

MCE2

The handy tool for pressure calibration.



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MC2: Practicality for Pressure Calibration

There are a few must-have tools for an instrument technician: the MC2 Pressure Calibrator is definitely one of them. It is a compact hand-held calibrator with calibration capabilities for pressure and electrical signals.

Once you start using MC2, you will notice it is a straightforward, user-friendly calibrator. First of all, the MC2 is compact in size and design. It is easy to carry and use. Secondly, the MC2 has a large graphical display, a menu-based interface and full numerical keyboard. Performing calibrations is quick and simple. In addition to this, the standard



rechargeable battery and battery charger facilitate active use of MC2. Thirdly, the MC2 has impact protectors and a membrane keyboard. This makes MC2 a robust, weatherproof calibrator made to withstand tough use. Finally, the MC2 can be equipped with both internal and external pressure modules. Although MC2 is a straightforward, practical calibrator, it still provides a wide range of configuration possibilities for pressure calibration.

Being a Beamex calibrator, MC2 represents the high, uncompromised quality standards evident in other Beamex calibration equipment. It is another MC calibrator you can rely on and a calibrator that completes your range of MC calibrators.

The actual size of the MC2 Pressure Calibrator



MC2 Features:

- Internal pressure module
- Connection for interchangeable external pressure modules
- Active and passive current measurement
- Voltage measurement
- Frequency measurement
- Pulse counting
- Switch testing
- Internal 24 V DC loop supply
- Selectable loop resistor for HART® loops

Features of the MC2 Pressure Calibrator



1. MC2 has a large graphical display with a multilingual interface. The interface is menu-based, which makes MC2 very user-friendly.

2. MC2 provides wide configuration possibilities, thanks to its internal and external pressure modules.

3. MC2 is robust and made for tough use. The impact protectors and membrane keyboard make it field compatible and weatherproof.

4. MC2 has a full numerical keyboard. Entering numbers is both quick and easy.

Other Advanced Features

Error % display

When calibrating a transmitter, the transmitter's output may be displayed in an error % unit rather than in an engineering unit.

Error display in input or output units

When calibrating a transmitter, the transmitter's output may be displayed as error in input or output engineering units.

%-display

Any measurement may be presented as a percent within the user-programmable range.

Scaling

A versatile, programmable scaling function allows the user to scale any measured unit into any custom unit. Scaling also includes a rooting transfer function for flow applications.

User setups

The unit has several user configurable setups that make it easy to save and quickly recall the desired configuration.

Leak testing

The leak test function indicates the pressure drop and leak rate during the user-programmable period.

Programmable alarms

Any measurement can be programmed to have an alarm based on the measurement value or on its rate of change of the measurement value.

Damping

Programmable damping allows the user to select different filterings for the measurements.

Bar graph

The bar graph allows the user to display the measurement as an analogue bar, with programmable start and end points.

Difference

Difference measurement allows the user to measure the difference between two pressure modules.

Deviation

The deviation function allows the user to display a deviation between a given reference value and the actual measurement.

Redundance

Redundance measurement allows the user to measure the same pressure using two pressure modules (internal and external) simultaneously. The unit alarms if the readings excessively differ from each other.

Additional Information

The unit also allows the user to view different additional information such as Min / Max / Rate / Internal temperature, etc.

Games

The unit even includes two games for the user's entertainment.

