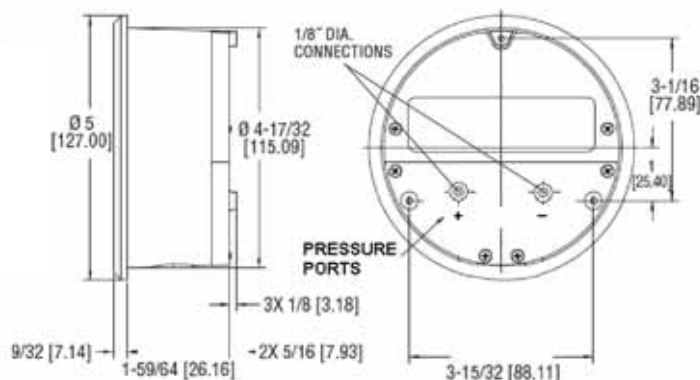




## Series DM-1000 DigiMag® Digital Differential Pressure Gage

### Specifications - Installation and Operating Instructions



The Series DM-1000 DigiMag® Digital Differential Pressure Gage is the ideal digital instrument to take the place of analog mechanical pressure gages. The DigiMag® Digital Gages are more versatile than analog gages with their ability to be field-programmed to display many commonly used engineering units as well as percent of full scale. The Series DM-1000 can be programmed in 8 commonly used engineering units plus percent of full scale. This capability allows quick units selection on site, eliminating the need to calculate various unit conversions. The DigiMag® Digital Differential Pressure Gages have an added feature for filter applications where a set point can be input where the display will blink when the filter is dirty, alerting the user that a maintenance action needs to occur.

Programming the Series DM-1000 is easy using the menu key to access 4 simplified menus which provide access to: Security level; engineering units; filter set point; view peak and valley process readings; digital damping for smoothing erratic process applications; display update to conserve battery life; zero and span field calibration.

The Series DM-1000 DigiMag® Digital Differential Pressure Gage possesses a full scale accuracy of 1% on ranges down to 2" w.c. and 2% accuracy down to the very low ranges of 1" to 0.25" w.c. Models are also available with bi-directional ranges. DigiMag® Digital Differential Pressure Gages offer power versatility by working with 9-24 VDC line power or simply 9V battery power. If using line power and connecting the 9V battery, the battery will act as a back-up if line power is lost or interrupted.

#### SPECIFICATIONS

**Service:** Air and non-combustible, compatible gases.

**Wetted Materials:** Consult factory.

**Housing Materials:** Glass filled plastic.

**Accuracy:** ±1% F.S. including linearity, hysteresis and repeatability; ±2% F.S. for ranges 1" w.c. and below.

**Temperature Limits:** 0 to 140°F (-18 to 60°C).

**Compensated Temperature Limits:** 32 to 122°F (0 to 50°C).

**Long Term Stability:** ±1% F.S. per year.

**Thermal Effect:** ±0.05% F.S./°F typ.; ±0.10% F.S./°F for ranges 1" w.c. and below.

**Display:** 4-digit LCD (Digits: 0.60"H x 0.33"W).

**Display Update:** Selectable for 1 second to 10 minutes or update only from button push.

**Pressure Limits:** Normal and bi-directional ranges 5" w.c. and lower = 2 psi (13.7 kPa); Normal and bi-directional ranges 10" w.c. and higher = 11 psi (75 kPa).

**Selectable Engineering Units:** in w.c., psi, kPa, Pa, mm w.c., mBar, in Hg, mm Hg, FS (0-100%).

**Power Requirements:** 9V battery or external power supply 9-24 VDC. Battery included but not connected.

**Type of Battery:** 9V alkaline battery (Duracell® PC 1604 or equivalent).

**Battery Service Life:** Battery life depending on the Display Update setting: 150 hours (typical) if Display Update = 1 second; 9 month (typical) if Display Update = 10 minutes; 1.5 years (typical) if Display Update is disabled. Battery may last up to four times longer when using lithium-based battery ULTRALIFE U9VL-J.

**Current Consumption:** 5 mA maximum.

**Electrical Connections:** Removable terminal block for 16 to 26 AWG.

**Electrical Entry:** Cable gland for 0.114 to 0.250" (2.9 to 6.4 mm) diameter cable.

**Process Connections:** 1/8" (3 mm) I.D. tubing.

**Enclosure Rating:** NEMA 4X (IP66).

**Weight:** 1.18 lb (535 g).

**Size:** 5" (127 mm) O.D. front face.

**Agency Approvals:** CE, EN 61326-1 [Immunity Test Requirement for Industrial Environments] with the following SPEC:

IEC 61000-3-2  
IEC 61000-3-3  
IEC61000-4-2  
IEC61000-4-3  
IEC61000-4-4  
IEC61000-4-5  
IEC61000-4-6  
IEC61000-4-11

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**INSTALLATION**

**Mounting**

A vertical position required. That is the position in which all standard models are calibrated at the factory. Provide a 4-9/16" diameter opening in panel. Insert gage and secure in place with provided screws and adapters.

