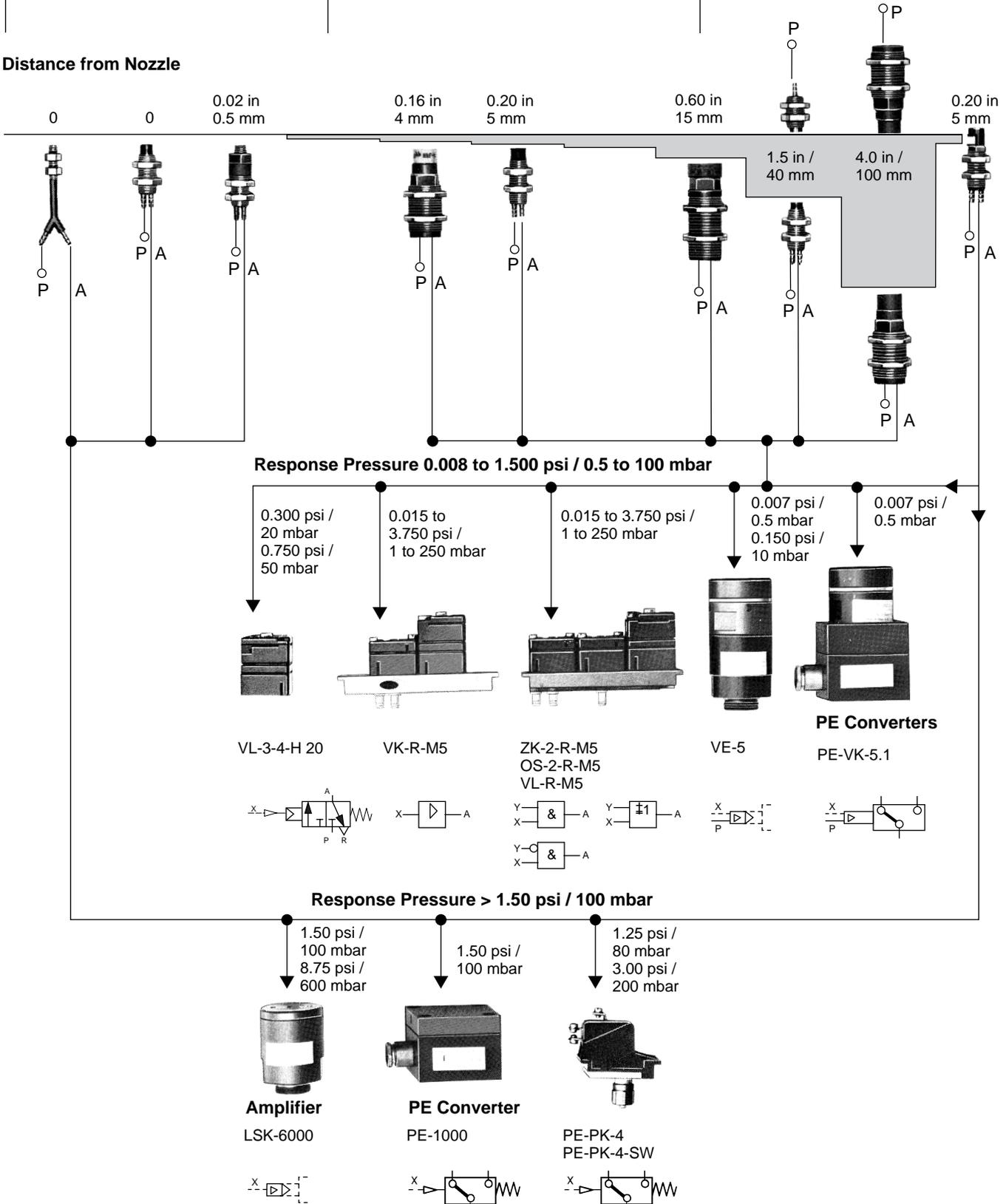


# Non-Contact Pneumatic Sensors

## Overview

Back Pressure Sensors			Reflex/Proximity Sensors			Air Barrier Sensors		
SD-2	SD-3	SD-3-N	RFL-4	RML-5 RML-4.8-S	RFL-15	SML-40 S SD-3	SFL-100 S SFL-100 F	SFL-6

