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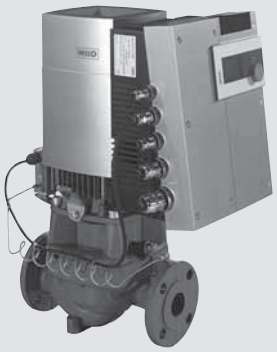

Wilo-Stratos GIGA

D Einbau- und Betriebsanleitung

GB Installation and operating instructions

F Notice de montage et de mise en service

NL Inbouw- en bedieningsvoorschriften

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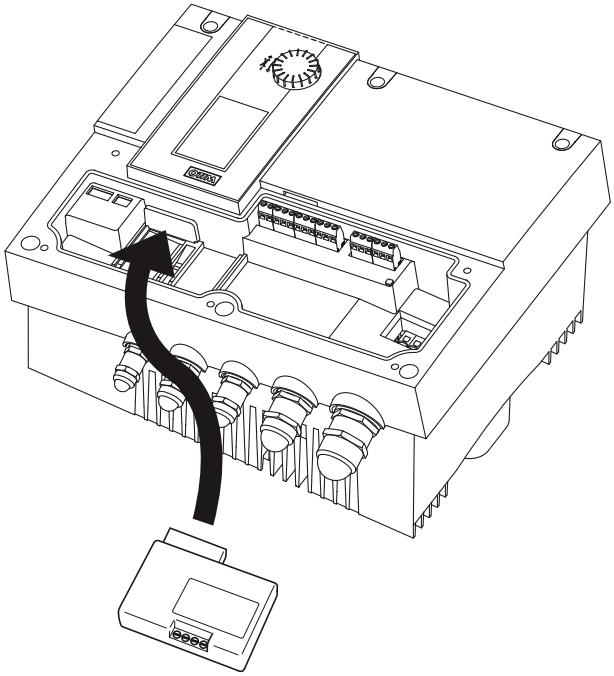
Fig. 1: IF-Modul



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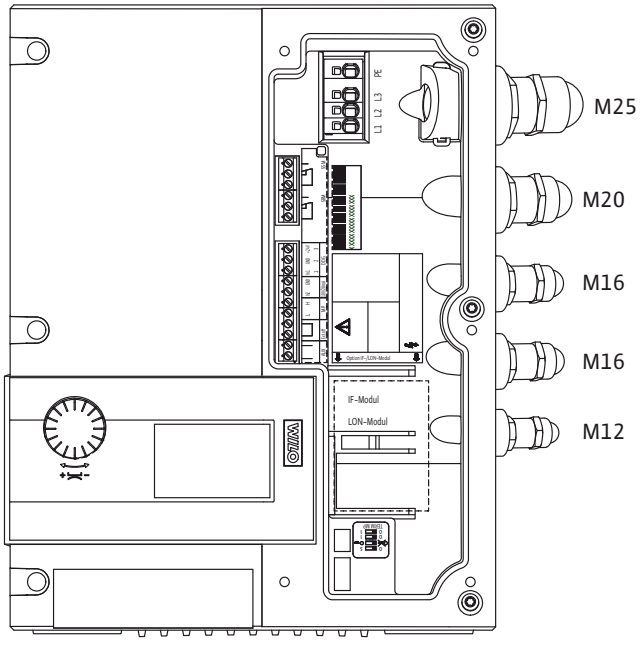

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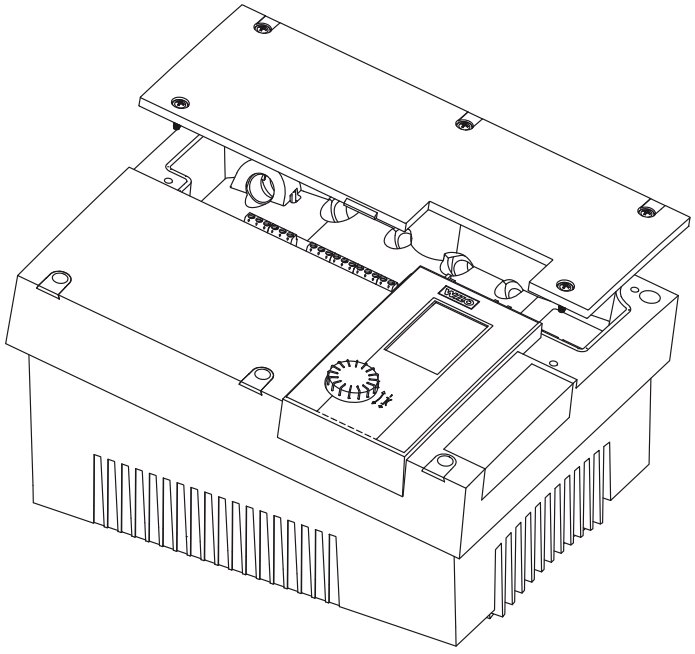

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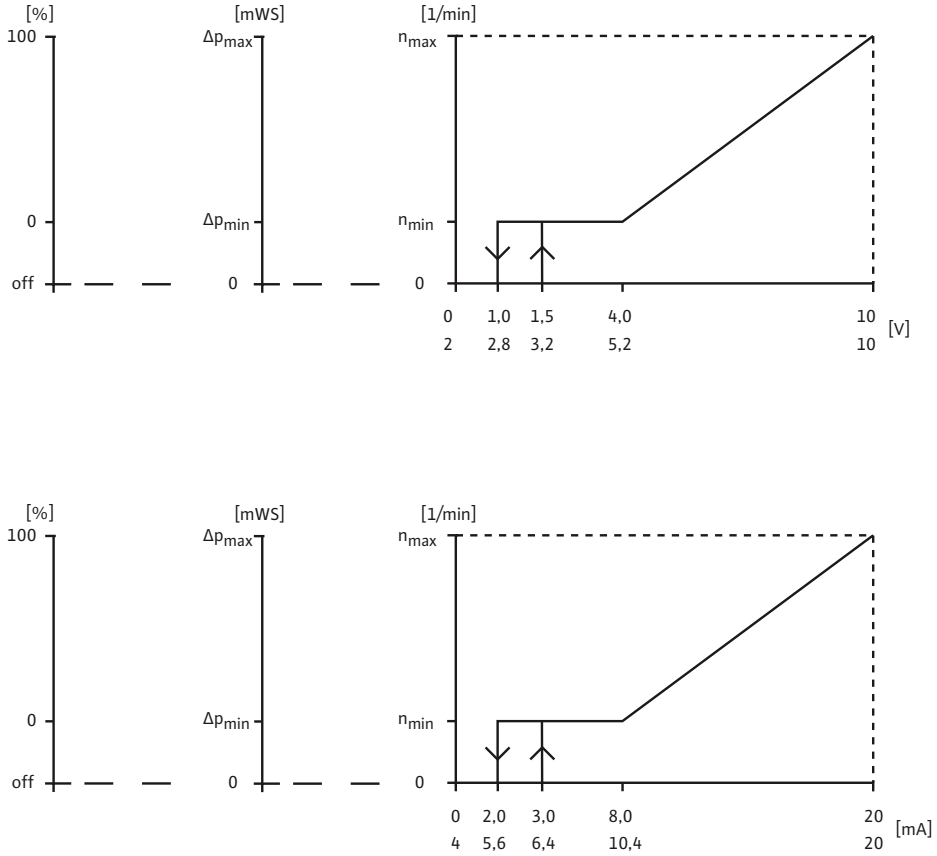
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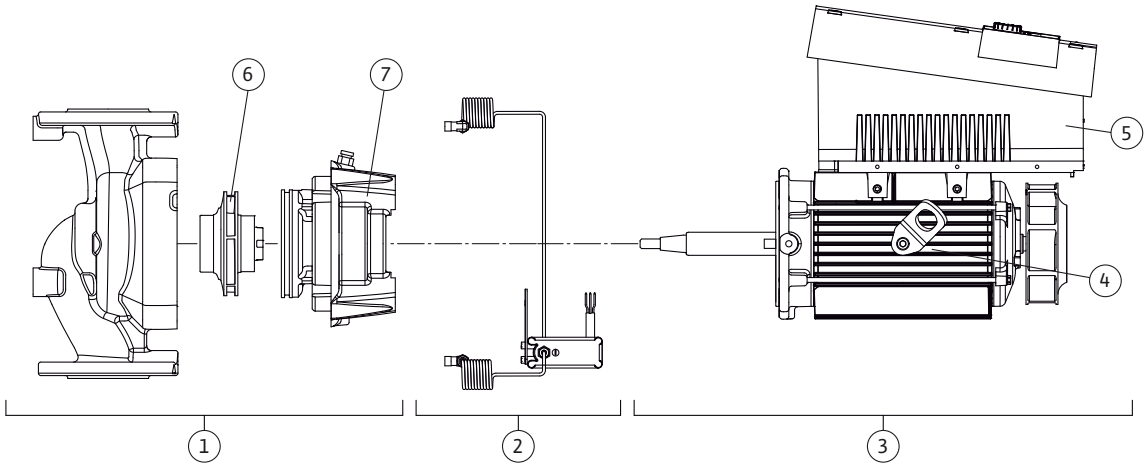
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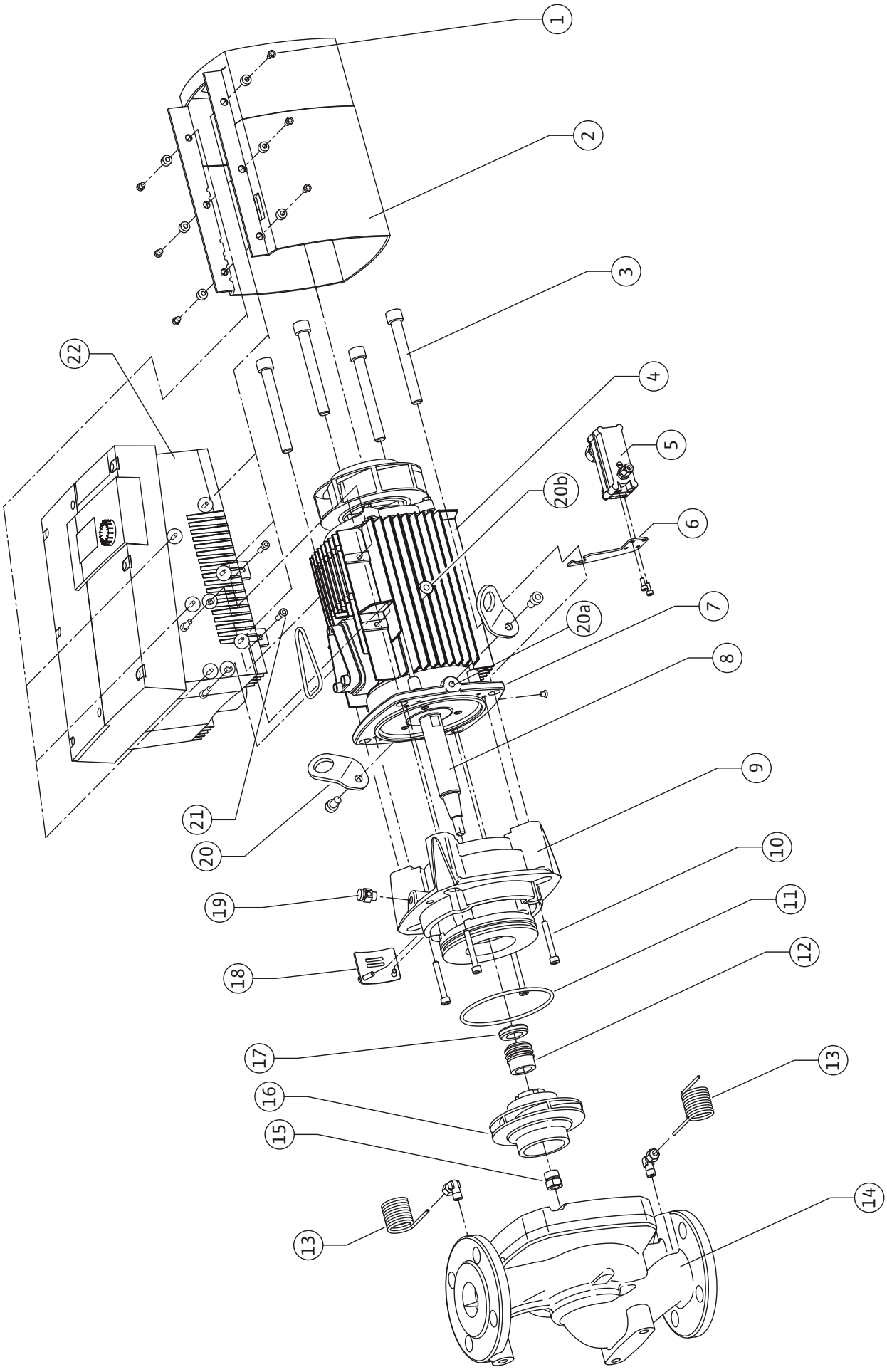
Fig. 6: Stratos GIGA



1 General notes

About this document

The language of the original operating instructions is German. All other languages of these instructions are translations of the original operating instructions.

These installation and operating instructions are an integral part of the product. They must be kept readily available at the place where the product is installed. Strict adherence to these instructions is a precondition for the proper use and correct operation of the product.

The installation and operating instructions correspond to the relevant version of the product and the underlying safety regulations and standards valid at the time of going to print.

EC declaration of conformity:

A copy of the EC declaration of conformity is a component of these operating instructions.

If a technical modification is made on the designs named there without our agreement or the declarations made in the installation and operating instructions on the safety of the product/personnel are not observed, this declaration loses its validity.

2 Safety

These operating instructions contain basic information which must be adhered to during installation, operation and maintenance. For this reason, these operating instructions must, without fail be read by the service technician and the responsible specialist/operator before installation and commissioning.

It is not only the general safety instructions listed under the main point “safety” that must be adhered to but also the special safety instructions with danger symbols included under the following main points.

2.1 Indication of instructions in the operating instructions

Symbols

General danger symbol

Danger due to electrical voltage

NOTE

Signal words

DANGER!
Acutely dangerous situation.
Non-observance results in death or the most serious of injuries.

WARNING!
The user can suffer (serious) injuries. 'Warning' implies that (serious) injury to persons is probable if this information is disregarded.

CAUTION!
There is a risk of damaging the product/unit. 'Caution' implies that damage to the product is likely if this information is disregarded.

NOTE:
Useful information on handling the product. It draws attention to possible problems.

Notes applied directly on the product must be strictly complied with and kept in legible condition. These include:.

- Direction of rotation arrow
- Name plate
- Warning sticker

2.2 Personnel qualifications

The installation, operating and maintenance personnel must have the appropriate qualifications for this work. Area of responsibility, terms of reference and monitoring of the personnel are to be ensured by the operator. If the personnel are not in possession of the necessary knowledge, they are to be trained and instructed. If need be, this can be accomplished by the manufacturer of the product at the request of the operator.

2.3 Danger in the event of non-observance of the safety instructions

Non-observance of the safety instructions can result in risk of injury to persons and damage to the environment and the product/unit. Non-observance of the safety instructions results in the loss of any claims to damages.

In detail, non-observance can, for example, result in the following risks:

- Danger to persons from electrical, mechanical and bacteriological influences
- Damage to the environment due to leakage of hazardous materials
- Property damage
- Failure of important product/unit functions
- Failure of required maintenance and repair procedures.

2.4 Safety consciousness on the job

The safety instructions included in these installation and operating instructions, the existing national regulations for accident prevention together with any internal working, operating and safety regulations of the operator are to be complied with.

2.5 Safety instructions for the operator

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

- If hot or cold components on the product/the unit lead to hazards, local measures must be taken to guard them against touching.
- Guards protecting against touching moving components (such as the coupling) must not be removed whilst the product is in operation.
- Leakages (e.g. from a shaft seal) of hazardous fluids (e.g. explosive, toxic or hot) must be conveyed away so that no danger to persons or to the environment arises. National statutory provisions are to be complied with.
- Danger from electrical current must be eliminated. Local directives or general directives [e.g. IEC, VDE etc.] and local energy supply companies must be adhered to.

2.6 Safety instructions for installation and maintenance work

The operator must ensure that all installation and maintenance work is carried out by authorised and qualified personnel, who are sufficiently informed from their own detailed study of the operating instructions.

Work to the product/unit must only be carried out when at a standstill. It is mandatory that the procedure described in the installation and operating instructions for shutting down the product/unit be complied with.

Immediately on conclusion of the work, all safety and protective devices must be put back in position and/or recommissioned.

2.7 Unauthorised modification and manufacture of spare parts

Unauthorised modification and manufacture of spare parts will impair the safety of the product/personnel and will make void the manufacturer's declarations regarding safety.

Modifications to the product are only permissible after consultation with the manufacturer. Original spare parts and accessories authorised by the manufacturer ensure safety. The use of other parts will absolve us of liability for consequential events.

2.8 Improper use

The operating safety of the supplied product is only guaranteed for conventional use in accordance with Section 4 of the operating instructions. The limit values must on no account fall under or exceed those specified in the catalogue/data sheet.

3 Transport and interim storage

3.1 Shipping

The pump is delivered from the factory packaged in a cardboard box or secured to a pallet and protected against dust and moisture.

Transport inspection

On arrival, inspect the pump immediately for any transport damage. If damage is found, the necessary procedure involving the forwarding agent must be taken within the specified period.

Storage

Before installation, the pump must be kept dry, frost-free and protected from mechanical damage.

CAUTION! Risk of damage due to incorrect packaging!
If the pump is transported again at a later time, it must be packaged so that it cannot be damaged during transport.

- **Use the original packaging for this, or choose equivalent packaging. Use the provided transport eyes for lifting.**
- **Check the transport eyes before use for damage and secure fixation.**

3.2 Transport for installation/ dismantling purposes

WARNING! Danger of personal injury!
Improper transport can lead to personal injury.

- **The pump must be transported using approved load-bearing equipment (e.g. block and tackle, crane, etc.). These are to be attached to the transport eyes at the motor flange (Fig. 7, shown here: lifting direction with vertical motor shaft).**
- **If necessary, e.g. in case of repairs, the transport eyes can be moved from the motor flange to the motor housing (see e.g. Fig. 8). Before installing the transport eyes at the motor housing, unscrew the spacers from the openings for the transport eyes (Fig. 6, Item 20b) (see chapter 10.2.1 "Replacing the mechanical seal" on page 100).**
- **Before using the transport eyes, check the eyes for damage and ensure that the fastening screws are completely screwed in and tightened.**

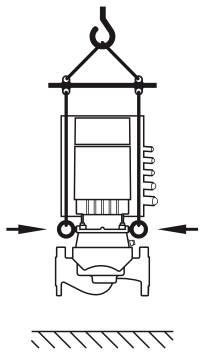


Fig. 7: Transporting the pump

- **If the transport eyes have been moved from the motor flange and installed at the motor housing, then they are only approved for carrying or transporting the motor impeller unit (Fig. 8) and not for transport of the whole pump and not for separation of the motor impeller unit from the pump housing.**
- **If the transport eyes are moved from the motor flange to the motor housing, e.g. in case of repairs (see chapter 10 "Maintenance" on page 98), then these are to be reattached to the motor flange after completion of the installation or maintenance work and the spacers are to be screwed into the openings of the transport eyes (Fig. 6, Item 20a).**

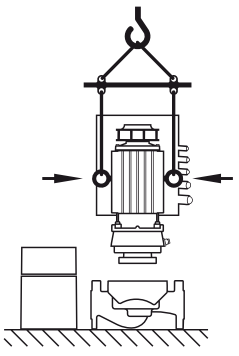


Fig. 8: Transport of the motor impeller unit

NOTE:
Swivel/turn the transport eyes to improve the balance in accordance with the direction of lifting. To do this, loosen and then retighten the fastening screws.

