

## Wilo-Sinum



**en** Installation and operating instructions



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## 1 General information

### 1.1 About these instructions

These instructions form part of the product. Compliance with the instructions is essential for correct handling and use:

- Read the instructions carefully before all activities.
- Keep the instructions in an accessible place at all times.
- Observe all product specifications.
- Observe the markings on the product.

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

### 1.2 Copyright

WILO SE ©

The reproduction, distribution and utilisation of this document in addition to communication of its contents to others without express authorisation is prohibited. Offenders will be held liable for payment of damages. All rights reserved.

### 1.3 Subject to change

Wilo shall reserve the right to change the listed data without notice and shall not be liable for technical inaccuracies and/or omissions. The illustrations used may differ from the original and are intended as an exemplary representation of the product.

### 1.4 Exclusion from warranty and liability

Wilo shall specifically not assume any warranty or liability in the following cases:

- Inadequate configuration due to inadequate or incorrect instructions by the operator or the client
- Non-compliance with these instructions
- Improper use
- Incorrect storage or transport
- Incorrect installation or dismantling
- Insufficient maintenance
- Unauthorised repairs
- Inadequate construction site
- Chemical, electrical or electrochemical influences
- Wear

## 2 Safety

This chapter contains basic information for the individual phases of the life cycle. Failure to observe this information carries the following risks:

- Injury to persons from electrical, mechanical and bacteriological factors as well as electromagnetic fields
- Environmental damage from discharge of hazardous substances
- Property damage
- Failure of important functions of the product

Failure to observe the information contained herein will result in the loss of claims for damages.

**The instructions and safety instructions in the other chapters must also be observed!**

### 2.1 Identification of safety instructions

In these installation and operating instructions, safety instructions are displayed as follows:

- Danger to persons: Safety instructions are **preceded by a corresponding symbol** and are shaded in grey.
- Damage to property: Safety instructions start with a signal word and are displayed **without** a symbol.

## Signal words

- **DANGER!**  
Failure to follow the instructions will result in serious injuries or death!
- **WARNING!**  
Failure to follow the instructions can lead to (serious) injury!
- **CAUTION!**  
Failure to follow the instructions can lead to potentially irreparable property damage.
- **NOTICE!**  
Useful information on handling the product

## Symbols

These instructions use the following symbols:



General danger symbol



Danger caused by electric voltage



Notes

Follow all information that appears on the product and ensure that it remains permanently legible:

- Warning and hazard notices
- Rating plate
- Direction of rotation arrow/symbol for direction of flow
- Labelling of connections

## 2.2 Personnel qualifications

- Personnel have been instructed on locally applicable regulations governing accident prevention.
- Personnel have read and understood the installation and operating instructions.
- Electrical work: qualified electrician  
Person with appropriate technical training (according to EN 50110-1), knowledge and experience who can identify and prevent electrical hazards.
- Lifting work: trained specialist for the operation of lifting devices  
Lifting equipment, lifting gear, attachment points
- Installation/dismantling must be carried out by a qualified technician who is trained in the use of the necessary tools and fixation materials.
- Operation/control: Operating personnel, instructed in the functioning of the complete system

## 2.3 Electrical work

- Observe applicable local regulations when connecting to the mains power supply.
- Comply with the requirements of the local energy supply company.

- Have electrical work carried out by a qualified electrician.
- Earth the device.
- Carry out the electrical connection according to the instructions of the switchgear and control device.
- Train personnel on how to make electrical connections.
- Train personnel on the options for switching off the device.
- Disconnect device from the mains and secure it against being switched on again without authorisation.
- Replace defective connection cables. Contact customer service.

## 2.4 Delivered components

- Compare delivered components with the bill of materials on the delivery note and check conformity.
- Check if products are suitable for the intended use.
- Ensure that the permitted operating and design parameters are not exceeded as this could otherwise lead to system malfunctions, property damage and even injuries.
- Do not use the product if the delivery does not correspond to the specifications of conformity or is defective.

## 2.5 Transport

- Wear the following protective equipment:
  - Safety footwear
  - Safety helmet (when using lifting equipment)
- Locally applicable laws and regulations on work safety and accident prevention must be complied with.
- Only use legally prescribed and approved lifting and hoisting gear.
- Select the lifting gear based on the prevailing conditions (weather, attachment point, load, etc.).
- Always attach the lifting gear to the attachment points.
- Ensure that the lifting gear is securely attached.
- Ensure that the hoisting gear is stable.
- Ensure a second person is present to coordinate the procedure if required (e.g. if the operator's field of vision is blocked).
- Standing under suspended loads is not permitted. Do **not** move suspended loads over workplaces where people are present.

## 2.6 Operating space

**Definition:** An operating space is a room that corresponds to European regulations as well as European and harmonised standards and the relevant technical rules and regulations of professional and trade associations for this field of application. For the expansion automat to be used as described in these installation and operating instructions, the operating spaces must contain the following: equipment to produce and distribute thermal energy, water heating and cooling systems and facilities for water re-filling, and power generation and distribution sources as well as measurement and control technology and IT systems.

Access to this room is prohibited for unqualified and untrained staff.

The installation location of the expansion automat must meet certain conditions. It must be ensured that the operation, service and maintenance work, inspection and repair, installation and dismantling can be performed safely and without hinderance. The installation location for the expansion automat must be selected in such a way that the automat is securely positioned when it is installed. Please bear in mind that the net weight, including the volume flow, may produce very high forces. If the installation location is not stable, the vessel can tip over or slide. This can lead to malfunctions or physical injury.



### **DANGER**

#### **Risk of explosion**

There must not be any conductive gases, high dust concentrations or aggressive fumes in the ambient air. There is a risk of explosion if there is flammable gas in the air.

If the drain valve on the non-return valve (optional) opens for functional reasons or the pressure relief valve is opened, the process water will be drained to prevent the vessel from being overloaded. Another reason for the water to be drained could be an overflow at the connection if the vessel membrane is damaged to compensate for the air pressure. Depending on the process, the water temperature can be up to 70 °C. The water temperature can be higher as a result of improper use. There is a risk of injury due to burning or scalding.

Ensure that the water can be safely drained and that a safe draining container or a water storage vessel is placed in the immediate vicinity of the appropriate equipment to prevent water damage (groundwater protection: keep additives in mind!).

Equipment that has been flooded must not be used. There is a risk of the equipment short-circuiting and people or other living things in the water being electrocuted. Water saturation and corrosion can cause a malfunction and possible damage to individual components.

## **2.7 Never exceed the permitted temperature and pressure values**

- Operating fluids used must be designed so that the permitted operating temperature and mean temperature (heat carriers) are not exceeded.
- Excess pressure and exceeding permitted temperatures can lead to damage to components, malfunctions and serious personal injuries and property damage.
- Check equipment and temperature at regular intervals.

## 2.8 Fuses

- Keep service records.

The equipment supplied is already fitted with the necessary safety devices. Before the functionality of the equipment is tested or the factory settings are restored, it has to be decommissioned. “Decommissioned” means here that it is disconnected from the power supply and the hydraulic connections are blocked to prevent an accidental or unintentional reconnection.

## 2.9 Examination prior to commissioning, maintenance and follow-up examination

The measures ensure operational reliability and guarantee compliance with applicable European regulations, European and harmonised standards, and additional national regulations of EU states for this field of application.

- Examinations must be organised by the owner or operator.
- Keep maintenance records to plan and monitor the respective examination measures.

### Examination as per German Operating Safety Ordinance (Betriebssicherheitsverordnung, November 2011)

Category (See Annex II of Directive 2014/68/EU, Graph 2)	Rated volume of the vessel [Litres]	Examination prior to commissioning [§14]/examiner	Follow-up examination [§15 (5)]		
			Examination of exterior	Examination of interior	Strength test
II	150 – 300/3 bar	Specialist	Maximum interval not defined. The maximum interval must be defined by the operator based on the information provided by the manufacturer and practical experience and in due consideration of the vessel load. Inspections must be performed by qualified personnel only.		
III	400 – 10000/3 bar		No longer applicable [§15 (6)]	5/qualified personnel	10/qualified personnel
				[§15 (10)] When examining the interior, the visual examination can be substituted by similar methods. For the strength test, the test of the static pressure can be substituted by another non-destruction procedure if the stated examination is not possible due to the system construction or is not sensible due to the operating mode of the system.	



Further information about the maintenance of the equipment, examining the interior and the strength test can be found in section 8.

## 2.10 Maintenance and repair

- In other EC member states, the required examination of the pressure equipment must be performed in accordance with Directive 2014/68/EU as per national regulations.
- Perform maintenance and repair work only with the system shut down.
- Take the system out of service and secure against unintentional restart.
- Safety circuits and data transmission can trigger the security chain or lead to erroneous information.
- Observe regulations for the entire heating / cooling unit.
- To stop hydraulics components, block the corresponding sections and drain and depressurise using the safe system-water drains via the available drainage connections.



### CAUTION

#### Risk of burns

The maximum water temperature in the water-carrying components (vessel, pumps, housing, hoses, pipes, peripheral devices) can be up to 70 °C. The water temperature can be higher as a result of improper use of the system.

The maximum pressure of the system water in the water-carrying component may correspond to the maximum set pressure for the safety valve. Set pressure of vessel – 3 bar; set pressure of the safety valve – 3 bar; set pressure of the pump unit – 6, 10 or 16 bar: Pressure at the safety valve – 6, 10 or 16 bar.

- Wear the following protective equipment:
  - Safety glasses
  - Face protection
- To stop the electric equipment (pump control unit, valve, peripheral devices), cut electricity supply to the control unit.

The use or modification of components or replacement components from other manufacturers is prohibited without prior consent. Failure to comply can endanger operational reliability or cause serious physical injury. Failure to comply precludes damage claims from product liability.

- Contact customer service.

## 2.11 Other hazards

- Overloaded components due to unforeseeable extreme values
- Danger to continued operation in the event of changed, unacceptable ambient conditions
- Danger to continued operation in the event of safety devices being switched off or malfunctioning

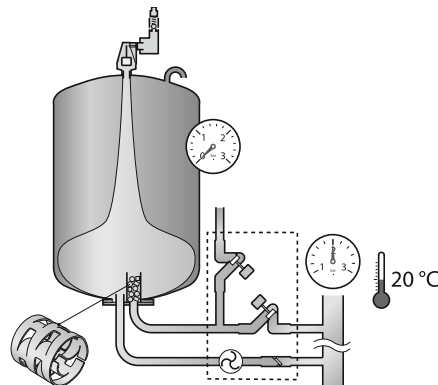
### 3 Product description

The content of these installation and operating instructions refers to the specifications of the standard version. Information regarding alternative versions and optional configurations have been inserted at the suitable location. Additional documentation will be made available if optional accessories have been ordered.

