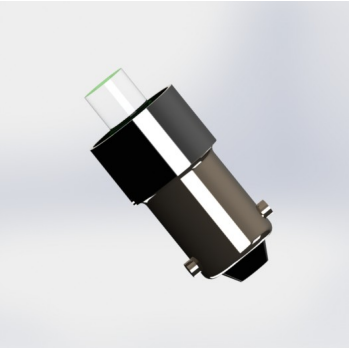
214 - RIA12 series

features



- **Part Number 214-501-75-50 RIA 12 Approved. Certificate number: RR-TRS-97-161 A**
- **Direct replacement for T3 ¼ BA9s Incandescent**
- **Durable to shock and vibration**
- **Centre contact Anode as standard, centre contact Cathode version available**
- **AC versions available**
- **Pack Quantity = 20 Pieces**

specifications

Ordering information and typical characteristics (Ta = 25°C)

Part Number	Colour	Voltage Vac/dc	Current DC (mA)	Luminous Intensity (mcd)	Wave Length (nm)	Operating Temp. (°C)	Storage Temp. (°C)	De-rating Graphs
214-501-75-50	Red	110 Vdc	3	600	630	-40 - +80	-40 - +100	D
214-521-75-50	Yellow	110 Vdc	3	600	585	-40 - +80	-40 - +100	D
214-532-75-50	Green	110 Vdc	3	800	515	-40 - +80	-40 - +100	F
214-930-75-50	Blue	110 Vdc	3	230	465	-30 - +85	-40 - +100	U
214-997-75-50	White	110 Vdc	3	1100	* See pg.2	-30 - +85	-40 - +100	I
214-501-22-50	Red	24 Vdc	17	600	630	-40 - +80	-40 - +100	D
214-521-22-50	Yellow	24 Vdc	17	600	585	-40 - +80	-40 - +100	D
214-532-22-50	Green	24 Vdc	17	800	515	-40 - +80	-40 - +100	F
214-930-22-50	Blue	24 Vdc	17	230	465	-30 - +85	-40 - +100	U
214-997-22-50	White	24 Vdc	17	1100	* See pg.2	-30 - +85	-40 - +100	I
214-993-22-50	Warm White	24 Vdc	17	850	* See pg.2	-30 - +85	-40 - +100	I

^ = 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 2.
- Luminous intensity is measured at 20mA on a discrete LED unless otherwise stated.

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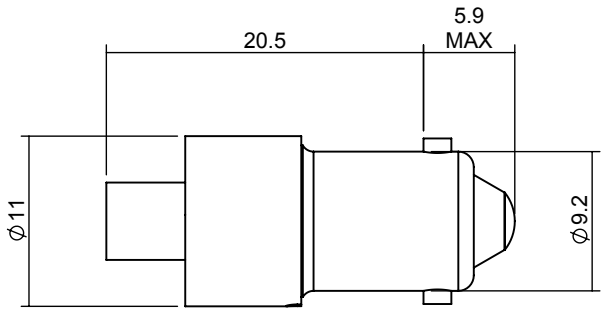
filament replacement leds

214 - RIA12 series

technical data



Green dot on base of product signifies reverse polarity
Colour dot on sleeve denotes LED colour.

Dimensions in mm (typical)
Not to scale

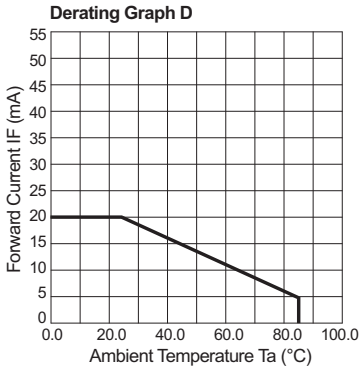
Lamp Base Style	Series	Metric Equivalent (mm)	Max. Power Dissipation (mW)
T3 ¼ BA9s Incandescent	214	10	625

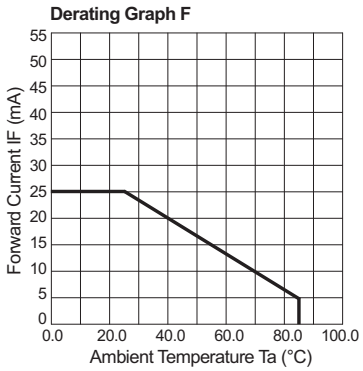
997F-C	*Typical emission colour White			
x	0.31	-	-	-
y	0.32	-	-	-

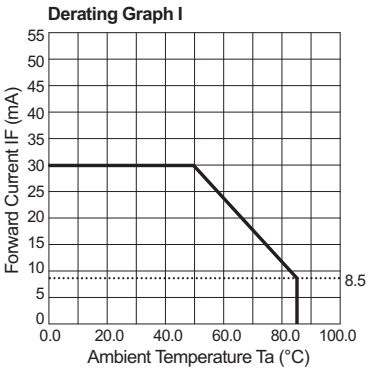
899F	*Typical emission colour Warm White			
x	0.4255	0.4390	0.4680	0.4519
y	0.4000	0.4310	0.4385	0.4086

