



## Electronic Sensors

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Selection Guide

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 <sup>1</sup>	N/A	P8S-EPSUS	N/A	N/A	N/A	N/A		
	LPM	9/16"	L076990000 <sup>2</sup>	N/A	L07699000C	N/A	N/A	N/A	L15	N/A	
		3/4" - 1-1/8"	L077000000 <sup>2</sup>	N/A	L07700000C	N/A	N/A	N/A	N/A	L15	N/A
		1-1/2" - 2"	L077010000 <sup>2</sup>	N/A	L07701000C	N/A	N/A	N/A	N/A	L15	N/A
		2-1/2" - 4"	L077020000 <sup>2</sup>	N/A	L07702000C	N/A	N/A	N/A	N/A	L15	N/A
Round body cylinders	SR/ SRG, SRM/SRDM	9/16" - 3/4"	P8S-GPFAX	P8S-GPFDX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	L5	L9	
		1-1/16" - 2-1/2"	P8S-GPFAX	P8S-GPFDX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	L5	L9	
	P	1-1/8" - 2-1/2"	P8S-GPFAX	P8S-GPFDX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	L5	L9	
		3" - 4"	P8S-GPFAX	P8S-GPFDX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC03	L5	L9	
Tie rod cylinders	4MA standard sensor	1-1/2" - 5"	P8S-GPFAX	P8S-GPFDX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	N/A	L5	N/A	
	2MNR	1-1/2" - 4"									
	4MA	6" - 8"						P8S-TMAOX	N/A	L9	
Iso cylinders	P1A standard sensor	10-25mm	P8S-GPFAX	P8S-GPFDX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	L6	L9	
		10mm	P1A-2XMK <sup>1</sup>	N/A	N/A	N/A	N/A	P1A-2CCC	L13	L13	
	P1A right angle sensors	12mm	P1A-2XMK <sup>1</sup>	N/A	N/A	N/A	N/A	P1A-2DCC	L13	L13	
		16mm	P1A-2XMK <sup>1</sup>	N/A	N/A	N/A	N/A	P1A-2FCC	L13	L13	
		20mm	P1A-2XMK <sup>1</sup>	N/A	N/A	N/A	N/A	P1A-2HCC	L13	L13	
		25mm	P1A-2XMK <sup>1</sup>	N/A	N/A	N/A	N/A	P1A-2JCC	L13	L13	
P1D standard & clean profiles	All	P8S-GPFAX	P8S-GPFDX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	N/A	L5	N/A		
P1D tie rod version	All	P8S-GPFAX	P8S-GPFDX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	P8S-TMAOX	L5	N/A		
Rodless cylinders	P1X	All	P8S-GPFAX	P8S-GPFDX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	P8S-TMAOY	L5	N/A	
	P1Z	All	P8S-GPFAX	P8S-GPFDX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	N/A	L5	N/A	
	OSP-P	All	P8S-GPFAX	P8S-GPFDX	P8S-GPCHX	N/A	N/A	Included w/ sensor	L11	N/A	
Guided cylinders	P5T	Flush mount	P8S-GPFAX	P8S-GPFDX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	N/A	L5	N/A	
		Right angle	N/A	P8S-SPETXD	P8S-SPTHXD	N/A	N/A	N/A	L10	N/A	
	P5E	All	P8S-GPFAX	P8S-GPFTX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	N/A	L5	N/A	
	HB	All	P8S-GPFAX	P8S-GPFTX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	N/A	L5	N/A	
		20 - 25mm	P8S-GPFAX	P8S-GPFTX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	L5	L9	
P5L	32 - 63mm	P8S-GPFAX	P8S-GPFTX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	L5	L9		
	80 - 100mm	P8S-GPFAX	P8S-GPFTX	P8S-GPCHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC03	L5	L9		
Rotary actuators	PV XR	Normally open	SMH-1P <sup>2</sup>	N/A	SMH-1PC	N/A	N/A	N/A	L19	N/A	
		Normally closed	SMC-1P <sup>2</sup>	N/A	SMC-1PC	N/A	N/A	N/A	L19	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 <sup>3</sup>	N/A	SWH-1PC	N/A	N/A	Included w/ sensor	L21	N/A	
20, 25, 32		SWH-2P <sup>3</sup>	N/A	SWH-2PC	N/A	N/A	Included w/ sensor	L21	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 L22 for Weld Immune Sensors.  
 \* See page L24 for cord sets.



For inventory, lead times, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

Selection Guide

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 <sup>1</sup>	N/A	P8S-ENSUS	N/A	N/A	N/A	N/A	
	LPM	9/16"	L076950000 <sup>2</sup>	N/A	L07695000C	N/A	N/A	N/A	L15	N/A
		3/4" - 1-1/8"	L076960000 <sup>2</sup>	N/A	L07696000C	N/A	N/A	N/A	L15	N/A
		1-1/2" - 2"	L076970000 <sup>2</sup>	N/A	L07697000C	N/A	N/A	N/A	L15	N/A
		2-1/2" - 4"	L076980000 <sup>2</sup>	N/A	L07698000C	N/A	N/A	N/A	L15	N/A
Round body cylinders	SR/ SRG, SRM/SRDM	9/16" - 3/4"	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	L5	L9
		1-1/16" - 2-1/2"	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	L5	L9
	P	1-1/8" - 2-1/2"	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	L5	L9
		3" - 4"	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC03	L5	L9
Tie rod cylinders	4MA standard sensor	1-1/2" - 5"	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GPNSCX	P8S-GNMHX	N/A	L5	N/A
	2MNR	1-1/2" - 4"						P8S-TMAOX	N/A	L9
	4MA	6" - 8"						P8S-TMAOX	N/A	L9
ISO cylinders	P1A standard sensor	10-25mm	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	L6	L9
		10mm bore	P1A-2XLK <sup>1</sup>	N/A	N/A	N/A	N/A	P1A-2CCC	L13	L13
	P1A right angle sensors	12mm bore	P1A-2XLK <sup>1</sup>	N/A	N/A	N/A	N/A	P1A-2DCC	L13	L13
		16mm bore	P1A-2XLK <sup>1</sup>	N/A	N/A	N/A	N/A	P1A-2FCC	L13	L13
		20mm bore	P1A-2XLK <sup>1</sup>	N/A	N/A	N/A	N/A	P1A-2HCC	L13	L13
		25mm bore	P1A-2XLK <sup>1</sup>	N/A	N/A	N/A	N/A	P1A-2JCC	L13	L13
P1D standard & clean profiles	All	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	N/A	L5	N/A	
P1D tie rod version	All	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	P8S-TMAOX	L5	N/A	
Rodless Cylinders	P1X	All	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	P8S-TMA0Y	L5	N/A
	P1Z	All	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	N/A	L5	N/A
	OSP-P	All	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	N/A	N/A	N/A	N/A	N/A
Guided cylinders	P5T	Flush mount	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	N/A	L5	N/A
		Right angle	N/A	P8S-SNETX	P8S-SNTHX	N/A	N/A	N/A	L10	N/A
	P5E	All	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	N/A	L5	N/A
	HB	All	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	N/A	L5	N/A
		20 - 25mm	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	L5	L9
		32 - 63mm	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	L5	L9
P5L	80 - 100mm	P8S-GNFAX	P8S-GNFDX	P8S-GNCHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC03	L5	L9	
Rotary actuators	PV XR	Normally open	SMH-1N <sup>2</sup>	N/A	SMC-1NC	N/A	N/A	N/A	L19	N/A
		Normally closed	SMC-1N <sup>2</sup>	N/A	SMC-1NC	N/A	N/A	N/A	L16	N/A
	PRN(A)	All	See page L17							
	PTR	10, 15	SWH-1N <sup>3</sup>	N/A	SWH-1NC	N/A	N/A	Included w/ sensor	L21	N/A
20, 25, 32		SWH-2N <sup>3</sup>	N/A	SWH-2NC	N/A	N/A	Included w/ sensor	L21	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 L22 for Weld Immune Sensors.  
 \* See page L24 for cord sets.

Selection Guide
Drop-in Sensors
Solid State / Reed Sensors
Weld Immune Sensors
Cordset / Connect Block
Proximity Sensors
CPS Smart Sensing
Electronic Sensors



For inventory, lead time, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

Selection Guide

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 <sup>1</sup>	N/A	P8S-ERSUS	N/A	N/A	N/A	N/A		
	LPM	9/16"	L077030000 <sup>1</sup>	N/A	L07703000C	N/A	N/A	N/A	L11	N/A	
		3/4" - 1-1/8"	L077040000 <sup>1</sup>	N/A	L07704000C	N/A	N/A	N/A	N/A	L11	N/A
		1-1/2" - 2"	L077050000 <sup>1</sup>	N/A	L07705000C	N/A	N/A	N/A	N/A	L11	N/A
		2-1/2" - 4"	L077060000 <sup>1</sup>	N/A	L07706000C	N/A	N/A	N/A	N/A	L11	N/A
Round body cylinders	SR/ SRG, SRM/SRDM	9/16" - 3/4"	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	L8	L9	
		1-1/16" - 2-1/2"	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	L8	L9	
	P	1-1/8" - 2-1/2"	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	L8	L9	
		3" - 4"	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC03	L8	L9	
Tie rod cylinders	4MA standard sensor	1-1/2" - 5"	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	N/A	L8	N/A	
	2MNR	1-1/2 - 4"									
	4MA	6" - 8"									P8S-TMAOX
ISO cylinders	P1A standard sensor	10-25mm	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	L6	L9	
		10mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2CCB	L13	L13	
	P1A alternate sensors	12mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2DCB	L13	L13	
		16mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2FCB	L13	L13	
		20mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2HCB	L13	L13	
		25mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2JCB	L13	L13	
P1D standard & clean profiles	All	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	N/A	L8	N/A		
P1D tie rod version	All	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	P8S-TMAOX	L8	N/A		
Rodless cylinders	P1X	All	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	P8S-TMAOY	L8	N/A	
	P1Z	All	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	N/A	L8	N/A	
	OSP-P	All	P8S-GRCHX	P8S-GRFDX	P8S-GRCHX	N/A	N/A	Included w/ sensor	L8	N/A	
Guided cylinders	P5T	Flush mount	P8S-GRFLX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	N/A	L8	N/A	
		Right angle	N/A	P8S-SRETX	P8S-SRTHX	N/A	N/A	N/A	L8	N/A	
	P5E	All	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	N/A	L8	N/A	
	HB	All	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	N/A	L8	N/A	
		20 - 25mm	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	L8	L8	
		32 - 63mm	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	L8	L8	
P5L	80 - 100mm	P8S-GRFAX	P8S-GRFDX	P8S-GRCHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC03	L8	L8		
	Rotary actuators	PV XR	N.O. high amp	SMR-1 <sup>1</sup>	N/A	SMR-1C	N/A	N/A	L19	N/A	
			N.O. low amp	SMR-1L <sup>1</sup>	N/A	SMR-1LC	N/A	N/A	N/A	L19	N/A
N.C.		SMD-1L <sup>1</sup>	N/A	SMD-1LC	N/A	N/A	N/A	L19	N/A		
PRN	50 - 800	See model code						L18	N/A		
PTR	10, 15	SWR-1 <sup>2</sup>	N/A	SWR-1C	N/A	N/A	Included w/ sensor	L21	N/A		
	20, 25, 32	SWR-2 <sup>2</sup>	N/A	SWR-2C	N/A	N/A	Included w/ sensor	L21	N/A		

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

Note: See page L22 for Weld Immune Sensors.  
\* See page L24 for cord sets.



