

LR-Cal LPK 300-PP

- Rugged service case with integrated electric pump for generation of pressure / vacuum $-0.85...+20$ bar ($-12...+300$ psi) , manual pressure fine adjustment and documenting calibrator similar to LR-Cal LPC 300
- Up to 10 changeable reference pressure sensors, this means up to 10 different pressure ranges with just one instrument.
- Pressure ranges from $0...250$ mbar ($0...4$ psi) to $0...1000$ bar ($0...14500$ psi). Unique number of pressure ranges available. Pressure, vacuum, compound and absolute pressure ranges.
- Accuracy: $\pm 0.025\%$ FS.
- Incl. factory certificates of calibration for pressure, current and voltage measurement. Optional DAkkS certification (for pressure)
- Measurement of current ($0/4...20$ mA) and voltage ($0...10$ V).
- Output of voltage 24 VDC, max. 30 mA, to source unit under test
- Mode MEASURE: fast and very accurate pressure measurement
- Mode CALIBRATE: Predefine calibration procedures and work on them in the field. Then data transmission via USB interface possible
- Mode SWITCH TEST: shows switching points and calculates hysteresis



The portable LR-Cal LPK 300-PP pressure calibration case is a compact, portable pressure calibrator, which has been designed for mobile use as well as for stationary workshop and laboratory testing. The instrument consists of a calibrator, which is built into a rugged service case. With this design, the portable pressure calibrator is suited to extremely harsh operating conditions.

The integrated electric pump enables the operator to generate pressures up to 20 bar, as well as vacuum down to -0.85 bar. The instrument is fitted with a sensitive fine adjustment valve for exact setting of each requested pressure point.

For a solution that always matches your application, there are many different pressure reference sensors LR-Cal LPC-S to choose from, with accuracies up to 0.025% and measuring ranges up to 1000 bar, which can be interchanged quickly and without tools. If the reference pressure sensor on the instrument is changed, then the digital indicator will recognise the new measuring range and so this saves the operator from having to configure it via menu.

For pressure ranges >20 bar, the LR-Cal LPC-S reference pressure sensor is to be mounted as reference instrument on the top of an external manual pressure test pump, e.g. model LR-Cal LPP 40, LR-Cal LPP 60, LR-Cal LPP 700 or LR-Cal LPP 1000). In this case, the sensor is just electrically connected to the LR-Cal LPK 300-PP calibrator.

In the setup menu, there are 3 operating modes to choose from. A menu assistant supports the user during each operation and records, for example, the calibration data from several calibrations or automatically calculates the switch hysteresis. To power the test item and to read the measurement signals, there are electrical inputs and outputs.

For the evaluation and documentation of the calibration data stored in the LR-Cal LPC 300 the software LR-Cal LPC-Cal is available. Using this software, the data is automatically transferred into a printable calibration certificate. For data transfer, the LR-Cal LPC 300 is fitted with an USB interface.

At least 1 pressure reference sensor LR-Cal LPC-S must be ordered separately, max. 10 reference sensors LR-Cal LPC-S can be handled by the calibrator.

If used for pressure ranges over 20 bar, an external manual pressure test pump must be ordered separately, e.g. models LR-Cal LPP 40, LR-Cal LPP 60, LR-Cal LPP 700 or LR-Cal LPP 1000.



LPK 300-PP Pressure Calibration Case $\pm 0,025\%$ FS with electr. pressure/vacuum pump -0.85...+20 bar

LR-Cal



Reference pressure sensors LR-Cal LPC-S for LR-Cal LPK 300-PP

Min. 1 sensor, max. 10 sensors with one LR-Cal LPK 300-PP instrument. If the integrated electric pressure/vacuum pump shall be used, we recommend pressure ranges up to max. 20 bar.