#### 3.1 Functional principle

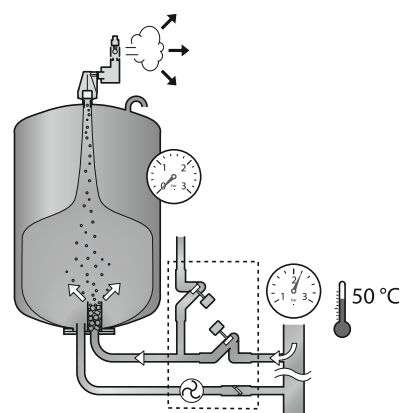
##### 1. Cold

The automat contains a small amount of water.  
The automat is still at rest.



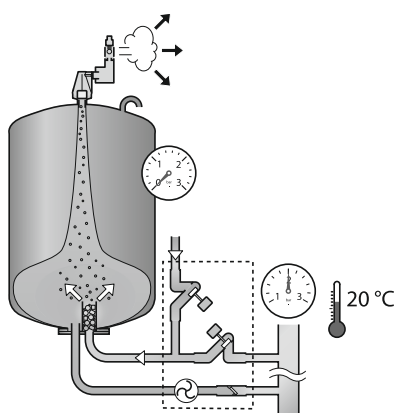
##### 2. Warming up

The volume of water and the system pressure increases. The unit responds to this by opening the solenoid valve. Water flows into the pressureless vessel. The water in the vessel is de-aerated due to both the drop in pressure and the presence of the PALL rings.



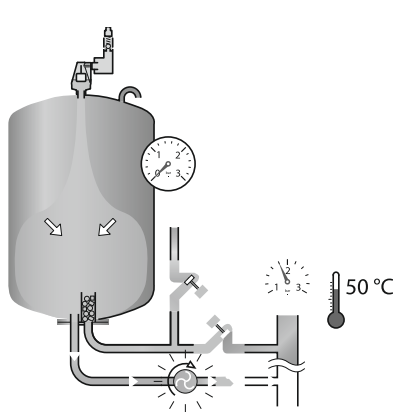
##### 5. Topping-up

If the water level in the vessel drops to a critical level, an appropriate amount of water will be carefully pumped into the system from the water mains. This water will be de-aerated (by pressure loss and the PALL rings), before entering the vessel.



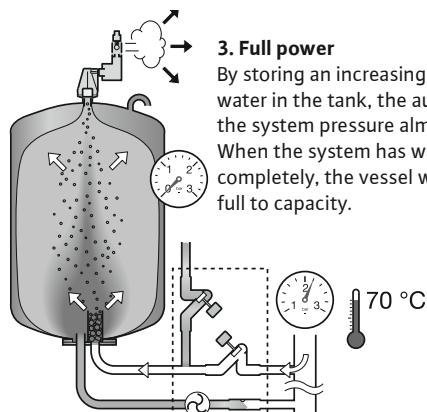
##### 4. Cooling down

The volume of water and the system pressure decreases. The de-aerated water is pumped from the pressureless vessel back into the system. This restores the system pressure.



##### 3. Full power

By storing an increasing amount of water in the tank, the automat keeps the system pressure almost constant. When the system has warmed up completely, the vessel will be almost full to capacity.



#### 3.2 Connection options

Connection options	Intended use
Ethernet connection	Connects the product to a building management system (BMS) via Modbus or BACnet
Standard USB connection (also known as USB-A)	For saving the offline logs and configuration parameters. Second option for the connection: For updating the switchgear firmware (download control software).
CAN	Connection pair for connectivity of multiple products of the series (Master-Slave).

Connection options	Intended use
RS-485	Connection of the product to the internet (via gateway and HFC protocol)  Alternative – BMS via Modbus  Alternative – BMS via BACnet  (only one of the three options can be selected)
Wireless	Connection via a smartphone app

### 3.3 Labelling

Typenschild - Behälter:

<b>wilo</b>		WILO SE Nonklischenstraße 100 44263 Dortmund - Germany	
Type :			
Typ :			
N° de série :	Année de fabrication :		
Serial-No. :	Year of manufacture :		
Serien-Nr. :	Herstellungsjahr :		
Capacité nominale :	litres		
Nominal volume :	litre		
Nenninhalt :	liter		
Surpression de service admissible :	bar		
Permissible working overpressure :	bar		
Zulässiger Betriebsüberdruck :	bar		
Surpression d'essai :	bar		
Test overpressure :	bar		
Prüfüberdruck :	bar		
Température de service mini. / maxi. admissible :	°C		
Permissible working temperature min. / max. :	°C		
Zulässige Betriebstemperatur min. / max. :	°C		
CE 0045			



Typenschild - Pumpenmodul:

<b>wilo</b>		Typ :	Serien-Nr. :	Schutzart :
		Type :	Serial-No. :	Protection cl. :
		Type :	N° de Série :	Cl. de protection :
		Type :	Volgnummer :	Beschermingsgr. :
Flamcoo B.V. - Amersfoortsseweg 9 - 3751 LJ Bunschoten - the Netherlands				
Nennspannung :		Zulässige Medientemperatur min. / max. :	°C	
Nominal voltage :		Permissible media temperature min. / max. :		
Tension nominale :		Température de média mini. / maxi. admissible :		
Nominale spanning :		Toegestane temperatuur media :		
Nennstrom :	A	Zulässiger Betriebsüberdruck :	Herstellungsjahr :	
Nominal current :		Permissible working overpressure :	Year of manufacture :	
Courant nominal :		Surpression de service admissible :	Année de fabrication :	
Nominale stroom :		Toelaatbare werkdruk :	Jaar van vervaardiging :	
Nennleistung :	kW	Zulässige Umgebungstemperatur min. / max. :	°C	
Nominal power :		Permissible ambient temperature min. / max. :		
Puissance assignée :		Température de ambiante mini. / maxi. admissible :		
Nominaal vermogen :		Toelaatbare omgevingstemperatuur min. / max. :		
CE				

Elektrische Warnungen:

Attention, high voltage! Opening by qualified personnel only.  
Disconnect the unit from the power supply before opening it.

Achtung, gefährliche Spannung! Nur vom Fachpersonal zu öffnen.  
Vor dem Öffnen des Gerätes spannungsfrei schalten.



<b>wilo</b>		
Capacity	intake / inhoud / Capaciteits	L
Gas charge	gasdruk / gasvul / Gasvullingsdruk	Bar
Max. working pressure	Max. zul. werkdruk / Max. werkdruk / Presión de servicio	Bar
Test pressure	Proefdruk / Proefdruk / Presión de prueba / Tipproefspanning	Bar
System temperature range (Max Tc)	Systeemtemperatuurbereik / Systeemtemperatuurbereik / Plage de température du système	°C
Max. temp. diaphragm	Max. temp. Membran / Max. temp. membrana / Temp. membrana max	°C
Article code	Artikelnummer / Artikelnummer / Código de artículo	
GB04L72		

Transportsicherung:

Nach Montage: Transportsicherung entfernen.
After mounting: Remove the transport safety.
Après l'installation: Retirez la sécurité des transports.
Na montage: Verwijder de veiligheid van het vervoer.
<b>wilo</b>

Service:  
[www.wilo.com](http://www.wilo.com)

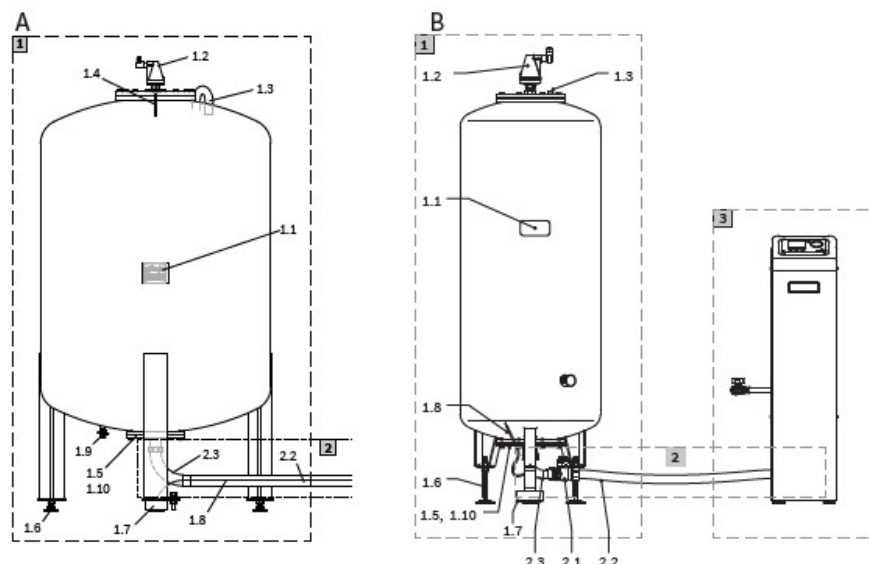
### 3.4 Pump control type key

Beispiel: **D80 -1 -50**

Schlüssel: **AB - C - D**

- Nennfrequenz der Betriebsspannung (Hz): **50** = 50 Hz; **60** = 60 Hz;
- Pumpenhersteller: **1; 2; 3; 4; 5**
- Leistungsklasse: **M; 2; 10; 20; 60; 80; 90; 100; 130**
- Modul Ausführung: **M**= Monopumpe; **D**= Duopumpe

### 3.5 Components, equipment

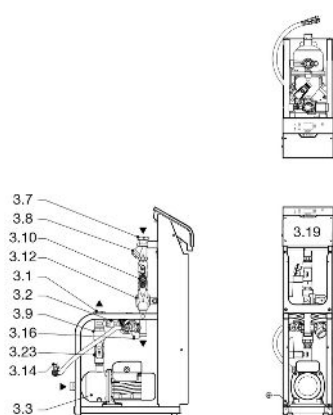


1	Vessel made of steel with built-in, replaceable membrane made of butyl rubber to intake the expansion water with atmospheric degassing.
1.1	Rating plate – vessel
1.2	Air vent valve, float valve with air-intake preventer to release extracted gases into the atmosphere
1.3	Connection to the atmospheric pressure compensation of vessel interior (space between vessel inner surface and membrane outer surface)
1.4	Lifting hook, load suspension for transport
1.5	Flange, vessel connection with internally fitted degassing, bolt connection, connection surface, valve outflow line, pump suction line, each with flat gasket (labelled)
1.6	Height-adjustable feet
1.7	Capacity sensor with screw-type round plug connector for the signal conductor
1.8	Level sensor signal conductor
1.9	Labelling for pump and valve connection
2	Connection assembly, pre-installed, with flat seal
2.1	Self-draining non-return valve (vessel) with flat seal, control unit connection
2.2	Flexible pressure/suction hose
2.3	Pipe bend, flat seal, vessel connection (DN 32: 400 – 1000 litres; DN 40: 1200 – 1600 litres)
3	Pump module, control module incl. rating plate