WARNING! Danger of personal injury!
Setting up the pump without securing it can lead to personal injury.

- **Do not place the pump unsecured on the pump base. The base with the threaded holes is only used for attachment. When standing freely, the pump might not be sufficiently stable.**

DANGER! Danger of death!
The pump itself and the parts of pump can be extremely heavy. Falling parts pose a risk of cuts, crush injuries, bruises or impacts, which may lead to death.

- **Always use suitable lifting equipment and secure parts against falling.**
- **Never stand underneath a suspended load.**
- **Make sure the pump is securely positioned and is stable during storage and transport as well as prior to all installation and other assembly work.**

4 Intended use

Purpose

The glanded pumps of the Stratos GIGA series are intended for use as circulation pumps in building services.

Fields of application

They may be used for:

- Hot water heating systems
- Cooling and cold water circulation systems
- Industrial circulation systems
- Heat carrier circuits

Restrictions

The pumps are exclusively intended for installation and operation in enclosed rooms. Typical installation locations are technical rooms within the building with other domestic installations. The following is not permitted:

- Outdoor installation and operation outdoors

DANGER! Danger of death!
The permanently magnetised rotor inside the motor presents an acute danger to persons with pacemakers. Non-observance results in death or the most serious of injuries.

- **Do not open the motor!**
- **Only allow Wilo customer service to dismantle and install the rotor for maintenance and repair work.**

WARNING! Danger of personal injury!
Opening the motor leads to high, suddenly occurring magnetic forces. These can cause serious cuts, crushing injuries and bruises.

- **Do not open the motor!**
- **Only allow Wilo customer service to dismantle and install the motor flange and the end shield for maintenance and repair work.**

CAUTION! Danger of property damage!
Unpermitted substances in the fluid can destroy the pump. Abrasive solids (e.g. sand) increase pump wear.
Pumps without an Ex certificate are not suitable for use in potentially explosive areas.

- **Intended use of the pump/installation also includes following these instructions.**
- **Any use above and beyond these is regarded as incorrect use.**

5 Product information

5.1 Type key

The type key consists of the following elements:

Example:	Stratos GIGA 40/1–51/4.5 xx
Stratos GIGA	High-efficiency pump in-line single pump
40	Nominal diameter DN of the flange connection
1 –51	Delivery heads range (for Q=0 m^3/h): 1 = smallest adjustable delivery head [m] 51 = largest adjustable delivery head [m]
4.5	Rated motor power [kW]
xx	Version: e.g. **R1** – without differential pressure sensor

5.2 Technical data

Property	Value	Remarks
Speed range	500 – 5200 rpm	
Nominal diameters DN	40/50/65	
Pipe connections	Flanges PN 16	EN 1092-2
Permissible min./max. fluid temperature	–20°C to +140°C	
Ambient temperature min./max.	0 to 40°C	
Max. admissible operating pressure	16 bar	
Insulation class	F	
Protection class	IP 55	
Electromagnetic compatibility Emitted interference in acc. with Interference resistance in acc. with	 EN 61800-3 EN 61800-3	 Residential Industrial
Sound pressure level[1)]	< 74 dB(A)	
Approved fluids	Heating water according to VDI 2035 Cooling/cold water Water/glycol mixture up to 40% vol. Heat transfer oil Other fluids	Standard version Standard version Standard version Only for special version Only for special version
Electrical connection	3~400 V ± 10%, 50 Hz 3~380 V –5% + 10%, 60 Hz	Supported network types: TN, TT, IT
Speed control	Built-in frequency converter	
Relative humidity – at $T_{environment}$ = 30°C – at $T_{environment}$ = 40°C	 90%, non-condensing 60%, non-condensing	

1) Average value of the sound-pressure level at a spatially rectangular measuring surface at a distance of 1 m from the pump surface in accordance with DIN EN ISO 3744

Please state all the information on the pump name plate when ordering spare parts.

Fluids

If water/glycol mixtures are used (or fluids with a viscosity other than that of pure water), an increase in power consumption of the pump is to be taken into account. Only use mixtures with corrosion inhibitors. The respective manufacturer's instructions are to be observed.

- The fluid must be free of sediments.
- Wilo's approval must be obtained for use of other media.
- Mixtures with a proportion of glycol of > 10% influence the Δp-v pump curve and the flow calculation.

NOTE:
The flow value shown on the IR-Monitor/IR-Module (PDA) display or output to the building management system must not be used to control the pump. This value is merely an indicator of general trends.

A flow value is not output on every type of pump.

NOTE:
Always read and follow the material safety data sheet for the fluid being pumped!

5.3 Scope of delivery

- Stratos GIGA pump
- Installation and operating instructions

5.4 Accessories

Accessories must be ordered separately:

- Three mounting brackets with fixation material for installation on a base
- Installation aid for mechanical seal
- IR-Monitor
- IR-Module (PDA)
- IF-Module PLR for connecting to PLR/interface converter
- IF-Module LON for connection to the LONWORKS network
- BACnet IF-Module
- Modbus IF-Module
- CAN IF-Module

See catalogue for detailed list.

NOTE:
IF-Module may only be plugged in when the pump is de-energised (voltage-free).

6 Description and function

6.1 Description of the product

The Wilo-Stratos GIGA high-efficiency pumps are glanded pumps with built-in power adjustment and “Electronic Commutated Motor” (ECM) technology. The pumps are designed as single-stage low-pressure centrifugal pumps with flange connection and mechanical seal.

The pumps can be installed both directly as pipe installation pumps in sufficiently secured pipes or be placed on a foundation base.

The pump housing is designed as an in-line construction; i.e. the suction and pressure-side flanges are on one axis. All pump housings are provided with a pump base. Installation on a foundation base is recommended.

Main components

Fig. 6 shows an exploded drawing of the pump with the main components. In the following, the assembly of the pump is explained in detail.

Arrangement of the main components in accordance with Fig. 6 and Tab. 1:

No.	Part
1	Fastening screws of the fan cover
2	Fan cover
3	Motor impeller unit fastening screws
4	Motor housing
5	Differential pressure sensor (DDG)
6	DDG holder
7	Motor flange
8	Motor shaft
9	Lantern
10	Fastening screws of the lantern
11	O-ring
12	Rotating unit of the mechanical seal (mechanical seal)
13	Pressure measuring line
14	Pump housing
15	Impeller nut
16	Impeller
17	Counter ring of the mechanical seal (GLRD)
18	Protective plate
19	Bleed valve
20	Transport eye
20a	Attachment points for transport eyes at the motor flange
20b	Attachment points for transport eyes at the motor housing
21	Fastening screws of the electronic module
22	Electronic module

Tab. 1: Arrangement of the main components

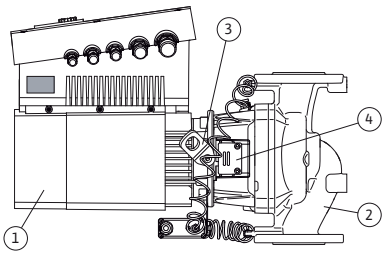


Fig. 9: Pump assembly

The typical characteristic of the Stratos GIGA series is the jacket cooling of the motor. The air current is optimally conducted by the long fan cover (Fig. 9, Item 1) for cooling the motor cooling and the electronic module.

(Fig. 9, Item 2) shows the pump housing with a special lantern channel to reduce the load of the impeller.

The transport eyes (Fig. 9, Item 3) are to be used in accordance with chapters 3 and 10.

The window in the lantern that is covered with the protective plate (Fig. 9, Item 4) is used for maintenance work in accordance with chapter 10 “Maintenance” on page 98. The window can also be used to check for leaks with consideration of the safety regulations in accordance with chapter 9 “Commissioning” on page 95 and chapter 10 “Maintenance” on page 98.

Name plates

The Wilo-Stratos GIGA has three name plates:

- The pump name plate (Fig. 10, Item 1) includes the serial number (Ser.-No.../...), which is, for example, required for spare parts ordering.
- The electronic module name plate (electronic module = inverter or frequency converter) (Fig. 10, Item 2) indicates the designation electronic module being used.

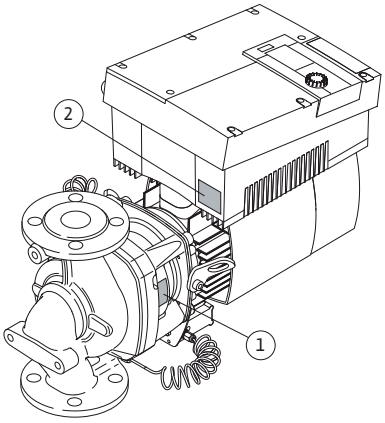


Fig. 10: Arrangement of the name plates: Pump name plate, electronic module name plate

- The drive name plate is at the inverter on the side with the cable lead-throughs (Fig. 11, Item 3). The electrical connection is to be made in accordance with the specifications on the drive name plate.

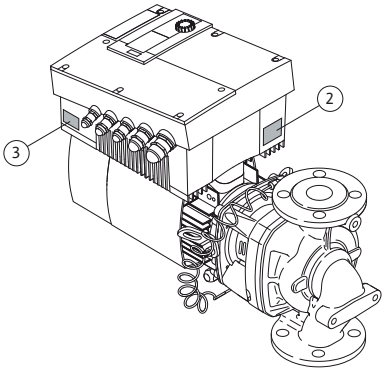


Fig. 11: Arrangement of the name plates: Drive name plate, electronic module name plate

Functional assemblies

The pump has the following main functional assemblies:

- Hydraulic unit (Fig. 5, Item 1), consisting of the pump housing, impeller (Fig. 5, Item 6) and lantern (Fig. 5, Item 7)
- Optional differential pressure sensor (Fig. 5, Item 2) with connecting and fastening parts
- Drive (Fig. 5, Item 3), consisting of EC motor (Fig. 5, Item 4) and electronic module (Fig. 5, Item 5).

The hydraulic unit is not a ready-to-install assembly due to the motor shaft which goes through; it is taken apart for most maintenance and repair work.

The hydraulic unit is driven by the EC motor (Fig. 5, Item 4), which is controlled from the electronic module (Fig. 5, Item 5).

As far as the assembly is concerned, the impeller (Fig. 5, Item 6) and the lantern (Fig. 5, Item 7) belong to the motor impeller unit (Fig. 12).

For the following purposes, the motor impeller unit can be separated from the pump housing (which can remain in the piping) (also see chapter 10 “Maintenance” on page 98):

- To provide access to the inside parts (impeller and mechanical seal)
- To make it possible to separate the motor from the hydraulic unit.

When this is done, the transport eyes (Fig. 12, Item 2) are removed from the motor flange (Fig. 12, Item 1), taken to the motor housing and refastened there with the same screws to the motor housing (Fig. 12, Item 3).

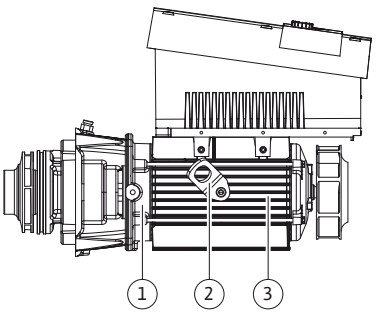


Fig. 12: Motor impeller unit

Electronic module

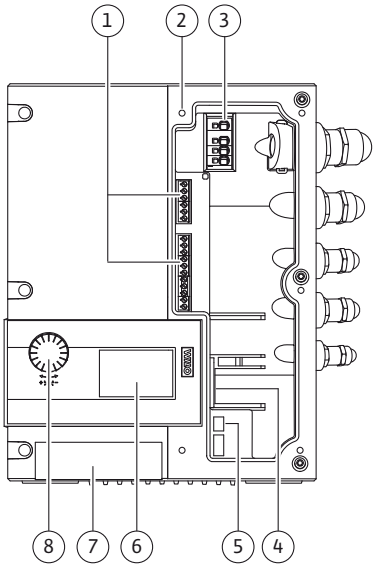


Fig. 13: Electronic module

The electronic module controls the speed of the pump to a setpoint that can be adjusted within the control range.

The hydraulic output is controlled by differential pressure and the set control mode. In all control modes, however, the pump adapts itself continuously to the changing power requirements of the system, which is the case especially when thermostatic valves or mixers are used.

The basic advantages of the electronic control are:

- Energy saving at the same time as reduced operating costs
- Fewer differential pressure valves required
- Reduction of flow noise
- Adaptation of the pump to changing operating requirements

Legend (Fig. 13):
1 Control terminals
2 Attachment points cover
3 Power terminals (mains terminals)
4 Interface for IF-Module
5 DIP switch
6 Display
7 Infrared window
8 The red button

6.2 Control modes

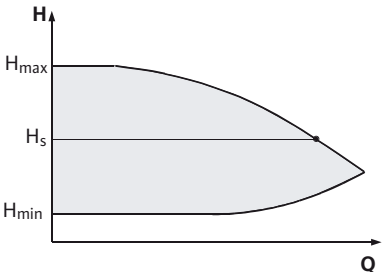


Fig. 14: Δp-c control

The selectable control modes are:

Δp-c:

The electronics keep the differential pressure created by the pump above the permitted feed flow range constantly at the pre-selected differential pressure setpoint H_S up to the maximum pump curve (Fig. 14).

Q = Volume flow
H = Differential pressure (min./max.)
H_S = Differential pressure setpoint

NOTE:
For further information about setting the control mode and the associated parameters, see chapter 8 “Operation” on page 81 and chapter 9.4 “Setting the control mode” on page 97.

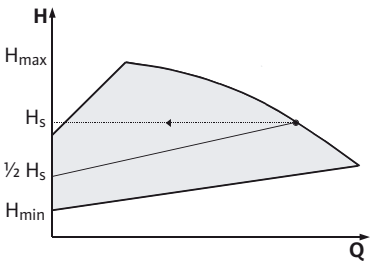


Fig. 15: Δp-v control

Δp-v:

The electronics linearly change the differential pressure setpoint to be kept by the pump between the delivery heads H_S and ½ H_S. The differential pressure setpoint H_S decreases or increases with the volume flow (Fig. 15).

Q = Volume flow
H = Differential pressure (min./max.)
H_S = Differential pressure setpoint

NOTE:
For further information about setting the control mode and the associated parameters, see chapter 8 “Operation” on page 81 and chapter 9.4 “Setting the control mode” on page 97.

NOTE:
A differential pressure sensor is needed for the control modes that are being performed (Δp-c and Δp-v) which sends the actual value to the electronics.

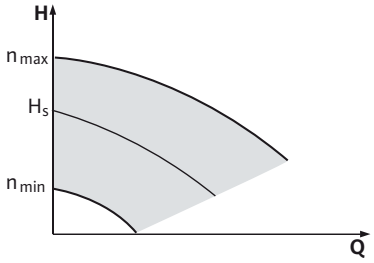


Fig. 16: Manual control mode

Manual control mode:

The speed of the pump can be kept to a constant speed between n_{min} and n_{max} (Fig. 16). “Manual control” mode deactivates all other control modes.

PID control:

If the aforementioned standard control modes cannot be used – e.g. if other sensors are to be used or the distance to the pump is very long – then the PID control (**P**roportional-**I**ntegral-**D**ifferential control) is available.

By selecting a good combination of individual control portions, the operator can ensure fast reacting, constant control without lasting setpoint deviations.

The output signal of the selected sensor can take any intermediate value. The respective actual value reached (sensor signal) will be shown as a percentage (100% = maximum measurement range of the sensor) on the status page of the menu.

NOTE:
The displayed percentage value only corresponds indirectly to the current delivery head of the pump(s). It can be, for example, that the maximum delivery head has already been reached at a sensor signal < 100%.
For further information about setting the control mode and the associated parameters, see chapter 8 “Operation” on page 81 and chapter 9.4 “Setting the control mode” on page 97.

6.3 Dual pump function/Y-pipe application

NOTE:
The properties described below are only available if the internal MP interface (MP = Multi Pump) is used.

- Both pumps are controlled by the master pump.

  If one of the pumps malfunctions, the other will run according to the master's control settings. In case of a total failure of the master, the slave pump operates at emergency operation speed.
  The emergency operation speed can be set in menu <5.6.2.0> (see chapter 6.3.3 on page 71).
- The master's display will show the status of the double pump. On the slave display, 'SL' will appear.
- The master pump is the left pump in the direction of flow.

  Connect the differential pressure sensor to this pump.

  The measuring points of the differential pressure sensor of the master pump must be on the suction and pressure side of the double-pump system in the corresponding collector pipe (Fig. 17).

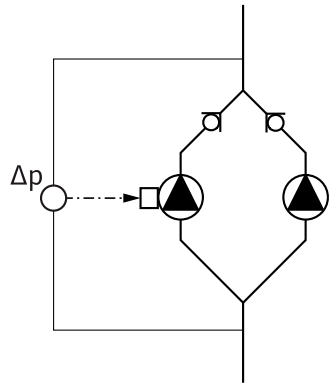


Fig. 17: Example, DDG connection

InterFace module (IF-Module)

For communication between pumps and the building management system, one IF-Module (accessories) is required per pump. This is plugged into the terminal space (Fig. 1).

- The master-slave communication uses an internal interface (terminal: MP, Fig. 25).
- Normally for double pumps, only the master pump must be equipped with an IF-Module.

Communication	Master pump	Slave pump
PLR/Interface converter	IF-Module PLR	No IF-Module necessary
LONWORKS network	IF-Module LON	No IF-Module necessary
BACnet	BACnet IF-Module	No IF-Module necessary
Modbus	Modbus IF-Module	No IF-Module necessary
CAN bus	CAN IF-Module	No IF-Module necessary

6.3.1 Operating modes

Main/standby operation

Each of the two pumps provides the configuration flow rate. The other pump is available in case of malfunction or runs after pump cycling. Only one pump runs at a time (see Fig. 14, 15 and 16).

Parallel operation

In the partial load range, the hydraulic output is provided at the beginning by one pump. The second pump will be switched on when it is most effective to do this, i.e. when the total power consumptions P_1 of both pumps in the partial load range is less than the power consumption P_1 of one pump. Both pumps will then be simultaneously adjusted upwards to the maximum speed (Fig. 18 and 19).

