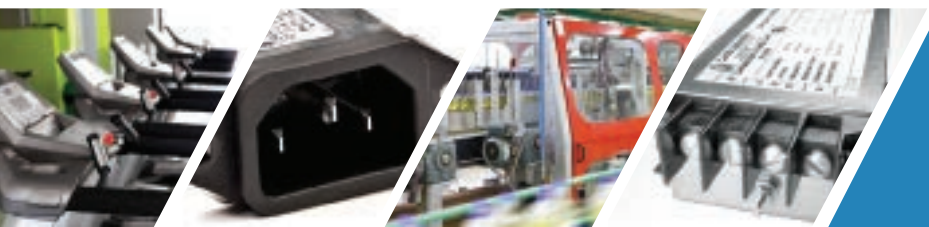
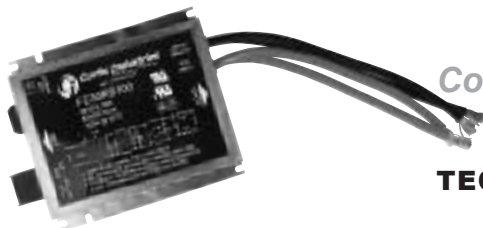


Innovative Engineering Solutions



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Curtis Industries Filter Selection Guide

| | Filter Series | PERFORMANCE | | MAXIMUM | | PACKAGE/TERMINATION | | | | | | | | Catalog Page Number | |
|---------------------------|-----------------|--|-------------------|-----------------|------------|---------------------|------|--------|--------------|-------------|--------|-----------|-------|---------------------|--------------|
| | | RELATIVE ATTENUATION | | LEAKAGE CURRENT | | Wire | Q.C. | I.E.C. | Fused I.E.C. | Volt Select | Switch | P.C. Term | Screw | | Solder Term. |
| | | Common Mode | Differential Mode | mA @115VAC | mA @250VAC | | | | | | | | | | |
| SINGLE PHASE | F1100/1199 | •• | •• | 0.5 | 1.0 | • | • | | | | | • | • | • | 4 |
| | F1150 | • | • | 0.25 | 0.40 | • | • | | | | | | • | • | 4 |
| | F1200/1299 | •• | •• | 0.5 | 1.0 | • | • | • | | | | | • | • | 7 |
| | F1250 | • | •• | 0.25 | 0.40 | • | • | • | | | | | • | • | 7 |
| | F1300/1399 | •••• | •• | 0.5 | 1.0 | • | • | • | | | | • | | • | 11 |
| | F1350 | ••• | •• | 0.25 | 0.40 | • | • | • | | | | • | | • | 11 |
| | F1900 | • | • | 0.25 | 0.40 | | • | | | | | | | • | 15 |
| | F1400 | ••••• | ••••• | 0.25 | 0.40 | • | • | • | | | | | | • | 16 |
| | F1500 | •••• | ••• | 0.25 | 0.40 | | • | • | • | | | | | • | 18 |
| | F1600 | ••••• | ••• | 0.25 | 0.40 | • | • | • | • | | | • | | • | 20 |
| | F1700/1799 | •• | •••• | 0.5 | 1.0 | • | • | • | | | | | • | • | 22 |
| | F1760/1700/1780 | •••• | •••• | 0.5 | 1.0 | • | • | | | | | | • | • | 24 |
| | F2800 | ••••• | ••••• | 0.25 | 0.50 | • | • | | | | | | | • | 26 |
| | F5100 | •• | •• | 0.25 | 0.50 | | | • | | | | | | • | 28 |
| | F5200 | •• | •• | 0.25 | 0.50 | | | | • | | | | | • | 30 |
| | F5500 | •••• | •••• | 0.25 | 0.50 | | | • | | | | | | • | 32 |
| | F5600 | ••••• | •••• | 0.50 | 1.20 | | | • | • | | | | | • | 34 |
| | F5700 | •••• | ••••• | 0.50 | 1.20 | | | • | | | | | | • | 36 |
| | F5900 | ••••• | ••••• | 0.50 | 1.20 | | | • | • | | • | | | • | 38 |
| POWER ENTRY | F2199/2200 | • | • | 0.25 | 0.40 | | • | • | | | | | | • | 44 |
| | F2300 | ••• | •• | 0.25 | 0.40 | | • | • | | | | | | • | 45 |
| | F2400/2500 | • | • | 0.25 | 0.40 | | • | • | | | | | | • | 46 |
| | F2600 | • | • | 0.25 | 0.40 | | • | | • | | • | • | | • | 48 |
| | F2700 | ••••• | ••••• | 0.25 | 0.40 | • | • | • | • | | • | | | • | 50 |
| | FPE7 | • | • | 0.25 | 0.40 | | • | • | • | • | | | | • | 52 |
| | FPE8 | • | • | 0.25 | 0.40 | | • | • | • | | • | | | • | 52 |
| | FPE1 | •• | •• | 0.25 | 0.40 | | • | • | • | • | • | | | • | 56 |
| THREE-PHASE | F3480/F3600 | •••• | •••• | | | • | • | | | | | | • | | 60 |
| | FD00 | (See Section on DC filters for more information) | | | | | | | | | | | | 67 | |
| | FD02 | (See Section on DC filters for more information) | | | | | | | | | | | | 68 | |
| | FD1 | (See Section on DC filters for more information) | | | | | | | | | | | | 69 | |
| | FD2 | (See Section on DC filters for more information) | | | | | | | | | | | | 70 | |
| | FD3 | (See Section on DC filters for more information) | | | | | | | | | | | | 70 | |
| | MEDICAL | F3099 | • | •• | 0.002 | 0.005 | • | • | | | | | | | • |
| F3000/3100/3200/3400/3500 | | • | •• | 0.002 | 0.005 | | • | • | | | | | | • | 73 |
| F3300 | | • | • | 0.015 | 0.025 | | • | | • | | • | • | | • | 75 |
| FPM7 | | • | • | 0.002 | 0.005 | | • | • | • | • | | | | • | 77 |
| FPM8 | | • | • | 0.002 | 0.005 | | • | • | • | | • | | | • | 77 |
| FPM1 | | •• | •• | 0.002 | 0.005 | | • | • | • | • | • | | | • | 81 |

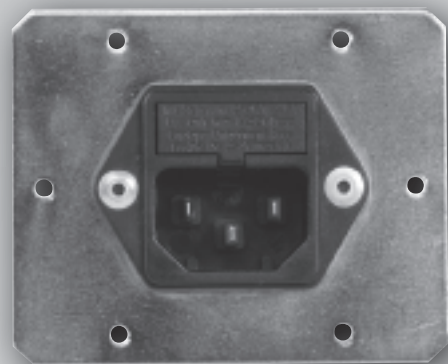
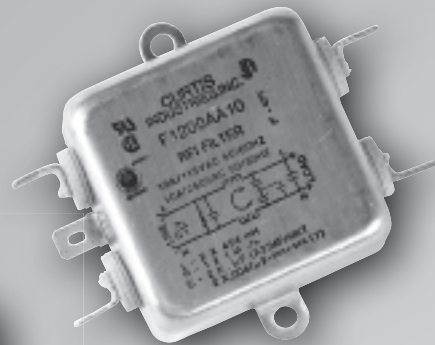


SINGLE PHASE FILTERS]

General Performance

High Performance

Wide Band



F1100/F1150/F1199 RFI Filters

General Purpose

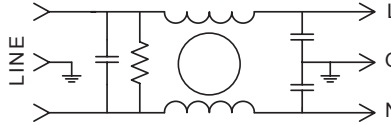
SINGLE PHASE FILTERS



Features:

- Most Economical Design
- Designed for General Purpose, Common Mode Applications
- Available in Standard (F1100) and Low-Leakage (F1150) (F1160) (F1170) (F1180) (F1190) (F1199) Models

F1100/F1150/F1199 Simplified Schematic



| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | |
|------------------------|-------------------------------------|-------------------------------------|--|-------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | | | MODE | Frequency - MHz | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 1A | F1100AA01 F1100BB01 | QC/QC Wire/Wire | Common Differential | 20 | 35 | 43 | 52 55 | 55 65 | 50 50 |
| | F1150AA01 F1150BB01 | QC/QC Wire/Wire | Common Differential | 20 | 30 | 37 | 50 55 | 50 65 | 50 50 |
| | F1199AA01 | QC/QC | Common Differential | 32 5 | 45 14 | 45 23 | 43 47 | 43 50 | 40 45 |
| 2A | F1199AA02 F1199BB02 | QC/QC Wire/Wire | Common Differential | 24 5 | 35 13 | 43 16 | 45 45 | 45 50 | 40 45 |
| | 3A | F1100AA03 F1100BB03 F1100PP03 | QC/QC Wire/Wire PC/PC | Common Differential | 20 | 35 | 43 | 52 55 | 55 64 |
| F1150AA03 F1150BB03 | | QC/QC Wire/Wire | Common Differential | 20 | 30 | 37 | 50 55 | 50 64 | 50 46 |
| F1199AA03 F1199BB03 | | QC/QC Wire/Wire | Common Differential | 20 5 | 30 12 | 38 14 | 48 38 | 48 44 | 44 42 |
| 6A | F1100AA06 F1100BB06 | QC/QC Wire/Wire | Common Differential | 10 | 22 2 | 30 5 | 46 51 | 50 57 | 45 49 |
| | F1150AA06 F1150BB06 | QC/QC Wire/Wire | Common Differential | 10 | 20 2 | 27 5 | 45 51 | 45 57 | 45 49 |
| | F1199AA06 F1199BB06 | QC/QC Wire/Wire | Common Differential | 9 5 | 20 12 | 28 14 | 42 33 | 50 42 | 47 42 |
| 10A | F1100AA10 F1100BB10 | QC/QC Wire/Wire | Common Differential | 10 | 22 | 30 2 | 46 27 | 50 47 | 45 50 |
| | F1150AA10 F1150BB10 | QC/QC Wire/Wire | Common Differential | 10 | 20 | 27 2 | 45 27 | 45 47 | 45 50 |
| | F1199AA10 F1199BB10 F1199DD10 | QC/QC Wire/Wire Screw/Screw | Common Differential | 9 5 | 20 12 | 25 14 | 38 33 | 42 42 | 40 42 |
| 20A | F1100AA20 F1100DD20 | QC/QC Screw/Screw | Common Differential | 8 | 18 | 22 5 | 36 22 | 42 46 | 45 60 |
| | F1150AA20 F1150DD20 | QC/QC Screw/Screw | Common Differential | 8 | 15 | 20 5 | 32 22 | 38 46 | 45 60 |
| | F1199AA20 F1199DD20 | QC/QC Screw/Screw | Common Differential | 10 5 | 20 12 | 28 15 | 35 30 | 38 40 | 40 40 |
| 30A | F1199DD30 | Screw/Screw | Common Differential | 13 5 | 23 12 | 30 15 | 35 30 | 38 40 | 40 40 |

NOTE: Other combinations of terminals may be specified on special order.

Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

| | | |
|-----------------------|--------|--------|
| Rated Current: | 115VAC | 250VAC |
| | 1A | 1A |
| | 2A | 1.5A |
| | 3A | 2.5A |
| | 6A | 4A |
| | 10A | 6A |
| | 20A | 10A |
| | 30A | 15A |

Current Overload: 6X for 8 seconds

| | | |
|-----------------------------|--------------------|--------------|
| Hi-Pot Test (1 min): | F1100/F1150 | F1199 |
| Line to Ground: | 1500VAC | 1500VAC |
| Line to Line: | 1768VDC | 1450VDC |

Insulation Resistance: 9 x 10⁹ Ω at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

- A: QC – Quick Connect
- B: Wire
- D: Screw
- P: PCB Pins

Maximum Leakage Current:

| | | | |
|---------------------|--------|--------|--------|
| Each Line to Ground | F1100 | F1150 | F1199 |
| 115VAC, 60Hz: | 0.40mA | 0.25mA | 0.25mA |
| 250VAC, 50Hz: | .75mA | 0.40mA | 0.45mA |

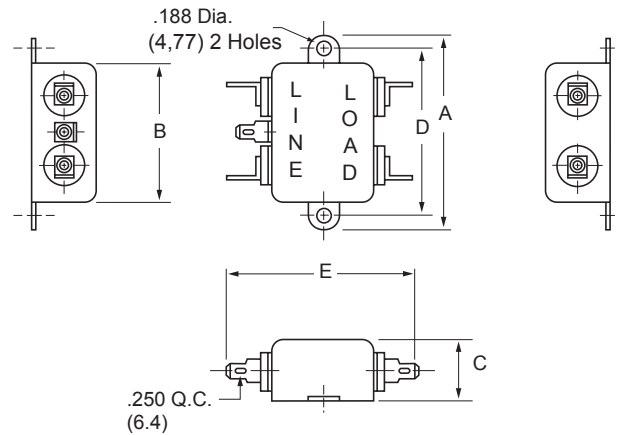
Agency Approvals:



F1100AA/F1150AA

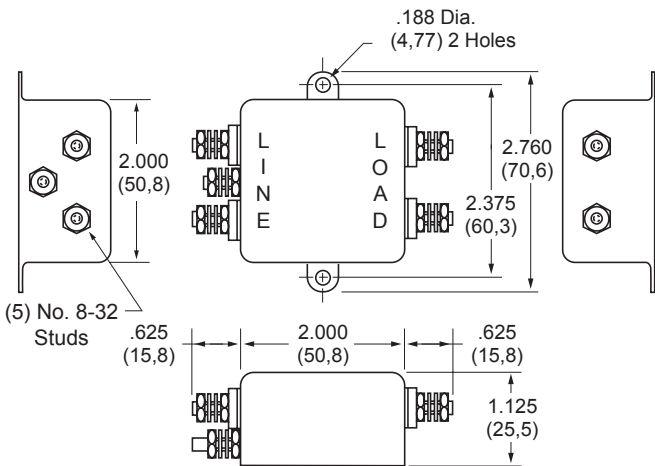
(1, 3, 6, 10 and 20Amp) Dimensions

| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1A | 2.500 (63,5) | 1.750 (44,5) | .625 (15,8) | 2.125 (53,9) | 1.425 (36,2) |
| 3A | 2.500 (63,5) | 1.750 (44,5) | .750 (19,1) | 2.125 (53,9) | 1.8 (45,8) |
| 6A | 2.500 (63,5) | 1.750 (44,5) | .750 (19,1) | 2.125 (53,9) | 1.8 (45,8) |
| 10A | 2.500 (63,5) | 1.750 (44,5) | 1.125 (28,5) | 2.125 (53,9) | 1.8 (45,8) |
| 20A | 2.760 (70,6) | 2.000 (60,8) | 1.125 (28,5) | 2.375 (60,3) | 2.550 (64,8) |



F1100DD/F1150DD

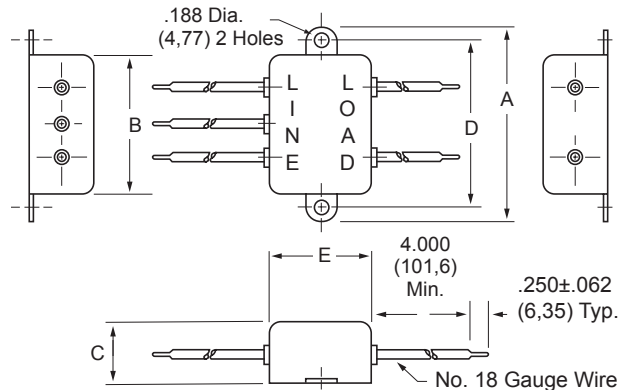
(20Amp Only) Dimensions



F1100BB/FB1150BB

(1, 3, 6 and 10Amp) Dimensions

| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1A | 2.500 (63,5) | 1.750 (44,5) | .625 (15,8) | 2.125 (53,9) | .875 (22,2) |
| 3A | 2.500 (63,5) | 1.750 (44,5) | .750 (19,1) | 2.125 (53,9) | 1.250 (31,8) |
| 6A | 2.500 (63,5) | 1.750 (44,5) | .750 (19,1) | 2.125 (53,9) | 1.250 (31,8) |
| 10A | 2.500 (63,5) | 1.750 (44,5) | 1.125 (28,5) | 2.125 (53,9) | 1.250 (31,8) |



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

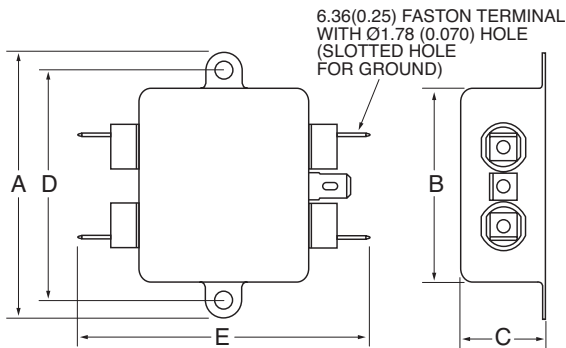
F1100/F1150/F1199 RFI Filters (continued)

General Purpose

SINGLE PHASE FILTERS

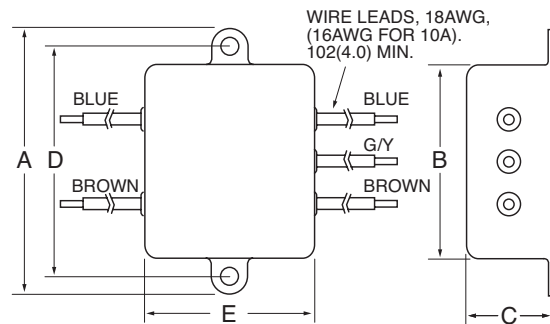
F1199AA (1, 2, 3, 6, 10 and 20Amp) Dimensions

| Amps | A | B | C | D | E |
|------|----------------|----------------|----------------|------------------|----------------|
| 1A | 2.53 (64,3) | 1.82 (46,2) | 0.66 (16,8) | 2.126 (54,0) | 2.25 (57,2) |
| 2A | 2.53 (64,3) | 1.82 (46,2) | 0.66 (16,8) | 2.126 (54,0) | 2.25 (57,2) |
| 3A | 2.53 (64,3) | 1.82 (46,2) | 0.78 (19,8) | 2.126 (54,0) | 2.61 (66,3) |
| 6A | 2.53 (64,3) | 1.82 (46,2) | 0.78 (19,8) | 2.126 (54,0) | 2.61 (66,3) |
| 10A | 2.53 (64,3) | 1.82 (46,2) | 1.16 (29,5) | 2.126 (54,0) | 2.61 (66,3) |
| 20A | 2.81 (71,4) | 2.07 (52,6) | 1.16 (29,5) | 2.375 (60,33) | 3.36 (85,3) |



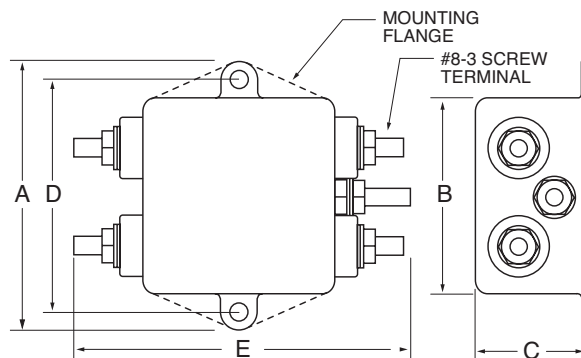
F1199BB (2, 3, 6 and 10Amp) Dimensions

| Amps | A | B | C | D | E |
|------|----------------|----------------|----------------|-----------------|----------------|
| 2A | 2.53 (64,3) | 1.82 (46,2) | 0.66 (16,8) | 2.126 (54,0) | 0.96 (24,4) |
| 3A | 2.53 (64,3) | 1.82 (46,2) | 0.78 (19,8) | 2.126 (54,0) | 1.32 (33,5) |
| 6A | 2.53 (64,3) | 1.82 (46,2) | 0.78 (19,8) | 2.126 (54,0) | 1.32 (33,5) |
| 10A | 2.53 (64,3) | 1.82 (46,2) | 1.16 (29,5) | 2.126 (54,0) | 1.32 (33,5) |

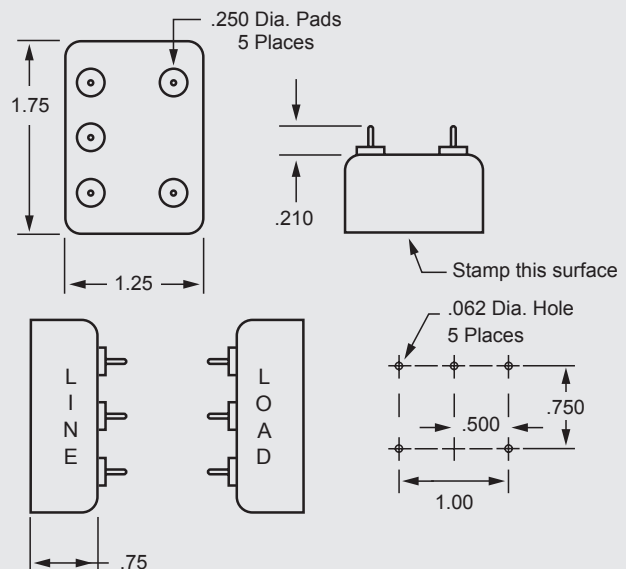


F1199DD (10, 20 and 30Amp) Dimensions

| Amps | A | B | C | D | E |
|------|-----------------|----------------|----------------|------------------|-----------------|
| 10A | 2.53 (64,3) | 1.82 (46,2) | 1.16 (29,5) | 2.126 (54,0) | 2.72 (69,1) |
| 20A | 2.81 (71,4) | 2.07 (52,6) | 1.16 (29,5) | 2.375 (60,33) | 3.46 (87,9) |
| 30A | 4.20 (106,7) | 3.38 (85,9) | 1.53 (38,9) | 3.75 (95,25) | 5.34 (135,6) |



F1100PP Recommended PC Mounting



F1200/F1250/F1299 RFI Filters

Features:

- Designed for General Purpose Common Mode and Differential Mode Applications
- Higher Line-to-Line Capacitance for Protection from Pulsed, Intermittent, or Continuous RFI
- Available in Standard (F1200) and Low-Leakage (F1250) (F1260) (F1270) (F1280) (F1299) Models
- Available with Integral IEC Connector up to 10Amps



| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | |
|------------------------|-------------|-----------------------|--|-----------------|-----|-----|-----|----|----|
| | | | MODE | Frequency - MHz | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 1A | F1200AA01 | QC/QC | Common | 20 | 35 | 43 | 52 | 55 | 50 |
| | F1200BB01 | Wire/Wire | Differential | 4 | 38 | 59 | 66 | 62 | 54 |
| | F1250AA01 | QC/QC | Common | 20 | 30 | 37 | 50 | 50 | 50 |
| | F1250BB01 | Wire/Wire | Differential | 4 | 38 | 59 | 66 | 62 | 54 |
| 2A | F1299AA02 | QC/QC | Common | 24 | 35 | 43 | 45 | 45 | 40 |
| | F1299BB02 | Wire/Wire | Differential | 6 | 35 | 50 | 55 | 50 | 45 |
| 3A | F1200AA03 | QC/QC | Common | 20 | 35 | 43 | 52 | 55 | 50 |
| | F1200BB03 | Wire/Wire | Differential | 4 | 38 | 59 | 70 | 64 | 59 |
| | F1200CA03 | IEC/QC | | | | | | | |
| | F1250AA03 | QC/QC | Common | 20 | 30 | 37 | 50 | 50 | 50 |
| | F1250BB03 | Wire/Wire | Differential | 4 | 38 | 59 | 70 | 64 | 59 |
| | F1250CA03 | IEC/QC | | | | | | | |
| 6A | F1299AA03 | QC/QC | Common | 26 | 37 | 45 | 45 | 45 | 40 |
| | F1299BB03 | Wire/Wire | Differential | 6 | 40 | 55 | 55 | 50 | 45 |
| | F1299CA03 | IEC/QC | | | | | | | |
| | F1200AA06 | QC/QC | Common | 10 | 22 | 30 | 46 | 50 | 45 |
| | F1200BB06 | Wire/Wire | Differential | 9 | 25 | 48 | 70 | 70 | 62 |
| | F1200CA06 | IEC/QC | | | | | | | |
| 10A | F1250AA06 | QC/QC | Common | 10 | 20 | 27 | 45 | 45 | 45 |
| | F1250BB06 | Wire/Wire | Differential | 9 | 25 | 48 | 70 | 70 | 62 |
| | F1250CA06 | IEC/QC | | | | | | | |
| | F1299AA06 | QC/QC | Common | 20 | 31 | 40 | 45 | 45 | 40 |
| | F1299BB06 | Wire/Wire | Differential | 6 | 35 | 50 | 55 | 50 | 45 |
| | F1299CA06 | IEC/QC | | | | | | | |
| 20A | F1200AA10 | QC/QC | Common | 10 | 22 | 30 | 46 | 50 | 45 |
| | F1200BB10 | Wire/Wire | Differential | 10 | 16 | 43 | 70 | 70 | 66 |
| | F1200CA10 | IEC/QC | | | | | | | |
| | F1250AA10 | QC/QC | Common | 10 | 20 | 27 | 45 | 45 | 45 |
| | F1250BB10 | Wire/Wire | Differential | 10 | 16 | 43 | 70 | 70 | 66 |
| | F1250CA10 | IEC/QC | | | | | | | |
| 30A | F1299AA10 | QC/QC | Common | 9 | 20 | 25 | 38 | 42 | 40 |
| | F1299BB10 | Wire/Wire | Differential | 14 | 14 | 38 | 50 | 48 | 45 |
| | F1299CA10 | IEC/QC | | | | | | | |
| | F1299DD10 | Screw/Screw | | | | | | | |
| | F1200AA20 | QC/QC | Common | 10 | 22 | 30 | 42 | 47 | 40 |
| | F1200DD20 | Screw/Screw | Differential | 9 | 19 | 44 | 70 | 70 | 70 |
| 30A | F1250AA20 | QC/QC | Common | 10 | 20 | 25 | 38 | 40 | 40 |
| | F1250DD20 | Screw/Screw | Differential | 9 | 19 | 44 | 70 | 70 | 70 |
| | F1299AA20 | QC/QC | Common | 10 | 20 | 28 | 35 | 38 | 40 |
| | F1299DD20 | Screw/Screw | Differential | 14 | 14 | 38 | 50 | 48 | 45 |
| 30A | F1200DD30 | Screw/Screw | Common | 7 | 15 | 20 | 34 | 42 | 40 |
| | | | Differential | 11 | 13 | 44 | 70 | 60 | 57 |
| | F1299DD30 | Screw/Screw | Common | 12 | 23 | 30 | 35 | 38 | 40 |
| | | | Differential | 15 | 40 | 55 | 55 | 55 | 50 |

NOTE: Other combinations of terminals may be specified on special order.

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

Curtis Industries
A Division of Powers Holdings, Inc.

1-800-657-0853

General Purpose

SINGLE PHASE FILTERS

F1200/F1250/F1299 RFI Filters (continued)

Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current:

| | | | | | | | |
|--------|----|------|------|----|-----|-----|-----|
| 115VAC | 1A | 2A | 3A | 6A | 10A | 20A | 30A |
| 250VAC | 1A | 1.5A | 2.5A | 4A | 6A | 10A | 15A |

Current Overload: 6X for 8 seconds

| | | |
|-----------------------------|---------------------|---------------------|
| Hi-Pot Test (1 min): | F1200 Series | F1299 Series |
| Line to Ground: | 1500VAC | 1500VAC |
| Line to Line: | 1768VDC | 1450VDC |

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max at rated current

Humidity Range: 0% to 95% R.H.

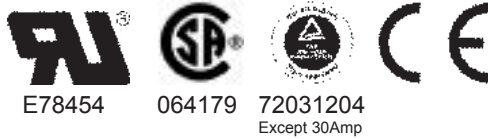
Termination:

| | |
|-----------------------|-------------------|
| A: QC – Quick Connect | C: IEC Receptacle |
| B: Wire | D: Screw |

Maximum Leakage Current:

| | | | | | | | |
|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Each Line to Ground | F1200 | F1250 | F1299 | F1260 | F1270 | F1280 | F1290 |
| 115VAC, 60Hz: | 0.40mA | 0.25mA | .25mA | .25mA | .002mA | .015mA | .030mA |
| 250VAC, 50Hz: | .75mA | .40mA | .45mA | .45mA | .005mA | .025mA | .050mA |

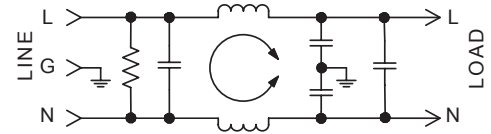
**Agency Approvals
F1200/F1250:**



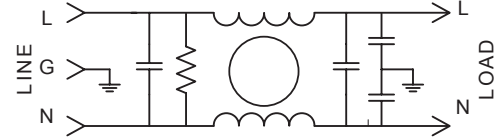
**Agency Approvals
F1299:**



F1200/F1250 Simplified Schematic

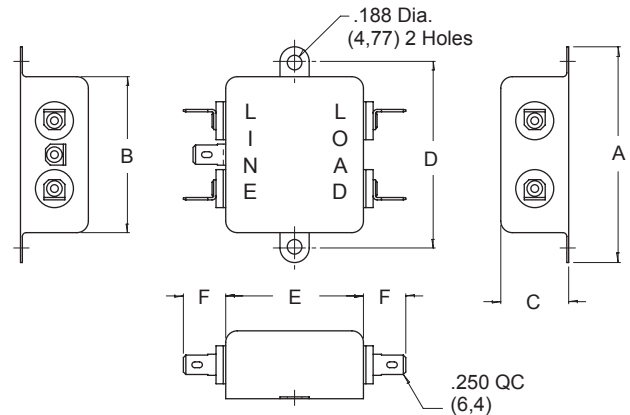


F1299 Simplified Schematic



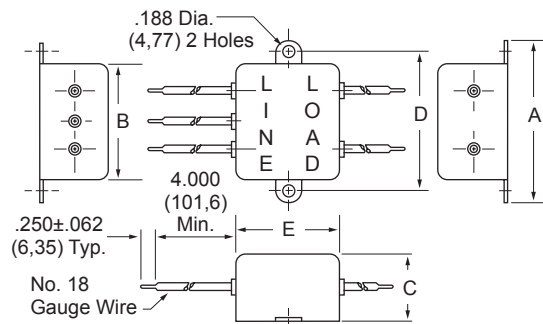
F1200AA/F1250AA (1, 3, 6, 10 and 20Amp) Dimensions

| Amps | A | B | C | D | E | F |
|------|-----------------|----------------|-----------------|-----------------|-----------------|----------------|
| 1A | 2.750 (69,9) | 2.00 (50,8) | .875 (22,2) | 2.375 (60,3) | 1.750 (44,5) | .550 (14,0) |
| 3A | 2.750 (69,9) | 2.00 (50,8) | 1.125 (28,5) | 2.375 (60,3) | 1.750 (44,5) | .550 (14,0) |
| 6A | 2.750 (69,9) | 2.00 (50,8) | 1.125 (28,5) | 2.375 (60,3) | 1.750 (44,5) | .550 (14,0) |
| 10A | 2.750 (69,9) | 2.00 (50,8) | 1.125 (28,5) | 2.375 (60,3) | 2.000 (50,8) | .550 (14,0) |
| 20A | 3.310 (84,1) | 2.50 (63,5) | 1.500 (38,1) | 2.940 (74,7) | 2.000 (50,8) | .550 (14,0) |



F1200BB/FB1250BB (1, 3, 6 and 10Amp) Dimensions

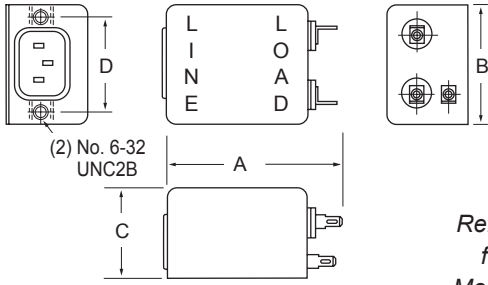
| Amps | A | B | C | D | E |
|------|-----------------|----------------|-----------------|-----------------|-----------------|
| 1A | 2.750 (69,9) | 2.00 (50,8) | .875 (22,2) | 2.375 (60,3) | 1.750 (44,5) |
| 3A | 2.750 (69,9) | 2.00 (50,8) | 1.125 (28,5) | 2.375 (60,3) | 1.750 (44,5) |
| 6A | 2.750 (69,9) | 2.00 (50,8) | 1.125 (28,5) | 2.375 (60,3) | 1.750 (44,5) |
| 10A | 2.750 (69,9) | 2.00 (50,8) | 1.125 (28,5) | 2.375 (60,3) | 2.000 (50,8) |



General Purpose

SINGLE PHASE FILTERS

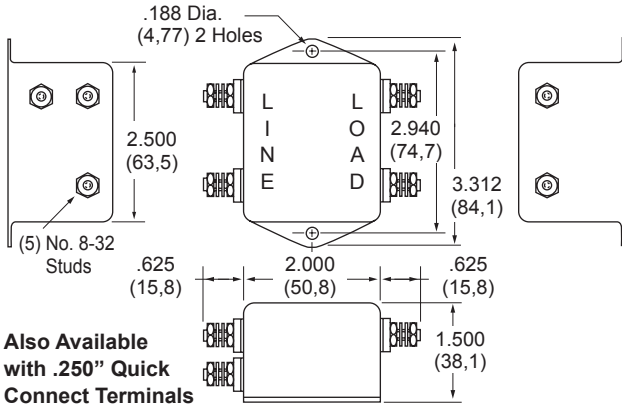
F1200CA/F1250CA (3, 6, and 10Amp) Dimensions



Refer to Page 40
for Standard
Mounting Cutouts

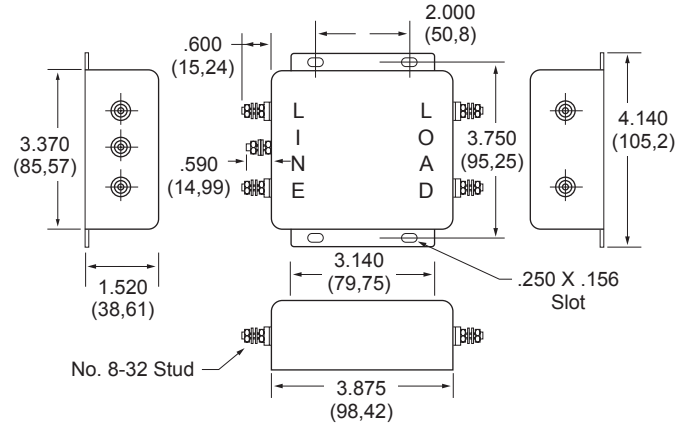
| Amps | A | B | C | D |
|------|----------------|-----------------|-----------------|-----------------|
| 3A | 2.55 (64,8) | 2.000 (50,8) | 1.50 (38,1) | 1.575 (40,0) |
| 6A | 3.05 (77,5) | 2.000 (50,8) | 1.500 (38,1) | 1.575 (40,0) |
| 10A | 3.05 (77,5) | 2.000 (50,8) | 1.500 (38,1) | 1.575 (40,0) |

F1200DD/F1250DD (20Amp Only) Dimensions



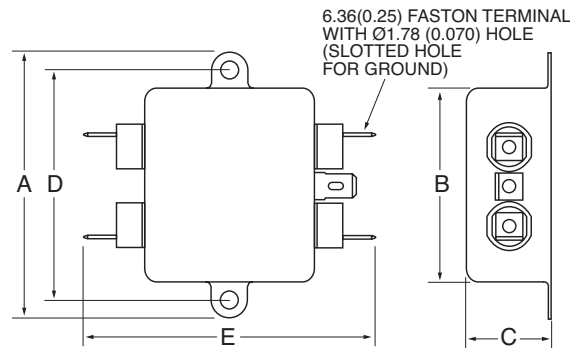
Also Available
with .250" Quick
Connect Terminals

F1200DD30 (30Amp Only) Dimensions



F1299AA (2, 3, 6, 10 and 20Amp) Dimensions

| Amps | A | B | C | D | E |
|------|----------------|----------------|----------------|------------------|----------------|
| 2A | 2.81 (71,4) | 2.07 (52,6) | 0.91 (23,1) | 2.375 (60,33) | 3.10 (78,7) |
| 3A | 2.81 (71,4) | 2.07 (52,6) | 1.16 (29,5) | 2.375 (60,33) | 3.10 (78,7) |
| 6A | 2.81 (71,4) | 2.07 (52,6) | 1.16 (29,5) | 2.375 (60,33) | 3.10 (78,7) |
| 10A | 2.81 (71,4) | 2.07 (52,6) | 1.16 (29,5) | 2.375 (60,33) | 3.35 (85,1) |
| 20A | 3.35 (85,1) | 2.56 (65,0) | 1.53 (38,9) | 2.938 (74,63) | 3.35 (85,1) |



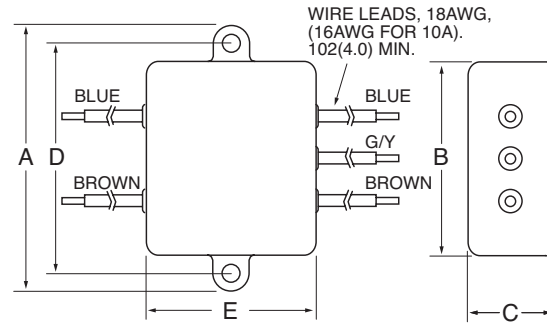
F1200/F1250/F1299 RFI Filters (continued)

General Purpose

SINGLE PHASE FILTERS

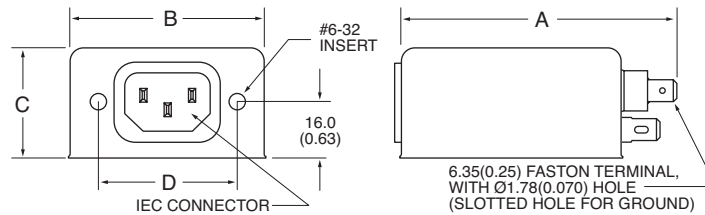
F1299BB (2, 3, 6 and 10Amp) Dimensions

| Amps | A | B | C | D | E |
|------|----------------|----------------|----------------|------------------|----------------|
| 2A | 2.81 (71,4) | 2.07 (52,6) | 0.91 (23,1) | 2.375 (60,33) | 1.81 (46,0) |
| 3A | 2.81 (71,4) | 2.07 (52,6) | 1.16 (29,5) | 2.375 (60,33) | 3.10 (78,7) |
| 6A | 2.81 (71,4) | 2.07 (52,6) | 1.16 (29,5) | 2.375 (60,33) | 3.10 (78,7) |
| 10A | 2.81 (71,4) | 2.07 (52,6) | 1.16 (29,5) | 2.375 (60,33) | 2.07 (52,6) |



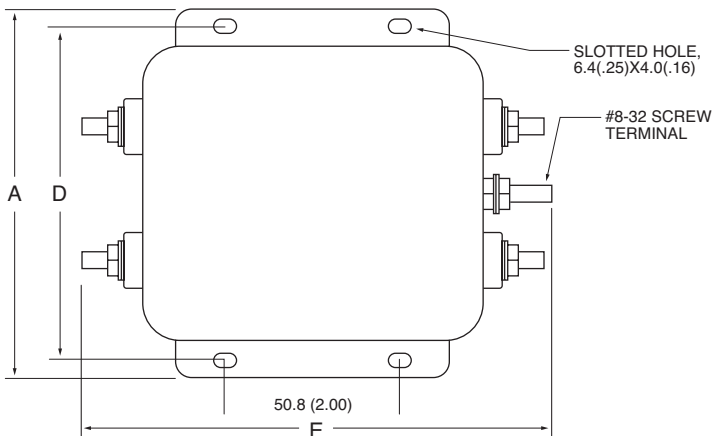
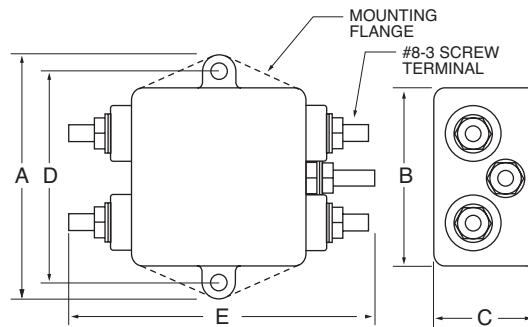
F1299CA (3, 6 and 10Amp) Dimensions

| Amps | A | B | C | D |
|------|----------------|----------------|----------------|-----------------|
| 3A | 3.21 (81,5) | 2.25 (57,2) | 1.28 (32,5) | 1.575 (40,0) |
| 6A | 3.21 (81,5) | 2.25 (57,2) | 1.28 (32,5) | 1.575 (40,0) |
| 10A | 3.71 (94,2) | 2.25 (57,2) | 1.28 (32,5) | 1.575 (40,0) |



F1299DD (10, 20 and 30Amp) Dimensions

| Amps | A | B | C | D | E |
|------|-----------------|----------------|----------------|------------------|-----------------|
| 10A | 2.81 (71,40) | 2.07 (52,6) | 1.16 (29,5) | 2.375 (60,33) | 3.46 (87,9) |
| 20A | 3.35 (85,1) | 2.56 (65,0) | 1.53 (38,9) | 2.938 (74,63) | 3.46 (87,9) |
| 30A | 4.20 (106,7) | 3.38 (85,9) | 1.53 (38,9) | 3.750 (95,25) | 5.34 (135,6) |



F1300/F1350/F1399 RFI Filters

Features:

- T Circuit Configuration—Designed for Motor, Capacitive and Other Low Impedance Loads
- Dual Coils — Higher Performance in Unknown RFI and Noise Susceptibility Applications
- Integral IEC Connector and PC Mounted Versions Now Available



| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | | |
|------------------------|-------------|-----------------------|--|-----------------|-----|-----|-----|----|----|----|
| | | | MODE | Frequency - MHz | | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 | |
| 1A | F1300AA01 | QC/QC | Common | 40 | 65 | 65 | 65 | 65 | 65 | |
| | F1300BB01 | Wire/Wire | Differential | 2 | 57 | 69 | 70 | 70 | 60 | |
| | F1350AA01 | QC/QC | Common | 30 | 60 | 65 | 65 | 65 | 65 | |
| | F1350BB01 | Wire/Wire | Differential | 2 | 57 | 69 | 70 | 70 | 60 | |
| 2A | F1399AA02 | QC/QC | Common | 40 | 65 | 65 | 65 | 65 | 40 | |
| | F1399BB02 | Wire/Wire | Differential | 5 | 45 | 70 | 65 | 60 | 50 | |
| 3A | F1300AA03 | QC/QC | Common | 40 | 65 | 65 | 65 | 65 | 65 | |
| | F1300BB03 | Wire/Wire | | Differential | 7 | 64 | 70 | 70 | 70 | 58 |
| | F1300CA03 | IEC/QC | | | | | | | | |
| | F1300CP03 | IEC/PC | | | | | | | | |
| | F1350AA03 | QC/QC | Common | 30 | 60 | 65 | 65 | 65 | 65 | |
| | F1350BB03 | Wire/Wire | | Differential | 7 | 64 | 70 | 70 | 70 | 58 |
| F1350CA03 | IEC/QC | | | | | | | | | |
| F1350CP03 | IEC/PC | | | | | | | | | |
| F1399AA03 | QC/QC | Common | 40 | 65 | 65 | 65 | 65 | 40 | | |
| F1399BB03 | Wire/Wire | | Differential | 12 | 55 | 70 | 65 | 60 | 50 | |
| F1399CA03 | IEC/QC | | | | | | | | | |
| 6A | F1300AA06 | QC/QC | Common | 12 | 48 | 60 | 65 | 65 | 65 | |
| | F1300BB06 | Wire/Wire | | Differential | 10 | 40 | 70 | 70 | 70 | 60 |
| | F1300CA06 | IEC/QC | | | | | | | | |
| | F1350AA06 | QC/QC | Common | 2 | 40 | 60 | 65 | 65 | 65 | |
| | F1350BB06 | Wire/Wire | | Differential | 10 | 40 | 70 | 70 | 70 | 60 |
| | F1350CA06 | IEC/QC | | | | | | | | |
| F1399AA06 | QC/QC | Common | 30 | 55 | 65 | 65 | 65 | 40 | | |
| F1399BB06 | Wire/Wire | | Differential | 5 | 40 | 70 | 65 | 60 | 50 | |
| F1399CA06 | IEC/QC | | | | | | | | | |
| 10A | F1300AA10 | QC/QC | Common | 12 | 48 | 60 | 65 | 65 | 65 | |
| | F1300BB10 | Wire/Wire | | Differential | 13 | 13 | 64 | 70 | 67 | 56 |
| | F1300CA10 | IEC/QC | | | | | | | | |
| | F1350AA10 | QC/QC | Common | 2 | 40 | 60 | 65 | 65 | 65 | |
| | F1350BB10 | Wire/Wire | | Differential | 13 | 13 | 64 | 70 | 67 | 56 |
| | F1350CA10 | IEC/QC | | | | | | | | |
| F1399AA10 | QC/QC | Common | 5 | 40 | 52 | 60 | 60 | 50 | | |
| F1399BB10 | Wire/Wire | | Differential | 5 | 12 | 50 | 65 | 60 | 55 | |
| F1399CA10 | IEC/QC | | | | | | | | | |
| F1399DD10 | Screw/Screw | | | | | | | | | |
| 15A | F1300AA15 | QC/QC | Common | 14 | 35 | 44 | 56 | 58 | 55 | |
| | | | Differential | 15 | 10 | 45 | 70 | 67 | 56 | |
| 20A | F1300AA20 | QC/QC | Common | 5 | 44 | 60 | 65 | 65 | 60 | |
| | | | Differential | — | — | 35 | 60 | 57 | 45 | |
| | F1350AA20 | QC/QC | Common | 2 | 35 | 61 | 63 | 60 | 50 | |
| | | | Differential | — | — | 35 | 60 | 57 | 45 | |
| F1399AA20 | QC/QC | Common | 5 | 40 | 52 | 60 | 60 | 52 | | |
| F1399DD20 | Screw/Screw | | Differential | 5 | 12 | 50 | 65 | 60 | 55 | |

NOTE: Other combinations of terminals may be specified on special order.