### Distance from Nozzle

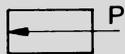


# Non-Contact Pneumatic Sensors

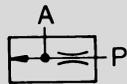
## Back Pressure Sensors

### Back Pressure End Stop

Type SD-2

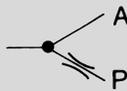


Type SD-3



### Barbed Restrictor Y-Connector

Type Y-PK-3-D



### Mounting Block for SD-3

Type SDA-12 x 1-B

Back pressure sensors are used as limit switches and end stops to transmit signals dependent upon distance.

Type SD-3 can be used as an air barrier sensor in combination with the SML-40-S ejecting nozzle. See page 200.

These devices are especially suited for limit sensing and positioning control where a high degree of accuracy is required and where available operating forces are minimal. Because of their small size, they can be used in inaccessible areas at varying ambient temperatures and in a dirty atmosphere.

The mounting block, Type SDA-12 x 1-B, securely holds the SD-3 when it is used as a limit stop (end stop).

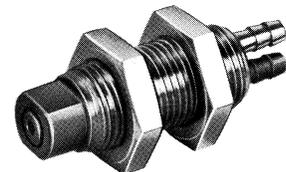
Type Y-PK-3-D



Type SD-2



Type SD-3



The back pressure sensor is connected to the compressed air supply at connection P (black). With the valve in open position, the air flows outward. If the nozzle is blocked, a signal appears at outlet A (yellow), which may reach as high as the supply pressure. The signal will remain as long as the nozzle is blocked.

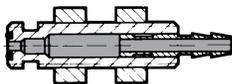
The back pressure sensor, Type SD-2, is used with a separate air supply throttling system. The restrictor Y-fitting, Type Y-PK-3-D, may be used for this purpose (connection P with 0.016 in / 0.4 mm throttle block, connection A yellow).

The following measures are recommended to reduce air consumption:

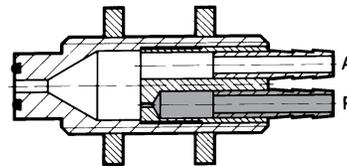
- Supply the back pressure nozzle with compressed air only if a signal is to be generated.
- Install a needle valve in air line P if the pressure is greater than 45 psi / 3 bar.

If the signal pressure from the sensor does not equal the actuating pressure required for the downstream unit, a pressure amplifier must be used.

Type SD-2



Type SD-3



P = Supply  
A = Outlet

Order Number	Part No./Type	7455 SD-2	4498 SD-3	7456 Y-PK-3-D	11541 SDA-12 x 1-B
Medium		Compressed air (filtered, lubricated or unlubricated)			
Mounting		M6 with mounting nuts	M12 x 1 with mounting nuts	Tubing connections	Through holes
Mounting Hole Diameter		0.26 in / 6.5 mm	0.5 in / 12.5 mm		
Connection		Barbed fitting for 3/16 in / 3 mm tubing			
Orifice Size		0.098 in / 2.5 mm (throttle 0.016 in / 0.4 mm)			
Supply Pressure Range at P*		0 to 120 psi / 0 to 8 bar			
Signal Pressure Range at A		See graphs on page 226			
Air Consumption		See graphs on page 227			
Min. Closing Force		8.9 psi / 0.615 bar x supply pressure	12 psi / 0.83 bar x supply pressure		
Ambient Temperature		-40 to +212°F / -40 to +100°C†		14 to 140°F / -10 to +60°C	
Design		Nozzle, no moving parts			
Material		Stainless steel (face-hardened), brass. Seals: Buna N.		Brass, plastic	Steel, galvanized
Weight		0.015 lb / 0.007 kg	0.044 lb / 0.020 kg	0.011 lb / 0.005 kg	0.265 lb / 0.120 kg

\*14 to 140°F / -10 to +60°C

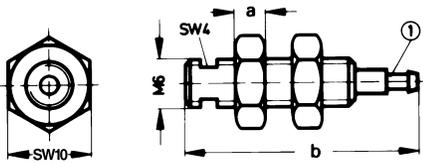
† Depending on tubing used.

