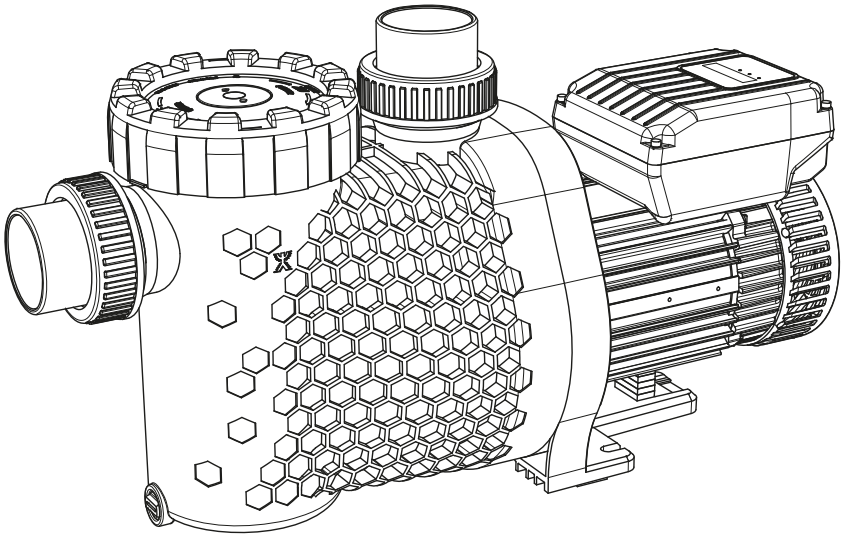
maytronics

EN Pump data sheet

ecoclear® 1400-VS 2.0 hp

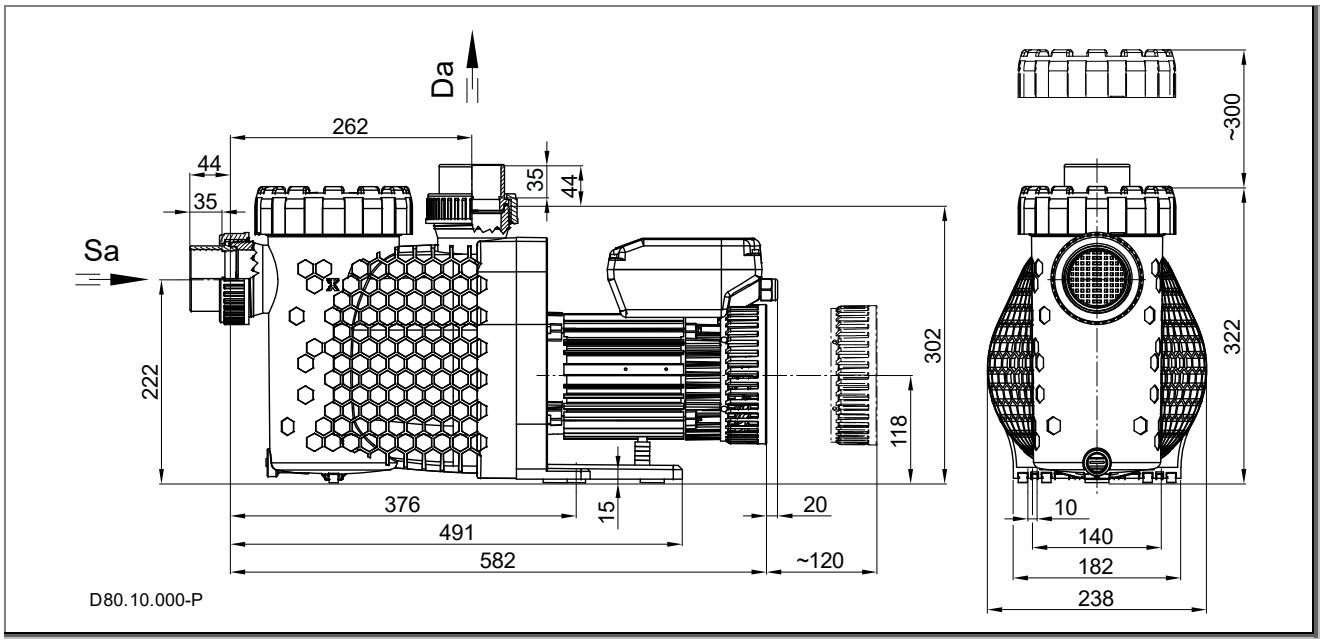


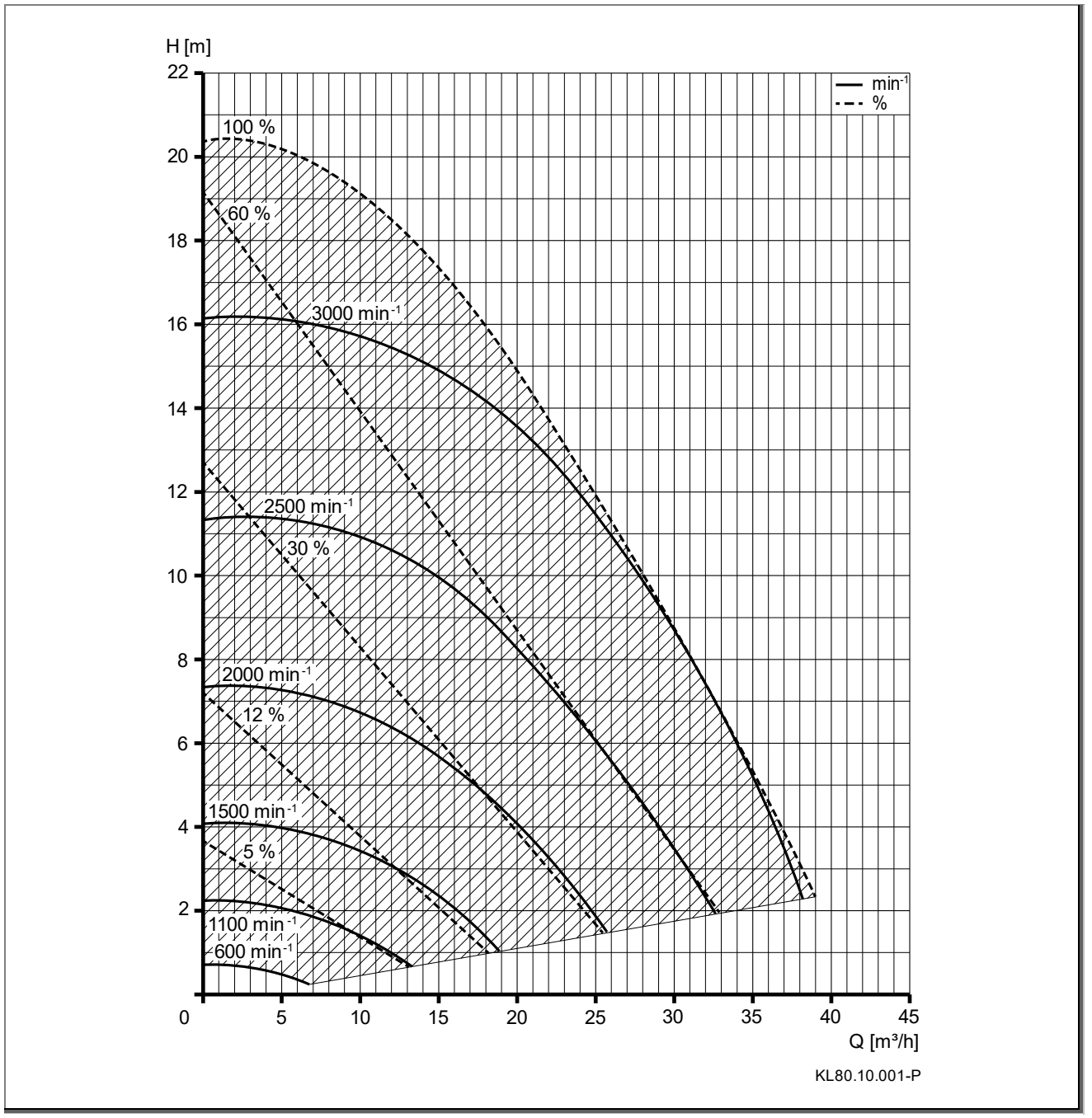
09|2024

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Oxley QLD 4075

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info@maytronics.com

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Da
Sa
262
44
35
35
44
222
302
118
376
491
582
15
20
~120
~300
322
10
140
182
238
D80.10.000-P


