Portable Process and Pressure Calibration Instruments

Calibrators • Simulators • Sources • Pumps • Gauges
1048 Voltage/Current/Loop Calibrator
A compact voltage, current, and process loop calibrator for engineering, manufacturing, test, and process control applications. The 1048 combines digital accuracy with simple analogue control and is well suited to plant operations such as powering control loops.
- Source/measure voltage and current
- 3 source ranges: 0 to 22mA and 0 to 22V
- 3 measure ranges: 0 to 70mA and 0 to 50V
- Accuracy 0.02% of range
- Transmitter simulator/sink loop control
- Output steps and ramps
- Fine adjustment (inching)
- Battery powered 9V PP3, 20 hours typical use
- H142 x W78 x D50mm, weight 0.34kg

7005 Voltage/Current/Loop Calibrator
A handheld instrument for the calibration and simulation of voltage and current loops. The 7005 is a high accuracy compact calibrator with source and measure capabilities.
- Current measurement: 125mA, source 50mA. Resolution 1μA
- Voltage measurement: 25V, source 21V. Resolution 1mV
- Accuracy: Source 0.01% of setting. Measure 0.01% of reading
- Transmitter and square root functions
- Auto-ranging feature
- Programmable steps and ramp
- 9 hours typical use between charges
- Supplied with battery charger and carry case
- H165 x W90 x D45mm, weight 0.42kg

7006 Loop-Mate 1: Loop Simulator and Source
A cost-effective handheld loop simulator that provides 4 to 20mA or 0 to 10V loop signals. Features include manual and automatic step modes with audible indication that changes pitch as the output increases/decreases.
- 4 to 20mA or 0 to 10V ranges
- Set-points: 0, 10, 25, 50, 75, 90, 100% of range
- Accuracy 0.1% of range
- TxSim or RxTest modes
- Internal loop supply, 25mA maximum
- Auto-stepping mode: up/down/up, 0.5, 1, 2, 4, or 8 sec/step
- Battery powered 9V PP3, 40 hours typical use
- Supplied with carry case
- H140 x W65 x D30mm, weight 0.18kg

7007 Loop-Mate 2: Loop Signal Indicator
A simple operation portable loop signal indicator with LCD display. Suitable for use with the 7006 Loop-Mate 1.
- 4 to 20mA, 0 to 10V, 0 to 50V ranges
- LCD 4 digit display, mA, V, or % of range
- Accuracy 0.05% of reading
- RxSim, TxTest, or 50mA/50V measure modes
- Internal loop supply, 25mA maximum
- Battery powered 9V PP3, 40 hours typical use
- Supplied with carry case
- H140 x W65 x D30mm, weight 0.20kg
**1049 PT100 Simulator**
A handheld precision simulator for PT100 0.3850 platinum resistance elements used for accurate temperature measurement. High performance metal film resistors are used throughout which ensures a good temperature coefficient and long term stability.
- -200°C to +800°C with 23 set points
- Accuracy ± 0.3°C
- Less than 30ppm/°C temperature coefficient
- ITS-90 IEC60751
- Exceeds class A
- Passive resistance source
- Supplied with carry case
- H112 x W61 x D55mm, weight 0.17kg
- °F version available – 1050 (-100°F to 1000°F, ± 0.5°F accuracy)

**7000 RTD Temperature Calibrator**
A portable process control instrument that combines a precision digital thermometer (using RTD probes) with an RTD/ohms calibrator.
- Temperature – Accuracy 0.05°C (0.09°F). Resolution 0.01°C (0.02°F)
- Resistance – Accuracy 0.03Ω. Resolution 0.01Ω
- 2, 3, and 4 wire connections
- Measure and simulate °C, °F, °K, and ohms
- Ramp and step
- PT100 plus 7 other RTD types
- User programmable
- 24 hours typical use between charges
- Supplied with battery charger and carry case
- H165 x W90 x D45mm, weight 0.42kg

**1090 Process and Temperature Calibrator**
A portable, key-press operation instrument that combines source and measurement functions for thermocouples, RTDs, mV, and mA. The 1090 features a memory storage function that holds frequently used values.
- Measures/simulates 8 thermocouple types, PT100-RTD, mV and mA
- Displays units in °C, °F, μV/mV, or mA
- Accuracy: Source 0.02% of range, 0.5°C. Measure 0.05% of range, 0.7°C
- Automatic or manual cold junction compensation
- Inching and step functions with time configurable steps
- Process loops 4 to 20mA and 0 to 50mA
- Mains or battery operation, 60 hours typical use between charges
- Supplied with battery charger and carry case
- H235 x W150 x D75mm, weight 1.2kg

