



ITT

Pure-Flo®

# Automation & Control



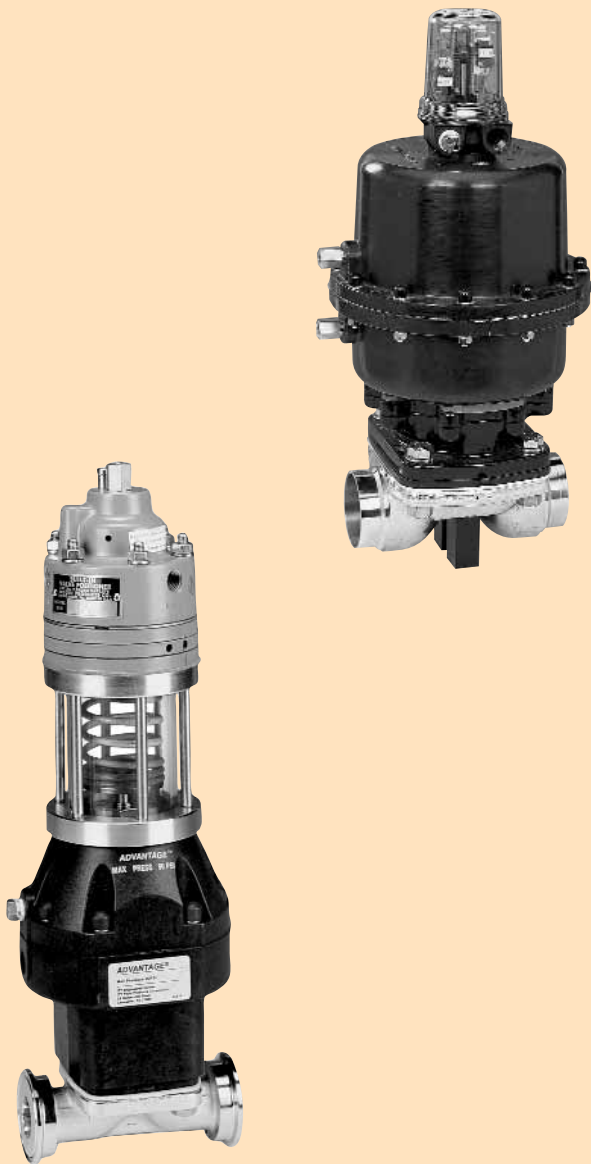
*Engineered for life*

[www.ittpureflo.com](http://www.ittpureflo.com)

# Table of Contents

Introduction . . . . .	3
Advanced Switch Package . . . . .	4-7
Value Switch Package . . . . .	8-9
Switch Package SP2 . . . . .	10-11
Pneumatic Positioner . . . . .	12
Manual Bonnet Switch Package . . . . .	13





## Introduction

Constantly increasing demands to meet regulatory, quality and production efficiency requirements has driven the Biotech and Pharmaceutical industries to rely heavily on process control systems. These systems must provide reliable and accurate feedback from the manufacturing process.

Diaphragm valves have unique operating characteristics that must be considered when utilizing feedback and control apparatus. The Pure-Flo selection of switches and positioning products are engineered and tested to provide consistent and reliable performance on Pure-Flo valves.

The worldwide network of Pure-Flo technical resources is available to assist in the specification and application of the complete line of Pure-Flo automation and control products.

## Advanced Switch Package (ASP)

The ASP is a diaphragm valve position monitoring system developed specifically for the BioPharm industry. The flexibility of the ASP will streamline installation and maintenance efforts.

The ASP offers:

