APEM

QRM - Rear Mounting LED Indicators

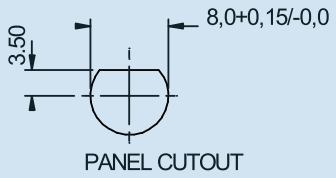
QRM-NV - NVG Compatible Rear Mounting LED Indicators

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

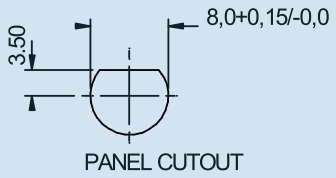
MATERIAL

- 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

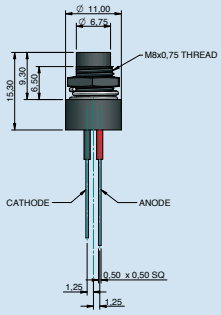
- Max reverse voltage: 5V
- Viewing angle: 60°
- Life expectancy: 100,000 hours
- Operating temperature range: -40° to 85°C
- Storage temperature: -55° to 100°C
- Max panel thickness: 3.5mm
- Torque: 60cNm

MATERIAL

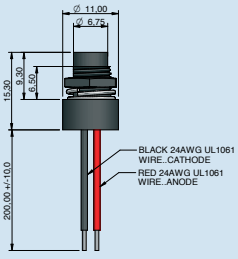
- Body: Black chrome plated brass
- Nut: Black chrome plated brass
- Panel seal: Nitrile O-ring
- Lock washer: Spring steel
- Terminal seal: Epoxy
- Wires: 24AWG high temperature TFE to UL1213

TECHNICAL DRAWINGS

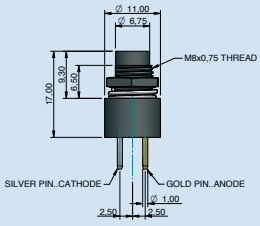
QRM Pins



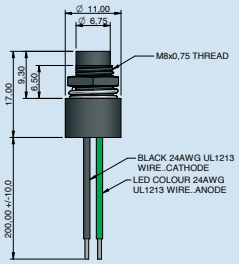
QRM Wires



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 5 = Wires	B = Black Chrome	XX = Fixed Light YY = Bi-colour ZZ = Tri-colour	**QRM** R = Red G = Green Y = Yellow B = Blue W = White HR = Hyper Red HG = Hyper Green HY = Hyper Yellow HB = Hyper Blue HW = Hyper White RG = Red/Green RY = Red/Yellow GY = Green/Yellow RYG = Red/Yellow/Green **QRM-NV** NV-GRA = NVIS Green A NV-GRB = NVIS Green B NV-YWA = NVIS Yellow A NV-YWB = NVIS Yellow B NV-RD = NVIS Red NV-WH = NVIS White	02 = 2VDC 06 = 6VDC 12 = 12VDC 12A = 12VAC/DC 24 = 24VDC 24A = 24VAC/DC 28 = 28VDC 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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