A

Operating Instructions

Humidity monitoring system for compressed air

Puracon Mobile / Stationary ECO

Version: 12/13-E

General Information

We strongly recommend reading this manual thoroughly prior to operation and follow all the safety precautions precisely. Damage resulting from any deviation from these instructions is excluded from warranty and liability for this product. Carry out other commissioning steps only if you have fully understood the following contents.

Before commissioning and using the unit, carry out all the essential preliminary work and measures concerning legal regulations and safety. These are described on the following pages of this operation manual.

Description of marks and warning signs

The following warning signs are used in this document to identify the corresponding warning notes which require particular attention by the user. The warning signs are defined as follows:

Caution
Indicates an imminently hazardous situation which, if not avoided, could result in serious injury, physical injury or death.

Warning
Indicates a potentially hazardous situation which, if not avoided, could result in physical injury or damage to the product or environment.

Note
Indicates additional information on how to use the unit.

Scope of Delivery Puracon Mobile M200 / M300

Puracon Mobile M200 / M300 is used for manual humidity monitoring during filling procedures or to check the equipment before diving. The humidity value can be controlled during the entire filling procedure. Exceeding of the limits will be indicated by a red LED. The Puracon Mobile M200 / M300 can be connected directly between cylinder and filling hose (no installation work on the compressor required).

Pressure Ranges

- M200: 150 to 250 bar
- M300: 250 to 350 bar

Specifications

- Adjustable measuring speed
- Auto shut down (battery saving mode)
- Pressure compensation
- Higher accuracy by new temperature compensation
- Applicable without installation work on the compressor
- Storage of max. humidity value
- Alarm LED - freely adjustable limit

Technical data - Puracon Mobile M200 / M300

Technical data	
Dimensions L x W x H [mm]:	60 x 90 x 40
Dimensions incl. hose connections L x W x H [mm]:	150 x 90 x 40
Connector:	Standard G5/8
Weight [kg]:	0,8
Power supply:	2 x AAA LR03 alk. batteries
Protection rating:	IP64
Operating pressure range M 200 [bar]:	150 - 250
Operating pressure range M 300 [bar]:	250 - 550
Operating temperature [°C]:	+5 bis +40
Medium:	Compressed air

Scope of Delivery Puracon Stationary ECO

Puracon Stationary ECO is a cost-efficient solution for humidity monitoring during the filling procedure. The Puracon Stationary ECO can be connected directly to the high-pressure line after the humidity filter. The humidity value can be observed during the entire filling procedure. Exceeding of the limits will be indicated by a red LED.

Specifications

- Adjustable measuring speed
- Auto shut down (battery saving mode)
- Pressure compensation
- Higher accuracy by new temperature compensation
- Storage of max. humidity value
- Alarm LED - freely adjustable limit

Technical data - Puracon Stationary ECO

Technical data	
Dimensions L x W x H [mm]:	60 x 90 x 40
Dimensions incl. hose connections L x W x H [mm]:	150 x 90 x 40
Connector:	G1/4 thread
Weight [kg]:	0,8
Power supply:	2 x AAA LR03 Alk. Batterie
Protection rating:	IP64
Operating pressure [bar]:	150 - 350 bar (adjustable pressure range)
Operating temperature [°C]:	+5 to +40
Medium:	Compressed Air