H [m]
Q [m³/h]
min-1
%
100 %
60 %
30 %
12 %
5 %
3000 min-1
2500 min-1
2000 min-1
1500 min-1
1100 min-1
600 min-1
0
2
4
6
8
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KL80.10.001-P

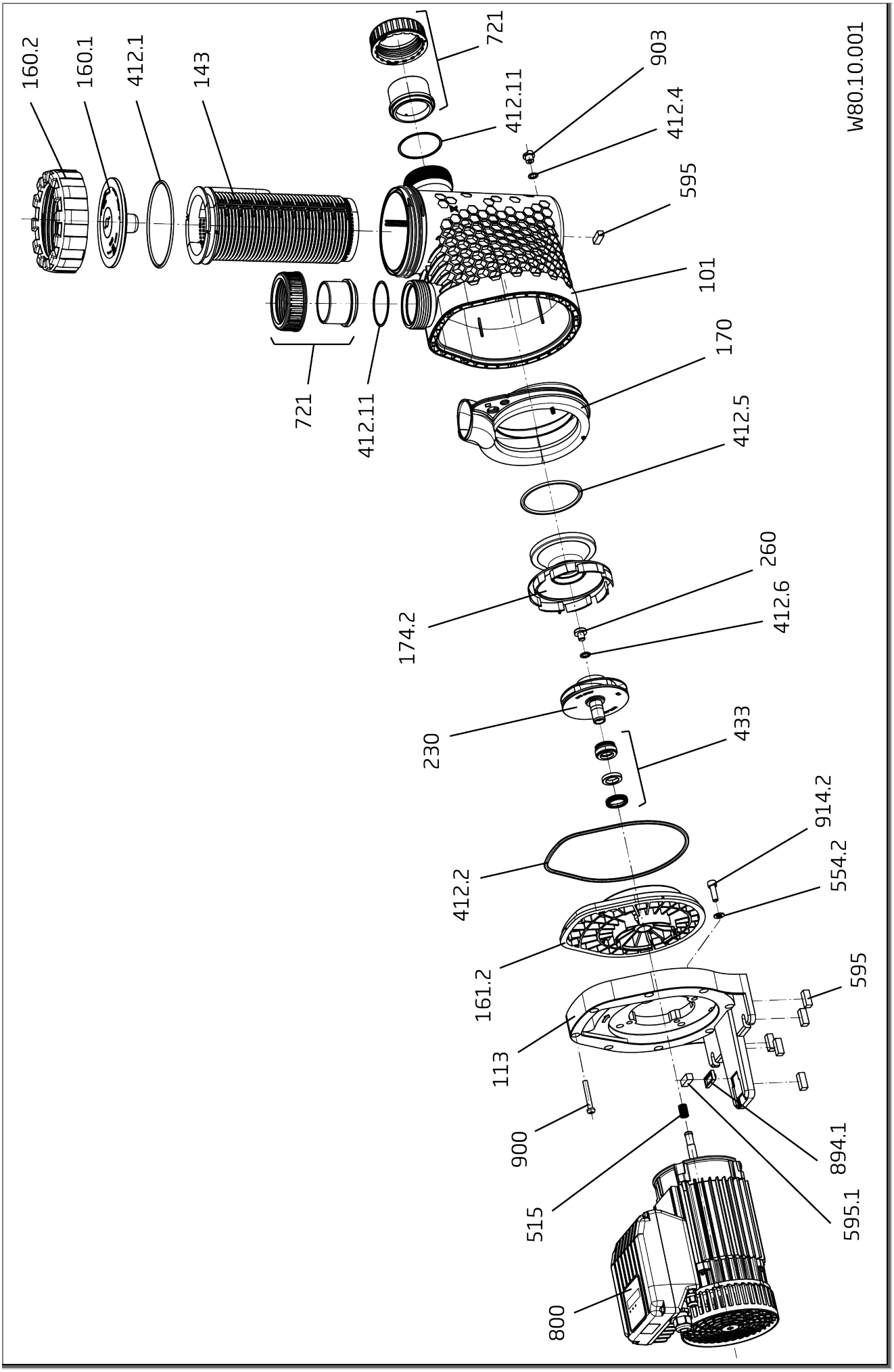
TD 50/60 Hz	Sa [mm]	Da [mm]	d-Saug [inch]	d-Druck [inch]	max. L [mm]
ecoclear 1400-VS	60,3	60,3	2	2	602

1~ 230-240 V

TD 50/60 Hz	n [min^{-1}]	P_1 [kW]	P_2 [kW]	I [A]	Lpa (1m) [dB(A)]	Lwa [dB(A)]	m [kg]	WSK/PTC
ecoclear 1400-VS	600	0,03	0,01	0,50	35,9	44	11,0	●/○
ecoclear 1400-VS	2850	1,99	1,10	6,10	65,3	73	11,0	●/○
ecoclear 1400-VS	3400*	1,99	1,10	6,10	65,3	73	11,0	●/○

TD 50/60 Hz	n [min^{-1}]	$H_{max.}$ [m]	SP	Hs [m]	Hz [m]	IP	W-Kl	T [°C]	P-GHl [bar max.]
ecoclear 1400-VS	600	0,7	○	3	3	55	F	40(60)	2,5
ecoclear 1400-VS	2850	16,1	●	3	3	55	F	40(60)	2,5
ecoclear 1400-VS	3400*	21,0	●	3	3	55	F	40(60)	2,5

* In "constant power" mode


W80.10.001
160.2
160.1
412.1
143
721
412.11
903
412.4
595
101
170
412.5
260
412.6
174.2
230
433
914.2
554.2
412.2
161.2
113
595
900
894.1
515
595.1
800