In manual control mode, both pumps always run synchronously. Parallel operation of two pumps is only possible with two identical pump types.

Compare to chapter 6.4 “Other functions” on page 72.

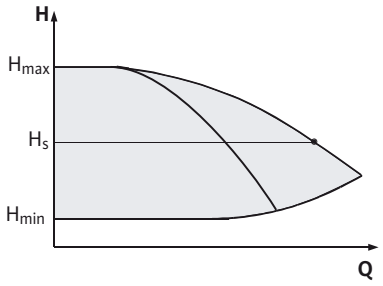


Fig. 18: Δp-c control (parallel operation)

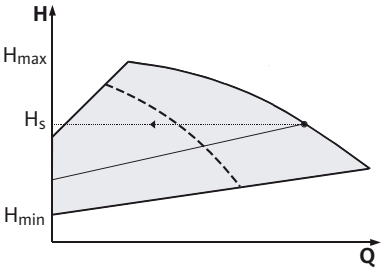


Fig. 19: Δp-v control (parallel operation)

6.3.2 Behaviour in dual pump operation

Pump cycling

In dual pump operation, a pump cycling occurs periodically (the period can be set; Factory setting: 24 h).

Pump cycling can be triggered:

- Internally, time-controlled (menu <5.1.3.2> + <5.1.3.3>)
- Externally (menu <5.1.3.2>) by a positive edge at the “AUX” contact (see Fig. 25),
- Or manually, (menu <5.1.3.1>)

Manual or external pump cycling is possible five seconds after the last pump cycling, at the earliest.

Activation of external pump cycling simultaneously deactivates internal time-controlled pump cycling.

Behaviour of the inputs and outputs

Actual value input In1 setpoint input In2

- Set at the master: acts on the whole unit

"Ext off":

- Set at the master (menu <5.1.7.0 >): depending on the setting in menu <5.1.7.0 >, acts only on the master or on the master and the slave.
- Set at the slave: acts only on the slave.

Fault and run signals

ESM/SSM:

- A collective fault signal (SSM) can be connected to the master for a central control centre.
- In this case, the contact may only be made to the master.
- The display is for the whole unit.
- This signal can be programmed on the master (or using the IR-Monitor/PDA) as an individual fault signal (ESM) or a collective fault signal (SSM) in menu <5.1.5.0>.
- The contact must be made to each pump for individual fault signals.

EBM/SBM:

- A collective run signal (SBM) can be connected to the master for a central control centre.
- In this case, the contact may only be made to the master.
- The display is for the whole unit.
- This signal can be programmed on the IR-Monitor (or using the PDA) as an individual run signal (EBM) or collective run signal (SBM) (menu <5.1.6.0>).
- The functions – "Readiness", "Operation", "Mains on" – from EBM/SBM can be set at <5.7.6.0> at the master.

NOTE:

"Readiness" means:	The pump could run; there is no fault.
"Operation" means:	Motor turning.
"Mains on" means:	Mains voltage is present.

- The contact must be made to each pump for individual run signals.

Operating possibilities at the slave pump

No further settings can be made on the slave beyond "Ext off" and "Block/release pump".

6.3.3 Operation during interruption of communication

When communication is interrupted between two pump heads in dual pump operation, both displays show the error code "E052". Both pumps behave as single pumps for as long as the interruption lasts.

- Both modules report the fault via the ESM/SSM contact.
- The slave pump runs in emergency operation (manual control) mode according to the emergency operation speed previously set on the master (see menu items <5.6.2.0>). The factory setting of the emergency operation speed is about half of the maximum speed of the motor.
- After acknowledging the fault display, the status indicator will be shown on both pump displays for the duration of the communication interruption. This resets the ESM/SSM contact at the same time.
- The slave pump display will show the symbol (– Pump running in emergency operation).
- The (former) master pump continues to have control. The (former) slave pump follows the emergency operation settings. It is only possible to exit emergency operation by actuating the factory setting or, after ending the communication interruption, by shutting power off and on again.
- NOTE:
  During communication interruptions, the (former) slave pump cannot run in auto control, since the differential pressure sensor has switched

to the master. When the slave pump is running in emergency operation mode, changes cannot be made to the module.

- After the end of the communication interruption, the pumps will resume regular dual pump operation as before the fault.

Slave pump behaviour

Leaving emergency operation at the slave pump:

- Factory settings restored
  During a communication interruption on the (former) slave, if emergency operation is discontinued because the factory settings have been restored, the (former) slave will start up with the factory settings of a single pump. It will then run in Δp-c mode at approximately half the maximum delivery head.

NOTE:
In the absence of a sensor signal, the (former) slave will run at maximum speed. To prevent this, the (former) master's differential pressure sensor signal can be looped through. When the double pump is operating normally, it is not affected by sensor signals pending on the slave.

- Mains off, Mains on
  During a communication interruption on the (former) slave, if emergency operation is discontinued due to mains off, mains on, the (former) slave will start up with the latest emergency operation settings received from the master (for example, control mode with preset speed or off).

Master pump behaviour

Leaving emergency operation at the master pump:

- Factory settings restored
  During a communication interruption on the (former) master, if the factory settings are restored, it will start up with the factory settings of a single pump. It will then run in Δp-c mode at about half the maximum delivery head.
- Mains off, Mains on
  During a communication interruption on the (former) master, if emergency operation is discontinued due to power cycling (mains off, mains on), the (former) master will start up with the latest settings it has from the double pump configuration.

6.4 Other functions

Disabling or enabling a pump

A particular pump can generally be enabled or disabled in terms of operation in menu <5.1.4.0>. A disabled pump cannot be used in operation until the disabling has been manually lifted.

The setting can be made at each pump directly or over the infrared interface.

Pump kick

A pump kick will be carried out after the end of a period of 24 h and 2 minutes after the pump or a pump head has been in standstill. The reason for the standstill does not matter (Manual off, Ext. off, Fault, Adjustment, Emergency operation, BMS setting). This procedure is repeated until the pump is switched back on via a control mechanism. The “pump kick” function cannot be disabled via the menu or any other interfaces. As soon as the pump is switched on via the control system, the countdown to the next pump kick is interrupted.

The duration of a pump kick is 5 seconds. The motor turns at minimum speed during this period. If both pump heads of a double pump are switched off, e.g. by Ext. off, then both run for the period of 5 seconds. The pump kick also takes place in “Main/standby operation” operating mode if the pump cycling takes more than 24 h. A pump kick is also attempted even in case of a fault.

The remaining operating time until the next pump kick can be seen in menu <4.2.4.0>. This menu is only available when the motor is stopped. The number of pump kicks can be seen in menu <4.2.6.0>.

All faults, with the exception of warnings, that occur during the pump kick switch the motor off. The corresponding fault code is shown on the display.

Behaviour after being switched on

The pump operates with its factory settings in initial commissioning.

- The service menu deals with the setting and converting of individual pumps; see chapter 8 “Operation” on page 81.
- To correct faults, also see chapter 11 “Faults, causes and remedies” on page 105.

CAUTION! Danger of property damage!
Modifying the settings for the differential pressure sensor can lead to malfunctions. The factory settings are configured for the supplied WILO differential pressure sensor.

- **Default value: input In = 0–10 volts, pressure value correction = ON**
- **When using the supplied Wilo differential pressure sensor, these settings must not be changed!**

  Modifications are only needed if another differential pressure sensor is used.

Switching frequency

At high ambient temperatures, the thermal load on the module can be reduced by lowering the switching frequency (menu <4.1.2.0>).

NOTE:
The switching frequency can only be changed via the CAN bus or IR-PDA.
Lower switching frequencies result in increased noise levels.

Variants

If the menu <5.7.2.0> “Pressure value correction” is not available on the display of a given pump, that pump is a variant in which the following functions are not available:

- Pressure value correction (menu <5.7.2.0>)
- Efficiency-optimised activation and deactivation in double pumps
- Flow rate trend display

7 Installation and electrical connection

Safety

DANGER! Danger of death!
Incorrect installation and inexpert electrical connection can pose a risk of fatal injury.

- **Have the electrical connections established by licensed electricians only, in compliance with the applicable regulations.**
- **Accident prevention regulations must be observed!**

DANGER! Danger of death!
Failure to install safety devices of the electronic module and the motor can cause electrical shock or contact with rotating parts, potentially resulting in life-threatening injuries.

- **Before commissioning, all safety devices such as module covers or fan covers that were removed must be reinstalled.**

DANGER! Danger of death!
Deadly danger due to module not being installed! Fatal voltages can be present at the motor contacts.

- **Normal operation of the pump is only permitted with the module installed.**
- **The pump is not allowed to be connected or operated without the module being installed.**

DANGER! Danger of death!
The pump itself and the parts of pump can be extremely heavy. Falling parts pose a risk of cuts, crush injuries, bruises or impacts, which may lead to death.

- **Always use suitable lifting equipment and secure parts against falling.**
- **Never stand underneath a suspended load.**
- **Make sure the pump is securely positioned and is stable during storage and transport as well as prior to all installation and other assembly work.**

CAUTION! Danger of property damage!
Danger of damage due to incorrect handling.

- **Have the pump installed by qualified personnel only.**
- **The pump may never be operated without the module being installed.**

CAUTION! Damage to the pump due to overheating!
The pump must not be allowed to operate dry for more than 1 minute. Dry running causes a build-up of energy in the pump, which can damage the shaft, impeller, and mechanical seal.

- **Make sure that the volume flow does not go below the minimum value Q_{min}.**
  Calculation of Q_{min}:

$$Q_{min} = 10\% \times Q_{max\ pump} \times \frac{\text{Actual speed}}{\text{Max. speed}}$$

7.1 Permitted installations position and change of the arrangement of components before the installation

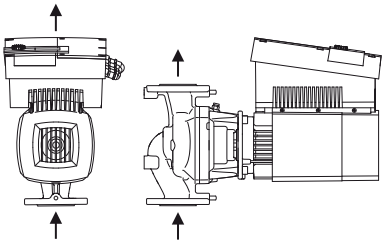


Fig. 20: Arrangement of the components upon delivery

The component arrangement concerning the pump housing is preinstalled as a factory setting (see Fig. 20) at can be changed if need be at the operating location. This can be necessary, for example, to:

- Ensure the bleeding of the pumps
- Make operation easier
- Prevent impermissible installation positions (i.e. motor and/or electronic module downwards)

In most cases, it is enough to rotate the motor impeller unit relative to the pump housing. The possible arrangement of components is the result of the permitted installation positions.

Permitted installation positions with horizontal motor shaft

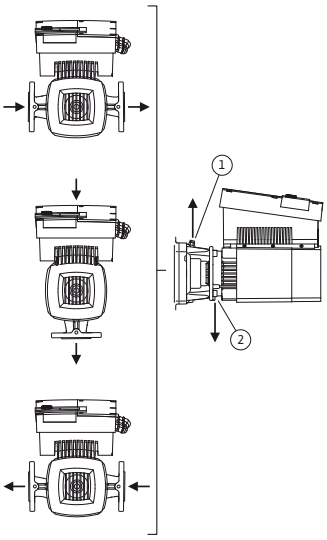


Fig. 21: Permitted installation positions with horizontal motor shaft

The permitted installation positions with horizontal motor shaft are shown in Fig. 21. Any installation position is allowed except for “electronic module facing down”. The venting of the pump is only ensured when the bleed valve is pointing upwards (Fig. 21, Item 1).
Only in this position can condensate be directed away and into a provided drilled hole (Fig. 21, Item 2).

Permitted installation positions with vertical motor shaft

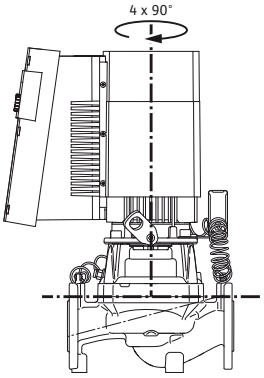


Fig. 22: Permitted installation positions with vertical motor shaft

The permitted installation positions with vertical motor shaft are shown in Fig. 22. Any installation position is allowed except for “motor facing down”.

The motor impeller unit can – relative to the pump housing – be arranged in four different positions (each shifted by 90°).

Changing the component arrangement

NOTE:
To make the installation work easier, the “dry” installation of the pump in the piping can be helpful, e.g., installation without electrical connection and without filling of the pump or system.

- Carry out steps 5 to 10 in accordance with chapter 10.2.1 “Replacing the mechanical seal” on page 100.
- Rotate the motor impeller unit by 90° or 180° in the desired direction and install the pump in the reverse order.
- Fasten the holder of the differential pressure sensor (Fig. 6, Item 6) with one of the screws (Fig. 6, Item 3) on the side opposite the electronic module (the position of the sensor relative to the module does not change when doing this).
- Wet the O-ring (Fig. 6, Item 11) well before installation (do not install the O-ring in a dry condition).

NOTE:
Be sure that the O-ring (Fig. 6, Item 11) is not installed in a twisted position or squeezed during installation.

- Before commissioning, fill the pump/system and apply system pressure; check for leaks afterwards. If there is a leak at the O-ring, first air

will come out of the pump. This leakage can, for example, be checked with a leakage spray at the gap between the pump housing and the lantern as well as their screwed connections.

- In the event of continual leakage, use a new O-ring, if need be.

CAUTION! Danger of personal injury!

Incorrect handling can result in property damage.

- **If the transport eyes are moved from the motor flange to the motor housing, e.g. to replace the motor impeller unit, then these have to be reattached to the motor flange after completion of the installation work (also see chapter 3.2 "Transport for installation/dismantling purposes" on page 62). In addition, the spacers are also to be screwed back into the openings (Fig. 6, Item 20b).**

CAUTION! Danger of property damage!

Incorrect handling can result in property damage.

- **When turning the components, make sure that the pressure measuring lines are not bent or kinked.**
- When reinstalling the differential pressure sensor, bend the pressure measuring lines evenly and as little as possible to put them into the required position or into a suitable position. When doing this, do not deform the areas at the clamp boltings.
- For optimal positioning of the pressure measuring lines, the differential pressure sensor can be separated from the holder (Fig. 6, Item 6), rotated by 180° around the longitudinal axis and reinstalled.

7.2 Installation

Preparation

- The pump should only be installed following completion of all welding and soldering work and, if necessary flushing of the pipe system. Dirt can cause pump failure.
- The pumps must be protected from the weather and installed in a frost/dust-free, well-ventilated environment which is not potentially explosive. The pump must not be installed outdoors.
- Install the pump in a place that is easy to access so that subsequent inspections, maintenance (e.g. mechanical seal) or replacement is easily possible. Air flow to the electronic module's heat sink must not be restricted.

Positioning/alignment

- A hook or a lug with sufficient load-bearing capacity must be installed vertically over the pump (total weight of the pump: see catalogue/data sheet). This is to allow hoisting gear or similar aids to be attached to the pump during maintenance or repair work.

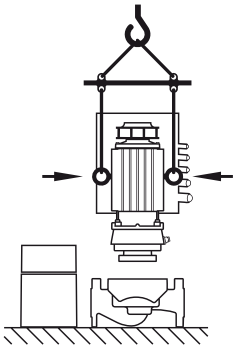


Fig. 23: Transport of the motor impeller unit

DANGER! Danger of death!
The pump itself and the parts of pump can be extremely heavy. Falling parts pose a risk of cuts, crush injuries, bruises or impacts, which may lead to death.

- **Always use suitable lifting equipment and secure parts against falling.**
- **Never stand underneath a suspended load.**

CAUTION! Danger of property damage!
Danger of damage due to incorrect handling.

- **If the transport eyes have been moved from the motor flange and installed at the motor housing, then they are only approved for carrying or transporting the motor impeller unit (Fig. 23) and not for transport of the whole pump and not for separation of the motor impeller unit from the pump housing (pay attention to the previous dismantling and subsequent installation of the spacer).**
- **Transport eyes that have been installed at the motor housing are not approved for the transport of the whole pump and not for sep-**

arating or pulling out of the motor impeller unit from the pump housing.

- **Only lift the pump with approved load-bearing equipment (e.g. block and tackle, crane, etc.; see chapter 3 “Transport and interim storage” on page 62).**

- When installing the pump, an axial minimum wall/roof clearance of the motor's fan cover of 400 mm is to be maintained.

NOTE:
Shut-off devices shall be installed in front of and behind the pump in all cases, in order to avoid having to drain the entire system when checking or replacing the pump.

CAUTION! Danger of property damage!
A volume flow going against or with the direction of flow (turbine operation or generator operation) can cause irreparable damage to the drive.

- **A non-return valve shall be installed on the pressure side of each pump.**
- The pipes and pump must be free of mechanical stress when installed. The pipes must be fastened in such a way that the pump does not bear the weight of the pipes.
- The direction of flow must correspond to the direction arrow on the pump housing flange.
- The bleed valve at the lantern (Fig. 6, Item 19) always has to be pointed upwards if the motor shaft is horizontal (Fig. 5/6). If the motor shaft is vertical, any orientation is permitted.
- Any installation position is allowed except for “motor facing down”.
- The electronic module must not face downwards.

NOTE:
When pumping out a tank, ensure that the fluid level is always high enough above the suction port of the pump so that the pump never runs dry. The minimum inlet pressure must be maintained.

- When the pump is used in air-conditioning or cooling systems, the condensation that forms in the lantern can be drained specifically via an existing hole. A drain pipe can be connected at this opening. Small amounts of fluid leakage can be also drained off.

NOTE:
In the case of insulated systems, only the pump housing may be insulated, not the lantern or motor.

7.3 Electrical connection

Safety

DANGER! Danger of death!
A fatal shock may occur if the electrical connection is not made correctly.

- **Only allow the electrical connection to be made by an electrician approved by the local electricity supplier and in accordance with applicable local regulations.**
- **Observe the installation and operating instructions for the accessories!**

DANGER! Danger of death!
Contact voltage can be life-threatening.
Work on the module may only be started after waiting five minutes, due to the dangerous residual contact voltage (capacitors).

- **Before working on the pump, disconnect the power supply and wait for five minutes.**
- **Check to ensure all connections (including potential-free contacts) are voltage-free.**

- **Never use an object to poke around the openings on the module and never insert anything into the module!**

DANGER! Danger of death!
For generator operation or turbine operation of the pump (rotor drive), there may be a dangerous contact voltage at the module's contacts.

- **Close the shut-off device in front of and behind the pump.**

WARNING! Danger of mains overload!
An inadequate mains design can lead to system failures and even to cable fires due to mains overload.