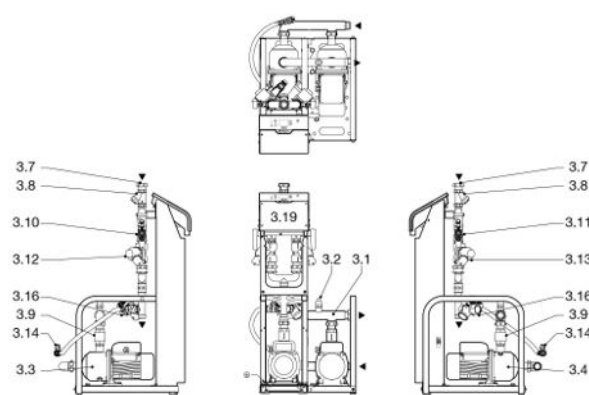
### 3.6 Components, pump modules

3.1	Pump pressure pipe; system supply (labelled)
3.2	Pressure sensor
3.3	Pump 1 with manual venting (hexagon head screw with gasket)
3.4	Pump 2 with manual venting (hexagon head screw with gasket)
3.5	Pump 1, glandless pump, self-priming; A speed selection switch, max. position! B vent (slotted-head screw with gasket)
3.6	Pump 2, glandless pump, self-priming; A speed selection switch, max. position! B vent (slotted-head screw with gasket)
3.7	Valve discharge pipe, system discharge (labelled)
3.8	Particle filter
3.9	Non-return valve
3.10	Manual control valve 1 (graph)
3.11	Manual control valve 2 (graph)
3.12	Solenoid valve, overflow valve no. 1
3.13	Solenoid valve, overflow valve no. 2

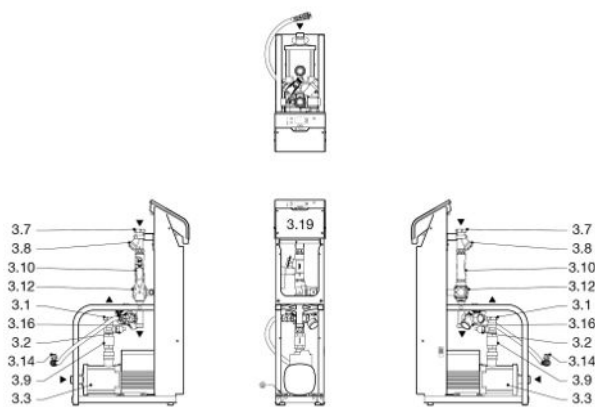
3.14	Top-up pipe including stop valve (non-return valve), discharge hose, solenoid valve, top-up valve, no. 3 and non-return valve (optional)
3.16	Safety valve (vessel)
3.17	Non-return valve system connection (optional)
3.18	Automatic air vent with anti-suction device
3.19	Control unit, Flextronic
3.20	Drainage pump
3.21	Manual control valve 3 (graph)
3.22	Front panel
3.23	Control unit, Flextronic 400 V



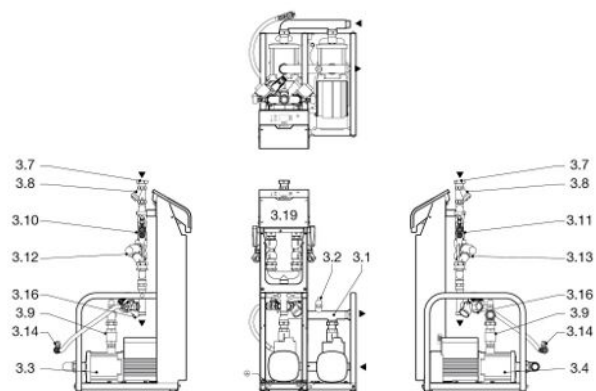
WILO G4 M02



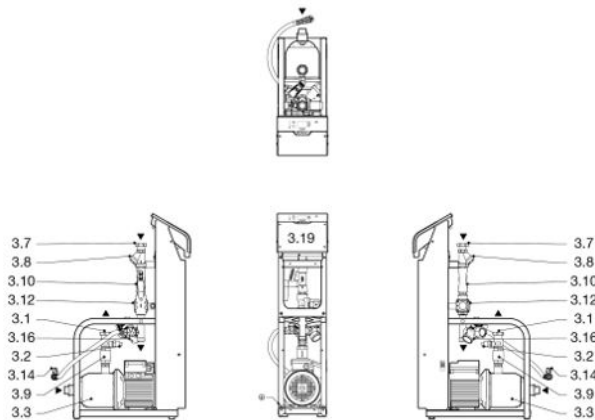
WILO G4 D02



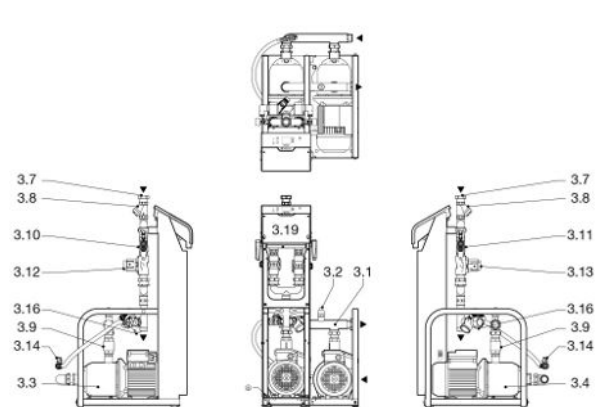
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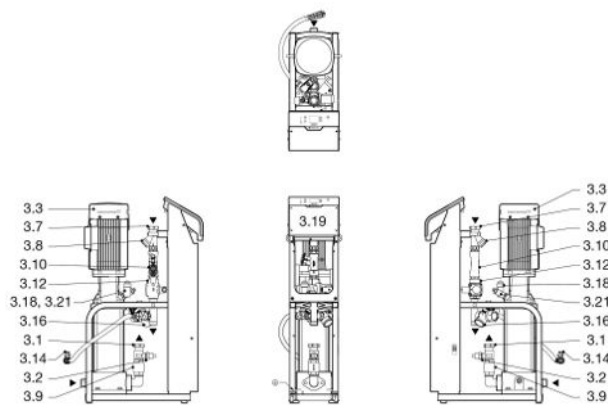
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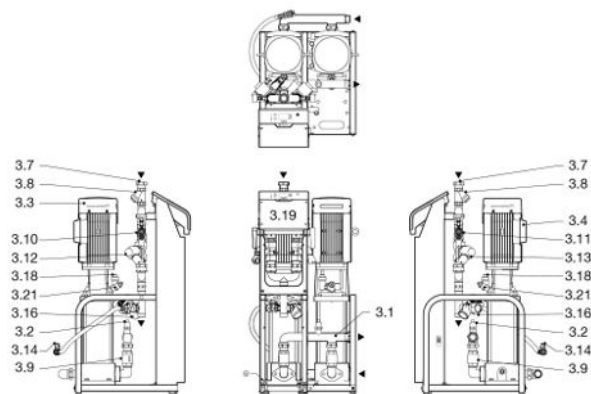
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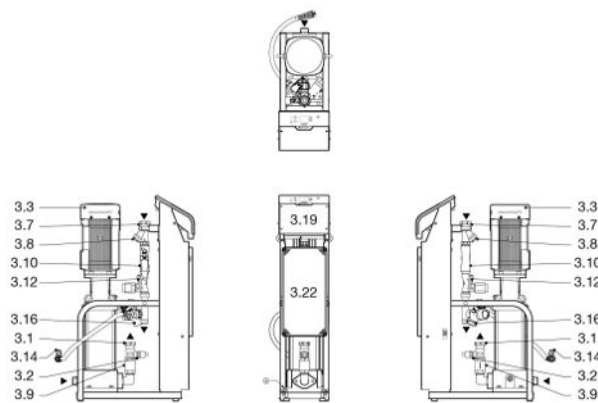
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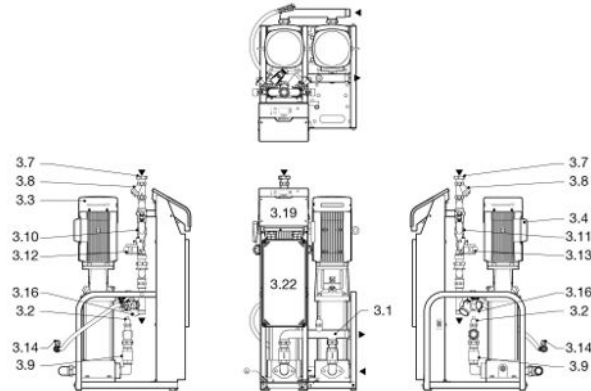
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WILO G4 D60

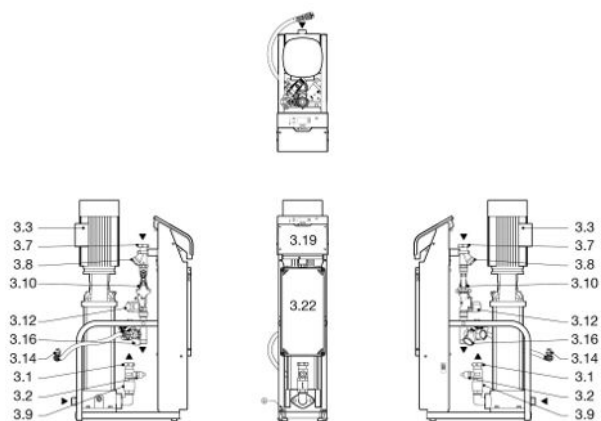


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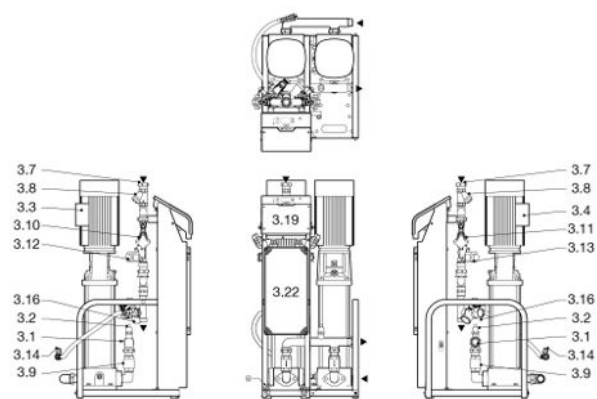


