

Electronic Sensors

Solid State, Reed and Proximity Sensors



B

Electronic Sensors
Actuator Products

Selection
Guide

Drop-in
Sensors

Solid State /
Reed Sensors

Weld Immune
Sensors

Cordset/
Connect Block

Proximity
Sensors

PNP Solid State Sensor Selection Guide

Series	Bore size or type	3M flying leads	10m flying leads	8mm quick connect*	8mm quick connect w/ 1 m lead*	12mm quick connect*	Bracket	Sensor page #	Bracket page #	
Compact cylinders	P1Q	12mm - 100mm	P8S-EPFXS ¹	N/A	P8S-EPSUS	N/A	N/A	N/A	N/A	
	P1M standard sensor	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B343	
	P1M right angle sensor	All	N/A	P8S-SPETXD	P8S-SPTHXD	N/A	N/A	N/A	B346	
	LPM	9/16"	L076990000 ²	N/A	L07699000C	N/A	N/A	N/A	B350	N/A
		3/4" - 1-1/8"	L077000000 ²	N/A	L07700000C	N/A	N/A	N/A	B350	N/A
1-1/2" - 2"		L077010000 ²	N/A	L07701000C	N/A	N/A	N/A	B350	N/A	
	2-1/2" - 4"	L077020000 ²	N/A	L07702000C	N/A	N/A	N/A	B350	N/A	
Round body cylinders	P1L	20 - 25mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B343	B345
		32 - 63mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B343	B345
		80 - 100mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC03	B343	B345
	SRM/SRDM	9/16" - 3/4"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B343	B345
		1-1/16" - 2-1/2"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B343	B345
	P	1-1/8" - 2-1/2"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B343	B345
	3" - 4"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC03	B343	B345	
Tie rod cylinders	3MA/4MA standard sensor	1-1/2" - 5"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B343	N/A
	3MA/4MA	6" - 8"						P8S-TMA0X	B343	N/A
Iso cylinders	P1A standard sensor	10-25mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B343	B345
		10mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2CCC	B349	B349
	P1A right angle sensors	12mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2DCC	B349	B349
		16mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2FCC	B349	B349
		20mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2HCC	B349	B349
		25mm	P1A-2XMK ¹	N/A	N/A	N/A	N/A	P1A-2JCC	B349	B349
P1D standard & clean profiles	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B343	N/A	
	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMA0X	B343	N/A	
Rodless cylinders	P1X	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMA0Y	B343	N/A
	P1Z	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B343	N/A
	OSP-P	All	KL3308 ¹	KL3309 ⁴	KL3312	N/A	N/A	Included w/ sensor	B348	N/A
Guided cylinders	P5T	Flush mount	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B343	N/A
		Right angle	N/A	P8S-SPETXD	P8S-SPTHXD	N/A	N/A	N/A	B346	N/A
	P5E	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B343	N/A
	HB	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B343	N/A
		20 - 25mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B343	B345
P5L	32 - 63mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B343	B345	
	80 - 100mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC03	B343	B345	
Rotary actuators	PV WR XR	Normally open	SMH-1P ²	N/A	SMH-1PC	N/A	N/A	N/A	B352	N/A
		Normally closed	SMC-1P ²	N/A	SMC-1PC	N/A	N/A	N/A	B352	N/A
	PRN(A)	All	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PTR	10, 15	SWH-1P ³	N/A	SWH-1PC	N/A	N/A	Included w/ sensor	B353	N/A	
	20, 25, 32	SWH-2P ³	N/A	SWH-2PC	N/A	N/A	Included w/ sensor	B353	N/A	

1. Flying leads are 2 meters in length
 2. Flying Leads are 1.5 meters in length

3. Flying leads are 1 meter in length
 4. Flying leads are 5 meter in length

Note: See page B354 for Weld Immune Sensors.
 * See page B355 for cord sets.

NPN Solid State Sensor Selection Guide

Series	Bore size or type	3m flying leads	10m flying leads	8mm quick connect*	8mm quick connect w/ 1m lead*	12mm quick connect*	Bracket	Sensor page #	Bracket page #		
Compact cylinders	P1Q	12mm - 100mm	P8S-ENFXS ¹	N/A	P8S-ENSUS	N/A	N/A	N/A	N/A		
	P1M standard sensor	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B343		
	P1M right angle sensor	All	N/A	P8S-SNETX	P8S-SNTHX	N/A	N/A	N/A	B346		
	LPM	9/16"	L076950000 ²	N/A	L07695000C	N/A	N/A	N/A	B350	N/A	
		3/4" - 1-1/8"	L076960000 ²	N/A	L07696000C	N/A	N/A	N/A	B350	N/A	
1-1/2" - 2"		L076970000 ²	N/A	L07697000C	N/A	N/A	N/A	B350	N/A		
2-1/2" - 4"		L076980000 ²	N/A	L07698000C	N/A	N/A	N/A	B350	N/A		
Round body cylinders	P1L	20 - 25mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B343	B345	
		32 - 63mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B343	B345	
		80 - 100mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC03	B343	B345	
	SRM/SRDM	9/16" - 3/4"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B343	B345	
		1-1/16" - 2-1/2"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B343	B345	
	P	1-1/8" - 2-1/2"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B343	B345	
		3" - 4"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC03	B343	B345	
Tie rod cylinders	3MA/4MA standard sensor	1-1/2" - 5"	P8S-GNFLX	P8S-GPNFTX	P8S-GNSHX	P8S-GPNSCX	P8S-GNMHX	N/A	B343	N/A	
	3MA/4MA	6" - 8"						P8S-TMA0X	B343	N/A	
ISO cylinders	P1A standard sensor	10-25mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B343	B345	
		10mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	N/A	P1A-2CCC	B349	B349
	P1A right angle sensors	12mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	N/A	P1A-2DCC	B349	B349
		16mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	N/A	P1A-2FCC	B349	B349
		20mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	N/A	P1A-2HCC	B349	B349
		25mm bore	P1A-2XLK ¹	N/A	N/A	N/A	N/A	N/A	P1A-2JCC	B349	B349
P1D standard & clean profiles	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B343	N/A		
P1D tie rod version	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMA0X	B343	N/A		
Rodless Cylinders	P1X	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMA0Y	B343	N/A	
	P1Z	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B343	N/A	
	OSP-P	All	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Guided cylinders	P5T	Flush mount	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B343	N/A	
		Right angle	N/A	P8S-SNETX	P8S-SNTHX	N/A	N/A	N/A	B346	N/A	
	P5E	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B343	N/A	
	HB	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B343	N/A	
		20 - 25mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B343	B345	
32 - 63mm		P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B343	B345		
P5L	80 - 100mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC03	B343	B345		
Rotary actuators	PV WR XR	Normally open	SMH-1N ²	N/A	SMC-1NC	N/A	N/A	N/A	B352	N/A	
		Normally closed	SMC-1N ²	N/A	SMC-1NC	N/A	N/A	N/A	B352	N/A	
	PRN(A)	All	See page B308								
	PTR	10, 15	SWH-1N ³	N/A	SWH-1NC	N/A	N/A	Included w/ sensor	B351	N/A	
20, 25, 32		SWH-2N ³	N/A	SWH-2NC	N/A	N/A	Included w/ sensor	B351	N/A		

1 Flying leads are 2 meters in length
 2 Flying Leads are 1.5 meters in length
 3 Flying leads are 1 meter in length

Note: See page B354 for Weld Immune Sensors.
 * See page B355 for cord sets.

