8           1-1437563-8         TTE1NGRAT1/4         C8           1-1437563-4         TTE43NST1/4         C8           1-1437563-5         TTE43NST1/4         C8           1-1437563-4         TST11DGRA1D         C5           1-1437564-5<			-
1-1437558-7         MTA106GPC         C44           1-1437558-8         MTA106HPC         C44           1-1437559-9         MTG106D         C48           1-1437559-1         MTG106E         C48           1-1437559-2         MTG106G         C48           1-1437559-3         MTG106G         C48           1-1437559-4         MTG106G         C48           1-1437559-5         MTG106G         C48           1-1437559-6         MTG126E         C49           1-1437559-7         MTG126E         C49           1-1437562-0         TT21NGPC8T1/4         C8           1-1437562-1         TT21NGPC9T1/4ES         C16           1-1437562-5         TT21NGPC9T1/4E         C1           1-1437562-6         TT21NGRA1ES         C8           1-1437562-7         TT21NGRA1ES         C8           1-1437562-8         TT21NGRA11/4         C8           1-1437563-0         TTE41NGW2T         C8           1-1437563-1         TTE41NGW2T         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437563-4         TTE11DGRA1D         C5           1-1437564-4         TST11DGRA2D         C5           1-1			-
1-1437558-8         MTA106H         C43           1-1437559-9         MTG106D         C48           1-1437559-1         MTG106D         C48           1-1437559-2         MTG106F         C48           1-1437559-3         MTG106G         C48           1-1437559-4         MTG106H         C48           1-1437559-5         MTG106H         C48           1-1437559-6         MTG106C         C49           1-1437559-7         MTG106C         C49           1-1437559-8         MTG206N         C48           1-1437562-0         TT21NGPC8T1/4         C8           1-1437562-1         TT21NGPC9T1/4ES         C16           1-1437562-2         TT21NGPC9T1/4E         C8           1-1437562-5         TT21NGPC9T1/4E         C8           1-1437562-6         TT21NGRA1ES         C8           1-1437563-1         TTE41NGW2T         C8           1-1437563-1         TTE41NGW2T         C8           1-1437563-3         TTE43N8T1/4         C8           1-1437563-4         TTE43N8T1/4         C8           1-1437564-4         TST11DGRA1D         C5           1-1437564-4         TST11DGRA1D         C5           1-143			
1-1437558-9       MTA 106HPC       C44         1-1437559-1       MTG 106D       C48         1-1437559-2       MTG 106F       C48         1-1437559-3       MTG 106G       C48         1-1437559-4       MTG 106G       C48         1-1437559-5       MTG 126D       C49         1-1437559-6       MTG 126D       C49         1-1437559-6       MTG 126D       C49         1-1437559-6       MTG 126D       C49         1-1437559-7       MTG 126E       C49         1-1437559-8       MTG 206N       C48         1-1437562-0       TT21NGPCST1/4       C1         1-1437562-6       TT21NGRATES       C8         1-1437562-6       TT21NGRATI/4       C8         1-1437562-6       TT21NGRATI/4       C12         1-1437562-7       TTE1NGRATI/4       C8         1-1437562-8       TT21NGRATI/4       C8         1-1437563-1       TTE43N9T1/4       C8         1-1437563-2       TTE43N9T1/4       C8         1-1437563-3       TTE43N9T1/4       C8         1-1437564-4       TST11DGRA1D       C5         1-1437564-5       TST11DGRA1D       C5         1-1437564-4 <td< td=""><td></td><td></td><td>-</td></td<>			-
1-1437559-2         MTG106E         C48           1-1437559-3         MTG106G         C48           1-1437559-4         MTG106G         C48           1-1437559-5         MTG106H         C48           1-1437559-6         MTG126D         C49           1-1437559-7         MTG206N         C48           1-1437559-8         MTG206N         C48           1-1437559-8         MTG206N         C48           1-1437559-7         TT21NGPCST1/4         C8           1-1437562-0         TT21NGPCST1/4         C8           1-1437562-1         TT21NGPCST1/4         C8           1-1437562-5         TT21NGRA1         C8           1-1437562-8         TT21NGRA7T1/4         C12           1-1437562-8         TT21NGRA7T1/4         C12           1-1437563-0         TTE41NGW2T         C8           1-1437563-1         TTE43NST1/4         C8           1-1437563-2         TTE43NST1/4         C8           1-1437563-3         TTE43NST1/4         C8           1-1437564-1         TST11DGRA1D         C5           1-1437564-3         TST11DGRA1D         C5           1-1437564-4         TST11DGRA1D         C5           1			
1-1437559-3         MTG106F         C48           1-1437559-4         MTG106G         C48           1-1437559-5         MTG106H         C48           1-1437559-6         MTG126D         C49           1-1437559-7         MTG126E         C49           1-1437559-8         MTG206N         C48           1-1437561-2         11106-AG         C54           1-1437562-0         TT21NGPC9T1/4         C11           1-1437562-1         TT21NGPC9T1/4ES         C16           1-1437562-2         TT21NGRA1         C8           1-1437562-8         TT21NGRA1         C8           1-1437562-9         TT21NGRA7T1/4         C12           1-1437563-0         TTE41NGW2T         C8           1-1437563-1         TTE43N8T1/4         C8           1-1437563-2         TTE43N8T1/4         C8           1-1437563-3         TTE43N8T1/4         C8           1-1437563-4         TTE43N8T1/4         C8           1-1437564-5         TST11DGRA1D         C5           1-1437564-4         TST11DGRA1D         C5           1-1437564-5         TST11DGRA1D         C5           1-1437564-6         TST11DGRA1D         C5			
1-1437559-4         MTG106G         C48           1-1437559-5         MTG106H         C48           1-1437559-6         MTG126D         C49           1-1437559-7         MTG126E         C49           1-1437559-8         MTG206N         C48           1-1437562-0         TT21NGPCSTI/4         C11           1-1437562-1         TT21NGPCSTI/4         C11           1-1437562-1         TT21NGPCSTI/4         C16           1-1437562-5         TT21NGPCSTI/4         C18           1-1437562-6         TT21NGRA1TI/4         C8           1-1437562-8         TT21NGRA3TI/4         C8           1-1437563-0         TTE41NGW2T         C8           1-1437563-1         TTE41NGW2T         C8           1-1437563-2         TTE43N9T1/4         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437563-4         TTE43N9T1/4         C8           1-1437563-5         TTE43N9T1/4         C8           1-1437564-1         TST11DGRA1D         C5           1-1437564-1         TST11DGRA1D         C5           1-1437564-6         TST11DGRA1D         C5           1-1437564-7         TST11DGRA1D         C5			
1-1437559-6         MTG126D         C49           1-1437559-7         MTG126E         C49           1-1437559-8         MTG206N         C48           1-1437561-2         11106-AG         C54           1-1437562-0         TT21NGPC8T1/4         C8           1-1437562-1         TT21NGPC9T1/4ES         C16           1-1437562-5         TT21NGPC9T1/4ES         C16           1-1437562-5         TT21NGRA1ES         C8           1-1437562-6         TT21NGRA3T1/4         C8           1-1437562-7         TT21NGRA3T1/4         C8           1-1437562-8         TT21NGRA7T1/4         C12           1-1437563-0         TTE43N8T1/4         C8           1-1437563-1         TTE43N9T1/4         C8           1-1437563-2         TTE43N9T1/4         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437563-4         TTE43N9T1/4         C8           1-1437564-3         TST11DGRA1D         C5           1-1437564-4         TST11DGRA1D         C5           1-1437564-5         TST11DGRA1D         C5           1-1437564-7         TST11DGRA1D         C5           1-1437564-7         TST11DGRA1D         C5			
1-1437559-7         MTG126E         C49           1-1437559-8         MTG206N         C48           1-1437561-2         11106-AG         C54           1-1437562-0         TT21NGPC8T1/4         C8           1-1437562-1         TT21NGPC9T1/4ES         C16           1-1437562-5         TT21NGRA1         C8           1-1437562-6         TT21NGRA1ES         C8           1-1437562-6         TT21NGRA7T1/4         C12           1-1437562-7         TT21NGRA7T1/4         C12           1-1437562-8         TT21NGRA7T1/4         C12           1-1437563-0         TTE41NGPC1         C8           1-1437563-1         TTE43N9T1/4         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437564-4         TST11DGRA1D         C5           1-1437564-5         TST11DGRA1D         C5           1-1437564-6         TST11DGSRA1D         C5           1-1437564-7         TST11DGSRA1D         C5           1-1437564-8         TST11DGSRA1D         C5           1-1437564-8         TST11DGVRA1D         C5 <td></td> <td></td> <td></td>			
1-1437559-8         MTG200N         C48           1-1437561-2         11106-AG         C54           1-1437562-0         TT21NGPC8T1/4         C8           1-1437562-1         TT21NGPC9T1/4         C11           1-1437562-2         TT21NGPC9T1/4         C11           1-1437562-5         TT21NGRA1ES         C8           1-1437562-6         TT21NGRA1ES         C8           1-1437562-8         TT21NGRA7T1/4         C12           1-1437562-9         TT21NGRA7T1/4         C12           1-1437563-0         TTE41NGPC1         C8           1-1437563-1         TTE43N9T1/4         C8           1-1437563-2         TTE43N9T1/4         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437563-5         TTE43N9T1/4         C8           1-1437563-5         TTE43N9T1/4         C8           1-1437564-4         TST11DGRA1D         C5           1-1437564-5         TST11DGSRA1D         C5           1-1437564-6         TST11DGSRA1D         C5           1-1437564-7         TST11DGVRA1D         C5           1-1437564-8         TST11DGVRA1D         C5           1-1437565-1         FSM13J         E5			