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## P8S Global Drop-In Solid State Sensors



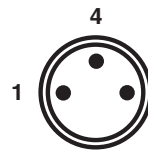
Wiring	PNP sensor	NPN sensor	PNP sensor ATEX certified
3m flying leads	<b>P8S-GPFAX</b>	<b>P8S-GNFAX</b>	<b>P8S-GPFLX/EX</b>
10m flying leads	<b>P8S-GPFDX</b>	<b>P8S-GNFDX</b>	N/A
0.3m lead with 8mm connector	<b>P8S-GPCHX</b>	<b>P8S-GNCHX</b>	
0.3m lead with 12mm connector	<b>P8S-GPMHX</b>	<b>P8S-GNMHX</b>	
1m lead with 8mm connector	<b>P8S-GPSCX</b>	<b>P8S-GNSCX</b>	

### Specifications

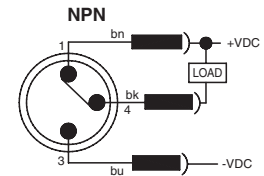
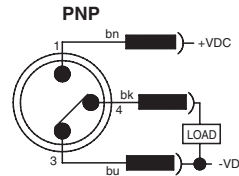
Switch classification	Standard PNP or NPN	ATEX certified PNP
Type	Electronic	
Output function	Normally open	
Sensor output	PNP/NPN	PNP
Operating voltage	10 - 30 VDC	10 - 30 VDC
Continuous current	100 mA max.	70 mA max.
Response sensitivity	28 Gauss min.	
Switching frequency	1 KHz	
Power consumption	10 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	IP68	
Shock and vibration stress	30g, 11 ms, 10 to 55 Hz, 1mm	
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

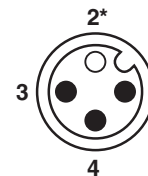
#### Flying lead or 8 mm connector (shown)



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

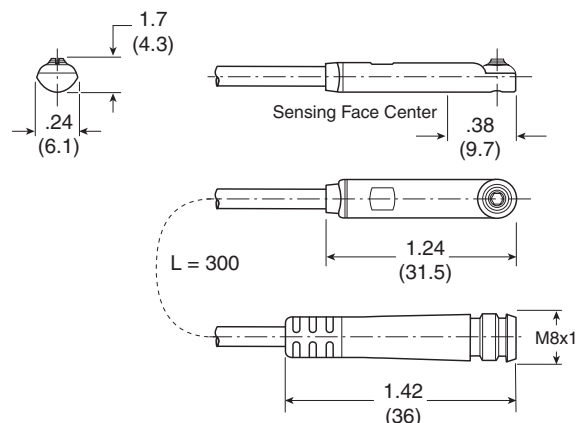
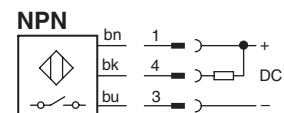
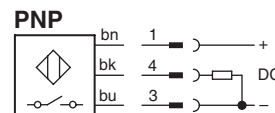


#### 12 mm connector



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.



For inventory, lead time, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

## P8S Global Drop-In Reed Sensors



Wiring	Reed sensor
3m flying leads	<b>P8S-GRFAX</b>
10m flying leads	<b>P8S-GRFDX</b>
10m flying leads	<b>P8S-GRFDX2*</b>
0.3m lead with 8mm connector	<b>P8S-GRCHX</b>
0.3m lead with 12mm connector	<b>P8S-GRMHX</b>
1m lead with 8mm connector	<b>P8S-GRSCX</b>

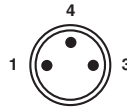
### Specifications

Type	2-wire reed
Output function	Normally open
Operating voltage	10 - 30 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	IP68
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

\* 10-230 VAC/DC for P8S-GRFDX2.

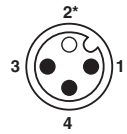
### Wiring connection

#### Flying Lead or 8 mm Connector



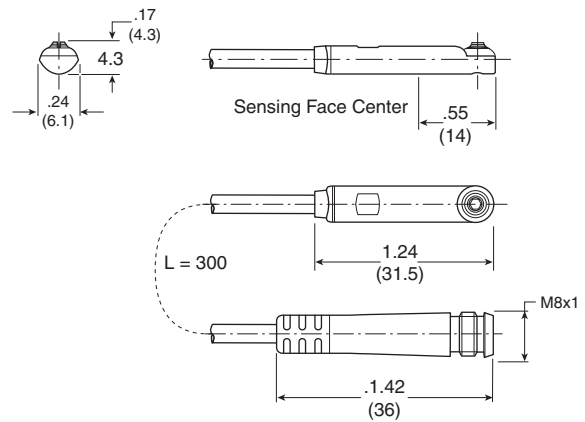
Pin	Wire	Function
1	Brown	Operating voltage (+V)
4	Black	Not used
3	Blue	Output signal (-V or ground)

#### 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

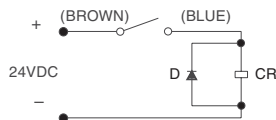
\* Pin 2 not present.



### 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.

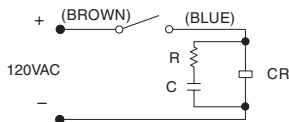


D: Diode: select a diode with the breakdown voltage and current rating according to the load.

**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

#### ⚠ 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  $R \text{ (ohms)} > E/0.3$ .



For inventory, lead times, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

## P8S Mini-Global Drop-In Solid State Sensors

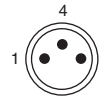


Wiring	PNP Sensor	NPN Sensor
3m Flying Leads	<b>P8S-MPFLY</b>	<b>P8S-MNFLY</b>
10m Flying Leads	<b>P8S-MPFTX</b>	<b>P8S-MNFTX</b>
0.3m Lead with 8mm Connector	<b>P8S-MPSHX</b>	<b>P8S-MNSHX</b>

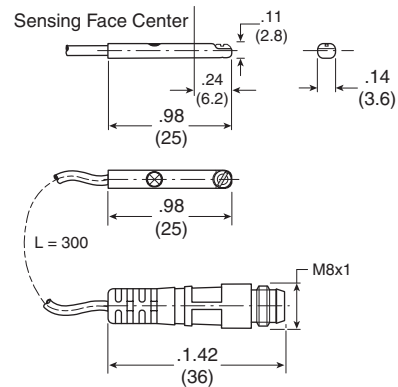
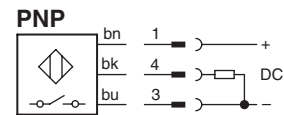
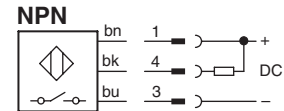
### Specifications

Type	Electronic
Output Function	Normally open
Sensor Output	PNP or NPN
Operating Voltage	10 - 30 VDC
Continuous Current	≤ 70 mA
Response Sensitivity	≤ 48 Gauss
Switching Frequency	1000 Hz
Power Consumption	≤ 8 mA without load
Voltage Drop	≤ 2.5 VDC
Ripple	10% of operating voltage
Hysteresis	≤ 15 Gauss
Repeatability	≤ ±0.1 mm
EMC	EN 60 947-5-2
Short-circuit Protection	Yes
Power-up Pulse Suppression	No
Reverse Polarity Protection	Yes
Enclosure Rating	IP67
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
Connector Cable	PUR 3 x 0.09mm <sup>2</sup>
Connector	PUR cable w/8mm connector

### Wiring connection



Pin	Wire	Function
1	Brown	+VDC
4	Black	NO
3	Blue	-VDC



Selection Guide

Drop-in Sensors

Solid State / Reed Sensors

Weld Immune Sensors

Cordset / Connect Block

Proximity Sensors

CPS Smart Sensing

Electronic Sensors



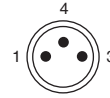
For inventory, lead time, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

## P8S Mini-Global Drop-In Reed Sensors

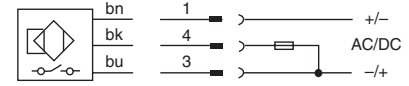


### Wiring connection

Wiring	Reed Sensor
3m Flying Leads	<b>P8S-MRFLY</b>
10m Flying Leads	<b>P8S-MRFTX</b>
0.3m Lead with 8mm Connector	<b>P8S-MRSHX</b>

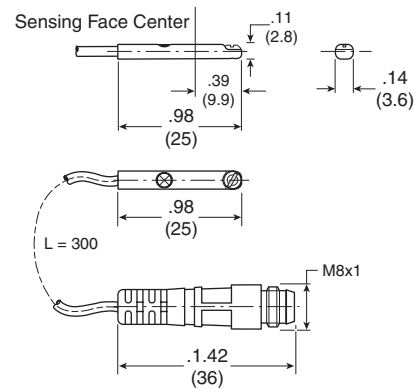


Pin	Wire	Function
1	Brown	Operating voltage (+V)
4	Black	Output signal
3	Blue	Ground (-V)



### Specifications

Type	3-Wire Reed
Output Function	Normally Open
Operating Voltage	10 - 30 VAC, 10 - 30 VDC
Switching Power	10 W/VA
Continuous Current	≤ 500 mA max.
Response Sensitivity	≤ 48 Gauss
Switching Frequency	500 Hz
Hysteresis	≤ 7 Gauss
Repeatability	≤ 0.1 mm
EMC	EN 60 947-5-2 / EN 40 050
Enclosure Rating	IP67
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
Connector Cable	PUR 3 x 0.09 mm <sup>2</sup>
Connector	PUR cable w/8mm connector



### ⚠ 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.



For inventory, lead times, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

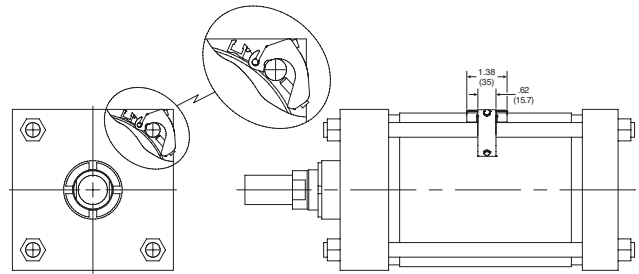


## Tie Rod Bracket Assembly

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); and all 6"-8" bore Sensors and bracket assemblies must be ordered separately.

