

# DigiGauge

## Digital Pressure Gauge

### Instruction Manual



The Rototherm DigiGauge is a high-accuracy, high-resolution digital pressure indicator housed in a sealed stainless steel case. Designed for direct mounting, the DigiGauge is suitable for highly accurate measurement of pressure in critical process areas. The DigiGauge's ceramic diaphragm strain gauge sensor is compatible with most gases and liquids whilst the sealed IP67 case allows the DigiGauge to be fitted in the most hostile of environments. Two standard AA alkaline cells allow over 12 months' of continuous operation.

## Before Installation

Before installing this gauge, please read these instructions completely, failure to do so could result in permanent damage to the unit. Particular attention should be given to the following points:-

**Pressure rating:-** When selecting the full scale pressure range take pressure surge conditions into account.

**Medium compatibility:-** Check for compatibility between the pressure medium and the wetted parts of the gauge.

**System contamination:-** Ensure that the DigiGauge and all parts are thoroughly cleaned before installing into any system.

## Installation

Installation should be undertaken only by qualified personnel familiar with safety practices and standards relating to pressure systems.

**Location and mounting :** It is recommended that the gauge is located where it can be readily inspected and serviced. The gauge is designed to be supported using the process connection stem alone, no additional mounting brackets are required. Avoid siting the gauge where there is extreme vibration.

**Ambient temperature :** Temperature induced errors will be minimised if the gauge can be operated close to the calibration temperature of 20°C (68°F).

**Fittings and hardware :** To allow the gauge to be removed easily for servicing and calibration it is recommended that a service valve is placed in the pressure line immediately before the DigiGauge. This service valve, together with other fittings and hardware should be of an appropriate pressure rating. If pressure surges are likely to occur it is advisable to fit a pressure limiting device such as a snubber. Use a siphon tube or 'pig-tail' to isolate the gauge from high temperature pressure media. When tightening the gauge use a spanner applied to the hexagon of the process connection stem - do not tighten by turning the body of the gauge as this might damage the water-proof seal between the body and pressure block.

## Display Units

The display reading may be given in either primary or secondary units of pressure according to the setting of dual-in-line switch SW1 which is located on the upper (display) circuit board (see figure 1)

As standard, the primary and secondary units of pressure are bar and pounds per square inch (psi). If supplied, the dial film marked with the secondary units of pressure will be stored between the aluminium dial backing plate and the primary dial film.

Switch position	Display units
SW1 OFF	Primary units
SW1 ON	Secondary units

## Display Update Rate

The display reading may be updated at a rate of once every 2 seconds or once every 0.5 seconds. Selection of the update rate is made using SW2.

Switch position	Update rate
SW2 OFF	Once every 2 seconds
SW2 ON	Once every 0.5 seconds

Note that the battery life is specified at the (slower) 2 second update rate and is reduced when operating at the 0.5 second update rate.