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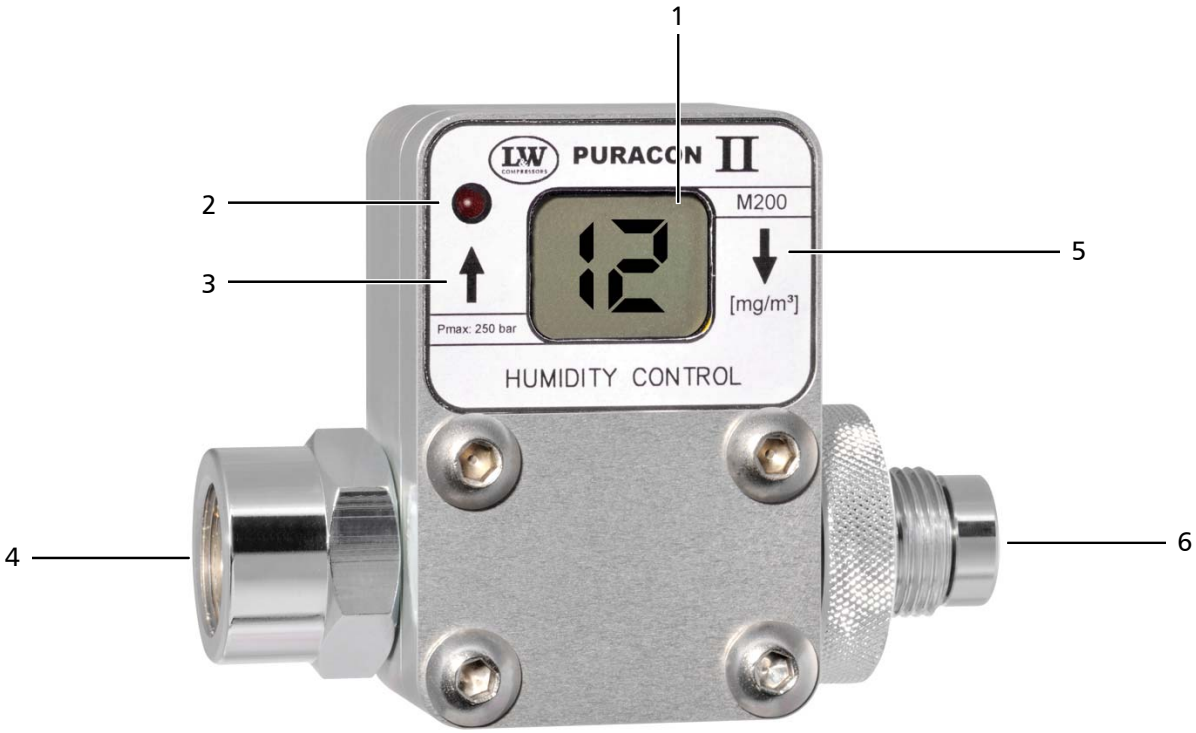
Unit Assembly - Puracon Mobile



No.	Designation
1	LCD display
2	Alarm LED
3	UP - button
4	Filling hose connection
5	DOWN - button
6	Compressed air cylinder connection

Unit Assembly - Puracon Stationary ECO

No.	Designation
1	LCD display
2	Alarm LED
3	UP - button
4	Connector: G1/4 IG
5	DOWN - button
6	Connector: G1/4 IG

SAFETY PRECAUTIONS

Intended Use

Only use the unit in perfect condition for its intended purpose, safety and intended use and observe the operating instructions! In particular disorders that may affect safety have to be eliminated immediately!

Use the unit exclusively for the determined medium (see "Technical Data"). Any other use that is not specified is not authorized. The manufacturer/supplier shall not be liable for any damages resulting from such use. Such risk lies entirely with the user. Authorization for use is also under the condition that the instruction manual is complied with and inspection and maintenance requirements are enforced.

No change and modification to the unit can be made without the written agreement of the manufacturer. The manufacturer is not liable for damage to persons or property resulting from unauthorised modifications.

Operators

Target groups in these instructions;

Operators

Operators are persons who are authorized and briefed for the use of the compressor.

Qualified personnel

Qualified personnel are persons who are entitled to repair, service, modify and maintain the system.

Warning
Only trained personnel are permitted to work on the unit!

Warning
Work on the electrical equipment on / with the machine / unit may only be carried out by qualified electricians.

Strictly follow the instruction for use

Any use of the device requires full understanding and strict observation of this instruction. The device is only to be used for purposes specified here. Also pay attention to the specific instructions for the use of compressors, filling stations and to the corresponding statutory requirements and standards.

Maintenance

When the basic measurement shows a high deviation after a filter change, the device must be returned to the manufacturer for inspection (examination of actual condition), calibration (comparison with true values) and adjustment (adjustment to true values).

Maintenance work can be carried out by the user (actions to maintain the specified condition) - see chapter "Maintenance".