Part number P8S-TMAOX fits 1-1/2" to 8" bores and 32-200mm bores for Global Sensors

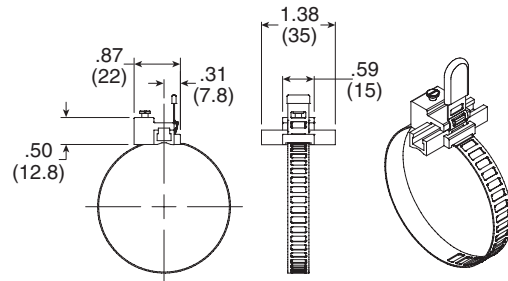
P8S-TMAOX



## Round Body Bracket Assembly

Sensors and brackets must be ordered separately

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



Selection Guide

Drop-in Sensors

Solid State / Reed Sensors

Weld Immune Sensors

Cordset / Connect Block

Proximity Sensors

CPS Smart Sensing

Electronic Sensors



## Right Angle Sensors

### Solid State – P8S Right Angle Sensors

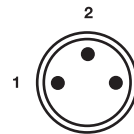


#### Specifications

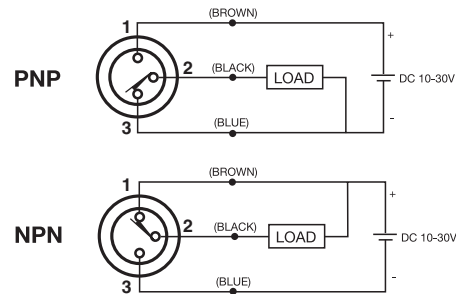
Type	Electronic
Output function	Normally open
Switching output	PNP/NPN
Operating voltage	10 - 30 VDC
Continuous current	≤ 150 mA
Response sensitivity	30 Gauss min.
Switching frequency	5kHz
Power consumption	15 mA
Voltage drop	≤ 2 VDC
Ripple	≤ 10% of operating voltage
Delay time (24V)	Approx. 20 ms
Time delay before availability	≤ 2 ms
Hysteresis	≤ 1.5mm
Repeatability	≤ 0.2mm
EMC	EN 60 947-5-2
Short-circuit protection	Yes
Power-up pulse suppression	Yes
Reverse polarity protection	Yes
Enclosure rating	IP67 DIN 40050
Shock and vibration stress	30g, 11ms, 10 to 55 Hz, 1mm
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	<b>P8S-SPTHXD</b>	<b>P8S-SNTHX</b>
10m flying leads	<b>P8S-SPETXD</b>	<b>P8S-SNETX</b>

#### Wiring connection



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



### Reed – P8S Right Angle Sensors

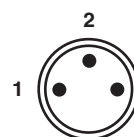


#### Specifications

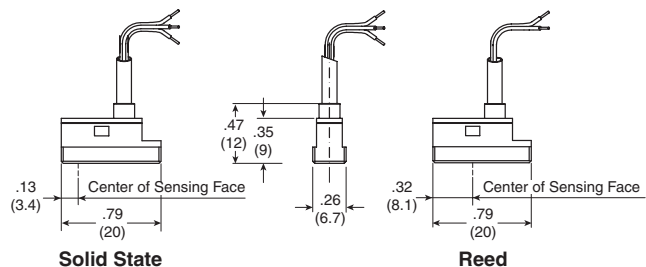
Type	2-wire reed
Output function	Normally open
Output voltage	10 - 110* VAC, 10 - 30 VDC
Continuous current	≤ 100 mA
Response sensitivity	30 Gauss min.
Switching frequency	400 Hz
Voltage drop	≤ 3 V
Ripple	≤ 10% of operating voltage
Time delay (24V)	Approx. 20 ms
Hysteresis	≤ 1.0mm
Repeatability	≤ 0.2mm
EMC	EN 60 947-5-2
Reverse polarity protection	Yes
Enclosure rating	IP67
Shock and vibration stress	30g, 11ms, 10 to 55 Hz, 1mm
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	<b>P8S-SRTHX</b>
10m flying leads	<b>P8S-SRETX</b>

#### 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.



For inventory, lead times, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

**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 <sup>2</sup>	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, 1mm	
Shock to EN 60068-2-27	G	50, 11 ms	
Bump to EN 60068-2-29	G	30, 11 ms, 1000 bumps each axis	



**Ordering Information**

Selection Guide	Version	Voltage	Type	Part number
Drop-in Sensors	Magnetic switch, reed contact, normally open, LED indicator, cable 3m	10-30 VAC / VDC	<b>RST-K</b>	<b>P8S-GRFAX</b>
	Magnetic switch, reed contact, normally open, LED indicator, cable 10m	10-30 VAC / VDC	<b>RST-K</b>	<b>P8S-GRFDX</b>
Solid State / Reed Sensors	Magnetic switch, reed contact, normally open, LED indicator, cable 10m	10-230 VAC / VDC	<b>RST-K</b>	<b>P8S-GRFDX2</b>
	Magnetic switch, reed contact, normally open, snap connector M8, LED indicator, cable 0.24m	10-30 VAC / VDC	<b>RST-S</b>	<b>P8S-GRCHX</b>
Weld Immune Sensors	Magnetic switch, reed contact, normally open, screw connector M8, LED indicator, cable 0.24m	10-30 VAC / VDC	<b>RST-S</b>	<b>P8S-GRCHX</b>
	Magnetic switch, reed contact, normally closed, cable 10m	10-30 VAC / VDC	<b>RST-K</b>	<b>P8S-GEFRX</b>
Cordset / Connect Block	Magnetic switch, electronic, PNP LED indicator, cable 3m	10-30 VDC	<b>EST-K</b>	<b>P8S-GPFAX</b>
	Magnetic switch, electronic, PNP LED indicator, cable 10m	10-30 VDC	<b>EST-K</b>	<b>P8S-GPFDX</b>
	Magnetic switch, electronic, PNP M8, LED indicator, cable 0.24m	10-30 VDC	<b>EST-S</b>	<b>P8S-GPCHX</b>
Proximity Sensors	Magnetic switch, electronic, NPN M8, LED indicator, cable 0.24m	10-30 VDC	<b>EST-S</b>	<b>P8S-GNCHX</b>
	Included in delivery: 1 magnetic switch 1 adapter for dovetail groove mounting			

**Accessories**

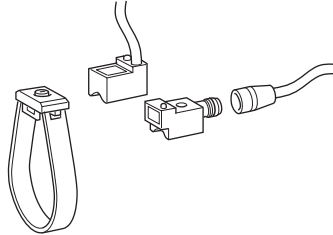
Description	Type	Part number
Cable M8, 2.5m without lock nut	<b>KS 25</b>	<b>KY3240</b>
Cable M8, 5.0m without lock nut	<b>KS 50</b>	<b>KY3241</b>
Cable M8, 5.0m without lock nut	<b>ES-S / RS-S</b>	<b>4041</b>
Cable M8, 5.0m with lock nut	<b>KSG 50</b>	<b>KC3104</b>
Adapter for dovetail groove (pack of 10)		<b>KL3333</b>



For inventory, lead times, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

**P1A Series Solid State Sensors**

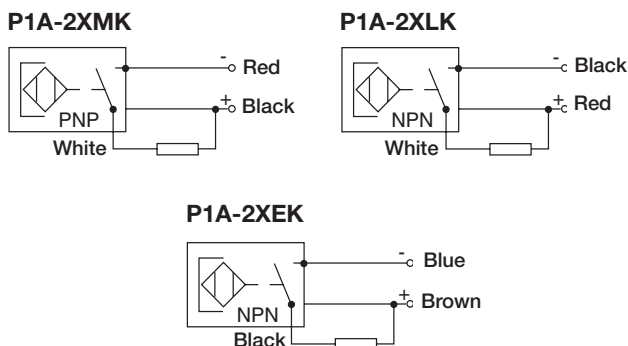
These sensors are of solid-state type, with no moving parts. Short-circuit and transient protection is incorporated as standard. The integral electronics make these sensors suitable for applications with very high switching frequencies.



**Specifications**

Design	Hall element
Output	PNP resp. NPN, N.O.
Voltage range	10-30 VDC
Max permissible ripple	10%
Max voltage drop	0.5 V at 100 mA
Max load current, P1A-2XMK, LK	150 mA
P1A-2XHK, EK, JH, FH	100 mA
Max breaking power (resistive)	6 W
Internal consumption	<30 mA at 30 V
Min actuating distance	5 mm
Hysteresis	1.1 - 1.3mm
Repeatability accuracy	±0.1mm
Max on/off switching frequency	1 kHz
Max on/off switching time	0.8/3.0 ms
Encapsulation, P1A-2XHK, EK, MK, LK	IP67
Temperature range	-10 °C to 60 °C (14°F to 140°F)
Indication	LED
Shock resistance	40 g
Material, housing	Polyamid 11
Material, mould	Epoxy
Cable	PVC 3x0.15 mm <sup>2</sup>
Cable incl. female part connector	PVC 3x0.15 mm <sup>2</sup>
Connector	8mm snap on
Mounting	Mounting yoke
Material, mounting	Acetal/Stainless steel
Material, screw	Stainless steel

**Wiring connection**



**Electronic Sensors**

Output	Cable length	Weight (lb)	Part number
PNP, N.O.	2m	0.09	<b>P1A-2XMK, Rt. angle</b>
NPN, N.O.	2m	0.09	<b>P1A-2XLK, Rt. angle</b>
NPN, N.O.	2m	0.022	<b>P1A-2XEK</b>

**Mounting Brackets**

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

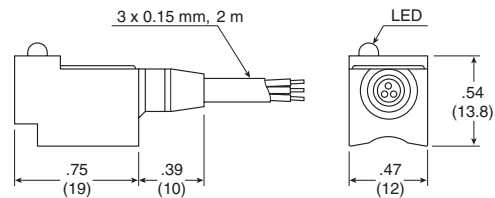
**Cable for Sensors**

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

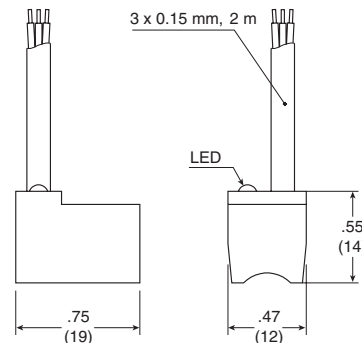
\* Cable ordered separately

\*\* Cable includes female part connector for sensor

**P1A-2XHK and P1A-2XEK**



**P1A-2XMK and P1A-2XLK**



Selection Guide

Drop-in Sensors

Solid State / Reed Sensors

Weld Immune Sensors

Cordset / Connect Block

Proximity Sensors

CPS Smart Sensing

Electronic Sensors



For inventory, lead time, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

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: L076960000C.

