Limit Switches

Commercial & Military
MODELS

P6 series switches are sealed against immersion and corrosive atmospheres. These switches are designed for rugged duty both mechanically and electrically. One-piece housing, sealed at the plunger and at the base, offers true environment-free sealing to comply with MIL-PRF-8805/39, MIL-PRF-8805/40, MIL-PRF-8805/43, and MIL-PRF-8805/100. Most case parts are grounded for EMI reduction.

The P6 series is available with roller plunger styles for cam or slide actuation and pin plunger for in-line actuation. Contact factory for additional designs.

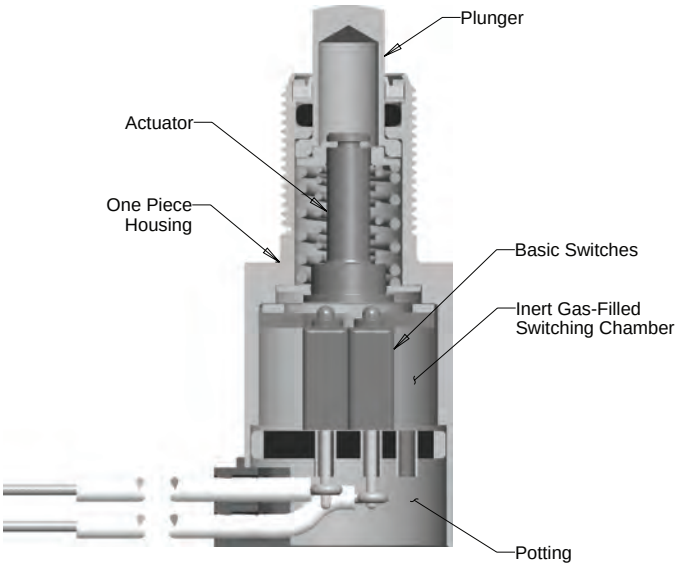
P6 series features the OTTO B2, B3 or B5 series snap-action basic switch. High contact pressure and unique contact design provides low contact resistance for low level switching as well as full rated service.



FEATURES:

- Products available per MIL-PRF-8805/39/40/43/100
- One-piece housing
- Sealed at plunger and base
- EMI reduction construction
- Choice of pin or roller plunger
- Choice of axial or radial leads and options with or without connectors





Cross section example of OTTO P6-24XXX series.

SERIES	FEATURE	ACTUATION	MAX RATING *(Resistive @ 115VAC, 28VDC)*	SEAL RATING	MOUNTING	CIRCUITRY
P6	Mil Grade, Sealed	*(Pin, Roller)* Momentary Action	7A	MIL-PRF-8805 Symbol 3 or Symbol 4	5/8", 15/32" Threaded	1, 2 & 4 Poles
P6-3	Subminiature, Sealed	*(Lever, Plunger, Roller)* Momentary Action	10A	MIL-PRF-8805 Symbol 3	3/8", 1/2" dia. Mounting Holes	1, 2 & 3 Poles
P6-4	Commercial, Sealed	*(Ball, Roller)* Momentary Action	4A	IP6K8S	9/16" Threaded	1 or 2 Poles

Your official representative

ALDERS® Indicate. Control. Connect.