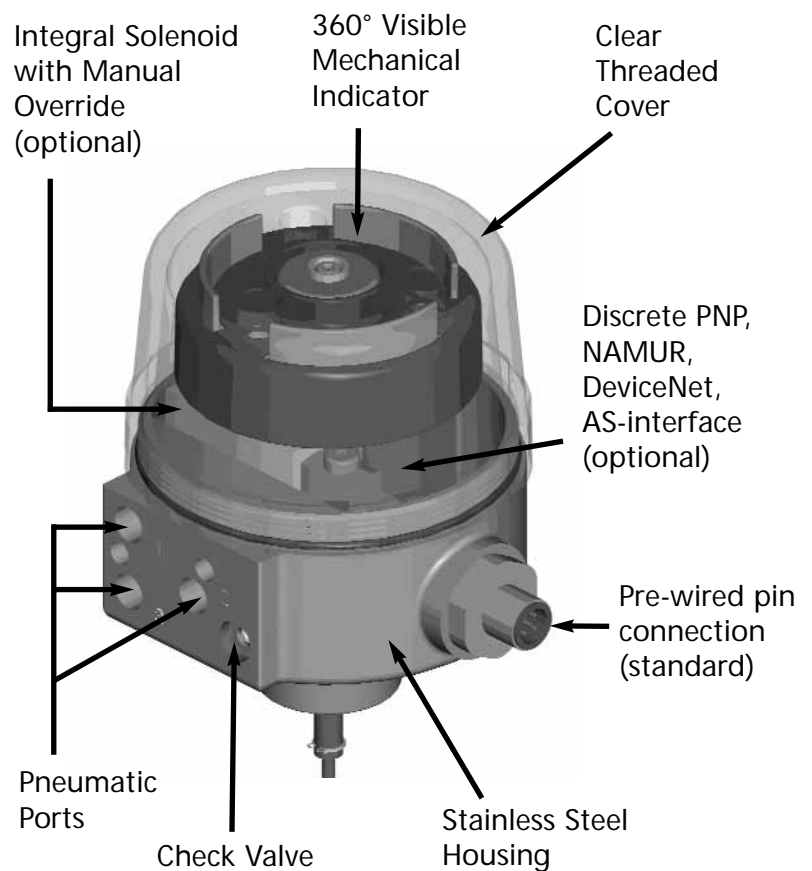
- Small dimensional envelope
- Network capability
- Maintenance friendly features
- Self calibrating targets

The ASP couples directly to the ITT Pure-Flo Advantage® or Advantage® Piston Actuator lines of pneumatic actuators. It is available in an array of configurations to meet a number of customer requirements.

When specified, the ASP uses embedded control systems to automate valves and link position feedback I/O to a Distributed Control System (DCS) or host PLC. AS-interface and DeviceNet protocols are available.

Utilizing the benefits of network architecture, the ASP allows installation costs to be reduced by eliminating costs associated with individual "home run" wiring and field connection labor.

Note: See ASP-06 brochure for more details



# ASP Specifications

## Size Range

1/4"-2" (DN 6-50)

3"-4" (DN 80-100) with adapter

## Max External Temperature

140°F (60°C)