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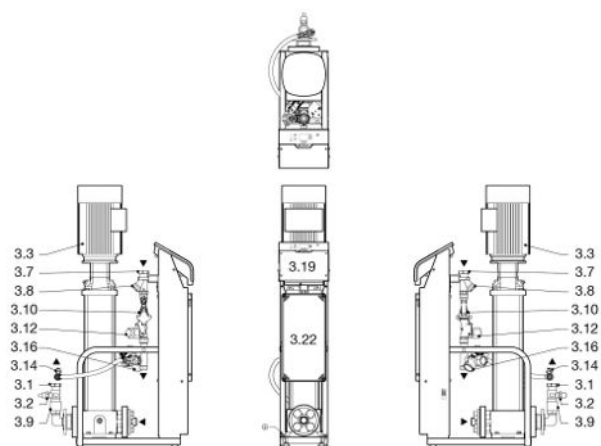




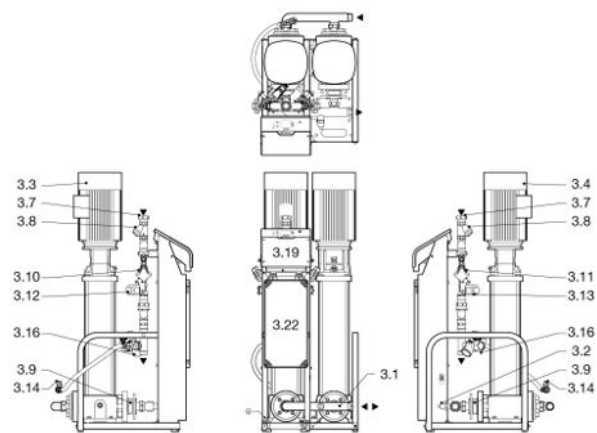
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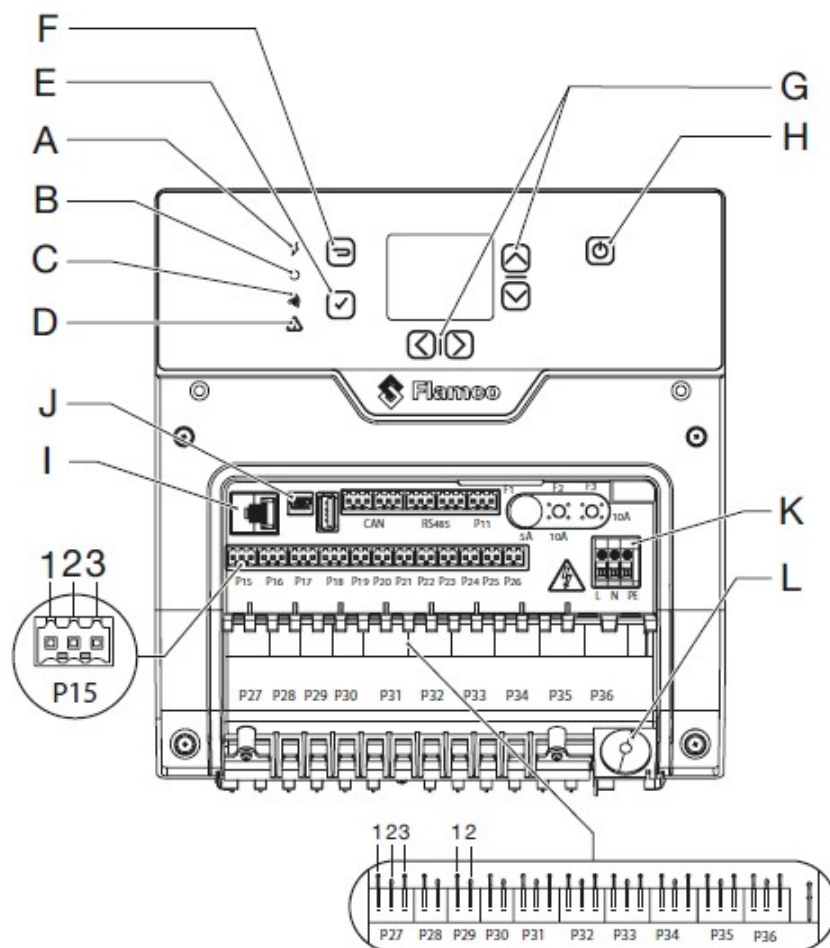
WILO G4 M130



WILO G4 D130



## 3.7 Control unit



Item	Description	Assignment
A	Power supply (orange = power supply connected)	
B	Status display (green = ok, automatic mode)	
C	Bluetooth display (blue = active) (no function)	
D	Fault/Alarm (red = fault)	
E	Confirmation	
F	Back	
G	Navigation buttons	
H	Display on/off (off = hold 8 s)	
I	RJ-45 socket for Modbus/BACnet via TCIP	
J	USB-A socket (software update, write data)	
CAN	CAN-Bus connection	1 CAN Hi 2 CAN Lo 3 GND
RS485	Modbus/Bacnet/HFC via RS485	1 B+ 2 B- 3 GND
F1	Fuse 1 (P31&P32) 5x20 5A	
F2	Fuse 2 (P33&P35) 5x20 10AT	
F3	Fuse 2 (P34&P36) 5x20 10AT	
K	Power supply	1 L 2 N 3 PE
L	Cable entry for power supply	

Item	Description	Assignment
P11	SELV, vessel fill level, analogue output	1 0 – 10 V 2 4 – 20 mA 3 GND
P15	System pressure sensor	1 +VDC 3 signal 3 GND
P16	Vessel filling level sensor	1 +VDC 2 –VDC 3 GND
P17	–	
P18	–	
P19	SELV, external top-up water meter (impulse)	1 NO 2 GND
P20	SELV, status (only 400 V)	1 NO 2 GND
P21	SELV, external temperature sensor	1 NO 2 GND
P22	SELV, external gas sensor	1 NO 2 GND
P23	SELV, external membrane breakage detector	1 NO 2 GND
P24	SELV, filling level sensor (min.)	1 NO 2 GND
P26	SELV, system pressure (analogue output 0 – 10 V)	1 NO 2 GND
P27	Programmable collective fault signal, potential-free	1 NO 2 COM 3 NC
P28	Programmable collective fault signal, potential-free	1 NC 2 GND
P29	Programmable collective fault signal, potential-free	1 NC 2 GND
P30	–	
P31	230 V output (top-up valve V3)	1 PE 2 L 3 N
P32	230 V output (drain valve (external))	1 PE 2 L 3 N
P33	Voltage output, differential pressure valve V1	1 PE 2 L 3 N
P34	Voltage output, differential pressure valve V2	1 PE 2 L 3 N

Item	Description	Assignment
P35	Voltage output, M1 pump 1	1 PE
		2 L
		3 N
P36	Voltage output, M2 pump 2	1 PE
		2 L
		3 N

The installed pressure and volume sensors are operated with extra-low voltage

## 4 Application/use

### 4.1 Intended use

The product can be used in closed water-based heating and cooling systems where temperature-related changes in the system-water volume (of the heat carrier) can be absorbed and the required operating pressure is regulated by a separate expansion automat.

Hot-water heating systems are subject to EN 12828. Special rules and regulations may apply for temperatures above 105 °C or system power of more than 1 MW. The client/operator must obtain information on additional security measures from the relevant official authorities.

For use in similar systems (e.g. heat-transfer systems for the process industry or technological heat), special safety measures may be required.

- Please see additional documents.

#### Fluid

- None-flammable water without solids or long-fibre components.
- Observe VDI 2035

Components that come in contact with the fluid include pipes, connected hoses, device and system connections including valves and fittings as well as their housing, and sensors, pumps, vessels and vessel membrane. Property damage will occur if the system is operated with unsuitable fluid. Damage to components lead to serious physical injury and property damage.

### 4.2 Improper use

The product is not designed for applications that are not explicitly intended for it by the manufacturer. This includes, in particular:

- Pumping fluids that attack the materials on the product chemically or mechanically.
- Pumping fluids with abrasive or long-fibre components.
- Pumping fluids that are not intended for this purpose by the manufacturer.
- Connections with the wrong voltage and/or frequency.
- Use in unsuitable system designs.
- Use of unauthorised installation materials.

## 5 Transport and storage



### WARNING

#### Risk of injury from a lack of protective equipment!

Danger of (serious) injuries during work.

- Wear protective gloves to protect against cuts.
- Wear safety shoes.
- If lifting accessories are used, wear a safety helmet.



### WARNING

#### Risk of injury from falling parts!

Never allow anyone to stand under suspended loads!

- Do not move the load over workplaces where persons are present.

---

## CAUTION

### Risk of damage to property!

Unsuitable lifting gear can cause the system to slip out or fall down.

- Only use suitable and approved lifting gear.
  - Never attach the lifting gear to the piping. Use the existing lifting eyelets for fixation.
  - Ensure stability.
- 

---

## CAUTION

### Risk of damage to property due to incorrect loading!

Subjecting the pipes and valves to loads while in transit can result in leakages.

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## CAUTION

### Risk of damage to property due to environmental influences!

The system can be damaged by environmental influences.

- Take suitable measures to protect the system from moisture, frost and heat as well as mechanical damage.
- 



## NOTICE

- After removing the packaging, store or assemble the system in accordance with the installation conditions described (see Installation and electrical connection page ).
- 

### 5.1 Delivery

The product is delivered on a pallet.

- Observe transport and storage instructions attached to the packaging.
- The transport dimensions, weights, necessary passageways and transport areas of the system can be found on the supplied installation plan or documentation.
- On delivery and before removing the packaging, check the packaging for damage.

If damage is detected due to a fall or similar:

- Inspect product and accessories for possible damage.
- Notify the delivery company (forwarding agent) or customer service, even if you do not find any obvious damage to the product or its accessories.

### 5.2 Transport

- If the outer packaging is damaged or no longer present, apply suitable protection from humidity and dirt.
- Do not remove the outer packaging until you are at the installation site.
- If the system is transported again at a later date, fit new suitable protection against moisture and contamination.
- Demarcate and cordon off the working area.
- Keep unauthorised persons away from the working area.
- Use approved lifting slings: Sling chains or polyester webbing slings.
- Empty, hanging vessels can be lifted and moved with the provided and suitable lifting eyelets prior to installation. Always use two lifting eyelets simultaneously for lifting and moving; never pull sideways at the eyelets.

### 5.3 Storage

- Place the product on a firm and even surface.
- Ambient conditions: 10 °C to 40 °C, max. humidity: 50 %.
- Dry hydraulics and pipework before packing.
- Protect the system from humidity and dirt.
- Protect the system from direct exposure to sunlight.

