HERBORNER PUMPENTECHNIK

MDS 1

Modular diagnostic system

Operating instructions

Also on the Internet!

Herborner Pumpenfabrik J.H. Hoffmann GmbH & Co.

House address:	Phone	Telefax
Littau 3-5	++49	++49
D-35745 HERBORN	(27 72)	(27 72)
	9 33 - 0	9 33 - 100

Internet
http://www.herborner-pumpen.de

e-mail
info@herborner-pumpen.de

1. Introduction

The MDS 1 modular diagnostic system consists of a temperature sensor and a housing, which contains electronic equipment for the processing and reproduction of measured data. The software required for operation is stored in the electronic equipment.

2. Suitability

The unit is suitable for 400V +- 10% AC, 50Hz. Furthermore, operation of the MDS 1 modular diagnostic system also means feeding the distribution voltage.

The unit's components and the software are designed for use with clean pure water. The temperature of the water should not be above 40°C.

3. Function of the MDS 1

The MDS 1 monitoring system represents a dry run protection for the sliding ring seal at fixed temperature of the medium. The hardware is used to record, process and save operating data for the sliding ring seal used. The temperature of the stationary ring of the sliding ring seal is determined in connection with the software The cumulative running times in different operating modes can be shown using a display. Buttons are used to navigate the menu structure. LEDs are used as visual warning elements. It is a requirement of the MDS 1 that the temperature of the medium fluctuates within an interval of +- 5K of a set temperature.

The aim of the MDS 1 is to allow protection of the seal and, therefore, increased security of the entire installation, by reliable identification of dry running. This takes place by the continuous recording of the following measured variables:

- Running time
- Temperature of the stationary ring of the sliding ring seal.

The temperature at the stationary ring of the sliding ring seal is recorded using a sensor very close to the sliding surface. The position of the sensor is shown in Figure 1, using the example of the UNIBAD bath water circulation pump.