1-1437561-2         11106-AG         C54           1-1437562-0         TT21NGPCST1/4         C8           1-1437562-1         TT21NGPCST1/4         C11           1-1437562-2         TT21NGPCST1/4         C16           1-1437562-5         TT21NGRA1         C8           1-1437562-6         TT21NGRA1         C8           1-1437562-8         TT21NGRA1         C8           1-1437562-8         TT21NGRATI1/4         C12           1-1437562-9         TT21NGRATI1/4         C12           1-1437563-0         TTE41NGW2T         C8           1-1437563-1         TTE43N9T1/4         C8           1-1437563-2         TTE43N9T1/4         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437563-4         TST11DGRA1D         C5           1-1437564-5         TST11DGRA1D         C5           1-1437564-6         TST11DGSRA1D         C5           1-1437565-0         FSM13J         E5           1-1437565-1         FSM13J         E5           1-1437565-2         FSM13J         E5           1-1437565-3         FSM13J         E5           1-1437565-4         FSM112         E15           1-14			÷.,
1-1437562-1         TT21NGPC9T1/4         C11           1-1437562-2         TT21NGPC9T1/4ES         C16           1-1437562-5         TT21NGRA1         C8           1-1437562-6         TT21NGRA1ES         C8           1-1437562-6         TT21NGRA1ES         C8           1-1437562-9         TT21NGRA7T1/4         C12           1-1437563-0         TTE41NGQW2T         C8           1-1437563-1         TTE41NGWW2T         C8           1-1437563-2         TTE43N9T1/4         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437563-4         TTE43N9T1/4         C8           1-1437563-5         TTE43N9T1/4         C8           1-1437563-6         TST11DGRA1D         C5           1-1437564-6         TST11DGRA1D         C5           1-1437564-7         TST11DGSRA1D         C5           1-1437564-6         TST11DGSRA1D         C5           1-1437564-7         TST11DGRA2D         C5           1-1437564-6         TST11DGRA2D         C5           1-1437565-0         FSM13J         E5           1-1437565-1         FSM13J         E5           1-1437565-2         FSM14J         E5			C54
1-1437562-2         TT21NGPC9T1/4ES         C16           1-1437562-5         TT21NGRA1ES         C8           1-1437562-6         TT21NGRA1ES         C8           1-1437562-8         TT21NGRA3T1/4         C12           1-1437562-9         TT21NGRA7T1/4         C12           1-1437563-0         TTE41NGPC1         C8           1-1437563-1         TTE41NGW2T         C8           1-1437563-2         TTE43N8T1/4         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437563-4         TTE43N9T1/4         C8           1-1437563-5         TTE43N9T1/4         C8           1-1437563-4         TTE43N9T1/4         C8           1-1437563-5         TTE43N9T1/4         C8           1-1437563-6         TST11DGRA1D         C5           1-1437564-1         TST11DGRA2D         C5           1-1437564-6         TST11DGRA1D         C5           1-1437564-6         TST11DGRA1D         C5           1-1437564-6         TST11DGRA1D         C5           1-1437565-1         FSM13J         E5           1-1437565-2         FSM13J         E5           1-1437565-3         FSM14J         E5			
1-1437562-5         TT21NGRA1         C8           1-1437562-6         TT21NGRA1ES         C8           1-1437562-8         TT21NGRA3T1/4         C8           1-1437562-9         TT21NGRA7T1/4         C12           1-1437563-0         TTE41NGPC1         C8           1-1437563-1         TTE43N9T1/4         C8           1-1437563-3         TST1DGRAD         C5           1-1437564-1         TST11DGRAD         C5           1-1437564-5         TST11DGRAD         C5           1-1437564-6         TST11DGRAD         C5           1-1437565-1         FSM13J         E5           1-1437565-2         FSM1J         E4           1-1437565-3         FSM1J         E4           1-1437			
1-1437562-8         TT21NGRA3T1/4         C8           1-1437562-9         TT21NGRA7T1/4         C12           1-1437563-0         TTE41NGPC1         C8           1-1437563-1         TTE41NGPC1         C8           1-1437563-2         TTE43N8T1/4         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437563-4         TTE43N9T1/4         C8           1-1437563-5         TTE43N9T1/4         C8           1-1437563-4         TTE43N9T1/4         C8           1-1437564-4         TST11DGRA1D         C5           1-1437564-3         TST11DGSRA1D         C5           1-1437564-5         TST11DGSRA1D         C5           1-1437564-6         TST11DGVRA1D         C5           1-1437564-8         TST11DGVRA2D         C5           1-1437565-0         FSM13J         E5           1-1437565-1         FSM14J         E5           1-1437565-2         FSM14J         E5           1-1437565-6         FSM1J         E4,E5           1-1437565-6         FSM1LP         E15           1-1437565-7         FSM1LPA         E15           1-1437565-8         FSM1LPA         E15           1-14375			
1-1437562-9         TT21NGRA7T1/4         C12           1-1437563-0         TTE41NGPC1         C8           1-1437563-1         TTE41NGWV2T         C8           1-1437563-2         TTE43N8T1/4         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437563-4         TTE43N9T1/4         C8           1-1437563-5         TTE43N9T1/4         C8           1-1437563-5         TTE43P8T1/4         C8           1-1437563-5         TTE43P8T1/4         C8           1-1437564-1         TST11DGRA1D         C5           1-1437564-3         TST11DGSRA1D         C5           1-1437564-4         TST11DGSRA1D         C5           1-1437564-5         TST11DGVRA1D         C5           1-1437564-6         TST11DGVRA2D         C5           1-1437565-0         FSM13J         E5           1-1437565-1         FSM13J         E5           1-1437565-2         FSM14J         E5           1-1437565-3         FSM14J         E5           1-1437565-4         FSM11PA         E15           1-1437565-5         FSM1LPA         E15           1-1437565-6         FSM1LPA         E15           1-1437565			
1-1437563-0         TTE41NGPC1         C8           1-1437563-1         TTE41NGWW2T         C8           1-1437563-2         TTE43N8T1/4         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437563-4         TTE43N9T1/4         C8           1-1437563-5         TTE43N9T1/4         C8           1-1437563-6         TTE43N9T1/4         C8           1-1437564-1         TST11DGRA1D         C5           1-1437564-1         TST11DGSRA1D         C5           1-1437564-5         TST11DGSRA1D         C5           1-1437564-6         TST11DGVRA1D         C5           1-1437564-6         TST11DGVRA1D         C5           1-1437565-0         FSM13J         E5           1-1437565-0         FSM13J         E5           1-1437565-1         FSM13J         E5           1-1437565-2         FSM14J         E5           1-1437565-3         FSM16J         E5           1-1437565-5         FSM11P         E15           1-1437565-7         FSM1LP         E15           1-1437565-7         FSM1LPA         E15           1-1437565-8         FSM1LPA         E15           1-1437565-9			
1-1437563-2         TTE43N8T1/4         C8           1-1437563-3         TTE43N9T1/4         C8           1-1437563-3         TTE43N9T1/4E         C8           1-1437563-5         TTE43N9T1/4E         C8           1-1437563-5         TTE43P8T1/4         C8           1-1437564-5         TST11DGRA1D         C5           1-1437564-3         TST11DGRA2D         C5           1-1437564-4         TST11DGSPC1D         C5           1-1437564-5         TST11DGSRA1D         C5           1-1437564-6         TST11DGRA2D         C5           1-1437564-7         TST11DGRA1D         C5           1-1437564-6         TST11DGRA2D         C5           1-1437564-7         TST11DGVRA1D         C5           1-1437564-8         TST11DGVRA1D         C5           1-1437565-0         FSM13J         E5           1-1437565-1         FSM13J         E5           1-1437565-2         FSM14J         E5           1-1437565-3         FSM18J         E5           1-1437565-4         FSM12PA         E15           1-1437565-5         FSM11PA         E15           1-1437567-6         APB1CQPC         D18           1-143756			
1-1437563-3         TTE43N9T1/4         C8           1-1437563-4         TTE43N9T1/4E         C8           1-1437563-5         TTE43P8T1/4         C8           1-1437563-5         TTE43P8T1/4         C8           1-1437564-1         TST11DGRA1D         C5           1-1437564-3         TST11DGSPC1D         C5           1-1437564-4         TST11DGSRA1D         C5           1-1437564-5         TST11DGSRA1D         C5           1-1437564-6         TST11DGSRA1D         C5           1-1437564-6         TST11DGVRA1D         C5           1-1437564-7         TST11DGVRA2D         C5           1-1437564-8         TST11DGVRA2D         C5           1-1437565-0         FSM13J         E5           1-1437565-1         FSM13J         E5           1-1437565-2         FSM1J         E4,E5           1-1437565-5         FSM1J         E4,E5           1-1437565-6         FSM1LPA         E15           1-1437565-7         FSM1LPAR         E15           1-1437565-8         FSM1LPTR         E15           1-1437567-0         APA2RGRA         D17           1-1437567-3         APB1CGPC         D18           1-143			
