

A large, stylized rainbow graphic composed of several thick, curved bands of color. From top to bottom, the colors are magenta, dark blue, light blue, green, and yellow-green. The bands are slightly offset, creating a sense of depth and movement.

LPG 300

PORTABLE LOW PRESSURE CONTROLLER

MANUAL



INSTRUMENTS
leyro

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1. GENERAL

The manual is a part of the scope of delivery and serves to ensure the proper management and optimal operation of the instrument.

Leyro does not accept claims for warranty and liability neither this publication nor in case of improper treatment of the described products.

For this reason, the manual should read before starting up. In addition, the manual is aimed at all personnel who require knowledge of the transport, installation, operation, maintenance and repair.

The manual should not be used for the purpose of competition without the consent in writing of Leyro and should not be sent to third parties. Copies for personal use are permitted.

The document may contain technical inaccuracies or typographical errors. The content will be reviewed on a regular basis. These changes will take place in later versions. The described products can improve and change at any time without prior notice.

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1.1 Symbology



This symbol indicates safety instructions.

These safety instructions must be followed carefully.

Failure to heed these instructions for personal injury or property damage that could happen. Therefore Leyro ® is not responsible for.



This symbol indicates a note.

These notes should be observed to achieve the optimal performance of the equipment.



This symbol indicates danger.

There is a risk of serious or fatal injury failure to observe these safety instructions.

2. SAFETY

Warning!



Prior to installation, implementation service and operation make sure that selected low pressure controller suitable with regard to range measurement, design and specific measuring conditions.



Failure to comply may cause serious injury and/or property damage.

The different chapters of this instruction manual contains other important safety instructions.

2.1 Intended use

The driver of low pressure model LPG300 is designed to test and calibrate pressure sensors.

The instrument has been designed and built solely for the purpose described here and should be used in compliance with the same.

Comply with the technical specifications of this instruction manual. Improper handling or technical operation of the instrument does not comply with the specifications required the taken out of service immediately and inspected by an authorised Leyro.

Control the electronic precision instrument with appropriate diligence (protect it from humidity, impacts, strong magnetic fields, static electricity and extreme temperatures; not to introduce any object in the instrument or openings). Plugs and Sockets must be protected from dirt.

If you change the instrument from a cold environment to a warm, malfunctions may occur in it. In such a case, should wait until it fits the instrument temperature to room temperature before switching it back on.

No claims due to improper handling is not supported.

2.2 Personnel qualification

Warning!

Risk of injury due to insufficient qualifications!

Improper handling can cause considerable personal damage.

The activities described in these operating instructions debenrealizarse only by skilled technicians with the consiguiente cualificación. Keep unqualified dangerous areas.

Qualified personnel

Due to their training, their knowledge of the regulation and measurement technique as well as his experience and his knowledge of regulations, standards and directives in force in the country of use qualified personnel is capable of carrying out the work described and recognize potential hazards only.

Some specific use conditions require additional skills, eg. about aggressive media.

2.3 Specific risks



Warning!

It is essential protection against electrostatic discharge!

The use of grounded work surfaces and personal wrist straps is required works exposed circuitry (printed circuit boards), to avoid damage to sensitive electronic components caused by electrostatic discharge.

To perform a safe working on the instrument owner must ensure that: a first aid kit is available and that is always present aid if necessary.

Operators regularly receive instructions, on all issues related to security work, first aid and environmental protection, and know also instruction manual and particularly the safety instructions.



Danger!

Danger to life due to electrical current. There are direct death danger to touch live parts. Is operated with a defective power supply (e.g. short circuit from the mains voltage to the output voltage), can result in life-threatening voltages at the device!



Warning!

Residual media in dismounted low pressure controller can cause risks to people, the environment and equipment.

Take appropriate precautionary measures. Do not use this instrument in security systems or devices given emergency. Incorrect use of the instrument may cause injury.

In case of failure it is possible aggressive media with extreme temperatures or low pressure or that there is a vacuum in the instrument.

MaxP = 1 bar atmospheric pressure

2.4 Labelling/ Safety marks



It is absolutely necessary to read the operating instructions prior to Assembly and commissioning of the instrument!



CE, Communauté Européenne

The instruments bearing this mark comply with the relevant European directives.



This marking on the instruments indicates that they must not be disposed of in domestic waste. The disposal is carried out by return to the manufacturer or by the corresponding municipal authorities (see EU directive 2002/96/EC).

3. PRODUCT DESCRIPTION

Brief description

The driver of low pressure LPG300 fits:

The easy supply of positive and negative reference pressure.
Measurement of positive and negative pressure.
Differential pressure measurement.
Checking for leaks of a test piece.

