

# APEM

QRM - Rear Mounting LED Indicators

QRM-NV - NVG Compatible Rear Mounting LED Indicators

NVIS Compliant to MIL Std 3009



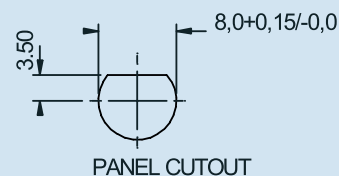
# QRM SERIES

## 8mmØ Rear Mounting LED Indicators

### Features and Specifications

#### FEATURES

- 8mmØ rear mounting LED indicator
- 5mm flush diffused LEDs, standard intensity or hyper bright (sunlight readable)
- Bi-colour and Tri-colour LEDs also available
- Black chrome finish
- 2VDC – 28VAC/DC
- 200mm wires or pin terminations
- IP67 sealed (EN60529)
- Rear end epoxy sealed
- Supplied with fixing nut, spring washer and O-ring (Dress nut available as an option - contact Apem)



#### OPTICAL SPECIFICATIONS

| Voltage                                                                                  | Operating Voltage<br>(Min to Max)                       | Operating Current<br>(Typical All Types)           |
|------------------------------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------|
| 2VDC (No resistor)                                                                       | 1.8 to 2.5VDC                                           | 20mA*                                              |
| 12VDC                                                                                    | 10.8 to 13.2VDC                                         | 20mA                                               |
| 24VDC                                                                                    | 21.6 to 26.4VDC                                         | 20mA                                               |
| 28VDC                                                                                    | 25.2 to 30.8VDC                                         | 20mA                                               |
| Luminous Intensity (Typical)                                                             | Standard Diffused LED/Forward Voltage<br>(all voltages) | Hyper Bright LED/Forward Voltage<br>(all voltages) |
| HE Red                                                                                   | 10mcd/2.0V                                              | 980mcd/2.2V                                        |
| Green                                                                                    | 8mcd/2.2V                                               | 300mcd/3.2V                                        |
| Yellow                                                                                   | 6mcd/2.1V                                               | 250mcd/2.2V                                        |
| Blue                                                                                     | 50mcd/3.3V                                              | 200mcd/3.8V                                        |
| White                                                                                    | 25mcd/3.8V                                              | 500mcd/3.3V                                        |
| Bi-colour (Typical) (Red/Green)                                                          | 10/8mcd/2.0V/2.2V                                       | -                                                  |
| Tri-colour (Typical) (Red/Green/Yellow)                                                  | 10/8/6mcd/2.0V/2.2V/2.1V                                | 110/30/20mcd/1.9/2.2/2.1V                          |
| Bi-colour - The colour is changed by reversing the polarity of the supply voltage        |                                                         |                                                    |
| Tri-colour - The indicator has red and green LEDs when both connected yellow is produced |                                                         |                                                    |
| *Customer to supply resistor for desired operating current                               |                                                         |                                                    |
| When using an indicator with "No Resistor" please pay attention to the forward voltage   |                                                         |                                                    |

#### TECHNICAL CHARACTERISTICS

- Max reverse voltage: 5V
- Viewing angle: 60°
- Life expectancy: 100,000 hours
- Operating temperature range: -40° to 85°C
- Storage temperature: -55° to 100°C
- Max panel thickness: 3.5mm
- Torque: 60cNm

#### MATERIAL

- Body: Black chrome plated brass
- Nut: Black chrome plated brass
- Panel seal: Nitrile O-ring
- Lock washer: Spring steel
- Terminal seal: Epoxy
- Wires: 24AWG to UL1061

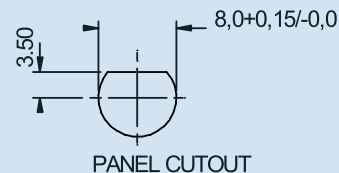
# QRM-NV SERIES

## NVIS Compatible 8mmØ Rear Mounting LED Indicator

### Features and Specifications

#### FEATURES

- 8mmØ rear mounting LED indicator
- NVIS Green A, NVIS Green B, NVIS Yellow, NVIS Red, NVIS White
- High temperature NVG filters
- NVIS compliant to MIL Std 3009
- Black chrome finish
- 2VDC – 28VDC
- 200mm wires or rigid pin (1.00mm) terminations
- IP67 sealed (EN60529)
- Rear end epoxy sealed
- Supplied with fixing nut, spring washer and O-ring (Dress nut available as an option - contact Apem)