1-1437563-4         TTE43N9T1/4E         C8           1-1437563-5         TTE43P8T1/4         C8           1-1437564-1         TST11DGRA1D         C5           1-1437564-3         TST11DGRA2D         C5           1-1437564-4         TST11DGSRA1D         C5           1-1437564-5         TST11DGSRA1D         C5           1-1437564-6         TST11DGSRA1D         C5           1-1437564-6         TST11DGSRA1D         C5           1-1437564-7         TST11DGVRA1D         C5           1-1437564-7         TST11DGVRA2D         C5           1-1437565-0         FSM13J         E5           1-1437565-1         FSM13A         E5           1-1437565-2         FSM1J         E4           1-1437565-5         FSM1J         E4           1-1437565-6         FSM1J         E4           1-1437565-6         FSM1LPA         E15           1-1437565-7         FSM1LPA         E15           1-1437565-8         FSM1LPA         E15           1-1437565-9         FSM1LPTR         E15           1-1437567-0         APA2RGRA         D17           1-1437567-1         APB1CGPC         D18           1-1437567-2			
1-1437564-1         TST11DGRAID         C5           1-1437564-3         TST11DGRA2D         C5           1-1437564-4         TST11DGSPC1D         C5           1-1437564-5         TST11DGSRA1D         C5           1-1437564-6         TST11DGSRAB1D         C5           1-1437564-6         TST11DGVRA1D         C5           1-1437564-8         TST11DGVRA1D         C5           1-1437564-8         TST11DGVRA2D         C5           1-1437564-8         TST11DGVRA2D         C5           1-1437564-8         TST11DGVRA2D         C5           1-1437564-8         TST11DGVRA2D         C5           1-1437565-0         FSM13J         E5           1-1437565-1         FSM14J         E5           1-1437565-3         FSM1EP         E15           1-1437565-6         FSM1LP         E15           1-1437565-7         FSM1LPA         E15           1-1437565-8         FSM1LPA         E15           1-1437565-9         FSM1LPA         E15           1-1437567-0         APA2RGRA         D17           1-1437567-1         APB1GPC         D18           1-1437567-2         APB1CGPC         D18           1-1437567-			
1-1437564-3         TST11DGRA2D         C5           1-1437564-4         TST11DGSPC1D         C5           1-1437564-5         TST11DGSRA1D         C5           1-1437564-6         TST11DGSRABID         C5           1-1437564-7         TST11DGVRA1D         C5           1-1437564-8         TST11DGVRA2D         C5           1-1437565-0         FSM13J         E5           1-1437565-1         FSM13J         E5           1-1437565-2         FSM14J         E5           1-1437565-3         FSM16J         E5           1-1437565-4         FSM11BJ         E5           1-1437565-5         FSM1LP         E15           1-1437565-7         FSM1LP         E15           1-1437565-7         FSM1LPA         E15           1-1437565-7         APB1CGPC         D18           1-1437567-1         APB1FGRA         D18           1-1437567-2         APB1FGRA         D18           1-1437567-3         APB1	1-1437563-5	TTE43P8T1/4	C8
1-1437564-4         TST11DGSPC1D         C5           1-1437564-5         TST11DGSRA1D         C5           1-1437564-6         TST11DGSRAB1D         C5           1-1437564-7         TST11DGVRA1D         C5           1-1437564-7         TST11DGVRA1D         C5           1-1437564-7         TST11DGVRA1D         C5           1-1437564-7         TST11DGVRA2D         C5           1-1437565-0         FSM13J         E5           1-1437565-1         FSM13JA         E5           1-1437565-3         FSM16J         E5           1-1437565-4         FSM18J         E5           1-1437565-5         FSM1J         E4,E5           1-1437565-6         FSM1LPA         E15           1-1437565-7         FSM1LPAR         E15           1-1437567-8         FSM1LPAR         E15           1-1437567-0         APA2RGRA         D17           1-1437567-1         APB1BGPC         D18           1-1437567-2         APB1GGRA         D18           1-1437567-3         APB1CGPC         D18           1-1437567-4         APB1GGRA         D18           1-1437567-5         APB1GGRA         D18           1-1437567-6			
1-1437564-5         TST11DGSRA1D         C5           1-1437564-6         TST11DGSRAB1D         C5           1-1437564-7         TST11DGVRA1D         C5           1-1437564-8         TST11DGVRA1D         C5           1-1437564-8         TST11DGVRA2D         C5           1-1437565-0         FSM13J         E5           1-1437565-1         FSM13JA         E5           1-1437565-2         FSM14J         E5           1-1437565-3         FSM16I         E5           1-1437565-4         FSM18J         E5           1-1437565-5         FSM1J         E4,E5           1-1437565-6         FSM1LPA         E15           1-1437565-7         FSM1LPA         E15           1-1437565-8         FSM1LPATR         E15           1-1437567-0         APA2RGRA         D17           1-1437567-2         APB1GPC         D18           1-1437567-3         APB1CGPC         D18           1-1437567-4         APB1GPC         D18           1-1437567-5         APB1GRA         D18           1-1437567-6         APB2QMGRA         D18           1-1437567-7         APB2GPC         D18           1-1437567-8         AP			
1-1437564-7         TST11DGVRA1D         C5           1-1437564-8         TST11DGVRA2D         C5           1-1437565-0         FSM13J         E5           1-1437565-1         FSM13JA         E5           1-1437565-2         FSM13J         E5           1-1437565-3         FSM14J         E5           1-1437565-4         FSM14J         E5           1-1437565-5         FSM1J         E4,E5           1-1437565-6         FSM1J         E4,E5           1-1437565-7         FSM1LP         E15           1-1437565-8         FSM1LPA         E15           1-1437565-9         FSM1LPTR         E15           1-1437567-0         APA2RGRA         D17           1-1437567-1         APB1BGPC         D18           1-1437567-3         APB1CGRA         D18           1-1437567-3         APB1CGRA         D18           1-1437567-5         APB1FGPC         D18           1-1437567-6         APB2MGRA         D18           1-1437567-7         APB2GPC         D18           1-1437567-7         APB2GPC         D18           1-1437567-7         APB2GPC         D18           1-1437567-8         APBE1FGPC			
1-1437564-8         TST11DGVRA2D         C5           1-1437565-0         FSM13J         E5           1-1437565-1         FSM13JA         E5           1-1437565-2         FSM14J         E5           1-1437565-3         FSM16J         E5           1-1437565-6         FSM1J         E5           1-1437565-6         FSM1J         E4,E5           1-1437565-6         FSM1LP         E15           1-1437565-6         FSM1LPA         E15           1-1437565-7         FSM1LPA         E15           1-1437565-8         FSM1LPAR         E15           1-1437565-9         FSM1LPTR         E15           1-1437567-0         APA2RGRA         D17           1-1437567-1         APB1GPC         D18           1-1437567-3         APB1CGPC         D18           1-1437567-3         APB1CGRA         D18           1-1437567-3         APB1CGRA         D18           1-1437567-4         APB1FGPC         D18           1-1437567-5         APB1FGRA         D18           1-1437567-6         APB2MGRA         D18           1-1437567-7         APB2RGPC         D18           1-1437567-8         APBE1FGPC			
1-1437565-0         FSM13J         E5           1-1437565-0         FSM13JA         E5           1-1437565-1         FSM13JA         E5           1-1437565-2         FSM14J         E5           1-1437565-3         FSM16J         E5           1-1437565-4         FSM18J         E5           1-1437565-5         FSM11P         E15           1-1437565-6         FSM1LP         E15           1-1437565-7         FSM1LPA         E15           1-1437565-8         FSM1LPA         E15           1-1437565-9         FSM1LPAR         E15           1-1437567-0         APA2RGRA         D17           1-1437567-1         APB1GPC         D18           1-1437567-2         APB1CGPC         D18           1-1437567-3         APB1CGPC         D18           1-1437567-4         APB1FGRA         D18           1-1437567-5         APB1FGRA         D18           1-1437567-6         APB2MGRA         D18           1-1437567-7         APB2RGPC         D18           1-1437567-8         APBE1FGPC         D19           1-1437569-1         I64J2A11         117           1-1437569-1         I64J2A11			
1-1437565-2         FSM14J         E5           1-1437565-3         FSM16J         E5           1-1437565-4         FSM18J         E5           1-1437565-5         FSM1J         E4,E5           1-1437565-6         FSM1LP         E15           1-1437565-7         FSM1LPA         E15           1-1437565-8         FSM1LPAR         E15           1-1437565-9         FSM1LPAR         E15           1-1437567-0         APA2RGRA         D17           1-1437567-1         APB1BGPC         D18           1-1437567-2         APB1CGPC         D18           1-1437567-3         APB1CGPC         D18           1-1437567-4         APB1FGPC         D18           1-1437567-5         APB1FGPC         D18           1-1437567-6         APB2QGRA         D18           1-1437567-7         APB2RGPC         D18           1-1437567-8         APBE1FGPC         D19           1-1437567-9         APBE1FGPC         D19           1-1437569-0         164J0A22         I17           1-1437569-1         164J2A11         117           1-1437569-2         164J2A22         117           1-1437569-3         164J2A11 </td <td></td> <td></td> <td></td>			
1-1437565-3         FSM16J         E5           1-1437565-4         FSM18J         E5           1-1437565-5         FSM1J         E4,E5           1-1437565-6         FSM1LP         E15           1-1437565-7         FSM1LPA         E15           1-1437565-8         FSM1LPAR         E15           1-1437565-9         FSM1LPAR         E15           1-1437567-0         APA2RGRA         D17           1-1437567-1         APB1BGPC         D18           1-1437567-2         APB1CGPC         D18           1-1437567-3         APB1CGPC         D18           1-1437567-4         APB1FGPC         D18           1-1437567-5         APB1FGRA         D18           1-1437567-6         APB2RGPC         D18           1-1437567-7         APB2RGPC         D18           1-1437567-8         APBE1FGPC         D19           1-1437569-9         APBE1FGRA         D20           1-1437569-0         164J0A22         I17           1-1437569-1         164J2A11         117           1-1437569-2         164J2A22         117           1-1437569-3         164J2B11         117			E5