- **When designing the mains, with regard to the cable cross-sections and fuses, give special consideration to the fact that short-term simultaneous operation of all pumps is possible in multi-pump operation.**

Preparation/Notes

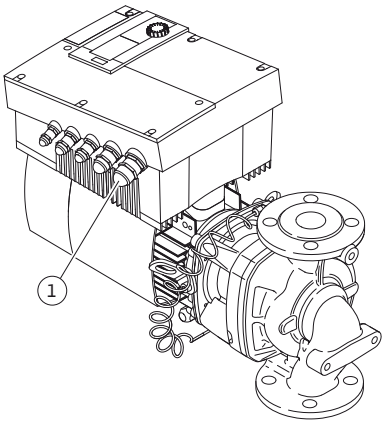


Fig. 24: M25 threaded cable connection

- The electrical connection must be established via a fixed power cable (cross-section to be maintained: 4 x 1.5 mm^2, min.; 4 x 4 mm^2, max.), which has a plug attachment or an all-pole switch with a contact opening width of at least 3 mm. The power cable is to be fed through the M25 threaded cable connection (Fig. 24, Item 1).
- In order to comply with electromagnetic compatibility standards, the following cables must always be shielded:
  - DDG (if installed on-site)
  - IN2 (setpoint)
  - DP communication (for cable lengths > 1 m); (terminal “MP”)
    Comply with polarity:
    MA = L => SL = L
    MA = H => SL = H
  - Ext. Off
  - AUX
  - Communication cable IF-Module

  The shield must be applied to both sides: on the EMC cable clips in the module and on the other end. The lines for SBM and SSM do not have to be shielded.
- In order to ensure drip protection and strain relief on the threaded cable connection, cables with a sufficient outer diameter must be used and must be screwed sufficiently tightly. Also, the cables near the threaded cable connection are to be bent to form a drainage loop, to drain any accumulated drips. Position the threaded cable connection or lay the cables accordingly to ensure that no drips can run into the module. Non-assigned threaded cable connections must remain sealed with the plugs provided by the manufacturer.
- The supply cable is to be placed in such a way that under no circumstances can it come into contact with the pipe and/or the pump and motor housing.
- When pumps are used in systems with water temperatures above 90°C, a suitably heat-resistant connection line must be used.
- This pump is equipped with a frequency converter and may not be protected by a residual-current-operated protection switch. Frequency converters can impair the function of residual-current-operated protection circuits.

  Exception: residual-current-operated protection switches which have a selective type B universal-current-sensitive design are allowed.
  - Labelling: RCD
  - Trigger current: > 30 mA
- Check the current type and voltage of the mains connection.

- Observe the name plate information for the pump. The current type and voltage of the mains connection must correspond to the specifications on the name plate.
- Mains side fuse protection: max. permissible 25 A
- Take additional earthing into account!
- The use of a miniature circuit breaker is recommended.

NOTE:
Miniature circuit breaker tripping characteristic: B
- Overload: 1.13–1.45 x $I_{nominal}$
- Short-circuit: 3–5 x $I_{nominal}$

Terminals

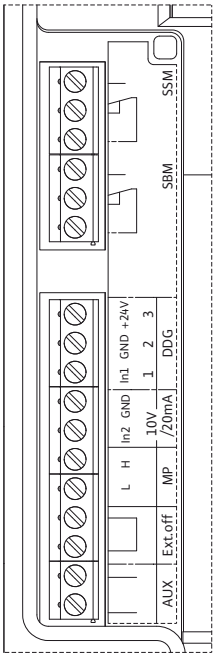


Fig. 25: Control terminals

- Control terminal (Fig. 25)
  (See following table for assignment)

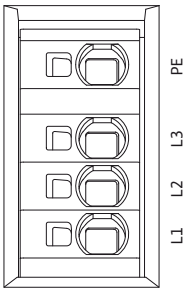


Fig. 26: Power terminals (mains connection terminals)

- Power terminals (mains connection terminals) (Fig. 26)
  (See following table for assignment)

Connection terminal allocation

Designation	Assignment	Notes
L1, L2, L3	Mains connection voltage	Three-phase current 3~400 V AC, 50 Hz, IEC 38.
PE	Protective conductor connection	
IN1 (1) (input)	Actual value input	Type of signal: Voltage (0–10 V, 2–10 V) Input resistance: $R_i \geq 10$ kΩ Type of signal: Current (0–20 mA, 4–20 mA) Input resistance: $R_i = 500$ Ω Can be configured in the service menu <5.3.0.0> Connected at the factory via the M12 threaded cable connection (Fig. 2), via (1), (2), (3) according to the sensor cable designations (1,2,3).
IN2 (input)	Setpoint input	IN2 can be used as the input for remote setpoint adjustment in all operating modes. Type of signal: Voltage (0–10 V, 2–10 V) Input resistance: $R_i \geq 10$ kΩ Type of signal: Current (0–20 mA, 4–20 mA) Input resistance: $R_i = 500$ Ω Can be configured in the service menu <5.4.0.0>
GND (2)	Earth connections	For both input IN1 and IN2
+ 24 V (3) (output)	DC voltage for an ext. consumer/sensor	Max. load 60 mA. The voltage is short-circuit proof.
AUX	External pump cycling	Pump cycling can be performed using an external, potential-free contact. One-time bridging of the two terminals will cause external pump cycling to take place, if it is enabled. Bridging a second time will cause the procedure to repeat, provided the minimum run time is adhered to. Can be configured in the service menu <5.1.3.2> Contact load: 24 V DC/10 mA
MP	Multi Pump	Interface for dual pump function
Ext. Off	Control input “Overriding off” for external, potential-free switch	The pump can be switched on/off via an external potential-free contact. In systems with a high switching frequency (> 20 on/off operations per day); switching on/off must take place via “Ext. Off”. Can be configured in the service menu <5.1.7.0> Contact load: 24 V DC/10 mA
SBM	Individual run signal/collective run signal, readiness signal and mains on signal	Potential-free individual run signal/collective run signal (changeover contact), operation readiness signal is available at the SBM terminals (menus <5.1.6.0>, <5.7.6.0>).
	Contact load:	Permitted minimum: 12 V DC, 10 mA Permitted maximum: 250 V AC, 1 A.
SSM	Individual/collective fault signal	Potential-free single/collective fault signal (changeover contact) is available at the SSM terminals (menu <5.1.5.0>).
	Contact load:	Permitted minimum: 12 V DC, 10 mA Permitted maximum: 250 V AC, 1 A.
Interface IF-Module	Connection terminals of the serial digital BA interface	The optional IF-Module is pushed into a multi-plug in the terminal box. The connection is twist proof.

NOTE:
The terminals IN1, IN2, AUX, GND, Ext. Off and MP meet the requirement for “safe isolation” (in acc. with EN61800-5-1) to the mains terminals, as well as to the SBM and SSM terminals (and vice versa).

Differential pressure sensor connection

Cable	Colour	Terminal	Function
1	black	IN1	Signal
2	blue	GND	Earth
3	brown	+24 V	+24 V

NOTE:
For a double pump or Y-pump installation, the differential pressure sensor is to be connected to the master pump.
The measuring points of the differential pressure sensor of the master pump must be on the suction and pressure side of the double-pump system in the corresponding collector pipe.

Procedure

- Establish connections observing the terminal allocation.
- Earth the pump/system according to regulations.

8 Operation

8.1 Operating elements

The electronics module is operated using the following operating elements:

The red button

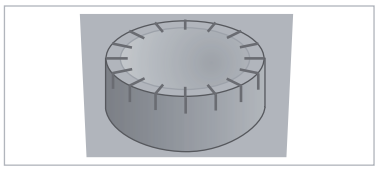


Fig. 27: The red button

The red button (Fig. 27) can be turned to select menu elements and used to change values. Pressing the red button activates a selected menu element and confirms values.

DIP switch

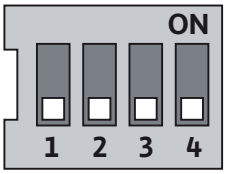


Fig. 28: DIP switch

The DIP switches (Fig. 13, Item 5/Fig. 28) are located under the housing cover.

- Switch 1 is for switching between the standard and service mode.
  For additional information, see chapter 8.6.6 “Activating/deactivating service mode” on page 88.
- Switch 2 allows activation or deactivation of the “access disable” feature.
  For additional information, see chapter 8.6.7 “Activating/deactivating access disable” on page 88.
- Switches 3 and 4 permit termination of the multi-pump communication.
  For additional information, see chapter 8.6.8 “Activating/deactivating termination” on page 88.

8.2 Display structure

Information appears on the display as shown in the sample illustration below:

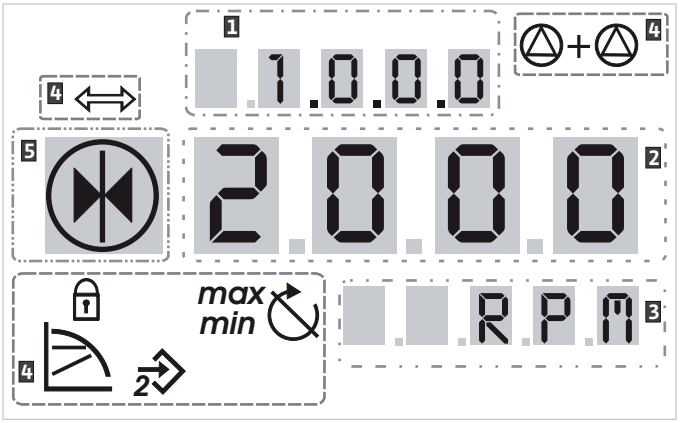


Fig. 29: Display structure

Item	Description	Item	Description
1	Menu number	4	Standard symbols
2	Value display	5	Symbol display
3	Units display		

NOTE:
The display can be rotated by 180°. To change, see menu number <5.7.1.0 >.

8.3 Explanation of standard symbols

The following symbols are shown on the display at the positions shown above:

Symbol	Description	Symbol	Description
	Constant speed control	min	Min operation
	Constant control Δp-c	max	Max. operation
	variable control Δp-v		Pump is running
	PID control		Pump is stopping
	Input In (external setpoint) activated		Pump running in emergency operation
	Access disable		Pump stops in emergency operation
	BMS (**B**uilding **M**anagement **S**ystem) is active		DP/MP operating mode: Main/reserve
	DP/MP operating mode: Parallel operation		-

8.4 Symbols in graphics/instructions

Chapter 8.6 “Operating instructions” on page 85 contains graphics that illustrate the operating concept and provide instructions for configuring settings.

In the graphics and instructions, the following symbols are used as simple representations of menu elements or actions:

Menu elements

- **Menu status page**: Standard view on the display.
- **“One level down”:** A menu element that can be used to jump to a lower menu level (e.g. <4.1.0.0> to <4.1.1.0>.
- **“Information”:** A menu element that shows information about the device status or settings that cannot be changed.
- **“Selection/setting”:** A menu element that provides access to a changeable setting (element with menu number <X.X.X.0>).

“One level up”: A menu element that can be used to jump to a higher menu level (e.g. <4.1.0.0> to <4.0.0.0>.

Menu error page: In the event of an error, the current error number is displayed instead of the status page.

Actions

- **Turn red button**: Turn the red button or increase or decrease settings or menu numbers.
- **Press red button**: Press the red button to activate a menu element or confirm a change.
- **Navigate**: Perform the steps that follow to navigate in the menu to the displayed menu number.
- **Wait time:** The remaining time (in seconds) is displayed on the value display until the next state is reached automatically or manual input can be made.
- **Set DIP switch to the OFF position**: Set the DIP switch number “X” under the housing cover to the 'OFF' position.
- **Set DIP switch to the ON position**: Set the DIP switch number “X” under the housing cover to the 'ON' position.

8.5 Display modes

Display test

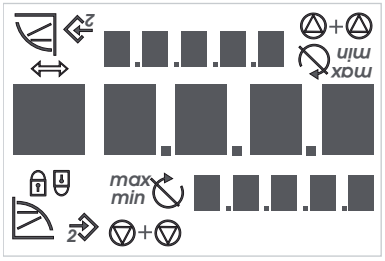


Fig. 30: Display test

As soon as the power supply of the electronic module has been established, a 2-second display test is carried out, during which all characters on the display are shown (Fig. 30). Afterwards the status page is displayed.

After interruption of the power supply, the module carries out various shut-off functions. The display will be shown for the duration of this process.

DANGER! Danger of death!
There can be electrical charges present in the display even if is switched off.

- **Observe general safety instructions!**

8.5.1 Display status page

The standard view on the display is the status page. The current set-point is displayed in the number segments. Other settings are displayed using symbols.

NOTE:
For dual pump operation, the operating mode is also shown in symbol format on the status page (“Parallel operation” or “Main/reserve”). The display of the slave pump shows “SL”.

8.5.2 Display menu mode

The electronic module functions can be called via the menu structure. The menu contains sub-menus on several levels.

The current menu level can be changed using “One level up” or “One level down” menu items, for example, to change from menu <4.1.0.0.> to <4.1.1.0>.

The menu structure is similar to structure of the chapters and sections in these operating instructions: Section 8.5(.0.0) contains subsections 8.5.1(.0) and 8.5.2(.0); in the electronics module, menu <5.3.0.0> contains menu sub-items <5.3.1.0> to <5.3.3.0>, etc.

The currently selected menu element can be identified by the menu number on the display and the associated symbol.

Within a menu level, menu numbers can be selected sequentially by turning the red button.

NOTE:
If the red button is not operated for 30 seconds at any position in menu mode, the display returns to the status page.

Every menu level can contain four different element types:

"One level down" menu element

The "One level down" menu element is indicated on the display by the symbol shown here (arrow on the units display). If a "One level down" menu element is selected, pressing the red button causes a change to the next menu level down. On the display, the new menu level is indicated by a menu number that has increased by one digit as a result of the change; for example, menu <4.1.0.0> changes to menu <4.1.1.0>.

"Information" menu element

The "Information" menu element is marked on the display by the symbol shown here (standard symbol for "access disable"). If an "Information" menu element is selected, pressing the red button has no effect. When an "Information" menu element is selected, current settings or measurements that cannot be changed by the user are displayed.

"One level up" menu element

The "One level up" menu element is indicated on the display by the symbol shown here (arrow on the symbol display). If a "One level up" menu element is selected, briefly pressing the red button causes a change to the next higher menu level. On the display, the new menu level is indicated by the menu number. For example, when one returns from menu level <4.1.5.0>, the menu number jumps to <4.1.0.0>.

NOTE:
If the red button is pressed for two seconds while a "One level up" menu element is selected, the display jumps back to the status page.

"Selection/setting" menu element

The "Selection/setting" menu element does not have a special label on the display, but is identified graphically in these instructions by the adjacent symbol.

If a "Selection/setting" menu element is selected, pressing the red button will change to edit mode. In edit mode, flashing values can be changed by turning the red button.

In some menus, acceptance of the input by pressing the red button will be confirmed by the brief display of the "OK" symbol.

8.5.3 Display error page

Fig. 31: Error page (status in the event of an error)

If an error occurs, the error page will be shown on the display rather than the status page. The value display shows the letter "E" and the three-digit error code separated by a decimal point (Fig. 31).

8.5.4 Menu groups

Basic menu

Basic settings are shown in the main menus <1.0.0.0>, <2.0.0.0> and <3.0.0.0>, which provide access to set values that may have to be changed during regular pump operation.

Info menu

The main menu <4.0.0.0> and its sub-menu elements show measuring data, device data, operating data and current states.

Service menu

The main menu <5.0.0.0> and its sub-menu elements provide access to basic system settings for commissioning. The sub-elements are in a write-protected mode as long as service mode is not activated.

CAUTION! Danger of property damage!
Improper setting changes can lead to pump operation errors, which can lead to property damage to the pump or system.

- **Settings in service mode should only be made during commissioning and only by qualified personnel.**

Error acknowledgement menu

In the event of an error, the error page is displayed instead of the status page. Pressing the red button from this position opens the error acknowledgement menu (menu number <6.0.0.0>). Any fault signals present can be acknowledged after a waiting period.

CAUTION! Danger of property damage!
Errors which are acknowledged without their cause having been remedied can result in repeated faults, which could lead to property damage to the pump or system.

- **Only acknowledge errors after they have been remedied.**
- **Only have faults corrected by qualified personnel.**
- **If in doubt, consult the manufacturer.**

For additional information, see chapter 11 “Faults, causes and remedies” on page 105 and the error table shown there.

Access disable menu

The main menu <7.0.0.0> is only displayed when DIP switch 2 is in the ON position. It cannot be reached via normal navigation.

In the “Access disable” menu, the access disable can be activated or deactivated by turning the red button. The change is confirmed by pressing the red button.

8.6 Operating instructions

8.6.1 Adjusting the setpoint

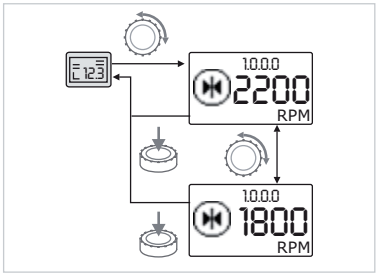


Fig. 32: Entering the setpoint

On the status page of the display, the setpoint can be adjusted as follows (Fig. 32):

- Turn the red button.

  The display changes to menu number <1.0.0.0>. The setpoint begins to flash and is increased or decreased by continuing to turn.
- To confirm the change, press the red button.

  The new setpoint will be accepted and the display will return to the status page.

8.6.2 Changing to menu mode

To change to menu mode, proceed as follows:

- While the display is showing the status page, press the red button for two seconds (except in case of an error).

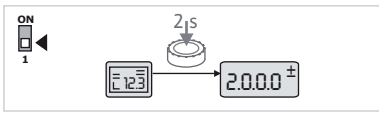


Fig. 33: Standard menu mode

Standard behaviour:
The display changes to menu mode. Menu number <2.0.0.0> is displayed (Fig. 33).

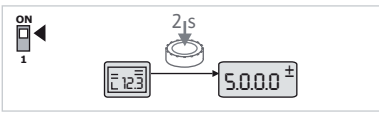


Fig. 34: Service menu mode

Service mode:
If service mode is activated via DIP switch 1 menu number <5.0.0.0> is displayed first. (Fig. 34).

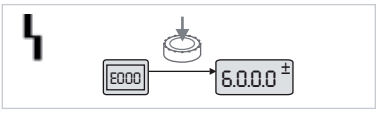


Fig. 35: Error case menu mode

Error case:
In case of error, menu number <6.0.0.0> is displayed (Fig. 35).

8.6.3 Navigation

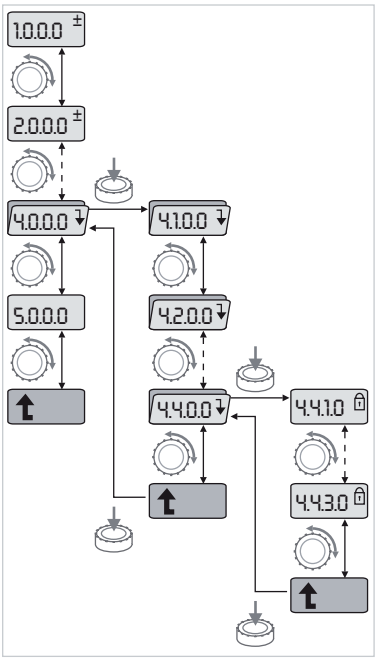


Fig. 36: Navigation example

- Change to menu mode (see 8.6.2 “Changing to menu mode” on page 86).