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

Curtis Industries
A Division of Powers Holdings, Inc.

1-800-657-0853

General Purpose

SINGLE PHASE FILTERS

F1300/F1350/F1399 RFI Filters (continued)

Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current:

| | | | | | | | |
|--------|----|------|------|----|-----|-----|-----|
| 115VAC | 1A | 2A | 3A | 6A | 10A | 15A | 20A |
| 250VAC | 1A | 1.5A | 2.5A | 4A | 6A | 15A | 16A |

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min): **F1300/F1350**

Line to Ground: 1500VAC
Line to Line: 1768VDC

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination: A: QC – Quick Connect C: IEC Receptacle
B: Wire P: PCB Pins

Maximum Leakage Current: Each Line to Ground

| | | | | | | | |
|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | F1300 | F1350 | D1399 | F1360 | F1370 | F1380 | F1390 |
| 115VAC, 60Hz: | 0.4mA | 0.25mA | 0.25mA | .15mA | .002mA | .015mA | .030mA |
| 250VAC, 50Hz: | .75mA | .40mA | 0.45mA | .25mA | .005mA | .025mA | .050mA |

Agency Approvals:

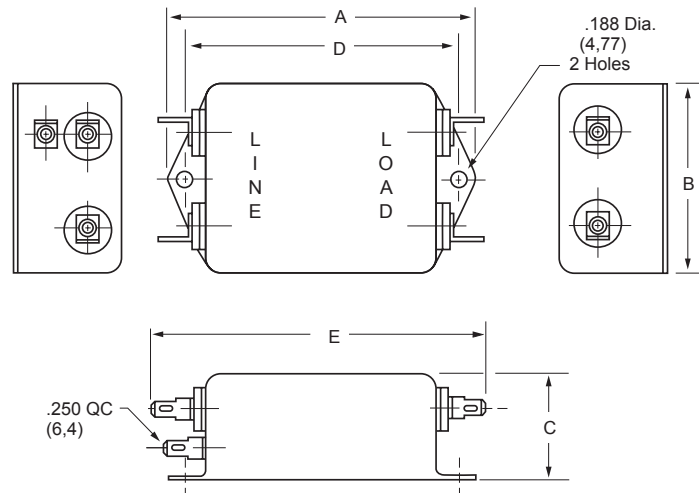


General Purpose

SINGLE PHASE FILTERS

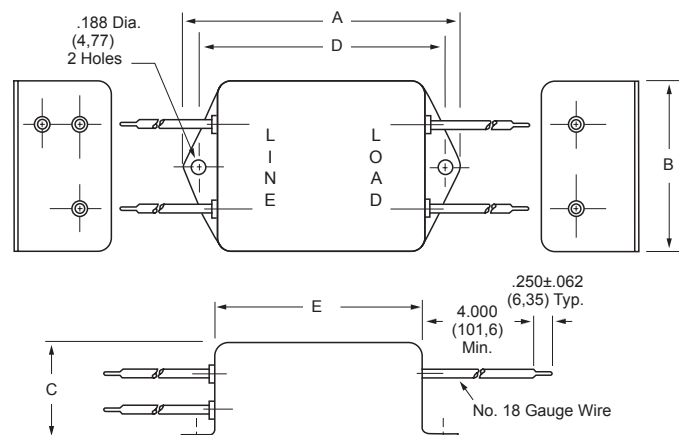
F1300AA (1, 3, 6, 10 and 15Amp) F1350AA (1, 3, 6 and 10Amp) Dimensions

| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1A | 2.750 (69,9) | 1.750 (44,5) | 1.125 (28,5) | 2.375 (60,3) | 2.925 (74,3) |
| 3A | 3.312 (84,1) | 2.000 (50,8) | 1.125 (28,5) | 2.940 (74,7) | 3.49 (88,7) |
| 6A | 3.312 (84,1) | 2.000 (50,8) | 1.125 (28,5) | 2.940 (74,7) | 3.49 (88,7) |
| 10A | 3.312 (84,1) | 2.000 (50,8) | 1.500 (38,1) | 2.940 (74,7) | 3.49 (88,7) |
| 15A | 3.312 (84,1) | 2.000 (50,8) | 1.500 (38,1) | 2.940 (74,7) | 3.49 (88,7) |

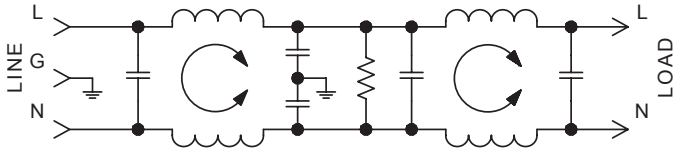


F1300BB/F1350BB (1, 3, 6 and 10Amp) Dimensions

| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1A | 2.750 (69,9) | 1.750 (44,5) | 1.125 (28,5) | 2.375 (60,3) | 2.000 (50,8) |
| 3A | 3.312 (84,1) | 2.000 (50,8) | 1.125 (28,5) | 2.940 (74,7) | 2.500 (63,5) |
| 6A | 3.312 (84,1) | 2.000 (50,8) | 1.125 (28,5) | 2.940 (74,7) | 2.500 (63,5) |
| 10A | 3.312 (84,1) | 2.000 (50,8) | 1.500 (38,1) | 2.940 (74,7) | 2.500 (63,5) |



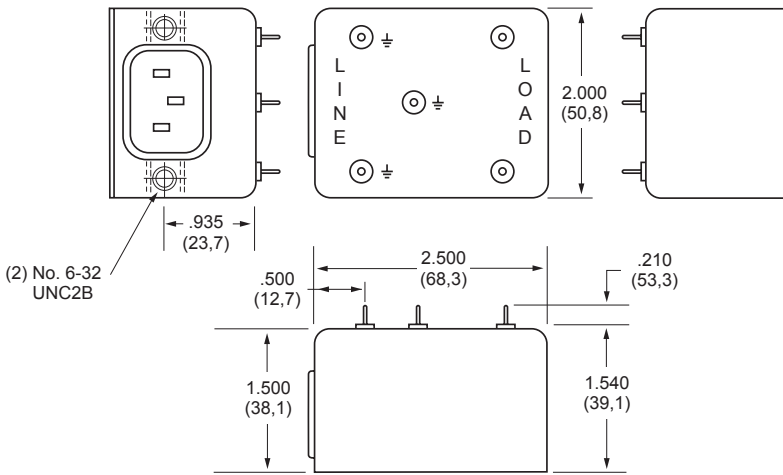
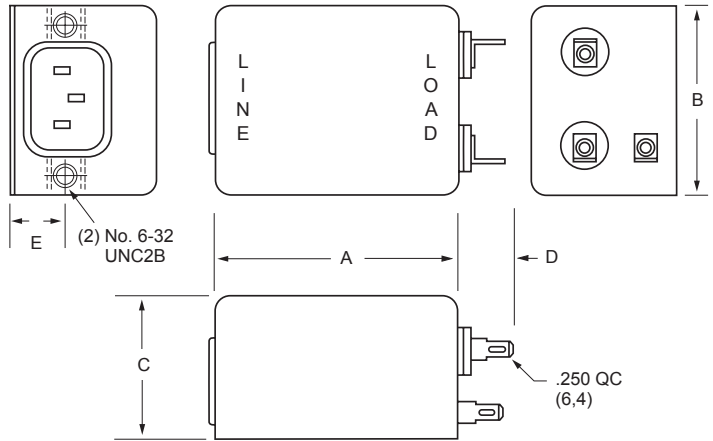
F1300/F1350 Simplified Schematic



F1300CA (3, 6 and 10Amp) F1350CA (3 and 6Amp) Dimensions

Refer to Page 40
for Standard
Mounting Cutouts

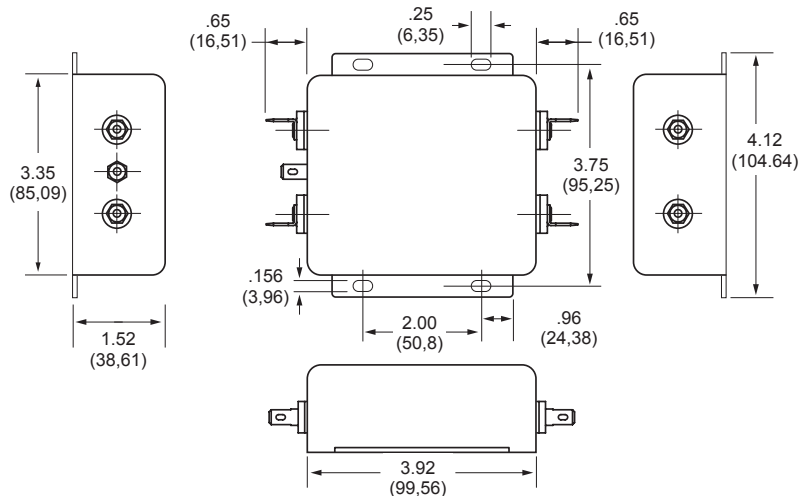
| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|----------------|----------------|
| 3A | 2.500 (63,6) | 2.000 (50,8) | 1.500 (38,1) | .550 (14,0) | .565 (14,3) |
| 6A | 2.500 (63,5) | 2.000 (50,8) | 1.500 (38,1) | .550 (14,0) | .565 (14,3) |
| 10A | 2.880 (73,1) | 2.120 (53,8) | 1.500 (38,1) | .65 (16,0) | .565 (14,3) |



F1300CP/F1350CP (3Amp Only) Dimensions

Refer to Page 40
for Standard
Mounting Cutouts

F1300AA/F1350AA (20Amp Only) Dimensions



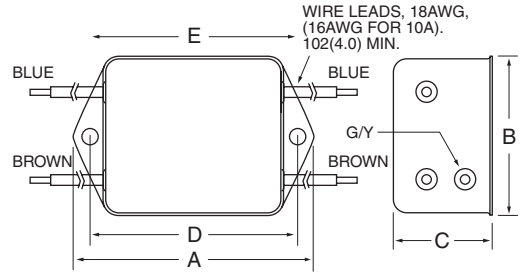
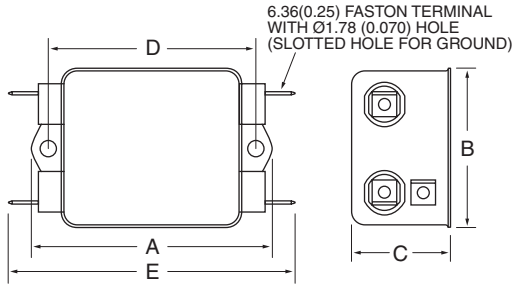
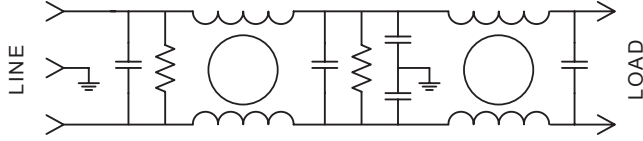
Dimensions are in inches and millimeters
unless otherwise specified.
Values in parentheses are metric equivalents.

F1300/F1399 RFI Filters (continued)

General Purpose

SINGLE PHASE FILTERS

F1399 Simplified Schematic

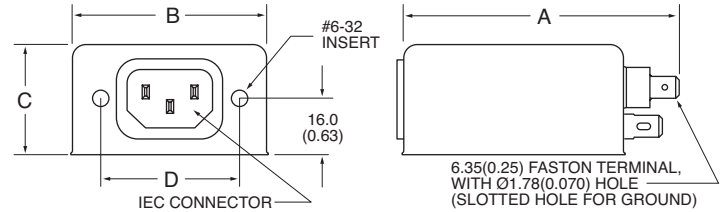


F1399BB (2, 3, 6 and 10Amp) Dimensions

| Amps | A | B | C | D | E |
|------|----------------|----------------|----------------|------------------|----------------|
| 2A | 2.07 (52,6) | 1.81 (46,0) | 1.16 (29,5) | 2.375 (60,33) | 2.78 (70,6) |
| 3A | 2.56 (65,0) | 2.07 (52,6) | 1.16 (29,5) | 2.938 (74,63) | 3.35 (85,1) |
| 6A | 2.56 (65,0) | 2.07 (52,6) | 1.16 (29,5) | 2.938 (74,63) | 3.35 (85,1) |
| 10A | 2.56 (65,0) | 2.07 (52,6) | 1.53 (38,9) | 2.938 (74,63) | 3.35 (85,1) |

F1399AA (2, 3, 6, 10 and 20Amp) Dimensions

| Amps | A | B | C | D | E |
|------|-----------------|----------------|----------------|------------------|-----------------|
| 2A | 3.35 (85,1) | 1.81 (46,0) | 1.16 (29,5) | 2.375 (60,33) | 2.78 (70,6) |
| 3A | 3.85 (97,8) | 2.07 (52,6) | 1.16 (29,5) | 2.938 (74,63) | 3.35 (85,1) |
| 6A | 3.85 (97,8) | 2.07 (52,6) | 1.16 (29,5) | 2.938 (74,63) | 3.35 (85,1) |
| 10A | 3.85 (97,8) | 2.07 (52,6) | 1.53 (38,9) | 2.938 (74,63) | 3.35 (85,1) |
| 20A | 5.23 (132,8) | 3.37 (85,6) | 1.53 (38,9) | 3.75 (95,25) | 4.20 (106,7) |

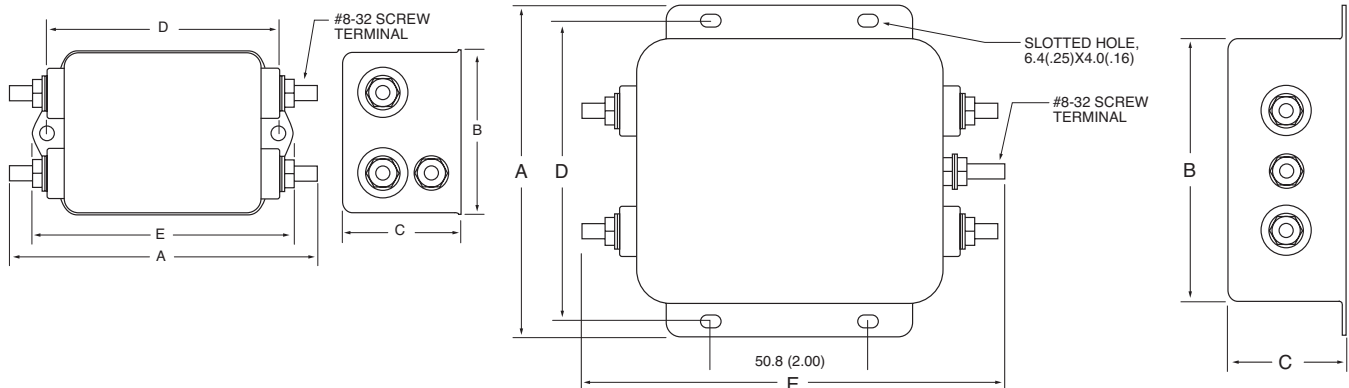


F1399CA (3, 6 and 10Amp) Dimensions

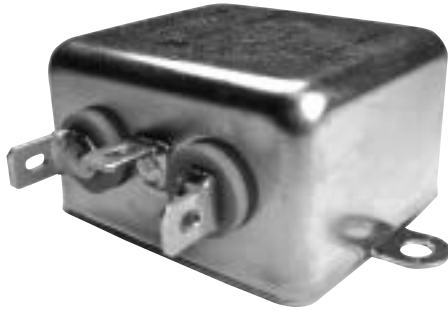
| Amps | A | B | C | D |
|------|-----------------|----------------|----------------|-----------------|
| 3A | 4.33 (110,0) | 2.25 (57,2) | 1.28 (32,5) | 1.575 (40,0) |
| 6A | 4.33 (110,0) | 2.25 (57,2) | 1.28 (32,5) | 1.575 (40,0) |
| 10A | 4.33 (110,0) | 2.25 (57,2) | 1.53 (38,9) | 1.575 (40,0) |

F1399DD (10 and 20Amp) Dimensions

| Amps | A | B | C | D | E |
|------|-----------------|----------------|----------------|------------------|-----------------|
| 10A | 3.96 (100,6) | 2.07 (52,6) | 1.53 (38,9) | 2.938 (74,63) | 3.35 (85,1) |
| 20A | 5.34 (135,6) | 3.37 (85,6) | 1.53 (38,9) | 3.75 (95,25) | 4.20 (106,7) |



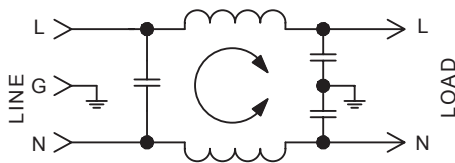
F1900 RFI Filters



Features:

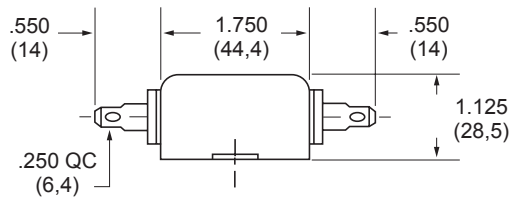
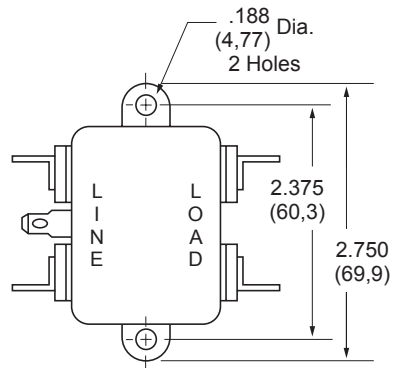
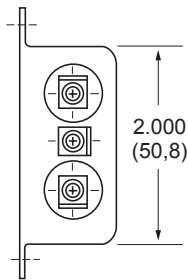
- Designed for Equipment Requiring UL1410 Approval (Consumer Electronics)
- Utilizes UL1414 Approved Components
- Greater Differential Mode Protection

F1900 Simplified Schematic



F1900AA

(3 and 6Amp) Dimensions



Specifications:

Rated Voltage: 125VAC Maximum - 50/60 Hz

Rated Current: 120VAC
3A
6A

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

Line to Ground 1500VAC

Line to Line 1768VDC

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

A: QC – Quick Connect

Maximum Leakage Current:

Each Line to Ground **F1900**
115VAC, 60Hz: 0.25mA

Agency Approvals:



E78454



064179

| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | |
|------------------------|-------------|-----------------------|--|-----------------|-----|-----|-----|----|----|
| | | | MODE | Frequency - MHz | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 3A | F1900AA03 | QC/QC | Common | 20 | 30 | 37 | 50 | 50 | 50 |
| | | | Differential | 7 | 19 | 28 | 50 | 57 | 70 |
| 6A | F1900AA06 | QC/QC | Common | 10 | 20 | 27 | 45 | 45 | 45 |
| | | | Differential | 8 | 18 | 24 | 45 | 52 | 64 |

NOTE: Other combinations of terminals may be specified on special order.

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

Curtis Industries
A Division of Powers Holdings, Inc.

1-800-657-0853

General Purpose

SINGLE PHASE FILTERS

F1400 RFI Filters

High Performance

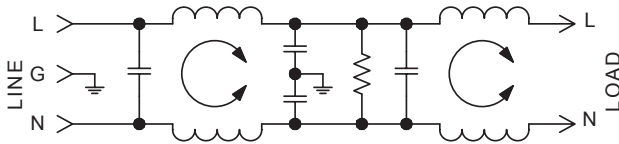
SINGLE PHASE FILTERS



Features:

- High Peak Current Design — High Insertion Loss for Switching Power Supply Emissions
- Low-Leakage Current
- Compact Case Sizes in 6 and 10Amp Models
- Available with Integral IEC Connector in 3 and 6Amp Models

F1400 Simplified Schematic



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current:

| | |
|--------|--------|
| 115VAC | 250VAC |
| 3A | 1.5A |
| 6A | 4A |
| 10A | 6A |

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

| | |
|----------------|---------|
| Line to Ground | 1500VAC |
| Line to Line | 1768VDC |

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

- A: QC – Quick Connect
- B: Wire
- C: IEC Receptacle

Maximum Leakage Current:

| | |
|---------------------|--------------|
| Each Line to Ground | F1400 |
| 115VAC, 60Hz: | 0.25mA |
| 250VAC, 50Hz: | 0.40mA |

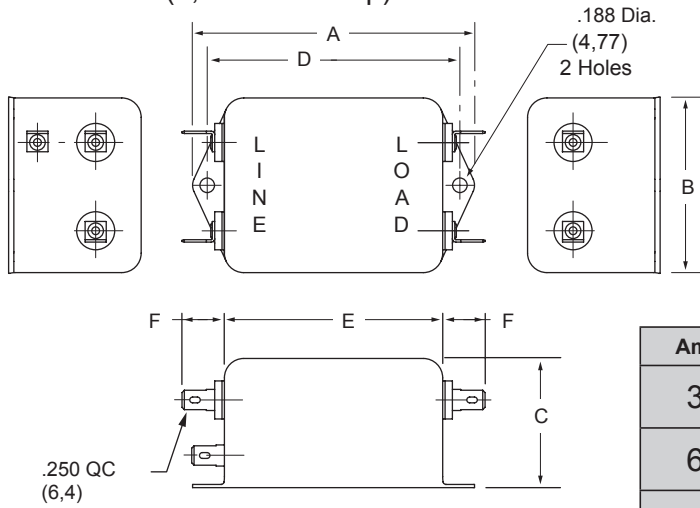
Agency Approvals:



| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | |
|------------------------|-------------------------------------|------------------------------|--|-----------------|-----|-----|-----|----|----|
| | | | MODE | Frequency - MHz | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 3A | F1400AA03 F1400BB03 F1400CA03 | QC/QC Wire/Wire IEC/QC | Common | 58 | 65 | 65 | 65 | 60 | 44 |
| | | | Differential | 40 | 60 | 65 | 65 | 65 | 60 |
| 6A | F1400AA06 F1400BB06 F1400CA06 | QC/QC Wire/Wire IEC/QC | Common | 58 | 65 | 65 | 65 | 60 | 54 |
| | | | Differential | 36 | 55 | 60 | 60 | 55 | 50 |
| 10A | F1400AA10 F1400BB10 | QC/QC Wire/Wire | Common | 56 | 65 | 65 | 65 | 60 | 54 |
| | | | Differential | 40 | 50 | 60 | 65 | 65 | 60 |

NOTE: Other combinations of terminals may be specified on special order.

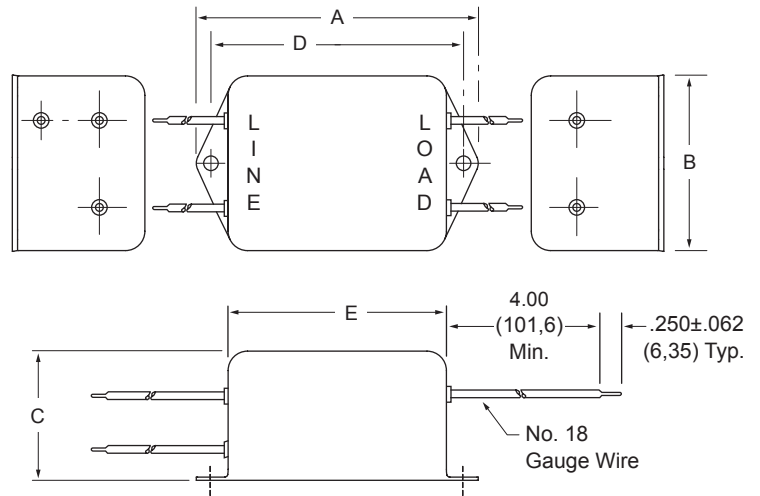
F1400AA (3, 6 and 10Amp) Dimensions



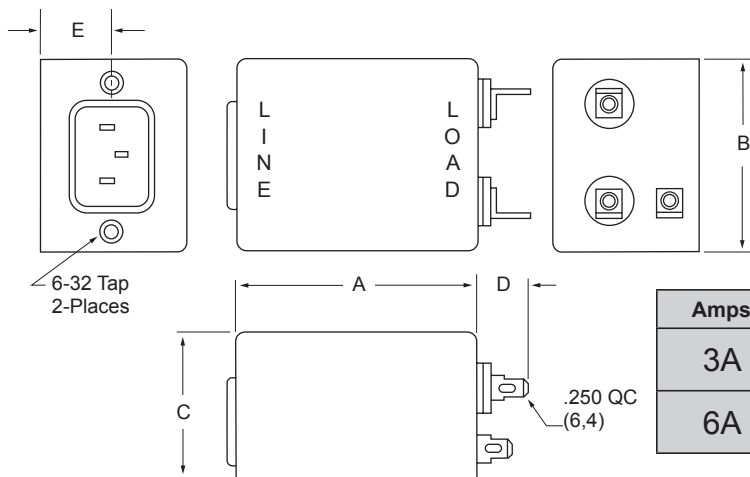
| Amps | A | B | C | D | E | F |
|------|-----------------|-----------------|-----------------|------------------|-----------------|----------------|
| 3A | 3.310 (84,1) | 2.000 (50,8) | 1.500 (38,2) | 2.940 (74,7) | 2.500 (63,5) | .550 (14,0) |
| 6A | 3.310 (84,1) | 2.000 (50,8) | 1.500 (38,2) | 2.940 (74,7) | 2.500 (63,5) | .550 (14,0) |
| 10A | 4.70 (119,4) | 2.250 (57,1) | 1.750 (44,4) | 4.250 (107,9) | 3.750 (95,3) | .550 (14,0) |

F1400BB (3, 6 and 10Amp) Dimensions

| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|------------------|-----------------|
| 3A | 3.310 (84,1) | 2.000 (50,8) | 1.500 (38,1) | 2.940 (74,7) | 2.500 (63,5) |
| 6A | 3.310 (84,1) | 2.000 (50,8) | 1.500 (38,1) | 2.940 (74,7) | 2.500 (63,5) |
| 10A | 4.70 (119,4) | 2.250 (57,1) | 1.750 (44,4) | 4.250 (107,9) | 3.750 (95,3) |



F1400CA (3 and 6Amp) Dimensions



Refer to Page 40
for Standard
Mounting Cutouts

| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|----------------|----------------|
| 3A | 2.880 (73,1) | 2.120 (53,8) | 1.500 (38,1) | .550 (14,0) | .565 (14,3) |
| 6A | 2.880 (73,1) | 2.120 (53,8) | 1.500 (38,1) | .550 (14,0) | .565 (14,3) |

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

F1500 RFI Filters

High Performance

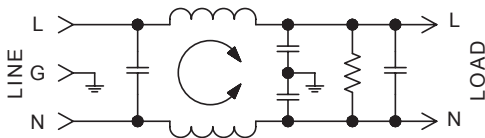
SINGLE PHASE FILTERS



Features:

- IEC Connector Plus Common and Differential Mode Performance in Compact Case
- "L" Circuit Configuration — Cost-Effective in Many Linear and Switching Power Supply Applications
- High-Inductance Design for Greater Attenuation
- Available with 0.250" Quick Connect Terminals or Wire Leads on the Load Side

F1500CA Simplified Schematic



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

| | | |
|-----------------------|--------|--------|
| Rated Current: | 115VAC | 250VAC |
| | 3A | 1.5A |
| | 6A | 3A |
| | 10A | 6A |
| | 15A | 8A |

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

| | |
|----------------|---------|
| Line to Ground | 1500VAC |
| Line to Line | 1768VDC |

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

- A: QC – Quick Connect
- C: IEC Receptacle
- F: IEC Receptacle with Fuse Holder

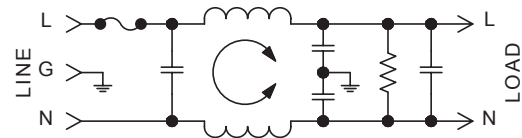
Maximum Leakage Current:

| | |
|---------------------|--------------|
| Each Line to Ground | F1500 |
| 115VAC, 60Hz: | 0.25mA |
| 250VAC, 50Hz: | 0.40mA |

Agency Approvals:



F1500FA Simplified Schematic



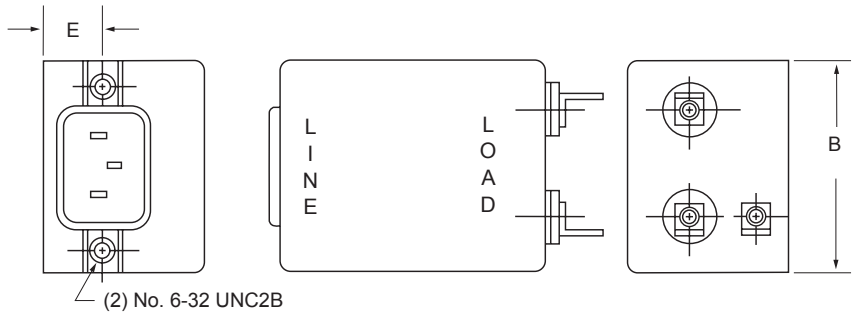
| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | |
|------------------------|------------------------|------------------------|--|-----------------|-----|-----|-----|----|----|
| | | | MODE | Frequency - MHz | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 3A | F1500CA03 F1500FA03 | IEC/QC Fused IEC/QC | Common | 32 | 43 | 50 | 50 | 50 | 50 |
| | | | Differential | 35 | 60 | 65 | 60 | 55 | 40 |
| 6A | F1500CA06 F1500FA06 | IEC/QC Fused IEC/QC | Common | 32 | 42 | 45 | 45 | 45 | 45 |
| | | | Differential | 30 | 60 | 65 | 65 | 60 | 50 |
| 10A | F1500CA10 F1500FA10 | IEC/QC Fused IEC/QC | Common | 29 | 36 | 39 | 45 | 45 | 45 |
| | | | Differential | 15 | 50 | 65 | 65 | 60 | 50 |
| 15A | F1500CA15 | IEC/QC | Common | 26 | 32 | 36 | 44 | 46 | 52 |
| | | | Differential | 35 | 60 | 65 | 65 | 65 | 65 |

NOTE: Other combinations of terminals may be specified on special order.

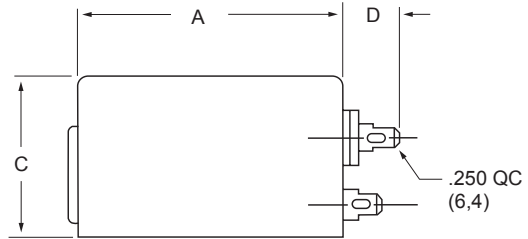
F1500CA

(3, 6, 10 and 15Amp) Dimensions

Refer to Page 40
for Standard
Mounting Cutouts



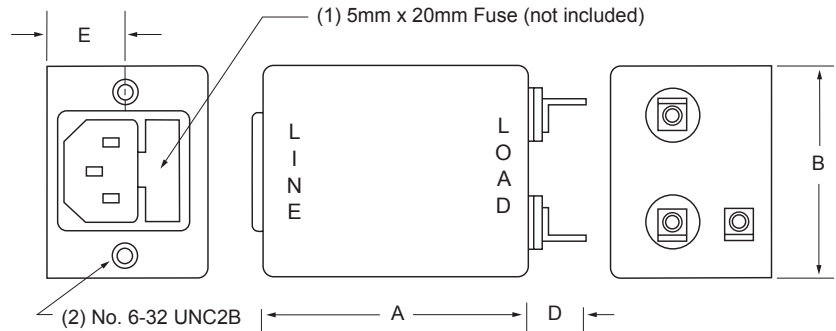
| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|----------------|----------------|
| 3A | 2.000 (50,8) | 2.000 (50,8) | 1.500 (38,1) | .550 (14,0) | .565 (14,3) |
| 6A | 2.500 (63,5) | 2.000 (50,8) | 1.500 (38,1) | .550 (14,0) | .565 (14,3) |
| 10A | 2.500 (63,5) | 2.000 (50,8) | 1.500 (38,1) | .550 (14,0) | .565 (14,3) |
| 15A | 3.25 (82,6) | 2.25 (57,2) | 1.75 (44,5) | .550 (14,0) | .705 (17,9) |



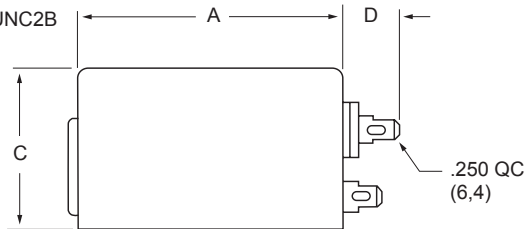
F1500FA

(3, 6 and 10Amp) Dimensions

Refer to Page 40
for Standard
Mounting Cutouts



| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|----------------|----------------|
| 3A | 2.000 (50,8) | 2.000 (50,8) | 1.500 (38,1) | .550 (14,0) | .752 (19,1) |
| 6A | 2.500 (63,5) | 2.000 (50,8) | 1.500 (38,1) | .550 (14,0) | .752 (19,1) |
| 10A | 2.500 (63,5) | 2.000 (50,8) | 1.500 (38,1) | .550 (14,0) | .752 (19,1) |



F1600 RFI Filters

High Performance

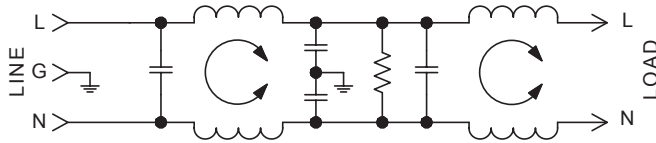
SINGLE PHASE FILTERS



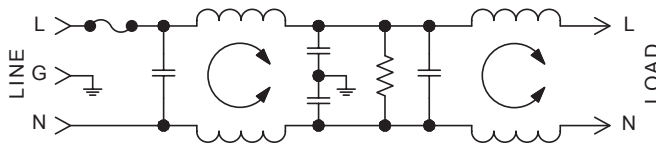
Features:

- T Section, Dual Coil Design – High Insertion Loss for Switching Power Supply Emissions
- Low-Leakage Current Design
- Space-Efficient with Integral IEC Connector and Compact Case in Current Ratings up to 10Amps
- Available in Fused IEC Connector and PC Mounted Versions

F1600CX Simplified Schematic



F1600FA Simplified Schematic



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

| | | |
|-----------------------|--------|--------|
| Rated Current: | 115VAC | 250VAC |
| | 3A | 1.5A |
| | 6A | 3A |
| | 10A | 6A |

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

| | |
|----------------|---------|
| Line to Ground | 1500VAC |
| Line to Line | 1768VDC |

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

- A: QC – Quick Connect
- B: Wire
- C: IEC Receptacle
- F: Fused IEC
- P: PCB Pins

Maximum Leakage Current:

| | |
|---------------------|--------------|
| Each Line to Ground | F1600 |
| 115VAC, 60Hz: | 0.25mA |
| 250VAC, 50Hz: | 0.40mA |

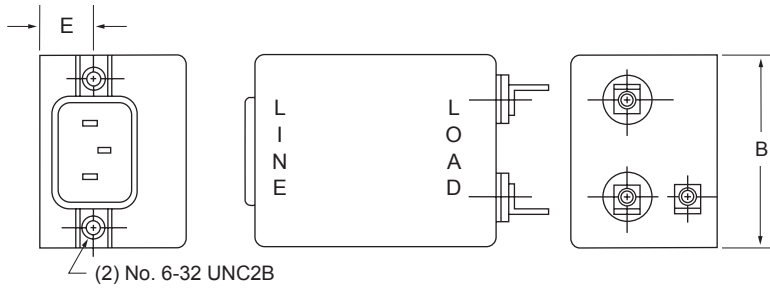
Agency Approvals:



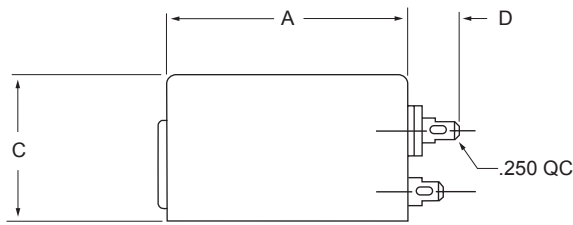
| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | |
|------------------------|--|--|--|-----------------|-----|-----|-----|----|----|
| | | | MODE | Frequency - MHz | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 3A | F1600CA03 F1600CP03 F1600FA03 F1600CB03 | IEC/QC IEC/PC Fused IEC/QC IEC/Wire | Common | 52 | 65 | 65 | 65 | 65 | 65 |
| | | | Differential | 40 | 50 | 60 | 65 | 65 | 50 |
| 6A | F1600CA06 F1600CP06 F1600FA06 F1600CB06 | IEC/QC IEC/PC Fused IEC/QC IEC/Wire | Common | 45 | 65 | 65 | 65 | 65 | 59 |
| | | | Differential | 30 | 45 | 55 | 50 | 50 | 50 |
| 10A | F1600CA10 F1600CB10 | IEC/QC IEC/Wire | Common | 50 | 65 | 65 | 65 | 65 | 54 |
| | | | Differential | 23 | 45 | 55 | 50 | 50 | 50 |

NOTE: Other combinations of terminals may be specified on special order.