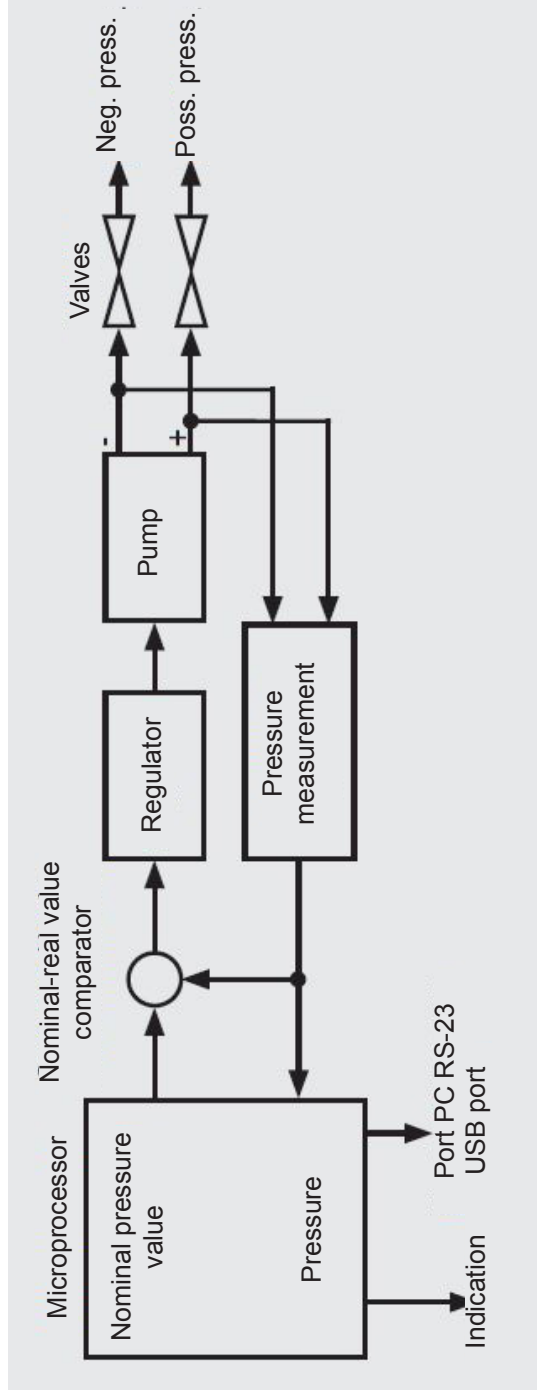
Scope of delivery

Power supply

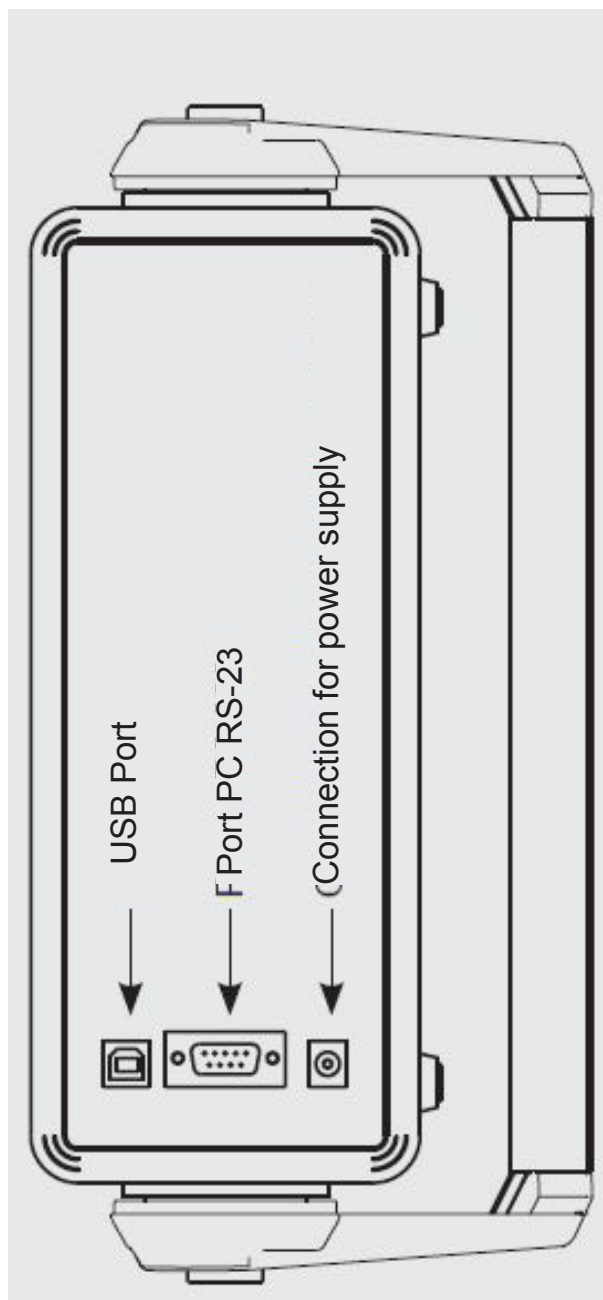
Instruction manual

According to DIN in 10204 3.1 calibration certificate (optional: certified ENAC)

Check with delivery note if all of the parts are delivered



Electrical connections in the rear



Power supply

Low pressure controller is designed from the factory for connecting to a DC 24 v power supply. The power connector is located on the back of the instrument.



Danger!

Danger of electric shock! It is essential to pull the plug from the socket before replacing the fuse! Is operated with a defective power supply (e.g. short circuit from the mains voltage to the output voltage), they can result in life-threatening voltages at the instrument!



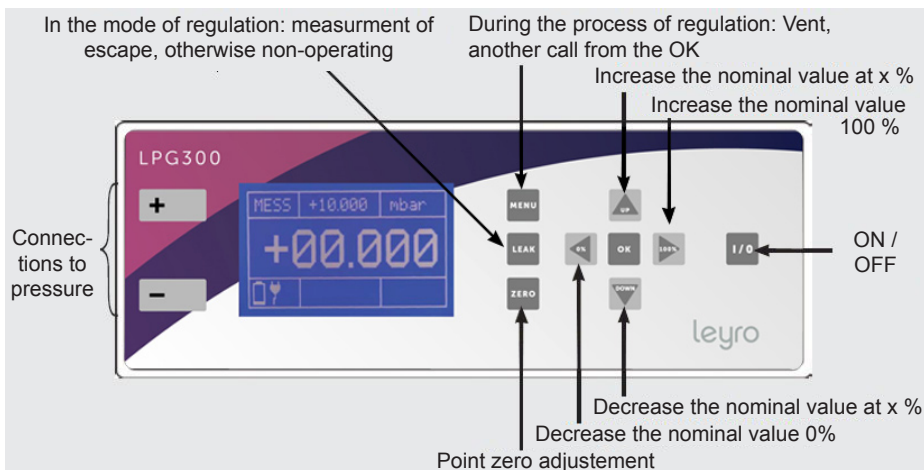
Only use the original power (Mascotmodelo 9926) included in the scope of supply source.

1. In case of connection to other devices, select the connection mode with special care. In certain circumstances, some internal connection in third party devices (e.g. connection to ground) can cause not permitted voltage potentials, which in turn could affect the performance of the device itself or other connected device, or even destroy them.
2. The connector must be always connected in the form accessible to an electrical outlet, to allow for easy disconnection at any time.

LPG 300 Front view




The screen behind the plate front glass is glass. If during use cannot be dismissed completely a glass breakage including destruction of blade, all persons who are in the environment close to the instrument should wear glasses of protection before and during use.



A grey square button with the text "I / O" in black.

ON / OFF


Key to turn and turn off the instrument

A grey square button with the text "MENU" in black.

Menu


Via this button you access SETUP menu, in which you can perform the settings for the corresponding operating mode. If CTRL mode is used, the instrument will remain in the VENT after exiting the SETUP menu mode.

The SETUP menu options are composed of six sub-options. In Chapter 5 you will find a detailed description of the points.

A grey square button with the text "LEAK" in black.

LEAK

With the key LEAK can be checked for leakage of a device connected to the controller (This function however is possible only in the CONTROL mode).

A grey square button with the text "ZERO" in black.

