



DTG-2000

Digital Pressure Test Gauge

0.2 % FS · -1 to 700 bar in five stock ranges, to 1000 bar to order · IP65 stainless

Operating Manual

Issue 2 · September 2026

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1 Safety

Read this section before installing the gauge. Every item in it is here because ignoring it can injure you, damage the gauge or give you a wrong reading.

- The gauge is not intrinsically safe and has no explosion protection. Do not use it in an explosive atmosphere.
- Never exceed the overpressure limit for the range: twice full scale up to 350 bar, one and a half times above it. Burst pressure is three times full scale. Choose the range so that the highest pressure you will see sits inside it with a margin.
- Fit and remove the gauge with a spanner on the hexagon. Do not turn it by the case: that twists the sensor off its stem.
- Isolate and vent the line before fitting or removing the gauge. Valves, pipe and fittings on the line are the installer's responsibility and must be rated for the pressure.
- Keep the port clean. A wire strand or a chip of swarf in the port can puncture the sensor diaphragm.
- Do not strike the face. The window, the display and the keys are behind it.
- Fit the cells with the polarity marked, and seat the rear cover ring when closing. Reversed cells damage the electronics; an unseated ring loses the IP65 rating.

Zero the gauge only with the port open to atmosphere. Zeroing under pressure writes that pressure in as zero and every later reading is wrong by it.

2 Introduction

The DTG-2000 is a digital pressure test gauge with 0.2 percent of full scale accuracy including linearity and hysteresis, on a piezoresistive sensor with no mechanical movement to wear. It replaces the precision pointer gauge on the calibration bench, on the test pump and on the plant.

The display is five digits of 18 mm with a bar graph across the top for the trend and a second line for the minimum or maximum seen since reset. Six pressure units step on one key and are remembered at switch-off. A three-item menu sets the sampling interval, the display timeout and the zero. Four AAA cells run it for 1200 hours.

The case is SUS304 stainless, 3 inches in diameter, sealed to IP65 with SUS316 wetted parts. Five stock ranges cover –1 to 2 bar up to –1 to 700 bar, with any range to 1000 bar to order; a quarter-inch NPT connection is standard, five other threads and a switch or analogue output are available in the order code.

3 Specification

Item	Specification
Accuracy	±0.2 % of full scale, including linearity and hysteresis
Temperature stability	0.05 % FS per °C or better • compensated from –10 to 70 °C
Overpressure	2 × full scale up to 350 bar • 1.5 × full scale above 350 bar • burst 3 × full scale
Display	Five-digit LCD, 18 mm digits • bar graph • second line for min or max • unit, low battery and overrange indicators
Units	kPa, bar, MPa, psi, kgf/cm ² , mbar
Settings	Sampling interval CO: continuous or 1 to 99 s, default 5 s • display timeout LC: always on or 1 to 99 min, default 5 min • zero ZER
Media	Gases and liquids compatible with SUS316 • media temperature –10 to 80 °C

Item	Specification
Wetted parts	SUS316
Case	SUS304, 3 inch (76 mm) diameter • IP65 • about 230 g
Connection	¼ NPT male standard • ½ NPT, ¼ BSP, ½ BSP, M20 × 1.5, G ½ to order (code C, 0 to 5)
Outputs (option, code B)	0 none • 1 SPDT switch • 2 4–20 mA • 3 0–20 mA • 4 0–10 V • 5 0–5 V • 6 SPDT with 0–10 V
Power	4 × AAA, 6 V DC • 1200 hours minimum • cells supplied, not fitted
Operating environment	–10 to 60 °C • 0 to 90 % RH non-condensing • storage –20 to 70 °C
Compliance	EN 61010-1 • EN 61326-1 • CE • not rated for explosive atmospheres

Ranges

The order code is DTG-2000-A-B-C: A the range code, B the output, C the connection. The label on the stem gives the range and connection of the gauge you have.