F1600CA (3, 6 and 10Amp) Dimensions **F1600CB** (3, 6 and 10Amp) Dimensions



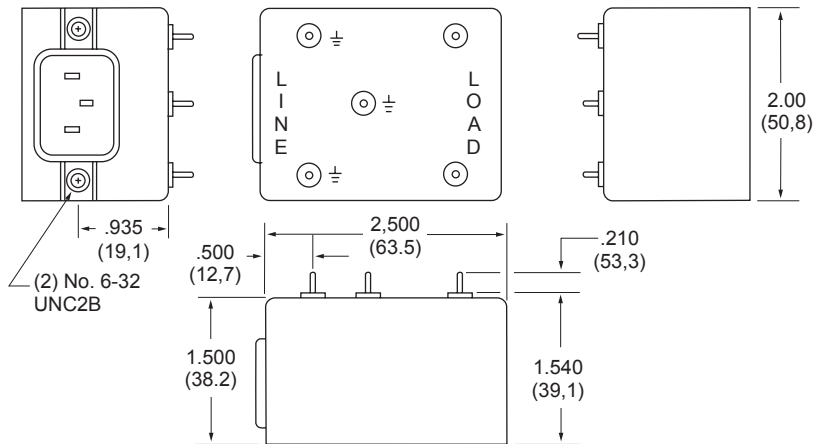
Refer to Page 40
for Standard
Mounting Cutouts



| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|----------------|----------------|
| 3A | 2.500 (63,5) | 2.000 (50,8) | 1.500 (38,2) | .550 (14,0) | .565 (14,3) |
| 6A | 2.500 (63,5) | 2.000 (50,8) | 1.500 (38,2) | .550 (14,0) | .565 (14,3) |
| 10A | 3.750 (95,2) | 2.250 (57,2) | 1.750 (44,5) | .550 (14,0) | .640 (16,3) |

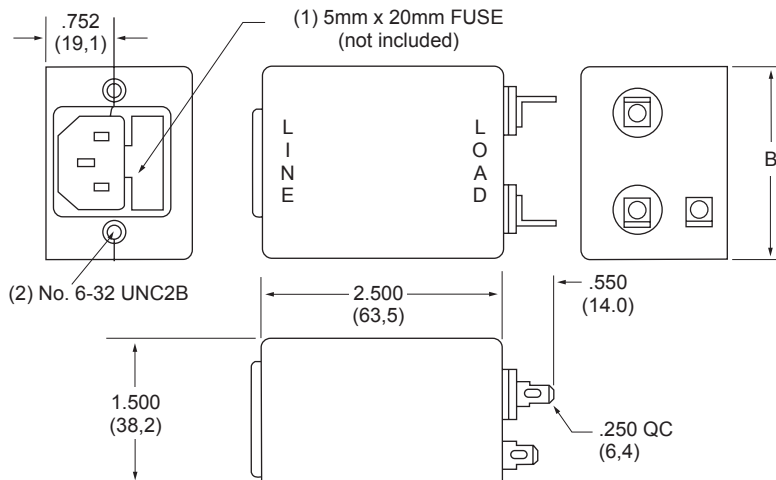
F1600CP
(3 and 6Amp)
Dimensions

Refer to Page 40
for Standard
Mounting Cutouts



F1600FA
(3 and 6Amp)
Dimensions

Refer to Page 40
for Standard
Mounting Cutouts



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

F1700/F1799 RFI Filters

High Performance

Features:

- General Purpose — Designed for Applications with Higher Differential Mode Noise
- Higher Line-to-Line Capacitance for Protection from Pulsed, Intermittent or Continuous RFI
- A Cost-Effective Replacement for Independent Coil Design in Many SMPS Applications
- Available with Integral IEC Connector



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

| | | |
|-----------------------|--------|--------|
| Rated Current: | 115VAC | 250VAC |
| | 3A | 2.5A |
| | 6A | 4A |
| | 10A | 6A |
| | 20A | 10A |
| 30A | 15A | |

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

| | |
|----------------|---------|
| Line to Ground | 1500VAC |
| Line to Line | 1768VDC |

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

| | |
|-----------------------|-------------------|
| A: QC – Quick Connect | C: IEC Receptacle |
| B: Wire | D: Screw |

Maximum Leakage Current:

| | | | | | |
|---------------------|--------|-------|--------|--------|--------|
| Each Line to Ground | F1700 | F1710 | F1720 | F1740 | F1799 |
| 115VAC, 60Hz: | 0.40mA | .15mA | .002mA | .060mA | 0.25mA |
| 250VAC, 50Hz: | 0.75mA | .25mA | .005mA | .120mA | 0.45mA |

Agency Approvals:

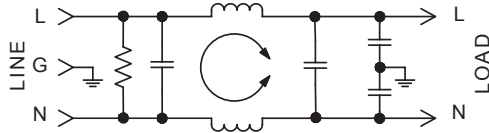


E78454

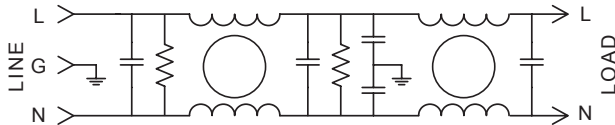
064179

72031235
Except F1700DD30

F1700 Simplified Schematic



F1799 Simplified Schematic

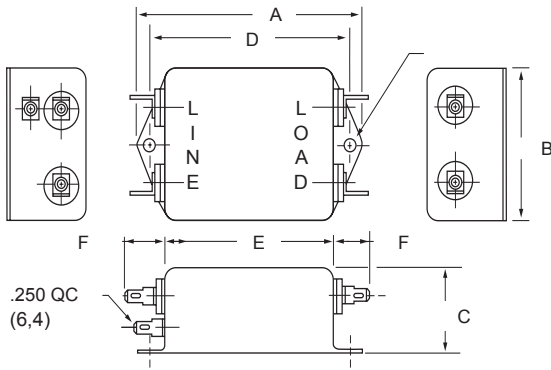


SINGLE PHASE FILTERS

| Nominal Current Rating | Part Number | Termination Line/Load | MODE | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | |
|------------------------|-------------|-----------------------|--------------|--|-----|-----|-----|----|----|
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 3A | F1700AA03 | QC/QC | Common | 20 | 35 | 43 | 52 | 55 | 50 |
| | F1700BB03 | Wire/Wire | Differential | 25 | 60 | 65 | 65 | 50 | 50 |
| | F1700CA03 | IEC/QC | | | | | | | |
| | F1710AA03 | QC/QC | Common | 20 | 34 | 40 | 45 | 45 | 40 |
| 6A | F1720AA03 | QC/QC | Differential | 35 | 60 | 65 | 60 | 55 | 40 |
| | F1740AA03 | QC/QC | Common | 20 | 30 | 35 | 35 | 35 | 40 |
| | F1700AA06 | QC/QC | Differential | 35 | 60 | 65 | 60 | 55 | 40 |
| | F1700BB06 | Wire/Wire | Common | 10 | 22 | 30 | 46 | 50 | 45 |
| 10A | F1700CA06 | IEC/QC | Differential | 15 | 50 | 65 | 60 | 60 | 60 |
| | F1700AA10 | QC/QC | Common | 10 | 22 | 30 | 46 | 50 | 45 |
| | F1700BB10 | Wire/Wire | Differential | 20 | 45 | 60 | 65 | 60 | 55 |
| 20A | F1700CA10 | IEC/QC | | | | | | | |
| | F1700AA20 | QC/QC | Common | 10 | 22 | 30 | 42 | 47 | 40 |
| 30A | F1700DD20 | Screw/Screw | Differential | 15 | 45 | 60 | 65 | 60 | 55 |
| | F1720DD20 | Screw/Screw | Common | 10 | 22 | 30 | 42 | 47 | 52 |
| 30A | F1700DD30 | Screw/Screw | Differential | 7 | 15 | 20 | 34 | 42 | 40 |
| | F1799DD30 | Screw/Screw | Common | 15 | 45 | 65 | 65 | 60 | 55 |
| | | | Differential | 10 | 45 | 55 | 60 | 60 | 50 |
| | | | | 15 | 65 | 65 | 65 | 60 | 55 |

NOTE: Other combinations of terminals may be specified on special order.

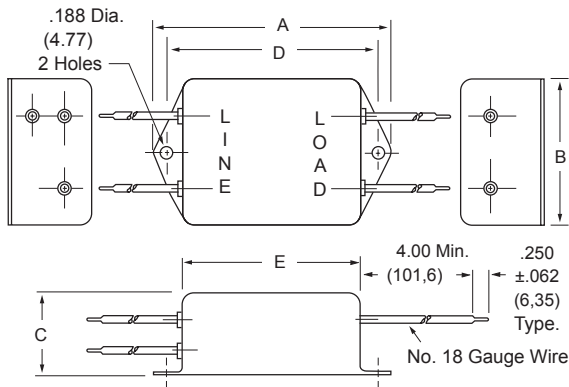
F1700AA, 1710, 1720, 1740 (3, 6 and 10Amp) Dimensions



| Amps | A | B | C | D | E | F |
|------|----------------------------------|-----------------|-----------------|-----------------|-----------------|----------------|
| 3A | 2.750 (69,8) | 1.750 (44,4) | 1.125 (28,5) | 2.375 (60,3) | 2.000 (50,8) | .550 (14,0) |
| 6A | 3.312 (84,1) | 2.000 (50,8) | 1.125 (28,5) | 2.940 (74,7) | 2.500 (63,5) | .550 (14,0) |
| 10A | 3.312 (84,1) | 2.000 (50,8) | 1.500 (38,2) | 2.940 (74,7) | 2.500 (63,5) | .550 (14,0) |
| 20A | See 1700DD20 for Case Dimensions | | | | | |

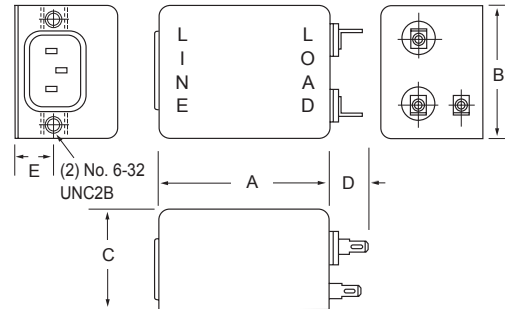
F1700BB (3, 6 and 10Amp) Dimensions

| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 3A | 2.750 (69,8) | 1.750 (44,4) | 1.125 (28,5) | 2.375 (60,3) | 2.000 (50,8) |
| 6A | 3.312 (84,1) | 2.000 (50,8) | 1.125 (28,5) | 2.940 (74,7) | 2.500 (63,5) |
| 10A | 3.312 (84,1) | 2.000 (50,8) | 1.500 (38,1) | 2.940 (74,7) | 2.500 (63,5) |



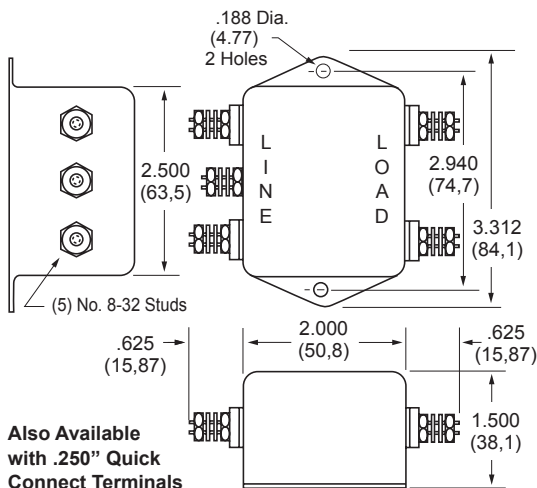
F1700CA (3, 6 and 10Amp) Dimensions

Refer to Page 40 for Standard Mounting Cutouts



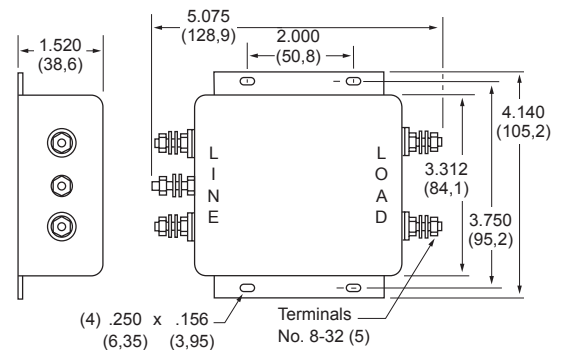
| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|----------------|----------------|
| 3A | 2.000 (50,8) | 2.000 (50,8) | 1.500 (38,1) | .550 (14,0) | .565 (14,3) |
| 6A | 2.500 (63,5) | 2.000 (50,8) | 1.500 (38,1) | .550 (14,0) | .565 (14,3) |
| 10A | 2.500 (63,5) | 2.000 (50,8) | 1.500 (38,1) | .550 (14,0) | .565 (14,3) |

F1700DD20 (20Amp) Dimensions

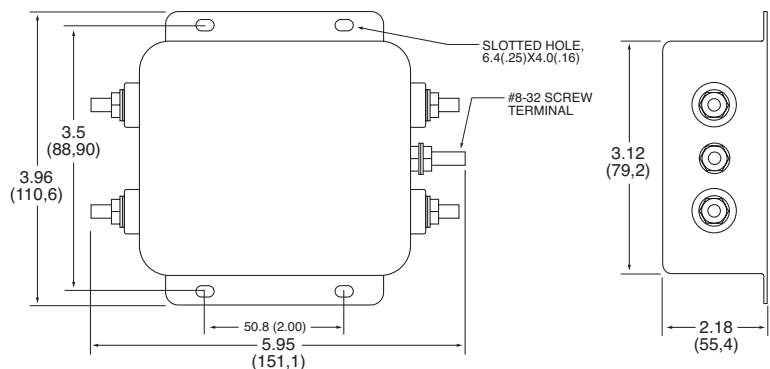


Also Available with .250" Quick Connect Terminals

F1700DD30 (30Amp) Dimensions



F1799DD (30Amp) Dimensions



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

F1760/F1770/F1780 RFI Filters

High Performance

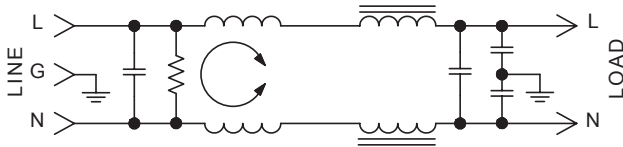
SINGLE PHASE FILTERS



Features:

- Designed for Applications Where Switching Power Supplies, SCR's and TTL Circuits Are Utilized
- Protection from Pulsed, Intermittent or Continuous RFI
- Effective CM and DM Suppression for Most FCC VDE Requirements Down to 150KHz
- Available in Stud and Quick Connect Terminal Versions

F1760 Simplified Schematic



Specifications:

Rated Voltage: 250VAC, Maximum - 50/60 Hz

Rated Current: 115VAC 250VAC
20A 14A

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

Line to Ground 1500VAC
Line to Line 1768VDC

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

A: QC – Quick Connect
D: Screw

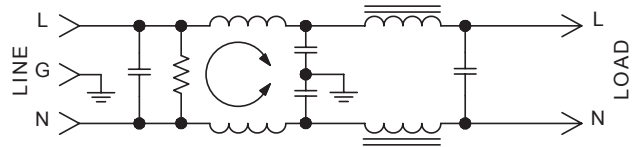
Maximum Leakage Current:

Each Line to Ground **F1760/1770/1780**
115VAC, 60Hz: 0.5mA
250VAC, 50Hz: 1.0mA

Agency Approvals:

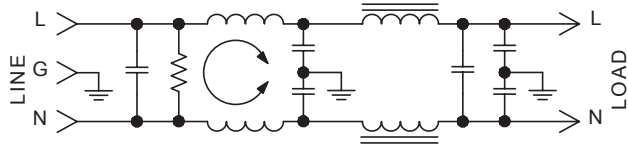


F1770 Simplified Schematic



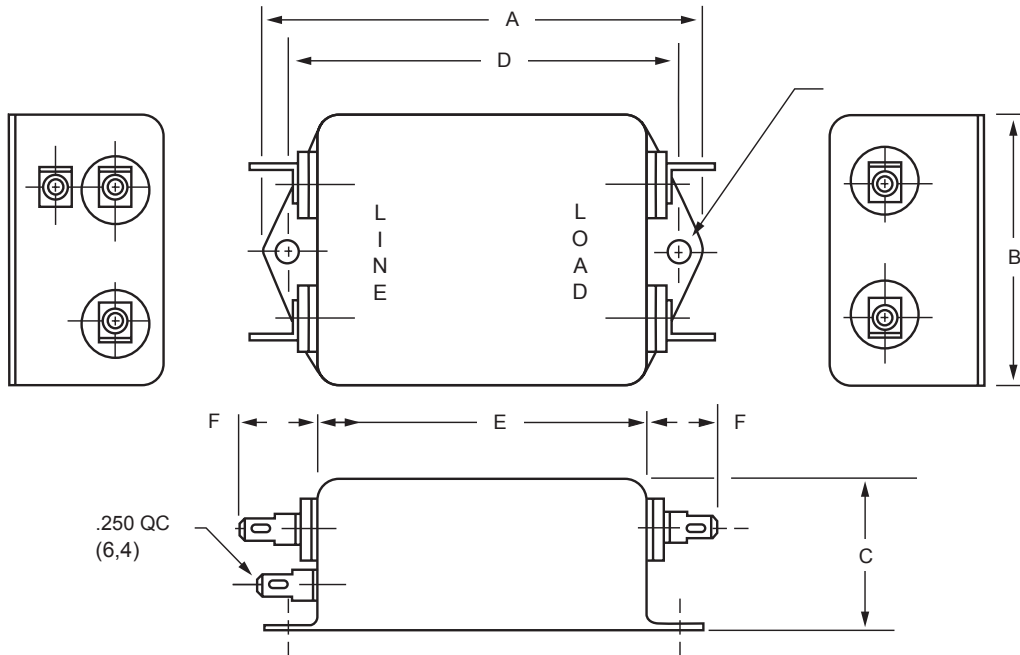
| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | | | |
|------------------------|-------------|-----------------------|--|-----------------|-----|-----|-----|----|----|----|--|
| | | | MODE | Frequency - MHz | | | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 20 | 30 | |
| 3A | F1760AA03 | QC/QC | Common Differential | 15 | 30 | 40 | 45 | 50 | 45 | 45 | |
| | F1760DD03 | Screw/Screw | | 40 | 65 | 65 | 60 | 55 | 55 | 55 | |
| 3A | F1780AA03 | QC/QC | Common Differential | 13 | 25 | 40 | 60 | 60 | 55 | 50 | |
| | F1780DD03 | Screw/Screw | | 40 | 65 | 65 | 62 | 55 | 45 | 45 | |
| 6A | F1760AA06 | QC/QC | Common Differential | 15 | 30 | 35 | 35 | 44 | 43 | 42 | |
| | F1760DD06 | Screw/Screw | | 40 | 65 | 65 | 65 | 53 | 52 | 50 | |
| 6A | F1780AA06 | QC/QC | Common Differential | 13 | 30 | 40 | 65 | 65 | 53 | 48 | |
| | F1780DD06 | Screw/Screw | | 40 | 65 | 65 | 62 | 55 | 45 | 45 | |
| 10A | F1760AA10 | QC/QC | Common Differential | 15 | 30 | 35 | 50 | 50 | 40 | 40 | |
| | F1760DD10 | Screw/Screw | | 40 | 65 | 65 | 55 | 50 | 50 | 50 | |
| 10A | F1780AA10 | QC/QC | Common Differential | 13 | 20 | 35 | 65 | 65 | 55 | 50 | |
| | F1780DD10 | Screw/Screw | | 40 | 65 | 65 | 62 | 55 | 45 | 45 | |
| 20A | F1760AA20 | QC/QC | Common Differential | 12 | 25 | 31 | 42 | 47 | 50 | 40 | |
| | F1760DD20 | Screw/Screw | | 41 | 65 | 65 | 65 | 60 | 60 | 55 | |
| 20A | F1780AA20 | QC/QC | Common Differential | 12 | 30 | 32 | 60 | 60 | 60 | 55 | |
| | F1780DD20 | Screw/Screw | | 41 | 65 | 65 | 65 | 60 | 60 | 55 | |

F1780 Simplified Schematic

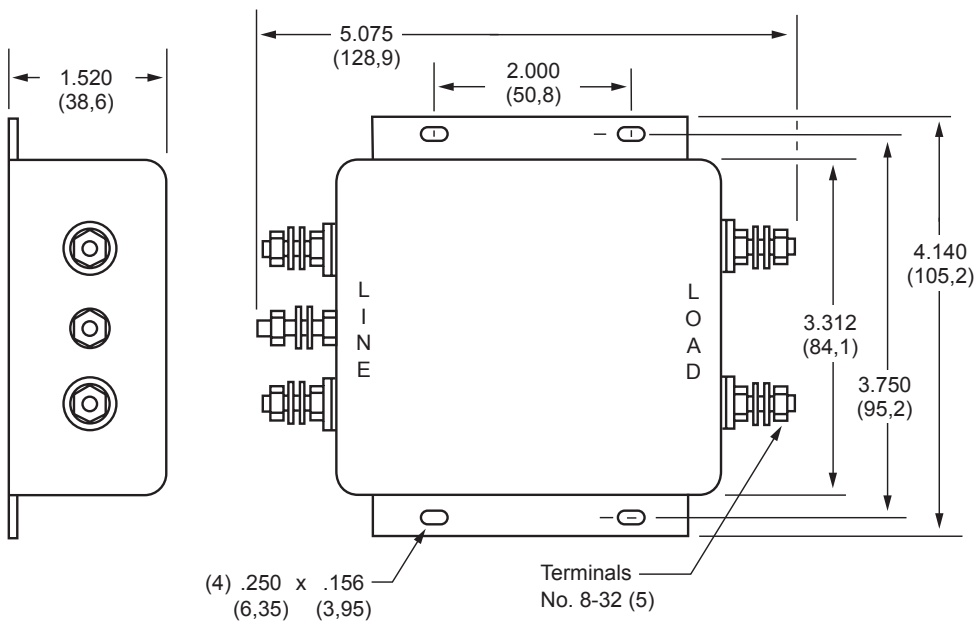


| Amps | A | B | C | D | E | F |
|------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|
| 3A | 2.750 (69,8) | 1.750 (44,4) | 1.125 (28,5) | 2.375 (60,3) | 2.000 (50,8) | .550 (14,0) |
| 6A | 3.312 (84,1) | 2.000 (50,8) | 1.500 (38,2) | 2.940 (74,7) | 2.500 (63,5) | .550 (14,0) |
| 10A | 3.312 (84,1) | 2.000 (50,8) | 1.500 (38,2) | 2.940 (74,7) | 2.500 (63,5) | .550 (14,0) |

F1760/F1770/1780AA
(3, 6, and 10Amp) Dimensions



F1760/F1770/1780 (20Amp Only) Dimensions



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

F2800 RFI Filters

High Performance

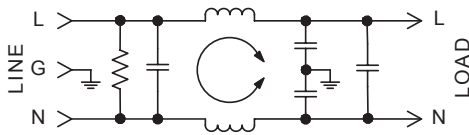
SINGLE PHASE FILTERS



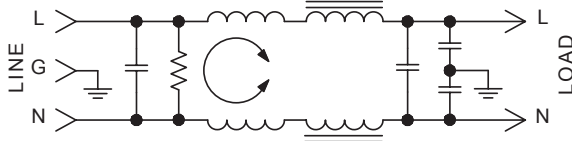
Features:

- Designed for VDE "A" and FCC "B" Switching Power Supply Applications
- Low-Leakage Current
- Compact Case Sizes in Current Ratings up to 15A
- Effective Reduction of Common Mode and Differential Mode Noise from 100KHz to 30MHz

F2800 Simplified Schematic 3 & 6Amp



F2800 Simplified Schematic 10 & 15Amp



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

| | | |
|-----------------------|--------|--------|
| Rated Current: | 115VAC | 250VAC |
| | 3A | 1.5A |
| | 6A | 4A |
| | 10A | 6A |
| | 15A | 12A |

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

| | |
|----------------|---------|
| Line to Ground | 1500VAC |
| Line to Line | 1768VDC |

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

A: QC – Quick Connect
B: Wire

Maximum Leakage Current:

| | |
|---------------------|--------------|
| Each Line to Ground | F2800 |
| 115VAC, 60Hz: | 0.25mA |
| 250VAC, 50Hz: | 0.40mA |

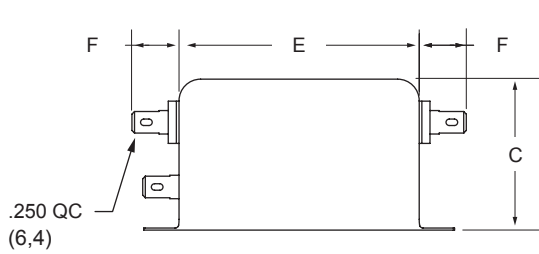
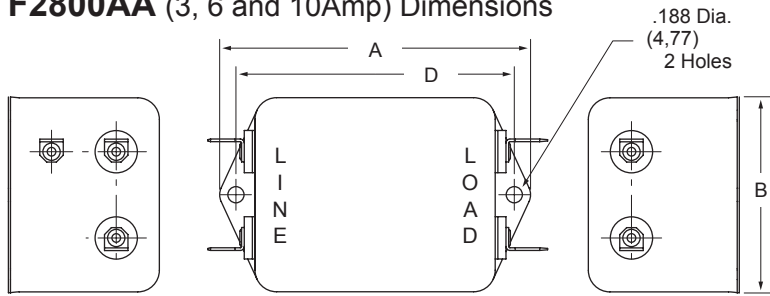
Agency Approvals:



E78454 064179 72031309

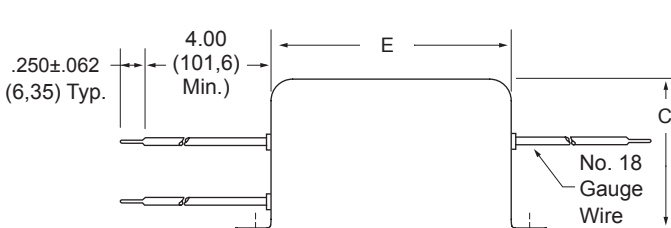
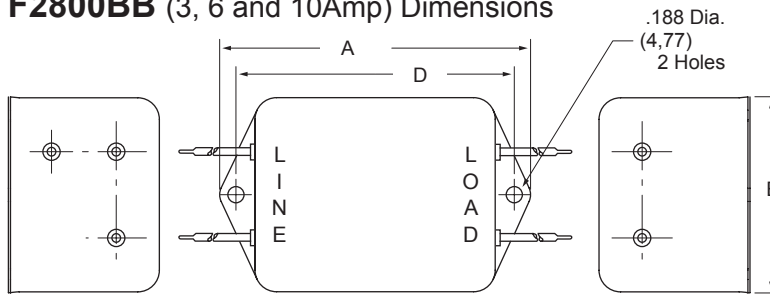
| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | | | | | |
|------------------------|------------------------|-----------------------|--|-----------------|-----|-----|-----|-----|-----|----|----|--|--|
| | | | MODE | Frequency - MHz | | | | | | | | | |
| | | | | .01 | .05 | .15 | .50 | 1.0 | 5.0 | 10 | 30 | | |
| 3A | F2800AA03 F2800BB03 | QC/QC Wire/Wire | Common | 10 | 30 | 35 | 35 | 35 | 40 | 45 | 50 | | |
| | | | Differential | 5 | 25 | 50 | 60 | 65 | 50 | 45 | 45 | | |
| 6A | F2800AA06 F2800BB06 | QC/QC Wire/Wire | Common | 5 | 20 | 30 | 35 | 40 | 40 | 40 | 50 | | |
| | | | Differential | 5 | 10 | 40 | 60 | 60 | 50 | 50 | 45 | | |
| 10A | F2800AA10 F2800BB10 | QC/QC Wire/Wire | Common | 5 | 15 | 25 | 30 | 35 | 40 | 45 | 50 | | |
| | | | Differential | 7 | 20 | 50 | 60 | 60 | 60 | 60 | 55 | | |
| 15A | F2800AA15 F2800BB15 | QC/QC Wire/Wire | Common | 8 | 21 | 29 | 33 | 36 | 38 | 45 | 50 | | |
| | | | Differential | 10 | 30 | 70 | 70 | 70 | 70 | 70 | 60 | | |

F2800AA (3, 6 and 10Amp) Dimensions



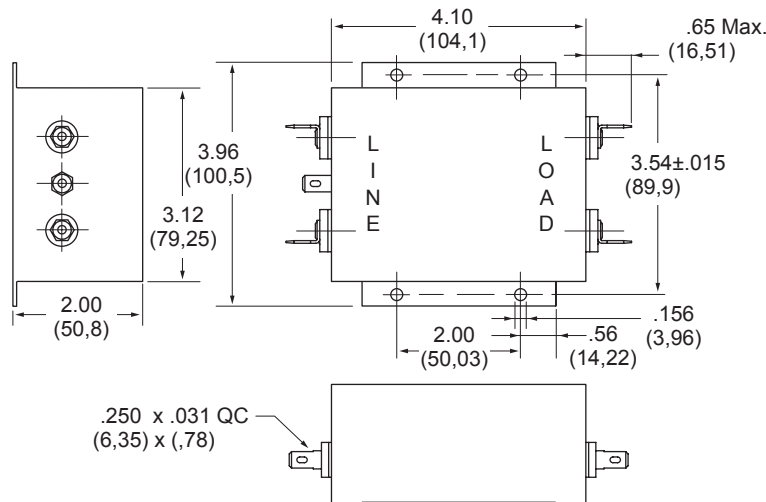
| Amps | A | B | C | D | E | F |
|------|-----------------|-----------------|-----------------|------------------|-----------------|----------------|
| 3A | 3.310 (84,1) | 2.000 (50,8) | 1.500 (38,2) | 2.940 (74,7) | 2.500 (63,5) | .550 (14,0) |
| 6A | 3.310 (84,1) | 2.000 (50,8) | 1.500 (38,2) | 2.940 (74,7) | 2.500 (63,5) | .550 (14,0) |
| 10A | 4.44 (113) | 2.250 (57,1) | 1.750 (44,4) | 4.063 (103,2) | 3.630 (92,2) | .650 (16,5) |

F2800BB (3, 6 and 10Amp) Dimensions



| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|------------------|-----------------|
| 3A | 3.310 (84,1) | 2.000 (50,8) | 1.500 (38,1) | 2.940 (74,7) | 2.500 (63,5) |
| 6A | 3.310 (84,1) | 2.000 (50,8) | 1.500 (38,1) | 2.940 (74,7) | 2.500 (63,5) |
| 10A | 4.690 (119) | 2.250 (57,1) | 1.750 (44,4) | 4.063 (103,2) | 3.630 (92,2) |

**F2800AA
F2800BB
(15Amp)
Dimensions**

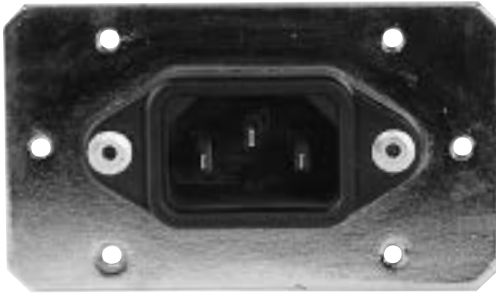


Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses are metric equivalents.

F5100 RFI Filters

Wide Band

SINGLE PHASE FILTERS



Ideal for Linear Power Supplies in Digital Equipment

Features:

- General Purpose Filter with Extended High-Frequency Insertion Loss Characteristics
- Effective Suppression of Incoming Common Mode and Differential Mode Noise
- Low-Profile Package with Integral IEC Connector
- Available in 3, 6 and 10Amp Ratings

| Nominal Current Rating | Part Number | Termination Line/Load |
|------------------------|-------------|-----------------------|
| 3A | F5100CG03 | IEC/ Solder Tab |
| 6A | F5100CG06 | IEC/ Solder Tab |
| 10A | F5100CG10 | IEC/ Solder Tab |

Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current:

| | |
|--------|--------|
| 115VAC | 250VAC |
| 3A | 1.5A |
| 6A | 4A |
| 10A | 6A |

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

| | |
|----------------|---------|
| Line to Ground | 1400VDC |
| Line to Line | 1450VDC |

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

- C: IEC Receptacle
- G: Wire Wrap/Solder

Maximum Leakage Current:

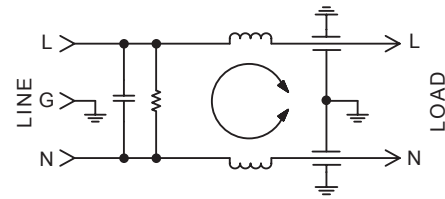
| | |
|---------------------|--------------|
| Each Line to Ground | F5100 |
| 115VAC, 60Hz: | 0.25mA |
| 250VAC, 60Hz: | 0.50mA |

Agency Approvals:

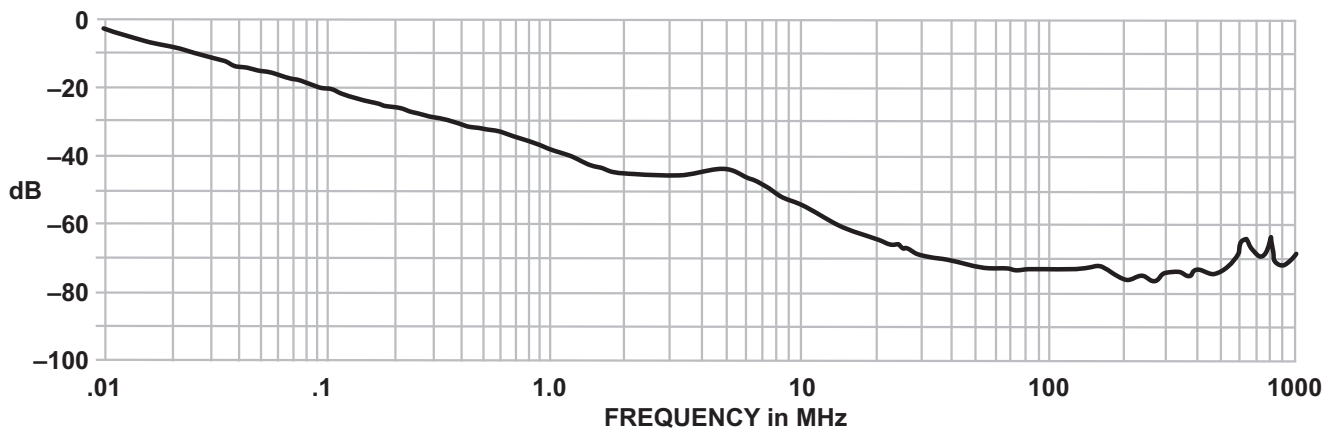


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F5100 Simplified Schematic

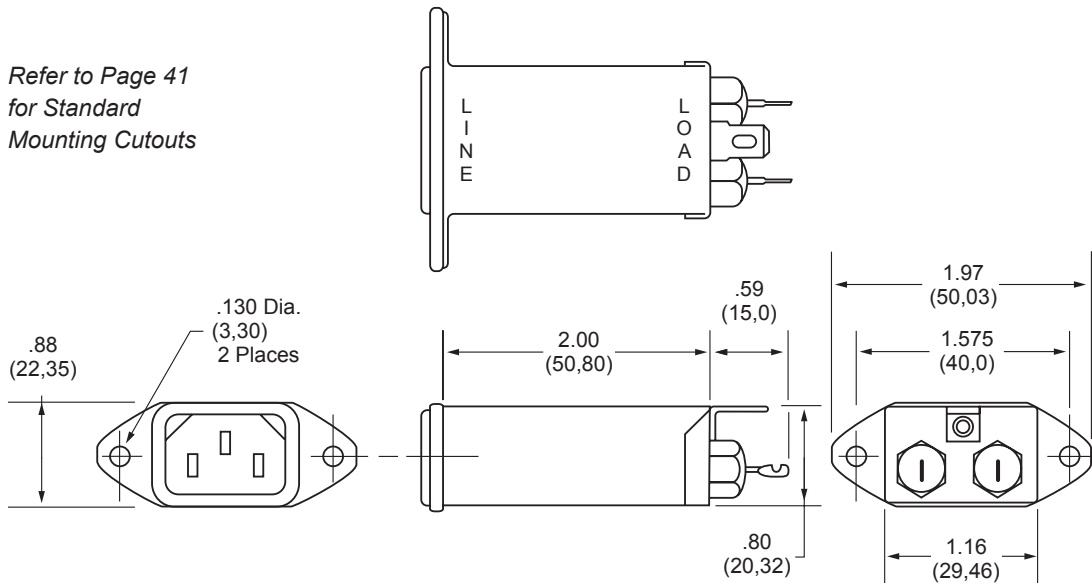


F5100 SERIES
TYPICAL COMMON MODE
INSERTION LOSS — dB
(50 OHM CIRCUIT)

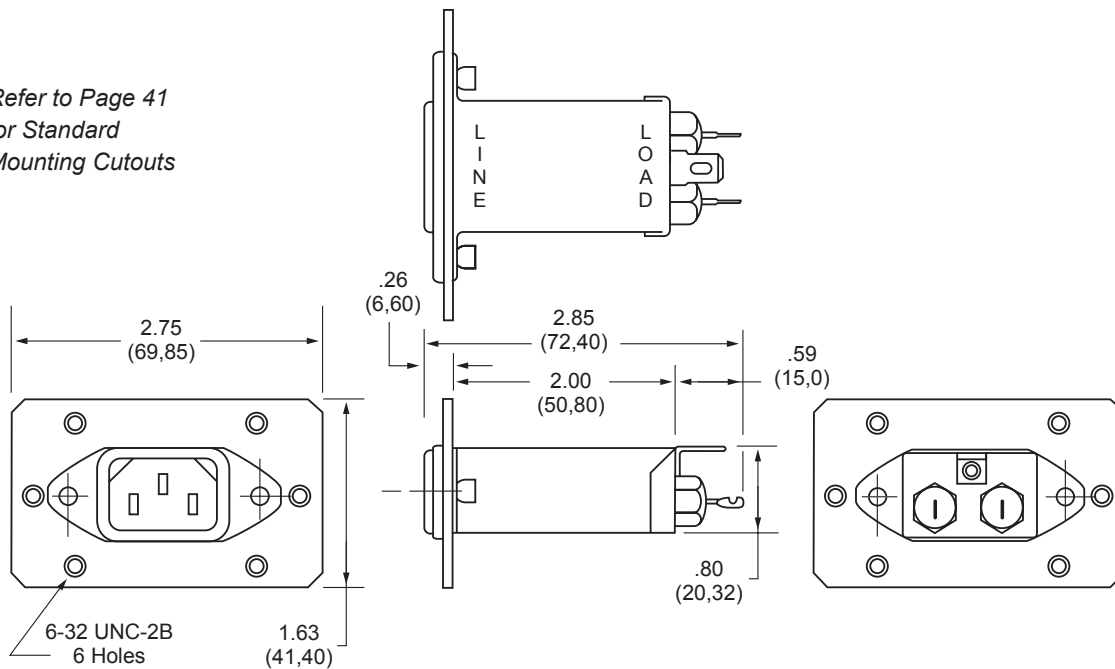


F5100CG (3, 6 and 10Amp) Dimensions

Refer to Page 41
for Standard
Mounting Cutouts

**F5101CG** (3, 6 and 10Amp) Dimensions with attached mounting plate

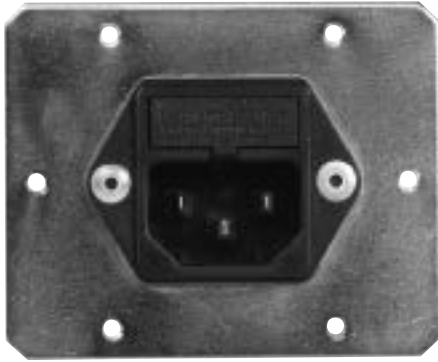
Refer to Page 41
for Standard
Mounting Cutouts



F5200 RFI Filters

Wide Band

SINGLE PHASE FILTERS



Ideal for Linear Power Supplies in Digital Equipment

Features:

- General Purpose Filter with Extended High-Frequency Insertion Loss Characteristics
- Effective Suppression of Incoming Common Mode and Differential Mode Noise
- Low-Profile Package with Integral IEC Connector
- Available in 3 and 6Amp Ratings

| Nominal Current Rating | Part Number | Termination Line/Load |
|------------------------|-------------|--------------------------|
| 3A | F5200FG03 | Fused IEC/ Solder Tab |
| 6A | F5200FG06 | Fused IEC/ Solder Tab |

Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current: 115VAC 250VAC
 3A 1.5A
 6A 4A

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

Line to Ground 1400VDC
Line to Line 1450VDC

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

F: Fused IEC Receptacle
G: Wire Wrap/Solder

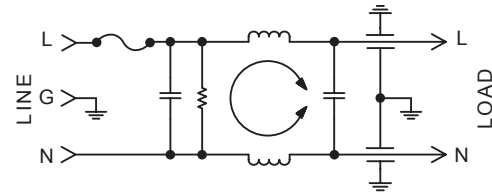
Maximum Leakage Current:

Each Line to Ground **F5200**
115VAC, 60Hz: 0.25mA
250VAC, 60Hz: 0.50mA

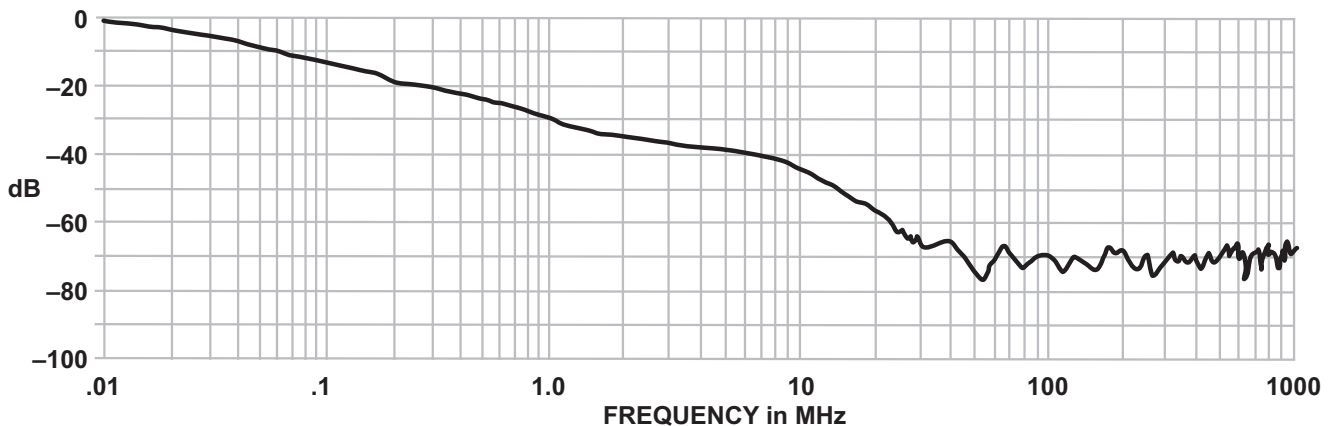
Agency Approvals:



F5200 Simplified Schematic

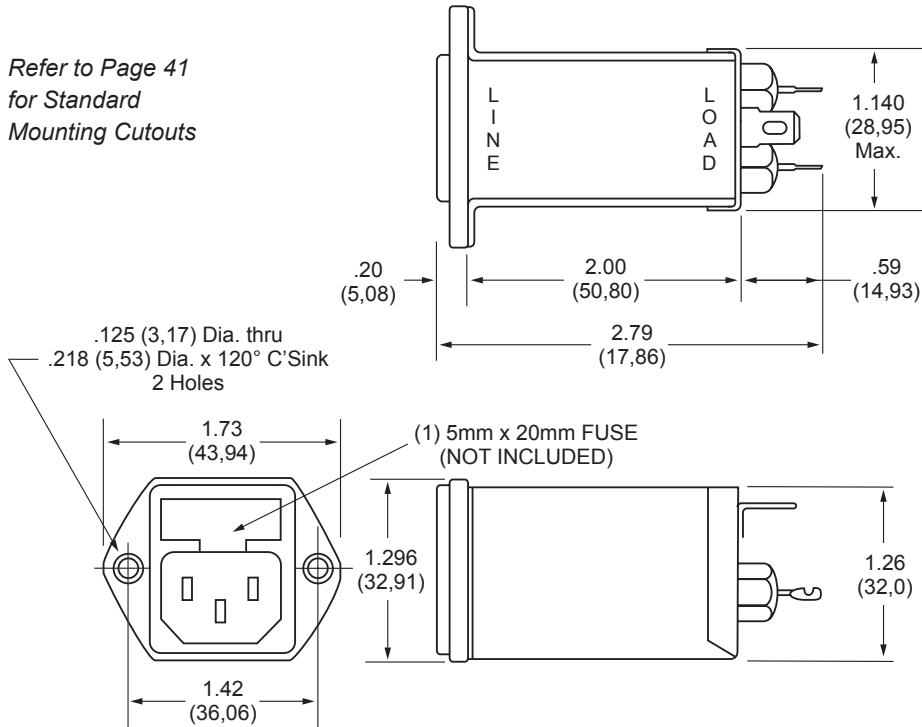


F5200 SERIES
TYPICAL COMMON MODE
INSERTION LOSS — dB
(50 OHM CIRCUIT)



