

**Translation of the Original Operating Manual**  
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**DMU 20 D**



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**READ THOROUGHLY BEFORE USING THE DEVICE**

**KEEP FOR FUTURE REFERENCE**

ID: 900.100.0841 | Version: 11.2019.0

**1. General and Safety-Related Information on This Operating Manual**

This operating manual enables safe and proper handling of the product, and forms part of the device. It should be kept in close proximity to the place of use, accessible for staff members at any time.

All persons entrusted with the mounting, installation, putting into service, operation, maintenance, removal from service, and disposal of the device must have read and understood the operating manual and in particular the safety-related information.

**The following documents are an important part of the operating manual:**

- Data sheet

For specific data on the individual sensors, please refer to the respective data sheet.

Download these by accessing [www.afriso.com](http://www.afriso.com) or request them by e-mail or phone: info@afriso.com | Fon: +49 7135 102-211

In addition, the applicable accident prevention regulations, safety requirements, and country-specific installation standards as well as the accepted engineering standards must be observed.

**1.1 Symbols Used**

	- Type and source of danger - Measures to avoid the danger
<b>Warning word</b>	
	- Imminent danger! - Non-compliance <b>will result in death or serious injury.</b>
<b>DANGER</b>	
	- Possible danger! - Non-compliance <b>may result in death or serious injury.</b>
<b>WARNING</b>	
	- Hazardous situation! - Non-compliance <b>may result in minor or moderate injury.</b>
<b>CAUTION</b>	

**NOTE** – draws attention to a possibly hazardous situation that may result in property damage in case of non-compliance.

- ✓ Precondition of an action

**1.2 Staff Qualification**

**Qualified persons** are persons that are familiar with the mounting, installation, putting into service, operation, maintenance, removal from service, and disposal of the product and have the appropriate qualification for their activity.

This includes persons that meet at least one of the following three requirements:

- They know the safety concepts of metrology and automation technology and are familiar therewith as project staff.
- They are operating staff of the measuring and automation systems and have been instructed in the handling of the systems. They are familiar with the operation of the devices and technologies described in this documentation.
- They are commissioning specialists or are employed in the service department, and have completed training that qualifies them for the repair of the system. In addition, they are authorized to put into operation, to ground, and to mark circuits and devices according to the safety engineering standards.

All work with this product must be carried out by qualified persons!

**1.3 Intended Use**

The devices are used to convert the physical parameter of pressure into an electric signal.

The **pressure transmitter** is suited to measure the differential-pressure of dry, non-aggressive gases and pressurized air.

The user must check whether the device is suited for the selected use. In case of doubt, please contact our sales department (info@afriso.com | Fon: +49 7135 102-211). AFRISO assumes no liability for any wrong selection and the consequences thereof!

The fluids that can be measured are dry, non-aggressive gases and pressurized air that are compatible with the materials in contact with the fluids, as described in the data sheet. For application, it must additionally be ensured that the fluid is compatible with the parts in contact with the fluid.

**1.4 Limitation of Liability and Warranty**

Failure to observe the instructions or technical regulations, improper use and use not as intended, and alteration of or damage to the device will result in the forfeiture of warranty and liability claims.

**1.5 Safe Handling**

**NOTE** – Do not blow air into the pressure ports! The device will be damaged thereby.

**NOTE** – Treat the device with care both in the packed and unpacked condition!

**NOTE** – The device must not be altered or modified in any way.

**NOTE** – Do not throw or drop the device!

**NOTE** – Excessive dust accumulation (over 5 mm) and complete coverage with dust must be prevented!

The device is state-of-the-art and is operationally reliable. Residual hazards may originate from the device if it is used or operated improperly.

**1.6 Scope of Delivery**

Check that all parts listed in the scope of delivery are included free of damage, and have been delivered according to your purchase order:

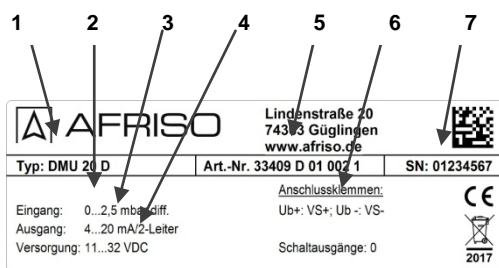
- pressure transmitter DMU 20 D
- this operating manual

**1.7 Transport and Storage**

Storage temperature range: -10 °C to +70°C. In case of transport or returns it must be ensured that both pressure inlets are open on differential pressure sensors. Absolute pressure sensors must be transported in cabins equipped with pressure compensation when transported by air freight.