1-1437565-4         FSM18J         E5           1-1437565-5         FSM1J         E4,E5           1-1437565-6         FSM1LP         E15           1-1437565-7         FSM1LPA         E15           1-1437565-8         FSM1LPAR         E15           1-1437565-9         FSM1LPAR         E15           1-1437567-0         APA2RGRA         D17           1-1437567-1         APB1BGPC         D18           1-1437567-2         APB1CGPC         D18           1-1437567-3         APB1CGPC         D18           1-1437567-4         APB1GGPC         D18           1-1437567-5         APB1GGRA         D18           1-1437567-6         APB2MGRA         D18           1-1437567-7         APB2RGPC         D18           1-1437567-8         APBE1FGPC         D18           1-1437569-9         IAPBE1FGPC         D19           1-1437569-0         16410A22         I17           1-1437569-1         164J2A11         I17           1-1437569-2         164J2A22         I17           1-1437569-3         164J2B11         I17			
1-1437565-5         FSM1J         E4,E5           1-1437565-6         FSM1LP         E15           1-1437565-7         FSM1LPA         E15           1-1437565-8         FSM1LPATR         E15           1-1437565-9         FSM1LPATR         E15           1-1437567-0         APA2RGRA         D17           1-1437567-1         APB1BGPC         D18           1-1437567-2         APB1CGPC         D18           1-1437567-3         APB1CGPC         D18           1-1437567-4         APB1GGPC         D18           1-1437567-5         APB1FGPC         D18           1-1437567-6         APB2MGRA         D18           1-1437567-7         APB1FGRA         D18           1-1437567-8         APB2MGRA         D18           1-1437567-9         APB2HFGPC         D18           1-1437569-1         APB2HFGPC         D19           1-1437569-1         I64J0A22         I17           1-1437569-1         I64J2A11         I17           1-1437569-2         I64J2A22         I17           1-1437569-3         I64J2B11         I17			
1-1437565-7         FSM1LPA         E15           1-1437565-8         FSM1LPATR         E15           1-1437565-9         FSM1LPTR         E15           1-1437567-0         APA2RGRA         D17           1-1437567-0         APA2RGRA         D17           1-1437567-1         APB1BGPC         D18           1-1437567-2         APB1CGPC         D18           1-1437567-3         APB1CGRA         D18           1-1437567-4         APB1FGPC         D18           1-1437567-5         APB1FGRA         D18           1-1437567-6         APB2MGRA         D18           1-1437567-7         APB2RGPC         D18           1-1437567-8         APBE1FGPC         D19           1-1437567-9         APBE1FGPC         D19           1-1437569-1         I64J0A22         I17           1-1437569-1         I64J2A11         I17           1-1437569-2         I64J2A22         I17           1-1437569-3         I64J2B11         I17			
1-1437565-8         FSM1LPATR         E15           1-1437565-9         FSM1LPTR         E15           1-1437567-0         APA2RGRA         D17           1-1437567-1         APB1BGPC         D18           1-1437567-2         APB1CGPC         D18           1-1437567-3         APB1CGRA         D18           1-1437567-4         APB1FGRA         D18           1-1437567-5         APB1FGRA         D18           1-1437567-6         APB1FGRA         D18           1-1437567-7         APB2RGPC         D18           1-1437567-8         APB2RGPC         D18           1-1437567-9         APB2RGPC         D18           1-1437567-9         APB2RGPC         D19           1-1437569-1         164J0A22         117           1-1437569-1         164J2A11         117           1-1437569-2         164J2A22         117           1-1437569-3         164J2B11         117			
1-1437565-9         FSM1LPTR         E15           1-1437567-0         APA2RGRA         D17           1-1437567-1         APB1BGPC         D18           1-1437567-2         APB1CGPC         D18           1-1437567-3         APB1CGPC         D18           1-1437567-4         APB1FGPC         D18           1-1437567-5         APB1FGRA         D18           1-1437567-6         APB2MGRA         D18           1-1437567-7         APB2RGPC         D18           1-1437567-8         APBE1FGRA         D18           1-1437567-9         APBE1FGRA         D20           1-1437567-9         APBE1FGRA         D20           1-1437567-9         APBE1FGRA         D20           1-1437567-9         I64J0A22         I17           1-1437569-1         164J2A11         I17           1-1437569-2         164J2A22         I17           1-1437569-3         164J2B11         I17			
1-1437567-1         APB1BGPC         D18           1-1437567-2         APB1CGPC         D18           1-1437567-3         APB1CGRA         D18           1-1437567-4         APB1FGPC         D18           1-1437567-5         APB1FGPC         D18           1-1437567-6         APB1FGRA         D18           1-1437567-7         APB2MGRA         D18           1-1437567-8         APB2FGPC         D19           1-1437567-9         APBE1FGPA         D20           1-1437569-0         164J0A22         I17           1-1437569-1         164J2A11         I17           1-1437569-2         164J2A21         I17           1-1437569-3         164J2B11         I17	1-1437565-9	FSM1LPTR	E15
1-1437567-2         APB1CGPC         D18           1-1437567-3         APB1CGRA         D18           1-1437567-4         APB1FGPC         D18           1-1437567-5         APB1FGRA         D18           1-1437567-6         APB2MGRA         D18           1-1437567-7         APB2MGRA         D18           1-1437567-8         APB2IFGPC         D18           1-1437567-9         APBE1FGPC         D19           1-1437569-0         16410A22         I17           1-1437569-1         164J2A11         I17           1-1437569-2         164J2A22         I17           1-1437569-3         164J2B11         I17			
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3-1437554-1         A101SCWCQO         C22           3-1437554-2         A101SCWZQ         C22           3-1437554-3         A101SD9AB         C22,C30           3-1437554-4         A101SD9AV2B         C22           3-1437554-5         A101SD9AV2B         C22           3-1437554-6         A101SD9AV2Q         C22,C31           3-1437554-7         A101SD9V30Q         C22           3-1437554-8         A101SD9V30Q         C22           3-1437555-0         A201MD9AV2Q         C22,C30           3-1437555-1         A201MDAQ         C22           3-1437555-2         A201MYCB         C22           3-1437555-3         A201MYCB         C22           3-1437555-4         A201MYCB         C22           3-1437555-5         A201MYQQ         C22,C33           3-1437555-6         A201MYQ         C22           3-1437555-7         A201SWZQ         C22,C33           3-1437555-8         A201MYQ         C22           3-1437555-8         A201SWA2Q         C22,C33           3-1437556-9         A201SD4Q         C22,C33           3-1437556-8         AE103MD1AB         C40           3-1437556-9         AE103MD1A2B         C40     <		-	
3-1437554-2         A101SCWZQ         C22           3-1437554-3         A101SD9AB         C22,C30           3-1437554-4         A101SD9AQ         C22,C30           3-1437554-5         A101SD9AV2B         C22           3-1437554-6         A101SD9V30B         C22           3-1437554-7         A101SDQV30Q         C22           3-1437554-8         A101SDQV2Q         C22,C30           3-1437554-8         A101SDQV2Q         C22,C32           3-1437555-1         A201MDAQ         C22           3-1437555-2         A201MPY9AV2Q         C22           3-1437555-4         A201MYCB         C22           3-1437555-5         A201MYCB         C22           3-1437555-6         A201MYZQ         C22,C33           3-1437555-7         A201SWZQ         C22,C33           3-1437555-8         A201SWZQ         C22,C33           3-1437555-7         A201SWZQ         C22,C33           3-1437555-8         A201SWZQ         C22,C33           3-1437555-9         A201SWZQ         C22,C33           3-1437555-9         A201SWZQ         C22,C33           3-1437556-0         AE103MD1AB         C40           3-1437556-3         AE103MD1AB			*
3-1437554-3         A101SD9AB         C22,C30           3-1437554-4         A101SD9AQ         C22,C30           3-1437554-5         A101SD9AV2B         C22           3-1437554-5         A101SD9AV2Q         C22,C31           3-1437554-7         A101SD9V30B         C22           3-1437554-8         A101SDQVQ         C22,C30           3-1437554-9         A101SDQQ         C22,C32           3-1437555-1         A201MDAQ         C22           3-1437555-1         A201MDAQ         C22           3-1437555-2         A201MYZQ         C22,C32           3-1437555-3         A201MYZQ         C22           3-1437555-4         A201MYZQ         C22           3-1437555-5         A201MYZQ         C22,C33           3-1437555-6         A201SWZB         C22           3-1437555-7         A201SWZB         C22           3-1437555-8         A201SD9AQ         C22,C30           3-1437555-9         A201SD9AQ         C22,C30           3-1437556-0         AE103MD1AB         C40           3-1437556-1         AE103MD1AB         C40           3-1437556-2         AE103MD1CB         C41           3-1437556-3         AE103MD1CB         C41		、 、	
