



Electrical Options

Proximity Switches

for hydraulic and pneumatic cylinders



ADVANTAGES

- Mount directly on hydraulic or pneumatic cylinders.
- Unique mounting allows 90° rotation.
- Weld immune circuit with standard SCP.
- Harsh environments don't affect sensing.
- No external mounting brackets required.
- Wide application flexibility.

Hanna offers the NAMCO EE230 Series Cylindicator® Proximity Switches for mounting on hydraulic and pneumatic cylinders. The sensing probe looks at the piston cushion or spud, providing full extend or full retract indication. Since the probe is inside the cylinder, harsh external environments cannot affect sensing. There are no costly external mounting brackets required.

The 2-wire AC circuit operates on 20 to 230 VAC for wide application flexibility. It operates reliably as a programmable controller input or with relay coils. The low 1.7 mA "off-state," leakage current allows direct input to programmable controllers without adding shunt resistors.

A LED indicator marked READY indicates that power is being supplied to switch. Another LED indicator marked TARGET indicates switch activation. Both LEDs flashing indicates a short circuit. Short circuit protection is standard, and protects the switch from shorts in the load or line. Upon sensing a short condition (.5 Amp or greater current) the switch assumes a non-conducting mode. The fault condition must be removed and power turned off to reset, preventing automatic restarts.

EE230 Series Cylindicators meet UL requirements for 3000 psi hydraulic systems. Four mounting holes allow 90° rotation increments, without costly spacer blocks and without changing probe length.

The units are designed to work within 1" of resistance welder tips carrying 20,000 Amperes. EE230 Series Cylindicators are ideal for stroke detection on hydraulic or pneumatic cylinders.

SPECIFICATIONS

Pressure	3000 psi
Sensing range	0.04" ± .005"
Operating temperature range	-4° to +158° F
Repeatability	±10%
Switching differential	10%
Supply voltage (50/60 Hz)	20-230 VAC/DC*
"On-state" voltage drop	10 V @ 5-30 mA
	6V @ 31-500 mA
Load current maximum	0.5 Amp
minimum	5 mA
Inrush current (rms 1 cycle)	3 Amp
"Off-state" current	1.7 mA

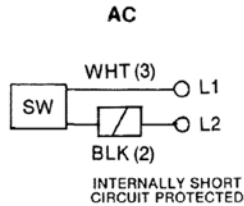
Short circuit protection is standard

Indicating LED's
 standard 1) Power on/non-conducting
 2) Both LEDs flashing indicates
 a short circuit.

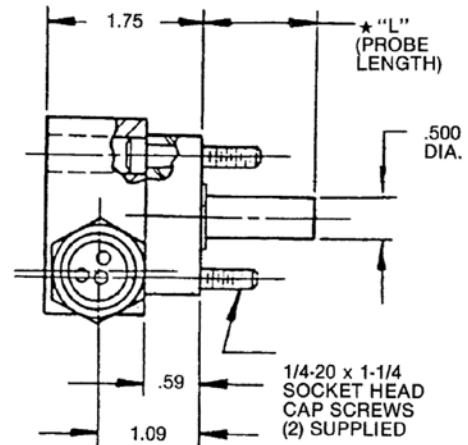
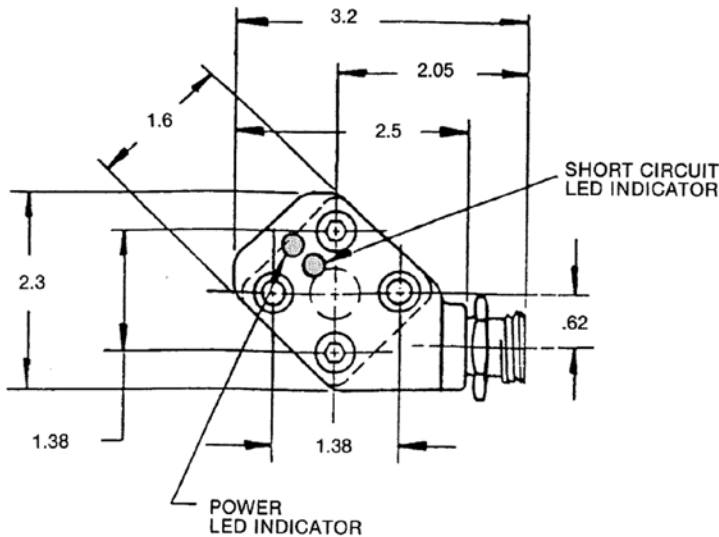
Meets NEMA 1, 12, 13 Ratings.

* 0.5 Henry inductive load Max. for DC applications.

WIRING DIAGRAMS



DIMENSIONS



ORDERING INFORMATION

Availability

EE230 Series Cylindicator Proximity Switches are available on Hanna Series 2H, 3L, 3A, 3AN, and CA cylinders, 2.00" through 8.00" bores. The switches are not available on the front head of Series 3L, 3A, 3AN and CA cylinders on the following sizes: 2.00" bore, 1.38" diameter rod, and 2.50" bore, 1.75" diameter rod. See pages 4 and 5 for exact mounting position availability for Series 3L, 3A, 3AN and CA; see pages 6 and 7 for mounting position availability for Series 2H cylinders.

Specify switches for head end, cap end or both ends. Specify mounting position of switches and pipe port locations.

Use the following plug-in cables

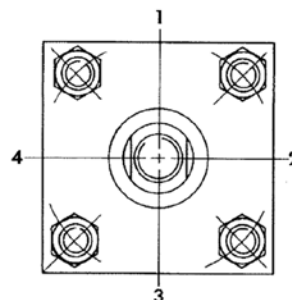
Brad Harrison Co.		Joy Mfg. Co.	
40901	3' (.91 meters)	X-8984-3	3' (.91 meters)
40902	6' (1.83 meters)	X-8984-4	6' (1.83 meters)
40903	12' (3.66 meters)	X-8984-5	12' (3.66 meters)

Note: Cables not supplied by Hanna Corporation.

Mounting Information

EE230 Series Switches will be mounted at the factory according to customer specified locations. Refer to numbered positions on end view of cylinder as shown here.

Position location for both the Front Head and Blind Head is determined by viewing the cylinder at the Rod End. Position #5 is at back face of Blind Head.