ALDERS electronic GmbH
Arnoldstraße 19
47906 Kempen - Germany

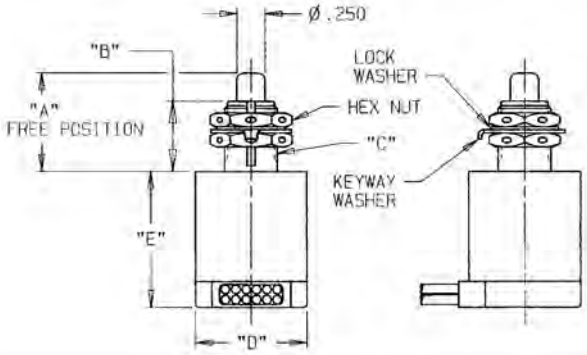
+49 2152 8955-0

sales@alders.de /

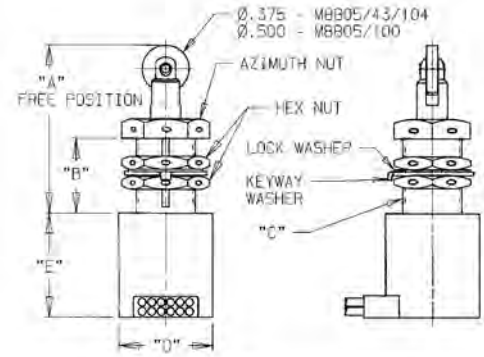


P6 Limit Switch **Drawings and Schematics**

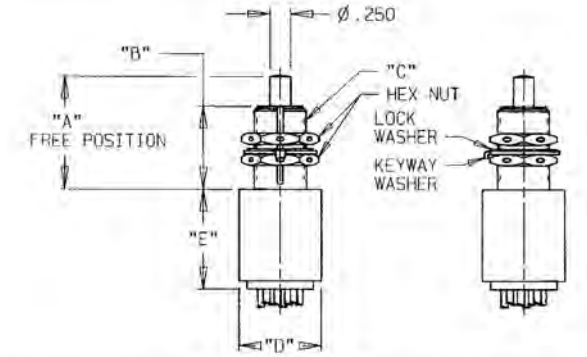
STYLE A PIN PLUNGER RADIAL LEADS



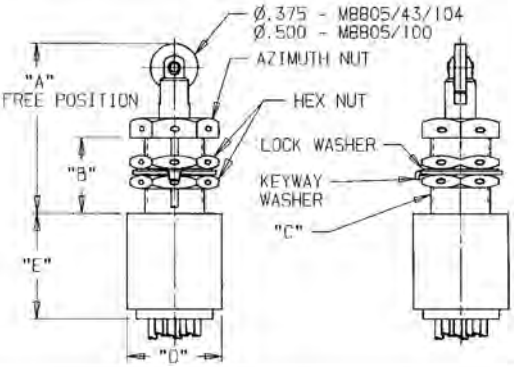
STYLE B ROLLER PLUNGER RADIAL LEADS



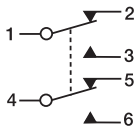
STYLE C PIN PLUNGER AXIAL LEADS



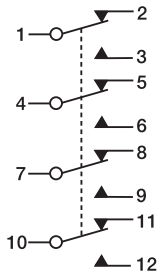
STYLE D ROLLER PLUNGER AXIAL LEADS



2PDT SCHEMATIC



4PDT SCHEMATIC



Specifications Subject To Change Without Notice

SPECIFICATIONS: Standard Models					
ELECTRICAL RATINGS:					
Load	**Sea Level @ 28VDC**	**50,000 feet @ 28VDC**			
RATING TABLE 1					
Resistive	7A	7A			
Inductive	4A	2.5A			
Motor	4A	*(4A)*			
DWV	1000Vrms	400Vrms			
RATING TABLE 2					
Resistive	7A	7A			
Inductive	3A	3A			
Motor	4A	4A			
Lamp	2A	1A			
DWV	1250Vrms	600Vrms			
RATING TABLE 3					
Resistive	4A	4A			
Inductive	2A	2A			
Motor	4A	4A			
DWV	1000Vrms	400Vrms			
RATING TABLE 4					
Load Type	**Power Circuit**	**Elex Logic**	**Low Level**	**Power Circuit**	**Elex Logic**
Resistive	1A	0.01A	0.01A	1A	0.01A
Inductive	0.5A	N/A	N/A	0.5A	N/A
DWV		1000Vrms		400Vrms	

SPECIFICATIONS: Standard Models		
Electrical Life:	Up to 25,000 cycles	
Low Level Life:	Up to 25,000 cycles	
Contact Resistance:	Per MIL-PRF-8805	
Operating Force:	6.0 lbs. to 12.0 lbs. standard. Other forces available.	
Overtravel Force:	30.0 lbs. max	
Release Force:	4.0 lbs. min	
Pretravel:	MIL-PRF-8805/39, /40, /43: MIL-PRF-8805/100:	0.040 inches 0.070 inches
Movement Differential:	MIL-PRF-8805/39, /40, /43: MIL-PRF-8805/100:	0.020 inches 0.035 inches
Overtravel:	MIL-PRF-8805/39, /40, /100:	0.250 inches
Wire Type:	Per MIL-W-22759/7 Marked per MIL-W-5088. Standard length: 6 feet. Other lengths available.	
Operating Temp Range:	-55°C to 85°C	
Mounting/Termination:	Bushing mounting with positive, non-turn features. Wire leads potted at terminal base for strain relief and added insulation. Each wire is marked with circuit identification.	
For specific details not shown above, please consult the appropriate military specification sheet or OTTO's product drawing.		

