

Smart Press

PST...-R ELECTRONIC PRESSURE SWITCHES

PRODUCT DATA



APPLICATION

Honeywell FEMA's PST...-R series Electronic Pressure Switches are suitable for an extremely wide range of applications, including the precision-adjustment and monitoring of system pressures in the field of plant construction, fluidics, process technology, and pneumatics, as well as in the monitoring and control of pumps and compressors. They can be adjusted (configured and parameterized) in two levels (the basic and the expert level).

Featuring monitored sensors with a standardized warning output, these devices are suitable for use in manufacturing lines in the automotive industry as well as in machine tool construction and building automation. The PST..A...-R versions (with absolute pressure sensor) are designed specifically for monitoring steam systems. The switches provide sufficient accuracy (0.5% of final value) for measurement monitoring in many laboratory applications.

FEATURES

- Precise pressure monitoring
- Corrosion-resistant stainless steel sensor
- Rugged electronics
- Suitable for outdoor use
- High accuracy and stability
- Fast response time
- Plug connectors
- Versions for high viscosity media
- Variable configurations for open-collector outputs
- Max. / min. value memory
- Combined bar graph and digital value display
- Versions with absolute pressure sensors

SPECIFICATIONS

Sensor

Pressure ranges	-1 ... 600 bar (versions: see Table 3)
Burst pressure	See Table 3
Dimensions	See section "Dimensions" on pg. 4.

Parts in contact with medium

High-pressure versions	1.4571 + 1.4542
Low-pressure / flush	1.4571 + 1.4435
Housing and back	polybutylene terephthalate (PBT)

Process connection (versions: see Table 3)

Manometer connection	G1/2" external thread
Flush connection	G3/4" external thread
Temperature, medium	-20...+100 °C

Storage and operating conditions

Max. ambient temp.	-20...+50 °C (+60 °C < 30 VDC)
Storage temperature	-35...+80 °C
Relative air humidity	0...95%, non-condensing

Accuracy and drift

Accuracy, total	0.5% of final value
Medium temp. drift	0.3% per 10 K (0.5% per 10 K in case of 250/400/600 mbar)

Electrical Specifications

Power supply	24 VDC (15...36 VDC), 600 mA
Power consumption	< 1 W
Protection class	II as per EN 60335-1
Protection type	IP65 as per EN 60529 (see section "Accessories")
Climate class	C as per DIN IEC 60654
Connectors	Two 5-prong M12 connectors, A-coded, as per DIN IEC 60947-5-2 and additional 3-prong M12 connector, B-coded
EMC	compatible as per EN61326/A1

Outputs of connector 1 (2 open-collector outputs)

Max. load 250 mA / 14...36 VDC
 Reaction time 30 ms
 Configurable as high-side / low-side or as push-pull switches
 Switching difference configurable (SP and RP)

Outputs of connector 2

Diagnostic output ("WARN" output)

Max. load: max. 20 mA, 14...36 VDC

Transmitter output (analog)

Configurable in EXPERT level
 Voltage / current: 0...10 V, +10 mA (4...20 mA at 500 Ω)
 transient response approx. 300 ms

Relay output of connector 3

Contact type 1 switch-over contact, potential-free (SPDT)
 Min. electrical lifetime 250,000 switching cycles
 Contact material AgSnO₂+Au (gold plated silver contacts)

Switching performance (intact gold plating)

AC1 (resistive) 1.5 VA (24 VDC / 60 mA, < 230 VAC / 6.5 mA)
 AC15 (inductive) unsuitable
 Max. switch-on current 60 mA for < 5 ms
 Min. switching perf. 50 mW (either > 5 V or > 2 mA)

Switching performance of contact base (gold plating not present)

AC1 (resistive) 690 VA (230 VAC / 3 A)
 AC15 (inductive) 230 VA (230 VAC / 1 A)
 Max. switch-on current 30 mA for < 5 ms
 Min. switching perf. 500 mW (either > 12 V or > 10 mA)

NOTE: Power can be supplied either via connector 1 or via connector 2.

Accessories

In order to meet the requirements of the IP65 protection rating as per EN 60529, unused connectors must be fitted with STA12 protective caps (not incl. in the shipment; must be ordered separately):

- ST12-5-A: A-coded 5-prong M12 female angled connector, for connectors 1 and 2.
- ST12-4-A: B-coded 4-prong M12 female angled connector, for connector 3 (relay).
- STA12: Protective caps, for unused connectors.
- Factory setting of parameters and configuration.
- K430D siphon for high temperature media.
- U430B siphon for high temperature media.

