



Korry

Illuminating. Always.



Standard 389 Switch

Korry 389 LED illuminated 5/8-inch switch

Korry has engineered its 389 LED switch for human machine interface (HMI) applications where superior lighting performance, product reliability, and system versatility are required.

Surface mounted electronics with the latest generation of high-brightness LEDs deliver exceptional illumination characteristics such as brightness output and dimming control.

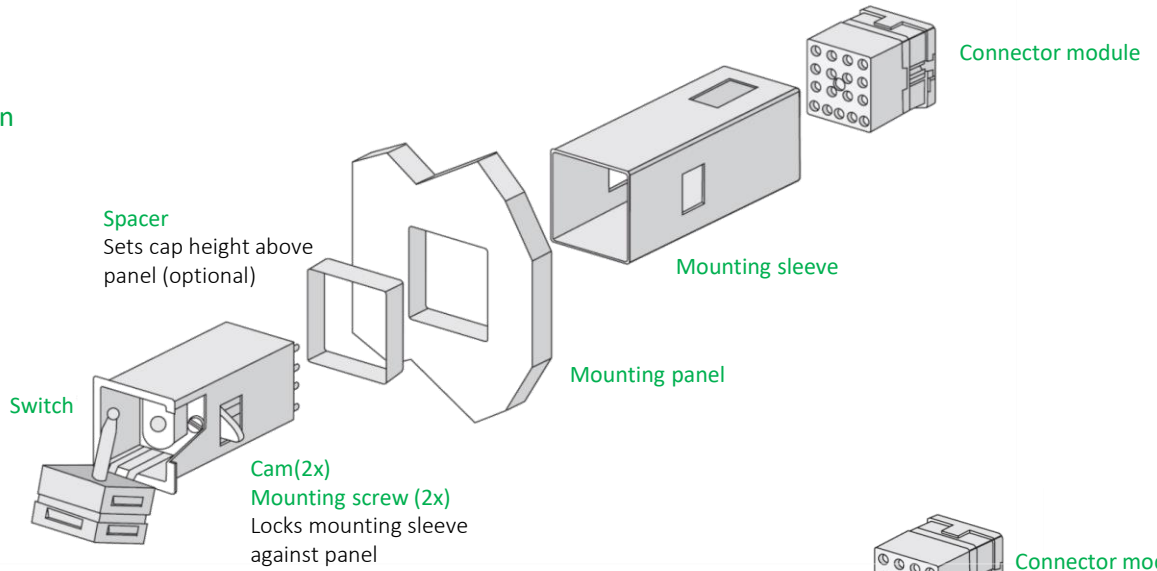
The 389's versatile circuit card assembly (CCA) design allows for any type of dimming requirement to be met.

Mechanically interchangeable with most 5/8-inch switch products, the Korry 389 provides uncompromising performance in system interface capabilities.