Pressure range	[bar]	0...0.25	0...0.4	0...0.6	0...1	0...1.6	0...2.5	0...4	0...6	0...10	0...16
Overpressure limit	[bar]	1.6	2	4	5	10	10	14	35	35	80
Burst pressure	[bar]	2.4	2.4	4.8	6	12	12	20.5	40	42	96
Accuracy of measuring chain:	±0.025% FS (calibrated at 23°C (74°F) and in vertical mounting position, pressure connection facing downwards)										
Pressure range	[bar]	0...25	0...40	0...60	0...100	0...160	0...250	0...400	0...600	0...700	0...1000
Overpressure limit	[bar]	80	80	120	200	320	500	800	1200	1200	1500
Burst pressure	[bar]	96	96	550	800	1000	1200	1700	2400	2400	3000
Accuracy of measuring chain:	±0.025% FS (calibrated at 23°C (74°F) and in vertical mounting position, pressure connection facing downwards)										
Pressure range	[bar]	-0.4...0	-0.6...0	-1...0	-0.25...+0.25	-0.4...+0.4	-0.6...+0.6	-1...+1.5	-1...+3	-1...+5	-1...+9
Overpressure limit	[bar]	2	4	5	2	4	5	10	14	35	35
Burst pressure	[bar]	2.4	4.8	6	2.4	4.8	6	12	20,5	40	42
Accuracy of measuring chain:	±0.025% FS (calibrated at 23°C (74°F) and in vertical mounting position, pressure connection facing downwards)										
Pressure range	[bar]	-1...+10	-1...+15	-1...+20	-1...+24	-1...+39	All pressure ranges from 0...0.4 bar to 0...25 bar are also available as absolute pressure ranges.				
Overpressure limit	[bar]	35	80	80	80	80					
Burst pressure	[bar]	42	96	96	96	96					
Accuracy of measuring chain:	±0.025% FS (calibrated at 23°C (74°F) and in vertical mounting position, pressure connection facing downwards)										

Technical data LR-Cal LPK 300-PP

Pressure generation

Electric pump -0.85...+20 bar (-12...+300 psi), for clean, dry and non-aggressive gases only.

Indication

Display Large TFT colour screen for the display of reference and test signals and additional information
 Display resolution up to 6 digits, adjustable
 Pressure units mbar, bar, psi, Pa, hPa, Mpa, mmHg, cmHg, inHg, mmH2O, cmH2O, mH2O, inH2O, kg/cm² and a customer-specific unit (freely selectable dependant on measuring range)

Functions

Operating modes MEASURING, CALIBRATION and SWITCH-TEST
 Measurement rate 2 values per second
 Functions MEASURING, CALIBRATION, SWITCH-TEST
 Min-/Max memory, Tare, Min-/Max alarm (audible/visual), filter (running average), zero-point adjustment, PowerSave function
 Menu languages German, English, Spanish, French, Italian (settable), or Russian

CALIBRATE function

Memory capacity up to 16 test items
 Test points / test item up to 32 comparison points per test item

SWITCH-TEST function

Switch points Determination of the switch points and automatic calculation of the hysteresis

Measuring input: Voltage

Measuring ranges 0...1 VDC, 0...2 VDC, 0...5 VDC, 0...10 VDC
 Resolution up to 6 digits, adjustable
 Accuracy 1 mV

Measuring input: Current

Measuring ranges 0...20 mA, 4...20 mA
 Resolution up to 6 digits, adjustable
 Accuracy 5 μ A

Output

Voltage supply 24 VDC (load: max. 50 mA; min. 20 mA), can be activated via menu

Power supply

Supply Internal Lithium-Ion rechargeable battery (charging time 8 h typ.)
 Battery life approx. 20 hours of operation (without electric pump)

Electrical safety resistance to overvoltage, short-circuit resistant, voltage resistant up to 60 VDC

Input resistance Current measurement: 20 Ohm; Voltage measurement: 1 Megaohm

Permissible ambient conditions

Operating temperature -10...50°C (14...122°F)
 Storage temperature -20...+60°C (-4...+140°F)
 Relative humidity 35...85% r.h. (non-condensing)

Communication

Interface USB (special cable required)

Case material NK-7TM resin

Front plate Aluminium, membrane keypad, transparent screen

Ingress protection Case closed: IP 67; Case open: IP 40

Dimensions 387.4 x 304.8 x 177.8 mm (15.25 x 12 x 7 in)

Weight approx.. 7 kg (15.5 lbs)

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Technical data LR-Cal LPC-S sensor for LR-Cal LPK 300-PP