Carry out general menu navigation as follows (for an example, see Fig. 36):

During navigation, the menu number flashes.

- To select the menu element, turn the red button.

  The menu number is incremented up or down. The symbol associated with the menu element and the setpoint or actual value are shown, if applicable.

- If the downward pointing arrow for “One level down” is shown, press the red button to change to the next level down. On the display, the new menu level is indicated by the menu number, for example, <4.4.0.0> changes to <4.4.1.0>.

  The symbol for the menu element and/or the current value (setpoint, actual value or selection) will be shown.

- To return to the next higher menu level, select the “One level up” menu element and press the red button.

  On the display, the new menu level is indicated by the menu number, for example, <4.4.1.0> changes to <4.4.0.0>.

NOTE:
If the red button is pressed for two seconds while a “One level up” menu element is selected, the display jumps back to the status page.

8.6.4 Changing selection/settings

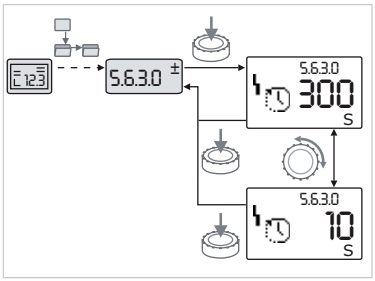


Fig. 37: Setting with return to the "Selection/settings" menu element

To change a setpoint or a setting, generally proceed as follows (for an example, see Fig. 37):

- Navigate to the desired "Selection/settings" menu element.

  The current value or state of the setting and the associated symbol are displayed.
- Press the red button. The symbol representing the setpoint or the setting flashes.
- Turn the red button until the desired setpoint or setting is displayed. For an explanation of the settings represented by the symbols, see the table in chapter 8.7 "Menu elements reference" on page 89.
- Press the red button again.

  The selected setpoint or setting is confirmed, and the value or symbol stops flashing. The display is back in menu mode with the menu number unchanged. The menu number flashes.

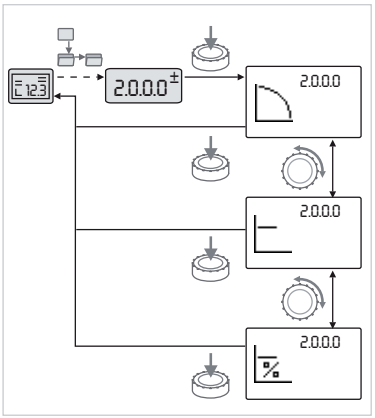


Fig. 38: Setting with return to the status page

NOTE:
When values are changed under <1.0.0.0>, <2.0.0.0> and <3.0.0.0>, <5.7.7.0> and <6.0.0.0>, the display jumps back to the status page (Fig. 38).

8.6.5 Calling up information

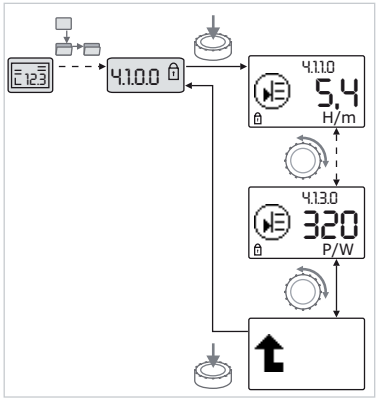


Fig. 39: Calling up information

Changes cannot be made in "Information" menu elements. These are identified on the display by the default "access disable" symbol. To call up current settings, proceed as follows:

- Navigate to the desired "Information" menu element (<4.1.1.0> in the example).

  The current value or state of the setting and the associated symbol are displayed. Pressing the red button has no effect.
- Turn the red button to access the "Information" menu elements in the current sub-menu (see Fig. 39). For an explanation of the settings represented by the symbols, see the table in chapter 8.7 "Menu elements reference" on page 89.
- Turn the red button until the "One level up" menu element is displayed.
- Press the red button.

  The display returns to the next higher menu level (<4.1.0.0> here).

8.6.6 Activating/deactivating service mode

Additional settings can be made in service mode. The mode is activated or deactivated as follows.

CAUTION! Danger of property damage!
Improper setting changes can lead to pump operation errors, which can lead to property damage to the pump or system.

- **Settings in service mode should only be made during commissioning and only by qualified personnel.**

- Set DIP switch 1 to the ON position.

  Service mode is activated. The symbol shown here flashes on the status page.

The sub-elements of menu 5.0.0.0 switch from the "Information" element type to the "Selection/setting" element type, and the standard "access disable" symbol (see symbol) is hidden for the respective elements (except for <5.3.1.0>).

The values and settings for these elements can now be edited.

- To deactivate, return the switch to its starting position.

8.6.7 Activating/deactivating access disable

In order to prevent impermissible changes to the pump settings, all functions can be disabled.

When access is disabled, this is shown on the status page by the default "access disable" symbol.

To activate or deactivate this, proceed as follows:

- Set DIP switch 2 to the ON position.

  Menu <7.0.0.0> is displayed.

- Turn the red button to activate or deactivate the disable.

- To confirm the change, press the red button.

  The current state of the disable is represented on the symbol display by the symbols shown here.

Disable active

No changes can be made to setpoints or settings. The read access to all menu elements remains as it was.

Disable inactive

The elements of the basic menu can be edited (menu elements <1.0.0.0 >, <2.0.0.0> and <3.0.0.0>).

NOTE:
To edit the sub-elements of menu <5.0.0.0>, service mode must also be activated.

- Reset DIP switch 2 to the OFF position.

  The display returns to the status page.

NOTE:
Errors can be acknowledged after a waiting period despite the "access disable" being active.

8.6.8 Activating/deactivating termination

In order to establish a definite communication connection between the modules, it is necessary to terminate both ends of the cable.

In a double pump, the modules are already prepared for double pump communication at the factory.

To activate or deactivate this, proceed as follows:

- Set DIP switches 3 and 4 to the "ON" position.

  TERMINATION IS ACTIVATED.

NOTE:
Both DIP switches must always be in the same position.

- To deactivate, return the switches to the starting position.

8.7 Menu elements reference

The following table gives an overview of the available elements of all menu levels. The menu number and the element type are designated separately, and the function of the element is explained. If applicable, there is information about the setting options of the individual elements.

NOTE:
A few elements are hidden under certain conditions and are therefore skipped in the menu navigation.

If, for example, the external setpoint adjustment under menu number <5.4.1.0> is set to “OFF”, the number <5.4.2.0> will be hidden. Menu number <5.4.2.0> will only be visible if menu number <5.4.1.0> has been set to “ON”.

The condition for hiding a menu element is explained in the last column of the table.

No.	Designation	Type	Symbol	Values/explanations	Display conditions
1.0.0.0	Setpoint	±		Setting/display of the setpoint (for further information, see chapter 8.6.1 “Adjusting the setpoint” on page 85)	
2.0.0.0	Control mode	±		Setting/display of the control mode (for further information, see chapters 9.4 “Setting the control mode” on page 97 and 6.2 “Control modes” on page 68)	
				Constant speed control	
				Constant Δp-c control	
				Variable Δp-v control	
				PID control	
3.0.0.0	Pump on/off	±		ON Pump switched on	
				OFF Pump switched off	
4.0.0.0	Information			Information menus	
4.1.0.0	Actual values			Display of current actual values	
4.1.1.0	Actual values sensor (IN1)			Depending on current control mode. Δp-c, Δp-v: Value H in m PID control: Value in %	Not displayed for manual control mode
4.1.2.0	Switching frequency		PWM	HIGH High switching frequency (factory setting)	The switching frequency can only be changed via the CAN bus or IR-Module
			PWM	LOW Low switching frequency	
4.1.3.0	Power			Current power input P_1 in watts	

No.	Designation	Type	Symbol	Values/explanations	Display conditions
4.2.0.0	Operating data			Display of operating data	The operating data refer to the module currently being operated
4.2.1.0	Operating hours			Sum of the pump's active hours of operation (counter can be reset by infrared interface)	
4.2.2.0	Consumption			Energy consumption in kWh/MWh	
4.2.3.0	Countdown, pump cycling			Time to pump cycling in h (at a resolution of 0.1 h)	Shown only for DP-MA and internal pump cycling. Can be set in the service menu <5.1.3.0>
4.2.4.0	Remaining time until pump kick			Time until the next pump kick (after the pump has had a 24 h standstill (e.g. via Ext. off), it will be automatically operated for 5 seconds)	
4.2.5.0	Mains on counter		123...	Number of switching-on procedures of the supply voltage (each occasion the supply voltage is established after an interruption is counted)	
4.2.6.0	Pump kick counter		123...	Number of pump kicks carried out	
4.3.0.0	States		ON OFF ON		
4.3.1.0	Base-load pump			The value display statically shows the identity of the regular base-load pump. The unit display statically shows the identity of the temporary regular base-load pump.	Only displayed in DP-MA mode
4.3.2.0	SSM			ON State of the SSM relay if there is no fault signal	
			MA		
			MA/SL		
				OFF State of the SSM relay if no fault signal is present	
			MA		
			MA/SL		
4.3.3.0	SBM			ON State of the SBM relay if a readiness/operation or “mains on” signal is present	
				OFF State of the SBM relay if no readiness/operation or “mains on” signal is present	

No.	Designation	Type	Symbol	Values/explanations	Display conditions
			  	SBM Run signal	
			  	SBM Readiness signal	
				SBM Mains on signal	
4.3.4.0	Ext. Off		  	Signal present at the input “Ext. off”	
			  	OPEN Pump is switched off	
			  	SHUT Pump is enabled for operation	
4.3.5.0	BMS protocol type			Bus system active	Only displayed when BMS is active
				LON field bus system	Only displayed when BMS is active
				CAN field bus system	Only displayed when BMS is active
				Gateway Protocol	Only displayed when BMS is active
4.4.0.0	Device data			Displays device data	
4.4.1.0	Pump name			Example: Stratos-GIGA 40/1-51/4.5 (display in ticker format)	Only the basic pump model appears on the display; version names are not shown.
4.4.2.0	Software version of user controller			Displays the software version of the user controller.	

No.	Designation	Type	Symbol	Values/explanations	Display conditions
4.4.3.0	Software version of motor controller			Display the software version of the motor controller	
5.0.0.0	Service			Service menus	
5.1.0.0	Multi pump			Double pump	Only displayed when DP is active (incl. sub-menus)
5.1.1.0	Operating mode	±		Main/standby operation	Only displayed in DP-MA mode
				Parallel operation	Only displayed in DP-MA mode
5.1.2.0	Setting, MA/SL	±		Manual converting from master to slave mode	Only displayed in DP-MA mode
5.1.3.0	Pump cycling				Only displayed in DP-MA mode
5.1.3.1	Manual pump cycling	±		Carries out pump cycling independent of the countdown	Only displayed in DP-MA mode
5.1.3.2	Internal/external	±		Internal pump cycling	Only displayed in DP-MA mode
				External pump cycling	Only displayed in DP-MA mode, see “AUX” terminal
5.1.3.3	Internal: Time interval	±		Can be set between 8 hours and 36 hours in 4-hour increments	Displayed when internal pump cycling is activated
5.1.4.0	Pump enabled/ disabled	±		Pump enabled	
				Pump disabled	
5.1.5.0	SSM	±		Individual fault signal	Only displayed in DP-MA mode
				Collective fault signal	Only displayed in DP-MA mode
5.1.6.0	SBM	±		Individual readiness signal	Is only displayed with DP-MA and SBM function at readiness/operation
				Individual run signal	Only displayed in DP-MA mode
				Collective readiness signal	Only displayed in DP-MA mode
				Collective run signal	Only displayed in DP-MA mode
5.1.7.0	External Off	±		Individual external Off	Only displayed in DP-MA mode
				Collective external Off	Only displayed in DP-MA mode
5.2.0.0	BMS			Settings for Building Management System (BMS) – building automation	Incl. all sub-menus, only displayed when BMS is active
5.2.1.0	LON wink/service	±		The wink function permits the identification of a device in the LON network. A “wink” is executed by confirmation.	Only displayed in LON operation
5.2.2.0	Local/remote operation	±		BMS local operation	

No.	Designation	Type	Symbol	Values/explanations	Display conditions
				BMS remote operation	
5.3.0.0	IN1 (sensor input)			Settings for sensor input 1	Not displayed in the manual control mode (incl. all sub-menus)
5.3.1.0	IN1 (sensor value range)			Display of sensor value range 1	Not displayed with PID control
5.3.2.0	IN1 (value range)			Setting of the value range Possible values: 0...10 V/2...10 V/ 0...20 mA/4...20 mA	
5.4.0.0	IN2			Setting for external setpoint input 2	
5.4.1.0	IN2 active/inactive			ON External setpoint input 2 active	
				OFF External setpoint input 2 inactive	
5.4.2.0	IN2 (value range)			Setting of the value range Possible values: 0...10 V/ 2...10 V/0...20 mA/4...20 mA	Not displayed when IN2 = inactive
5.5.0.0	PID parameters			Settings for PID control	Only displayed when PID control is active (incl. all sub-menus)
5.5.1.0	P parameter			Setting of the proportional term of the control	
5.5.2.0	I parameter			Setting of the integral term of the control	
5.5.3.0	D parameter			Setting of the derivative term of the control	
5.6.0.0	Error			Settings for behaviour in case of error	
5.6.1.0	HV/AC			HV “heating” mode	
				AC “cooling/air-conditioning” mode	
5.6.2.0	Emergency operation speed			Display of emergency operation speed	
5.6.3.0	Auto reset time			Time until automatic acknowledgement of an error	
5.7.0.0	Other settings				
5.7.1.0	Display orientation			Display orientation	
				Display orientation	

No.	Designation	Type	Symbol	Values/explanations	Display conditions
5.7.2.0	Pressure value correction	±		When pressure value correction is enabled, the differential pressure deviation measured by the differential pressure sensor that is factory-fitted on the pump flange is taken into account and corrected.	Only displayed in Δp-c mode. Is not displayed for all pump variants.
				Pressure value correction off	
				Pressure value correction on	
5.7.6.0	SBM function	±		Setting for behaviour of signals	
				SBM run signal	
				SBM readiness signal	
				SBM mains on signal	
5.7.7.0	Factory setting	±		OFF (default setting) Settings are not changed by confirming.	Is not displayed when “access disable” is active. Is not displayed when building management system active.
				ON Confirming will reset the settings to factory settings. **Caution!** All manual settings will be lost.	Is not displayed when “access disable” is active. Is not displayed when building management system active.
6.0.0.0	Error acknowledgement	±		For additional information, see chapter 11.3 “Acknowledging errors” on page 108.	Only displayed if an error is present
7.0.0.0	Access disable	±		“Access disable” inactive (changes possible) (for further information, see chapter 8.6.7 “Activating/deactivating access disable” on page 88).	
				“Access disable” active (no changes possible) (for further information, see chapter 8.6.7 “Activating/deactivating access disable” on page 88).	

9 Commissioning

Safety

DANGER! Danger of death!
Failure to install safety devices of the electronic module and the motor can cause electrical shock or contact with rotating parts, potentially resulting in life-threatening injuries.

- **Before commissioning as well as after maintenance work, all safety devices such as module covers and fan cover that were removed must be reinstalled.**
- **Keep a safe distance during commissioning!**
- **Never connect the pump without the module.**

Preparation

Before commissioning, the pump and module must be at ambient temperature.

9.1 Filling and bleeding

- Prime and bleed the system as required.

CAUTION! Damage to the pump!
Dry running will destroy the mechanical seal.

- **Make sure that the pump does not run dry.**
- To avoid cavitation noise and damage, a minimum inlet pressure must be guaranteed at the suction port of the pump. This minimum inlet pressure depends on the operating situation and the duty point of the pump, and must be defined accordingly.
- The main parameters for defining the minimum intake pressure are the NPSH of the pump at its duty point and the vapour pressure of the fluid.
- Bleed the pumps by releasing the bleed valves (Fig. 40, Item 1). Dry running destroys the mechanical seal of the pump. The differential pressure sensor must not be bled (risk of destruction).

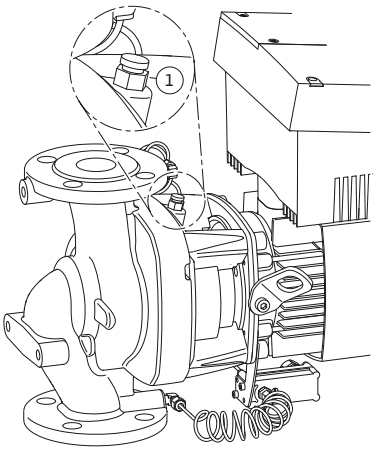


Fig. 40: Bleed valve

WARNING! Danger due to extremely hot or extremely cold pressurised fluid!
Depending on the temperature of the fluid and the system pressure, when the vent screw is opened completely, extremely hot or extremely cold fluid in liquid or vapour form may escape or shoot out at high pressure.

- **Always exercise caution when opening the vent screw.**
- **Protect the module box from any water escaping when bleeding.**

WARNING! Danger of burns or freezing to the pump when body parts come into contact with the pump!
Depending on the pump or system operating conditions (fluid temperature), the entire pump can become very hot or very cold.

- **Keep a safe distance during operation!**
- **Allow the pump/system to cool off/warm up before performing any work.**
- **Always wear protective clothing, protective gloves and protective goggles when working.**

WARNING! Danger of injury!
If the pump/system is installed improperly, liquid may be ejected during commissioning. Individual components may also become loose.

- **Keep a safe distance from the pump during commissioning.**
- **Wear protective clothing, protective gloves and protective goggles.**

DANGER! Danger of death!
Falling pumps or pump parts may result in life-threatening injuries.

- **When performing installation work, protect the pump components against falling.**

9.2 Double pump installation/Y-pump installation

Fig. 41: Setting the master pump

NOTE:
For the initial commissioning of a Y-pump installation that has not been preconfigured, both pumps are set to their factory setting. After connecting the double pump communication cable, the fault code "E035" is displayed. Both drives run at the emergency operation speed.

On acknowledgement of the error message, menu <5.1.2.0> is displayed and "MA" (= master) flashes. In order to acknowledge "MA", "access disable" must be deactivated and service mode must be active (Fig. 41).

Both pumps are set to "master" and "MA" flashes on the displays of both electronic modules.

- Acknowledge one of the two pumps as master pump by pressing the red button. The status "MA" appears on the display of the master pump. The differential pressure sensor must be connected on the master.
  The measuring points of the differential pressure sensor of the master pump must be on the suction and pressure side of the double-pump system in the corresponding collector pipe.

  The other pump will then display the status "SL" (= slave pump).

  All further pump settings must now be made via the master only.

NOTE:
The procedure can be manually started later by selecting the menu <5.1.2.0>.
(For information about navigation in the service menu, see 8.6.3 "Navigation" on page 86).