Note
Check the following possible defects before returning the device:

- Filter housing sealing defective
- Expiration date of the filter cartridge has been exceeded
- No original L&W filter cartridge / user filling of the filter cartridge

Liability for proper function or damage

The liability for the proper function of this device is irrevocably transferred to the owner or operator to the extent that the device has been serviced or repaired by personnel not employed or authorized by Lenhardt & Wagner or when the device was used in a manner not conforming to its intended use.

Lenhardt & Wagner and its distribution partners cannot be held responsible for damage caused by non-compliance with the recommendations given above. The warranty and liability provision of the terms of sale and delivery of Lenhardt & Wagner and its distribution partners are likewise not modified by the recommendation given above.

Safety regulations

Inspections according to legal and local obligatory regulations regarding accident prevention are carried out by the manufacturer or by authorised expert personnel. No guarantees whatsoever are valid for damage caused or favoured by the non-consideration of these directions for use.

INSTALLATION

Mechanical installation

Danger
Before any work will be carried out, isolate the power supply to prevent injury and reduce the pressure in the pipes to atmospheric pressure. The installation of a non-return value in the outlet of the sensor housing towards the filling panel may only be carried out by a qualified technician.

For installation observe the following:

- Before mounting the housing, tighten the screws of the sensor cover again (Fig.1).

Fig. 1 - Retighten cover screws

Installation Puracon Mobile

- Connect Puracon Mobile with the standard connector G5/8 to the compressed air cylinder and the filling connection.

Installation Puracon Stationary ECO

- Mount the sensor tightly at a place with low vibration.
- Mount the sensor with the rear side at least by two M8 mounting screws (Fig.2). ATTENTION: Screw depth max. 4 mm!
- An installation only by gas lines is not allowed!

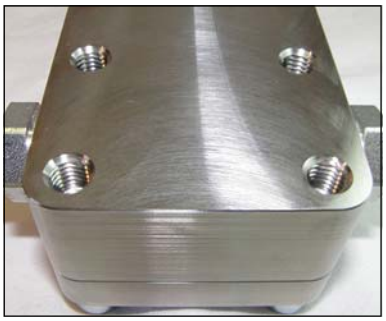


Fig. 2 - Housing rear side 4 x M8

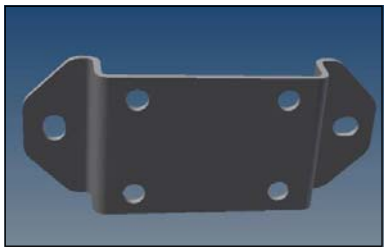


Fig. 3 - Mounting bracket

Note
We recommend using the mounting bracket (Fig.3). (Article-N°.: 007840)

OPERATION

Important operation instructions

- Each contamination and humidity values higher than 60 mg/m³ can influence the measurement or/and damage the sensor. Ensure a clean pipe line system.
- Before mounting, the pipes must be cleaned from contamination to avoid damage of the sensor. Every contamination can reduce the measured values or damage the sensor. Each excessive pressure and temperature changes can produce condensate.
- Humidity values higher than 60 mg/m³ can reduce the sensor lifetime.
- High pressure and temperature changes provoke high humidity fluctuation. Too high system humidity tends to condensate.
- Consistent measurement or sensor protection from condensation as follows:
  - ensure permanently a sensor minimum pressure of about 70% of the filling pressure
  - avoid gas flow returning into the pipe system
  - do not exceed the maximum humidity value of 25mg/m³ (orange LED) according to EN12021 (2012)
  - prevent the sensor from frequent, abrupt pressure changes..

Legal regulation and filling authorization

- The water content of the gas supplied by the compressor for filling gas cylinder should not exceed 25 mg/m³. The owner of the compressor and the person in charge of filling are responsible for ensuring that this limit is not exceeded. Gas may only be filled by person listed as authorized persons in the compressor check book.
- WARNING! Correct humidity values are only possible during gas flow and with a working pressure from 200 to 300 bar. For other pressure ranges or for better accuracy see "Adjustment pressure range"

Switch on or restart the device

Push the UP- and DOWN-buttons simultaneously to switch the device on.

The display indicates the software version and the actual humidity value after commissioning/ restart.