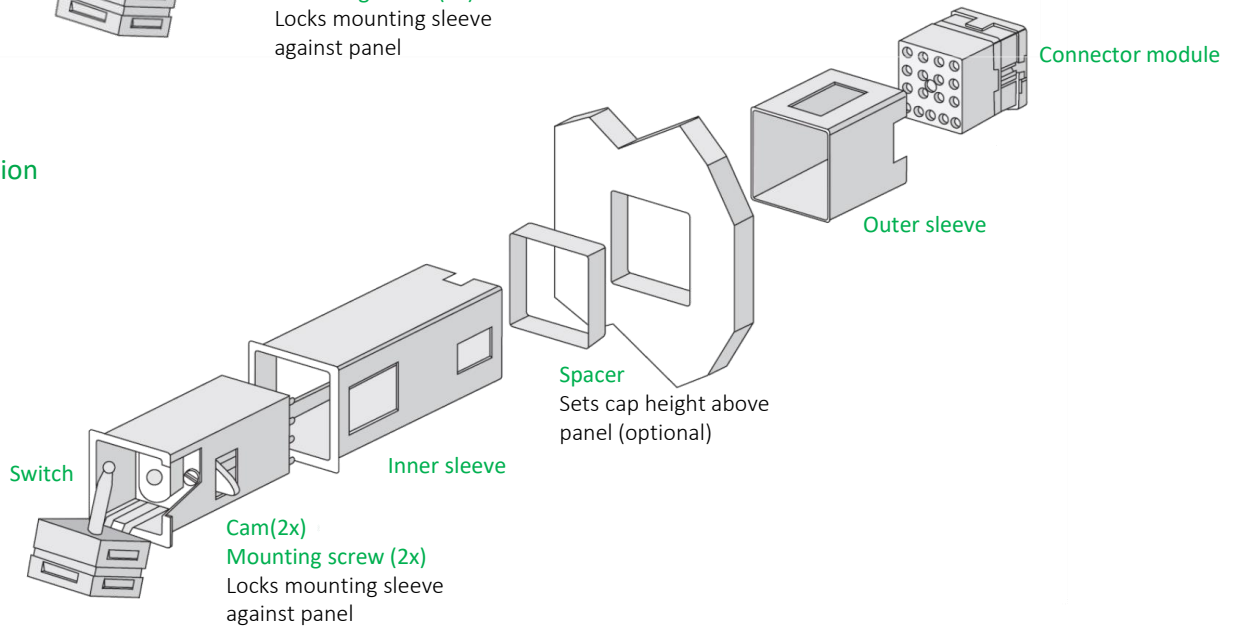


Korry 389 Assembly and Installation

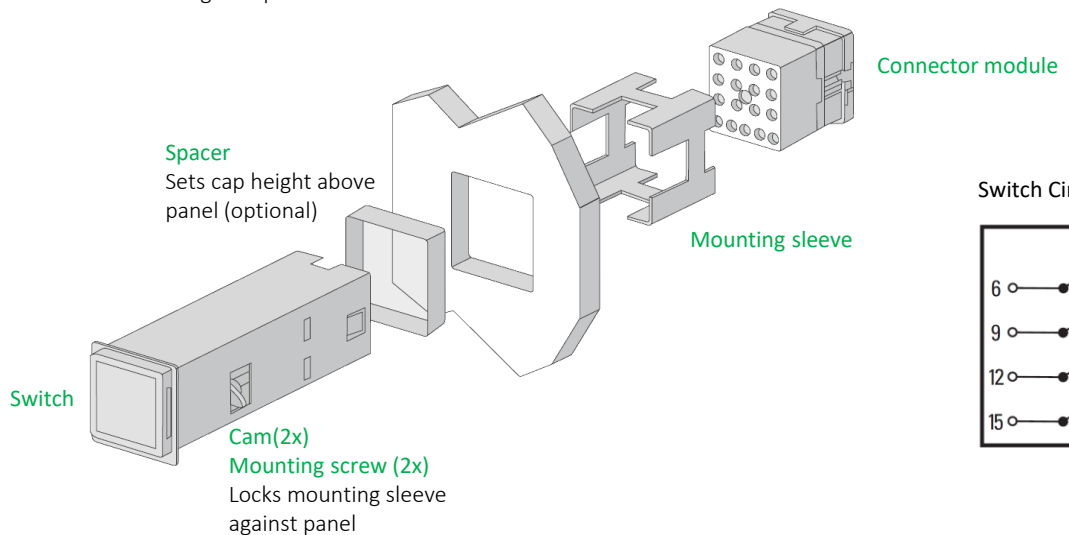
Single-Sleeve Mounting Configuration



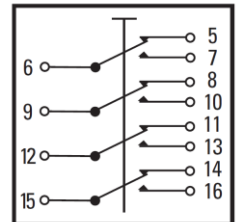
Double-Sleeve Mounting Configuration



Universal-Sleeve Mounting Configuration



Switch Circuit Diagram





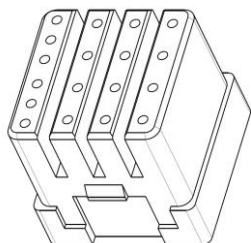
Environmental

Test	Specification
Contact resistance	MIL-STD-202F, Method 307
Contact bounce	MIL-PRF-22885F, Para. 4.7.5
Touch temperature	MIL-PRF-22885/109A
Permanency of marking	MIL-STD-202F, Method 215J
Strength of actuation means	MIL-PRF-22885F Para. 4.7.10
Thermal shock	MIL-STD-202F, Method 107G, Condition A
Vibration	MIL-STD-810C, Method 514.2, Category B2, Procedure 1A
Shock	MIL-STD-202F, Method 213B, Condition B
Moisture resistance	MIL-STD-202F, Method 106F
Insulation resistance	MIL-STD-202F, Method 302, Condition B
Dielectric withstanding voltage	MIL-STD-202F, Method 301 MIL-STD-202F, Method 105C, Condition B
Salt spray*	MIL-STD-202F, Method 101D, Condition A
Explosion	MIL-STD-202F, Method 109B
Sand and dust*	MIL-STD-202F, Method 110A
Overload cycling	MIL-PRF-22885F, Para.4.7.27
Electrical endurance	MIL-PRF-22885F, Para. 4.7.28
Mechanical endurance	MIL-PRF-22885F, Para. 4.7.29
Power	RTCA/DO-160D, Sections 16 and 17
Audio frequency conducted susceptibility	RTCA/DO-160D, Section 18, Category Z
Magnetic effect	RTCA/DO-160D, Section 15, Category Z
Induced signal susceptibility	RTCA/DO-160D, Section 19, Category Z