**Included Accessories:**

- Mounting lugs – 3
- 6-20 x 2-1/2 screws – 3
- 6-19 x 3/8 screws – 3
- Cable gland – 1



**Pressure Connections**

Two integral tubing connections are provided on the back of the gage. They are sized to fit 1/8" (3.12 mm) I.D. tubing. To measure single positive pressure, connect tubing to the + port and vent the – port to atmosphere. To measure single negative pressure (vacuum), connect tubing to the – port and vent the + port to atmosphere. To measure differential pressure, connect higher pressure to the + port and lower pressure to the – port. Be sure the pressure rating of the tubing exceeds that of the operating ranges.

**Electrical Connections**

A 9V battery or an external power supply 9-24 VDC can be used to power the unit. If both battery and external power supply are connected, the battery will work as back up power.

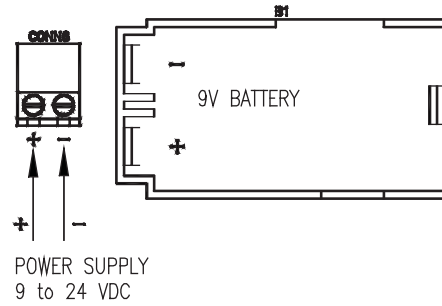
**Battery Installation**

The unit is shipped with a separate 9V alkaline battery. Remove the unit's top back cover, do not remove bottom cover. Connect the 9V battery to the battery holder as shown in Figure 1. Replace top back cover and tighten screws to 2 ±.25 in. lbs.

**External Power Supply Installation**

Remove the unit's back cover then connect the external power supply to the terminal block as shown in Figure 1.

**CAUTION** POWER MUST BE OFF WHILE WIRING CONNECTIONS ARE BEING MADE. DO NOT EXCEED SPECIFIED SUPPLY VOLTAGE RATINGS. PERMANENT DAMAGE NOT COVERED BY WARRANTY WILL RESULT.



