



Valve Position Monitors



APL 5 Series
CSA Approved Type 4X/6
Class I, Div 1, Grps B, C, D T6
Class II, Div 1, Grps E, F, G
Class III



NEW:
APL-9 Series
Stainless Steel
Type 4X, IP 67



APL 2 Series
CSA Approved, Type 4X



TRIAC® APL Series Limit Switches

The Triac APL Series Limit Switches feature high quality, easy to use multiple option switch boxes for rotary actuators. Their die cast aluminum housings are powder coated for corrosion resistance and feature red/green visual indicators, quick-set cams and easy access terminal strips. These economical switch boxes offer numerous switch, sensor and transmitter options to handle most applications found in today's process and industrial markets.

APL-2 Series "Compact" Switch

- CSA Approved, Type 4X
- Die-cast aluminum powder coated enclosure
- SIL 2/3 capable
- Solid and compact design
- Dome visual indicator (3-way available)
- Dual 1/2" NPT conduit entries, 8 pts. on terminal strip
- Quick-set spring loaded cam
- Captive cover bolts
- NAMUR low profile brackets
- Available Switches 10, 18, 20 & 23
- Ambient temperature range -20°C to 80°C (-4°F to 176°F)



APL-210



APL-218

Simple device for intrinsically safe applications



APL-9 Series Stainless Steel

- Type 4X, IP 67
- 304 Stainless Steel enclosure
- Stainless Steel shaft & captive cover bolts
- Dome visual indicator
- Dual 1/2" NPT conduit entries, 8 pts. on terminal strip
- Quick-set spring loaded cam
- NAMUR stainless steel bracket
- Up to four switches, various mechanical, proximity and reed type sensors
- Ambient temperature range -20°C to 80°C (-4°F to 176°F)



APL-3 Series



- CSA Approved, Type 4X
- Die-cast aluminum powder coated enclosure
- SIL 2/3 capable
- Rugged and flexible design
- Dome visual indicator (3-way available)
- Dual 1/2" NPT conduit entries, 8 pts. on terminal strip
- Quick-set spring loaded cam
- Captive cover bolts
- NAMUR brackets
- Multiple options - up to four switches, various mechanical, proximity and reed type sensors, feedback potentiometers and 4-20mA transmitters
- Ambient temperature range -20°C to 80°C (-4°F to 176°F)



APL-4 Series



- CSA Approved, Class I, Division 1, Groups C & D T6 Class I, Zone 1, AEx db IIB T6 Gb, Ex db IIB T6 Gb, Type 4X/6, IP 66/67/68 (10m 72 hr)
- ATEX/IECEx rating available: Ex db IIB T6 Gb
(*Use ATEX suffix to denote this option. Ex: APL-410N-ATEX)
- Dome visual indicator (3-way available)
- SIL 2/3 capable
- Dual 3/4" NPT conduit entries, 8 pts. on terminal strip
- Quick-set spring loaded cam
- Captive cover bolts
- NAMUR brackets
- Multiple options - up to four switches, various mechanical, proximity and reed type sensors, feedback potentiometers and 4-20mA transmitters
- Ambient temperature range -25°C to 60°C (-13°F to 140°F)
- Low temp options down to -40°C (-40°F) - switches 29, 30A, 34, 35, 36 only



APL-5 Series



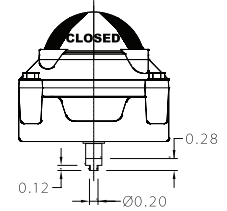
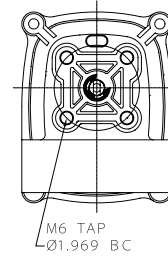
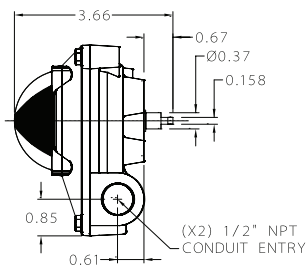
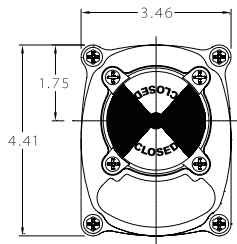
Available in Stainless Steel

- CSA Approved: Type 4X/6, IP 66/67/68 (10m 72 hr)
Class I, Division 1, Group B, C & D T6;
Class II, Division 1, Group E, F, G; Class III
Class I, Zone 1, Aex db IIC T6 Gb;
Class II, Zone 21, AEx tb IIIC T65°C Db
Ex db IIC T6 Gb; Ex tb IIIC T65°C Db
- ATEX/IECEx rating available:
Ex db IIC T6 Gb; Ex tb IIIC T85°C Db; Ex ia IIC T6 Gb; Ex ia IIIC T85°C Db;
IP67 (*Use ATEX suffix to denote this option. Ex: APL-510N-ATEX)
- SIL 2/3 capable
- Dome visual indicator (3-way available)
- Dual 3/4" NPT conduit entries, 8 pts. on terminal strip
- Quick-set spring loaded cam
- Screw on enclosure lid with spring loaded cover bolts - unique design to hold bolts inside cover
- NAMUR brackets
- Multiple options - up to four switches, various mechanical, proximity and reed type sensors, feedback potentiometers and 4-20mA transmitters
- Ambient temperature range -25°C to 60°C (-13°F to 140°F)
- Low temp option down to -50°C (-58°F) switches 29, 35, 36 only (switches 30A, 34 to -40C (-40F))