# Non-Contact Pneumatic Sensors

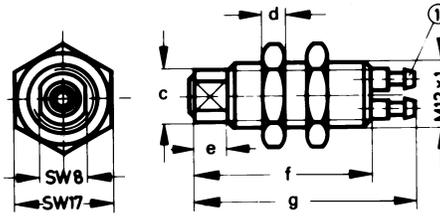
## Dimensions and Mounting Hardware

# FESTO

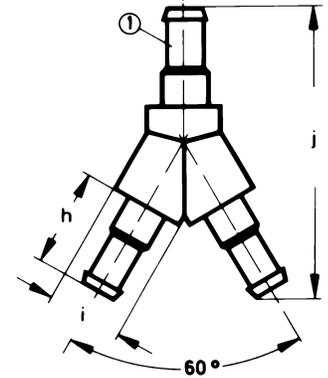
Type SD-2



Type SD-3



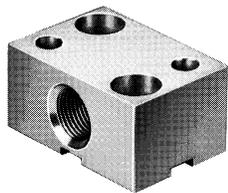
Type Y-PK-3-D



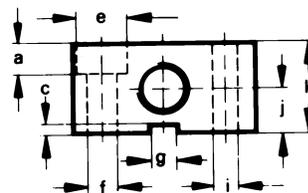
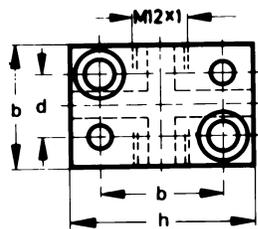
### Dimensions

- a 0.20 in / 5 mm
  - b 1.16 in / 29.5 mm
  - c 0.39 in / 10 mm
  - d 0.16 in / 4 mm
  - e 0.24 in / 6 mm
  - f 1.26 in / 32 mm
  - g 1.58 in / 40 mm
  - h 0.33 in / 8.5 mm
  - i 0.26 in / 6.5 mm
  - j 1.00 in / 25.5 mm
- ① Barbed fitting for 3/16 in / 3 mm tubing, connection P black, connection A yellow  
SW = wrench size, mm

### Mounting Block, Type SDA for Back Pressure Sensors, Type SD



Type SDA-12 x 1-B



### Dimensions

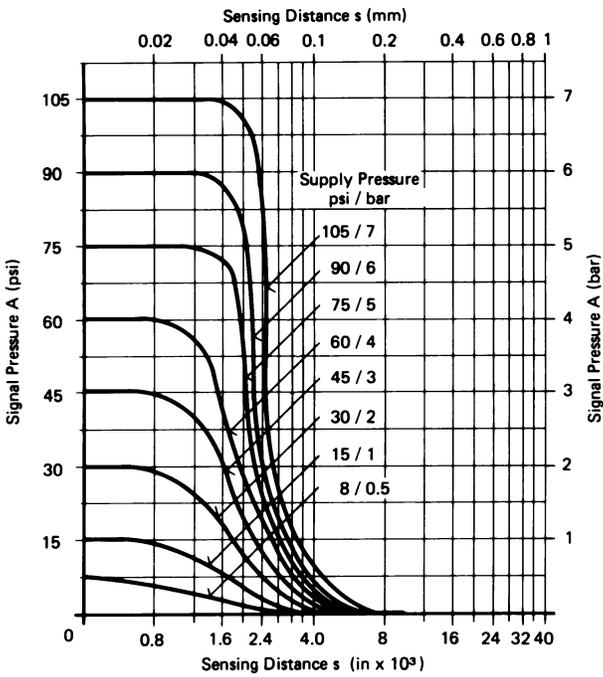
- a 0.27 in / 6.8 mm
- b 1.06 in / 27 mm
- c 0.08 in / 2 mm
- d 0.55 in / 14 mm
- e 0.43 in / 11 mm
- f 0.26 in / 6.6 mm
- g 0.24 in / 6 mm
- h 1.57 in / 40 mm
- i 0.23 in / 5.8 mm
- j 0.39 in / 10 mm
- k 0.79 in / 20 mm