ZERO

Button for manual adjustment of the zero point of the integrated sensor. Due to factors external, such as temperature, position, or ambient pressure, the zero point of the instrument, i.e. the indicator with open pressure inputs, can be modified. During adjustment of the zero point, the instrument determines automatically such modifications and includes them in the current pressure indication. The zero point adjustment requires a switching of the internal valves, which is not possible without a loss of pressure (if this causes disturbance during use, the adjustment of the zero point can be disabled).

Pressure connections

Differential pressure instruments are connected to the instrument connections + and -.

Relative pressure instruments are connected to the connection (connection - open to the atmosphere) for negative pressure instruments are connected to the connection - (connection + open to the atmosphere).



Fasten only unpressurized test and calibration devices! Not be operating with compressed air or breath tests.

Otherwise, the instruments with low measuring ranges can be damaged.

The connection to the low pressure controller occurs through a connection pressure of 6.6 x 11 mm. The diameter of the hose must have 6 mm.

Overpressure protection

The maximum allowable pressure must not be exceeded:

PRESSURE RANGE

1 mbar
10 mbar
50 mbar
100 mbar
500 mbar
1,000 mbar

OVERLOAD

Quintuple overload
Quintuple overload
Quintuple overload
Quintuple overload
Double overload
Double overload

4. TRANSPORT, PACKAGING AND STORAGE

Transport

Check if the low pressure controller presents any damage caused during transport.
Immediately notify any apparent damage.

Packaging

Do not remove packaging until just before mounting. Keep the packaging, since it is the optimal protection during transportation (e.g. If the place of installation changes or if the instrument is sent for possible repairs).

Storage

Conditions permitted in the storage place:

Storage temperature: -10 ... +70 °C

Humidity: 30 ... 80 % h.r. (no condensation)

Avoid:

Direct sunlight or proximity to hot objects
Mechanical vibration, mechanical shock (putting it down hard)
Soot, vapour, dust and corrosive gases
Potentially explosive environments, flammable atmospheres

Store the driver of low pressures in its original packaging in a location that fulfils the conditions listed above. If you do not have the original packaging, pack and store the instrument as follows:

1. Wrap the instrument in an antistatic plastic film.
2. Place the instrument, along with the insulating material in the packing.

3. For a long (more than 30 days) storage put a bag with a desiccant in packing.
4. Not sealed the entrances of pressure during storage! Variations in barometric pressure could cause damage to instruments with low measuring ranges.

**Warning!**

Before storing the instrument (following operation), remove all the residual media. This is especially important when the environment is harmful to health, e.g.. caustic, toxic, carcinogenic, radioactive, etc.

5. OPERATION





Not be operating with compressed air or breath tests. Otherwise, the instruments with low measuring ranges can be damaged.





Protect the instrument from direct sunlight, as this may cause measurement errors.



Operating Control mode (CTRL)





CTRL mode is used for calibration of pressure and pressure switches or other devices to pressure sensors. CTRL mode the pump is activated and regulates the nominal pressure in the corresponding form. The internal sensor supplies the current real value through the indicator.

Configuration

Press MENU button. Confirm the menu MODE (MODUS) with OK option and press  /  until CTRL. Confirm with OK.

Set the upper limit of the pressure range in the sub-menu RANGE (range) (key  /  keys and  / ). Confirm with OK

Setting the unit of pressure in the sub-menu UNIT (unit) keys  /  and confirm with OK.

In the sub-menu STEP (steps), the sequence of steps is set to % (keys  /  and  / ), confirm with OK.

Exit the sub-menu by pressing the MENU key.

Use

To exit the menu becomes instrument VENT mode, i.e., gauge sensor is purged.

The nominal value of the pressure range is indicated in the upper center of the screen. In the bottom half of the same percentage value can be read. To exit this menu value stands at 0%. By pressing the button OK can switch between specification nominal pressure and the percentage value.

Modify nominal value in x%:

Modification of pressure in % via keys



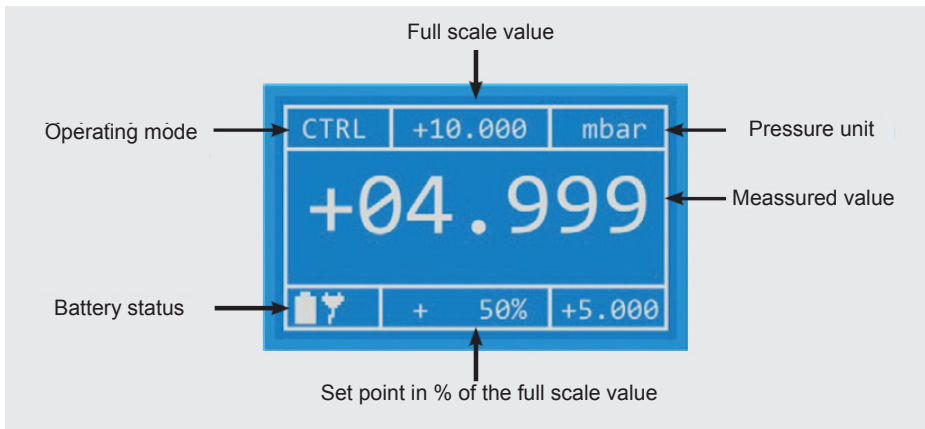
Modification of pressure to 100 % via → key

Modification of pressure again to 0% via ← key

The percentage value can be changed with the keys ↑ / ↓ (in the established steps amplitudes) and keys ← / →.

Specification nominal pressure can be changed only with the keys ↑ / ↓. Keys ← / → can skip specification of nominal pressure in the corresponding place.

As soon the controller display indicates a stable value, data can be registered.



In mode CTRL is possible to manually adjust the zero point of the controller and check for leakage of the connected device.



Manual adjustment of zero point: by pressing the ZERO key the instrument reference measuring cell is set.



Leakproofness test: By pressing the LEAK button, the control process will be deactivated and the system closed. It can be controlled via the display if the value is stable. By pressing the LEAK button again, the mode will be stopped and the unit placed back in Control mode.


Operating mode Measure (MEAS)

By pressing the LEAK button, the control process will be deactivated and the system closed. It can be controlled via the display if the value is stable. By pressing the LEAK button again, the mode will be stopped and the unit placed back in Control mode.

Configuration


For mode MEAS, the RANGE and STEP of the sub-menu options are irrelevant.  

Press the MENU button. Confirm the menu point MODE with OK and press the  / button until MEAS appears. Confirm with OK. 

In the menu, go to the UNIT item with the  / button, select the pressure unit and confirm with OK.