Circuitry	Plunger/Lead Exit Style	Dim. A Free Position *(inches +/- 0.030)*	Dim. B Bushing Length *(inches +/- 0.030)*	Dim. C Thread *(inches)*	Dim. D Body Dia *(max inches).*	Dim. E Body Length *(max inches)*	Electrical Rating Table	Military Number	Catalog Number
MIL-PRF-8805/39									
2PDT	A-Pin/Radial	1.375	1.000	0.625-24	0.720	0.980	1	MS21321-1	P6-24000
4PDT	A-Pin/Radial	1.375	1.000	0.625-24	1.031	1.200	1	MS21321-2	P6-24001
MIL-PRF-8805/40									
2PDT	A-Pin/Radial	1.375	1.000	0.625-24	1.015	0.980	3	MS24331-1	P6-24002
MIL-PRF-8805/43									
2PDT	A-Pin/Radial	0.875	0.625	0.469-32	0.720	1.000	1	MS27240-1	P6-24003
4PDT	A-Pin/Radial	0.875	0.625	0.469-32	1.031	1.200	1	MS27240-2	P6-24004
2PDT	B-Roller/Radial *	1.295	N/A	0.469-32	0.720	1.000	1	MS27240-3	P6-14000
4PDT	B-Roller/Radial *	1.295	N/A	0.469-32	1.031	1.200	1	MS27240-4	P6-14001
2PDT	A-Pin/Radial	0.875	0.625	0.469-32	0.720	1.000	4	MS27240-5	P6-24005
4PDT	A-Pin/Radial	0.875	0.625	0.469-32	1.031	1.200	4	MS27240-6	P6-24006
2PDT	B-Roller/Radial *	1.295	N/A	0.469-32	0.720	1.000	4	MS27240-7	P6-14002
4PDT	B-Roller/Radial *	1.295	N/A	0.469-32	1.031	1.200	4	MS27240-8	P6-14003
MIL-PRF-8805/100									
4PDT	A-Pin/Radial	1.375	1.000	0.625-24	1.030	1.100	2	MIL-PRF-8805/100-007	P6-24043
4PDT	C-Pin/Axial	1.375	1.000	0.625-24	1.030	1.200	2	MIL-PRF-8805/100-008	P6-24044
4PDT	B-Roller/Radial **	1.781	0.794	0.625-24	0.925	1.100	2	MIL-PRF-8805/100-009	P6-14035
4PDT	D-Roller/Axial **	1.781	0.794	0.625-24	1.030	1.200	2	MIL-PRF-8805/100-010	P6-14036
4PDT	A-Pin/Radial	1.375	1.000	0.625-24	1.030	1.100	2	MIL-PRF-8805/100-015	P6-24007
4PDT	C-Pin/Axial	1.375	1.000	0.625-24	1.030	1.200	2	MIL-PRF-8805/100-016	P6-24008
4PDT	B-Roller/Radial **	1.781	0.794	0.625-24	1.030	1.100	2	MIL-PRF-8805/100-017	P6-14005
4PDT	D-Roller/Axial **	1.781	0.794	0.625-24	1.030	1.200	2	MIL-PRF-8805/100-018	P6-14006

* Roller diameter is 0.375 inches. ** Roller diameter is 0.500 inches.

NOTE: SEE MILITARY QPL CROSS REFERENCE LISTING on our website.

Modified Military Styles



Circuitry	Free Position *(inches)*	Bushing Length *(inches)*	Overall Length *(inches)*
PIN PLUNGER, RADIAL LEAD EXIT			
2PDT	1.375	1.000	2.375
2PDT	1.575	1.200	2.575
2PDT	0.875	0.625	1.875
4PDT	1.375	1.000	2.475
PIN PLUNGER, AXIAL LEAD EXIT			
2PDT	0.875	0.625	2.250
2PDT	1.575	1.200	2.950
ROLLER PLUNGER, RADIAL LEAD EXIT			
4PDT	1.781	0.794	2.781
2PDT	1.295	0.630	2.295
2PDT	1.980	1.095	2.980
ROLLER PLUNGER, AXIAL LEAD EXIT			
2PDT	1.700	0.860	3.200
4PDT	2.150	0.794	3.800

Custom Paint

Design 4 *(Resilient)* sealed single pole switch features polyurethane paint on the switch body and has a military style connector. Bushing is 15/32-32.



Actuating Force: 9.0 +/- 3.0 lbs.
Release Force: 4.0 lbs. min
Overtravel: 0.125" min
Circuit: SPDT
Rating: 7 amps Resistive
4 amps Inductive
Contacts: Gold

Flange Mount

Low profile, 4-pole switch features flange mounted stainless steel housing with an 8 pin connector.



