

SWITCHES

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MAGNETIC SWITCH PRODUCTS

Magnetic switch products are designed to signal when an actuator with an integrated magnet has reached a set point in its travel. Bimba switches are pretested for use with Bimba actuators, eliminating the costly and time-consuming design and fabrication required to integrate third party switches. Switches are available in multiple configurations to meet your application needs. A variety of outputs are offered for each switch family, including PNP (transistor sourcing), NPN (transistor sinking), normally open contacts, and higher power triac.

PRODUCT FEATURES

Bimba offers more than twenty switch product series. The series are grouped by mounting style: band or track mounted. The choice of mounting style depends on the actuator used and user preference. Each series offers a unique mix of features allowing the user to select the right balance of price, performance and features for their application.

FEATURES

Magnetic Reed Switch

- Lower cost
- Optional integrated LED
- AC or DC options
- Compact size
- Straight or 90° take out
- Quick disconnect or flying lead cable ends
- Track or band mounted

Solid State Switch

- Solid state reliability
- Faster response time
- Integrated LED
- Compact size
- Straight or 90° take out
- Quick disconnect or flying lead cable ends
- Reverse polarity and over-voltage protection
- Track or band mounted

BENEFITS

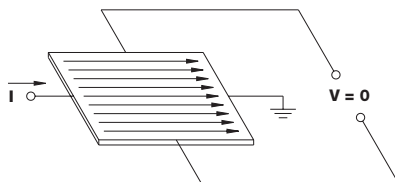
- Small operating window enables precise control of machine and processes
- Solid State switches have longer life than mechanical switches, reducing downtime
- Optional 90° take out simplifies wire routing
- Multiple cable length options simplify installation
- LED provides visual confirmation of switch function
- Compact size enables multiple switches to be installed on one actuator
- Multiple mounting options enable users to select the option that fits their needs

BIMBA SOLID STATE MAGNETIC SWITCH

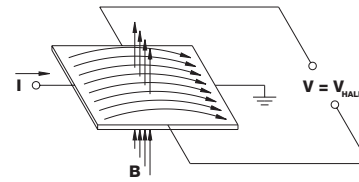
A Bimba solid state switch is a three-wire device recommended for low current DC loads such as interfacing with programmable controllers. It provides compact, reliable sensing with virtually infinite life. An LED indicator light illuminates when switching occurs. Models are available in current sinking (NPN) and current sourcing (PNP) models. Either can be used for loads like counters and solid state relays. Selection of sinking or sourcing models depends on the requirements of the programmable controller.

The Bimba Solid State Switch is based on giant magnetoresistive (GMR) technology. It includes four solid state resistors (two active, two shielded), each of which has many thin layers of magnetoresistive material. In each layer, the electrons are oriented opposite the adjacent layer, providing a great deal of resistance to electrical flow. The presence of a magnetic field overcomes the magnetic coupling between the adjacent layers, causing parallel alignment of magnetic moments between layers, and resistance drops significantly.

By connecting the four resistors in a classic Wheatstone bridge configuration, the voltage across a single resistor is doubled, providing a linear output. This voltage is then amplified and sent to a comparator that switches the sensor output when it detects that a minimum magnetic field strength is present. High voltage transistors provide TTL-compatible output rated at 25 milliamps. The switch includes reverse polarity, overvoltage, and transient protection.



PRINCIPLE OF SOLID STATE (NO MAGNETIC FIELD)



PRINCIPLE OF SOLID STATE (MAGNETIC FIELD PRESENT)

SINKING VS. SOURCING

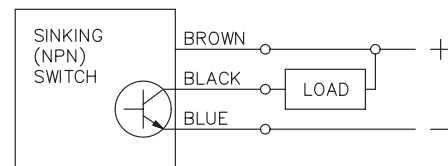
Bimba offers both sinking and sourcing Solid State Switch models:

- **Sinking switches** are applied to the **negative** side of a load. When the switch is activated, the negative (ground) is connected, completing the circuit.
- **Sourcing switches** are applied to the **positive** side of a load. When the switch is activated, power is connected, completing the circuit.

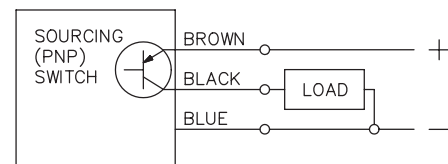
The model needed will be determined by a number of factors, including:

- Company standards.
- PLC input cards. (You may have sinking input cards available or your PLC only has a sinking type. Be aware that for some PLC manufacturers, sourcing input cards require a sinking switch or sinking input cards require a sourcing switch; check the specifications to clarify.)
- Type of circuit. PLC manufacturers typically filter input modules that use sourcing field devices and use unfiltered input modules with sinking field devices.

Typical Solid State Sinking Configuration (NPN)



Typical Solid State Sourcing Configuration (PNP)



HOW TO SPECIFY

MAGNETIC SWITCH SELECTION CHART

Mounting Style	Model	Description	Original Line® Original Line Electric®	Double-Wall®	EF/Twist Clamp Twin Bore/ ET Pneu-Moment™ Stopper/ LPA/NPA	Flat-1® Flat-II®	Pneu Turn®	Linear Thruster Original Line Electric® Thruster	Ultran®
Track Mounted	MD	4mm round track (C-Slot), EdgeSwitch™	X1		X4		X1	X1	
	MH	4mm round track (C-Slot), Mini EdgeSwitch™	X1		X4	X5	X1	X1	
	MR	4mm round track (C-Slot), Reed switch	X1		X4		X1	X1	
	MS	4mm round track (C-Slot), Solid State switch	X1		X4		X1	X1	
	MRS-.027	MRS-Z actuator small bore, Heavy duty reed switch	X2						
	MRS-.087	MRS-Z actuator large bore, Heavy duty reed switch	X3						
	MRS-1.5	MRS-Z actuator, Heavy duty AC-only triac switch	X3						
	H	Flat actuator, Solid State switch				X			
	MRS-AB	5mm square track (ISO 15552), Reed switch							
	HS_-AB	5mm square track (ISO 15552), Solid State switch							
	UB	5mm square track (Ultran), Solid State or Reed switch							
	SW	Extruded body electric, Solid State switch							
Band Mounted	HS	Band mounted, Solid State switch	X				X	X6	
	MRS-.027-B	Band mounted (ISO 6432), Heavy duty reed switch							
	MRS-.087-B	Band mounted, Heavy duty reed switch	X	X			X		
	MRS-1.5-B	Band mounted, Heavy duty AC-only triac switch	X	X			X		
	MSS	Band mounted, High illumination solid state switch	X						
	R10	Band mounted, High illumination reed switch	X						
	R10P	Band mounted, High illumination reed switch, Circuit protection	X						
	RAC	Band mounted, High current AC-only triac switch	X						
	RHT	Band mounted, High temperature reed switch	X						
Threaded Body	RSU	Threaded barrel (Ultran), Reed switch							X
	P	Threaded barrel (Ultran), Inductive switch							X

X1 - "T" option required

X2 - MRS Series with -Z option 9/16" and 3/4" bore only

X3 - MRS Series with -Z option 1-1/16" through 2-1/2" bore only

X4 - Extruded Thruster/ET and LPA/NPA not compatible with 90 degree switch option

X5 - Flat-I only, "U" option required

X6 - Not for use with 9/16" bore

X7 - "U" option required

X8 - "T" option required - not available on 8, 10, or 12mm bore with option ED, Q, U

X9 - 18mm bore only

X10 - 25mm through 63mm bore only

MAGNETIC SWITCH SELECTION CHART

Mounting Style	Model	Description	Ultran® Slide High Load Ultran®	Ultran® Band	Repairable Stainless Steel All Stainless OL	Extruded Body Electric Actuators	ISO 15552	ISO 6432
Track Mounted	MD	4mm round track (C-Slot), EdgeSwitch™	X7	X9				X8
	MH	4mm round track (C-Slot), Mini EdgeSwitch™	X7	X9				X8
	MR	4mm round track (C-Slot), Reed switch	X7	X9				X8
	MS	4mm round track (C-Slot), Solid State switch	X7	X9				X8
	MRS-.027	MRS-Z actuator small bore, Heavy duty reed switch						
	MRS-.087	MRS-Z actuator large bore, Heavy duty reed switch	X8					
	MRS-1.5	MRS-Z actuator, Heavy duty AC-only triac switch						
	H	Flat actuator, Solid State switch	X8					
	MRS-AB	5mm square track (ISO 15552), Reed Switch					X	
	HS_-AB	5mm square track (ISO 15552), Solid State switch					X	
	UB	5mm square track (Ultran), Solid State or Reed switch		X10				
	SW	Extruded body electric, Solid State switch				X		
Band Mounted	MRS-.027-B	Band mounted (ISO 6432), Heavy duty reed switch						X
	MRS-.087-B	Band mounted, Heavy duty reed switch						X
	MRS-1.5-B	Band mounted, Heavy duty AC-only triac switch						X
	HS	Band mounted, Solid State switch						
	MSS	Band mounted, High illumination Solid State switch						
	R10	Band mounted, High illumination reed switch						X
	R10P	Band mounted, High illumination reed switch, Circuit protection						X
	RAC	Band mounted, High current AC-only triac switch						X
	RHT	Band mounted, High temperature reed switch						X
Threaded Body	RSU	Threaded barrel (Ultran), Reed switch	X					
	P	Threaded barrel (Ultran), Inductive switch	X					

X1 - "T" option required
 X2 - MRS Series with -Z option 9/16" and 3/4" bore only
 X3 - MRS Series with -Z option 1-1/16" through 2-1/2" bore only
 X4 - Extruded Thruster/ET and LPA/NPA not compatible with 90 degree switch option
 X5 - Flat-I only, "U" option required
 X6 - Not for use with 9/16" bore
 X7 - "U" option required
 X8 - "T" option required - not available on 8, 10, or 12mm bore with option ED, Q, U
 X9 - 18mm bore only
 X10 - 25mm through 63mm bore only