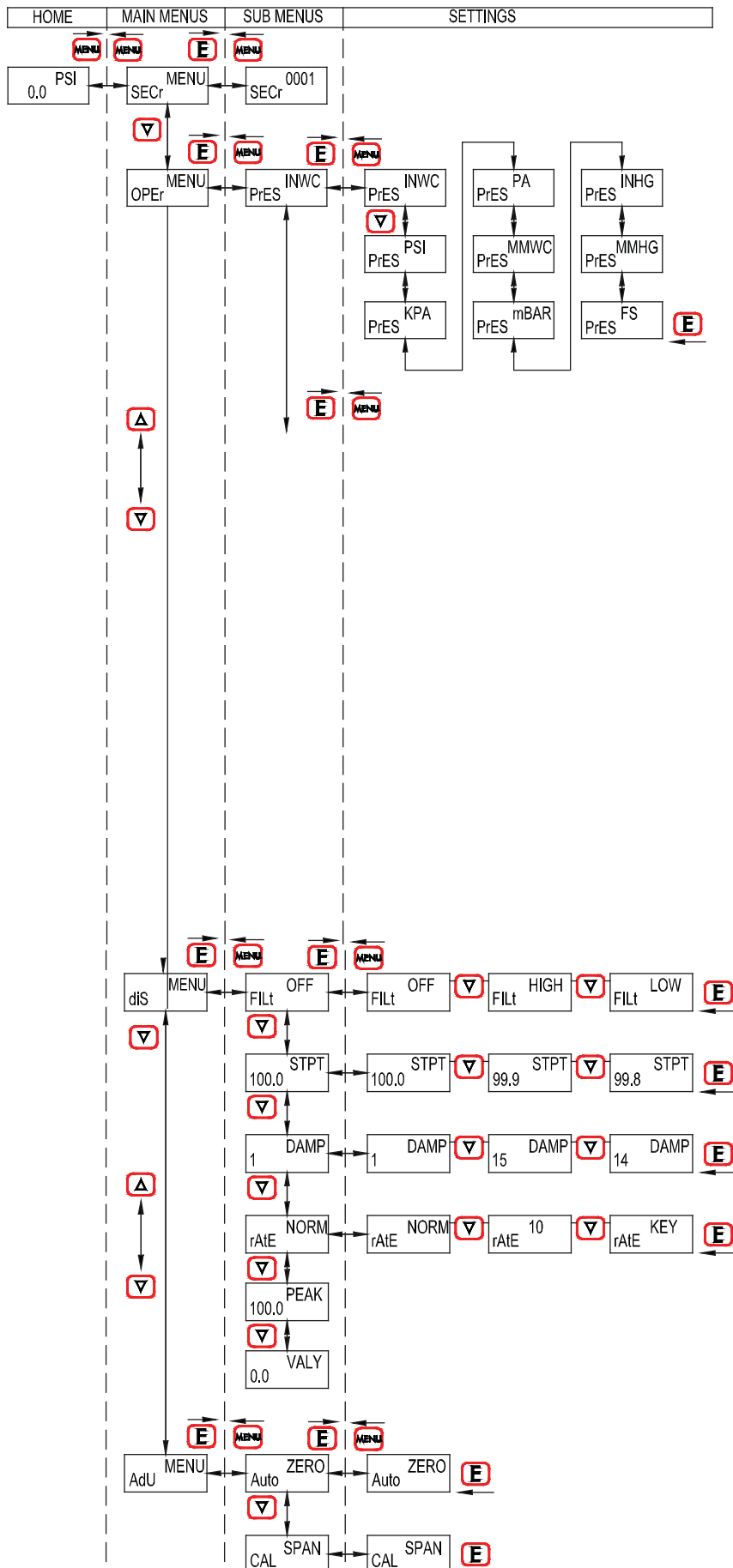
**FIGURE 1**

**OPERATING INSTRUCTIONS**

**Key Functions**

	Home Position Function	Main Menu Function	Sub Menu Function
<b>Menu</b> 	Allows access to the menus	Return to home position	Return to previous menu
<b>Up Arrow</b> 	Displays pressure readings instantly (rAtE KEY MODE only)	Sequences through menus	Increments a value
<b>Down Arrow</b> 		Sequences through menus	Decrements a value
<b>Enter</b> 	Displays full scale range of unit	Enter into SUB MENU	Changes a value or setting. Press ENTER and display will blink. Adjust with UP or DOWN arrows. Press ENTER to store. Display will stop blinking.

Menu Map



**MAIN MENU PROGRAMMING INSTRUCTIONS**  
(Upper Right Display Reads MENU)

**Security Menu: SECR-MENU**

Lock out access to all menus or lock out access to all menus except Auto-Zero function (Auto-ZERO).

**Operation Menu: OPER-MENU**

Select the measurement type – pressure, velocity or flow and corresponding engineering units (Velocity and flow are not available for Model DM-1100).

**Display Menu: diS-MENU**

Monitor and adjust display related settings: Filter type, filter point, dampening, display update, peak and valley.

**Advanced Menu: AdU-MENU**

Perform auto-zero or full-scale calibration.

**SECURITY MENU: SECR-MENU**

With the gage reading pressure (home position), press and hold the **MENU** key until the Security MENU is displayed. Press the **E** key to show the security SUB MENU **SECR-0001**. When the security SUB MENU is selected, the present security level is displayed in the upper right hand display. To change the security level, adjust the number displayed to the number shown in the following table for the desired security level.

Security Level Displayed	Access	Password Value to Enter
1	All menus access	10
2	All menus locked except the auto-zero function	90
3	All menus locked	111

The password values shown in the table cannot be altered, so retain a copy of these pages for future reference.

**OPERATION MENU: OPER-MENU**

With the gage reading a numerical value (home position), press and hold the **MENU** key until the Security MENU is displayed. Press the **▼** key to show the **OPER-MENU**. Press the **E** key to show the Operation SUB MENU.

The Operation SUB MENUS for Series DM-1100 is **PrES-INWC** (Pressure–Unit)

**PRESSURE SUB MENU: PRES – INWC**

**PrES – INWC:** Pressure – inches of water column

With the LCD reading **PrES – INWC**, press the **E** key; the display will blink. Press the **▼** key to change the pressure unit then press the **E** key to save the desired unit.

For pressure measurement, the following units are available:

- |   |                                      |
|---|--------------------------------------|
| <b>INWC</b> – Inches of water column      | <b>MBAR</b> – Millibar               |
| <b>PSI</b> – Pounds per square inch       | <b>INHG</b> – Inches of mercury      |
| <b>KPA</b> – Kilopascals                  | <b>MMHG</b> – Millimeters of mercury |
| <b>PA</b> – Pascals                       | <b>FS</b> – % of full scale          |
| <b>MMWC</b> – Millimeters of water column |                                      |

**TABLE 1 PRESSURE RANGE VS. AVAILABLE UNITS**

in w.c.	psi	kPa	Pa	mbar	mm w.c.	in Hg	mm Hg	% of FS	Resolution (in w.c.)
0.250	–	0.062	62.20	0.622	6.35	–	0.467	100.0	0.001
0.500	–	0.124	124.5	1.245	12.70	–	0.934	100.0	0.001
1.000	–	0.249	249.1	2.492	25.40	–	1.868	100.0	0.001
2.000	–	0.498	498.2	4.982	50.80	–	3.736	100.0	0.001
5.000	0.181	1.245	1245	12.45	127.0	0.368	9.34	100.0	0.002
10.00	0.361	2.491	2491	24.91	254.0	0.736	18.68	100.0	0.010
15.00	0.543	3.738	3738	37.38	381.0	1.104	28.02	100.0	0.010
25.00	0.903	6.227	6227	62.27	635.0	1.839	46.71	100.0	0.010
50.00	1.806	12.45	–	124.5	1270	3.678	93.42	100.0	0.020
100.0	3.613	24.91	–	249.1	2540	7.355	186.8	100.0	0.100