Solid State Sensors (NPN/PNP)

Switching Logic	N.O. NPN (Sinking) N.O. PNP (Sourcing)
Supply Voltage Range	5 - 30 VDC
On-State Voltage Drop	1.5 V max. at 100 mA
Current Output Range	100 mA
Burden Current	7 mA at 12 V 14 mA at 24 V
Leakage Current	0.01 mA
LED Function	NPN: Red (Target Present) PNP: Green (Target Present)
Minimum Current to Light LED	1 mA
Operating Temperature	14° to 158°F (-10° to 70°C)
Storage Temperature	-4° to 176°F (-20° to 80°C)
Enclosure Protection	IEC standard IP 67 NEMA 6P
Lead Wire	3 conductor, 24 gauge
Lead Wire Length	59 inches, 1.5 meter
Color of Cable	Black
Switching Response	Max. 1k Hz
Shock Resistance	50 G (490 m/s <sup>2</sup> )
Vibration Resistance	Double Amplitude 1.5 mm (Frequency 10 to 55 Hz 1 scanning, 1 minute)

Reed Sensor (Low AMP)

Switching Logic	N.O. SPST (Form A)
Supply Voltage Range	3 - 125 V AC/DC
On-State Voltage Drop	1.8V max. at 20 mA DC
Power Rating*	5 W (2.5 W) 5 VA (2.5 VA)
Switching Current Range*	5-40 mA (5-20 mA)
Leakage Current	0
LED Function	Red (Target Present)
Minimum Current to Light LED	3 mA
Operating Temperature	14° to 158°F (-10° to 70°C)
Storage Temperature	-4° to 176°F (-20° to 80°C)
Enclosure Protection	IEC standard IP67 NEMA 6P
Lead Wire	2 conductor, 24 gauge
Lead Wire Length	59 inches, 1.5 meter
Color of Cable	Gray
Switching Response	Max. 300 Hz
Shock Resistance	30 G (300 m/s <sup>2</sup> )
Vibration Resistance	Double Amplitude 1.5 mm (Frequency 10 to 55 Hz 1 scanning, 1 minute)

\* Number in parentheses pertains to inductive loads.

Circuits

NPN Sensor – Sinking Output

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



PNP Sensor – Sourcing Output

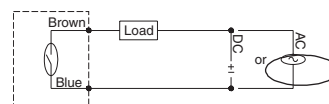
Color of Cable – Black  
"On" State Voltage Drop – 1.5V Maximum



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

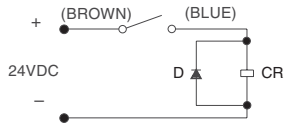
Reed Sensor

NOTE: Polarity must be observed for DC operation only.



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

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

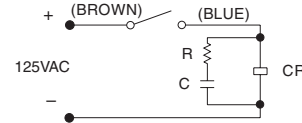


D: Diode: select a Diode with the breakdown voltage and current rating according to the load.

**Typical Example** – 100 Volt, 1 Amp Diode  
CR: Relay coil (under 0.5W coil rating)

(Recommended for longer life 125 VAC)

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

**⚠ Caution**

- Use an ampmeter 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  $R \text{ (ohms)} > E/0.3$ .

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Drop-in Sensors

Solid State / Reed Sensors

Weld Immune Sensors

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CPS Smart Sensing

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## PRNA Sizes 3 to 30 Sensors

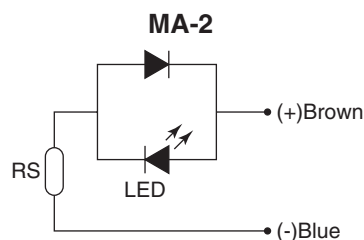
### Fixed Position Sensor

#### Specifications

Part Number	See Ordering Information
Type of Sensor	Solid State
Application	Relay, PLC, IC Circuit
Output Method	NPN
Load Voltage	5 to 30VDC
Load Current	5 to 200 mA
Max. Power Consumption of Switch Control	Max. 200 mA at 24V
Max. Leak Current	Max. 10 $\mu$ A
Internal Voltage Drop	1.5VDC or Less
Mean Response Time	1 ms
Shock Resistance	490 m/s <sup>2</sup>
Ambient Temperature	5 to 60°C
Enclosure Rating	IP67
Hysteresis	Approximately 2°
Response Range	15° +/- 7°
Lead Wire Length	1 meter

#### Ordering information

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



### Variable Position Sensor

#### Specifications

Type of Sensor	Solid State
Application	Relay, PLC, IC Circuit
Output Method	NPN
Load Voltage	5 to 30 VDC
Load Current	5 to 200 mA
Max. Power Consumption of Switch Control	Max. 200 mA at 24V
Max. Leak Current	Max. 10 $\mu$ A
Internal Voltage Drop	1.5 VDC
Mean Response Time	1 ms
Shock Resistance	490 m/s <sup>2</sup>
Ambient Temperature	5 to 60°C
Enclosure Rating	IP67
Hysteresis	Approximately 2°
Response Range	23° +/- 7°
Lead Wire Length	1 meter

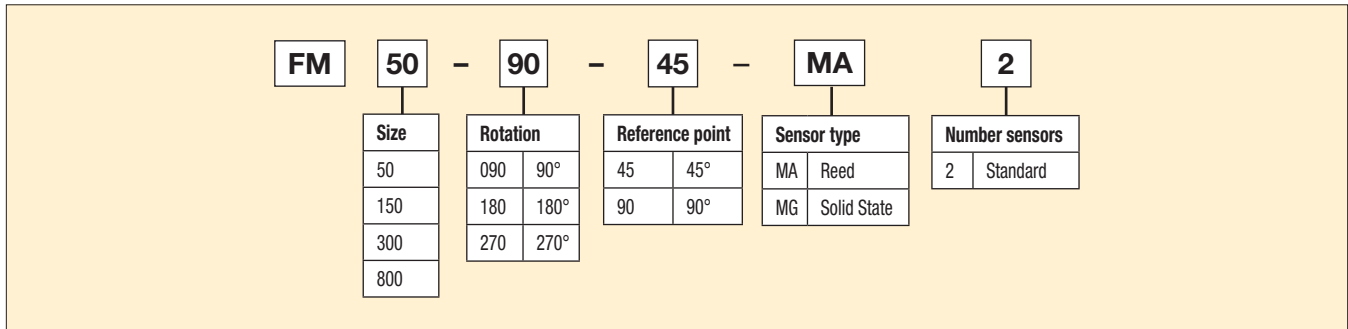
#### Variable position sensor

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

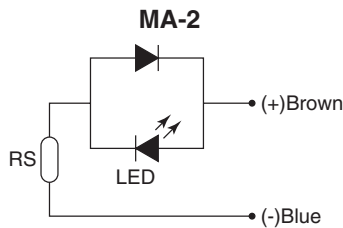


PRN Sizes 50 to 800 Sensors

Ordering information



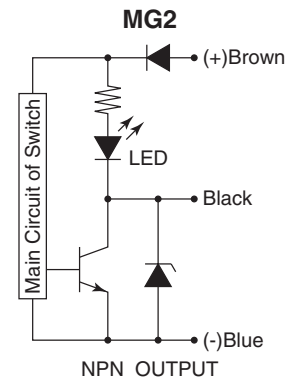
Reed sensors



Specifications

Output Method	NPN
Load Current	5 to 45 mA
Internal Voltage Drop	2V or Less
Mean Response Time	1.0 ms
Shock Resistance	294 m/s <sup>2</sup>
Ambient Temperature	5 to 60°C
Indicator Light	Red LED
Lead Wire Length	1 meter

Solid state sensors



Specifications

Application	Relay, PLC, IC Circuit
Output Method	NPN
Load Voltage	5 to 30VDC
Load Current	5 to 200 mA
Max. Power Consumption of Switch Control	Max. 20 mA at 24V
Max. Leak Current	Max. 10 µA
Internal Voltage Drop	1.5V or Less
Mean Response Time	1 ms
Shock Resistance	490 m/s <sup>2</sup>
Ambient Temperature	5 to 60°C
Enclosure Rating	IP67
Indicator Light	Red LED
Lead Wire Length	1 meter

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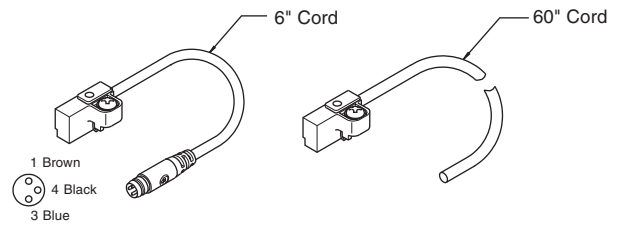
Electronic Sensors



For inventory, lead time, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

**PV & XR Series Solid State (Hall Effect) Sensors**

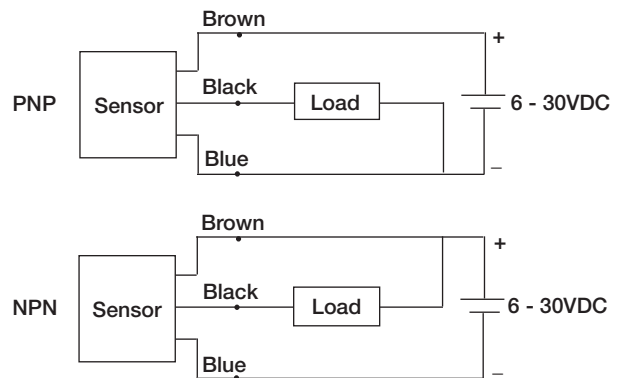
Type	LED color	Logic	Cable/Connector	Part number
N.O.	Green	PNP	1.5m black with leads	<b>SMH-1P</b>
N.O.	Red	NPN		<b>SMH-1N</b>
N.C.	Yellow	PNP		<b>SMC-1P</b>
N.C.	White/Red	NPN		<b>SMC-1N</b>
N.O.	Green	PNP	0.15m black with connector	<b>SMH-1PC</b>
N.O.	Red	NPN		<b>SMH-1NC</b>
N.C.	Yellow	PNP		<b>SMC-1PC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



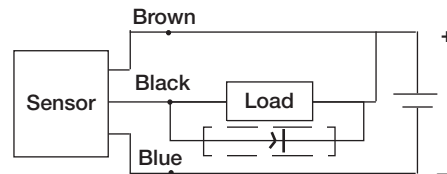
**Specifications**

Type	Solid State Type (PNP or NPN)
Switching Logic	Normally Open or Normally Closed
Supply Voltage Range	6 - 30 VDC
Max. Switch Current	150 mA
Current Consumption	7 mA at 12 VDC, 14 mA at 24 VDC
Switching Response	500 Hz Maximum
Residual Voltage	0.8 V Maximum (150 mA)
Leakage Current	10 uA Maximum
Insulation Resistance	100 M ohm min.
Min. Current for LED	1mA
Operating Temperature	-10° to 85°C (14° to 185°F)
Lead Termination	1500mm (60 in) or 150mm (6 in) with connector
Enclosure Rating	IP67
Shock Resistance	50 G's, 490 m/sec <sup>2</sup>

