



# MODEL P650A ANALOG DAMPENER (FILTER)

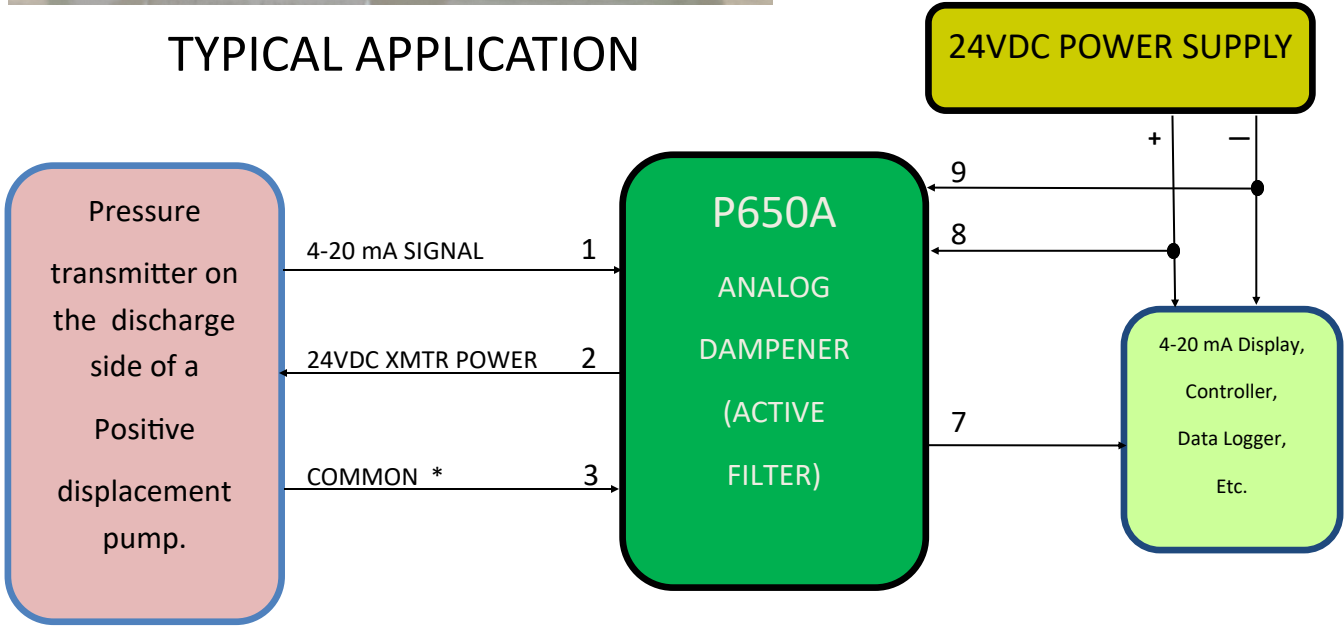


The Compass Instruments P650A analog dampener (filter) is used to average and smooth 4-20 milliamp analog signals.

Analog signals can experience a wide range of variations and “noise” that skews and distorts the actual data. Pressure surges and turbulent flow in flow meter outputs, vibration noise in load cells and induced noise, in long cable runs from analog transducers, are several examples. These problems can cause difficulties with process controllers and measurement instrumentation making displayed data difficult to read, skewing logging data and causing unintended results from control loops.

One solution to these difficulties is to smooth (dampen) the signal with the Compass Instruments P650A 4-20MA Signal Dampener.

## TYPICAL APPLICATION



\* Common is not needed with 2 wire transmitters



**MODEL P650A  
ANALOG DAMPENER  
(FILTER)**

**Theory of Operation:**

Analog signals can experience distortion and noise due to any number of process anomalies, such as pulsating and turbulent flow, vibrations, waves as well as induced electromagnetic interference on signal cables.

When introduced into a system, this distortion and noise can cause difficulties with displays, data collection and process control systems. High accuracy transducers and data acquisition systems will lose accuracy and control loops may not be able to respond correctly.

Various software algorithms have been devised to overcome these problems, but often result in insufficient filtering or in lengthy signal delays that interfere with proper system functions.

Using the Compass Instruments P650A 4-20mA Signal Dampener, between the signal source and the control equipment, to smooth the analog signal, is more effective and creates an accurate and true representation of the average data with less signal delay.