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Reed Sensor Selection Guide

Series	Bore size or type	3m flying leads	10m flying leads	8mm quick connect*	8 mm quick connect w/ 1 m lead*	12mm quick connect*	Bracket	Sensor page #	Bracket page #	
Compact cylinders	P1Q	12mm - 100mm	P8S-ERFXS ¹	N/A	P8S-ERSUS	N/A	N/A	N/A	N/A	
	P1M standard sensor	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B344	N/A
	P1M right angle sensor	All	N/A	P8S-SRETX	P8S-SRTHX	N/A	N/A	N/A	B346	N/A
	LPM	9/16"	L077030000 ¹	N/A	L07703000C	N/A	N/A	N/A	B348	N/A
		3/4" - 1-1/8"	L077040000 ¹	N/A	L07704000C	N/A	N/A	N/A	B348	N/A
1-1/2" - 2"		L077050000 ¹	N/A	L07705000C	N/A	N/A	N/A	B348	N/A	
	2-1/2" - 4"	L077060000 ¹	N/A	L07706000C	N/A	N/A	N/A	B348	N/A	
Round body cylinders	P1L	20 - 25mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B344	B345
		32 - 63mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B344	B345
		80 - 100mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC03	B344	B345
	SRM/SRDM	9/16" - 3/4"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B344	B345
		1-1/16" - 2-1/2"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B344	B345
	P	1-1/8" - 2-1/2"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B344	B345
		3" - 4"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC03	B344	B345
Tie rod cylinders	3MA/4MA standard sensor	1-1/2" - 5"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B344	N/A
	3MA/4MA	6" - 8"						P8S-TMA0X	B342	N/A
ISO cylinders	P1A standard sensor	10-25mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B342	B345
		10mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2CCB	B349	B349
	P1A alternate sensors	12mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2DCB	B349	B349
		16mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2FCB	B349	B349
		20mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2HCB	B349	B349
		25mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2JCB	B349	B349
P1D standard & clean profiles	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B344	N/A	
	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMA0X	B344	N/A	
Rodless cylinders	P1X	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMA0Y	B344	N/A
	P1Z	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B344	N/A
	OSP-P	All	KL3302 ³	KL3300 ⁴	KL3302	N/A	N/A	Included w/ sensor	B344	N/A
Guided cylinders	P5T	Flush mount	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B344	N/A
		Right angle	N/A	P8S-SRETX	P8S-SRTHX	N/A	N/A	N/A	B344	N/A
	P5E	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B344	N/A
	HB	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B344	N/A
		20 - 25mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B344	B344
32 - 63mm		P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B344	B344	
	80 - 100mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC03	B344	B344	
Rotary actuators	PV WR XR	N.O. high amp	SMR-1 ¹	N/A	SMR-1C	N/A	N/A	N/A	B352	N/A
		N.O. low amp	SMR-1L ¹	N/A	SMR-1LC	N/A	N/A	N/A	B352	N/A
		N.C.	SMD-1L ¹	N/A	SMD-1LC	N/A	N/A	N/A	B352	N/A
	PRN	50 - 800	See model code						B351	N/A
PTR	10, 15	SWR-1 ²	N/A	SWR-1C	N/A	N/A	Included w/ sensor	B353	N/A	
	20, 25, 32	SWR-2 ²	N/A	SWR-2C	N/A	N/A	Included w/ sensor	B353	N/A	

1. Flying leads are 1.5 meters in length
 2. Flying Leads are 1 meters in length

3. Flying leads are 2 meter in length
 4. Flying leads are 5 meter in length

Note: See page B354 for Weld Immune Sensors.
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P8S Global Drop-In Solid State Sensors



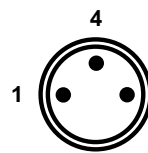
Wiring	PNP sensor	NPN sensor	PNP sensor ATEX certified
3m flying leads	P8S-GPFLX	P8S-GNFLX	P8S-GPFLX/EX
10m flying leads	P8S-GPFTX	P8S-GNFTX	
0.3m lead with 8mm connector	P8S-GPSHX	P8S-GNSHX	N/A
0.3m lead with 12mm connector	P8S-GPMHX	P8S-GNMHX	
1m lead with 8mm connector	P8S-GPSCX	P8S-GNSCX	

Specifications

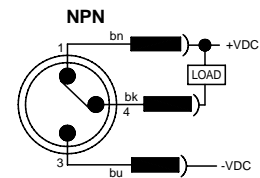
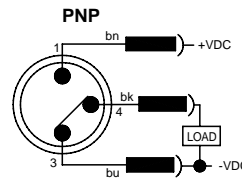
Switch classification	Standard PNP or NPN	ATEX certified PNP
Type	Electronic	
Output function	Normally open	
Sensor output	PNP/NPN	PNP
Operating voltage	10 - 30VDC	180 - 30VDC
Continuous current	100 mA max.	70 mA max.
Response sensitivity	28 Gauss min.	
Switching frequency	1 KHz	
Power consumption	10 mA max.	
Voltage drop	2.5 VDC max.	
Ripple	10% of operating voltage	
Hysteresis	1.5 mm max.	
Repeatability	0.1 mm max.	
EMC	EN 60 947-5-2	
Short-circuit protection	Yes	
Power-up pulse suppression	Yes	
Reverse polarity protection	Yes	
Enclosure rating	IP 68	
Shock and vibration stress	30g, 11 ms, 10 to 55 Hz, 1 mm	
Operating temperature range	-25°C to +75°C (-13°F to 167°F)	-20°C to +45°C (-4°F to 113°F)
Housing material	PA 12, black	
Connector cable	PVC	
Connector	PUR	—
Approval for ATEX	—	3D/3G

Wiring connection

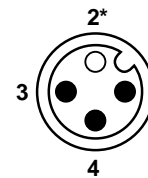
Flying lead or 8 mm connector (shown)



Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
4	Black	Output signal (N.O.)
3	Blue	-VDC

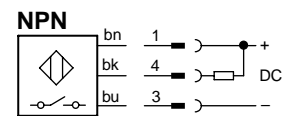
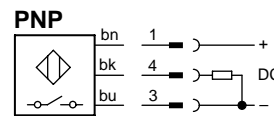


12 mm connector

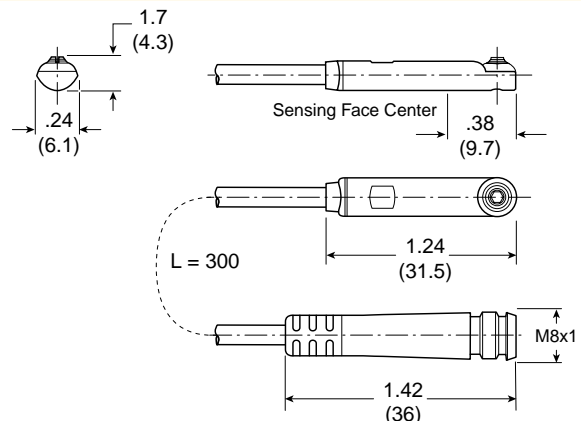


Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
4	Black	Output signal (N.O.)
2*	White	Not used
3	Blue	-VDC

* Pin 2 not present.



Dimensions



P8S Global Drop-In Reed Sensors



Wiring	Reed sensor
3m flying leads	P8S-GRFLX
10m flying leads	P8S-GRFTX
0.3m lead with 8mm connector	P8S-GRSHX
0.3m lead with 12mm connector	P8S-GRMHX
1m lead with 8mm connector	P8S-GRSCX

Specifications

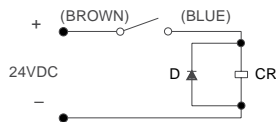
Type	2-Wire Reed
Output function	Normally open
Operating voltage	10 - 120 VAC*, 10 - 30 VDC
Switching power	6 W/VA
Continuous current	100 mA max.
Response sensitivity	30 Gauss min.
Switching frequency	400 Hz
Voltage drop	2.5 V max.
Ripple	10% of operating voltage
Hysteresis	1.5 mm max.
Repeatability	0.2 mm max.
Emc	EN 60 947-5-2
Reverse polarity protection	Yes
Enclosure rating	IP 68
Shock and vibration stress	30g, 11 ms, 10 to 55 Hz, 1 mm
Operating temperature range	-25°C to +75°C (-13°F to 167°F)
Housing material	PA 12, Black
Connector cable	PVC
Connector	PUR cable with 8 or 12 mm connector

* 8mm connector rated for 50 vac max.

Circuit for switching contact protection (for inductive loads, e.g. solenoids, relays)

(Required for proper operation 24VDC)

Put diode parallel to load (CR) following polarity as shown.

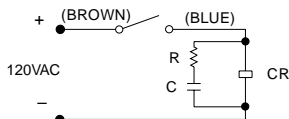


D: Diode: select a diode with the breakdown voltage and current rating according to the load.

Typical Example – 100 volt, 1 amp diode
 CR: Relay coil (under 0.5W coil rating)

(Recommended for longer life 120 VAC)

Put a resistor and capacitor in parallel with the load (CR). Select the resistor and capacitor according to the load.

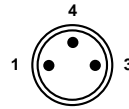


Typical Example:

CR: Relay coil (under 2W coil rating)
 R: Resistor 1 KΩ - 5 KΩ, 1/4 W
 C: Capacitor 0.1 μF, 600 V

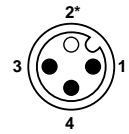
Wiring connection

Flying Lead or 8 mm Connector



Pin	Wire	Function
1	Brown	Operating voltage (+V)
2	White	Not used
3	Blue	Output signal (-V or ground)
4	Black	Not used

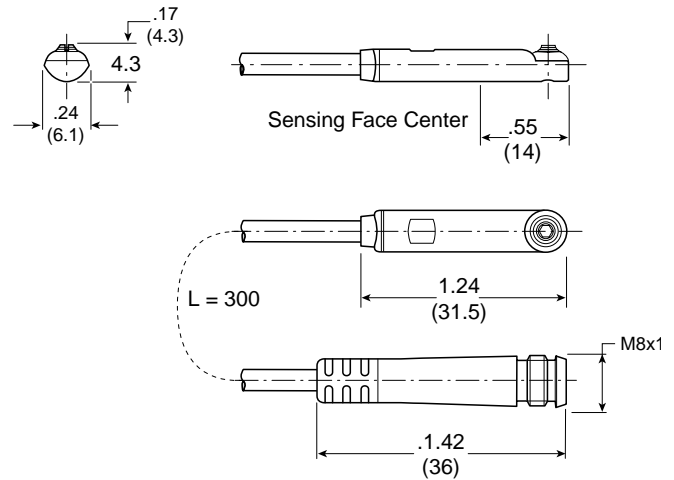
12 mm Connector



Pin	Wire	Function
1	Brown	Operating voltage (+V)
2*	White	Not used
3	Blue	Output signal (-V or ground)
4	Black	Not used

* Pin 2 not present.

