



Time Electronics
Calibration, Test and Measurement

Portable Process and Pressure Calibration Instruments

Calibrators • Simulators • Sources • Pumps • Gauges

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Loop & Temperature Calibration Instruments

Handheld Loop Calibrators, RTD and Thermocouple Calibrators



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.

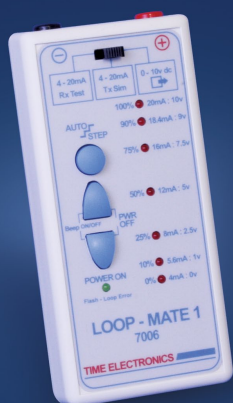
- Source/measure voltage and current
- 3 source ranges: 0 to 22mA and 0 to 22V
- 3 measure ranges: 0 to 70mA and 0 to 50V
- Accuracy 0.02% of range
- Transmitter simulator/sink loop control
- Output steps and ramps
- Fine adjustment (inching)
- Battery powered 9V PP3, 20 hours typical use
- H142 x w78 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.

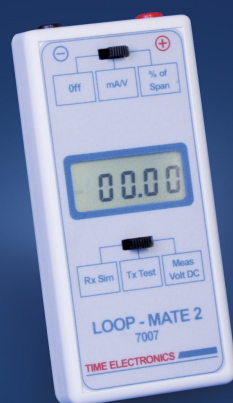
- Current measurement: 125mA, source 50mA. Resolution 1 μ A
- Voltage measurement: 25V, source 21V. Resolution 1mV
- Accuracy: Source 0.01% of setting. Measure 0.01% of reading
- Transmitter and square root functions
- Auto-ranging feature
- Programmable steps and ramp
- 9 hours typical use between charges
- 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 $\pm 0.3^{\circ}\text{C}$
- Less than 30ppm/ $^{\circ}\text{C}$ temperature coefficient
- ITS-90 IEC60751
- Exceeds class A
- Passive resistance source
- Supplied with carry case
- H112 x W61 x D55mm, weight 0.17kg
- $^{\circ}\text{F}$ version available – 1050 (-100 $^{\circ}\text{F}$ to 1000 $^{\circ}\text{F}$, $\pm 0.5^{\circ}\text{F}$ 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 $^{\circ}\text{C}$, $^{\circ}\text{F}$, $^{\circ}\text{K}$, 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 $^{\circ}\text{C}$, $^{\circ}\text{F}$, $\mu\text{V}/\text{mV}$, 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 $^{\circ}\text{C}$ or $^{\circ}\text{F}$ units.

- Measure (3 ranges) up to 40V, 400mA, 40k Ω
- Output voltage (3 ranges) up to 10V, $1\mu\text{V}$ resolution
- Output current (3 ranges) up to 20mA, $1\mu\text{A}$ resolution
- Output Resistance (3 ranges) up to 40k Ω , 0.01 Ω 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 -950mbar, pneumatic pressure to 40bar (600psi)
- 7095 – Hydraulic pressure to 700bar (10,000psi)
- Non-oil based lubricant used on all moving parts
- Both supplied as kits with carry case, hoses, and fittings
- 7090 – H200 x W125mm, weight 0.91kg
- 7095 – H240 x W125mm, weight 1.4kg
- 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 – 0.95bar vacuum to 40bar (600psi) pressure
- 7194 Pneumatic Pump – 0.95bar vacuum to 100bar (1500psi) pressure
- 7195 Hydraulic Pump – 0.9bar vacuum to 600bar (8700psi) 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 D315mm, weight 2.7kg
- 7194 – W270 x H178 x D450mm, weight 7.5kg
- 7195 – W198 x H135 x D290mm, weight 3.2kg



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 40bar (600psi), accuracy 0.2% of FS (suitable for the 7090/7193)
- 7094 – 0 to 100bar (1500psi), accuracy 0.2% of FS (suitable for the 7194)
- 7096 – 0 to 700bar (8700psi), 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 D45mm, weight 0.6kg



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 200bar. The 7078 eliminates the need for multiple gauges to span many different ranges, solving the problem of over ranging errors.

- Vacuum to 200bar (3000psi)
- 0.1% of reading accuracy
- 9 engineering units – bar, psi, Hg, kPa, inHg, inH₂O, Kg/cm², mmHg, mbar
- High accuracy silicone piezo resistive sensors
- Reads both gauge and absolute pressure
- Easy to read colour display with full 2 line alphanumerics
- Compact and robust with protective rubber housing
- H165 x W115 x D55mm, weight 0.88kg



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 20bar versions (vacuum available on 2bar model)
- Pressure/vacuum calibration, 0.04% accuracy
- Loop current calibration (displayed in mA, or % of range, 4 to 20mA)
- 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
- H157 x W90 x D33mm, weight 0.29kg



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 600bar (8700psi).