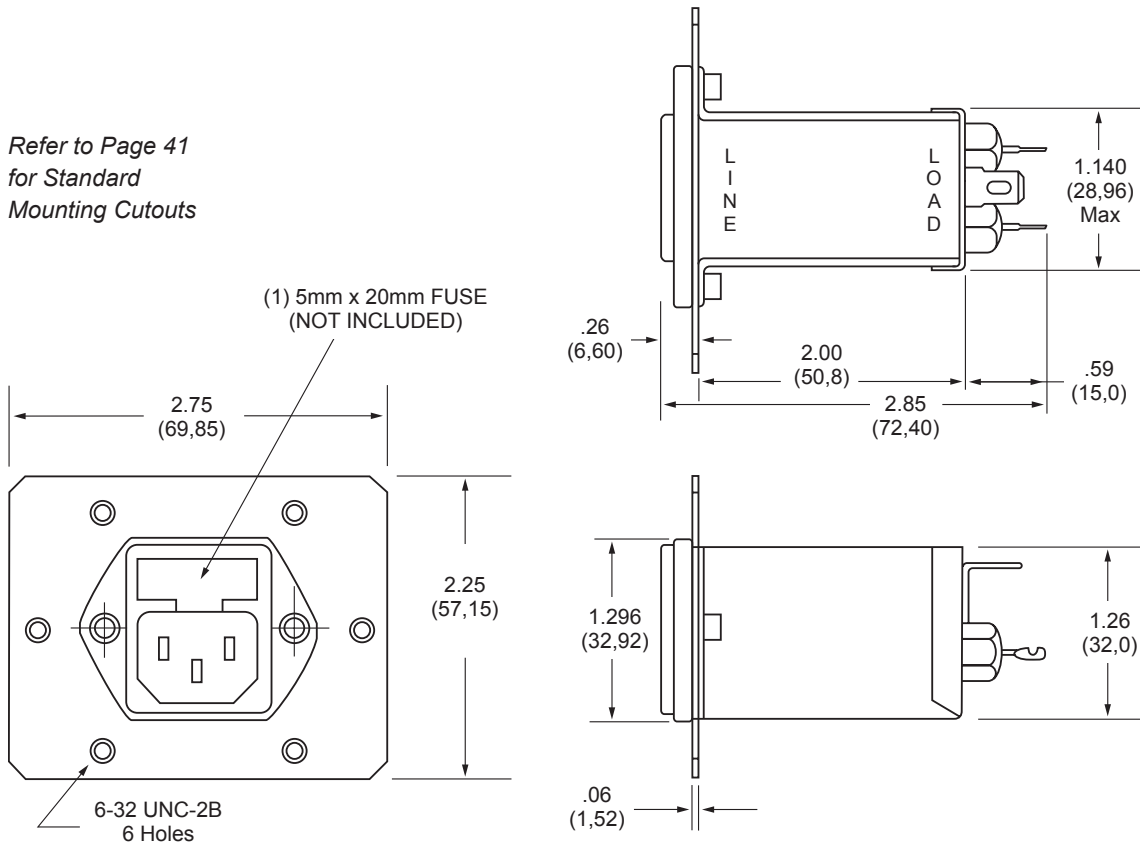
F5200FG (3 and 6Amp) Dimensions

Refer to Page 41
for Standard
Mounting Cutouts



F5201FG (3 and 6Amp) Dimensions with attached mounting plate

Refer to Page 41
for Standard
Mounting Cutouts



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

F5500 RFI Filters

Wide Band

SINGLE PHASE FILTERS

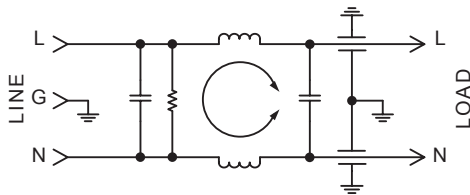


Ideal for Linear and Switching Power Supplies

Features:

- FCC and VDE Level "A" Applications
- High Inductance Single Coil Design Provides High Common Mode and Differential Mode Performance Above 150KHz
- High-Frequency Construction Techniques Maintain >50dB Insertion Loss from 10MHz to 1GHz
- Compact, Space-Saving Package Available in 3, 6 and 10-Amp Ratings

F5500 Simplified Schematic



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current:

| | |
|--------|--------|
| 115VAC | 250VAC |
| 3A | 3A |
| 6A | 4A |
| 10A | 6A |

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

| | |
|----------------|---------|
| Line to Ground | 1400VDC |
| Line to Line | 1450VDC |

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

C: IEC Receptacle
G: Wire Wrap/Solder

Maximum Leakage Current:

| | |
|---------------------|--------------|
| Each Line to Ground | F5500 |
| 115VAC, 60Hz: | 0.25mA |
| 250VAC, 60Hz: | 0.50mA |

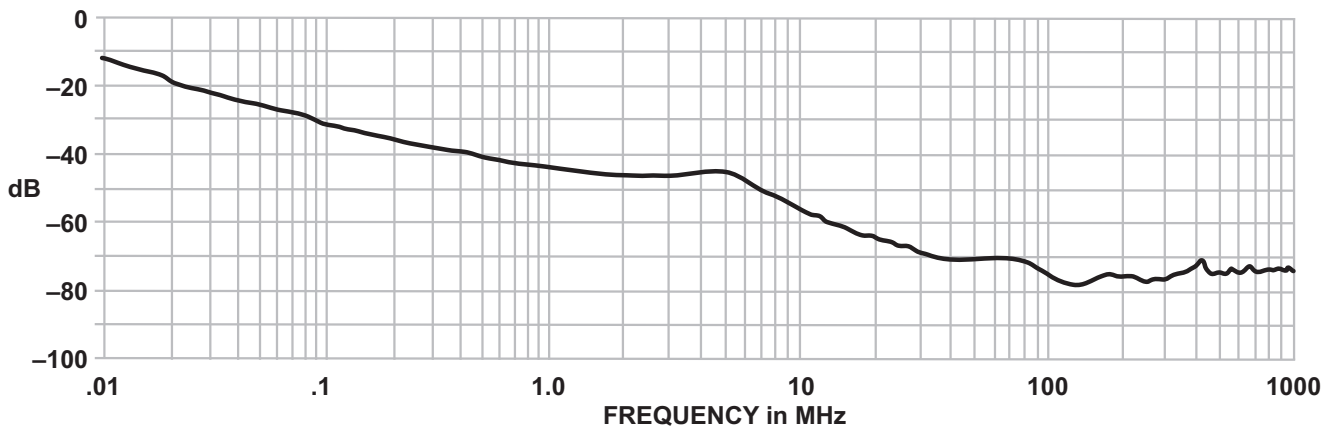
Agency Approvals:

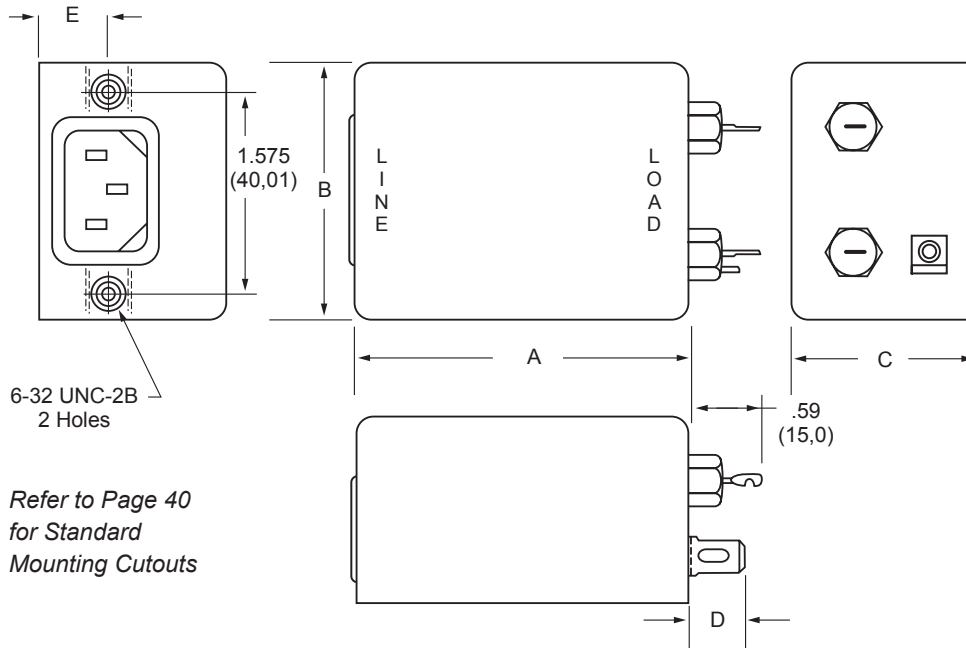


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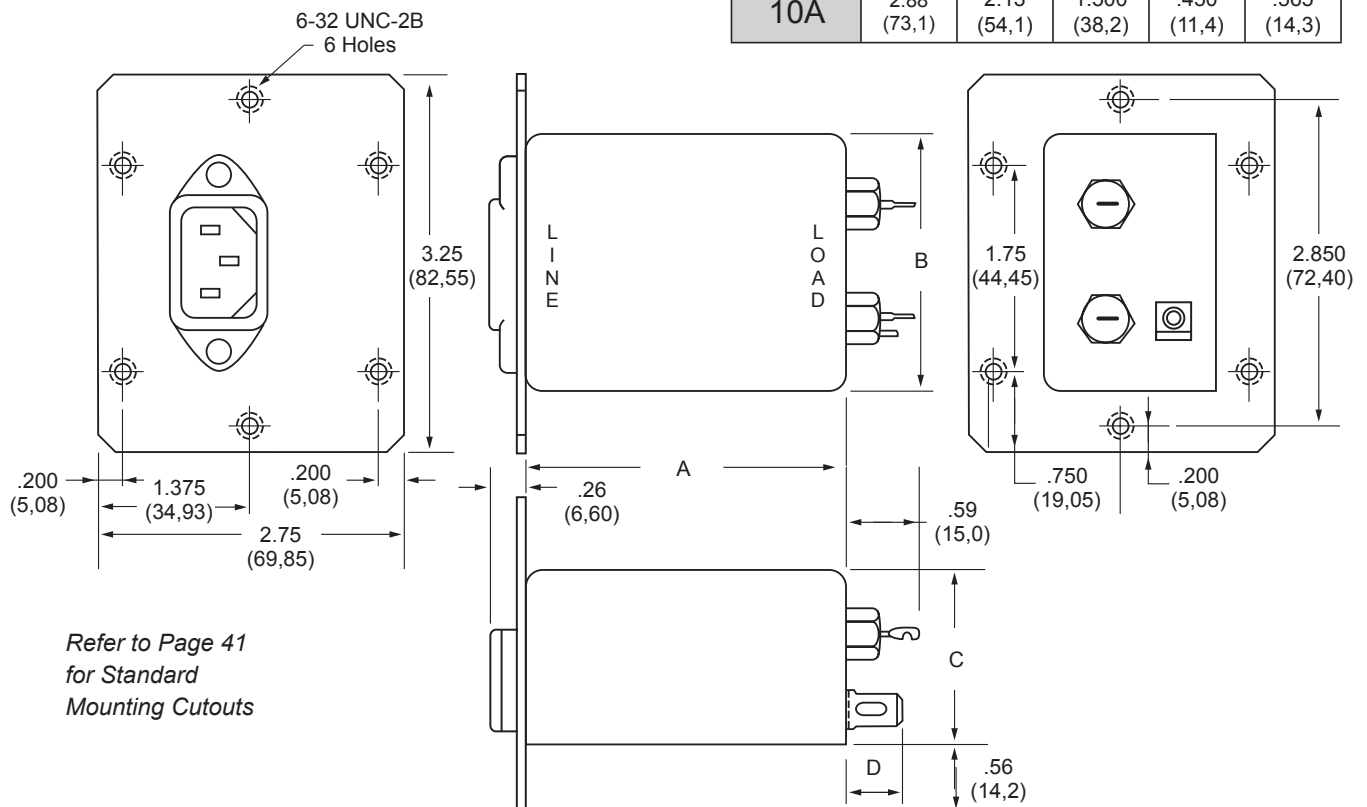
| Nominal Current Rating | Part Number | Termination Line/Load |
|------------------------|-------------|-----------------------|
| 3A | F5500CG03 | IEC/ Solder Tab |
| 6A | F5500CG06 | IEC/ Solder Tab |
| 10A | F5500CG10 | IEC/ Solder Tab |

**F5500 SERIES
TYPICAL COMMON MODE
INSERTION LOSS — dB
(50 OHM CIRCUIT)**



F5500CG (3, 6 and 10Amp) Dimensions**F5501CG** (3, 6 and 10Amp) Dimensions
with attached mounting plate

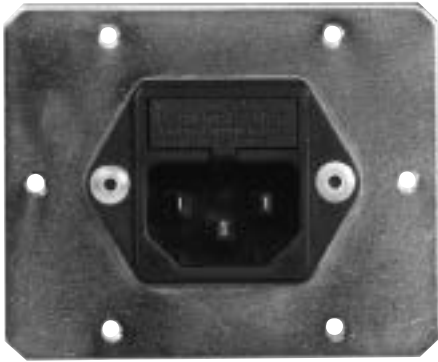
| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|----------------|----------------|
| 3A | 2.000 (50,8) | 2.000 (50,8) | 1.500 (38,2) | .450 (11,4) | .565 (14,3) |
| 6A | 2.88 (73,1) | 2.13 (54,1) | 1.500 (38,2) | .450 (11,4) | .565 (14,3) |
| 10A | 2.88 (73,1) | 2.13 (54,1) | 1.500 (38,2) | .450 (11,4) | .565 (14,3) |



F5600 RFI Filters

Wide Band

SINGLE PHASE FILTERS



Features:

- Suited for FCC "B" and VDE "A" Switching Power Supply Applications
- High Inductance, Multi-Stage Design with High Common Mode and Differential Mode Insertion Loss for Switching Power Supply Emissions
- >70dB Insertion Loss from 200KHz to 1GHz
- Compact, Space-Efficient Package Available in 3 and 6Amp Ratings

Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current:

| | |
|--------|--------|
| 115VAC | 250VAC |
| 3A | 1.5A |
| 6A | 4A |

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

| | |
|----------------|---------|
| Line to Ground | 1400VDC |
| Line to Line | 1450VDC |

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max at rated current

Humidity Range: 0% to 95% R.H.

Termination:

- C: IEC Receptacle
- F: Fused IEC Receptacle
- G: Wire Wrap/Solder

Termination: Quick Connect

Maximum Leakage Current:

| | |
|---------------------|--------------|
| Each Line to Ground | F5600 |
| 115VAC, 60Hz: | 0.50mA |
| 250VAC, 60Hz: | 1.20mA |

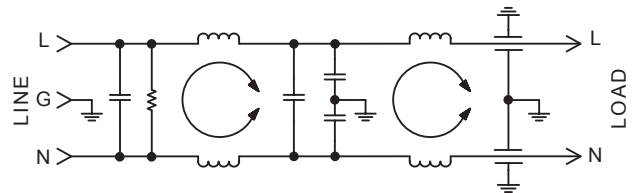
Agency Approvals:



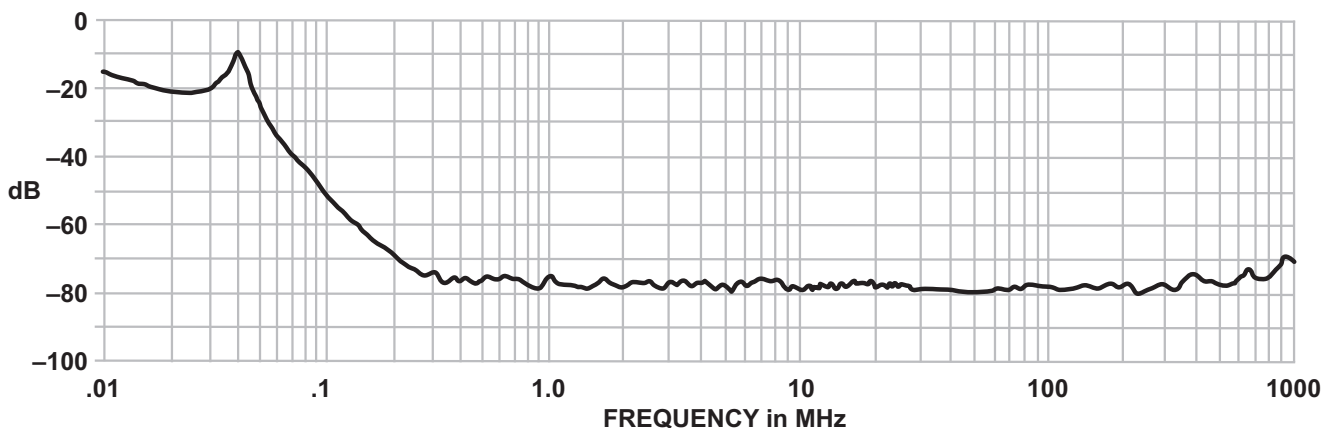
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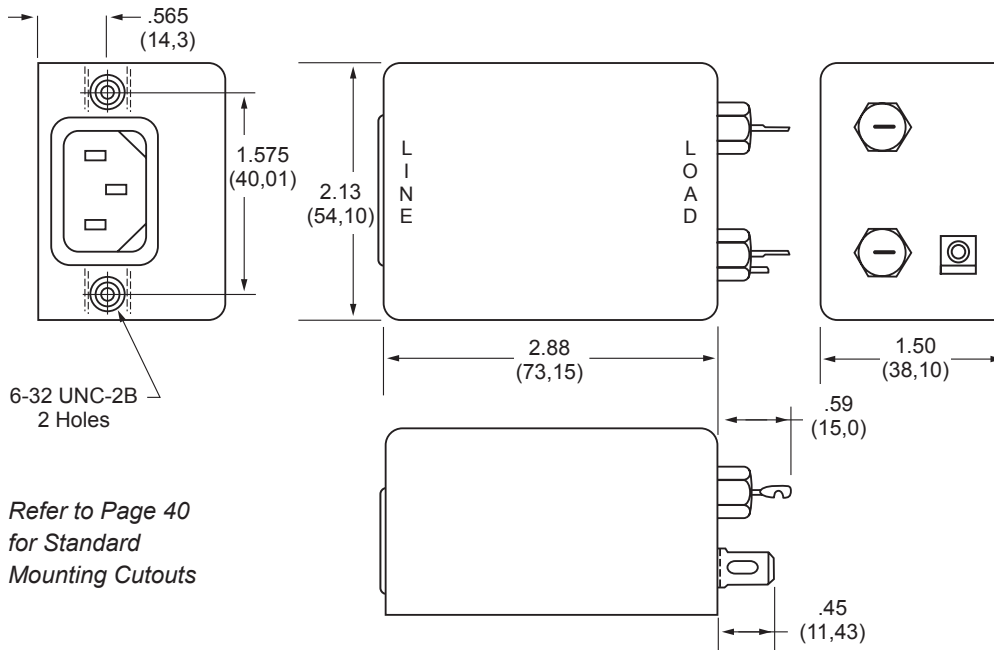
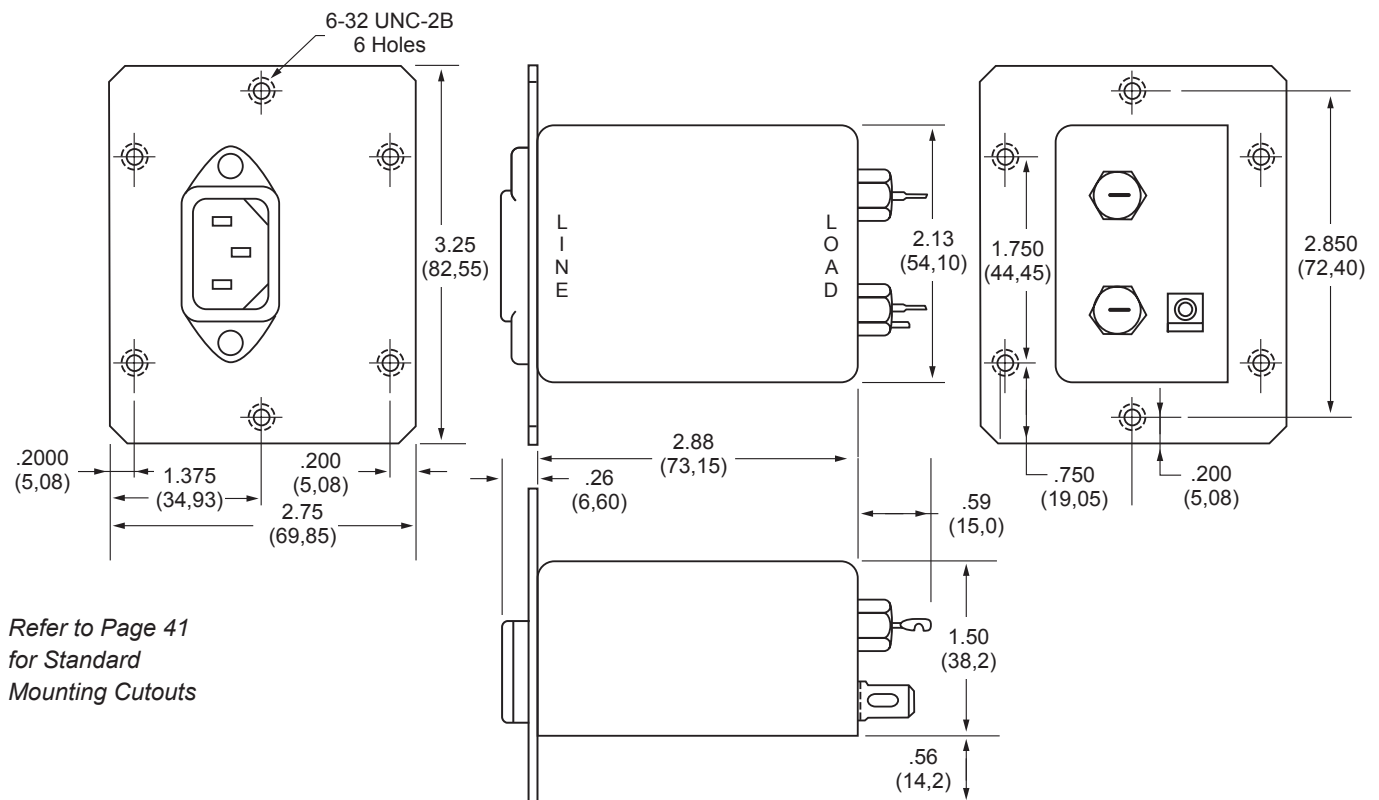
| Nominal Current Rating | Part Number | Termination Line/Load |
|------------------------|-------------|-----------------------|
| 3A | F5600CG03 | IEC/Solder Tab |
| | F5600FG03 | Fused IEC/Solder Tab |
| 6A | F5600CG06 | IEC/Solder Tab |
| | F5600FG06 | Fused IEC/Solder Tab |

F5600 Simplified Schematic



**F5600 SERIES
TYPICAL COMMON MODE
INSERTION LOSS — dB
(50 OHM CIRCUIT)**



F5600CG (3 and 6Amp) Dimensions**F5601CG (3 and 6Amp) Dimensions with attached mounting plate**

F5700 RFI Filters

Wide Band

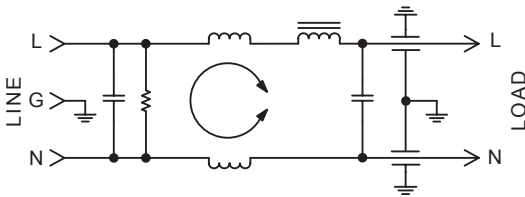
SINGLE PHASE FILTERS



Features:

- Ideal for VDE "B" and MIL-STD-461 Switching Power Supply Applications
- Very High Inductance Design with Differential Mode Choke to Provide Improved Performance Below 100KHz
- Wide-Band Insertion Loss >60dB from 10MHz to 1GHz
- Compact, Space-Efficient Package Available in 3 and 6Amp Ratings

F5700 Simplified Schematic



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current: 115VAC 250VAC
3A 2A
6A 4A

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

Line to Ground 1400VDC
Line to Line 1450VDC

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

C: IEC Receptacle
G: Wire Wrap/Solder

Maximum Leakage Current:

Each Line to Ground **F5700**
115VAC, 60Hz: 0.50mA
250VAC, 60Hz: 1.20mA

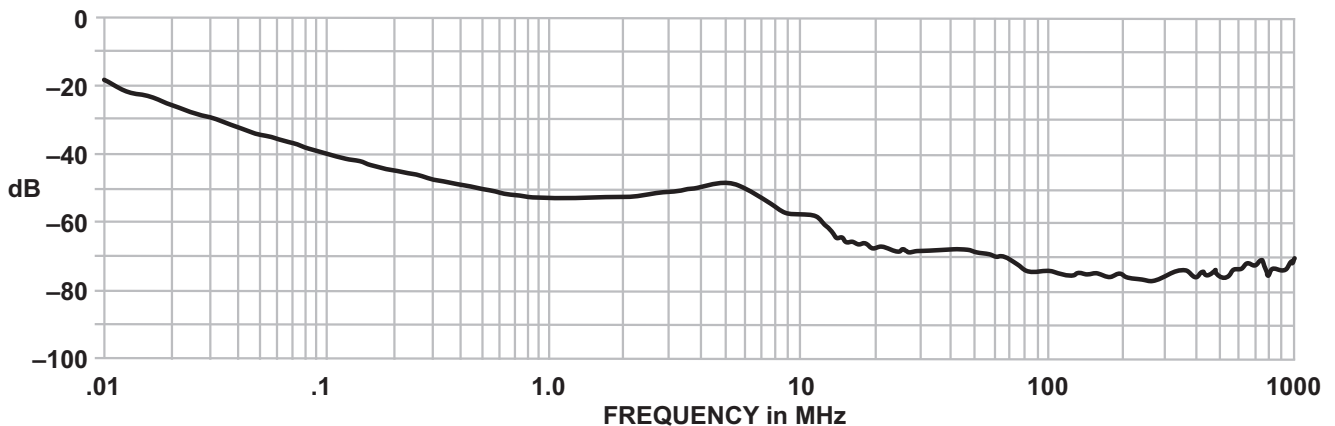
Agency Approvals:

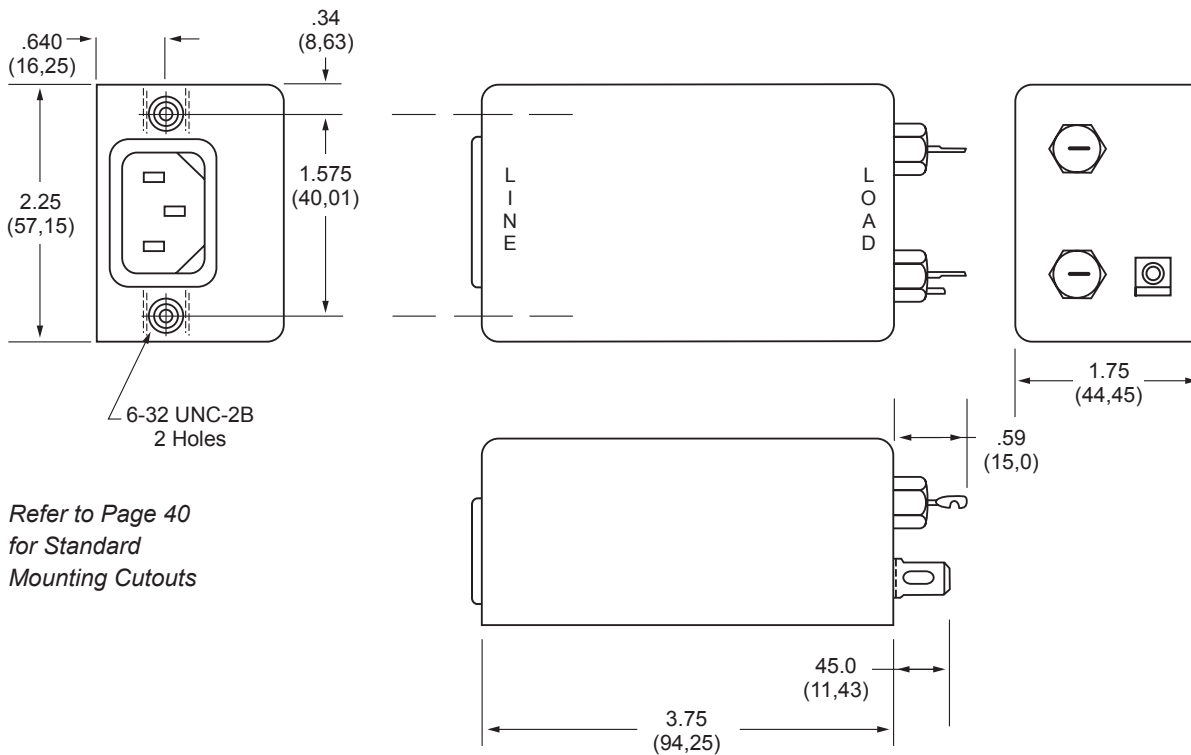


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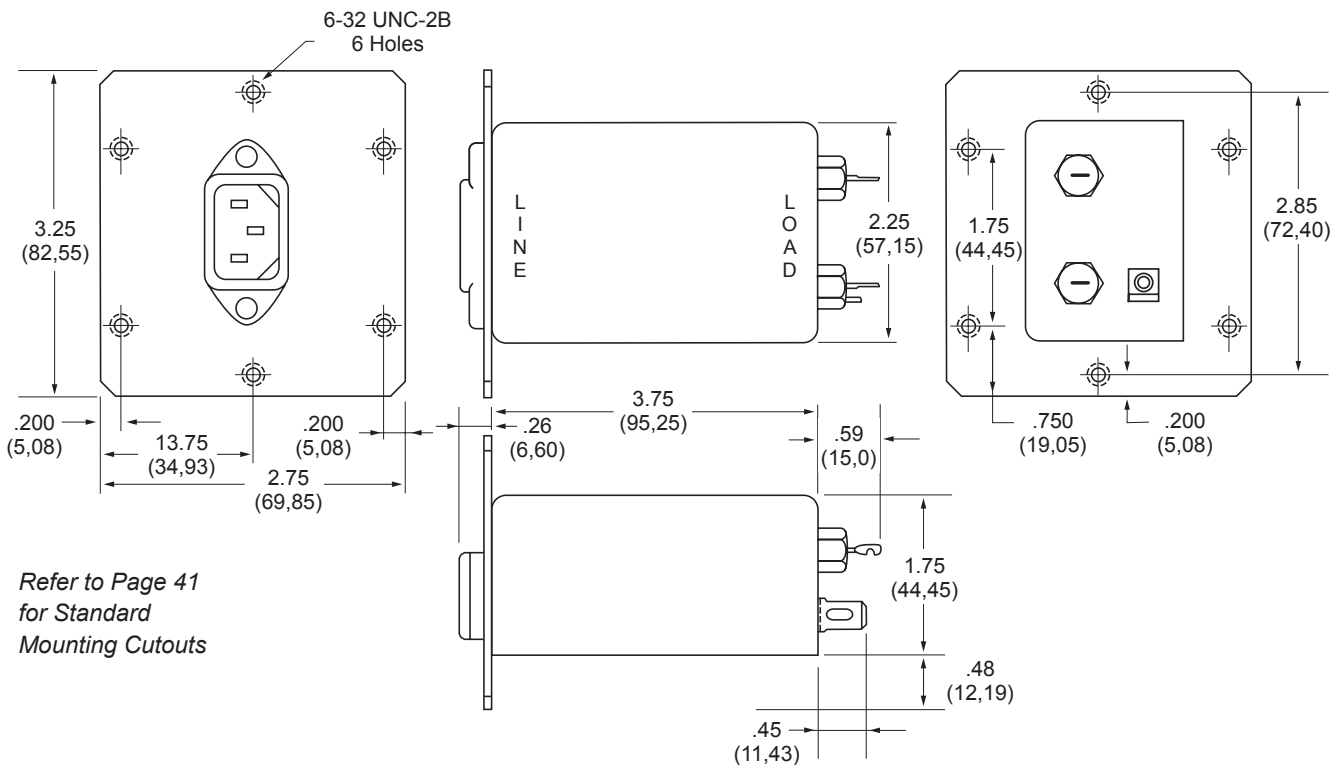
| Nominal Current Rating | Part Number | Termination Line/Load |
|------------------------|-------------|-----------------------|
| 3A | F5700CG03 | IEC/ Solder Tab |
| 6A | F5700CG06 | IEC/ Solder Tab |

F5700 SERIES
TYPICAL COMMON MODE
INSERTION LOSS — dB
(50 OHM CIRCUIT)



F5700CG (3 and 6Amp) Dimensions

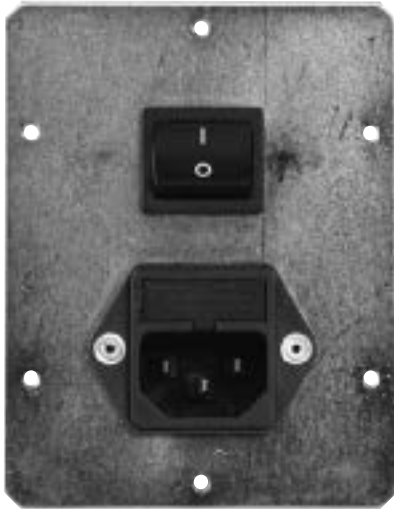
Refer to Page 40
for Standard
Mounting Cutouts

F5701CG (3 and 6Amp) Dimensions with attached mounting plate

Refer to Page 41
for Standard
Mounting Cutouts

F5900 RFI Filters

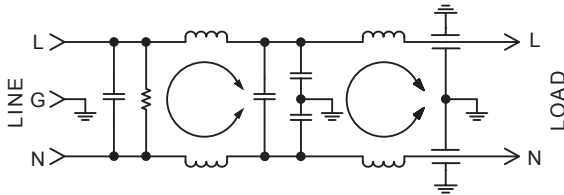
Wide Band



Features:

- High Performance Filter Designed for Switching Power Supply Emissions
- >70dB Insertion Loss from 200KHz to 1GHz
- Integral Power Switch and 5 x 20mm Fuse Holder
- Available in 3 and 6Amp Versions with Optional Mounting Faceplates

F5900 Simplified Schematic without Switch



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current:

| | |
|--------|--------|
| 115VAC | 250VAC |
| 3A | 1.5A |
| 6A | 4A |

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

| | |
|----------------|---------|
| Line to Ground | 1500VDC |
| Line to Line | 1450VDC |

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

- C: IEC Receptacle
- F: Fused IEC
- G: Wire Wrap/Solder
- J: Switched IEC

Maximum Leakage Current:

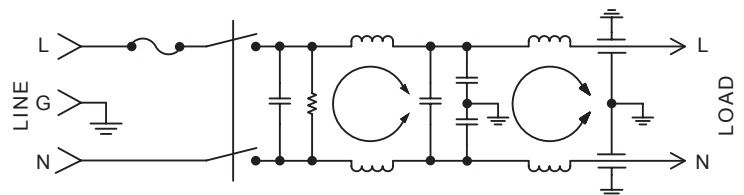
| | |
|---------------------|--------------|
| Each Line to Ground | F5900 |
| 115VAC, 60Hz: | 0.50mA |
| 250VAC, 60Hz: | 1.20mA |

Agency Approvals:

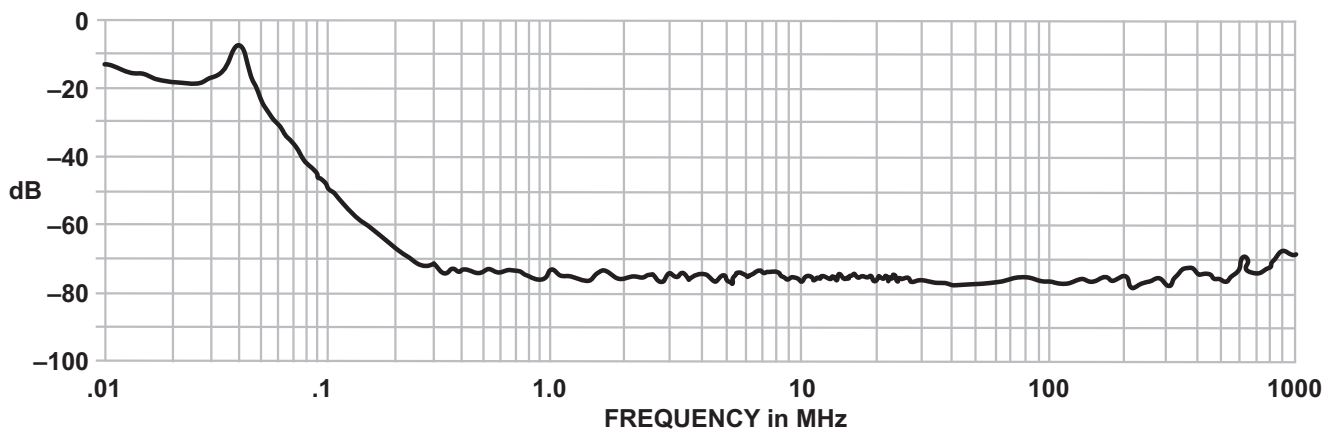


E78454

F5900 Simplified Schematic with Switch

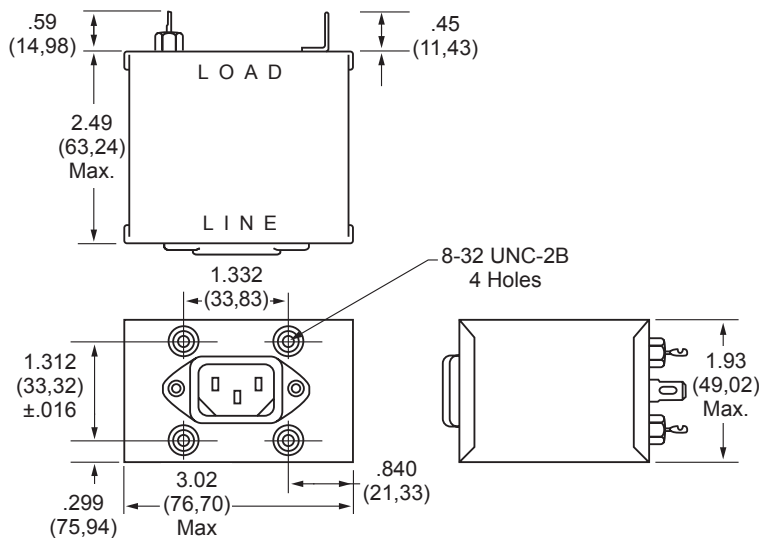


**F5900 SERIES
TYPICAL COMMON MODE
INSERTION LOSS — dB
(50 OHM CIRCUIT)**



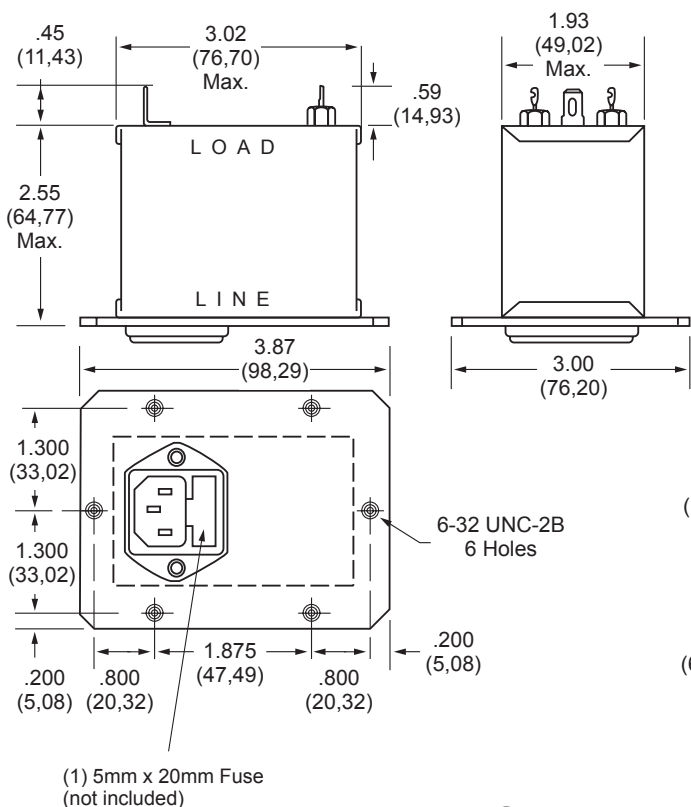
F5900CG (3 and 6Amp) Dimensions

Refer to Page 42
for Standard
Mounting Cutouts



F5900FG (3 and 6Amp) Dimensions

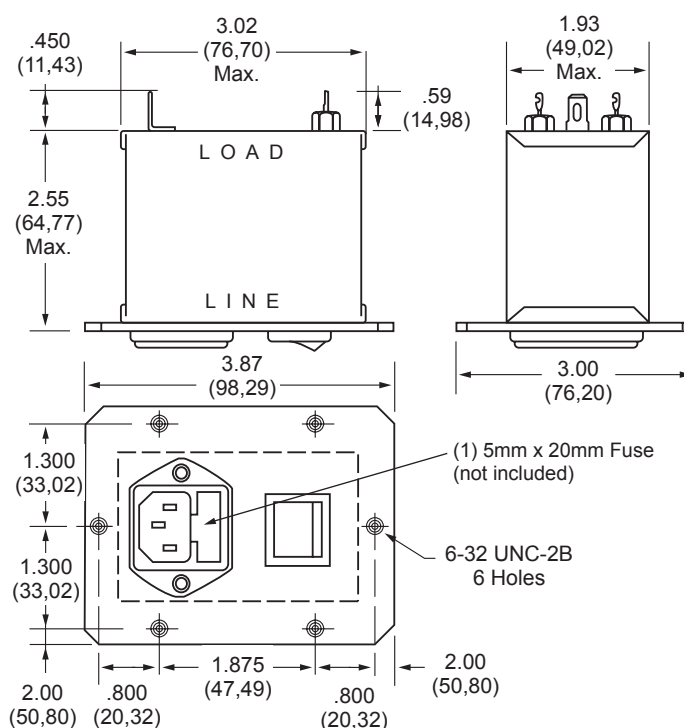
Refer to Page 42 for Standard Mounting Cutouts



| Nominal Current Rating | Part Number | Termination Line/Load |
|------------------------|-------------|-------------------------|
| 3A | F5900CG03 | IEC/Solder Tab |
| | F5900FG03 | Fused IEC/Solder Tab |
| | F5900JG03 | Switched IEC/Solder Tab |
| 6A | F5900CG06 | IEC/Solder Tab |
| | F5900FG06 | Fused IEC/Solder Tab |
| | F5900JG06 | Switched IEC/Solder Tab |

F5900JG (3 and 6Amp) Dimensions

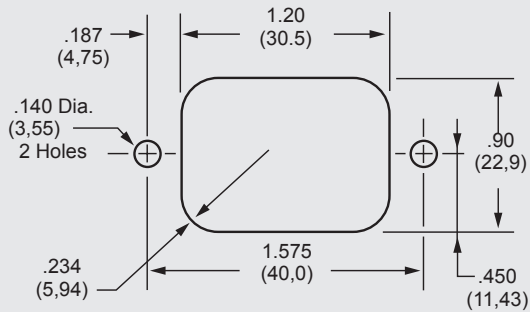
Refer to Page 42
for Standard
Mounting Cutouts



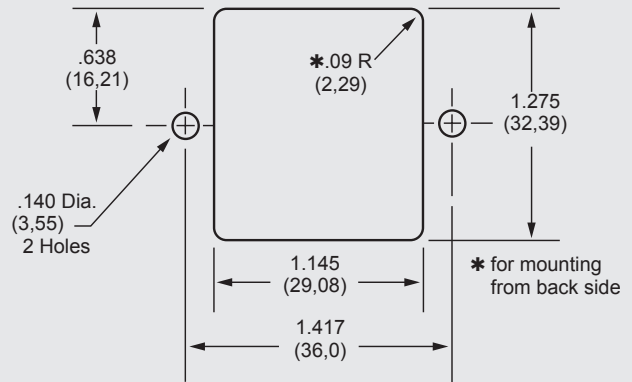
Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses are metric equivalents.

