

# 651 SERIES

## PANEL INDICATOR LED



### FEATURES

- Ø12.7mm (½") mounting
- Black anodised aluminium housing
- Sealed to IP67 - weatherproof
- Coloured diffused lens
- Internal potting
- Reverse protection diode fitted in all voltage models
- Range of LED colour options
- Range of voltage options

### BENEFITS

- Standard industrial mounting size
- Ideal for portable equipment
- Suitable for external applications
- Diffused lens gives wide viewing angle
- Suitable for high vibration applications
- Protects against wrong polarity installation (voltage models)
- Suitable for status panel indication
- Manufactured with internal resistor
- Outstanding reliability
- Vandal resistant

Marl Part Number	LED Colour	Typical Voltage Vopr	Typical Current DC Iopr	Max. Reverse Voltage	Typical LED Luminous Intensity	Typical LED Wavelength λp	Operating Temp Topr *	Storage Temp Tstg
651-102-04	Red 660nm	1.85 **	20	3	500	660	-40 to +85	-40 to +85
651-105-04	Red 625nm	2.0 **	20	3	95	625	-40 to +85	-40 to +85
651-111-04	Yellow	2.1 **	20	3	45	590	-40 to +85	-40 to +85
651-114-04	Green	2.2 **	20	3	45	565	-40 to +85	-40 to +85
651-102-20	Red 660nm	5-6	11-17	1000	275-425	660	-40 to +85	-40 to +85
651-105-20	Red 625nm	5-6	10-16	1000	42-72	625	-40 to +85	-40 to +85
651-111-20	Yellow	5-6	10-16	1000	19-34	590	-40 to +85	-40 to +85
651-114-20	Green	5-6	9-15	1000	16-41	565	-40 to +85	-40 to +85
651-102-21	Red 660nm	12	20	1000	500	660	-40 to +85	-40 to +85
651-105-21	Red 625nm	12	19	1000	89	625	-40 to +85	-40 to +85
651-111-21	Yellow	12	19	1000	41	590	-40 to +85	-40 to +85
651-114-21	Green	12	19	1000	41	565	-40 to +85	-40 to +85
651-102-23	Red 660nm	24-28	16-20	1000	400-500	660	-40 to +85	-40 to +85
651-105-23	Red 625nm	24-28	16-20	1000	72-95	625	-40 to +85	-40 to +85
651-111-23	Yellow	24-28	16-19	1000	34-41	590	-40 to +85	-40 to +85
651-114-23	Green	24-28	16-19	1000	34-41	565	-40 to +85	-40 to +85
651-102-24	Red 660nm	48	17	1000	425	660	-40 to +85	-40 to +85
651-105-24	Red 625nm	48	17	1000	78	625	-40 to +85	-40 to +85
651-111-24	Yellow	48	17	1000	36	590	-40 to +85	-40 to +85
651-114-24	Green	48	17	1000	36	565	-40 to +85	-40 to +85
651-102-75	Red 660nm	110 Vac	9	N/A	225	660	-40 to +85	-40 to +85
651-105-75	Red 625nm	110 Vac	9	N/A	39	625	-40 to +85	-40 to +85
651-111-75	Yellow	110 Vac	9	N/A	17	590	-40 to +85	-40 to +85
651-114-75	Green	110 Vac	9	N/A	16	565	-40 to +85	-40 to +85
651-102-76	Red 660nm	230 Vac	4	N/A	100	660	-40 to +85	-40 to +85
651-105-76	Red 625nm	230 Vac	4	N/A	17	625	-40 to +85	-40 to +85
651-111-76	Yellow	230 Vac	4	N/A	8	590	-40 to +85	-40 to +85
651-114-76	Green	230 Vac	4	N/A	5	565	-40 to +85	-40 to +85
		Vdc (unless stated)	mA	V	mcd	nm	°C	°C

### OPTIONAL FLYING LEAD TERMINATORS

Marl Part No. Suffix	Wire Length	Wire Colour	No/Diameter of Conductors	Diameter of Insulation	Wire Specification
651-102-04-15	150mm	Red - Anode Black - Cathode	19/0.16mm	1.2mm	Type 44, 22 Gauge High Performance Wire
651-102-04-19	1000mm				

### NOTES

Intensities (Iv) may vary between LEDs within a batch. Additional LED Colours, Voltage Options and Flying Lead lengths available for semi-custom projects. Please contact our Sales Team. All LED components are supplied in anti-static packaging.