Teil Part	St. Qty	Benennung	Description	MTAU Code
101	1	Gehäuse kpl., schwarz, bestehend aus: Teil 101, 143, 160.1, 160.2, 412.1, 412.4, 903	Housing black, cpl., consisting of: Part 101, 143, 160.1, 160.2, 412.1, 412.4, 903	20-400-0001
113	1	Zwischenflansch, Bio-Kunststoff, schwarz	Intermediate housing, bio plastic, black	20-400-0002
143	1	Saugsieb, Bio-Kunststoff	Strainer basket, bio plastic	20-400-0003
160.1	1	Klarsichteinsatz, transparent, LED	Transparent lid with LED	20-400-0004
160.2	1	Gewindering, Bio-Kunststoff, schwarz	Ring for lid, bio plastic, black	20-400-0005
161.2	1	Dichtungsgehäuse, Bio-Kunststoff	Gland housing, bio plastic	20-400-0006
170	1	Spiraleinsatz, Bio-Kunststoff	Spiral insert, bio plastic	20-400-0007
174.2	1	Leitschaufeleinsatz, Bio-Kunststoff	Diffuser, bio plastic	20-400-0008
230	1	Laufrad, d = 110 mm, b = 10,5 mm	Impeller, dia = 110mm, b = 10.5 mm	20-400-0009
260	1	Laufradkappe, M 10 x 12	Impeller hub cap, M 10 x 12	20-400-0010
412.1	1	O-Ring f. Deckel, 137 x 5 mm, NBR	O-ring for lid, 137 x 5 mm, NBR	20-400-0011
412.2	1	O-Ring für Dichtungsgehäuse, 208,92 x 5,33 mm	O-ring for gland housing, 208.92 x 5.33	20-400-0012
412.4	1	O-Ring für Verschlussschraube, 11 x 2,5 mm	O-ring for drain plug, 11 x 2.5 mm	20-400-0013
412.5	1	O-Ring für Leitschaufeleinsatz, 90 x 5 mm	O-ring for diffuser, 90 x 5 mm	20-400-0014
412.6	1	O-Ring für Laufradmutter, 11 x 2,5 mm, Viton	O-ring for impeller nut, 11 x 2.5 mm, Viton	20-400-0015
412.11	2	O-Ring für Rohranschlüsse, 68 x 3,5 mm	O-ring for pipe connections, 68 x 3.5 mm	20-400-0016
433	1	Gleitringdichtung kpl., 20 mm, "C"	Mechanical seal cpl., 20 mm, "C"	20-400-0017
515	1	Toleranzring, 12 x 18 mm	Star-ring, 12 x 18 mm	20-400-0018
554.2	4	Unterlegscheibe, d = 8,4 mm, A 2	Washer, dia = 8.4 mm, A 2	20-400-0019
595	1	Gummipuffer, 10 x 12,5 x 27 mm	Rubber buffer, 10 x 12,5 x 27 mm	20-400-0020
595.1	6	Gummipuffer, 10 x 10 x 27 mm	Rubber buffer, 10 x 10 x 27 mm	20-400-0021
721	2	Übergangsverschraubung, saug- und druckseitig	Union, inlet and outlet side	
		Überwurfmutter f. Bundbuchse d = 63+75 mm, schwarz, 2 inch	Union nut for glue socket dia = 63 + 75 mm, black, 2 inch	
		Bundbuchse d-innen = 60,3 mm, ABS, schwarz, AU, 2 inch	Glue socket dia-inner = 60.3 mm, ABS, black, for AU, 2 inch	
800	1	Wechselstrom-Motor 1,10 kW, 230 V, Eco VS, AU, inklusive Motorelektronik mit FU	Single-phase motor 1.10 kW, 230 V, Eco VS, AU, including motor electronic with frequency converter	20-400-0022
894.1	5	Adapter für Motorfuß	Adapter for motor foot	20-400-0023
900	8	Schneidschraube, 7 x 48,4 mm, A 2	Screw, 7 x 48.4 mm, A 2	20-400-0024
903	1	Verschlussschraube, G 1/4, PP, schwarz	Drain plug, G 1/4, PP, black	20-400-0025
914.2	4	Innensechskantschraube, M 8 x 25, A 2	Hexagon socket screw, M 8 x 25, A 2	20-400-0026
412.11 + 721	1	Anschluss-Set, d-innen = 60,3 mm, ABS, für Australien, bestehend aus: 2x O-Ring, 2 x Bundbuchse d-innen = 60,3 mm und 2x Überwurfmutter für Bundbuchse d = 63 mm	Connection set cpl. , dia-inner = 60.3 mm, ABS, for Australia, consisting of: 2 x O-ring, 2 x glue socket dia-inner = 60.3 mm and 2 x union nut for glue socket d = 63mm	20-400-0027
	1	Öffnungshilfe f. beleuchteten Deckel	Opening device for LED lid	20-400-0028
	1	Reparatursatz O-Ringe	Repair set of O-rings	20-400-0029

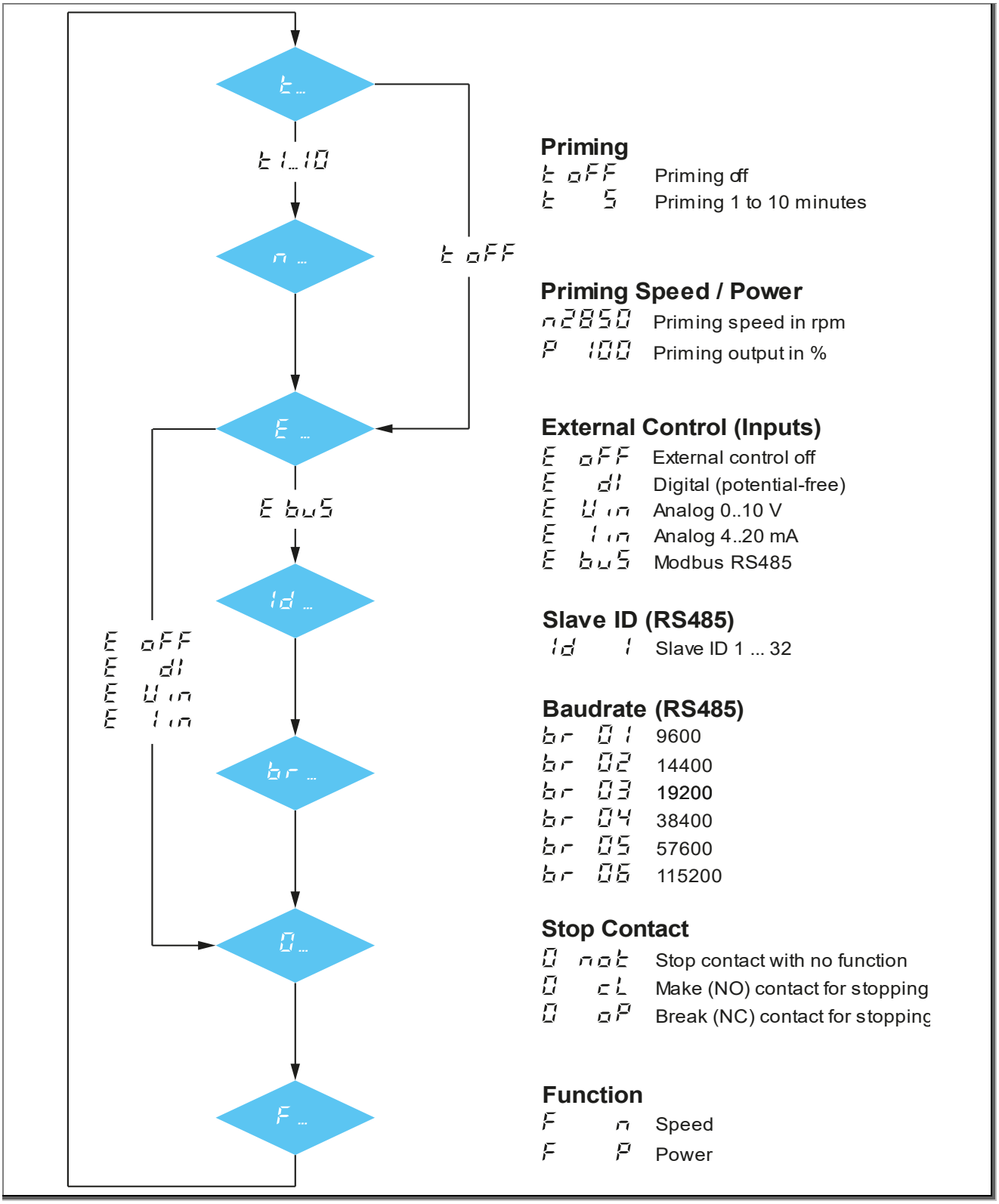
NOTICE

Related Documentation

The additional information compiled in this data sheet must be kept together with the original operation manual for "Non-self-priming and self-priming pumps with/without plastic lanterns" and must be accessible to the relevant personnel at all times.

Glossary	
TD	Technical data
Sa	Inlet connection
Da	Outlet connection
d-Saug	Recommended diameter of the suction line up to 5 m
d-Druck	Recommended diameter of the pressure line up to 5 m
max. L	Maximum length of the pump
D	Density
P_1	Power input
P_2	Power output
I	Rated current
Lpa $_{(1\ m)}$	Sound pressure level at 1 m measured in accordance with DIN 45635
Lwa	Acoustic capacity
m	Weight
WSK	Built-in or external overload switch
PTC	PTC resistor
$H_{max.}$	Total dynamic head
SP	Self-priming
Hs; Hz	Geodetic head between water level and pump
Hs	Total suction head
Hz	Total dynamic head with flooded suction
IP	Type of motor enclosure
W-Kl	Class of insulation
n	Motor speed
P-GHI	2.5 bar max. casing pressure/system pressure
T	Water temperature
●	Yes
○	No
T/°C	Clarification of the max. water temperature 40 °C: the max. water temperature allowed according to the GS approval.
1~/3~	Suitable for continuous operation at 1~ 220 - 240 V ± 5% 3~ Y/Δ 380 - 420 V/220 - 240 V ± 5% 3~ Y/Δ 660 - 725 V/380 - 420 V ± 5% For standard voltage in accordance with DIN IEC 60038; DIN EN 60034

Menu structure



Priming

t oFF	Priming off
t 5	Priming 1 to 10 minutes

Priming Speed / Power

n2850	Priming speed in rpm
P 100	Priming output in %

External Control (Inputs)

E oFF	External control off
E dI	Digital (potential-free)
E U in	Analog 0..10 V
E I in	Analog 4..20 mA
E bus	Modbus RS485

Slave ID (RS485)

Id 1	Slave ID 1 ... 32

Baudrate (RS485)

br 01	9600
br 02	14400
br 03	19200
br 04	38400
br 05	57600
br 06	115200

Stop Contact

0 not	Stop contact with no function
0 cL	Make (NO) contact for stopping
0 oP	Break (NC) contact for stopping

Function

F n	Speed
F P	Power

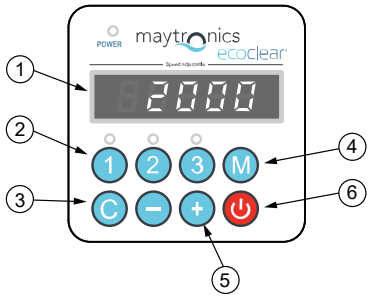
Refer to the chapters "Operation"and "Configuration of parameters"for a description of the screen graphics.