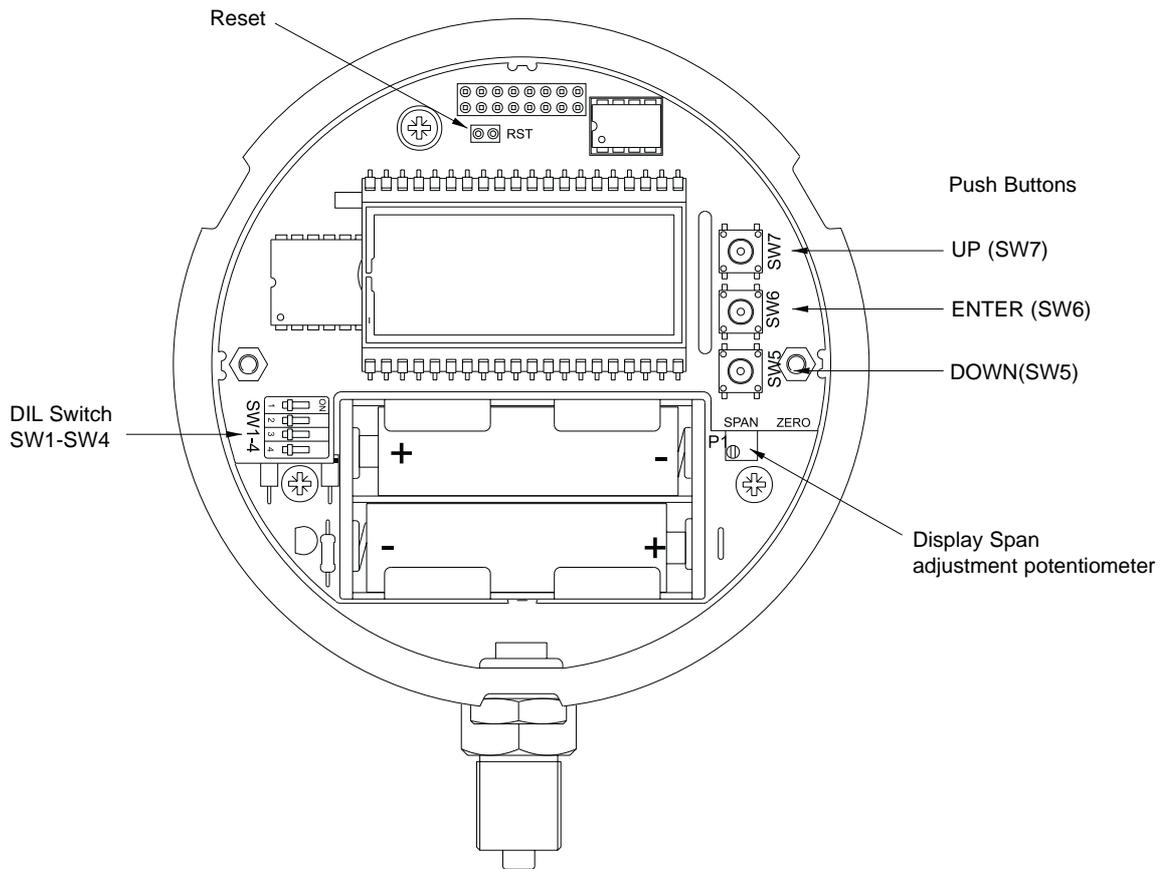


Figure 1 - Internal view of switches, reset terminals and calibration potentiometer

## Battery Replacement

The gauge is powered by two alkaline manganese 1.5 volt cells, type LR6 (AA). When these are due for replacement the display will alternate between the pressure reading and message bAtt. This warning will be given when the battery voltage falls to 2.0 volts (1.0 volt per cell), at which point the battery has approximately one month of life remaining. An internal voltage regulator circuit maintains measurement accuracy until the battery voltage falls to approximately 1.5 volts. Always replace the cells in pairs, do not mix old and new cells.

To replace the battery unscrew the front bezel ring and remove the window and sealing gasket. Remove the two nylon-headed screws and lift off the dial. Remove the old cells and fit two "AA" size 1.5V alkaline manganese cells into the battery holder. The correct polarity of the cells is shown in Figure 2 below and is also marked on the battery holder. (The instrument will not be damaged if the cells are fitted incorrectly.) Refit the dial, place the sealing gasket on the front face of the case then centre the window on the gasket. Refit the bezel ring tightly with firm hand pressure.

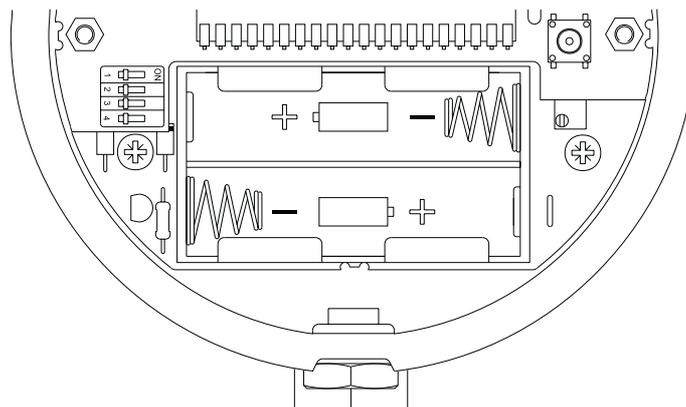


Figure 2 - Correct battery polarity

## Minimum and Maximum Reading Option

The DigiGauge may be fitted with an option which stores the maximum and minimum pressures measured. These pressures may be displayed or cleared by means of magnetically-operated switches without opening the sealed case.

