POSITION SENSING CYLINDERS

There are a number of different position sensing devices for fluid power cylinders. Described below are four main types:

1. Tie rod mounted limit switches that are actuated by a magnetic piston
2. End-of-stroke proximity switches that are actuated by the cylinder cushion boss
3. Linear displacement transducer constructed as a probe inside the cylinder rod
4. Servo-type positioner for an air cylinder operating by force-balance

Each is briefly described below. Ordering instructions are provided for the tie rod mount limit switches. Please contact Lehigh sales and engineering for application assistance to define the ordering information for other positioning systems.

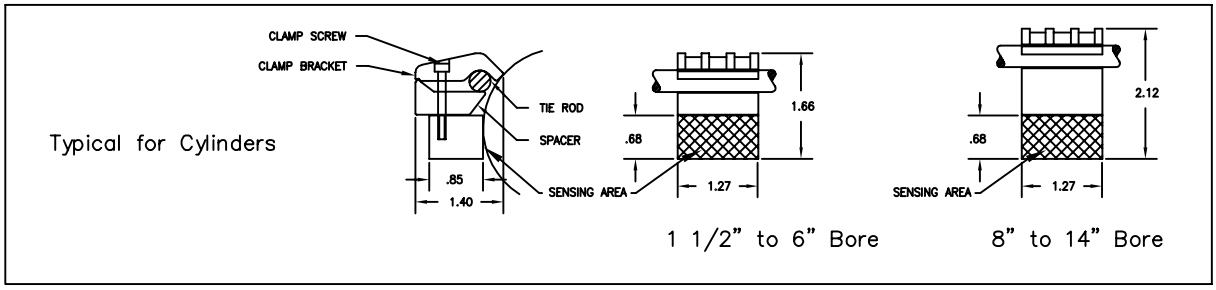
TIE ROD MOUNTED LIMIT SWITCHES

This series of compact reed and hall effect switches is designed specifically as a rugged yet cost effective product to electrically sense cylinder stroke position.

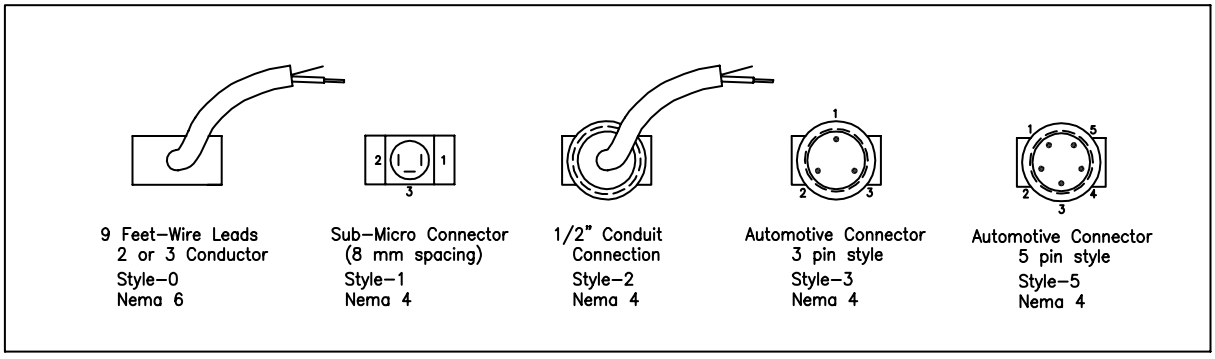
Mounting is accomplished by clamping the switch to the cylinder tie rod with the self-adjusting clamp that comes with the switch.

A large number of custom circuits are featured to match your application requirements.

DIMENSIONAL INFORMATION



TERMINATION INFORMATION



POSITION SENSING CYLINDERS

TIE ROD MOUNTED LIMIT SWITCHES (Cont.)