Standard Mounting Cutouts

F1200CA, F1250CA, F1299CA, F1300CA, F1399CA, F1400CA, F1500CA, F1600CA, F1700CA



F1500FA, F1600FA,

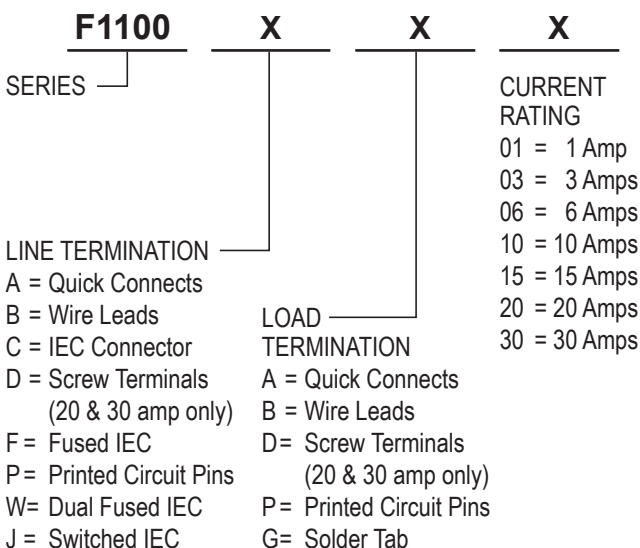


How to Order

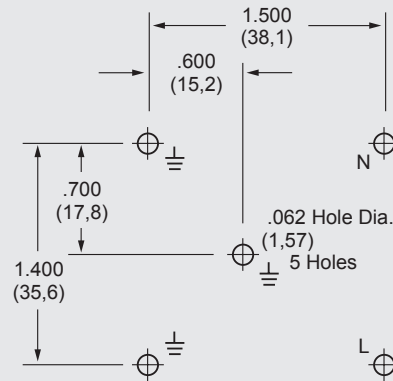
The Curtis part numbering system is made up of four elements. Each element denotes a specific requirement (mechanical or electrical) which, when properly sequenced, fully identifies the required catalog filter. As shown, the first five alpha/numeric characters denote the series type; the sixth character (alpha) denotes the type of line termination; the seventh character (alpha) denotes the type of load termination; the last two characters (numeric) denote the current rating.

Compose your part number as follows: Select the series required, add two alpha character for the line and load termination, followed by two numeric characters for the required current rating. For example, F1100AB06 completely identifies an F1100 series filter with quick connects on line side and wire leads on load side, with a 6-amp rating.

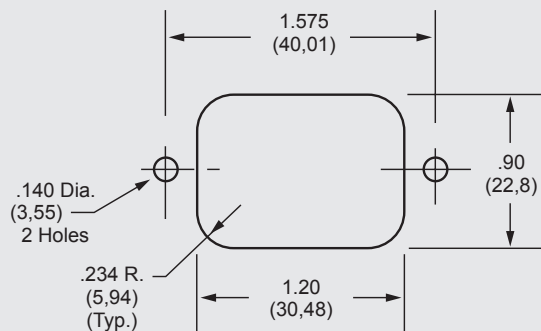
SINGLE PHASE FILTERS



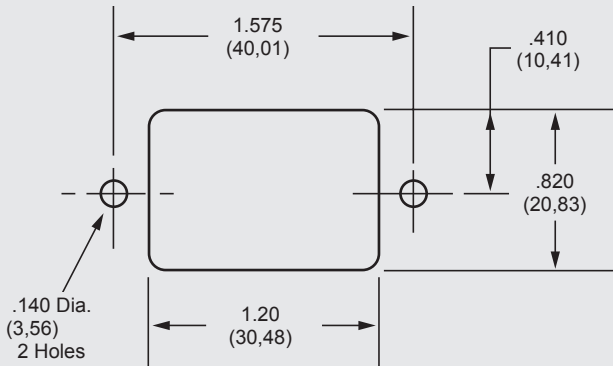
F1300CP, F1350CP, F1600CP



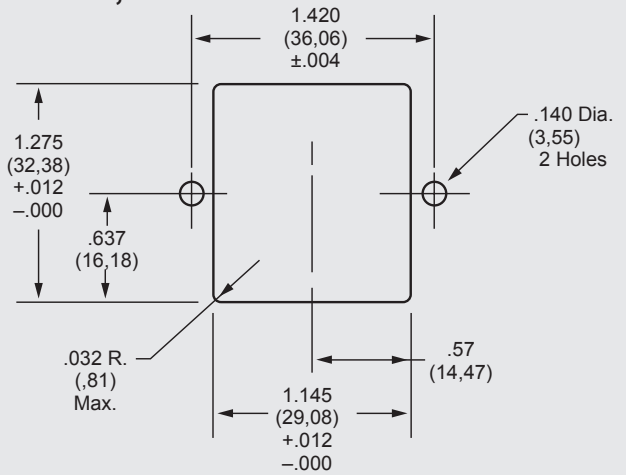
F5500/5600/5700 SERIES



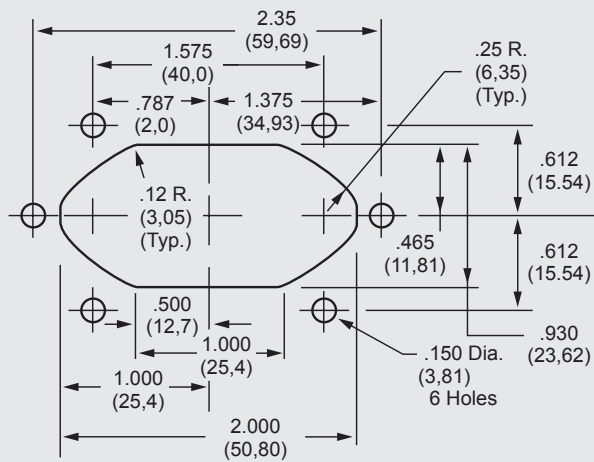
F5100 SERIES



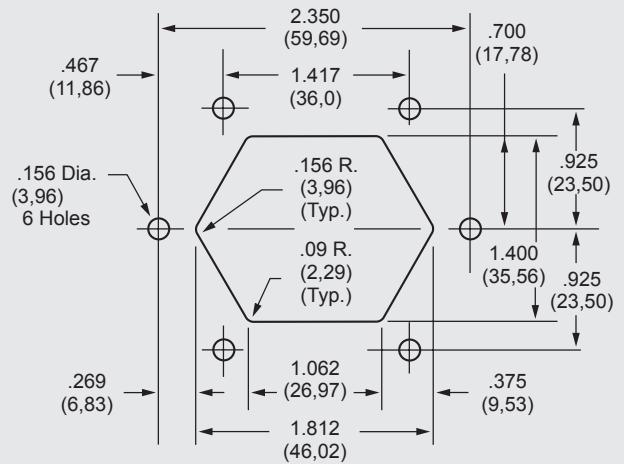
F5200, F5600FG SERIES



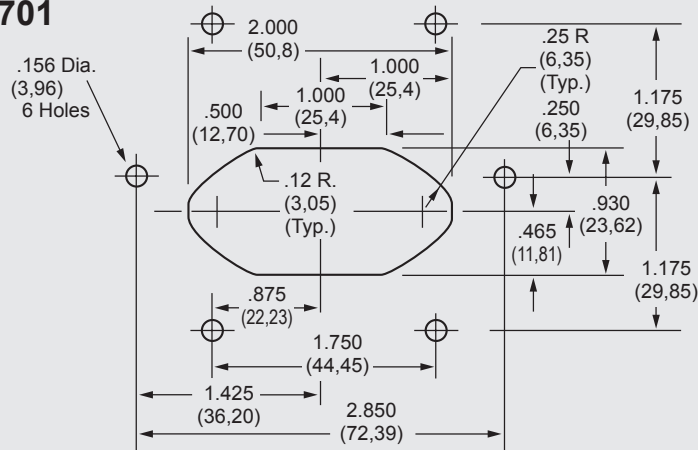
F5101 SERIES



F5201, F5601FG SERIES



F5501/5601CG/5701 SERIES

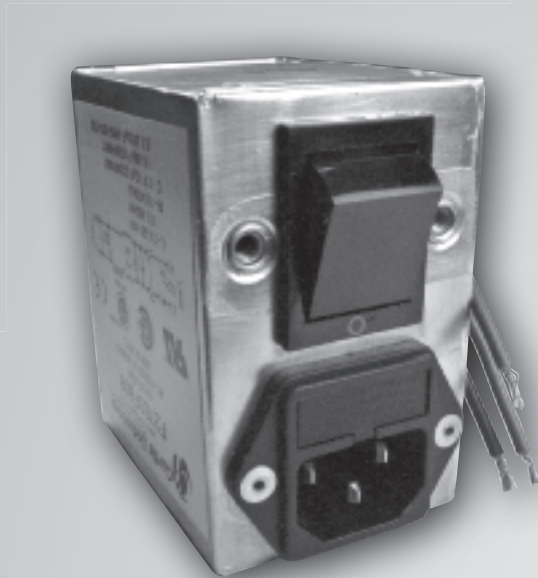


NOTE: Tolerance for all dimensions unless otherwise specified: .XXX three place ± .004, .XX two place ± 0.10

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

POWER ENTRY MODULES]

General Purpose Combination



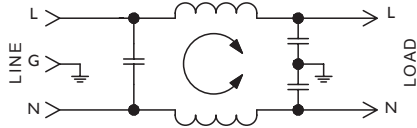
F2199/F2200 RFI Filters

General Purpose Filtered Modules

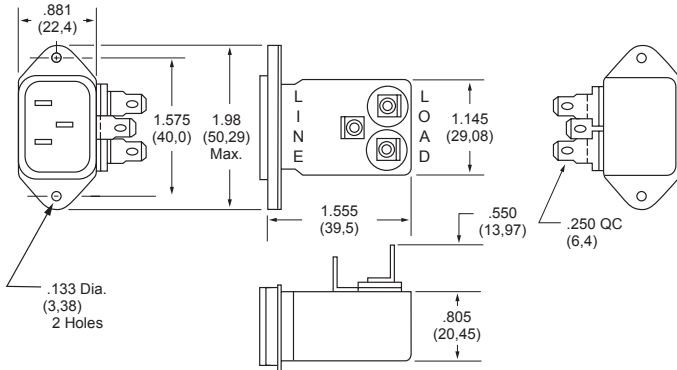
Features:

- General Purpose Filters — Designed for Common Mode Emissions or Susceptibility Applications
- Integral IEC Connector in Space-Efficient Package
- Ideal for Linear Power Supplies in Digital Equipment

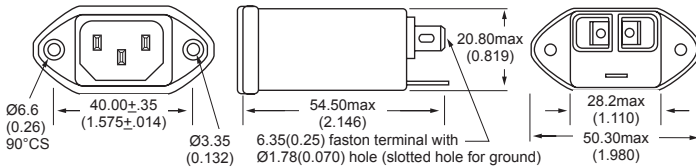
F2199/F2200 Simplified Schematic



F2200CA (1, 3 and 6Amp) Dimensions



F2199CA (1, 3, 6 and 10Amp) Dimensions



Refer to Page 58
for Standard
Mounting Cutouts

Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current:

| | |
|--------|--------|
| 115VAC | 250VAC |
| 1A | 1A |
| 3A | 3A |
| 6A | 6A |
| 10A | 8A |

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

| | |
|----------------|---------|
| Line to Ground | 1500VAC |
| Line to Line | 1768VDC |

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

A: QC – Quick Connect
C: IEC Receptacle

Maximum Leakage Current:

| | |
|---------------------|--------------------|
| Each Line to Ground | F2199/F2200 |
| 115VAC, 60Hz: | 0.25mA |
| 250VAC, 50Hz: | 0.40mA |

Agency Approvals:



E78454

73780
099523

72031376
72102892

| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | |
|------------------------|-------------|-----------------------|--|-----------------|----------|----------|----------|----------|----------|
| | | | MODE | Frequency - MHz | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 1A | F2199CA01 | IEC/QC | Common Differential | 32 5 | 45 14 | 45 23 | 43 47 | 43 50 | 40 45 |
| | F2200CA01 | IEC/QC | Common Differential | 22 — | 35 2 | 40 3 | 46 35 | 50 40 | 50 40 |
| 3A | F2199CA03 | IEC/QC | Common Differential | 20 5 | 30 12 | 38 14 | 48 38 | 48 44 | 44 42 |
| | F2200CA03 | IEC/QC | Common Differential | 15 — | 25 2 | 30 3 | 45 35 | 50 40 | 50 40 |
| 6A | F2199CA06 | IEC/QC | Common Differential | 9 5 | 20 12 | 28 14 | 42 33 | 50 42 | 47 42 |
| | F2200CA06 | IEC/QC | Common Differential | 9 — | 20 2 | 25 7 | 41 28 | 45 46 | 50 57 |
| 10A | F2199CA10 | IEC/QC | Common Differential | 3 5 | 13 12 | 20 16 | 35 20 | 40 28 | 45 40 |

NOTE: Other combinations of terminals may be specified on special order.

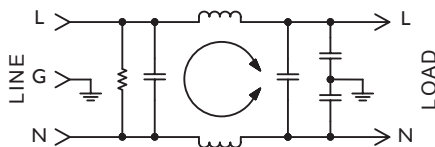
F2300 RFI Filters



Features:

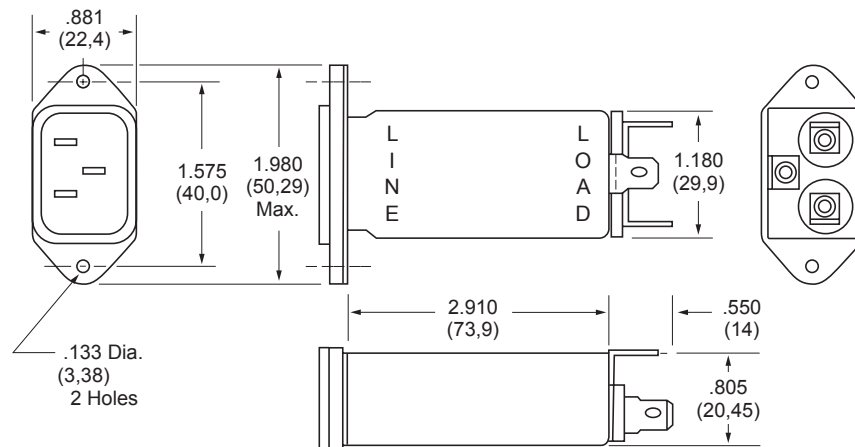
- Effective Protection from Pulsed, Intermittent or Continuous RFI for FCC "A" Applications
- High-Performance Low-Leakage Filter in Low Profile Package with Integral IEC Connector
- Increased Inductance and Line-to-Line Capacitance Provide Enhanced Common Mode and Differential Mode Attenuation

F2300CA Simplified Schematic



F2300CA (6Amp) Dimensions

Refer to Page 58
for Standard
Mounting Cutouts



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current: 115VAC 250VAC
6A 6A

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

Line to Ground 1500VAC
Line to Line 1768VDC

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max at rated current

Humidity Range: 0% to 95% R.H.

Termination:

A: QC – Quick Connect
C: IEC Receptacle

Maximum Leakage Current:

Each Line to Ground **F2300**
115VAC, 60Hz: 0.25mA
250VAC, 50Hz: 0.40mA

Agency Approvals:



| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | |
|------------------------|-------------|-----------------------|--|-----------------|-----|-----|-----|----------|----------|
| | | | MODE | Frequency - MHz | | | | | |
| 6A | F2300CA06 | IEC/QC | Common Differential | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| | | | | | | | | 25 12 | 37 30 |

NOTE: Other combinations of terminals may be specified on special order.

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



Curtis Industries
A Division of Powers Holdings, Inc.

1-800-657-0853

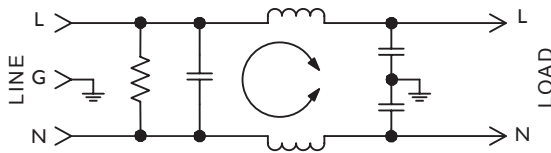
F2400/2500 RFI Filters



Features:

- Higher Performance Filters Designed for Common Mode and Differential Mode Applications
- 4X Greater Differential Mode Insertion Loss at 1 MHz than F2199/F2200 Series with No Increase in Physical Size
- Especially Suited for Use with Linear Power Supplies and FCC "A" Applications

F2400/2500 Simplified Schematic



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

| | | |
|-----------------------|--------|--------|
| Rated Current: | 115VAC | 250VAC |
| | 3A | 1.5A |
| | 6A | 3A |
| | 10A | 10A |
| | 15A | 10A |

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

| | |
|----------------|---------|
| Line to Ground | 1500VAC |
| Line to Line | 1768VDC |

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

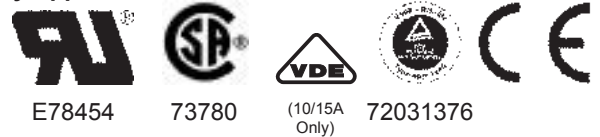
Termination:

A: QC – Quick Connect
C: IEC Receptacle

Maximum Leakage Current:

| | |
|---------------------|--------------------|
| Each Line to Ground | F2400/F2500 |
| 115VAC, 60Hz: | 0.25mA |
| 250VAC, 50Hz: | 0.40mA |

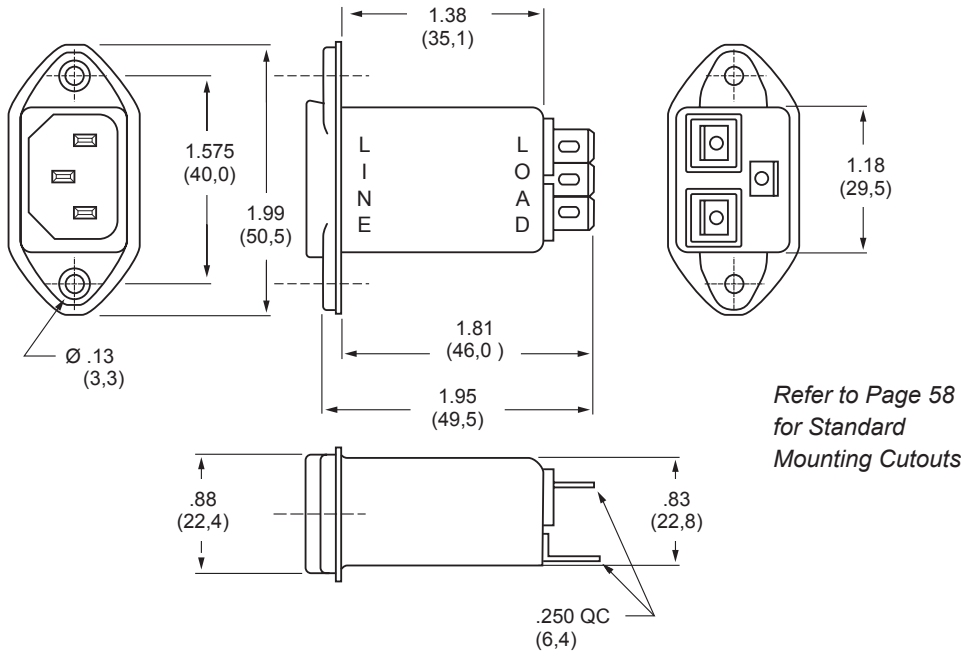
Agency Approvals:



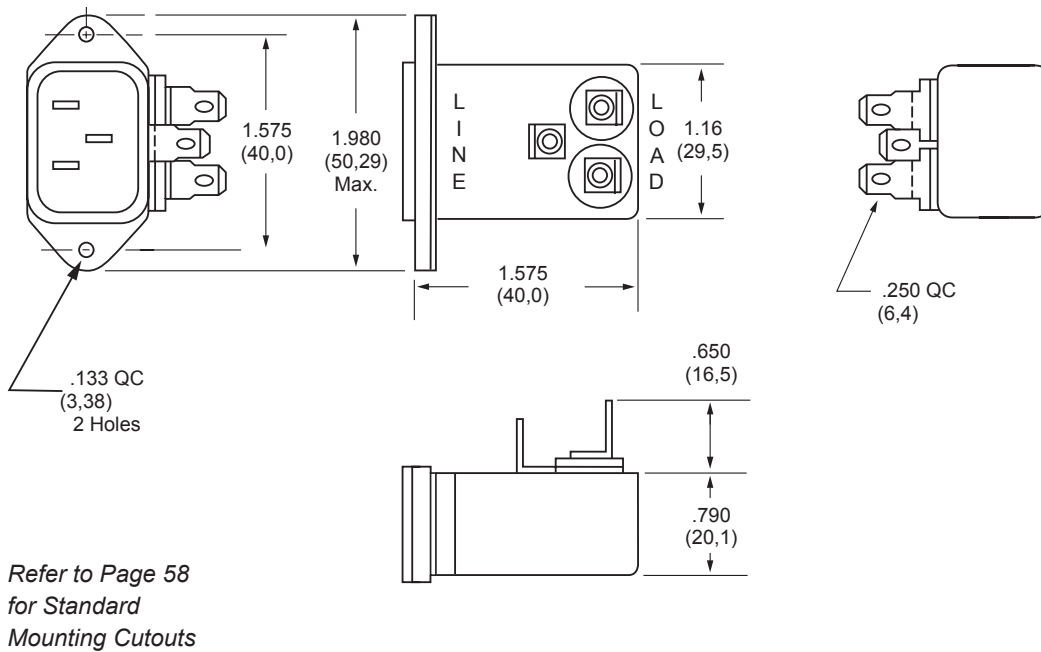
| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | |
|------------------------|------------------------|-----------------------|--|-----------------|-----|-----|-----|----|----|
| | | | MODE | Frequency - MHz | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 3A | F2400CA03 F2500CA03 | IEC/QC IEC/QC | Common | 22 | 35 | 40 | 46 | 50 | 50 |
| | | | Differential | 8 | 18 | 24 | 40 | 50 | 40 |
| 6A | F2400CA06 F2500CA06 | IEC/QC IEC/QC | Common | 15 | 24 | 31 | 42 | 45 | 50 |
| | | | Differential | 8 | 18 | 24 | 40 | 50 | 40 |
| 10/15A | F2400CA10 F2400CA15 | IEC/QC IEC/QC | Common | 4 | 10 | 13 | 28 | 35 | 40 |
| | | | Differential | 2 | 8 | 15 | 30 | 35 | 35 |

NOTE: Other combinations of terminals may be specified on special order.

F2400CA (3, 6, 10 and 15Amp) Dimensions



F2500CA (3 and 6Amp) Dimensions



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

F2600 RFI Filters



Features:

- General Purpose “L-Type” Circuit Effective in Reducing Both Incoming and Outgoing Powerline Noise Levels in FCC “A” Applications
- Integral 5 X 20mm Single or Dual Fused IEC Connector
- Optional SST Switched IEC Connector
- All Series Available in Labor-Saving PC Mounted Case Style

Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current: 115VAC 250VAC
 3A 3A
 6A 6A

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

Line to Ground 1500VAC
 Line to Line 1768VDC

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max at rated current

Humidity Range: 0% to 95% R.H.

Termination:

- A: QC – Quick Connect
- F: Fused IEC
- J: Switched IEC
- P: PCB Pins
- W: Dual Fused IEC

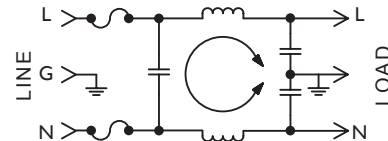
Maximum Leakage Current:

Each Line to Ground **F2600**
 115VAC, 60Hz: 0.25mA
 250VAC, 50Hz: 0.40mA

Agency Approvals:



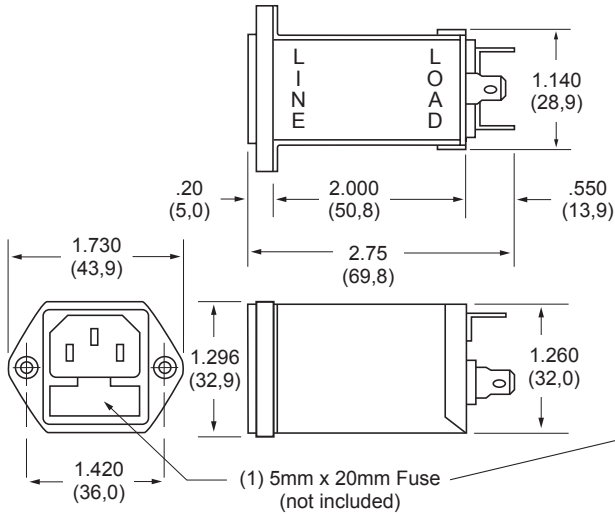
F2600F Simplified Schematic



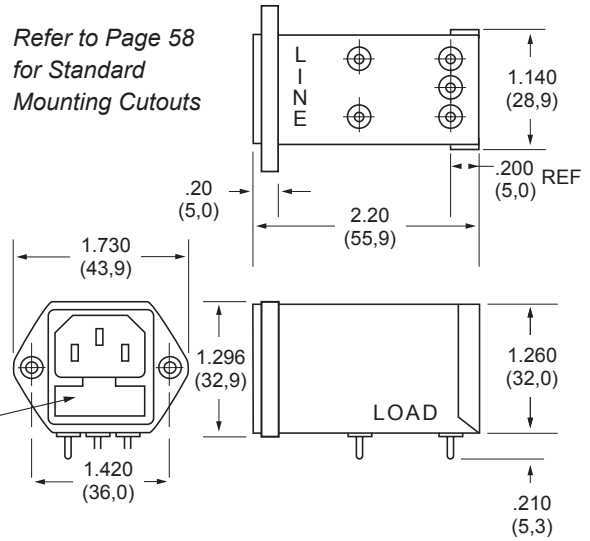
| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | |
|------------------------|------------------------|--|--|-----------------|-----|-----|-----|----|----|
| | | | MODE | Frequency - MHz | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 3A | F2600FA03 F2600FP03 | Fused IEC/QC Fused IEC/PC | Common | 21 | 35 | 41 | 50 | 50 | 50 |
| | | | Differential | 8 | 18 | 24 | 40 | 50 | 40 |
| 6A | F2600FA06 F2600FP06 | Fused IEC/QC Fused IEC/PC | Common | 18 | 34 | 41 | 45 | 45 | 45 |
| | | | Differential | 8 | 18 | 24 | 40 | 50 | 50 |
| 3A | F2600WA03 F2600WP03 | Dual Fused IEC/QC Dual Fused IEC/PC | Common | 21 | 35 | 41 | 45 | 45 | 50 |
| | | | Differential | 8 | 18 | 24 | 40 | 50 | 40 |
| 6A | F2600WA06 F2600WP06 | Dual Fused IEC/QC Dual Fused IEC/PC | Common | 18 | 34 | 41 | 40 | 40 | 45 |
| | | | Differential | 8 | 18 | 24 | 40 | 50 | 50 |
| 3A | F2600JA03 F2600JP03 | Switched IEC/QC Switched IEC/PC | Common | 21 | 35 | 41 | 45 | 45 | 50 |
| | | | Differential | 8 | 18 | 24 | 40 | 50 | 40 |
| 6A | F2600JA06 F2600JP06 | Switched IEC/QC Switched IEC/PC | Common | 18 | 34 | 41 | 40 | 40 | 45 |
| | | | Differential | 8 | 18 | 24 | 40 | 50 | 50 |

NOTE: Other combinations of terminals may be specified on special order.

F2600FA (3 and 6Amp) Dimensions

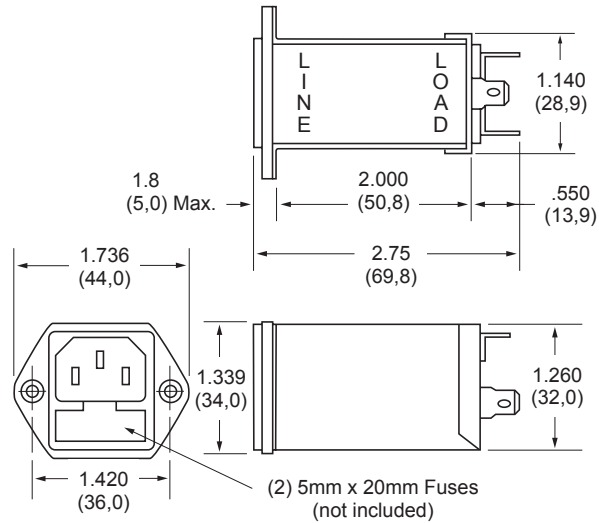
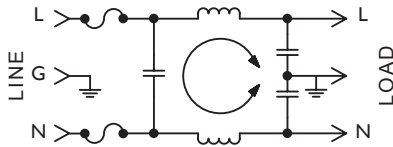


F2600FP (3 and 6Amp) Dimensions



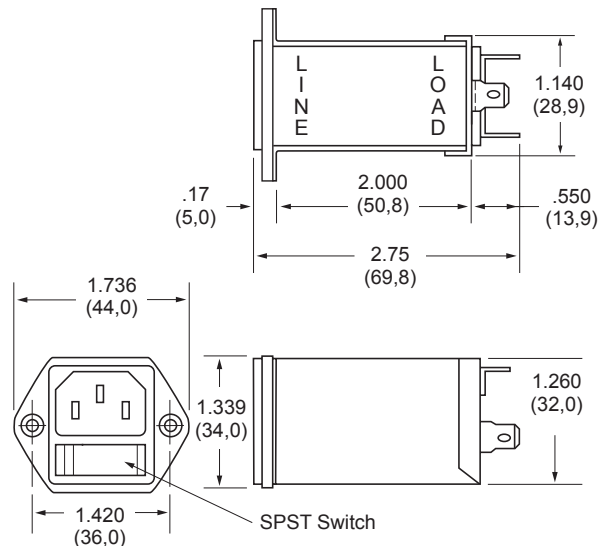
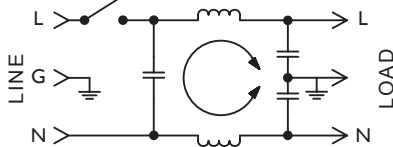
F2600WA (3 and 6Amp) Dimensions

F2600W Simplified Schematic



F2600JA (3 and 6Amp) Dimensions

F2600J Simplified Schematic



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



F2700 RFI Filters

General Purpose Filtered Modules



Features:

- Designed for FCC "B" and VDE "B" Switching Power Supply Applications
- Very High Inductance Design with Differential Mode Choke to Provide Improved Performance Below 100KHz
- Compact, Space-Efficient Package Available in 3 and 6Amp Ratings
- Also Available with Integral Fused IEC Connector and "ON/OFF" Power Switch

Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current: 115VAC 250VAC
 3A 2A
 6A 4A

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

Line to Ground 1500VAC
 Line to Line 1768VDC

Insulation Resistance: 9 x 10⁹ Ω at 100VDC

Ambient Temperature: 40°C Max. at rated current

Humidity Range: 0% to 95% R.H.

Termination:

- A: QC – Quick Connect
- B: Wire
- C: IEC Receptacle
- F: Fused IEC

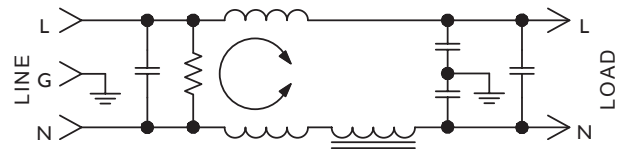
Maximum Leakage Current:

Each Line to Ground **F2700**
 115VAC, 60Hz: 0.25mA
 250VAC, 50Hz: 0.40mA

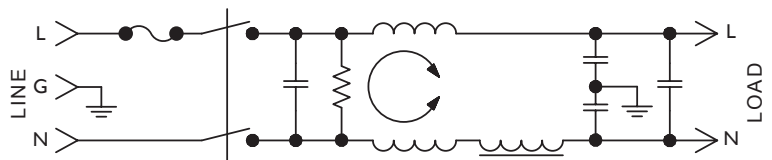
Agency Approvals:



F2700 Without Switch or Fuse Simplified Schematic



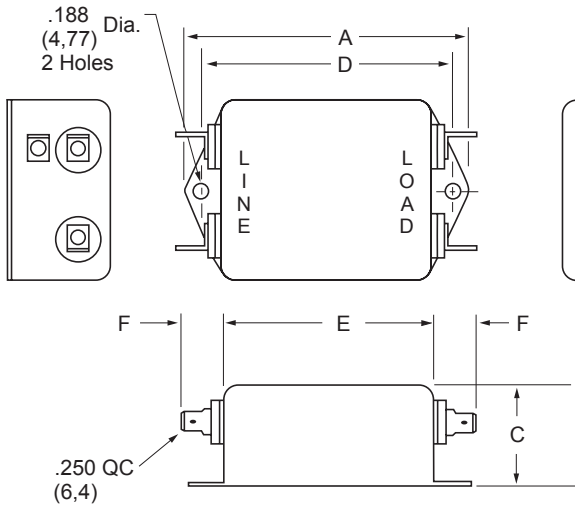
F2700 With Switch and Fuse Simplified Schematic



| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | | | | | |
|------------------------|------------------------|--------------------------|--|-----------------|-----|-----|-----|-----|-----|-----|----|----|--|
| | | | MODE | Frequency - MHz | | | | | | | | | |
| | | | | .01 | .02 | .05 | .15 | .50 | 1.0 | 5.0 | 10 | 30 | |
| 3A | F2700AA03 | QC/QC | Common | 20 | 27 | 36 | 45 | 42 | 42 | 42 | 40 | 38 | |
| | | | Differential | 5 | 27 | 52 | 70 | 70 | 70 | 70 | 60 | 58 | |
| 3A | F2700CA03 F2700FB03 | IEC/QC Fused IEC/Wire | Common | 20 | 27 | 36 | 45 | 42 | 42 | 42 | 40 | 38 | |
| | | | Differential | 5 | 27 | 52 | 70 | 70 | 70 | 70 | 60 | 58 | |
| 6A | F2700AA06 | QC/QC | Common | 10 | 18 | 28 | 39 | 42 | 45 | 45 | 45 | 45 | |
| | F2700CA06 | IEC/QC | Differential | 5 | 20 | 48 | 70 | 70 | 70 | 70 | 70 | 65 | |

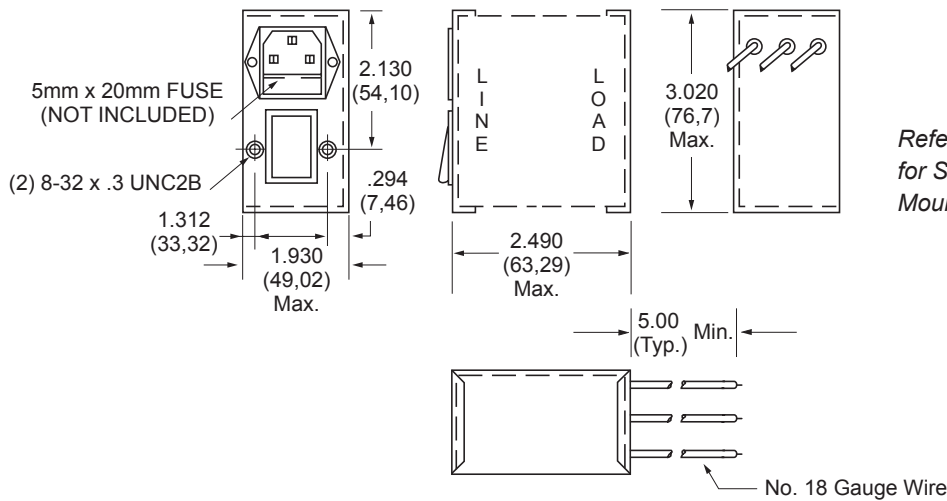
NOTE: Other combinations of terminals may be specified on special order.

F2700AA (3 and 6Amp) Dimensions



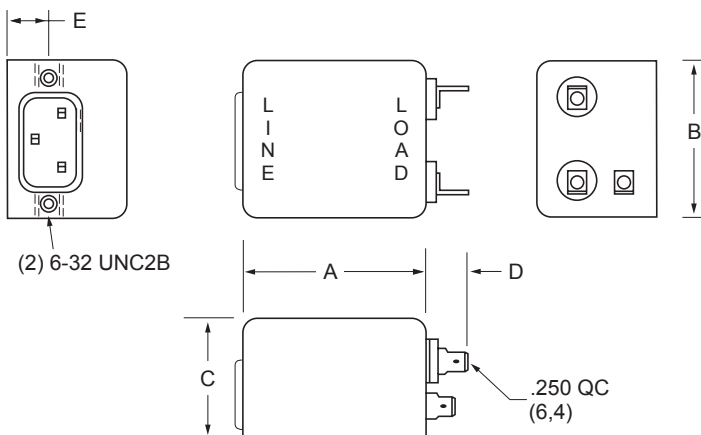
| Amps | A | B | C | D | E | F |
|------|------------------|-----------------|-----------------|------------------|-----------------|----------------|
| 3A | 3.315 (84,2) | 2.000 (50,8) | 1.500 (38,1) | 2.940 (74,7) | 2.500 (63,5) | .550 (14,0) |
| 6A | 4.440 (112,8) | 2.250 (57,2) | 1.750 (44,5) | 4.063 (103,2) | 3.620 (91,9) | .550 (14,0) |

F2700FB03 (3Amp) Dimensions



Refer to Page 58
for Standard
Mounting Cutouts

F2700CA (3 and 6Amp) Dimensions



Refer to Page 58
for Standard
Mounting Cutouts

| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|----------------|-----------------|
| 3A | 2.880 (73,2) | 2.125 (54,0) | 1.719 (43,6) | .550 (14,0) | .575 (14,6) |
| 6A | 3.750 (95,2) | 2.250 (57,1) | 1.750 (44,4) | .550 (14,0) | .640 (16,29) |



FPE7/FPE8 Series

Combination



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current: 115VAC 250VAC
 3A 3A
 6A 6A

Current Overload: 6X for 8 Seconds

Hi-Pot Test (1 min):

Line to Ground 1500VAC
 Line to Line 1768VDC

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at Rated Current

Humidity Range: 0% to 95% R.H.

Termination:

- IEC Receptacle
- Wire Wrap/Solder

Maximum Leakage Current:

Each Line to Ground **PE7, PE 8, PE9**
 115VAC, 60Hz: 0.25mA
 250VAC, 50Hz: 0.40mA

Voltage Select Card: Installed in 120VAC position unless otherwise specified

Agency Approvals:

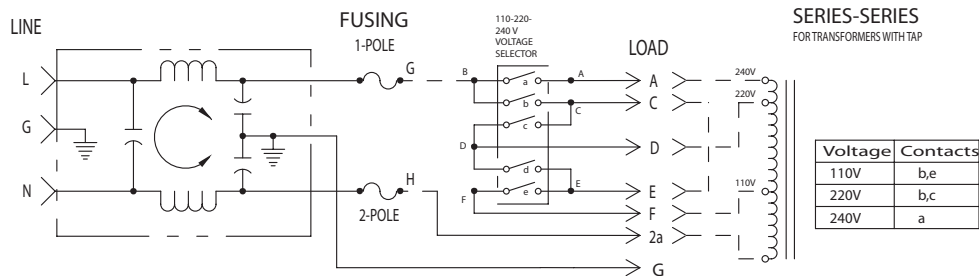


Refer to Page 55 for Ordering Instructions

Features:

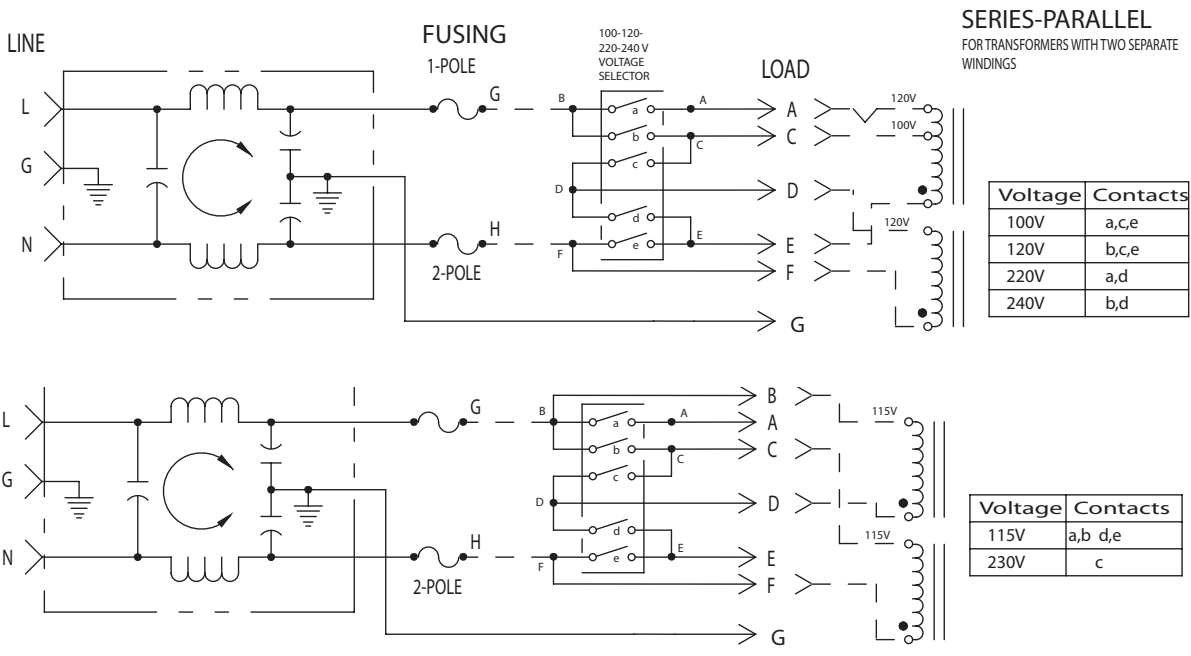
- RFI Filter Module Combines IEC Connector, Fusing, and Voltage Select Features in One Unit
- FPE7 Series Filters Provide 20% More Differential Mode Attenuation Than Comparable Units
- Accepts Either U.S. or European Standard Fuse Sizes

FPE7 Series Simplified Schematic

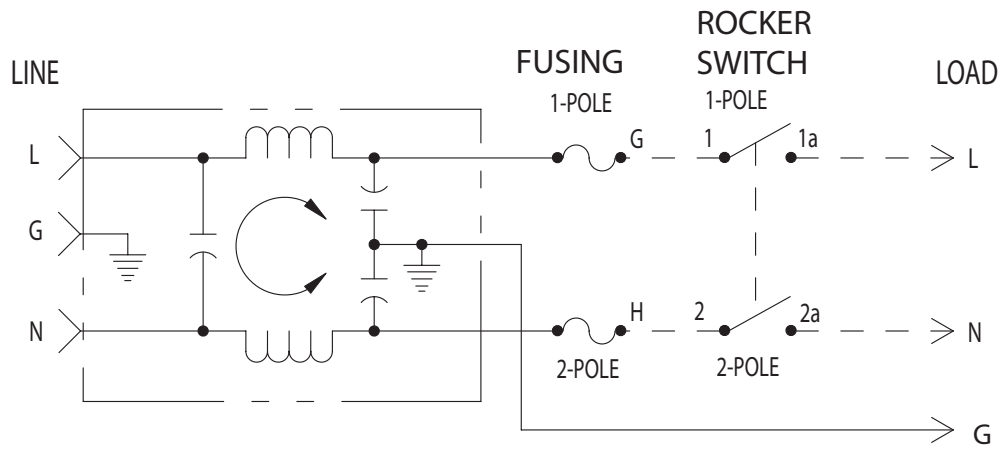


| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | |
|------------------------|------------------------|-----------------------|--|-----------------|-----|-----|-----|----|----|
| | | | MODE | Frequency - MHz | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 3A | FPE7XXX03 FPE8XXX03 | IEC/Solder Tabs | Common | 18 | 24 | 30 | 45 | 45 | 50 |
| | | | Differential | 8 | 18 | 24 | 46 | 50 | 40 |
| 6A | FPE7XXX06 FPE8XXX06 | IEC/Solder Tabs | Common | 10 | 19 | 24 | 39 | 44 | 50 |
| | | | Differential | 8 | 18 | 24 | 39 | 40 | 40 |

FPE7 Series Simplified Schematic



FPE8 Series Simplified Schematic

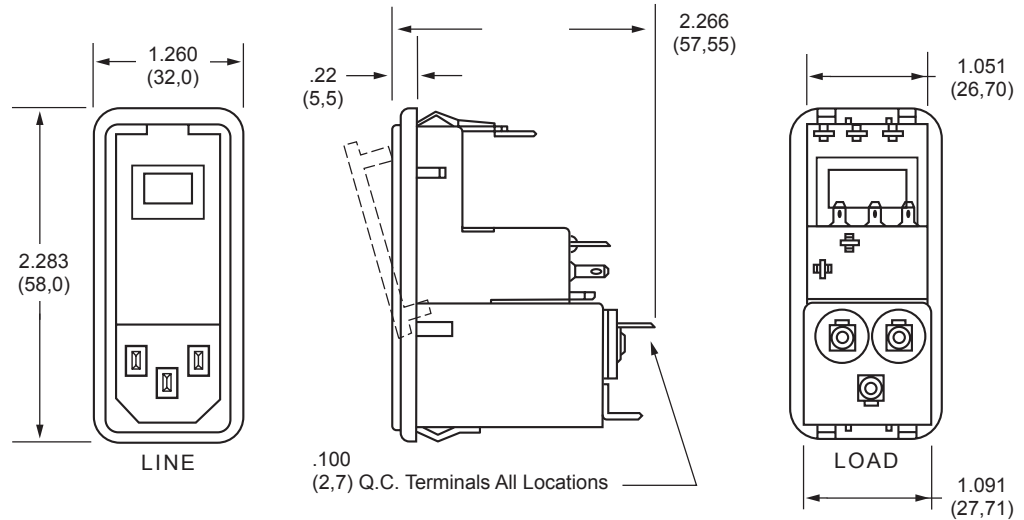


Dimensions are in inches and millimeters unless otherwise specified. Values in parentheses are metric equivalents.