Radio frequency susceptibility	RTCA/DO-160D, Section 20, Category T
Radio frequency emission	RTCA/DO-160D, Section 21, Category M
Lightning induced transient	RTCA/DO-160D, Section 22, Category XXC3
Temperature / altitude	MIL-STD-810C, Method 504.1, Category 1
Filed of view	MIL-PRF-22885F, Para. 4.7.39
Stray light	MIL-PRF-22885F, Para. 4.7.38

* Results are based on switches being inside of an enclosure. To meet higher requirements, see further information on sealing options. An enclosure would still be required

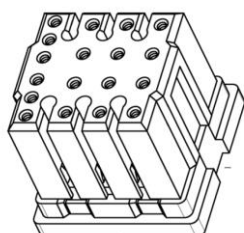
389 Connector and Header Options

6-Pin Connector Module



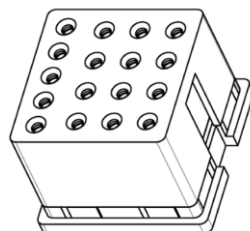
44387-001 module uses M39029/57-354 crimp pins. accepts AWG 22,24, and 26. (Only for use with Universal Sleeve Mounting)

6-Pin Connector Module



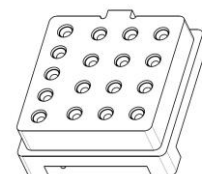
19854-XXX module uses M39029/57-354 crimp pins, accepts AWG 22, 24 and 26

5-Pin Connector Module

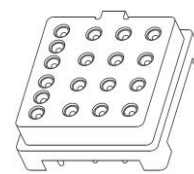


28196-XXX module uses M39029/22-192 crimp pins, accepts AWG 20, 22 and 24

Printed Circuit Board (PCB) Headers



38803-001
5-pin header

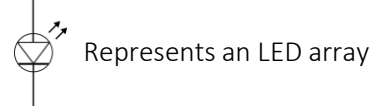


33463-001
6-pin header

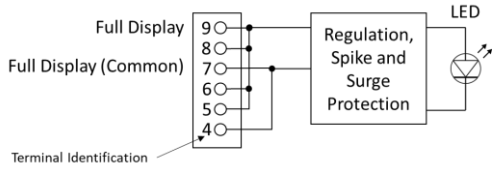


Standard 389 Lamp Circuit Diagrams

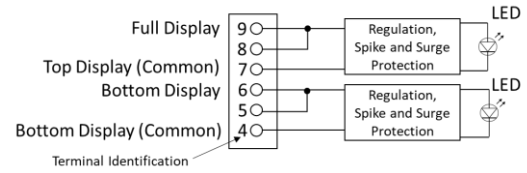
Shown are examples of standard circuits. Other options are available upon request.
Terminal designations for reference only.