- The sensor measures the passing medium humidity every 2 seconds immediately after start. The measurement time slows then automatically down to 20 seconds.
- A flashing red alarm LED indicates the maximum humidity limit value of 25 mg/m³.

Caution
Do not fill cylinders when the red LED is illuminated and the digital display indicates a value higher than 25mg/m³. After longer standstill of the compressor or after filter change, the red LED may be illuminated and the digital display may indicate a value higher than 25 mg/m³. This is caused by the remaining humidity in the pipes or by the delayed effect of new filters.

Note
Correct humidity values are only possible during gas flow and with a working pressure from 200 to 300 bar.

Switch device off

Puracon automatically switches off after 60 minutes. To switch the device off, push the UP- and DOWN-buttons simultaneously, release the UP-button and hold the DOWN-button for further 5 seconds.

Measurement during filling

Dry the sensor before humidity measurement. Push the UP- and DOWN-buttons simultaneously to switch the device on.

Measurement during filling as follows:

- Connect Puracon Mobile to the compressor filling hose.
- Switch compressor on.
- Open the filling hose valve just a little and discharge air for 30 seconds on ambient pressure until a value below 20 mg/m³ will be displayed.
- Close valve again and connect Puracon Mobile to the cylinder.
- Fill cylinder up to maximum pressure.
  A possible higher value in the beginning presents no problems. However, the value should decrease below 20 mg/m³ within the next few minutes. A filling pressure of min. 200 bar must be reached to guarantee a correct value.
  Max. value = 25 mg/m³.

Connect Puracon Mobile to the compressor filling hose

Open the filling hose valve only a little

Connect Puracon Mobile to the cylinder

Measurement cylinder humidity

Dry the sensor before humidity measurement. Push the UP- and DOWN-buttons simultaneously to switch the device on.

Predrying with compressor air

Connect sensor to the compressor. Switch compressor on. Open the filling hose valve just a little and discharge air on ambient pressure until a value below 20 mg/m³ will be displayed.

Predrying with cylinder air.

Caution: Min. cylinder pressure 200 bar.

Connect sensor to the cylinder. Open the filling hose valve just a little and discharge air on ambient pressure until a value below 20 mg/m³ will be displayed.

Measurement with throttle valve

- Connect throttle valve. Push the UP-button for a faster measurement.
- Open cylinder for about 10 - 30 seconds and discharge the air via the throttle valve.
- Close the cylinder again for about 10 - 30 seconds.
- Open the cylinder, wait for 10 seconds, read value, close cylinder.
- This procedure can be repeated 1-3 times when the value is not below 35 mg/m³.

Measurement with lung demand valve

- Connect lung demand valve. Push the UP-button for a faster measurement.
- Open the cylinder for 5 seconds, connect the cylinder, deflate lung demand valve.
- Repeat this procedure for about 5 - 10 times.
- Open the cylinder for 5 seconds, read value.

Caution
This value is only valid with a cylinder pressure of at least 180 bar.

ERROR MESSAGES

Error display

Error messages treatment as follows:

- Restart the device by pushing the UP- and DOWN-buttons simultaneously.
- If the error message remains displayed, see following error code table:

Code	Cause	Remedy
E 1	Sensor not calibrated	Service
E 2	Humidity - value outside normal parameters	Service, clean sensor, change sensor
E 3	Temperature - value outside normal parameters	Service, change sensor
E 4	Power supply sensor not correct	Service
E 5	Sensor oscillators defective	Service
E 9	Batteries empty	Dismount sensor, change batteries

MAINTENANCE AND SERVICE

Maintenance Work

Carry out service and maintenance work exclusively when the compressor is stopped and depressurized. The unit should be leak-checked regularly. Leaks can be preferably localised by using a leak detector spray (if necessary, brush pipes with soapy water).

We urgently recommend that all maintenance, repair and installation work must only be carried out by trained personnel. This is necessary because all maintenance work can not be explained exactly and detailed in this manual.

Only use authentic spare parts for service work.

Danger
Components under pressure, such as the hose ends, can quickly come loose when manipulated and can cause potentially fatal injuries due to the pressure surge.
Any work on system parts may only be performed in a pressure-compensated state.

