LEO-Record

DIGITAL GAUGE
WITH MEMORY FUNCTION

imsystem
Technologies for Automation

Features

- High accuracy
- Insulated and encapsulated piezoresistive pressure sensor
- Pressure and temperature recording
- Non-volatile memory ensures a high degree of data security
- Very low power consumption, long battery life
- Optional: Intrinsically safe version LEO-Record-Ei available for use in explosive environments

Functions

- Wide range of pressure units to choose from
- 5 user-defined pressure units configurable via software
- Zero point calibration via buttons
- Record function can be stopped and started manually
- Various configurable recording functions

Typical applications

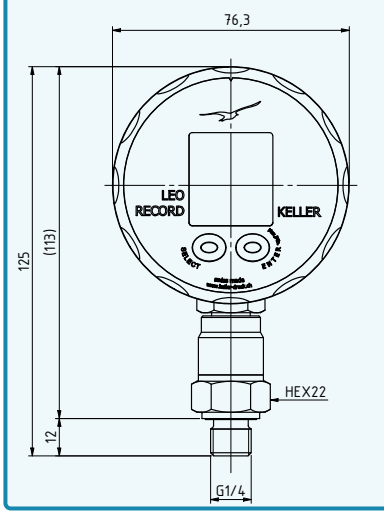
- Long-term monitoring and logging
- Water supply line monitoring
- Leakage monitoring
- Pressure monitoring in oil fields
- Gas line pressure checking

Accuracy
± 0,05 %FS

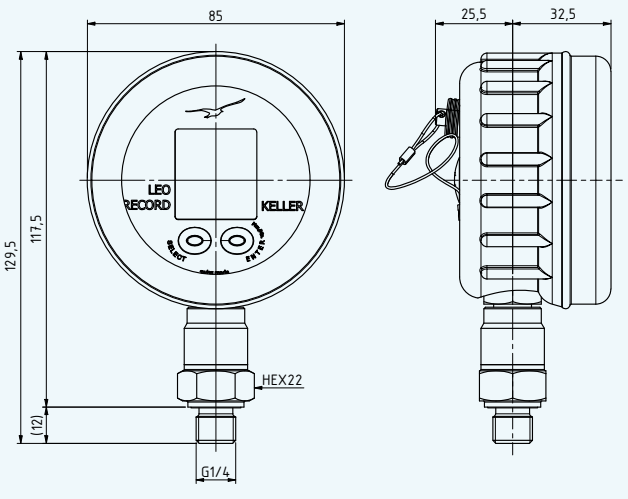
Total error band
± 0,1 %FS

Pressure ranges
-1…3 bar to 0…1000 bar

LEO-Record



LEO-Record with rubber cover



Specifcations

LEO-Record piezoresistive standard pressure ranges

Relative pressure PR	Absolute pressure PAA	Absolute pressure PA	Proof pressure	Display resolution
-1…3	0…4		10	0,001
-1…10	0…11		30	0,001
-1…30	0…31		90	0,01
	0…61		180	0,01
	0…101		300	0,01
		0…300	600	0,1
		0…700	1200	0,1
		0…1000	1200	0,1
bar rel.	bar abs.	bar abs.	bar	bar
Reference pressure at atmospheric pressure	Reference pressure at 0 bar abs. (vacuum)	Reference pressure at 1 bar abs.	Relating to Reference pressure	

LEO-Record capacitive standard pressure ranges

Relative pressure PR	Differential pressure PD	Proof pressure	Negative Proof pressure	Display resolution
0…0,03		0,3	0,03	0,01
0…0,1		1	0,1	0,01
0…0,3		1,5	0,3	0,1
bar rel.	bar diff.	bar	bar	mbar
Reference pressure at atmospheric pressure		Based on reference pressure		

The PD version features a 6 mm diameter capillary connection for reference.

Performance

LEO-Record piezoresistive

Accuracy @ RT (20…25 °C)	≤ ± 0,05 %FS	Non-linearity (best fit straight line, BFSL), pressure hysteresis, non-repeatability, zero point deviation and amplification deviation
Total error band (0…50 °C)	≤ ± 0,1 %FS	Maximum deviation within the specified pressure and temperature range
Compensated temperature range	0…50 °C	
Long term stability	≤ ± 0,1 %FS	Per year under reference conditions, annual recalibration recommended
Position dependency	≤ ± 1,5 mbar	Calibrated in vertical installation position with pressure connection facing downwards
Pressure range reserve	± 10 %	Valid measured values outside the pressure range, no overflow/underflow
Temperature measurement accuracy	± 1 °C typ.	

Specifcations

LEO-Record capacitive

Accuracy @ RT (20…25 °C)	≤ ± 0,1 %FS	Non-linearity (best fit straight line, BFSL), pressure hysteresis, non-repeatability, zero point deviation and amplification deviation
Total error band (0…50 °C)	≤ ± 0,2 %FS	Maximum deviation within the specified pressure and temperature range
Compensated temperature range	0…50 °C	
Long term stability	≤ ± 0,1 %FS	Per year under reference conditions, annual recalibration recommended
Long term stability 30 mbar range	≤ ± 0,1 mbar	
Position dependency	≤ ± 0,2 %FS	Calibrated in vertical installation position with pressure connection facing downwards
Temperature measurement accuracy	± 1 °C typ.	
Pressure range reserve	± 10 %	Valid measured values outside the pressure range, no overflow/underflow
Line pressure dependency (PD version)	≤ ± 0,005 %FS / bar	
Line pressure	≤ 2 bar	

