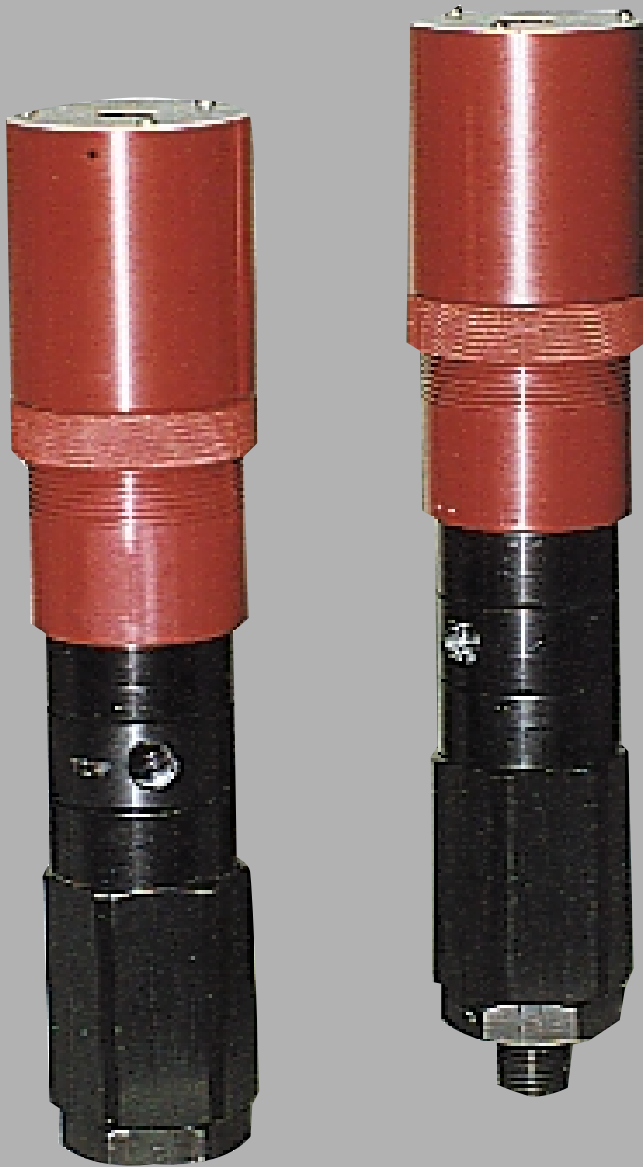


**BETTIS®**

# Pressurematic SP Pressure Pilot



  
**EMERSON™**  
Process Management

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## Description

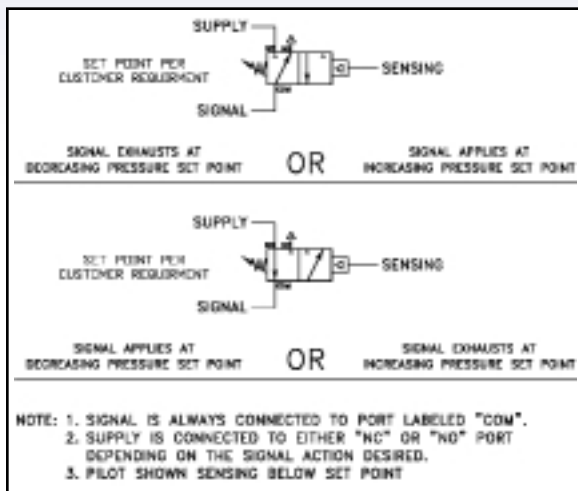
The Pressurematic SP series pressure pilot is part of the Bettis line of pressure sensory devices used to monitor input pipeline or process pressure. The pilot is suitable for use in high or low pressure shut down applications, utilizing either a pneumatic or

hydraulic signal. Pilot set points are determined by piston size and spring rate. A piston converts pressure into motion when a pre-determined set point is reached.