**2. Product Identification**

The device can be identified by means of the type plate with order code. The most important data can be gathered therefrom.



- 1 Type designation
- 2 Inlet
- 3 Signal
- 4 Supply
- 5 Article number
- 6 Terminal assignment
- 7 Serial number

Fig. 1: Type plate

**3. Mounting**

**3.1 Mounting and Safety Instructions**

	- Airborne parts, leaking fluid, electric shock - Always mount the device in a depressurized and de-energized condition!
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**NOTE** – The close proximity of interference sources (transformers, transmitters, motors) and heat sources must be avoided.

**NOTE**– Shocks or vibrations of the mounting place can cause a falsified output signal.

**NOTE** –When installing the device, do not use any force in order to prevent damage to the device or the system.

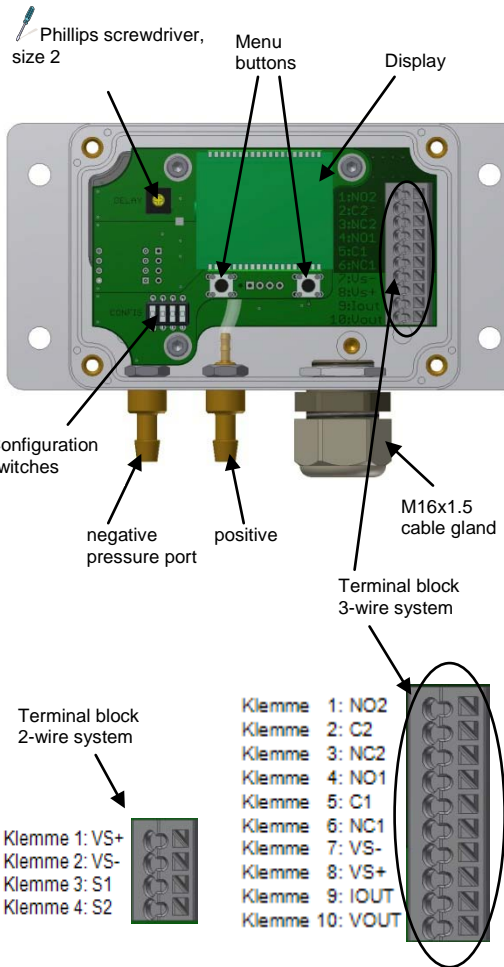
**NOTE** – Do not remove the packaging of the device until shortly before the mounting procedure in order to exclude any damage!

Dispose of the packaging properly!

**3.2 Mounting Steps**

- Attach the device by means of the mounting holes in a suitable mounting place. You can find the corresponding dimension drawing under "6. Dimensions / Fastening".
- Appropriately, the device should be mounted in a vertical position, that is, both pressure ports are directed downwards. The sensors have been factory-calibrated in this installation position. This type of mounting will also prevent any condensate of the pressure lines entering the sensor.
- Use suitable connection hoses to connect the device.

Potentiometer for adjusting the damping



**4. Electrical Connection**

**4.1 Connection and Safety Instructions**

	- Improper installation may result in electric shock - Always mount the device in a depressurized and de-energized condition!
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- Open the housing cover using a suitable Phillips screwdriver and connect the differential pressure transmitter with the aid of the following explanation. Thereafter, screw down the housing cover again.

- Insert the supply line from outside through the cable gland so far that the connecting wires can easily be connected to the right-hand terminal block (SUPPLY).

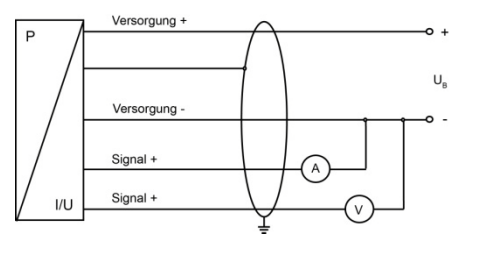
- Then tighten the cable gland by hand. However, ensure that the cable is without tension.

