Intrinsically-Safe Multi-calibrator Ex-CAL 5000

Especially suitable for calibration, servicing and maintenance in Ex-hazardous areas.

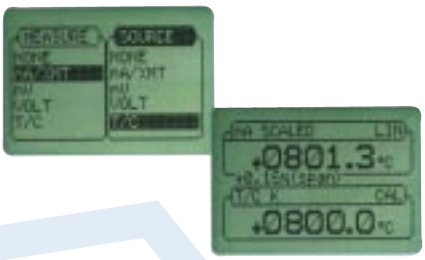
- Multi-lingual user guidance
- Robust design
- Well arranged display
- Measuring/transmitting of mA, mV, V, T, PT thermometers, ohm, frequency (additional pressure and threshold value switch for measuring)

Ex-data:

Ex designation:
Ⓔx II 2 (1) G EEx ia IIC T5

EC-type-examination certificate no.:
KEMA 03 ATEX 1377 X

Thanks to its robust construction and versatile and compact design, the Ex-Cal 5000 is the optimum calibrating tool for use in the Ex-area. A simple selection menu enables all functions to be selected and shown on the large LCD. The menu enables the user to only make the settings required for each measuring task.
The calibration job shows all the required information, such as actual and setpoint values, in their physical sizes, which enables deviations to be spotted immediately. The measuring error on the specimen is displayed in % in relation to the measured value or the margin.



The Ex-Cal 5000 also independently detects whether a 2, 3 or 4 wire resistance thermometer is connected. Standard measured quantities such as mA, mV, V, PT100, PT1000, frequency and pulse duration, pressure (measure via ext. sensor only) and resistance can be recorded and/or out output. An input for pressure/ temperature switch test is also present.

The Ex-Cal 5000 is cold junction compensated:
The compensation wires from the

transducers are clamped directly onto the calibrator. Thanks to the clamping point, which also has an integrated temperature measurement feature, no special connection adapters are required. When calibrating transducers for temperature or pressure, the transducer must be supplied from an external source. In order to store readout data, a 4 MB memory card can be integrated.

The data can then be downloaded onto the PC via a RS232 interface using a data cable (outside of the Ex-area). The battery condition can also be displayed

Standard delivery:

- Device
- Battery
- Charger
- Connection leads
- Carry case
- Calibration certificate

Optional accessories:

- Internal 4 MB memory card
- Ext. pressure sensors
- Calibration certificate

Technical data:

Ambient temperature:	-10°C ... +50°C
Power supply:	NIMH-Akku
Operating time:	Measuringmode: 4h Transmittingmode: 2,5h
Dimensions:	210mm x 120mm x 50mm
Weight:	ca. 1,2kg

Ex-CAL 5000 specifications

Performing measurements

Input	Measuring range	Accuracy	Resolution	Remarks
mV	0 – 100 mV	0,02% + 0,01%	0,001	R_{ON} > 20 MΩ
	100 – 600 mV	0,025% + 0,005%	0,01	
V	0 – 6 V	0,025% + 0,005%	0,0001	R_{ON} > 1 MΩ
	6 – 60 V	0,05% + 0,005%	0,001	
mA	0 – 52 mA	0,01% + 0,01%	0,001	R_{ON} 2,5 Ωm. Fuse
Ohm	0 – 400 Ohm	0,005% + 0,02%	0,01	Measuring current 0,9 mA
	400 – 2000 Ohm	0,02% + 0,015%	0,1	Measuring current 0,9 mA
Frequency	0 – 655 Hz	0,006%	0,01	R_{ON} > 300 kΩ
	655 – 1310 Hz	0,1 Hz	0,1	R_{ON} > 300 kΩ
	1310 – 20000 Hz	1 Hz	1	R_{ON} > 300 kΩ
Pulse/min.	0 – 6 x 10^5	1 Pulse/min.	1	R_{ON} > 300 kΩ
Pulse/h	0 – 10^7 –1	1 Pulse/h	1	R_{ON} > 300 kΩ
Counter	0 – 10^8 –1	∞	1 Pulse	R_{ON} > 300 kΩ