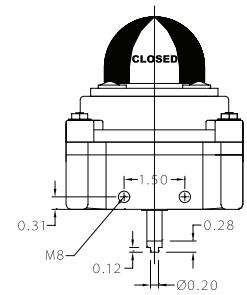
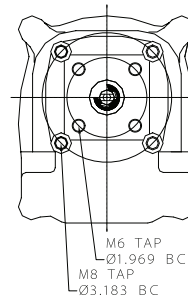
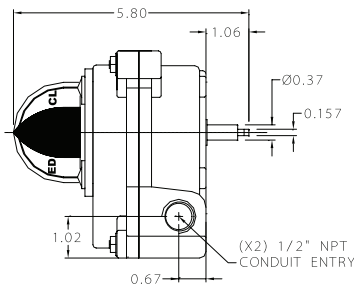
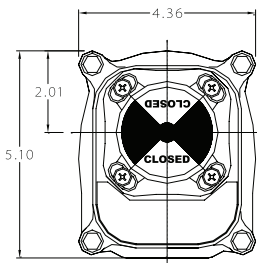


APL Series Dimensions (IN)

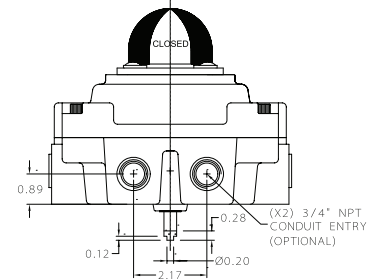
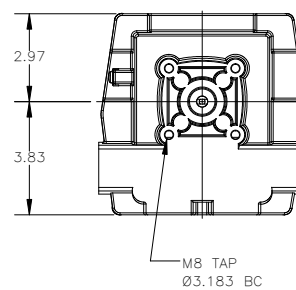
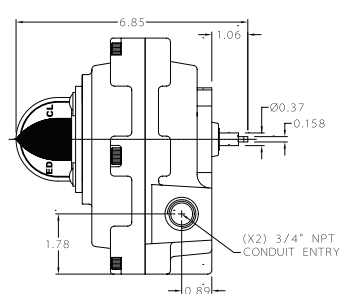
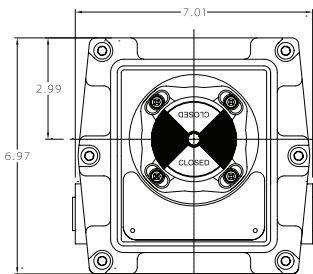
APL-2 Series



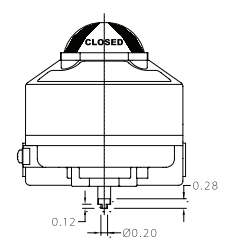
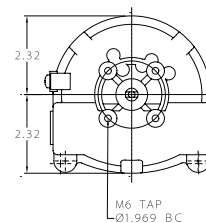
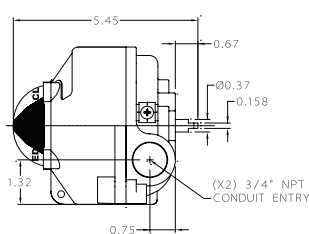
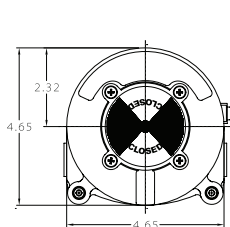
APL-3 Series