FPE7/FPE8 Series *(continued)*

FPE7/FPE8 Snap-Mount Series (3 and 6Amp) Dimensions

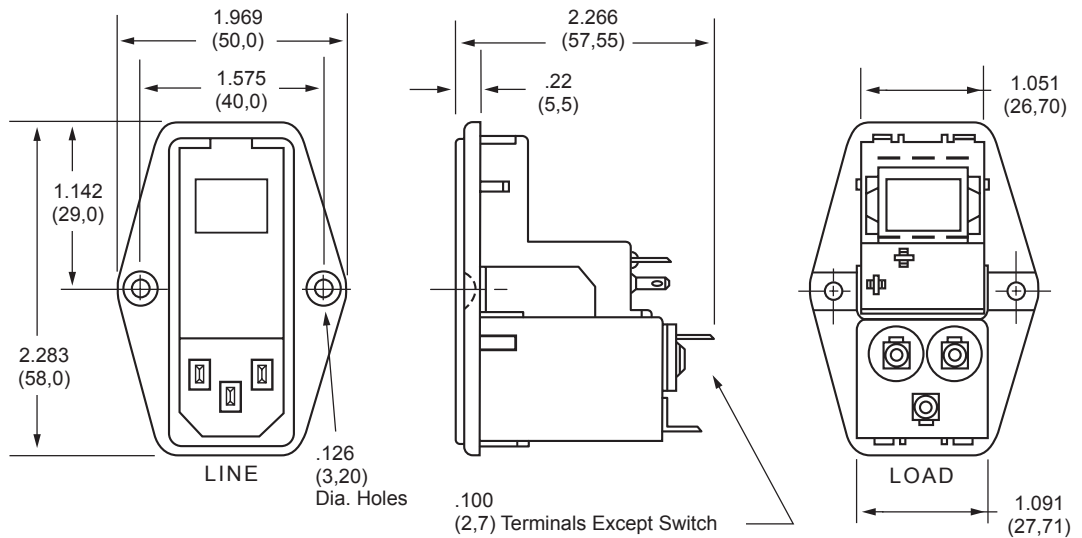
Refer to Page 55
for Standard
Mounting Cutouts



Combination

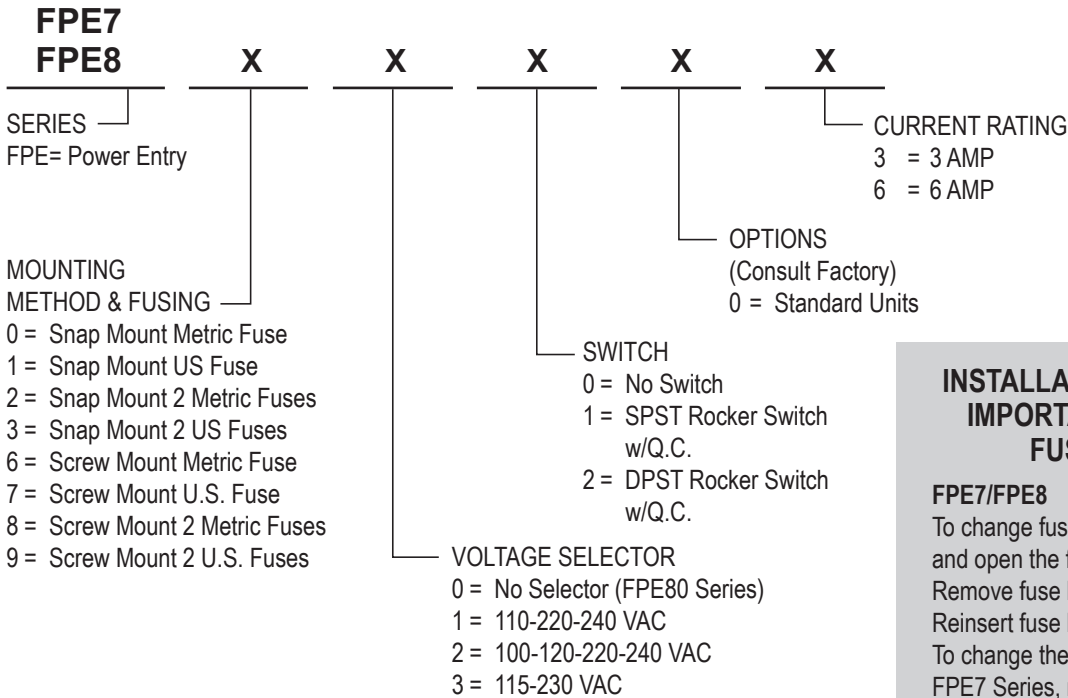
FPE7/FPE8 Screw-Mount Series (3 and 6Amp) Dimensions

Refer to Page 55
for Standard
Mounting Cutouts



POWER ENTRY MODULES

How to Order



INSTALLATION INSTRUCTION IMPORTANT – CHANGING FUSE/VOLTAGE

FPE7/FPE8

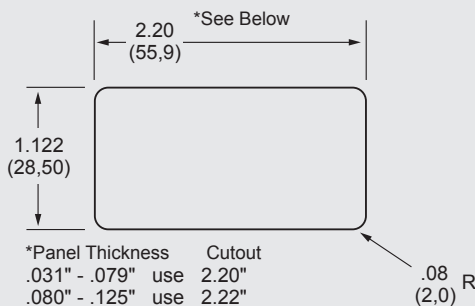
To change fuse, remove power cord and open the front cover on the module. Remove fuse holder and replace fuse. Reinsert fuse holder and close cover.

To change the operating voltage on the FPE7 Series, remove the power cord and open front cover. Rotate voltage select wheel until desired voltage appears in window of cover.

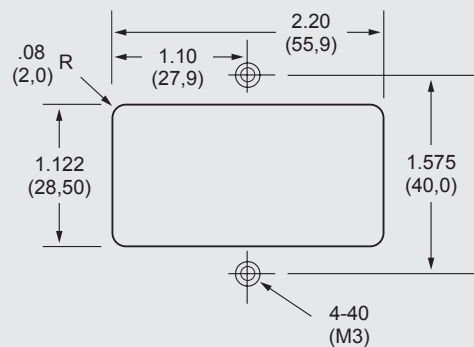
- Filter shipped without fuse.

Always use caution when selecting and changing fuses and voltage requirements. Curtis Industries is not responsible for malfunction due to improper installation/selection of fuse and/or voltage select.

FPE7/FPE8 Snap-Mount Series



FPE7/FPE8 Screw Mount Series



FPE1 Series



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current: 115VAC 250VAC
10A 10A

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

Line to Ground 1500VAC
Line to Line 2250VDC

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max at rated current

Humidity Range: 0% to 95% R.H.

Termination:

- QC – Quick Connect
- IEC Receptacle

Maximum Leakage Current:

| Each Line to Ground | PE1 | PE1-PO |
|---------------------|--------|--------|
| 115VAC, 60Hz: | 0.25mA | 0.4mA |
| 250VAC, 50Hz: | 0.40mA | .75mA |

Voltage Select Card: Installed in 120VAC position unless otherwise specified

Agency Approvals:



E78454 064179 72031202

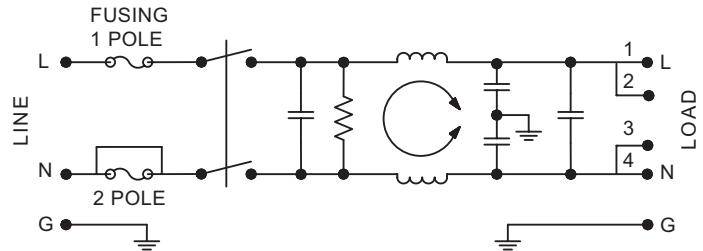
Features:

- RFI Filter Module Combines IEC Connector, Fusing, Optional Voltage Select and On/Off Switch into a Single, Space-Efficient Assembly
- Enhanced Low Frequency Response with No Resonant Peaks
- Fully Shielded for Radiative Noise Control
- Accepts Either U.S. or European Standard Fuse Sizes. Dual or Single Power Line Fusing

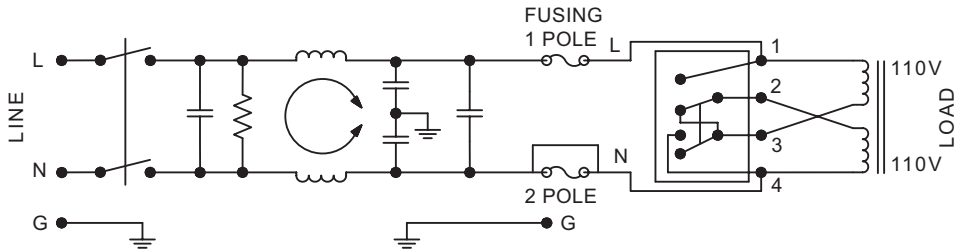
Combination

POWER ENTRY MODULES

FPE1 Series Simplified Schematic without Voltage Selector



FPE1 Series Simplified Schematic with Voltage Selector

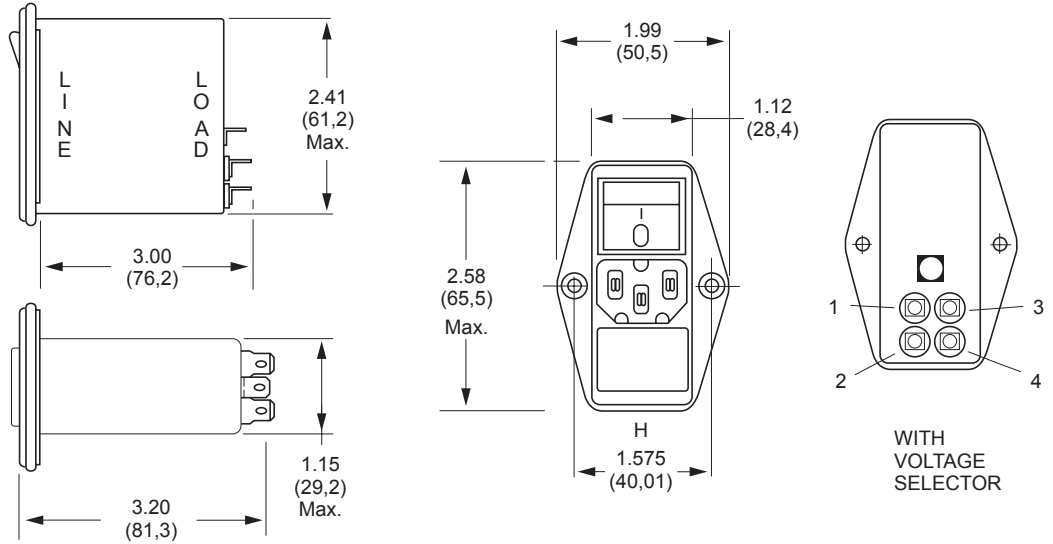


| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | | |
|------------------------|-------------|-----------------------|--|-----------------|-----|-----|-----|-----|----|----|
| | | | MODE | Frequency - MHz | | | | | | |
| | | | | .05 | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 10A | FPE1XXX10 | IEC/QC | Common | 10 | 20 | 30 | 38 | 45 | 50 | 50 |
| | | | Differential | 10 | 20 | 30 | 35 | 55 | 60 | 55 |
| | FPE1XXXP0 | IEC/QC | Common | 13 | 24 | 33 | 38 | 48 | 54 | 54 |
| | | | Differential | 10 | 20 | 30 | 35 | 65 | 65 | 55 |

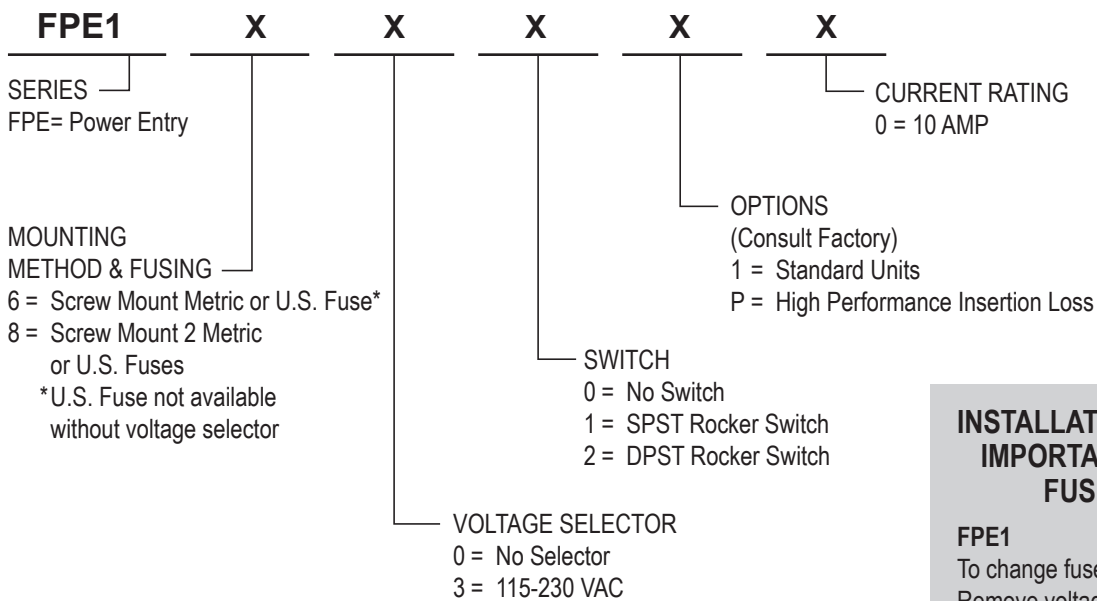
NOTE: Other combinations of terminals may be specified on special order.

FPE1
(10Amp)
Dimensions

Refer to Standard Mounting Cutouts on Page 58



How to Order



**INSTALLATION INSTRUCTION
IMPORTANT – CHANGING
FUSE/VOLTAGE**

FPE1

To change fuse, remove power cord. Remove voltage selector and replace fuse. Reinsert fuse holder. To change the operating voltage on the FPE1 Series, remove the power cord and rotate fuse holder block until desired voltage aligns with the mark on the module housing.

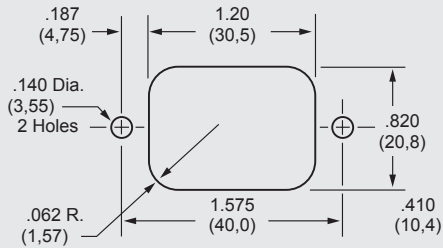
- Filter shipped without fuse.

Always use caution when selecting and changing fuses and voltage requirements. Curtis Industries is not responsible for malfunction due to improper installation/selection of fuse and/or voltage select.

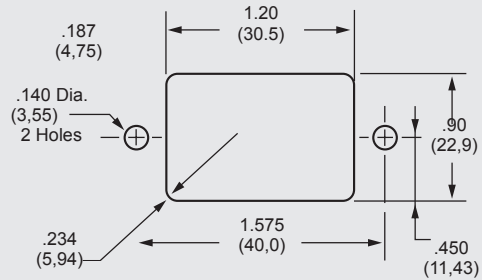


Standard Mounting Cutouts

F2199CA, F2200CA, F2300CA, F2400CA, F2500CA, F2700CA, F3100CA, F3200CA, F3400CA, F3500CA

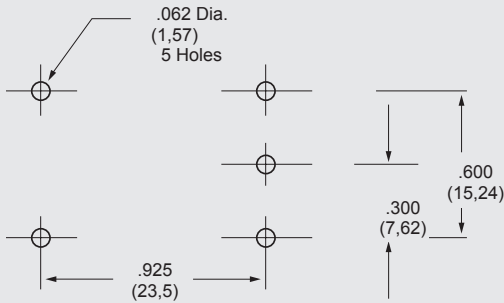


Back Mounting

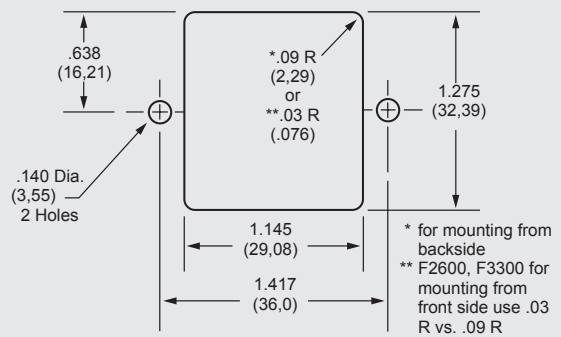


Front Mounting

F2600FP, F3300FP

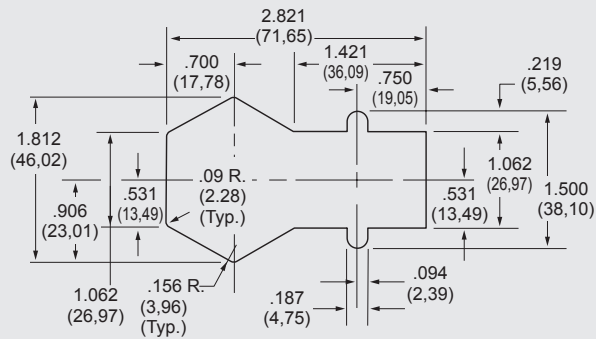


F2600, F3300

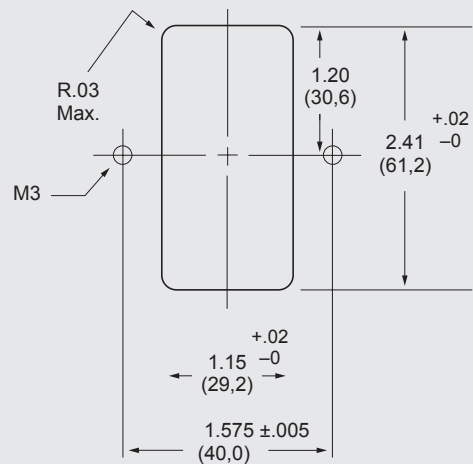


POWER ENTRY MODULES

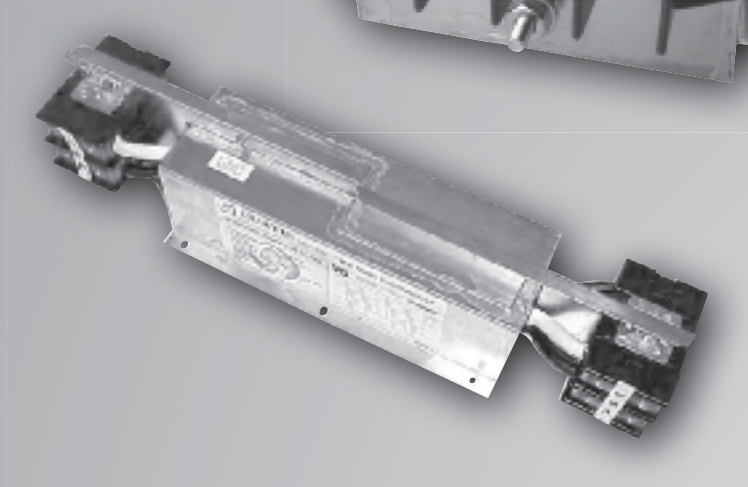
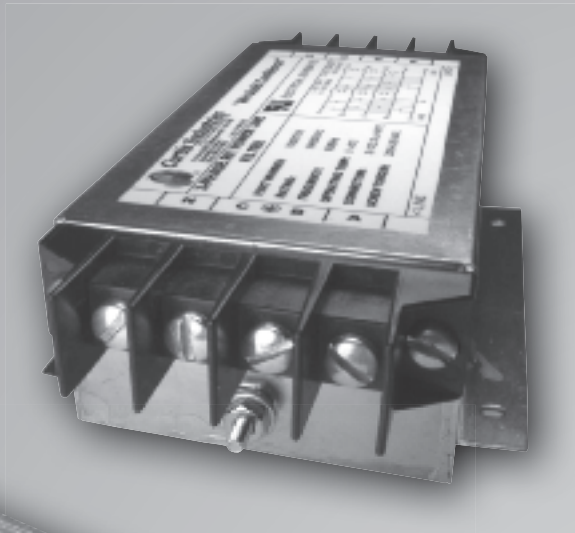
F2700FB



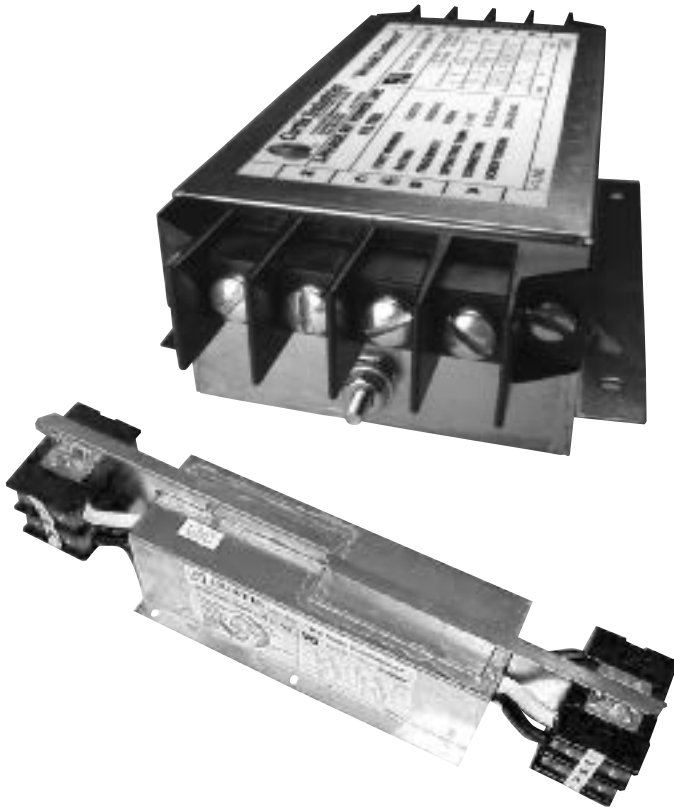
FPE1 Screw Mount Series



THREE-PHASE FILTERS]



Series F3480/F3600



Specifications:

Rated Voltage: 480 VAC - 50/60 Hz
600 VAC - 50/60 Hz

Rated Current: 480 VAC - 9A to 608A
600 VAC - 8A to 600A

Current Overload: 6X for 8 seconds

| Hi-Pot Test (1 min): | 480VAC | 600VAC |
|----------------------|----------|----------|
| Line to Ground | 2210 VDC | 3150 VDC |
| Line to Line | 2780 VDC | 3150 VDC |

Insulation Resistance: 1000 MΩ min. at 250 VDC

Ambient Temperature: 0°C to 40°C (32°F to 104°F)

Humidity Range: 0% to 95% R.H.

Termination:

- Wire
- Terminal Blocks
- Pressure Terminal Blocks

Weight: 3 to 65lbs (1.36 to 29.50kg)

Agency Approvals:

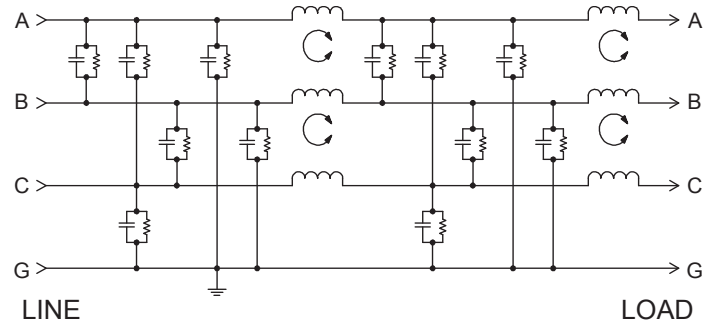


E78454

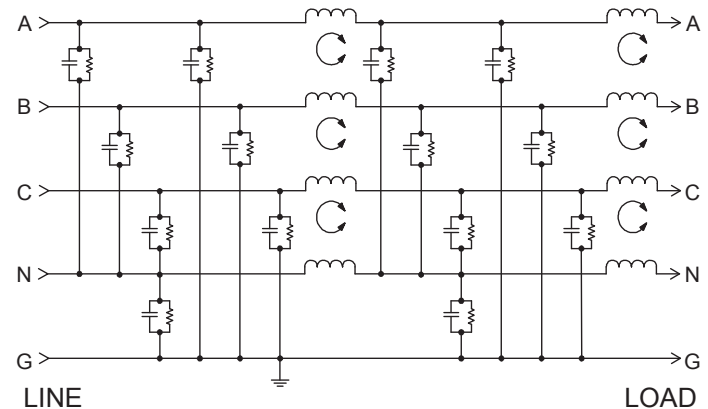
Designed to attenuate conducted interference in a small package providing excellent insertion loss, the F3480/F3600 series filters will provide effective EMC solutions up to 600A at 600VAC and power applications up to 360kVA. With effective noise suppression in the critical 150kHz-30MHz range, this advanced 2-stage filter line will support both Delta and Wye connected loads. Curtis three phase filters are designed to provide EMC solutions in many applications such as:

- Motor
- Motor Control Centers
- Facility Filters
- Uninterruptible Power Supplies
- Power Conditioning Units
- Laser Welders
- Automated Test Equipment
- Robotics
- CNC Machinery
- Elevators
- Industrial Ovens

F3480 Simplified Schematic



F3600 Simplified Schematic



3-Phase Power Line Filters

Ordering Information:

F3600 T 600

3-Phase Series:
 F3480 = 480 VAC
 F3600 = 600 VAC

T = Terminal Blocks
 B = Wire Leads
 A = .250 Q.C. Terminal
 (8 - 50A Only)

Current Rating 008 - 608
 (Refer to Charts)

| F3480 Series - 480 VAC | | | | | | | | | | | | | | | | |
|------------------------|------------------|---------------------------------------|-----------------------------|----|----|----|----|----|----|---------------------|------|-------|-------|-------|------|-----------|
| Rated Current (Amps) | Part Number | Maximum Leakage Each L/G (250V, 60Hz) | Minimum Insertion Loss (dB) | | | | | | | Dimensions (Inches) | | | | | | |
| | | | Frequency (MHz) | | | | | | | A | B | C | D | E | F | G |
| 608A | F3480T608 | 140mA | Frequency (MHz) | | | | | | | 18.75 | 5.25 | 5.93 | 41.25 | 16.00 | 8.00 | .28 x .40 |
| | .15 .5 1 5 10 30 | | | | | | | | | | | | | | | |
| | F3480B608 | | CM | 60 | 70 | 70 | 60 | 45 | 30 | | | | | | | |
| | | | DM | 30 | 40 | 40 | 35 | 30 | 20 | | | | | | | |
| 322A | F3480T322 | 90mA | Frequency (MHz) | | | | | | | 10.50 | 5.25 | 4.63 | 23.50 | 8.00 | 4.00 | .28 x .40 |
| | .15 .5 1 5 10 30 | | | | | | | | | | | | | | | |
| | F3480B322 | | CM | 60 | 70 | 70 | 65 | 55 | 45 | | | | | | | |
| | | | DM | 30 | 40 | 40 | 40 | 35 | 20 | | | | | | | |
| 185A | F3480T185 | 90mA | Frequency (MHz) | | | | | | | 11.25 | 4.12 | 4.25 | 20.25 | 10.00 | 5.00 | .20 x .30 |
| | .15 .5 1 5 10 30 | | | | | | | | | | | | | | | |
| | F3480B185 | | CM | 60 | 70 | 70 | 65 | 55 | 45 | | | | | | | |
| | | | DM | 30 | 35 | 35 | 45 | 40 | 30 | | | | | | | |
| 135A | F3480T136 | 80mA | Frequency (MHz) | | | | | | | 8.50 | 4.12 | 4.25 | 16.00 | 7.00 | 3.50 | .20 x .30 |
| | .15 .5 1 5 10 30 | | | | | | | | | | | | | | | |
| | F3480B136 | | CM | 60 | 65 | 70 | 60 | 50 | 40 | | | | | | | |
| | | | DM | 25 | 35 | 45 | 30 | 30 | 20 | | | | | | | |
| 112A | F3480T112 | 80mA | Frequency (MHz) | | | | | | | 8.50 | 4.12 | 4.25 | 16.00 | 7.00 | 3.50 | .20 x .30 |
| | .15 .5 1 5 10 30 | | | | | | | | | | | | | | | |
| | F3480B112 | | CM | 60 | 65 | 70 | 60 | 50 | 40 | | | | | | | |
| | | | DM | 25 | 35 | 45 | 30 | 30 | 20 | | | | | | | |
| 80A | F3480T080 | 30mA | Frequency (MHz) | | | | | | | 8.50 | 4.12 | 4.25 | 16.00 | 7.00 | 3.50 | .20 x .30 |
| | .15 .5 1 5 10 30 | | | | | | | | | | | | | | | |
| | F3480B080 | | CM | 60 | 70 | 70 | 65 | 55 | 45 | | | | | | | |
| | | | DM | 15 | 25 | 45 | 40 | 40 | 30 | | | | | | | |
| 60A | F3480T060 | 30mA | Frequency (MHz) | | | | | | | 8.50 | 4.12 | 4.25 | 16.00 | 7.00 | 3.50 | .20 x .30 |
| | .15 .5 1 5 10 30 | | | | | | | | | | | | | | | |
| | F3480B060 | | CM | 60 | 70 | 70 | 65 | 55 | 45 | | | | | | | |
| | | | DM | 15 | 25 | 45 | 40 | 40 | 30 | | | | | | | |
| 50A | F3480A050 | 15mA | Frequency (MHz) | | | | | | | 8.00 | 5.12 | 2.25 | -- | 5.00 | -- | .19 x .25 |
| | .15 .5 1 5 10 30 | | | | | | | | | | | | | | | |
| | F3480B050 | | CM | 60 | 75 | 80 | 75 | 70 | 50 | | | | | | | |
| | | | DM | 10 | 40 | 50 | 50 | 50 | 40 | | | 10.10 | | | | |
| 32A | F3480A032 | 7mA | Frequency (MHz) | | | | | | | 8.00 | 5.12 | 2.25 | -- | 5.00 | -- | .19 x .25 |
| | .15 .5 1 5 10 30 | | | | | | | | | | | | | | | |
| | F3480B032 | | CM | 60 | 70 | 80 | 75 | 65 | 45 | | | | | | | |
| | | | DM | 10 | 45 | 50 | 50 | 50 | 40 | | | 10.10 | | | | |
| 16A | F3480A016 | 3mA | Frequency (MHz) | | | | | | | 6.00 | 3.88 | 2.00 | -- | 4.00 | -- | .16 x .20 |
| | .15 .5 1 5 10 30 | | | | | | | | | | | | | | | |
| | F3480B016 | | CM | 50 | 70 | 80 | 75 | 65 | 50 | | | | | | | |
| | | | DM | 10 | 50 | 50 | 40 | 40 | 40 | | | 10.10 | | | | |
| 9A | F3480A009 | 3mA | Frequency (MHz) | | | | | | | 6.00 | 3.88 | 2.00 | -- | 4.00 | -- | .16 x .20 |
| | .15 .5 1 5 10 30 | | | | | | | | | | | | | | | |
| | F3480B009 | | CM | 60 | 80 | 80 | 70 | 60 | 50 | | | | | | | |
| | | | DM | 30 | 45 | 50 | 50 | 50 | 50 | | | 10.10 | | | | |

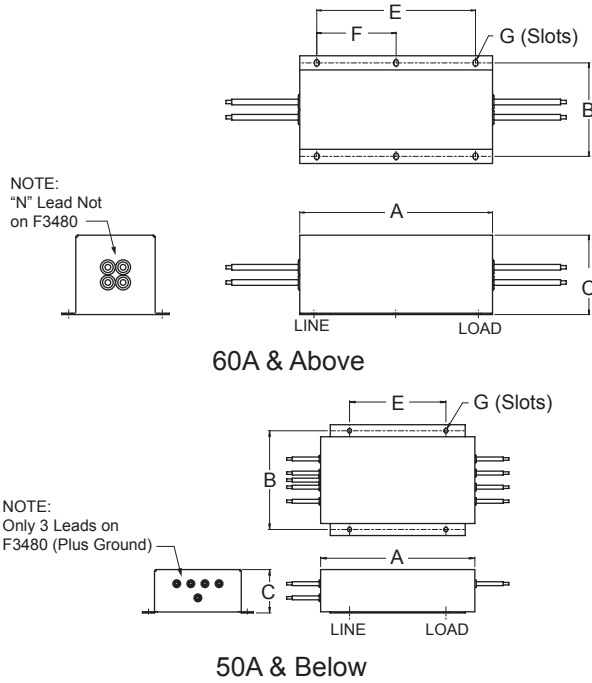
THREE-PHASE FILTERS

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

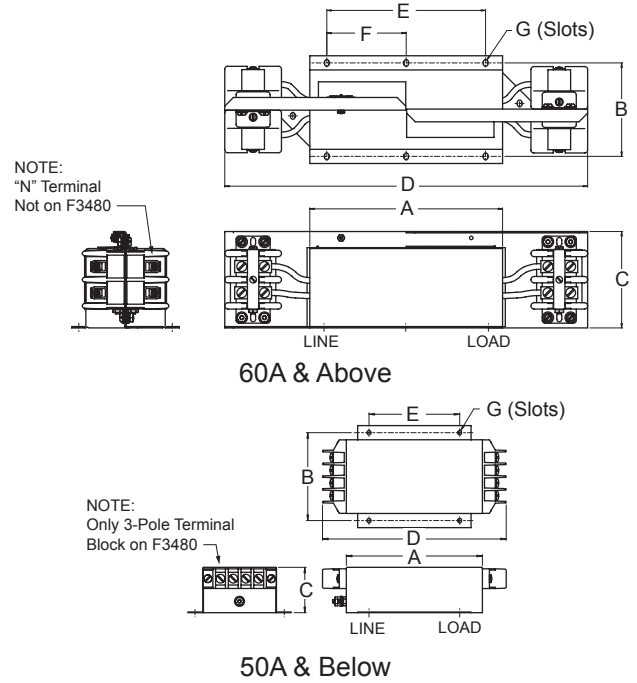


Series F3480/F3600

F3480B & F3600B Dimensions



F3480T & F3600T Dimensions



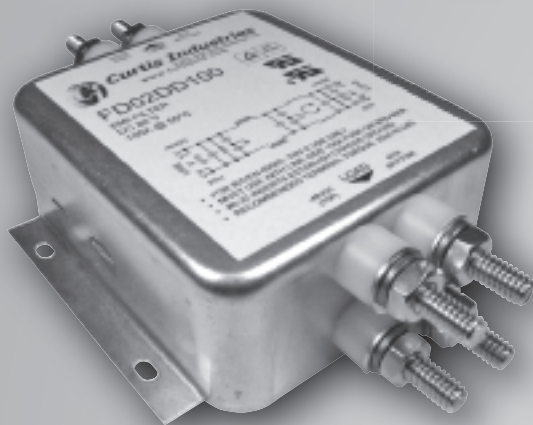
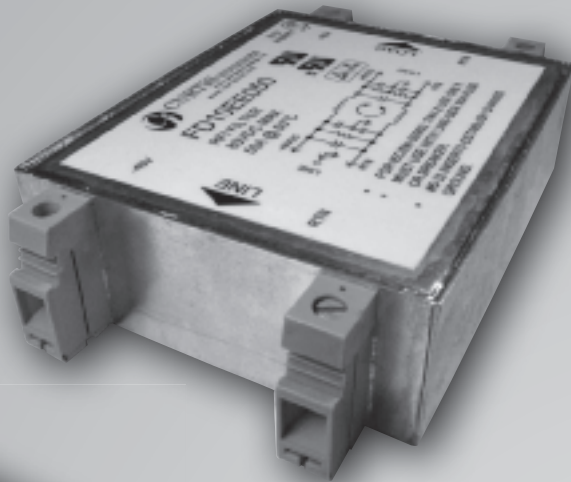
F3600 Series - 600 VAC

| Rated Current (Amps) | Part Number | Maximum Leakage Each L/G (250V, 60Hz) | Minimum Insertion Loss (dB) | | | | | | | Dimensions (Inches) | | | | | | |
|----------------------|-------------|---------------------------------------|-----------------------------|----|----|----|----|----|--|---------------------|------|------|-------|-------|------|-----------|
| | | | Frequency (MHz) | | | | | | | A | B | C | D | E | F | G |
| 600A | F3600T600 | 120mA | Frequency (MHz) | | | | | | | 18.75 | 5.25 | 5.93 | 41.25 | 16.00 | 8.00 | .28 x .40 |
| | CM | | 60 | 60 | 50 | 50 | 40 | 30 | | | | | | | | |
| | DM | | 20 | 35 | 35 | 30 | 25 | 20 | | | | | | | | |
| 300A | F3600T300 | 60mA | Frequency (MHz) | | | | | | | 10.50 | 5.25 | 5.93 | 26.50 | 8.00 | 4.00 | .28 x .40 |
| | CM | | 60 | 60 | 50 | 50 | 40 | 30 | | | | | | | | |
| | DM | | 25 | 30 | 35 | 45 | 30 | 20 | | | | | | | | |
| 180A | F3600T180 | 60mA | Frequency (MHz) | | | | | | | 11.25 | 4.12 | 4.25 | 20.25 | 10.00 | 5.00 | .20 x .30 |
| | CM | | 60 | 60 | 60 | 60 | 50 | 40 | | | | | | | | |
| | DM | | 20 | 30 | 35 | 45 | 40 | 30 | | | | | | | | |
| 80A | F3600T080 | 30mA | Frequency (MHz) | | | | | | | 8.50 | 4.12 | 4.25 | 16.00 | 7.00 | 3.50 | .20 x .30 |
| | CM | | 60 | 60 | 60 | 60 | 50 | 40 | | | | | | | | |
| | DM | | 15 | 25 | 25 | 40 | 40 | 30 | | | | | | | | |
| 45A | F3600A045 | 10mA | Frequency (MHz) | | | | | | | 8.00 | 5.12 | 2.25 | -- | 5.00 | -- | .19 x .25 |
| | CM | | 60 | 60 | 80 | 70 | 60 | 45 | | | | | | | | |
| | DM | | 10 | 10 | 15 | 50 | 40 | 30 | | | | | | | | |
| 25A | F3600A025 | 8mA | Frequency (MHz) | | | | | | | 8.00 | 5.12 | 2.25 | -- | 5.00 | -- | .19 x .25 |
| | CM | | 60 | 60 | 80 | 70 | 60 | 45 | | | | | | | | |
| | DM | | 5 | 5 | 30 | 50 | 40 | 30 | | | | | | | | |
| 16A | F3600A016 | 4mA | Frequency (MHz) | | | | | | | 6.00 | 3.88 | 2.00 | -- | 4.00 | -- | .16 x .20 |
| | CM | | 50 | 70 | 80 | 70 | 60 | 45 | | | | | | | | |
| | DM | | 5 | 5 | 35 | 40 | 40 | 40 | | | | | | | | |
| 8A | F3600A008 | 4mA | Frequency (MHz) | | | | | | | 6.00 | 3.88 | 2.00 | -- | 4.00 | -- | .16 x .20 |
| | CM | | 60 | 70 | 80 | 70 | 60 | 45 | | | | | | | | |
| | DM | | 5 | 10 | 50 | 40 | 40 | 40 | | | | | | | | |



DC FILTERS]

General Purpose High Performance



FD Series Filters



The FD Series of DC filters are designed as a general purpose line of filters for DC applications. They are designed to comply with UL/EN 60950 and UL 1459, CISPER 22 and Telecordia (Bellcore) GR-1089 at 25Amps and above. These filters are available with and without circuit breakers for additional protection.

The FD Series is a compact size that can filter up to 300MHz ideally suited for the telecom-datacom market. The FD0 Series is available from 6Amps to 100Amps in the smallest, economical package. The FD02 is a high frequency filter up to 3GHz (3,000MHz) in a compact package.

These filters are ideally used in communications and central office equipment.

- Power Supplies for Communications Equipment
- Network Routing Equipment
- Switching Equipment
- Base Stations
- Modems
- Services
- Ethernet Hubs



Specifications:

Rated Voltage: 80VDC Maximum

Rated Current: 6A
10A
20A
25A
50A
75A
100A

Current Overload: 6X for 8 seconds

Hi-Pot Rating (1 min):

Line to Ground 1060VDC
Line to Line 100VDC

Insulation Resistance: 1000 MΩ at 80VDC

Ambient Temperature: 0°C to 55°C (32°F to 131°F)

Humidity Range: 0% to 95% R.H.