Range code (A)	Range	Availability
2G	–1 to 2 bar	Stock
20G	–1 to 20 bar	Stock
40G	–1 to 40 bar	Stock
350G	–1 to 350 bar	Stock
700G	–1 to 700 bar	Stock
1G, 2.5G, 4G, 6G, 10G, 16G, 25G, 60G, 100G, 250G, 400G, 600G, 800G, 1KG	–1 bar to the code value, in bar (1KG = 1000 bar)	To order

4 The instrument



Figure 1 DTG-2000, -1 to 700 bar version, 1/4 NPT

Display

Five digits across the middle show the pressure in the selected unit, with the unit to the right. The bar graph across the top shows the pressure as a proportion of full scale. The smaller line beneath the digits shows the stored minimum or maximum when MIN/MAX is pressed, with Min or Max beside it. A battery symbol on the left shows the cell state and flashes when the cells need replacing. When the pressure is outside the range the overrange indicator shows and the reading should not be relied on.

Keys

Key	What it does
ON/OFF	Switches the display on and off. With the display off the gauge sleeps; a press wakes it.
MIN/MAX	Steps the second line between the minimum and the maximum pressure seen since the last reset.
P/UNIT/ZERO	Short press, about one second: steps the pressure unit. Long press, five seconds: enters the settings menu, and steps through it.
RESET/ENT	In normal display: clears the stored minimum and maximum. In the menu: changes the value of the item shown.

Connection

The pressure port is a 1/4 NPT male thread as standard; other threads are supplied to the order code and marked on the stem label. The wetted parts are SUS316. Any gas or liquid compatible with SUS316 can be measured, from -10 to 80 °C at the port.

Battery compartment

Behind the rear cover, which is held by screws. Four AAA cells sit in a bracket with the polarity marked. The cover seals on an O-ring which must be seated on closing. The gauge is delivered with the cells in the box, not fitted.

5 Operation

5.1 Fitting the cells

1. With the gauge off the line and unpressurised, remove the rear cover screws and lift the cover off.
2. Lift out the cell bracket, fit four AAA cells with the polarity marked, and refit the bracket.
3. Check the O-ring is in its groove, refit the cover and tighten the screws evenly.
4. Press ON/OFF. The display comes on in the unit last selected.

Replace the cells when the battery symbol flashes. The gauge keeps its settings and its selected unit without cells.

5.2 Switching on and off

Press ON/OFF to switch the display on, and again to switch it off. With the display off the gauge sleeps and draws almost nothing. If no key is pressed the display also switches itself off after the timeout set in the menu, five minutes as delivered; press ON/OFF to bring it back.

5.3 Choosing the pressure unit

1. With the display on, press P/UNIT/ZERO for about one second and release it.
2. The unit steps to the next in the sequence and the reading is converted. Repeat to reach the unit you want.
3. The unit is stored and the gauge comes on in it next time.

5.4 Minimum and maximum

The gauge stores the lowest and highest pressure it has seen since the last reset. Press MIN/MAX to show them in turn on the second line. Press RESET/ENT in normal display to clear both to the present pressure. Clear them at the start of a test, and again after a line has been pressurised for the first time, otherwise the stored maximum is the fitting pressure rather than the test.

5.5 Making a measurement

1. Choose a gauge whose range holds the highest pressure you will see with margin, and check the stem label.
2. Isolate and vent the line. Fit the gauge with a spanner on the hexagon, using the sealing appropriate to the thread: PTFE tape on tapered NPT, a bonded seal on parallel BSP and G threads.
3. Switch on, choose the unit, and press RESET/ENT to clear min and max.
4. Open the line and read the pressure. Wait for the reading to settle before recording it; the display updates at the sampling interval set in the menu.
5. To leave the gauge on a line for a period, set the sampling interval and the timeout for the battery life you need, and read min and max at the end.