PROXIMITY SWITCH MOUNTING POSITIONS AVAILABLE FOR 3A,

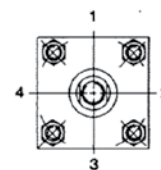
BORE	ME3		ME4		MF1		MF2		MF5		MF6		MP1		MP2		MS2		MS3		
	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	
1.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	5	-	-	-	5	-	-	-	-	-	-	-	5	-	5	-
*2.00	-	-	-	-	1	1	1	1	-	1	1	-	1	1	1	1	1	1	-	-	-
	-	-	-	-	-	2	2	-	-	2	2	-	2	2	2	2	-	-	-	-	-
	-	-	-	-	3	3	3	3	-	3	3	-	3	3	3	3	-	-	3	3	3
	-	-	-	-	-	4	4	-	-	4	4	-	4	4	4	4	-	-	-	-	-
	-	-	-	-	-	5	-	-	-	5	-	-	-	-	-	-	-	5	-	5	-
*2.50	-	-	-	-	1	1	1	1	-	1	1	-	1	1	1	1	1	1	1	1	1
	-	-	-	-	-	2	2	-	-	2	2	-	2	2	2	2	-	-	-	-	-
	-	-	-	-	3	3	3	3	-	3	3	-	3	3	3	3	-	-	3	3	3
	-	-	-	-	-	4	4	-	-	4	4	-	4	4	4	4	-	-	-	-	-
	-	-	-	-	-	5	-	-	-	5	-	-	-	-	-	-	-	5	-	5	-
3.25	-	-	-	-	1	1	1	1	-	1	1	-	1	1	1	1	1	1	1	1	1
	-	-	-	-	-	2	2	-	-	2	2	-	2	2	2	2	-	-	-	-	-
	-	-	-	-	3	3	3	3	-	3	3	-	3	3	3	3	-	-	3	3	3
	-	-	-	-	-	4	4	-	-	4	4	-	4	4	4	4	-	-	-	-	-
	-	-	-	-	-	5	-	-	-	5	-	-	-	-	-	-	-	5	-	5	-
4.00	-	-	-	-	1	1	1	1	-	1	1	-	1	1	1	1	1	1	1	1	1
	-	-	-	-	-	2	2	-	-	2	2	-	2	2	2	2	-	-	-	-	-
	-	-	-	-	3	3	3	3	-	3	3	-	3	3	3	3	-	-	3	3	3
	-	-	-	-	-	4	4	-	-	4	4	-	4	4	4	4	-	-	-	-	-
	-	-	-	-	-	5	-	-	-	5	-	-	-	-	-	-	-	5	-	5	-
5.00	-	-	-	-	1	1	1	1	1	1	1	-	1	1	1	1	1	1	1	1	1
	-	-	-	-	2	2	2	-	2	2	2	-	2	2	2	2	-	-	-	-	-
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	-	-	-	-	-	5	-	-	-	5	-	-	-	-	-	-	-	5	-	5	-
6.00	-	-	-	-	1	1	1	1	1	1	1	-	1	1	1	1	1	1	1	1	1
	-	-	-	-	2	2	2	-	2	2	2	-	2	2	2	2	2	2	-	-	-
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	-	-	-	-	4	4	4	-	4	4	4	-	4	4	4	4	4	4	4	-	-
	-	-	-	-	-	5	-	-	-	5	-	-	-	-	-	-	-	5	-	5	-
8.00	1	1	1	1	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	-	-	-	-	-	-	-	2	2	2	2	2	2	-	-	-
	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3	-	-	3	3	3
	4	4	4	4	-	-	-	-	-	-	-	-	4	4	4	4	4	4	-	-	-
	-	5	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	5	-

F/H = Front Head, B/H = Blind Head

*Note: Switch is not available on F/H 2.00 BORE 1.38 DIA. ROD, 2.50 BORE 1.75 DIA. ROD

3AN, CA and 3L SERIES CYLINDERS

Position location for both the Front Head and Blind Head is determined by viewing the cylinder at the Rod End. Position #5 is at back face of Blind Head.



BORE	MS4		MS1/MS7		MT1		MT2		MT4		MX0		MX1		MX2		MX3		MX4		
	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	
1.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.	.	.	.	.	.	.
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	5	-	-	-	5	-	5	-	5	-	5	-	-	-	-	-	-	5	-	-
*2.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	4	4	4	4	-	4	4	-	4	4	4	4	4	4	4	4	4	4	4	4	4
	-	5	-	-	-	5	-	5	-	5	-	5	-	-	-	-	-	-	5	-	-
*2.50	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	4	4	4	4	-	4	4	-	4	4	4	4	4	4	4	4	4	4	4	4	4
	-	5	-	-	-	5	-	5	-	5	-	5	-	-	-	-	-	-	5	-	-
3.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2	2
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	4	4	4	4	-	4	4	-	4	4	4	4	4	4	4	4	4	4	4	4	4
	-	5	-	-	-	5	-	5	-	5	-	5	-	-	-	-	-	-	5	-	-
4.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	4	4	4	4	-	4	4	-	4	4	4	4	4	4	4	4	4	4	4	4	4
	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-
5.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	4	4	4	4	-	4	4	-	4	4	4	4	4	4	4	4	4	4	4	4	4
	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-
6.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
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	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-
8.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	4	4	4	4	-	4	4	-	4	4	4	4	4	4	4	4	4	4	4	4	4
	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-

F/H = Front Head, B/H = Blind Head

*Note: Switch is not available on F/H 2.00 BORE 1.38 DIA. ROD, 2.50 BORE 1.75 DIA. ROD

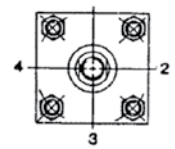
PROXIMITY SWITCH MOUNTING POSITIONS AVAILABLE FOR

