



**KELLER**

## LEO5

### High-resolution digital manometer

#### Features

- Insulated piezoresistive pressure sensor encapsulated in an oil-filled metal housing
- Robust, watertight stainless steel housing with safety glass front
- Large, backlit LC display
- Integrated rechargeable battery (USB chargeable)
- License-free KELLER software available to download

#### Functions

- High-resolution pressure measurements
- Pressure peak detection with 5 kHz sampling frequency
- Data logger
- Operated via capacitive touch keys
- Bar graph display
- Temperature display
- Min/max display

#### Typical Applications

- Pressure testing
- Calibration
- Laboratory use
- Industrial applications



#### Accuracy

± 0,05 %FS

#### Total Error Band

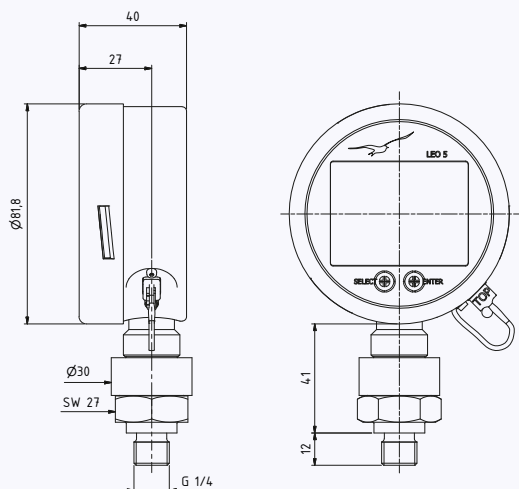
± 0,1 %FS

#### Pressure Ranges

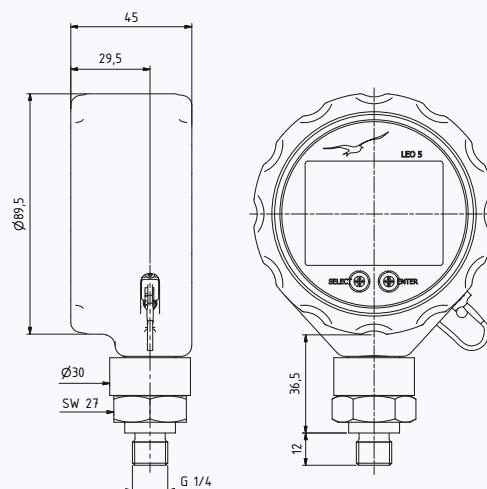
-1...3 bar to 0...1000 bar



LEO5 manometer



LEO5 with rubber cover





## LEO5 – Specifications

### Standard Pressure Ranges

|                        |        |        |        |         |         |         |        |         |         |         |         |         |          |          |
|------------------------|--------|--------|--------|---------|---------|---------|--------|---------|---------|---------|---------|---------|----------|----------|
| Gauge pressure, PR     | -1...1 | -1...3 | -1...6 | -1...10 | -1...16 | -1...30 |        |         |         |         |         |         |          | bar rel. |
| Absolute pressure, PAA | 0...2  | 0...4  | 0...7  | 0...11  | 0...17  | 0...31  | 0...61 | 0...101 | 0...161 |         |         |         |          | bar abs. |
| Absolute pressure, PA  |        |        |        |         |         |         |        |         |         | 0...300 | 0...400 | 0...700 | 0...1000 | bar      |
| Overload resistance    | 8      | 8      | 20     | 20      | 40      | 60      | 200    | 200     | 300     | 600     | 800     | 1100    | 1100     | bar      |
| Display resolution     | 0,0001 | 0,0001 | 0,001  | 0,001   | 0,001   | 0,001   | 0,001  | 0,01    | 0,01    | 0,01    | 0,01    | 0,02    | 0,05     | 0,1 bar  |

|     |     |                   |                              |
|-----|-----|-------------------|------------------------------|
| Key | PR  | Gauge pressure    | Zero at atmospheric pressure |
|     | PAA | Absolute pressure | Zero at 0 bar abs. (vacuum)  |
|     | PA  | Absolute pressure | Zero at 1 bar abs.           |

### Performance

|                                     |                     |                                                                                        |
|-------------------------------------|---------------------|----------------------------------------------------------------------------------------|
| Accuracy @ RT (20...25 °C)          | $\leq \pm 0,05$ %FS | Nonlinearity (BFSL), pressure hysteresis, non-repeatability, zero point, amplification |
| Total error band (0...50 °C)        | $\leq \pm 0,1$ %FS  | Max. deviation within the specified pressure and temperature range                     |
| Long-term stability                 | $\leq \pm 0,1$ %FS  | Per year under reference conditions, yearly recalibration recommended                  |
| Degree of dependency on location    | $\leq \pm 1,5$ mbar | Calibrated in vertical installation position with pressure connection facing downwards |
| Accuracy of temperature measurement | $\pm 1$ °C typ.     |                                                                                        |
| Pressure range reserve              | $\pm 10\%$          |                                                                                        |
| Vacuum endurance                    | $\leq 0,2$ bar abs. | Of operation $\leq 0,2$ bar abs. upon request                                          |

### Temperature Ranges

|                               |             |
|-------------------------------|-------------|
| Compensated temperature range | 0...50 °C   |
| Media temperature             | -10...60 °C |
| Ambient temperature           | 0...50 °C   |
| Storage temperature           | -20...70 °C |