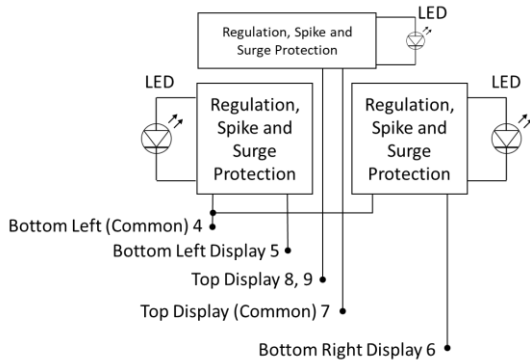
6-Pin Lamp Circuit – accepts M39029/57-354 crimp pins, accepts AWG 22, 24 and 26 (Bipolar Design)



FULL DISPLAY

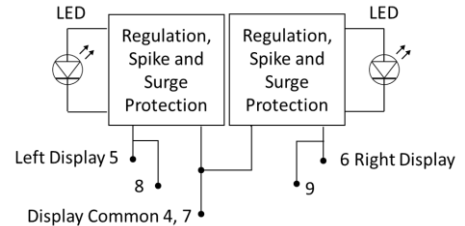


HORIZONTAL SPLIT DISPLAY – SPLIT COMMON (Single Common Available)

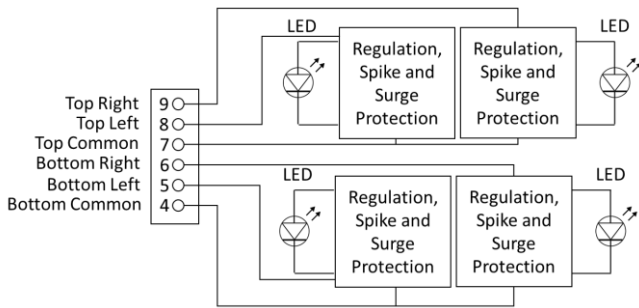


3-WAY DISPLAY – SPLIT COMMON

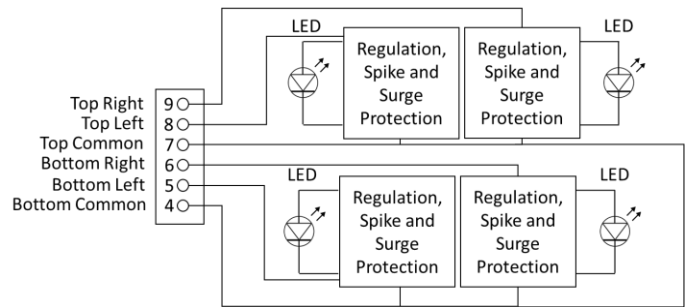
(Other Splits, Power and Common Combinations Available)



VERTICAL SPLIT DISPLAY – SINGLE COMMON

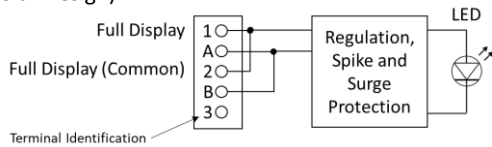


4-WAY DISPLAY – SPLIT COMMON

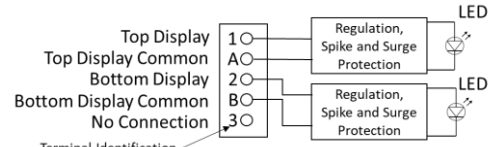


4-WAY DISPLAY – SINGLE COMMON

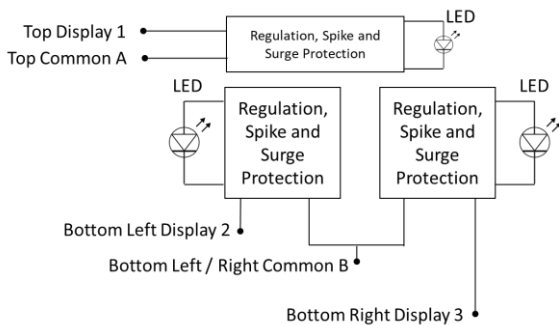
5-Pin Lamp Circuit – accepts M39029/22 crimp pins, accepts AWG 20,22 and 24 (Bipolar Design)