# Non-Contact Pneumatic Sensors

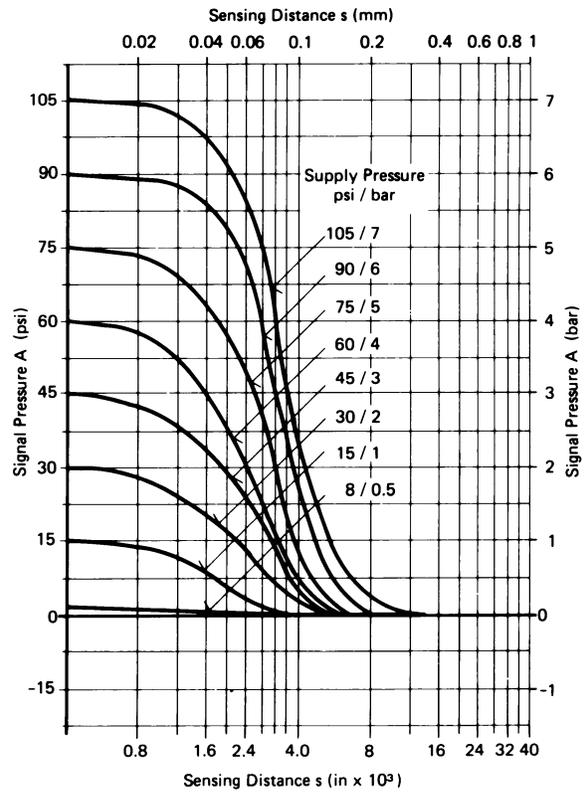
## Back Pressure Sensors, Operating Characteristics

Signal Pressure Versus Sensing Distance and Supply Pressure at Back Pressure Sensors

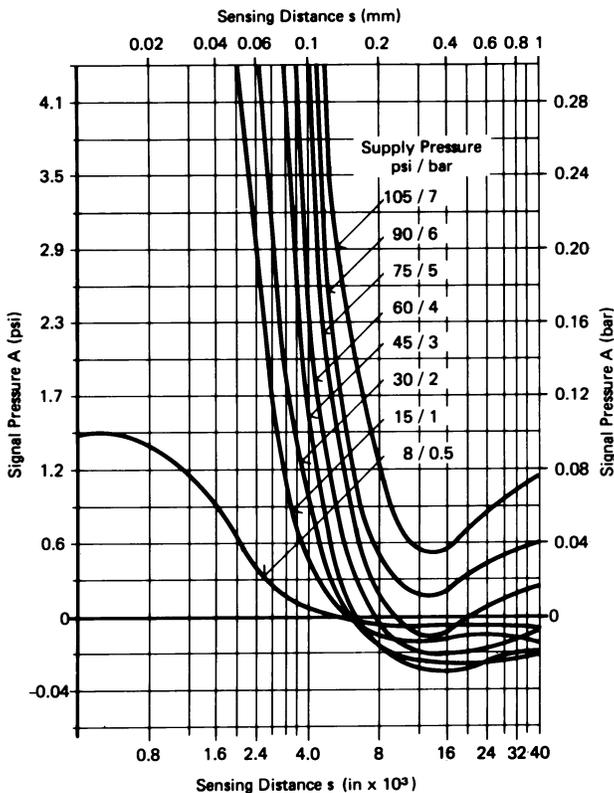
Type SD-2



Type SD-3  
(Graph 1)