Default setting

Function	Constant speed *	Constant performance
Preset:	1 = 2000 min^{-1} 2 = 2400 min^{-1} 3 = 2850 min^{-1}	1 = 60 % 2 = 80 % 3 = 100 %
Priming speed/Priming performance: Priming time:	= 2850 min^{-1} = 5 minutes	= 100 % = 5 minutes
Speed/performance which can be set:	600..3000 min^{-1} *(in 10 min^{-1} steps)*	5..100 % *(in 1 % steps)*
Priming time which can be set:	oFF, 1..10 Min. *(in 1 min. steps)*	oFF, 1..10 Min. *(in 1 min. steps)*
External controlling: Switching behaviour Input "0": Baud rate “br”:	oFF not 03	oFF not 03

* Constant speed is the default setting.

User interface



User interface:

(1) LED display: displays the current speed/performance of the motor.

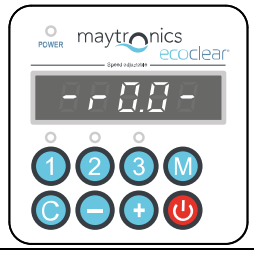
(2) 1 2 3: selection of the preset speeds/performance level.

(3) C: to display the current consumption and select the menu points in the setup.

(4) M: to set the parameters.

(5) − +: to change the speed/performance/parameters

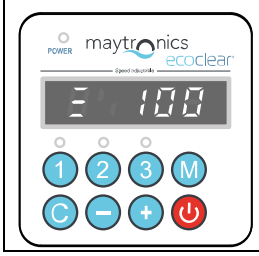
(6) ⏻: to stop the motor.



The software version -r0.0- is displayed briefly when the supply voltage is switched on.

Operation





Operation:

The preconfigured presets can be selected with the 1 2 or 3 buttons.

If the pump activates from a complete standstill, it starts up in priming mode (if this is activated) and subsequently runs at the selected preset.

As long as the pump is in the priming phase a bar moves in the first position on the display from the lower, through the middle to the upper position.

Presets are activated directly without priming.

The motor is stopped by pressing the ⏻ button. The "Power" LED flashes and the display shows oFF.

If analog control or an RS485 is configured in the parameters, reactivation can be achieved with button 1 of the external input to start the motor.



Settings of presets:

The desired preset is selected using the 1 2 and 3 buttons, following which the value is changed with the − + buttons. The configured value is saved directly and the desired preset started in the case of renewed selection.

Notice: The preset cannot be changed during the priming phase (priming).



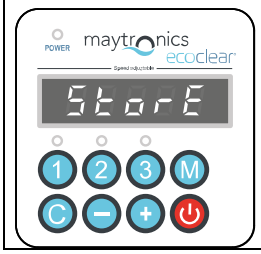
The pump current power requirements are shown in watt (P 700) in the display when the C button is pressed.
When pressed again, the speed or performance in % is displayed.

The control unit's display switches off after three minutes without action.

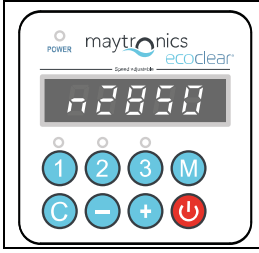
After a voltage drop the pump automatically starts up again with the speed/performance last set, or remains stopped if it had been stopped beforehand.

Configuration of parameters

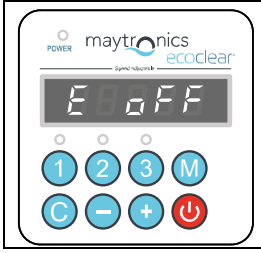




Setting the parameters:
You can change to the setup menu by pressing the M button for 3 seconds. There the C button can be used to scroll through the menu.
The left-hand positions on the display illustrate the current menu item, while the right-hand positions indicate the associated setting.
If the M button is pressed within the menu, all the changed values are stored and the setup menu exited. The text StorE is shown in the display.
If you press the ⏻ button, the setup menu is exited without the changed values being stored.



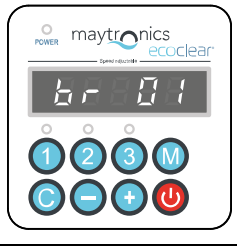
Priming parameters (Priming):
The time during the suctioning phase is set with menu item t.
t oFF = no priming phase
Parameters: oFF, 1 - 10 minutes
The speed or power are defined with menu item n or P (during power control).



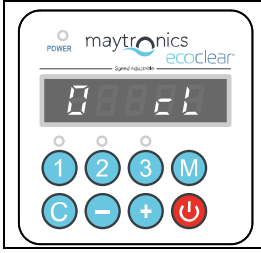
Digital Inputs:
External controlling can be activated or deactivated with the menu item E.
oFF = deactivated (only the control panel is activated)
di = digital inputs (potential-free) activated
U in = Analog input 0..10 V
I in = Analog input 4..20 mA
bus = RS485 Modbus-RTU



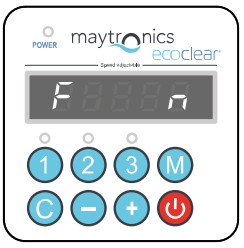
Slave ID:
The Modbus RTU slave ID can be configured in menu item Id.
Configurable from 1 - 32



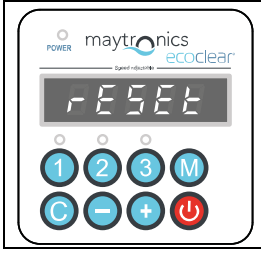
Baud rate:
The baud rate for communication with Modbus RTU can be configured in menu item br
br 01 = 9600
br 02 = 14400
br 03 = 19200 (default setting)
br 04 = 38400
br 05 = 57600
br 06 = 115200



Switching behaviour "0" (stop):
The switching behaviour of the digital input 0 (stop) can be changed by using the menu item 0. The external stop functions for all control options.
noc = the external stop contact is deactivated. Breaking the GND contact is adequate for stopping in “Digital” control mode.
cL = (closer/NO) the motor is stopped at a closed stop contact.
oP = (opener/NC) the motor is stopped at an open stop contact.