Note: ASP is not autoclavable

## Housing Material

Housing: Stainless Steel

Cover: Polysulfone, FDA compliant

## Enclosure Ratings

Nema 4X, IP66

## Switch Selection

- PNP (3 wire) ASP-S
- Namur (2 wire) ASP-N

## Class I Div I, Groups A-G

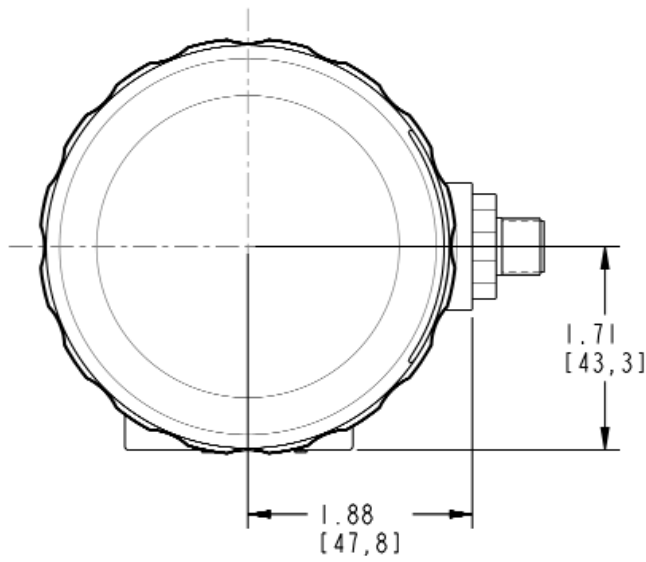
ASP-N with amplifier

## Class I Div 2, Groups A-G

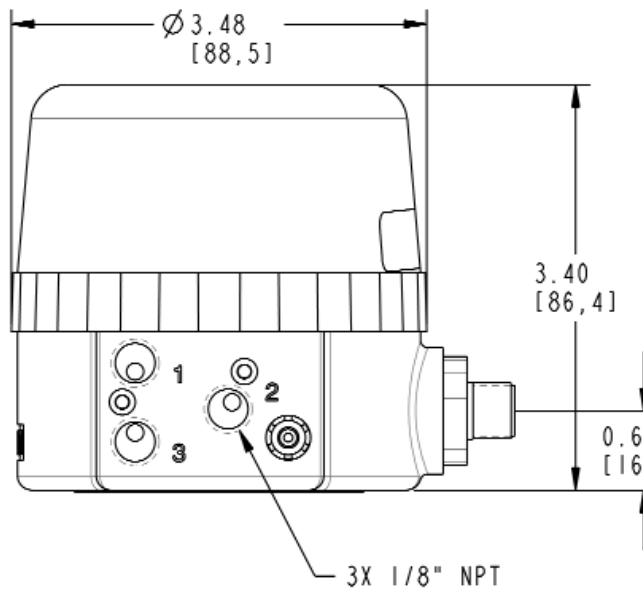
ASP-S

## Intrinsic Safety (FM Approved)

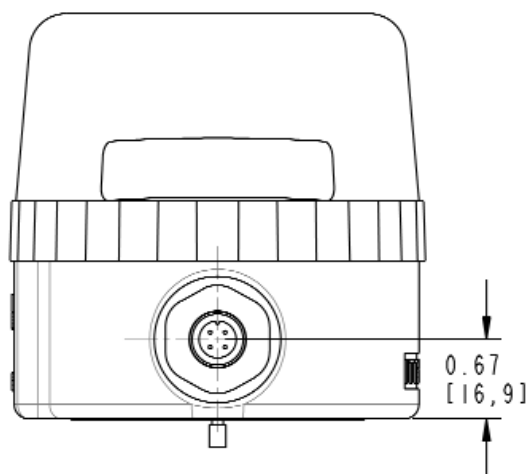
ASP-N with barrier



Top View



Side View



Side View

# ASP DeviceNet Option

DeviceNet protocol is a Controller Area Network (CAN), developed originally by the automotive industry.

Communication signals and device power are provided on a 4-wire trunk/drop network. DeviceNet easily interfaces with PLC's or higher level network protocols.

- Trunk / drop topology
- Up to 64 field devices
- Discrete device (on/off) capable
- Simple installation
- Connects easily to higher level networks
- Maximum distance: 500 meters

## Features:

- (2) inputs and (2) outputs
- PNP short-circuit protected inputs
- 0.5 amp short-circuit protected outputs
- All I/O are powered by DeviceNet
- Operating Temperature -40° to 70°C (-40° to 158°F)
- Supports explicit messaging, poll, change of state, and cyclic I/O messages.
- Self setting switches
- LED's for Open/Closed indication
- Supported baud rate: 125 kbps, 250 kbps, 500 kbps

# Solenoid Specifications

Flow Rating (Cv/Kv): .220

(255 l/m min)

Voltage: 24VDC

Power: 1 Watt

Temp Rating: 0° - 40° C

Max. Pilot Pressure: 90 psi / 6.2 bar

Max. Working Pressure: 90 psi / 6.2 bar

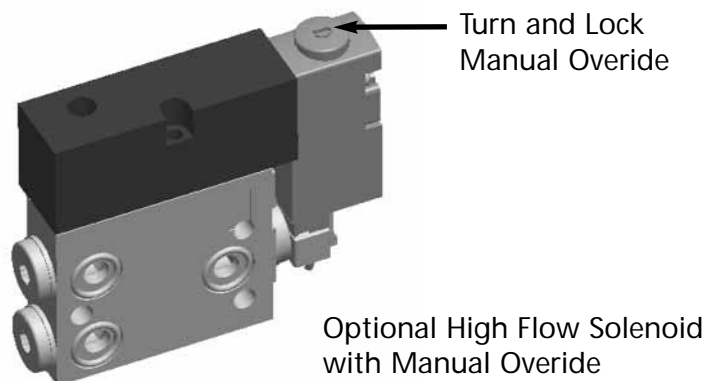
Min. Pilot Pressure: 45 psi / 3 bar

# DeviceNet Specifications:

Supply Voltage	
Bus Power	11-26 VDC (24 VDC recommended)
Internal Current Consumption	< =50 mA plus sum of sensor and solenoid currents