### Electrical Data

|                                       |                                                 |
|---------------------------------------|-------------------------------------------------|
| Rechargeable battery                  | Lithium-ion 4,2 V / 2,3 Ah                      |
| Battery life (standard)               | Up to 2000 hours of continuous operation        |
| Battery life (peak mode)              | Up to 160 hours of continuous operation         |
| Battery charging cycles               | > 300                                           |
| GND case insulation                   | > 10 MΩ @ 300 VDC                               |
| External interface                    | USB (KELLER protocol)                           |
| Interface measuring rate              | 2 measurements per second                       |
| Electrical connection                 | Mini USB-B                                      |
| CE conformity as per 2014/30/EU (EMC) | EN 61000-6-1 to -6-4, EN 61326-1 / EN 61326-2-3 |



## LEO5 – Specifications

### Electrical Data

Data logger

|                 |                                                      |
|-----------------|------------------------------------------------------|
| Logger function | Records pressure, temperature and measuring time     |
| Data storage    | ≥ 56 000 measured values                             |
| Recording modes | Interval, event-controlled                           |
| Measuring rate  | ≥ 1 second, can be configured in 1-second increments |

### Display

|                                |                                                                                                                                                                               |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions/appearance          | Width × height: 51,3 mm × 38,8 mm, also refer to Dimensions and options                                                                                                       |
| Number of digits on LC display | 2 rows with 5 digits each                                                                                                                                                     |
| Display mode                   | Pressure + min/max or pressure + temperature, additional bar graph                                                                                                            |
| Measuring rate (standard)      | 2 measurements per second                                                                                                                                                     |
| Measuring rate (peak mode)     | 5 kHz (reduced resolution and accuracy)                                                                                                                                       |
| Configurable units of pressure | [bar], [mbar], [Pa], [hPa], [kPa], [MPa], [PSI], [mH <sub>2</sub> O], [cmH <sub>2</sub> O], [inH <sub>2</sub> O], [ftH <sub>2</sub> O], [mmHg], [inHg], [kp/cm <sup>2</sup> ] |
| Additional units of pressure   | 5 user-defined units can be configured                                                                                                                                        |

### Mechanical Data

Materials in contact with media

|                                          |                           |
|------------------------------------------|---------------------------|
| Pressure connection                      | Stainless steel AISI 316L |
| Pressure transducer separating diaphragm | Stainless steel AISI 316L |
| Pressure transducer seal (internal)      | FKM (Viton® type A)       |
| Pressure connection seal (external)      | FKM (Viton® type A)       |

Other materials

|                                 |                          |
|---------------------------------|--------------------------|
| Display housing                 | Stainless steel AISI 304 |
| Oil filling pressure transducer | Silicone oil             |

Further details

|                           |                                |                                                  |
|---------------------------|--------------------------------|--------------------------------------------------|
| Pressure connection       | G1/4                           | Other options see available pressure connections |
| Diameter × height × depth | Approx. 82 mm × 135 mm × 40 mm | Without rubber cover                             |
|                           | Approx. 90 mm × 139 mm × 45 mm | With rubber cover                                |
| Weight                    | Approx. 430 g                  |                                                  |
| Protection                | IP66                           |                                                  |



## LEO5 – Dimensions and Options

### LC Display

| Front cover | Content | Dimensions                                                                                                           |
|-------------|---------|----------------------------------------------------------------------------------------------------------------------|
|             |         | <p>Width x height:<br/>51,3 mm x 38,8 mm</p> <p>Digit height:<br/>top: 15 mm x 7 mm<br/>bottom: 10,5 mm x 4,5 mm</p> |

### External Connection

| Placement | Mini USB-B connection |
|-----------|-----------------------|
|           |                       |

### Available Pressure Connections

| G1/4 (standard) | G1/2       | 1/4 NPT     | 1/2 NPT               | G1/2 EN 837 |
|-----------------|------------|-------------|-----------------------|-------------|
|                 |            |             |                       |             |
| G1/2 flush      | G3/4 flush | 7/16-20 UNF | Clamp DIN 32676 flush | G1/4 EN 837 |
|                 |            |             |                       |             |

Other pressure connections available upon request.

### Optional Advanced Versions

| Standard | Detached sensors | Bluetooth interface |
|----------|------------------|---------------------|
|          |                  |                     |

### Other Customer-specific Options

- Other pressure and temperature ranges
- Parts that come into contact with media made from Hastelloy, Inconel or titanium
- Customer-specific front covers
- Customer-specific firmware with e.g. application-specific calculations
- Other sealing materials for pressure transducers
- Other oil fillings for pressure transducers



## LEO5 – Software, Scope of Delivery and Accessories

### Interface

The LEO5 manometer has a USB interface. Details of the communication protocols can be found at [www.keller-druck.com](http://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.

### «Logger 5» Software

The Logger 5 software is suitable for the following activities:

- Reading data from the autonomous data collector, e.g. LEO5, and saving to a file on a PC
- Programming and configuring the data logger
- Active reading of the pressure and temperature measured values in one-second intervals and presenting the data in graphs
- Visualising and analysing measurements saved in files
- Printing out reports or saving them as PDF files
- Exporting data and making it available to other applications for further processing
- Performing level measurement calculations

### «CCS30» Software

Recording measured values

- Live visualisation
- Adjustable measuring and storage interval
- Export function

Configuration

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

### “ManoConfig” Software

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

Range of functions

- Display of online measured values
- Configuring the wait period before automatic shutdown
- Selecting standard pressure units
- Activating/deactivating pressure units
- Programming user-defined pressure units
- Restoring to factory settings
- Calibrating the manometer

### Scope of Delivery

| Plastic case                                                                        | USB cable                                                                           | KELLER 5-point report                                                               | Operating instructions D/E/F                                                          |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |

### Accessories

| Rubber cover                                                                        | Calibration certificate                                                                                                  |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|  |                                       |
| For additional protection in harsh environments                                     | Issued by the external calibration laboratory of the German accreditation body DAKkS or the Swiss accreditation body SAS |