**Electrical connections (conductor cross-sections)**

without core-end sleeve: 1.5 mm<sup>2</sup>

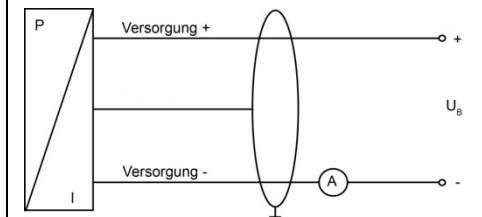
**3-wire system (current / voltage)**

Supply - : terminal 7: VS-  
 Supply +: terminal 8: VS+  
 Signal: terminal 9: IOUT  
 Signal: terminal 10: VOUT



**2-wire system (power)**

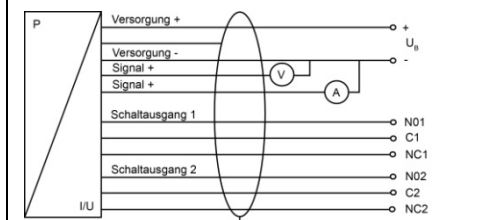
Supply +: terminal 1: VS+  
 Supply -: terminal 2: VS-



with core-end sleeve: 1 mm<sup>2</sup>

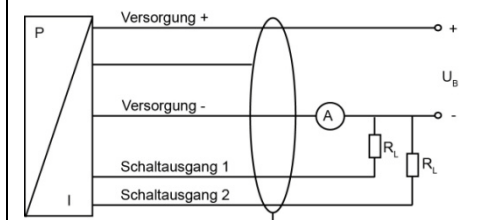
**3-wire system (current / voltage) with 2 contacts**

Contact 2 NO2: terminal 1: NO2  
 Contact 2 C2: terminal 2: C2  
 Contact 2 NC2: terminal 3: NC2  
 Contact 1 NO1: terminal 4: NO1  
 Contact 1 C1: terminal 5: C1  
 Contact 1 NC1: terminal 6: NC1  
 Supply -: terminal 7: VS-  
 Supply +: terminal 8: VS+  
 Signal: terminal 9: IOUT  
 Signal: terminal 10: VOUT



**2-wire system (power) with 2 contacts**

Supply +: terminal 1: VS+  
 Supply -: terminal 2: VS-  
 Contact 1: terminal 3: S1  
 Contact 2: terminal 4: S2



**4.2. Pressure Connection**

- Connect the hose with the higher pressure to the right-hand (positive) pressure port.
- Connect the hose with the lower pressure to the left-hand (negative) pressure port.

**5. Commissioning**

- ✓ The device has been installed properly
- ✓ The device does not have any visible defect

After applying the supply voltage, the output signal can be measured. If the output signal deviates, two things must be taken into account.

1. The run-in period of the sensor is about 30 minutes. After this period, the sensor signal must be stable if the differential pressure is zero and the ambient temperature is constant.
2. In case of small measuring ranges, the position influence results in a measurable, physically induced zero displacement. However, this error can be zero-balanced at the potentiometer after the run-in time of the sensor (set the output signal of the sensor to the setpoint-value with open pressure inlets). Regarding this, refer to the menu description.

**NOTE** – Do not touch the bonding wires! This may result in a failure of the device.

## 6. Operation

### 6.1 Setting of Damping

The potentiometer for adjusting the damping is located to the left of the display (see Fig. 2). The damping of the device can be adjusted in the range of 0 to 5000ms by turning the potentiometer using a suitable Phillips screwdriver.

### 6.2 Menu Buttons

The DMU 20 D comes standard with a display. Without a display, the device can be zeroed via the menu buttons. Zeroing is made by pressing the left menu button for at least 1 second.

### 6.3 Configuration Switches

#### 3-wire variant:

1	2	3	4
Off	0 ... 10 V / 0 ... 20 mA		
On	0 ... 5 V / 4 ... 20 mA		
Off	Automatic zeroing off		
On	Zeroing active at start and after every 24h		
Nominal pressure range			
Off	Off	1.6	4   10   40   250   1000
Adjustable customer-specifically			
On	On	1.0	2.5   6   25   60   400
On	On		160   600