#### OPTICAL SPECIFICATIONS

| LED Colour          | NVIS Radiance                          | NVIS Chromaticity | Dominant Wavelength (nm) Typical | Luminous Intensity/ Forward Voltage Typical |
|---------------------|----------------------------------------|-------------------|----------------------------------|---------------------------------------------|
| NW1S Green A        | $NR_A \leq 1.7E-10 @ 0.1f_l$           | $r \leq .037$     | 530nm                            | 150mcd/3.3V                                 |
| NW1S Green B        | $NR_A \leq 1.7E-10 @ 0.1f_l$           | $r \leq .057$     | 555nm                            | 150mcd/3.3V                                 |
| NW1S Yellow Class A | $5.0E-8 \leq NR_A \leq 1.5E-7 @ 15f_l$ | $r \leq .083$     | —                                | 150mcd/3.3V                                 |
| NW1S Yellow Class B | $4.7E-8 \leq NR_B \leq 1.4E-7 @ 15f_l$ | $r \leq .083$     | 585nm                            | 150mcd/3.3V                                 |
| NW1S Red            | $4.7E-8 \leq NR_B \leq 1.4E-7 @ 15f_l$ | $r \leq .060$     | 605nm                            | 110mcd/2.1V                                 |
| NW1S White          | $NR_A \leq 1.0E-9 @ 0.1f_l$            | $r \leq .040$     | (x).33/(y).33                    | 150mcd/3.3V                                 |

#### TECHNICAL CHARACTERISTICS

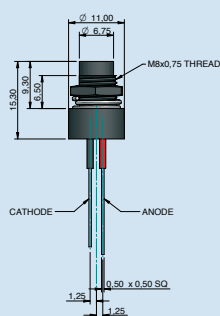
- Max reverse voltage: 5V
- Viewing angle: 60°
- Life expectancy: 100,000 hours
- Operating temperature range: -40° to 85°C
- Storage temperature: -55° to 100°C
- Max panel thickness: 3.5mm
- Torque: 60cNm

#### MATERIAL

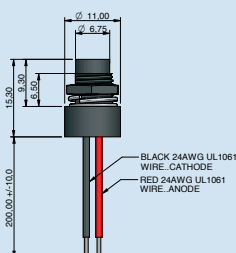
- Body: Black chrome plated brass
- Nut: Black chrome plated brass
- Panel seal: Nitrile O-ring
- Lock washer: Spring steel
- Terminal seal: Epoxy
- Wires: 24AWG high temperature TFE to UL1213

#### TECHNICAL DRAWINGS

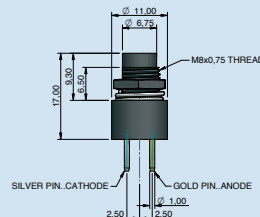
QRM Pins



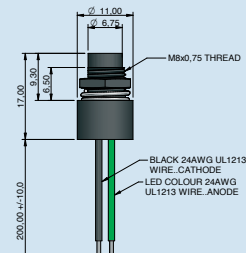
QRM Wires



QRM-NV Pins



QRM-NV Wires



# QRM/QRM-NV SERIES

## 8mmØ Rear Mounting LED Indicator

### Order Overview

| QRM    | -NV         | 8             | 5                     | B                | XX                                                    | NV-GRA                                                                                                                                                                                                                                                                                                                                                                                                                                           | 12                                                                                                                     | E                   |
|--------|-------------|---------------|-----------------------|------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------|
| SERIES | NVIS OPTION | MOUNTING HOLE | TERMINALS             | BEZEL FINISH     | TYPE OF ILLUMINATION                                  | LED COLOUR                                                                                                                                                                                                                                                                                                                                                                                                                                       | VOLTAGE                                                                                                                | SEALING             |
| QRM    | NVIS Option | 8 = 8mmØ      | 4 = Pins<br>5 = Wires | B = Black Chrome | XX = Fixed Light<br>YY = Bi-colour<br>ZZ = Tri-colour | <b>QRM</b><br>R = Red<br>G = Green<br>Y = Yellow<br>B = Blue<br>W = White<br><br>HR = Hyper Red<br>HG = Hyper Green<br>HY = Hyper Yellow<br>HB = Hyper Blue<br>HW = Hyper White<br><br>RG = Red/Green<br>RY = Red/Yellow<br>GY = Green/Yellow<br><br>RYG = Red/Yellow/Green<br><br><b>QRM-NV</b><br>NV-GRA = NVIS Green A<br>NV-GRB = NVIS Green B<br>NV-YWA = NVIS Yellow A<br>NV-YWB = NVIS Yellow B<br>NV-RD = NVIS Red<br>NV-WH = NVIS White | 02 = 2VDC<br>06 = 6VDC<br>12 = 12VDC<br>12A = 12VAC/DC<br>24 = 24VDC<br>24A = 24VAC/DC<br>28 = 28VDC<br>28A = 28VAC/DC | E = IP67 (Standard) |

#### TECHNICAL CHARACTERISTICS

- Standard wire length is 200mm  
QRM- Series: red wire denotes Anode (+), black wire denotes Cathode (-)  
QRM-NV Series: The colour of the NVIS LED is identified by colour of the positive wire
- Pin Terminals  
QRM- Series: red insulated sleeving identifies the Anode (+) terminal  
QRM-NV Series: The gold pin identifies the Anode (+) terminal
- Bi-colour LEDs, by connecting the Anode (+) one colour is produced, by reversing the supply voltage another colour is produced
- The Tri-colour LED has red and green LEDs, when both are connected yellow is produced
- Tri-colour wires are one red Anode (+), one green Anode (+) and one black Cathode (-)
- Tri-colour pins are one short pin (Anode green), one middle pin (Anode red) and one long pin (Cathode)

## APEM product ranges



Switches



Joysticks



Switch Panels



Indicators



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