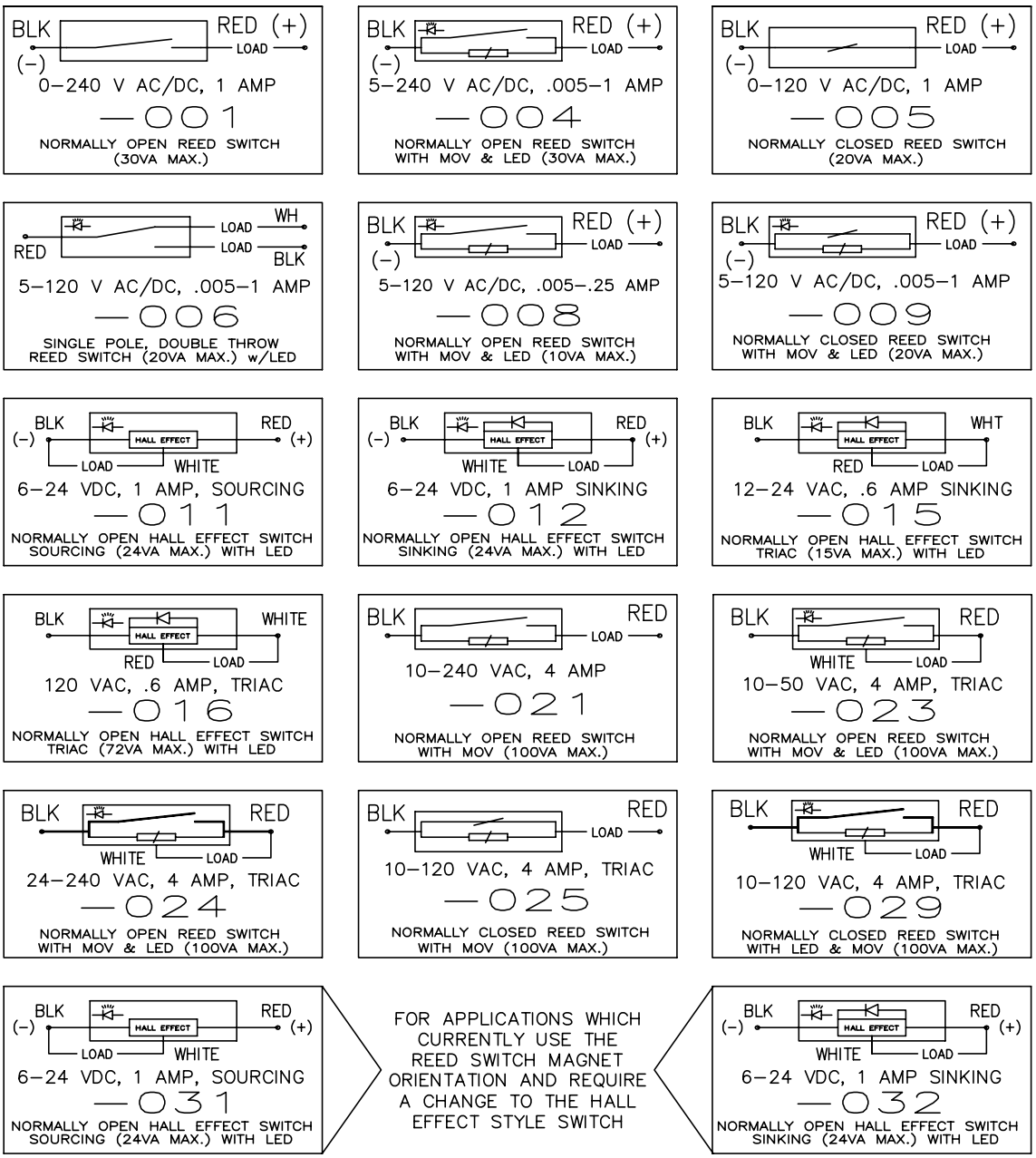
TECHNICAL INFORMATION

Working Temperature: -22°F to +176°F
Vibration Resistance: 10 to 55 Hz
Life Expectancy at Full Load: 10,000,000 Cycles
Max. Switch Current: .25 amp to 4 amp
Repeatability: 0.001"

Shock Resistance: 30g @ 11 ms
Operating Time: OPERATE = 1.5 usec - .6 msec
RELEASE = .5 usec - .05 msec
NEMA Rating: NEMA 6 with Wire Lead Cables, Style 0
NEMA 4 with Connectors, Styles 1,2,3,5

CAUTION - LOADS: Failure to put a load in the line when testing or operating a switch can result in instantaneous failure! The typical application load for the switches is a Programmable Logic Controller (PLC). To test the switch prior to installation the following should apply: (A) For 24 VDC use a 2,000 Ohm, 1/2 Watt resister or equivalent. (B) For 120 VAC/DC use a 12,000 Ohm, 2 Watt resister or equivalent. (C) For a 240 VAC/DC use a 20,000 Ohm, 2 Watt resister or equivalent.