**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 & XR 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.

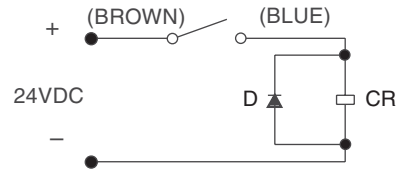
Type	LED color	Rating	Cable/Connector	Part number
N.O.	Green	High Amp	1.5m Gray with Leads	<b>SMR-1</b>
N.O.	Red	Low Amp		<b>SMR-1L</b>
N.C.	Yellow	Low Amp		<b>SMD-1L</b>
N.O.	Green	High Amp	0.15m Gray with Connector	<b>SMR-1C</b>
N.O.	Red	Low Amp		<b>SMR-1LC</b>
N.C.	Yellow	Low Amp		<b>SMD-1LC</b>

### SMR-1L or SMD-1L Low Amp Reed Sensor Specifications

Switching Logic	Normally Open (SMR-1L) Normally Closed (SMD-1L)
Voltage Rating	85-125 VAC or 6-30 VDC* (N.O.) 6-30 VAC, 6-30 VDC* (N.C.)
Power Rating:	
AC or DC Resistive Load	10 watts (N.O.)
AC or DC Inductive Load	5 watts (N.O.)
AC or DC	3 watts (N.C.)
Switching Current Range:	
Resistive Load (PC, Sequencer)	5-40 mA (N.O.), 5-25 mA (N.C.)
Inductive Load (Relay)	5-25 mA
Minimum Current for LED	5 mA
Switching Response	300 Hz (N.O.), 200 Hz (N.C.)
Breakdown Voltage	200 VDC
Contact Resistance	100 M ohm min.
Operating Temperature	-10° to 85°C (14° to 185°F)
Lead Termination	1.5m (6 in) or 0.15m (6 in) with connector
Enclosure Rating	IP67
Shock Resistance	30 G's, 300 m/sec <sup>2</sup>

### Integral circuit for switching contact protection

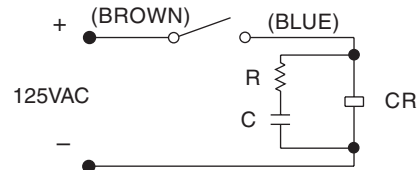
(Required for proper operation 24V DC)  
 Put Diode parallel to load (CR) with polarity as shown below.



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

### SMR-1 High Amp Reed Sensor Specifications

Switching Logic	Normally Open
Voltage Rating	85-125 VAC or 5-30 VDC*
Power Rating:	
AC or DC Resistive Load	10 watts
AC or DC Inductive Load	5 watts
Switching Current Range:	
Resistive Load (PC, Sequencer)	30-300 mA
Inductive Load (Relay)	30-100 mA
Minimum Current for LED	18 mA
Switching Response	300 Hz Maximum
Breakdown Voltage	200 VDC
Contact Resistance	100 M ohm min.
Operating Temperature	-10° to 85°C (14° to 185°F)
Lead Termination	1.5m (6 in) or 0.15m (6 in) with connector
Enclosure Rating	IP67
Shock Resistance	30 G's, 300 m/sec <sup>2</sup>

\* Polarity is restricted for DC operation

(+) to Brown

(-) to Blue

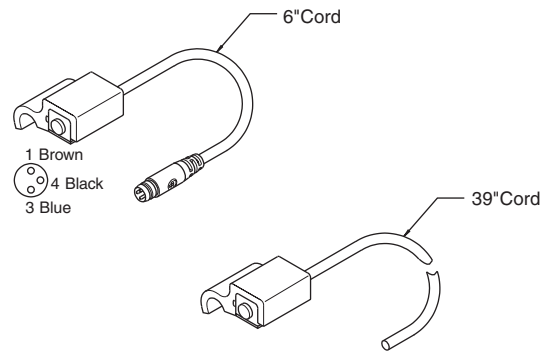
If these connections are reversed the contacts will close, but the LED will not light.

**Note:** Care must be taken not to exceed the Power Rating of the sensor while still observing the voltage and current limitations.

**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	<b>SWH-1PC</b>	<b>SWH-1P</b>	<b>SWH-1NC</b>	<b>SWH-1N</b>
15	<b>SWH-1PC</b>	<b>SWH-1P</b>	<b>SWH-1NC</b>	<b>SWH-1N</b>
20	<b>SWH-2PC</b>	<b>SWH-2P</b>	<b>SWH-2NC</b>	<b>SWH-2N</b>
25	<b>SWH-2PC</b>	<b>SWH-2P</b>	<b>SWH-2NC</b>	<b>SWH-2N</b>
32	<b>SWH-2PC</b>	<b>SWH-2P</b>	<b>SWH-2NC</b>	<b>SWH-2N</b>

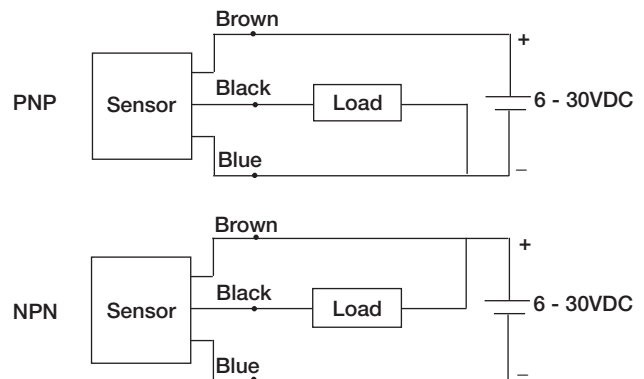
**Note:** Sensors with male quick connect option require female cordsets to be ordered separately. Please reference page K25.



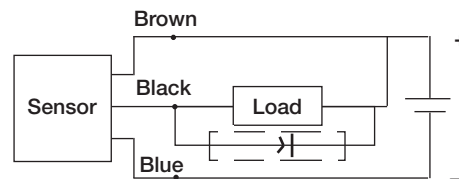
**Specifications**

Type	Solid State (PNP or NPN)
Switching Logic	Normally Open
Supply Voltage Range	6 - 30VDC
Current Output Range	Up to 100 mA at 5 VDC, Up to 200 mA at 12 VDC and 24 VDC
Current Consumption	7 mA at 5 VDC, 15 mA at 12 VDC, and 30 mA at 24 VDC
Switching Response	1000 Hz Maximum
Residual Voltage	1.5V Maximum
Leakage Current	10uA Maximum
Breakdown Voltage	1.8kVACrms for 1 sec., lead to case
Min. Current for LED	1mA
Operating Temperature	14 to 140°F (-10 to 60°C)
Enclosure Rating	Meets IEC IP67, fully encapsulated
Lead Wire	3 conductor, 24 gauge
Lead Wire Length	39 in (1 m)
Vibration Resistance	10-55 Hz, 1.5mm double amplitude

**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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## PTR Series Reed Sensors

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

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

### Specifications

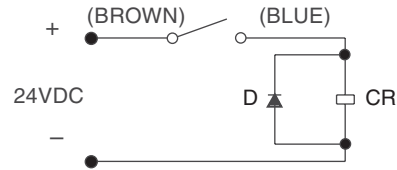
Switching Logic	Normally Open
Voltage Rating	85-125 VAC or 6-30 DC*
Power Rating	10 Watts AC or DC/Resistive Load 5 Watts AC or DC/Inductive Load
Switching Current Range	10-200 mA/Resistive Load (PC, Sequencer) 10-100 mA/Inductive Load (Relay)
Switching Response	300 Hz Maximum
Breakdown Voltage	1.8kVACrms for 1 sec., lead to case
Min. Current for LED	18mA
Operating Temperature	14 to 140°F (-10 to 60°C)
Enclosure Rating	Meets IEC IP67, fully encapsulated
Lead Wire	2 conductor, 22 Gauge
Lead Wire Length	39 in (1m)
Vibration Resistance	10-55 Hz, 1.5mm double amplitude

\* Polarity is restricted for DC operation  
 (+) to White  
 (-) to Black  
 If these connections are reversed the contacts will close, but the LED will not light.

### Protection circuit (Inductive loads)

(Required for proper operation 24VDC)

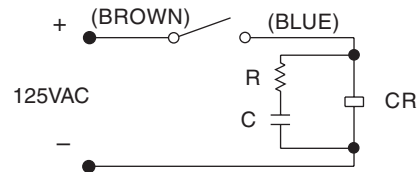
Select a diode with a breakdown voltage and current rating according to the load (CR). Place a diode in parallel to the load with the polarity as indicated:



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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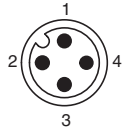
Electronic Sensors

**Weld Immune Sensor**

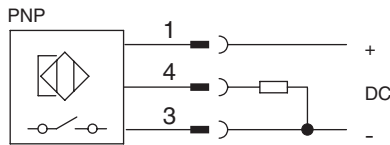


- Weld immune in all welding applications (AC, DC and medium frequency welding).
- Sensor locks the output during the welding process; when welding process stops, the sensor updates the output accordingly.

**NOTE:** Tie rod construction of the P1D Series can be ordered directly in the model code.

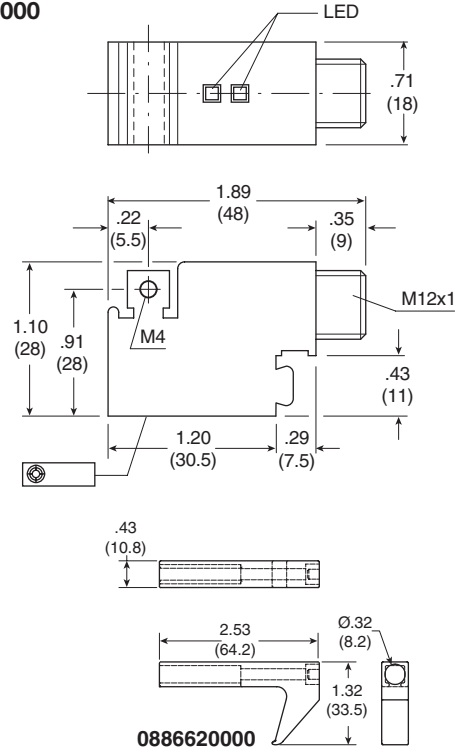


Pin	Function
1	Operating voltage (+VDC)
4	Output signal (N.O.)
3	-VDC
2	Not used



Description	Part number
Weld immune sensor	<b>0886600000</b>
Tie rod bracket kit	<b>0886620000</b>

**0886600000**



**Specifications**

Type	Electronic
Output function	Normally Open
Switching Output	PNP (3-Wire)
Operating voltage	10-30 VDC
Response sensitivity	≤ 30 Gauss
Switching frequency	40 Hz
Residual ripple	≤ 10% of Supply Voltage
Voltage drop	≤ 2 VDC
Power consumption, attenuated	≤ 32mA
Power consumption, unattenuated	≤ 18mA
Continuous current	≤ 300mA
Hysteresis	≤ 1.5mm
Repeatability	≤ 0.1mm
EMC	EN 60 947-5-2
Wire break protection	Yes
Short circuit protected	Yes
Reverse polarity protected	Yes
Power-up pulse suppression	Yes
Enclosure rating	IP67
Shock/vibration stress	30 g, 11ms, 10-55 Hz, 1mm
Operating temperature	-25°C to 75°C (-13°F to 167°F)
Housing material	Die-cast zinc with PTFE coating
LEDs	Status Indicator (yellow) Function Indicator (green)
Connector	M12 connector