**To display the minimum and maximum pressures** : Place a bar magnet on the top right-hand side of the case within the box marked Min - Max on the instrument label. The DigiGauge display will then alternate between the maximum and minimum values as long as the magnet is held in place. The maximum pressure is shown after the display message **Hi** and the minimum value follows **Lo**.

**To reset (clear) the minimum and maximum values** : Place a bar magnet on the top left-hand side of the case within the box marked Min-Max Clear on the instrument label. After approximately 5 seconds the minimum and maximum values will be cleared, confirmed by the display message **HiLo CLrd**.

## Setup Mode

The gauge has a set-up mode which may be used for the following:-

- Set the full scale pressure range.
- Clear the stored instrument zero value
- Clear the stored instrument linearisation value

Three pushbutton switches, SW5, SW6 and SW7, are used when programming the gauge. To gain access to these switches, which are located to the right of the display, the bezel and dial must first be removed. The data entered in the setup mode is stored in non-volatile memory. When entering a value, the currently stored value is recalled from memory and written to the display.

### Entering the setup mode

Hold down the UP and DOWN pushbuttons (SW7 and SW5) for approximately 5 seconds, the gauge will then enter the setup mode which will be confirmed by the display message SET UP. The pushbuttons should then be released. The SET UP message will be replaced by the following menu:-

### **FS - CLr.Z - CLr.L - End.**

Press UP (SW7) to advance through the menu. When the required function is displayed, press ENTER (SW6) to select it. The various functions are described below.

**FS** : Set the full-scale pressure range

The full-scale pressure range is equal to that of the pressure sensor. It is set during manufacture and should not be changed in normal operation.

**CLr.Z** : Clear the display zero value

1. Using the UP pushbutton switch (SW7) scroll through the setup menu until the display shows CLr.Z
2. Move DIL switch SW4 to its 'ON' position
3. Press the ENTER pushbutton (SW6). The display will show the message donE which indicates that the zero value has now been cleared from the gauge.
4. Return DIL switch SW4 to its 'OFF' position.

**CLr.L** : Clear the linearisation value

1. Using the UP pushbutton switch (SW7) scroll through the setup menu until the display shows CLr.L
2. Move DIL switch SW3 to its 'ON' position
3. Press the ENTER pushbutton (SW6). The display will show the message donE which indicates that the linearisation value has now been cleared from the gauge.
4. Return DIL switch SW3 to its 'OFF' position.

**End** : End setup

Terminates the setup mode of operation and restarts the gauge in the normal measurement mode.

## Calibration

Each DigiGauge instrument is fully calibrated during manufacture and certificates of calibration may be requested at time of ordering. It is recommended that the calibration of the gauge should be checked against a known standard every 12 months or at intervals specified by relevant quality assurance procedures. British Rototherm offers a rapid in-house recalibration service for its pressure measurement products, traceable to national standards. Please contact the Sales Office for details.

Note that calibration is made easier by operating the gauge at the 0.5 second update rate which allows adjustments to be made more quickly.

### To zero the gauge

1. Ensure that there is no pressure applied to the gauge.
2. Some versions of the DigiGauge may be fitted with an optional multiturn potentiometer for zero adjustment. If the zero potentiometer is fitted (marked ZERO on the printed circuit board) turn the adjustment screw until the display shows a reading of **0000**. Turn the screw clockwise to increase the reading on the display, or anticlockwise to decrease. If no potentiometer is fitted adjust the zero using the procedure given in steps 3 to 5 below.
3. On the bank of dual-in-line (DIL) switches, (marked SW1-4 on the printed circuit board), move switch SW4 (marked 4 on the switch) to the ON position (move the switch from its left-most position to the right most position). The gauge will display **ZERO**.
4. Hold down the middle push-button switch (marked SW6 on the printed circuit board) until the display shows **Std.Z**. Release the middle push-button switch.
5. The gauge will now display **ZERO** once more. Move the DIL switch SW4 back to the original position (move the switch from the right-most position to the left-most position). The gauge is now zeroed.