Dimensions



⚠ Caution

- Use an ammeter to test reed sensor current. Testing devices such as incandescent light bulbs may subject the reed sensor to high in-rush loads.
- **NOTE:** When checking an unpowered reed sensor for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2 M ohm) when the sensor is activated. This is due to the presence of a diode in the reed sensor.
- Anti-magnetic shielding is recommended for reed sensors exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our sensors. Other manufacturers' sensors may not operate correctly in conjunction with these magnets.
- Use relay coils for reed sensor contact protection.
- The operation of some 120 VAC PLC's (especially some older Allen-Bradley PLC's) can overload the reed sensor. The sensor may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the sensor and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Sensors with long wire leads (greater than 15 feet) can cause capacitance build-up and sticking will result. Attach a resistor in series with the reed sensor (the resistor should be installed as close as possible to the sensor). The resistor should be selected such that R (ohms) > E/0.3.

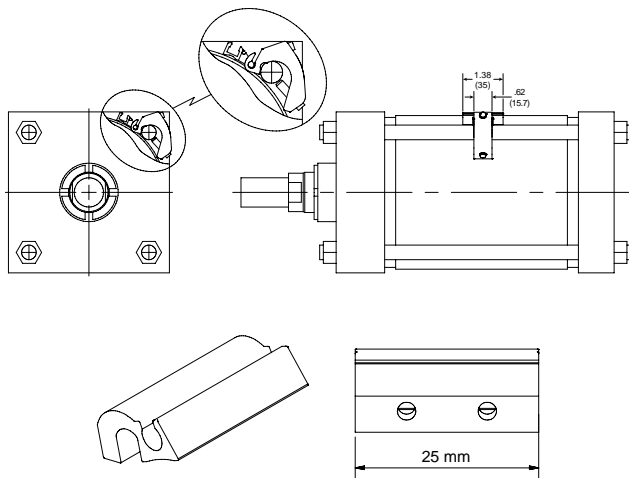
B
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Tie Rod Bracket Assembly Part Number and Dimensions

Tie Rod Bracket Assembly is necessary for Global and Mini-Global Sensor installation on all tie rod construction cylinders. This includes all Intermediate Trunnion mounts (Style DD or MT4); some 1-1/8" bore 3MA Series mounts; and all 6"-8" bore Sensors and bracket assemblies must be ordered separately.

Part number P8S-TMA0X fits 1-1/2" to 8" bores and 32-200mm bores for Global Sensors
 Part number P8S-TMA0Z fits 1-1/8" bore for Mini-Global Sensors

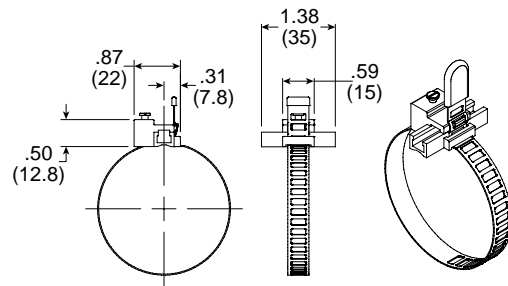
P8S-TMA0X



Round body bracket assembly part numbers Sensors and brackets must be ordered separately

Bore size	Round body bracket
9/16" - 1-1/16"	P8S-TMC01
20 - 25mm	P8S-TMC01
1-1/8" - 2-1/2"	P8S-TMC02
32 - 63mm	P8S-TMC02
3" - 4"	P8S-TMC03
80 - 100mm	P8S-TMC03

P8S-TMA0Z



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P8S Right Angle Solid State Sensors

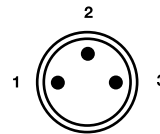


Specifications

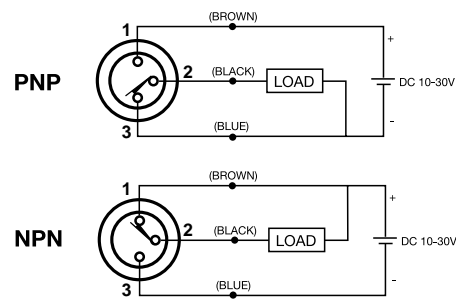
Type	Electronic
Output function	Normally open
Switching output	PNP/NPN
Operating voltage	10 - 30VDC
Continuous current	≤ 150 mA
Response sensitivity	30 Gauss min.
Switching frequency	5kHz
Power consumption	15 mA
Voltage drop	≤ 2 VDC
Ripple	≤ 10% of operating voltage
Delay time (24v)	Approx. 20 ms
Time delay before availability	≤ 2 ms
Hysteresis	≤ 1.5 mm
Repeatability	≤ 0.2 mm
EMC	EN 60 947-5-2
Short-circuit protection	Yes
Power-up pulse suppression	Yes
Reverse polarity protection	Yes
Enclosure rating	IP 67 DIN 40050
Shock and vibration stress	30g, 11ms, 10 to 55 Hz, 1 mm
Ambient temperature range	-25°C to +75°C (-13°F to 167°F)
Housing material	PA 12, black
Connector cable	PVC
Connector	PUR cable w/8 mm connector

Wiring	PNP sensors	NPN sensors
0.2m lead with 8mm connector	P8S-SPTHXD	P8S-SNTHX
10m flying leads	P8S-SPETXD	P8S-SNETX

Wiring connection



Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
2	Black	Output signal (N.O.)
3	Blue	-VDC



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P8S Right Angle Reed Sensors

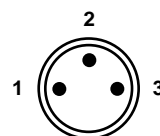


Specifications

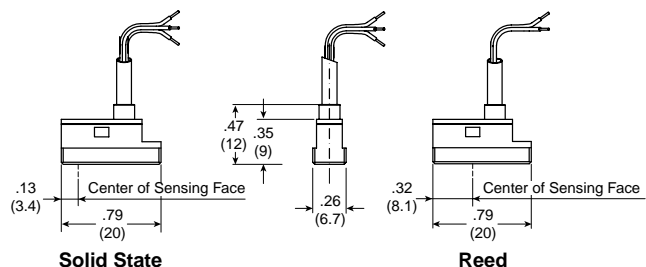
Type	2-wire reed
Output function	Normally open
Output voltage	10 - 110* VAC, 10 - 30 VDC
Continuous current	≤ 100 mA
Response sensitivity	30 Gauss min.
Switching frequency	400 Hz
Voltage drop	≤ 3 V
Ripple	≤ 10% of operating voltage
Time delay (24v)	Approx. 20 ms
Hysteresis	≤ 1.0 mm
Repeatability	≤ 0.2 mm
EMC	EN 60 947-5-2
Reverse polarity protection	Yes
Enclosure rating	IP 67
Shock and vibration stress	30g, 11ms, 10 to 55 Hz, 1 mm
Ambient temperature range	-25°C to +75°C (-13°F to 167°F)
Housing material	PA 12, black
Connector cable	PVC
Connector	PUR cable w/8 mm connector

Wiring	Reed sensors
0.2m lead with 8mm connector	P8S-SRTHX
10m flying leads	P8S-SRETX

Wiring connection



Pin	Wire	Function
1	Brown	Operating voltage (+V)
3	Black	Not used
2	Blue	Output signal (-V or Ground)



* 8Mm connector rated for 50 vac max.



OSP-P Magnetic Switches

OSP-P Magnetic Switches for T-Slot – Series RST & EST

Magnetic switches are used for electrical sensing of the position of the piston, e.g. at its end positions. They can also be used for sensing of intermediate positions.

Sensing is contactless, based on magnets which are built-in as standard. A yellow LED indicates operating status.

The universal magnetic switches are suitable for all OSP-P Actuators.

1) For the magnetic switch temperature range, please take into account the surface temperature and the self-heating properties of the linear drive.



