

LEO Ultimate

High-precision digital pressure gauge with accuracy up to 0,01 %FS

Key features

- Accuracy up to 0,01 %FS
- Absolute and relative pressure measurement
- Data logger with high storage capacity
- USB-C and Bluetooth connectivity
- Large backlit LCD with excellent readability
- Premium buttons with tactile feedback
- Robust and elegant metal housing

Functions

- 5 Measuring Modes: Standard, Peak, Leak, Rate, Alarm
- Intuitive menu navigation and shortcut functions
- Two bar graphs for full-scale and dynamic ranges
- Advanced functions via mobile and desktop apps
- Powered by standard AA batteries
- External power via USB-C

Typical applications

- Calibration reference in laboratories and service centers
- On-site pressure verification and field testing
- Commissioning and maintenance of pressure systems
- Reference gauge for hydraulic and pneumatic systems

Accuracy

$\pm 0,05$ %FS / optional $\pm 0,01$ %FS

Total error band

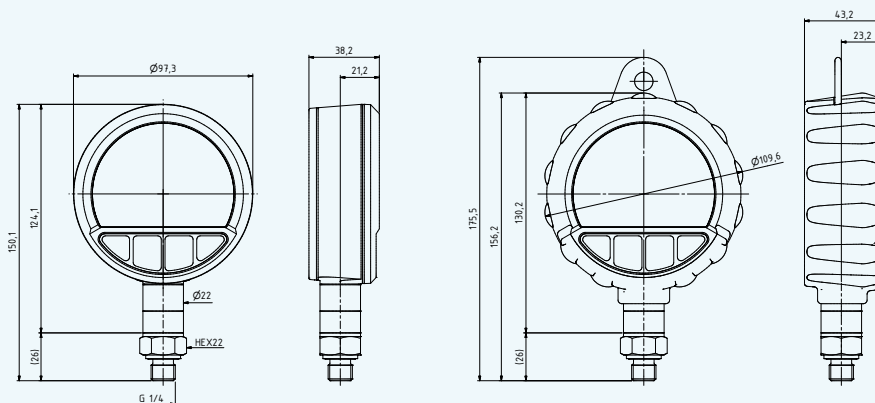
$\pm 0,05$ %FS @ 0...50 °C

Pressure ranges

-1...1 bar to 0...1000 bar / -15...15 psi to 0...15000 psi



LEO Ultimate



LEO Ultimate – Specifications

Every LEO Ultimate can measure absolute pressure and relative pressure. The pressure display can be switched as required. The performance specifications refer to the extended absolute pressure range¹. The default setting is the absolute pressure range².

Standard pressure ranges [bar]

Orderable pressure range	Proof pressure	Display options			
		Pressure range		Extended pressure range	
		Absolute ²	Relative	Absolute ¹	Relative
1	3	0...1	0...1	0...2	-1...1
1,6	9	0...1,6	0...1,6	0...2,6	-1...1,6
2,5	9	0...2,5	0...2,5	0...3,5	-1...2,5
4	9	0...4	0...4	0...5	-1...4
6	30	0...6	0...6	0...7	-1...6
10	30	0...10	0...10	0...11	-1...10
16	90	0...16	0...16	0...17	-1...16
25	90	0...25	0...25	0...26	-1...25
40	90	0...40	0...40	0...41	-1...40
60	300	0...60	0...60	0...61	-1...60
100	300	0...100	0...100	0...101	-1...100
160	300	0...160	0...160	0...161	-1...160
250	1200	0...250	0...250	0...251	-1...250
400	1200	0...400	0...400	0...401	-1...400
600	1200	0...600	0...600	0...601	-1...600
1000	1200	0...1000	0...1000	0...1001	-1...1000
bar	bar	bar	bar	bar	bar

Standard pressure ranges [psi]