## 6 Installation and electrical connection



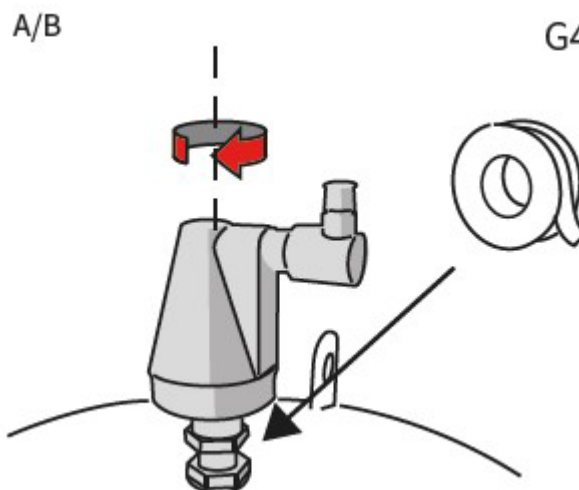
### WARNING

#### Physical injury due to malfunction!

External force leads to damage and leakage in the pipework. The product can fall down.

- Ensure that no external forces act on the system (e.g. thermal expansion, flow-induced vibrations, or net weight on the feed and return pipes).

### 6.1 Installation



- Attach automatic aeration (delivered separately).

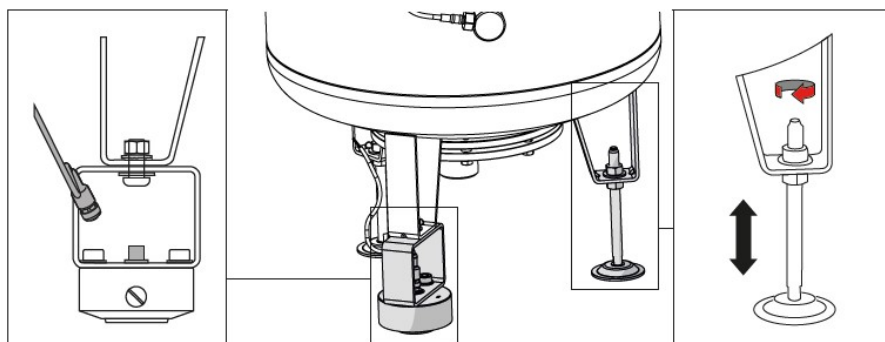
### CAUTION

#### Damage to property due to overpressure!

If the screw cap is not open, overpressure may build up in the vessel. Gas release is limited.

- Open screw cap.

- If the vessel is standing at the installation location and its position will no longer be changed, remove the securing mechanism at the level sensor.
- Avoid knocks against the sensor.
- Ensure the sensor is on a suitable surface that does not impair the function of the sensor pressure pad.



- Install weight/capacity sensor and height-adjustable feet.
- Align the vessel vertically using the height-adjustable feet. Use vertical magnetic spirit levels.
- Ensure that no exterior forces act upon the vessel (e.g. tools that are lying around or loads leaning against the sides).
- Do not affix vessel to the floor or on the installation surface (do not use a fixation method that could damage the vessel, for example, do not embed the feet in concrete).

or lime, do not weld the vessel or the feet, do not attach clamps or ties to the vessel body or components).

- Install control module, vessel and auxiliary vessel at the same height.



### NOTICE

If the vessels are at different heights, the volume sensor reading will not correspond to the actual volume in the vessel, which leads to error messages. The pressure maintaining function of the system could be impaired.



### NOTICE

If the vessels and control unit are located at different heights, high pressure can build up at the connection between the control unit and vessels. This leads to a very low volume flow or to loss of pressure boosting.

- Ensure that the installation location for the vessel and the control unit is determined based on the connection assembly.

## 6.2 Sound insulation

- If necessary, mount sound insulation at the contact areas of the module frame and pipe-work.

## 6.3 Connecting the vessel



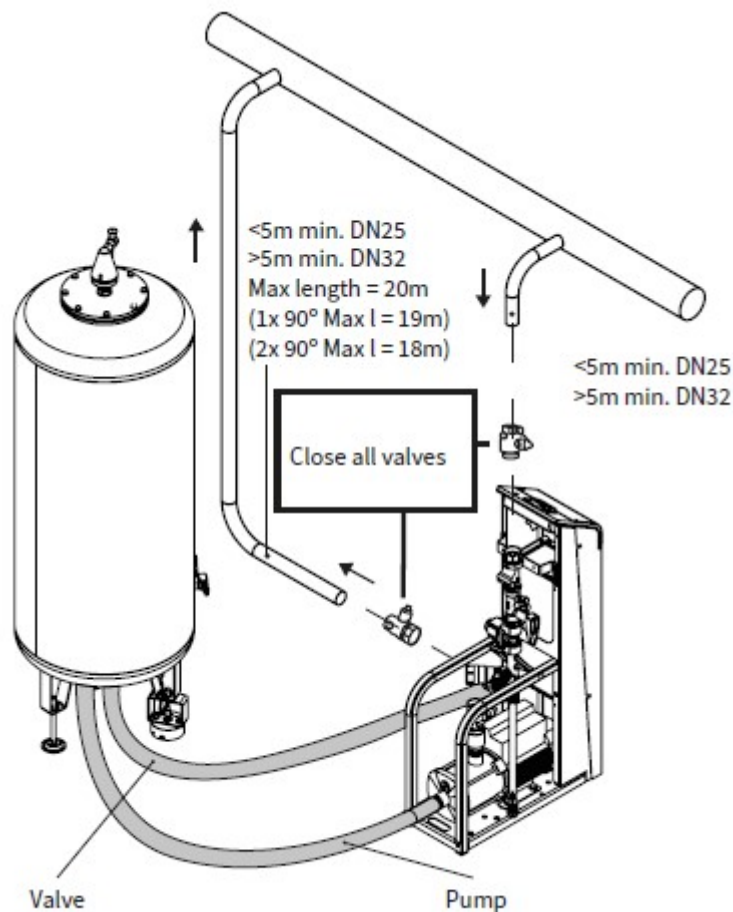
### CAUTION

#### Damage to property due to incorrect installation!

- Connect the pump module and vessel with the supplied flexible discharge hose only (connection assembly).
- Observe the “pump” and “valve” stickers on the connections. Attach the corresponding connection from the pump module (valve) to the pump (valve) at the vessel connection.
- In order to allow piping to be fitted in parallel, do not cross connections and mount the vessel connecting flange if necessary. Use the supplied flat seals.

The vessel connection to the pump module can be either an electrical or hydraulic connection. See Installation diagram and example [► 35] in Annex 1.

- Before filling and commissioning the vessel, observe the following:



- Install the connection assembly between the vessel and control module.
- Connect the signal cable to the capacity sensor via the quick-release connector. Screw the connection completely into the connector (protection class IP67).
- Mount the non-return valve on the connection assembly between the vessel (main vessel, auxiliary vessel) and control module.

#### 6.4 Top-up connection

- Mount the top-up connection on the control unit.

Topping up safely requires a supply pressure of 4 to 6 bar (max 8 bar). If the supply pressure is high, components must be installed to minimise water hammering (pressure reduction).

See Installation diagram and example [► 35].

Before filling and commissioning the expansion automat, observe the following specifications:

- Mount the inlet with the shut-off valve (scope of delivery) on the top-up hose.
- Mount the shut-off valve on the top-up intake.
- Avoid tension on the hose, bending curves less than 50 mm and constriction.
- If the top-up is hooked up to the water mains, mount a non-return valve with filter in the array (in accordance with EN 806-4, EN 1717).
- Install these accessories horizontally and fit a shut-off valve in front of the assembly.



#### NOTICE

Clean filter regularly and replace if necessary

#### 6.5 Draining connection

- Mount drainage equipment in the vicinity of the system to ensure safe drainage of volume flows at the safety valve (Item 3.16), at the non-return valve (accessory, topping up) and at the atmospheric pressure compensation connection (Item 1.3).
- Install a drainage funnel and, if necessary, drain pipe for the non-return valve.

#### 6.6 System connection

- Mount system connection on the heating or cooling system.

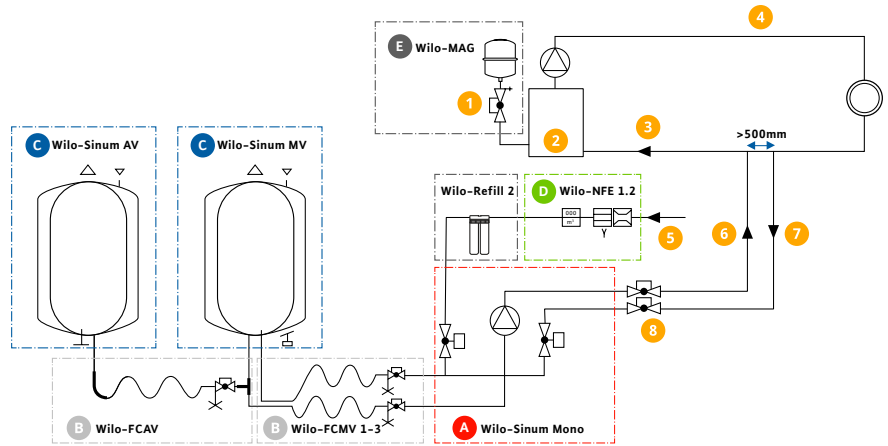


Fig. 1: Sinum (v3) installation example

Before filling and commissioning the expansion automat, observe the following specifications:

## CAUTION

### Damage to property if fluid temperature is too high!

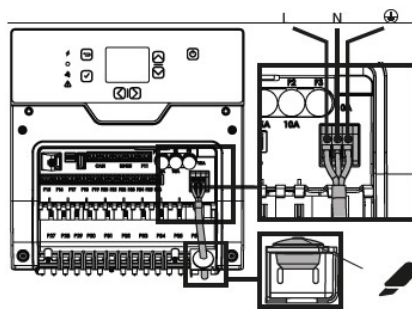
Components (control unit and membrane) can be damaged by excessive fluid temperatures  $> 70^{\circ}\text{C}$  (to  $80^{\circ}\text{C}$ ).

- Insulate the expansion tube.

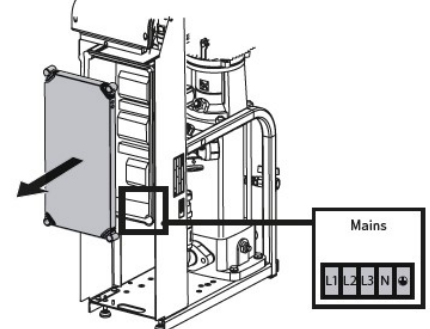
- Close the stop valve at the system inlet and outlet of the control unit
- Perform the installation at the return of the heating system, if possible.
- Connect directly to the heat generator. No external hydraulic pressure is allowed to be present at the intake (e.g. hydraulic compensation devices, manifolds).
- The installation of the expansion pipes depends on the flow. If the expansion pipes are installed at the return (longer than 5 m), pipes should always be used that are at least one nominal diameter larger than the nominal diameter of the pump module. Ensure that the system connection of the control unit is not under additional load (thermal expansion, flow fluctuations, net weight, etc.).
- Systems with a temperature above  $100^{\circ}\text{C}$  must have a minimum pressure limiter in the expansion pipe (system drainage, valve drainage pipe). See Annex 1 [► 35]. For applications according to DIN EN 12828:2003 (D), the limiter is only envisaged if the pressure-maintaining system does not have automatic top-up.
- Use sealants and pipework that is suitable for the installation.
- Observe maximum permissible volume flow and maximum permissible temperature and pressure values for the respective expansion pipe (control unit, system inlet and outlet).
- Mount non-return valve in the immediate vicinity of the system connection on the control unit. The non-return valve must be protected against being switched off by accident.