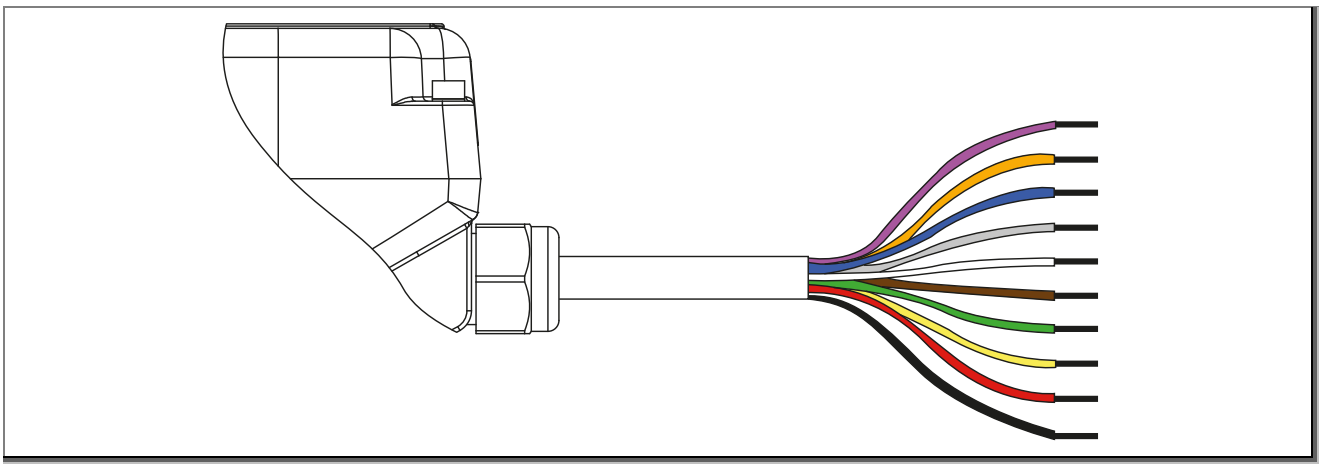
Function:
In the menu item F you can change between constant speed and constant performance.
n: constant speed = setting the speed in rpm
P: constant performance = setting the performance in %



Resetting:
The motor is reset to the factory setting when the C button is pressed for at least 10 seconds. The motor stops and rESEt is displayed.

The pump should be activated and deactivated using the keypad or via the control cable (inputs) provided for this purpose. The mains voltage should not be interrupted to achieve this. This can be realised via a BADU Blue, BADU OmniTronic, BADU NetLink or a coupling relay. Switching using mains voltage places a burden on the electronics and may lead to premature failure of the pump.

Connection of external control systems
A 10-wire cable with open ends (wires) is provided for external control of the pump. Please refer to the following image for the assignment of individual wires to the functions.



Violet	4..20 mA	Brown	Digital In 1 (DI1)
Orange	0..10 V	Green	Digital In 2 (DI2)
Blue	AGND	Yellow	Digital In 3 (DI3)
Grey	RS485-A	Red	Digital In STOP
White	RS485-B	Black	GND

Connection options

Brown/Green/Yellow/Red/ Black	The three preconfigured speeds/outputs (presets) 1-2-3 can be be activated by button via the inputs (impulse signal). The additional STOP input is required for stopping. The external switch contacts should be of a potential-free design.
Brown/Green/Yellow/Black	The three preconfigured speeds/powers (presets) 1-2-3 can be be activated by switch via the inputs (continuous signal). The external switch contacts should be of a potential-free design.
Red/Black	The STOP input can be used separately (e.g. for connection of an off switch). The external switch contact should be of a potential-free design.
Violet/Blue	The target speed/power is configured using a current of 4..20 mA.
Orange/Blue	The target speed/power is configured using a voltage of 0..10 V.
Grey/White/Black	To control the pump via RS485 with Modbus RTU protocol

Wiring examples can be found in "Wiring examples for different presets".

If several inputs are simultaneously connected, they are realised in the following sequence:

1. STOP input
2. Preset 3
3. Preset 2
4. Preset 1



Inputs for external control need to be activated and configured in the Settings menu. Details can be found in the following subsections.

NOTICE

It is possible to connect an external control cable. Open the four screws on the terminal box lid for this purpose and remove the lid carefully. Feed the black control cable through the cable gland and attach the white plug in the lid to the lateral slot. Close the terminal box lid again and tighten the four screws firmly.

NOTICE

If the “Priming” function is activated, the pump always starts from a complete standstill with the configured priming speed/power (Priming). It only switches to the desired fixed speed/power (Priming) after the priming time expires.
The values are started directly during active operation.
The cable ends should be insulated if the external control system is not required.

NOTICE

For easy interaction with peripheral devices such as electric heat exchangers or dosing systems, installing a flow monitor with the appropriate evaluation unit is recommended. This can also output a fault message.

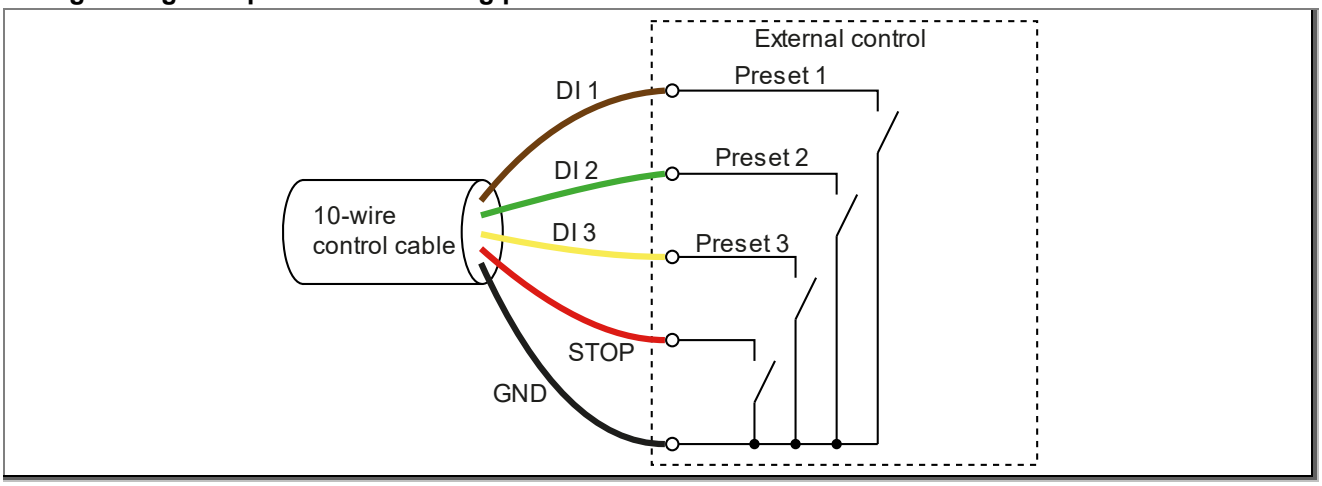
NOTICE

The following items must be observed to avoid motor malfunctions:

- The control cable must be laid in a technically correct manner. Installation parallel to your own power cable or other consumers must be avoided.
- Interference voltage may reach the inputs if the control cables need to be extended. This should be avoided by, for example, shielding. Shielding should only be connected with PE on the motor side.
- The power cables of different operating equipment should not be operated on the same supply line.

Wiring examples for different presets

Wiring via digital inputs with switching pulses



Configuration of pump (See "Operation" on page 21)

External control (inputs)	E di	Digital In (potential-free)
Stop contact	0 cL	Make contact (NO) for stopping

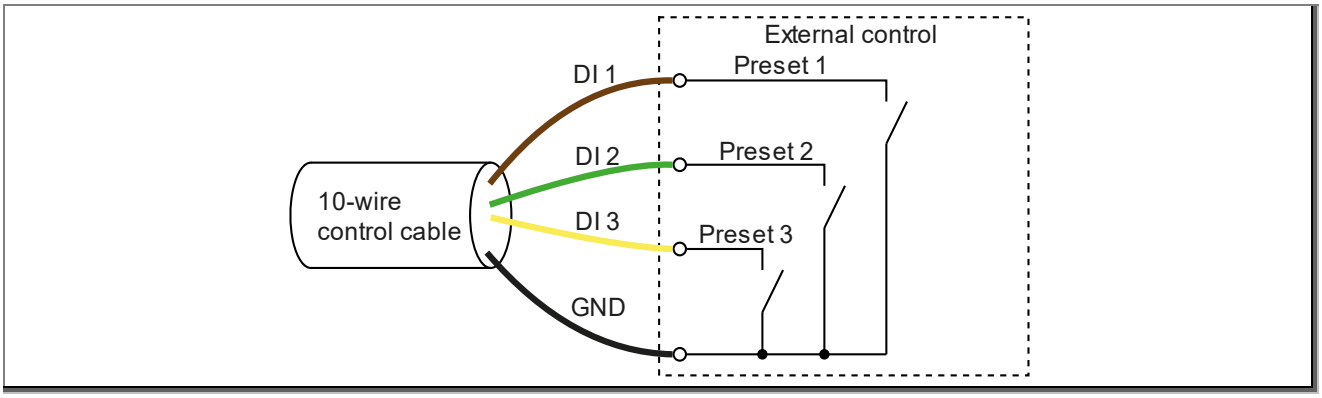
Fixed speeds/values are activated via short switching pulses. Control is also possible using buttons, with only the switching edges being evaluated in this case.