5.6 The settings menu

Three settings, reached from normal display by holding P/UNIT/ZERO for five seconds. Each short press of P/UNIT/ZERO then steps to the next item; RESET/ENT changes the value shown. Holding P/UNIT/ZERO again leaves the menu and returns to the pressure display.

- CO, sampling interval. Shows as CO_xx. Each press of RESET/ENT adds one second; holding it counts up continuously. The range is 0 to 99 seconds and wraps from 99 to 0. Zero means the gauge samples continuously. A longer interval means fewer readings and a longer battery life. Delivered at 5 seconds.
- LC, display timeout. Shows as LC_xx, adjusted the same way. The range is 0 to 99 minutes. Zero means the display never times out. Delivered at 5 minutes.
- ZER, zero. Shows as Zer_n. RESET/ENT toggles it to Zer_Y. Leaving the menu with Zer_Y showing sets the present pressure as zero; leaving with Zer_n changes nothing.

5.7 Zeroing

Do this with the gauge off the line, or on a line that is isolated and vented to atmosphere. Never under pressure.

1. Remove the gauge from the line, or isolate and vent the line to atmosphere, and wait for the reading to settle.
2. Hold P/UNIT/ZERO for five seconds to enter the menu at CO_xx.
3. Press P/UNIT/ZERO twice, shortly, to reach Zer_n.
4. Press RESET/ENT once so that Zer_Y shows.
5. Hold P/UNIT/ZERO to leave the menu. The display returns showing zero.

If the reading with the port open is more than a few digits from zero before you start, note it. A drift that grows from one calibration to the next is the sign that the gauge needs recalibrating rather than re-zeroing.

6 Installation on a line

For a gauge left on a line rather than used on the bench, the source of most trouble is where and how it is fitted rather than the gauge itself.

- Mount it where it is ventilated, dry and out of direct sun, and where there is room to read it and to get a spanner on it. Outdoors, fit a protective cover against sun and rain.
- On a liquid line, take the pressure from the side of the pipe so that sediment does not settle into the port. On a gas line, take it from the top of the pipe, with the gauge above the pipe so that any condensate drains back.
- Allow a straight run of pipe of at least five diameters either side of the tapping, and keep the gauge at least a metre from the tapping and below it, so that the impulse line stays full of liquid and free of pulsation.
- On steam, take the tapping from the side of the pipe through a syphon, with a vent at the top and a drain close to the gauge.
- Keep the impulse line where the temperature is steady, and protect it against freezing: ice in the port destroys the sensor.
- Where a pump or a valve can cause water hammer, fit a snubber. A pressure spike above the overpressure limit damages the sensor even if the display never shows it.

7 Care and maintenance

- Clean the case and window with a damp cloth. Do not use solvents, and do not direct a jet at the rear cover.
- Keep the port capped when the gauge is off the line and in its case.
- Replace the cells when the battery symbol flashes. Remove them if the gauge will be stored for months.
- Store between -20 and 70 °C, dry, in the case.

Calibration

Every gauge is supplied calibrated. Recalibrate at two years, or annually where your quality system requires; earlier if the zero drifts, if the reading disagrees with a reference, or after an overpressure. Calibration with a traceable certificate is available from GPS; contact us with the model and the range code on the stem label. The gauge has no user calibration.

8 Supplied with the instrument

- DTG-2000 gauge, range, output and connection as ordered
- Carrying case

- Four AAA cells, not fitted
- This manual

Kits with a GPS hand pump, hose and adapters are made up to order: the 721 pneumatic pump for the low ranges, the 711A water or 705 oil hydraulic pump for the high ones.

9 Warranty

One year from the date of purchase, subject to product registration with GPS. The warranty covers defects in materials and workmanship and does not cover damage from overpressure, from fitting by the case, from foreign matter in the port, from reversed or leaking cells, or from use in an explosive atmosphere.

For service, calibration or technical support contact GPS at sales@gpslimited.com or +44 (0) 203 093 0914.