Characteristics

Electrical characteristics	Unit	Type RST	Type EST
Switching output		Reed	PNP
Operating voltage	V	10-30 AC/DC	10-30 DC
Ripple		—	≤ 10%
Voltage drop	V	≤ 3	≤ 2
Electrical configuration		Two wire	Three wire
Output function		normally open normally closed	normally open
Permanent current	mA	≤ 100	≤ 100
Breaking capacity	W	≤ 6 peak	—
Power consumption at UB = 24V, switched on, without load	mA	—	≤ 10
Function indicator		LED, yellow (not for normally closed)	
Response time	ms	≤ 2	≤ 0.5
Sensitivity	mT	2 – 4	2 – 4
Time delay before availability	ms	—	≤ 2
Reverse polarity protection		Yes	Yes
Short-circuit protection		No	Yes (pulsed)
Switchable capacity load	μF	0.1 at 100 W, 24 VDC	
Switching frequency	Hz	≤ 400	≤ 5k
Repeatability	mm	≤ 0.2	≤ 0.2
Hysteresis	mm	≤ 1.5	≤ 1.5
EMC	EN	60947-5-2	
Lifetime		≥ 35 Mio. cycles with PLC load	Unlimited
Power-up pulse suppression		—	Yes
Protection for inductive load		—	Yes
Mechanical characteristics	Unit	Type RST	Type EST
Housing		Plastic / PA66 + PA6I red	
Cable cross section	mm ²	2 x 0.14	3 x 0.14
Cable type*		PUR, black	PUR, black
Bending radius	mm	≥ 36	≥ 30
Weight (Mass)	kg	ca. 0.030 RST-K ca. 0.010 RST-S	ca. 0.030 EST-K ca. 0.010 EST-S
Degree of protection	IP	67 to DIN EN 60529	
Ambient temperature range**	°C	-25°C to +80°C	-25°C to +75°C at UB=10 – 30 V -25°C to +80°C at UB=10 – 28 V
– with adapter	°C	-25°C to +60°C	
Adapter tightening torque	Nm	0.15 (tightening torque of screwing adapter onto magnetic switch)	
Shock resistance			
Vibration to EN 60068-2-6	G	15, 11 ms, 10 to 55 Hz, 1 mm	
Shock to EN 60068-2-27	G	50, 11 ms	
Bump to EN 60068-2-29	G	30, 11 ms, 1000 bumps each axis	

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Ordering Information

Version	Voltage	Type	Order number
Magnetic switch, reed contact, normally open, LED indicator, cable 2 m	10-30 V AC / DC	RST-K	KL3302
Magnetic switch, reed contact, normally open, LED indicator, cable 5 m	10-30 V AC / DC	RST-K	KL3300
Magnetic switch, reed contact, normally open, snap connector M8, LED indicator, cable 0.24 m	10-30 V AC / DC	RST-S	KL3302
Magnetic switch, reed contact, normally open, screw connector M8, LED indicator, cable 0.24 m	10-30 V AC / DC	RST-S	KL3303
Magnetic switch, reed contact, normally closed, cable 5 m	10-30 V AC / DC	RST-K	KL3305
Magnetic switch, electronic, PNP LED indicator, cable 2 m	10-30 V DC	EST-K	KL3308
Magnetic switch, electronic, PNP LED indicator, cable 5 m	10-30 V DC	EST-K	KL3309
Magnetic switch, electronic, PNP snap connector M8, LED indicator	10-30 V DC	EST-S	KL3312
Magnetic switch, electronic, PNP screw connector M8, LED indicator	10-30 V DC	EST-S	KL3306

Included in delivery: 1 magnetic switch
 1 adapter for dovetail groove mounting

Accessories

Description	Type	Order number
Cable M8, 2.5 m without lock nut	KS 25	KY3240
Cable M8, 5.0 m without lock nut	KS 50	KY3241
Cable M8, 10.0 m without lock nut	KS 100	KY3140
Cable M8, 2.5 m with lock nut	KSG 25	KC3102
Cable M8, 5.0 m with lock nut	KSG 50	KC3104
Adapter for dovetail groove (pack of 10)		KL3333

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Solid State / Reed Sensors

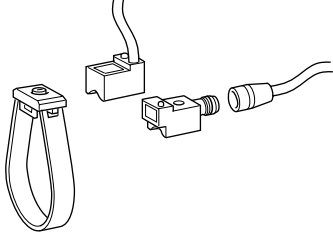
Weld Immune Sensors

Cordset / Connect Block

Proximity Sensors

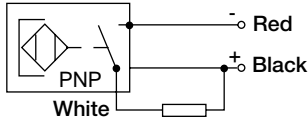
P1A Series Solid State Sensors

These sensors are of solid-state type, with no moving parts. Short-circuit and transient protection is incorporated as standard. The integral electronics make these sensors suitable for applications with very high switching frequencies.

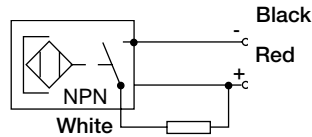


Wiring connection

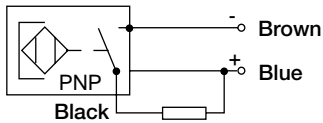
P1A-2XMK



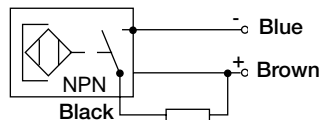
P1A-2XLK



P1A-2XHK, P1A-2XJH

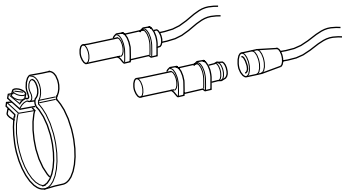


P1A-2XEK, P1A-2XFH

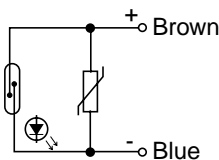


P1A Series Reed Sensors

The reed sensors incorporate a well-proven, universal-voltage, compact reed switch element; making them suitable for a wide range of applications. They can work with electronic control systems or conventional relay systems.



Wiring connection



Electronic Sensors

Output	Cable length	Weight (lb)	Part number
PNP, N.O.	2 m	0.09	P1A-2XMK, Rt. angle
NPN, N.O.	2 m	0.09	P1A-2XLK, Rt. angle
PNP, N.O.	2 m	0.022	P1A-2XHK
NPN, N.O.	2 m	0.022	P1A-2XEK
PNP, N.O.	*	0.033	P1A-2XJH
NPN, N.O.	*	0.033	P1A-2XFH

Mounting Brackets

Fits cylinder bore size	Weight (lb)	Part number
10mm	0.01	P1A-2CCC
12mm	0.01	P1A-2DCC
16mm	0.0176	P1A-2FCC
20mm	0.0176	P1A-2HCC
25mm	0.022	P1A-2JCC

Cable for Sensors

Cable length	Weight (lb)	Part number
3 m	0.12	9126344341**
10 m	0.4	9126344342**

* Cable ordered separately

** Cable includes female part connector for sensor

Electronic Sensors

Output	Cable length	Weight (lb)	Part number
Making (N.O.)	3m	0.12	P1A-2XRL
Making (N.O.)	*	0.004	P1A-2XSH

Mounting Brackets

Fits cylinder bore size	Weight (lb)	Part number
10mm	0.004	P1A-2CCB
12mm	0.005	P1A-2DCB
16mm	0.006	P1A-2FCB
20mm	0.009	P1A-2HCB
25mm	0.010	P1A-2JCB

Cable for Sensors

Cable length	Weight (lb)	Part number
3 m	0.12	9126344341**
10 m	0.4	9126344342**

* Cable ordered separately

** Cable includes female part connector for sensor

LP/LPM Series Sensors

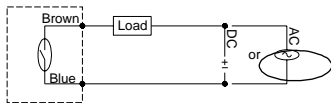
Bore size	Reed (Low AMP)	NPN sinking	PNP sourcing
9/16"	L077030000	L076950000	L076990000
3/4", 1-1/8"	L077040000	L076960000	L077000000
1-1/2", 2"	L077050000	L076970000	L077010000
2-1/2", 3", 4"	L077060000	L076980000	L077020000

Note: For sensors with an 8mm connector, replace the last digit with a 'C'. For example: L07696000C.

Circuits

Reed Sensor

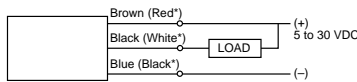
NOTE: Polarity must be observed for DC operation only.



*Number in parentheses pertains to inductive loads.

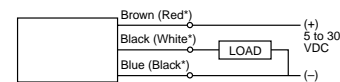
NPN Sensor – Sinking Output

Color of Cable Black
 "On" State Voltage Drop 1.5V Maximum



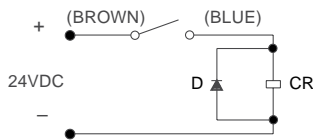
PNP Sensor – Sourcing Output

Color of Cable Black
 "On" State Voltage Drop 1.5V Maximum

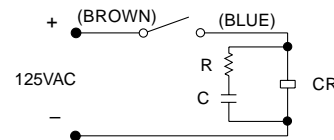


Circuit for Switching Contact Protection (Inductive Loads) – for Reed Sensor Only (Required for proper operation 24V DC)

Put Diode parallel to load (CR) following polarity as shown below.



Put a resistor and capacitor in parallel with the load (CR). Select the resistor and capacitor according to the load.



D: Diode: select a Diode with the breakdown voltage and current rating according to the load.

Typical Example – 100 Volt, 1 Amp Diode
 CR: Relay coil (under 0.5W coil rating)
 (Recommended for longer life 125 VAC)

Typical Example:
 CR: Relay coil (under 2W coil rating)
 R: Resistor 1 KΩ – 5 KΩ, 1/4 W
 C: Capacitor 0.1 μF, 600 V

*Wire colors in parentheses pertain to sensors manufactured before 10/15/93.