BORE	ME5		ME6		MF1		MF2		MF5		MF6		MP1		MS2		MS3		
	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	
1.50	-	-	-	-	-	-	-	-	-	-	-	-	-	.	.	.	.	.	.
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	5	-	-	-	5	-	-	-	5	-	-	-	-	-	5	-	5	5
2.00	1	1	1	1	1	1	1	1	-	1	1	-	1	1	1	1	-	-	-
	-	2	2	-	-	2	2	-	-	2	2	-	2	2	-	-	-	-	-
	3	3	3	3	3	3	3	3	-	3	3	-	3	3	-	-	3	3	3
	-	4	4	-	-	4	4	-	-	4	4	-	4	4	-	-	-	-	-
	-	5	-	-	-	5	-	-	-	5	-	-	-	-	-	5	-	5	5
2.50	1	1	1	1	1	1	1	1	-	1	1	-	1	1	1	1	1	1	1
	-	2	2	-	-	2	2	-	-	2	2	-	2	2	-	-	-	-	-
	3	3	3	3	3	3	3	3	-	3	3	-	3	3	-	-	3	3	3
	-	4	4	-	-	4	4	-	-	4	4	-	4	4	-	-	-	-	-
	-	5	-	-	-	5	-	-	-	5	-	-	-	-	-	5	-	5	5
3.25	1	1	1	1	1	1	1	1	-	1	1	-	1	1	1	1	1	1	1
	-	2	2	-	-	2	2	-	-	2	2	-	2	2	-	-	-	-	-
	3	3	3	3	3	3	3	3	-	3	3	-	3	3	-	-	3	3	3
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	-	5	-	-	-	5	-	-	-	5	-	-	-	-	-	5	-	5	5
4.00	1	1	1	1	1	1	1	1	-	1	1	-	1	1	1	1	1	1	1
	-	2	2	-	-	2	2	-	-	2	2	-	2	2	-	-	-	-	-
	3	3	3	3	3	3	3	3	-	3	3	-	3	3	-	-	3	3	3
	-	4	4	-	-	4	4	-	-	4	4	-	4	4	-	-	-	-	-
	-	5	-	-	-	5	-	-	-	5	-	-	-	-	-	5	-	5	5
5.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	-	2	2	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-
	3	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	3	3	3
	-	4	4	-	-	4	4	4	4	4	4	4	4	4	-	-	-	-	-
	-	5	-	-	-	5	-	-	-	5	-	-	-	-	-	5	-	5	5
6.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	-	2	2	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-
	3	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	3	3	3
	-	4	4	-	-	4	4	4	4	4	4	4	4	4	-	-	-	-	-
	-	5	-	-	-	5	-	-	-	5	-	-	-	-	-	5	-	5	5
7.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	-	2	2	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-
	3	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	3	3	3
	-	4	4	-	-	4	4	4	4	4	4	4	4	4	-	-	-	-	-
	-	5	-	-	-	5	-	-	-	5	-	-	-	-	-	5	-	5	5
8.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	-	2	2	-	-	2	2	2	2	2	2	2	2	2	2	2	-	-	-
	3	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	3	3	3
	-	4	4	-	-	4	4	4	4	4	4	4	4	4	4	4	-	-	-
	-	5	-	-	-	5	-	-	-	5	-	-	-	-	-	5	-	5	5

F/H = Front Head, B/H = Blind Head

2H SERIES CYLINDERS

Position location for both the Front Head and Blind Head is determined by viewing the cylinder at the Rod End. Position #5 is at back face of Blind Head.



BORE	MS4		MS7		MT1		MT2		MT4		MX0		MX1		MX2		MX3		MX4	
	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H	F/H	B/H
1.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	5	-	-	-	5	-	5	-	5	-	5	-	-	-	-	-	5	-	-
2.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	4	4	4	4	-	4	4	-	4	4	4	4	4	4	4	4	4	4	4	4
	-	5	-	-	-	5	-	5	-	5	-	5	-	-	-	-	-	5	-	-
2.50	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	4	4	4	4	-	4	4	-	4	4	4	4	4	4	4	4	4	4	4	4
	-	5	-	-	-	5	-	5	-	5	-	5	-	-	-	-	-	5	-	-
3.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	4	4	4	4	-	4	4	-	4	4	4	4	4	4	4	4	4	4	4	4
	-	5	-	-	-	5	-	5	-	5	-	5	-	-	-	-	-	5	-	-
4.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	4	4	4	4	-	4	4	-	4	4	4	4	4	4	4	4	4	4	4	4
	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5
5.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	4	4	4	4	-	4	4	-	4	4	4	4	4	4	4	4	4	4	4	4
	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5
6.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	4	4	4	4	-	4	4	-	4	4	4	4	4	4	4	4	4	4	4	4
	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5
7.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	4	4	4	4	-	4	4	-	4	4	4	4	4	4	4	4	4	4	4	4
	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5
8.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	2	2	2	-	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2
	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	4	4	4	4	-	4	4	-	4	4	4	4	4	4	4	4	4	4	4	4
	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5	-	5

F/H = Front Head, B/H = Blind Head

Reed Switches for pneumatic cylinders



Reed Switch with Conduit Fitting for 1.50" through 3.25" bore sizes only



Reed Switch with Band Bracket for 4.00" and 5.00" bore sizes

ADVANTAGES

- Adjustable mounting permits switch location anywhere within range of piston travel.
- Several switches may be mounted to control or initiate any sequence function.
- No external moving parts to wear or maintain.
- Suited for use in harsh plant environments.
- Neon indicator light (LED) for 3-Amp model provides convenient positioning and troubleshooting of switch and circuits.
- Suitable for AC or DC service.
- 3-Amp switch provides internal transient protection under normal conditions.

Hanna Corporation offers Reed Switches manufactured by PHD, Inc. The switches are available in two types: a standard switch and a 3-Amp version.

Basically, the Reed Switch consists of two overlapping ferro magnetic blades (reeds). The reeds are hermetically sealed inside a glass tube leaving a small air gap between them.

Since the reeds are magnetic, they will assume opposite polarity, and be attracted to each other when influenced by a magnetic field. Sufficient magnetic flux density will cause the reeds to flex and contact each other. When the magnetic field is removed, they will again spring apart to their normal positions.

The cylinder/Reed Switch combination operates by using a magnetic band on the cylinder piston, which closes the externally mounted switch as it approaches. When the piston moves away again, the switch opens.

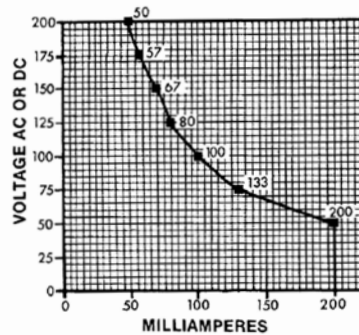
Standard switches can be operated on both AC or DC current. They are ideal for use as input for many types of sequences and programmable controllers. In some cases they can be used to drive some relays or valve solenoids.