FUNCTION

The PST...R Electronic Pressure Switches are screwed directly into the pressure line. When monitoring gaseous media and low-viscosity liquids, a G1/2" standard manometer connection can be used. In the case of high-viscosity and semi-liquid media, a G3/4" (flush) process connection must be used.

The LCD display screen indicates the pressure as a 4-digit digital value and as an analog value (bar graph).

Two LED's provide information on the switching status of the outputs and on the alarm status.

OUT1 and OUT2 (which are open-collector outputs) can be configured to monitor pressures as maximum, minimum, or window supervision. OUT2 can additionally be used as a "WARN" output.

OUT1 and OUT2 can be configured as N.O. or N.C. or SPDT (C.O.) contacts connecting to FSO or ZERO. All configurations can be reversed by changing the configuration from N.O. to N.C. or vice-versa. See also Table 1.

HARDWARE

The electronic pressure switches of this series provide switching and transmitting functionality, but also a relay output. See also Fig. 1.

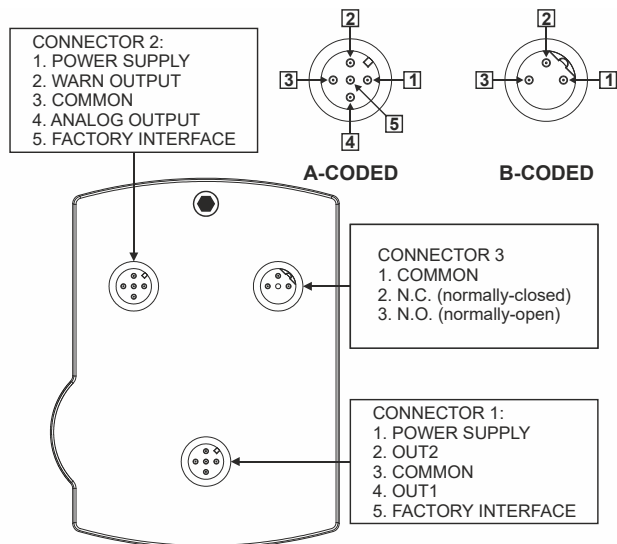


Fig. 1. PST...-R Series, rear view of housing

Table 1. Potential of outputs in dependence upon their configuration and status

symbols in display	configuration	output signal	
		active	inactive
FSO,	N.O. high-side	FSO	floating
ZERO,	N.O. low-side	ZERO	floating
FSO,	N.C. high-side	floating	FSO
ZERO,	N.C. low-side	floating	ZERO
ZERO, FSO,	push-pull	FSO	ZERO
ZERO, FSO,	inv. push-pull	ZERO	FSO

N.O. = normally-open; N.C. = normally closed

The pressure switches are protected by internal functions. If a fault is detected, the WARN output will become active. The WARN output is switched as N.C. to FSO. If a fault is detected, both LEDs are lit red and the "WARN" symbol appears in the display. The following are potential reasons for the appearance of the "WARN" symbol:

- Power supply voltage drops below critical level
- Sensor defect
- Operation outside of the permitted temperature range
- Overload of OUT1 / OUT2

The device is configured and parameterized using the large rotary/push button. The user can move from screen to screen

and enter values and/or change configurations by rotating the button. Values and configurations are confirmed and/or stored by pressing this button.

Configuration and parameterization are performed in two separate levels. If a 4-digit code is set, after the time-out (1 min), the unit is locked against modification by unauthorized persons.

Basic Level (Parameterization)

Allows parameterization of the outputs. Settings remain visible even if locked.

OUT1, OUT2, and AOUT

- If locked, can be unlocked (in the expert level; see below) by entering the 4-digit code.
- Setting of a filter value in a range of 0...95% (ATT).

OUT1 and OUT2

- Adjustment of the switch-points (SP) and reverse switch-points (RP).

AOUT

- Adjustment of the lower (ZERO) and upper (FSO = "full-scale output") reference values for limiting the analog output signal to a defined pressure range.

Sensor

- Setting of simulation (if SIM mode is ON).
- ATT signal delay.
- Min. / max. values.

Expert Level (Configuration)

Allows configuration of the outputs. If the unit is locked (by setting a 4-digit code, 0001 to 9999; 0000 = no code), the configuration settings will not be visible.