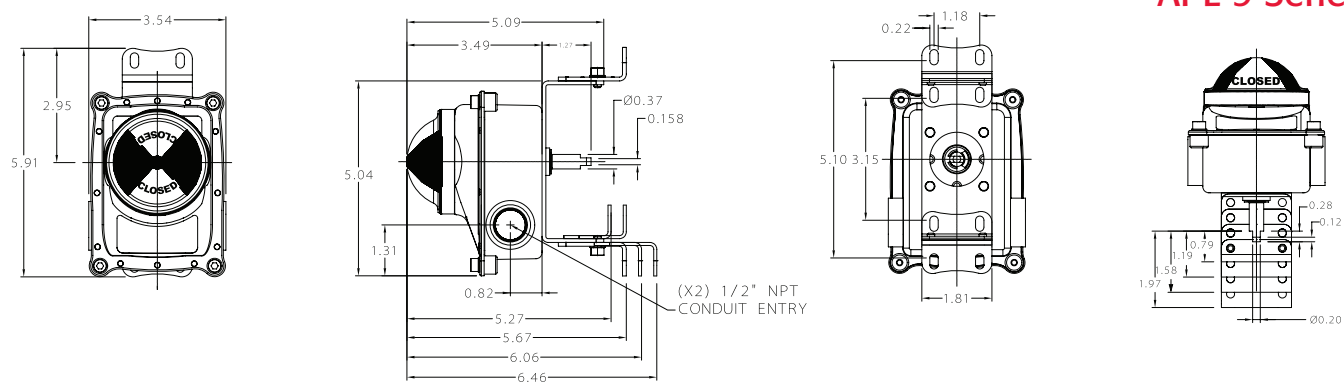
APL-4 Series



APL-5 Series

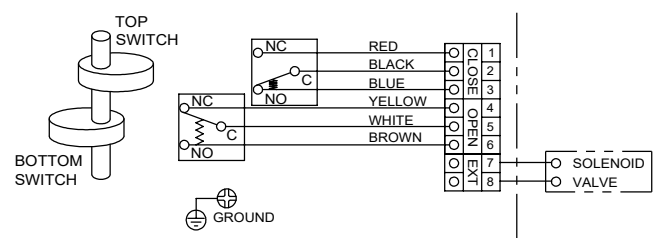


APL Series Dimensions (IN)