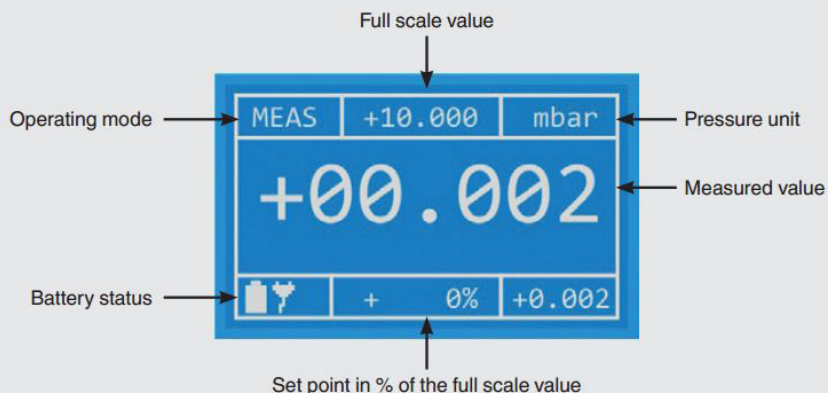
Press the MENU button in order to exit the menu.

SETTING submenu:  

- Go to the SETTINGS menu item with the  / button, confirm with OK.
- In the submenu, go to the zero point adjustment item and confirm with OK.
- Under the point, AUTO-ZERO, the automatic zero point adjustment for the MEAS mode can be activated or deactivated.

Operation

On leaving the menu, the zero point of the internal sensor is adjusted, dependent upon the setting. The instrument then begins to measure the subsequent pressures.



Using the ZERO button in MEAS mode, the instrument's zero point can be compensated at any time.

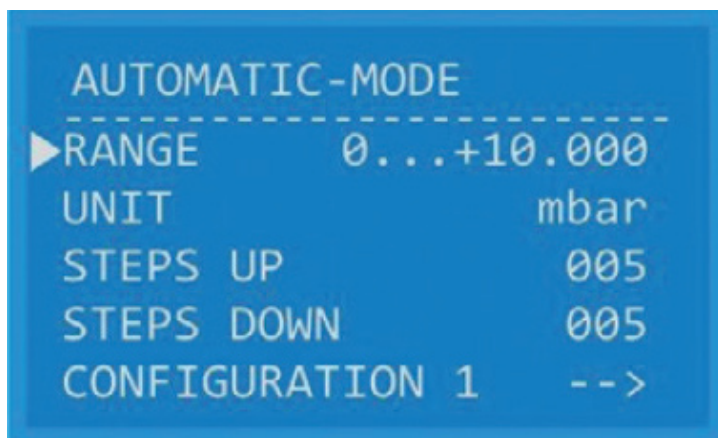


Caution!

If the connected pressure should exceed the permissible highest loading (125 %), the internal sensor will be closed off using a magnetic valve. The display will then show ERROR. Using the OK button, the instrument can be closed off and opened up freely.

Operating mode AUTO

In AUTO mode, a pressure profile can be stored. This is especially useful when multiple pressure sensors or pressure switches are to be calibrated with the same values. The mode also enables a defined profile to be traversed several times in succession.



Setting

Press the MENU button. Confirm the menu item MODE with the OK button and press the / button until AUTO appears. Confirm with OK.

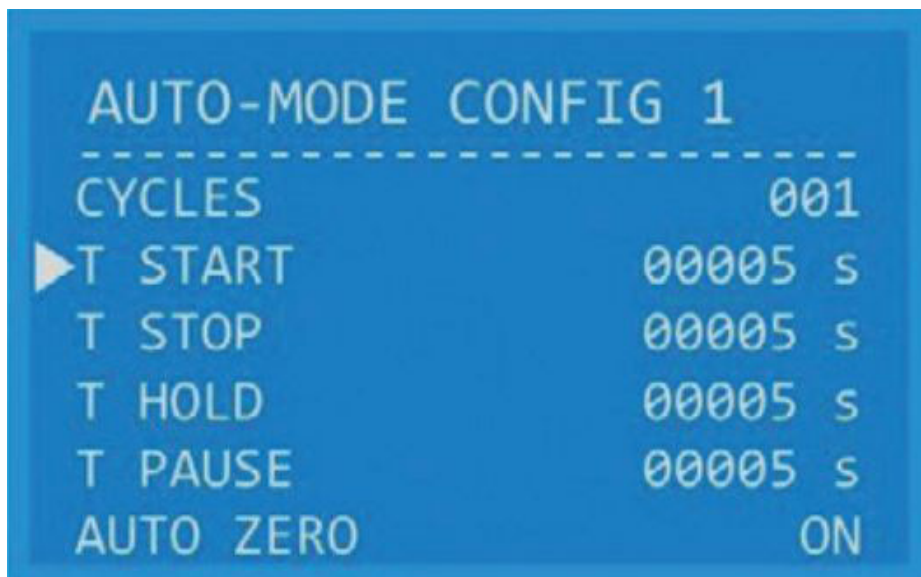
For the AUTO mode, the submenu points RANGE, UNIT and STEPS are not relevant.

Go to the SETTINGS menu item with the / buttons and confirm with the OK button. The submenu item zero point adjustment is not relevant.

In the submenu, go to the AUTO mode item with the UP/DOWN buttons and confirm with OK:

- RANGE: Pressure range that will be covered
- UNIT: Pressure unit
- STEPS: The number of steps which will be taken to increase and decrease the pressure. These increments are calculated by the controller itself.

In the submenu point, CONFIGURATION 1, further settings can be defined for the AUTO mode.



Setting

CYCLES: Here the number of cycles to be carried out in AUTO mode will be set.