However, electrical transients (inrush currents or line spikes) associated with inductive or capacitive loads can damage and shorten the life of the switch.

For such applications, the 3-Amp Reed Switch (AC only) is your best choice. This switch is very similar in construction to the standard Reed Switch. The difference is the inclusion of a triac which upgrades the contact rating to 3 Amps. The 3-Amp switch also has built-in protection against electrical transients.

SPECIFICATIONS

AN12 Voltage vs. Amperes Derating Curve



Model AN12

SPST - Form A
Breakdown voltage - 400 V DC Min.
Switching voltage - 200 V DC Max.
240 V AC Max.

Indicator Lights

Current Draw 0.3 milliamp
Min. DC on voltage - 90 V DC
Min. AC on voltage - 65 V AC

Model 13109-02-6 3-Amp

Circuit Normally open
VA (maximum) 360
Switching voltage 24-120 VAC (50/60 Hz)
Current (break) 3.0 Amp
Leakage 1.7 mA
Response time 1.5 ms On, 0-8.3 ms Off
Switch burden current 5 mA

Note: All incandescent loads derate switch capacity to 10% due to inrush current.

Shock Rating

The basic switch can withstand up to 60 G maximum in the direction of contact closure without misfire or malfunction.

Vibration Sensitivity

Switch will withstand vibration amplitude of 30 G at frequencies up to 6000 Hz without misfire. False operation can occur at vibration frequency levels higher than 6000 Hz.

Operating Temperature

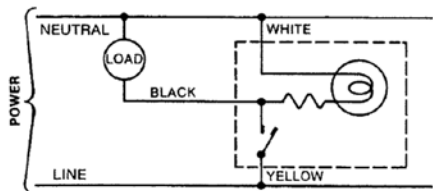
-40° to +170°F for standard cable.

Cable Specification

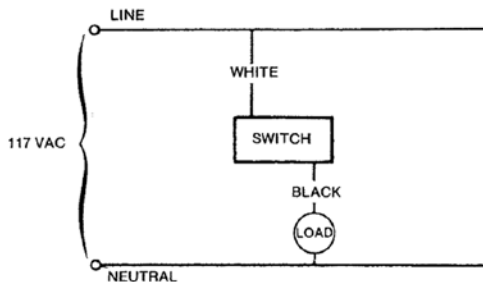
The conductors are tinned copper with polyethylene insulation. Conductors are cabled with rayon braid, a tinned copper braided shield and a chrome vinyl jacket on both AN12 and 13109-02-6 models.

WIRING DIAGRAMS

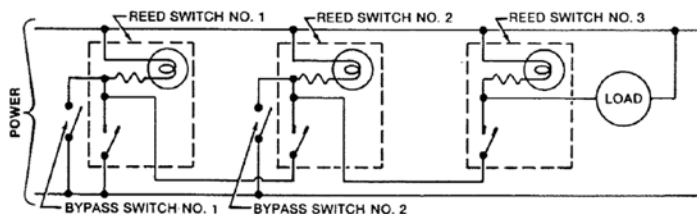
AN12 Switch Wiring Schematic



13109-02-6 3-Amp Switch Wiring Schematic



Series Connected Switches

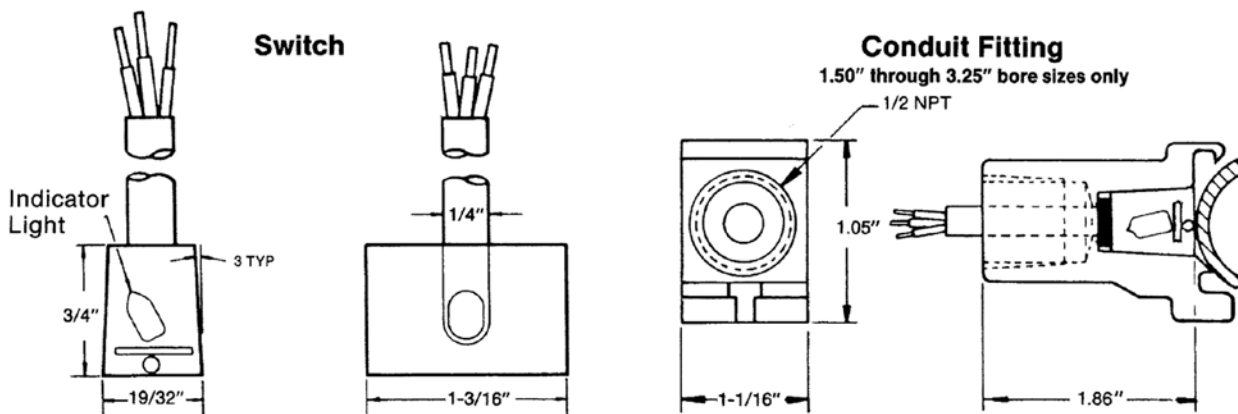


Caution: Do not connect switch without a load. Permanent damage to switch will result.

Note: Switch is internally protected against failure due to normal electrical transient levels. However it may be necessary to use additional transient protection if high levels exist.

The use of manually operated bypass switches (as shown above) in series reed switch connections permits each switch indicator light to be used to set up or check a reed switch. In the example shown here, when bypass switch #1 is closed, reed switch #2 may be set using its indicator light.