MC2 Pressure Calibrator - Specifications

General Specifications

Feature	Specification
Display	60 mm x 60 mm (2.36" x 2.36"), 160 x 160 pixels, back lit LCD
Weight	770 g (1.7 lbs)
Dimensions	215 mm (8.5") x 102 mm (4") x 49 mm (1.9") (d/w/h)
Keyboard	Membrane keyboard
Battery type	Rechargeable NiMH pack, 4000 mAh, 3.6V DC
Charging time	5 hours
Charger supply	100 ... 240 VAC, 50-60 Hz
Battery operation	24 hours in measurement mode, backlight off. 12 hours when taking 12 mA from loop supply, with backlight on.
Battery operation with optional dry battery cartridge and 4 alkaline AA cells	8 hours in measurement mode, backlight off. 4 hours when taking 12 mA from loop supply, with backlight on.
Operating temperature	-10 ... 50°C (14 ... 122°F)
Storage temperature	-20 ... 60°C (-4 ... 140°F)
Humidity	0 to 80% R.H. non condensing
Warmup time	Specifications valid after a 5-minute warmup period.
Max. input voltage	30 V AC, 60 V DC
Safety	Directive 73/23/EEC, EN 61010-1
EMC	Directive 89/336/EEC, EN 61326

Internal Pressure Modules (IPM)

Internal Module	Unit	Range ²	Resolution	1 Year Uncertainty(±) ¹
IPM200mC	kPa	±20	0.001	0.05% RDG + 0.05% FS
	mbar	±200	0.01	
	iwc	±80	0.01	
IPM2C	kPa	-100 to 200	0.01	0.05% FS
	bar	-1 to 2	0.0001	
	psi	-14.5 to 30	0.001	
IPM20C	kPa	-100 to 2000	0.1	0.05% FS
	bar	-1 to 20	0.001	
	psi	-14.5 to 300	0.01	

Feature	Specification
Temperature coefficient	< ±0.001 % RDG /°C outside 15 ... 35 °C. < ±0.0006 % RDG /°F outside 59 ... 95 °F
Maximum overpressure	2 x Range
Pressure port	G 1/8" female (G 1/8 (ISO 228/1) 60° internal cone adaptor)
Media compatibility	Wetted parts: AISI316 stainless steel, Nitrile rubber.
Supported pressure units	Pa, hPa, kPa, MPa, mbar, bar, lbf/ft2, psi, gf/cm2, kgf/cm2, kgf/m2, kp/cm2, at, mmH2O, cmH2O, mH2O, iwc, ftH2O, mmHg, cmHg, mHg, inHg, mmHg(0°C), inHg(0°C), mmH2O(4°C), inH2O(4°C), ftH2O(4°C), inH2O(60°F), mmH2O(68°F), inH2O(68°F), ftH2O(68°F), torr, atm, four (4) user specified units
Display update rate	2.5 / second

External Pressure Modules (EXT) with High Accuracy

Module	Range	1 Year Uncertainty(±) ¹
Barometric	800 ... 1200 mbar abs 23.6 ... 35.4 inHg a	0.5 mbar (0.015 inHg)
EXT10mD	±10 mbar differential	±4 iwc differential 0.1% Rdg + 0.05% Span
EXT100m	0 ... 100 mbar gauge	0 ... 40 iwc 0.04% Rdg + 0.025% FS
EXT400mC	±400 mbar	±160 iwc 0.04% Rdg + 0.02% FS
EXT1C	±1 bar	-14.5 ... 15 psi 0.04% Rdg + 0.01% FS
EXT2C	-1 ... 2 bar	-14.5 ... 30 psi 0.04% Rdg + 0.01% FS
EXT6C	-1 ... 6 bar	-14.5 ... 90 psi 0.04% Rdg + 0.01% FS
EXT20C	-1 ... 20 bar	-14.5 ... 300 psi 0.04% Rdg + 0.01% FS
EXT60	0 ... 60 bar	0 ... 900 psi 0.04% Rdg + 0.01% FS
EXT100	0 ... 100 bar	0 ... 1500 psi 0.04% Rdg + 0.01% FS
EXT160	0 ... 160 bar	0 ... 2400 psi 0.04% Rdg + 0.013% FS
EXT250	0 ... 250 bar	0 ... 3700 psi 0.04% Rdg + 0.015% FS
EXT600	0 ... 600 bar	0 ... 9000 psi 0.04% Rdg + 0.015% FS
EXT1000	0 ... 1000 bar	0 ... 15000 psi 0.04% Rdg + 0.015% FS

1) Uncertainty includes reference standard uncertainty, hysteresis, non-linearity, repeatability and typical long term stability for mentioned period. (k=2)

2) The internal pressure module's range may also be displayed in absolute pressure if an external Barometric Module (EXT B) is used.