## Features

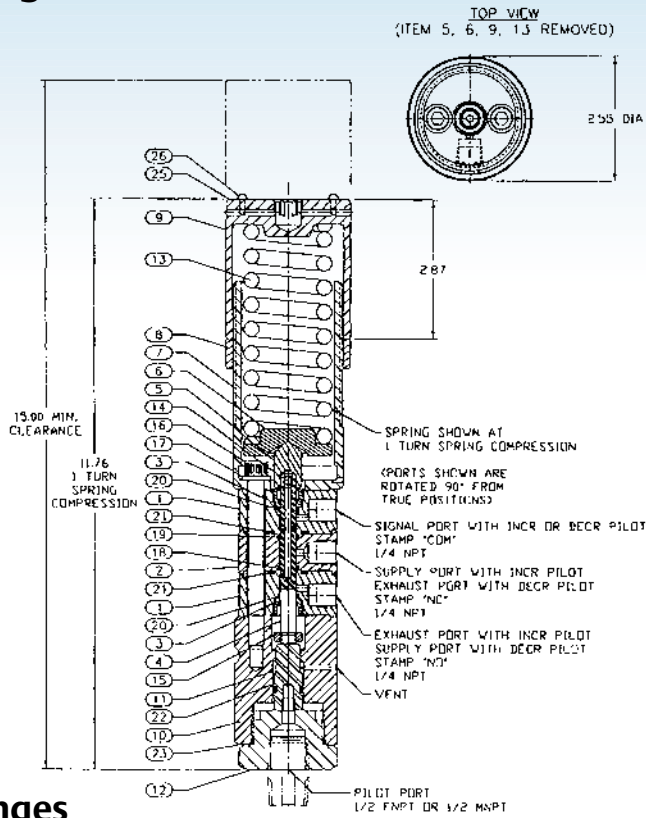
- Field adjustable high or low pressure set points
- Extended pressure sensing capability through interchangeable range springs
- Positive piston stop limits piston travel against overpressure
- Optional safety vent on sensing body, 1/8 NPT
- No brass, bronze or carbon steel parts
- Anodized aluminum body with stainless steel and aluminum internals
- Optional stainless steel sensing body and adapter
- Nitrile process seals standard, H-T fluoroelastomer seals to +250°F (+121°C), optional
- Material trim to NACE available

## Specifications



Ports:	Process – 1/2 FNPT or 1/2 MNPT Instrument – 1/4 FNPT
Media:	Process – Crude oil, gas Instrument – air, gas, hydraulic fluid
Maximum Working Pressure:	Process – 5000 PSI (340 BARg) Instrument – 1500 PSI (102 BARg)
Temperature Rating:	–50°F to +200°F (–46°C to +93°C)
Flow Coefficient (Cv):	0.023
Set Point Drift:	3%
Set Point Range:	High (increasing) 5000 psi Low (decreasing) 30 psi

# Design



Item	Description	Material
1	End Body	AL 6061-T6 ANDZ
2	Center Body	AL 6061-T6 ANDZ
3	Spool Bushing	AL 7075-T651
4	Valve Spool	SS 304
5	Spool Cap	AL 7075-T651
6	Spring Seat, Medium	SS 303
7	Spring Housing	AL 6061-T6 ANDZ
8	Locknut	AL 6061-T6 ANDZ
9	Spring Cap	AL 6061-T6 ANDZ
10	Body	AL 6061-T6 ANDZ
11	Piston, 0.625 DIA	17-4 PH
12	Adaptor, 1/2 FNPT	AL 6061-T6 ANDZ
13	Spring, Medium	SS 302
14	Lee Plug, Spool	AL 2024-T4 ANDZ
15	Jam Nut, Spool	HEXJ SS 304
16	Capscrew, Spring Housing	HXSC SS 304
17	Lockwasher, Spring Housing	HLCK SS 304
18*	O-Ring, Spool	Urethane 90A
19*	O-Ring, Center Body	Nitrile 70A MOS2
20*	O-Ring, End Body	Nitrile 70A MOS2
21*	O-Ring, End Body	Nitrile 70A
22*	O-Ring, Piston	Nitrile 70A
23*	O-Ring, Adaptor	Nitrile 70A
24*	Backup Ring, Piston (Note 1)	Nitrile 70A
25	Nameplate	AL 3003-H14
26	Drive Screw	SS 304

\* Recommended spare parts.

0.375 diameter piston o-ring uses a backup ring (24) not shown.