A switching pulse is required on “Digital In 4” (STOP) to stop the pump.

➔ Observe diagram for priority.

Wiring via digital inputs with switches

No stop contact is required in this configuration. Fixed speeds are active as long as the respective contact is closed.



Configuration of pump (See "Operation" on page 21)

External control (inputs)	E di	Digital In (potential-free)
Stop contact	0 not	No stop contact

Setpoint setting via analog inputs

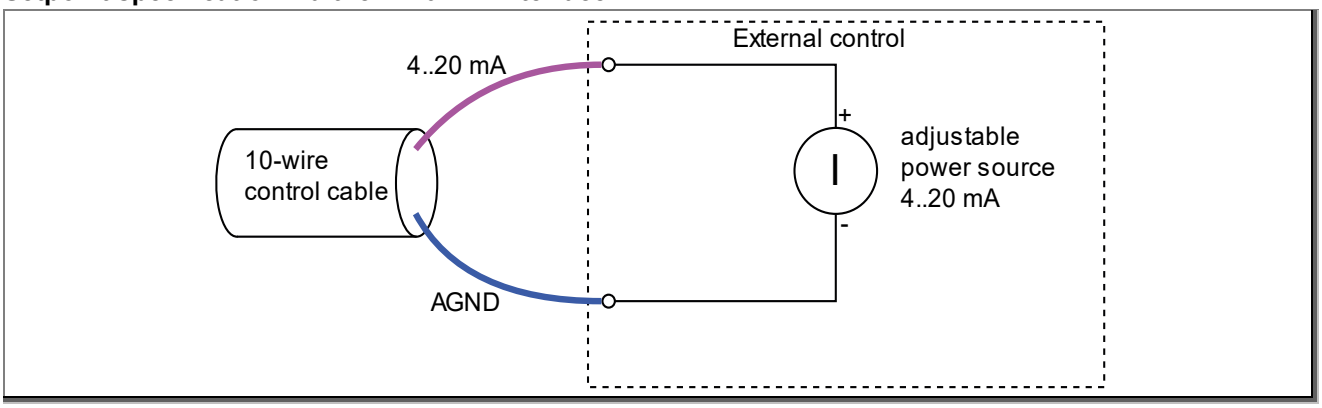
Alternatively, the speed and power of the pump can be configured via the two analog inputs.

0..10 V
4..20 mA

The setpoint value for the speed or power is continuously specified in this case via a voltage (0..10 V) or current (4..20 mA). The pump assumes the setpoint in stages of 10 rpm or in stages of 1 %.

Only one of the two interfaces should be connected.

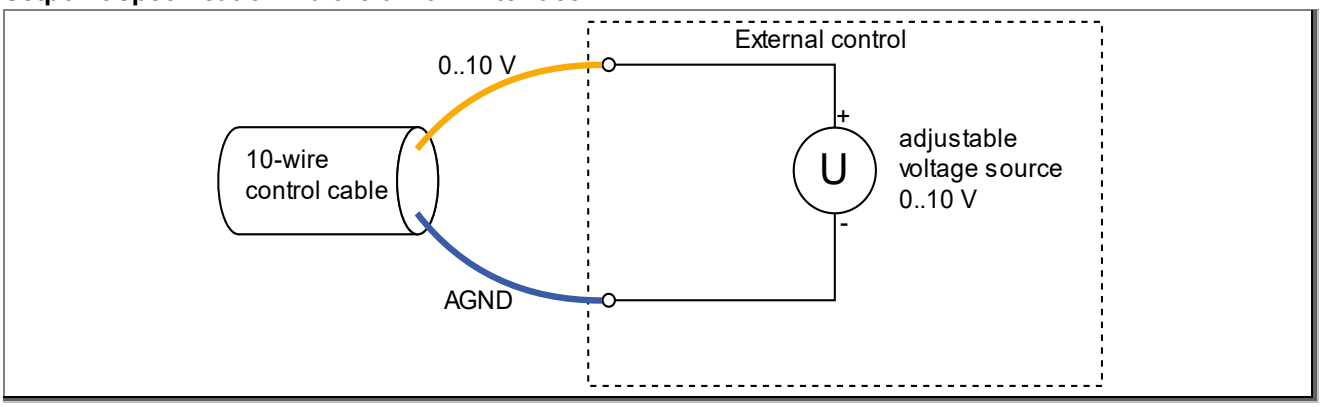
Setpoint specification via the 4..20 mA interface



Configuration of pump (See "Operation" on page 21)

External control (inputs)	E I in	Setpoint specification with current I = 4..20 mA
Stop contact	0 not	No stop contact

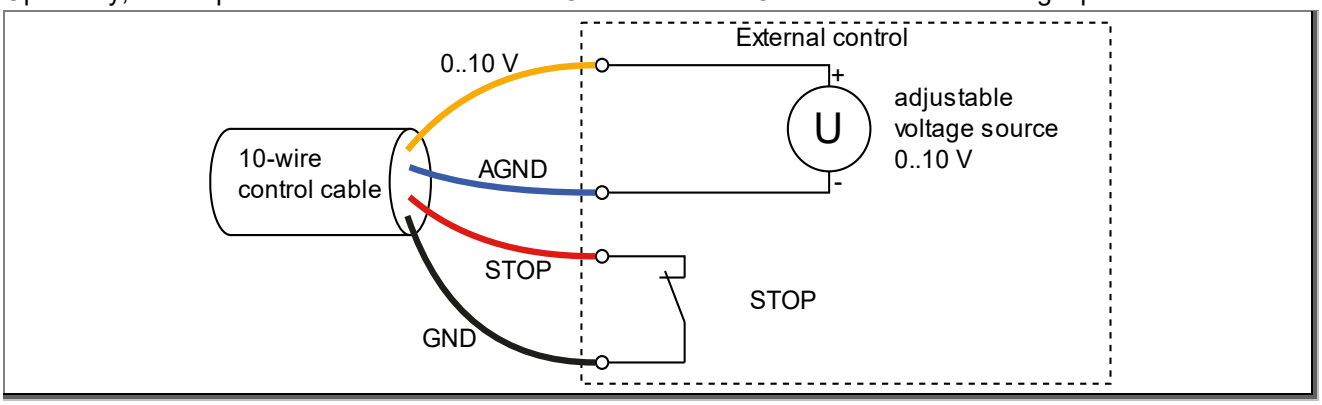
Setpoint specification via the 0..10 V interface



Configuration of pump (See "Operation" on page 21)

External control (inputs)	E U in	Setpoint specification with voltage U = 0..10 V
Stop contact	0 not	No stop contact

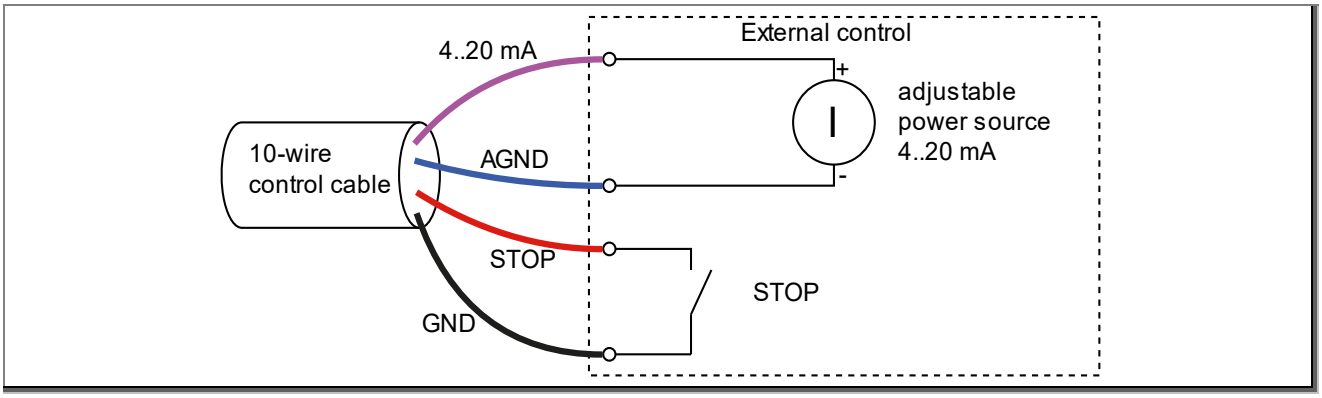
Optionally, the stop contact can be used as a NC contact and NO contact for both analog inputs.