**Specifications:**

Power: 24VDC In; 24VDC Out to field device

Signal: 4 to 20 mA input and output

Propagation Delay: ~100mS

Temperature Range: -20°C to +85°C

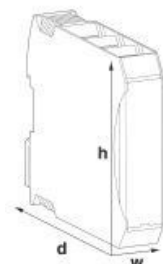
Mounting: DIN rail

Dimensions: w=17.5mm (0.7")

h=85mm (3.35")

d=70.4mm (2.8")

Weight: 66g (2.3oz)





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## **FUNCTIONS OF TERMINAL CONNECTIONS:**

**TERMINAL 1:** Analog 4-20 mA input signal from the field device that is to be filtered

**TERMINAL 2:** Power 24VDC output to the field device. If the field device is already powered, this output is not used. Internally, this pin is connected to TERMINAL 8

**TERMINAL 3:** Power common for the field device if necessary. Common is not needed with 2 wire transmitters

**TERMINAL 7:** Analog 4-20 mA filtered signal output

**TERMINAL 8:** Power 24VDC to the Signal Dampener (required). Shared with the field device if necessary. Internally, this pin is connected to TERMINAL 2

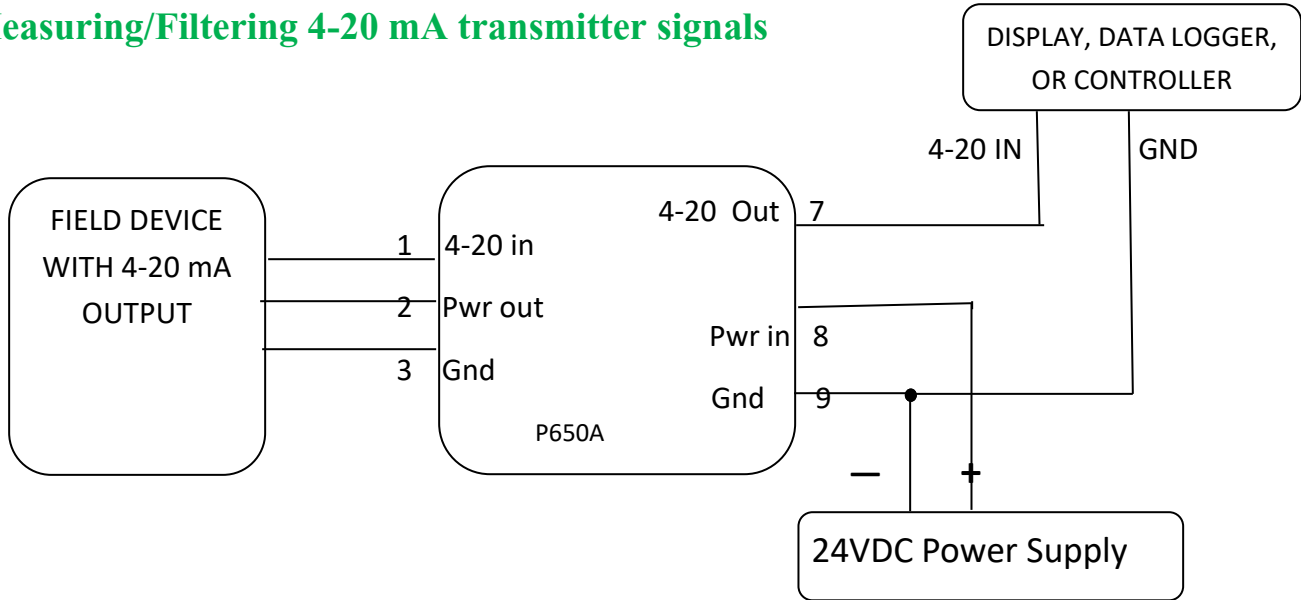
**TERMINAL 9:** Power common for the Signal Dampener

Terminals 4 through 6 and 10 through 12 are not used



**MODEL P650A  
ANALOG DAMPENOR  
(FILTER)**

**Measuring/Filtering 4-20 mA transmitter signals**



This unit is powered with 24VDC. Positive voltage on terminal 8 and common or ground on terminal 9. The unit will provide 24VDC power and ground for the field device when connected as shown.

**Measuring/Filtering 4-20 mA Signals from Powered Transmitters**