Input Circuits - (2) PNP 3-wire sensors	
Input Voltage	11-26 VDC
Input Short-Circuit Protection	700 mA
Input Signal Current	OFF 0-4 V, 0.05 mA
	ON 0.5 x Vbus, 1.1 mA-2.2 mA (@Vbus =24 VDC)
Input Delay	2.5 ms

Output Circuits (2) DC Actuators	
Output Voltage	18-26 VDC
Output Load Current	0.5 A each

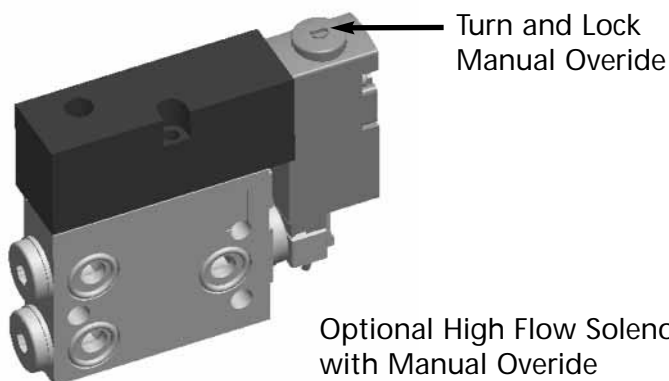


## AS-interface Specifications:

Supply Voltage	
Bus Power	20-30 VDC
Operating Current Consumption	<200 mA (from ASi network)

Input Circuits - (2) PNP 3-wire sensors	
Input Voltage	20-30 VDC
Input Short-Circuit Protection	700 mA
Input Signal Current (Input)	OFF 0-4 V, 0.05 mA
	ON 0.5 x Vbus, 1.1 mA-2.2 mA (@Vbus =24 VDC)
Input Delay	2.5 ms

Output Circuits (2) DC Actuators	
Output Voltage	18-26 VDC (from bus power)
Output Load Current	0.5 A each (from bus power)
Output current	<80 mA per output (max. 80 mA total)
AS-i version	2.1
Operating temperature	-25°... +70°C



## ASP AS-interface Option

AS-interface (ASi) is the easiest network to set up and maintain. Network topology flexibility, low installation and start up costs make the ASi a popular option for the BioPharm industry.

Communication signals and device power are provided on a single pair of wires. ASi Network topology is freeform allowing great flexibility for networking process skids.

- Most basic network protocol
- Ideal for on/off devices
- Highly resistant to electromagnetic interference
- Up to 62 field devices
- 100m max of network cable
- Small discrete-only requirements
- Simple installation
- Connects easily to higher level networks
- Baud rate: 167 kbps

### Features:

- (2) inputs and (2) outputs
- PNP short-circuit protected inputs
- 0.5 amp short-circuit protected outputs
- All of the I/O is powered by AS-interface Bus
- Self setting switches
- LED's for Open/Closed indication

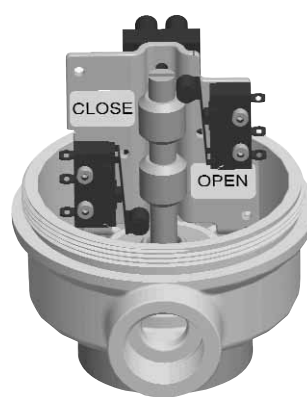
## Solenoid Specifications

Flow Rating (Cv/Kv): .220  
(255 l/m min)  
Voltage: 24VDC  
Power: 1 Watt  
Temp Rating: 0° - 40° C  
Max. Pilot Pressure: 90 psi / 6.2 bar  
Max. Working Pressure: 90 psi / 6.2 bar  
Min. Pilot Pressure: 45 psi / 3 bar

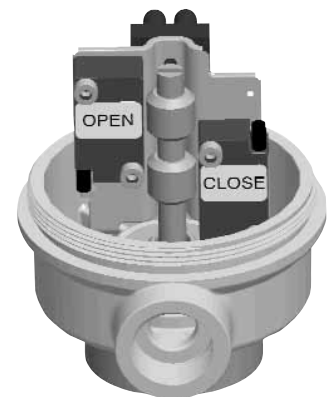
# Value Switch Package (VSP)

The VSP is a switch package engineered with cost effectiveness, simplicity and flexibility in mind. The VSP maintains a small dimensional envelope for process piping installations where space is at a premium. The VSP is offered with a complete range of mechanical switches and proximity sensors to meet your electrical and control system specifications.