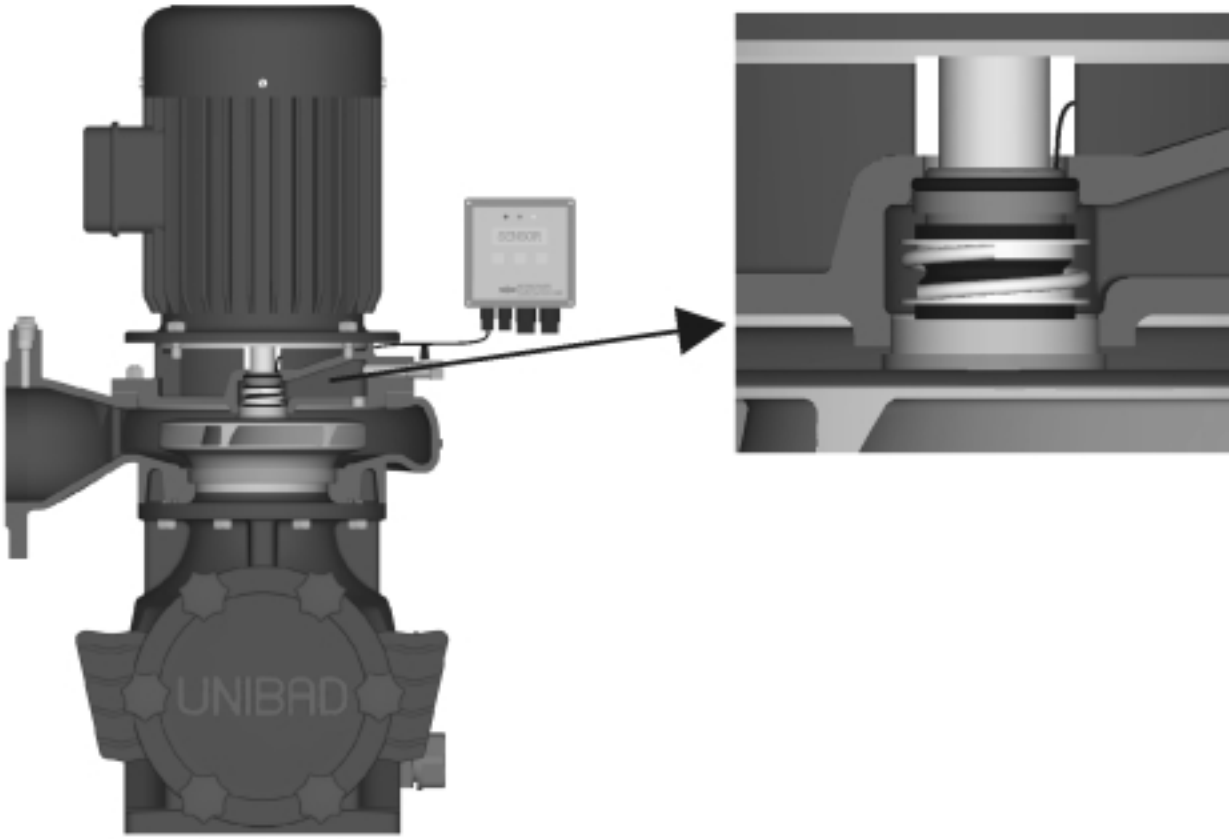
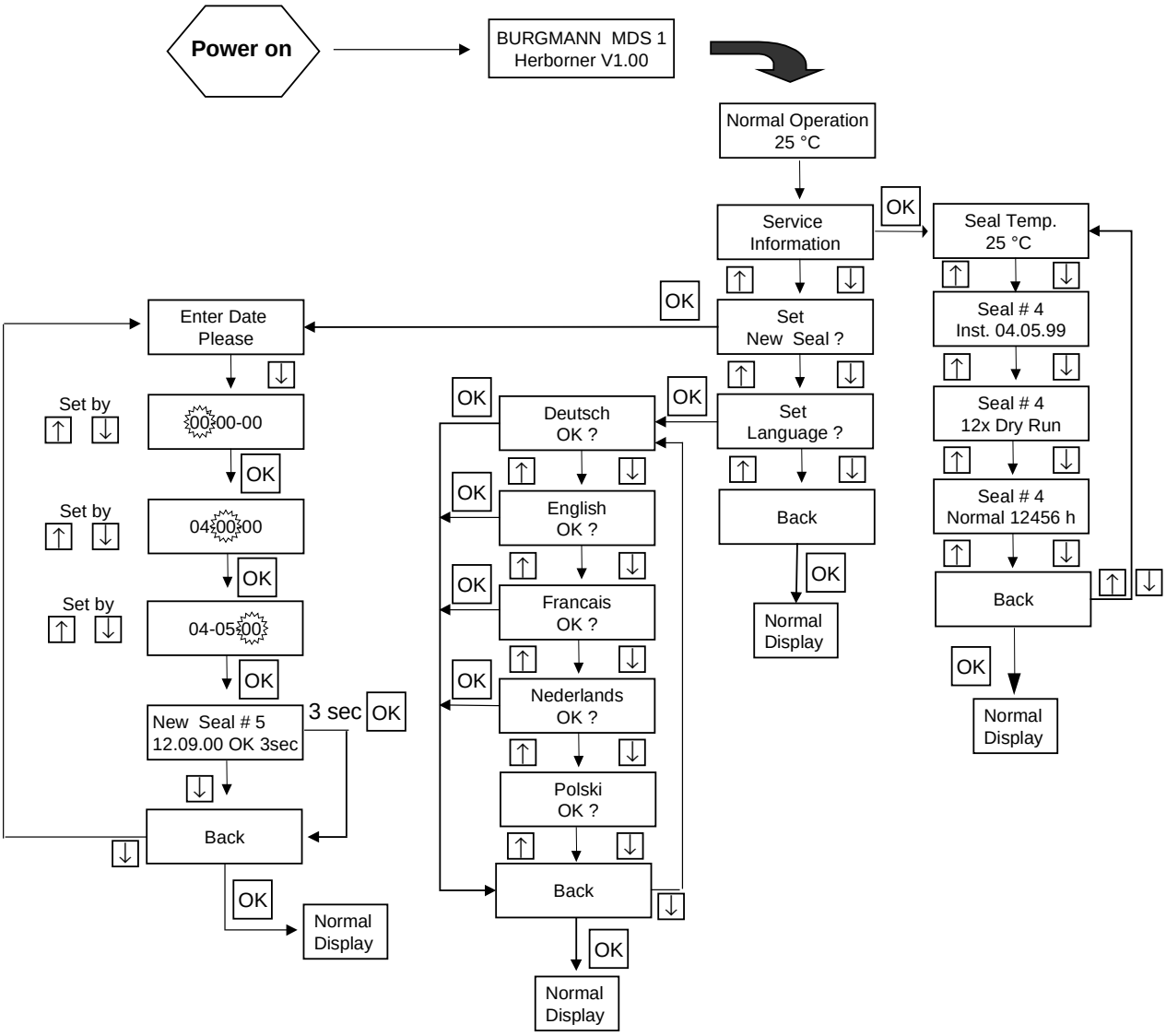