9.3 Setting the pump output

- The system was designed for a certain duty point (full load point, calculated maximum heating capacity requirement). During commissioning, the pump output (delivery head) must be set according to the duty point of the system.
- Factory settings do not comply with the pump output required for the system. It is determined with the help of the pump curve diagram for the selected pump type (from catalogue/data sheet).

NOTE:
The flow value shown on the IR-Monitor/PDA display or output to the building management system must not be used to control the pump. This value is merely an indicator of general trends.

A flow value is not output on every type of pump.

CAUTION! Danger of property damage!

An inadequate volume flow can lead to damage on the mechanical shaft seal; the minimum volume flow depends on the rotation speed of the pump.

- **Make sure that the volume flow does not go below the minimum value Q_{min}.**
  Calculation of Q_{min}:

$$Q_{min} = 10\% \times Q_{max\ pump} \times \frac{\text{Actual speed}}{\text{Max. speed}}$$

9.4 Setting the control mode

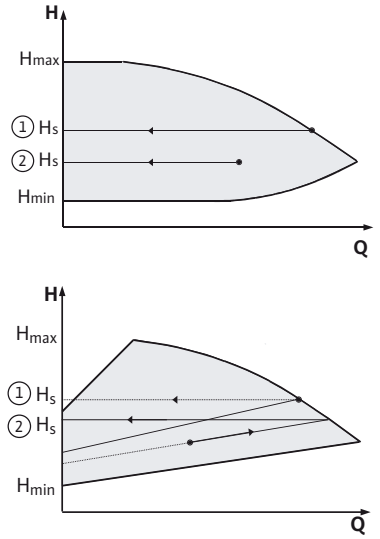


Fig. 42: Δp-c/Δp-v control

Δp-c/Δp-v control:

	Setting (Fig. 42)	Δp-c	Δp-v
①	Duty point on maximum pump curve	Draw from duty point towards the left. Read off setpoint H_S and set the pump to this value.	Draw from duty point towards the left. Read off setpoint H_S and set the pump to this value.
②	Duty point within the control range	Draw from duty point towards the left. Read off setpoint H_S and set the pump to this value.	Move to max. pump curve along control curve, then horizontally to the left, read off setpoint H_S and set the pump to this value.
	Adjustment range	H_{min}, H_{max} see pump curves (in catalogue, select or online)	H_{min}, H_{max} see pump curves (in catalogue, select or online)

NOTE:
Alternatively, manual control mode (Fig. 43) or PID operating mode can also be set.

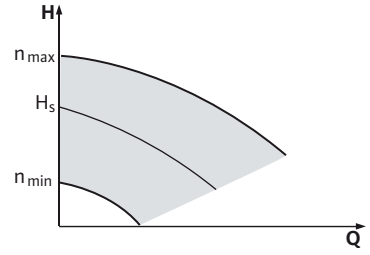


Fig. 43: Manual control mode

Manual control mode:

"Manual control" mode deactivates all other control modes. The speed of the pump is kept to a constant value and set using the rotary knob.

The speed range is dependent on the motor.

PID control:

The PID controller in the pump is a standard PID controller, as described in control engineering literature. The controller compares a measured process value to a predefined setpoint and attempts to adjust the process value to match the setpoint as closely as possible. Provided appropriate sensors are used, a variety of control systems (including pressure, differential pressure, temperature and flow control) can be realised. When selecting a sensor, keep in mind the electrical values presented in the table titled "Connection terminal allocation" on page 80.

The control behaviour can be optimised by adjusting the P, I and D parameters. The P (or proportional) term of the controller contributes a linear gain of the deviation between the process (actual) value and the setpoint to the controller output. The sign of the P term determines the controller's direction of action.

The I (or integral) term of the controller provides integral control based on the system deviation. A constant deviation results in a linear increase at the controller output. Hence a continuous system deviation is avoided.

The D (or derivative) term responds directly to the rate of change of the system deviation. This affects the rate at which the system responds. In the factory settings, the D term is set to zero, since this is an appropriate setting for a number of applications.

These parameters should only be changed in small increments, and the effects on the system should be monitored continuously. Parameter values should only be tuned by someone with training in control engineering.

Control portion	Factory setting	Adjustment range	Increment
P	0.5	–30.0 ... –2.0	0.1
		–1.99...–0.01	0.01
		0.00 ... 1.99	0.01
		2.0 ... 30.0	0.1
I	0.5 s	10 ms ... 990 ms	10 ms
		1 s ... 300 s	1 s
D	0 s (= deactivated)	0 ms ... 990 ms	10 ms
		1 s ... 300 s	1 s

The direction of action of the controller is determined by the sign of the P term.

Positive PID control (default):

If the sign of the P term is positive and the process value drops below the setpoint, the control will increase the pump speed until the setpoint has been reached.

Negative PID control:

If the sign of the P term is negative and the process value drops below the setpoint, the control will decrease the pump speed until the setpoint has been reached.

NOTE:
Check the controller's direction of action if PID control is being used, but the pump is only running at minimum or maximum speed without responding to changes in the parameter values.

10 Maintenance

Safety

Have maintenance and repair work carried out by qualified personnel only!

It is recommended to have the pump serviced and checked by WILO Customer Service.

DANGER! Danger of death!
There is a mortal danger through shock when working on electrical equipment.

- **Work on electrical equipment may only be done by electricians approved by the local electricity supplier.**
- **Before working on electrical equipment, switch it off and prevent it from being switched on again.**
- **Any damage to the connecting cable should always be rectified by a qualified electrician only.**
- **Never use an object to poke around the openings on the module or motor and never insert anything into the module or motor!**
- **Follow the installation and operating instructions for the pump, level control and other accessories.**

DANGER! Danger of death!
The permanently magnetised rotor inside the motor presents an acute danger to persons with pacemakers. Non-observance results in death or the most serious of injuries.

- **Do not open the motor!**
- **Only allow Wilo customer service to dismantle and install the rotor for maintenance and repair work.**

WARNING! Danger of personal injury!
Opening the motor leads to high, suddenly occurring magnetic forces. These can cause serious cuts, crushing injuries and bruises.

- **Do not open the motor!**
- **Only allow Wilo customer service to dismantle and install the motor flange and the end shield for maintenance and repair work.**

DANGER! Danger of death!
Failure to install safety devices at the module and at the motor can cause electrical shock or contact with rotating parts, potentially resulting in life-threatening injuries.

- **After maintenance, all safety devices (such as module and fan covers) that were removed must be reinstalled!**

CAUTION! Danger of property damage!
Danger of damage due to incorrect handling.

- **The pump may never be operated without the module being installed.**

DANGER! Danger of death!
The pump itself and the parts of pump can be extremely heavy. Falling parts pose a risk of cuts, crush injuries, bruises or impacts, which may lead to death.

- **Always use suitable lifting equipment and secure parts against falling.**
- **Never stand underneath a suspended load.**
- **Make sure the pump is securely positioned and is stable during storage and transport as well as prior to all installation and other assembly work.**

DANGER! Danger of burns or freezing to the pump when body parts come into contact with the pump!
Depending on the pump or system operating conditions (fluid temperature), the entire pump can become very hot or very cold.

- **Keep a safe distance during operation!**
- **In the case of high water temperatures and system pressures, allow the pump to cool down before all work.**
- **Always wear protective clothing, protective gloves and protective goggles when working.**

DANGER! Danger of death!
The tools used during maintenance work on the motor shaft (such as an open-end wrench) can be flung out if they come into contact with rotating parts and cause serious or even fatal injuries.

- **The tools used during maintenance work must be removed completely before the pump is started up.**
- **If the transport eyes are moved from the motor flange to the motor housing, they must be resecured to the motor flange following the installation or maintenance work.**

10.1 Air supply

After the completion of all maintenance work, reattach the fan cover with the provided screws so that the motor as well as the electronic module are sufficiently cooled.

The air supply to the motor housing must be checked at regular intervals. In case of contamination, ensure that an air supply is re-established in order to allow the both the motor and the module to cool sufficiently.

10.2 Maintenance work

DANGER! Danger of death!
Falling pumps or pump parts may result in life-threatening injuries.

- **When performing installation work, protect the pump components against falling.**

DANGER! Danger of death!
There is a mortal danger through shock when working on electrical equipment. Following removal of the module, a potentially fatal shock voltage may be present at the motor contacts.

- **Check for absence of voltage and cover or cordon off adjacent live parts.**

10.2.1 Replacing the mechanical seal

During the running-in period, a minor amount of dripping is to be expected. A visual inspection should be performed from time to time, however. If there is clearly detectable leakage, the seal must be changed.

Wilo offers a repair kit which contains the necessary parts for replacement.

Dismantling

1. Disconnect the system from the power supply and secure it against being switched on again.
2. Close the check valves in front of and behind the pump.
3. Make sure it is not live.
4. Earth the work area and short-circuit.
5. Disconnect the power cable.
6. Depressurise the pump by opening the bleed valve (Fig. 44 Item 1).

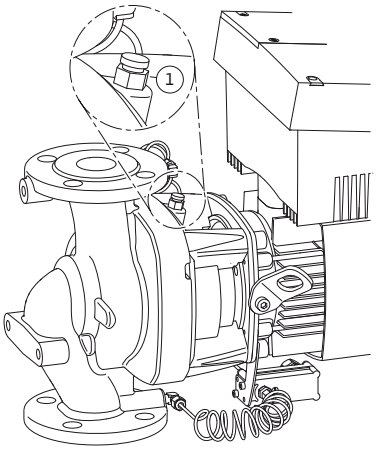


Fig. 44: Bleed valve

DANGER! Danger of scalding!
Due to high fluid temperatures there is a risk of scalding.

- **If the pump fluid is hot, allow it to cool down before performing any work.**

7. Loosen the screws (Fig. 6, Item 1) and pull off the fan cover (Fig. 6, Item 2) axially from the motor.
8. The spacers are to be turned out of the two drilled holes of the transport eyes (Fig. 6, Item 20b). Be sure to keep the spacers or screw them into the empty drilled holes after moving the transport eyes (see step 9) (Fig. 6, Item 20a).
9. Remove the two transport eyes (Fig. 6, Item 20) from the motor flange (Fig. 6, Item 20a) and attach them with the same screws to the motor housing (Fig. 6, Item 20b).
10. Attach the motor impeller unit to the transport eyes with suitable lifting equipment for the purpose of safeguarding.

NOTE:
When attaching the lifting equipment, avoid damaging the plastic parts, such as the fan wheel and module upper part.

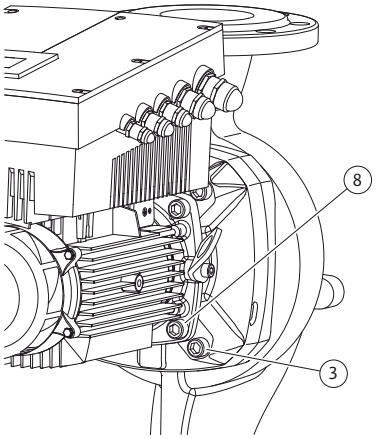


Fig. 45: Optional fixation of the motor impeller unit

11. Loosen and remove the screws (Fig. 6, Item 3). Depending on the pump type, the outer screws (Fig. 45, Item 3) are to be taken. The motor impeller unit (see Fig. 12) remains securely in the pump housing after the removal of the screws; there is no a danger of tipping even in the horizontal position of the motor shaft.

NOTE:

An offset screwdriver or socket wrench with ball coupling is best suited for unscrewing of the screws (Fig. 6, Item 3), especially for the pump types with limited space available. It is recommended to use two mounting bolts (see chapter 5.4 “Accessories” on page 65) instead of two screws (Fig. 6, Item 3) which are screwed in diagonally to each other in the pump housing (Fig. 6, Item 14). The mounting bolts make it easier to avoid damaging the impeller when dismantling the motor impeller unit and then reinstalling it.

12. When the screws (Fig. 6, Item 3) are removed, the differential pressure sensor will also be released from the motor flange. Allow the differential pressure sensor (Fig. 6, Item 5) with the holder (Fig. 6, Item 6) to be suspended at the pressure measurement lines (Fig. 6, Item 13).
    Disconnect the connecting cable of the differential pressure sensor in the electronic module.
13. Press the motor impeller unit (see Fig. 12) off the pump housing. It is a good idea to use two threaded holes (Fig. 46, Item 1) for this; particularly to loosen the seating. Screw two suitable screws into the threaded holes to loosen the seating. If the motor impeller unit can be moved easily, slots (Fig. 46, Item 2) between the pump housing and the lantern can also be used for pressing off (for example, use two screwdrivers as levers to do this). After pressing out about 15 mm, the motor impeller unit will no longer be guided in the pump housing.

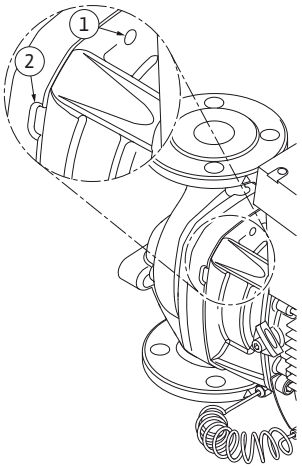


Fig. 46: Threaded holes and slots for pressing off the motor impeller unit from the pump housing

NOTE:

When pressing out further, the motor impeller unit (see Fig. 12) must, if necessary, be supported by lifting equipment to prevent possible tipping (especially if no mounting bolts are used).

14. Release the two captive screws (Fig. 47, Item 1) and remove the protective plate (Fig. 47, Item 2).
15. Put an open-end wrench (22 mm is the best size) into the lantern window and hold the shaft steady with the wrench surfaces (Fig. 47, Item 3). Unscrew the impeller nut (Fig. 6, Item 15). The impeller (Fig. 6, Item 16) is automatically pulled off the shaft.
16. Depending on the pump type, loosed the screws (Fig. 6, Item 10) or alternatively, the screws (Fig. 45, Item 8).
17. Release the lantern by using the two-arm extractor (universal extractor) from the motor centring device and pull it off the shaft. The mechanical seal (Fig. 6, Item 12) will also be removed when this is done. Prevent the lantern from being canted.
18. Press the mechanical seal's counter ring (Fig. 6, Item 17) out of the seat in the lantern.
19. Carefully clean the seating areas of the shaft and the lantern.

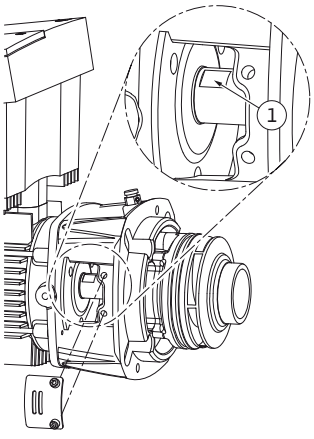


Fig. 47: Wrench surfaces on the shaft

Installation

NOTE:

For the following steps, observe the screw tightening torque specified for the respective thread type (see Tab. 2 “Screw tightening torques”).

20. Clean the flange support and centring surfaces of the pump housing, lantern and motor flange to ensure proper positioning of the parts.
21. Insert a new counter ring in the lantern.
22. Carefully push the lantern over the shaft and position it in the old position or another desired angular position to the motor flange. Observe the permitted installation positions of the components when doing this (see chapter 7.1 “Permitted installations position and change of the arrangement of components before the installation” on page 74). Attach the lantern with the screws (Fig. 6, Item 10) **or** – for the pump/lantern types in accordance with (Fig. 45) – with the screws (Fig. 45, Item 8) at the motor flange.
23. Push the new rotating unit of the mechanical seal (Fig. 6, Item 12) onto the shaft.

CAUTION! Danger of property damage!
Danger of damage due to incorrect handling.

- **The impeller is attached with a special nut whose assembly requires a particular procedure described below. If the installation instructions are not observed, there is a danger of over-screwing the thread or of harming the pumping function. The removal of damaged parts can be very difficult and lead to damaging of the shaft.**
- **Apply thread paste to both impeller nut threads for every installation. The thread paste has to be suitable for stainless steels and for the permitted operating temperature of the pump (e.g. Molykote P37). Dry assembly can lead to thread seizing (cold welding) of the thread and make the next dismantling impossible.**

24. During the assembly of the impeller, put an open-end wrench (22 mm is the best size) into the lantern window and hold the shaft steady with the wrench surfaces (Fig. 47, Item 3).
25. Screw the impeller nut into the impeller hub as far as it will go.
26. Tighten the impeller together with the impeller nut on the shaft **by hand** without changing the position achieved in the previous step. Do not use a tool to tighten the impeller.
27. Hold the impeller and manually loosen the impeller nut by about two rotations.
28. Without changing the position achieved in the previous step 27, tighten the impeller together with the impeller nut on the shaft again until increasing friction resistance occurs.
29. Hold on to the shaft (see step 24) and tighten the impeller nut with the specified tightening torque (see Tab. 2 “Screw tightening torques”). The nut (Fig. 48, Item 1) has to be about ±0.5 mm flush with the end of the shaft (Fig. 48, Item 2). If this is not the case, release the nut and repeat steps 25 to 29.
30. Remove the open-end wrench and reinstall the protective plate (Fig. 47, Item 2).
31. Clean the lantern groove and insert the new O-ring (Fig. 1, Item 10).
32. Attach the motor impeller unit to the transport eyes with suitable lifting equipment for the purpose of safeguarding. When attaching, avoid damaging plastic parts, such as the fan wheel and the upper part of the electronic module.
33. Insert the motor impeller unit (see Fig. 12) into the pump housing in the old position or another desired angular position. Observe

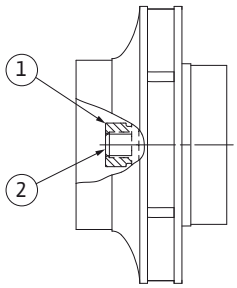


Fig. 48: Correct position of the impeller nut after the installation

the permitted installation positions of the components when doing this (see chapter 7.1 “Permitted installations position and change of the arrangement of components before the installation” on page 74). The use of mounting bolts is recommended (see chapter 5.4 “Accessories” on page 65). After the lantern guide has been firmly locked into place (about 15 mm before the end position), there is no longer any danger of tipping or canting. After the motor impeller unit has been secured with at least one screw (Fig. 6, Item 3), the attaching material can be removed from the transport eyes.

34. Screw in the screws (Fig. 6, Item 3) but do not tighten them all the way. When screwing in the screws, the motor impeller unit will be pulled into the pump housing.

CAUTION! Danger of property damage!

Danger of damage due to incorrect handling!

- **While screwing in the screws, ensure that the shaft can be turned by turning the fan wheel a bit. If the shaft is difficult to move, tighten the screws alternately and diagonally.**

35. Rescrew in the two screws (Fig. 6, Item 21) in case they were removed. Clamp in the holder (Fig. 6, Item 6) of the differential pressure sensor under one of the screw heads (Fig. 6, Item 3) on the side opposite the electronic module. Then tighten the screws (Fig. 6, Item 3) for the last time.
36. Remove the spacers from the drilled holes at the motor flange (Fig. 6, Item 20a) if necessary and move the transport eyes from the motor housing (Fig. 6, Item 20b) to the motor flange. Rescrew the spacers in the drilled holes in the motor housing.
37. Push the fan cover (Fig. 6, Item 2) onto the motor again and attach with the screws (Fig. 6, Item 1) at the module.