T START: Delay time to vent the sensor

T STOP: Delay time before reaching the maximum defined pressure

T HOLD: Hold time until a new pressure value is reached

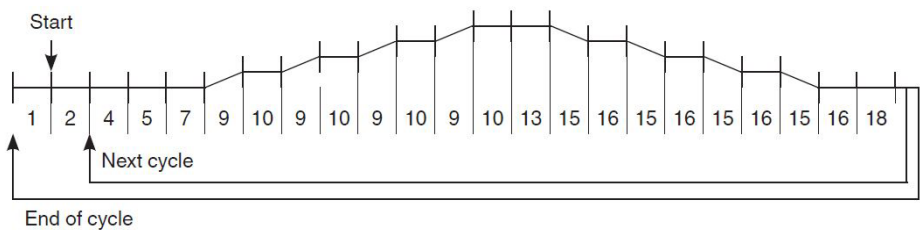
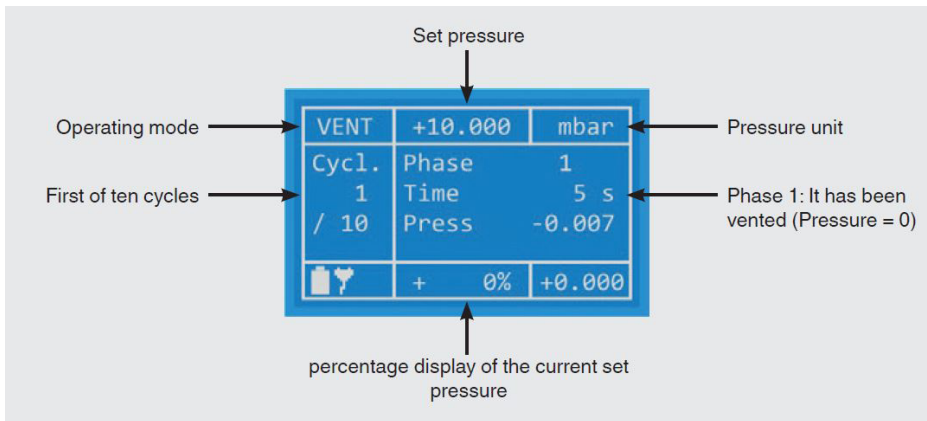
T PAUSE: Delay time between two cycles

AUTO ZERO: Automatic zero point adjustment at the completion of each cycle

To exit the submenu, press the MENU button.

Operation

On leaving the menu, the calibrator will revert to 'Standby status'. All information about the AUTO mode will be shown on the display.



The figure shows the flow chart for the AUTO mode. Based on the table, one will know which cycles are being carried out and the meaning of each.

Phase Description

1	Wait for the Start command with OK
2	Delay time can be defined in the Configuration
4	Duration of the system zero point adjustment
7	Hold time at the zero point
9	Time to control up to the next step
10	Hold time
13	Delay time at the maximum set pressure
15	Time to control up to the next step
16	Delay time at the zero point
18	The delay times can be defined in the configuration.

Between phases 10 and 16, the calibrator data can be evaluated and recorded if a stable value is displayed. The AUTO mode can be exited by pressing the MENU button. VENT will be shown In the top left of the display.

Leakage (LEAK)

In CTRL mode, the connected test item can be checked for leakage via LEAK button.

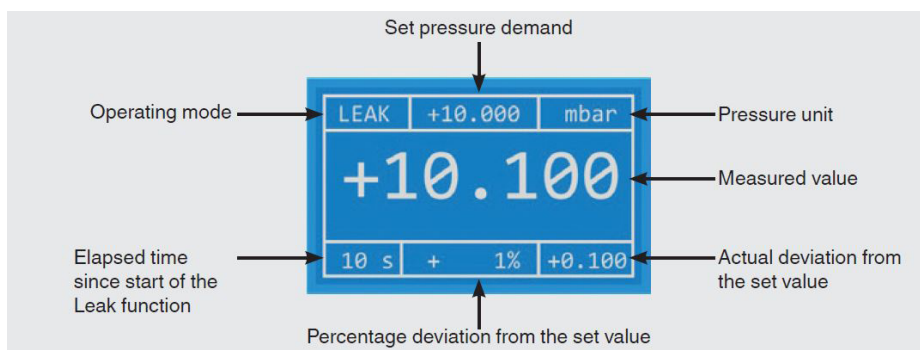
Setting

In order to be able to check a test item for leakage, the instrument must first be placed in CTRL mode.

Set the desired pressure using the \uparrow/\downarrow button or the \leftarrow/\rightarrow button (0 %/100 %) buttons.

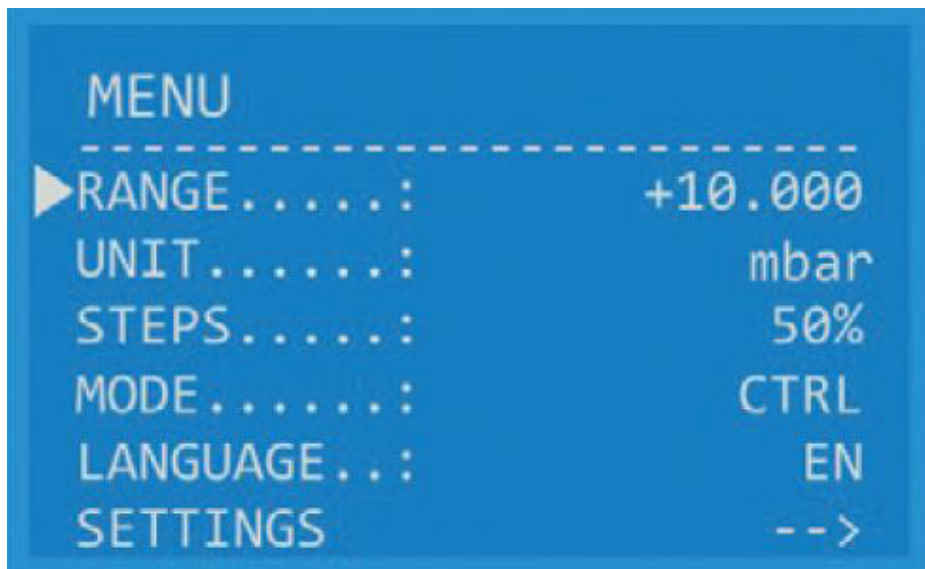
As soon as the pressure is reached and the value is stable, press the LEAK button. The internal pump will be switched off and the applied pressure will be held.

Operation



SETUP settings (SETUP)

The SETUP menu items are made up of six submenus.



RANGE: Setting of the pressure range (max. 100 % of the measuring span)

UNIT: Selection of the pressure unit (Pa, kPa, hPa, bar, mbar, psi, inH₂O, inHg, mmHg, Torr)

STEPS: Setting of the step size in x %. Settable in the range 1 ... 50 %

MODE: Selection of the operating mode

Control (CTRL): Regulates to the given set point

Measure (MEAS): Measurement of differential and relative pressure

Automatic (AUTO): Carries out a stored test routine

LANGUAGE: Selection of the displayed language

SETTINGS: Here additional instrument settings can be made

Navigation within the menu:

OK: Acts to confirm the relevant setting

Left/Right arrow: Setting of the active decimal point

Up/Down arrow: Change between the different submenu points

The menu points

With the MENU button and with the  button, press the up and down until one is at the required menu point. With the SELECT button, one reaches the desired submenu. The following items are available in the submenu:

RANGE

Under the RANGE menu point the controller's final control value can be changed for the control.