OUT1 (Connector 1)

- Max. monitor / min. monitor / window monitor.
- Normally-open or normally-closed open-collector (to FSO or ZERO) – see also Fig. 2.
- Low-side/high-side open-collector as push-pull switch (to FSO and ZERO - direct / reverse).

OUT2 (Connector 1)

- Max. monitor / min. monitor / window monitor / output.
- Normally-open or normally-closed open-collector (to FSO or ZERO) – see also Fig. 2.
- Low-side/high-side open-collector as push-pull switch (to FSO and ZERO - direct or reverse).

Analog Output (Connector 2)

- 0...10 V / 10...0 V or 4...20 mA / 20...4 mA output (default setting: 0...10 V).
- Pressure range adjustable in basic level.

Additional Configuration

- Relay output configurable to be coupled with OUT1, OUT2, or the warning output.
- Selection of the pressure units (bar, Pa, or psi) in the UNIT display.
- Data restorable using the REST command.
- Simulation mode:
 - SIM-: Simulation mode is OFF.
 - SIM1: Using the rotary/push button, the pressure is simulated over the entire range.
 - SIM2: The outputs switch alternately to test the installation's reaction time in the range of from 4 times per second (corresponding to 0%) to once every 16 seconds (corresponding to 100%).
- The LCD display's backlighting can be switched from "ON continuously" ("LCD+" shown in display) to "turned OFF when the rotary/push button has not been operated for 30 sec" ("LCD-" shown in display).
- Electronic drag indicator (appears in the LCD display as a dotted arrow) for indicating the max./min. pressure. After pressing the rotary/push button, the user can (in the EDIT mode) read off the elapsed time (in hours and minutes; resolution: 1 minute) between the event and the present time.

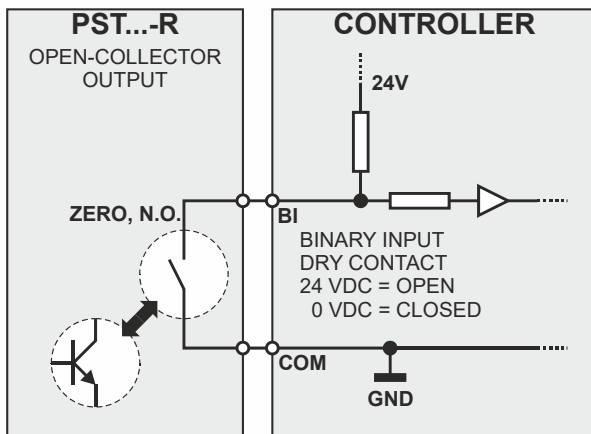


Fig. 2. Example configuration (N.O. open-collector to ZERO)

DIMENSIONS

The device is connected to the pressure-side via a G1/2" standard manometer threaded connection or a G3/4" flush process connection (see fig. below). The geometry of the G1/2" and G3/4" connections conforms to DIN EN 837.