### To set the correct span

1. Prior to span adjustment the gauge should be zeroed if necessary.
2. Apply full scale pressure to the gauge. The full-scale pressure rating (in bar) is marked on the dial or label attached to the case.
3. With full scale pressure applied, adjust the potentiometer marked SPAN on the printed circuit board until the display reading is equal to the full scale value. Turning the screw clockwise will increase the reading on the display, turning the screw anticlockwise will decrease it.

### To linearise the gauge

The procedure for linearisation depends on whether the gauge reads only positive pressures or is a compound type reading vacuum as well.

1. Apply precisely half of the maximum rated pressure to the gauge.
2. Move DIL switch SW3 to the ON position (move from the left most position to the right-most position). The display will now read **Lin**.
3. If the gauge reads only positive pressures proceed to 4. below. If the gauge is a compound type proceed to 6. below.
4. Hold down push button switch SW6 until the display reads Std.L then release switch SW6. The display will then show **Lin** once more.
5. Return DIL switch SW3 to its original position. The gauge is now correctly linearised.
6. For compound gauges move DIL switch SW1 to the ON position and SW2 to the OFF position. The display will now read **Lin.P**.
7. Hold down push button switch SW6 until the display reads St.LP then release switch SW6. The display will then show **Lin.P** once more.
8. Move DIL switch SW1 to the OFF position and SW2 to the ON position. The display will now read **Lin.n**.
9. Apply precisely 0.750 bar of vacuum (-0.750 bar gauge) to the gauge. Hold down push button switch SW6 until the display reads **St.Ln** then release switch SW6. The display will then show **Lin.n** once more.
10. Return DIL switch SW3 to the OFF position and SW1 & SW2 to their original positions. The compound gauge is now correctly linearised.

## Warranty

The Rototherm Digital Pressure Gauge is guaranteed to be free of manufacturing defects for a period of one year from the date of purchase. To obtain service under this warranty the instrument should be returned in its original packaging either to British Rototherm or its distributors. This warranty excludes the battery, damage due to battery leakage, misuse of the gauge or sensor damage caused by the application of excess pressure. Any details given in this instruction sheet are subject to change without notice.

## Specifications

**Case:** 100mm dia. 304 stainless steel case and bezel with 1/4"BSP (male) process connection.

**Protection:** IP67 / NEMA4X

**Display:** 4 digit LCD with 12.7mm (1/2") high characters.

**Sensor:** Alumina Ceramic (Al<sub>2</sub>O<sub>3</sub>) diaphragm strain gauge.

**Overpressure:** Max. applied pressure must not exceed 1.25 x full scale

**Compensated Range:** -10 to 60°C \* (14 to 140°F)

**Wetted Parts:** 316 stainless steel, Viton and ceramic.

<b>Temperature Limits:</b>	<b>Storage:</b>	-20 to 85°C (-4 to 185°F)
	<b>Ambient Operating:</b>	-10 to 60°C (14 to 140°F)
	<b>Pressure Medium</b>	-20 to 100°C (-4 to 212°F)
	<b>Internal Case:</b>	-10 to 60°C (14 to 140°F)

**Power Source:** 3V DC battery, 2 x 1.5V "AA" alkaline cells.

**Battery Life:** 12 months at 2 second update rate.

**Low Power Warning:** Display will alternate between pressure reading and BATT

**EMC :** BS EN 50081-1 : 1992 & BS EN 50082-2 : 1995

**Weight:** 900g

\* Temperature compensation is an optional feature.  
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ISO 9001

Certificate No. FM11958

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