The VSP is a perfect compliment to both the Advantage® and Advantage® Piston Actuator lines of pneumatic actuation.



Mechanical



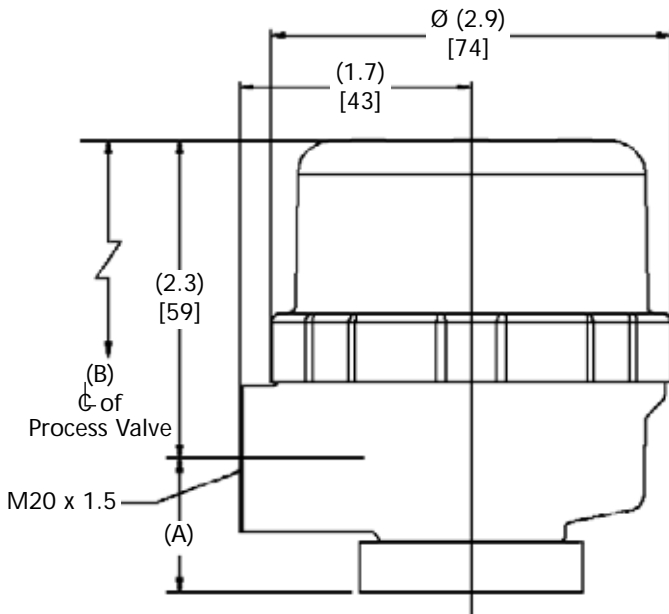
Proximity

Switch Package VSP				
Order Code	Switch Type	Switch Contact/ Output	Amperage	Voltage
VSPS48	Mechanical	Silver SPDT	6A	48 VAC/DC
VSPG30	Mechanical	Gold SPDT	100 mA	30VAC/DC
VSPZ	Proximity	2 Wire "Z"	200 mA	36 VDC
VSPN	Proximity	2 Wire Namur	1 mA	30 VDC
VSPPP	Proximity	3 Wire PNP	200 mA	36 VDC

### ATEX CERTIFICATION

Order Code	Switch Certification	Assembly Certification
VSPS48	Simple Apparatus	E <sub>2</sub> II 2 G T6 Ta: -25 to +60°C
VSPG30		
VSPN	E <sub>1</sub> II 1 G EEEx ia IIB T6 Ta: -20 to +60°C	Must be used with an approved barrier.
	E <sub>1</sub> II 2 G EEEx ia IIC T6 Ta: -20 to +70°C	

VSPG30 and VSPN (with barrier) are suitable for hazardous and explosive applications. VSPN uses Intrinsically Safe sensor technology. VSPS48 is not recommended for low current applications.



Valve Size	A		B			
			APA Actuator		Advantage Actuator	
	in	mm	in	mm	in	mm
BT	1.00	25.4	5.00	12.70	5.04	12.80
0.5	1.00	25.4	5.50	13.98	5.52	14.02
0.75	1.00	25.4	6.34	16.10	6.59	16.74
1	1.00	25.4	6.90	17.52	6.99	17.75
1.5	1.50	38.1	11.03	28.01	11.18	28.40
2	1.50	38.1	11.57	29.39	11.68	29.67

# VSP Specifications

### Size Range

1/4"-2" (DN 8-50)

### Max External Temperature

140°F (60°C)

### Housing Material

Housing: Polyamide, FDA compliant

Cover: Polysulfone, FDA compliant

### Switch Selection

- Mechanical
- Proximity

### Conduit Ports

One M20 conduit port, located radially at any position, 360° (1/2"-NPT adapter available).

### Product Ratings

#### Enclosure:

NEMA 4X, IP66

#### Class I, Div 1, Groups A-G:

VSPN with amplifier

#### Class I, Div 2, Group A-G:

VSPZ

VSPPP

#### Intrinsic Safety (FM and cCSAus, ATEX approved):

VSPN with barrier/amplifier

#### Switch Certifications

**VSPN:** CE, cCSAus, FM, ATEX

**VSPPP Sensor:** CE, cULus

**VSPZ:** CE, cULus

**VSPS48, VSPG30:** cULus

**Terminal Strip:** CE, cULus

**Wire Gauge:** 12 Gauge max. input

Note: VSP is not autoclavable

# Switch Package SP2

## Size Range

1/4"-4" (DN 8-100)

## Temperature

150°F (65°C)

## Housing Material

Upper and lower cover:  
Polyarylsulfone (PAS) Thermoplastic  
FDA compliant. Maximum temperature is 300°F (149°C).