NOTE

Observe the measures for commissioning (chapter 9 “Commissioning” on page 95.

38. Reclamp the connecting cable of the differential pressure sensor/ power cable in case it was disconnected.
39. Open the check valves in front of and behind the pump.
40. Reset the fuse.

Screw tightening torques

Part	Fig./Item Screw (nut)	Thread	Screw head Type...	Tightening torque Nm ± 10% (if not otherwise specified)	Installation information
Transport eyes	Fig. 6/Item 20	M8	Hexagon socket 6 mm	20	
Motor impeller unit	Fig. 6/Item 3 Fig. 44/Item 3	M12	Hexagon socket 10 mm	60	See chap.10.2.1 “Replacing the mechanical seal” on page 100.
Lantern	Fig. 6/Item 10 Fig. 44/Item 8	M6 M10	Hexagon socket 5 mm Hexagon socket 8 mm	7 40	
Impeller	Fig. 6/Item 15	Special nut	Hexagon head 17 mm	20	See chap.10.2.1 “Replacing the mechanical seal” on page 100. Open-end wrench, shaft: 22 mm
Protective plate	Fig. 6/Item 18	M5		3.5	
Fan cover	Fig. 6/Item 1	Special screw	Hexagon socket 3 mm	$4^{+0.5}$	
Electronic module	Fig. 6/Item 22	M5	Hexagon socket 4 mm	2	
Module cover	Fig. 3		Phillips recessed head PZ2	0.8	
Control terminals	Fig. 12/Item 4		Slit 3.5 x 0.6 mm	$0.5^{+0.1}$	
Power terminals	Fig. 12/Item 7		Slit SFZ 1-0.6 x 3.5 mm	0.5	Plugging of the cable without tools. Releasing of the cable with a screwdriver.
Union nut, cable lead-throughs	Fig. 2	M12x1.5 M16x1.5 M20x1.5 M25x1.5	Hexagon head 14 mm Hexagon head 17 mm Hexagon head 22 mm Hexagon head 27 mm	3 8 6 11	

Tab. 2 Screw tightening torques

10.2.2 Replacing the motor

- Carry out steps 1 to 19 to dismantle the motor in accordance with chapter 10.2 “Maintenance work” on page 100.
- Remove the screws (Fig. 6, Item 21) and pull the electronic module vertically upwards (Fig. 6).
- Before reinstalling the electronic module, pull the new O-ring between the module (Fig. 6, Item 22) and the motor (Fig. 6, Item 4) onto the contacting chamber.
- Press the electronic module into the contacting of the new motor and fasten with screws (Fig. 6, Item 21).
- Carry out steps 20 to 40 to install the motor in accordance with chapter 10.2 “Maintenance work” on page 100.

DANGER! Danger of death!
There is a mortal danger through shock when working on electrical equipment. Following removal of the module, a potentially fatal shock voltage may be present at the motor contacts.

- **Check for absence of voltage and cover or cordon off adjacent live parts.**

NOTE:

Increased bearing noise and unusual vibrations are a sign of bearing wear. Then the bearing has to be changed by Wilo customer service.

WARNING! Danger of personal injury!
Opening the motor leads to high, suddenly occurring magnetic forces. These can cause serious cuts, crushing injuries and bruises.
- **Do not open the motor!**
- **Only allow Wilo customer service to dismantle and install the motor flange and the end plate for maintenance and repair work.**

10.2.3 Replacing electronic module

DANGER! Danger of death!
If the rotor is driven by the impeller when the pump is in standstill, dangerous contact voltage can arise at the motor contacts.
- **Close the shut-off device in front of and behind the pump.**
- Carry out steps 1 to 7 to dismantle the electronic module in accordance with chapter 10.2 “Maintenance work” on page 100.
- Remove the screws (Fig. 6, Item 21) and pull the module from the motor.
- Replace the O-ring.
- Installation in reverse order.

NOTE:
The module has to be pressed on as far as possible when it is installed.

10.2.4 Replacing the fan wheel

Carry out steps 1 to 7 to dismantle the fan wheel in accordance with chapter 10.2 “Maintenance work” on page 100.
- Lever the fan wheel down from the motor shaft with a suitable tool.
- For the installation of the new fan wheel, pay attention to the correct bearing of the tolerance ring in the hub groove.
- The fan wheel has to be pressed on as far as possible when it is installed. Only press here in the area of the hub.

11 Faults, causes and remedies

Have faults remedied by qualified personnel only! Observe the safety instructions in chapter 10 “Maintenance” on page 98.
- **If the malfunction cannot be rectified, consult a specialist technician or the nearest customer service or representative office.**

Fault displays

For faults, causes and remedies, see the “Fault/warning signal” flow diagram and the following tables. The first column of the table lists the code numbers displayed in the event of a fault.

NOTE:
If the cause of the fault no longer exists, some faults resolve themselves automatically.

Legend

The following types of errors can occur with differing priorities (1 = lowest priority; 6 = highest priority):

Error type	Explanation	Priority
A	Permanent error	6
B	Permanent error on the 6th occurrence	5
C	Warning, after 5 min, transition to an error permanent error on the 6th occurrence	4
D	Like error type A, but error type A has a higher priority than error type D	3
E	Emergency operation: warning with emergency operation speed and activated SSM	2
F	Warning	1

11.1 Mechanical faults

Fault	Cause	Remedy
Pump does not start or stops working	Cable terminal loose	Check all cable connections
	Fuses faulty	Check fuses; replace defective fuses
Pump is running at reduced output	Stop valve on pressure side throttled	Slowly open the stop valve
	Air in the suction line	Seal leaks at the flanges; bleed
Pump is making noise	Insufficient supply pressure	Increase supply pressure, observe minimum pressure at the suction port, check slide valve and filter on the suction side and clean if necessary
	Motor has bearing damage	Have the pump checked by Wilo customer service or a specialised service centre and serviced if necessary

11.2 Error table

Classification	No.	Error	Cause	Remedy	Error type HV	Error type AC
–	0	No error				
System errors	E004	Undervoltage	Mains overloaded	Check electrical installation	C	A
	E005	Overvoltage	Mains voltage too high	Check electrical installation	C	A
	E006	2-phase operation	Missing phase	Check electrical installation	C	A
	E007	**Warning!** Generator operation (flow in flow direction)	The flow is driving the pump impeller; electrical current is being fed back to the mains	Check the setting; check system for proper operation **Caution!** Prolonged operation can cause damage to the module	F	F
	E009	**Warning!** Turbine operation (flow in flow direction)	The flow is driving the pump impeller; electrical current is being fed back to the mains	Check the setting; check system for proper operation **Caution!** Prolonged operation can cause damage to the module	F	F
Pump error	E010	Blocking	Shaft is mechanically blocked	If the blocking has not been removed after 10 seconds, the pump switches off. Check shaft for ease of movement. Request customer service	A	A
Motor errors	E020	Excess winding temperature	Motor overloaded	Allow motor to cool down Check settings Check/correct the duty point	B	A
			Motor ventilation limited	Provide unobstructed air access		
			Water temperature too high	Lower water temperature		
	E021	Motor overload	Duty point outside of duty chart	Check/correct the duty point	B	A
			Deposits in the pump	Request customer service		
	E023	Short circuit/earth leakage	Motor or module defective	Request customer service	A	A
	E025	Faulty contact	Module has no contact to motor	Request customer service	A	A
		Winding interrupted	Motor defective	Request customer service		

Classification	No.	Error	Cause	Remedy	Error type	
					HV	AC
	E026	WSK or PTC interrupted	Motor defective	Request customer service	B	A
Module errors	E030	Excess module temperature	Limited air supply to module heat sink	Provide unobstructed air access	B	A
	E031	Excess hybrid/power section temperature	Ambient temperature too high	Improve room ventilation	B	A
	E032	Intermediate circuit undervoltage	Voltage fluctuations in the mains	Check electrical installation	F	D
	E033	Intermediate circuit overvoltage	Voltage fluctuations in the mains	Check electrical installation	F	D
	E035	DP/MP: multiple instances of same identity	multiple instances of same identity	Reallocate master and/or slave (see chap. 9.2 on page 96)	E	E
Communication error	E050	BMS communication time-out	Bus communication interrupted or timed out Cable break	Check cable connection to building automation	F	F
	E051	Impermissible DP/MP combination	Different pumps	Request customer service	F	F
	E052	DP/MP communications time-out	Cable MP communication defective	Check cable and cable connections	E	E
Electronics faults	E070	Internal communication error (SPI)	Internal electronics error	Request customer service	A	A
	E071	EEPROM error	Internal electronics error	Request customer service	A	A
	E072	Power section/frequency converter	Internal electronics error	Request customer service	A	A
	E076	Internal transformer defective	Internal electronics error	Request customer service	A	A
	E077	24 V operating voltage for sensor defective	Sensor defective or connected incorrectly	Check differential pressure sensor connection	A	A
	E096	Infobyte not set	Internal electronics error	Request customer service	A	A
	E097	Flexpump data record missing	Internal electronics error	Request customer service	A	A
	E098	Flexpump data record invalid	Internal electronics error	Request customer service	A	A
	E110	Motor synchronisation error	Internal electronics error	Request customer service	B	A
	E111	Excess current	Internal electronics error	Request customer service	B	A
	E112	Excess rotation speed	Internal electronics error	Request customer service	B	A
System errors	E119	Turbine operation error (flow in flow direction; pump cannot start)	The flow is driving the pump impeller; electrical current is being fed back to the mains	Check the setting; check system for proper operation **Caution!** Prolonged operation can cause damage to the module	A	A

11.3 Acknowledging errors

General

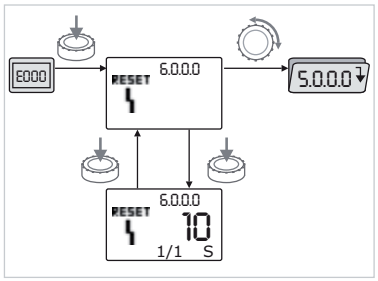


Fig. 49: Navigation in case of error

In the event of an error, the error page is displayed instead of the status page.

In this case, the following procedure can generally be used for navigation (Fig. 49):

- To change to menu mode, press the red button.

  Menu number <6.0.0.0> flashes on the display.

  By turning the red button, it is possible to navigate in the menu as usual.

- Press the red button.

  Menu number <6.0.0.0> appears steady on the display.

  On the units display, the current incidence (x) as well as the maximum incidence of the error (y) are displayed in the format “x/y”.

  Until the error can be acknowledged, pressing the red button again will cause a return to menu mode.

NOTE:
A 30-second time-out causes the display to revert to the status page or error page.

NOTE:
Every error number has its own error counter, which counts the incidence of the error within the last 24 hours and is reset after manual acknowledgement, 24-hour continuous “mains on” or a new “mains on”.

11.3.1 Error type A or D

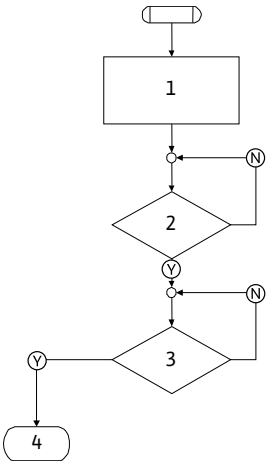


Fig. 50: Error type A, diagram

Error type A (Fig. 50):

Program step/query	Contents
1	• Error code is displayed • Motor off • Red LED on • SSM is activated • Error counter is incremented
2	> 1 minute?
3	Error acknowledged?
4	End; auto control resumes
Ⓨ	yes
Ⓝ	no

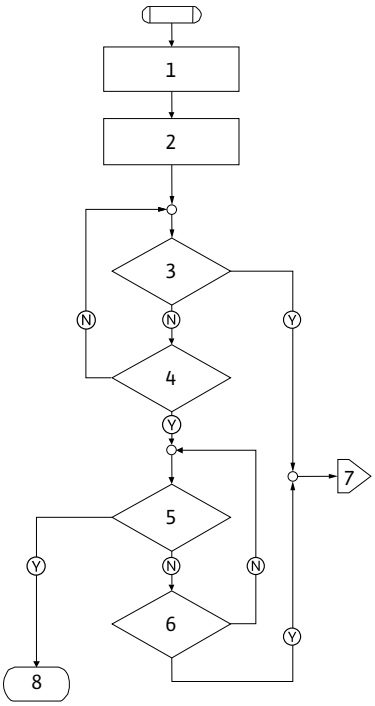


Fig. 51: Error type D, diagram

Error type D (Fig. 51):

Program step/query	Contents
1	• Error code is displayed • Motor off • Red LED on • SSM is activated
2	• Error counter is incremented
3	Is there a new type “A” fault?
4	> 1 minute?
5	Error acknowledged?
6	Is there a new type “A” fault?
7	Branching for error type “A”
8	End; auto control resumes
Ⓨ	yes
Ⓝ	no

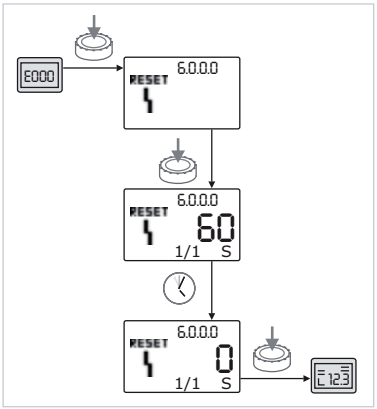


Fig. 52: Acknowledge error type A or D

If type A or D errors occur, proceed as follows to acknowledge (Fig. 52):

- To change to menu mode, press the red button.

  Menu number <6.0.0.0> flashes on the display.
- Press the red button again.

  Menu number <6.0.0.0> appears steady on the display.

  The time remaining until the error can be acknowledged is displayed.
- Wait until the remaining time is up.

  The time until manual acknowledgement is always 60 seconds for error types A and D.
- Press the red button again.

  The error is acknowledged, and the status page is displayed.

11.3.2 Error type B

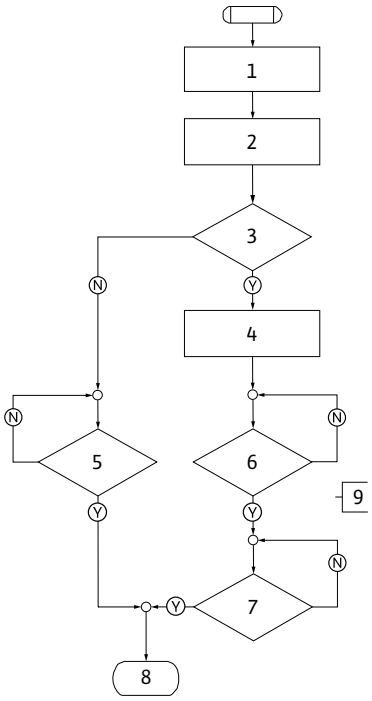


Fig. 53: Error type B, diagram

Error type B (Fig. 53):

Program step/query	Contents
1	• Error code is displayed • Motor off • Red LED on
2	• Error counter is incremented
3	Error counter > 5?
4	• SSM is activated
5	> 5 minutes?
6	> 5 minutes?
7	Error acknowledged?
8	End; auto control resumes
9	Error E021 > 1 minute
Ⓨ	yes
Ⓝ	no

If type B errors occur, proceed as follows to acknowledge:

- To change to menu mode, press the red button.

  Menu number <6.0.0.0> flashes on the display.
- Press the red button again.

  Menu number <6.0.0.0> appears steady on the display.

  On the units display, the current incidence (x) as well as the maximum incidence of the error (y) are displayed in the format “x/y”.

Incidence X < Y

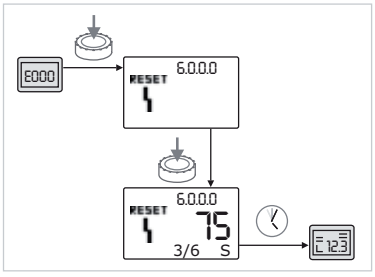


Fig. 54: Acknowledge error type B (X < Y)

If the current incidence of the error is less than the maximum incidence (Fig. 54):

- Wait for auto reset time.

  On the value display, the remaining time until auto reset of the error is displayed in seconds.

  After the auto reset time has run out, the error will be automatically acknowledged and the status page will be displayed.

NOTE:
The auto reset time can be set on menu number <5.6.3.0> (time input 10 to 300 s)

Incidence X = Y

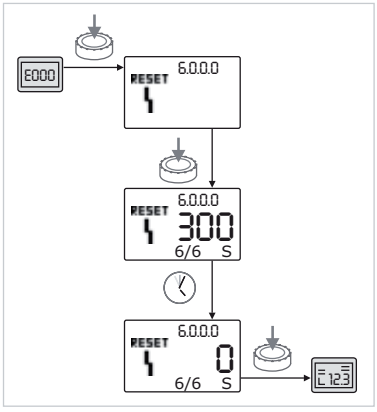


Fig. 55: Acknowledge error type B (X=Y)

If the current incidence of the error is the same as maximum incidence (Fig. 55):

- Wait until the remaining time is up.

  The time until manual acknowledgement is always 300 seconds.

  On the value display, the remaining time until manual acknowledgement of the error is displayed in seconds.
- Press the red button again.

  The error is acknowledged, and the status page is displayed.

11.3.3 Error type C

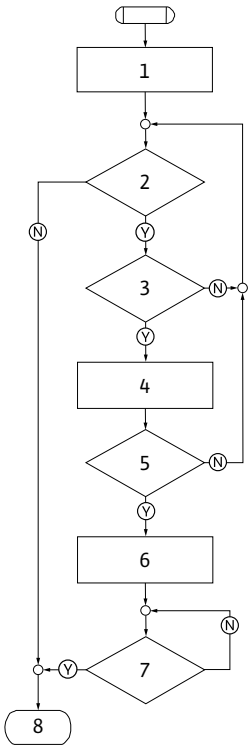


Fig. 56: Error type C, diagram

Error type C (Fig. 56):

Program step/query	Contents
1	• Error code is displayed • Motor off • Red LED on
2	Error criterion fulfilled?
3	> 5 minutes?
4	• Error counter is incremented
5	Error counter > 5?
6	• SSM is activated
7	Error acknowledged?
8	End; auto control resumes
Ⓨ	yes
Ⓝ	no

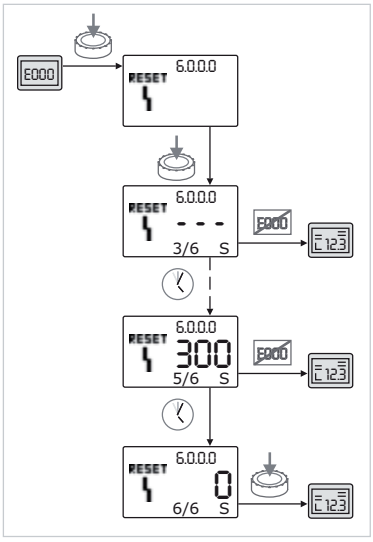


Fig. 57: Acknowledge error type C

If type C errors occur, proceed as follows to acknowledge (Fig. 57):

- To change to menu mode, press the red button.