FULL DISPLAY



HORIZONTAL SPLIT DISPLAY



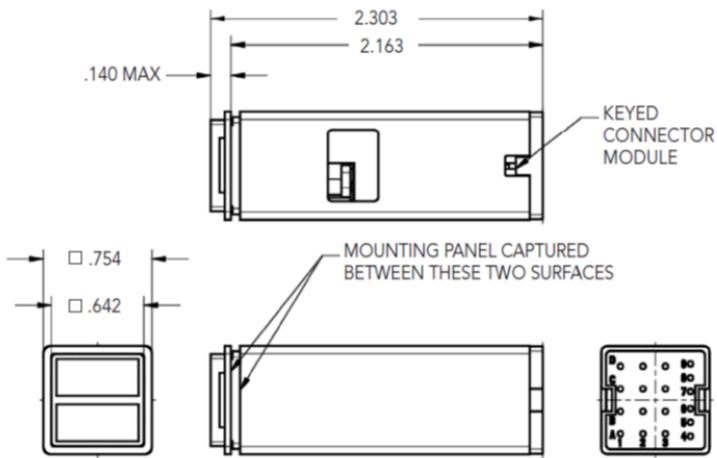
3-WAY SPLIT DISPLAY



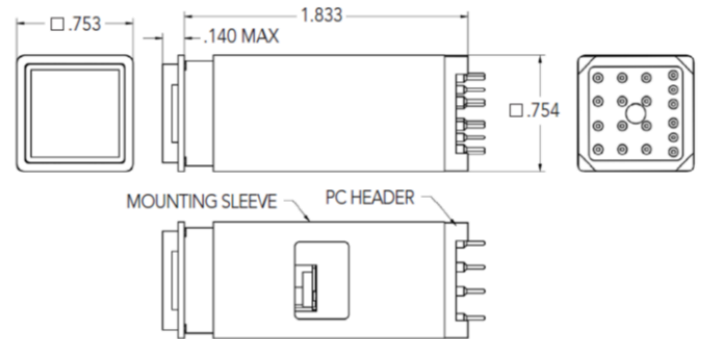
Standard 389 Configuration Envelopes and Panel Cutouts

(dimensions in inches)

