LEO-Record-H2

Digital gauge with logging function for hydrogen applications

Features

- Stainless steel with increased nickel content for a lower embrittlement rate
- Gold-plated diaphragm for minimal H2 diffusion
- Pressure and temperature recording
- Non-volatile memory ensures a high degree of data security
- Long battery life thanks to very low power consumption
- Optional: Intrinsically safe LEO-Record-Ei-H2 version available for use in explosive environments

Functions

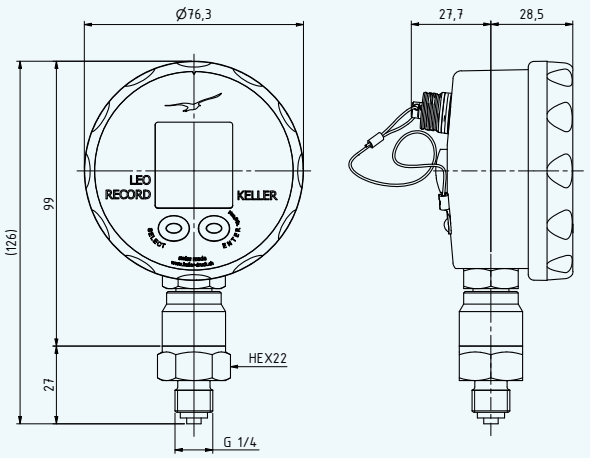
- Wide range of pressure units to choose from
- 5 user-defined pressure units configurable via software
- Simple zero point calibration via buttons
- Record function can be started and stopped manually
- Various recording functions can be configured

Typical hydrogen applications

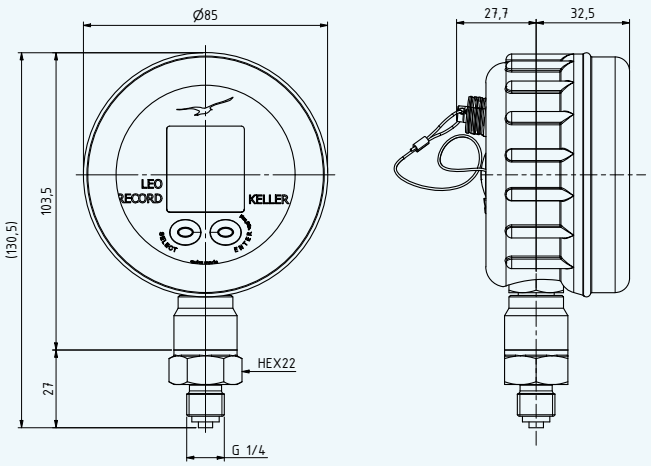
- Manufacturing / production
- Transport
- Containment / storage
- Petrol stations

Accuracy
± 0,05 %FS
Total error band
± 0,1 %FS
Pressure ranges
-1…3 bar to 0…1000 bar

LEO-Record-H2



LEO-Record-H2 with rubber cover



Edition 12/2024
Subject to alterations
info@keller-pressure.com

LEO-Record-H2 – Specifications

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	bar	bar
Reference pressure at atmospheric pressure	Reference pressure at 0 bar abs. (vacuum)	Reference pressure at 1 bar abs.	Relating to reference pressure	

Performance

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 compensated 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.	

LEO-Record-H2 – Specifications

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-H2).
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-H2 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 VDC	
RS485 voltage insulation	-7…12 VDC	
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 (EMC)	EN IEC 61326-1 / EN IEC 61326-2-3 / EN IEC 61000-6-1 / EN IEC 61000-6-2 / EN IEC 61000-6-3 / EN IEC 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

LC display

Dimensions/appearance	Width x height: 27,8 mm × 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, inH2O, ftH2O, mmHg, inHg, kp/cm2
Additional pressure units	5 user-defined units can be configured via software

LEO-Record-H2 – Specifications

Mechanical data

Materials in contact with media

Pressure connection	Stainless steel AISI 316L / 1.4435
Pressure transducer diaphragm	Stainless steel AISI 316L / 1.4435, gold plating 6 µm
Pressure transducer seal (internal)	None
Pressure connection seal (external)	None, metallically sealed

Other materials

LC display housing	Faradex AS-1003
Front glass	LEXAN® 163R
Oil filling sensor	Silicone oil

Further details

Pressure connection	G1/4 “Mano” with centring pin	See Dimensions and options
	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	Without rubber cover With rubber cover
Weight	approx. 250 g	

Environmental conditions

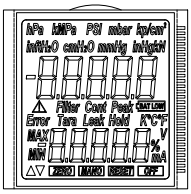
Medium temperature range	-40…85 °C	Icing not permitted.
Ambient temperature range	-10…60 °C	
Storage temperature range	-20…70 °C	
Protection	IP65	
Load cycles @ RT (20…25 °C), 0…100 %FS	10 m. pressure cycles	≤ 400 bar
	2 m. pressure cycles	> 400…600 bar
	100'000 pressure cycles	> 600…1000 bar
Note	Readability 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-H2 explosion protection

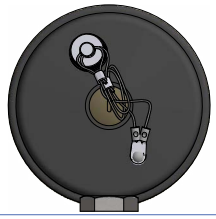
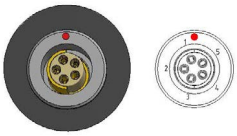
Intrinsically safe version in accordance with 2014/34/EU (ATEX), UKSI 2016/1107 (UKEX) and IECEx	Ex II 2G Ex ia IIC T4 Gb PTB 05 ATEX 2012 X IECEx PTB 13.0028 X	The intrinsically safe version may only be operated using the 3,6 V battery, SL-760 from Tadiran. Max. permitted ambient temperature range -20…60 °C.
Note	The conditions for safe use can be found in the operating instructions.	

