

Highly Precise Digital Manometer Precision (0,01 % FS*) RS485 BUS Interface

LEX1 is a micro-processor controlled, accurate and versatile digital pressure measuring instrument for calibration and testing purposes with 0,05 %FS standard accuracy. Option for precision 0,01% available as extra feature. Via the RS485 Bus Interface, communication with up to 128 connected instrument can take place. The pressure is measured twice per second and displayed. The top display indicates the actual pressure, the bottom display shows the Max. or Min. pressure.

ATEX / IECEx: LEX1 devices which are marked with "LEX1 Ei" are intrinsically safe for use in hazardous areas (by approval for both ATEX and IECEx standards).

Function

LEX1 has two operating keys. The left key is to turn the instrument on, to select the functions and the pressure units. The right key executes the selected function resp. unit or serves to display the Max. and Min. value.

The instrument has the following functions

RESET With the RESET-function, the Max. and Min. value is set to the actual pressure value.

ZERO Using the Zero-function will set any prevailing pressure to be the new zero point reference.

CONT The instrument turns off 15 min. after the last key function.

Activating CONT (Continuous) deactivates this automatic turn-off.

UNITS All standard instruments are calibrated in bar.

The pressure can be indicated in 13 different units.

Scope of Delivery: Carrying case and 5-point calibration certificate.



LEX1 with piezo-resistive pressure sensor



Optional accessories

- Carrying bag, protective rubber covering
- Interface converter K-114A

SPECIFICATIONS	
Number of Digits of the LCD Display	5 digit
Measuring Rate (Display LCD)	2 x per second
Measuring Rate via Serial Interface	Pressure up to 15 x per second
Storage / Operating Temperature	-10...60°C / 0...50°C
Medium Temperature Pressure Sensor	-20...80°C, others on request LEX1 Ei max. 60°C
Compensated Temperature Range	0...50°C
Battery	3 V battery, Typ CR 2430
Battery Life	approx. 2'000 hours continuous operation
Pressure Connection	G1/4" (other threads on request)
Bus Interface (****)	RS485 (RIELS bus protocol)
Electrical Connection (****)	External supply and RS485 communication via Fischer D103A054, flange socket fits with PC-converter cable K-114A (USB to RS485)
External Supply (****)	8...28 VDC
Temperature Measurement	Accuracy typ. 0,5°C
Material in Contact with Media	Stainless Steel (AISI 316L), Viton® O-ring. In addition with LEX1 capacitive: gold plated ceramic diaphragm, Nitril O-ring
Protection	IP65
Diameter x Height x Depth (approx.)	LEX1 piezoresistive: 76x118x55 mm LEX1 capacitive: 76x148x55 mm
Weight (approx.)	LEX1 piezoresistive: 300 g. LEX1 capacitive 335 g.

(****) In the Ex-Zone, the LEX1 Ei gauges are not allowed to be supplied externally, nor can they be connected via the RS485 interface.



LEX1 with capacitive pressure sensor

* Accuracy and Precision

"Accuracy" is an absolute term, "Precision" a relative term. Dead weight testers are primary standards for pressure, where the pressure is defined by the primary values of mass, length and time.

Highest class primary standards in national laboratories indicate the uncertainty of their pressure references with 70 to 90 ppM or close to 0,01%.

Commercial dead weight testers as used in our facilities to calibrate the transmitters and manometers indicate an uncertainty or accuracy of 0,025%.

Below these levels, RIELS use the expression "Precision" as the ability of a pressure transmitter or manometer to be at each pressure point within 0,01 %FS relative to these commercial standards.

The manometer's full-scale output can be set up to match any standard of your choice by correcting the gain with a calibration software.

Standard Pressure Ranges(**) LEX 1 (Ei) piezoresistive	Ranges	Resolution Display	Overpressure
PAA/PR	-1...2 bar	0,1 mbar	6 bar
PAA/PR	-1...10 bar	1 mbar	20 bar
PAA/PR	-1...20 bar	1 mbar	40 bar
PA	0...200 bar	10 mbar	400 bar
PA	0...400 bar	20 mbar	800 bar
PA	0...700 bar	50 mbar	1100 bar
PA	0...1000 bar	100 mbar	1100 bar

LEX 1 Ei

Intrinsically Safe Version, 94/9/CE and IECEx

Classification: II 2 G Ex ia IIC T6 Gb
 Certifications File:
 PTB 05 ATEX 2012 X and IECEx PTB 13.0028X

In comparison to the standard LEX1 the Ex-proof intrinsically safe version has internally more enhanced protective components mounted and is marked with the EX-logo.

Functions, ranges and accuracy are identical to the standard LEX 1 version.