## 6.7 Electrical connection

Connect power cable (100 - 240 VAC ~1N PE, 50/60 Hz)



Connect power cable (400 VAC ~3N PE, 50/60 Hz)







## DANGER

### Danger of death due to electrical current!

Improper electrical connection can lead to electric shock.

- Have electrical work carried out by a qualified electrician.
- Comply with accident prevention regulations.
- Observe local regulations.



## DANGER

### Danger of death due to electrical current!

- Disconnect the product from the mains and secure it against being switched on again.



## CAUTION

### Risk of damage to property due to welding work!

Offset welding current or incorrect earthing can cause fires or damage to the system components.

- Do not perform welding work on components that are connected to the control unit electrically.

- Current type, voltage and the frequency of the mains supply must correspond to the specifications on the rating plate; also see Annex 3 [► 40].
- Measure electrical connection cables sufficiently according to the total power consumption (see rating plate).
- Install residual-current device Type A (RCD) with a trigger current of 30 mA.
- Earth the system.
- Cables connected to the control unit may be live. Insulate open contacts.
- Connect the product via a power cut-off switch (3 mm contact distance). Mount the power cut-off switch in the direct vicinity of the product.
- Create potential equalisation between earthing connection and potential equalisation cable. The minimum diameter, quality and type of connection cable must adhere to local regulations and the regulations applicable to this application.
- Electric control terminals must be connected at the installation location with suitable operating voltage to the mains voltage supply.



## NOTICE

The configuration and system-dependant parameters can be programmed into the control unit directly.

## 7 Commissioning

### 7.1 Initial commissioning

- Ensure that the system is suitable for the purpose and that the product is securely installed.
- Test the function of the cover of the control unit, the cover of the pump feed, threaded cable glands and connection plug of the valve prior to commissioning.
- Document the commissioning procedure (actions and settings).
- Ensure that the installation and other actions have been fully executed prior to commissioning (e.g. power supply available and connected, functioning and active fuse protection, system leakproof, volume sensor transport protection removed).

## CAUTION

### Damage to property may occur due to incorrect commissioning!

Only fill the vessel after all commissioning measures.

- Set the manual control valve on the pump module (see Annex 2 [► 37]).
- Set the second manual control valve on the M02.
- Fill and vent the heating or cooling system (not the vessel!).
- Ensure the top-up pipe is ready for operation.
- Open the valve at the top-up connection and the non-return valve at the flexible hose connection assembly (vessel connection).
- Activate the control unit and perform commissioning procedure (Overview of menu items [► 27]).  
The commissioning procedure includes selecting the language.
- Scan the label of the Wilo-Sinum main vessel or select it based on its rated capacity (Labelling [► 11], rating plate of the vessel).
- Perform the factory-set operational calibration (Overview of menu items [► 27]).
- Activate the topping-up procedure. When the volume has reached approx. 7% (see display), switch off the control unit and vent the pump(s) (Components, pump modules [► 12]; Item 3.5, Item 3.6, Item 3.20). For pumps with automatic venting, turn the red sealing cap to open the venting.
- Open the sealing cap valve on the return circuit (system flow and return).



### WARNING

#### Risk of injury from hot components!

The heating system pipes can be hot.

- Seal the non-return valves.

After completing all work and checking the technical data, suggestions and explanations, the expansion automat is ready for operation.

- Activate control unit.

### CAUTION

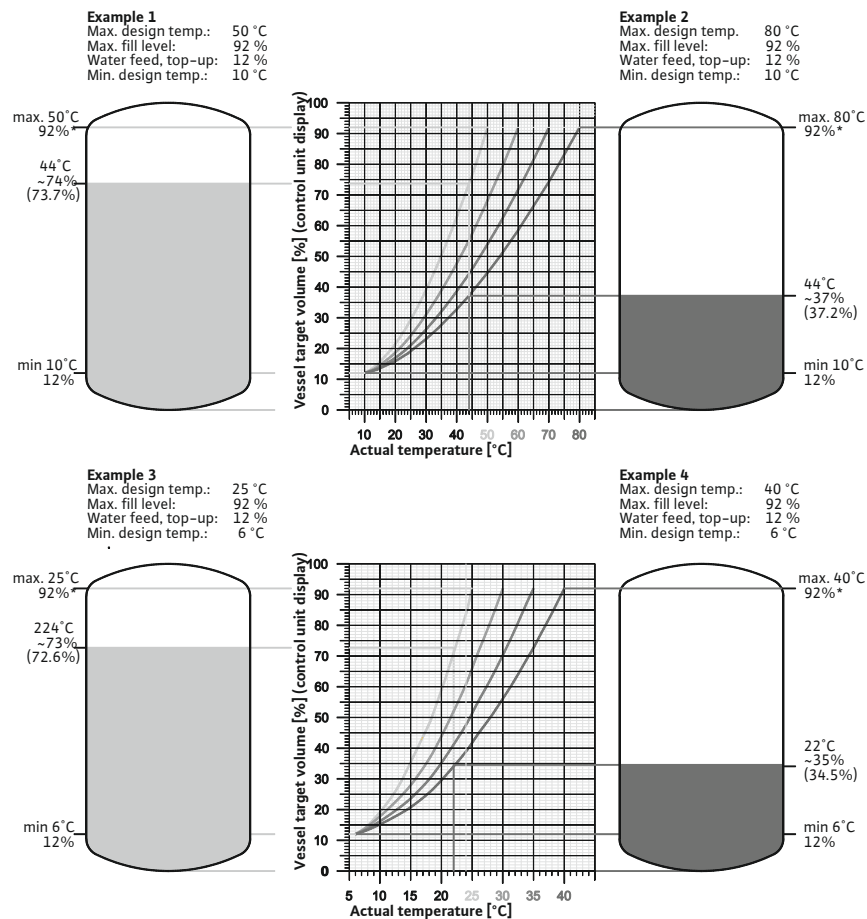
#### Damage to property may occur due to incorrect operation!

Closed balancing valves during operation cause damage to the pump unit.

- The balancing valves of the pump unit must always be open during operation.

## 7.2 Commissioning, volume and operating temperature












































- If a different minimum filling level is required after start-up (ready for operation and top-up installed), fill the vessel after commissioning to the minimum filling level for the actual system temperature.
- See also: Maintenance [► 31]



































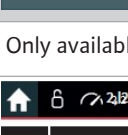


### 7.3 Overview of menu items



















Symbol	Name	Function
	Language selection	Select the language of the interface
	Time and date setting	Set the time and date
	I have read the handbook	Confirmation of acquaintance with commissioning procedure
	Vessel type selection – vessel calibration	Select the (main) vessel calibration
	Setting the pressure	Set the desired pressure default value
	Accessories selection	Select the additional control functions of the automat
	Commissioning overview	Confirm the automat settings

## 7.4 Symbols, function and position

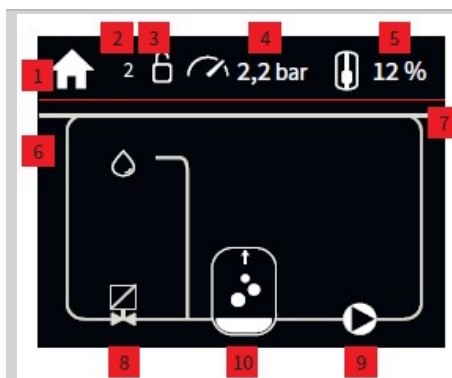
Symbol	Name	Function	Item
	Home	Shows the automat's status	
	Settings	Opens the settings menu	
	Log in	Login to access advanced settings	
	Manual mode	Manually activate the actuating drive	
	Service information	Display of service information	
	Pressure	Change the operating pressure and pressure tolerance interval	  
	Top-up level	Set the top-up, draining and alarm level	  
	Degassing	Select the degassing mode and the profile of prohibited hours	  
	General	Open the general settings menu	  
	Alarms	Assign alarm signals to the potential-free outputs	    
	Accessories	Activate the extended control accessories	    
	Time/date	Set the time and date	    

Symbol	Name	Function	Item
	Language	Select the language	  
	Factory re-set*	Reset the automat	  
	Firmware up-date*	Update the firmware	  
	Date	Set the date	   
	Time	Set the time	   
	System in-formation	Display information about the automat and switchgear.	 
	Error log	Show the last 30 error mes-sages	 
	Maintenance	Show the date when main-tenance has to be per-formed next	 
	Operating hours	Display the performance statistics	 
	USB detected	Save the log file to a USB stick	

\* Only available after login

   2,2 bar  12 %	  2,2 bar  12 %	 2,2 bar  12 %	  2,2 bar  12 %
 Ext  200 L	  Einstellungen Anmelden   Manueller Modus Service-Informationen	Hochdruckalarm 6,0 bar Pset + 2,2 bar Pset < 2,0 bar > Pset - 1,8 bar Niederdruckalarm 0,6 bar	Wartung 1 11-11-2018 Wartung 2 11-11-2018 Wartung 3 11-11-2018 Wartung 4 11-11-2018 ↓ 4.4
Operating data	Menu	Settings	Display

## Operating screen



- 1 Screen icon
- 2 Node number
- 3 Logged in
- 4 Current system pressure
- 5 Current vessel fill level
- 6 Topping up
- 7 System
- 8 Valve(s)
- 9 Pump(s)
- 10 Vessel
  - Bubbles indicate whether degassing is turned on or off
  - Animated bubbles indicate that the degassing is active
  - Arrow indicates increasing/decreasing water level in the diaphragm expansion vessel

## Pressure settings






- 1 High pressure alarm
- 2 Operating pressure upper limit
- 3 Operating pressure
- 4 Operating pressure lower limit
- 5 Low pressure alarm

## Degassing settings



- Main venting function
  - 1 Normal degassing mode
  - 2 Turbo degassing mode (24-hour high-frequency degassing)
  - 3 Degassing mode OFF
- Resting interval settings of the pump venting function
  - 4 No resting profile active
  - 5 Degassing is allowed on weekdays between 9 a.m. and 5 p.m.
  - 6 Degassing is allowed daily between 10 a.m. and 5 p.m.
  - 7 Degassing is allowed daily between 9 a.m. and 9 p.m.
  - 8 Degassing is allowed on weekdays and Saturdays between 7 p.m. and 7 a.m. and Sundays

## 7.5 Topping up, operation with water treatment module

	 2,2 bar	 12 %
Obergrenze	97 %	
Entleerung starten	94 %	
Entleerung stoppen	< 92 % >	
Nachfüllen stoppen	12 %	
Nachfüllen starten	9 %	

Obergrenze

Entleerung starten

Entleerung stoppen

Nachfüllen stoppen

Nachfüllen starten

Mindestfüllstand

Untergrenze

Filterkapazität

Maximale Nachfüllzeit pro Zyklus

Maximale Nachfüllmenge pro Zyklus in Litern

Nachfüllintervall

Nachfüllzyklen pro Tag

## 7.6 Restart

### CAUTION

#### Damage to property may occur due to incorrect restart!

- Ensure that the minimum and maximum system pressure is within the permitted operating pressure when the system is cooling down or heating up.