Figure 1 Position of the sensor

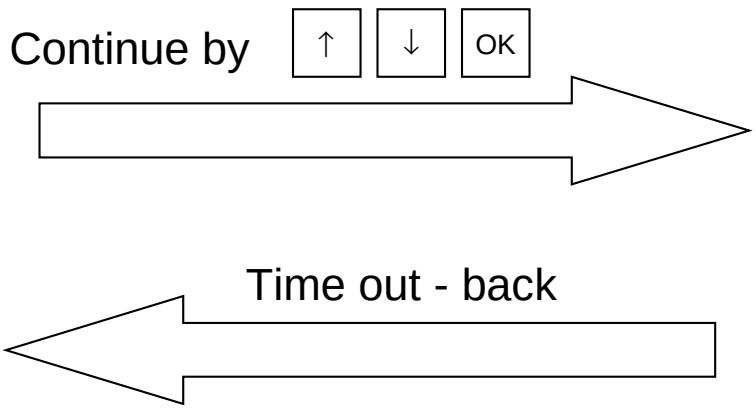
4. Temperature range for the electronic components

All electronic components are designed in such a way that perfect functioning is guaranteed at an ambient temperature of 40°C, measured at a distance of 1m from the pump.

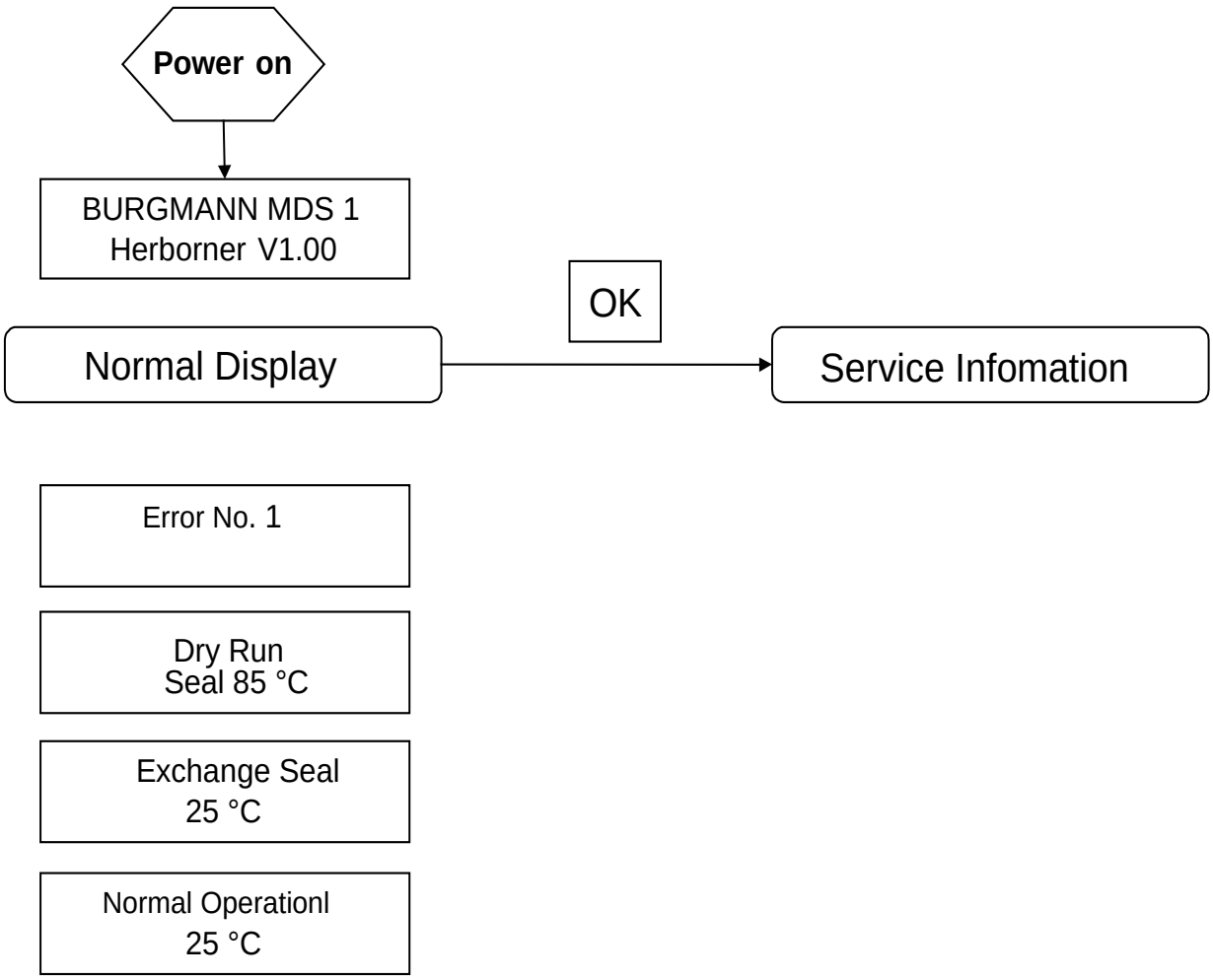
5. MDS 1 software