## Switch Selection (See Chart)

- Mechanical
- Proximity

## Conduit Ports

- Two 1/2" NPT conduit ports.
- Package can be rotated at 45° increments

## Electrical Rating

Nema: Nema 4x

Ingress Protection Rating: IP66

Class I, Div 1, Groups A-G:  
SP2N with amplifier

Class I, Div 2, Groups A-G:

SP2Z

SP2P

SP2NP

Intrinsically Safety  
(FM & CSA Approved):  
SP2N with amplifier

UL and CSA Approved: Switches  
and Terminal Strip

Hermetically Sealed: Proximity  
Switches

Housing Flammability Rating:  
V0

Wire Gauge:

12 Gauge Max

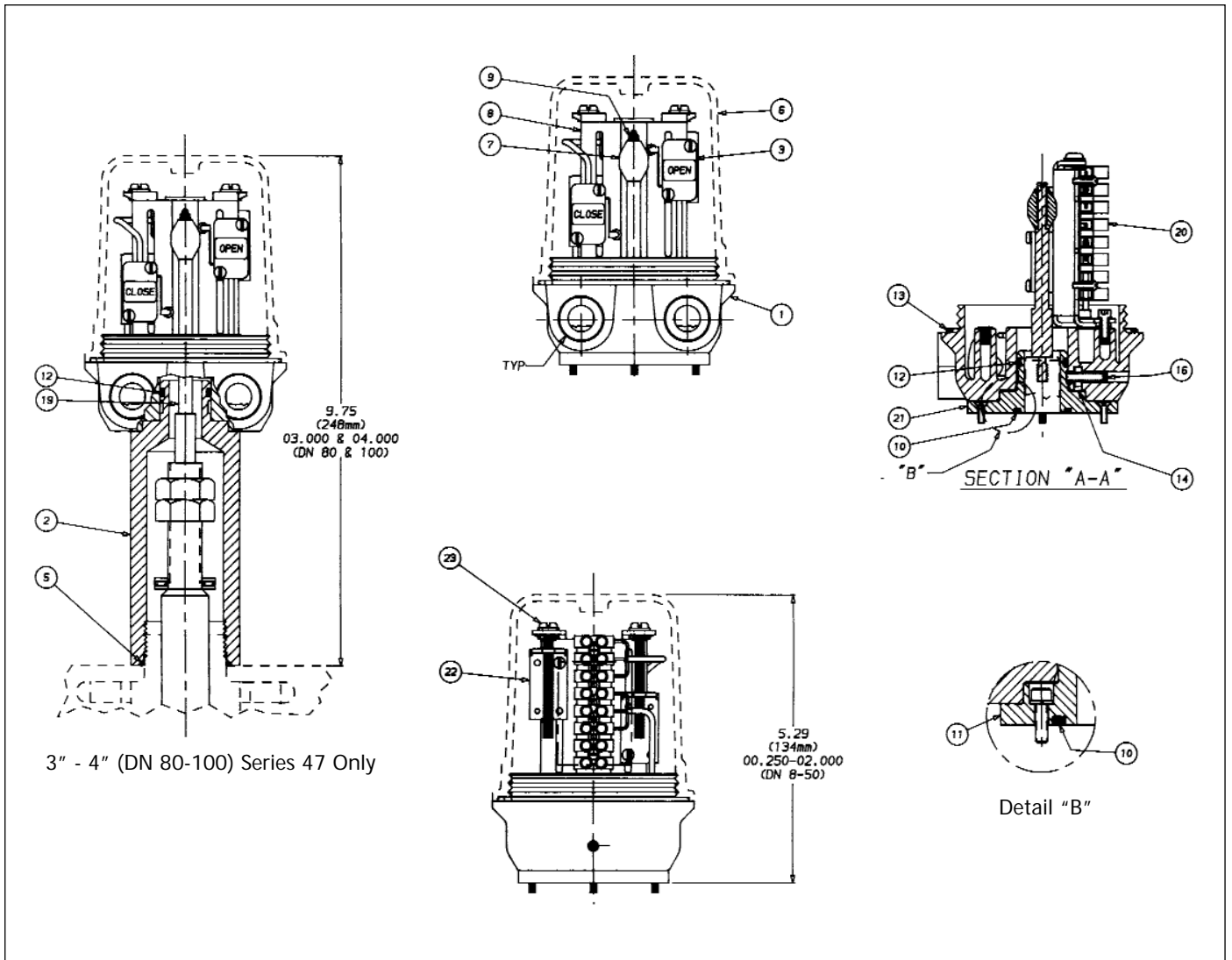
Cenelec Zones 0, 1, 2

SP2N with amplifier

Note: SP2 is not autoclavable.



Switch Package SP2				
Order Code	Switch Type	Switch Contact/ Output	Amperage	Voltage
SP2S	Mechanical	Silver	10 A	250 VAC
			250 mA	250 VDC
SP2G	Mechanical	Gold	1 A	125 VAC
SP2Z	Proximity	2 Wire "Z"	100 mA	30 VDC
SP2N	Proximity	2 Wire Namur	3 mA	24 VDC
SP2P	Proximity	3 Wire PNP	100 mA	30 VDC
SP2NP	Proximity	3 Wire NPN	100 mA	30 VDC



3" - 4" (DN 80-100) Series 47 Only