### NOTICE

Equipment to ensure low and high pressure prevention when operating the heating and cooling system is not part of the standard scope of delivery.

#### After temporary decommissioning

- Switch off control unit.
- Close the stop valves to the system and stop valve to the top-up line.
- Depressurise and drain water-bearing areas.
- It is recommendable that maintenance work be performed prior to the restart (see Maintenance [► 31]).
- Use the records made during commissioning for the restart and pay attention to system changes that could lead to new operating conditions for the expansion automat (e.g. to different system pressure).

#### After power outage

- Target parameters and default settings for pressure, aeration and topping-up remain the same. The automatic mode is re-started after power is restored (control unit "ON"). Unusual operating conditions of the system (e.g. cooling below the default setting) may be outside the permissible settings of the vessel.
- When the power is restored, check the automat's operation and set the date and time if necessary (overview of menu items).

## 8 Decommissioning and dismantling



### DANGER

#### Risk of electric shock due to improper decommissioning!

- At the end of the service life or during planned deactivation, disconnect the product from the power supply.
- Close connections to the hydraulics system and topping up connections.

- Depressurise and drain water-bearing areas
- Close connections to the hydraulics system and topping up connections.
- Decide on the purpose or reuse of system water in accordance with applicable regulations.
- System water may be treated (antifreeze or other additives). Discuss the provisions for reuse of components with the waste disposal contractor.

## 9 Maintenance



### DANGER

#### Danger of death due to electrical current!

The voltage of the external power supply is also present when the main switch is switched off!

- Disconnect the plug from the power supply before carrying out any work.
- Have electrical work carried out by a qualified electrician.
- Observe local regulations.

	<p>The due date for maintenance is specified in Menu 4.4.</p>
	<p>A maintenance error message appears on the due date. The error is shown in the list of current error messages/warnings and the error log.</p>

		Objectives, standard scope	Servicing activities, measures
Maintenance 1	365 days	Particle filter 3.8 * particle filter of non-return valve (only if installed)	Clean the filter insert and the housing.
		Suction block, air vent valve 1.2 *, automatic air vent 3.18*	Clean and check functionality. Unscrew cap and take out inside spring and ball bearing for cleaning. Reassemble the components in reverse order. Mount cap. Open again with one turn.
		Primer valve 3.10, 3.11 *	Check and reset the presets as in graphs (see Annex 2 [► 37]; seal valve)
		Pump 3.3, 3.6 *, valve 1, 2, 3.12, 3.13 *, valve 3 *, water meter 3.14 *	Functional check. Have check performed by trained and certified staff manually. Further inspections can be performed while the system is in operation (observe). Vent pumps (except MP/DP 60).
		Control unit 3.19*, configuration	Check and restore required settings (overview menu).
		Vessel 1 *, pump module 3 *	Check and restore impermeability of all hydraulic connections to the water-bearing areas. Check screw connections are leak tight and that the exterior has no damage, deformation or corrosion. Make ready for operation.
		Safety valve 3.16 *	Functional check. Have check performed by trained and certified staff manually. This requires a non-return valve 2.1* in the connection subassembly.
Maintenance 2	1825 days		Check interior of vessel. Perform regular inspections; see general safety instructions.
Maintenance 3	3650 days		Check strength of vessel!
Maintenance 4	584 days		Perform regular inspections of the electronics.

See “Components, pump modules [► 12]”.

### 9.1 Emptying and topping up the vessel

If the expansion water from the main or auxiliary vessel has to be drained, proceed as follows:



- Note actual volume value (%), (shown in control unit).
- Switch off control unit (press O/I button for 8 seconds).
- Close non-return valves on the expansion pipe (system inlet and outlet) and the connection assembly (vessel inlet and outlet).
- Close the stop valve at the top-up connection.
- Perform necessary work on the vessel (drainage, maintenance, repair, etc.).
- Activate control unit. Log in and go to "Factory reset". Perform commissioning (overview of menu options; commissioning 1 – 1.8).
- The initial filling starts automatically after commissioning.



## NOTICE

If more topping up is required than the default setting of the minimum filling volume of the vessel (6%), switch off the degassing function (degassing settings menu).

Filling must take place via the connection valve (labelled) of the vessel. If the main and auxiliary vessels have to be filled, open the non-return valve at each vessel connection (flow and return).

Ensure that the volume fill level is detected with the volume sensor of the main vessel.

- Disconnect the filling equipment.
- Open all previously closed valves (gasket) and vent pump(s).
- The pump venting function can optionally be turned on again.
- The operating mode is once again active.

The menu item has two questions. A reset only takes place if both are acknowledged.



## NOTICE

During a system restart, self-acknowledging errors or errors that must be acknowledged may occur.

## 9.2 Additional maintenance work

- Inspect and document electrical equipment together with the heating/cooling unit every 18 months (see DIN EN 60204-1:2007).

## 10 Faults, causes and remedies

### 10.1 Error messages



## DANGER

### Danger of death due to electrical current!

The external electrical power supply is also present at the terminals when the main switch is switched off!

- Disconnect the external power supply before any work.
- Electrical work must be carried out by a qualified electrician.
- Observe local regulations.



## WARNING

### Risk of injury due to improper repair!

- Only allow repairs to be carried out by qualified personnel.

Error	GUI	Measure
0	Maximum running time error of an individual pump	Pump failure. Check pump functionality. If no solution can be found, contact customer service.
1	Maximum running time error – redundant pumps	Pump failure. Check pump functionality. If no solution can be found, contact customer service.
2	Maximum running time error – load-sensitive pumps	Pump failure. Check pump functionality. If no solution can be found, contact customer service.

Error	GUI	Measure
3	Current, individual pump errors	Potential pump failure. Check the electrical connection of the pump. If no solution can be found, contact customer service.
4	Current error on pump A (two-pump configuration)	Potential pump failure. Check the electrical connection of the pumps. If no solution can be found, contact customer service.
5	Current error on pump B (two-pump configuration)	Potential pump failure. Check the electrical connection of the pumps. If no solution can be found, contact customer service.
6	Current error on pumps A and B (two-pump configuration)	Potential pump failure. Check the electrical connection of the pumps. If no solution can be found, contact customer service.
7	Current error on pump C	Potential pump failure. Check the electrical connection of the pumps. If no solution can be found, contact customer service.
8	Correction error of self-learning valve	Correct error by acknowledging the current error messages/warnings.
9	Correction error of self-learning pump	Correct error by acknowledging the current error messages/warnings.
10	Pressure sensor current exceeded	Check whether the pressure sensor cable is damaged.
11	Pressure sensor without power	Check if the pressure sensor cable is plugged in.
12	Pressure sensor current exceeded	Check whether the filling level sensor cable is damaged.
13	Pressure sensor without power	Check whether the pressure sensor cable is plugged in.
14	Power consumption of pump A too high	Potential pump failure. Check the electrical connection of the pump. If no solution can be found, contact customer service.
15	Power consumption of pump B too high	Potential pump failure. Check the electrical connection of the pump. If no solution can be found, contact customer service.
16	Power consumption of pump C too high	Potential pump failure. Check the electrical connection of the pump. If no solution can be found, contact customer service.
17	Maximum running time M1 exceeded	Pump is running too long. Ensure the system doesn't have a leak.
18	Maximum running time M2 exceeded	Pump is running too long. Ensure the system doesn't have a leak.
19	Maximum volume flow to be treated exceeded	Replace filter.
20	Pump is running but there is no reduction in the water level in the vessel	Potentially a pump fault or clogged vessel drain pipe
21	Valve open, water level of vessel does not increase	Potential valve fault or clogged vessel supply pipe
22	Maximum running time V1 exceeded	Valve is running too long. Ensure that the settings of the balancing valve are correct.
23	Maximum running time V2 exceeded	Valve is running too long. Ensure that the settings of the balancing valve are correct.
24	Start quick fill	Acknowledge error in the current error messages/warnings to start the quick fill.
25	Start to fill system	Acknowledge error in the current error messages/warnings to start filling the system.
26	System is running in automatic mode	Leave manual mode. The automat controls the pressure
27	Quick system fill is active, V to stop	Press V to stop/interrupt quick system fill
28	System fill is active, V to stop	Press V to stop/interrupt system fill
29	Manual mode active, press V to start automatic mode	Acknowledge message to operate the automat in automatic mode (to leave manual mode)
30	Membrane rupture	Membrane is broken. Replace membrane.
32	Increased water level in vessel without Wilo-Sinum activity	Potential error of the manifold, top-up or non-return valve
33	Reduction of water level in vessel without Wilo-Sinum activity	Potential leak in the vessel or connection assemblies or drain valve fault
34	Maintenance 1 due	Perform Maintenance 1 (yearly system maintenance)
35	Initial filling failed	Possible top-up valve fault or clogged supply pipe
36	Maximum topping up time exceeded	Potential fault of top-up valve
37	Maximum draining time exceeded	Potential fault of drain valve
38	No top-up flow	Ensure the litre meter is available

Error	GUI	Measure
39	Top-up water level too high	System requires too much topping up. Potential leakage
43	Initial filling active	Automat is filling a vessel with the minimum water level
44	Manual initial filling active	Fill vessel with minimum water level.
45	System filling timer has run down	System filling took too long. Check system and restart filling process.
46	Quick-fill timer has run down	System filling took too long. Check system and restart filling process.
47	Maintenance 2 due	Perform Maintenance 2 (inspect vessel interior, every 5 years)
48	Maintenance 3 due	Perform Maintenance 3 (check strength of vessel, every 10 years)
49	Maintenance 4 due	Perform Maintenance 4 (inspect vessel interior, every 5 years)
64	Low pressure alarm	System pressure below the "low pressure alarm value"
65	High pressure exceeded	System pressure above the "high pressure alarm value"
66	Water level below the lower limit	Water level in a vessel is below the "lower fill level limit"
67	Water level above the upper limit	Water level in a vessel is above the "upper fill level limit"
68	Pressure below lower limit	Danger of steam forming. Turn off a boiler
69	Dry-running protection	Top-up pump cannot be started because it is dry
70	Critical water level	Water level in a vessel is below "lower limit"
72	Temperature too high	Temperature at the inlet of the automat is greater than 70%. Please use an intermediary vessel
73	The period between top-up processes is too long	System requires too much topping up. Potential leakage
74	Number of top ups within a certain period was exceeded	System requires too much topping up. Potential leakage
75	Do not lean against the vessel	

## 11 Spare parts

Spare parts are ordered via customer service. To avoid return queries and incorrect orders, the serial or article number must always be supplied. **Subject to change without prior notice!**

## 12 Disposal

### 12.1 Information on the collection of used electrical and electronic products

Proper disposal and appropriate recycling of this product prevents damage to the environment and danger to your personal health.