UNIT

Here the unit, in which the low-pressure controller will display the measured value on the screen, can be selected. Dependent upon the measuring range of the instrument, various units are not available since they could not be displayed.

STEPS

Here the step size for the STEP function, in x % of the set range, can be changed. Possible settings are from 1 ... 50 %.

MODE

Here the operating mode of the controller can be set. The following modes can be selected:

Measure (MEAS): The controller measures the pressure in the set pressure unit

Control (CTRL): A set point is automatically regulated

Automatic (AUTO): A stored test routine will be carried out

LANGUAGE

Here the language in which the menu will be displayed can be set. There is the possibility to choose between German, English, Spanish and French.

SETTINGS

ZERO: Switching on and off of the automatic zero point adjustment following exit from the menu. It is even possible to set at what intervals the instrument will automatically perform a zero point adjustment.

RS232/USB: Selection of the appropriate serial interface

DISPLAY: Brightness setting

AUTO-MODE: Setting of the pressure range, the pressure unit and number of steps the pressure range will be divided up into. The STEPS UP/STEPS DOWN can be assigned different values.

INFO: Basic information on the instrument



6. INTERFACE

Information on the Firmware release and issue number of the Operating Instructions

Manual	Firmware
2.1.0	1.32

There is a possibility to control and monitor the controller via a PC over a serial interface (USB or RS-232). In control, measure and automatic modes a cyclic output of the current instrument status can be switched on and off. The output interval is 1 second.

USB interface

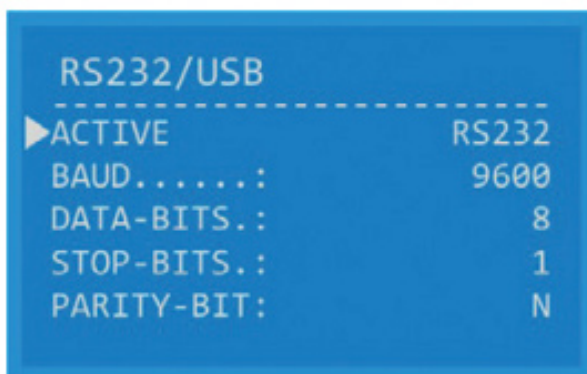
The PC provides a virtual COM port over the USB interface. The control of the instrument is therefore no different from the control via the RS-232.

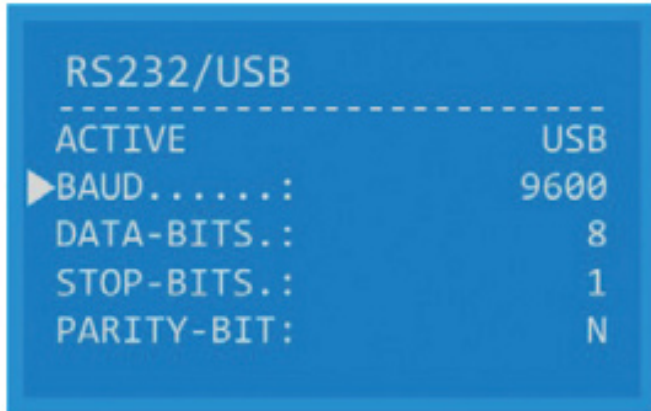
RS-232 interface

To connect, the Rx/D, Tx/D and GND lines are required. The connection is made with an in-line serial cable (1:1, male/female).

Interface configuration

Press the MENU button and press the \uparrow / \downarrow button until the SETTINGS submenu item appears and confirm with SELECT. In the submenu, go to the item RS-232/USB with the \uparrow / \downarrow button and confirm with OK. The following settings can be made:





ACTIVE: Selection of whether a serial interface will be used and which serial interface (USB, RS-232)

BAUD: Selection of the baud rate (1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 56000, 57600)

DATA-BITS: Defined value (8)

STOP-BITS: Defined value (1)

PARITY-BITS: Defined value (N)

Commands for serial interface

All interface commands are preceded by a colon and completed with the carriage return (CR). Command and parameters must be separated by a space. By adding a question mark to the appropriate action the parameter can be read rather than changed. Received commands are acknowledged with OK, null or false commands with ERROR.

Command	Answer function
Auto mode	
:saaz <0 1>	Auto zero before each cycle (phase 4) 0 --> off 1 --> on
:acy <1 ... 100>	Cycles to be carried out 1 ... 100 --> number of cycles
:asd <1 ... 100>	Steps Down 1 ... 100 --> number of steps to reach the end point
:asu <1 ... 100>	Steps Up 1 ... 100 --> number of steps to reach the end point
:ate <0 ... 10000>	Delay time at the end point (phase 13) 1 ... 10000 --> time in seconds
:ath <1 ... 10000>	Hold time (phase 10 and 16) 1 ... 10000 --> time in seconds
:atp <1 ... 10000>	Pause time (phase 18) 1 ... 10000 --> time in seconds
:atr <1 ... 10000>	Tolerance band 1 ... 10000 --> tolerance in 0.01 % FS (full scale) of the instrument measuring range. Once the instrument has been controlled within this tolerance band for 1 second, the hold time expires.
:ats <1 ... 10000>	Start delay (phase 2) 1 ... 10000 --> time in seconds
Interface output	
:o <0 1>	Output status information over interface 0 --> off 1 --> on

Control mode

:pa <-110 ... 110>	Increase the set pressure demand by x percent -110 ... +110 --> change in set pressure demand in %	
:pd	Decrease set pressure demand by currently-set step size in % (Step DOWN).	
:pr <-1100 ... 11000>	Adjust the current working and measuring ranges -1,100 ... +11,000 --> new measuring range in 0.01 % FS	
:ps <-10 ... 110>	Percentage set pressure demand -10 ... +110 --> set pressure demand in %	
:pu	Increase set pressure demand by currently-set step size in % (Step UP).	
:saz<0 1>	Set auto zero (in measuring and control modes) 0 --> off 1 --> on	
:sbr<0 ... 1>	Set baud rate RS-232 0 --> 1200 1 --> 2400 2 --> 4800 3 --> 9600 4 --> 14400	5 --> 19200 6 --> 28800 7 --> 38400 8 --> 56000 9 --> 57600
:sbu<0 ... 1>	Set baud rate USB 0 --> 1200 1 --> 2400 2 --> 4800 3 --> 9600 4 --> 14400	5 --> 19200 6 --> 28800 7 --> 38400 8 --> 56000 9 --> 57600
:sci<n u r>	Select active interface Set communication interface n --> Interface off u --> USB active r --> RS-232 active	
:sdb <0 ... 100>	Display brightness 0 ... 100 --> brightness in %	
:spu <0 ... 9>	Pressure unit 0 --> Pa 1 --> hPa 2 --> ka 3 --> mbar 4 --> bar 5 --> Torr	6 --> mmHg 7 --> inHg 8 --> psi 9 --> mmH ₂ O 10 --> inH ₂ O
:ssl <d e>	System language d = German e = English	