All external pressure modules (EXT) are also compatible with Beamex MC5, MC5P and MC3 Calibrators.

MC2 - Electrical measurements

Voltage measurement –1...60 V DC

Range	Resolution	1 Year Uncertainty(±) ¹⁾
± 0.25 V	0.001mV	0.02% RDG + 5 µV
±(0.25 ... 1 V)	0.01 mV	0.02% RDG + 5 µV
1 ... 25 V	0.1 mV	0.02% RDG + 0.25 mV
25 ... 60 V	1 mV	0.02% RDG + 0.25 mV

Feature	Specification
Temperature coefficient	< ±0.0015% RDG / °C outside of 18 ... 28°C < ±0.0008% RDG / °F outside of 64.4 ... 82.4°F
Input impedance	>1 Mohm
Supported units	V, mV, µV
Display update rate	3 / second

mA measurement ±100 mA

Range	Resolution	1 Year Uncertainty(±) ¹⁾
±25mA	0.0001 mA	0.02% RDG + 1.5 µA
±(25 ... 100 mA)	0.001 mA	0.02% RDG + 1.5 µA

Feature	Specification
Temperature coefficient	< ±0.0015% RDG / °C outside of 18 ... 28°C < ±0.0008% RDG / °F outside of 64.4 ... 82.4°F
Input impedance	< 7.5 ohm
Supported units	mA, µA
Display update rate	3 / second

Loop supply

Feature	Specification
Output Current	max 25 mA, short circuit protected
Output Voltage	24 V ± 10%
Output impedance in HART® compatible mode	300 ohm ± 20%

Frequency measurement 0.0027 ... 50 000 Hz

Range	Resolution	1 Year Uncertainty(±) ¹⁾
0.0027 ... 0.5 Hz	0.000001 Hz	0.01% RDG
0.5 ... 5 Hz	0.00001 Hz	0.01% RDG
5 ... 50 Hz	0.0001 Hz	0.01% RDG
50 ... 500 Hz	0.001 Hz	0.01% RDG
500 ... 5000 Hz	0.01 Hz	0.01% RDG
5000 ... 50000 Hz	0.1 Hz	0.01% RDG

Feature	Specification
Temperature coefficient	Specification valid from –10 to 50°C (14 ... 122°F)
Input impedance	> 1 Mohm
Trigger level	-1...14 V in 1 V steps and open collector inputs
Minimum signal amplitude	2 Vpp (< 10 kHz), 3 Vpp (10...50 kHz)
Supported units	Hz, kHz, cph, cpm, 1/Hz (s), 1/kHz (ms), 1/MHz (µs)
Gate period	267 ms + 1 signal period

1) Uncertainty includes reference standard uncertainty, hysteresis, nonlinearity, repeatability and typical long term stability for mentioned period. (k=2)

MC2 Pressure Calibrator features

Pulse counting

Feature	Specification
Range	0 to 9 999 999 pulses
Input impedance	> 1 Mohm
Trigger level	-1 ... 14 V in 1 V steps and open collector inputs
Minimum signal amplitude	2 Vpp (pulse length > 50 μ s), 3 Vpp (pulse length 10 ... 50 μ s)

Switch test

Feature	Specification
Potential free contacts	Test Voltage (Current) 2.8 V (0.13 mA) or 24 V (35 mA)
Voltage level detection	Input impedance > 1 Mohm
	Trigger level -1 ... 14 V in 1 V steps

Standard Accessories

- User guide
- Calibration certificate
- Internal rechargeable NiMH battery pack + battery charger
- A pair of test leads and clips
- USB cable
- Pressure connector adapter from G1/8" female to G 1/8" male with 60° internal cone

Optional Accessories

- Pressure T-hose
- Soft carrying case
- Connection cable for external (EXT) pressure modules
- Dry battery cartridge
- Calibration handpumps



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