Actuating Force: 6.0 +3.0/-2.0 lbs.
Release Force: 2.0 lbs. min
Circuit: 4PST N.C.
Rating: 0.5 amps Resistive for up to 100,000 cycles
Contacts: Silver/Gold

Longer Bushing

This 2-pole switch features an extra long mounting bushing. Bushing is 15/32-32.



Overtravel: 0.250" min
Operating Force: 9.0 +/- 3.0 lbs.
Release Force: 4.0 lbs. min
Circuit: 2PDT
Rating: 7 amps Resistive
3 amps Inductive
Contacts: Gold

Rubber Bonded Leads

Aircraft switch features special 48" leads with a Fluorosilicone rubber bonded to wire leads.



Total Travel: 0.300" min
Operating Force: 11.0 +/- 5.0 lbs.
Release Force: 4.0 lbs. min
Circuit: 4PDT
Rating: 0.04 amps to 0.5 amps Inductive
Contacts: Gold

Sleaved Wires

This 2-pole switch features a lower spring force and sleaved wires.



Overtravel: 0.500" min
Operating Force: 3.0 to 6.0 lbs.
Release Force: 2.0 lbs. min
Circuit: 2PDT
Rating: 7 amps Resistive
4 amps Inductive
Contacts: Gold

Adjustable Roller Plunger

Design 4 *(Resilient)* sealed 2PDT limit switch with adjustable orientation of roller plunger at 45' increments. 72" wire leads included.



Overtravel: 0.125" min
Operating Force: 9.0 +/- 3.0 lbs.
Release Force: 4.0 lbs. min
Circuit: 2PDT
Rating: 7 amps Resistive
4 amps Inductive
Contacts: Gold

Specifications Subject To Change Without Notice

P6-3 Sealed, Subminiature

P6-3 series subminiature sealed switches are contained in a rugged aluminum housing with choice of lever, roller or plunger. Featuring the B5 series basic switch, the P6-3 series is able to switch up to 10 amps. The high contact pressure and superior wiping action of the OTTO design also makes the P6-3 series an excellent choice when switching logic level loads.

The switches are sealed against water and other liquids per MIL-PRF-8805. Wire leaded models feature potted leads. The solder terminals are epoxy sealed.

FEATURES:

- Compact design
- Watertight to MIL-PRF-8805
- Choice of four actuator styles
- Choice of wire lead or solder termination styles
- Up to 10 amps switching capability
- High contact pressure
- Precision operating points



Lever Style



Plunger Style



Overtravel Plunger Style



Roller Lever Style

Standard Characteristics/Ratings:								
ELECTRICAL RATINGS:	Sea Level @ 28VDC			50,000 feet @ 28VDC				
Load	**Single Circuit N.O. or N.C.**	**2 Circuit Per Pole**		**Single Circuit N.O. or N.C.**	**2 Circuit Per Pole**			
Resistive	10A	10A		10A	10A			
Inductive	7.5A	5A		3.5A	2A			
Motor	4A	2A		N/A	N/A			
DWV	1000Vrms			500Vrms				
Electrical Life:	Up to 50,000 cycles							
Mechanical Life:	Up to 50,000 cycles							
OPERATIONAL:	**P6-31**	**P6-32**	**P6-33**	**P6-34**	**P6-35**	**P6-36**	**P6-37**	**P6-38**
Operating Force:	16 oz max	40 oz max	20 oz max	40 oz max	32 oz max	40 - 60 oz max	20 oz max	48 oz max
Release Force:	4 oz min	8 oz min	4 oz min	8 oz min	4 oz min	24 oz min	4 oz min	8 oz min
Movement Differential:	0.060" max	0.020"±0.010" max	0.060" max	0.020"±0.010" max	0.080" max	0.010" - 0.035" max	0.080" max	0.040" max
Pretravel:	0.125" max	0.050" max	0.125" max	0.070" max	0.125" max	0.050" max	0.125" max	0.070" max
Overtravel:	0.025" min	0.012" min	0.025" min	0.187" min	0.025" min	0.012" min	0.025" min	0.187" min
Strength of Actuator:	10.0 lbs.	25.0 lbs.	10.0 lbs.	25.0 lbs.	10.0 lbs.	25.0 lbs.	10.0 lbs.	25.0 lbs.
Temperature Range:	-55°C to +85°C							
Seal:	Enclosure Design 3, watertight per MIL-PRF-8805							
MATERIALS:								
Plunger:	Corrosion resistant steel							
Lever:	Corrosion resistant steel *(where applicable)*							
Mounting Hardware:	None provided except Actuator Style options 4 and 8 include hex nut, lockwasher and keyway washer							