Configuration of pump (See "Operation" on page 21)

External control (inputs)	E U in	Setpoint specification with voltage U = 0..10 V
Stop contact	0 oP	Break contact (NC) for stopping

The pump stops in this example as soon as the stop contact breaks, regardless of the type of signal applied to the analog input.



Configuration of pump (See "Operation" on page 21)

External control (inputs)	E In	Setpoint specification with current I = 4..20 mA
Stop contact	0 cL	Make contact (NO) for stopping

The pump stops in this example for as long as the stop contact is made.

Settings in the external control system

The following must be configured in the external control corresponding to the settings in the pump:

- Speed range (0..3000 rpm) or power range (0..100 %)
- Analog interface 0..10 V or 4..20 mA

If current and voltage outputs are available in the external control system, preference should be given to the 4..20 mA interface.

The range in the external control system is usually prescribed through the assignment of a minimum and maximum value.

➔ Observe the external control system instructions.

Interface settings:

Interface	4..20 mA	0..10 V
Signal min.	4 mA	0 V
Signal max.	20 mA	10 V

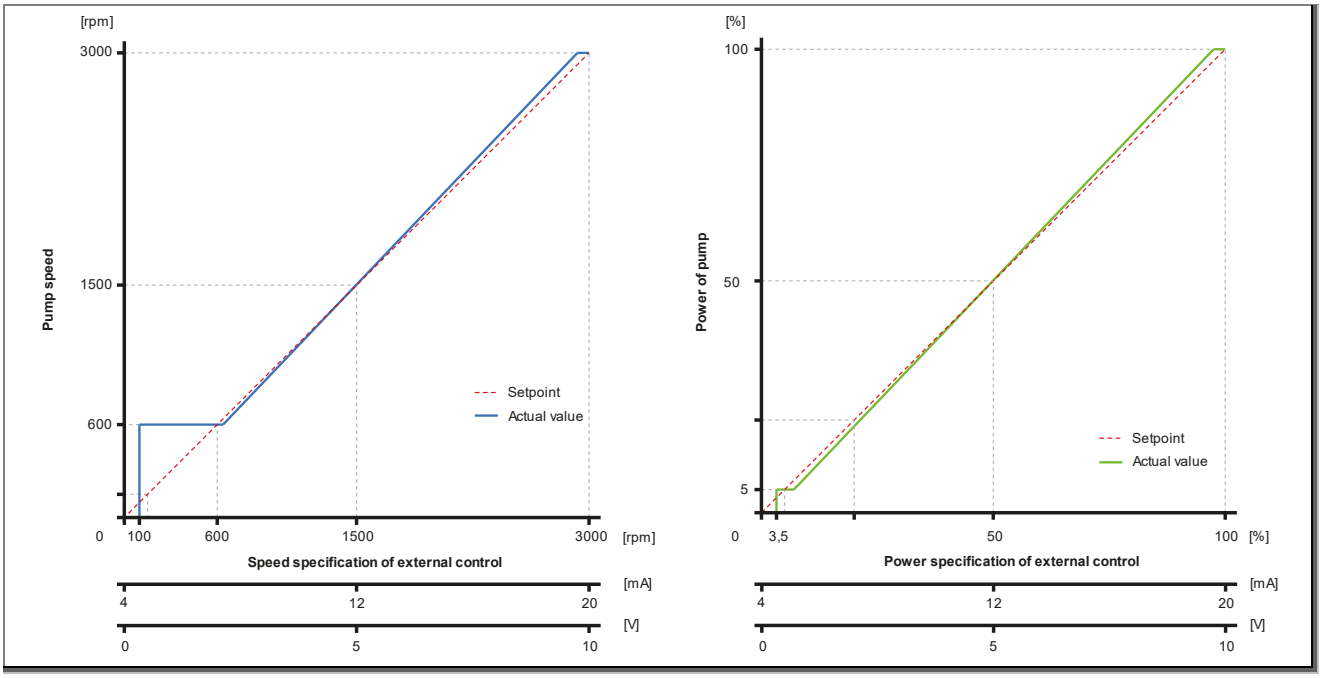
Setpoint value settings:

Interface	Speed	Power
Min. setpoint	0 rpm	0 %
Max. setpoint	3000 rpm	100 %

The pump starts in speed mode with a default value of approx. 100 rpm and minimum speed of 600 rpm.

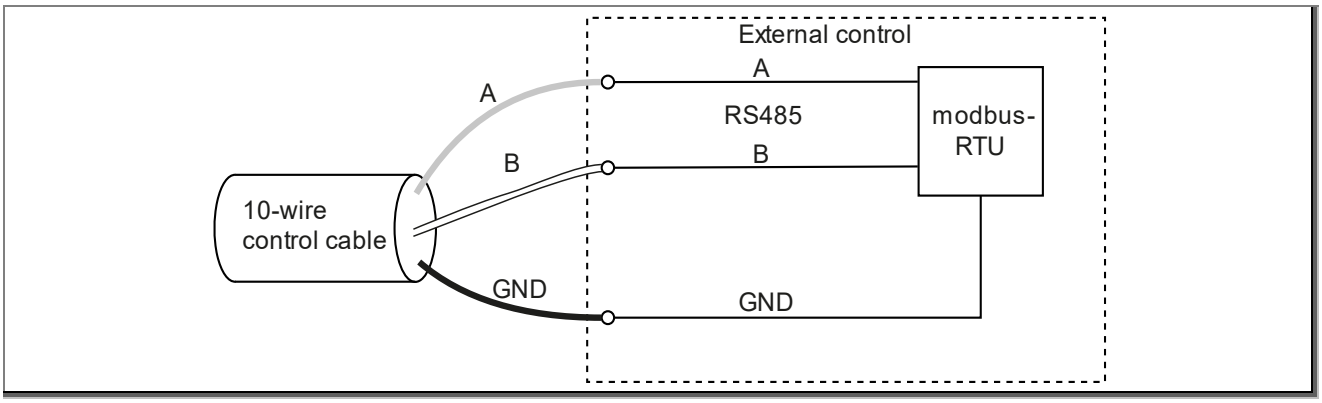
The pump starts in power mode from approx. 3.3 % with a minimum output of 5 %.

Minor tolerances are taken into account in the upper and lower range to enhance operational safety, meaning that minor deviations (<= 40 rpm) occur relative to the default value.



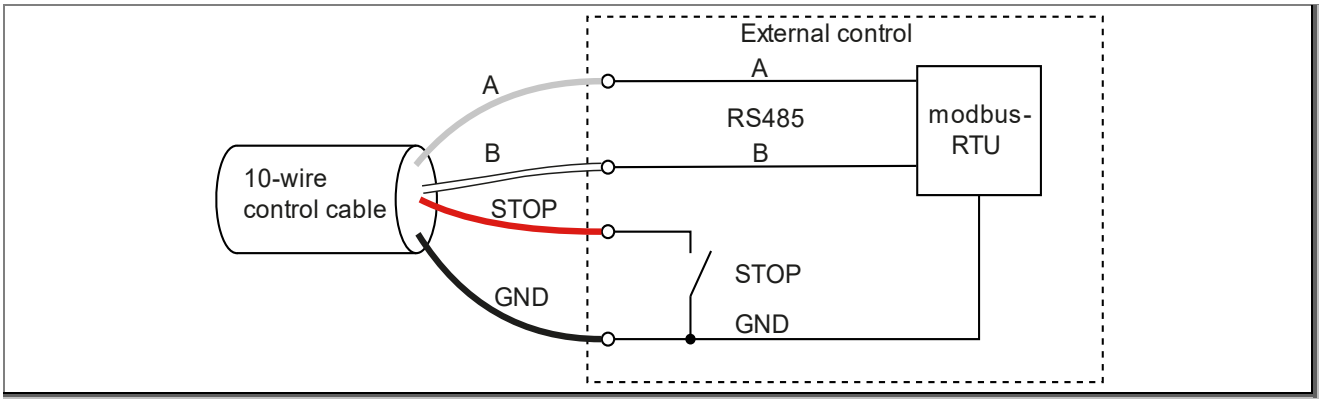
Setpoint setting via Modbus RTU

The pump can be controlled via the RS485 data interface with the Modbus RTU protocol.