**NOTE: OFL (over flow) or UFL (under flow) will appear when the low and high range levels have been exceeded by 10% F.S.**

#### DISPLAY MENU: diS – MENU

With the gage reading a numerical value (home position), press and hold the **MENU** key until the Security MENU is displayed. Press the ▼ key until the LCD shows **diS – MENU**. Press the **E** key to show the Display SUB MENUS.

#### FILTER TYPE SETTING

With the LCD reading **FILt – OFF**, press the **E** key; the display will blink. Press the ▼ key to change the filter type then press the **E** key to save the desired filter type.

**FILt – OFF:** Filter type = OFF. The filter function is disabled.

**FILt – HIGH:** Filter type = HIGH. The display blinks when pressure is greater than the filter point.

**FILt – LOW:** Filter type - LOW. The display blinks when pressure is less than the filter point.

#### FILTER POINT SETTING

With the LCD reading **0.00 – SPPT**, press the **E** key; the display will blink. Press the ▼ key to change the filter point then press the **E** key to save the desired filter point.

**0.00 – SPPT:** Filter point = 0.00. The filter point may be set to anywhere within the range of the instrument.

#### DAMPING SETTING

With the LCD reading **1 – DAMP**, press the **E** key; the display will blink. Press the ▼ key to change the damping level then press the **E** key to save the desired damping level.

**1 – DAMP:** Damping level = 1. The damping level can be adjusted from 1 to 15. Damping stabilizes the display from instabilities due to things such as vibration and excessive pressure fluctuations. The damping function adjusts the amount of readings that are averaged for each display update.

#### DISPLAY UPDATE SETTING

With the LCD reading **rAtE – NORM**, press the **E** key; the display will blink. Press the ▼ key to change the display update rate then press the **E** key to save the desired display update rate.

**rAtE – NORM:** Display update = Normal (1 second).

The gage reads the process pressure and updates the LCD every second.

**rAtE – 10:** Display update = 10 minutes.

The gage reads the process pressure and updates the LCD every 10 minutes.

**rAtE – KEY (On-Touch mode):** Display update is disabled.

The gage reads the process pressure and updates the LCD whenever the ▲ key is pressed. If the ▲ key is released, the LCD will hold and display the last pressure reading.

#### NOTES:

- Depending on the Display Update setting, the battery life is shown below:
  - 150 hours (typical) if Display Update is set for "Normal" 1 second update. rAtE-NORM
  - 9 months (typical) if Display Update is set for 10 minutes. rAtE-10
  - 1.5 years (typical) if Display Update is disabled. rAtE-KEY
- If the Display Update is set for 10 minutes or disabled (On-Touch mode), the process pressure value can be read instantly by pressing and holding the ▲ key on the front panel. Also the LCD will automatically show "ALAR" if the filter point has been exceeded.

#### PEAK AND VALLEY SETTING

**100.0 – PEAK:** Peak value = 100.0

The peak feature stores the highest pressure reading the instrument has measured since the last reset or power up. At power up **PEAK** is reset to the present pressure reading. To manually reset the **PEAK** value, press the **E** key while in the **PEAK** SUB MENU.

**0.0 – VALY:** Valley value = 0.0

The valley feature stores the lowest pressure reading the instrument has measured since the last reset or power up. At power up **VALY** is reset to the present pressure reading. To manually reset the **VALY** value, press the **E** key while in the **VALY** SUB MENU.

#### ADVANCED MENU: AdU – MENU

With the gage reading pressure (home position), press and hold the **MENU** key until the Security MENU is displayed. Press the ▼ key until the display shows the **AdU – MENU**. Press the **E** key to show the advanced function SUB MENUS.

**Auto ZERO:** auto-zero

**NOTE: For accurate calibration, DO NOT apply any pressure when performing this function.**

With the display reading **Auto ZERO**, release pressure to Zero then press the **E** key; the display will blink. Press the **E** key again to complete the auto-zero.

**CAL – SPAN:** full-scale calibration

With the display reading **CAL – FS**, apply full-scale pressure then press the **E** key; the display will blink. Press the **E** key again to save the full-scale calibration or press the **MENU** key to cancel the calibration.

#### MAINTENANCE

This model is not field-serviceable and should be returned if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization number before shipping.