**7050 Process and Thermocouple Calibrator**
A process calibrator that combines the essential functions of measurement and simulation of volts, millivolts, milliamps, and ohms with the direct readout simulation of thermocouples and RTDs in °C or °F units.
- Measure (3 ranges) up to 40V, 400mA, 40kΩ
- Output voltage (3 ranges) up to 10V, 1μV resolution
- Output current (3 ranges) up to 20mA, 1μA resolution
- Output Resistance (3 ranges) up to 40kΩ, 0.01Ω resolution
- Accuracy: Source and measure 0.03% of range
- Thermocouple measure and simulate: J, K, T, E, R, S, B, N
- RTD measure and simulate: PT100
- Battery or mains operation
- W270 x H175 x D250mm, weight 4.5kg
Pressure Calibration Instruments
Portable Pressure Calibrators, Test Pumps and Digital Gauges

7090 Pneumatic Calibration Pump
7095 Hydraulic Calibration Pump
Pneumatic and hydraulic calibration pumps that combine high performance with durability. Features include contoured cushioned handles for comfort and dual o-rings on all pistons to ensure zero leakage.
- 7090 – Vacuum to -950 mbar, pneumatic pressure to 40 bar (600 psi)
- 7095 – Hydraulic pressure to 700 bar (10,000 psi)
- Non-oil based lubricant used on all moving parts
- Both supplied as kits with carry case, hoses, and fittings
- 7090 – H200 x W125 mm, weight 0.91 kg
- 7095 – H240 x W125 mm, weight 1.4 kg
- Digital pressure gauges available (7091 and 7096)

7193 / 7194 / 7195 Benchtop Pressure Calibration Pumps
Benchtop pumps that are a comfortable and simple operation, providing an easy way to generate pressure in the lab. Each pump is a dual pressure source enabling them to be used as comparators for calibration with accompanying reference gauge.
- 7193 Pneumatic Pump – 0.95 bar vacuum to 40 bar (600 psi) pressure
- 7194 Pneumatic Pump – 0.95 bar vacuum to 100 bar (1500 psi) pressure
- 7195 Hydraulic Pump – 0.9 bar vacuum to 600 bar (8700 psi) pressure
- Easy to use with smooth pressure generation and high pressure stability
- Dual pressure source (double output manifold)
- Fine pressure adjustment
- 7193 – W198 x H140 x D315 mm, weight 2.7 kg
- 7194 – W270 x H178 x D450 mm, weight 7.5 kg
- 7195 – W198 x H135 x D290 mm, weight 3.2 kg

7089 / 7091 / 7094 / 7096 Digital Pressure Gauges
Digital pressure gauges that provide high accuracy, resolution and stability. Robust design and simple operation make these gauges ideal for a wide range of applications.
- 7089 – Vacuum only, accuracy 0.2% of FS
- 7091 – Vacuum to 40 bar (600 psi), accuracy 0.2% of FS (suitable for the 7090/7193)
- 7094 – 0 to 100 bar (1500 psi), accuracy 0.2% of FS (suitable for the 7194)
- 7096 – 0 to 700 bar (8700 psi), accuracy 0.2% of FS (suitable for the 7095/7195)
- Easy-to-read display with 5 digit resolution
- Unique self-protection capability technology
- 3 times per second measure speed
- Fully temperature compensated accuracy
- RS-232 connection on rear of gauge, EasyCal compatible
- H178 x W112 x D45 mm, weight 0.6 kg

7078 Auto-Ranging Digital Pressure Gauge
A high performance digital pressure gauge that has the ability to auto-range and maintain a 0.1% of reading accuracy from vacuum to 200 bar. The 7078 eliminates the need for multiple gauges to span many different ranges, solving the problem of over ranging errors.
- Vacuum to 200 bar (3000 psi)
- 0.1% of reading accuracy
- 9 engineering units – bar, psi, Hzg, kPa, in Hzg, in Hzg, Kg/cm², mm Hzg, mbar
- High accuracy silicone piezo resistive sensors
- Reads both gauge and absolute pressure
- Easy to read colour display with full 2 line alphanumericics
- Compact and robust with protective rubber housing
- H165 x W115 x D55 mm, weight 0.88 kg
7040 Digital Pressure/Current Calibrator

A versatile calibrator that combines a digital pressure gauge and current indicator. Suitable for pressure testing and maintenance as well as process loop applications.