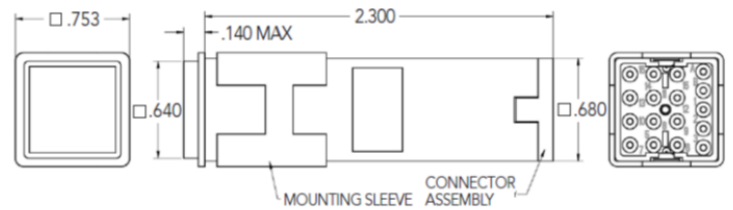
Single Sleeve and Connector Module



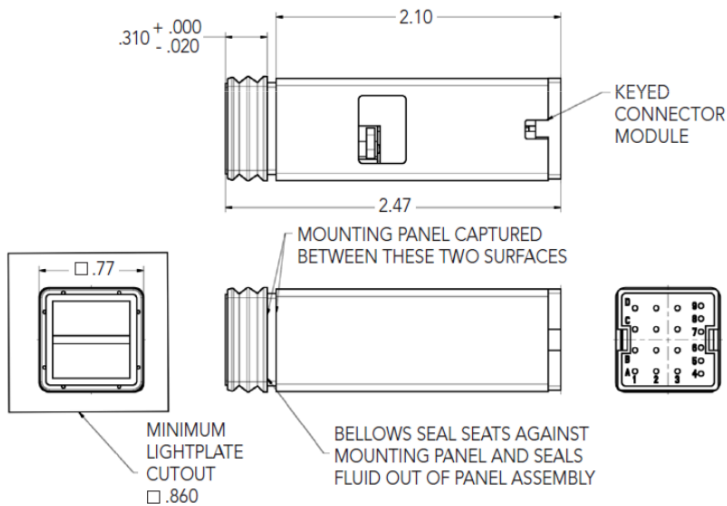
Single Sleeve and PC Header



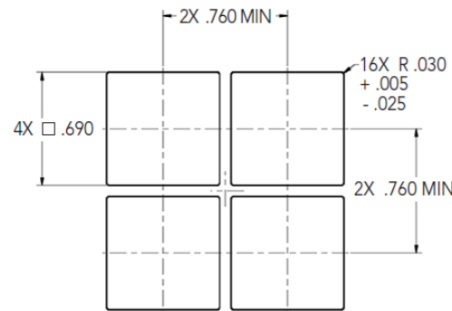
Universal Sleeve and Connector Module



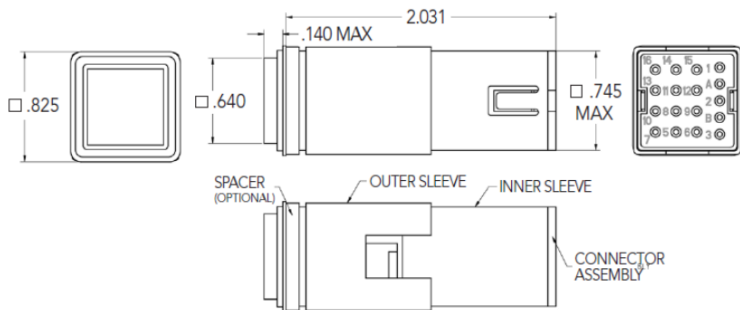
Single Sleeve, Connector Module and Bellows Seal



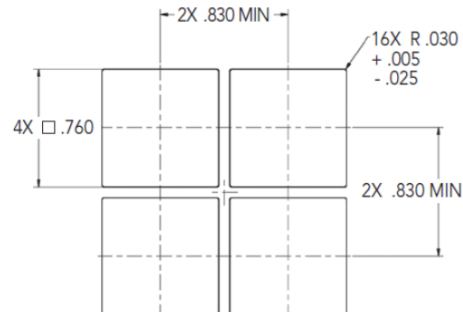
Panel Cutout for Single Sleeve



Double Sleeve and Connector Module



Panel Cutout for Double Sleeve



Reliability

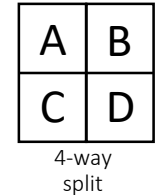
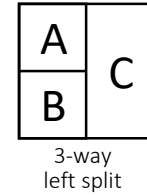
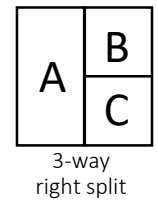
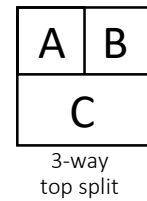
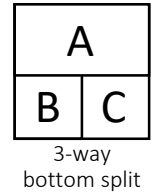
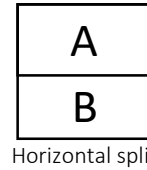
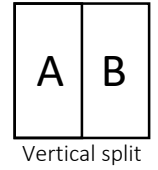
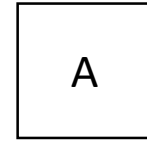
The Korry 389 switch has an MTBF of 1.5 million hours, which varies by configuration and application. The 1.5-million-hour MTBF is for a standard full display, assuming a 20-degree Celsius ambient operating temperature and 3,000 flying hours per year. This prediction was performed using 217 Plus from RiAC™ software.



Legends

Legend Types	Non-Energized Condition	Energized Condition
S (1B) Hidden legend. Letters not visible until illuminated. Lighted colored letters on opaque black background when energized		
B (1C) Hidden legend. Letters not visible until illuminated. Lighted colored background with opaque black letters when energized		
W (2D) Opaque black letters on white background. Background shows color when energized		
N (2G2) White letters on opaque black background. Letters show color when energized		
C (2B) Opaque black letters on colored background. Lighted colored background when energized		
(2F) Opaque white letters on dark background. Background shows color when energized		

Lens Configurations



Fonts

Legends are available in many fonts and character heights. Please contact us for details about your specific request

Commonly Used Fonts

FUTURA MEDIUM	FUTURA MEDIUM CONDENSED	HELVETICA MEDIUM
HELVETICA MEDIUM CONDENSED	GORTON NORMAL	GORTON CONDENSED
GORTON EXTRA CONDENSED	NEWS GOTHIC	DIN MITTELSCHRIFT 1451
DIN ENGSCHRIFT 1451	Character heights between 0.090" - 0.125"	