LEO-Record-H2 – 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

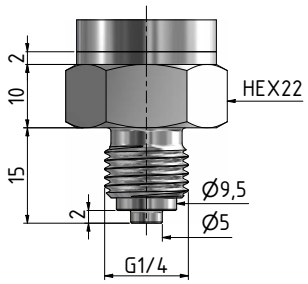
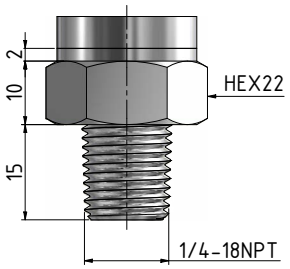
External connection

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

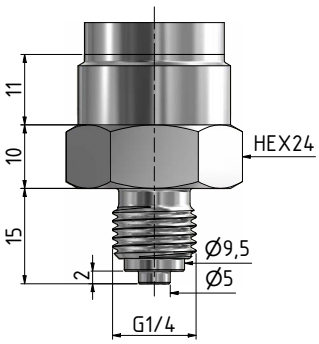
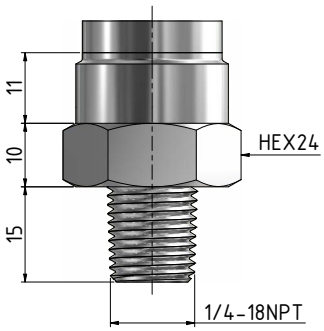
LEO-Record-H2 – Dimensions and options

Available pressure connections

Pressure ranges ≤ 120 bar

G1/4 “Mano” with centring pin	1/4-18NPT male
	
DIN EN837	ASME/ANSI B 120.1

Pressure ranges > 120 bar

G1/4 “Mano” with centring pin	1/4-18NPT male
	
DIN EN837	ASME/ANSI B 120.1

Other pressure connections available on request.

Examples of similar products

- Series 23SY-H2: Industrial transmitter for hydrogen applications
- Series 23SX-H2: High-precision industrial transmitter for hydrogen applications
- OEM series: Pressure transducer with electronics (e.g. Series 10LY-H2 or 20SY-H2 with thread) for integration into one’s own systems

LEO-Record-H2 – Software, scope of delivery and accessories

Interface

The LEO-Record-H2 gauge has a digital interface (RS485 half-duplex). Details of the communication protocols can be found at www.keller-druck.com. Documentation, a Dynamic Link Library (DLL) and various programming examples are available to integrate the communication protocol into your own software.

Interface converters

The connection to a computer is established via an RS485-USB interface converter. Suitable converters are available as accessories. To ensure smooth operation, we recommend the K-114A converter with the corresponding USB connector.

PressureSuite Desktop

With the «PressureSuite Desktop» Windows software, data recorded using KELLER pressure gauges with a recording function can be read and visualised. This data can be exported in CSV, JSON, image, Excel or Word format, as an image, or in other formats for further processing or documentation. Thanks to the intuitive software interface, the digital gauge is easy to configure and the various recording functions provide an optimum level of adaptability to suit the measuring task at hand. In order to convert measurement results directly after reading them, information about the measuring site, for instance parameters relating to water level calculation, can be saved directly in the measuring device.

PressureSuite Desktop has a free licence and is compatible with all products in the PressureSuite.

Configuration options

- Configurable pressure and temperature channels
- Configurable storage interval (1s … 99 days)
- Averaging from a configurable number of measurements
- Recording types
  - – Constant interval measurement
  - – Event-controlled recordings
    - · Recording starts when value exceeded
    - · Recording starts when measurement drops below a value
    - · Recording starts when value changes
    - → Combination of constant and event-controlled recording possible
- Calibration of the zero pressure point
- Start measurement immediately or at a specific time
- Water level calculation
- Data storage Linear or ring storage

PRESSURESUITE
DESKTOP

Mano-Config

The ManoConfig program is compatible with various types of KELLER gauges and allows end customers to configure the devices.

Range of functions

- Configuring the wait period before automatic shutdown
- Activating/deactivating pressure units
- User-defined pressure units can be programmed
- Calibrating the pressure

CCS30

Measurement recording

- Graphical live visualisation of the measured values in a configurable time interval
- Adjustable measuring and storage interval
- Export function for the measured values recorded (csv, ...)

Configuration

- Call up of information (pressure and temperature range, firmware version, serial number etc.)

LEO-Record-H2 – Scope of delivery and accessories

Scope of delivery

Plastic case	3,6 V lithium battery, type SL-760	Operating instructions D/E/F	Copper seal for G 1/4 «mano» with centering pin
			

Accessories

Rubber cover	Carry case	Interface converter
		
For additional protection in harsh environments.	With belt loop.	K-114-A • With Fischer plug (5-pin) • Various adapter cables available
Calibration certificate with 5 measuring points	Calibration certificate with 11 measuring points	Calibration certificate
		
Deviation at room temperature Issued by KELLER.	Deviation at room temperature with hysteresis. Issued by KELLER.	Issued by an external calibration laboratory accredited by DakkS or SAS.