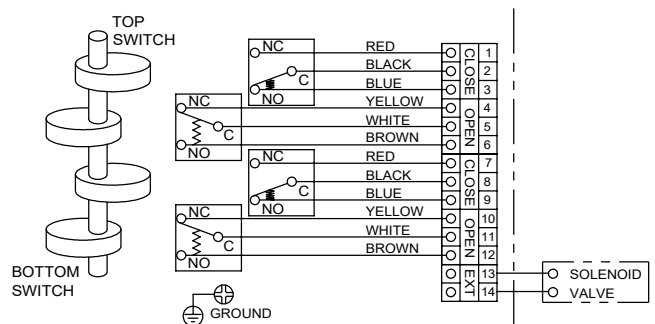


APL-9 Series

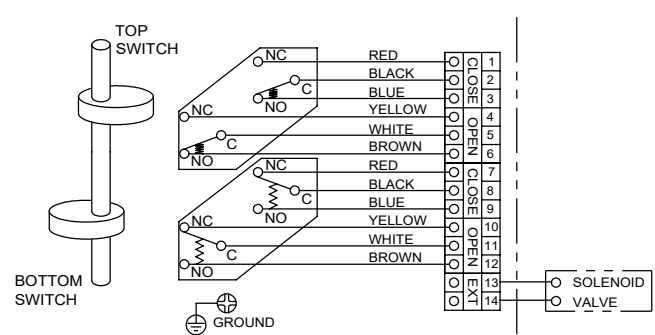
Wiring Schematics



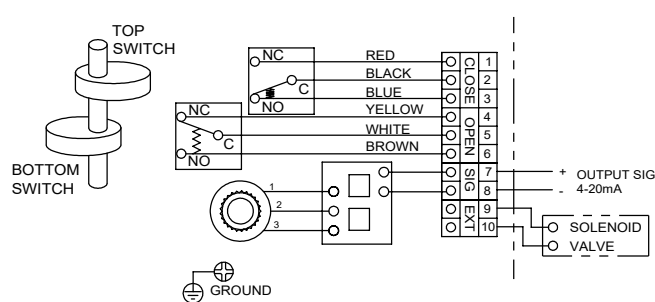
(2) SPDT SWITCHES



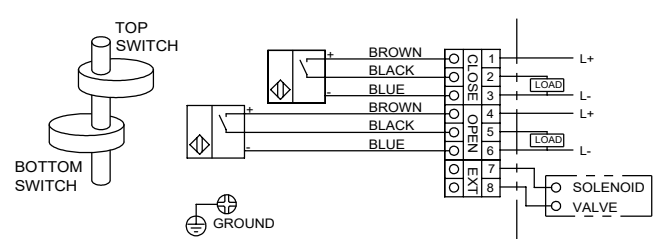
(4) SPDT SWITCHES



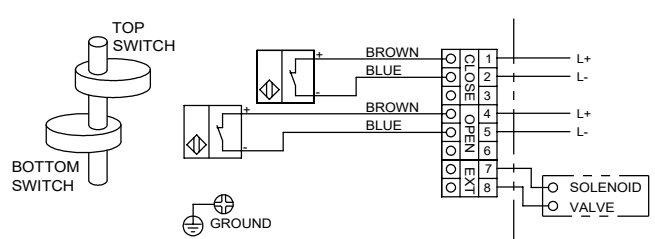
(2) DPDT SWITCHES



(2) SPDT SWITCHES
4-20mA TRANSMITTER



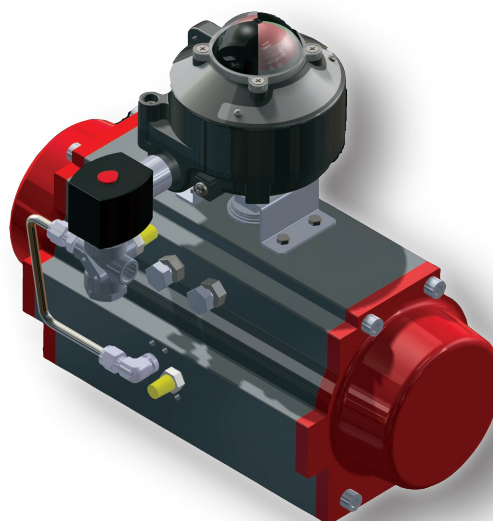
(2) P+F NBB2-V3-E2
INDUCTIVE SENSORS (PNP 3-WIRE)



(2) P+F NJ2+V3+N
INDUCTIVE SENSORS (NAMUR 2-WIRE)

Solenoid Valve Integration: APL-5 Series & ASCO Solenoid

3-Way Solenoid	- Spring Return
+EF8320G184	Brass Body
+EV8320G202	303 Stainless Steel Body
+EV8316G381V-D24	1.4 Watt Low-powered Stainless Steel Solenoid
4-Way Solenoid	- Double Acting
+EF8342G001	Brass Body
+EV8342G701	304 Stainless Steel Body



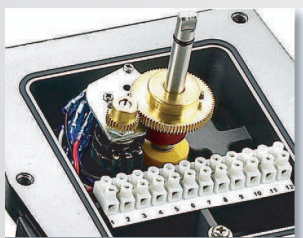
A-T Actuator Mounting

APL Mounting Code	Mounting Detail	AT Actuator Series/Sizes
20	NAMUR 30 x 80 x 20mm high pinion	3R Series: 3R20 - 3R300 S2 Series: S2-052 - S2-105 SSA Series: SS45 - SS105
30	NAMUR 30 x 130 x 30mm high pinion	3R Series: 3R500-3R3500 S2 Series: S2-125 - S2-210 SSA Series: SS125 - SS160 180 Series: 180-AL85DA - 180-AL160DA THD Series: S09
HD	THD & SY Series Heavy Duty Actuator	THD Series: S11, S13, S16, S20, S27 SY Series: S04, S05, S06
MAN	Manual Valve Mounting	

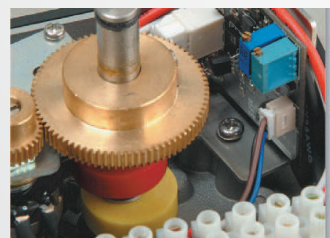
Optional Features:



3-Way Dome Indicator
Single port, T-port or L-port



Potentiometer
1k Ω Standard (Excludes APL-2)



Position Transmitter
12.5VDC to 37VDC,
4-20mA (Excludes APL-2)