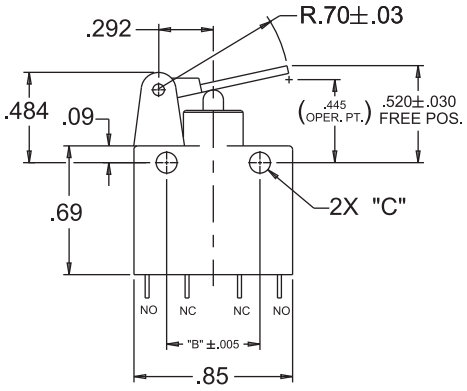
P6-3 Limit Switch, Single Pole
Part Number Code

P6-3 -	X	X	X	X	X
	Actuator Style	**Terminal Style**	**Circuitry**	**Mounting Holes** ***(See drawing below)***	**Serial Digit**
	1. Lever **2.** Plunger **3.** Roller Lever **4.** Overtravel Plunger*	**1.** Solder Terminals **3.** 1' Potted Leads **4.** 3' Potted Leads **5.** 6' Potted Leads	**1.** SPNO-DB, Form X **2.** SPNC-DB, Form Y **3.** SPDT-SB, Form C **4.** SPDT-DB, Form Z	**1.** No Holes **2.** 1/2" Centers for #4-40 Screws **4.** 3/8" Centers for #2-56 Screws	**0.** O Except for Specials

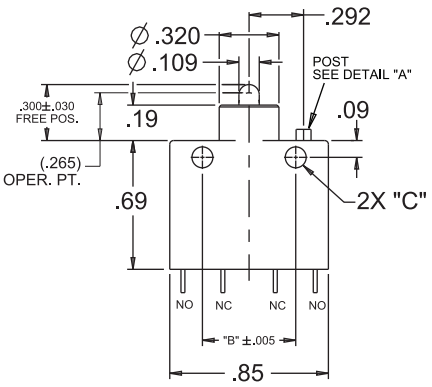
* No mounting holes are offered in models with threaded bushing

P6-3 Drawings, Single Pole

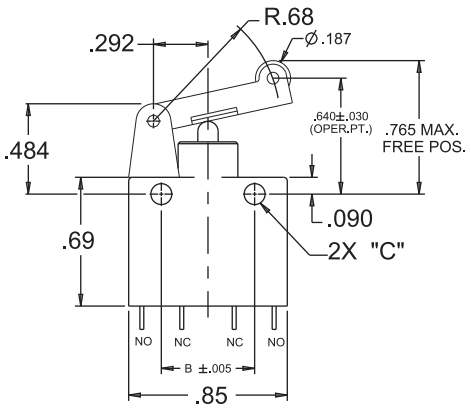
STYLE P6-31



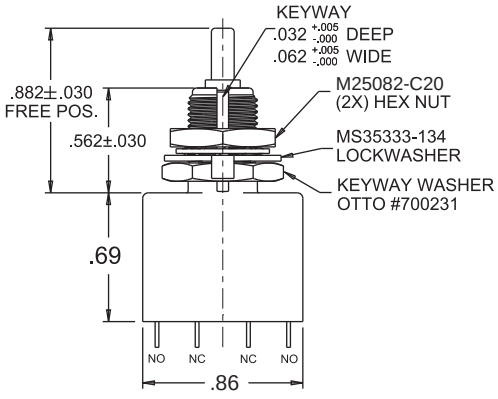
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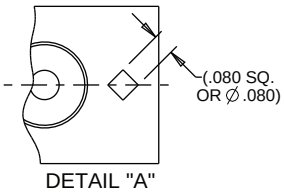
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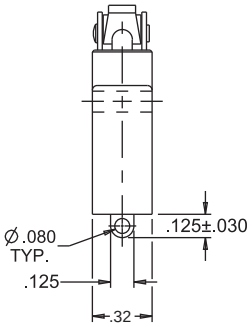
STYLE P6-34*



