TEST & MEASUREMENTS

Easy to use,
easy to order.

Specifications

- **Vacuum ranges:** -10% of the measuring range (10 bar and 20 bar ranges only are limited to -0.8 bar)
- **Keyboard selectable technical units:** mbar, bar, psi, mmwc (mmH_2O), cmwc (cmH_2O), mwc (mH_2O), inwc (inH_2O), mmHg, mHg, inHg, kPa, hPa, matm, atm, torr, $Lbin^2$, kgm^2, $kgcm^2$
- **Scale factor and square root:** for direct flow measurement
- **Pressure media:** compatible with most common non-corrosive, non-reducing, non-condensing and non explosive gases
- **Pressure ports:** 1/8" BSPPF
- **Accuracy:**
  Table A = 1 ±(0.1% of reading + 0.03% of f.s.)
  Table A = 2 ±(0.05% of reading + 0.02% of f.s.)
  The relative accuracies shown above are stated for 90 days and the operative conditions are from +5°C to +45°C. Outside the above temperature band the temperature drift is ±0.004% rdg/°C
- **Position effect:** negligible (excluded 20 mbar range)
- **Electrical ranges:**
  0 to 30.000 V
  0 to 22.000 mA
- **Electrical ranges accuracy:**
  ± (0.05% of reading + 0.01% of f.s.)
  The relative accuracy shown above is stated for 90 days and the operative conditions are from +18°C to +28°C. Outside the above temperature band the temperature drift is ±0.002% of rdg/°C
- **Common mode rejection:** >140 dB at 50/60 Hz ±1 Hz
- **Normal mode rejection:** > 60 dB at 50/60 Hz ±1 Hz
- **Shunt (current channel):** <110 Ω
- **Inpedence (voltage channel):** >1 MΩ
- **Maximum voltage input (voltage channel):** 50 V
- **Maximum current input (current channel):** 50 mA
- **Shortcircuit protection (loop power supply):** Fuse + Electronic
- **Overcurrent protection (current channel):** Fuse
- **Maximum load (passive loop):** 900Ω at 20 mA
- **Display:** dot matrix LCD (2 lines of 16 chracters each) with backlight device.
- **Operative life:**
  8 hours without printing and without load on 20 mA passive current loop
  4 hours without printing and with load on 20 mA passive current loop
- **Data memory:** up to 50 group of data
- **Working temperature limits:** from -5°C to 50°C
- **Storing temperature:** from -20°C to 60°C
- **Power supply:** Ni-MH rechargeable battery package
- **External dimensions:**
  100 x 60 x 240 mm (without pressure module)
  100 x 60 x 285 mm (with pressure module)
- **Weights:**
  net 1 Kg (instrument + pressure module)
  gross with packing 1,5 Kg

Ordering Code

MicroCal P 3210 - A - B - C - DDDD - E

The basic instrument is equipped with a built-in pressure sensor, calibration certificate, instruction Manual and a battery charger.

Table A — Pressure measurement accuracy

1	± (0.1% of rdg + 0.03% of f.s.)
2	± (0.05% of rdg + 0.02% of f.s.)

Table B — Pressure range

1	20.000 mbar	0.3000 PSI(cat. BB480000) Only with A=1
2	100.00 mbar	1.5000 PSI(cat. BB480001)
3	200.00 mbar	3.0000 PSI(cat. BB480002)
4	500.0 mbar	7.500 PSI (cat. BB480003)
5	1.0000 bar	15.000 PSI(cat. BB480004)
6	2.0000 bar	30.000 PSI(cat. BB480005)
7	5.000 bar	75.00 PSI (cat. BB480006)
8	10.000 bar	150.00 PSI(cat. BB480007)
9	20.000 bar	300.00 PSI(cat. BB480009) Only with A=1

Table C — Battery charger

1	115 Vac - USA plug
2	230 Vac - Schuko plug
3	230 Vac - UK plug
4	230 Vac - European plug
5	100 Vac - USA/Japan plug

Table D — Accessories

0	none
3	ABS case (for instrument + accessory kit)
5	External from 0 to 14 bar hand pressure pump (F3280001) - fig. 4
5x	External from 0 to 35 bar hand pressure pump (F3280010)
6	External from 0 to -0.8 bar hand pressure pump (F3280005) - fig. 5
7v	External from -0.8 to 2 bar hand pressure pump (F3280013) - fig. 1
8v	External from -0.8 to 40 bar hand pressure pump (F3280019) - fig. 3
A	Electrical signal test lead kit (EE300040)
B	BSP adaptor kit : n.2 1/8" BSPM - quick connection adaptor n.1 quick connect tee fitting n.1 2 mt Rilsan tube 6 mm OD n.2 1/8" BSPM - barb adaptor for 6 mm silicon tube n.2 washer n.2 1/8" BSPM - ¼" BSPF adaptors
C	NPT adaptor kit n.2 1/8" BSPM - quick connection adaptor n.1 quick connect tee fitting n.1 2 mt Rilsan tube 6 mm OD n.2 1/8" BSPM - barb adaptor for 6 mm silicon tube n.2 washer n.2 1/8" BSPM - 1/8" NPTF adaptors n.2 1/8" BSPM - ¼" NPTF adaptors

Table E — Calibration Report

1	Eurotron Calibration Report

Note : *For additional Pressure module requirements specify the part number and the accuracy (see table A and Table B). For example : Additional Pressure Module 500 mbar f.s. with 0.05% of rdg accuracy = cat. BB480003-2.*

Specifications may change without notice.