Pressure connection	1/2" BSP male (optional several threaded adapters available)
Material	
Wetted parts	Stainless steel (ranges ≥ 40 bar : Elgiloy® in addition)
Internal transmission fluid	Only for measuring ranges up to 25 bar (360 psi): synthetic oil
Sensor specifications	
Accuracy per year	$\leq 0.025\%$ FS (only with related LR-Cal LPK 300-PP)
Compensated range	+15...35°C (59...95°F); elsewhere temperature coefficient 0.002% of span/°C
Permissible ambient conditions	
Medium temperature	-20...+80°C / -4...+176°F (optional oxygen variants: max. +60°C / +140°F)
Operating temperature	-10...+50°C / 14...+122°F
Storage temperature	-20...+60°C / -4...+140°F
Relative humidity	35...85% r.h. (non-condensing)
Case	
Material	Stainless steel
Connection to LR-Cal LPK 300-PP	via supplied electrical connection cable
Ingress protection	IP65 (with cable connected)
Dimensions	Height 126 mm x largest diameter 40 mm
Weight	approx. 230 g (0.5 lbs.)
Output signal	Digital communication to LR-Cal LPK 300-PP

Technical data of the supplied mains charger

Input voltage	100...240 VAC, 50...60 Hz
Output voltage	9 VDC
Nominal output current	1280 mA
Ambient conditions	
Operating temperature	0...60°C
Storage temperature	-40...+85°C
Relative air humidity	5...95% r.h. (non-condensing)



Pressure port for unit under test: 1/2" BSP female rotating swivel nut, with O-ring.
Optional threaded adapters available.



Pressure port for reference sensor: 1/2" BSP female with O-ring.

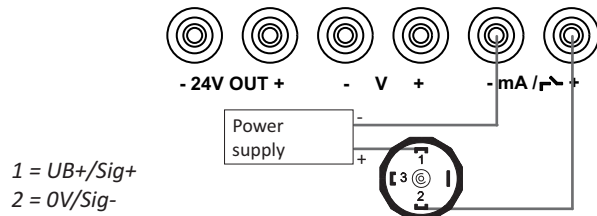
Conformities and certificates

- 2011/65/EU Hazardous substances (RoHS). Harmonized standard: EN 50581:2012
- 2014/30/EU Electromagnetic compatibility (EMC). Harmonized standard: EN 61326-1:2013
- Calibration: Certificate 3.1 acc. EN 10204 for current, voltage and pressure. Optional DAkkS certification for pressure.

Electrical connection of unit under test with mA or V output signal

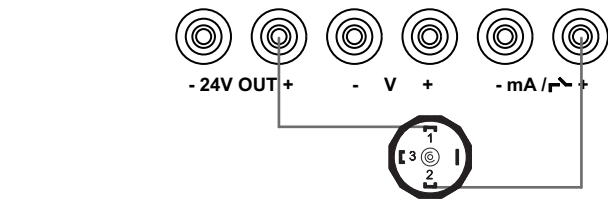
Unit under test with 2-wire current output (4...20 mA)
Unit under test with its own power supply available:

test item	self-powered	- 24V output +	- V max. 12V +	- mA max. 24mA +
2wire (mA)	no	sig+		sig+
2wire (mA)	yes			sig-
3wire (mA)	no	UB-	UB+	sig+
3wire (V)	no	UB-	UB+	sig+



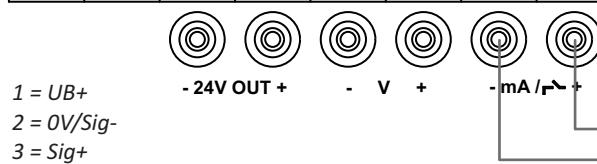
Unit under test with 2-wire current output (4...20 mA)
Unit under test powered via **LR-Cal** LPK 300-PP:

test item	self-powered	- 24V output +	- V max. 12V +	- mA max. 24mA +
2wire (mA)	no	sig+		sig+
2wire (mA)	yes			sig-
3wire (mA)	no	UB-	UB+	sig+
3wire (V)	no	UB-	UB+	sig+