#### 2-wire variant:

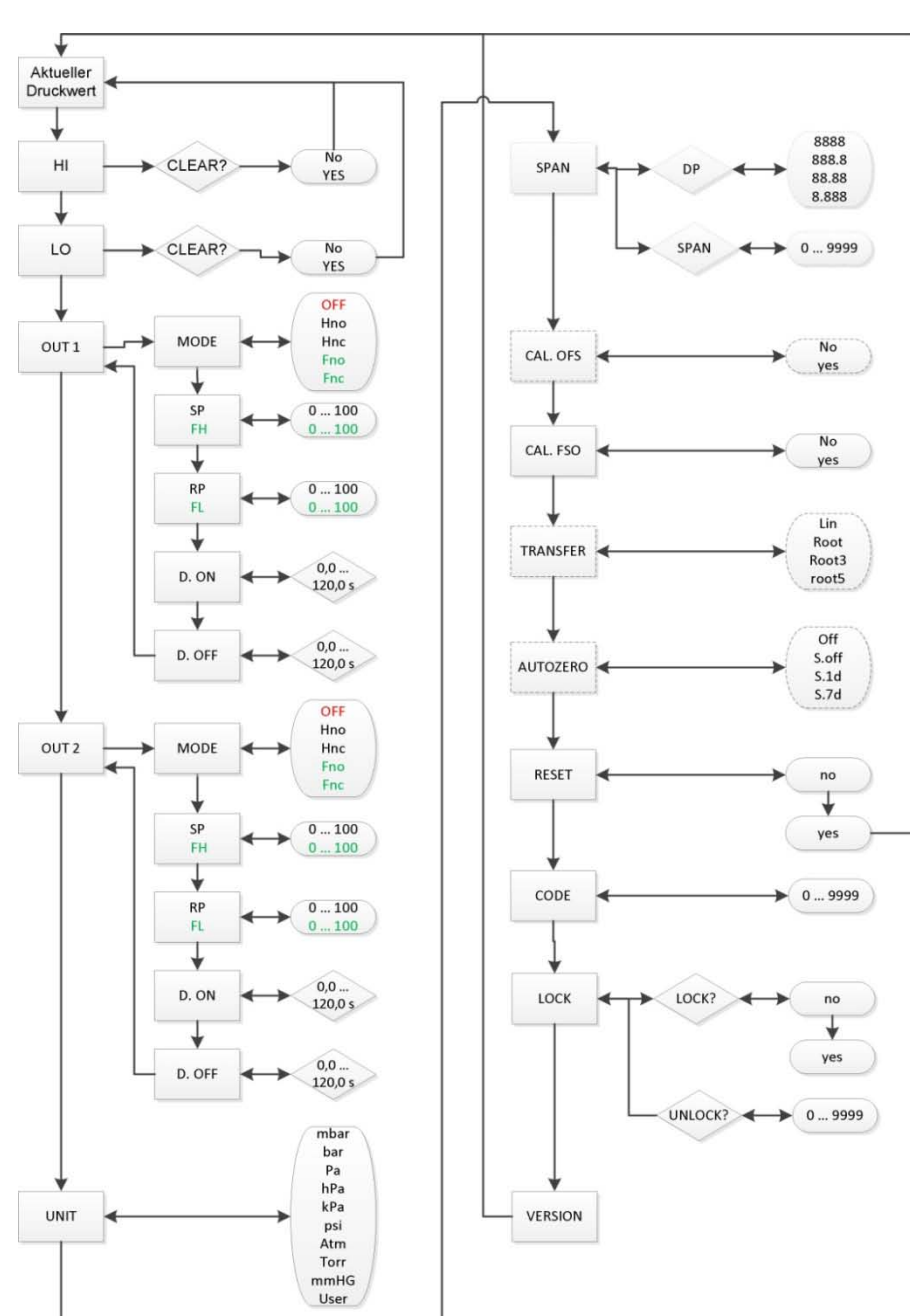
1	2	3	4
Off	Off	Automatic zeroing off	
On	Off	Zeroing active at start	
Off	On	Zeroing active at start, then every 24h	
On	On	Zeroing active at start, then every 7 days	
Nominal pressure range			
Off	Off	1.6	4   10   40   50   1000
Adjustable customer-specifically			
On	Off	1.0	2.5   6   2   60   400
On	On		16   0   600

In case of special pressure ranges, the switches 1 and 2 have no function.