Menu settings

:smm <a c m >	Define the operating modes of the instrument a --> start automatic mode c --> start control mode m --> start measure mode
:ssw <1 ... 100>	Step size 1 ... 100 --> step size from operating the up and down buttons in %
:swm <a c m z v s>	Define the operating modes of the instrument a --> start automatic mode c --> start control mode m --> start measure mode (only available in CONTROL and MEASURE modes) z --> ZERO (only available in CONTROL mode) l --> LEAK test l --> back to CTRL mode (like LEAK button) v --> VENT (vent the entire system) (only available in AUTOMATIC mode)
:szc <0,1>	Zeroing before entry into control mode 0 --> off 1 --> on
:szi <1 ... 60>	Zeroing interval 1 ... 60 --> time in minutes

Driver

The current USB interface driver is "Future Technology Devices International Limited" (FTDI) provided for download on its website for all major operating systems (Windows, Linux, Mac OS).

7. LOW PRESSURE CALIBRATOR

Maintenance

This low-pressure controller is maintenance-free.
Repairs must only be carried out by the manufacturer.

The safety of the operator may be endangered by the low-pressure controller if, for example:

- There is visible damage to the instrument.
- The instrument is not working as specified.
- The instrument has been stored under unsuitable conditions for an extended period of time.

If there is any doubt, please return the low-pressure controller to the manufacturer for repair or maintenance.

Cleaning



Caution!

Before cleaning, correctly disconnect the low-pressure controller from the pressure supply, switch it off and disconnect it from the mains.

Clean the instrument with a moist cloth.

Electrical connections must not come into contact with moisture.

Wash or clean the dismantled instrument before returning it, in order to protect persons and the environment from exposure to residual media.

Residual media on the dismantled low-pressure controller can result in a risk to persons, the environment and equipment. Take sufficient precautionary measures.



For information on returning the instrument see chapter "Return"

Recalibration

ENAC certificate

We recommend that the instrument is regularly recalibrated by the manufacturer, with time intervals of approx. 12 months. Every factory recalibration includes, additionally, an extensive free-of-charge check of all system parameters with respect to their compliance with the specification. The basic settings will be corrected if necessary.

8. FAULTS

Faults	Causes	Measures
Instrument is not working, the display is dark.	No voltage supply	<ul style="list-style-type: none">■ Check whether the plug is correctly in the socket■ Battery is empty and must first be recharged
Set pressure has not been reached, the pump is running continuously	System is not fully sealed; too large hose diameter or hose length	<ul style="list-style-type: none">■ Slide hose on correctly; eliminate any leaks■ Hose diameter max. 6 mm (see chapter 3 "Specifications")



Caution!

If faults cannot be eliminated by means of the measures listed above, the low-pressure controller must be shut down immediately, and it must be ensured that pressure and/or signal are no longer present, and it must be prevented from being inadvertently put back into service.

In this case, contact the manufacturer.

If a return is needed, please follow the instructions given in chapter 10.2 "Return".

9. DISMOUNTING, RETURN AND DISPOSAL



Warning!

Residual media on the dismantled low-pressure controller can result in a risk to persons, the environment and equipment. Take sufficient precautionary measures.

Dismounting

Only disconnect test and calibration installations once the system has been depressurised!

When disassembling the instrument the following must be followed:

1. Ensure that there is no positive or negative gauge pressure in the instrument and that all parts of the instrument are at room temperature.
2. Switch the instrument off using the ON/OFF switch
3. First pull the power supply unit from the mains socket and then from the power supply socket on the instrument.
4. Loosen the pressure connections
5. Do not close the pressure inputs!
6. Make sure there is no media left in the instrument.

Return



Warning!

Strictly observe the following when shipping the instrument:

All instruments delivered to Leyro must be free from any kind of hazardous substances (acids, bases, solutions etc.).

When returning the instrument, use the original packaging or a suitable transport package.

To avoid damage:

1. Do not return the instrument with the pressure connections closed! Barometric pressure changes can damage instruments with low pressure ranges.
2. Wrap the instrument in an antistatic plastic film.
3. Place the instrument, along with the shock-absorbent material, in the packaging. Place shock-absorbent material evenly on all sides of the transport packaging.
4. If possible, place a bag, containing a desiccant, inside the packaging.
5. Label the shipment as transport of a highly sensitive measuring instrument.

Diposal

Incorrect disposal can put the environment at risk.

Dispose of instrument components and packaging materials in an environmentally compatible way and in accordance with the country-specific waste disposal regulations.



This marking on the instruments indicates that they must not be disposed of in domestic waste. The disposal is carried out by return to the manufacturer or by the corresponding municipal authorities (see EU directive 2002/96/EC).

10. TECHNICAL DATA

Reference pressure sensors

Pressure range	mbar	1	10	50	100	500	1,000
Accuracy	% FS	0.3	0.1	0.1	0.1	0.1	0.1
Type of pressure	Positive or negative gauge pressure or differential pressure						
Pressure units	Pa, kPa, hPa, bar, mbar, psi, inH ₂ O, inHg, mmHg, Torr						

Base instrument

Control parameter	
Control steps	0 ... 50 % individually adjustable or 100 %
Control rate	approx. 5 s (dependent upon test volume)
Communication	
Interface	RS-232 and USB
Response time	1 value/s
Zero point adjustment	automatic (at definable time intervals) manual (ZERO button)

Base instrument

Instrument

Instrument version	desktop instrument with carry handle
Dimensions	102.6 x 257 x 271 mm without carry handle
Weight	4.6 kg
Ingress protection	IP 20
Pressure generation	internal, electric pump

Display

Screen	backlit, multiline graphic display
Resolution	5 (4 digits for 50/500 mbar measuring range)
Keyboard	Membrane keypad
Menu language	German, English, Spanish and French

Connections

Pressure connections	6.6 x 11 (hose diameter, D = 6 mm)
Wetted parts	Ni, Al, CuBe, PU

Voltage supply

Power supply	DC 24 V, 1 A
Power consumption	24 VA
Battery type	Li-Ion
Battery life	approx. 8 h