Termination: See Chart at Right

Wire Leads: 18AWG 6A to 20A (FD0)
(FD0 25Amp to 100Amp not available with wire leads)
10AWG 30Amp (FD1, FD2, FD3)
6AWG 50Amp
4AWG 75Amp & 100Amp

Agency Approvals:

6Amp to 20Amp



25Amp to 100Amp



General Purpose

DC FILTERS

Power Line Filter Selection Guide

FD00 & FD02 SERIES

| FILTER Part Number | Current Rating (Amps) | Termination | | |
|-----------------------|--------------------------|----------------|------------|-------|
| | | Quick Connects | Wire Leads | Studs |
| FD00AA006 | 6 | X | | |
| FD00BB006 | 6 | | X | |
| FD00AA010 | 10 | X | | |
| FD00BB010 | 10 | | X | |
| FD00AA020 | 20 | X | | |
| FD00DD020 | 20 | | | X |
| FD00DD025 | 25 | | | X |
| FD00DD050 | 50 | | | X |
| FD00DD075 | 75 | | | X |
| FD00DD100 | 100 | | | X |
| FD02DD025 | 25 | | | X |
| FD02DD050 | 50 | | | X |
| FD02DD075 | 75 | | | X |
| FD02DD100 | 100 | | | X |

FD1, FD2, FD3 SERIES

| FILTER Part Number | Current Rating (Amps) | Disconnect Type | | | Termination | | | |
|-----------------------|--------------------------|-------------------------------|-------------------------------|-------------------------------|-------------|---------------------------|----------------|-------------------|
| | | Single Pole Rocker Breaker | Double Pole Rocker Breaker | Double Pole Handle Breaker | Wire Leads | High Current Connector | Euro Connector | Dual Stud T-Block |
| FD10BB030 | 30 | | | | X | | | |
| FD10EE030 | 30 | | | | | | X | |
| FD10BB050 | 50 | | | | X | | | |
| FD10EE050 | 50 | | | | | | X | |
| FD10BB075 | 75 | | | | X | | | |
| FD10BB100 | 100 | | | | X | | | |
| FD20B_ _ _ | 30, 50, or 80 | | | | X | | | |
| FD20E_ _ _ | | | | | | | X | |
| FD20R_ _ _ | | X | | | | | | X |
| FD20D_ _ _ | | | X | | | | | X |
| FD20H_ _ _ | | | | X | | | | X |
| FD20_B_ _ _ | | | | | | X | | |
| FD20_C_ _ _ | | | | | | | X | |
| FD20_E_ _ _ | | | | | | | | X |
| FD20_T_ _ _ | | | | | | | | X |
| FD30B_ _ _ | | 30, 50, 75, or 100 | | | | X | | |
| FD30E_ _ _ | | | | | | | X | |
| FD30R_ _ _ | X | | | | | | | X |
| FD30D_ _ _ | | | X | | | | | X |
| FD30H_ _ _ | | | | X | | | | X |
| FD30_B_ _ _ | | | | | | X | | |
| FD30_C_ _ _ | | | | | | | X | |
| FD30_E_ _ _ | | | | | | | | X |
| FD30_T_ _ _ | | | | | | | | X |

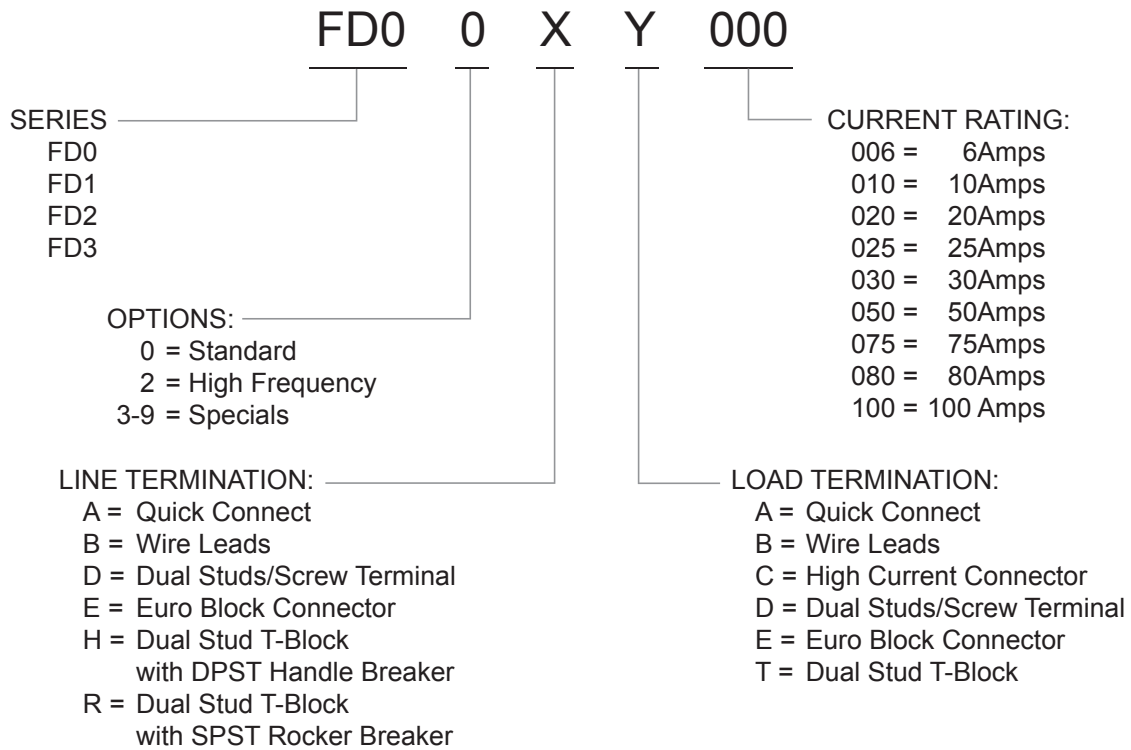
General Purpose

DC FILTERS



FD Series Filters

How to Order



NOTE: Not all terminations are available in all models.

General Purpose

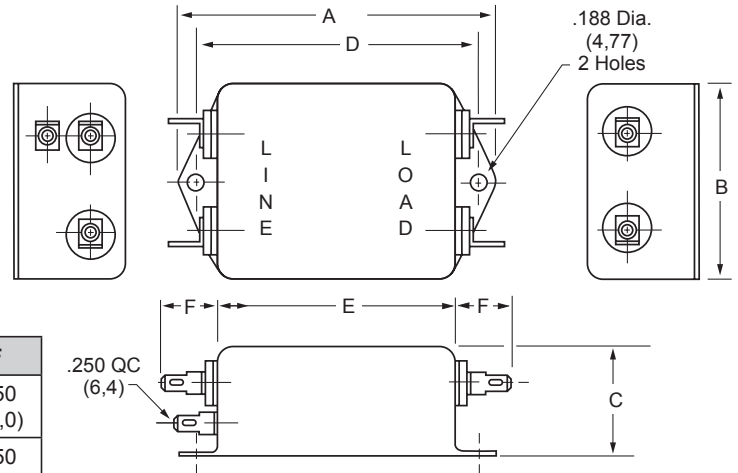
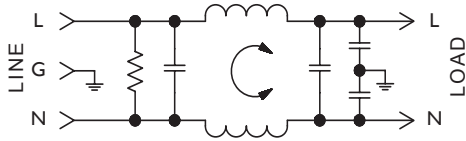
DC FILTERS

| Part Number | TYPICAL INSERTION LOSS - dB (50 ohm Circuit) | | | | | | | | | | | | | |
|--|--|-----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | MODE | Frequency - MHz | | | | | | | | | | | | |
| | | .01 | .03 | .10 | .15 | .50 | 1.0 | 5.0 | 10 | 30 | 100 | 300 | 1000 | 3000 |
| FD00XX006 FD00XX010 FD00XX020 | Common Differential | - | - | - | 10 15 | 22 45 | 30 60 | 42 60 | 47 50 | 40 50 | - | - | - | - |
| FD00XX025 FD00XX050 FD00XX075 FD00XX100 | Common Differential | - | - | - | 22 32 | 50 38 | 60 50 | 50 55 | 45 50 | 40 40 | - | - | - | - |
| FD02XX025 FD02XX050 FD02XX100 | Common Differential | 5 40 | 5 45 | 35 45 | 45 45 | 60 48 | 60 50 | 55 45 | 55 55 | 50 48 | 40 45 | 10 15 | 20 58 | 25 40 |
| FD10XX030 FD10XX050 FD10XX075 FD10XX100 | Common Differential | 5 55 | 15 60 | 48 70 | 60 70 | 65 70 | 65 65 | 60 70 | 60 60 | 55 50 | 25 35 | 25 15 | - | - |
| FD20XX030 FD20XX050 FD20XX080 | Common Differential | 5 55 | 15 65 | 48 70 | 60 65 | 70 60 | 70 65 | 70 55 | 60 50 | 55 45 | - | - | - | - |
| FD30XX030 FD30XX050 FD30XX075 FD30XX100 | Common Differential | 12 50 | 20 60 | 44 70 | 60 70 | 60 70 | 60 70 | 60 55 | 60 70 | 55 60 | - | - | - | - |



FD00 Filters

FD00AA (6, 10 and 20Amp) Dimensions

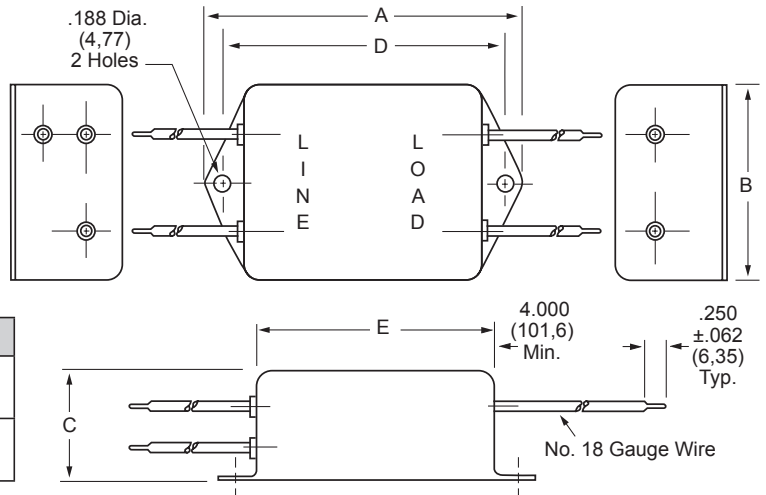


| Amps | A | B | C | D | E | F |
|------|--------------------------------------|-----------------|-----------------|-----------------|-----------------|----------------|
| 6A | 3.312 (84,1) | 2.000 (50,8) | 1.125 (28,5) | 2.940 (74,7) | 2.500 (63,5) | .550 (14,0) |
| 10A | 3.312 (84,1) | 2.000 (50,8) | 1.500 (38,2) | 2.940 (74,7) | 2.500 (63,5) | .550 (14,0) |
| 20A | See FD00DD below for Case Dimensions | | | | | |

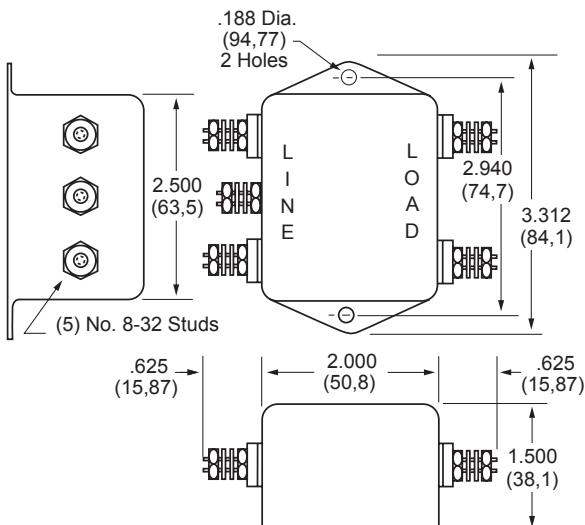
FD00BB

(6 and 10Amp) Dimensions

| Amps | A | B | C | D | E |
|------|-----------------|-----------------|-----------------|------------------|-----------------|
| 6A | 3.312 (84,1) | 2.000 (50,8) | 1.125 (28,5) | 2.940 (74,7) | 2.500 (50,8) |
| 10A | 3.312 (84,1) | 2.000 (50,8) | 1.500 (38,1) | 2.940 (74,70) | 2.500 (50,8) |



FD00DD (20Amp) Dimensions



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



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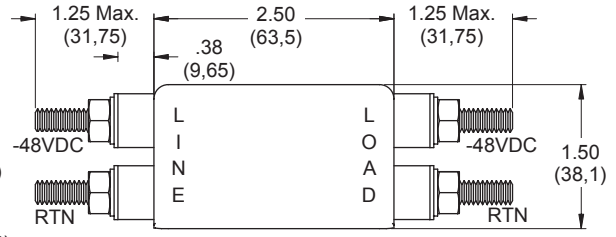
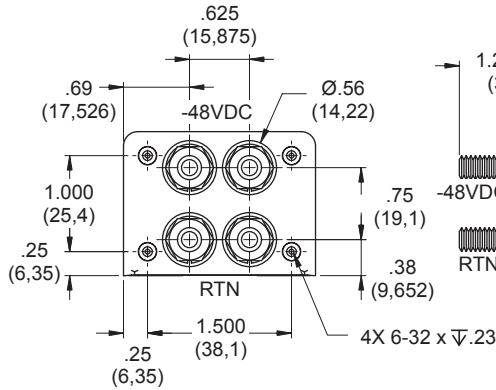
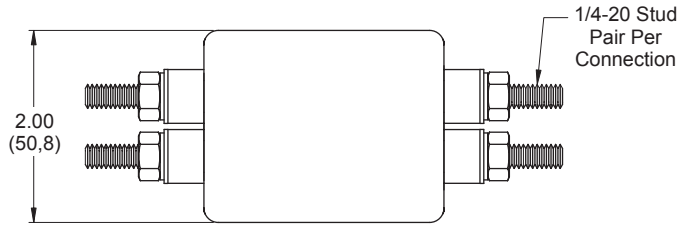
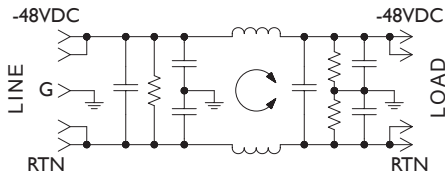
67

General Purpose

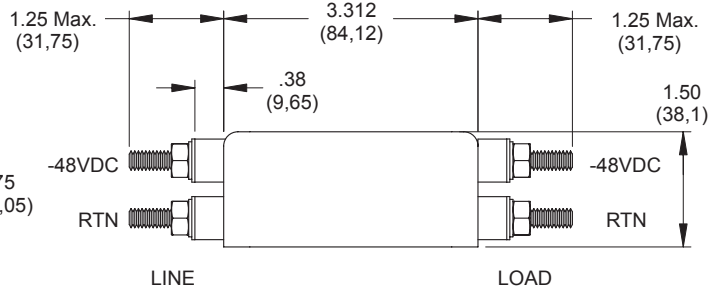
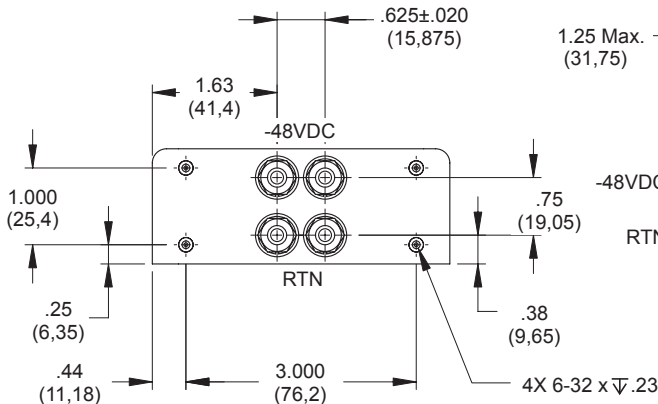
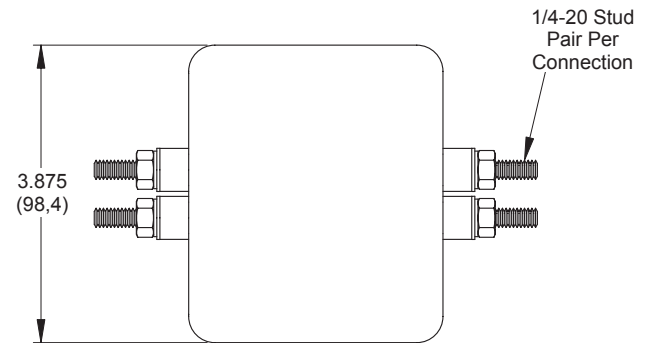
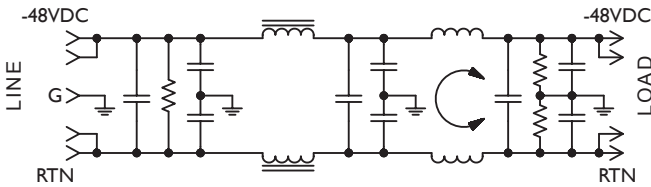
DC FILTERS

FD00 & FD02 Filters

FD00DD (25, 50, 75 and 100Amp) Dimensions



FD02DD (25, 50 and 100Amp) Dimensions



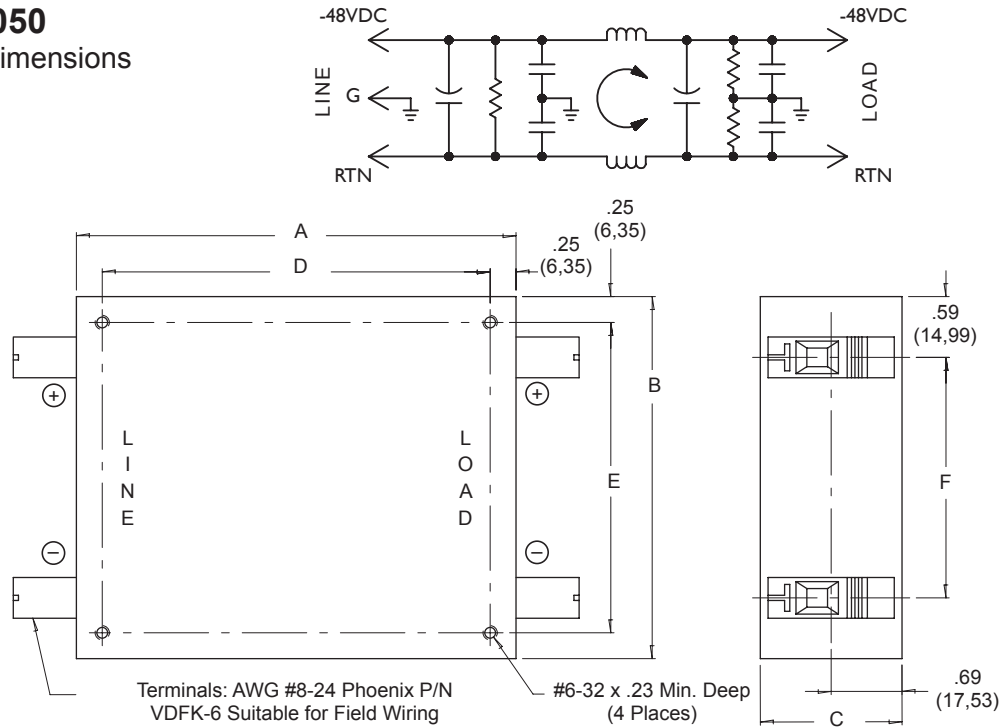
General Purpose

DC FILTERS



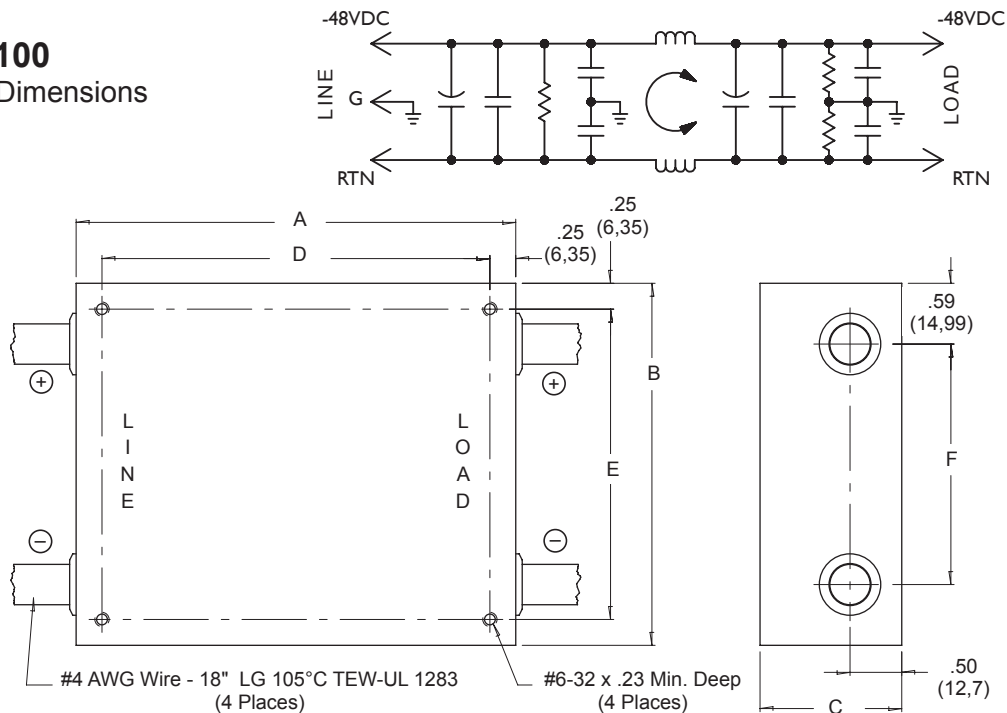
FD1 Filters

FD10EE050 (50Amp) Dimensions



| Amps | A | B | C | D | E | F |
|-----------|------------------|----------------|-----------------|------------------|-----------------|-----------------|
| 30A, 50A | 4.25 (107,95) | 3.50 (88,9) | 1.37 (34,79) | 3.750 (95,25) | 3.000 (76,2) | 2.33 (59,18) |
| 75A, 100A | 4.25 (107,95) | 3.50 (88,9) | 1.37 (34,79) | 3.750 (95,25) | 3.000 (76,2) | 2.33 (59,18) |

FD10BB100 (100Amp) Dimensions



High Performance

DC FILTERS

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



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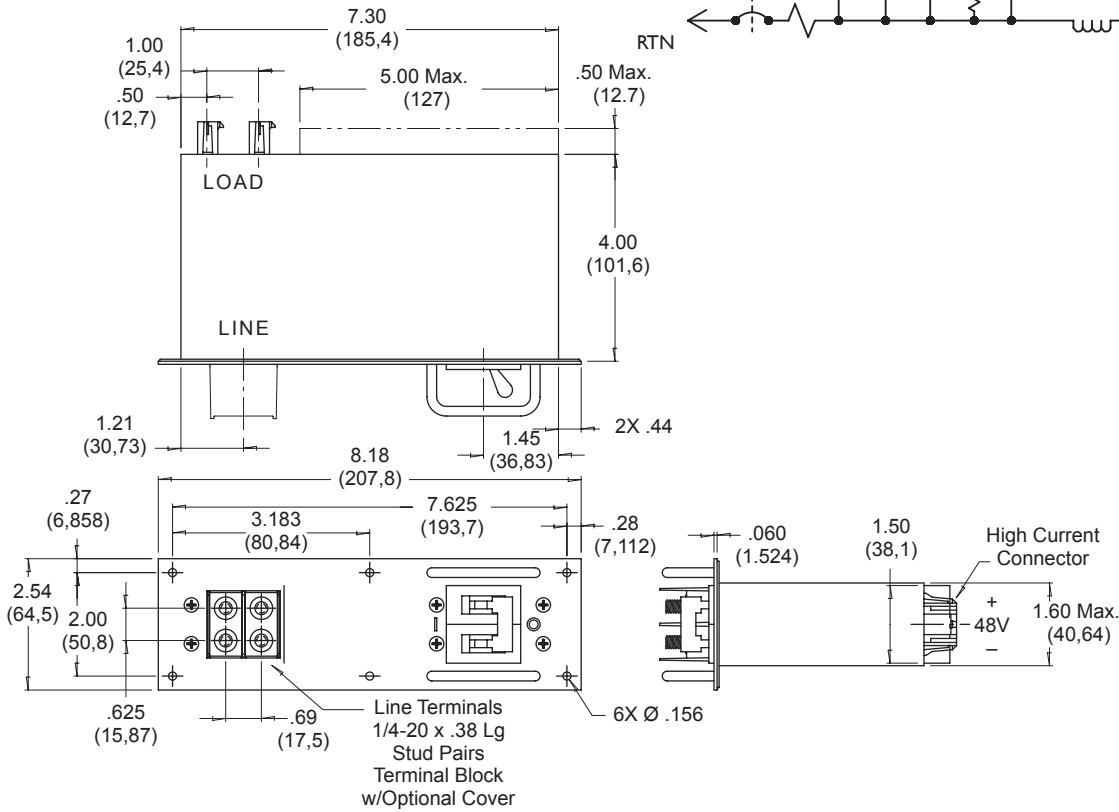
1-800-657-0853

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FD2 & FD3 Filters

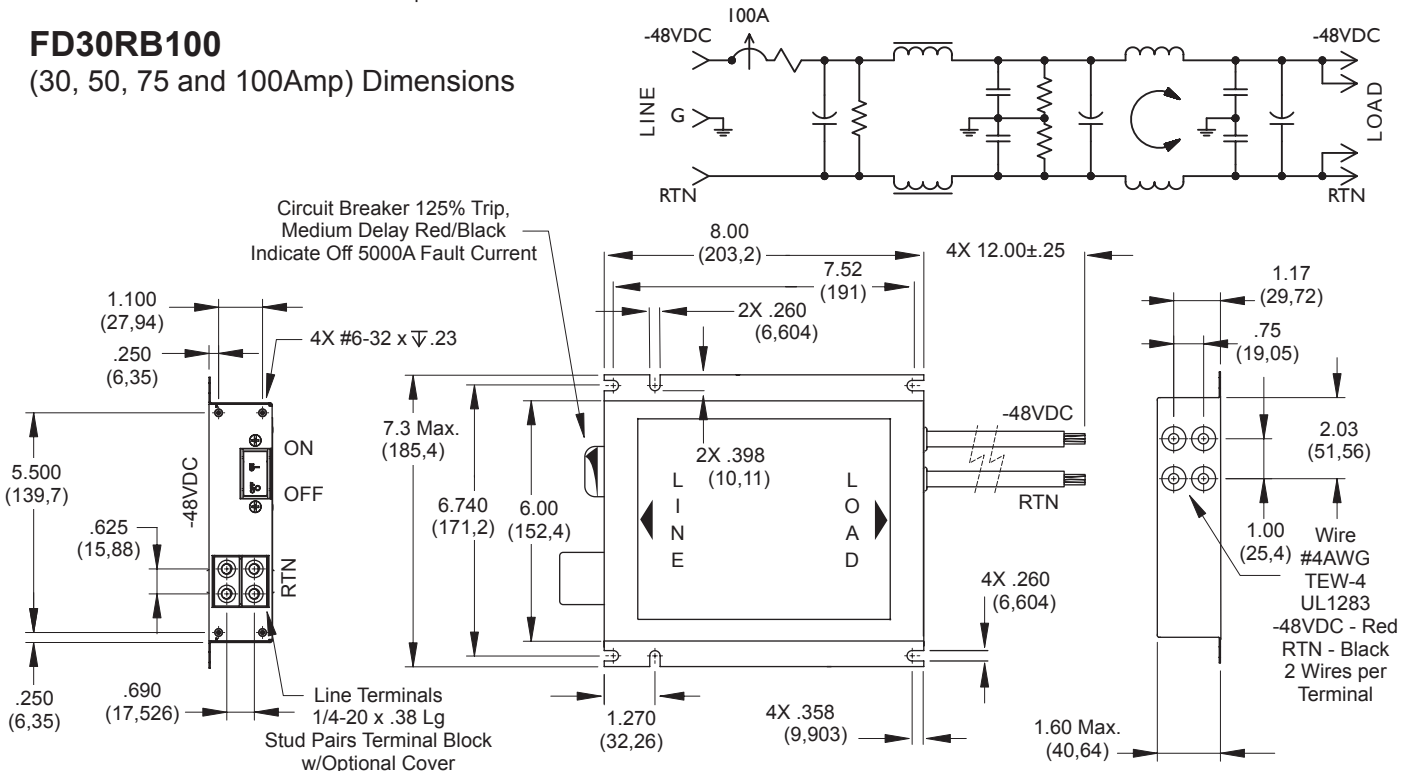
FD20HC080

(30, 50 and 80Amp) Dimensions



FD30RB100

(30, 50, 75 and 100Amp) Dimensions

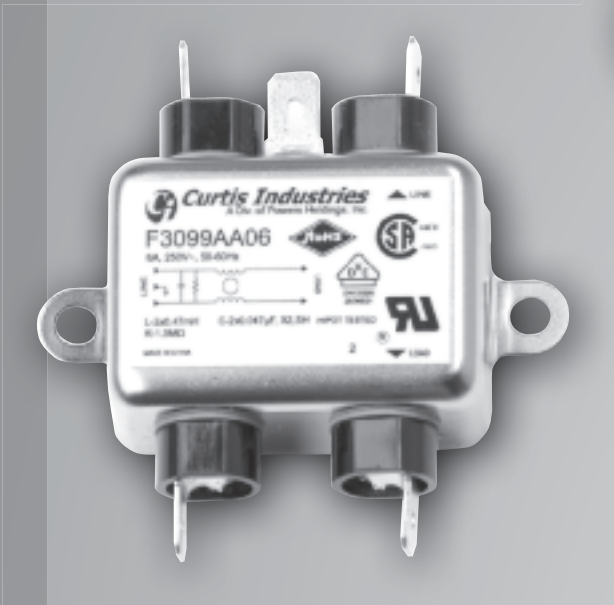
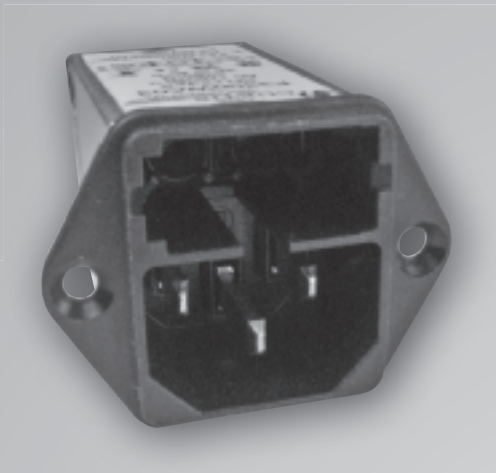


High Performance

DC FILTERS

MEDICAL FILTERS]

General Purpose Combination



F3099 RFI Filters



Specifications:

Maximum Voltage: 250VAC Maximum - 50/60 Hz

Rated Current: 250VAC
6A

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

Line to Ground 1500VAC

Line to Line 1450VDC

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max at rated current

Humidity Range: 0% to 95% R.H.

Termination:

A: Quick Connect

B: Wire

Maximum Leakage Current:

Each Line to Ground **F3099 Series**

115VAC, 60Hz: 2 μ A

250VAC, 50Hz: 5 μ A

Agency Approvals:



E78454



099523



72102892

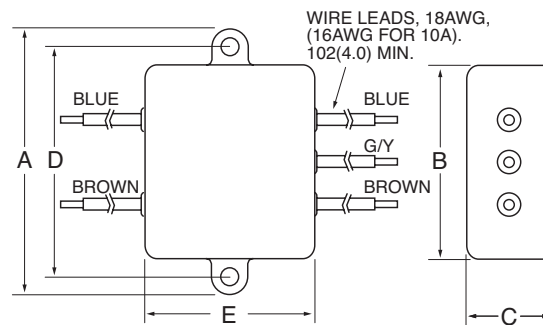
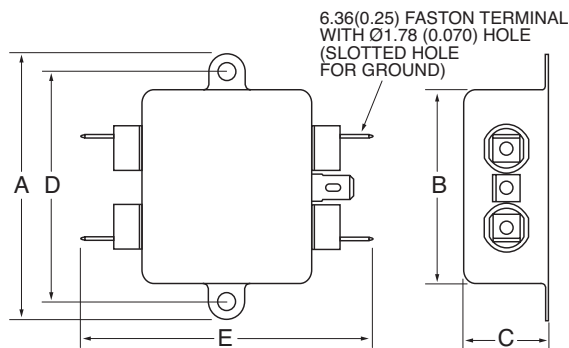
General Purpose Filtered Modules

Features:

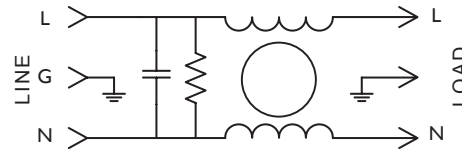
- Designed to Meet UL544 and IEC601 Specifications for Medical and Dental Equipment, both patient care and onpatient categories.
- Leakage current in this series is extremely low to satisfy the stringest leakage current limit imposed by safety regulations for medical and dental equipment.

F3099AA (6Amp) Dimensions

| Amps | A | B | C | D | E |
|------|-----------------|----------------|----------------|-----------------|-----------------|
| 6A | 2.53 (64,30) | 1.82 (46,2) | 0.78 (19,8) | 2.126 (54,0) | 2.53 (64,30) |
| | 2.53 (64,30) | 1.82 (46,2) | 0.78 (19,8) | 2.126 (54,0) | 1.32 (33,5) |



F3099 Series Simplified Schematic



MEDICAL FILTERS

| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | | | | |
|------------------------|------------------------|-----------------------|--|-----------------|------|-----|-----|-----|-----|----|----|--|
| | | | MODE | Frequency - MHz | | | | | | | | |
| | | | | 0.05 | 0.10 | .15 | .50 | 1.0 | 5.0 | 10 | 30 | |
| 6A | F3099AA06 F3099BB06 | QC/QC Wire/Wire | Common | 3 | 7 | 11 | 20 | 22 | 24 | 22 | 18 | |
| | | | Differential | — | 3 | 6 | 14 | 20 | 35 | 35 | 35 | |

F3000/3100/3200/3400/3500 RFI Filters



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current: 115VAC 250VAC
3A 3A
6A 6A

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

Line to Ground 1500VAC
Line to Line 1768VDC

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max at rated current

Humidity Range: 0% to 95% R.H.

Termination:

A: QC – Quick Connect
C: IEC Receptacle

Maximum Leakage Current:

Each Line to Ground **F3000 Series**
115VAC, 60Hz: 2 μ A
250VAC, 50Hz: 5 μ A

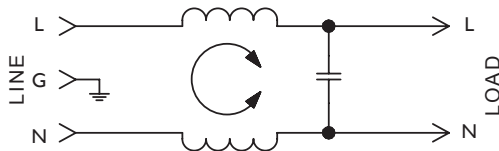
Agency Approvals:



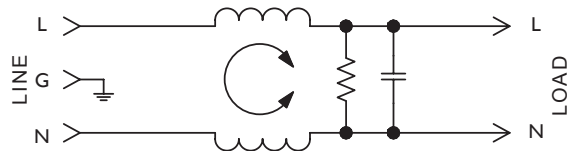
Features:

- Designed to Meet UL544 Specification for Medical and Dental Equipment. Available to UL/IEC 60601 Standard
- F3400/F3500 Have Enhanced Differential Mode Performance
- Effective in Other Low-Leakage Current Applications

F3000/F3100/F3200 Series Simplified Schematic



F3400/F3500 Series Simplified Schematic



| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | |
|------------------------|-------------------------------------|---------------------------|--|-----------------|-----|-----|-----|----|----|
| | | | MODE | Frequency - MHz | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 3A | F3400CA03 F3500CA03 | IEC/QC IEC/QC | Common | 22 | 32 | 35 | 30 | 25 | 20 |
| | | | Differential | 8 | 18 | 24 | 35 | 35 | 35 |
| 6A | F3000AA06 F3100CA06 F3200CA06 | QC/QC IEC/QC IEC/QC | Common | 10 | 20 | 23 | 25 | 23 | 15 |
| | | | Differential | | 2 | 8 | 32 | 34 | 23 |
| | | | Common | 15 | 21 | 24 | 24 | 22 | 26 |
| | Differential | 8 | 18 | 24 | 35 | 35 | 35 | | |

NOTE: Other combinations of terminals may be specified on special order.

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



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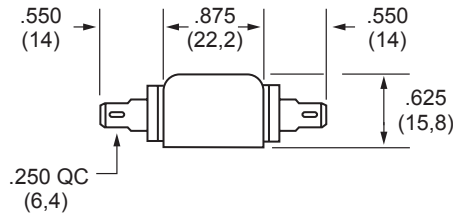
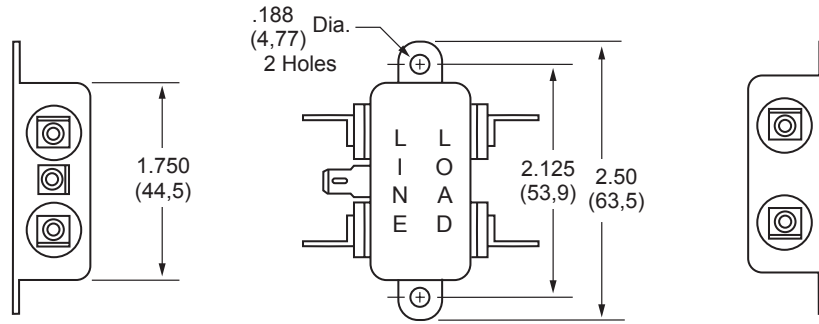
General Purpose Filtered Modules

MEDICAL FILTERS

F3000/3100/3200/3400/3500 (continued)

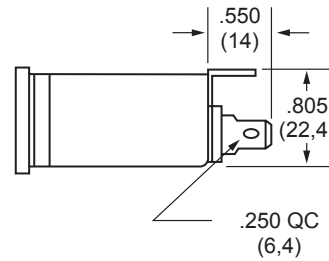
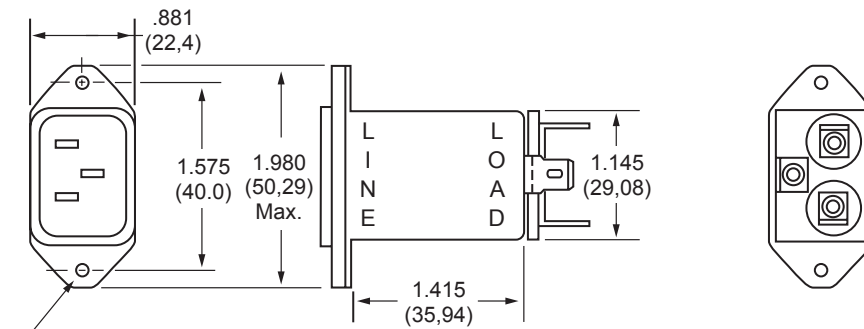
General Purpose Filtered Modules

F3000AA (6Amp) Dimensions

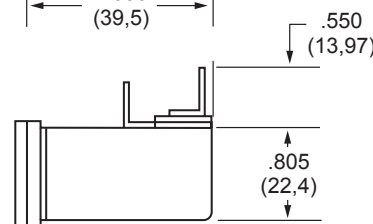
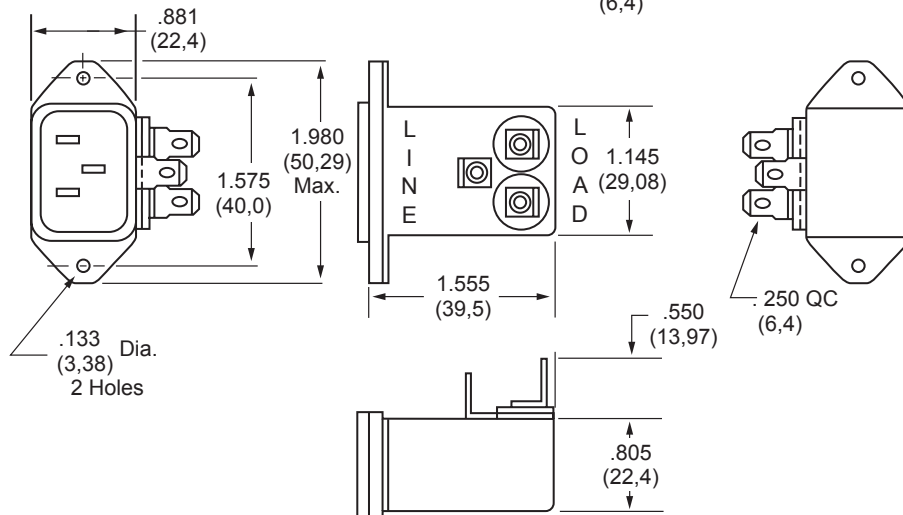


F3100CA (6Amp) F3400CA (3 and 6Amp) Dimensions

Refer to Page 58
for Standard
Mounting Cutouts



F3200CA (6Amp) F3500CA (3 and 6Amp) Dimensions



MEDICAL FILTERS

F3300 RFI Filters



Features:

- General Purpose “L-Type” Circuit Effective in Reducing Both Incoming and Outgoing Powerline Noise Levels in FCC “A” Applications
- Integral 5 X 20mm Single or Dual Fused IEC Connector
- Optional SST Switched IEC Connector
- Low-Leakage
- Available to UL/IEC 60601 Standard and Meets UL 544 Specification for Medical and Dental Applications
- Available in Labor-Saving PC Mounted Case Style

Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current: 115VAC 250VAC
 3A 3A
 6A 6A

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

Line to Ground 1500VAC
 Line to Line 1768VDC

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at Rated Current

Humidity Range: 0% to 95% R.H.

Termination:

- A: QC – Quick Connect
- F: Fused IEC
- J: Switched IEC
- P: PCB Pins
- W: Dual Fused IEC

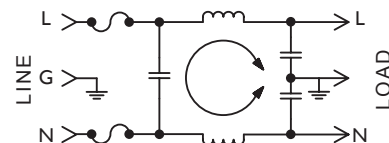
Maximum Leakage Current:

Each Line to Ground **F3300**
 115VAC, 60Hz: .015mA
 250VAC, 50Hz: .025mA

Agency Approvals:



F3300F Simplified Schematic



| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | |
|------------------------|------------------------|--|--|-----------------|-----|-----|-----|----|----|
| | | | MODE | Frequency - MHz | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 3A | F3300FA03 F3300FP03 | Fused IEC/QC Fused IEC/PC | Common | 21 | 32 | 36 | 30 | 28 | 28 |
| | | | Differential | 8 | 18 | 24 | 35 | 35 | 35 |
| 6A | F3300FA06 F3300FP06 | Fused IEC/QC Fused IEC/PC | Common | 18 | 30 | 34 | 26 | 25 | 25 |
| | | | Differential | 8 | 18 | 24 | 35 | 35 | 35 |
| 3A | F3300WA03 F3300WP03 | Dual Fused IEC/QC Dual Fused IEC/PC | Common | 21 | 32 | 36 | 30 | 28 | 28 |
| | | | Differential | 8 | 18 | 24 | 35 | 35 | 35 |
| 6A | F3300WA06 F3300WP06 | Dual Fused IEC/QC Dual Fused IEC/PC | Common | 18 | 30 | 34 | 26 | 25 | 25 |
| | | | Differential | 8 | 18 | 24 | 35 | 35 | 35 |
| 3A | F3300JA03 F3300JP03 | Switched IEC/QC Switched IEC/PC | Common | 21 | 32 | 36 | 30 | 28 | 28 |
| | | | Differential | 8 | 18 | 24 | 35 | 35 | 35 |
| 6A | F3300JA06 F3300JP06 | Switched IEC/QC Switched IEC/PC | Common | 18 | 30 | 34 | 26 | 25 | 25 |
| | | | Differential | 8 | 18 | 24 | 35 | 35 | 35 |

NOTE: Other combinations of terminals may be specified on special order.