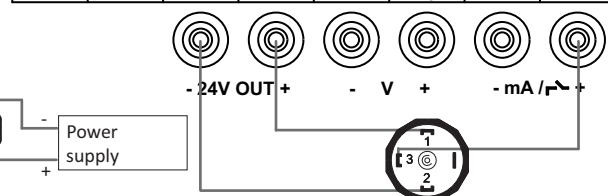
Unit under test with 3-wire current output (0...20 mA)
Unit under test with its own power supply available:

test item	self-powered	- 24V output +	- V max. 12V +	- mA max. 24mA +
2wire (mA)	no	sig+		sig+
2wire (mA)	yes			sig-
3wire (mA)	no	UB-	UB+	sig+
3wire (V)	no	UB-	UB+	sig+



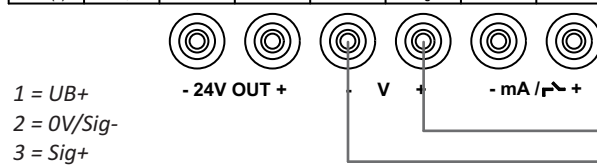
Unit under test with 3-wire current output (0...20 mA)
Unit under test powered via **LR-Cal** LPK 300-PP:

test item	self-powered	- 24V output +	- V max. 12V +	- mA max. 24mA +
2wire (mA)	no	sig+		sig+
2wire (mA)	yes			sig-
3wire (mA)	no	UB-	UB+	sig+
3wire (V)	no	UB-	UB+	sig+



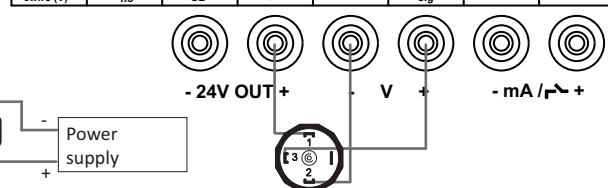
Unit under test with 3-wire voltage output, e.g. 0...10 V
Unit under test with its own power supply available:

test item	self-powered	- 24V output +	- V max. 12V +	- mA max. 24mA +
2wire (mA)	no	sig+		sig+
2wire (mA)	yes			sig-
3wire (mA)	no	UB-	UB+	sig+
3wire (V)	no	UB-	UB+	sig+

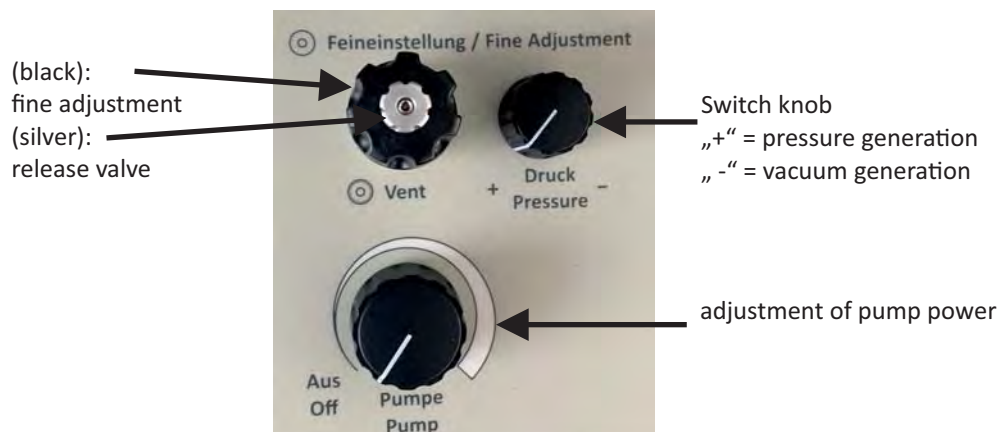


Unit under test with 3-wire voltage output, e.g. 0...10 V
Unit under test powered via **LR-Cal** LPK 300-PP:

test item	self-powered	- 24V output +	- V max. 12V +	- mA max. 24mA +
2wire (mA)	no	sig+		sig+
2wire (mA)	yes			sig-
3wire (mA)	no	UB-	UB+	sig+
3wire (V)	no	UB-	UB+	sig+



Operating elements of the integrated electric pump



User interface

- 1 - Setup menu
- 2 - Selection and entry confirmation
- 3 - One step back
- 4 - Entry acknowledgement
- 5 - Clear entry
- 6 - Numeric keypad