How to Order APL Series

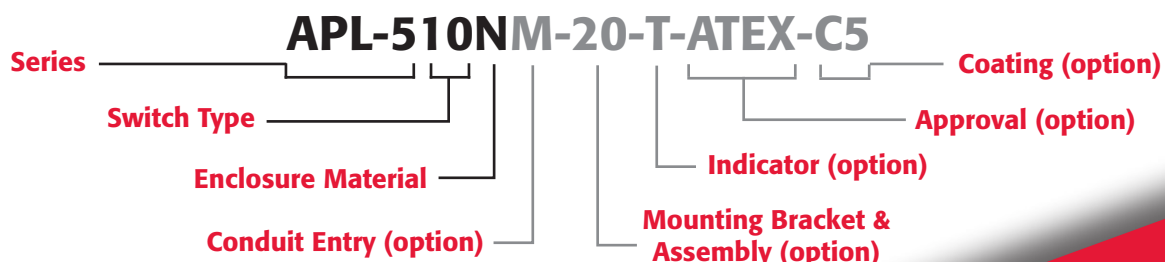
Series	Description	CSA Ratings - Max Housing	Option Availability by Series				
APL-2	CSA approved Type 4X - Compact Enclosure	5.6A, 250VAC					
APL-3	CSA approved Type 4X - Standard Enclosure	5.6A, 250VAC					
APL-4	CSA approved Type 4X, 6, 7, IP 66/67/68 - Large Enclosure	4A, 250VAC					
APL-5	CSA approved Type 4X, 6, 7, 9, IP 66/67/68 - Threaded Enclosure	4A, 250VAC	Option Availability by Series				
APL-9	Weatherproof Type 4X, IP 67 - 304 Stainless Steel housing	5.6A, 250VAC					
Switch Type	Description	Contact Ratings - Max	2	3	4	5	9
10	(2) SPDT Mechanical	16A@125/250VAC, 10A@30VDC, 0.6A@125VDC (APL-2 = 10.1A, 250VAC)	x	x	x	x	x
12	(4) SPDT Mechanical	16A@125/250VAC, 10A@30VDC, 0.6A@125VDC		x	x	x	x
14	(2) DPDT Mechanical (included on APL-4, adder on APL-5)	20A@125/250VAC, 1A@125VDC, 1HP@125VAC			x	x	
15	(2) SPDT Mechanical + Potentiometer	16A@125/250VAC, 10A@30VDC, 0.6A@125VDC		x	x	x	
16	(2) SPDT Mechanical + 4-20mA Transmitter	16A@125/250VAC, 10A@30VDC, 0.6A@125VDC		x	x	x	
18	(2) SPDT Mechanical (gold plated) - Simple Apparatus for Intrinsically Safe applications APL-2 & APL-3	0.1A@125VAC, 0.1A@30VDC	x	x	x	x	x
20	(2) Proximity Sensor (inductive), P&F NJ2-V3-N, 2-wire, NAMUR Output	8.2V nominal, 3mA nominal	x	x	x	x	x
21	(2) Proximity Sensor (inductive), Autonics PS17-5DNU, 3-wire, NPN	10-30VDC, 100mA max		x	x	x	
23	(2) Proximity Sensor (inductive), P&F NBB2-V3-E2, 3-wire, PNP	10-30VDC, 100mA max	x	x	x	x	x
25	(2) Proximity Sensor (inductive), P&F NJ2-V3-N, 2-wire, NAMUR output + Potentiometer	8.2V nominal, 3mA nominal		x	x	x	
26	(2) Proximity Sensor (inductive), P&F NJ2-V3-N, 2-wire, NAMUR output + 4-20mA Transmitter	8.2V nominal, 3mA nominal		x	x	x	
29	(2) Proximity Sensor (inductive), P&F NJ4-12GK-SN, 2-wire, NAMUR Output	8.2V nominal, 3mA nominal			x	x	
30A	(2) SPST Reed Proximity Sensor	0.5A, 200VDC, 50W max		x	x	x	x
34	(2) SPDT Reed Proximity Sensor, APH-634W	3.5A, 120VDC, 100W max (3W min)			x	x	
35	(2) SPDT Reed Proximity Sensor, APH-933W	3A, 500VDC, 100W max (3W min)			x	x	
36	(2) SPDT Reed Proximity Sensor, APH-27103	1A, 220VDC, 30W max			x	x	
Enclosure Material							
N	Model Standard; Aluminum: APL-2/3/4/5, 304 Stainless: APL-9		x	x	x	x	x
S	Stainless Steel; 316: APL-5, 316L: APL-9					x	x

OPTIONS:

Conduit Entry							
Blank	Series Standard NPT Conduit Entry	1/2 NPT on APL-2, APL-3, APL-9 3/4 NPT on APL-4, APL-5	x	x	x	x	x
M	M20x1.5	Atex/IECEx certification only	x	x	x	x	x
Mounting Bracket & Assembly (Must specify model for mounted units & separate mounting kits)							
Blank	None		x	x	x	x	x
20	NAMUR 30 x 80 x 20mm high pinion		x	x	x	x	
30	NAMUR 30 x 130 x 30mm high pinion		x	x	x	x	
HD	THD & SY Series Heavy Duty Actuator		x	x	x	x	x
MAN	Manual Valve Mounting		x	x	x	x	x
Indicator							
Blank	2 Way Dome (STANDARD), Green (Open) / Red (Close)		x	x	x	x	x
S	Single Port (Bottom Entry Valve), Green (Flow) / Red (No Flow)		x	x	x	x	
L	3 Way Dome, L-Port, Green (Flow) / Red (No Flow)		x	x	x	x	
T	3 Way Dome, T-Port, Green (Flow) / Red (No Flow)		x	x	x	x	
R	Reverse 2 Way Dome, Green (Close) / Red (Open)		x	x	x	x	
Approval							
Blank	None or CSA (series dependent)		x	x	x	x	x
ATEX	ATEX/IECEx Certified				x	x	
Coating							
Blank	None		x	x	x	x	x
C5	C5 Coating for Corrosive Environment		x	x	x	x	x

Notes:

- * Conduit plugs supplied with the switch box are for transit purposes only.
- To ensure protection, any unused conduit entry must be closed with appropriate conduit plug.
- * APL-4 minimum temperature = -40°C with switch type 29, 30A, 34, 35, 36
- * APL-5 minimum temperature = -40°C with switch type 30A, 34
- * APL-5 minimum temperature = -50°C with switch type 29, 35, 36



Triac

EX Series Limit Switches

The Triac
EX Series

hazardous location Limit Switch provides a compact design and low cost for both visual and remote electrical indication of rotary valve/actuator position. The heavy duty design and wide variety of options make the EX Series the ideal multi-purpose Limit Switch for use in NEMA 4, 4X, 7 and 9 applications.