For inventory, lead times, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

## 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

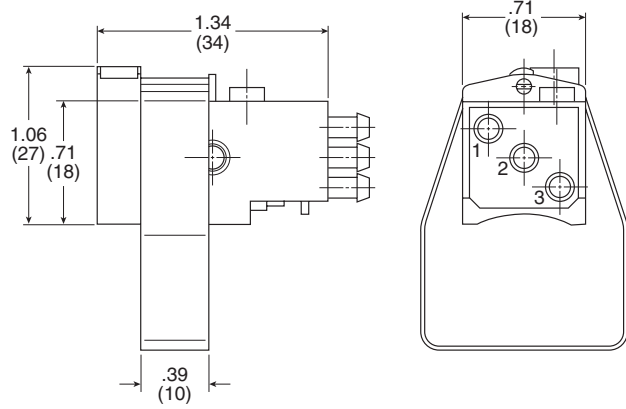
### Construction materials

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" (0.2mm) w/o air
Filtration	40 micron
Media	Filtered and regulated compressed air
Installation	In any position
Weight	Sensor 0.49 oz (0.014 kg) Sensor & bracket 0.99 oz (0.028 kg)

Description	Part number
Sensor – Air type	<b>KZ2364</b>
Mounting bracket	<b>KZ8255</b>



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**Female Quick Connect Cordset**

**8mm Cordset with Female Quick Connect**

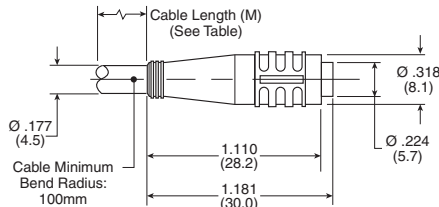
A female connector is available for all sensors with the male 8mm quick connect option. The male plug will accept a snap-on or threaded connector. Cordset part numbers are listed below:

Cable length	Threaded connector	Snap on connector
5 meters	<b>086620T005</b>	<b>086620S005</b>
2 meters	<b>086620T002</b>	<b>086620S002</b>

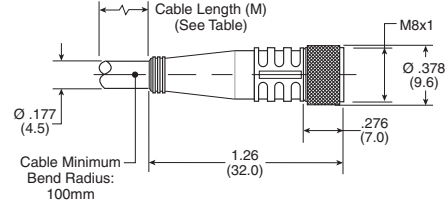
**Specifications**

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.
Conductors	Extra high flex stranding, PVC insulation
Temperature	-40°F to 194°F (-40°C to 90°C)
Protection	NEMA 1, 3, 4, 6P and IEC IP67
Cable Length	6.56 ft (2m) or 16.4 ft (5m)

**Snap-On Straight Connector**



**Threaded Straight Connector**



**12mm Cordset with Female Quick Connect**

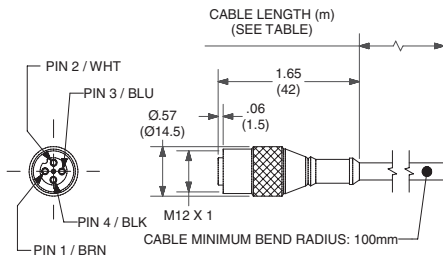
Cable length	M12 Right angle Connector	M12 Straight connector
5 meters	<b>9126487305</b>	<b>9126487205</b>
2 meters	<b>9126487302</b>	<b>9126487202</b>

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.

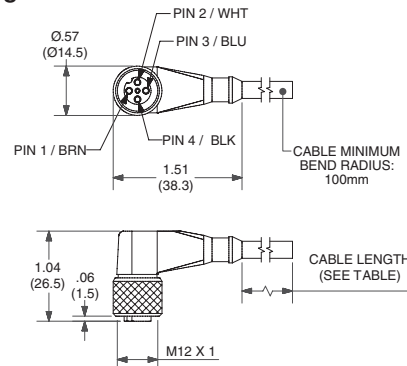
**Specifications**

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)

**Straight Connector**



**Right Angle Connector**





## Connection Block Valvetronic 110

The Valvetronic 110 is a connection block that can be used for collecting signals from sensors at various points on a machine and connecting them to the control system via a multicore cable. Valvetronic 110 can also be used for central connection of the multi-core cable to the outputs of a control system, and can be laid to a machine where the output signals can be connected. The connection block has ten 8mm snap-in connectors and a multi-core cable which is available in lengths of 3 or 10m. The connections on the block are numbered from 1 to 10. Blanking plugs are available for unused connections, as labels for marking the connections of each block.



### Connections

Ten 3-pole numbered 8 mm round snap-in female contacts



**Input block**  
 Pin 1 Common, +24 VDC  
 Pin 2 Input signal  
 Pin 3 Common, 0V



**Output block**  
 Pin 1 Common, GND Output signal  
 Pin 2 Common, 0V  
 Pin 3

### Electrical Data

Voltage	24 VDC (max. 60 V AC/75 V DC)
Insulation group	according to DIN 0110 class C
Load	max. 1 A per connection total max. 3 A

### Cable

Length	3m or 10m
Type of cable	LifYY11Y
Conductor	12
Area	0.34 mm <sup>2</sup>
Color marking	According to DIN 47 100

### Mechanical Data

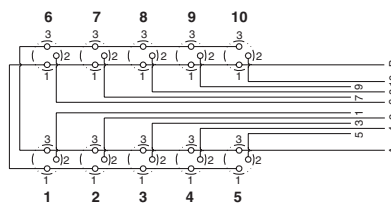
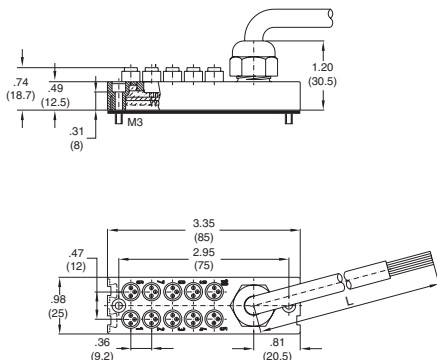
Enclosure	IP 67, DIN 40050 with fitted contacts and/or blanking plugs.
Temperature	-20 °C to 70 °C
Material	
Body	PA 6,6 VD according to UL 94
Contact holder	PBTP
Snap-in ring	LDPE
Moulding mass	Epoxy
Seal	NBR
Screws	Plated steel

**Industrial Durability**  
 Good chemical and oil resistance. Tests should be performed in aggressive environments.

### Ordering Information

Designation	Weight (kg)	Part number
Connection block Valvetronic 110 with 3m cable	0.32	<b>9121719001</b>
Connection block Valvetronic 110 with 10m cable	0.95	<b>9121719002</b>
Blanking plugs (pack of 10), use blanking plugs to close unused connections.	0.02	<b>9121719003</b>
Labels (pack of 10), White labels to insert in grooves on the side of the connection	0.02	<b>9121719004</b>

### Dimensions and Wiring Diagrams



Conductor	Color	Input	Output
1	Pink	Signal 1	Signal 1
2	Grey	Signal 2	Signal 2
3	Yellow	Signal 3	Signal 3
4	Green	Signal 4	Signal 4
5	White	Signal 5	Signal 5
6	Red	Signal 6	Signal 6
7	Black	Signal 7	Signal 7
8	Violet	Signal 8	Signal 8
9	Grey-Pink	Signal 9	Signal 9
10	Red-Blue	Signal 10	Signal 10
A	Blue	0 V	0 V
B	Brown	+24 V	PE



For inventory, lead time, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

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**Parker Hannifin Corporation**  
 Pneumatic Division  
 Richland, Michigan  
[www.parker.com/pneumatics](http://www.parker.com/pneumatics)

Selection Guide

Drop-in Sensors

Solid State / Reed Sensors

Weld Immune Sensors

Cordset / Connect Block

Proximity Sensors

CPS Smart Sensing

Electronic Sensors

**EPS-6 & 7 / CLS-1 & 4 End-of-Stroke Proximity Sensors**

**Ordering information**

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

\*\*\*\* 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-6	CLS-1	CLS-4
Code designator	H	D	F	B
Sensor type	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.	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	10 to 30 VDC	24 to 240 VAC/DC	24 to 240 VAC/DC
Load current, min	8 mA	NA	NA	NA
Load current, max	300 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.	10 micro amps max.	—	—
Voltage drop	7 V, max.	2 VDC max.	NA	NA
Operating temperature	-14° to 158° F	-14° to 158° F	-40°F to 221° F	-40° F to 400° F
Connection	3-pin mini	5-pin mini	3-pin mini	144" PTFE coated flying leads with 1/2" conduit hub
Enclosure rating	IEC IP67	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	No	No
Short circuit protection	Yes	Yes	No	No
Weld field immunity	Yes	Yes	Yes	Yes
Output	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	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: +10 to 30 VDC (White)	Pin 1: Common (Green)	Common: (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: Grounded (not connected or required)	Pin 3: Normally open (White)	Normally closed: (Red)
		Pin 4: Sinking output (Orange)		
		Pin 5: DC common (Black)		



For inventory, lead times, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

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**Parker Hannifin Corporation**  
Pneumatic Division  
Richland, Michigan  
[www.parker.com/pneumatics](http://www.parker.com/pneumatics)

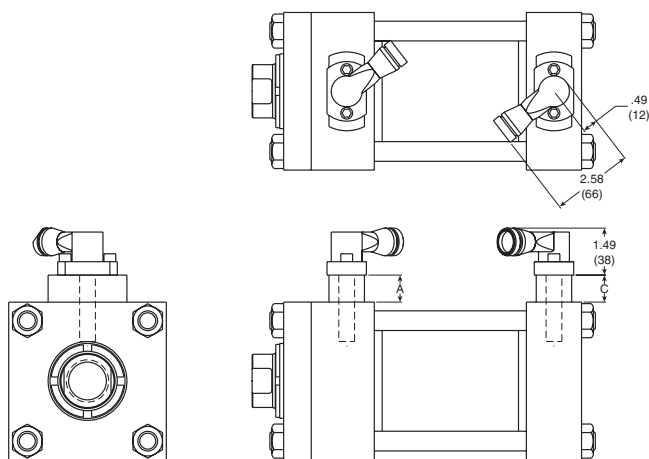
**Series and parallel wiring**

When Parker EPS-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.