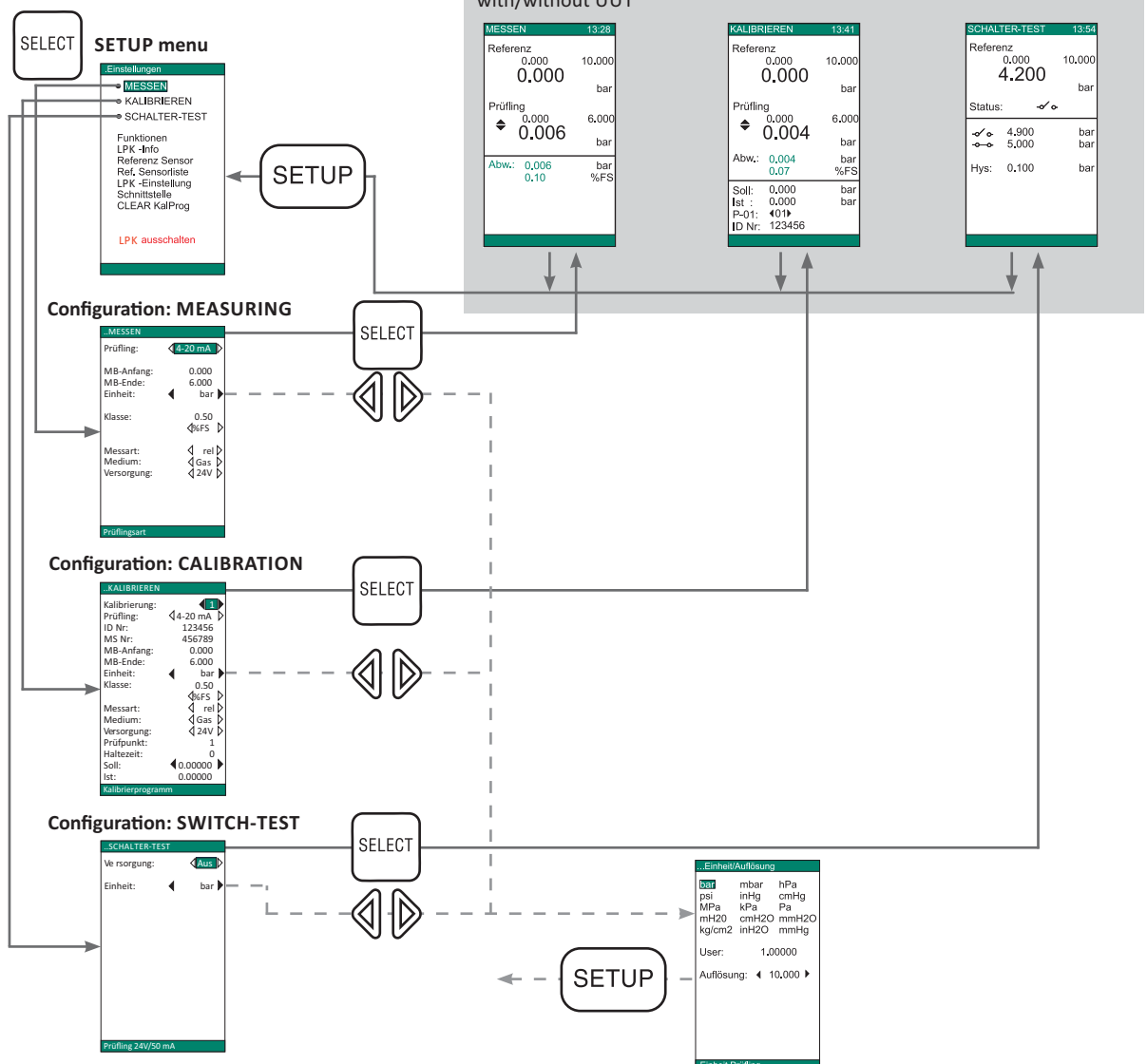
Switch ON:
via pressing any button/key.