Features:

- **Aluminum Housing:** Polyester Powder Coating
- **Twin Shaft Body Design:** The primary shaft is located in the housing base and connects to a mating shaft located in the housing cover. This twin shaft feature allows easy and accurate housing assembly by eliminating the blind-hole configuration associated with competitive switch boxes.
- **Multiple Switch Options:** Wide variety of mechanical, proximity and inductive switch options provide the most effective and economical choice for each specific application.
- **Visual Position Indication:** The 3D rotor provides high visibility confirmation of valve/actuator position. The splined retainer allows adjustment to coincide with the exact valve position.
- **"Easy-Set" Cams:** Splined, spring loaded and independently adjustable. This design offers tool-free calibration and positive vibration resistant engagement.
- **Multiple Cable Entries:** Standard with two 1/2" NPT cable entries with option for third 1/2" or 3/4" NPT cable entry.
- **Standardized Mounting:** ISO F05 mounting pattern and VDI/VDE3845 shaft
- **Options:** AS-i digital communication interface card, 3-position dribble control, 4-20mA feedback transmitter, special terminal strips, NAMUR mounting brackets.

Specifications

Temperature Range

(may vary due to switch range & approvals)

Operating temperature range DIV 1

-13°F to 176°F (-25°C to 80°C)

Operating temperature range DIV 2

-40°F to 176°F (-40°C to 80°C)

Electrical: according to switch option

Enclosure Approvals

UL and cULus, NEMA 4, 4X, 7 & 9, IP65 & 67

Switch Approvals

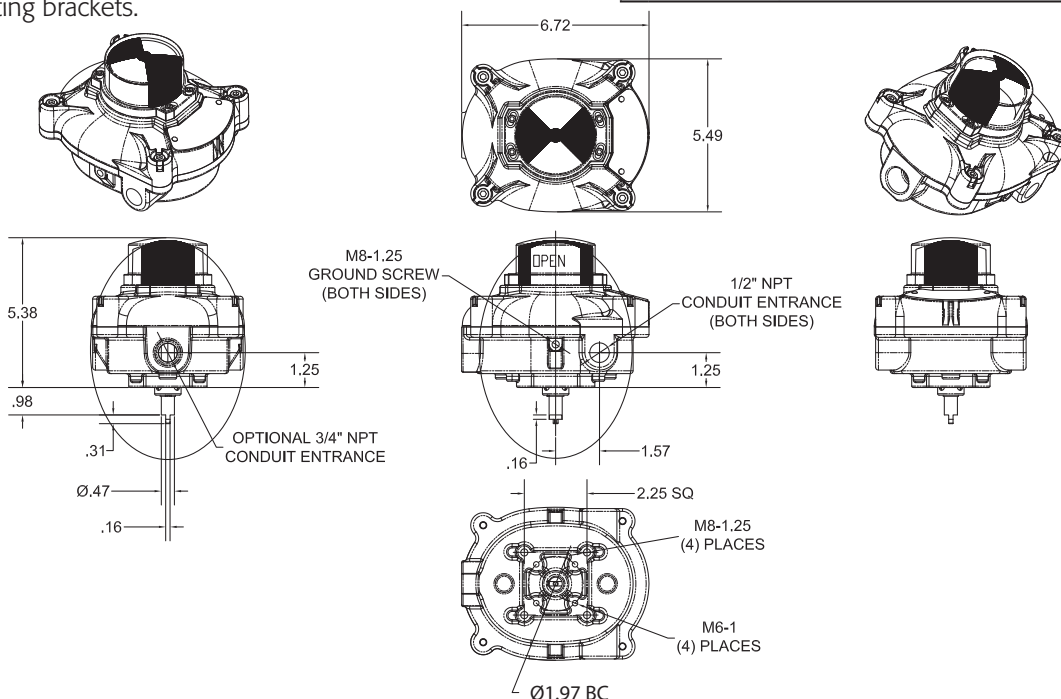
Class I Division 1 Groups C, D

Class I Division 2 Groups A, B, C, D
(proximity sensors only)

Class II Division 1 Groups E, F, G

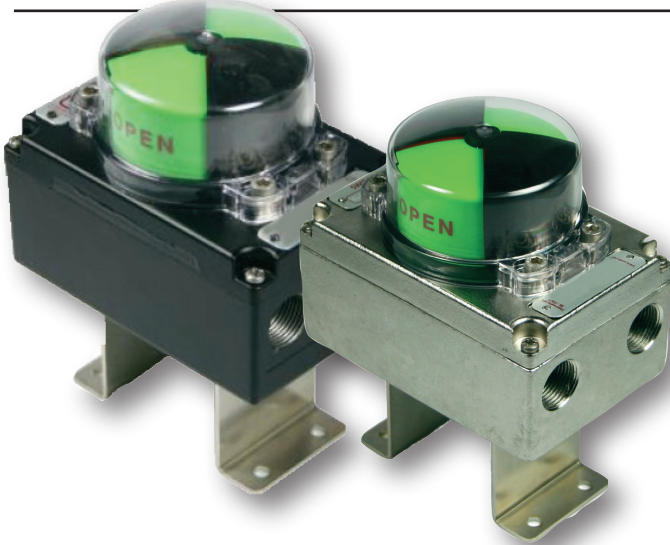
Class II Division 2 Groups F, G
(proximity sensors only)

Gold plated versions can also be used on
intrinsically safe applications.