Intensities (Iv) and colour shades of white (x,y co-ordinates) may vary between leds within a batch

de-rating information







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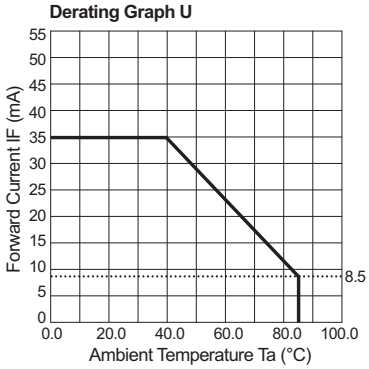
de-rating information continued



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214 - RIA12 series

also available

Part numbers also available in the 214 series:

Part Number	Colour	Voltage Vopr
214-301-00-50	Red	20 Vdc
214-301-21-50	Red	12 Vdc
214-301-22-50	Red	24 Vdc
214-301-23-51	Red	28 Vdc
214-301-23-52	Red	28 Vdc
214-301-25-52	Red	110 Vdc
214-301-55-50	Red	130 Vdc
214-301-87-50	Red	130 Vac/dc
214-324-22-50	Green	24 Vdc
214-324-22-51	Green	24 Vdc
214-324-55-50	Green	130 Vdc
214-324-74-50	Green	48 Vac 50 Hz
214-324-84-50	Green	130 Vac
214-324-87-50	Green	130 Vac/dc
214-325-00-50	Yellow	55 Vac/dc
214-325-22-50	Yellow	24 Vdc
214-325-55-50	Yellow	130 Vdc
214-325-87-50	Yellow	130 Vac/dc
214-501-00-52	Red	55 Vac/dc
214-501-00-53	Red	65 Vdc
214-501-00-55	Red	150 Vdc RP
214-501-00-56	Red	150 Vdc
214-501-00-99	Red	55 Vac/dc
214-501-23-50	Red	28 Vdc
214-501-24-38	Red	48 Vdc
214-501-25-50	Red	110 Vdc
214-501-51-50	Red	52 Vdc
214-501-75-99	Red	110 Vac 50 Hz
214-501-87-50	Red	130 Vac/dc
214-521-00-50	Yellow	55 Vac/dc
214-521-21-50	Yellow	12 Vdc
214-521-22-38	Yellow	24 Vdc
214-521-23-50	Yellow	28 Vdc
214-521-25-50	Yellow	110 Vdc
214-521-87-50	Yellow	130 Vac/dc
214-532-00-50	Green	55 Vac/dc
214-532-87-50	Green	130 Vac/dc
214-930-22-51	Blue	24 Vdc
214-930-23-50	Blue	28 Vdc
214-930-24-50	Blue	48 Vdc
214-930-25-50	Blue	110 Vdc
214-930-25-51	Blue	110 Vdc
214-930-25-99	Blue	110 Vdc
214-930-51-50	Blue	52 Vdc
214-934-22-50	Blue	24 Vdc
214-934-55-50	Blue	130 Vdc
214-934-87-50	Blue	130 Vac/dc
214-993-51-50	Warm White	52 Vdc
214-997-00-56	White	150 Vdc RP
214-997-00-57	White	150 Vdc
214-997-23-50	White	28 Vdc
214-997-24-50	White	48 Vdc
214-997-25-50	White	110 Vdc
214-997-25-51	White	110 Vdc
214-997-35-50	White	110 Vdc RP
214-997-51-50	White	52 Vdc
214-997-56-50	White	72 Vdc
214-997-87-50	White	130 Vac/dc
214-998-00-50	White	150 Vdc
214-998-22-50	White	24 Vdc
214-998-22-51	White	24 Vdc
214-998-25-51	White	110 Vdc
214-998-33-50	White	28 Vdc RP
214-998-55-50	White	130 Vdc
214-998-75-50	White	110 Vac 50 Hz
214-998-76-50	White	230 Vac 50 Hz
214-998-84-50	White	130 Vac
214-998-87-50	White	130 Vac/dc

The products listed above 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.

RP = Reverse Polarity

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214 - RIA12 series

design considerations

Single-Chip LEDs

All devices feature water clear high intensity LEDs as standard. In devices where discrete LEDs are used, the single chip LED devices have been modified by the removal of the domed portion of the encapsulation (flat-topped) to provide even illumination of switches and annunciators. Non flat topped versions are also available.
Flat-topping does not apply to devices using surface-mounted device (SMD) LEDs.

Product Evaluation

Filament replacement LEDs have been specifically designed to meet the primary objective of providing improved reliability. As this product range is suitable for both new-build and retro-fit, (sometimes in very old systems), a wide range of illuminated push button switches and lamp holders can be encountered. Due to subjectivity, evaluation of the LED type is recommended, (samples of all standard models are available). Care should be taken to correctly simulate operating ambient light conditions to ensure that the correct device has been selected to maximise viewing characteristics such as viewing angle, colour compatibility and on/ off contrast ratio.

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, marl should be contacted if the device is to be operated at a temperature significantly higher than 25°C. Marl accept no liability for any product that is operated higher than the stated voltage.

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