

# 651 RS series



## features



- Ø12.7mm mounting
- Black anodised aluminium housing
- Colour diffused lens with a wide viewing angle
- Sealed to IP67
- Suitable for high vibration applications
- Internal reverse protection diode fitted as standard in all voltage models
- -08 Denotes lamp test facility
- Pack Quantity = 10 Pieces

## specifications

Typical characteristics (Ta = 25°C)

RS Part Number	Marl Part Number	Colour	Voltage Vac/dc	Current DC (mA)	Luminous Intensity (mcd)	Wave Length (nm)	Operating Temp. (°C)	Storage Temp. (°C)	De-rating Graphs
2498443	651-102-04	Red	1.85 Vdc	20	500	660	-40 - +85	-40 - +85	B
2498493	651-102-20	Red	5-6 Vdc	18	500	660	-40 - +85	-40 - +85	B
2498544	651-102-21	Red	12 Vdc	20	500	660	-40 - +85	-40 - +85	B
2498588	651-102-22	Red	24 Vdc	19	500	660	-40 - +85	-40 - +85	B
3107148	651-102-22-08	Red	24 Vdc	19	500	660	-40 - +85	-40 - +85	B
2498623	651-102-75	Red	110 Vac	9	500	660	-40 - +85	-40 - +85	B
2498667	651-102-76	Red	230 Vac	4	500	660	-40 - +85	-40 - +85	B
3107249	651-102-76-08	Red	230 Vac	4	500	660	-40 - +85	-40 - +85	B
2498465	651-105-04	Red	2 Vdc	20	95	625	-40 - +85	-40 - +85	B
2498500	651-105-20	Red	5-6 Vdc	18	95	625	-40 - +85	-40 - +85	B
2498550	651-105-21	Red	12 Vdc	20	95	625	-40 - +85	-40 - +85	B
2498594	651-105-22	Red	24 Vdc	19	95	625	-40 - +85	-40 - +85	B
3107154	651-105-22-08	Red	24 Vdc	19	95	625	-40 - +85	-40 - +85	B
2498639	651-105-75	Red	110 Vac	9	95	625	-40 - +85	-40 - +85	B
3107205	651-105-75-08	Red	11 Vac	9	95	625	-40 - +85	-40 - +85	B
2498689	651-105-76	Red	230 Vac	4	95	625	-40 - +85	-40 - +85	B
3107255	651-105-76-08	Red	230 Vac	4	95	625	-40 - +85	-40 - +85	B
2498487	651-111-04	Yellow	2.1 Vdc	20	45	590	-40 - +85	-40 - +85	B
2498538	651-111-20	Yellow	5-6 Vdc	18	45	590	-40 - +85	-40 - +85	B
2498572	651-111-21	Yellow	12 Vdc	20	45	590	-40 - +85	-40 - +85	B
2498617	651-111-22	Yellow	24 Vdc	19	45	590	-40 - +85	-40 - +85	B
3107182	651-111-22-08	Yellow	24 Vdc	19	45	590	-40 - +85	-40 - +85	B
2498651	651-111-75	Yellow	110 Vac	9	45	590	-40 - +85	-40 - +85	B
2498702	651-111-76	Yellow	230 Vac	4	45	590	-40 - +85	-40 - +85	B
2498522	651-114-20	Green	2.2 Vdc	20	45	565	-40 - +85	-40 - +85	C
2498522	651-114-20	Green	5-6 Vdc	18	45	565	-40 - +85	-40 - +85	C
2498566	651-114-21	Green	12 Vdc	20	45	565	-40 - +85	-40 - +85	C
2498601	651-114-22	Green	24 Vdc	19	45	565	-40 - +85	-40 - +85	C
3107160	651-114-22-08	Green	24 Vdc	19	45	565	-40 - +85	-40 - +85	C
2498645	651-114-75	Green	110 Vac	9	45	565	-40 - +85	-40 - +85	C
3107211	651-114-75-08	Green	110 Vac	9	45	565	-40 - +85	-40 - +85	C
2498695	651-114-76	Green	230 Vac	4	45	565	-40 - +85	-40 - +85	C
3107261	651-114-76-08	Green	230 Vac	4	45	565	-40 - +85	-40 - +85	C

^ = Voltage for 20mA product is Vf at 20mA, not Vopr

- Products must be de-rated according to the de-rating information. Each de-rating graph refers to specific LEDs. Please refer to graphs on page 3.

- Luminous intensity is measured at 20mA on a discrete LED unless otherwise stated.