### 6.4 Display Features (Standard)

- 2-line LC display
- Visible area: 32.5 x 22.5 mm
- 5-digit main display, 7 segments
- Numeral height: 8 mm
- Display range: ±9999, 8-digit additional display, 14 segments
- Height: 5mm
- Bar graph, 52 segments

### 6.5 Menu System Structure (from Version 3.01)



### 6.6 Menu List

<b>Activation</b>	Activation of the menu with the right button
<b>Menu HI</b>	<b>Shows the maximum value since last start-up</b> Possible option: Deletion of value (CLEAR no / yes) (deletes the upper and lower max. values) Deleting the value: Press the left button → "CLEAR?" will flash in the lower line; the upper line will show "no"; the right button can be used to toggle between "yes" and "no". Acknowledge the selection by pressing the left button.
<b>Menu LO</b>	<b>Shows the minimum value since last start-up</b> Possible option: Deletion of value (CLEAR no / yes) (deletes the upper and lower min. values) Deleting the value: Press the left button → "CLEAR?" will flash in the lower line; the upper line will show "no"; the right button can be used to toggle between "yes" and "no". Acknowledge the selection by pressing the left button.
<b>Menu OUT 1 / OUT 2</b>	<b>Menu item only active for available contacts</b> → Off Deactive → Hno hysteresis, normally open → Hnc hysteresis, normally closed → Fno window, normally open → Fnc window, normally closed MODE will flash in the lower line; the upper line will show the current setting, e.g. "Hno"; the right button can be used to select the contact. Acknowledge the selection by pressing the left button.
<b>Menu SP FH</b>	<b>Values for switching points in %</b> Setting the switching points: Press the left button → "SP %" will flash in the lower line; the upper line will show the current value; the right button can be used to adjust the value. Acknowledge the selection by pressing the left button.
<b>Menu RP FL</b>	<b>Values for switch-back points in %</b> Setting the switch-back points: Press the left button → "SP %" will flash in the lower line; the upper line will show the current value; the right button can be used to adjust the value. Acknowledge the selection by pressing the left button.
<b>Menu D. ON</b>	<b>Switch-on delay in s</b> Setting the switch-on delay: Press the left button → "D. ON s" will flash in the lower line; the upper line will show the current value; the right button can be used to adjust the value between 0.0 and 120.0. Acknowledge the selection by pressing the left button.
<b>Menu D. OFF</b>	<b>Switch-back delay in s</b> Setting the switch-back delay: Press the left button → "D. OFF s" will flash in the lower line; the upper line will show the current value; the right button can be used to adjust the value between 0.0 and 120.0. Acknowledge the selection by pressing the left button.
<b>Menu UNIT</b>	<b>Setting the pressure unit</b> Adjustable units: [mbar], [bar], [Pa], [hPa], [kPa], [psi], [Atm], [torr], [mmHG], or [user] (if the USER unit has been selected the maximum display value shown can be set under the menu item "Span") Setting the unit: Press the left button → "unit" will flash in the lower line; the upper line will show the unit currently set; the right button can be used to select the unit. Acknowledge the selection by pressing the left button.
<b>Menu SPAN</b>	<b>The range value for the display can be adjusted if the user unit has been selected</b> Setting DP / SPAN: Press the left button → "SPAN" will be shown in the lower line; the upper line will show the value currently set. Press the left button again: "DP" will flash in the lower line; the upper line will show, for instance, 8.888; the right button can be used to change the decimal place, e.g. 88.88. Acknowledge the selection by pressing the left button. Now "SPAN" will flash in the lower line, the upper line will show the value currently set; the left button can be used to select the position, the right button can be used to change the respective numerical value. The selection is acknowledged by pressing the left button.
<b>Menu Cal. OFS</b>	<b>Calibrating the offset to the currently applied value</b> (Order code for standard design: -000) Calibrating the offset: Press the left button → "CAL. OFS?" will flash in the lower line; the upper line will show "no"; the right button can be used to toggle between "yes" and "no". Acknowledge the selection by pressing the left button.
<b>Menu Cal. FSO</b>	<b>Calibrating the end point (display and analog output) to the currently applied pressure</b> Calibrating the end point: Press the left button → "CAL. FSO?" will flash in the lower line; the upper line will show "no"; the right button can be used to toggle between "yes" and "no". Acknowledge the selection by pressing the left button.
<b>Menu TRANSFER</b>	<b>Root-extracted output signal</b> (Order code for special design: -605) → Lin Standard – Linear → root $y = x^{0.5}$ → root3 $y = x^{1.5}$ → root5 $y = x^{2.5}$ } cut off 0 ... 10%
<b>Menu AUTOZERO</b>	<b>Menu item only visible if a zeroing valve is present</b> (Value can only be read! Setting only possible via configuration switches.) (Order code: -600) → Off no automatic zeroing → S. Off upon switching-on the device → S. 1d upon switching-on and after every period of 24 hours → S. 7d upon switching-on and after every period of 7 days
<b>Menu RESET</b>	<b>Resets all menu settings to the factory settings</b> Reset: Press the left button → "RESET" will flash in the lower line; the upper line will show "no"; the right button can be used to toggle between "yes" and "no". Acknowledge the selection by pressing the left button
<b>Menu CODE</b>	<b>Activation of locking code</b> Set all values to a value unequal to 0 and acknowledge <input type="checkbox"/> The menu item LOCK will appear in the display
<b>Menu LOCK</b>	<b>Locking the menu</b> LOCK? The right button can be used to toggle between "yes" and "no". Acknowledge the selection by pressing the left button <input type="checkbox"/> If YES is selected, the menu will be closed immediately; the measured value will be displayed. (The locking code will be deactivated if all values have been set to 0 – If the code is activated the device will automatically lock after 2 minutes or after disconnecting the electrical connection) or UNLOCK? Enter the correct code in order to have the menu displayed again.
<b>Menu VERSION</b>	Displays the current firmware version