- 0.2, 2, 5, 10, or 20 bar versions (vacuum available on 2 bar model)
- Pressure/vacuum calibration, 0.04% accuracy
- Loop current calibration (displayed in mA, or % of range, 4 to 20 mA)
- 9 engineering units – bar, psi, KPa, inWg, cmWg, inHg, mmHg, Kg/cm², Atm
- Minimum/Maximum logging and leak rate functions
- 4.5 digit display
- RS-232 serial interface and EasyCal software compatible
- Battery powered 9V PP3, 50 hours typical use
- Supplied with carry case, fittings kit and hose, test lead, and RS-232 cable

7010 Single Channel Pressure Calibrator
7015 Dual Channel Pressure Calibrator

Portable battery or mains powered pressure calibrators designed for both lab and field applications. Models available from vacuum to 600 bar (8700 psi).

- Vacuum, 0.2, 2, 5, 10, 20, 35, 70, 100, 200, 400, or 600 bar versions
- Best accuracy 0.04% of full scale
- Pneumatic or hydraulic
- 4 selectable pressure units (4 per channel on 7015) and mA
- Loop current measure
- 24/36 V loop power
- Over-pressure alarm
- RS-232 serial interface and EasyCal software compatible

7016 Regulated Low Pressure Calibrator
7018 Differential Pressure Calibrator

Portable pressure calibrators that are rugged design and simple operation, ideal for field calibration applications. Models available from vacuum to 10 bar (145 psi).

- 7016 – Regulated low pressure: Vacuum, 0.2, 2, 5, or 10 bar versions
- 7018 – Differential pressure: 0.2, 2, 5, or 10 bar versions
- Pneumatic with 0.04% of full scale best accuracy
- 4 selectable pressure units and mA
- Loop current measure
- 24/36 V loop power
- Over-pressure alarm
- RS-232 serial interface and EasyCal software compatible

7198 Pressure Calibration Accessories Kit

A comprehensive set of pressure accessories to accompany pumps, gauges, and calibrators. The 7198 kit includes adaptors, fittings, connectors, and hoses to provide a quick solution to pressure component requirement in both the field and laboratory.

- Adaptors for metric, BSP parallel, taper threads, and NPT (male and female)
- Coupling connectors included allow any two adaptors to be connected together
- ¼” BSP G hose fittings for pushfit 4 mm and 6 mm external diameter hose
- Quick release couplings and barbed 6 mm and 8 mm internal diameter hose
- Nylon hose set with quick release connectors for low pressure connections
- Additional 4 mm and 6 mm nylon hoses to build up custom lengths as required
- Minimess 1620 test point adaptors and micro bore hose for high pressure
- 10” adjustable spanner and PTFE tape
- Kit supplied in adaptor case and hose bag
### Portable Loop & Temperature Instruments

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<tr>
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<tbody>
<tr>
<td>1048</td>
<td>Voltage / Current / Loop Calibrator - 0.02% Accuracy</td>
<td>C176</td>
<td>C138</td>
<td>✓</td>
<td>–</td>
<td>–</td>
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<tr>
<td>1049</td>
<td>PT100 Simulator Handheld (Class A °C)</td>
<td>C161</td>
<td>C114</td>
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<tr>
<td>1050</td>
<td>PT100 Simulator Handheld (Class A °F)</td>
<td>C161</td>
<td>C114</td>
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<td>1077</td>
<td>Millamp Transducer/Line Simulator - 0.02% Accuracy</td>
<td>C158</td>
<td>C108</td>
<td>opt 9027</td>
<td>opt 9529</td>
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<tr>
<td>1090</td>
<td>Temperature and Process Calibrator</td>
<td>C177</td>
<td>C139</td>
<td>✓</td>
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<td>✓</td>
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<tr>
<td>7000</td>
<td>RTD Temperature Calibrator</td>
<td>C183</td>
<td>C194</td>
<td>✓</td>
<td>internal</td>
<td>opt 7633</td>
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<td>7005</td>
<td>Voltage / Current / Loop Calibrator - 0.01% Accuracy</td>
<td>C184</td>
<td>C195</td>
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<td>internal</td>
<td>opt 7633</td>
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<tr>
<td>7006</td>
<td>Loop Simulator &amp; Source (Loop-Mate 1) - 0.1% Accuracy</td>
<td>C145</td>
<td>C145</td>
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<tr>
<td>7007</td>
<td>Loop Signal Indicator (Loop-Mate 2) - 0.05% Accuracy</td>
<td>C145</td>
<td>C144</td>
<td>✓</td>
<td>–</td>
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<tr>
<td>7050</td>
<td>Process and Thermocouple Calibrator</td>
<td>C180</td>
<td>C192</td>
<td>field case</td>
<td>internal</td>
<td>–</td>
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### Portable Pressure Instruments