HOW TO SPECIFY

MAGNETIC SWITCH SPECIFICATION CHART

Mounting Style	Model	Description	Sensor Type	Output Type	Operating Voltage	Actuating Time (mS)	Maximum Load Current (mA)	Reverse Polarity Protection
Track Mounted	MDF	4mm round track (C-Slot), EdgeSwitch™	Solid State	Normally open solid state	10V to 28V, DC	1.0	50	
	MHF	4mm round track (C-Slot), Mini EdgeSwitch™	Solid State	Normally open solid state	10V to 28V, DC	1.0	50	
	MHC or MHK	4mm round track (C-Slot), Mini EdgeSwitch™	Solid State	PNP, NPN	5V to 28V, DC	1.0	100	X
	MR	4mm round track (C-Slot), Reed switch	Reed	Normally open contact	5V to 120V, AC or DC	1.0	30	
	MS	4mm round track (C-Slot), Reed switch	Solid State	Autoconfig (PNP or NPN)	5V to 30V, DC	0.2	100	X
	MSC or MSK	4mm round track (C-Slot), Solid state switch	Solid State	PNP, NPN	4.5V to 30V, DC	1.0	200	X
	MRS-.027	MRS-Z actuator small bore, Heavy duty reed switch	Reed	Normally open contact	28V Max., AC or DC	1.0	250	
	MRS-.087	MRS-Z actuator large bore, Heavy duty reed switch	Reed	Normally open contact	200V Max., AC or DC	1.0	500	
	MRS-1.5	MRS-Z actuator, Heavy duty AC-only triac switch	Reed	Triac	12V to 230V, AC	2.0	1500	
	H	Flat actuator, Solid state switch	Solid State	PNP, NPN	4.5V to 30V, DC	1.0	150	X
	MRS-AB	5mm square track (ISO 15552), Reed switch	Reed	Normally open contact	5V to 240V, AC or DC	1.0	100	
	HSC-AB or HSK-AB	5mm square track (ISO 15552), Solid state switch	Solid State	PNP, NPN	5V to 30V, DC	1.0	200	X
	UBR	5mm square track (Ultran), Solid state switch	Reed	Normally open contact	5V to 240V, AC or DC	1.0	100	
	UBS	5mm square track (Ultran), Solid state switch	Solid State	PNP, NPN	5V to 30V, DC	1.0	200	X
	SW	Extruded body electric, Solid state switch	Solid State	PNP, NPN	10V to 30V, DC	1.0	200	X
Band Mounted	MRS-.027-B	Band mounted (ISO 6432), Heavy duty reed switch, No LED	Reed	Normally open contact	28V Max., AC or DC	1.0	250	
	MRS-.027-BL	Band mounted (ISO 6432), Heavy duty reed switch, LED	Reed	Normally open contact	6V to 24V, AC or DC	1.0	250	
	MRS-.087-B	Band mounted, Heavy duty reed switch, No LED	Reed	Normally open contact	120 (200)V, AC or DC	1.0	500	
	MRS-.087-BL	Band mounted, Heavy duty 3-wire reed switch, LED	Reed	Normally open contact	6V to 24V, AC or DC	1.0	500	
	MRS-.087-PBL	Band mounted, Heavy duty 2-wire reed switch, LED	Reed	Normally open contact	3V to 120V, AC or DC	1.0	20	
	MRS-1.5-B	Band mounted, Heavy duty AC-only triac switch	Reed	Triac	12V to 230V, AC	2.0	1500	
	HS	Band mounted, Solid state switch	Solid State	PNP, NPN	4.5V to 30V, DC	1.0	150	X
	MSS	Band mounted, High illumination solid state switch	Solid State	PNP, NPN	10V to 30V, DC	1.0	300	X
	R10	Band mounted, High illumination reed switch	Reed	Normally open contact	5V to 120V, AC or DC	1.0	1.0	
	R10P	Band mounted, High illumination reed switch, Circuit protection	Reed	Normally open contact	5V to 120V, AC or DC	1.0	150	
	RAC	Band mounted, High current AC-only triac switch	Reed	Triac	12V to 240V, AC	2.0	800	
	RHT	Band mounted, High temperature reed switch	Reed	Normally open contact	5V to 120V, AC or DC	1.0	500	
Threaded Body	RSU	Threaded barrel (Ultran), Reed switch	Reed	Normally open contact	200V, DC	0.33	150	X
	P	Threaded barrel (Ultran), Inductive switch	Inductive	PNP, NPN	10V to 30V, DC	0.33	150	X

MAGNETIC SWITCH SPECIFICATION CHART

Mounting Style	Model	Description	Over Voltage Protection	Transient Protection	LED	Temperature Rating	Enclosure
Track Mounted	MDF	4mm round track (C-Slot), EdgeSwitch™	X	X	X	-10C to 70C	IP67
	MHF	4mm round track (C-Slot), Mini EdgeSwitch™	X	X	X	-10C to 70C	IP67
	MHC or MHK	4mm round track (C-Slot), Mini EdgeSwitch™	X	X	X	-10C to 70C	IP67
	MR	4mm round track (C-Slot), Reed switch			X	-10C to 60C	IP67
	MS	4mm round track (C-Slot), Solid state switch	X	X	X	-20C to 80C	IP67
	MSC or MSK	4mm round track (C-Slot), Solid state switch	X	X	X	-20C to 80C	IP67
	MRS-.027	MRS-Z actuator small bore, Heavy duty reed switch				-25C to 85C	IP65
	MRS-.087	MRS-Z actuator large bore, Heavy duty reed switch				-25 to 85C	IP65
	MRS-1.5	MRS-Z actuator, Heavy duty AC-only triac switch				-25C to 85C	IP65
	H	Flat actuator, Solid state switch	X	X	X	-20C to 80C	IP67
	MRS-AB	5mm square track (ISO 15552), Reed switch			X	-10C to 70C	IP67
	HSC-AB or HSK-AB	5mm square track (ISO 15552), Solid state switch	X	X	X	-10C to 70C	IP67
	UBR	5mm square track (Ultram), Solid state switch			X	-10C to 70C	IP67
	UBS	5mm square track (Ultram), Solid state switch	X	X	X	-10C to 70C	IP67
	SW	Extruded body electric, Solid state switch			X	-25C to 85C	IP67
Band Mounted	MRS-.027-B	Band mounted (ISO 6432), Heavy duty reed switch, No LED				-25C to 85C	IP65
	MRS-.027-BL	Band mounted (ISO 6432), Heavy duty reed switch, LED			X	-25C to 85C	IP65
	MRS-.087-B	Band mounted, Heavy duty reed switch, No LED				-25C to 85C	IP65
	MRS-.087-BL	Band mounted, Heavy duty 3-wire reed switch, LED			X	-25C to 85C	IP65
	MRS-.087-PBL	Band mounted, Heavy duty 2-wire reed switch, LED			X	-25C to 85C	IP65
	MRS-1.5-B	Band mounted, Heavy duty AC-only triac switch				-25C to 85C	IP65
	HS	Band mounted, Solid state switch	X	X	X	-20C to 80C	IP67
	MSS	Band mounted, High illumination solid state switch	X	X	X	-20C to 70C	IP67
	R10	Band mounted, High illumination reed switch			X	-20C to 70C	IP67
	R10P	Band mounted, High illumination reed switch, Circuit protection	X	X	X	-20C to 70C	IP67
	RAC	Band mounted, High current AC-only triac switch				-20C to 70C	IP67
	RHT	Band mounted, High temperature reed switch				-40C to 125C	IP67
Threaded Body	RSU	Threaded barrel (Ultram), Reed switch	X	X		-25C to 85C	IP65
	P	Threaded barrel (Ultram), Inductive switch	X	X		-25C to 70C	IP67

WIRE COLOR CODES

Generally the wire colors for Bimba switches conform to CENELEC EN 50 044 wiring standard. All switches with the “Q” option used with Bimba cables conform to the standard, which is: Brown – Positive, Blue – Ground, and Black – Output. Some legacy switches do not conform to the standard as indicated in the catalog and documentation provided with the switch.

Important note: two wire switches use only the brown and blue wires. (Some legacy switches use red and black.) Do not connect the blue and brown wires across the power supply without a load in series with the switch; it will be destroyed by the short circuit.

HOW TO SPECIFY

SWITCH INFORMATION LOCATION

Mounting Style	Model	Description	Dimensions Page Number	Circuit Diagram Page Number	How to Order Page Number
Track Mounted	MD	4mm round track (C-Slot), EdgeSwitch™	316	318	333
	MH	4mm round track (C-Slot), Mini EdgeSwitch™	316, 317	318	333
	MR	4mm round track (C-Slot), Reed switch	316, 317	318	333
	MS	4mm round track (C-Slot), Solid State switch	316, 317	318	333
	MRS-.027	MRS-Z actuator small bore, Heavy duty reed switch	319	319	334
	MRS-.087	MRS-Z actuator large bore, Heavy duty reed switch	319	319	334
	MRS-1.5	MRS-Z actuator, Heavy duty AC-only triac switch	319	319	334
	H	Flat actuator, Solid State switch	320	320	335
	MRS-AB	5mm square track (ISO 15552), Reed switch	321	321	336
	HS-AB	5mm square track (ISO 15552), Solid State switch	321	321	336
	UB	5mm square track (Ultran), Solid State or Reed switch	322	322	337
	SW	Extruded body electric, Solid State switch	323	323	339
Band Mounted	HS	Band mounted, Solid State switch	326	326	342
	MRS-.027-B	Band mounted (ISO 6432), Heavy duty reed switch	324	324	338
	MRS-.087-B	Band mounted, Heavy duty reed switch	325	325	340
	MRS-1.5-B	Band mounted, Heavy duty AC-only triac switch	325	325	341
	MSS	Band mounted, High illumination solid state switch	327	328	343
	R10	Band mounted, High illumination reed switch	327	328	343
	R10P	Band mounted, High illumination reed switch, Circuit protection	327	328	343
	RAC	Band mounted, High current AC-only triac switch	327	328	343
	RHT	Band mounted, High temperature reed switch	3327	328	343
Threaded Body	RSU	Threaded barrel (Ultran), Reed switch	329	329	344
	P	Threaded barrel (Ultran), Inductive switch	329	329	345

SWITCH APPLICATION INFORMATION

Actuator Application Data

Hysteresis and Operating Windows

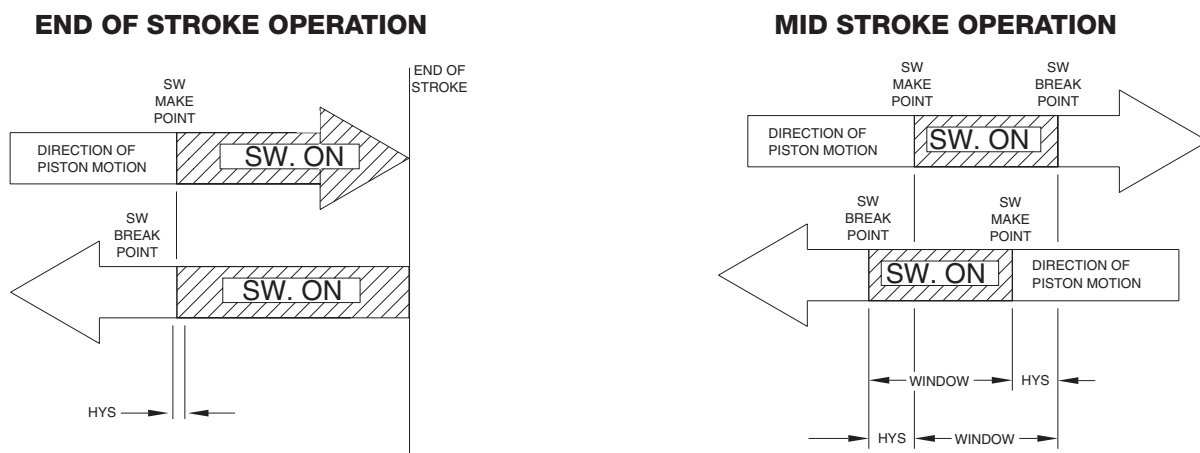
Hysteresis

Bimba Solid State switches are subject to hysteresis. Hysteresis is the difference in magnetic field strength needed to initiate switch operation versus the field strength needed to sustain switch operation. The effect is that the switch break point will be different from the switch make point in the piston travel.

Operating Window

The operating window is the distance the piston travels while the switch is in the “ON” state, and includes the hysteresis action. For the Solid State Switch, hysteresis is greater on one side of the operating window because this switch is sensitive to only one side of the magnet.

For high speed equipment, the time duration of the switch signal may be critical. The time duration is a function of the operating window length and the speed of operation of the actuator. It is calculated by dividing the minimum travel in the operating window by the piston speed, taking into account the hysteresis effect. The illustrations and chart below show the operating windows for the Solid State Switch.