Triac: UL Listed and Explosion Proof Limit Switches

EC/ES Series



- Available in Aluminum (EC) or 316SST (ES) Housing
- UL Listed NEMA 4, 4X, Weather Proof
- Visual indicator options
- Dual threaded conduit entries with extra terminals
- High Resolution Splined Cam
- Temperature Range: -40°F (-40°C) to 176°F (80°C)
- ISO F05 mounting pattern and VDI/VDE3845 shaft
- Available with 3-way Pneumatic valve
- Multiple options - up to three switches, various mechanical, proximity and reed type sensors, feedback potentiometers and 4-20mA transmitters, AS-i interface

EY Series



- Low Copper Aluminum Housing
- UL Listed NEMA 4, 4X, 7 & 9, Explosion Proof & Weather Proof Class I, Division 1, Groups B, C & D Class II, Division 1, Groups E, F & G
- Visual indicator with twin shaft design
- Up to four conduit entries with extra terminal options
- High Resolution Splined Cam
- Temperature Range: -40°F (-40°C) to 176°F (80°C) (T6)
- Low Temperature rating down to -76°F (-60°C) available on request (available with 1D Switch option only)
- ISO F05 mounting pattern and VDI/VDE3845 shaft
- Multiple options - up to six switches, various mechanical, proximity and reed type sensors, feedback potentiometers and 4-20mA transmitters

EW Series



- 316 Stainless Steel Housing
- UL Listed NEMA 4, 4X, 7 & 9, Explosion Proof & Weather Proof Class I, Division 1, Groups B, C & D Class II, Division 1, Groups E, F & G
- Visual indicator options with twin shaft design
- Up to four conduit entries with extra terminal options
- High Resolution Splined Cam
- Temperature Range: -40°F (-40°C) to 176°F (80°C) (T6)
- Low Temperature rating down to -76°F (-60°C) available on request (available with 1D Switch option only)
- ISO F05 mounting pattern and VDI/VDE3845 shaft
- Multiple options - up to six switches, various mechanical, proximity and reed type sensors, feedback potentiometers and 4-20mA transmitters

How To Order

UL Listed and Explosion Proof Limit Switches



Series	Description
EC	Aluminum housing, UL Listed NEMA 4/4X (Note 3)
ES	Stainless Steel housing, UL Listed NEMA 4/4X (Note 3)
EX	Aluminum housing, UL Listed NEMA 4/4X, 7, 9 (Note 1 & 3)
EY	Aluminum housing, UL Listed NEMA 4/4X, 7, 9 (Note 2 & 3)
EW	Stainless Steel housing, UL Listed NEMA 4/4X, 7, 9 (Note 2 & 3) (Low Temp option - Note 5)

Indication

1	Aluminum (SST for ES & EW) cover with Standard Red/Green indicator
2	Aluminum (SST for ES & EW) cover with 3-way "L" Port
3	Aluminum (SST for ES & EW) cover with 3-way "T" Port
4	Aluminum (SST for ES & EW) cover with 3-way Block Center
A	Aluminum (SST for ES) cover with no indication (ES or EC only)
B	Polycarbonate cover with Standard Red/Green indicator (EC only)
C	Aluminum (SST for ES) cover with disc indicator (ES or EC only)
L	Polycarbonate cover with 3-way "L" Port (EC only)
T	Polycarbonate cover with 3-way "T" Port (EC only)
Z	Polycarbonate cover with 3-way Block Center (EC only)

Switch Type

Ratings (Note 4)