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3-1437554-7         A101SD9V30B         C22           3-1437554-8         A101SDV30Q         C22           3-1437554-9         A101SDCQ         C22,C30           3-1437555-0         A201MD9AV2Q         C22,C32           3-1437555-1         A201MD9AV2Q         C22           3-1437555-2         A201MYAQ         C22           3-1437555-3         A201MYQB         C22           3-1437555-4         A201MYQE         C22           3-1437555-5         A201MYQE         C22           3-1437555-6         A201MYQE         C22           3-1437555-7         A201SD9AQ         C22,C30           3-1437556-8         A201SD9AQ         C22,C31           3-1437556-1         AE103MD1AB         C40           3-1437556-1         AE103MD1AB         C40           3-1437556-1         AE103MD1AB         C40           3-1437556-3         AE103MD1CB         C41           3-1437556-6         AE103MD1AB         C40           3-1437556-7         AE103SD1CQ         C39           3-1437556-8         AE103SD1CQ         C39           3-1437558-9         MTA206SA         C43           3-1437558-1         MTA206SA         C44 <t< td=""><td></td><td></td><td>-</td></t<>			-
3-1437554-8         A101SD9V30Q         C22           3-1437554-9         A101SDCQ         C22,C30           3-1437555-0         A201MD9AV2Q         C22,C32           3-1437555-1         A201MDAQ         C22           3-1437555-2         A201MYQ         C22           3-1437555-3         A201MYQ         C22           3-1437555-4         A201MYCB         C22           3-1437555-5         A201MYZQ         C22           3-1437555-6         A201MYZQ         C22           3-1437555-7         A201SD9AQ         C22,C33           3-1437555-8         A201SD9AQ         C22,C30           3-1437556-9         A201SD9AQ         C22,C30           3-1437556-1         AE103MD1AB         C40           3-1437556-2         AE103MD1AV2B         C40           3-1437556-3         AE103MD1CB         C41           3-1437556-4         AE103SD1CQ         C39           3-1437556-5         AE103SD1CQ         C39           3-1437556-8         AE103SD1CQ         C39           3-1437558-8         MTA206TA         C44           3-1437558-1         MTA206SPC         C44           3-1437558-2         MTA306DPC         C44 <t< td=""><td></td><td>· · · ·</td><td>,</td></t<>		· · · ·	,
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3-1437555-5         A201MYZQ         C22           3-1437555-6         A201P3YZQ         C22,C33           3-1437555-7         A201SCWZB         C22           3-1437555-8         A201SD9AQ         C22,C30           3-1437555-9         A201SD9AQ         C22,C31           3-1437555-9         A201SD9AV2Q         C22,C31           3-1437556-0         AE103MD1AB         C40           3-1437556-1         AE103MD1AB         C40           3-1437556-2         AE103MD1AV2B         C40           3-1437556-3         AE103MD1CB         C41           3-1437556-6         AE103SD1CB         C39           3-1437556-7         AE103SD1CQ         C35           3-1437556-8         AE103SD1CQUL         C35           3-1437558-0         MTA206SA         C43           3-1437558-1         MTA206SPC         C44           3-1437558-3         MTA206TPC         C44           3-1437558-4         MTA206FPC         C44           3-1437558-5         MTA306D         C43           3-1437558-6         MTA306EPC         C44           3-1437558-7         MTA306EPC         C44           3-1437558-8         MTA306EPC         C44			-
3-1437555-6         A201P3YZQ         C22,C33           3-1437555-7         A201SCWZB         C22           3-1437555-7         A201SCWZB         C22           3-1437555-8         A201SD9AQ         C22,C30           3-1437555-9         A201SD9AV2Q         C22,C31           3-1437556-1         AE103MD1AB         C40           3-1437556-2         AE103MD1AV2B         C40           3-1437556-3         AE103MD1AV2B         C40           3-1437556-6         AE103MD1CB         C41           3-1437556-7         AE103MD1CB         C41           3-1437556-8         AE103SD1CQ         C39           3-1437556-9         AE103SD1CQ         C39           3-1437558-8         MTA206SA         C43           3-1437558-9         MTA206SA         C43           3-1437558-1         MTA206TA         C43           3-1437558-2         MTA206TA         C43           3-1437558-3         MTA206TA         C43           3-1437558-4         MTA206FC         C44           3-1437558-5         MTA306D         C43           3-1437559-0         MTG326D         C49           3-1437559-1         MTG406N         C48			
3-1437555-7         A201SCWZB         C22           3-1437555-8         A201SD9AQ         C22,C30           3-1437555-9         A201SD9AV2Q         C22,C31           3-1437555-9         A201SD9AV2Q         C22,C31           3-1437556-0         AE101SD1V30QUL         C35           3-1437556-1         AE103MD1AB         C40           3-1437556-3         AE103MD1CB         C41           3-1437556-6         AE103SD1AV2B         C42           3-1437556-7         AE103SD1CB         C39           3-1437556-8         AE103SD1CQ         C39           3-1437556-9         AE103SD1CQUL         C35           3-1437558-9         MTA206SA         C43           3-1437558-1         MTA206SA         C43           3-1437558-2         MTA206T         C43           3-1437558-3         MTA206T         C44           3-1437558-3         MTA206TC         C44           3-1437558-4         MTA206TC         C44           3-1437558-5         MTA306D         C43           3-1437558-6         MTA306DC         C44           3-1437559-0         MTG326D         C49           3-1437559-0         MTG326D         C48		· · ·	-
3-1437555-9         A201SD9AV2Q         C22,C31           3-1437556-0         AE101SD1V30QUL         C35           3-1437556-1         AE103MD1AB         C40           3-1437556-1         AE103MD1AB         C40           3-1437556-2         AE103MD1AB         C40           3-1437556-3         AE103MD1CB         C41           3-1437556-6         AE103SD1CB         C39           3-1437556-7         AE103SD1CQ         C39           3-1437556-8         AE103SD1CQ         C39           3-1437556-9         AE103SD1CQ         C39           3-1437556-9         AE103SD1CQUL         C35           3-1437558-0         MTA206SA         C43           3-1437558-1         MTA206FPC         C44           3-1437558-2         MTA206TPC         C44           3-1437558-4         MTA206TPC         C44           3-1437558-5         MTA306D         C43           3-1437558-6         MTA306DPC         C44           3-1437558-7         MTA306E         C43           3-1437558-8         MTA306E         C43           3-1437559-1         MTG406N         C48           3-1437559-2         MTG406N         C48		· · ·	,
3-1437556-0         AE101SD1V30QUL         C35           3-1437556-1         AE103MD1AB         C40           3-1437556-2         AE103MD1AV2B         C40           3-1437556-3         AE103MD1AV2B         C40           3-1437556-3         AE103MD1AV2B         C40           3-1437556-3         AE103SD1CB         C41           3-1437556-7         AE103SD1CB         C39           3-1437556-8         AE103SD1CQ         C39           3-1437558-9         MTA206SA         C43           3-1437558-9         MTA206SPC         C44           3-1437558-1         MTA206T         C43           3-1437558-3         MTA206T         C43           3-1437558-4         MTA206TC         C44           3-1437558-5         MTA206TC         C44           3-1437558-6         MTA306D         C43           3-1437558-7         MTA306E         C43           3-1437558-8         MTA306E         C43           3-1437558-9         MTA306E         C43           3-1437558-9         MTG306P         C44           3-1437559-0         MTG326D         C49           3-1437559-3         MTG406N         C48           3-1437559-		· · · ·	,
3-1437556-1         AE103MD1AB         C40           3-1437556-2         AE103MD1AV2B         C40           3-1437556-3         AE103MD1AV2B         C40           3-1437556-4         AE103SD1AV2B         C41           3-1437556-6         AE103SD1AV2B         C42           3-1437556-7         AE103SD1CB         C39           3-1437556-8         AE103SD1CQ         C39           3-1437556-9         AE103SD1CQUL         C35           3-1437558-0         MTA206SA         C43           3-1437558-1         MTA206TA         C43           3-1437558-2         MTA206TA         C43           3-1437558-3         MTA206TC         C44           3-1437558-4         MTA206TC         C44           3-1437558-5         MTA306D         C43           3-1437558-6         MTA306E         C43           3-1437558-7         MTA306E         C43           3-1437558-9         MTA306E         C43           3-1437558-9         MTG306D         C48           3-1437559-1         MTG406N         C48           3-1437559-2         MTG406N         C48           3-1437559-3         MTL06D         C50           3-1437559-5		· · · ·	,
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3-1437558-7         MTA306E         C43           3-1437558-8         MTA306FPC         C44           3-1437558-9         MTA306F         C43           3-1437559-0         MTG326D         C49           3-1437559-1         MTG406N         C48           3-1437559-2         MTG406P         C48           3-1437559-3         MTG406P         C48           3-1437559-4         MTL106D         C50           3-1437559-5         MTL106D         C50           3-1437559-7         MTL106E         C50           3-1437559-7         MTL206N         C50           3-1437559-9         MTL206P         C50           3-1437559-9         MTL206P         C50           3-1437561-0         TT11DGPC3         C8           3-1437561-1         TT11DGPC42         C8           3-1437561-3         TT11DGPC711/4         C8           3-1437561-4         TT11DGPC8T1/4         C8           3-1437561-5         TT11DGPC8T1/4         C8           3-1437561-6         TT11DGPC711/4         C8           3-1437561-7         TT11DGPC8T1/4         C8           3-1437561-8         TT11DGPC8T1/4         C8           3-1437561-9 <td></td> <td></td> <td></td>			