SWITCH APPLICATION INFORMATION

Original Line® Cylinders with Indicated Switches

Bore Size			MDF, MHF, MHC, MHK			MR, MS, MSC, MSK		
			Operating Window	Maximum Hysteresis	Repeatability	Operating Window	Maximum Hysteresis	Repeatability
007	5/16"	8mm	0.055" (1mm)	0.030" (1mm)	0.005" (0.1mm)	0.250" (6mm)	0.040" (1mm)	0.010" (0.03mm)
01	7/16"	10-12mm	0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.275" (7mm)	0.040" (1mm)	0.010" (0.03mm)
02	9/16"	14-16mm	0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.350" (9mm)	0.040" (1mm)	0.010" (0.03mm)
04	3/4"	19-20mm	0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.375" (10mm)	0.040" (1mm)	0.010" (0.03mm)
06	7/8"		0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.425" (11mm)	0.040" (1mm)	0.010" (0.03mm)
09	1-1/16"	25-27mm	0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.450" (11mm)	0.050" (1mm)	0.010" (0.03mm)
12	1-1/4"		0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.450" (11mm)	0.050" (1mm)	0.010" (0.03mm)
17	1-1/2"	38mm	0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.450" (11mm)	0.050" (1mm)	0.010" (0.03mm)
24	1-3/4"		0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.450" (11mm)	0.050" (1mm)	0.010" (0.03mm)
31	2"	50mm	0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.450" (11mm)	0.050" (1mm)	0.010" (0.03mm)
50	2-1/2"		0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.450" (11mm)	0.050" (1mm)	0.010" (0.03mm)
70	3"		0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.500" (11mm)	0.050" (1mm)	0.010" (0.03mm)

Bore Size			HSC, HSK			MRS-.027, MRS-1.5-S		
			Operating Window	Maximum Hysteresis	Repeatability	Operating Window	Maximum Hysteresis	Repeatability
02	9/16"	14-16mm	0.290" (7mm)	0.040" (1mm)	0.015" (0.4mm)	0.345" (9mm)	0.015" (0.4mm)	0.015" (0.4mm)
04	3/4"	19-20mm	0.310" (8mm)	0.040" (1mm)	0.015" (0.4mm)	0.345" (9mm)	0.015" (0.4mm)	0.015" (0.4mm)
06	7/8"		0.320" (8mm)	0.040" (1mm)	0.015" (0.4mm)			
09	1-1/16"	25-27mm	0.330" (8mm)	0.040" (1mm)	0.015" (0.4mm)			
12	1-1/4"		0.340" (9mm)	0.040" (1mm)	0.015" (0.4mm)			
17	1-1/2"	38mm	0.350" (9mm)	0.040" (1mm)	0.015" (0.4mm)			
24	1-3/4"		0.350" (9mm)	0.040" (1mm)	0.015" (0.4mm)			
31	2"	50mm	0.360" (9mm)	0.040" (1mm)	0.015" (0.4mm)			
50	2-1/2"		0.370" (9mm)	0.040" (1mm)	0.015" (0.4mm)			
70	3"		0.380" (10mm)	0.040" (1mm)	0.015" (0.4mm)			

Bore Size			MRS-.087, MRS-1.5		
			Operating Window	Maximum Hysteresis	Repeatability
02	9/16"	14-16mm	0.350" (9mm)	0.040" (1mm)	0.015" (0.4mm)
04	3/4"	19-20mm	0.350" (9mm)	0.040" (1mm)	0.015" (0.4mm)
06	7/8"		0.350" (9mm)	0.040" (1mm)	0.015" (0.4mm)
09	1-1/16"	25-27mm	0.350" (9mm)	0.040" (1mm)	0.015" (0.4mm)
12	1-1/4"		0.350" (9mm)	0.040" (1mm)	0.015" (0.4mm)
17	1-1/2"	38mm	0.440" (11mm)	0.040" (1mm)	0.015" (0.4mm)
24	1-3/4"		0.440" (11mm)	0.040" (1mm)	0.015" (0.4mm)
31	2"	50mm	0.440" (11mm)	0.040" (1mm)	0.015" (0.4mm)
50	2-1/2"		0.440" (11mm)	0.040" (1mm)	0.015" (0.4mm)
70	3"		0.440" (11mm)	0.040" (1mm)	0.015" (0.4mm)

SWITCH APPLICATION INFORMATION

Flat Cylinders with Track Mounted Switches

Bore Size			MHF, MHC, MHK			HK, HC, MR, MS, MSC, MSK		
			Operating Window	Maximum Hysteresis	Repeatability	Operating Window	Maximum Hysteresis	Repeatability
02	9/16"	14mm	0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.250" (6mm)	0.040" (1mm)	0.010" (0.03mm)
04	3/4"	19mm	0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.300" (8mm)	0.040" (1mm)	0.010" (0.03mm)
09	1-1/16"	27mm	0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.300" (8mm)	0.040" (1mm)	0.010" (0.03mm)
17	1-1/2"	38mm	0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.300" (8mm)	0.040" (1mm)	0.010" (0.03mm)
31	2"	50mm	0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.325" (9mm)	0.040" (1mm)	0.010" (0.03mm)
50	2-1/2"	63mm	0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.325" (9mm)	0.040" (1mm)	0.010" (0.03mm)
70	3"	76mm	0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.375" (10mm)	0.040" (1mm)	0.010" (0.03mm)
125	4"	101mm	0.125" (3mm)	0.030" (1mm)	0.005" (0.1mm)	0.400" (10mm)	0.040" (1mm)	0.010" (0.03mm)

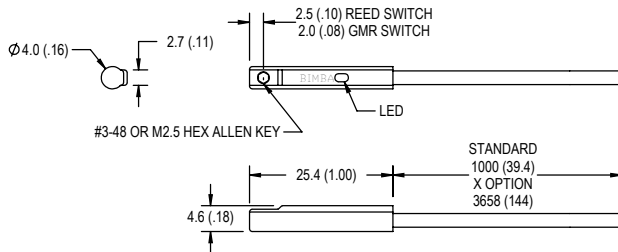
Pneu-Turn® Rotary Actuators with Indicated Switches

Bore Size			MDF, MHF, MHC, MHK			MRS-.087 -B		
			Operating Window	Maximum Hysteresis	Repeatability	Operating Window	Maximum Hysteresis	Repeatability
02	9/16"	14mm	26°	6°	±1°	62°	9°	±3°
04	3/4"	19mm	19°	5°	±0.8°	51°	7°	±2°
09	1-1/16"	27mm	17°	4°	±0.7°	54°	9°	±2°
17	1-1/2"	38mm	13°	3°	±0.5°	40°	6°	±2°
31	2"	50mm	9°	2°	±0.3°	30°	5°	±1°

Bore Size			MR, MS, MSC, MSK			HSC, HSK		
			Operating Window	Maximum Hysteresis	Repeatability	Operating Window	Maximum Hysteresis	Repeatability
02	9/16"	14mm	73°	8°	±2°	84°	7°	±3°
04	3/4"	19mm	57°	7°	±1.5°	61°	5°	±2°
09	1-1/16"	27mm	57°	6°	±1.5°	55°	5°	±2°
17	1-1/2"	38mm	47°	5°	±1°	41°	4°	±2°
31	2"	50mm	33°	4°	±0.75°	29°	3°	±1°

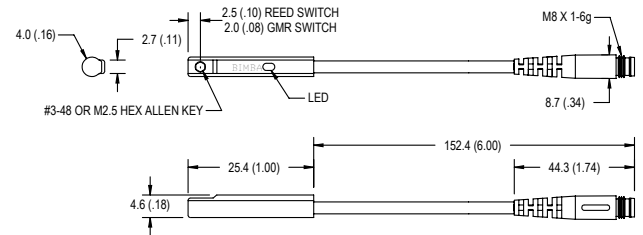
DIMENSIONS

M Series, 4mm Round Track (C-Slot), EdgeSwitch™, Mini EdgeSwitch™, Reed and Solid State Switches MDF, MDF-90, MHF-90, MHC-90, MHK-90, MR, MR-90, MS, MS-90, MSC, MSC-90, MSK, MSK-90

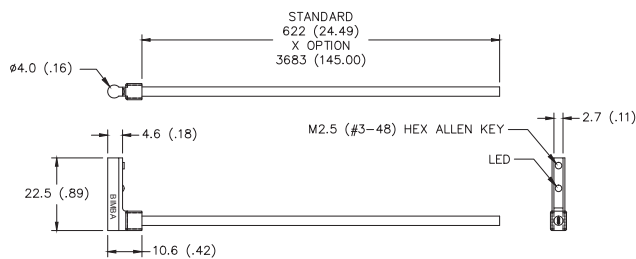


**MR, MRX, MS*, MSX, MSC*, MSCX,
MSK*, MSKX**

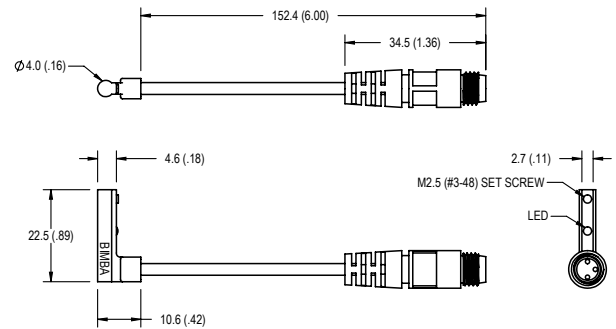
**Standard pigtail length for MS, MSC, and MSK switches is 622 (24.49)*



**MRQ, MRQC, MRQCX, MSQ, MSQC,
MSQCX, MSCQ, MSCQC, MSCQCX,
MSKQ, MSKQC, MSKQCX**



MR-90, MRX-90, MS-90, MSX-90



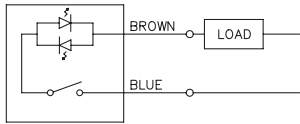
**MRQ-90, MRQC-90, MRQCX-90,
MSQ-90, MSQC-90, MSQCX-90**

HOW TO SPECIFY

WIRING DIAGRAMS

M Series, 4mm Round Track (C-Slot), EdgeSwitch™, Mini EdgeSwitch™, Reed and Solid State Switches MDF, MDF-90, MHF-90, MHC-90, MHK-90, MR, MR-90, MS, MS-90, MSC, MSC-90, MSK, MSK-90

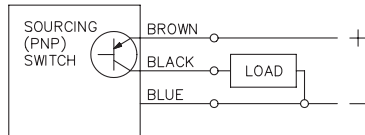
MDF, MHF (All types)



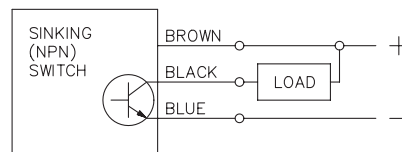
Reverse Polarity Not Protected

On Quick Connect switch models, connect only the Blue and Brown wires on the mating cable and cut back the Black wire. Do not connect switch to a mating cable that has been previously wired for a three-wire solid state switch as it will short the MDFQ switch.

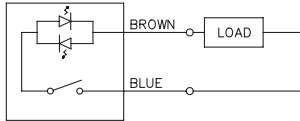
MHC, MSC (All types) (PNP, Sourcing, Solid State)



MHK, MSK (All types) (NPN, Sinking, Solid State)



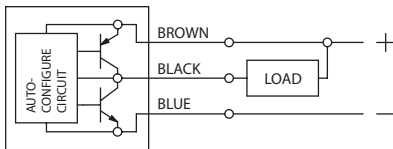
MR (All types) (Reed Switch)



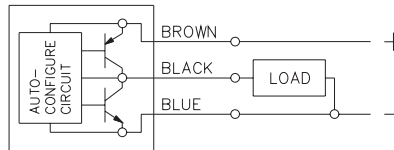
Reverse Polarity Not Protected

On Quick Connect switch models, connect only the Blue and Brown wires on the mating cable and cut back the Black wire. Do not connect switch to a mating cable that has been previously wired for a three-wire solid state switch as it will short the MRQ switch.

MS (All types) (Auto Configure PNP, Sourcing)



MS (All types) (Auto Configure NPN, Sinking)



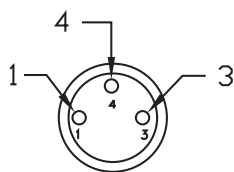
Color Codes

Brown	(+) Positive
Black	Output
Blue	(-) Negative

PIN AND WIRE ASSIGNMENTS FOR QUICK CONNECT

Switch “Q” Option Male Connector

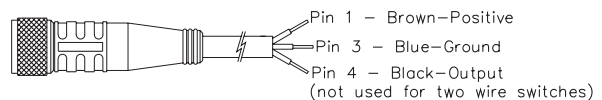
FACE VIEW OF M8 MALE CONNECTOR



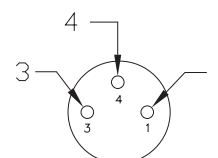
1. POSITIVE / HOT
3. NEGATIVE / NEUTRAL
4. OUTPUT

C4 and C5 Cable Female Connector

SIDE VIEW OF M8 FEMALE CONNECTOR



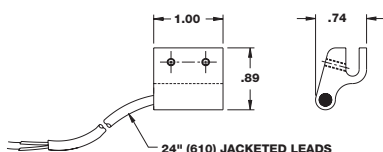
FACE VIEW OF M8 FEMALE CONNECTOR



DIMENSIONS

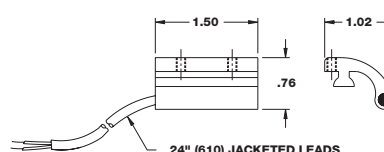
MRS-Z Actuator, Heavy Duty Reed Switches MRS-.027, MRS-.087, MRS-1.5 and MRS-1.5-S

MRS-.027



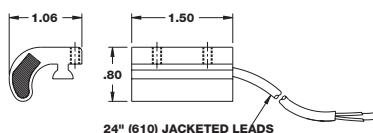
To order longer leads, specify D-12660-A-lead length in inches. Consult BIMBA distributor or factory for prices.