SWITCH MODULE TYPES



POSITION SENSING CYLINDERS
TIE ROD MOUNTED LIMIT SWITCHES (Cont.)

ORDERING INFORMATION

721–□00–□□□

Tie Rod Clamp Size

0	– 1 1/2" to 6" Bore Cylinders
9	– 8" to 14" Bore Cylinders

Termination Style

0	– Wire Leads, 2 or 3 Conductor, 9 Feet Long
1	– Sub Micro DIN Connector w/Female connector
2	– 1/2" Female Conduit Connector
3	– 3 Pin Automotive Connector
5	– 5 Pin Automotive Connector

Switch Module Type

01	– Reed Switch, Normally Open, 0–240 VAC/VDC
04	– Reed Switch, Normally Open, 5–240 VAC/VDC, w/Surge Suppression and LED
05	– Reed Switch, Normally Closed, 0–120 VAC/VDC
06	– Reed Switch, Single Pole, Double Throw, 5–120 VAC/VDC, with LED
08	– Reed Switch, Normally Open, 5–120 VAC/VDC, w/Surge Suppression and LED
09	– Reed Switch, Normally Closed, 0–120 VAC/VDC, w/Surge Suppression and LED
11	– Hall Effect, Sourcing (Magneto Resistive), with LED, 6–24 VDC
12	– Hall Effect, Sinking (Magneto Resistive), with LED, 6–24 VDC
15	– Hall Effect, Reed Switch, Triac Output, 12–24 VAC, with LED
16	– Hall Effect, Reed Switch, Triac Output, 120 VAC, with LED
21	– Reed Switch, Normally Open, 10–240 VAC, w/Surge Supression (4 amp)
23	– Reed Switch, Normally Open, Triac Output, 10–50 VAC, w/Surge Suppression and LED (4 amp)
24	– Reed Switch, Normally Open, Triac Output, 24–240 VAC, w/Surge Supression and LED (4 amp)
25	– Reed Switch, Normally Closed, Triac Output, 10–120 VAC, with Surge Suppression (4 amp)
29	– Reed Switch, Normally Closed, Triac Output, 10–120 VAC with Surge Suppression and LED (4 amp)
31	– Hall Effect, Normally Open, Sourcing, w/LED, 6–24 VDC, to replace Reed Switches (1 amp)
32	– Hall Effect, Normally Open, Sinking, w/LED, 6–24 VDC, to replace Reed Switches (1 amp)

Note: When ordering a pneumatic cylinder for use with tie rod mount limit switches, in addition to the cylinder part number, specify "with magnetic piston for reed switch" and reference the reed switch P/N, or "with magnetic piston for hall effect switch" and reference the hall effect switch P/N. Switch not included in cylinder pricing. Order switch separately.

INSTALLATION TIPS

1. Always use a load when testing the switches. Failure to use a load will permanently damage the switch.
2. Never test using a filament light bulb as a load. The severe inrush currents can cause switch failure or premature failure.
3. There are three types of loads (See "CAUTION - LOADS" on page 42):
   a. Resistive loads - the inputs to a PC or PLC
   b. Capacitive loads - long wire runs
   c. Inductive loads - low power solenoids
4. To control the loads, the following may be necessary:
   a. Resistive loads - confirm input parameters and compare to switch specifications
   b. Capacitive loads - keep wire runs as short as possible and route wires away from current-carrying conductors
   c. Inductive loads - use surge suppression versions of the switches or surge suppression coil connectors
5. Keep the area around the switch free from dirt and magnetic particles. The particles can affect the operation of the switch.
6. The switches can be used to indicate the end of piston travel or as intermediate stroke position indicators.
7. Be sure the sensing area of the switch is installed completely against the cylinder tube for proper operation.