3-1437558-9         MTA306F         C43           3-1437559-0         MTG326D         C49           3-1437559-1         MTG406N         C48           3-1437559-2         MTG406P         C48           3-1437559-3         MTG406P         C48           3-1437559-4         MTG406P         C48           3-1437559-5         MTL106D         C50           3-1437559-6         MTL106E         C50           3-1437559-7         MTL206N         C50           3-1437559-7         MTL206P         C50           3-1437559-7         MTL206P         C50           3-1437551-0         TT11DGPC3         C8           3-1437561-1         TT11DGPC42         C8           3-1437561-3         TT11DGPC711/4         C8           3-1437561-4         TT11DGPC811/4         C8           3-1437561-5         TT11DGPC711/4         C8           3-1437561-6         TT11DGPC711/4         C8           3-1437561-7         TT11DGPC811/4         C8           3-1437561-8         TT11DGRA1         C8           3-1437561-9         TT11DGRA1ES         C8           3-1437562-4         TT21PGPC1         C10           3-1437562-5 <td></td> <td>MTA306E</td> <td>C43</td>		MTA306E	C43
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RM122         -         16           RM1222         4-1437614-1         16           RM1224         4-1437614-2         16           RM1225         4-1437614-3         16           RM1226         4-1437614-4         16           RM1229         4-1437614-5         16           RM130         -         16           RM1302         4-1437614-6         16           RM1303         -         16           RM1304         4-1437614-7         16           RM1305         4-1437614-8         16           RM145         -         16           RM150         -         16           RM150         -         16           RM1502         5-1437614-0         16           RM1504         5-1437614-1         16           RM1505         5-1437614-1         16           RM1505         5-1437614-1         16           RM200         5-1437614-1         16           RM201         5-1437614-1         15           RM204         5-1437614-1         16           RM205         5-1437614-1         16           RM204         5-1437614-2         16 <td></td> <td>-</td> <td></td>		-	
RM1224         4-1437614-2         16           RM1225         4-1437614-3         16           RM1226         4-1437614-4         16           RM1229         4-1437614-5         16           RM130         -         16           RM1302         4-1437614-6         16           RM1304         4-1437614-7         16           RM1305         4-1437614-8         16           RM145         -         16           RM145         -         16           RM145         -         16           RM150         -         16           RM1502         5-1437614-0         16           RM1505         5-1437614-1         16           RM200         5-1437614-2         16           RM200         5-1437614-4         15           RM201         5-1437614-7         15           RM200         5-1437614-7         15           RM210         5-1437614-7         16           RM220	-	-	
RM1225         4-1437614-3         16           RM1226         4-1437614-4         16           RM1229         4-1437614-5         16           RM130         -         16           RM130         4-1437614-7         16           RM1301         4-1437614-7         16           RM1302         4-1437614-7         16           RM1305         4-1437614-9         16           RM145         -         16           RM145         -         16           RM145         -         16           RM150         -         16           RM1502         5-1437614-0         16           RM1505         5-1437614-1         16           RM200         5-1437614-2         16           RM201         5-1437614-7         15           RM201         5-1437614-7         15           RM210         5-1437614-8         16           RM220         5-1437614-1         16           RM230			
RM1226         4-1437614-4         16           RM1229         4-1437614-5         16           RM130         -         16           RM1302         4-1437614-6         16           RM1305         4-1437614-7         16           RM1305         4-1437614-7         16           RM1305         4-1437614-7         16           RM145         -         16           RM1452         4-1437614-9         16           RM150         -         16           RM150         -         16           RM150         -         16           RM1502         5-1437614-0         16           RM1505         5-1437614-1         16           RM1505         5-1437614-2         16           RM1652         5-1437614-3         16           RM200         5-1437614-4         15           RM201         5-1437614-7         15           RM201         5-1437614-8         16           RM220         5-1437614-8         16           RM230         6-1437614-1         16           RM232         6-1437614-2         16           RM240         -         16			
RM1229         4-1437614-5         16           RM130         -         16           RM1302         4-1437614-6         16           RM1304         4-1437614-7         16           RM1305         4-1437614-7         16           RM1305         4-1437614-7         16           RM1305         4-1437614-7         16           RM145         -         16           RM145         -         16           RM150         -         16           RM1502         5-1437614-0         16           RM1505         5-1437614-1         16           RM1505         5-1437614-2         16           RM1652         5-1437614-3         16           RM200         5-1437614-4         15           RM201         5-1437614-5         15           RM201         5-1437614-7         15           RM202         5-1437614-7         15           RM210         5-1437614-8         16           RM222         6-1437614-1         16           RM233         6-1437614-1         16           RM240         -         16           RM243         6-1437614-4         16			
RM130         -         I6           RM1302         4-1437614-6         I6           RM1304         4-1437614-7         I6           RM1305         4-1437614-7         I6           RM1305         4-1437614-7         I6           RM1452         4-1437614-8         I6           RM150         -         I6           RM150         -         I6           RM1502         5-1437614-0         I6           RM1505         5-1437614-1         I6           RM1505         5-1437614-2         I6           RM1505         5-1437614-3         I6           RM1052         5-1437614-4         I5           RM200         5-1437614-5         I5           RM201         5-1437614-7         I5           RM204         5-1437614-7         I5           RM205         5-1437614-8         I6           RM220         5-1437614-1         I6           RM220         5-1437614-1         I6           RM230         6-1437614-1         I6           RM232         6-1437614-1         I6           RM233         6-1437614-5         I5           RM240         - <td< td=""><td></td><td></td><td></td></td<>			
RM1304         4-1437614-7         16           RM1305         4-1437614-8         16           RM145         -         16           RM145         -         16           RM145         -         16           RM150         -         16           RM150         -         16           RM1502         5-1437614-0         16           RM1504         5-1437614-1         16           RM1505         5-1437614-1         16           RM1505         5-1437614-1         16           RM100         5-1437614-3         16           RM200         5-1437614-4         15           RM201         5-1437614-5         15           RM204         5-1437614-7         15           RM205         5-1437614-8         16           RM205         5-1437614-9         16           RM220         5-1437614-1         16           RM230         6-1437614-2         16           RM232         6-1437614-1         16           RM240         -         16           RM270         6-1437614-7         16,19           RM273         6-1437614-7         16,19	-	-	
RM1305         4-1437614-8         16           RM145         -         16           RM1452         4-1437614-9         16           RM150         -         16           RM150         -         16           RM150         -         16           RM1502         5-1437614-0         16           RM1505         5-1437614-1         16           RM1505         5-1437614-2         16           RM1652         5-1437614-3         16           RM200         5-1437614-4         15           RM201         5-1437614-5         15           RM200         5-1437614-6         15           RM201         5-1437614-7         15           RM205         5-1437614-7         15           RM210         5-1437614-7         16           RM220         5-1437614-1         16           RM220         5-1437614-2         16           RM230         6-1437614-3         16           RM230         6-1437614-3         16           RM240         -         16           RM270         6-1437614-5         15           RM270         6-1437614-6         16     <	RM1302	4-1437614-6	I6