MRS-.087



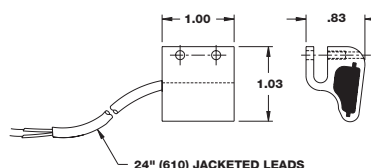
To order longer leads, specify D-7000-A-lead length in inches. Consult BIMBA distributor or factory for prices.

MRS-1.5



To order longer leads, specify D-7001-A-lead length in inches. Consult BIMBA distributor or factory for prices.

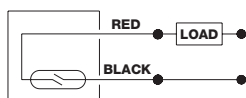
MRS-1.5-S



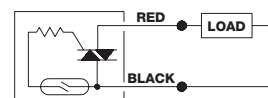
To order longer leads, specify D-16312-A-lead length in inches. Consult BIMBA distributor or factory for prices.

WIRING DIAGRAMS

MRS-.027, MRS-.087
(All Types) (Reed Switch)

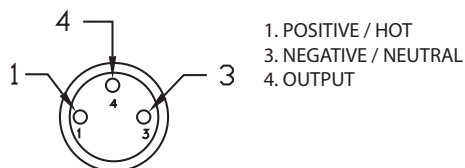


MRS-1.5, MRS-1.5-S
(All Types) (Reed Switch)

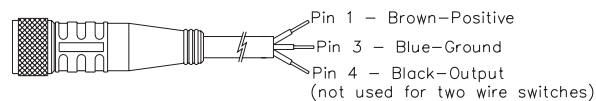


PIN AND WIRE ASSIGNMENTS FOR QUICK CONNECT

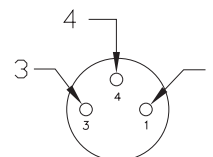
Switch "Q" Option Male Connector
FACE VIEW OF M8 MALE CONNECTOR



C4 and C5 Cable Female Connector
SIDE VIEW OF M8 FEMALE CONNECTOR



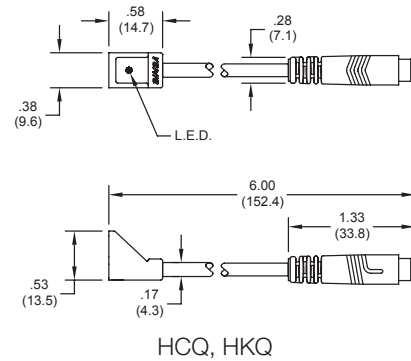
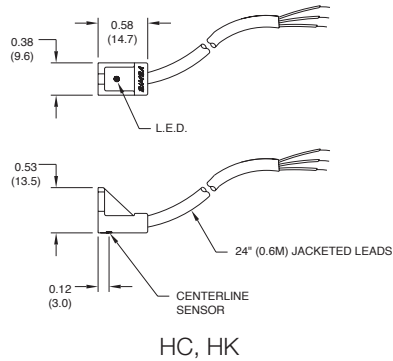
FACE VIEW OF M8 FEMALE CONNECTOR



HOW TO SPECIFY

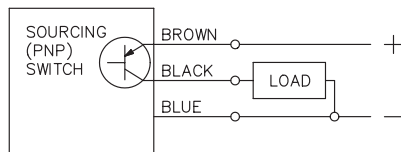
DIMENSIONS

Flat Actuator Track Mounted, Solid State Switches HC and HK

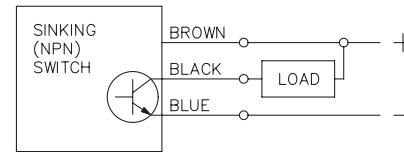


WIRING DIAGRAMS

HC (All Types) (Sourcing, PNP, Solid State)



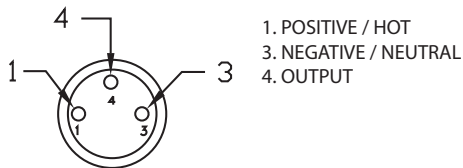
HK (All Types) (Sinking, NPN, Solid State)



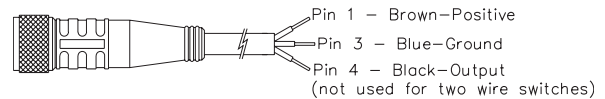
Color Codes	
Brown	(+) Positive
Black	Output
Blue	(-) Negative

PIN AND WIRE ASSIGNMENTS FOR QUICK CONNECT

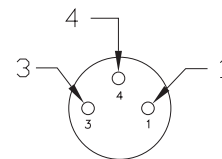
Switch "Q" Option Male Connector FACE VIEW OF M8 MALE CONNECTOR



C4 and C5 Cable Female Connector SIDE VIEW OF M8 FEMALE CONNECTOR

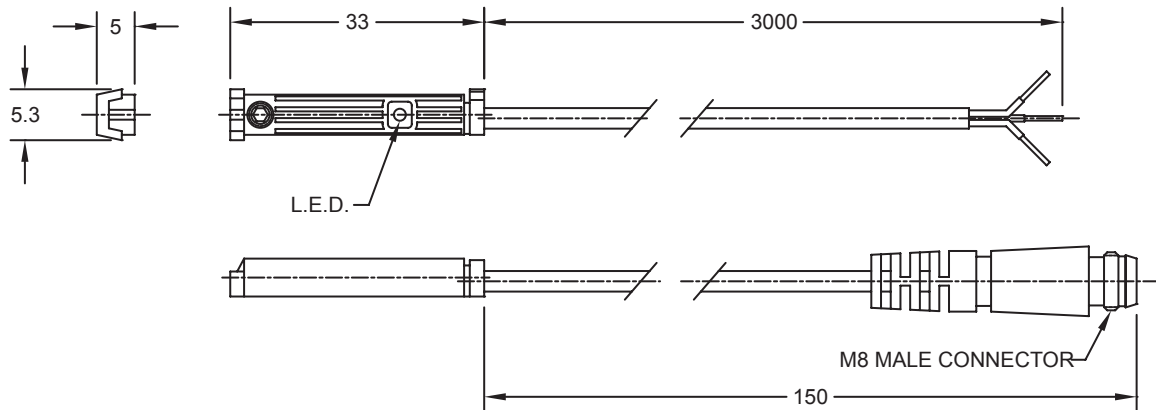


FACE VIEW OF M8 FEMALE CONNECTOR



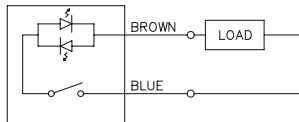
DIMENSIONS

5mm Square Track (ISO 15552), Reed or Solid State Switches HSC-AB, G-HSC-AB, HSK-AB, G-HSK-AB, MRS-AB, and G-MRS-AB

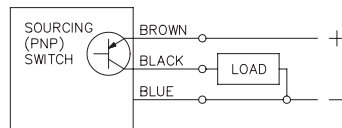


WIRING DIAGRAMS

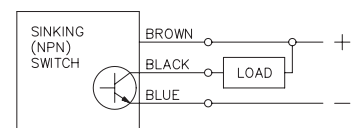
MRS-AB (All Types) (Reed Switch)



HSC-AB / G-HSC-AB (All Types) (Sourcing, PNP, Solid State)



HSK-AB / G-HSK-AB (All Types) (Sinking, NPN, Solid State)

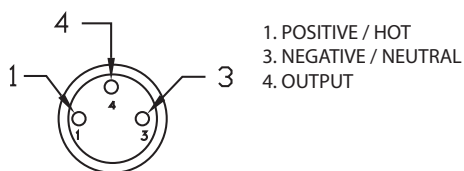


Color Codes

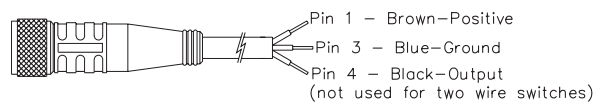
Brown	(+) Positive
Black	Output
Blue	(-) Negative

PIN AND WIRE ASSIGNMENTS FOR QUICK CONNECT

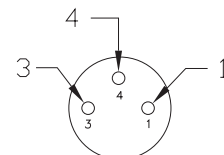
Switch "Q" Option Male Connector FACE VIEW OF M8 MALE CONNECTOR



C4 and C5 Cable Female Connector SIDE VIEW OF M8 FEMALE CONNECTOR



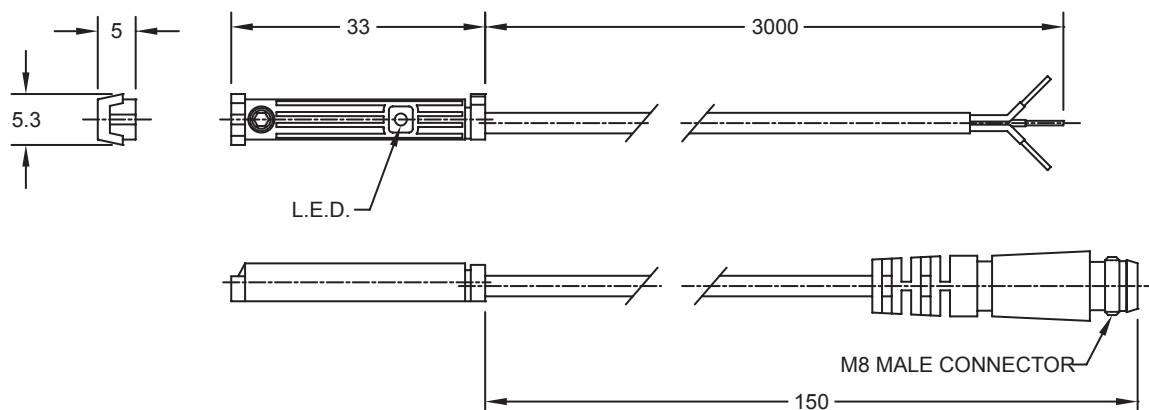
FACE VIEW OF M8 FEMALE CONNECTOR



HOW TO SPECIFY

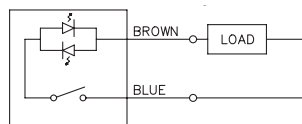
MAGNETIC SENSOR DIMENSIONAL DATA

5mm Square Track (Ultran), Reed or Solid State Switches UBR, UBSC, and UBSK

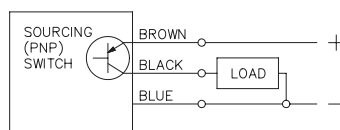


WIRING DIAGRAMS

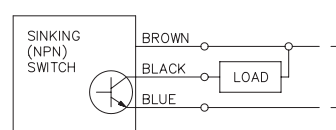
UBR (All Types) (Reed Switch)



UBSC (All Types) (Sourcing, PNP, Solid State)



UBSK (All Types) (Sinking, NPN, Solid State)