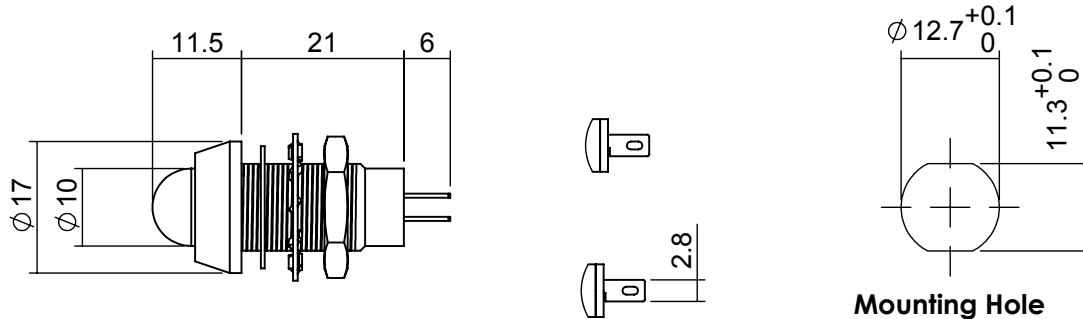
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## technical data



Mounting Hole

Dimensions in mm (typical)  
Not to scale

Anode termination denoted by red indicator  
Mounting hole to be clean and burr free

## housing material

## push on connectors

<b>Body</b> <b>Nut</b> <b>Panel Seal</b> <b>Fresnel Lens</b> <b>Encapsulation</b> <b>Lock Washer</b> <b>Termination</b> <b>Header</b>	Black Anodised Aluminium Bright Nickel Plated Brass Viton Epoxy PC5430 Resin Spring Steel - -	To ensure compliance with the Electrical Equipment (Safety) Regulations 1994 (S.I.1994/3260) we recommend making connection to this device using insulated push-on 110 terminals (0.5mm thick). Marl P/N: CONNECTOR3.2MMFEMALE. The diagram (right) shows how these fit on without straining the connections.	
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## technical characteristics

Series	Max. Power Dissipation	Max. Reverse Voltage	Panel Cutout	Nut Mounting Torque	Min. Mounting Centres	Max. Panel Thickness
651	1000	3*/1000^	12.7	1.0	19.5	1.5 - 8.0
units	mW	Vdc	mm	Nm	mm	mm

\* = Current Version      ^ = Voltage Version

## optional flying lead terminations

Order Code Suffix	Supply Voltage	Wire Colour	Wire Length	No/Diameter of Conductor	Diameter Insulation	Comments
19	DC products	Red-anode/ Black-cathode	1000mm	19/0.15mm	1.2mm	Customised lengths available

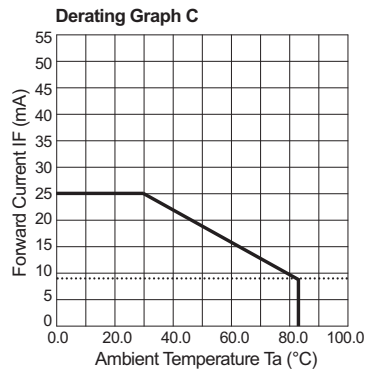
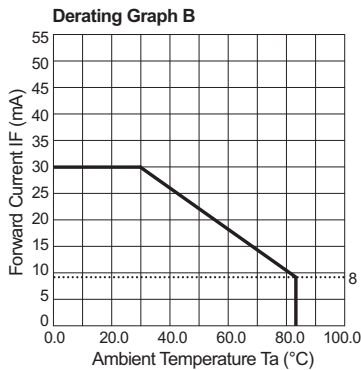
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## de-rating information



## also available

### Part numbers also available in the 651 series:

Part Number	Colour	Voltage Vopr
651-102-22-07	Red	24 Vdc
651-102-23	Red	28 Vdc
651-102-24	Red	48 Vdc
651-105-22-15	Red	24 Vdc
651-105-23	Red	28 Vdc
651-105-23-15	Red	28 Vdc
651-105-24	Red	48 Vdc
651-105-75-07	Red	110 Vac 50 Hz
651-111-23	Yellow	28 Vdc
651-111-48	Yellow	60 Vdc
651-114-04	Green	20 mA dc
651-114-23	Green	28 Vdc
651-114-75-15	Green	110 Vac 50 Hz
651-135-22	Red/Green	24 Vdc

The products listed here illustrate all of the options available to order. These products may have custom modifications that alter their operation beyond the generic information contained within this datasheet. Please contact sales for further information.

\* = These products do not contain integral resistors

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## 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 despatch. Marl recommend all users of LED based products follow the guidelines of BS 100015.

### Power De-Rating

The forward voltage/ current value of an LED is dependant 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. Consequently, a recommendation regarding operating voltages and currents is given in order to address these temperature effects. This recommendation is termed 'de-rating'. It is usual for forward voltages and currents to be specified for ambient temperature of 25°C. However, because the values of these qualities vary with temperature, please refer to the de-rating graphs for correct operation. Marl accept no liability for any product that is operated higher than the stated voltage.

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