  Menu number <6.0.0.0> flashes on the display.
- Press the red button again.

  Menu number <6.0.0.0> appears steady on the display.

  On the value display, "– – –" appears.

  On the units display, the current incidence (x) as well as the maximum incidence of the error (y) are displayed in the format "x/y".

  After 300 seconds, the current incidence will be counted up by one.

NOTE:
The error will be acknowledged automatically if the cause of the error is eliminated.

- Wait until the remaining time is up.

  If the current incidence (x) is the same as the maximum incidence of the error (y), this error can be acknowledged manually.
- Press the red button again.

  The error is acknowledged, and the status page is displayed.

11.3.4 Error type E or F

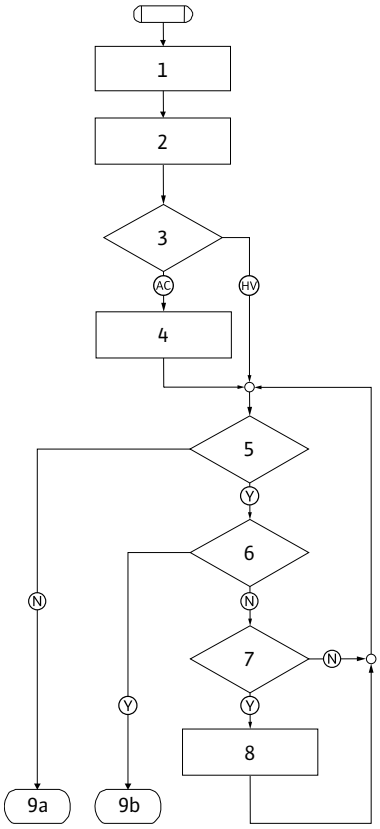


Fig. 58: Error type E, diagram

Error type E (Fig. 58):

Program step/query	Contents
1	• Error code is displayed • Pump goes into emergency operation
2	• Error counter is incremented
3	Error matrix AC or HV?
4	• SSM is activated
5	Error criterion fulfilled?
6	Error acknowledged?
7	Error matrix HV and > 30 minutes?
8	• SSM is activated
9a	End; auto control (double pump) resumes
9b	End; auto control (single pump) resumes
Ⓨ	yes
Ⓝ	no

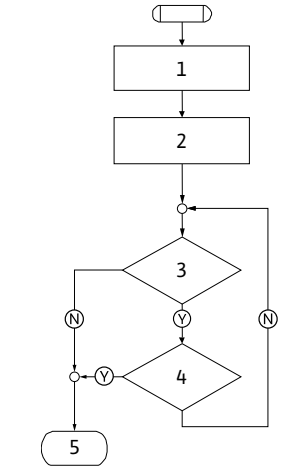


Fig. 59: Error type F, diagram

Error type F (Fig. 59):

Program step/query	Contents
1	• Error code is displayed
2	• Error counter is incremented
3	Error criterion fulfilled?
4	Error acknowledged?
5	End; auto control resumes
Ⓨ	yes
Ⓝ	no

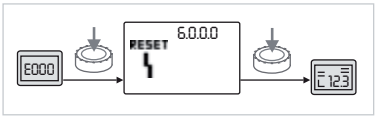


Fig. 60: Acknowledge error type E or F

If type E or F errors occur, proceed as follows to acknowledge (Fig 60):

- To change to menu mode, press the red button.

  Menu number <6.0.0.0> flashes on the display.
- Press the red button again.

  The error is acknowledged, and the status page is displayed.

NOTE:
The error will be acknowledged automatically if the cause of the error is eliminated.

12 Spare parts

Spare parts may be ordered via a local specialist retailer and/or WILO-customer service.

To avoid queries and incorrect orders, all data on the name plate should be submitted for each order (pump name plate Fig. 9 Item 1).

CAUTION! Danger of property damage!
Trouble-free pump operation can only be guaranteed when original spare parts are used.

- **Only use original Wilo spare parts.**
- **Information to be provided when ordering spare parts:**
  - **Spare part number**
  - **Name/description of the spare part**
  - **All data of the pump name plate**

NOTE:
List of genuine spare parts: see Wilo spare parts documentation and exploded drawing with the main components (Fig. 6 and Tab. 1).

13 Disposal

Proper disposal and recycling of this product prevents damage to the environment and risks to personal health.

1. Use public or private disposal organisations when disposing of all or part of the product.
2. For more information on proper disposal, please contact your local council or waste disposal office or the supplier from whom you obtained the product.

Subject to change without prior notice!

D EG – Konformitätserklärung

GB EC – Declaration of conformity

F Déclaration de conformité CE

(gemäß 2006/42/EG Anhang II,1A und2004/108/EG Anhang IV,2,
according 2006/42/EC annex II,1A and2004/108/EC annex IV,2,
conforme 2006/42/CE appendice II,1A et 2004/108/CE appendice IV,2)

Hiermit erklären wir, dass die Bauart der Baureihe : **Stratos GIGA**
Herewith, we declare that the product type of the series:
Par le présent, nous déclarons que l'agrégat de la série :

(Die Seriennummer ist auf dem Typenschild des Produktes angegeben. /
The serial number is marked on the product site plate. /
Le numéro de série est inscrit sur la plaque signalétique du produit.)

in der gelieferten Ausführung folgenden einschlägigen Bestimmungen entspricht:
in its delivered state complies with the following relevant provisions:
est conforme aux dispositions suivantes dont il relève:

EG-Maschinenrichtlinie **2006/42/EG**
EC-Machinery directive
Directives CE relatives aux machines

Die Schutzziele der Niederspannungsrichtlinie 2006/95/EG werden gemäß Anhang I, Nr. 1.5.1 der Maschinenrichtlinie 2006/42/EG eingehalten.
The protection objectives of the low-voltage directive 2006/95/EC *are realized according annex I, No. 1.5.1 of the EC-Machinery directive 2006/42/EC.*
Les objectifs protection de la directive basse-tension 2006/95/CE *sont respectées conformément à appendice I, n° 1.5.1 de la directive CE relatives aux machines 2006/42/CE.*

Elektromagnetische Verträglichkeit – Richtlinie **2004/108/EG**
Electromagnetic compatibility – directive
Compatibilité électromagnétique- directive

Angewendete harmonisierte Normen, insbesondere: **EN 809**
Applied harmonized standards, in particular: **EN ISO 14121-1**
Normes harmonisées, notamment: **EN 60034-1**
EN 61800-3
En 61800-5-1

Bei einer mit uns nicht abgestimmten technischen Änderung der oben genannten Bauarten, verliert diese Erklärung ihre Gültigkeit.
If the above mentioned series are technically modified without our approval, this declaration shall no longer be applicable.
Si les gammes mentionnées ci-dessus sont modifiées sans notre approbation, cette déclaration perdra sa validité.

Bevollmächtigter für die Zusammenstellung der technischen Unterlagen ist:
Authorized representative for the completion of the technical documentation:
Mandataire pour le complément de la documentation technique est :

WILO SE
Division Pumps & Systems –
PBU Pumps – Quality
Nortkirchenstraße 100
44263 Dortmund

Dortmund, 23.11.2010

i. V.
Erwin Prieß
Quality Manager

WILO SE
Nortkirchenstraße 100
44263 Dortmund
Germany

Document: 2109745.1

NL

EG-verklaring van overeenstemming

Hiermede verklaren wij dat dit aggregaat in de geleverde uitvoering voldoet aan de volgende bepalingen:

EG-richtlijnen betreffende machines 2006/42/EG

De veiligheidsdoelstellingen van de laagspanningsrichtlijn worden overeenkomstig bijlage I, nr. 1.5.1 van de machinerichtlijn 2006/42/EG aangehouden.

Elektromagnetische compatibiliteit 2004/108/EG

gebruikte geharmoniseerde normen, in het bijzonder:

zie vorige pagina

I

Dichiarazione di conformità CE

Con la presente si dichiara che i presenti prodotti sono conformi alle seguenti disposizioni e direttive rilevanti:

Direttiva macchine 2006/42/EG

Gli obiettivi di protezione della direttiva macchine vengono rispettati secondo allegato I, n. 1.5.1 dalla direttiva macchine 2006/42/CE.

Compatibilità elettromagnetica 2004/108/EG

norme armonizzate applicate, in particolare:

vedi pagina precedente

E

Declaración de conformidad CE

Por la presente declaramos la conformidad del producto en su estado de suministro con las disposiciones pertinentes siguientes:

Directiva sobre máquinas 2006/42/EG

Se cumplen los objetivos en materia de seguridad establecidos en la Directiva de Baja tensión según lo especificado en el Anexo I, punto 1.5.1 de la Directiva de Máquinas 2006/42/CE.

Directiva sobre compatibilidad electromagnética 2004/108/EG

normas armonizadas adoptadas, especialmente:

véase página anterior

P

Declaração de Conformidade CE

Pela presente, declaramos que esta unidade no seu estado original, está conforme os seguintes requisitos:

Directivas CEE relativas a máquinas 2006/42/EG

Os objectivos de protecção da directiva de baixa tensão são cumpridos de acordo com o anexo I, nº 1.5.1 da directiva de máquinas 2006/42/CE.

Compatibilidade electromagnética 2004/108/EG

normas harmonizadas aplicadas, especialmente:

ver página anterior

S

CE- försäkran

Härmed förklarar vi att denna maskin i levererat utförande motsvarar följande tillämpliga bestämmelser:

EG–Maskindirektiv 2006/42/EG

Produkten uppfyller säkerhetsmålen i lågspänningsdirektivet enligt bilaga I, nr 1.5.1 i maskindirektiv 2006/42/EG.

EG–Elektromagnetisk kompatibilitet – riktlinje 2004/108/EG

tillämpade harmoniserade normer, i synnerhet:

se föregående sida

N

EU-Overensstemmelseserklæring

Vi erklærer hermed at denne enheten i utførelse som levert er i overensstemmelse med følgende relevante bestemmelser:

EG–Maskindirektiv 2006/42/EG

Lavspenningsdirektivets vernemål overholdes i samsvar med vedlegg I, nr. 1.5.1 i maskindirektivet 2006/42/EF.

EG–EMV–Elektromagnetisk kompatibilitet 2004/108/EG

anvendte harmoniserte standarder, særlig:

se forrige side

FIN

CE-standardinmukaisuusseloste

Ilmoitamme täten, että tämä laite vastaa seuraavia asiaankuuluvia määräyksiä:

EU–konedirektiivit: 2006/42/EG

Pienjännitedirektiivin suojatavoitteita noudatetaan konedirektiivin 2006/42/EY liitteen I, nro 1.5.1 mukaisesti.

Sähkömagneettinen soveltuvuus 2004/108/EG

käytetyt yhteensovitetut standardit, erityisesti:

katso edellinen sivu.

DK

EF-overensstemmelseserklæring

Vi erklærer hermed, at denne enhed ved levering overholder følgende relevante bestemmelser:

EU–maskindirektiver 2006/42/EG

Lavspændingsdirektivets mål om beskyttelse overholdes i henhold til bilag I, nr. 1.5.1 i maskindirektivet 2006/42/EF.

Elektromagnetisk kompatibilitet: 2004/108/EG

anvendte harmoniserede standarder, særligt:

se forrige side

H

EK-megfelelőségi nyilatkozat

Ezennel kijelentjük, hogy az berendezés megfelel az alábbi irányelveknek:

Gépek irányelv: 2006/42/EK

A kisfeszültségű irányelv védelmi előírásait a 2006/42/EK gépekre vonatkozó irányelv I. függelékének 1.5.1. sz. pontja szerint teljesíti.

Elektromágneses összeférhetőség irányelv: 2004/108/EK

alkalmazott harmonizált szabványoknak, különösen:

lásd az előző oldalt

CZ

Prohlášení o shodě ES

Prohlašujeme tímto, že tento agregát v dodaném provedení odpovídá následujícím příslušným ustanovením:

Směrnice ES pro strojní zařízení 2006/42/ES

Cíle týkající se bezpečnosti stanovené ve směrnici o elektrických zařízeních nízkého napětí jsou dodrženy podle přílohy I, č. 1.5.1 směrnice o strojních zařízeních 2006/42/ES.

Směrnice o elektromagnetické kompatibilitě 2004/108/ES

použité harmonizační normy, zejména:

viz předchozí strana

PL

Deklaracja Zgodności WE

Niniejszym deklarujemy z pełną odpowiedzialnością, że dostarczony wyrób jest zgodny z następującymi dokumentami:

dyrektywą maszynową WE 2006/42/WE

Przestrzegane są cele ochrony dyrektywy niskonapięciowej zgodnie z załącznikiem I, nr 1.5.1 dyrektywy maszynowej 2006/42/WE.

dyrektywą dot. kompatybilności elektromagnetycznej 2004/108/WE

stosowanymi normami zharmonizowanymi, a w szczególności:

patrz poprzednia strona

RUS

Декларация о соответствии Европейским нормам

Настоящим документом заявляем, что данный агрегат в его объеме поставки соответствует следующим нормативным документам:

Директивы ЕС в отношении машин 2006/42/EG

Требования по безопасности, изложенные в директиве по низковольтному напряжению, соблюдаются согласно приложению I, № 1.5.1 директивы в отношении машин 2006/42/EG.

Электромагнитная устойчивость 2004/108/EG

Используемые согласованные стандарты и нормы, в частности:

см. предыдущую страницу

GR

Δήλωση συμμόρφωσης της ΕΕ

Δηλώνουμε ότι το προϊόν αυτό σ' αυτή την κατάσταση παράδοσης ικανοποιεί τις ακόλουθες διατάξεις :

Οδηγίες ΕΚ για μηχανήματα 2006/42/ΕΚ

Οι απαιτήσεις προστασίας της οδηγίας χαμηλής τάσης τηρούνται σύμφωνα με το παράρτημα I, αρ. 1.5.1 της οδηγίας σχετικά με τα μηχανήματα 2006/42/ΕG.

Ηλεκτρομαγνητική συμβατότητα ΕΚ-2004/108/ΕΚ

Εναρμονισμένα χρησιμοποιούμενα πρότυπα, ιδιαίτερα:

Βλέπε προηγούμενη σελίδα

TR

CE Uygunluk Teyid Belgesi

Bu cihazın teslim edildiği şekliyle aşağıdaki standartlara uygun olduğunu teyid ederiz:

AB-Makina Standartları 2006/42/EG

Alçak gerilim yönergesinin koruma hedefleri, 2006/42/AT makine yönergesi Ek I, no. 1.5.1'e uygundur.

Elektromanyetik Uyumluluk 2004/108/EG

kısmen kullanılan standartlar için:

bkz. bir önceki sayfa

RO

EC-Declaraţie de conformitate

Prin prezenta declarăm că acest produs aşa cum este livrat, corespunde cu următoarele prevederi aplicabile:

Directiva CE pentru maşini 2006/42/EG

Sunt respectate obiectivele de protecţie din directiva privind joasa tensiune conform Anexei I, Nr. 1.5.1 din directiva privind maşinile 2006/42/CE.

Compatibilitatea electromagnetică – directiva 2004/108/EG

standarde armonizate aplicate, îndeosebi:

vezi pagina precedentă

EST

EÜ vastavusdeklaratsioon

Käesolevaga tõendame, et see toode vastab järgmistele asjakohastele direktiividele:

Masinadirektiiv 2006/42/EÜ

Madalpingedirektiivi kaitse-eesmärgid on täidetud vastavalt masinate direktiivi 2006/42/EÜ I lisa punktile 1.5.1.

Elektromagnetilise ühilduvuse direktiiv 2004/108/EÜ

kohaldatud harmoneeritud standardid, eriti:

vt eelmist lk

LV

EC – atbilstības deklarācija

Ar šo mēs apliecinām, ka šis izstrādājums atbilst sekojošiem noteikumiem:

Mašīnu direktīva 2006/42/EK

Zemsprieguma direktīvas drošības mērķi tiek ievēroti atbilstoši Mašīnu direktīvas 2006/42/EK pielikumam I, Nr. 1.5.1.

Elektromagnētiskās savietojamības direktīva 2004/108/EK

piemēroti harmonizēti standarti, tai skaitā:

skatīt iepriekšējo lappusi

LT

EB atitikties deklaracija

Šiuo pažymima, kad šis gaminys atitinka šias normas ir direktyvas:

Mašinų direktyvą 2006/42/EB

Laikomasi Žemos įtampos direktyvos keliamų saugos reikalavimų pagal Mašinų direktyvos 2006/42/EB I priedo 1.5.1 punktą.

Elektromagnetinio suderinamumo direktyvą 2004/108/EB

pritaikytus vieningus standartus, o būtent:

žr. ankstesniame puslapyje

SK

ES vyhlásenie o zhode

Týmto vyhlasujeme, že konštrukcie tejto konštrukčnej série v dodanom vyhotovení vyhovujú nasledujúcim príslušným ustanoveniam:

Stroje – smernica 2006/42/ES

Bezpečnostné ciele smernice o nízkom napätí sú dodržiavané v zmysle prílohy I, č. 1.5.1 smernice o strojových zariadeniach 2006/42/ES.

Elektromagnetická zhoda – smernica 2004/108/ES

používané harmonizované normy, najmä:

pozri predchádzajúcu stranu

SLO

ES – izjava o skladnosti

Izjavljamo, da dobavljene vrste izvedbe te serije ustrezajo sledečim zadevnim določilom:

Direktiva o strojih 2006/42/ES

Cilji Direktive o nizkonapetostni opremi so v skladu s prilogo I, št. 1.5.1 Direktive o strojih 2006/42/EG doseženi.

Direktiva o elektromagnetni združljivosti 2004/108/ES

uporabljeni harmonizirani standardi, predvsem:

glejte prejšnjo stran

BG

ЕО-Декларация за съответствие

Декларираме, че продуктът отговаря на следните изисквания:

Машинна директива 2006/42/ЕО

Целите за защита на разпоредбата за ниско напрежение са съставени съгласно. Приложение I, № 1.5.1 от Директивата за машини 2006/42/ЕС.

Електромагнитна съвместимост – директива 2004/108/ЕО

Хармонизирани стандарти:

вж. предната страница

M

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Makkinarju – Direttiva 2006/42/KE

L-objettivi tas-sigurta tad-Direttiva dwar il-Vultaġġ Baxx huma konformi mal-Anness I, Nru 1.5.1 tad-Direttiva dwar il-Makkinarju 2006/42/KE.

Kompatibbiltà elettromanjetika – Direttiva 2004/108/KE

kif ukoll standards armonizzati b'mod partikolari:

ara l-paġna ta' qabel

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