Configuration of pump (See "Operation" on page 21)

External control (inputs)	E bUS	Digital In (potential-free)
Stop contact	0 noC	No stop contact



Configuration of pump (See "Operation" on page 21)

External control (inputs)	E bUS	Digital In (potential-free)
Stop contact	0 cL	Make contact (NO) for stopping

Modbus Parameter

RW = read write

RO = read only

Parameter No.	Name	Attr.	Min.	Max.	Unit	Description
40001	Start / Stop	RW	0	1		This register is edge controlled 0 --> 1 start 1 --> 0 stop
40004	Actual Speed Filtered	RO			min^{-1}	Real speed
40005	Target Speed	RW	600	3000	min^{-1}	Set target speed
40006	Error	RO				
40016	Real Power Mains	RO			W	Power consumption
40061	Reference Power Percent	RW	5	100	%	Set target power
40063	Motion Control Mode	RW	0	1		Motion control mode. 0 ------> speed mode. 1 ------> power mode.

Overview of possible operating and error messages

If an error occurs, the motor switches off permanently and a message is displayed. Exception: "Under voltage" if there is a failure or the power supply switches off. In the case of this error, the drive starts during the next reactivation of the mains voltage (when minimum voltage is achieved).

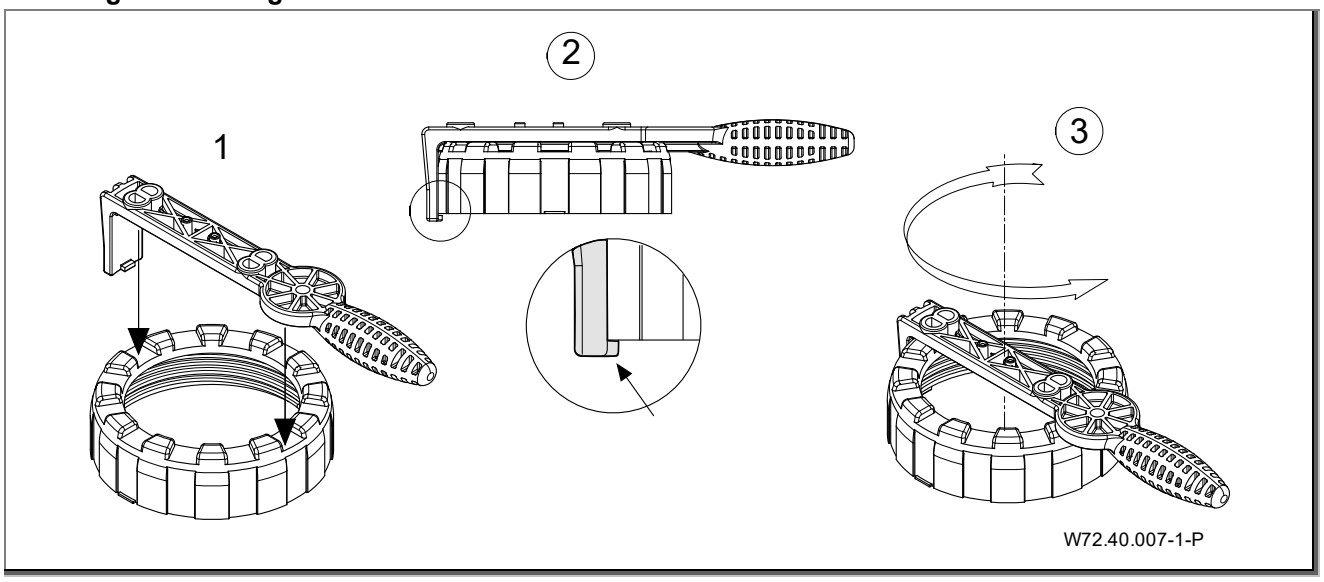
If a defect occurs, the system must be disconnected from the power supply. See chapter 2.2 of the original operating manual "Non self-priming and self-priming pumps with/without plastic lanterns (AK version)".

Error No.	Description
Err 1	Undervoltage intermediate circuit
Err 2	Overvoltage intermediate circuit
Err 3	Supply voltage too low/too high
Err 4	Temperature at the power electronics too high
Err 5	Overtemperature motor
Err 7	Overcurrent electronics
Err 10	Current measurement faulty
Err 20	Abortion during start-up, overload
Err 64	Short-circuit electronics
Err 97	Simultaneous occurrence of several errors or faults
Err 98	Connection to the control unit faulty

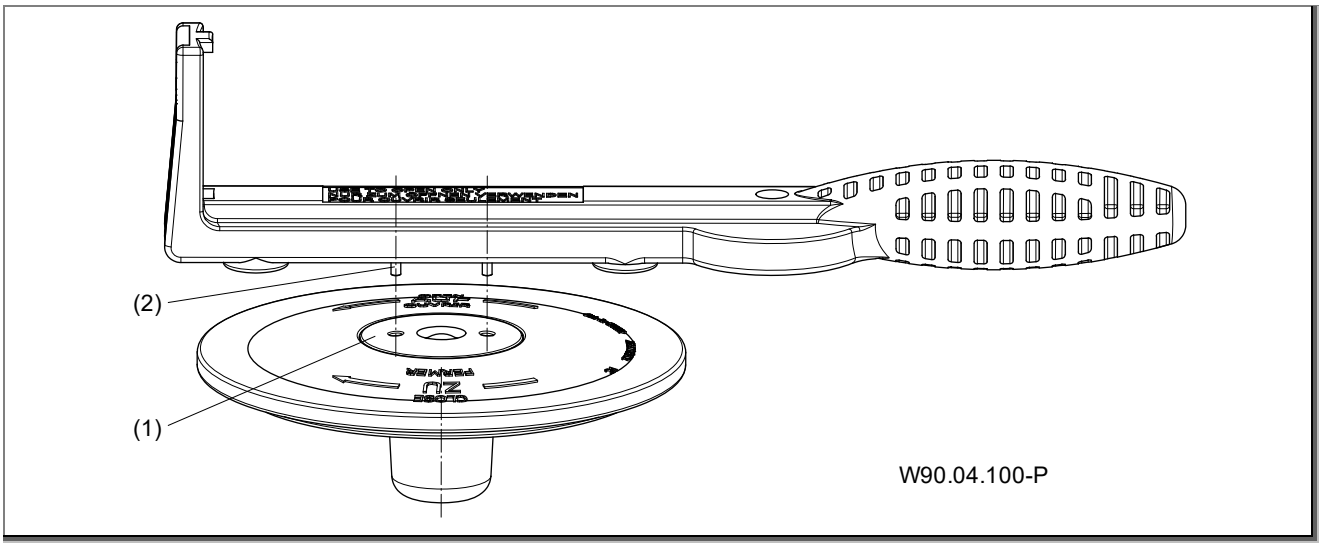
The following points refer to the related documentation!

Depending on the installation type, air can gather under the inserted viewing window. This is normal and harmless. It will not affect the functions of the pump.

Installing or removing the cover/strainer basket



Changing the battery in the transparent inlay



1. Switch pump off.
2. Close shut-off vlaves.
3. Remove lid.
4. Unscrew the small lid (1) with the two pins (2) of the opening device.
5. Remove the inlay.
6. Push the LED out of the bottom of the inlay.
7. Exchange the batteries. 2x Type CR2032, 3V
   Observe the pole (+/-)!
8. Assembly in reverse order.