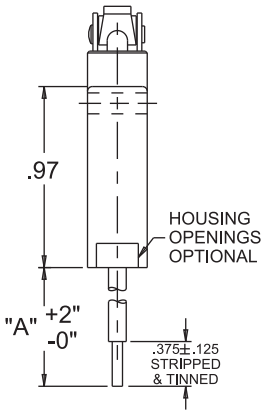
*SWITCH WIDTH IS .39



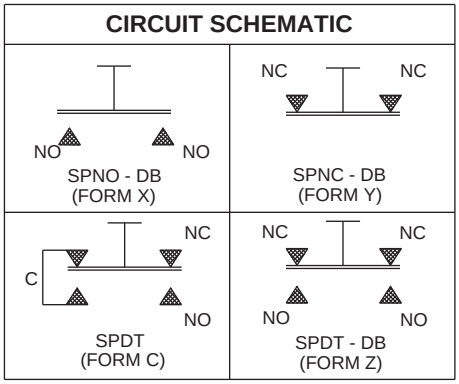
SOLDER TERMINAL
(TERM. STYLE 1 EXAMPLE)



POTTED WIRE LEADS
(TERM. STYLES 3,4 & 5 EXAMPLE)



CIRCUIT SCHEMATIC



POTTED WIRE LEADS	
STYLE	DIM "A"
3	12"
4	36"
5	72"

MOUNTING HOLES:	DIM "B" CNTRS.	DIM "C" DIA.
CODE 2 FOR 4-40 SCREWS	.500	Ø.112 ± .003
CODE 4 FOR 2-56 SCREWS	.375	Ø.089 ± .003

Specifications Subject To Change Without Notice

P6-3 Limit Switch, Double Pole

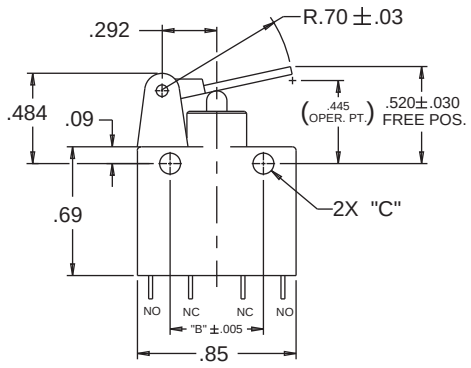
Part Number Code

P6-3 -	X	X	X	X	X
	Actuator Style	**Terminal Style**	**Circuitry**	**Mounting Holes** ***(See drawing below)***	**Serial Digit**
	5. Lever **6.** Plunger **7.** Roller Lever **8.** Overtravel Plunger*	**1.** Solder Terminals **3.** 1' Potted Leads **4.** 3' Potted Leads **5.** 6' Potted Leads	**1.** DPNO-DB, Form XX **2.** DPNC-DB, Form YY **3.** DPDT, Form CC **4.** DPDT-DB, Form ZZ	**1.** No Holes **2.** 1/2" Centers for #4-40 Screws **4.** 3/8" Centers for #2-56 Screws	**0.** O Except for Specials

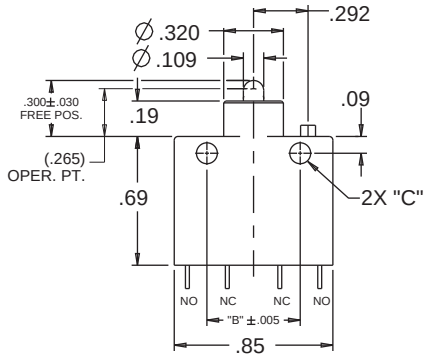
* No mounting holes are offered in models with threaded bushing