Switch OFF:
via menu item in main menu

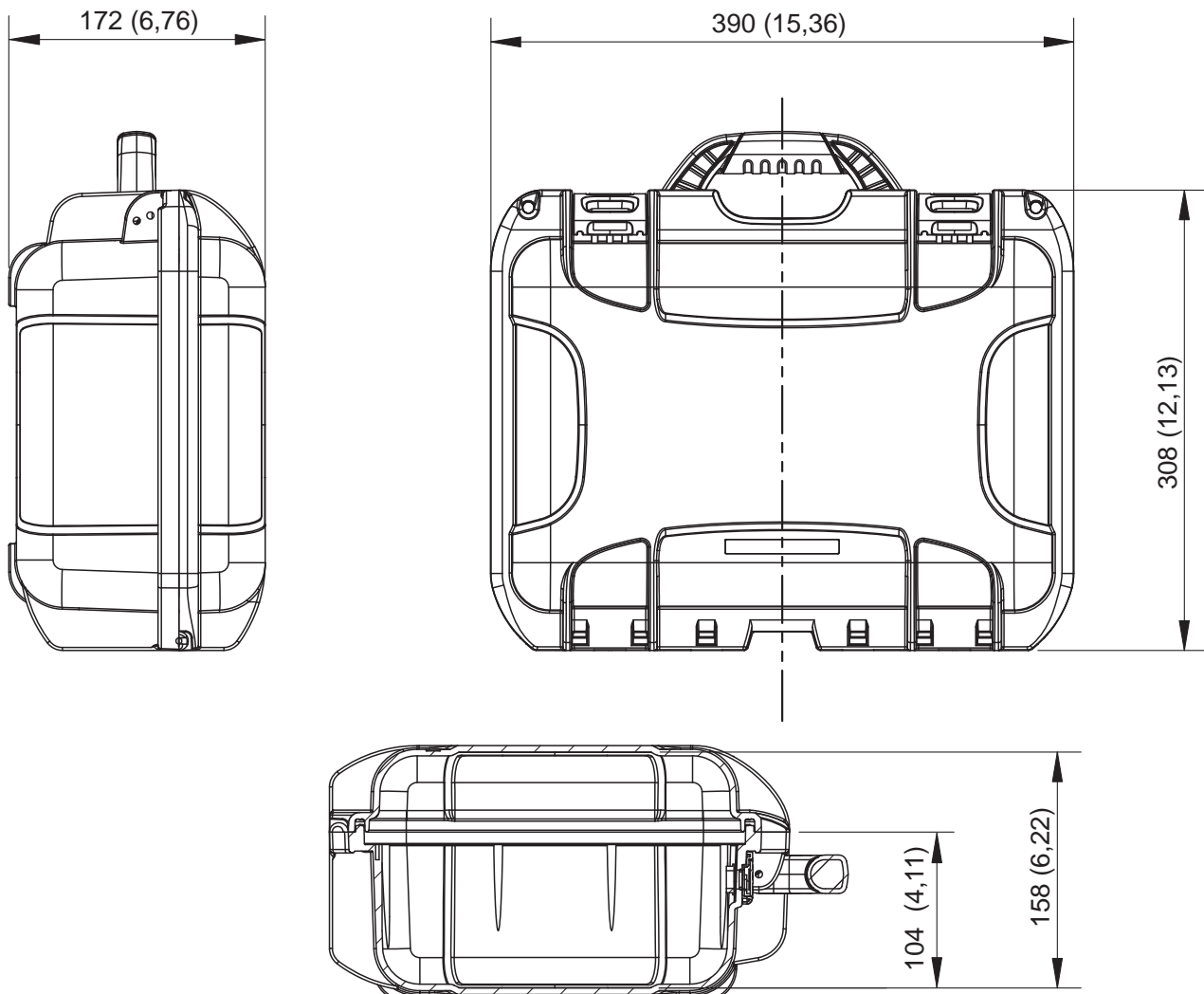


Operating modes

Menu structure



Dimension of the pressure calibration case **LR-Cal LPK 300-PP** in mm (inch)



Scope of standard delivery



- Pressure calibration case **LR-Cal LPK 300-PP** with integrated electric pump -0,85...+20 bar with integrated chargeable Li-Ion battery incl. factory calibration certificate (pressure, current, voltage) and Operating manual



- Mains charger 115...230 VAC (incl. EURO/UK/US adapters)



- Set of test cables (red/black)



- Electr. cable for reference sensor

Options and Accessories

Pressure reference sensors **LR-Cal LPC-S**

At least, 1 pc. must be ordered separately, max. 10.