\* Characteristics at Ta = 25°C. For operating temperature derating graphs, please refer to sheet 2.

\*\* These are Current models and the voltage shown is Vf at 20mA, not Vopr. Additionally, there is no reverse protection diode in Current models.

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# 651 SERIES PANEL INDICATOR LED



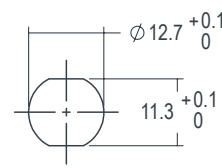
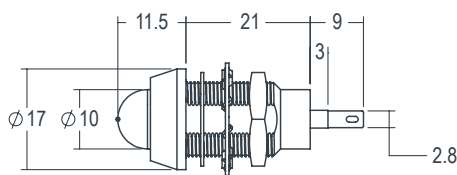
## TECHNICAL CHARACTERISTICS

Series	Max. Power Dissipation	Panel Cutout	Nut Mounting Torque	Min. Mounting Centres	Min - Max. Panel Thickness
651	1000	12.7	1.0	19.5	1.5 - 8.0
	mW	mm	Nm	mm	mm

## TECHNICAL DRAWING

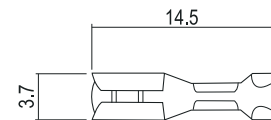
Weight (g): 13.1

Dimensions in mm (typical). Not to scale. Mounting hole to be clean and burr free. Anode termination (DC model) denoted by red sleeve.



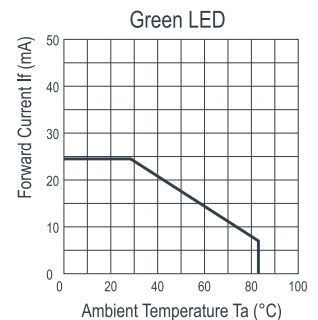
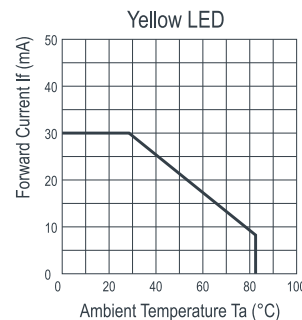
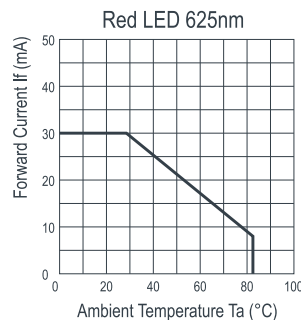
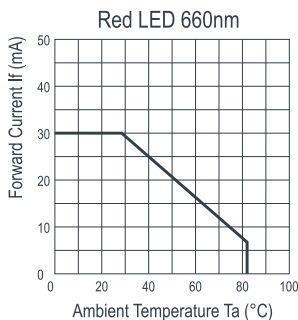
Mounting Hole

### PUSH ON CONNECTOR



925-000-00 is brass tin plated - for use with 651 series lamps. Dimensions in mm (typical). Not to scale.

## DE-RATING GRAPHS



## MATERIALS

Body	Black Anodised Aluminium
Nut	Nickel Plated Brass
Panel Seal	Viton
Lens	Polycarbonate
Encapsulation	Black Polyurethane
Lock Washer	Spring Steel
Termination	Silver Flash Coated Brass

## DESIGN CONSIDERATIONS

### Electro-Static Discharge (ESD)

Build up of electro-static discharge occurs in many situations involving people moving and handling products. The range of possible situations is very diverse but voltage levels as high as several thousand volts can and do arise in many individual situations. When an operator charged up to these levels handles a static sensitive device, there is a very probable likelihood that the device will be irreversibly damaged. It is essential that precautions are taken at all stages during manufacture and assembly of these products. Although LEDs were never considered to be static sensitive devices, changes in manufacturing

technology and materials used to produce higher intensity products over a large range of the wavelength spectrum have changed this. Marl has an approved system of ESD control from goods in, through production and into final packing and dispatch. Marl recommend all users of LED based products follow the current BSI guidelines for protection of electronic devices from electrostatic phenomena.

### Voltage, Current and Temperature

The forward voltage / current value of an LED is dependent upon the ambient temperature of the environment in which

it is operated. Therefore, care must be taken to operate the LED at the correct voltage / current values, depending upon the ambient temperature.

Marl should be contacted if the device is to be operated outside the temperature range specified. Marl accept no liability for any product that is operated outside the stated voltage or temperature range.

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