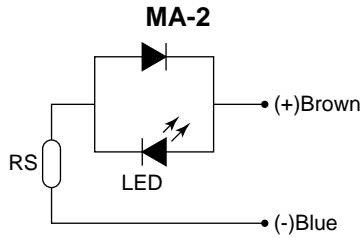
⚠ Caution

- Use an ammeter to test reed sensor current. Testing devices such as incandescent light bulbs may subject the reed sensor to high in-rush loads.
- NOTE: When checking an unpowered reed sensor for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2 M ohm) when the sensor is activated. This is due to the presence of a diode in the reed sensor.
- Anti-magnetic shielding is recommended for reed sensors exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our sensors. Other manufacturers' sensors may not operate correctly in conjunction with these magnets.

- Current capabilities are relative to operational temperatures.
- Use relay coils for reed sensor contact protection.
- The operation of some 120 VAC PLC's (especially some older Allen-Bradley PLC's) can overload the reed sensor. The sensor may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the sensor and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Sensors with long wire leads (greater than 15 feet) can cause capacitance build-up and sticking will result. Attach a resistor in series with the reed sensor (the resistor should be installed as close as possible to the sensor). The resistor should be selected such that $R \text{ (ohms)} > E/0.3$.

PRNA Sizes 3 to 30 Sensors

Fixed position sensor



Variable position sensor

Size	Part number
1	FR-1PRN
3	FR-3PRN
10	FR-10PRN
20	FR-20PRN
30	FR-30PRN

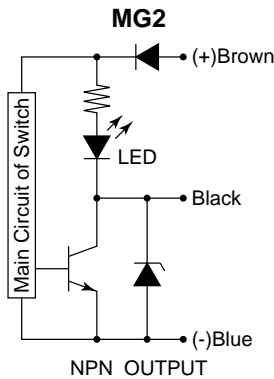
Model code and ordering information

Example: SR20 - 180 - 90

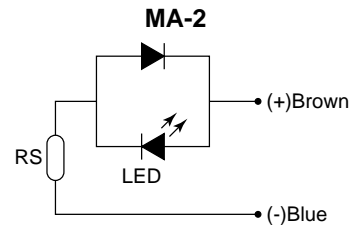
SR	20	-	180	-	90
	Size		Rotation		Reference point
	3		090 90°		45 45°
	10		100 100°		90 90°
	20		180 180°		
	30		270 270°		

PRN Sizes 50 to 800 Sensors

Solid state sensors



Reed sensors



Model code and ordering information

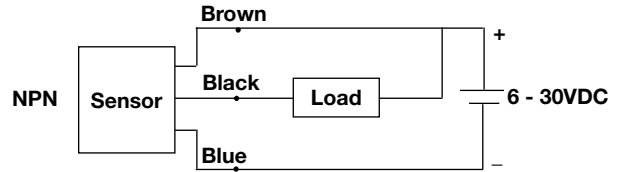
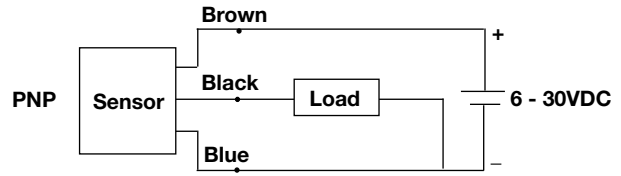
Example: FM50 - 90 - 45 - MA2

FM	50	-	90	-	45	-	MA	-	2
	Size		Rotation		Reference point		Sensor type		Number sensors
	50		090 90°		45 45°		MA Reed		2 Standard
	150		180 180°		90 90°		MG Solid State		
	300		270 270°						
	800								

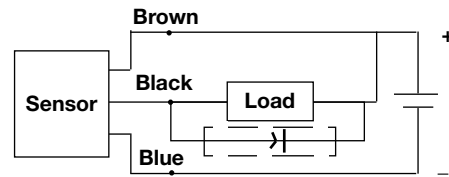
PV, WR & WR Series Solid State (Hall Effect) Sensors

Type	LED color	Logic	Cable/Connector	Part number
N.O.	Green	PNP	1.5m black with leads	SMH-1P
N.O.	Red	NPN		SMH-1N
N.C.	Yellow	PNP		SMC-1P
N.C.	White/Red	NPN	0.15m black with connector	SMC-1N
N.O.	Green	PNP		SMH-1PC
N.O.	Red	NPN		SMH-1NC
N.C.	Yellow	PNP	SMC-1PC	
N.C.	White/Red	NPN	SMC-1NC	

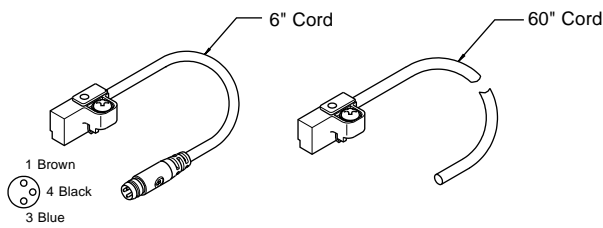
Wiring connection



Protection circuit*



* When connecting an inductive load (relay, solenoid valve, etc.), a protection circuit is recommended. Use a 100V, 1A diode. (NPN connection shown.)



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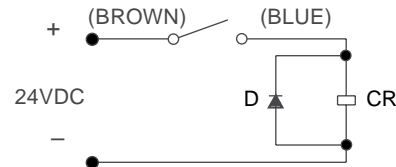
PV, WR & WR Series Reed Sensors

Reed sensors are available in a normally open or normally closed configuration. The low amp sensor is suitable for connection to PLCs or other low current devices. The high amp sensor can be used to drive sequencers, relays, coils, or other devices directly.

Type	LED color	Rating	Cable/Connector	Part number
N.O.	Green	High Amp	1.5m Gray with Leads	SMR-1
N.O.	Red	Low Amp		SMR-1L
N.C.	Yellow	Low Amp	0.15m Gray with Connector	SMD-1L
N.O.	Green	High Amp		SMR-1C
N.O.	Red	Low Amp	SMR-1LC	
N.C.	Yellow	Low Amp	SMD-1LD	

Integral circuit for switching contact protection

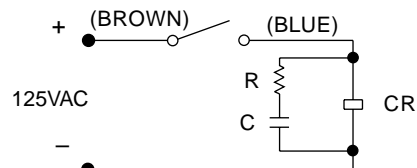
(Required for proper operation 24V DC)
 Put Diode parallel to load (CR) with polarity as shown below.



D: Diode: select a Diode with the breakdown voltage and current rating according to the load.

CR: Relay coil (under 0.5 W coil rating)

(Recommended for longer sensor life 125V AC)
 Put resistor and capacitor parallel to load (CR).



CR: Relay coil (under 2 W coil ratings)

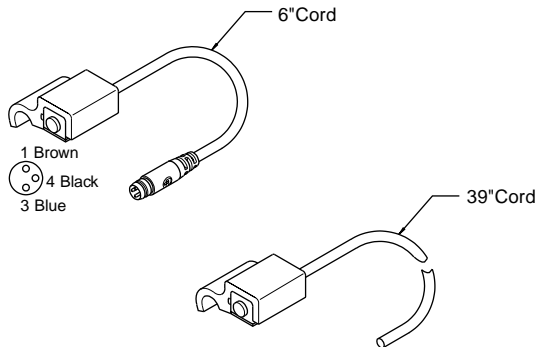
R: Resistor under 1 K ohm

C: Capacitor 0.1 μF

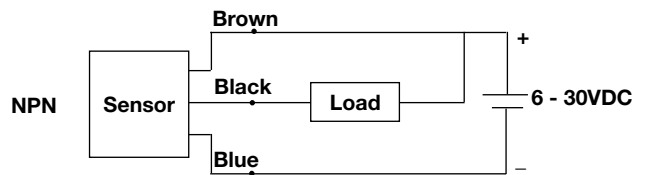
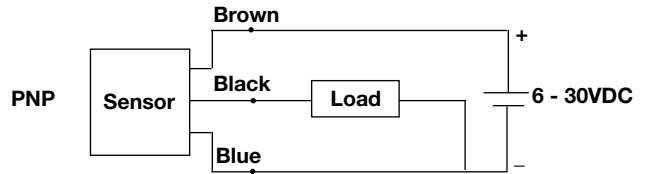
PTR Series Solid State (Hall Effect) Sensors

PTR model	PNP		NPN	
	With 6" male quick connect	With 39" potted-in leads	With 6" male quick connect	With 39" potted-in leads
10	SWH-1PC	SWH-1P	SWH-1NC	SWH-1N
15	SWH-1PC	SWH-1P	SWH-1NC	SWH-1N
20	SWH-2PC	SWH-2P	SWH-2NC	SWH-2N
25	SWH-2PC	SWH-2P	SWH-2NC	SWH-2N
32	SWH-2PC	SWH-2P	SWH-2NC	SWH-2N

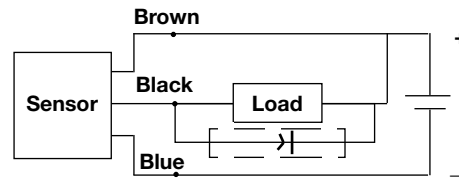
Note: Sensors with male quick connect option require female cordsets to be ordered separately. Please reference catalog 0900P-E, page M22.