Accuracy, Error Band (0...50 °C): $\leq 0,05\%FS$
 Long Term Stability:
 -Reference: 1 mbar or 0,05 %FS
 -Absolute: 0,5 mbar or 0,025 %FS
 Optional: Precision: 0,01 %FS 0,01 %FS (only for piezoresistive PA or PAA and ranges ≥ 10 bar)

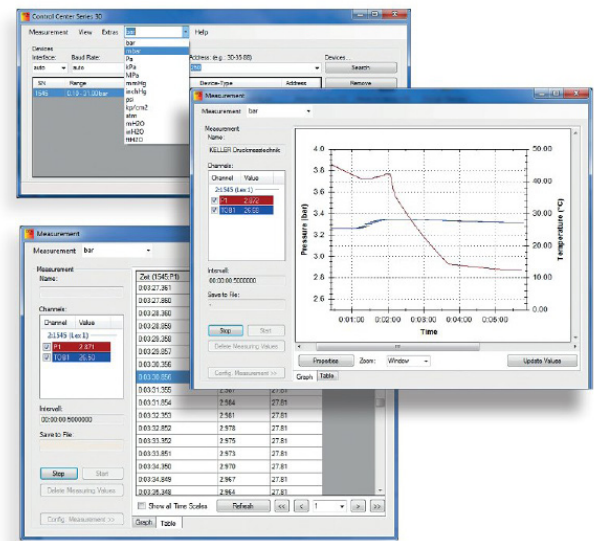
Standard Pressure Ranges (**) LEX 1 (Ei) capacitive	Ranges	Resolution Display	Overpressure	Negative Overpressure
PR/PD (***)	30 mbar	0,01 mbar	300 mbar	30 mbar
PR/PD (***)	100 mbar	0,01 mbar	1000 mbar	100 mbar
PR/PD (***)	300 mbar	0,1 mbar	1500 mbar	300 mbar

Accuracy, Error Band (0...50 °C): $\leq 0,2\%FS$
 Long Term Stability: $FS \geq 100$ mbar: $\pm 0,1\%FS$ $FS \leq 100$ mbar: $\pm 0,1$ mbar
 (***) Other pressure ranges as well as instruments with relative pressure measuring cells, on request
 (***) For the PD version, a tube connection $\varnothing 6$ mm for the reference is available
 PR = Vented Gauge. Zero at atmospheric pressure
 PA = Absolute. Zero at atmospheric pressure
 PAA = Absolute. Zero at vacuum

The factory setting of the zero for the ranges ≤ 61 bar absolute is at vacuum (0 bar absolute). For relative pressure measurements, activate "ZERO SET" at ambient pressure. Instruments > 61 bar absolute or instruments with a relative pressure sensor (label marked with: Range: rel) are calibrated with the zero at atmospheric pressure.

Scope of Delivery
 5-point calibration certificate and carrying case.

Computer Software CCS30: Pressure and temperature readings can be displayed and recorded on a PC or Laptop with the help of the software ControlCenterSeries30 (CCS30) and a serial interface cable K-103A (RS232) or K-114A (USB). The software also enables the configuration of the zero point settings. The RIELS bus protocol and programming examples in various programming languages are available. This allows very quick and easy implementation into customer software applications. Up to 128 devices can be connected together into a RIELS Bussystem.



Prüfprotokoll																							
Calibration Certificate / Fiche de calibration																							
Typ	LEX 1 / 1.20bar / 017503																						
Serialnummer	5297	Auflage No. 138439																					
Hersteller	RIELS Instruments GmbH																						
Spannweite	0.000 ... 21.000 bar abs																						
Genauigkeit	0.005 ... 0.005 bar abs																						
Temperaturbereich	0 ... 50 °C	Spannung																					
Druck-Temp. Bereich	0 ... 50 °C	Spannung																					
Druck-Temp. Bereich in Torr	0 ... 1520 Torr	Spannung																					
Werkstoffe	Druckübertragungselement: Pt 1000																						
Software	Messwert: 0,00 mbar																						
Druck	0,00 mbar	Temperatur																					
Temperatur	20 °C																						
Temperaturkoeffizient	0,000 %/°C																						
<table border="1"> <thead> <tr> <th>Druck</th> <th>Anzeige</th> <th>Fehler</th> </tr> <tr> <th>Pressure (mbar)</th> <th>Display (mbar)</th> <th>Error (mbar)</th> </tr> </thead> <tbody> <tr> <td>0,000</td> <td>0,000</td> <td>-0,02</td> </tr> <tr> <td>5,000</td> <td>4,997</td> <td>-0,01</td> </tr> <tr> <td>10,000</td> <td>9,999</td> <td>-0,01</td> </tr> <tr> <td>15,000</td> <td>14,999</td> <td>0,00</td> </tr> <tr> <td>20,000</td> <td>19,999</td> <td>0,00</td> </tr> </tbody> </table>			Druck	Anzeige	Fehler	Pressure (mbar)	Display (mbar)	Error (mbar)	0,000	0,000	-0,02	5,000	4,997	-0,01	10,000	9,999	-0,01	15,000	14,999	0,00	20,000	19,999	0,00
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