### List of Parts

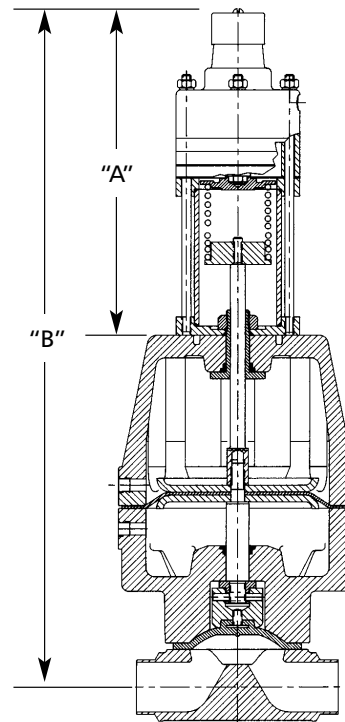
Item	Description	Material	Quantity
1'	Bonnet	Polyarylsulfone	1
1	Housing—Lower	PAS	1
2	Adapter—Switch	Stn., Stl. A-582, TY 303	1
3	Switch	—	2
4	Insulator—Switch	Nomex Aramid	1
5	"O" Ring, #128	Buna N, FDA Compliant	1
6	Housing—Upper	PAS	1
7	Actuator—Switch	Alum, B-211-6061-T6	1
8	Bracket—Switch Mtg	Stn., Stl., A-240, Series 300	1
9	Rod—Switch Actuator	Stn., Stl., A-582, TY 303	1
10	"O" Ring, #117	Buna N, FDA Compliant	1
11	Adapter—Switch	PAS	1
12	"O" Ring, #116	Buna N, FDA Compliant	1
13	"O" Ring, #152	Buna N, FDA Compliant	1
14	Nut—Square	Stn., Stl., 18-8	1
16	Screw—Hex Soc. Set	Stn., Stl., 18-8	1
19	Rod—Switch Actuator	Stn., Stl., A-582, TY 303	1
20	Terminal Strip	—	1
21	Adapter—Switch	PAS	1
22	Bracket—Adjusting	Stn., Stl., A-240, Series 300	2
23	Screw—Modified	Stn., Stl., 18-8	2

# Pneumatic Positioner

For throttling and flow control applications, the direct mounted Moore Positioner with Advantage<sup>®</sup> Actuator is a compact and reliable solution.