Wiring connection



Protection circuit*



* When connecting an inductive load (relay, solenoid valve, etc.), a protection circuit is recommended. Use a 100V, 1A diode. (NPN connection shown.)

PTR Series Reed Sensors

PTR model	With 6" male quick connect	With 39" potted-in leads
10	SWR-1C	SWR-1
15	SWR-1C	SWR-1
20	SWR-2C	SWR-2
25	SWR-2C	SWR-2
32	SWR-2C	SWR-2

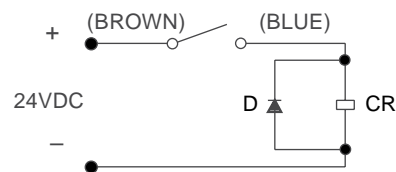
Sensors with male quick connect option require female cordsets to be ordered separately.

Note: Please reference catalog 0900P-E, page M22

Protection circuit (Inductive loads)

(Required for proper operation 24VDC)

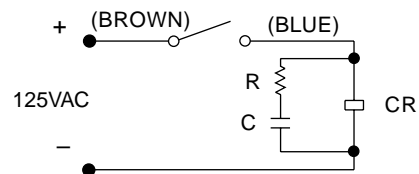
Select a diode with a breakdown voltage and current rating according to the load (CR). Place a diode in parallel to the load with the polarity as indicated:



CR: Relay coil (under 0.5W coil rating)

(Recommended for longer sensor life 125VAC)

Select a resistor and capacitor according to the load (CR). Place a resistor and capacitor in parallel to the load:



CR: Relay coil (under 2W coil rating)

R: Resistor under 1 K ohm

C: Capacitor 0.1 μF

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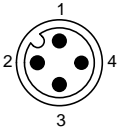
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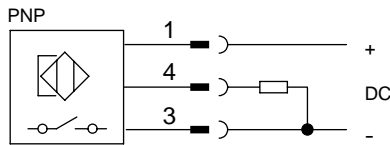
Weld Immune Sensor



- Weld immune in all welding applications (AC, DC and medium frequency welding).
- Sensor locks the output during the welding process; when welding process stops, the sensor updates the output accordingly.
- NOTE: Tie rod construction of the P1D Series can be ordered directly in the model code.

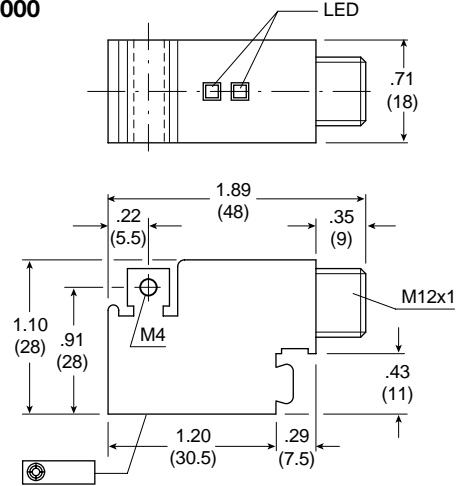


Pin	Function
1	Operating voltage (+VDC)
4	Output signal (N.O.)
3	-VDC
2	Not used

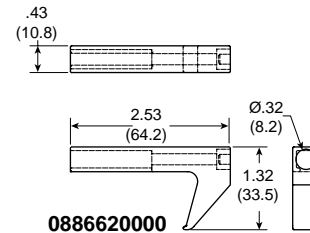


Description	Part number
Weld immune sensor	088660000
Tie rod bracket kit	0886620000

088660000



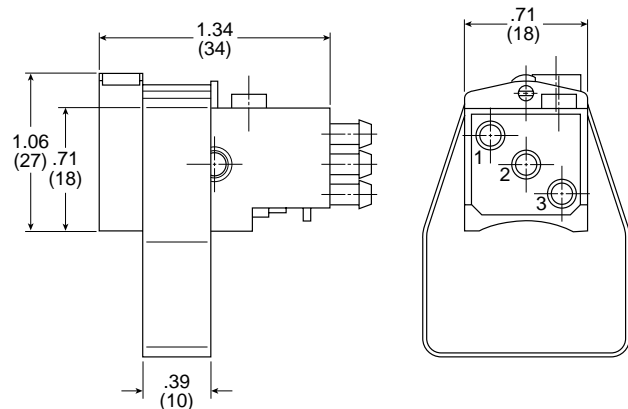
0886620000



Air Piloted Switch

Features	
Converts a magnetic field to an air pilot signal	
Band clamp allows for mounting to tie rod cylinders	
Fits 32 to 100mm bore (1.5 to 4 inch bore)	
Type	3/2 valve - NC, 2-position / spring return 3-way
Construction materials	
Body	Macrolon, glass fiber
Mounting bracket	Aluminum, anodized
Connection	3 - 3mm OD barbs
Characteristics	
Operating temperature	14°F to 140°F (-10°C to +60°C)
Operating pressure	30 PSI to 90 PSI (2 bar to 6 bar)
Normal operating pressure	90 PSI (6 bar)
Flow	0.04 Cv (40 l/min)
Cycle rate	40 hz
Switching accuracy	± 0.008" (0.2 mm) w/o air
Filtration	40 micron
Media	Filtered and regulated compressed air
Installation	In any position
Weight	Sensor 0.49 ozs (0.014 Kg) Sensor & bracket 0.99 Ozs (0.028 Kg)

Description	Part number
Sensor – Air type	KZ 2364
Mounting bracket	KZ 8255



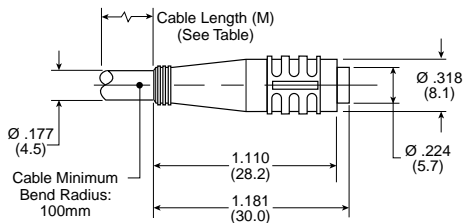
Quick Connect Cordset

8mm Cordset with Female Quick Connect

A female connector is available for all sensors with the male 8mm quick connect option. The male plug will accept a snap-on or threaded connector. Cordset part numbers are listed below:

Cable length	Threaded connector	Snap on connector
5 meters	086620T005	086620S005
2 meters	086620T002	086620S002

Snap-On Straight Connector



12mm Cordset with Female Quick Connect

M12 Straight connector

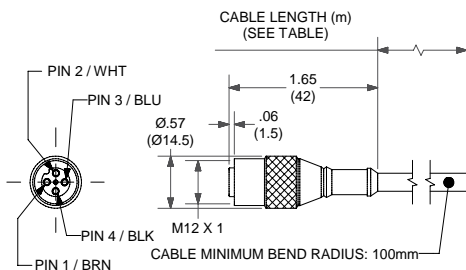
Cable length	Part number
5 meters	9126487205
2 meters	9126487202

M12 Right angle Connector

Cable length	Part number
5 meters	9126487205
2 meters	9126487202

A female connector is available for all sensors with the male 12mm quick connect option. The cordsets are available with a right angle or straight connector. Cordset part numbers are listed above.

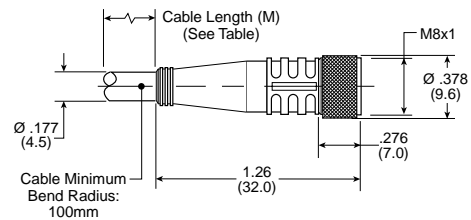
Straight Connector



Cordset Specifications

Connector Oil resistant polyurethane body material, PA 6 (Nylon) contact carrier, spacings to VDE 0110 Group C, (150 AC/DC)
 Contacts Gold plated beryllium copper, machined from solid stock
 Coupling Method..... Snap-Lock or chrome plated brass nut
 Cord Construction Oil resistant black PUR jacket, non-wicking, non-hygroscopic, 300V.
 Cable end is stripped and tinned.
 ConductorsExtra high flex stranding, PVC insulation
 Temperature -40 to 194°F (-40 to 90°C)
 Protection..... NEMA 1, 3, 4, 6P and IEC IP67
 Cable Length..... 6.56 ft (2m) or 16.4 ft (5m)

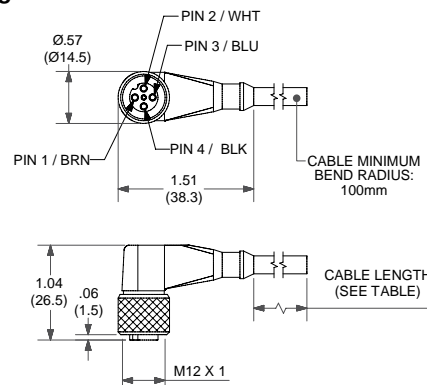
Threaded Straight Connector



Cordset Specifications

Connector Polyvinylchloride (PVC) body material, PVC contact carrier, spacing to VDE 0110 Group C, (250VAC / 300VDC)
 Contacts Gold Plated Copper Tin (CuSn), stamped from stock.
 Coupling Method..... Threaded nut: Chrome plated brass.
 Cord Construction PVC non-wicking, non-hygroscopic, 250VAC / 300VDC. Cable end is stripped.
 Conductors Extra high flex stranding with PVC insulation
 Temperature -13°F to 158°F (-25°C to 70°C)
 Protection..... NEMA 1, 3, 4, 6P and IEC IP67
 Cable Length..... 6.56 ft (2m) or 16.4 ft (5m)