15	43	0...15	0...15	0...30	-15...15
25	130	0...25	0...25	0...40	-15...25
40	130	0...40	0...40	0...55	-15...40
60	130	0...60	0...60	0...75	-15...60
100	435	0...100	0...100	0...115	-15...100
150	435	0...150	0...150	0...165	-15...150
250	1300	0...250	0...250	0...265	-15...250
400	1300	0...400	0...400	0...415	-15...400
600	1300	0...600	0...600	0...615	-15...600
1000	4350	0...1000	0...1000	0...1015	-15...1000
1500	4350	0...1500	0...1500	0...1515	-15...1500
2500	4350	0...2500	0...2500	0...2515	-15...2500
4000	17400	0...4000	0...4000	0...4015	-15...4000
6000	17400	0...6000	0...6000	0...6015	-15...6000
10000	17400	0...10000	0...10000	0...10015	-15...10000
15000	17400	0...15000	0...15000	0...15015	-15...15000
psi	psi	psi	psi	psi	psi

Reference pressure at vacuum	Reference pressure at atmospheric pressure	Reference pressure at vacuum	Reference pressure at atmospheric pressure
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LEO Ultimate – Specifications

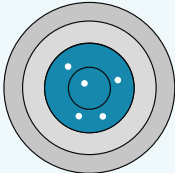
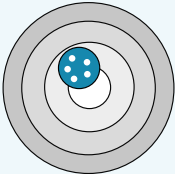
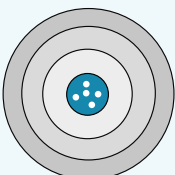
Performance

Accuracy @ RT (20...25 °C)	$\leq \pm 0,05$ %FS	Non-linearity (best fitted straight line BFSL), pressure hysteresis, non-repeatability, zeropoint and gain deviation
Total error band (0...50 °C)	$\leq \pm 0,05$ %FS	Maximum deviation within the compensated pressure and temperature range.
Compensated temperature range	0...50 °C	
Long-term stability	$\leq \pm 0,1$ %FS	Per year under reference conditions; annual recalibration recommended.
Position dependence	$\leq \pm 1,5$ mbar	Calibrated in vertical position with pressure connection facing downwards.
Pressure range reserve	± 10 %	Valid measured values outside the pressure range; no overflow or underflow yet.
Temperature measurement accuracy	± 1 °C typ.	

Enhanced precision / accuracy (optional)

For defined pressure ranges, KELLER Pressure can optionally achieve maximum reproducibility (precision) through additional measurement effort and selection of the pressure transducers. In addition, some products can be adjusted by an accredited calibration laboratory to the laboratory's higher-accuracy pressure sources.

Precision @ RT (20...25 °C)	$\leq \pm 0,025$ %FS	For all absolute standard pressure ranges ≥ 10 bar (exception 40 and 60 bar)	With a calibration certificate from KELLER Pressure ex works.
	$\leq \pm 0,01$ %FS	For absolute pressure ranges 10, 16, 100, 1000 bar	
Accuracy @ RT	$\leq \pm 0,025$ %FS	For all absolute standard pressure ranges ≥ 10 bar (exception of 40 and 60 bar)	With DakkS certificate from an external calibration laboratory.
	$\leq \pm 0,01$ %FS	For absolute pressure ranges 10, 16, 100, 1000 bar	

	Accuracy $\pm 0,05$ %FS, with KELLER Pressure factory calibration certificate (standard) KELLER Pressure uses pressure sources for product adjustment that are several times more accurate than the product under test. This allows products to be adjusted at the factory to an absolute accuracy of up to $\pm 0,05$ %FS.
	Precision $\pm 0,01$ %FS / $\pm 0,025$ %FS, with KELLER Pressure factory calibration certificate. For selected pressure ranges, maximum reproducibility is achieved through additional measurement effort and selection of the pressure sensors. For such high-precision instruments, KELLER Pressure uses the term «precision» to describe the ability of the instrument to reproduce measured values to within 0,01 %FS relative to the factory pressure sources.
	Accuracy 0,01% FS / 0,025% FS with DakkS certificate, issued by an external accredited calibration laboratory. By adjusting zero point and gain via the digital interface, the instrument can be adjusted and certified by an accredited calibration laboratory using the laboratory's higher-accuracy pressure sources. External calibration is performed in accordance with DKD guidelines under reference conditions and without taking long-term effects into account.

