PS309

Digital Pressure Manometer

Features:

- ☐ **Portable, Lightweight Construction**
- ☐ **Internal Battery Operation or Optional AC Converter**
- ☐ **Absolute Gauge and Differential Ranges – 0.08 psi FS to 3200 psi FS**
- ☐ **All Surfaces in Contact with Media are Stainless Steel – both Ports in Differential Units**
- ☐ **2 Vdc Analog Output Standard**
- ☐ **Optional Features Include 2-wire, 4 to 20 mA Current Output: Mode Switch for Linear/Square Root Outputs**

Description

The PS309 is a portable, completely self-contained digital pressure manometer, available in absolute, gauge and differential ranges. In addition to the front panel liquid crystal digital display, the unit also provides a 2 Vdc analog output suitable or recording, remote display or control purposes.

Featured are an integral variable reluctance transducer, solid state electronics module, 3½ digit liquid crystal display (LCD)* and battery pack with six 1.5V penlight cells for truly portable operation. The units can also be powered from an external DC power supply or AC battery eliminator (converter) module.

The transducer features all corrosion resistant materials in contact with the pressure madia (both ports in differental units), very low internal cavity volumes and ultra-low volumetric displacement with full-scale pressure excursion. Transducer calibration is unaffected by dielectric properties of the sensed fluid. Gauge and differential transducers may be disassembled and range changed by simple diaphragm replacement.

Individual meter scaling adjustments are provided for both single and dual operating modes which permit display of output in any popular engineering or scientific pressure and flow units. Decimal points are user-programmable by easy internal ajustment.

Optional features include switch-selected dual operating modes – “Pressure” (output linear with applied pressure), and “Flow” (output proportional to square root of Δ P), each with a separate 2 Vdc analog output and individual display scaling adjustments; two-wire, 4-20 mA current output configurations with single and dual operating modes; AC-powered battery eliminator power source; and, universal mounting brackets for panel mounting – either front or rear mount – or, top or bottom shelf-mounting arrangements.

** 3½ digit (shown in picture) also available. Right most digit is fixed at 0 in 4½ digit display.*

Specifications

Pressure Ranges:	Any full-scale pressure from 0-0.08 psi to 0-3200 psi, absolute or gauge; ±0.08 psid to ±3200 psid, differential.
Accuracy:	±0.25% FS, including linearity, hysteresis and repeatability. ±0.5% for absolute version.
Overpressure:	
Differential or Gauge:	200% FS, up to 4000 psi maximum, with less than 0.5% zero shift
Absolute:	20 psi or 200% FS, whichever is greater, to 4000 psi max., with less than 0.5% zero shift
Line Pressure:	3200 psig max., with zero shift less than 1% FS/1000 psi
Pressure Media:	Any fluid compatible with Type 410 stainless steel and inconel; other material available – see Ordering Information
O-rings:	BUNA-N standard (PS309D only – not used on PS309A). Other materials available – see Ordering Information
Pressure Cavity Volume:	4×10^{-3} cu in, symmetrical in differential units
Volumetric Displacement:	3×10^{-4} cu in FS
Analog Output(s):	Single, linear voltage output for Output Options 1 and 2; linear and square root voltage outputs for Option 3; single, linear 4-20mA output for Options 4 and 5; single linear or square root 4-20mA output (switch-selectable) for Option 6. *See Ordering Information.*

Specifications *(cont.)*

Input Power:

Voltage Output Options 1, 2 & 3. Six 1.5V AA penlight cells; external 8 to 32 Vdc power supply; or, optional AC adapter (auxiliary input power jack and plug provided)

Two-wire, 4-20 mA Transmitter, *Options 4, 5 & 6:* External 14 to 40 Vdc power supply only.

Output Signal Connections:

Voltage output units: Subminiature phone jack, Switchcraft #TR-2A "Micro-Jax" or equal; two provided on dual output version; mating plug(s) #850 or equal, provided.

Current output units; two-terminal barrier strip on rear panel.