Right Angle Connector



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EPS-5, 6 & 7 / CLS-1 & 4

End-of-Stroke Proximity Sensors

Ordering information

Sensor type	Inductive proximity			Non-contacting magnetically actuated	
Style	EPS-7	EPS-5	EPS-6	CLS-1	CLS-4
Sensor part number	148897****	146617****	148896****	148275****	149109****
6' Cable	0853550006	0853550006	0859170006	0853550006	—
12' Cable	0853550012	0853550012	0859170012	0853550012	—
6' Cable, right angle	0875470006	0875470006	—	0875470006	—

**** Part number suffix: **** 4-digit suffix indicates probe length: 0125=1.25", 0206=2.06", 0288=2.875", 0456=4.562"

Specifications

Style	EPS-7	EPS-5	EPS-6	CLS-1	CLS-4
Code designator	H	R	D	F	B
Sensor type	Inductive proximity	Inductive proximity	Inductive Proximity	Non-contacting magnetically actuated	Non-contacting magnetically actuated
Description	Economical, General Purpose, 2 wire device, primarily for AC applications, not suitable for 24 VDC applications. Use EPS-5 only for automotive industry customers who specify them.		Economical, General Purpose, 3 wire, DC sensor, dual output: sinking and sourcing	Functional replacement for AB (Mechanical) Limit Switches in many applications, or where customer needs NC contacts, zero leakage, zero voltage drop, higher or lower load current than EPS-style.	Functional replacement for AB (Mechanical) Limit Switches in many High Temperature applications, or where customer needs NC contacts, zero leakage, zero voltage drop, higher or lower load current than EPS-style.
Supply voltage	20 to 250 VAC/DC	20 to 230 VAC/DC	10 to 30 VDC	24 to 240 VAC/DC	24 to 240 VAC/DC
Load current, min	8 mA	5 mA	NA	NA	NA
Load current, max	300 mA	500 mA	200 mA	4 AMPS @ 120 VAC 3 AMPS @ 24 VDC	4 AMPS @ 120 VAC 3 AMPS @ 24 VDC
Leakage current:	1.7 mA, max.	1.7 mA, max.	10 micro amps max.	—	—
Voltage drop	7 V, max.	10 V, max	2 VDC max.	NA	NA
Operating temperature	-14° to 158° F	-4° to 158° F	-14° to 158° F	-40°F to 221° F	-40° F to 400° F
Connection	3-pin mini	3-pin mini	5-pin mini	3-pin mini	144" PTFE coated flying leads with 1/2" conduit hub
Enclosure rating	IEC IP67	NEMA 4, 6, 12, 13	IEC IP67	NEMA 1, 2, 3, 4, 4x, 5, 6, 6P, 11, 12, 12K, 13	NEMA 1, 2, 3, 4, 4x, 5
Led indication	Yes	Yes	Yes	No	No
Short circuit protection	Yes	Yes	Yes	No	No
Weld field immunity	Yes	Yes	Yes	Yes	Yes
Output	2 wire, Normally Open with leakage current	2 wire, Normally Open with leakage current	Dual output: DC Sinking and DC Sourcing, user selectable via wiring	SPDT (Single pole double throw), Normally Open/ Normally Closed, Form C	SPDT (Single pole double throw), Normally Open/ Normally Closed, Form C
Approvals / marks	CE, UL, CSA	UL	CE, UL, CSA	UL or CSA	UL or CSA
Make / break location	0.125" from end of stroke, typical. Tolerance is 0/-0.125"				
Wiring instructions	Pin 1: AC ground (Green)	Pin 1: AC ground (Green)	Pin 1: +10 to 30 VDC (White)	Pin 1: Common (Green)	Common: (Black)
	Pin 2: Output (Black)	Pin 2: Output (Black)	Pin 2: Sourcing output (Red)	Pin 2: Normally Closed (Black)	Normally Open: (Blue)
	Pin 3: AC line (White)	Pin 3: AC line (White)	Pin 3: Grounded (not connected or required)	Pin 3: Normally Open (White)	Normally Closed: (Red)
			Pin 4: Sinking output (Orange)		
			Pin 5: DC common (Black)		

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Series and parallel wiring

When Parker EPS-5, 6 or 7 proximity sensors are used as inputs to programmable controllers, the preferred practice is to connect each sensor to a separate input channel of the PC. Series or parallel operations may then be accomplished by the internal PC programming.

Parker EPS-5, 6 or 7 sensors may be hard wired for series operation, but the voltage drop through the sensors (see specifications) must not reduce the available voltage below what is needed to actuate the load.

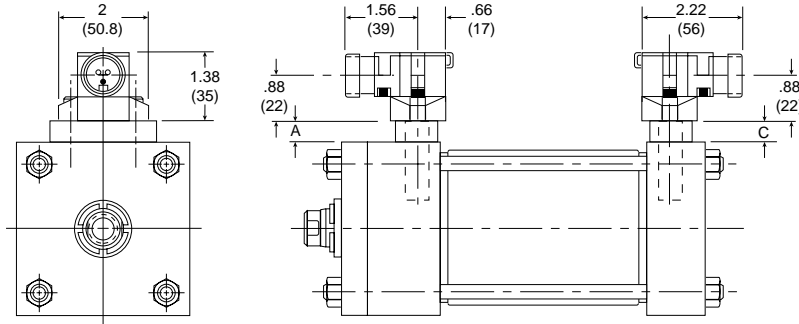
Parker EPS-5, 6 or 7 sensors may also be hard wired for parallel operation. However, the leakage current of each sensor will pass through the load. The total of all leakage currents must not exceed the current required to actuate the load. In most cases, the use of two or more EPS-5, 6 or 7 sensors in parallel will require the use of a bypass (shunt) resistor.

EPS-5
Automotive applications

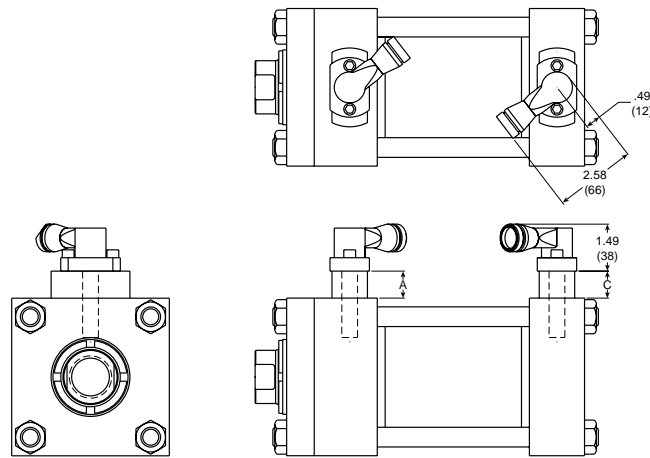
(Meets some Automotive Manufacturer's Specifications)

Series	A max.	C max.
2A, 4MA, 4MAJ	1.55"	1.30"

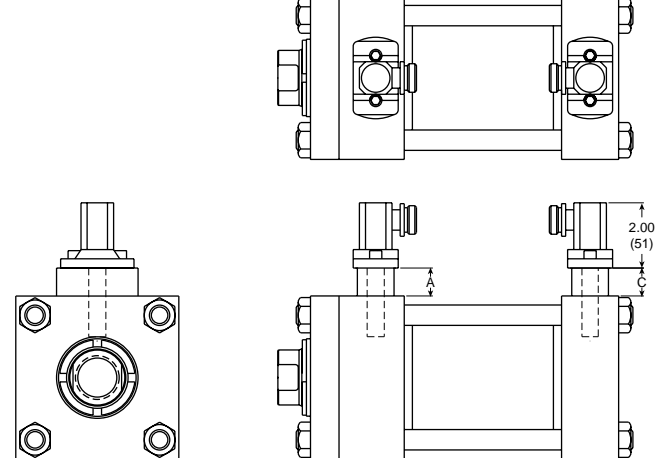
For exact dimensions, see Bulletin 0840-G-E1



EPS-7 & EPS-6 sensors

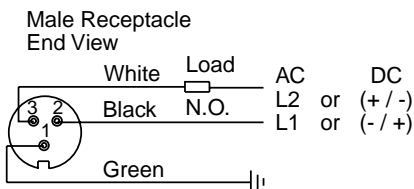


CLS-1 & 4 sensors

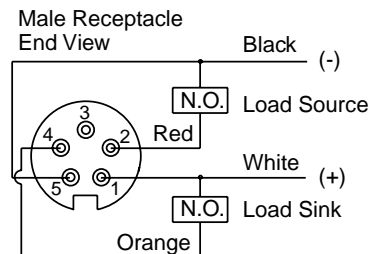


Connector pin numbering

3-pin mini



5-pin mini



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How to specify EPS sensors

Parker EPS proximity sensors may be ordered on 2A, 2AN, 4MA and 4MAJ Series cylinders as follows:

- 1) Complete the basic cylinder model number.
- 2) Place an "S" in the model number to denote sensors and/or special features.
- 3) Mounting styles D, DB, JB, or HB should be used with caution because of possible mounting interferences. Consult bulletin 0840-G-E1 for additional information.
- 4) Special modifications to cylinders other than sensors must have a written description.