5.1 Complete user interface

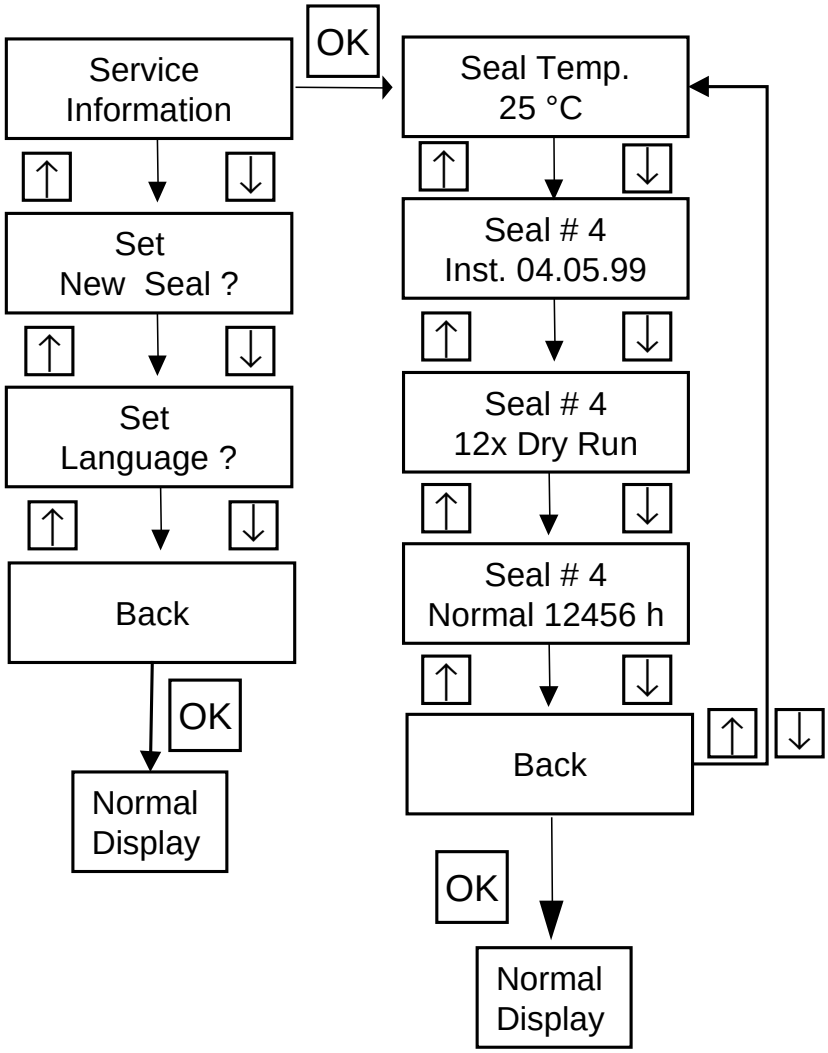


5.2 Normal display



5.3 Service functions

5.3.1 Information



From the normal display, you get to the menu item ”Service Information” by pressing [🡻]. Pressing [OK] will display the current seal temperature. By repeatedly pressing [🡻] or [🡹] you can navigate through the following menu items:

- Installation date of the seal currently being used
- Number of dry runs of the seal currently being used
- Service life in normal operation of the seal currently being used
- ”Exit Service Information?” query
- [OK] takes you back to the normal display

5.3.2 Settings

From the normal display, you reach the menu item ”Set new seal” by pressing [🡻] twice. After confirming by pressing [OK] you come to the setting of the installation date. By confirming with [🡻], the date can now be entered directly. The date is entered in the form DD-MM-YY, and the desired figure is set using [🡻] and [🡹]. By pressing [OK] you move from the day to the month and to the year. When the correct date appears on the display, confirm by holding down [OK] for 3 seconds. **Once this is done, the date for the current seal cannot be changed!**

The seal can be changed 20 times. When the unit is commissioned, 00-00-00 appears as the date on the display. The internal meter for the current seal will not increase unless the original display is 00-00-00 (it is factory-set to increase by 1). For all subsequent changes of seal, the date before the re-setting will not be 00-00-00, meaning that, in these cases, the internal meter for the current seal will be increased by 1.

This prevents the installation date of the current seal (with the exception of the first seal) being changed during operation.

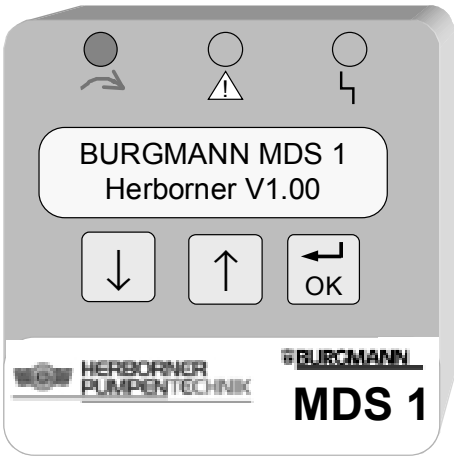
From the normal display, you get to the menu item ”Set language” by pressing [🡻] three times. After confirming with [OK] you reach the following language settings, which can be controlled using [🡻] or [🡹] and selected using [OK].

- Deutsch
- English
- Francais
- Nederlands
- Polski

After selecting the language, you reach the query as to whether or not you wish to exit the ”Languages” settings. By confirming with [OK] you return to the normal display.

6. Organisation of the display

6.1 Power on message



This message appears for 5 seconds.

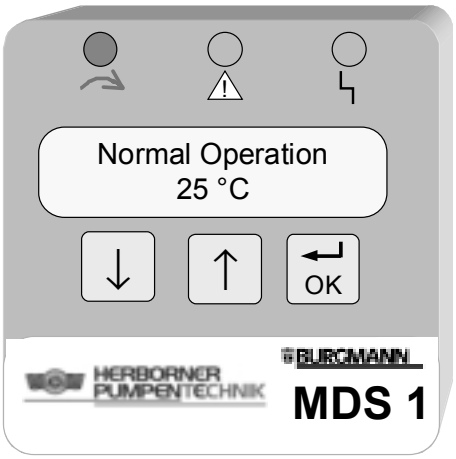
6.2 Operation

The operating statuses described below are displayed with the following priority:

1. Error no.
2. Dry run
3. Change seal
4. Normal operation

The display of the temperature of the seal is in the range 0 °C to 200 °C.

6.2.1 Normal operation

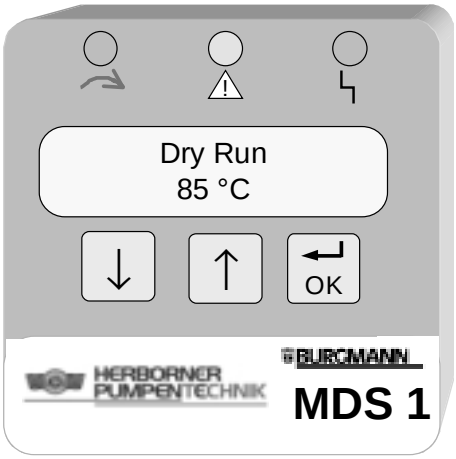


The temperature of the stationary clamping ring is displayed.