Warning
The use of accessories that have not been tested can lead to death or serious injury or damage to the unit. Only use authentic spare parts for service work.

Warning
Carry out maintenance or service work when the unit is switched off and protected against unexpected restart.

The following maintenance work can be carried out by the user.

Carry out the following maintenance work every 12 months

Maintenance type	Quantity	Order. No.
Visual control for contamination or damage of the sinter filter. Change the sinter filter and the O-ring if necessary.	1	007318
Sensor check - see page A21	-	-
Changing the battery	-	-

Changing the battery

Danger
Do not open when the unit is pressurized.

Warning
Do not touch or contaminate the sensor. Each contamination can influence the measurement or/and damage the sensor.

Battery change as follows:

- Switch device off.
- Loosen and extract cover screws 4 x M8.
- Remove sensor housing top an place it on a clean surface.
  ATTENTION: Do not touch or contaminate the sensor.
- Change the batteries
- Place cover
- Place and mount screws crosswise

Battery change is now completed.

Fig. 1 - Battery change

Sensor maintenance / check

Danger
Do not open when the gas lines are pressurized!

Sensor maintenance / check as follows:

- Turn the device on
- Loosen cover screws, do not extract (Fig.1).
- Lift cover at least 1 cm and blow through the gap.
- The humidity value should fast increase up to at least 50 mg/m³. If the humidity value should not increase, return sensor, display unit and cables to the manufacturer for check / repair / calibration!
- Place cover
- Place and mount screws crosswise

Fig.1 - Loosen cover screws, do not extract

The sensor maintenance / check is now completed.

Return to manufacturer

Please return device, all cables as well as a short error description to the manufacturer. A free software update and a cleaning will be carried out during check / repair / calibration.

Note
For return delivery to manufacturer ensure sufficient sensor protection.

Note
To continue the compressor operation after removing the sensor, mount the supplied connection piece. Order number: 007323

Check sinter filter / replacement of the seal

Danger
Do not open when the gas lines are pressurized!

Warning
Do not touch or contaminate the sensor. Each contamination can influence the measurement or/and damage the sensor.

Sinter filter or seal check as follows:

- Switch device off.
- Loosen and extract cover screws 4 x M8.
- Remove sensor housing top an place it on a clean surface. ATTENTION: Do not touch or contaminate the sensor.
- Unscrew the sinter filter out of the sensor housing and check it (visual inspection). Replace a damaged or contaminated sinter filter immediately (seal kit Puracon: 007318).
- Replace the seal.
- Place sensor housing top and tighten cover screws.

The sinter filter or seal check is now completed.

Fig. 1 - Cover screws

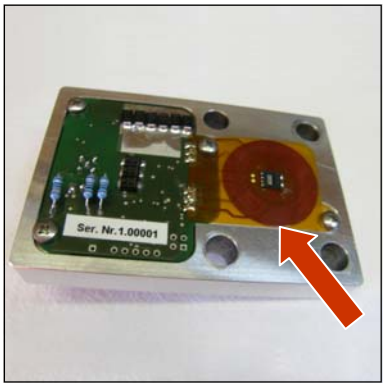


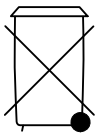
Fig. 2 - Sensor housing cover and sensor


Fig. 3 - Bottom part sealing ring and sinter filter

Disposal

The product must be disposed in accordance with national waste disposal regulations and by an appropriate waste disposal company.

Electric and electronic components



EU-wide regulations for the disposal of electric and electronic appliances which have been defined in the EU Directive 2002/96/EC and in national laws are effective from August 2005 and apply to this device.

Common household appliances can be disposed by using special collecting and recycling facilities. However, as this device has not been registered for household usage, it must not be disposed of through these means.

The device can be returned to L&W. Please do not hesitate to contact us if you have any further questions on this issue.

Entsorgungshinweis zu Batterien und Akkus

Disposal information for batteries and rechargeable batteries

Consumers are obliged to return these used batteries or rechargeable batteries (statutory obligation) to the manufacturer. The disposal in household waste is forbidden.

Customers can properly dispose old batteries and rechargeable batteries free of charge at dedicated collection points.

Batteries delivered by L&W can also be returned after use.