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



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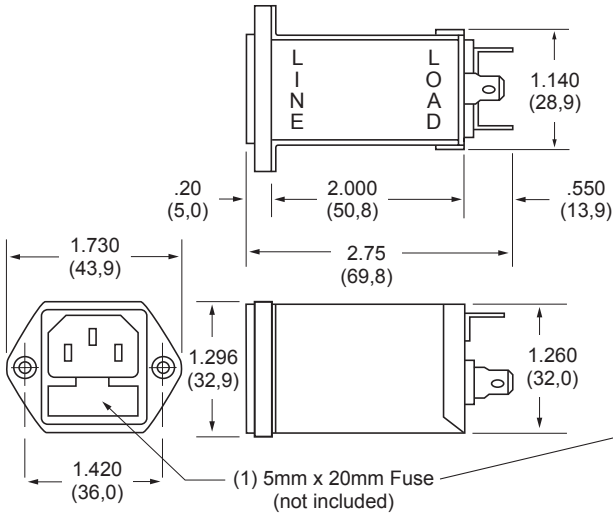
1-800-657-0853

General Purpose Filtered Modules

MEDICAL FILTERS

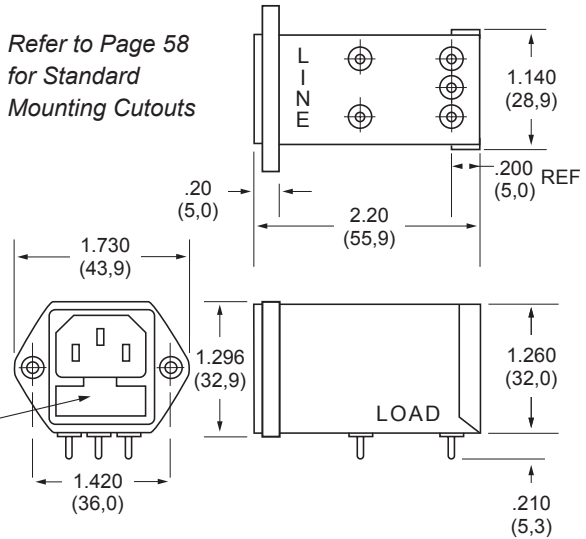
F3300 Series (continued)

F3300FA (3 and 6Amp) Dimensions



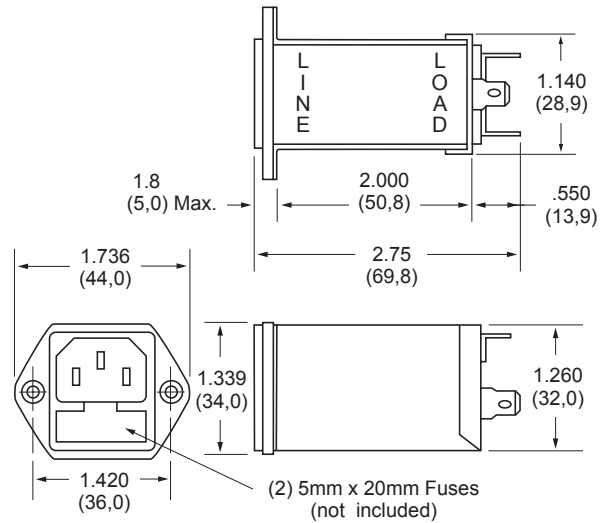
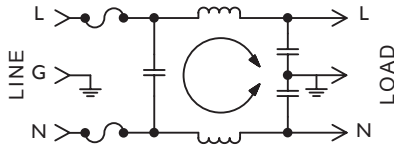
F3300FP (3 and 6Amp) Dimensions

Refer to Page 58 for Standard Mounting Cutouts



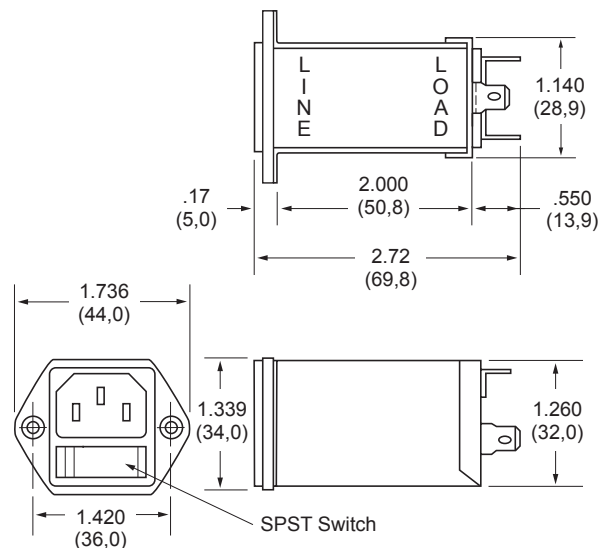
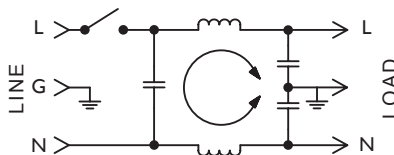
F3300WA (3 and 6Amp) Dimensions

F3300W Simplified Schematic



F3300JA (3 and 6Amp) Dimensions

F3300J Simplified Schematic



FPM7/FPM8 Series



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current: 115VAC 250VAC
3A 3A
6A 6A

Current Overload: 6X for 8 Seconds

Hi-Pot Test (1 min):

Line to Ground 1500VAC
Line to Line 1768VDC

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max. at Rated Current

Humidity Range: 0% to 95% R.H.

Termination:

- IEC Receptacle
- Wire Wrap/Solder

Maximum Leakage Current:

Each Line to Ground **FPM7, FPM8**
115VAC, 60Hz: 0.002mA
250VAC, 50Hz: 0.005mA

Voltage Select Card: Installed in 120VAC position unless otherwise specified

Agency Approvals:

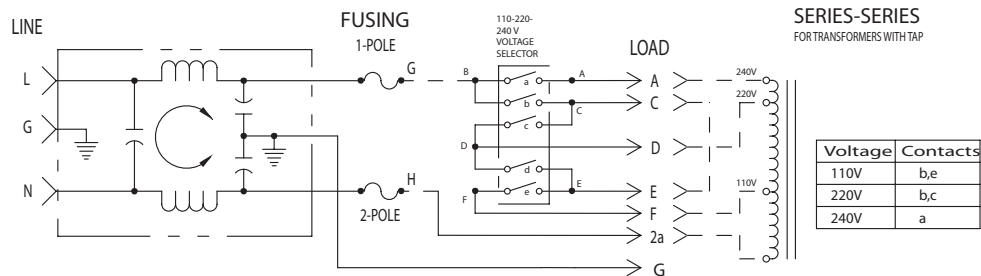


Refer to Page 80 for Ordering Instructions

Features:

- RFI Filter Module Combines IEC Connector, Fusing, and Voltage Select Features in One Unit
- FPM7 Series Filters Provide 20% More Differential Mode Attenuation Than Comparable Units
- Accepts Either U.S. or European Standard Fuse Sizes
- Available to UL/IEC 60601 Standard and Meets UL 544 Specification for Medical and Dental Applications

FPM7 Series Simplified Schematic



| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | |
|------------------------|------------------------|-----------------------|--|-----------------|-----|-----|-----|----|----|
| | | | MODE | Frequency - MHz | | | | | |
| | | | | .15 | .50 | 1.0 | 5.0 | 10 | 30 |
| 3A | FPM7XXX03 FPM8XXX03 | IEC/Solder Tabs | Common | 14 | 20 | 22 | 24 | 22 | 15 |
| | | | Differential | 8 | 18 | 24 | 46 | 50 | 40 |
| 6A | FPM7XXX06 FPM8XXX06 | IEC/Solder Tabs | Common | 10 | 15 | 18 | 18 | 18 | 15 |
| | | | Differential | 8 | 18 | 24 | 39 | 40 | 40 |

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



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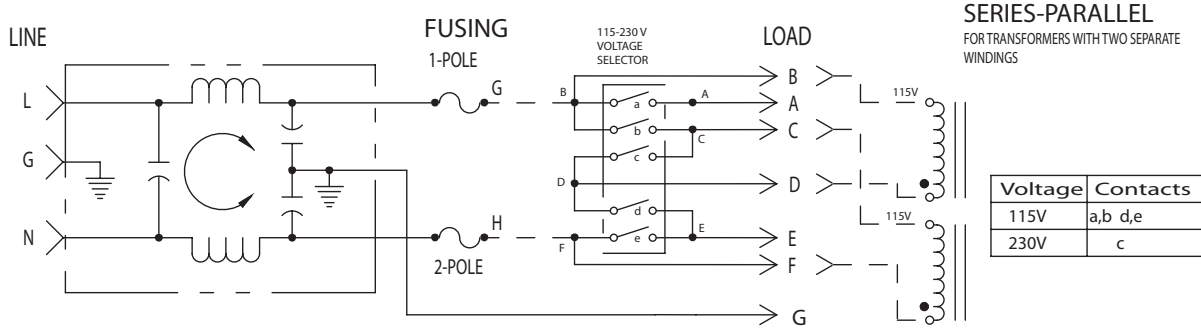
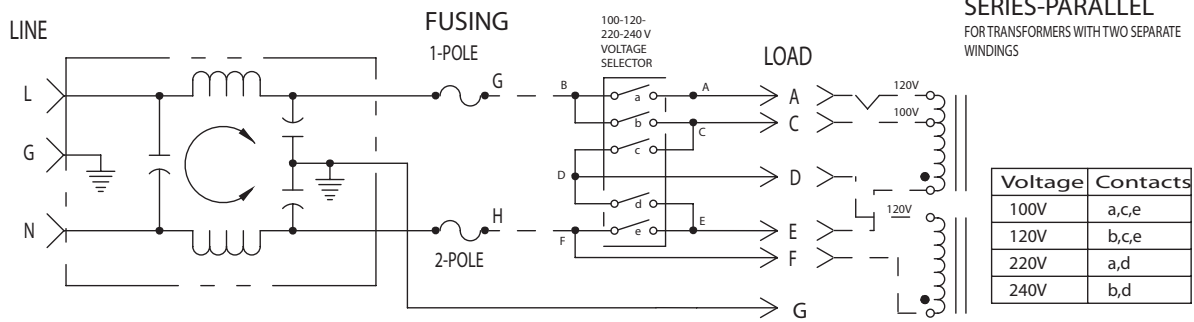
1-800-657-0853

General Purpose Filtered Modules

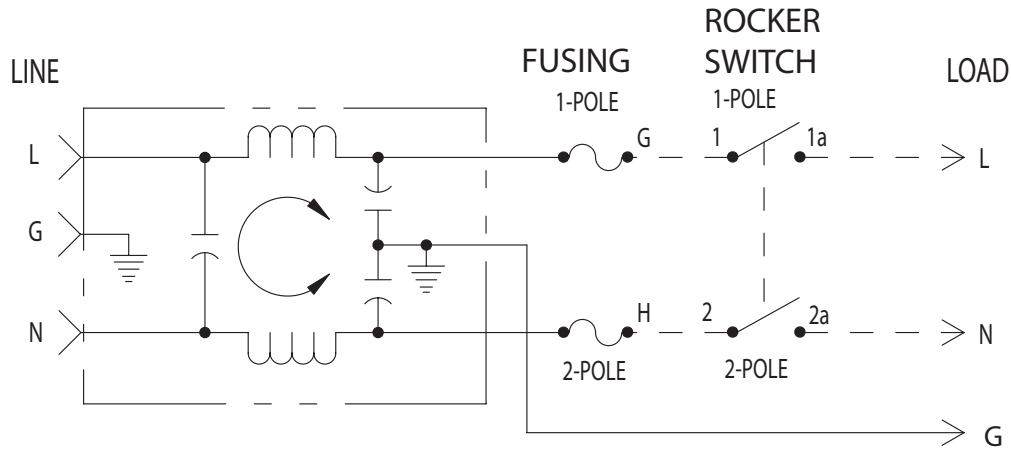
MEDICAL FILTERS

FPM7/FPM8 Series (continued)

FPM7 Series Simplified Schematic



FPM8 Series Simplified Schematic

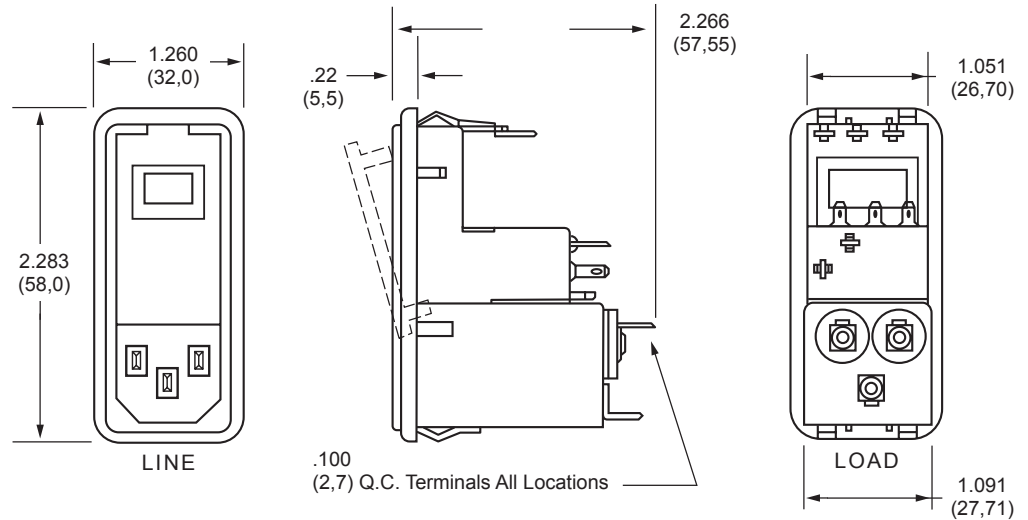


Combination

MEDICAL FILTERS

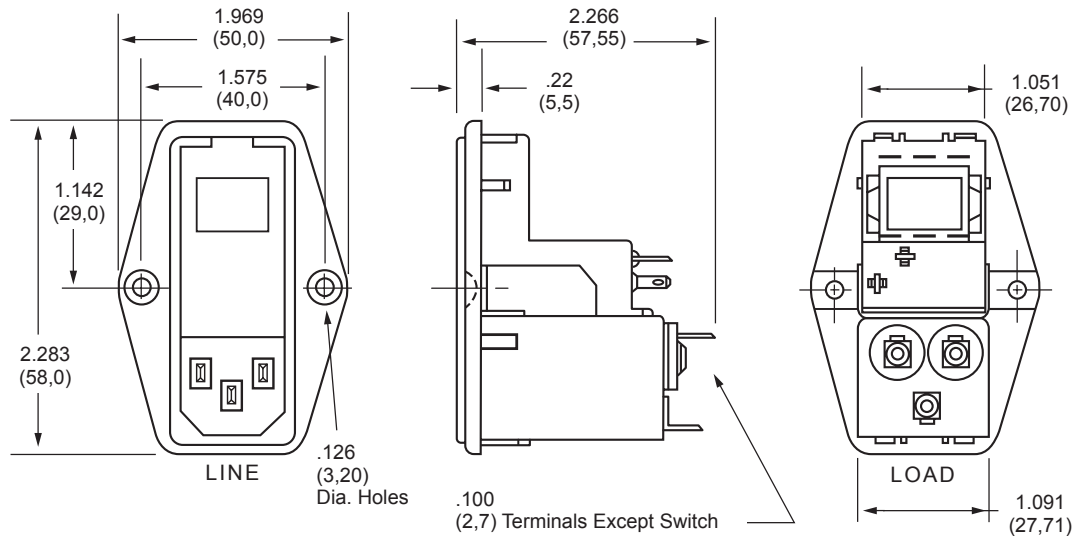
FPM7/FPM8 Snap-Mount Series (3 and 6Amp) Dimensions

Refer to Page 80
for Standard
Mounting Cutouts



FPM7/FPM8 Screw-Mount Series (3 and 6Amp) Dimensions

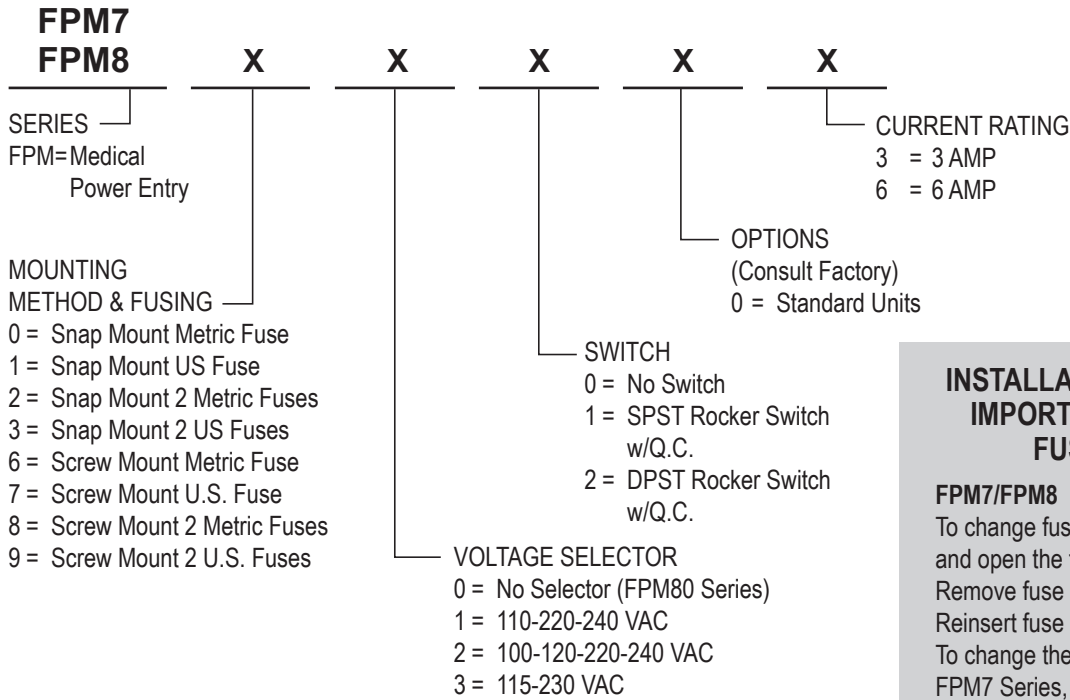
Refer to Page 80
for Standard
Mounting Cutouts



FPM7/FPM8 Series *(continued)*



How to Order



INSTALLATION INSTRUCTION IMPORTANT – CHANGING FUSE/VOLTAGE

FPM7/FPM8

To change fuse, remove power cord and open the front cover on the module. Remove fuse holder and replace fuse. Reinsert fuse holder and close cover. To change the operating voltage on the FPM7 Series, remove the power cord and open front cover. Rotate voltage select wheel until desired voltage appears in window of cover.

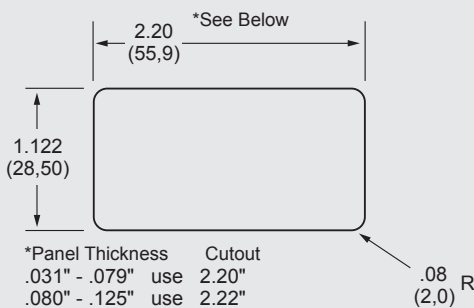
- Filter shipped without fuse.

Always use caution when selecting and changing fuses and voltage requirements. Curtis Industries is not responsible for malfunction due to improper installation/selection of fuse and/or voltage select.

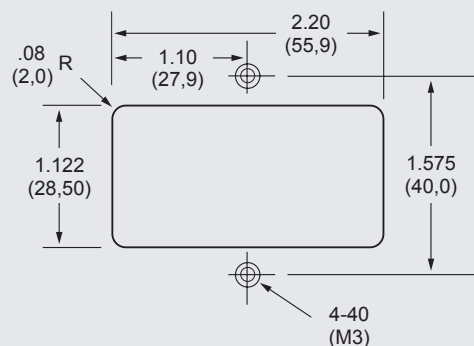
Combination

MEDICAL FILTERS

FPM7/FPM8 Snap-Mount Series



FPM7/FPM8 Screw Mount Series

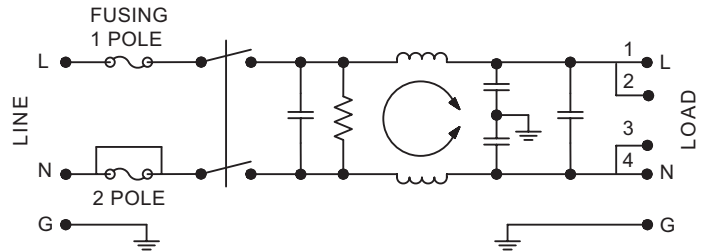




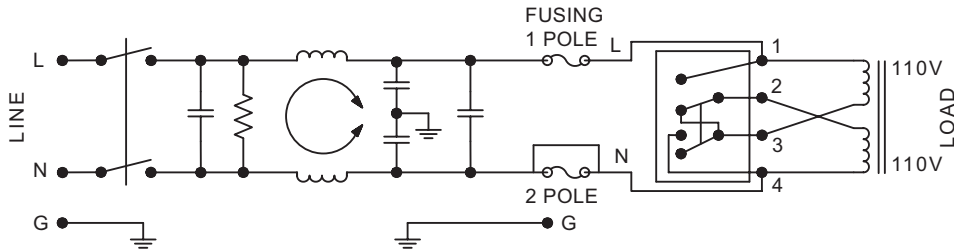
Features:

- RFI Filter Module Combines IEC Connector, Fusing, Optional Voltage Select and On/Off Switch into a Single, Space-Efficient Assembly
- Enhanced Low Frequency Response with No Resonant Peaks
- Fully Shielded for Radiative Noise Control
- Accepts Either U.S. or European Standard Fuse Sizes. Dual or Single Power Line Fusing
- Meets IEC 60601 Standard and Meets UL 544 Specification for Medical and Dental Applications

FPM1 Series Simplified Schematic without Voltage Selector



FPM1 Series Simplified Schematic with Voltage Selector



Specifications:

Rated Voltage: 250VAC Maximum - 50/60 Hz

Rated Current: 115VAC 250VAC
10A 10A

Current Overload: 6X for 8 seconds

Hi-Pot Test (1 min):

Line to Ground 1500VAC
Line to Line 2250VDC

Insulation Resistance: $9 \times 10^9 \Omega$ at 100VDC

Ambient Temperature: 40°C Max at rated current

Humidity Range: 0% to 95% R.H.

Termination:

- QC – Quick Connect
- IEC Receptacle

Maximum Leakage Current:

| Each Line to Ground | PM1 | PM1-PO |
|---------------------|---------|---------|
| 115VAC, 60Hz: | 0.002mA | 0.015mA |
| 250VAC, 50Hz: | 0.005mA | 0.025mA |

Voltage Select Card: Installed in 120VAC position unless otherwise specified

Agency Approvals:



Combination

MEDICAL FILTERS

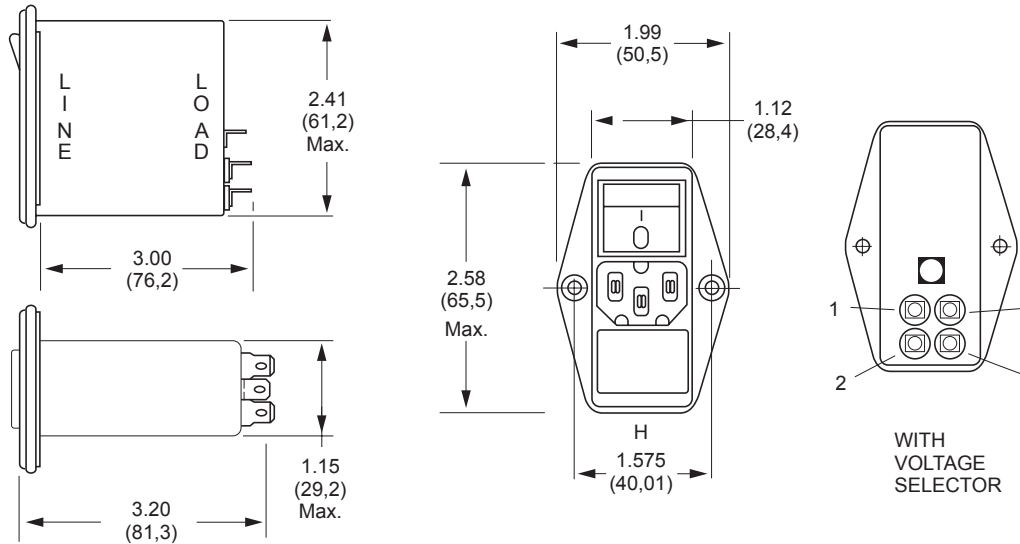
| Nominal Current Rating | Part Number | Termination Line/Load | MINIMUM INSERTION LOSS - dB (50 ohm Circuit) | | | | | | | | |
|------------------------|-------------|-----------------------|--|-----------------|-----|-----|-----|-----|----|----|----|
| | | | MODE | Frequency - MHz | | | | | | 10 | 30 |
| | | | | .05 | .15 | .50 | 1.0 | 5.0 | | | |
| 10A | FPM1XXX10 | IEC/QC | Common | 10 | 20 | 30 | 33 | 25 | 20 | 15 | |
| | | | Differential | 10 | 20 | 30 | 35 | 55 | 60 | 55 | |
| | FPM1XXXP0 | IEC/QC | Common | 12 | 23 | 30 | 35 | 25 | 25 | 30 | |
| | | | Differential | 10 | 20 | 30 | 35 | 65 | 65 | 55 | |

NOTE: Other combinations of terminals may be specified on special order.

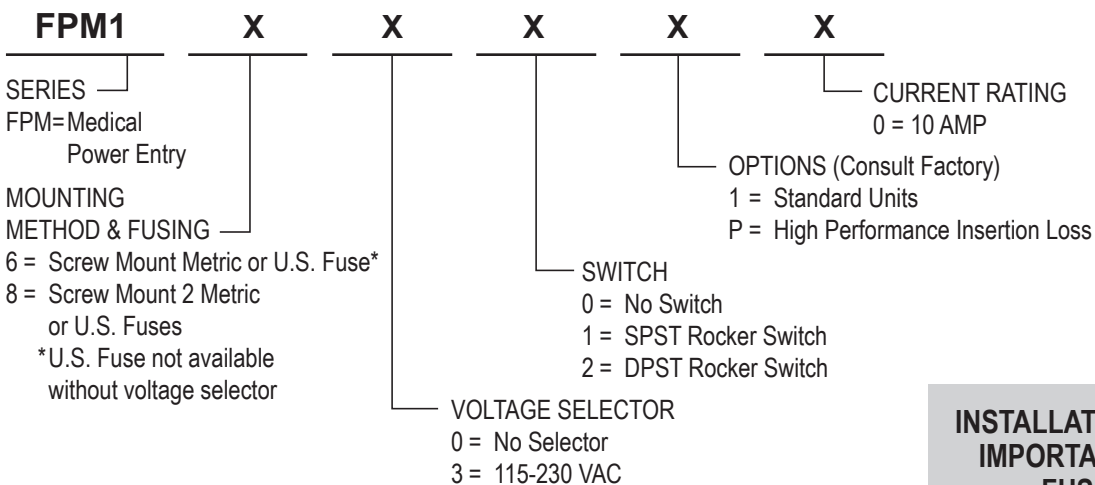


FPM1 Series (continued)

FPM1 (10Amp) Dimensions



How to Order



INSTALLATION INSTRUCTION IMPORTANT – CHANGING FUSE/VOLTAGE

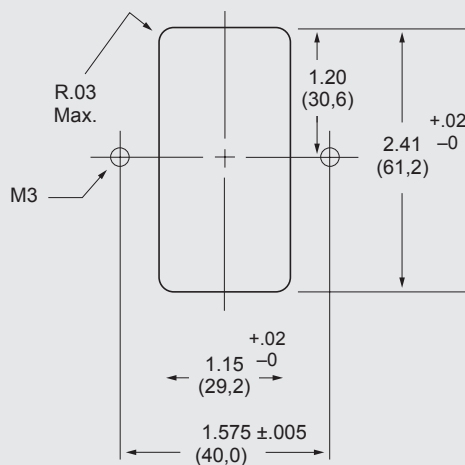
FPM1

To change fuse, remove power cord. Remove voltage selector and replace fuse. Reinsert fuse holder. To change the operating voltage on the FPM1 Series, remove the power cord and rotate fuse holder block until desired voltage aligns with the mark on the module housing.

- Filter shipped without fuse.

Always use caution when selecting and changing fuses and voltage requirements. Curtis Industries is not responsible for malfunction due to improper installation/selection of fuse and/or voltage select.

FPE1 Screw Mount Series



Combination

MEDICAL FILTERS

TECHNICAL CONSIDERATIONS]

Understanding Terminology

Technical Considerations

Conducted Emissions Testing

Custom Filter Capabilities



Understanding Terminology

Curtis Industries, a leading manufacturer of superior-quality electronic and electrical components and assemblies for more than 70 years, offers a complete line of RFI power line filters designed to help your equipment meet FCC and CE requirements on conducted EMI.

Radio frequency interference (RFI) is unwanted noise generated by a wide variety of electronic and electrical devices. Governments of most industrial

countries, including the United States, Canada and the European Union have enacted guidelines on emitted RFI.

Curtis designs quality into every product and then tests for quality by specification compliance, including hipot, component value, grounding and leakage, on a 100% production basis. We employ a rigorous component qualification program with thorough incoming and on-line inspection procedures. Our computer-controlled 100% safety and performance testing to demanding customer requirements is your assurance of the highest quality RFI filters available today.

This section provides you with some basic knowledge on terminology and technical information helpful in solving your noise emission in power circuits. For additional information visit our website at www.curtisind.com.



Definitions

Attenuation: The decrease in intensity or absorption of electromagnetic energy. Expressed in dB.

Conducted Interference: Electromagnetic signals entering a device through direct connection.

Emissions: The level of electromagnetic disturbances equipment causes to its environment.

Filter: Remove electrical noise or interference from the power line by cleaning up the sine wave.

Immunity: The level to which equipment is immune to electromagnetic disturbances in its environment

Impedance: Opposition to the flow of electrical current when a given voltage is applied.

Inductor: Passive component that produces a voltage proportional to the change in current. Measured in Henrys.

Insertion Loss: The electromagnetic signal loss resulting from the insertion of a filter in a transmission line. Expressed in dB.



What is RFI?

Radio frequency interference (RFI) is the radiation or conduction of radio frequency energy (or electronic noise) produced by electrical and electronic devices at levels that interfere with the operation of adjacent equipment. Frequency ranges of most concern are 10 kHz to 30 MHz (conducted) and 30 MHz to 1 GHz (radiated).

What causes RFI?

The most common sources include components such as switching power supplies, relays, motors and triacs. These devices are found in a wide variety of equipment used in industrial, medical, white goods, and building HVAC equipment.

What are the types of RFI?

An electrical or electronic device emits RFI in two ways:

- **Radiated RFI** is emitted directly into the environment from the equipment itself.
- **Conducted RFI** is released from components and equipment through the power line cord into the AC power line network. This conducted RFI can affect the performance of other devices on the same network.

How can RFI be controlled?

- **Radiated RFI** is usually controlled by providing proper shielding in the enclosure of the equipment.
- **Conducted RFI** can be attenuated to satisfactory levels by including a power line filter in the system.

The filter suppresses conducted noise leaving the unit, reducing RFI to acceptable levels. It also helps to lower the susceptibility of the equipment to incoming power line noise that can affect its performance.

What is the government's role in regulating RFI?

Governments and safety agencies of major industrial countries, including the United States, Canada, and the European Union have established noise emission regulations that are focused on digital and other electronic equipment. The most important of these guidelines are FCC CFR 47 (Parts 15 and 18) in the United States and CISPR 11, 14 and 22 in the European Union.

FCC CFR 47 (Part 15) regulates the RF

interference of electronic computing devices, defined as any electronic device or system that generates and uses timing signals or pulses at a rate in excess of 10,000 pulses (cycles) per second and uses digital techniques. This definition includes telephone equipment that utilizes digital techniques and any device or system that generates and uses radio frequency energy for the purpose of performing data-processing functions such as electronic computations, operations, transformations, recording, filing, sorting, storage, retrieval or transfer.

FCC regulations are broken down into **Class A** computing devices marketed for use in commercial, industrial or business environments, and **Class B** devices intended for use in a residential environment.

The European Union has harmonized the various national regulations and has established the international standards CISPR 11, 14 and 22. CISPR 11 covers industrial, scientific and medical equipment. CISPR 14 covers electrical and thermal appliances and tools. CISPR 22 covers information technology equipment.

In addition to governmental regulations, safety agencies worldwide have established guidelines for all electrical/electronic components. These include UL, CSA and TUV. They are designed to protect against shock and fire hazard.

How do RFI power line filters work?

Consisting of a multiple-port network of passive components arranged as a dual low-pass filter, the RFI filter attenuates radio frequency energy to acceptable levels, while permitting the power frequency current to pass through with little or no attenuation. Their function, essentially, is to trap noise and to prevent it from entering or leaving your equipment.

RFI is conducted through a power line in two modes. Asymmetric or **common mode** noise occurs between the line and ground. Symmetric or **differential mode** is measured from line to line. See the selection guide on page 2 under "Performance."

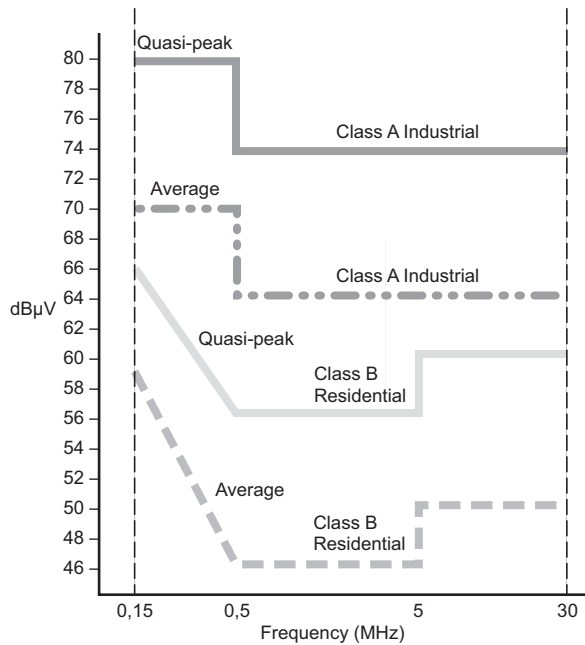


Technical Considerations

Meeting Emissions Standards

The emissions limits that a piece of equipment must meet will depend on the intended market for that piece of equipment. If there is more than one market, more than one emission standard may have to be met. This can have a substantial effect on the circuit, size, and cost of a filter. Standards like the CISPR's or the FCC Rules Part 15 have frequency limits of 150 kHz to 30 MHz.

FCC 15 AND CISPR CONDUCTED EMISSION LIMITS DIGITAL EQUIPMENT



EMI measurements are generally made using Spectrum Analyzers with Average or Quasi-Peak detectors in accordance with methods described in CISPR 16. Quasi-Peak differs from Average measurements by weight-averaging the peaks into the total.

Equipment meeting these specifications can utilize a filter with a fairly high cutoff frequency. Other standards like FCC 18 with a low frequency limit of 10 kHz will result in the equipment using lower cutoff filters. As might be expected, the lower the cutoff frequency, the larger the physical size and the higher the cost of the filter.

Conducted RFI Susceptibility

The problem of susceptibility can be extremely difficult to deal with because the amplitude and frequency of the offending RF noise are seldom known and are often intermittent. If the malfunction can be duplicated by isolating the equipment from the power line with LISN's

(Line Impedance Stabilization Network) and using signal generators to inject RF of varying amplitude and frequency, some insight can be gained as to the nature of the problem. However, the criteria for acceptable performance will have to be decided upon so that a filter yielding this level of performance can be obtained from the test procedure. Unfortunately, this still does not eliminate the need for final testing in the actual operating environment which, in many cases, occurs in the field.

Selection of a suitable filter can best be based on the type of power supply or input impedance of the equipment and on the mode of the offending RFI noise.

Noise Modes

Power line filters attenuate noise in two different modes.

Common Mode: Also known as line-to-ground noise measured between the power line and ground potential.

Differential Mode: Also known as line-to-line noise measured between the lines of power.

Power line filters are designed to attenuate either one or both modes of noise. The need for one design over another will depend on the magnitude of each noise type present. The attenuation is measured in dB (decibels) at various frequencies of signal.

Circuit Configuration

Power line RFI filters are generally built with two or three-pole filter networks. As the number of poles and the corresponding component count increases, the cost will increase also. Trying to typify an equipment's impedance as either high or low for purposes of filter selection may not be successful. If it is a complex impedance, it could probably be low at some frequencies, high at others, and some intermediate value at still other frequencies.

Although we have been generally successful in recommending a two-pole network for linear power supplies and three-pole networks for switching power supplies and synchronous motors, you should not limit your testing to just one circuit type if either additional circuit performance or lower cost is desired. Consider the following: If the equipment looked strictly capacitive, the performance of a two-pole network would be reduced to that of a single-pole filter.

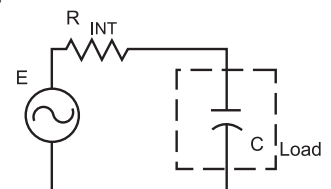


Figure 1a.
A signal source (E) with its internal impedance driving a capacitive load.



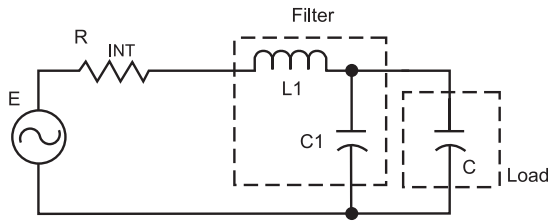
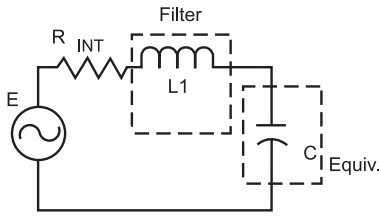


Figure 1b.

The same circuit as in Figure 1a, with the addition of a 2-pole low pass filter. Notice filter capacitor C1 is in parallel with the capacitive load.

Figure 1c.

Combining capacitor C1 in Figure 1b, with the load results in this circuit configuration.



The filter has been reduced to one inductive element, L1.

Obviously a three-pole filter would be preferred for maximum performance. Likewise, if the equipment looked strictly inductive, the performance of a three-pole network would be reduced to that of a two-pole network.

Figure 2a.

A signal source with its internal impedance driving an inductive load.

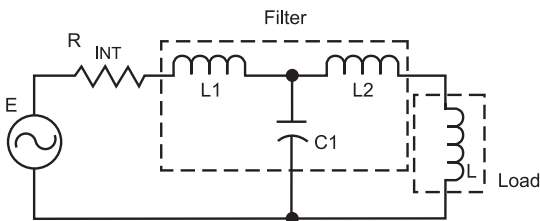
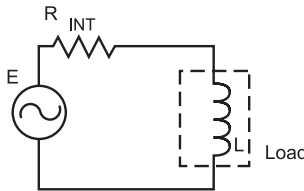


Figure 2b.

The same circuit as in Figure 2a, with the addition of a 3-pole low pass filter. Notice filter inductance L2 is in series with the inductive load.

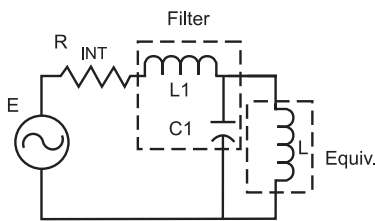


Figure 2c.

Combining inductor L2 in Figure 2b, with the load results in this circuit configuration, the filter has been reduced to two effective elements, L1 & C1.

Undoubtedly the two-pole filter would be a more economical choice with probably equal performance in this application. Since the equipment is not likely to be equivalent to either one of these simple cases, the only way to find the best cost-effective solution is to test the filters in your equipment and base your judgement on these test results.

Leakage Current

The maximum leakage current that a device is allowed depends on the requirements of the particular safety agency involved. Here, selection of the filter is quite easy since either the filter is designed to meet a given level or it is not. Although there is no compromise when it comes to safety specifications, it should be understood that for a given level of performance, as the leakage current is reduced, the physical size of the package will increase. Curtis medical filters have a very low leakage current.

Insertion Loss

DO NOT use the insertion loss specifications to make your final decision. Power line filters are two-terminal pair passive networks whose attenuation characteristics can be defined by a complex transfer function. How that transfer function will react in a particular system and at specific frequencies will depend on the complex impedances connected to each side of the filter. The equipment impedance and the impedance of the power line, even if a 50 ohm LISN (Line Impedance Stabilization Network) is being used during emission testing, will not generally be equal to the resistive 50 ohms used during insertion loss measurements. Therefore, the performance of the filter in the equipment cannot be related to the published insertion loss data.

Minimum Insertion Loss

Do not be alarmed that the insertion loss figures we have published may be of lower value than those of our competition. You will only find guaranteed minimum insertion loss figures in this catalog, without any mention of typical values.

Insertion loss test data measured in a 50 ohm system is a valuable incoming inspection tool to assure you that consistent product is being shipped. The only figures of any importance are those that specify the criteria for acceptance or rejection of that product, and those figures are the minimum values.



RFI/EMI Conducted Emissions Testing

Curtis offers full RFI/EMI conducted emissions testing services for manufacturers who must produce equipment in accordance with FCC and CE standards.

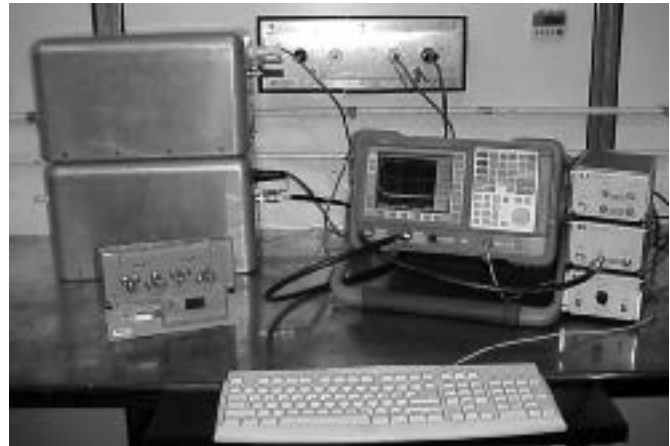
Curtis testing facilities consist of a laboratory equipped to test and evaluate EMI characteristics of equipment that must comply with FCC Part 15 and/or CISPR standards. With these facilities, Curtis can provide manufacturers with greater assistance in the selection of RFI/EMI filters to help them meet the necessary emission levels.

Isolated Environment Enhances Test Capabilities

- Totally isolated environment for both equipment under test and test instrumentation provided by separate chambers.
- RF screen room shielded against magnetic, electric and plane wave field per MIL-STD-285.
- Specially constructed line impedance stabilization networks (LISN) for FC Part 15 and CISPR testing.
- Sensitive, reliable automatic measurement and recording of conducted emissions data from 10 KHz to 1 GHz.
- Computer-controlled Agilent E7402A Spectrum Analyzer with associated amplifiers and attenuators.
- Agilent E7402A graphics capabilities allow quick generation of hard copies of emissions test results.

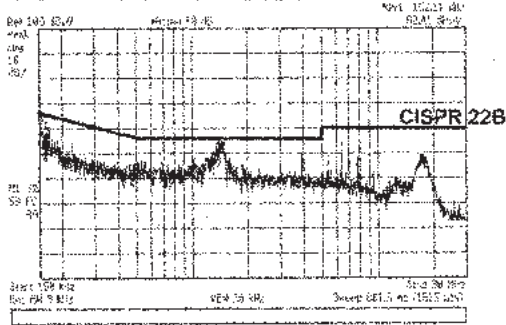


The Curtis screen room provides complete RFI isolation for equipment under test and the test instrumentation.



Computer-controlled test equipment assures fast turnaround on RFI emissions testing.

WITH FILTER



Fast Pre-Compliance Test Results

Computer-generated graphics and test reports provide the customer with fast turnaround on all testing.

On-site RFI filter design/applications engineers are available to assist in evaluating test results and to determine cost-effective solutions to conducted emissions problems before going to agencies.

Please contact your local Curtis representative or the factory sales staff to coordinate pre-compliance testing of your equipment at Curtis Industries.



Curtis can provide environmental testing to demonstrate performance and survival in harsh conditions.



Family of Products

- > RFI Filters
- > Filtered Power Entry
- > Custom Filters
- > Terminal Blocks
- > Custom Terminal Blocks
- > Liquid Level Controllers
- > PCB Mount Blocks
- > DIN Rail