DIMENSIONS



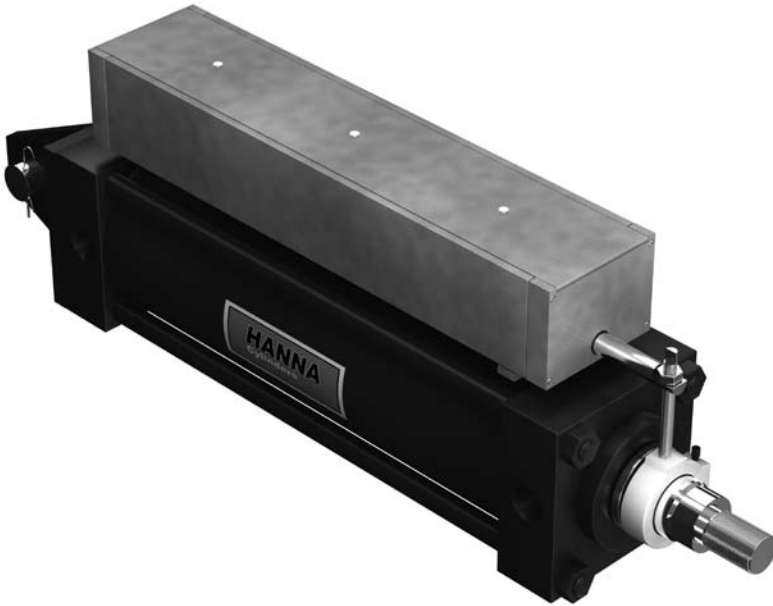
ORDERING INFORMATION

Reed Switches are available on Hanna Series 3A, 3AN, CA and MA cylinders, 1.50" bores through 5.00" bores. All cylinders are furnished with aluminum tubes, except for fiberglass tubes on CA cylinders.

When ordering, specify either Switch Model AN12 or Model 13109-02-6, and quantity per cylinder.

Limit Switch Assembly

for hydraulic and pneumatic cylinders



ADVANTAGES

- Dust and moisture resistant housing.
- Corrosion resistant and non-conducting housing.
- Fast readjustment time.
- Low maintenance costs.
- All wiring contained in a single housing.
- Fast installation — only 4 mounting screws.
- Optimum number of switches per foot.
- Enclosure prevents false tripping.

Hanna offers the Model PL-1 Limit Switch Assembly which has proven its reliability and versatility in countless applications. A cam and multiple switch package, the PL-1 assembly is easily mounted to Hanna hydraulic or pneumatic cylinders. The unit provides precise electronic control of cycling, programming, digital sensing and servo-positioning operations. All wiring and switches are enclosed in a corrosion resistant and non-conducting housing for ease of installation, low maintenance.

SPECIFICATIONS

- Conduit connection 1" NPT tapped in rear head
- Insulation Fiber or fiberglass paper at each switch plus full area gaskets at cover and heads
- Sealing Fully gasketed to exclude moisture and dirt
- Rod seals Abrasive-resistant polyurethane wipers
- Cam rods Hard chrome-plated C1144 accuracy stock
- Switch location Infinitely adjustable
- Housing Extruded 6061-T6 aluminum, with non-conducting hard anodic coating
- Operating temperature range -40° F to +180° F.
- Operating differential Approx. 3/16 inch each switch
- Operating force 12 pounds max., depending on length
- Housing length Stocked up to 8'. Longer on special orders
- Cover fastening Quarter turn lock bars (captive) Hinged covers as optional extra
- Switches See facing page for a wide range of switch options

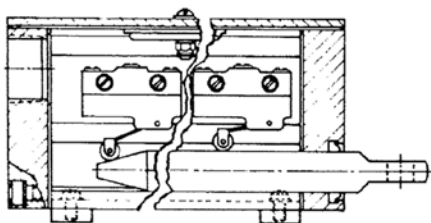
SWITCHES FOR MODEL PL-1 LIMIT SWITCH ASSEMBLY

(12 switches per foot, 6 each side, 6 positions.)

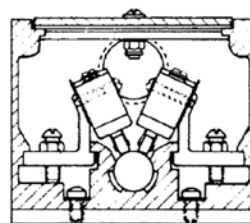
SWITCH	CIRCUIT	TERM'LS	125 VAC	250 VAC	480 VAC	125 VDC	250 VDC
MICRO* BZ-2RW822-A2	SPDT	3 Screw	15A 1/8 HP	15A 1/4 HP	15A	0.5A	0.25A
LICON 16-404	SPDT	4 Lug	10A	10A	—	—	—
MICRO RZ-3YWT822	SPDT (SPLIT)	5 Screw	5A	5A	—	—	—

NOTE: By reversing one switch, two adjacent switches may operate as close as 1 inch apart.

*Standard unless otherwise specified.



Model PL-1 Side View shows roller level switches that provide smoother action, longer life and reliability. Large screw terminals accept wire or solderless connectors. One piece 3/4" cam rod design eliminates backlash and fretting. Double end option makes possible momentary or customized cam profiles.



Model PL-1 End View shows unique Vee placement of switches for unlimited overlap possibilities. Massive snap-in bracket has double clamp screws with lock-nuts for vibration-proof setting. Maximum of 12 miniature switches per foot (6 per side); or 26 sub-miniature switches per foot (13 per side).

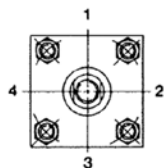
ORDERING INFORMATION

To order Limit Switch Assembly only, specify:

- A. Stroke in inches.
- B. Switch specifications: Unless specified, an equal number of left and right hand switches will be furnished. Left and right hand switches may be converted at any time. State choice and quantity:
 - 1. Miniature Micro BZ-2RW822-A2
 - 2. Sub-Miniature Licon 16-404 up to 26 switches per foot.
 Alternate Miniature MICRO 5 terminal switch BZ-3YWT822.
- C. Optional hinged cover at small additional cost. Specify right or left hand opening, viewed from rod end.
- D. Specify extra cam rod length required beyond standard in inches. Often required for front flange mounted cylinders.

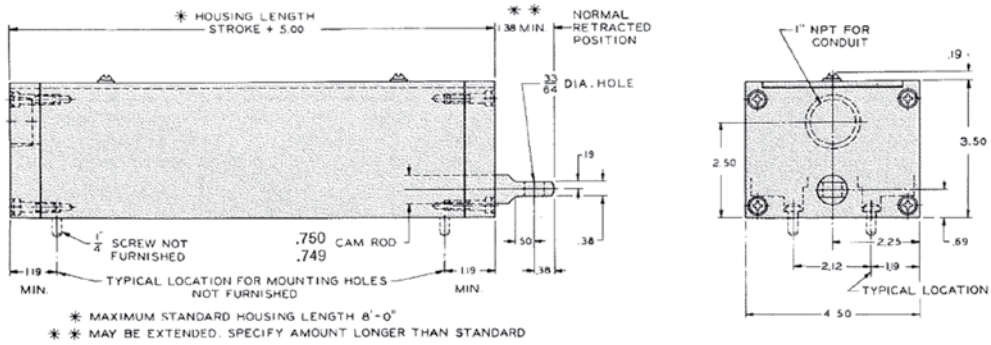
To order Limit Switch Assembly in combination with cylinder, and the Limit Switch Assembly is to be mounted to cylinder, specify:

- A. Cylinder model number.
- B. Piston rod diameter
- C. Cushions, if required
- D. Rod end type
- E. Cylinder diameter
- F. Cylinder stroke
- G. Side of cylinder on which the Limit Switch Assembly should be mounted. Refer to numbered positions on end view of cylinder as shown here.
- H. Location of pipe ports and cushion needles (if cushioned). Pipe ports will normally be furnished at Position 4.

