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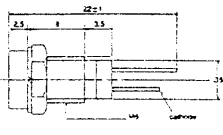
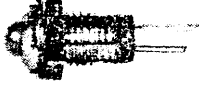
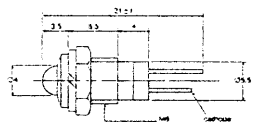

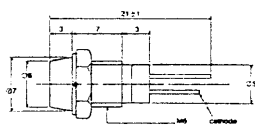

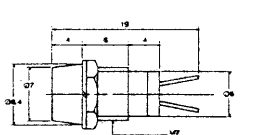

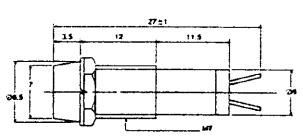

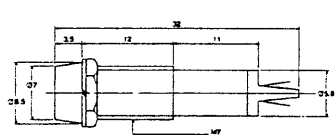
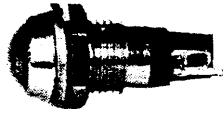
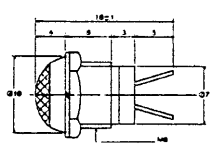
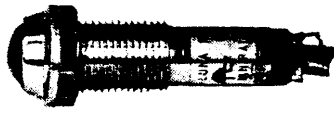
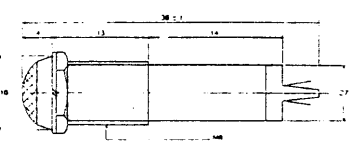
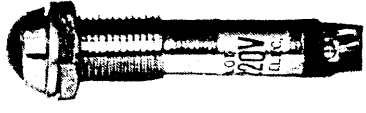
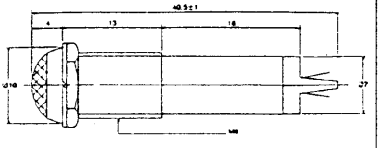
**B**

**and R**

# Panel Indicators (LED + Neon)

A range of 6, 7 and 8mm diameter panel indicators offering an attractive variety of bezel shapes and finishes. All the indicators feature brass bodies with either chrome plated or black nickel chromate plated finish. The 79 and 86 series are available as three types; LED, LED with integral resistor and neon with integral

resistor, enabling the user to mix indicators on a panel but keep a common bezel shape. The LED indicators with integral resistors may be operated directly by the nominal rail voltage and are therefore made as easy to use as filament lamps but with the advantages of very long life and resistance to vibration.

| 67/68/69 Series  | Mounting hole dia. 6.2mm  | Order Code            |                 |                             |                 |
|--|---|-----------------------|-----------------|-----------------------------|-----------------|
| <b>'67' Type</b><br><br>LED Indicator |    | RED<br>GREEN<br>AMBER | CHROME BEZEL    | BLACK NICKEL - CHROME BEZEL |                 |
|  |   |                       | LED-B67004-NOOR | LED-B67104-NOOR             |                 |
|  |   |                       | LED-B67004-NOOG | LED-B67104-NOOG             |                 |
| <b>'68' Type</b><br><br>LED Indicator |    | RED<br>GREEN<br>AMBER | LED-B68004-NOOR | LED-B68104-NOOR             |                 |
|  |   |                       | LED-B68004-NOOG | LED-B68104-NOOG             |                 |
|  |   |                       | LED-B68004-NOOA | LED-B68104-NOOA             |                 |
| <b>'69' Type</b><br><br>LED Indicator |    | RED<br>GREEN<br>AMBER | LED-B69004-NOOR | LED-B69104-NOOR             |                 |
|  |   |                       | LED-B69004-NOOG | LED-B69104-NOOG             |                 |
|  |   |                       | LED-B69004-NOOA | LED-B69104-NOOA             |                 |
| <b>'79' Series (with solder terms)</b>   | Mounting hole dia. 7.2mm  | CHROME BEZEL          |                 |                             |                 |
| <br>LED Indicator                   |  | RED<br>GREEN<br>AMBER | LED-B79000-SOOR |                             |                 |
|  |   |                       | LED-B79000-SOOG |                             |                 |
|  |   |                       | LED-B79000-SOOA |                             |                 |
| <br>LED Indicator with resistor     |  | RED<br>GREEN<br>AMBER | 6V dc           | 12V dc                      | 24V dc          |
|  |   |                       | LED-V79006-SOOR | LED-V79012-SOOR             | LED-V79024-SOOR |
|  |   |                       | LED-V79006-SOOG | LED-V79012-SOOG             | LED-V79024-SOOG |
|  |   |                       | LED-V79006-SOOA | LED-V79012-SOOA             | LED-V79024-SOOA |
| <br>Neon Indicator with resistor    |  | RED<br>GREEN<br>AMBER | 240/220V ac     | 120/110V ac                 |                 |
|  |   |                       | NEO-V79240-SOOR | NEO-V79120-SOOR             |                 |
|  |   |                       | NEO-V79240-SOOG | NEO-V79120-SOOG             |                 |
|  |   |                       | NEO-V79240-SOOA | NEO-V79120-SOOA             |                 |
| <b>'86' Series (with solder terms)</b>   | Mounting hole dia. 8.2mm  | CHROME BEZEL          |                 |                             |                 |
| <br>LED Indicator                   |  | RED<br>GREEN<br>AMBER | LED-B86000-SOOR |                             |                 |
|  |   |                       | LED-B86000-SOOG |                             |                 |
|  |   |                       | LED-B86000-SOOA |                             |                 |
| <br>LED Indicator with resistor     |  | RED<br>GREEN<br>AMBER | 6V dc           | 12V dc                      | 24V dc          |
|  |   |                       | LED-V86006-SOOR | LED-V86012-SOOR             | LED-V86024-SOOR |
|  |   |                       | LED-V86006-SOOG | LED-V86012-SOOG             | LED-V86024-SOOG |
|  |   |                       | LED-V86006-SOOA | LED-V86012-SOOA             | LED-V86024-SOOA |
| <br>Neon Indicator with resistor    |  | RED<br>GREEN<br>AMBER | 240/220V ac     | 120/110V ac                 |                 |
|  |   |                       | NEO-V86240-SOOR | NEO-V86120-SOOR             |                 |
|  |   |                       | NEO-V86240-SOOG | NEO-V86120-SOOG             |                 |
|  |   |                       | NEO-V86240-SOOA | NEO-V86120-SOOA             |                 |