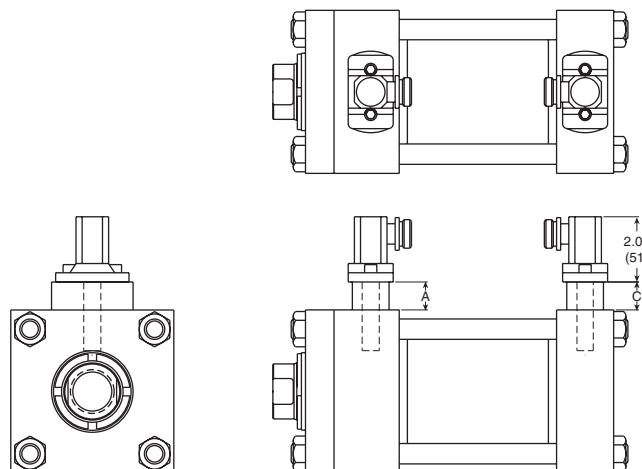
Parker EPS-6 or 7 sensors may be hard wired for series operation, but the voltage drop through the sensors (see specifications) must not reduce the available voltage below what is needed to actuate the load.

Parker EPS-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-6 or 7 sensors in parallel will require the use of a bypass (shunt) resistor.

**EPS-7 & EPS-6 sensors**

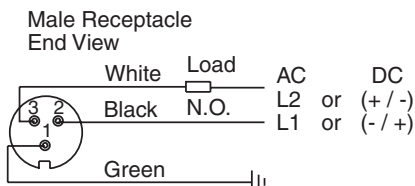


**CLS-1 & 4 sensors**

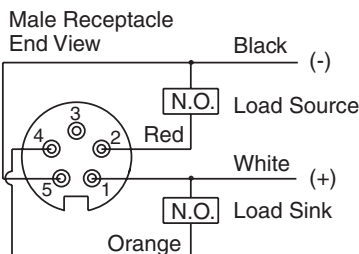


**Connector pin numbering**

**3-pin mini**



**5-pin mini**



Selection Guide
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Cordset / Connect Block
Proximity Sensors
CPS Smart Sensing
Electronic Sensors

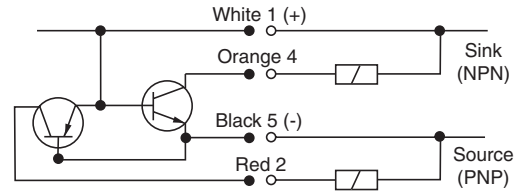
**EPS-6**

**Connectors**

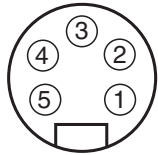
The male quick disconnect on the Parker EPS-6 is a Brad Harrison 41310 connector.

**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)



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



Cable length	Part number
3	<b>0859170003</b>
6	<b>0859170006</b>
12	<b>0859170012</b>

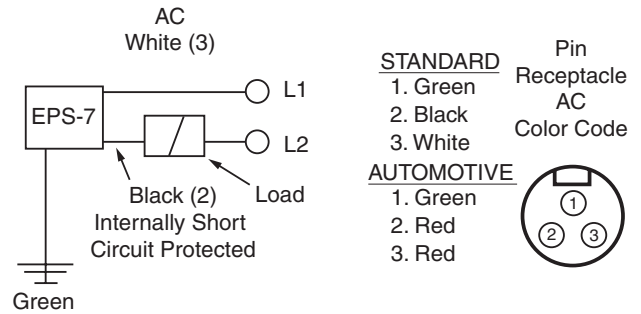
**EPS-7**

**Connectors**

The male quick disconnect on the Parker EPS-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'	<b>085356003</b>	<b>0853550003</b>
6'	<b>085356006</b>	<b>0853550006</b>
9'	<b>085356009</b>	—
12'	<b>0853560012</b>	<b>0853550012</b>



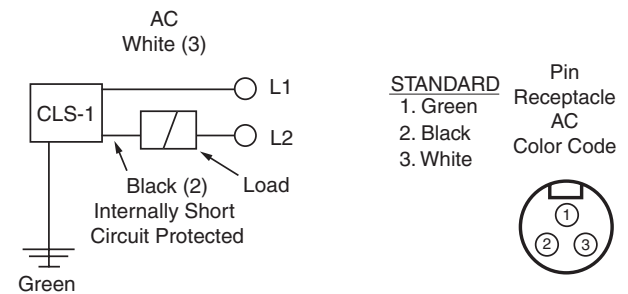
**CLS**

**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'	<b>0853550003</b>
6'	<b>0853550006</b>
9'	—
12'	<b>0853550012</b>



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).

**How to specify EPS sensors**

Parker EPS proximity sensors may be ordered on 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.
- 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, "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

**Head end**

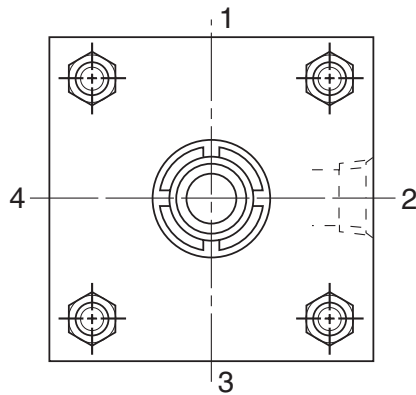
H	1	3	A	GG
Specify:	Port Location	Sensor Location	Sensor Orientation	Actuation Point
H = EPS-7	See Figure 1.	See Figure 1.	See Figure 2 for EPS-7 and EPS-6 only.	GG = End of Stroke
D = EPS-6				
F = CLS-1				
B = CLS-4				
N = Prep for sensors only				

**Cap end**

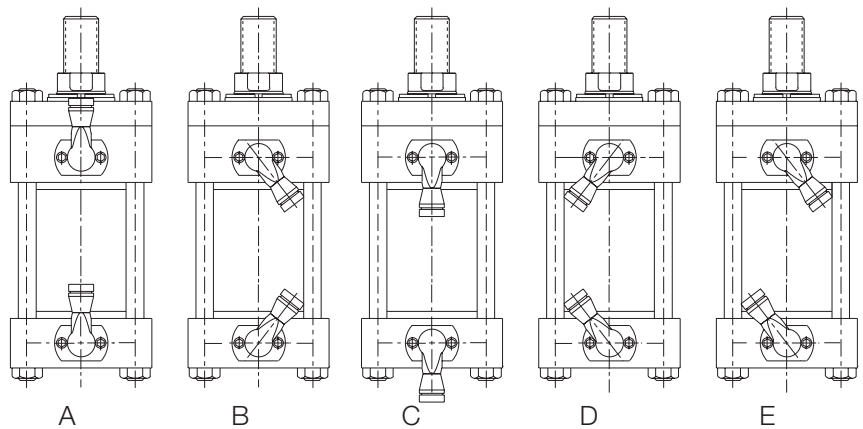
4	2	B	GG
Port Location See Figure 1.	Sensor Location See Figure 1.	Sensor Orientation See Figure 2 for EPS-7 and EPS-6 only.	Actuation Point GG = End of Stroke

**Note:** All specified sensor and port locations are as seen from rod end of cylinder.  
 \* Contact pdnapps@parker.com for this option with 4MA and 4MAJ Series cylinders.

**Figure 1**



**Figure 2**



**Example:**

4.00 CJ4MAUS14AC 12.000  
 S = H13CGG-13CGG

Selection Guide

Drop-in Sensors

Solid State / Reed Sensors

Weld Immune Sensors

Cordset / Connect Block

Proximity Sensors

CPS Smart Sensing

Electronic Sensors



For inventory, lead time, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

**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.

**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**

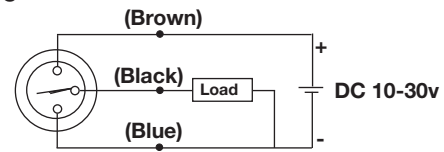
Series	PNP		NPN	
	Quick* connect	Flying leads	Quick ** connect	Flying leads
HB	B8830-P	913090000	B8830-N	913090100
P5L	B8830-P	913090000	B8830-N	913090100

\* Order cordset B8757-P separately.  
\*\* Order cordset B8757-N separately.

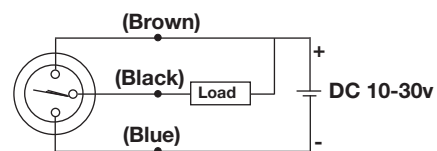
**Electrical Specifications**

Voltage	10-30 VDC (3 wire) PNP or NPN
No Load Current	5.5-9.5 mA
Continuous Current	150 mA
Switching Speed	8 ms
Switch Frequency	5000 Hz
Switching Distance	Aluminum = 0.016 in (0.4mm) Brass = 0.028 in (0.7mm) Steel = 0.039 in (1.0mm)
Overload Protection	Triggered at 170 mA
Reverse Polarity Protection	Incorporated
Temp. Range	-13 to 158°F (-25 to 70°C)
Enclosure Rating	Meets NEMA 1,3,4,6,13 and IEC IP67, fully encapsulated

**PNP wiring connection**

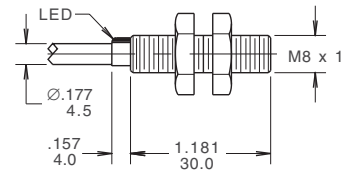


**NPN wiring connection**



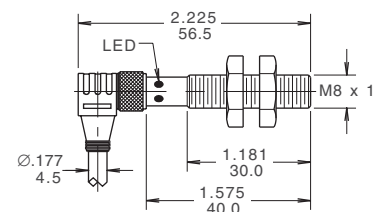
**POTTED-IN SENSOR**

Lead type sensor with 20 ft. (6m) cord length



**PLUG-IN SENSOR**

A threaded right angle cordset must be ordered separately. The cordset contains two LEDs: 1 - power, 2 - target indication. Cordset length is 20 ft. (6m).



For inventory, lead times, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

## CPS Continuous Position Sensors

### Value Proposition

Many applications require more than just end of stroke sensing of an actuator, but traditional methods of continuous sensing are expensive to implement. Parker's CPS (Continuous Position Sensing) series of the P8S sensor family enables quick precise and contactless continuous position sensing of a piston in standard actuators. This offers an outstanding price/performance ratio.

### Product Overview

P8S Continuous Position Sensors detect continuously the position of the piston of pneumatic actuators using a direct, non-contact technology along the length of the sensors, measuring ranges from 32 to 256 mm. They can be mounted in T-slots without the need for additional accessories for cylinders build with common T-slots dimensions. Mounting on other cylinder types ie round cylinders type is possible with adaptors. The sensor settings can be adjusted during installation and during operation later on, using a teach button or, depending on the variant, using IO-Link.

The sensors continuously supply data via analogue outputs or IO-Link. Analogue position sensors, for current or voltage, have a voltage output of 0 V ... 10 V as well as a current output of 4 mA ... 20 mA. It enables flexible machine concepts and making it possible to solve tasks in areas such as quality monitoring and process control in conjunction with pneumatic cylinders. This continuous transfer of position data upgrades the functionality of the pneumatic cylinders by making them more intelligent and as a result, more versatile.