Operating Temperature: 0° to 160°F

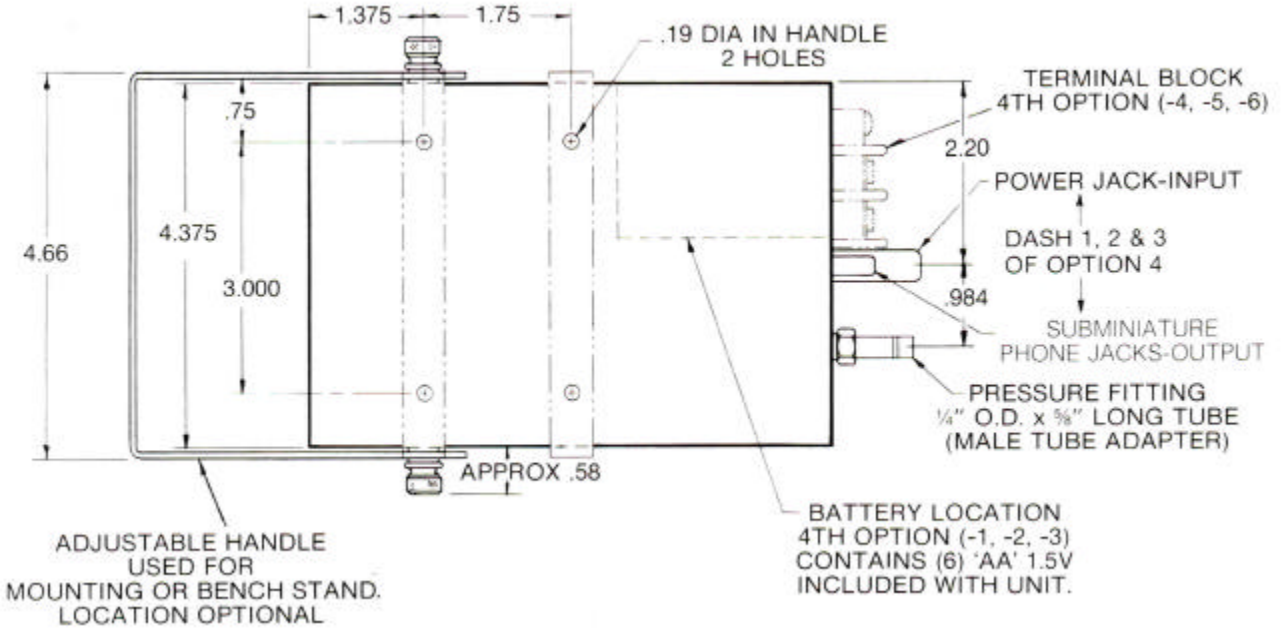
Temperature Error: <0.02% FS/°F

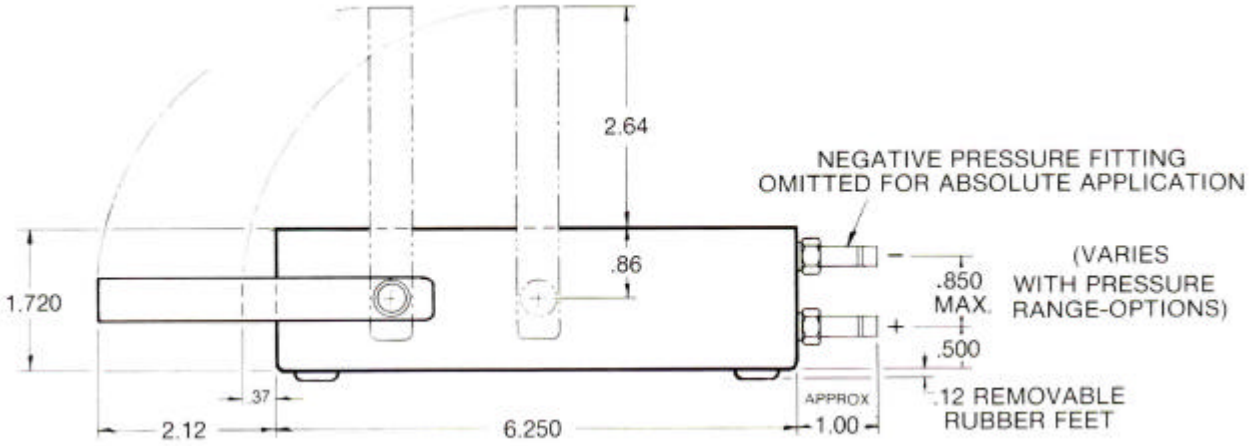
Pressure Connections: Brass tube end male adapters, ¼" O.D. X 5/8" long, Parker type 4-2 T2HF, or equal; 2 each provided on differential units, one in absolute units.