LEO Ultimate – Specifications

Electrical specifications

Battery	2 × 1,5 V Mignon AA, Energizer Ultimate Lithium
Battery life	> 3500 h (default settings)
Electrical connection	USB-C
Electrical interface	USB 2.0 (12Mbit/s)
External power supply	5 VDC / 50 mA
Communication protocol	USB CDC (Virtual COM Port)
GND - CASE isolation	> 10 MΩ @ 500 VDC

Bluetooth

Technology type	Bluetooth® Low Energy 5.4
Frequency range	2402 – 2480 MHz
Channel spacing	2 MHz
Maximum transmit power	+6 dBm
Antenna type	Integrated chip antenna

Data logger

Selectable measurement modes	Standard (Min/Max), Leak, Peak, Rate, Alarm
Storage channels	Absolute pressure, Relative pressure, Temperature
Data memory	800'000 readings
Storage interval	Configurable: Up to 50 times per second
Storage modes	Stop When Full / Overwrite

LC-Display

Number of digits on the main display	Adjustable from 4 to 5 1/2 digits
Left bar graph	Full-scale pressure display
Right bar graph	Configurable: Dynamic pressure range display with drag indicator
Display interval	Configurable: ≤ 10/s
Selectable pressure units	bar, mbar, psi, Pa, kPa, MPa, mH ₂ O, mmH ₂ O, inH ₂ O, ftH ₂ O, mmHg, inHg, kgf/cm ²
Additional pressure units	5 custom pressure units configurable via software
Menu language	English

Electromagnetic compatibility

CE conformity in accordance with 2014/30/EU		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
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Radio Equipment Directive

EU (CE / RED)		EN IEC 62368-1, EN 300 328, EN 301 489-1, EN 301 489-17, EN 62311, EN 62479
USA (FCC) / Canada (ISED)		47 CFR Part 15B, 47 CFR Part 1.1310 / 2.1093 ICES-003, RSS-102
Japan		JRF certification: 217-220682
Australia / New Zealand		Australia: ABN 81 145 810 206 New Zealand: Company no. 090887882

LEO Ultimate – Specifications

Mechanical specifications

Materials in contact with media

Pressure connection	Stainless steel AISI 316L	≤ 415 bar (6000 psi)
	Stainless steel AISI 318LN, 1,4462	> 415 bar (6000 psi)
Separating diaphragm pressure transducer	Stainless steel AISI 316L	
Seal, pressure transducer (internal)	None	If the "Precision or increased accuracy" option is selected: FKM (-20...200 °C)
Seal, pressure connection (external)	FKM (75 Shore, -20...200 °C)	

Other materials

Display housing	Die-cast zinc, nickel-plated
Front glass	PMMA
Push-buttons	VMQ
Protective cover	NBR-PVC
Mounting bracket protective cover	PA12
Oil filling pressure transducer	Silicone oil

Further details

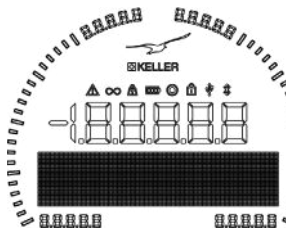
Pressure connection	G1/4 male, G1/2 male, 1/4-18NPT male, G1/4 mano EN 837, G1/2 mano EN 837
Diameter x Height x Depth	approx. 96,9 x 150,1 x 38,2 mm Without rubber protective cover, process connection G1/4, standard version
Weight (approx.)	approx. 720g (incl. batteries, without protective cover) approx. 800g (incl. batteries, with protective cover)