170-374  
170-375.

# LED Specifications

## Maximum Ratings

|                       |           |               |
|-----------------------|-----------|---------------|
| Forward Current       | $I_F$     | 30 mA         |
| Reverse voltage       | $V_R$     | 3 V           |
| Power Dissipation     | $P_D$     | 70 mW         |
| Operating Temp. Range | $T_{opg}$ | -25° to +80°C |
| Storage Temp. Range   | $T_{stg}$ | -30° to +85°C |

## Operating Characteristics

|   |           | Red        | Green      | Amber      | Condition             |
|---|-----------|------------|------------|------------|-----------------------|
| Recommended forward current                                     | $I_F$     | 3 - 15 mA  | 10 - 20 mA | 10 - 20 mA |                       |
| Forward Voltage (typ.)  | $V_F$     | 2V         | 2.1V       | 2.1V       | at $i_F = 10$ mA      |
| Light Intensity (typ.)  | $L$       | 0.8 mcd    | 1.0 mcd    | 2.0 mcd    | at $i_F = 20$ mA      |
| Wavelength (typ.)   | $\lambda$ | 700 nm     | 565 nm     | 585 nm     |                       |
| Leakage current (typ.)  | $I_R$     | 10 $\mu$ A |            |            | at $V_R = 3$ V        |
| Viewing Angle   |           | 120°       |            |            |                       |
| Operating Current —<br>LED indicators with<br>Integral Resistor | $I$       | 10 mA      | 15 mA      | 15 mA      | at nominal<br>voltage |

## Neon Specifications

| Style                | 79     | 86     |
|----------------------|--------|--------|
| Current Red/Amber    | 0.6 mA | 1.2 mA |
| Green                | 0.5 mA | 0.8 mA |
| Max Starting Voltage | 75V    |        |
| Max Ambient Temp.    | 95°C   |        |

## General Electrical Specification of all Indicators

|                       | LED Indicators           | Neon Indicators           |
|-----------------------|--------------------------|---------------------------|
| Insulation Resistance | 50 M $\Omega$ at 500V dc | 100 M $\Omega$ at 500V dc |
| Proof Voltage         | 500V ac for 1 min.       | 1500V ac for 1 min.       |
| Life                  | 50,000 hours             | 20,000 hours              |

Polarity of 79 + 86 LED Indicators is shown by a colour blob for the anode (+ve)

N.B. For alternative terminations (e.g. wire ended, P.O.T.'s etc) or any other special requirements please contact B & R Sales Office.

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B & R Relays Ltd. Templefields, Harlow, Essex CM20 2BG. Telephone: Harlow (0279) 34561. Telex: 81140

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