RM145         -         I6           RM1452         4.1437614-9         I6           RM150         -         I6           RM150         -         I6           RM1502         5.1437614-0         I6           RM1505         5.1437614-1         I6           RM1505         5.1437614-2         I6           RM1652         5.1437614-3         I6           RM200         5.1437614-5         I5           RM201         5.1437614-6         I5           RM204         5.1437614-7         I5           RM205         5.1437614-8         I6           RM205         5.1437614-9         I6           RM200         5.1437614-9         I6           RM220         5.1437614-9         I6           RM220         5.1437614-1         I6           RM230         6.1437614-2         I6           RM230         6.1437614-3         I6           RM240         -         I6           RM243         6.1437614-5         I5           RM270         6.1437614-6         I6           RM272         6.1437614-7         I6,19           RM3100         7.1437614-8			
RM1452         4-1437614-9         16           RM150         -         16           RM1502         5-1437614-0         16           RM1504         5-1437614-1         16           RM1505         5-1437614-2         16           RM1505         5-1437614-2         16           RM1502         5-1437614-3         16           RM1652         5-1437614-4         15           RM200         5-1437614-5         15           RM201         5-1437614-7         15           RM205         5-1437614-7         15           RM205         5-1437614-8         16           RM200         5-1437614-9         16           RM220         5-1437614-9         16           RM220         5-1437614-1         16           RM230         6-1437614-2         16           RM230         6-1437614-3         16           RM240         -         16           RM270         6-1437614-4         16           RM273         6-1437614-7         16,19           RM280         6-1437614-7         16,19           RM300         7-1437614-1         15           RM3100         7-14		4-1437614-8	
RM150         -         I6           RM1502         5-1437614-0         I6           RM1504         5-1437614-1         I6           RM1505         5-1437614-2         I6           RM1502         5-1437614-3         I6           RM1505         5-1437614-4         I5           RM200         5-1437614-5         I5           RM201         5-1437614-6         I5           RM201         5-1437614-7         I5           RM204         5-1437614-8         I6           RM205         5-1437614-9         I6           RM200         5-1437614-9         I6           RM220         5-1437614-1         I6           RM220         5-1437614-2         I6           RM230         6-1437614-1         I6           RM232         6-1437614-2         I6           RM233         6-1437614-2         I6           RM240         -         I6           RM250         6-1437614-4         I6           RM272         6-1437614-5         I5           RM270         6-1437614-7         I6,19           RM300         7-1437614-8         I6           RM3100         7-1437614	-	4-1437614-9	
RM1504         5-1437614-1         16           RM1505         5-1437614-2         16           RM1652         5-1437614-3         16           RM200         5-1437614-4         15           RM201         5-1437614-5         15           RM204         5-1437614-6         15           RM205         5-1437614-7         15           RM200         5-1437614-8         16           RM205         5-1437614-8         16           RM200         5-1437614-9         16           RM220         5-1437614-1         16           RM220         5-1437614-1         16           RM230         6-1437614-1         16           RM232         6-1437614-2         16           RM233         6-1437614-3         16           RM240         -         16           RM240         -         16           RM270         6-1437614-5         15           RM270         6-1437614-8         16           RM273         6-1437614-7         16,19           RM300         7-1437614-9         16           RM3100         7-1437614-1         15           RM3100         7-1437614-	-	-	
RM1505         5-1437614-2         16           RM1652         5-1437614-3         16           RM200         5-1437614-4         15           RM201         5-1437614-5         15           RM204         5-1437614-5         15           RM205         5-1437614-7         15           RM205         5-1437614-8         16           RM200         5-1437614-8         16           RM205         5-1437614-9         16           RM220         5-1437614-0         16           RM220         6-1437614-1         16           RM230         6-1437614-2         16           RM233         6-1437614-2         16           RM240         -         16           RM250         6-1437614-5         15           RM270         6-1437614-5         15           RM270         6-1437614-7         16,19           RM273         6-1437614-7         16,19           RM280         6-1437614-7         16,19           RM3100         7-1437614-1         15           RM3100         7-1437614-2         15           RM3100         7-1437614-3         15           RM3800	RM1502	5-1437614-0	I6
RM1652         5-1437614-3         16           RM200         5-1437614-4         15           RM201         5-1437614-5         15           RM204         5-1437614-6         15           RM205         5-1437614-7         15           RM210         5-1437614-8         16           RM205         5-1437614-9         16           RM210         5-1437614-9         16           RM220         5-1437614-9         16           RM220         5-1437614-1         16           RM230         6-1437614-2         16           RM232         6-1437614-3         16           RM240         -         16           RM240         -         16           RM270         6-1437614-5         15           RM270         6-1437614-5         15           RM270         6-1437614-7         16,19           RM273         6-1437614-8         16           RM280         6-1437614-1         15           RM3100         7-1437614-2         15           RM3100         7-1437614-2         15           RM3100         7-1437614-3         15           RM3800         7-1437614-			
RM200         5-1437614-4         15           RM201         5-1437614-5         15           RM204         5-1437614-6         15           RM205         5-1437614-7         15           RM210         5-1437614-7         15           RM210         5-1437614-7         15           RM210         5-1437614-9         16           RM220         5-1437614-9         16           RM220         6-1437614-1         16           RM220         6-1437614-2         16           RM230         6-1437614-2         16           RM233         6-1437614-3         16           RM240         -         16           RM240         -         16           RM270         6-1437614-5         15           RM270         6-1437614-6         16           RM272         6-1437614-7         16,19           RM273         6-1437614-8         16           RM273         6-1437614-1         15           RM3100         7-1437614-1         15           RM3100         7-1437614-1         15           RM3100         7-1437614-3         15           RM3800         7-1437614-4			
RM201         5-1437614-5         15           RM204         5-1437614-6         15           RM205         5-1437614-7         15           RM210         5-1437614-7         15           RM210         5-1437614-7         15           RM220         5-1437614-9         16           RM220         5-1437614-9         16           RM220         6-1437614-1         16           RM230         6-1437614-2         16           RM232         6-1437614-3         16           RM233         6-1437614-3         16           RM240         -         16           RM243         6-1437614-5         15           RM270         6-1437614-5         15           RM270         6-1437614-7         16,19           RM273         6-1437614-7         16,19           RM280         6-1437614-7         15           RM3100         7-1437614-0         15           RM3100         7-1437614-1         15           RM3100         7-1437614-3         15           RM3800         7-1437614-4         15           RM3800         7-1437614-7         15           RM4000			
RM205         5-1437614-7         15           RM210         5-1437614-8         16           RM220         5-1437614-9         16           RM220         5-1437614-0         16           RM220         6-1437614-1         16           RM230         6-1437614-2         16           RM232         6-1437614-2         16           RM233         6-1437614-2         16           RM243         6-1437614-3         16           RM240         -         16           RM240         6         16           RM270         6-1437614-5         15           RM270         6-1437614-6         16           RM273         6-1437614-7         16,19           RM280         6-1437614-9         16           RM3040         7-1437614-0         15           RM3100         7-1437614-1         15           RM3100         7-1437614-1         15           RM3100         7-1437614-3         15           RM3800         7-1437614-4         15           RM3800         7-1437614-5         15           RM400         7-1437614-7         15           RM4000         7-143761			-
RM210         5-1437614-8         16           RM220         5-1437614-9         16           RM222         6-1437614-0         16           RM230         6-1437614-1         16           RM232         6-1437614-2         16           RM233         6-1437614-2         16           RM233         6-1437614-2         16           RM240         -         16           RM243         6-1437614-4         16           RM250         6-1437614-5         15           RM270         6-1437614-6         16           RM272         6-1437614-7         16,19           RM273         6-1437614-8         16           RM280         6-1437614-9         16           RM3040         7-1437614-1         15           RM3100         7-1437614-1         15           RM3100         7-1437614-1         15           RM3100         7-1437614-3         15           RM3800         7-1437614-4         15           RM3800         7-1437614-7         15           RM400         7-1437614-7         15           RM400         7-1437614-7         15           RM4100 <t< td=""><td>RM204</td><td></td><td>-</td></t<>	RM204		-