Ambient conditions

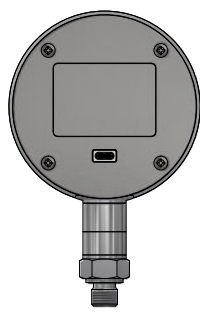
Media temperature range	-20...85 °C	Icing not permitted.
Ambient temperature range	-10...70 °C	
Storage temperature range	-20...80 °C	
Note	The readability of the display is guaranteed between -10 °C and 70 °C. Outside this temperature range, the display is only partially legible.	
Protection class	IP67	
Load cycles @ RT (20...25°C)	> 10 million pressure cycles	0...100 %FS
Vibration resistance	5 g, 10...500 Hz	IEC 60068-2-6
Shock resistance	50 g, 6 ms	IEC 60068-2-27
Humidity	DIN EN IEC 60068-2-78, Severity level IV	The protective cover must be used for outdoor applications or where there is an increased risk of corrosion.
Salt spray	DIN EN ISO 1456, Stufe 1	

LEO Ultimate – Dimensions and variants

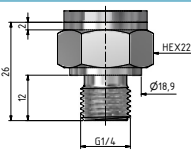
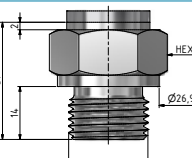
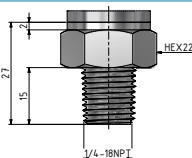
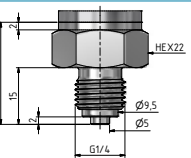
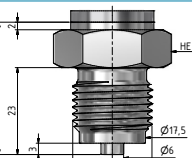
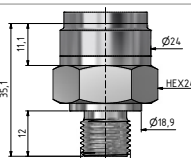
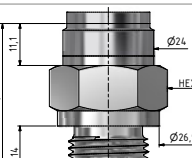
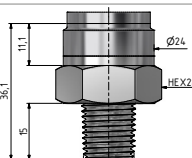
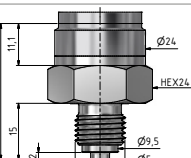
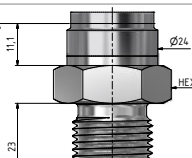
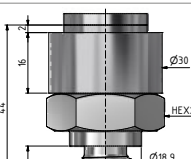
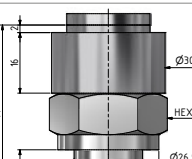
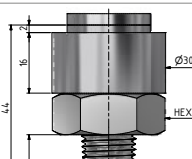
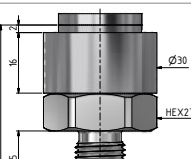
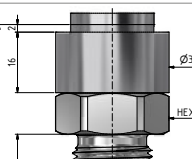
LC-Display

Content	Dimensions
	Outer diameter Size: 76,8 mm
	Digit size, main display: 10,2 x 6,1 mm
	DOT matrix field Size: 59,8 x 13,45 mm Number of dots: 30 x 133 A detailed description of the functions of individual segments can be found in the operating instructions.

Electrical connection

Position	USB-C, IP67
	

Available pressure connections

	G1/4 male	G1/2 male	1/4-18NPT male	G1/4 mano	G1/2 mano
For pressure ranges ≤ 160 bar					
For pressure ranges > 160 bar					
For variants with enhanced precision / accuracy					
	DIN EN ISO 1179-2	DIN EN ISO 1179-2	ASME/ANSI B 1.20.1	DIN EN 837	DIN EN 837

LEO Ultimate – Software

PressureSuite Mobile

With the 'PressureSuite Mobile' app for Android and iOS, recorded data from KELLER Pressure products with a recording function can be read out and visualised wirelessly via Bluetooth. The app enables the further processing and documentation of measurement data, which can be exported in formats including CSV, JSON, image and others.

Thanks to the clear and intuitive user interface, the devices are easy to configure. The various recording functions allow for optimal adaptation to the specific measurement task. For direct conversion of the measurement results after reading, information about the measurement point, such as parameters for water level calculation, can be stored directly in the measuring device.