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<tr>
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<tbody>
<tr>
<td>7010</td>
<td>Pressure Calibrator (Vac to 600bar versions)</td>
<td>C178</td>
<td>C190</td>
<td>field case</td>
<td>internal</td>
<td>✓</td>
<td>ECFLA</td>
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<tr>
<td>7015</td>
<td>Pressure Calibrator (Vac to 600bar versions)</td>
<td>C178</td>
<td>C190</td>
<td>field case</td>
<td>internal</td>
<td>✓</td>
<td>ECFLA</td>
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<tr>
<td>7016</td>
<td>Regulated Pressure Calibrator (Vac to 10bar versions)</td>
<td>C178</td>
<td>C190</td>
<td>field case</td>
<td>internal</td>
<td>✓</td>
<td>ECFLA</td>
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<td>7018</td>
<td>Differential Pressure Calibrator (0.2 to 10bar versions)</td>
<td>C178</td>
<td>C190</td>
<td>field case</td>
<td>internal</td>
<td>✓</td>
<td>ECFLA</td>
</tr>
<tr>
<td>7040</td>
<td>Pressure/Current Calibrator (Vac to 20bar versions)</td>
<td>C185</td>
<td>C196</td>
<td>✓</td>
<td>–</td>
<td>–</td>
<td>ECFLA</td>
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<tr>
<td>7090</td>
<td>Handheld Pneumatic Pump Kit (-950mbar to 40bar)</td>
<td>–</td>
<td>–</td>
<td>✓</td>
<td>–</td>
<td>–</td>
<td>–</td>
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<tr>
<td>7095</td>
<td>Handheld Hydraulic Pump Kit (0 to 700bar) with hoses, fittings, case</td>
<td>–</td>
<td>–</td>
<td>✓</td>
<td>–</td>
<td>–</td>
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<tr>
<td>7193</td>
<td>Benchtop Pneumatic Calibration Pump (0.95bar vac to 40bar)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
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<tr>
<td>7194</td>
<td>Benchtop Pneumatic Calibration Pump (0.95bar vac to 100bar)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>7195</td>
<td>Benchtop Hydraulic Calibration Pump (0.9bar vac to 600bar)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
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<tr>
<td>7078</td>
<td>Auto Ranging Digital Gauge (Vac to 200bar, 0.1% accuracy of setting)</td>
<td>–</td>
<td>–</td>
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<tr>
<td>7088 / 7091</td>
<td>Digital Gauges - 7088: vacuum only / 7091: vac - 40bar 7094: 0 to 100bar / 7096: 7000, 0.2% acc)</td>
<td>C204</td>
<td>C205</td>
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<tr>
<td>7198</td>
<td>Pressure Calibration Accessories Kit (Adaptors, fittings, connectors, hoses)</td>
<td>–</td>
<td>–</td>
<td>✓</td>
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### Pressure Range Codes for 7010, 7015, 7016, 7018 and 7040

<table>
<thead>
<tr>
<th>Range (bar)</th>
<th>Code</th>
<th>Option Code</th>
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<tbody>
<tr>
<td>Vac</td>
<td>0.2</td>
<td>7111</td>
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<tr>
<td>2</td>
<td>7100</td>
<td>7101</td>
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<tr>
<td>5</td>
<td>7102</td>
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<td>10</td>
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<td>70</td>
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<td>7111</td>
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