- 5) Specify letter prefix "H" for EPS-7, "D" for EPS-6, "R" for EPS-5, "F" for CLS-1, or "B" for CLS-4, then fill in the four fields specifying port location, sensor orientation and actuation point for both head and cap. If only one sensor is used, place "XXXX" in the unused fields.

Example = H13CGG-XXXX denotes a sensor on the head end only, EPS-7

Example = BXXXX-42BGG denotes a sensor on the cap end only, CLS-4

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Head end

R	1	3	A	GG
Specify:	Port Location	Sensor Location	Sensor Orientation	Actuation Point
R = EPS-5	See Figure 1.	See Figure 1.	See Figure 2 for EPS-7 and EPS-6 only.	GG = End of Stroke
H = EPS-7				See Bulletin 0840-G-E1 for stroke remaining.
D = EPS-6				
F = CLS-1				
B = CLS-4				
N = Prep for sensors only				

Cap end

4	2	B	GG
Port Location	Sensor Location	Sensor Orientation	Actuation Point
See Figure 1.	See Figure 1.	See Figure 2 for EPS-7 and EPS-6 only.	GG = End of Stroke
			See Bulletin 0840-G-E1 for stroke remaining.

Note: All specified sensor and port locations are as seen from rod end of cylinder.
 *EPS-5 sensors will be oriented so that the connectors face each other.
 **Consult the Wadsworth, Ohio facility for this option with 4MA and 4MAJ Series cylinders.

Figure 1

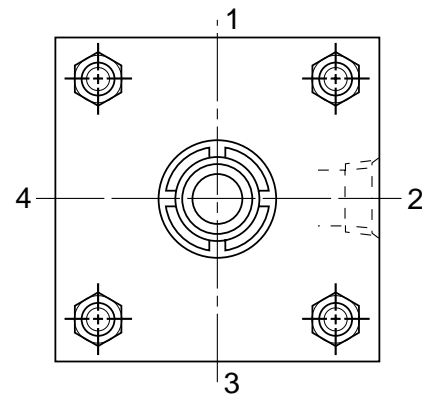
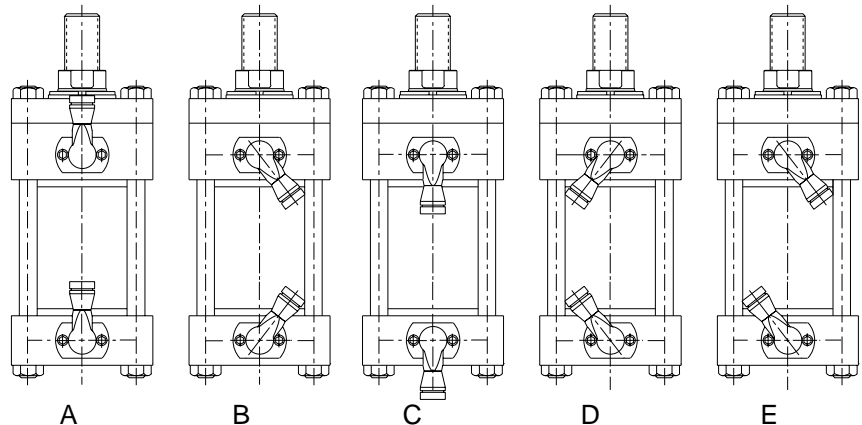


Figure 2



Example:
 4.00 CJ4MAUS14AC 12.000
 S = H13CGG-13CGG

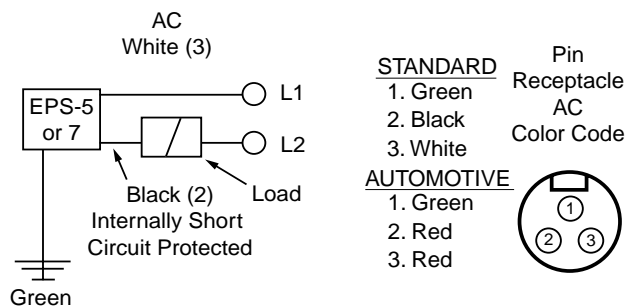
EPS-5 & EPS-7

Connectors

The male quick disconnect on the Parker EPS-5 or 7 is a Brad Harrison 40909 connector.

Female connects must be purchased with one of the following cable lengths.

Cable length	Part number	
	Automotive	Standard
3'	085356003	0853550003
6'	085356006	0853550006
9'	085356009	—
12'	0853560012	0853550012



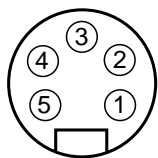
EPS-6

Connectors

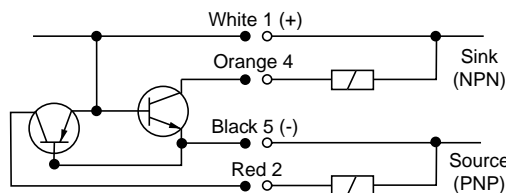
The male quick disconnect on the Parker EPS-6 is a Brad Harrison 41310 connector.

Plug pin and cable identification

- 1) +10 to 30 VDC (White)
- 2) Source (Red)
- 3) Grounded not connected nor required
- 4) Sink (Orange)
- 5) Common (Black)



Cable length	Part number
3	0859170003
6	0859170006
12	0859170012



LED Function	“Ready”	“Target”
Power Applied (No Target)	ON	OFF
Target Present	OFF	ON
Short Circuit Condition	FLASH	FLASH

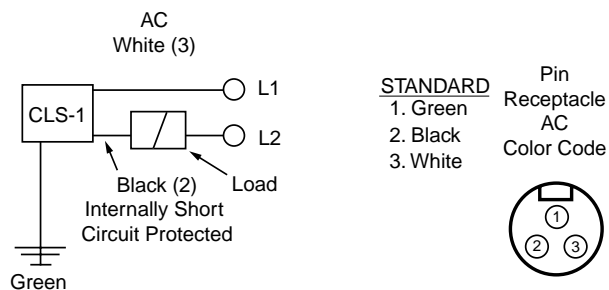
CLS

Connectors

The male quick disconnect on the Parker CLS-1 is a Brad Harrison 40909 connector.

Female connects must be purchased with one of the following cable lengths.

Cable length	Part number
3'	0853550003
6'	0853550006
9'	—
12'	0853550012



The connection for the CLS-4 are 144" PTFE insulated flying leads with 1/2" conduit hub. 3-wire: Common (black), Normally open (blue), and Normally closed (red).

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End-of-Stroke Proximity Sensors

PTR and HP Series Proximity Sensors

The inductive type proximity sensor provides end of rotation indication. The non-contact probe senses the presence of the ferrous cushion spear and has no springs, plungers, cams or dynamic seals that can wear out or go out of adjustment. The sensor is solid state and meets NEMA 3, 4, & 13 specifications. For ease of wiring, the connector housing is rotatable through 360°. To rotate, lift the cover latch, position, and release.

A standard proximity sensor controls 20-230 VAC/DC loads from 5 to 500 mA. The low 1.7 mA off-state leakage current can allow use for direct PLC input. The standard short circuit protection (SCP) protects the sensor from a short in the load or line upon sensing such a condition (5 amp or greater current) by assuming a non-conductive mode. The fault condition must be corrected and the power removed to reset the sensor preventing automatic restarts.

The low voltage DC sensor is also available for use with 10-30 VDC. This sensor is in a non-rotatable housing, but does incorporate the short circuit protection.

Both sensors are equipped with two LEDs, "Ready" and "Target". The "Ready" LED is lit when power is applied and the cushion spear is not present. The "Target" LED will light and the "Ready" LED will go out when the sensor is closed, indicating the presence of the cushion spear. Both LEDs flashing indicates a short circuit condition.

Notes:

1. Available with or without cushions.
2. Not available with stroke adjusters.
3. Pressure rating: 3000 PSIG
4. Operating temperature: -4°F to 150°F
5. Specify sensor type, orientation and voltage when ordering.
6. The low voltage DC sensor is available in non-rotatable style only, consult representative for further information.

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Proximity
 Sensors

Inductive Proximity Sensors – 8mm Barrel Type

Proximity sensors are normally ordered with the unit as part of the model number. Use these part numbers for replacement parts only.

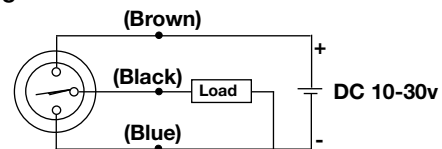
Ordering information

Series	PNP		NPN	
	Quick* connect	Flying leads	Quick ** connect	Flying leads
HB	B8830-P	913090000	B8830-N	913090100
P5L	B8830-P	913090000	B8830-N	913090100
WR	B8830-P	913090000	B8830-N	913090100

* Order cordset B8757-P separately.

** Order cordset B8757-N separately.

PNP wiring connection



NPN wiring connection