### 6.7 Dimensions / Fastening

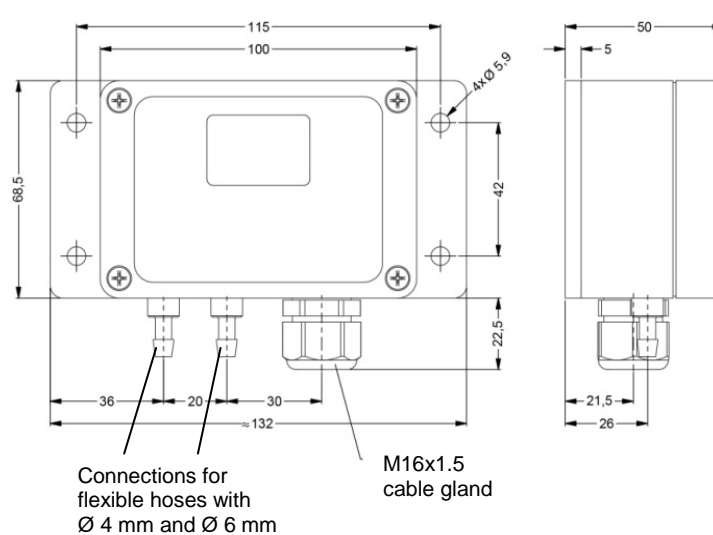


Fig. 3: Dimension drawing of DMU 20 D

### 7 Maintenance / Removal from Service

<b>DANGER</b>	- Airborne parts, leaking fluid, electric shock - Always service the device in a depressurized and de-energized condition!
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In principle, the device requires no maintenance. If necessary, clean the housing of the device using a moist cloth and a non-aggressive cleaning solution.

**NOTE** – After dismantling, mechanical connections must be fitted with protective caps.

#### 8.1 Service/Repair

Information on service / repair:

- www.afriso.com
- info@afriso.com
- Service phone: +49 7135 102-211

### 8.2 Return

<b>WARNING</b>	- due to pollutants - Wear suitable protective clothing, e.g. gloves, safety goggles
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For every return shipment, whether for recalibration, decalcification, alteration or repair, the device must be cleaned thoroughly and packed in a break-proof manner. A return declaration with a detailed fault description must be added to the defective device. If your device has come into contact with pollutants, a declaration of decontamination is additionally required. Appropriate templates can be found on our homepage. Download these by accessing [www.afriso.com](http://www.afriso.com) or request them by e-mail or phone: [info@afriso.com](mailto:info@afriso.com) | Fon: +49 7135 102-211

In case of doubt regarding the fluid used, devices without a declaration of decontamination will only be examined after receipt of an appropriate declaration.

### 9 Disposal

The device must be disposed of according to the European Directive 2012/19/EU (WEEE – Waste electrical and electronic equipment). Waste equipment must not be disposed of in household waste!

**NOTE** – Dispose of the device properly!

### 10 Warranty Terms

The warranty terms are subject to the legal warranty period of 24 months, valid from the date of delivery. If the device is used improperly, modified or damaged, we will rule out any warranty claim. Any damaged diaphragm will not be accepted as a warranty case. Likewise, there shall be no entitlement to any warranty claim if the defects have arisen due to normal wear and tear.

### 11 EU Declaration of Conformity / CE

The delivered device meets the legal requirements. The applied Directives, harmonized standards and documents are listed in the EU Declaration of Conformity valid for the product. It can be found under [www.afriso.com](http://www.afriso.com). In addition, the operational safety of the device is confirmed by the CE sign on the type plate.