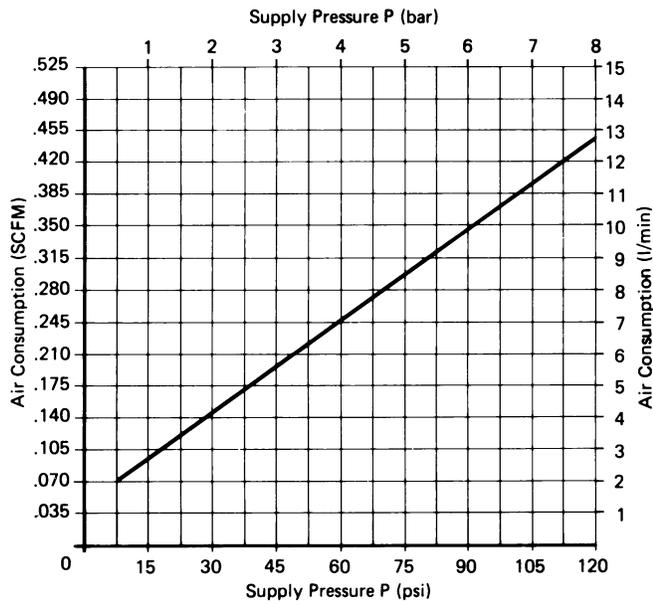


Type SD-3  
(Detail - Graph 1)

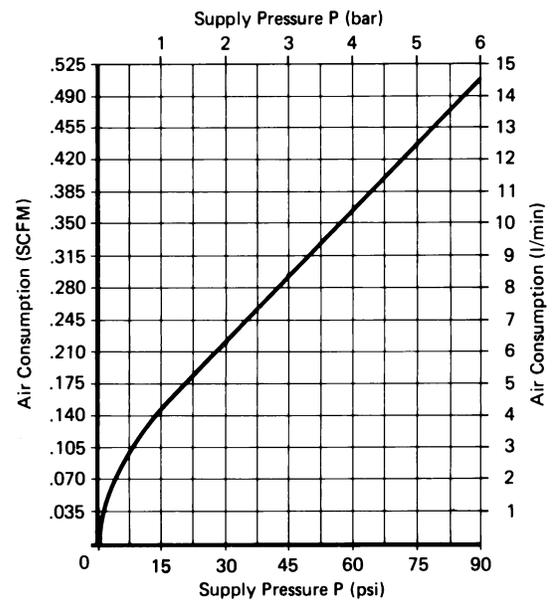


Note: Selection of supply pressure is critical for obtaining signals that approach either digital or analog outputs as required by individual applications.

Air Consumption versus Supply Pressure  
Type SD-2 with Y-PK-3-D



Type SD-3

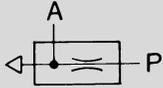


# Non-Contact Pneumatic Sensors

## Back Pressure Sensors

### Back Pressure Liquid Level Sensor

Type SD-3-N



This back pressure sensor generates a signal when a certain liquid level is reached.

The device is supplied with compressed air at connection P (black). The recommended supply pressure range is 1.5 to 2.25 psi / 0.1 to 0.15 bar. When the valve is not operating, the supply air flows outward through the sensing tube. As soon as the rising liquid obstructs the opening of the sensing tube, a signal appears at port A (yellow). The signal is proportional to the height of the liquid over the tube opening as well as to weight, reaching as high as the supply pressure. The signal pressure persists as long as the outlet is obstructed by the liquid.

The nominal diameters of tubing or hoses between the liquid surface and the back pressure sensor should be selected on the basis of distance, using the following table:

Tubing Length	Orifice Diameter
20 in / 0.50 m	0.1 in / 2.5 mm
40 in / 1.00 m	0.12 in / 3 mm
100 in / 2.50 m	0.16 in / 4 mm
200 in / 5.00 m	0.24 in / 6 mm

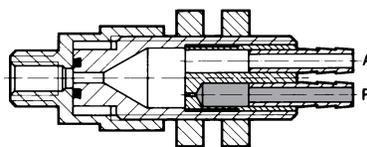


Since the sensing tube comes into contact with liquid, the material selected should be a material capable of withstanding liquid or vapor. Probable temperatures should also be taken into account.