RM220         5-1437614-9         16           RM222         6-1437614-0         16           RM230         6-1437614-1         16           RM232         6-1437614-2         16           RM233         6-1437614-2         16           RM240         -         16           RM250         6-1437614-3         16           RM243         6-1437614-5         15           RM250         6-1437614-5         15           RM270         6-1437614-6         16           RM273         6-1437614-7         16,19           RM280         6-1437614-8         16           RM300         7-1437614-1         15           RM3100         7-1437614-2         15           RM3100         7-1437614-3         15           RM3700         7-1437614-4         15           RM3800         7-1437614-5         15           RM3800         7-1437614-7         15           RM3800         7-1437614-7         15           RM400         7-1437614-7         15           RM4100         7-1437614-7         15           RM4120         -         15           RM4130         -			-
RM222         6-1437614-0         16           RM230         6-1437614-1         16           RM232         6-1437614-2         16           RM233         6-1437614-3         16           RM240         -         16           RM243         6-1437614-4         16           RM250         6-1437614-4         16           RM270         6-1437614-5         15           RM270         6-1437614-7         16,19           RM270         6-1437614-8         16           RM272         6-1437614-8         16           RM273         6-1437614-9         16           RM280         6-1437614-1         15           RM3100         7-1437614-1         15           RM3100         7-1437614-2         15           RM3100         7-1437614-3         15           RM3100         7-1437614-1         15           RM3800         7-1437614-5         15           RM380         7-1437614-7         15           RM400         7-1437614-7         15           RM4100         7-1437614-8         15           RM4100         7-1437614-8         15           RM4120         <	-		
RM230         6-1437614-1         16           RM232         6-1437614-2         16           RM233         6-1437614-3         16           RM240         -         16           RM243         6-1437614-4         16           RM250         6-1437614-5         15           RM270         6-1437614-7         16,19           RM270         6-1437614-7         16,19           RM270         6-1437614-7         16,19           RM273         6-1437614-8         16           RM280         6-1437614-9         16           RM300         7-1437614-0         15           RM3100         7-1437614-1         15           RM3100         7-1437614-2         15           RM3100         7-1437614-3         15           RM3100         7-1437614-4         15           RM3800         7-1437614-5         15           RM3800         7-1437614-7         15           RM400         7-1437614-7         15           RM4100         7-1437614-7         15           RM4100         7-1437614-8         15           RM4120         -         15           RM4130 <td< td=""><td>-</td><td></td><td></td></td<>	-		
RM232         6-1437614-2         16           RM233         6-1437614-3         16           RM240         -         16           RM243         6-1437614-4         16           RM250         6-1437614-5         15           RM270         6-1437614-6         16           RM270         6-1437614-7         16,19           RM270         6-1437614-8         16           RM272         6-1437614-8         16           RM273         6-1437614-8         16           RM280         6-1437614-9         16           RM3040         7-1437614-0         15           RM3100         7-1437614-1         15           RM3100         7-1437614-2         15           RM3100         7-1437614-3         15           RM3800         7-1437614-4         15           RM3800         7-1437614-5         15           RM3800         7-1437614-7         15           RM4040         7-1437614-7         15           RM4100         7-1437614-8         15           RM4120         -         15           RM4130         -         15           RM4700         -		6-1437614-1	
RM240         -         I6           RM243         6-1437614-4         I6           RM250         6-1437614-5         I5           RM270         6-1437614-6         I6           RM272         6-1437614-7         I6,19           RM273         6-1437614-7         I6,19           RM273         6-1437614-7         I6           RM280         6-1437614-9         I6           RM3040         7-1437614-0         I5           RM3100         7-1437614-1         I5           RM3100         7-1437614-2         I5           RM3100         7-1437614-3         I5           RM3100         7-1437614-4         I5           RM3800         7-1437614-5         I5           RM3800         7-1437614-4         I5           RM3800         7-1437614-5         I5           RM4000         7-1437614-7         I5           RM4100         7-1437614-8         I5           RM4120         -         I5           RM4130         -         I5           RM4700         -         I5	RM232		I6
RM243         6-1437614-4         16           RM250         6-1437614-5         15           RM270         6-1437614-6         16           RM271         6-1437614-7         16,19           RM273         6-1437614-8         16           RM280         6-1437614-9         16           RM3040         7-1437614-0         15           RM3100         7-1437614-1         15           RM3100         7-1437614-2         15           RM3100         7-1437614-3         15           RM3100         7-1437614-4         15           RM3100         7-1437614-5         15           RM3100         7-1437614-7         15           RM3800         7-1437614-7         15           RM3800         7-1437614-7         15           RM4000         7-1437614-7         15           RM4100         7-1437614-7         15           RM4100         7-1437614-7         15           RM4120         -         15           RM4130         -         15           RM4700         -         15		6-1437614-3	
RM250         6-1437614-5         15           RM270         6-1437614-6         16           RM272         6-1437614-7         16,19           RM273         6-1437614-8         16           RM273         6-1437614-9         16           RM280         6-1437614-9         16           RM3040         7-1437614-0         15           RM3100         7-1437614-1         15           RM3120         7-1437614-2         15           RM3130         7-1437614-3         15           RM3700         7-1437614-4         15           RM3800         7-1437614-5         15           RM3800         7-1437614-7         15           RM400         7-1437614-7         15           RM4100         7-1437614-7         15           RM4100         7-1437614-7         15           RM4100         7-1437614-7         15           RM4120         -         15           RM4130         -         15           RM4700         -         15		- 6 1/2761/ /	
RM270         6-1437614-6         16           RM272         6-1437614-7         16,19           RM273         6-1437614-8         16           RM273         6-1437614-9         16           RM280         6-1437614-9         16           RM3040         7-1437614-0         15           RM3100         7-1437614-1         15           RM3120         7-1437614-2         15           RM3130         7-1437614-3         15           RM3700         7-1437614-4         15           RM3800         7-1437614-5         15           RM3800         7-1437614-6         15           RM3800         7-1437614-7         15           RM4040         7-1437614-7         15           RM4100         7-1437614-7         15           RM4120         -         15           RM4130         -         15           RM4700         -         15			
RM273         6-1437614-8         16           RM280         6-1437614-9         16           RM3040         7-1437614-0         15           RM3100         7-1437614-1         15           RM3120         7-1437614-2         15           RM3130         7-1437614-3         15           RM3700         7-1437614-4         15           RM3800         7-1437614-5         15           RM3800         7-1437614-7         15           RM400         7-1437614-7         15           RM4100         7-1437614-8         15           RM4100         7-1437614-7         15           RM4100         7-1437614-8         15           RM4100         -         15           RM4100         -         15           RM4700         -         15			-
RM280         6-1437614-9         16           RM3040         7-1437614-0         15           RM3100         7-1437614-1         15           RM3120         7-1437614-2         15           RM3130         7-1437614-3         15           RM3700         7-1437614-4         15           RM3800         7-1437614-5         15           RM3800         7-1437614-6         15           RM3800         7-1437614-7         15           RM4040         7-1437614-7         15           RM4100         7-1437614-8         15           RM4120         -         15           RM4130         -         15           RM4700         -         15	RM272	6-1437614-7	I6,I9
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South America: 55-11-3611-1514 Hong Kong: 852-2735-1628 Japan: 81-44-844-8013 UK: 44-141-810-8967

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