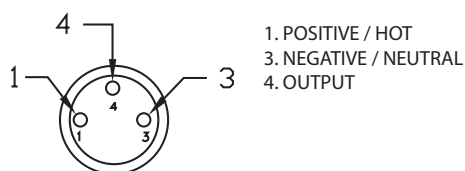
Color Codes

Brown	(+) Positive
Black	Output
Blue	(-) Negative

PIN AND WIRE ASSIGNMENTS FOR QUICK CONNECT

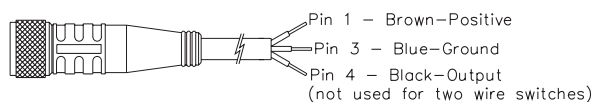
Switch "Q" Option Male Connector

FACE VIEW OF M8 MALE CONNECTOR

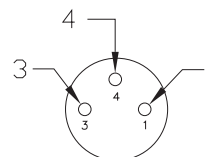


C4 and C5 Cable Female Connector

SIDE VIEW OF M8 FEMALE CONNECTOR

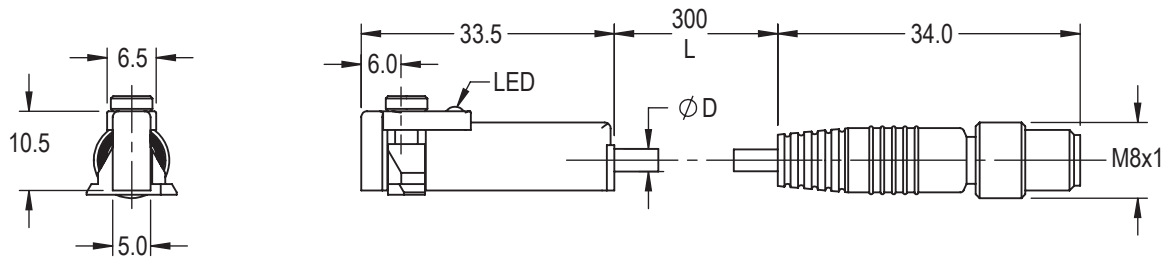


FACE VIEW OF M8 FEMALE CONNECTOR



DIMENSIONS

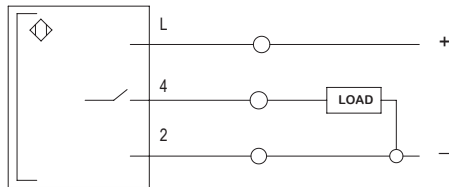
SW Series, Extruded Body Electric, Solid State Switches SW



WIRING DIAGRAMS

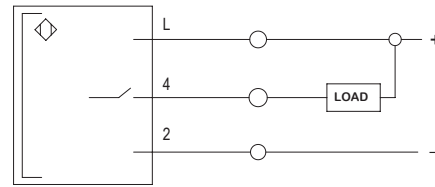
SW-PNO

(Sourcing, PNP, Solid State, Normally Open)



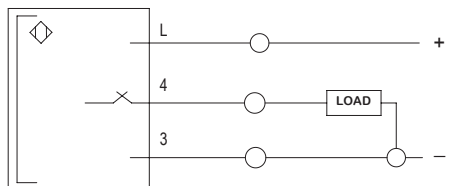
SW-NNO

(Sinking, NPN, Solid State, Normally Open)



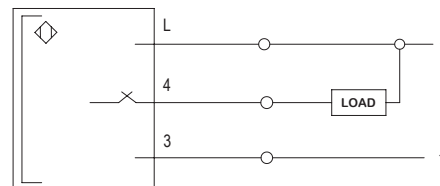
SW-PNC

(Sourcing, PNP, Solid State, Normally Closed)



SW-NNC

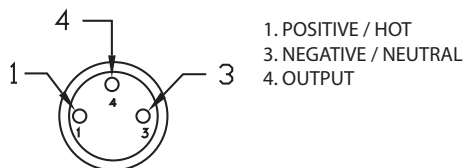
(Sinking, NPN, Solid State, Normally Closed)



PIN AND WIRE ASSIGNMENTS FOR QUICK CONNECT

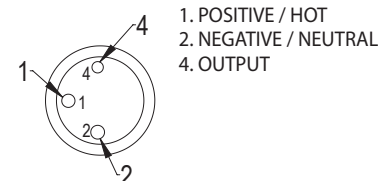
Face View of Male Connector Normally Closed Switches

COMPATIBLE WITH C4/C5 CABLES



Face View of Male Connector Normally Open Switches

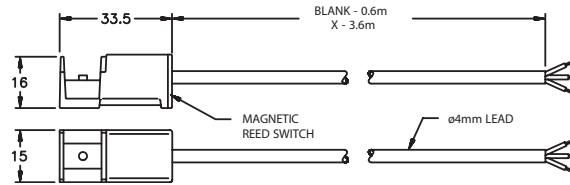
NOT COMPATIBLE WITH C4/C5 CABLES



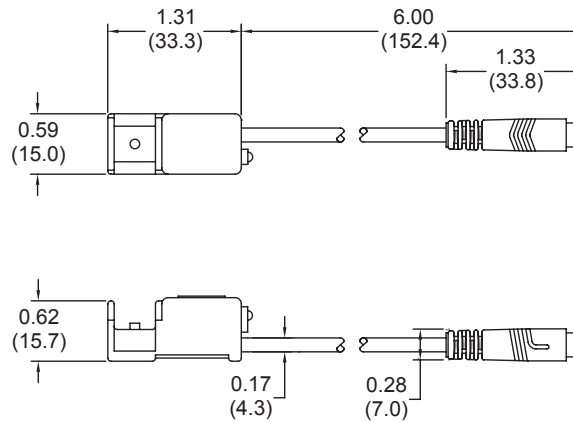
HOW TO SPECIFY

DIMENSIONS

MRS-.027-B Series, Band Mounted (ISO 6432), Heavy Duty Reed Switches MRS-.027-B, MRS-.027-BL

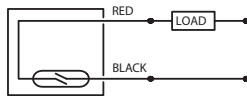


LED INDICATOR: A 'L' IN THE MODEL NUMBER SIGNIFIES THE PRESENCE OF A LED INDICATOR.
CABLE LENGTH: THE STANDARD CABLE LENGTH IS 0.6M. SWITCHES WITH A 'X' IN THE MODEL NUMBER INDICATE A CABLE LENGTH OF 3.6M.



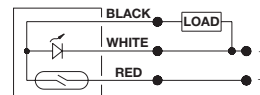
WIRING DIAGRAMS

MRS-.027-B (All Types) (Reed Switch)



2 WIRE MODELS, NO LED

MRS-.027-BL (All Types) (Reed Switch)

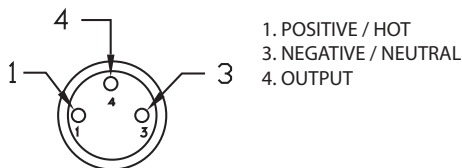


3 WIRE MODELS, WITH LED

PIN AND WIRE ASSIGNMENTS FOR QUICK CONNECT

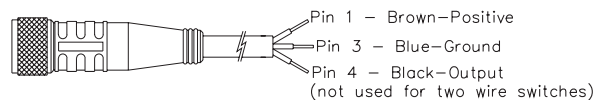
Switch "Q" Option Male Connector

FACE VIEW OF M8 MALE CONNECTOR

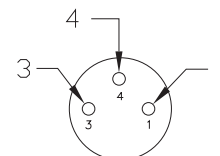


C4 and C5 Cable Female Connector

SIDE VIEW OF M8 FEMALE CONNECTOR



FACE VIEW OF M8 FEMALE CONNECTOR

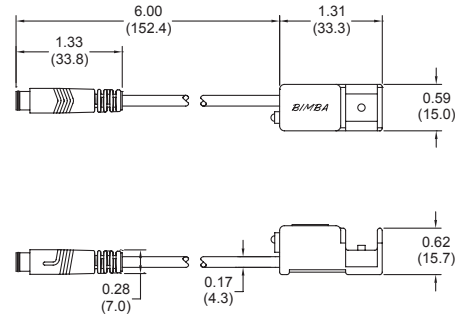
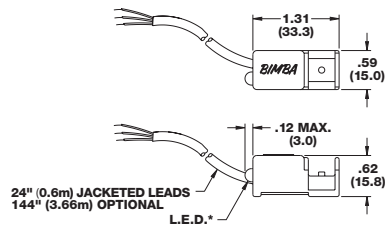


DIMENSIONS

MRS-.087-B and MRS-1.5-B Series, Band Mounted, Heavy Duty Reed Switches

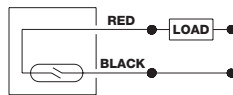
MRS-.087-B, MRS-.087-PB, and MRS-1.5-B

MRS-.087-B
MRS-.087-BL
MRS-.087-PBL
MRS-1.5-B

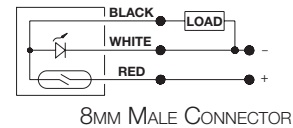


WIRING DIAGRAMS

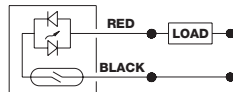
MRS-.087-B (All Types) (Reed Switch)



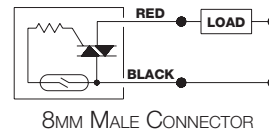
MRS-.087-BL (All Types) (Reed Switch)



MRS-.087-BL (All Types) (Reed Switch)



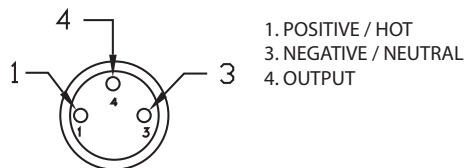
MRS-1.5-B (All Types) (Reed Switch)



PIN AND WIRE ASSIGNMENTS FOR QUICK CONNECT

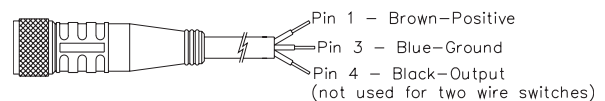
Switch "Q" Option Male Connector

FACE VIEW OF M8 MALE CONNECTOR

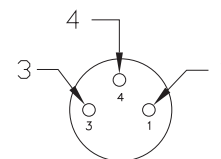


C4 and C5 Cable Female Connector

SIDE VIEW OF M8 FEMALE CONNECTOR



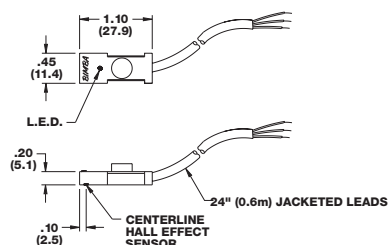
FACE VIEW OF M8 FEMALE CONNECTOR



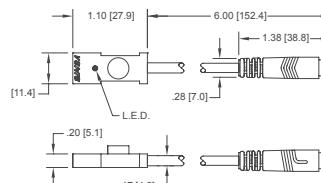
HOW TO SPECIFY

DIMENSIONS

HS Series, Band Mounted, Solid State Switches HSC and HSK



HSC, HSK

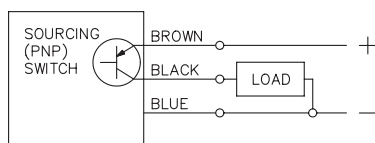


HSCQ, HSKQ

WIRING DIAGRAMS

HSC

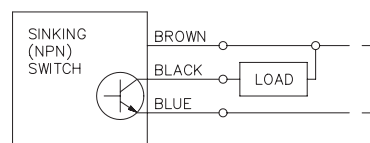
(All Types) (Sourcing, PNP, Solid State)



CAUTION: Shorting black wire to ground will damage switch.

HSK

(All Types) (Sinking, NPN, Solid State)



CAUTION: Shorting black wire to supply voltage will damage switch.