P6-3 Drawings, Double Pole

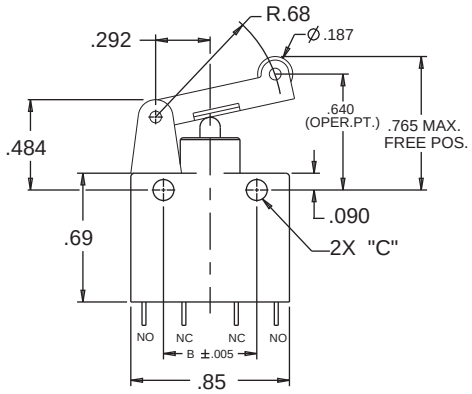
STYLE P6-35



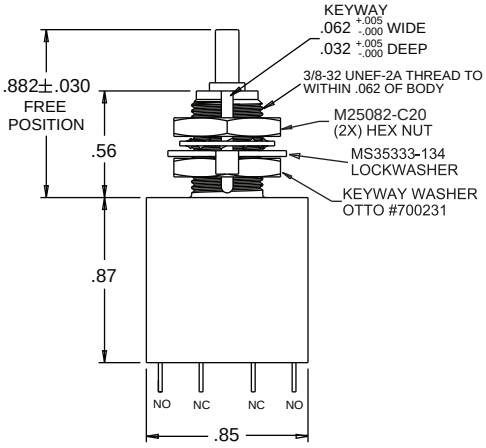
STYLE P6-36



STYLE P6-37

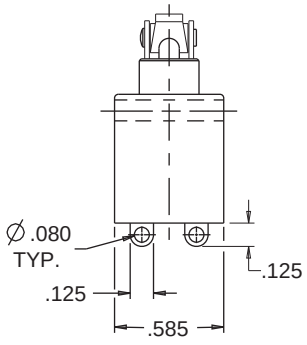


STYLE P6-38



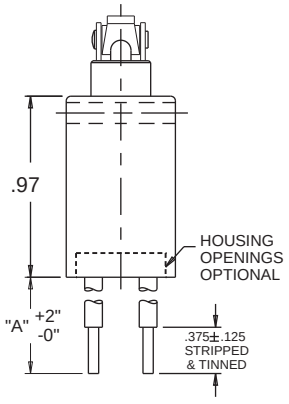
SOLDER TERMINAL

(TERM. STYLE 1 EXAMPLE)

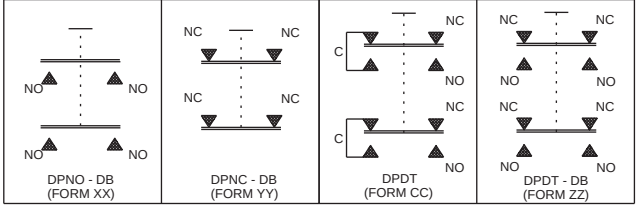


POTTED WIRE LEADS

(TERM. STYLES 3, 4 & 5 EXAMPLE)



CIRCUIT SCHEMATIC



POTTED WIRE LEADS	
STYLE	DIM "A"
3	12"
4	36"
5	72"

MOUNTING HOLES:	DIM "B" CNTRS.	DIM "C" DIA.
CODE 2 FOR 4-40 SCREWS	.500	Ø.112 ± .003
CODE 4 FOR 2-56 SCREWS	.375	Ø.089 ± .003

P6-4 Sealed

The P6-4 series switches are commercial-grade limit switches that are watertight and completely sealed to IP6K8S and IP6K9K. They are designed to be operated in extreme temperature ranges and with their stainless steel housing, are for use in the most rugged, harsh environments. These switches are available with either a ball or roller plunger actuation method. In addition, these switches can be configured as single pole and double pole plus single throw and double throw. The P6-4 offers three connection methods: solder or screw terminal plus flying wire leads.



Ball Plunger
Actuator Style



Roller Plunger
Actuator Style

FEATURES:

- Sealed watertight to IP6K8S and IP6K9K
- One-piece stainless-steel housing
- Built to withstand extreme temperatures
- Choice of ball or roller plunger
- Three connection method options

POTTED LEADS IDENTIFICATION	
SPST-NO-DB, FORM X	2 White Wire *(NO POLE-1)*
SPST-NC-DB, FORM Y	2 Black Wire *(NC POLE-1)*
SPDT-DB, FORM Z	2 White Wire *(NO POLE-1)* 2 Black Wire *(NC POLE-1)*
DPST-NO-DB, FORM X	2 White Wire *(NO POLE-1)* 2 Red Wire *(NO POLE-2)*
DPST-NC-DB, FORM Y	2 Black Wire *(NC POLE-1)* 2 Yellow Wire *(NC POLE-2)*
DPDT-DB, FORM Z	2 White Wire *(NO POLE-1)* 2 Black Wire *(NC POLE-1)* 2 Red Wire *(NO POLE-2)* 2 Yellow Wire *(NC POLE-2)*
SPST-NO-DB, & SPST-NC-DB	2 White Wire *(NO POLE-1)* 2 Yellow Wire *(NO POLE-2)*

Standard Characteristics/Ratings:			
ELECTRICAL RATINGS:			
Load	**Sea Level @ 28VDC**	**Sea Level 115VAC, 60Hz**	**Cycles**
Standard Resistive	4A	4A	50,000
Standard Inductive	2A	2A	50,000
Logic Level Resistive	10mA @ 5VDC	NA	100,000
DWV	1000Vrms		
MECHANICAL:			
Pretravel:	0.055 max		
Actuating Force:	3.5 +/- 1.5 lbs or 5.5 +/- 2.0 lbs		
Overtravel:	0.125		
Full Overtravel Force:	17.0 lb. max		
Releasing Force:	1.0 lb. min		
Mechanical Life:	Up to 100,000 cycles		
ENVIRONMENTAL:			
Temperature Range:	-55˚C to 105˚C		
MATERIALS:			
Actuator:	Stainless steel or Torlon PAI		
Case:	Stainless steel *(303)*		
Seal:	IP6K8S and IP6K9K		
Mounting Hardware:	Hex nut and lockwasher		
Terminal Hardware:	Screw and lockwasher *(only with screw terminal switches)*		