- Vacuum, 0.2, 2, 5, 10, 20, 35, 70, 100, 200, 400, or 600bar 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
- 24/36V loop power
- Over-pressure alarm
- RS-232 serial interface and EasyCal software compatible
- W270 x H175 x D250mm, weight 3kg



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 10bar (145psi).

- 7016 – Regulated low pressure: Vacuum, 0.2, 2, 5, or 10bar versions
- 7018 – Differential pressure: 0.2, 2, 5, or 10bar versions
- Pneumatic with 0.04% of full scale best accuracy
- 4 selectable pressure units and mA
- Loop current measure
- 24/36V loop power
- Over-pressure alarm
- RS-232 serial interface and EasyCal software compatible
- W270 x H175 x D250mm, weight 3kg



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
- 1/4 BSP G hose fittings for pushfit 4mm and 6mm external diameter hose
- Quick release couplings and barbed 6mm and 8mm internal diameter hose
- Nylon hose set with quick release connectors for low pressure connections
- Additional 4mm and 6mm nylon hoses to build up custom lengths as required
- Minimes 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





Ordering Information

Ordering information for portable process and pressure instruments

		Factory Calibration Certificate (NPL)	UKAS Calibration Certificate (ISO 17025)	Carry Case	Rechargeable Battery Pack	Mains Power Supply	EasyCal Software
Portable Loop & Temperature Instruments							
1048	Voltage / Current / Loop Calibrator - 0.02% Accuracy	C176	C138	✓	–	opt 7643	–
1049	PT100 Simulator Handheld (Class A °C)	C161	C114	✓	–	–	–
1050	PT100 Simulator Handheld (Class A °F)	C161	C114	✓	–	–	–
1077	Milliamp Transducer/Line Simulator - 0.02% Accuracy	C158	C108	opt 9027	opt 9529	–	–
1090	Temperature and Process Calibrator	C177	C139	✓	internal	✓	–
7000	RTD Temperature Calibrator	C183	C194	✓	internal	opt 7633	–
7005	Voltage / Current / Loop Calibrator - 0.01% Accuracy	C184	C195	✓	internal	opt 7633	–
7006	Loop Simulator & Source (Loop-Mate 1) - 0.1% Accuracy	C145	C145	✓	–	–	–
7007	Loop Signal Indicator (Loop-Mate 2) - 0.05% Accuracy	C145	C144	✓	–	–	–
7050	Process and Thermocouple Calibrator	C180	C192	field case	internal	–	–

Portable Pressure Instruments

7010	Pressure Calibrator (Vac to 600bar versions)	C178	C190	field case	internal	✓	ECFLA
7015	Pressure Calibrator (Vac to 600bar versions)	C178	C190	field case	internal	✓	ECFLA
7016	Regulated Pressure Calibrator (Vac to 10bar versions)	C178	C190	field case	internal	✓	ECFLA
7018	Differential Pressure Calibrator (0.2 to 10bar versions)	C178	C190	field case	internal	✓	ECFLA
7040	Pressure/Current Calibrator (Vac to 20bar versions)	C185	C196	✓	–	–	ECFLA
7090	Handheld Pneumatic Pump Kit (-950mbar to 40bar)	–	–	✓	–	–	–
7095	Handheld Hydraulic Pump Kit (0 to 700bar) with hoses, fittings, case	–	–	✓	–	–	–
7193	Benchtop Pneumatic Calibration Pump (0.95bar vac to 40bar)	–	–	–	–	–	–
7194	Benchtop Pneumatic Calibration Pump (0.95bar vac to 100bar)	–	–	–	–	–	–
7195	Benchtop Hydraulic Calibration Pump (0.9bar vac to 600bar)	–	–	–	–	–	–
7078	Auto Ranging Digital Gauge (Vac to 200bar, 0.1% accuracy of setting)	C204	C205	–	–	–	–
7089 / 7091 7094 / 7096	Digital Gauges - 7089: vacuum only / 7091: vac - 40bar 7094: 0 to 100bar / 7096: 700b, 0.2% acc)	C202	C203	opt 9804	–	opt 9805	ECFLA
7198	Pressure Calibration Accessories Kit (Adaptors, fittings, connectors, hoses)	–	–	✓	–	–	–

Pressure Range Codes for 7010, 7015, 7016, 7018 and 7040

Range (bar)	Vac	0.2	2	5	10	20	35	70	100	200	400	600
Option Code	7111	7100	7101	7102	7103	7104	7105	7106	7107	7108	7109	7110



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