If the conditions for normal operation are present, the display on the right appears and the green LED is illuminated. Normal operation means that the conditions for normal operation are present for a continuous period of 2 seconds. The ”Appliance fault” relay is not displayed. ”Appliance fault” appears as soon as one of the following higher-priority operating statuses is present.

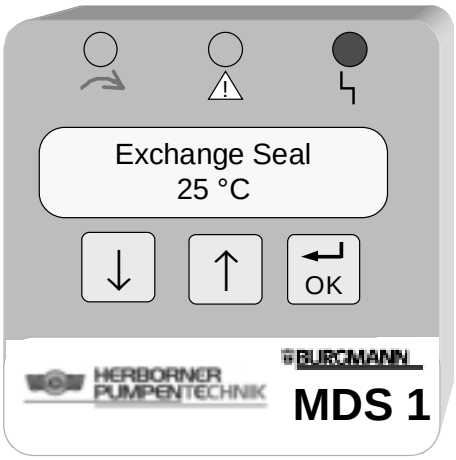
6.2.2 Dry run

The temperature of the seal is significantly higher (> 70°C) than the set temperature for the medium. For a dry run, the display on the right appears and the yellow LED starts to flash. If dry run is present for a continuous 10-second period, the relay ”Appliance fault” responds. This relay can be used to turn off the pump.



6.2.3 End of life cycle

After 20 dry runs, the display on the right appears, and the red LED is illuminated. Even after more than 20 dry runs, the system can continue to operate, as the protection function is maintained with the assistance of the relay. However, it is recommended that the seal be exchanged after a maximum of 20 dry runs.



6.3 LED and relay status

Temp. Clamping ring [°C]	Number of dry runs [n]	Display	LED Green	LED Yellow, flashing	LED Red	Relay Appliance fault
< 70	< 20	Normal operation 25 °C	1	0	0	0
> 70	< 20	Dry run Seal 85 °C	0	1	0	1
< 70	≥ 20	Exchange seal 25 °C	0	0	1	0

For the yellow LED, ”1” means flashing.

The appliance fault can be used to automatically turn off the pump. By saving the running time directly before the relay changes (and, therefore, before the pump may be turned off), the correct running time can be recalled when the pump is brought back into operation.

7. Technical data

Input voltage:	400 V_{AC} ± 10 %
Secondary voltage:	min. 18 V_{AC} @ TA = 50 °C, I_{sek} = 144 mA, U_{Prim} = 360 V_{AC}
Power drain, secondary:	max. 2,6 VA
Distribution voltage +5 V:	5 V_{DC} ± 2,5%
Turn-on voltage, relay output:	max. 250 V
Switching current, relay output:	max. 100 mA
Seal temperature sensor:	NTC

8. EMC conformity

The electronics are designed in such a way that, after installation in the housing, all the relevant prescriptions for CE certification (EMC, low potential voltage) are met. The EMC surge test was carried out up to 3.5 kV and the EMC burst test up to 4kV.

The following maximum deviations from the displayed value are allowed, under the influence of high frequency:

T_{GLRD}	**± 5 %**

The following standards are applied:

8.1 EMC (resistance to jamming)

Input and Output AC power ports

EN 61000-4-4

EN 61000-4-11 EN 60141 Part 1-1

EN 61000-4-5 (für # 3 und # 4)

VDE 0160 5.3.1.1.3 EN 60146-1-1

EN 61000-4-6

Immunity housing

EN 61000-4-3

ENV 50204

EN 61000-4-2 (für # 3 und # 4)

EN 61000-4-8

8.2 EMC (interference emission)

EN 55022, class B: 150 kHz – 30 MHz und 30 MHz – 1000 MHz

IEC 1000-2-6

EN 55011

EN 60178 is applied as a guideline for low potential voltage and the prescriptions for potential-free separation according to VDE0700 are to be followed.

9. Error messages, causes and remedial measures

Display	Possible cause	Remedy
Error no. 1	Temperature sensor wires are touching, causing a short circuit	Check wiring and connections, remove short circuit
	Temperature sensor is defective	Contact Herborner Pumpen
Error no. 2	One or both of the temperature sensor wires is disconnected	Check the wiring, if a wire is defective, contact Herborner Pumpen
	One or both of the temperature sensor stranded wires does not have a contact with the connection terminals	Check connections and tighten terminal screws
	Temperature sensor is defective	Contact Herborner Pumpen