P6-4 Limit Switch
Part Number Code

P6-4 -	X	X	XX		X	*	*
	Actuator Style	**Terminal Style**	**Circuitry**		**Actuation Force**	**Not Used**	**Not Used**
	1. Ball	**1.** Solder	**11.** 1 pole	SPST-NO-DB, FORM X	**1.** 3.5 +/- 1.5 LBS		
	2. Roller	**2.** Screw	**12.** 1 pole	SPST-NC-DB, FORM Y	**2.** 5.5 +/- 2.0 LBS		
		3. 12" Potted Leads	**13.** 1 pole	SPDT-DB, FORM Z*			
		4. 36" Potted Leads	**24.** 2 pole	DPST-NO-DB, FORM X			
		5. 72" Potted Leads	**25.** 2 pole	DPST-NC-DB, FORM Y			
			26. 2 pole	DPDT-DB, FORM Z*			
			27. 2 pole	SPST-NO-DB & SPST-NC-BD			

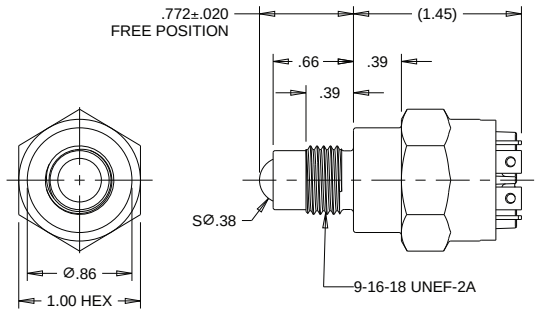
* Options not available for Screw Terminal Style *(2)*

Specifications Subject To Change Without Notice

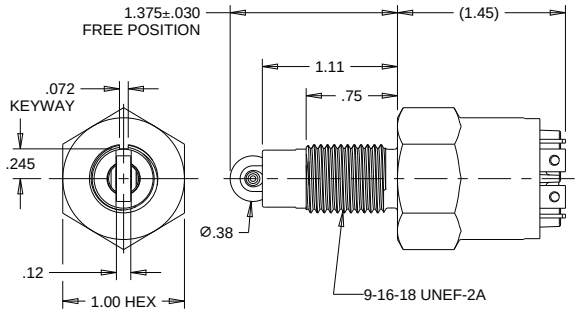
P6-4 Drawings

ACTUATOR STYLE

BALL ACTUATOR STYLE

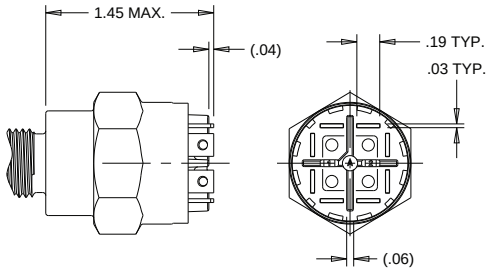


ROLLER ACTUATOR STYLE



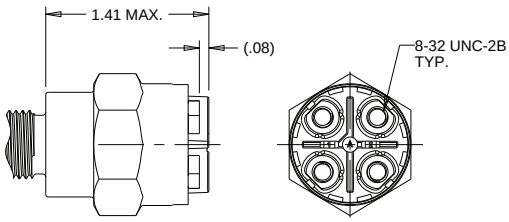
TERMINAL STYLE

SOLDER TERMINAL STYLE

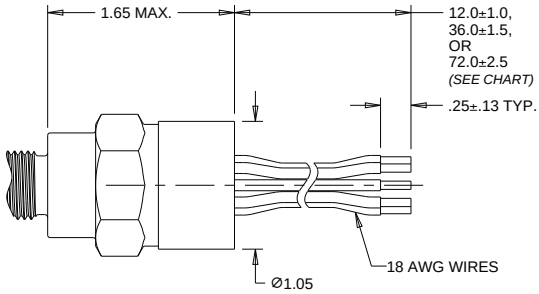


NO TERMINALS: ROUNDED END
NC TERMINALS: SQUARED END

SCREW TERMINAL STYLE



POTTED LEADS STYLE



CIRCUITRY OPTIONS