Order-Code depends on pressure range and starts with **LPC-S-**.



Order-Code: **LPK300-PP-ABSCHEIDER**

Dirt Trap

If the pressure calibration case **LR-Cal LPK 300-PP** is operated with the integrated electric pump (pressure ranges up to 20 bar and vacuum), this accessory is strongly recommended to avoid contamination of the pump with dirt particles / humidity of the unit under test.

The dirt trap is mounted between pressure port for unit under test and the unit under test. As the dirt trap is equipped with a 1/8" female thread, stainless steel threaded adapters to 1/2" BSP female, 1/4" BSP female, 1/2" NPT female and 1/4" NPT female are included in scope of delivery of this accessory, as well as 2 USIT gaskets (1/2" and 1/4").



Order-Code: **LPK300-PP-ADAPTSET**

Set of threaded adapters for test pressure port 1/2" BSP female:
to 1/4" BSP female, to 1/2" NPT female and to 1/4" NPT female

Order-Code: **LPK300-PP-DICHTSET**

Set of USIT gaskets:

4 x for 1/2" and 2 x for 1/4"



Order-Code: **LPK300-PP-DAKKS**

DAkKS certificate of calibration (instead of factory certificate)

for each reference sensor **LR-Cal LPC-S** (pressure measurement)

(This order-code is NOT valid for re-certifications)

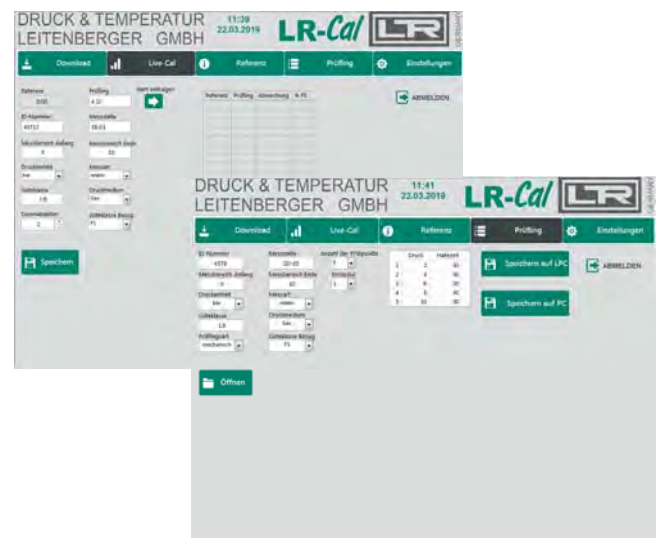
Order-Code: **LPC300-SW-USB**

Windows-PC software **LPC-Cal**

incl. USB interface cable

Online calibration, download of saved
calibration procedures,

Creation of certificates of calibration, and much more.



Usage

Operation with pressure ranges up to 20 bar:

Unit under test directly mounted to **LR-Cal** LPK 300-PP case,
Reference sensor **LR-Cal** LPC-S directly mounted (pressure connection and electrical connection).

Unit under test directly mounted to test
port of the **LR-Cal** LPK 300-PP case.



The reference sensor **LR-Cal** LPC-S is
mounted in the **LR-Cal** LPK 300-PP case.
The sensor is also electrically connected
to the **LR-Cal** LPK 300-PP case.

Operation with pressure ranges over 20 bar:

Unit under test and reference sensor **LR-Cal** LPC-S are connected to a manual pressure test pump.
The reference sensor is electrically connected to the **LR-Cal** LPK 300-PP case.

Unit under test connected to
LR-Cal pressure test pump
(at test hose).



The reference sensor, mounted on top
of the **LR-Cal** pressure test pump is used.
The reference sensor **LR-Cal** LPC-S
is electrically connected to the
LR-Cal LPK 300-PP case.

Recommended pressure test pumps for pressure ranges over 20 bar:

- Model **LR-Cal** LPP 40 for pressure ranges -1...+40 bar (operated with ambient air)
- Model **LR-Cal** LPP 60 for pressure ranges -1...+60 bar (operated with ambient air)
- Model **LR-Cal** LPP 700 for pressure ranges 0...700 bar (operated with water or oil)
- Model **LR-Cal** LPP 1000 for pressure ranges 0...1000 bar (operated with water or oil)