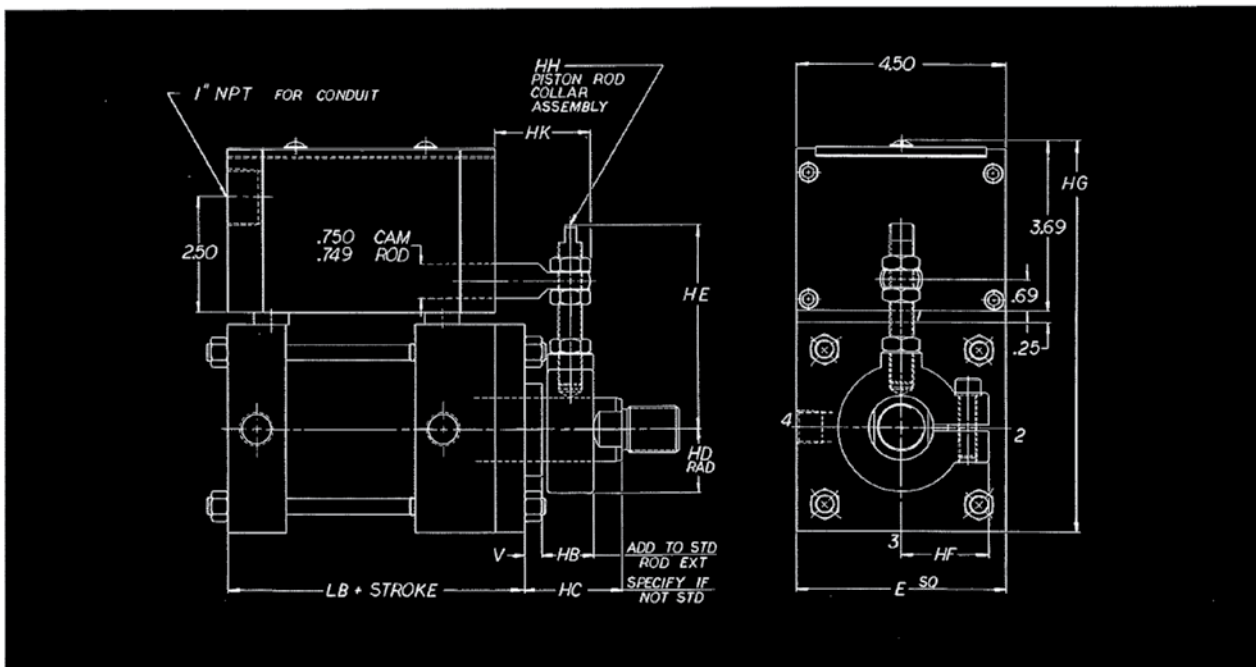


Position location for the Front Head and Blind Head is determined by viewing the cylinder at the Rod End.

DIMENSIONS



LIMIT SWITCH ASSEMBLY INSTALLATION WITH SERIES 3A AND 3AN PNEUMATIC, AND 3L HYDRAULIC CYLINDERS



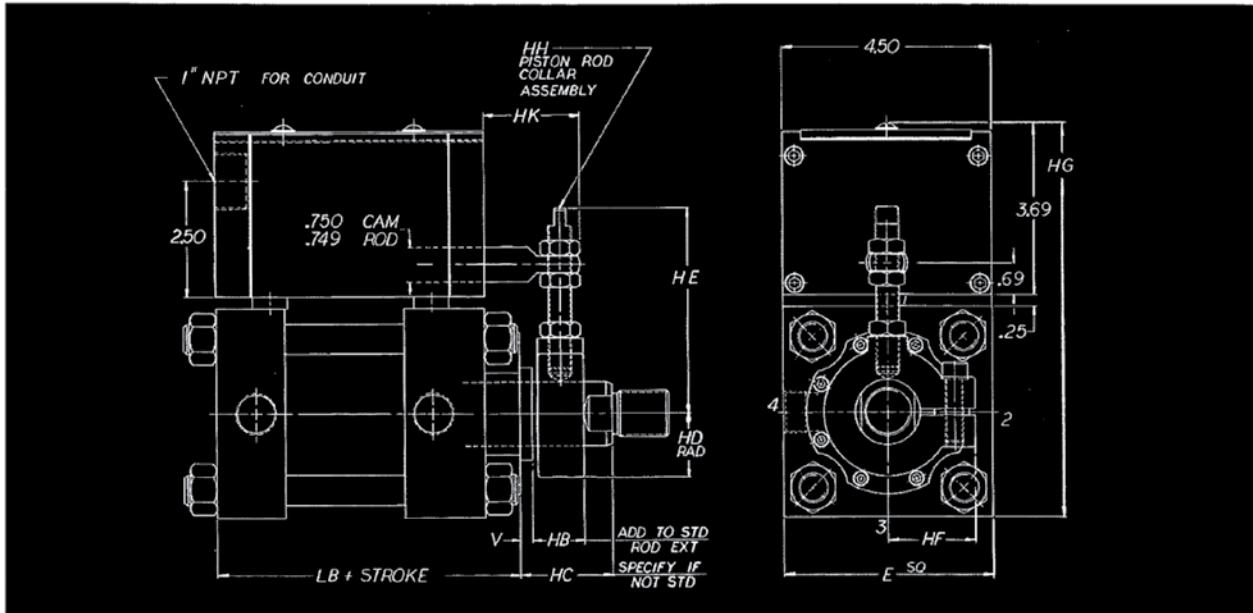
SERIES 3A, 3AN AND 3L CYLINDER DIMENSIONS