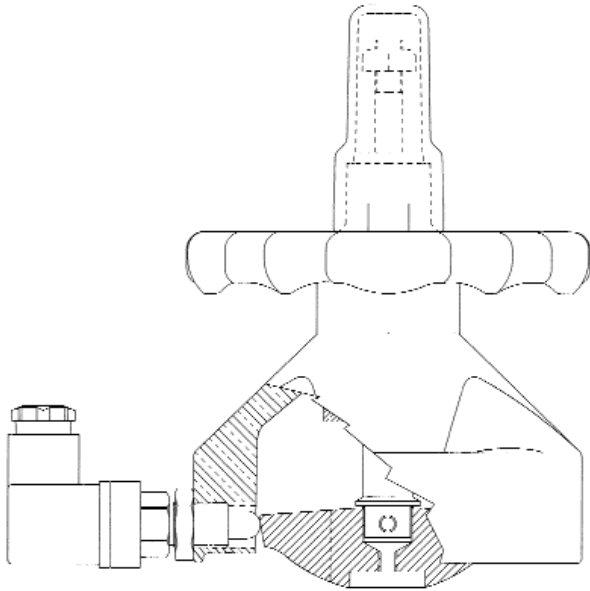
## Features:

- Pneumatic Moore 73-series positioner
- Operates on 3-15 psi (0.2-1.0 bar)
- A transducer can be adapted to handle an I/P conversion from a typical 4-20 mA
- Close-coupled design allows for direct air loading from the Moore positioner to the upper actuator chamber in Air to Open - Air to Close and Fail Open actuators
- The transparent tubing and red spring disc allows for visual position verification

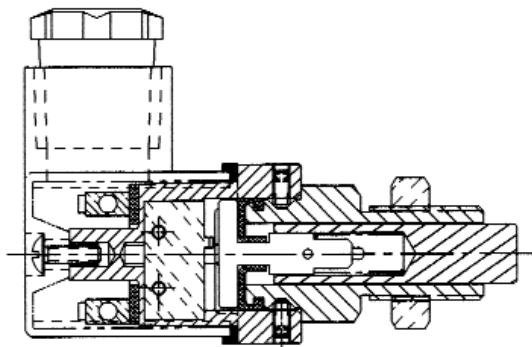


Valve Size		A		B	
Inch	DN	Inch	cm	Inch	cm
0.75	20	8.34	212	14.06	357
1.00	25	8.34	212	14.46	367
1.50	40	9.06	230	18.81	478
2.00	50	9.06	230	19.28	490
3.00 +	80	9.81	249	27.03	687
4.00 +	100	9.81	249	28.23	717

<sup>+</sup>Dimensions reflect 47 acuator



2" PAS Bonnet Assembly Closed Position



Manual Bonnet Mechanical Switch Assembly

## Manual Bonnet Switch Package

### Bonnet Configuration:

Hand wheel operated 913 and 963 bonnet assemblies

### Size Range:

0.50", 0.75", 1.00", 1.50" and 2.00"

### Enclosure Size:

2.75" L x 1.18" square

### External Housing Material:

Nylon

### Switch Voltage:

Silver Contacts - 250 vac, 5A

Gold Contacts - 30 vdc, 0.1A

### Temperature Ratings:

External -32°F to 150°F

### Washdown Capabilities:

IPA, Sodium Hypochlorite, Sodium Hydroxide, Hydrogen Peroxide, chloride detergents

### Approvals:

Enclosure - Nema 4X hosedown, IP 65

Mechanical Switch - UL/CSA

### Conduit Port:

1/2" NPT

### Terminals:

NO, NC, C

### Wire Gage:

14-20 AWG

### Adjustability:

Switch is adjustable, housing can be rotated 360° at 45° increments





For more information, please contact:

**Pure-Flo Headquarters**

33 Centerville Road  
Lancaster, PA 17603-2064 USA  
Phone +1 (800) 787-3561  
Phone +1 (717) 509-2200  
Fax +1 (800) 239-9402

Website: [www.ittpureflo.com](http://www.ittpureflo.com)  
E-mail: [pureflo.custserv@itt.com](mailto:pureflo.custserv@itt.com)

**Valve Office Locations:**

Pure-Flo  
110-B West Cochran  
Simi Valley, CA 93065 USA  
Phone +1 (800) 926-8884  
Phone +1 (805) 520-7200  
Fax +1 (805) 520-7205

Pure-Flo  
Richards Street  
Kirkham, Lancashire  
PR4 2HU, England  
Phone +44-1772-682696  
Fax +44-1772-686006

**Other Locations:**

Pure-Flo  
9625 55th Street  
Kenosha, WI 53144 USA  
Phone +1 (262) 654-6466  
Fax +1 (262) 658-0694



© 2006 ITT Industries, Inc.  
Industrial & BioPharm Group

8H.POD