0A	Mechanical SPDT Silver Plated	5amp @ 250VAC, 0.5amp @ 24VDC, resistive/inductive
0C	Mechanical SPDT Gold Plated	0.1amp @ 120VAC, resistive
0E	Mechanical DPDT Silver Plated	5amp @ 250VAC, 1/4 HP @ 125VAC, resistive/inductive
1A	Proximity Reed (w/ LED) SPST	1 amp @ 125VAC, resistive
1D	Proximity Reed SPDT (Low Temp w/ EW only - Note 5)	0.25amp @ 120VAC, 0.416amp @ 48VDC, resistive
1F	Proximity Reed DPDT (EX, EY or EW only)	0.25amp @ 120VAC, 0.416amp @ 48VDC, resistive
7J	Solid State Sensor (P&F NJ2-V3-N) (Requires IS barrier)	NAMUR 2 wire, supply voltage 8VDC (Req IS barrier)
7A	Solid State Sensor (P&F NBB2-V3-US)	2 Wire, 5 to 200mA, 20 to 140V (AC or DC)
7C	Solid State Sensor (P&F NBB2-V3-E2)	3 Wire, PNP, 5 to 100mA @ 30VDC, amplified
82	Three-way Pneumatic valve (ES or EC only)	
AS	AS-i Protocol	
DA	3-Position control w/ feedback on DA actuator (EX, EY or EW only)	3 position control + position feedback for DA actuator
DB	3-Position control w/ feedback on SR actuator (EX, EY or EW only)	3 position control + position feedback for SR actuator
DC	3-Position control w/o feedback on DA actuator	3 position control, no position feedback for DA actuator
DE	3-Position control w/o feedback on SR actuator	3 position control, no position feedback for SR actuator
TA	4-20 mA Transmitter with 2 SPDT switches	4-20mA output, 9 - 30VDC (0A switch rating)
TX	4-20 mA Transmitter	4-20mA output, 9 - 30VDC (no switches)
N1	Nova V3 Proximity SPDT Silver-oxide hermetically sealed	5amp @ 250VAC, 5amp @ 28VDC, Max inductive load 4A
N3	Nova V3 Proximity SPDT gold-bifurcated hermetically sealed	1amp @ 125VAC, 1amp @ 30VDC, Max inductive load 0.5A



Switch Quantity

0	No Switches (Use with 'TX' option)
2	Two Switches
3	Three Switches - Type 0A or OC
4	Four Switches - Type 0A (EX, EY or EW only)
5	Five SPDT Switches (for DA & DB 3-position only)
6	Six SPDT Switches - Type 0A (EY or EW only)

Terminal Strip

S	Standard terminal strip
A	AS-i terminal connection
E	Pneumatic connections (1/8") (ES or EC only)

Color/Coating

BK	Black polyester powder coated
EP	Electro-polished stainless steel (ES or EW only)

Conduit

N	1/2" NPT conduit connections
G	(2) 1/2" NPT, (1) 3/4" NPT conduit connection (EX, EY or EW only)

Mounting Bracket

-20	2R20 thru 2R300, 30-80mm - 20mm high pinion
-30	2R500 thru 2R3500, 30-130mm - 30mm high pinion
-HD	THD Series Heavy Duty Actuators

NOTE #1:

EX series has the following approval:

- Enclosure Approvals: UL and cUL, Type 4, 4X, 7 & 9, (ML FILE NO. E236166)
- Class I, Division 1 Groups C & D
- Class II, Division 1, Groups E, F & G

NOTE #2:

EY & EW series have the following approval:

- Enclosure Approvals: UL and cUL, Type 4, 4X, 7 & 9, (ML FILE NO. E236166)
- Class I, Division 1 Groups B, C, & D
- Class II, Division 1, Groups E, F & G

NOTE #3:

EC, ES, EX, EY & EW series have the following approvals:

- Enclosure Approvals: UL and cUL, Type 4, 4X, (ML FILE NO. E336774)
- Switch Approvals: UL and cUL (ML FILE NO. E236166) (Proximity Reed and Solid State Sensors only)
- Class I, Division 2, Groups A, B, C & D
- Class II, Division 2, Groups F & G

NOTE #4:

The recommended minimum load for switch type "0A", "0E", & "N1" is 50mA. All other switch types are suitable for applications as low as 1mA.

NOTE #5:

EW enclosure with 1D switch is the only combination rated to low temp applications (-76°F/-60°C).

NOTES:

*Gold plated switches are suitable for intrinsically safe applications and also hazardous locations.

*Conduit plugs supplied with the switch box are for transit purposes only. To ensure Type 4, 4X, 7 & 9 protection, any unused conduit entry must be closed with appropriate conduit plug.

Series **EX 1 0A 2 S BK N-20** Mounting Bracket

Indication

Conduit

Switch Type

Color/Coating

Switch Quantity

Terminal Strip

Special Application Limit Switches



HUBAS200EA13A

AS-i Omega, AS-i protocol with integral solenoid valve, limit switch, AS-i interface

HUBDB500GA45A

3-position dribble control system for spring return actuators

HUBDA500GA35A

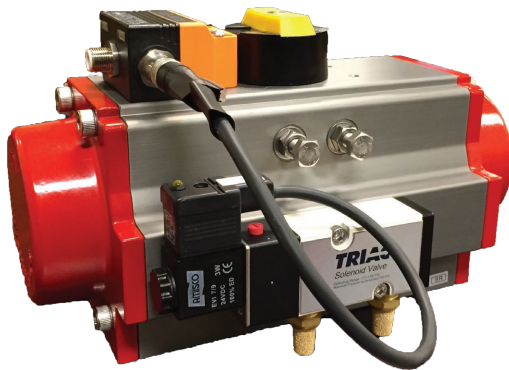
3-position control system for double acting actuators (90° or 180° rotation)



Low Pro Sandwich Style Switch

L2F14230

Low profile switch for use with other top mounted accessories



Puck Style Low Pro Switch

Available with 2 solid state sensors or with AS-i protocol



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