CYL. BORE	ROD DIA.	E	HB	HC	HD	HE	HF	HG	HH	HK	LB	V		
1.50	.62	2.00	.88	1.50	.88	3.25	1.50	5.94	-1	1.50	4.00	.25		
	1.88			3.38		-4			1.75			.50		
2.00	.62	2.50	.88	1.50	.88	3.25	1.50	6.44	-1	1.50	4.00	.25		
	1.88			3.38		-4			1.75			.50		
	1.38			1.12		2.38			1.38			3.50	1.88	-8
2.50	.62	3.00	.88	1.50	.88	3.25	1.50	6.94	-9	1.50	4.12	.25		
	1.88			3.38		-10			1.75			.50		
	1.38			2.38		1.38			3.50			-8	2.00	.62
	1.75			1.12		2.62			1.38			3.62	1.88	-12	2.12	.75

SERIES 3A, 3AN AND 3L CYLINDER DIMENSIONS

CYL. BORE	ROD DIA.	E	HB	HC	HD	HE	HF	HG	HH	HK	LB	V
3.25	1.00	3.75	.88	1.62	.88	4.25	1.50	7.69	-11	1.75	4.88	.25
	1.38		2.12		4.50		-15		2.00	.38		
	1.75		2.38	1.38	4.62	1.88	-17		2.12	.50		
	2.00		2.50		4.75		-18					
4.00	1.00	4.50	.88	1.62	.88	4.25	1.50	8.44	-11	1.75	4.88	.25
	1.38		2.12		4.50		-15		2.00	.38		
	1.75		2.38	1.38	4.62	1.88	-17		2.12	.50		
	2.00		2.50		4.75	2.75	-18			.62		
	2.50		2.75	2.12			-58		2.25			
5.00	1.00	5.50	.88	1.62	.88	4.62	1.50	9.44	-24	1.75	5.12	.25
	1.38		2.12		4.75		-30		2.00	.38		
	1.75		2.38	1.38	5.00	1.88	-31		2.12	.50		
	2.00		2.50		4.75		-18			.62		
	2.50		2.75	2.12			-58		2.25			
	3.00		5.50				-29					
6.00	1.38	6.50	1.12	2.00		5.50		10.44	-60	2.00	5.75	.25
	1.75			2.25	1.38	5.62	1.88		-61	2.12		.38
	2.00			2.38		5.12			-26			.50
	2.50			2.62	2.12	5.62	2.75		-27	2.25		
	3.00				5.50		-28					
	3.50		1.38	2.88	3.12	5.25	3.75		-29	2.38		
8.00	1.38	8.50	1.12	2.00		6.50		12.44	-63	2.00	5.88	.25
	1.75			2.25	1.38	7.12	1.88		-46	2.12		.38
	2.00			2.38		6.25			-64			.50
	2.50			2.62	2.12	7.00	2.75		-47	2.25		
	3.00				6.62		-65					
	3.50				6.50		-42					
	4.00		1.38	2.88	3.12	6.62	3.75		-43	2.38		
	4.50				6.50		-66					
	5.00				6.62		-44					
	5.50				6.50		-45					
10.00	1.75	10.62	1.12	2.25	1.38	7.25	1.88	14.56	-46	2.12	7.12	.38
	2.00			2.38		7.25	1.88		-48			.50
	2.50			2.62	2.12	7.62	2.75		-67	2.25		
	3.00					7.38			-68			
	3.50				7.50		-55					
	4.00		1.38	2.88	3.12	7.62	3.75		-69	2.38		
	4.50				7.88		-70					
	5.00				7.88		-71					
5.50					-72							
12.00	2.00	12.75	1.12	2.38	1.38	8.31	1.88	16.69	-48	2.12	7.62	.38
	2.50			2.62	2.12	8.62	2.75		-50	2.25		.50
	3.00					9.25			-73			
	3.50				8.50		-51					
	4.00		1.38	2.88	3.12	8.62	3.75		-74	2.38		
	4.50				8.88		-75					
	5.00				9.31		-76					
5.50					-77							
14.00	2.50	14.75	1.12	2.62	2.12	9.31	2.75	18.69	-50	2.25	8.88	.50
	3.00					9.62			-78			
	3.50					9.31			-51			
	4.00		1.38	2.88	3.12	9.50	3.75		-79	2.38		
	4.50				9.62		-80					
	5.00				9.88		-81					
	5.50						-82					

LIMIT SWITCH ASSEMBLY INSTALLATION WITH SERIES 2H HYDRAULIC CYLINDERS



SERIES 2H CYLINDER DIMENSIONS

CYL. BORE	ROD DIA.	E	HB	HC	HD	HE	HF	HG	HH	HK	LB	V						
1.50	.62	2.50	.88	1.50	.88	3.44	1.50	6.44	-2	1.50	5.00	.25						
	1.00			1.88					-4	1.75		.50						
2.00	1.00	3.00	.88	1.62	.88	3.69	1.50	6.94	-7	1.75	5.25	.25						
	1.38		1.12	2.12			1.38		1.88	-8		2.00	.38					
2.50	1.00	3.50	.88	1.62	.88	3.94	1.50	7.44	-11	1.75	5.38	.25						
	1.38		1.12	2.12			1.38		1.88	-12		2.00	.38					
	1.75		2.38	-13			2.12		.50									
3.25	1.38	4.50	1.12	2.00	1.38	4.44	1.88	8.44	-16	2.00	6.25	.25						
	1.75		2.25	1.38					4.44	1.88		8.44	-17	2.12	.38			
	2.00		2.38	-18					2.12	.38								
4.00	1.75	5.00	1.12	2.12	1.38	4.69	1.88	8.94	-21	2.12	6.62	.25						
	2.00		1.38	2.50					1.38	4.69		1.88	8.94	-22	2.25	.38		
	2.50		2.75	2.12					4.69	1.88		8.94	-23	2.38	.25			
5.00	2.00	6.50	1.12	2.25	1.38	5.44	1.88	10.44	-26	2.12	7.12	.38						
	2.50		1.38	2.75			1.38		5.44	1.88		10.44	-27	2.38	.25			
	3.00		2.75	2.12			5.44		2.75	10.44		-28	2.38	.38				
	3.50		-29	2.38			.25											
6.00	2.50	7.50	1.38	2.62	2.12	5.94	2.75	11.44	-32	2.38	8.38	.25						
	3.00								2.12				5.94	2.75	11.44	-33	2.38	.25
	3.50								3.12				5.94	2.75	11.44	-34	2.38	.25
	4.00								3.12				5.94	2.75	11.44	-35	2.38	.25
7.00	3.00	8.50	1.38	2.62	2.12	6.44	3.75	12.44	-36	2.38	9.50	.25						
	3.50								2.12				6.44	3.75	12.44	-37	2.38	.25
	4.00								3.12				6.44	3.75	12.44	-38	2.38	.25
	4.50								3.12				6.44	3.75	12.44	-66	2.38	.25
	5.00								3.12				6.44	3.75	12.44	-39	2.38	.25
8.00	3.50	9.50	1.38	2.62	2.12	6.94	3.75	13.44	-42	2.38	10.50	.25						
	4.00								2.12				6.94	3.75	13.44	-43	2.38	.25
	4.50								3.12				6.94	3.75	13.44	-66	2.38	.25
	5.00								3.12				6.94	3.75	13.44	-44	2.38	.25
	5.50								3.12				6.94	3.75	13.44	-45	2.38	.25