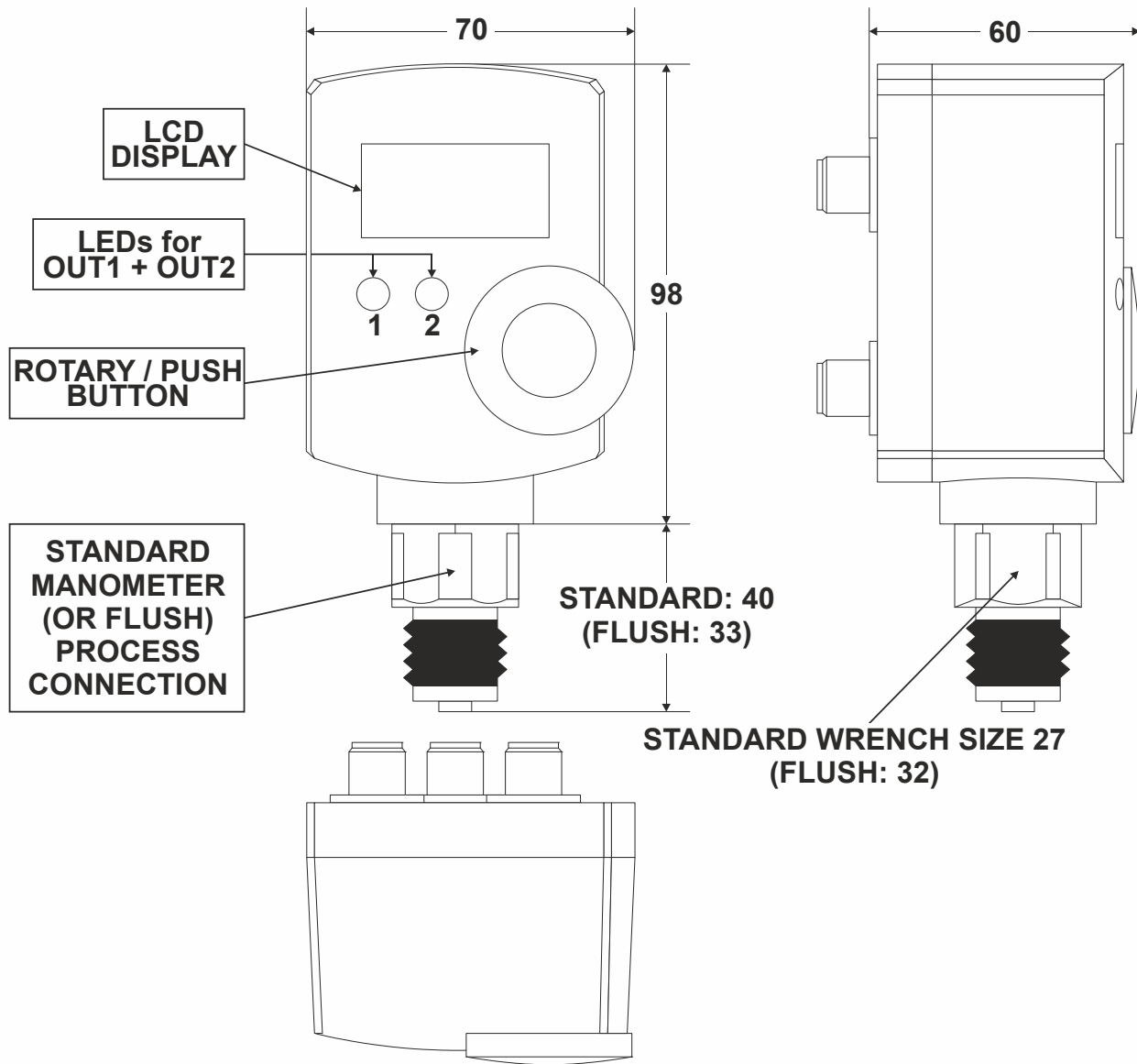


Fig. 3. Dimensions (mm)