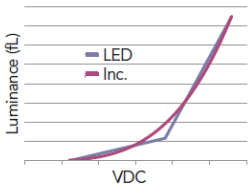
Optical Characteristics

	Luminance		Chromaticity		Contrast	
	Dim @ 14 VDC	Bright @ 28 VDC	X	Y	On	Off
RED	10 ± 5	200 - 500	0.670	0.334	0.6 Min	0 ± 0.1
			0.670	0.310		
			0.695	0.285		
			0.710	0.292		
AMBER	10 ± 5	200 - 500	0.570	0.430	0.6 Min	0 ± 0.1
			0.560	0.420		
			0.600	0.380		
			0.610	0.390		
GREEN	10 ± 5	200 - 500	0.200	0.640	0.6 Min	0 ± 0.1
			0.200	0.740		
			0.320	0.740		
			0.320	0.640		
BLUE	10 ± 5	150 - 400	0.140	0.250	0.4 Min	0 ± 0.1
			0.140	0.150		
			0.200	0.150		
			0.200	0.250		
WHITE	10 ± 5	200 - 500	0.280	0.270	0.6 Min	0 ± 0.1
			0.280	0.370		
			0.340	0.370		
			0.340	0.270		

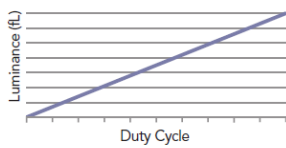
- Luminance and color requirements are for legend types S (1B), B (1C), W (2D), C (2B), and (2F)
- Type N legends are used for night visibility and are designed to match the light-plate luminance value
- NVIS colors are available per MIL-STD-3009
- Korry products meet the night-vision compatibility requirements of MIL-STD-3009
- Contrast shown is for S legends only
- Other optical characteristics are available upon request

Dimming Methodologies

Variable Voltage



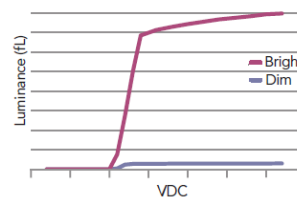
Pulse Width Modulation (PWM)



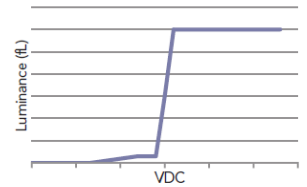
Logic Input

2-to-4-point dimming using multiple ground pins

Constant Illumination over Variable Voltage



Programmable



Electrical and Operating Characteristics

Property	Characteristics
Switch type	Momentary / alternate action, four pole, double throw, form C, single break microswitch IAW MIL-PRF-8805
Switch contact ratings	Resistive: sea level 7A at 28 VDC Inductive: sea level at 4A at 28 VDC Lamp: sea level 2.5A at 28VDC
LED current rating	35mA max at 28 VDC, bright mode, full display
Total cap travel	0.177 inch max. (4.19 mm)
Actuation force	2-5 pounds (0.91-2.27 kg)
Cap extraction	2-5 pounds (0.91-2.27 kg)
Mounting torque	16-20 inch-ounces
Actuation life	100,000 cycles (MIL-PRF-22885)
Temperature	-55° C to +85° C (MIL-PRF-22885)



389 Switch Accessories

Sealing accessories

To meet higher requirements than those listed in the environmental specifications, the following sealing options are available.

	Drip proof	Sand and dust	Waterproof	Humidity	Spill proof	Salt fog
Wiper seal *	X	X				
Internal seal *		X		X		X
External seal *	X	X	X	X	X	X
Bellows seal *	X	X	X	X	X	X

* Panel seals are also available

Electrical Interface Accessories

- M39029 crimp pins: solder-less wire connections that can easily be removed and reinstalled into the connector module
- Connector module: a standard electrical interface that accommodates the M39029 crimp-pin feature
- PCB header: for installation onto a PCB or CCA

Miscellaneous Accessories

- Spacers: available for insertion between the mounting panel and housing flange to position the cap assembly level with an adjacent light plate
- Mounting sleeves: Different mounting-sleeve configurations compatible with either the connector module or PC-header electrical interface
 - Universal sleeve: A single-sleeve option accommodating mounting panel thicknesses from 0.032 to 0.432-inch thicknesses. Access to the rear of the mounting panel is required
 - Single sleeve: used with the connector module interface to secure the switch around the mounting panel. This sleeve does not allow for the switch to be replaced from the front of the panel. Access to the rear of the mounting panel is required
 - Double sleeve: used with the connector module interface. This sleeve allows for the switch to be replaced from the front of the panel (Not compatible with PC header option)
- Flip-guard assembly: multiple styles available to prevent inadvertent switch actuation
- Connector-module extraction tool: M22885/108T8234.



For more information contact us at:
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www.korrry.com

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The information and data given are typical for the equipment described. However, any individual item is subject to change without any notice