# APEM

## QRM - Rear Mounting LED Indicators

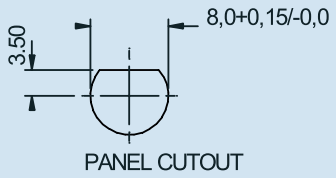
## QRM-NV - NVG Compatible Rear Mounting LED Indicators

## 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** | **Operating Current** |
|---|---|---|
| | (Min to Max) | (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 | Hyper Bright LED/Forward Voltage |
| | (all voltages) | (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

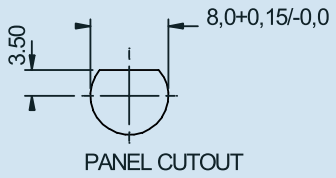
## MATERIAL

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

## TECHNICAL CHARACTERISTICS

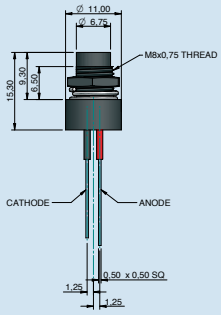
- Max reverse voltage: 5V
- Viewing angle: 60°
- Life expectancy: 100,000 hours
- Operating temperature range: -40° to 85°C
- Storage temperature: -55° to 100°C
- Max panel thickness: 3.5mm
- Torque: 60cNm

## MATERIAL

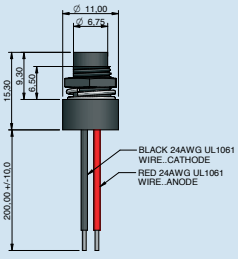
- Body: Black chrome plated brass
- Nut: Black chrome plated brass
- Panel seal: Nitrile O-ring
- Lock washer: Spring steel
- Terminal seal: Epoxy
- Wires: 24AWG high temperature TFE to UL1213

## TECHNICAL DRAWINGS

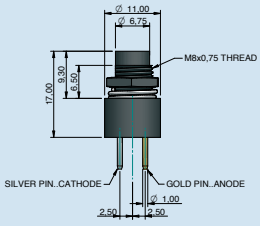
QRM Pins



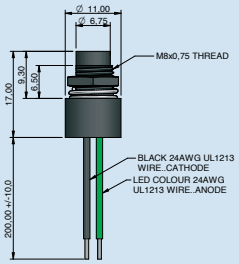

QRM Wires




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 | **QRM**<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>**QRM-NV**<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

APEM

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