Mounting: May be panel mounted, or secured to horizontal or vertical surfaces using universal brackets. (See Accessories).

Weight: 35 ounces, including batteries.

Installation Drawing

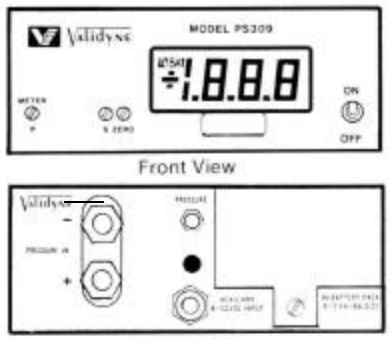




Output Option Configurations*

(3½ Digit Display Shown)

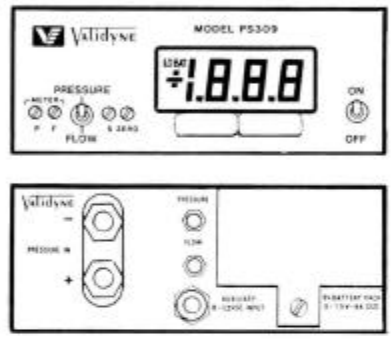
DASH 1 & 2



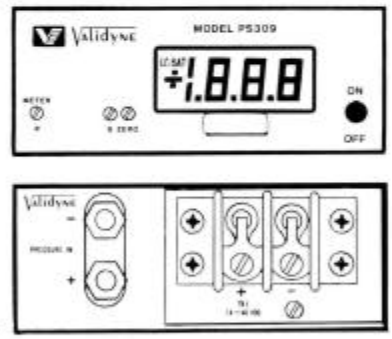
Front View

Rear View

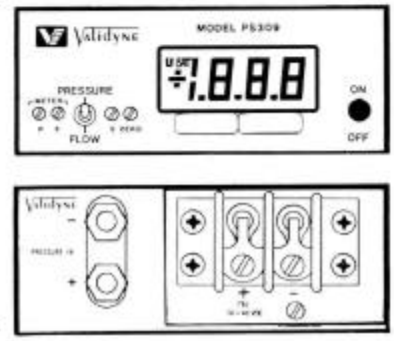
DASH 3



DASH 4 & 5

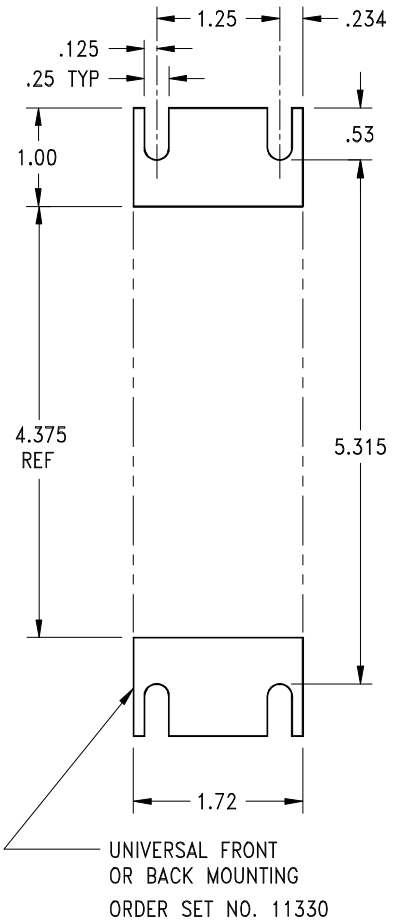


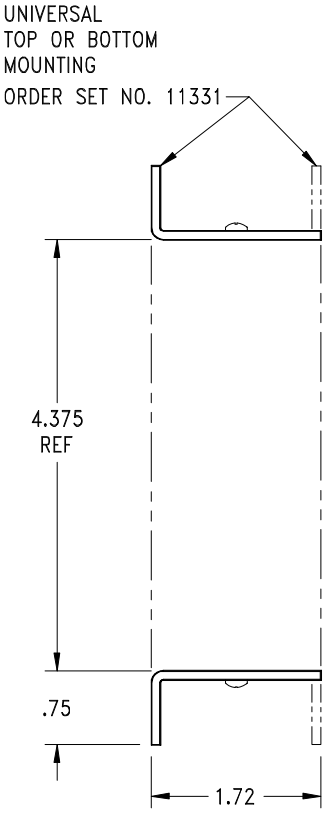
DASH 6



** For complete description of output option numbers, refer to next page.*

Mounting Hardware





Ordering Information *specify part number as follows:*

Measurement

Option Letter	Description
D	= Differential or Gauge
A	= Absolute

Display

Option Number	Description
1	= 3½ Digit
2	= 4½ Digit**

** Final position is fixed zero

O-Rings:

Option Letter	Description
A	= None (PS309A only)
N	= BUNA-N
E	= Ethylene Propylene
V	= Viton A
T	= Teflon (2 PSI & above)
S	= Silicone

Operation Temp. Range

S = 0° - 160°F

PS309D – 2 – N – 1 – XXX – S – 4 – XXX - A

Output/Input Power

Dash #	Pressure (Linear) Output -FS	Zero	+FS	Flow (Sq. Root) Output	Input Power
Voltage Output					
1	-	0 Vdc	2 Vdc	-	Battery
2	-2 Vdc	0 Vdc	+2 Vdc	-	Battery
3	-	0 Vdc	+2 Vdc	$E_0 = 2 \sqrt{\frac{P_{IN}}{P_{FS}}}$ (Vdc)	Battery
Current Output					
4	-	4 mA	20 mA	-	External
5	4 mA	12 mA	20 mA	-	External
6	-	4 mA	20 mA	$I_0 = 4 + 16 \sqrt{\frac{P_{IN}}{P_{FS}}}$ mA dc	External
7	-	0 Vdc	+2 Vdc	$E_0 = \frac{P_{IN}}{P_{FS}}$ (Linear)	Int. Battery
8	-2 Vdc	0 Vdc	+2 Vdc	$E_0 = \frac{P_{IN}}{P_{FS}}$ (Linear)	Int. Battery

Time Constant		Low Pass Frequency
A	1.0 sec	0.159 Hz
B	0.10 sec	1.59 Hz
None	0.01 sec	15.9 Hz

Range – Sq. Rt.

(For Output Options –3 and –6 only) Specify the actual full-scale flow value and units to be used to scale the display in the FLOW (Sq. Rt.) mode; e.g. 150 CFM, 1000 LPM, etc.

Sensor Material:

Option No.	Description
4	= Type 410 SST
5	= 410 Nickel Plated*
6	= 410 Gold Plated*
7	= 17-7 PH SST (10 psi & above)*

Pressure Range:

Specify the full-scale pressure value and engineering units to be used to scale the display in the Pressure Mode; e.g. 100 mm. Hg, 1.0 psid, etc.

Notes:

1. **Decimal Points:**
   Available decimal point locations are:
   1. X. X. X. 0.
   When specifying Range (or Ranges, for output options 3 and 6), show full-scale value, engineering units *and* decimal point location(s); e.g. 15.00 psia, 100.0 CFM, 5.00 in H_2O, etc. (Display range is 0000 thru 19990.) Final position is fixed zero.
2. Validyne packing lists and invoices will show a part number *similar* to that developed above, except a two-digit range code number will appear instead of the range and units specified. Units will be identified with the range(s) and units specified, however.
3. Display Engineering Units Available: PSI, mm HG, cm H_2O. in H_2O. PRESS%, in Hg, CFM, LPM, GPM, FLOW%, Torr, kPa, PSIA. Other Engineering Units available – consult factory.

CD379 Battery Operated Digital Transducer Indicator

For Remote Sensor Applications

The model CD379 Digital Transducer Indicator provides the same capabilities and features as the PS309 Digital Manometer, except it is designed for use with external variable reluctance pressure sensors in applications where it is necessary or desirable to locate the sensor at, or near, the pressure source, or for convenience in bleeding the sensor pressure cavities for liquid pressure media uses. It may also be used in applications where the full-scale pressure range is either higher or lower than those available in the PS309, or a higher line pressure capability is needed.

For example, when used with the Validyne model DP103, full-scale gauge or differential ranges as low as 0.22 in. H_2O are available. Similarly, when combined with the model DP360, ranges to 8000 psid may be accommodated. In general, the CD379 may be used with any Validyne AC-output type variable reluctance transducer.

Cable lengths of 1000 feet or more can be used to connect the CD379 to the remote transducer without compromising accuracy or performance.

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