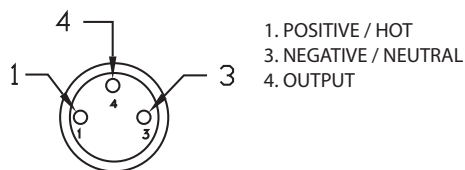
Color Codes

Brown	(+) Positive
Black	Output
Blue	(-) Negative

PIN AND WIRE ASSIGNMENTS FOR QUICK CONNECT

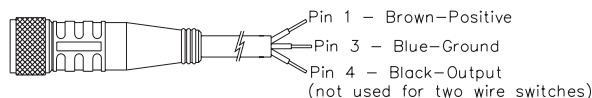
Switch "Q" Option Male Connector

FACE VIEW OF M8 MALE CONNECTOR

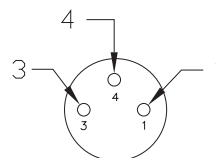


C4 and C5 Cable Female Connector

SIDE VIEW OF M8 FEMALE CONNECTOR



FACE VIEW OF M8 FEMALE CONNECTOR



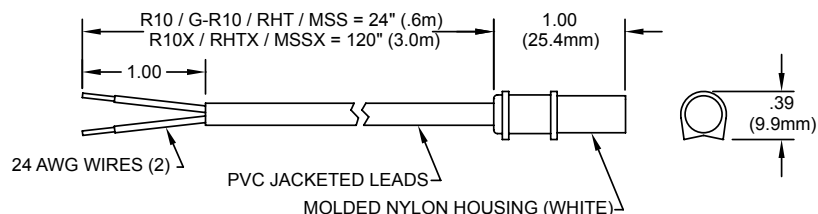
DIMENSIONS

R Series Band Mounted, High Illumination Reed Switches MSS, G-R10, R10P, G-R10P, RAC, RHT

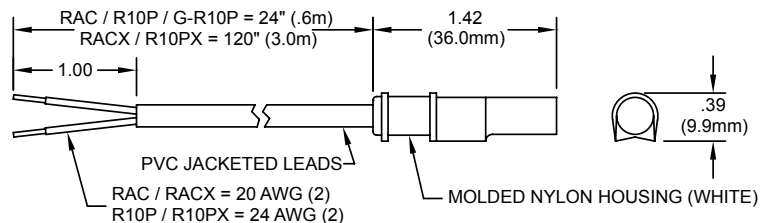
Compatible and Tested for use with:

Original Line Cylinders, All Stainless Original Line Cylinders, Pneu-Turn Rotary Actuators, Linear Thrusters, Double-Wall Cylinders, and Repairable Stainless Steel Cylinders

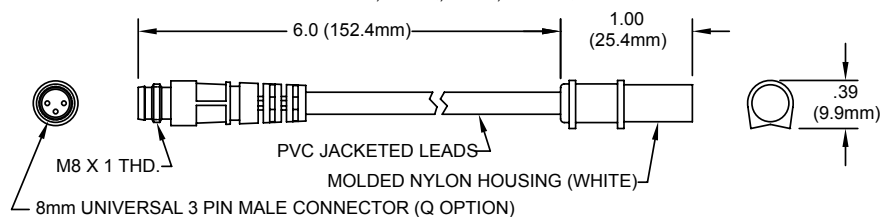
MSS, MSSX, R10, R10X, G-R10, RHT, RHTX



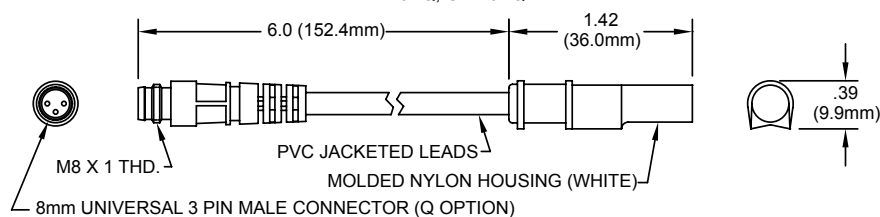
RAC, RACX, R10P, G-R10P, R10PX



MSS, MSSQ, R10Q, G-R10Q



R10PQ, G-R10PQ



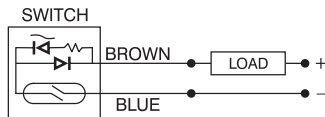
WIRING DIAGRAMS

R Series Band Mounted, High Illumination Reed Switches

MSS, R10, R10P, RAC, RHT

R10 / G-R10 / R10X / RHT (No LED) / RHTX (No LED)

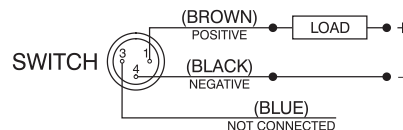
Miniature Reed Switch, Cable Type (2 Wire Switch)



Input Voltage 120 Volts Max. (AC or DC)
Maximum Load Current 500 mA Max. (Resistive)
Operating Temperature -20° C to 70° C

R10Q / G-R10Q / R10PQ / G-R10PQ

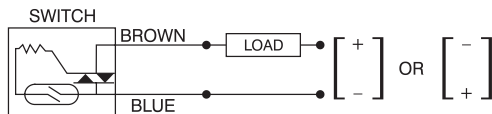
Miniature Reed Switch, 8mm Male Quick Connect (2 Wire Switch)



Input Voltage 120 Volts Max. (AC or DC)
Maximum Load Current 500 mA Max. (Resistive)
Operating Temperature -20° C to 70° C

RAC / RACX

High Power AC Reed Switch, Cable Type (2 Wire Switch)



Contact Rating 200 Watts Max.
Input Voltage 12 to 240 Volts (AC only)
Minimum Load Current 80 mA
Maximum Load Current 800 mA

MSS / MSSX

Miniature Solid State Switch, Cable Type (2 Wire Switch)



Typical Current Sourcing (PNP) Configuration

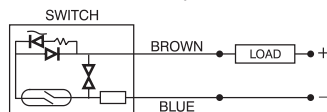


Typical Current Sinking (NPN) Configuration

Input Voltage 10 to 30 V DC
Minimum Load Current 4 mA
Maximum Load Current 300 mA
On Voltage Drop 2.5 Volts @ 4 mA
 3.5 Volts @ 300 mA
Operating Temperature -20° C to 70° C

R10P / G-R10P / R10PX

Miniature Reed Switch, Cable Type, Circuit Protected (2 Wire Switch)



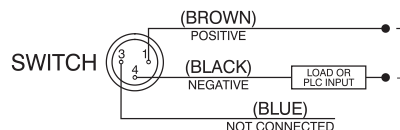
Input Voltage 120 Volts Max. (AC or DC)
Maximum Load Current 150 mA Max.
Operating Temperature -20° C to 70° C

Circuit Protection

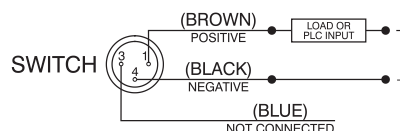
Varistor 138 Volts
Choke 680 µH

MSSQ

Miniature Solid State Switch, 8mm Male Quick Connect (2 Wire Switch)



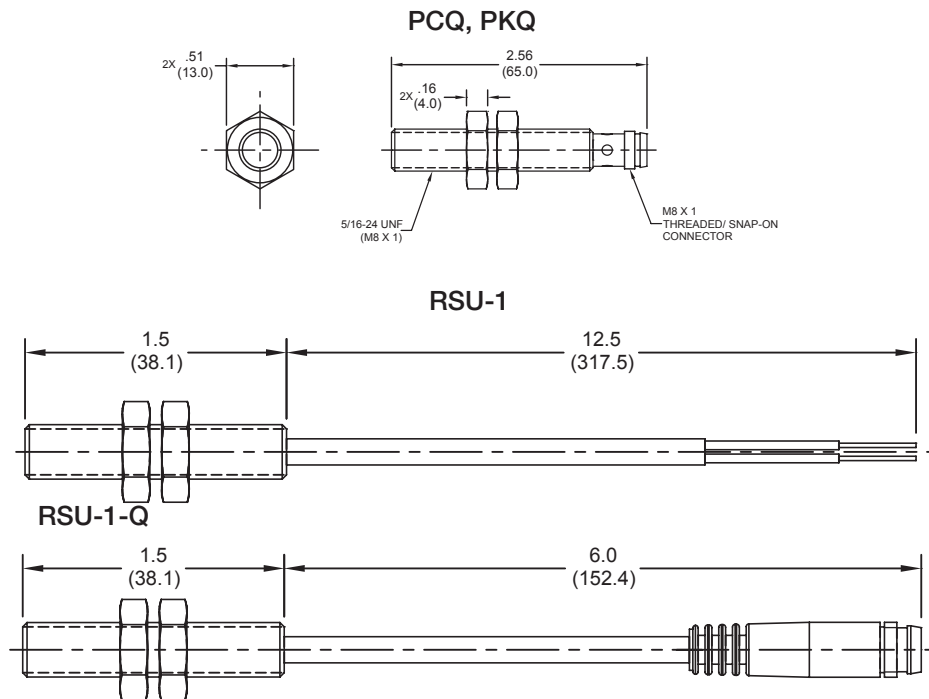
Typical Current Sourcing (PNP) Configuration



Typical Current Sinking (NPN) Configuration

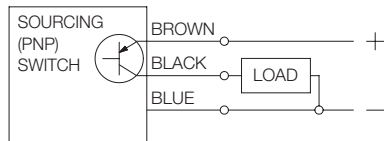
DIMENSIONS

P and RSU Series, Threaded Barrel (Ultram), Inductive and Reed Switches PCQ, PKQ, RSU-1

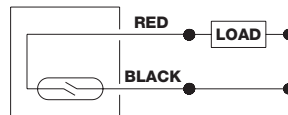


WIRING DIAGRAMS

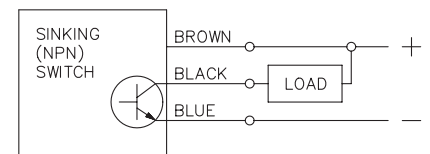
PCQ (All Types) (Sourcing, PNP, Solid State)



RSU-1 (All Types) (Reed Switch)



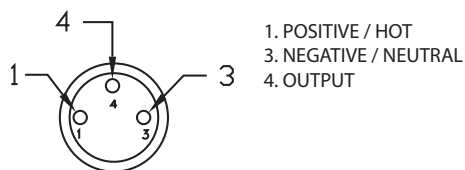
PKQ (All Types) (Sinking, NPN, Solid State)



PIN AND WIRE ASSIGNMENTS FOR QUICK CONNECT

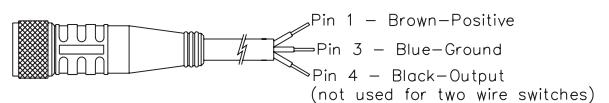
Switch "Q" Option Male Connector

FACE VIEW OF M8 MALE CONNECTOR

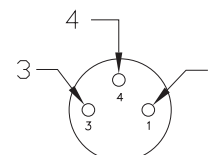


C4 and C5 Cable Female Connector

SIDE VIEW OF M8 FEMALE CONNECTOR



FACE VIEW OF M8 FEMALE CONNECTOR



MAGNETIC SWITCH APPLICATION INFORMATION

Helpful Hints

- Be sure your actuator has a magnet option.
- Be sure to match your Solid State Switches to the proper circuits, i.e., sinking switches for sinking circuits and sourcing switches for sourcing circuits.
- Be sure to choose the correct input voltage for the switch ratings.
- Don't try to use a switch with a low current output to drive a high power circuit.
- If you have a high speed application, be sure your load circuitry doesn't have a high signal delay (some circuits have filters which cause signal delays).

Bimba has technical bulletins that describe the following situations:

1. Contact Protection (transient suppression for Reed Switches) for inductive or capacitive load switching.
2. "Or" logic operation for Solid State Switches connected in parallel.
3. "And" logic operation for Solid State Switches connected in Series.

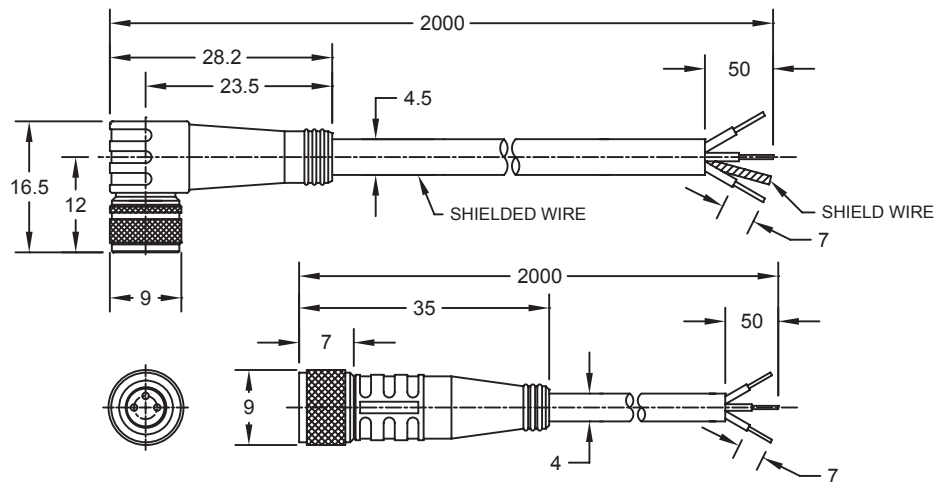
Call 1-800-44-BIMBA to speak to our Technical Assistance Center and request a copy at no charge or visit our website at www.bimba.com and click Tech Center.