Permissible ambient conditions

Media	Ambient air
Operating temperature	10 ... 40 °C
Storage temperature	-10 ... +70 °C
Relative humidity	30 ... 80 % r. h. (non-condensing)

Approvals and certificates

CE conformity

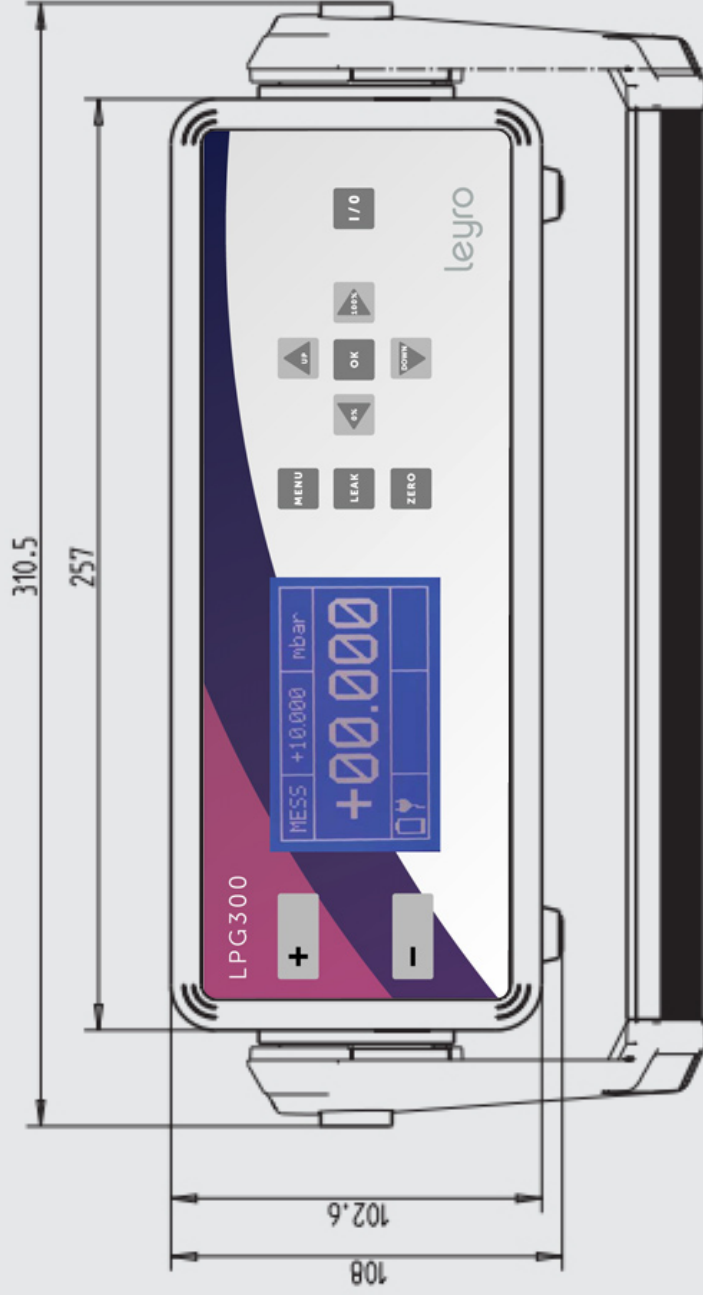
EMC directive	2004/108/EC, EN 61000-6-3, emissions for residential, commercial and light-industrial environments and EN 61000-6-2, interference immunity for industrial environments
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Certificate

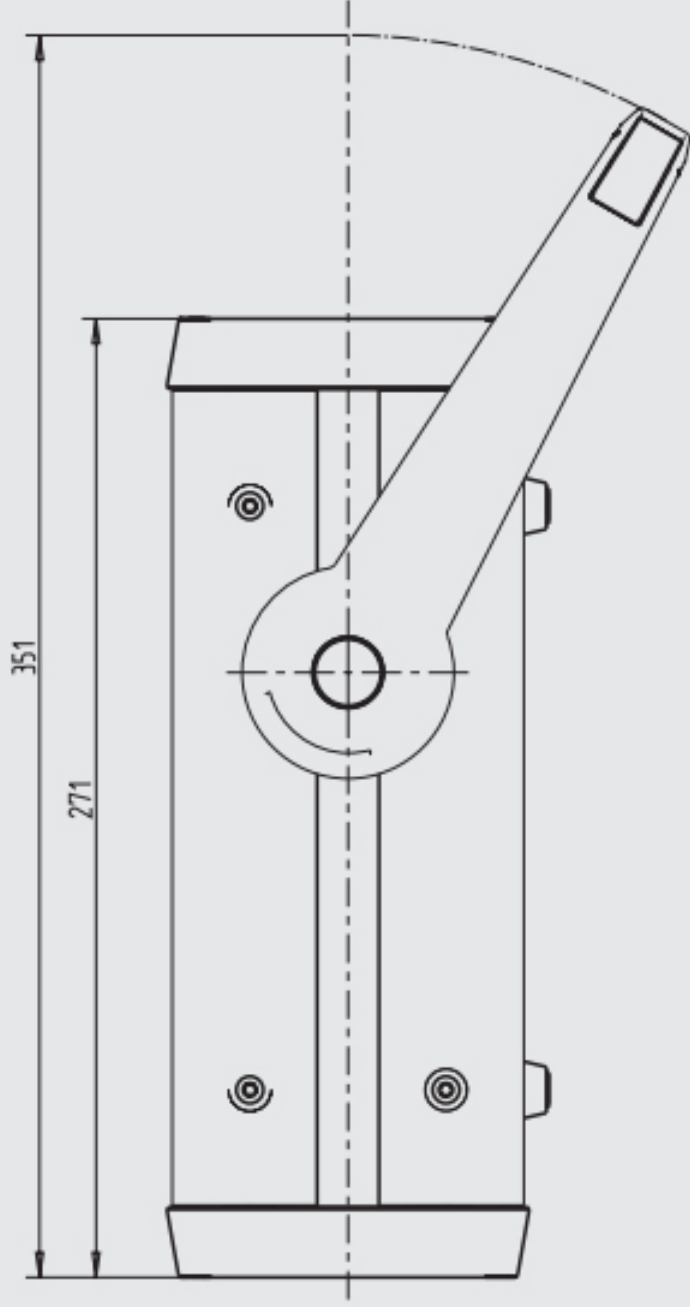
Calibration ¹⁾	incl. 3.1 calibration certificate per EN 10204
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1) Calibration in a horizontal position.

FRONT VIEW



SIDE VIEW



NOTES _____

[illegible]

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