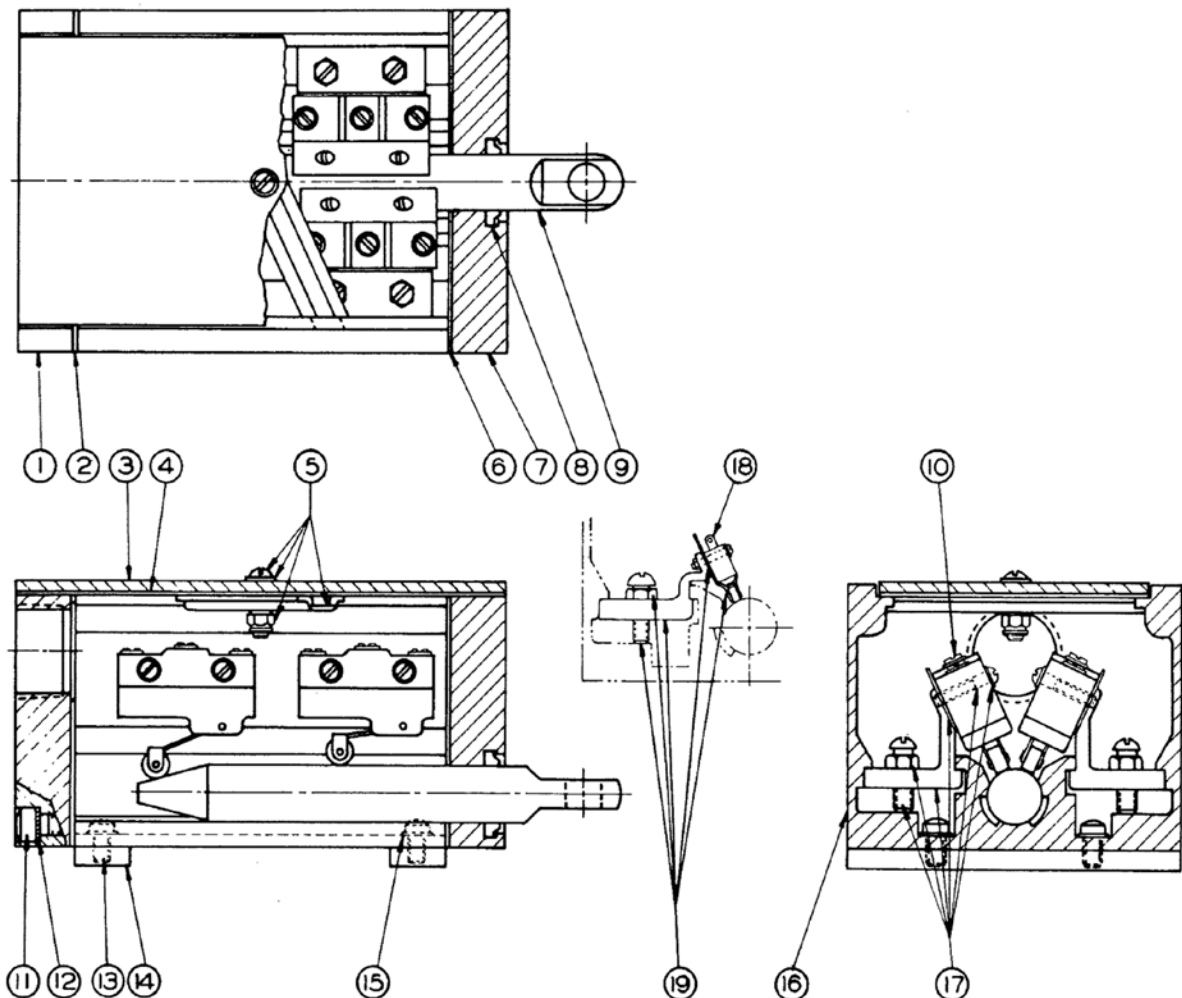
NOTE: 10.00, 12.00 and 14.00 bore dimensions and drawings available from factory upon request.

LIMIT SWITCH ASSEMBLY PARTS LIST

Part No.	Part Nomenclature	Part No.	Part Nomenclature
1	End plate blind end	11	End plate screw
2	Gasket blind end	12	Lock washer
3	Cover plate	13	Mounting screw*
4	Cover plate gasket	14	Mounting bar*
5	Cover clamp assembly	15	Lock washer*
6	Gasket rod end	16	Extrusion housing
7	End plate rod end	17	Switch bracket assembly
8	Rod wiper	18	Switch
9	Cam rod	19	Switch bracket assembly
10	Switch		

* Furnished only when Limit Switch Assembly is mounted to cylinder. When ordering Switch #10 or #18, specify Manufacturer's No.

When ordering parts, include Part No. and Serial No.



OPTIONS

Electronic feedback devices such as MTS, Balluff, Temposonic & Gemco (partial listing).
(Hanna can supply & install upon customer request.)

Protective housings for submersion service.

Intrinsically safe & explosion-proof probes & switches.

Variety of output selections: 4 ~ 20 ma / 0 ~ 10 vDC
(consult factory).

Cable connections per customer requirements (consult factory).