### Technical Data

<b>Cylinder type:</b>	Profile with T-slot
<b>Installation:</b>	Drop in, fixed by allen key 1,5 mm
<b>Measuring range:</b>	32 to 256 mm depending on type <sup>1)</sup>
<b>Housing length:</b>	45 to 269 mm depending on type
<b>Output Function:</b>	Analog   IO-Link
<b>Analog output (voltage):</b>	0 to 10 V   -
<b>Analog output (current):</b>	4 to 20 mA   -
<b>Teach-in:</b>	Yes
<b>Enclosure rating:</b>	IP67 (according to EN 60529)
<b>Supply Voltage:</b> <sup>2)</sup>	15 to 30 V DC
<b>Power consumption:</b> <sup>3)</sup>	<= 22 mA (analogue)   <= 25 ma (IO-Link)
<b>Max load resistance:</b> <sup>4)</sup>	<= 500 Ω
<b>Min load resistance:</b> <sup>5)</sup>	<= 2 kΩ
<b>Protection class:</b>	III
<b>Time delay before availability:</b>	1,5 s
<b>Required magnetic field sensitivity:</b>	3 mT / -2 mT (analog)   3 mT (IO-Link)
<b>Resolution:</b> <sup>6)</sup>	0,03% full scale range (max >=0,05 mm)
<b>Linearity error:</b> <sup>7)</sup>	0,3 mm
<b>Repeat accuracy:</b> <sup>8)</sup>	0,06% full scale range (>= 0,1 mm)
<b>Sampling rate:</b> <sup>9)</sup>	1 ms
<b>Indication LED color:</b>	Yellow (analog)
<b>Reserve polarity protection:</b>	Yes (analog)
<b>Short circuit protection:</b>	Yes (analog)
<b>Ambient operating temperature range:</b>	-20 to +70 °C (PUR cable)
<b>Shock and vibration resistance:</b>	30 g 11 ms / 10 ... 55 Hz, 1 mm
<b>EMC:</b> <sup>10)</sup>	According to EN 60947-5-2
<b>International standard:</b>	CE   C UL US   CCC (not applicable)   RoHs   IO-Link
<b>UL file No:</b>	On request
<b>Housing material:</b>	Plastic polyamid PA12
<b>Screw material:</b>	Stainless steel
<b>Cable material:</b>	PUR (Polyurethane)
<b>Conductor cross-section:</b>	0,08 mm <sup>2</sup>
<b>Connector:</b>	M12 (IO-Link) or M8 (analog)



<sup>1)</sup> ± 1 mm

<sup>2)</sup> Reverse-polarity protected, operation in short-circuit protected network: max. 8 A.

<sup>3)</sup> Without load

<sup>4)</sup> Power output, at 24 V

<sup>5)</sup> Voltage output

<sup>6)</sup> FSR: Full Scale Range; max. measuring range.

<sup>7)</sup> At 25 °C, linearity error (maximum deviation) depending on response curve and minimal deviation function.

<sup>8)</sup> At 25 °C, repeatability magnet movement in one direction.

<sup>9)</sup> Only in standard mode, not in IO-Link mode.

<sup>10)</sup> The analogue measured value can deviate under transient conditions.

Selection  
GuideDrop-in  
SensorsSolid State /  
Reed SensorsWeld Immune  
SensorsCordset /  
Connect BlockProximity  
SensorsCPS Smart  
SensingElectronic  
Sensors

**Ordering Information**

Drop in T-slot, Turn, Screw, it's done

Output	Measuring length	Configuration option	Part number	Weight [g]	For product series
Analog	32 mm	Teach Button	<b>P8SAGACHA</b>	16	With T-slot groove *
	64 mm		<b>P8SAGACHB</b>	26	
	128 mm		<b>P8SAGACHD</b>	46	
	192 mm		<b>P8SAGACHF</b>	66	
	256 mm		<b>P8SAGACHH</b>	86	
IO-Link	32 mm	Teach Button or IO-Link parameter	<b>P8SAGHMHA</b>	20	With T-slot groove *
	64 mm		<b>P8SAGHMHB</b>	30	
	128 mm		<b>P8SAGHMHD</b>	50	
	192 mm		<b>P8SAGMHMF</b>	70	
	256 mm		<b>P8SAGMHMH</b>	90	

\* Required magnetic field sensitivity: 3mT / -2 mT (Analog) / 3mT (IO-Link)

**Note:**

PUR cable with M12 (IO-Link) or M8 (Analog) male connector knurled nut, 4-pin, 0,3 meter length. Please consult Parker Pneumatic Division for measuring range 96, 160 & 224 mm.

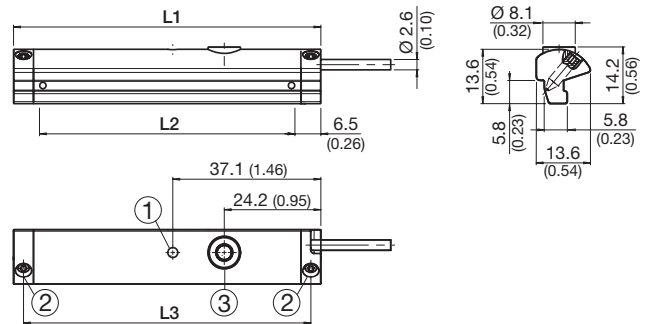
**P8S Sensor**

			Part number	
L1	L2 *	L3	Analog	IO-Link
45	32	40	<b>P8SAGACHA</b>	<b>P8SAGHMHA</b>
77	64	72	<b>P8SAGACHB</b>	<b>P8SAGHMHB</b>
141	128	136	<b>P8SAGACHD</b>	<b>P8SAGHMHD</b>
205	192	200	<b>P8SAGACHF</b>	<b>P8SAGMHMF</b>
269	256	264	<b>P8SAGACHH</b>	<b>P8SAGMHMH</b>

\*L2 equal to the measuring range

**Note:**

PUR cable with M12 (IO-Link) or M8 (Analog) male connector knurled nut, 4-pin, 0,3 meter length. Please consult Parker Pneumatic Division for measuring range 96, 160 & 224 mm.

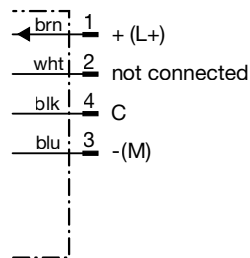


- ① Function indicator
- ② Fixing screw
- ③ Teach-in button

Dimensions in mm (inch)

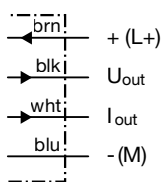
**Connection type and diagram**

**IO Link version**



PUR 0.3 meter length with M12 male connector knurled nut, 4-pin

**Analog version**

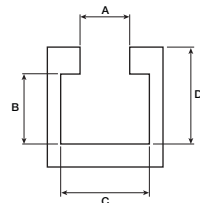


PUR 0.3 meter length with M8 male connector knurled nut, 4-pin

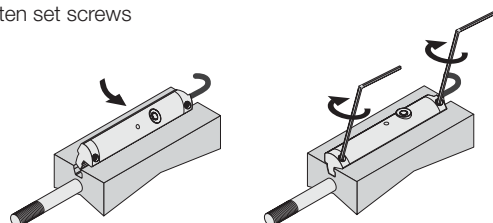
**Without Adaptor**

Direct drop-in T-slot  
T-slot dimensions [mm ± 0.1]

- A 5.55
- B 3.40
- C 6.80
- D 4.80



- 1) Pivot sensor into the slot
- 2) Teach the CPS unit the desired measuring range
- 3) Tighten set screws





**Mountings**

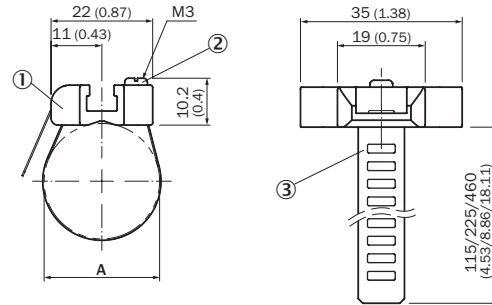
All mountings can be moved on the cylinder body before screwing in place and then putting sensors in the slots. Dimensions in mm (inch)

Parker Cylinder Series	Mounting Bracket
P1A (ISO 6432)	P8S-TMC0+
P1D (ISO 6431)	None
P1D (Tie-Rod)	P8S-TMAOX
OSP (Rodless)	Consult factory
P1P (Compact)	None
P5T (Thrust)	None
4MA (NFPA)	None
4MA (6"-8" bore)	P8S-TMAOX
SRM (Round)	P8S-TMC0+

+ Use "1" for bore size under 1-1/8" (32mm)  
 Use "2" for 1-1/8" (32mm) to 2-1/2" (63mm)  
 Use "3" for 3" (80mm) to 4" (100mm)

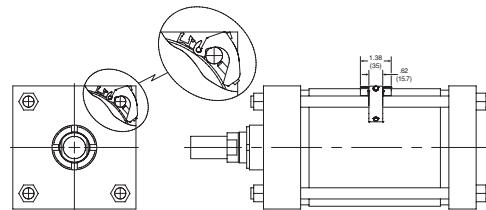
\*\* Parker recommends to use 2 mounting brackets for CPS 64mm and longer

**P8S-TMC01, 02 & 03**



① Sensor adapter with T-Slot  
 ② Fixing screw  
 ③ Strap

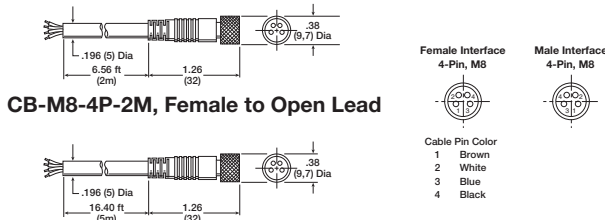
**P8S-TMAOX**



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); and all 6"-8" bore Sensors and bracket assemblies must be ordered separately.

Part number P8S-TMAOX fits 1-1/2" to 8" bores and 32-200mm bores for Global Sensors

**M8 Female Cables**

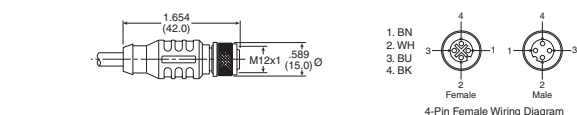


**CB-M8-4P-2M, Female to Open Lead**

**CB-M8-4P-5M, Female to Open Lead**

Connector	Contacts	Length	Cover	Part number
M8 female	4	2m	PUR	<b>CB-M8-4P-2M</b>
M8 female	4	5m	PUR	<b>CB-M8-4P-5M</b>

**M12 A-code Cables**



**RKC Female Sockets**

Description	Part number
4-pin female to flying lead cable, PVC	<b>RKC 4.4T-*</b>
4-pin female to 4-pin male cable, PVC	<b>RKC 4.4T-*-RSC 4.4T</b>

Where \* = 1, 2, 4 meter standard lengths



For inventory, lead time, and kit lookup, visit [www.pdnplu.com](http://www.pdnplu.com)

Selection Guide  
 Drop-in Sensors  
 Solid State / Reed Sensors  
 Weld Immune Sensors  
 Cordset / Connect Block  
 Proximity Sensors  
 CPS Smart Sensing  
 Electronic Sensors