Electrical data

Battery	3.6 V lithium battery, type SL-760	For hazardous application areas, only 3.6 V SL-760 batteries from Tadiran are permitted (LEO-Record-Ei)
Battery life	Approx. 2 years	When used continuously with a storage interval of every 10 seconds
External voltage supply	8…28 VDC	LEO-Record-Ei devices cannot be used with an external power supply, and the RS485 interface must not be used in explosive areas. See operating instructions for further information
Overvoltage and reverse polarity protection of external power supply	± 32 V DC	
RS485 voltage insulation	-7…12 V DC	
GND - CASE insulation	> 10 MΩ @ 50 VDC	
External interface	RS485 half-duplex	
Interface measuring rate	2/s	
Electrical connection	Female socket D 103 A054-130	

Electromagnetic compatibility

CE conformity as per 2014/30/EU (EMV)	EN 61326-1 / EN 61326-2-3 / EN 61000-6-1 / EN 61000-6-2 / EN 61000-6-3 / EN 61000-6-4

Data logger

Cyclical logger	Recording of pressure and temperature	Various recording functions can be configured
Data storage	57,000 measured values with timestamp	Measurement interval ≤ 15s
	28,000 measured values with timestamp	Measurement interval > 15s
Storage interval	Shortest 1/s	Configurable

Specifcations

LC display

Dimensions/appearance	Width x height: 27,8 mm x 30 mm (see Dimensions and options)
Number of digits on LC display	2 rows with 5 digits each
Display mode	Pressure and record status
Display interval	2/s
Configurable pressure units	bar, mbar, hPa, kPa, MPa, PSI, mH2O, cmH2O, kp/cm2
Additional pressure units	5 user-defined units can be configured via software

Mechanical data

Materials in contact with media

Component	LEO-Record piezoresistive	LEO-Record capacitive
Pressure connection	Stainless steel AISI 316L	Aluminium oxide 96%, gold plated
Pressure transducer diaphragm		Stainless steel AISI 316L
Pressure transducer seal (internal)	None	Nitrile
Pressure connection seal (external)	FKM (75 Shore, -20…200 °C)	FKM (75 Shore, -20…200 °C)

Other materials

Component	LEO-Record piezoresistive	LEO-Record capacitive
Display housing	Faradex AS-1003	Faradex AS-1003
Front glass	LEXAN® 163R	LEXAN® 163R
Pressure transducer oil filling	Silicone oil	None

Other data

Component	LEO-Record piezoresistive	LEO-Record capacitive	
Pressure connection	G 1/4 male	G 1/4 male	See Dimensions and options
	1/4-18NPT male	1/4-18NPT male	
Diameter x height x depth	76 mm x 125 mm x 54 mm 85 mm x 130 mm x 58 mm	76 mm x 150 mm x 55 mm 85 mm x 130 mm x 58 mm	Without rubber cover With rubber cover
Weight (approx.)	250 g	350 g	Without rubber cover

Environmental conditions

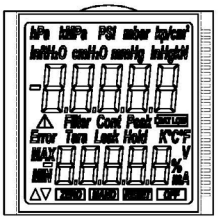
Medium temperature range	-40…85 °C	Icing not permitted
Ambient temperature range	-10…60 °C	
Storage temperature range	-20…70 °C	
Protection	IP65	
Note	Readability of the LC display is guaranteed between 0 °C and 50 °C Outside of this temperature range, the readability of the display may be limited	

LEO-Record-Ei explosion protection

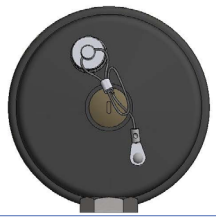
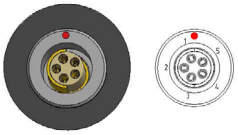
Intrinsically safe version LEO-Record-Ei in accordance with 2014/34/EU (ATEX) and IECEx	Ex II 2G Ex ia IIC T4 Gb PTB 05 ATEX 2012 X IECEx PTB 13.0028 X	The intrinsically safe version may only be operated using the 3.6 V battery, SL-760 from Tadiran Max. permitted ambient temperature range -20…60 °C
Note	The conditions for safe use can be found in the operating instructions	

Dimensions and options

LC display

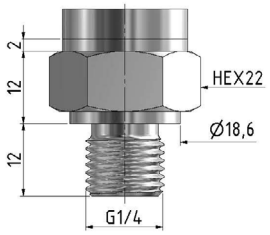
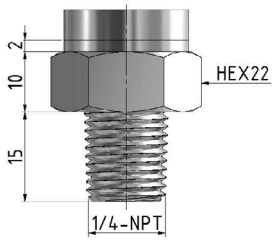
Front cover	Content	Dimensions
		Width × height: 27,8 mm × 30,0 mm Digit size: top: 8,4 mm × 3,8 mm bottom: 6,3 mm × 2,9 mm

External connection

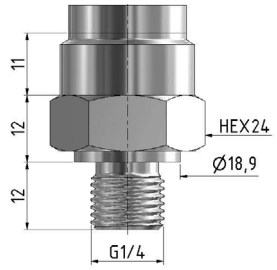
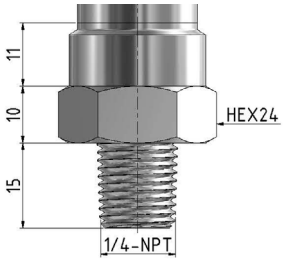
Placement	Connection	Pin assignment	
	Female socket D 103 A054-130	Red	Reference point
		1	GND
		2	n.c.
		3	+Vs
		4	RS485A
		5	RS485B

Available pressure connections

For pressure range ≤ 200 bar

G1/4	1/4-18NPT
	
DIN EN ISO 1179-2	ASME/ANSI B 120.1

For pressure ranges > 200 bar

G1/4	1/4-18NPT
	
DIN EN ISO 1179-2	ASME/ANSI B 120.1

Other pressure connections available on request.