Glossary

Actuating Time Average	Average time to close contacts on a reed switch.
Solid State	Solid State switching device activated by magnetic field
Hysteresis	The difference (in distance) between the spot where the switch turns "on" when the piston moves in one direction, and when the switch turns "off" when the piston moves in the opposite direction. This difference occurs because it takes more magnetic force to turn the switch "on" than it does to keep it on.
Inductive Load	The characteristic of an electrical load or device that enables it to store energy while operating and to return that energy to the circuit, as electricity, when the current is turned off, i.e., solenoids
Input Current	The amount of current needed to power switch
Inrush Current	Initial current draw from inductive loads. May be two or three times the rated holding current for such devices
Kickback, Inductive	Occurs when inductive loads are switched off. This may cause transients that can damage reed switches
MRS	Magnetic Reed Switch is a mechanical switch activated by a magnetic field
Off-state Leakage	Amount of current flow to output in the off state
Operating Window	See charts. The active window that the sensor will be in the "on" state
R-C Network	A filter network that combines a resistor and capacitor in series across a reed switch, that filters the switch from inductive kickback or transients
Response	Same as on/off time or actuating time average
Reverse Polarity Protection	Protects switch damage caused by switching the positive and negative leads
Self-Commutation	A condition inherent in triac switching when transients cause the triac to momentarily turn on, even though a magnetic field is not present
Signal Repeatability	Range at which switch will turn on or off, given the same physical switching point
Sinking	Term used for device that switches a load to ground (NPN)
Sourcing	Term used for device that switches power supply to load (PNP)
Triac	A solid state device used to switch inductive AC loads
Turn On/Off Time	The amount of time it takes to turn on or off a Solid State device

DIMENSIONS

M8 Female Quick Connect Cables C4 and C5

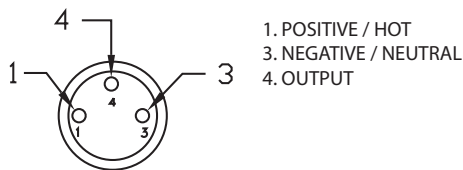


WIRING DIAGRAMS

Pin and Wire Assignments for Quick Connect

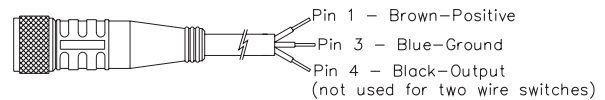
Switch "Q" Option Male Connector

FACE VIEW OF M8 MALE CONNECTOR

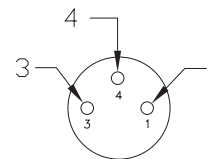


C4 and C5 Cable Female Connector

SIDE VIEW OF M8 FEMALE CONNECTOR



FACE VIEW OF M8 FEMALE CONNECTOR

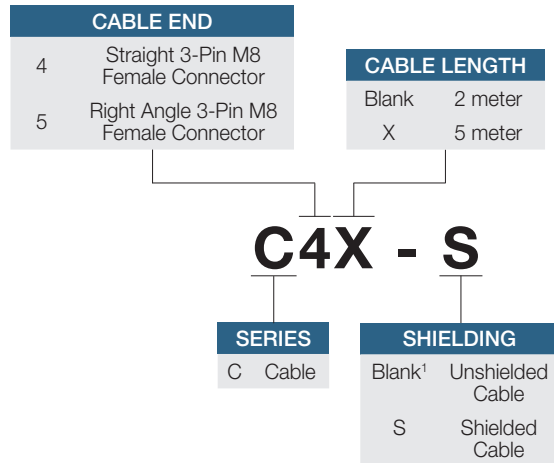


Quick Connect Cable Specifications

Contact Carrier Material:	Nylon
Conductors:	3 x 24 AWG
Molded Connector Head:	Polyurethane (PUR)
Contact Material:	Gold plated brass
Power Rating:	125 V @ 3A
Wire Insulation Material:	Polyvinyl Chloride (PVC)
Jacket Material:	Polyurethane (PUR)
Temperature Range:	-4° F to 200° F (-20° C to 90° C)
Protection Class:	NEMA 1, 3, 4, 6, and IEC IP67
Insulation Resistance:	10 ⁹

M8 FEMALE QUICK CONNECT CABLES (C4 AND C5)

Compatible and Tested for use with:
All Bimba Actuators with “Q” Option



¹ Not available with Right Angle Connector



M SERIES, 4MM ROUND TRACK (C-SLOT), EDGESWITCH™, MINI-EDGESWITCH™, REED AND SOLID STATE SWITCHES

SERIES		CABLE END	
MD	EdgeSwitch Solid State	Blank	24" (0.6m) with Flying Leads
MH	Mini EdgeSwitch Solid State		MR Series 39" (1m) with Flying Leads
MR	Reed Switch	X	144" (3.6m) with Flying Leads
MS	Solid State Switch	Q ²	6" (0.15m) M8 Male Connector
		QS ^{1,3,4}	6" (0.15m) M8 Male Swivel Connector

OUTPUT		MATING CABLE ⁵		CABLE TAKE OUT	
Blank ^{1,2}	MR Series - 2 Wire Reed Switch	Blank	No cable	Blank ²	Straight
	MS Series - 3 Wire Auto Configure NPN/PNP	C	2m Mating Cable (C4)	90	90°
C ^{1,3}	3 Wire Sourcing (PNP)	CX	5m Mating Cable (C4X)		
K ^{1,3}	3 Wire Sinking (NPN)				
F ^{3,4}	2 Wire Solid State				

MHKQSCX - 90

¹ Not applicable to MD Series

² Not applicable to MH Series

³ Not applicable to MR Series

⁴ Not applicable to MS Series

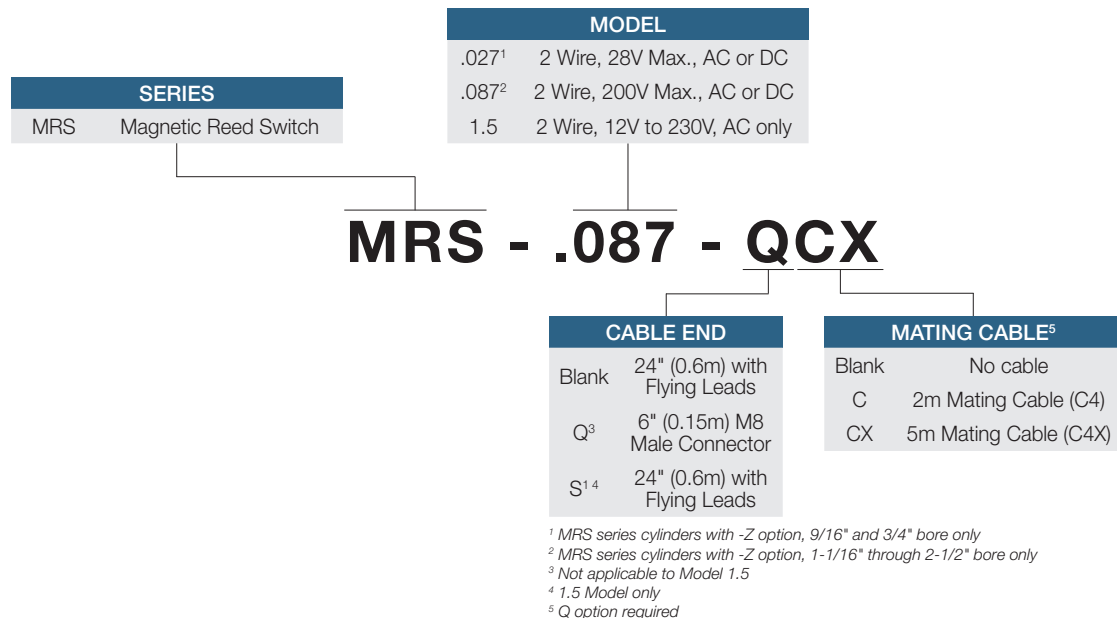
⁵ Q or QS option required

Compatible and Tested for use with:

- Original Line® Cylinders
- Pneu-Turn® Actuators
- Linear Thrusters (-T option required)
- Extruded Flat
- Twist Clamp
- Twin Bore
- Stopper Cylinders
- Extruded Flat Lift Table
- Narrow Profile Air Table
- Low Profile Air Table
- PneuMoment™
- ISO 6432 Cylinders (-T option required)
- Flat-1® Cylinders (-U option required)

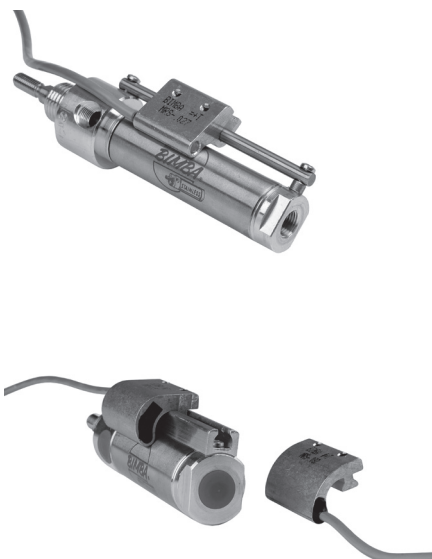


MRS® SERIES, MRS-Z ACTUATOR, HEAVY DUTY REED SWITCHES

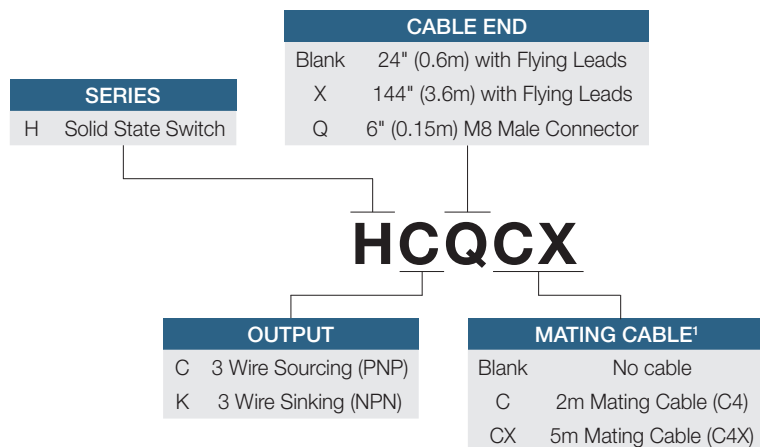


Compatible and Tested for use with:

- MRS® Series Cylinders (-Z option required)



H SERIES, FLAT ACTUATOR TRACK MOUNTED, SOLID STATE SWITCHES



¹ Q option required

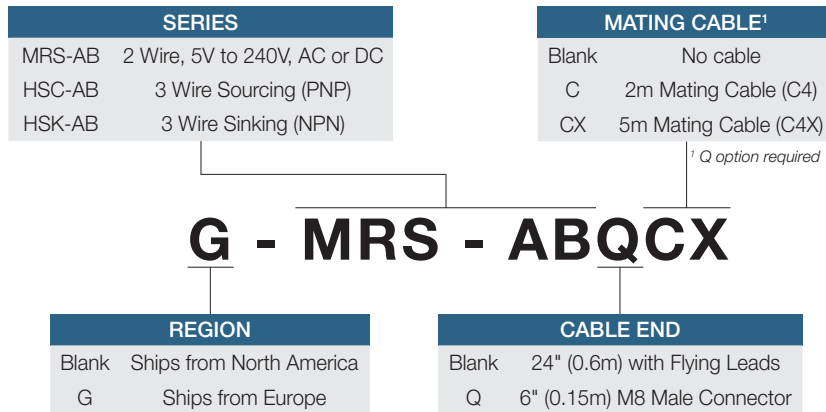
Compatible and Tested for use with:

- Flat-1® Cylinders
- Square Flat-1® Cylinders
- Flat-II® Cylinders
- Square Flat-II® Cylinders
- Ultram® Rodless Actuators (with -T option)