PressureSuite Mobile is licence-free and compatible with all PressureSuite Bluetooth products. The mobile application is optimised for field use and enables wireless communication with the measuring instruments without the need for additional hardware.

Configuration options via PressureSuite Mobile

- Measurement modes: Standard (Min/Max), Leak, Peak, Rate, Alarm
- Selectable pressure and temperature channels
- Adjustable measurement and storage interval
- Display settings: units, number of digits, display interval, timeouts, contrast, alarms, ...
- Adjustment of the pressure zero point

Data logger functions

- Continuous interval measurement
- Start and stop measurement immediately or at a defined time
- Data storage modes: Stop When Full or Overwrite

PressureSuite Desktop

The 'PressureSuite Desktop' Windows software is used to read out and visualise recorded data from KELLER Pressure pressure transmitters with a recording function. The measurement data can be exported for further processing or documentation as CSV, JSON, image, Excel, Word report and in other formats. Thanks to the software's clear user interface, the devices are easy to configure and the various recording functions allow for optimal adaptation to the measurement task. To convert measurement results immediately after reading, information about the measurement point, such as parameters for water level calculation, can be stored directly in the measuring instrument. PressureSuite Desktop is licence-free and compatible with all PressureSuite products.

Configuration options via PressureSuite Desktop

- Measurement modes: Standard (Min/Max), Leak, Peak, Rate, Alarm
- Selectable pressure and temperature channels
- Adjustable measurement and storage interval
- Display settings: units, decimal places, display interval, timeouts, contrast, alarms, ...
- Adjustment of the pressure zero point

Data logger functions

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LEO Ultimate – Contents and accessories

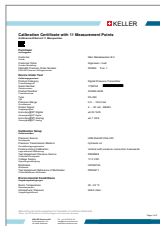
Scope of Delivery

USB cable	USB adapter	Batteries	Calibration certificate	Copper seals	
					
USB-C male to USB-C male 90° (0.5m)	USB-A male to USB-C female	2 × Energizer Ultimate Mignon AA lithium batteries 3000 mAh, 1,5 V (already installed in the device)	With 5 measurement points Measurement deviation at room temperature	For G 1/4 male EN 837 with centring pin	For G 1/2 male EN 837 with centring pin

Accessories

Protective caps		Adapter nipples	Service case	EPDM profile gaskets	
					
Without mounting bracket For additional protection in harsh environments	With mounting bracket For additional protection in harsh environments	For calibration For direct attachment of the barometer	For transport and storage	For G 1/4 male	For G 1/2 male

Calibration certificates

	
With 11 measuring points Measurement deviation at room temperature with hysteresis	External Issued by an external, accredited calibration laboratory in accordance with DAkkS or SAS

LEO Ultimate – Order Overview

Each LEO Ultimate can be configured according to the following criteria – for maximum precision, robustness and flexibility in everyday use.

	Pressure range	Pressure connection	Data logger	Accuracy	Precision
LEO Ultimate Standard	(as per order)	G1/4 male	with data logger	0,05 %FS	Standard
Alternatives	1 bar 1,6 bar 2,5 bar 4 bar 6 bar 10 bar ^{1,2} 16 bar ^{1,2} 25 bar ² 40 bar 60 bar 100 bar ^{1,2} 160 bar ² 250 bar ² 400 bar ² 600 bar ² 1000 bar ^{1,2} 15 psi 25 psi 40 psi 60 psi 100 psi 150 psi ^{1,2} 250 psi ^{1,2} 400 psi ² 600 psi 1000 psi 1500 psi ^{1,2} 2500 psi ² 4000 psi ² 6000 psi ² 10000 psi ² 15000 psi ^{1,2}	G1/2 male 1/4-18-NPT male G1/4 mano EN 837 G1/2 mano EN 837	without data logger	0,025 %FS 0,01 %FS	0,025 %FS 0,01 %FS

¹ Available with an accuracy or precision of 0,01 %FS

² Available with an accuracy or precision of 0,025 %FS