If the surface to be sensed is highly agitated, cushioning should be provided. For this purpose, the sensing tube may be fitted with an outer casing with one or more small holes in the bottom so that the liquid surface within remains calm.

A pneumatic sensing system offers distinct advantages for liquids with a high degree of foam. While electronic sensing devices often respond to foam, the pneumatic signaling device registers a pressure change only if the liquid surface of higher specific gravity reaches it.

Accessories:  
Mounting brackets, see page 199.



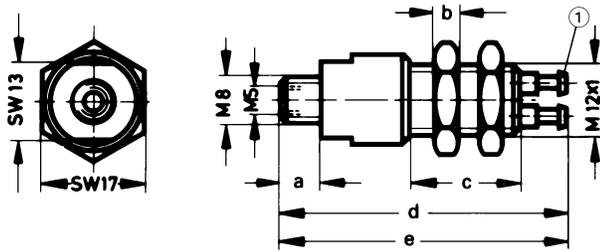
P = Supply  
A = Outlet

Order Number	Part No./Type	7457 SD-3-N
Medium		Compressed air (filtered, unlubricated)
Mounting		M12 x 1 with mounting nuts
Mounting Hole Diameter		0.5 in / 12.5 mm
Connection		Barbed fittings for 3/16 in / 3 mm tubing
Orifice Size		0.1 in / 2.5 mm (throttle 0.016 in / 0.5 mm)
Supply Pressure Range at P*		0-120 psi / 0-8 bar (preferably 1.5-2.25 psi / 0.1-0.14 bar)
Signal Pressure Range at A		0 to supply pressure
Air Consumption at 1.5 psi / 0.1 bar		3.5 x 10 <sup>2</sup> SCFM / 1 l/min
Ambient Temperature		-40 to +212°F / -40 to +100°C†
Design		Nozzle, no moving parts
Material		Housing: stainless steel, Al. Seals: Buna N
Weight		0.06 lb / 0.025 kg

\* 14 to 140°F / -10 to +60°C temperature range of medium

† Depending on tubing used

### Type SD-3-N



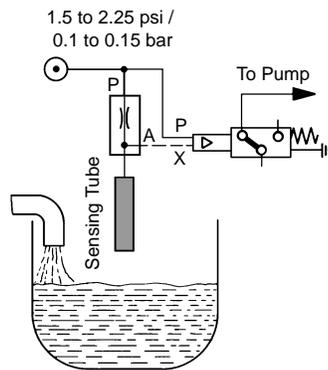
### Dimensions

- a 0.28 in / 7 mm
- b 0.16 in / 4 mm
- c 0.75 in / 19 mm
- d 1.62 in / 41 mm
- e 1.93 in / 49 mm

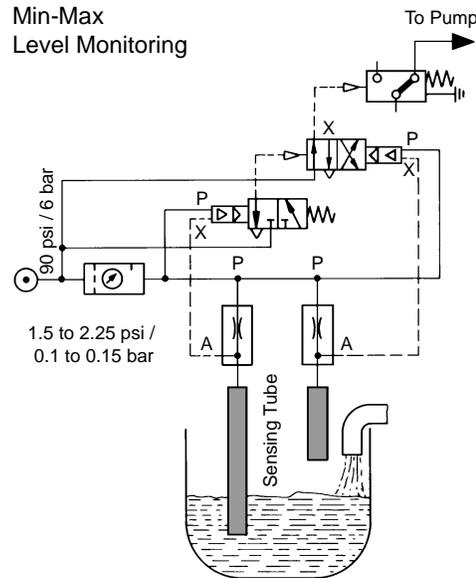
① Barbed fitting for 3/16 in / 3 mm tubing, connection P black, connection A yellow

SW = wrench size, mm

### Simple Level Monitoring



### Min-Max Level Monitoring



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