HOW TO ORDER

AB SERIES, 5MM SQUARE TRACK (ISO 15552), REED OR SOLID STATE SWITCHES

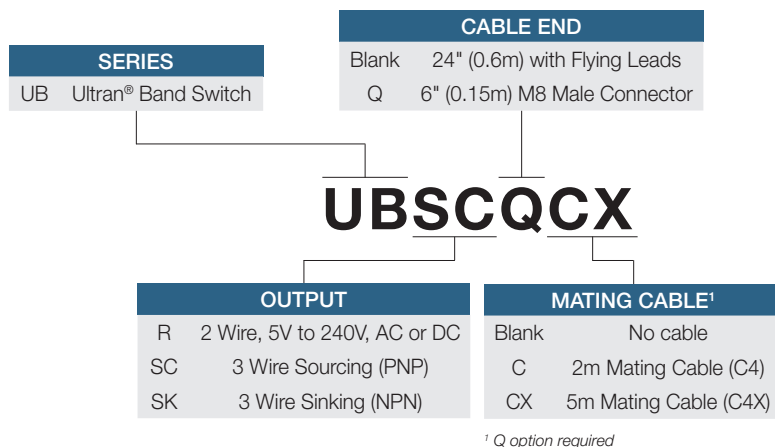


Compatible and Tested for use with:

- ISO 15552



UB SERIES, 5MM SQUARE TRACK (ULTRAN®), REED OR SOLID STATE SWITCHES



Compatible and Tested for use with:

- Ultran® Band Cylinders (25mm to 63mm bore sizes)



MRS-.027-B SERIES, BAND MOUNTED (ISO 6432), HEAVY DUTY REED SWITCHES

SERIES		CABLE END	
MRS-.027	AC/DC Switch	Blank	24" (0.6m) with Flying Leads
		Q	6" (0.15m) M8 Male Connector

MRS - .027XBLQCX - M25

CABLE LENGTH		WIRE COUNT, LED		MATING CABLE ²		BAND	
Blank	24" (0.6m) with Flying Leads	B	2 Wire, No LED	Blank	No cable	Blank	No band
X ¹	144" (3.6m) with Flying Leads	BL	3 Wire, LED	C	2m Mating Cable (C4)	-M10	10mm
				CX	5m Mating Cable (C4X)	-M12	12mm
						-M16	16mm
						-M20	20mm
						-M25	25mm

¹ Q option not available

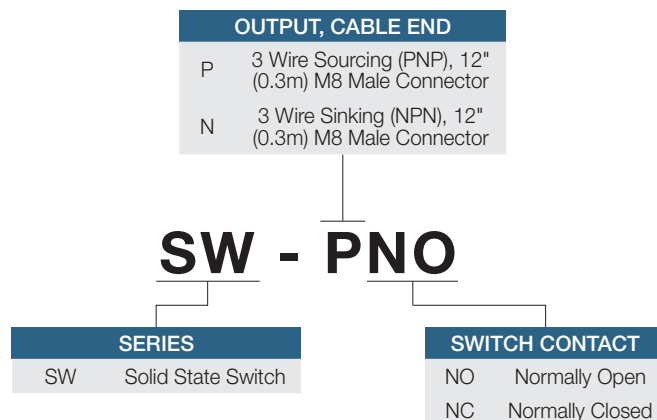
² Q option required

Compatible and Tested for use with:

- ISO 6432 Cylinders



SW SERIES, EXTRUDED BODY ELECTRIC, SOLID STATE SWITCHES



Compatible and Tested for use with:

- Belt Driven Actuator S Series B27
- Belt Driven Actuator S Series B80-B110
- Belt Driven Actuator ST Series ST80
- Belt Driven Actuator D Series LP15B-LP20B
- Belt Transfer Actuator Series BAT80-BT80
- Ballscrew Actuator Series S27
- Ballscrew Actuator Series S80-S110
- IntelliAxis™ H- Bot
- IntelliAxis™ T- Bot
- RS Rack Slide

HOW TO ORDER

MRS-.087-B SERIES, BAND MOUNTED, HEAVY DUTY REED SWITCHES

SERIES		CABLE END	
MRS-.087	AC/DC Switch	Blank	24" (0.6m) with Flying Leads
		Q	6" (0.15m) M8 Male Connector

MRS - .087BLQCX - DW5

WIRE COUNT, CABLE LENGTH, LED		MATING CABLE ³		BAND	
B ¹	2 Wire, 24" (0.6m) with Flying Leads, No LED	Blank	No cable	Blank	No band
PBL ¹	2 Wire, 24" (0.6m) with Flying Leads, LED	C	2m Mating Cable (C4)	-02	9/16" (14mm)
BL ¹	3 Wire, 24" (0.6m) with Flying Leads, LED	CX	5m Mating Cable (C4X)	-04	3/4" (19mm)
XB ²	2 Wire, 144" (3.6m) with Flying Leads, No LED			-06	7/8"
PCBL ²	2 Wire, 144" (3.6m) with Flying Leads, LED			-09	1-1/16" (27mm)
XBL ²	3 Wire, 144" (3.6m) with Flying Leads, LED			-12	1-1/4"
				-17	1-1/2" (38mm)
				-24	1-3/4"
				-31	2" (50mm)
				-50	2-1/2"
				-70	3"
				-M10	10mm
				-M12	12mm
				-M16	16mm
				-M20	20mm
				-M25	25mm
				-DW1	1-1/2" Double Wall
				-DW2	2" Double Wall
				-DW3	2-1/2" Double Wall
				-DW4	3-1/4" Double Wall
				-DW5	4" Double Wall

¹ Cable length applies to flying lead only
² Not valid with Q option
³ Q option required

Compatible and Tested for use with:

- Original Line Cylinders
- Pneu-Turn Rotary Actuators
- Linear Thrusters
- Double-Wall Cylinders



MRS-1.5-B SERIES, BAND MOUNTED, HEAVY DUTY HIGH CURRENT AC-ONLY REED SWITCH

SERIES	
MRS-1.5	AC Switch

MRS - 1.5XB - DW5

WIRE COUNT, CABLE LENGTH, LED	
B	2 Wire, 24" (0.6m) with Flying Leads, No LED
XB	2 Wire, 144" (3.6m) with Flying Leads, No LED

BAND	
Blank	No band
-02	9/16" (14mm)
-04	3/4" (19mm)
-06	7/8"
-09	1-1/16" (27mm)
-12	1-1/4"
-17	1-1/2" (38mm)
-24	1-3/4"
-31	2" (50mm)
-50	2-1/2"
-70	3"
-M10	10mm
-M12	12mm
-M16	16mm
-M20	20mm
-M25	25mm
-DW1	1-1/2" Double Wall
-DW2	2" Double Wall
-DW3	2-1/2" Double Wall
-DW4	3-1/4" Double Wall
-DW5	4" Double Wall

Compatible and Tested for use with:

- Original Line Cylinders
- Pneu-Turn Rotary Actuators
- Linear Thrusters
- Double-Wall Cylinders



HS SERIES, BAND MOUNTED, SOLID STATE SWITCHES

CABLE END	
Blank	24" (0.6m) with Flying Leads
X	144" (3.6m) with Flying Leads
Q	6" (0.15m) M8 Male Connector

SERIES
HS Solid State Switch

HSCQCX - M25

OUTPUT
C 3 Wire Sourcing (PNP)
K 3 Wire Sinking (NPN)

MATING CABLE ¹
Blank No cable
C 2m Mating Cable (C4)
CX 5m Mating Cable (C4X)

¹ Q option required

BAND
Blank No band
-02 9/16" (14mm)
-04 3/4" (19mm)
-06 7/8"
-09 1-1/16" (27mm)
-12 1-1/4"
-17 1-1/2" (38mm)
-24 1-3/4"
-31 2" (50mm)
-50 2-1/2"
-70 3"
-M10 10mm
-M12 12mm
-M16 16mm
-M20 20mm
-M25 25mm

Compatible and Tested for use with:

- Original Line Cylinders
- Pneu-Turn Rotary Actuators
- Linear Thrusters



R SERIES BAND MOUNTED, HIGH ILLUMINATION, REED SWITCHES

REGION ¹		CABLE END	
Blank	Ships from North America	Blank	24" (0.6m) with Flying Leads
G	Ships from Europe	X	120" (3m) with Flying Leads
		Q ²	6" (0.15m) M8 Male Connector

SERIES		MATING CABLE ³	
MSS	2 Wire, Solid State Sourcing (PNP)/ Sinking (NPN)	Blank	No cable
R10	2 Wire, Reed Switch	C	2m Mating Cable (C4)
R10P	2 Wire, Reed Switch with Circuit Protection	CX	5m Mating Cable (C4X)
RAC	2 Wire, High Current Reed Switch		
RHT	2 Wire, High Temperature Reed Switch		

BAND SIZE ⁴	
Part Number	Bore Size
USB25	Mounting band for cylinders up to 2-1/2" (63mm) bore
USB50	Mounting band for cylinders 2-1/2" (63mm) bore up to 5" (127mm) bore
USB80	Mounting band for cylinders 2-1/2" (63mm) bore up to 8" (203mm) bore

¹ Only available with R10, R10Q, R10P, and R10PQ

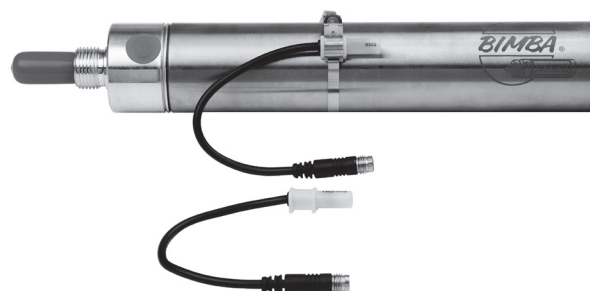
² Not available with RAC/RHT switch

³ Q option required

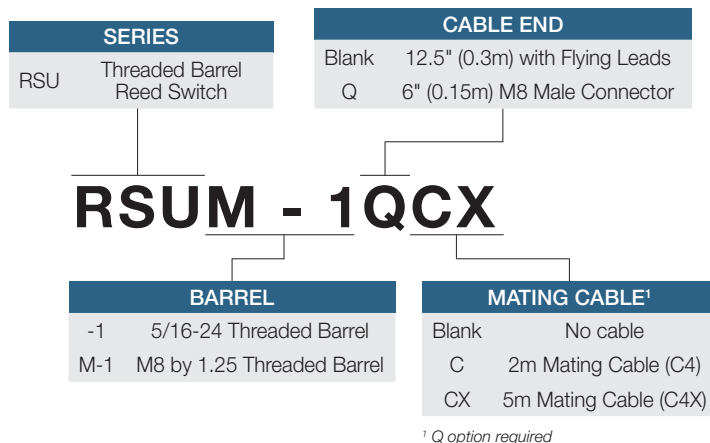
⁴ All switches above are band mounted. Band is ordered separately.

Compatible and Tested for use with:

- Original Line Cylinders
- All Stainless Original Line Cylinders
- Pneu-Turn Rotary Actuators
- Linear Thrusters
- Repairable Stainless Steel Cylinders



RSU SERIES, THREADED BARREL (ULTRAN), REED SWITCHES

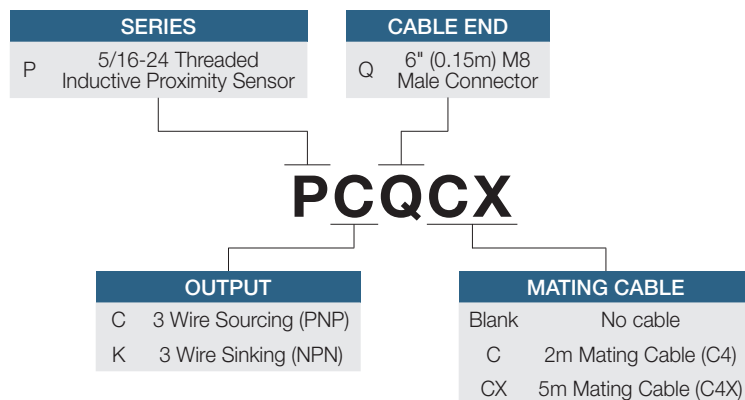


Compatible and Tested for use with:

- Ultran Rodless Cylinders



P SERIES, THREADED BARREL (ULTRAN), INDUCTIVE SWITCHES



Compatible and Tested for use with:

- Ultran Rodless Cylinders





NOTES