# Ranges

SP Series	Piston Diameter (in.)	Spring Wire Diameter (in)	Spring Rate (lb/in)	Instrument Signal Pressure (PSIG)	Range Screw Turns	N.O. Instrument Signal off with Increasing Pilot Process Pressure			N.C. Instrument Signal on with Increasing Pilot Process Pressure			
						Pilot Set Point (PSIG)	Pilot Reset Point (PSIG)	Pilot Dead Band (PSIG)	Pilot Set Point (PSIG)	Pilot Reset Point (PSIG)	Pilot Dead Band (PSIG)	
SP-20LL	1.250	0.225	Extra Light (83)	100	1	15	30	15	30	15	15	
						18	100	130	30	130	100	30
					1500	1	10	30	20	30	10	20
						18	100	135	35	135	100	35
SP-20L	1.250	0.263	Light (200)	100	1	40	60	20	60	40	20	
						10	155	190	35	190	155	35
					1500	1	35	60	25	60	35	25
						10	155	90	20	195	155	20
SP-20M	1.250	0.312	Medium (449)	100	1	70	90	20	90	70	20	
						10	320	355	35	355	320	35
					1500	1	65	95	30	95	65	30
						10	315	360	45	360	315	45
SP-20H	1.250	0.331	Heavy (631)	100	1	125	150	25	150	125	25	
						10	490	530	40	530	490	40
					1500	1	120	155	35	155	120	35
						10	490	540	50	540	490	50
SP-10L	0.625	0.312	Light (200)	100	1	175	210	35	210	175	35	
						10	625	680	55	680	625	55
					1500	1	170	230	60	230	170	60
						10	600	680	80	680	600	80
SP-10M	0.625	0.312	Medium (449)	100	1	340	385	45	385	340	45	
						10	1355	1440	85	1440	1355	85
					1500	1	320	395	75	395	320	75
						10	1330	1450	120	1450	1330	120
SP-10H	0.625	0.331	Heavy (631)	100	1	525	585	60	585	525	60	
						10	1970	2130	160	2130	1970	160
					1500	1	505	595	90	595	505	90
						10	1930	2155	225	2155	1930	225
SP-06M	0.375	0.312	Medium (449)	100	1	895	1070	175	1070	895	175	
						10	3515	3860	345	3860	3515	345
					1500	1	865	1110	245	1110	865	245
						10	3465	3945	480	3945	3465	480
SP-06H	0.375	0.331	Heavy (631)	100	1	1255	1505	250	1505	1255	250	
						10	4560	5000	440	5000	4560	440
					1500	1	1215	1560	345	1560	1215	345
						10	4500	5000	500	5000	4500	500

Notes:

1. Allow 10% deviation from tabulated values due to manufacturing tolerances and temperature affects.
2. Pilot set-points may be interpolated linearly, between 100 psig and 1500 psig instrument signal pressures.
3. Maximum deadband values listed are for maximum pilot and pneumatic signal pressure at room temperature.
4. Deadbands typically double where signal media is hydraulic fluid. Consult factory for more data.

# Model Designation

Model number format: **SP** – **N<sub>1</sub>** **L<sub>1</sub>** – option code letters, alphabetical order

Description of model number:

**SP** – Pressurematic SP Series Pressure Pilot

- instrument ports connections 1/4 NPT female for supply, signal and exhaust.
- sensing port connection 1/2 NPT female standard, other configurations as options.
- standard trim construction with aluminum body and adapter, and stainless steel piston for pilot pressures to 2160 psi, operating temperature from –50°F (-46°C) ambient to +200°F (+93°C) process.
- standard low temperature molybdenum disulphide filled nitrile and cast urethane spool o-ring seals.
- special trim construction with stainless steel body and adapter for sour applications or pilot pressures to 5000 psi.
- special trim construction with H-T fluoroelastomer piston and adapter o-ring seals, for sour process applications and/or an operating temperature from –30°F (-34°C) ambient to +250°F (+121°C) process.
- signal “on” with increasing or decreasing pilot pressure.

**N<sub>1</sub>** – Piston diameter in 1/16th inch increments:

- 06 0.375 piston diameter
- 10 0.625 piston diameter
- 20 1.250 piston diameter

**L<sub>1</sub>** – Spring rate class:

- LL extra low 0.225 diameter wire
- L low 0.263 diameter wire
- M medium 0.312 diameter wire
- H high 0.331 diameter wire

**Option code letters:**

- C Stainless steel sensing body and adapter for sour applications or pilot pressures to 5000 psi
- D Adapter connection 1/2 NPT female
- E 1/8 NPT female body vent connection
- F H-T fluoroelastomer piston and adapter o-ring seals for –30°F (-34°C) to + 250°F (+121°C) or sour process applications

**Example:**

“SP-10M-C” designates Pressurematic SP Series Pilot with 0.625 diameter piston and medium spring, stainless steel sensing body and adapter for sour applications or pilot pressures to 5000 psi, aluminum sensing body and adapter with low temperature nitrile o-ring seals, and 1/2 NPT male adapter connection.

[www.EmersonProcess.com/Bettis](http://www.EmersonProcess.com/Bettis)

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