PRODUCT IDENTIFICATION SYSTEM

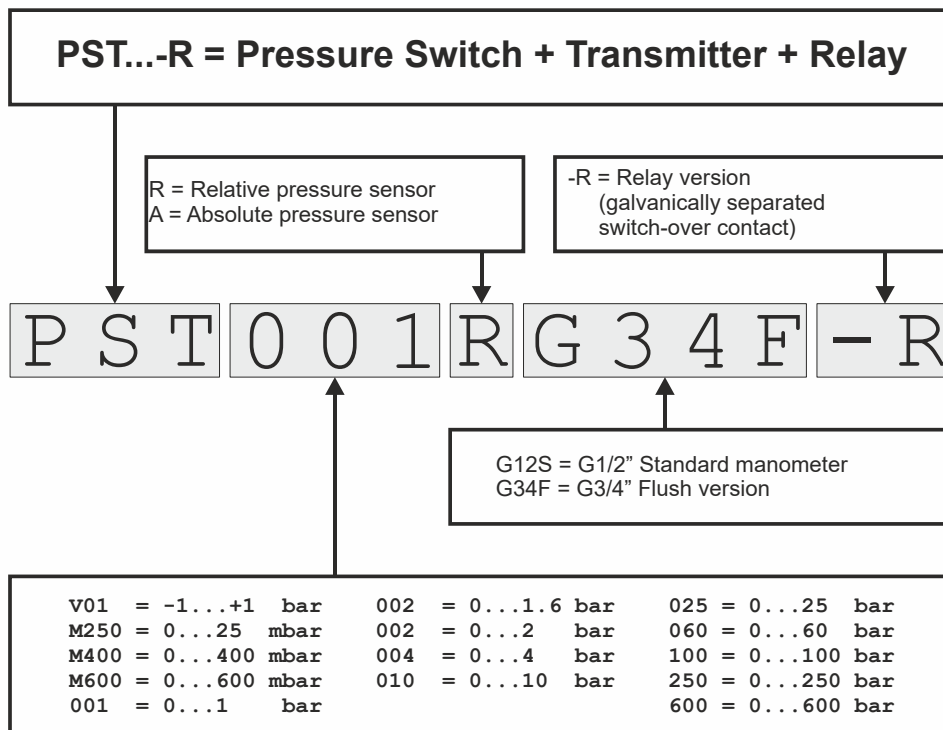


Fig. 4. Product identification system

TERMINOLOGY

Table 2. Abbreviations and their meanings

Abbr.	Explanation	Notes
SP	Setpoint, switch point	
RP	Reset point, reverse switch point	
SPDT	Single-pole double-throw changeover contact (C.O.)	
SPST	Single-pole single-throw contact	
N.O.	Normally-open	
N.C.	Normally-closed	
ZERO	Binary "low" voltage (< 1 V)	
FSO	Full-scale output, binary "high" voltage (> 12 VDC; 10 V at AOUT)	
AOUT	Analog output	
OUT1	Open-collector output 1 (binary)	
OUT2	Open-collector output 2 (binary)	
WARN	Binary output for fault indication	

PRESSURE RANGES

Table 3. Pressure ranges, connection, and equipment of models

pressure range (bar)	type of pressure	bursting pressure (bar)	max. pressure (bar)	temperature drift (%/10 K)	process connection	equipment
						switch, transmitter, and relay
-1...+1	relative	≥ 10	6	0.3	G1/2"	PSTV01RG12S-R
0...0.25	relative	≥ 10	1	0.5*	G1/2"	PSTM250RG12S-R
0...0.4	relative	≥ 10	2	0.5*	G1/2"	PSTM400RG12S-R
0...0.6	relative	≥ 10	2	0.5*	G1/2"	PSTM600RG12S-R
0...1	relative	≥ 10	6	0.3	G1/2"	PST001RG12S-R
0...1.6	relative	≥ 10	6	0.3	G1/2"	PST002RG12S-R
0...4	relative	≥ 20	12	0.3	G1/2"	PST004RG12S-R
0...10	relative	≥ 50	30	0.3	G1/2"	PST010RG12S-R
0...25	relative	≥ 125	75	0.3	G1/2"	PST025RG12S-R
0...60	relative	≥ 300	180	0.3	G1/2"	PST060RG12S-R
0...100	relative	≥ 500	300	0.3	G1/2"	PST100RG12S-R
0...250	relative	≥ 1600	500	0.3	G1/2"	PST250RG12S-R
0...600	relative	≥ 1800	1000	0.3	G1/2"	PST600RG12S-R
-1...+1	relative	≥ 10	6	0.3	G3/4"	PSTV01RG34F-R
0...0.25	relative	≥ 10	1	0.5*	G3/4"	PSTM250RG34F-R
0...0.4	relative	≥ 10	2	0.5*	G3/4"	PSTM400RG34F-R
0...0.6	relative	≥ 10	2	0.5*	G3/4"	PSTM600RG34F-R
0...1	relative	≥ 10	6	0.3	G3/4"	PST001RG34F-R
0...1.6	relative	≥ 10	6	0.3	G3/4"	PST002RG34F-R
0...4	relative	≥ 20	12	0.3	G3/4"	PST004RG34F-R
0...10	relative	≥ 50	30	0.3	G3/4"	PST010RG34F-R
0...25	relative	≥ 125	75	0.3	G3/4"	PST025RG34F-R
0...2	absolute	≥ 10	6	0.3	G1/2"	PST002AG12S-R
0...10	absolute	≥ 50	30	0.3	G1/2"	PST010AG12S-R
0...2	absolute	≥ 10	6	0.3	G3/4"	PST002AG34F-R
0...10	absolute	≥ 50	30	0.3	G3/4"	PST010AG34F-R

NOTE*: Due to their design, depending upon their installation orientation, the weight of the diaphragm and of the filling medium in the sensors of the PSTM... series can have an effect on measurement values of up to 0.5% FS. The devices are all calibrated in the vertical position; in other orientations, deviations in measurement values are therefore possible. For this reason, vertical installation (i.e. with the device positioned vertically above the connection pipe) is to be preferred. In the event that devices of the PSTM... series are installed in a horizontal position, they can be zeroed using the integrated zeroing function ("SET0" shown in the display) prior to initial operation.