Accuracy in % from measured value + % from final value

Transmitting

Input	Measuring range	Accuracy	Resolution	Remarks
mV	-10 – 100 mV	0,01% + 0,005%	0,001	R_{OFF} > 0,2 Ω
V	0 – 12 V	0,01% + 0,005%	0,0001	R_{OFF} > 0,2 Ω
mA	0 – 21mA	0,01% + 0,02%	0,001	R_{LOAD} 900 Ω
Ohm	0 – 400 Ohm	0,005% + 0,02%	0,01	Measuring current 1 mA
	0 – 2000 Ohm	0,02% + 0,015%	0,1	Measuring current 1 mA
Pulse transmitter	0 – 10^8 –1	∞	1 Pulse	R_{ON} > 300 kΩ
Frequency	0 – 100 Hz	0,01 Hz ± 1 LSD	0,01	0 – 12V/<25 mA
	0 – 2000 Hz	0,006%	0,01	0 – 12V/<25 mA
Pulse/min.	0 – 6000	1 Pulse/min.	1	0 – 12V/<25 mA
Pulse/h	0 – 99,999	36 Pulse/h	1	0 – 12V/<25 mA

Accuracy in % from measured value + % from final value

Temperature

Resistance thermo-meter	Measuring range	Accuracy		Resolution
		Measuring	Transmitting	
Pt1000 ①	–200/400 °C	0,2 °C	0,2 °C	0,1 °C
Pt 500 ①	–200/850 °C	0,4 °C	0,4 °C	0,1 °C
Pt 200 ①	–200/850 °C	0,6 °C	0,6 °C	0,1 °C
Pt 100 ①	–200/850 °C	0,25 °C	0,25 °C	0,03 °C
Pt 50 ①	–200/850 °C	0,5 °C	0,5 °C	0,06 °C
D- 100 ②	–200/630 °C	0,25 °C	0,25 °C	0,03 °C
Ni 100 ③	– 60/250 °C	0,2 °C	0,2 °C	0,1 °C
Ni 120 ④	– 60/250 °C	0,2 °C	0,2 °C	0,1 °C
Cu 10 ⑤	–200/260 °C	2,0 °C	2,0 °C	0,3 °C

①= IEC 751, ②= JIS 1604-1989, ③= DIN 43760, ④= MINCO 7, ⑤= MINCO 16-9

Error data without cold junction error Max. measuring current for simulation of resistance thermometers: 5 mA

Temperature

Thermo-element	Measuring range	Accuracy		Resolution
		Measuring	Transmitting	
J ①	-210 ... 1200°C	0,5 °C	0,3 °C	0,1 °C
L ②	-200 ... 900°C	0,3 °C	0,2 °C	0,1 °C
K ①	-250 ... 1370°C	0,6 °C	0,3 °C	0,1 °C
T ①	-250 ... 400°C	0,3 °C	0,2 °C	0,1 °C
U ②	-200 ... 600°C	0,3 °C	0,2 °C	0,1 °C
B ①	-250 ... 1820°C	1,0 °C	0,6 °C	0,1 °C
R ①	-50 ... 1768°C	1,0 °C	0,6 °C	0,1 °C
S ①	-50 ... 1768°C	1,4 °C	0,7 °C	0,1 °C
E ①	-250 ... 1000°C	0,4 °C	0,2 °C	0,1 °C
N ①	-200 ... 1300°C	0,6 °C	0,3 °C	0,1 °C
C ①	-0 ... 2320°C	1,0 °C	0,5 °C	0,1 °C
D ①	-0 ... 2495°C	1,0 °C	0,5 °C	0,1 °C

①= IEC 584, ②= DIN 43710, *error data without cold-point error*

Characteristics

Temperature unit and scale
Units °C and °F, scales IPTS 68 and ITS 90 selectable

Pressure units
Display of measured value selectable from one of 15 units

Communicating with PC
RS 232 interface

Multi-lingual user guidance
German, English, French, Italian, Spanish, Portuguese

Operating modes

Step function
Transmits measured values in either 10%, 20%, 25% increments or in 10 selectable increments within the measuring range.

Ramp function
Programmable upward/downward runtime and dwell time

Scaling
Input/output measured values can be rescaled.

Transducer calibration
Simultaneous measurement of actual value, transmission of setpoint value, display of input and output variables in °C/°F

Transducer simulation
Output in mA, scaled display in °C/°F

Signal converter
Converter function for all measured quantities, galvanic insulation

Key macro
9 modes are stored and selected by their own key.

Switch test
Measured value on opening and closing the switch is recorded, forward resistance is also measured.

Data memory
Capacity - 4 MB internal memory (optional)

Display

60 x 40 mm graphic LCD display
Resolution: 5-digit, reading rate: typically 5 measured values/second