EUROTRON Instruments S.p.A.
V.le F.lli Casiraghi 409/413
I 20099 Sesto S. Giovanni (MI)
Tel.: +39-02 248820.1
Fax: +39-02 2440286
e-mail: info@eurotron.com
http://www.eurotron.com

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MicroCal P

Palm-Top Pressure Indicator / Calibrator

Bulletin 08-80.3 E

eurotron
"Excellence in measurements"

TEST & MEASUREMENTS

Accuracy ±0.05% of reading

20mbar to 20bar pressure modules

Voltage and Active and Passive current loop inputs

Memory for Data and Procedures

Simultaneous pressure and signal input display

CalpMan
Software to document your calibration and to test activities in compliance with ISO9000

All descriptions are related to full options instrument. See latest page for the different configurations.

Eurotron - *One of the world leaders in high technology equipment: portable flue gas analysers - high accuracy calibrators - non-contact IR thermometers.*

To keep your equipment adequately calibrated in compliance with ISO 9000

General

*The **MicroCal P** palm-top modular system introduces a new era in pressure calibration standard. Compact, rugged, accurate, battery powered, CE marked, the **MicroCal P** represents the ideal equipment for field and laboratory test and calibration activities.*
Each instrument consists of a basic electronic module combined with an easy replaceable Pressure Module. The Pressure Modules can be selected according to your application requirements.

MicroCal P basic unit
This is a microprocessor - controlled measuring instrument to grant high flexibility of performances. The incorporated processor, transmits the signal from the Pressure Module to the microprocessor, which digitally compensate the sensor data. This mathematical modelling of the pressure sensor virtually eliminates all errors over a wide range of temperature. Both pressure and electrical parameter readings are indicated on a high contrast two-line alphanumeric LCD display equipped with a backlight device.
The required pressure technical unit can be selected through a simplified procedure. In addition to pressure measurements the instrument, MicroCal P2 only, is equipped with a second channel designed for voltage (up to 30 V) and current (up to 22 mA) measurements.

Replaceable Pressure Module
The gauge/differential pressure sensor is installed in a replaceable Pressure Module. The individual sensor temperature/linearization matrix data are stored in a non volatile EEPROM resident in the module; the basic unit will reads the data to compensate the sensor data.
An extended number of Pressure Modules are available, in a wide variety of pressure measurement ranges. Each Pressure Module can. be used in any basic unit and the measurement system will provide measurement accuracy in conformity with the declared specifications.

Pressure Calibration System - Hand pumps
When connected to an auxiliary device such as a hand-pump with volume adjuster and ventilation valve, MicroCal P can be used as a pressure calibrator. Different models of hand pumps are available by Eurotron for most application requirements.
Two basic type of pressure hand pumps are available:

- **Axial** types pumps, advised for general application and where a vacuum or a maximum pressure of 10 bar is required.
- **Pliers** type pumps, advised for more practical operations and where a maximum pressure of 2, 14 or 20 bar is required.

These pumps have an auxiliary direct connection for a reference standard pressure gauge to run fast test with a comparison method.
The above pumps can. be ordered also separately pointing out the relevant catalogue number (see ordering instructions table D - eg. pump 0 to 20 bar cat. F3280002).
The instrument can be supplied, on request, in a leather case with shoulder strap for an easy transport, or in a rigid ABS case to be carried with all specified accessories.

Modular hand-held System

Instrument Highlight

Traceable certification
Report of Calibration stating the nominal and actual values and the deviation errors with a traceability declaration and references

Self-Test
A built-in auto-test routine is automatically activated when switching the instrument -On-

Pressure Ranges
9 different pressure ranges are available as a standard. Additional ranges are scheduled and special ranges are available on request.

Pressure Units
Most. common pressure units can be selected for readout. Additional units can be included on request.

Auto Zero
Displayed offset can be reset by activating a soft key.

mA and V Inputs
Available on MicroCal P2 model only. The instrument can measure current (up to 22mA) on active and passive loop and voltage (up to 30V) and display the value simultaneously with pressure value. The instrument can supply directly the transmitter with the internal 24Vdc power supply.

Peak
To measure the low and high peak values. May also be used to measure pressure pulses.

Switch test
A pressure switch test facility is included and the display will automatically hold open or closed value

Compensated
To eliminate temperature effects the instrument is temperature compensated in the range from +5°C to +45°C.

Filter/Damp
Introduction of a digital filter for unstable readings

Leak Test
Provides pressure drop data on a programmable time period.

Digital Interface
A bidirectional TTL port is available for communication with a computer. A TTL to RS232 adapter is available on request.

Media
The instrument is supplied as a standard for air or non corrosive dry gases. Pressure module compatible with AISI 316 SS are scheduled and available on request.

EMC Compatibility
Instrument fully tested in conformity with the directive n. 89/336/CEE Electromagnetic Compatibility.

CalpMan
Calibration Procedure Manager

Standard Agencies and Quality Auditors require the availability, the collection and the analysis of traceability documents for all the equipment installed in the process or used in the laboratory.
A supporting software for DOS and Windows (CalpMan -Calibration Procedure Manager) is available (supplied together with a memory module installed into the instrument and a digital interface cable when the Table D = 1 option is specified) , to transfer a selection of calibration routines from a PC to the internal memory of the instrument in order to simplify the field calibration activity by selecting the appropriate Tag number.
Calpman can handle the following pieces of information:

- Tag identification code
- Tag auxiliary information
- Operator/Inspector name
- Up to 5 different test points
- Next calibration date
- Programmable scaling
- Linear or square operation
- Alarm levels
- Damp and damp band setting
- Automatic error picture
- Error band

The serial number of the MicroCal P, the date and time call be automatically entered, using the internal real time clock, during the calibration activity.
The above procedure can be downloaded from the PC to MicroCal P (up to 50 Tag procedures), calibration data will be memory stored and transferred back to the PC to document the calibration activity that allows to build a quality control chart/data bank from a single calibration sheet to a detailed historical report.