#### NOTICE

##### Disposal in domestic waste is prohibited!

In the European Union this symbol may be included on the product, the packaging or the accompanying documentation. It means that the electrical and electronic products in question must not be disposed of along with domestic waste.

Please note the following points to ensure proper handling, recycling and disposal of the used products in question:

- Hand over these products at designated, certified collection points only.
- Observe the locally applicable regulations!

Please consult your local municipality, the nearest waste disposal site, or the dealer who sold the product to you for information on proper disposal. See [www.wilo-recycling.com](http://www.wilo-recycling.com) for more information about recycling.

**Subject to change without prior notice!**

## 13 Annex 1

### 13.1 Technical data, information

**CAUTION! DO NOT STACK!**

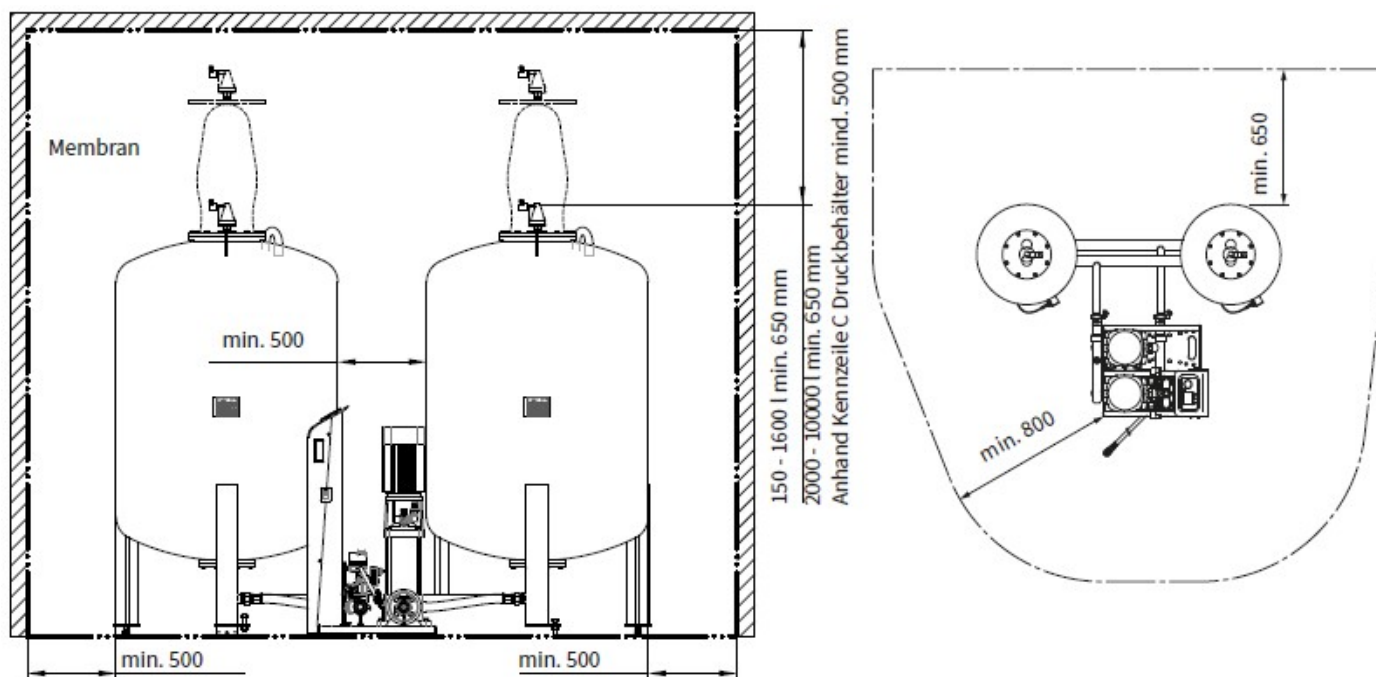
### 13.1.1 Ambient conditions

Bearing		
Room:	Protected against:	Ambient conditions:
Closed	Solar radiation	60 – 70% relative humidity, non-condensing
Frost-free	heat radiation	Maximum temperature 50 °C
Dry	Vibration	Free of electrically conductive gases, explosive gas mixtures, aggressive atmosphere

Operating space		
Room:	Protected against:	Ambient conditions:
Closed	Solar radiation	60 – 70% relative humidity, non-condensing; temperature 3 to 40 °C
Frost-free	Heat radiation	Depending on the type 3 to 50 °C
Dry	Vibration	Free of electrically conductive gases, explosive gas mixtures, aggressive atmosphere. Caution: Higher temperatures can lead to the drive system overloading.

### 13.1.2 Minimum distances



### 13.1.3 Examples of installation

- Keep distance from system supply, system drainage, at the return integration point between 0.5 and 1 metre.

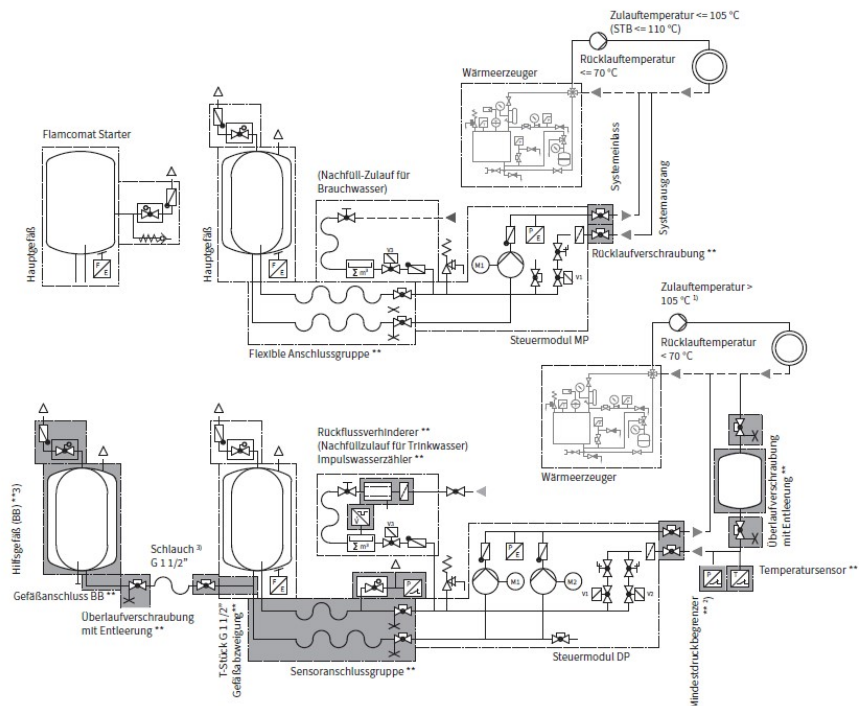
## CAUTION

### Damage to property due to incorrect installation!

A horizontal return can become clogged with dirt.

- Do not install connection from below.

- For rated temperatures > 100 °C and > 110 °C, additional stipulations from European standards apply.
- Not necessary according to DIN EN 12828
- Add additional auxiliary vessels symmetrically with a manifold (main vessel in the middle) with due regards to minimum distances. The branch line from the main vessel must be flexible.



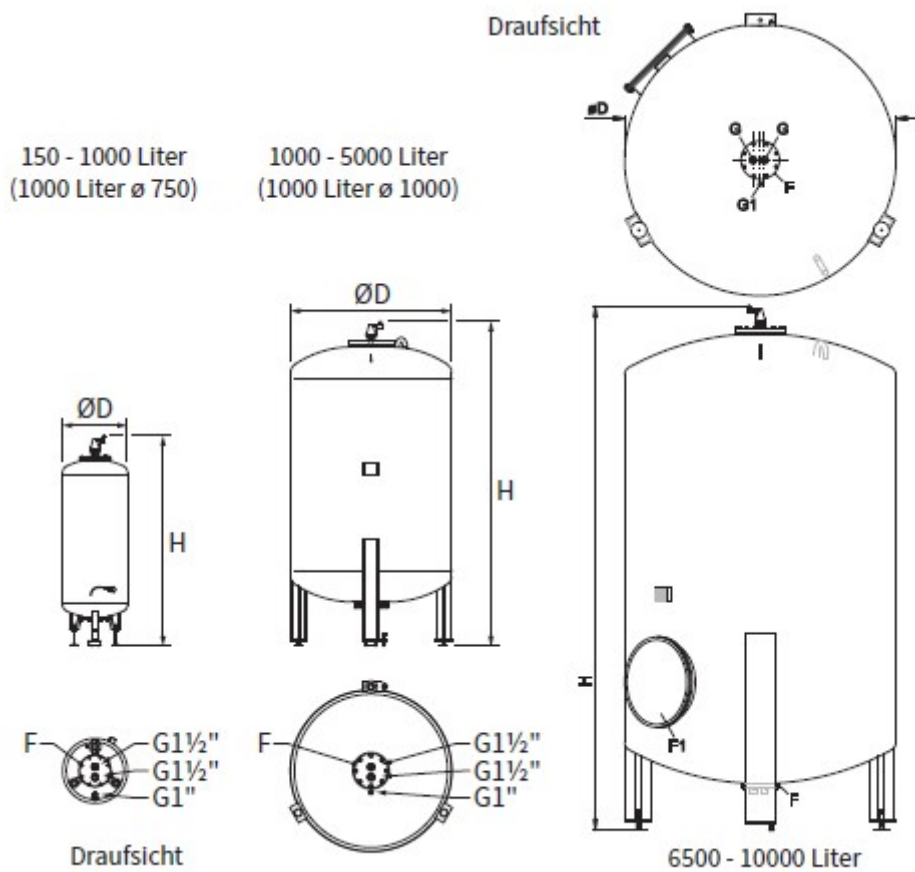
\*\* Accessories, optional extras

## 14 Annex 2

### 14.1 Technical data, specifications, hydraulics systems

#### 14.1.1 Vessel: Volume, dimensions and weights

Nennkapazität [Liter]	Gefäßdurchmesser D (Eigenschaft C) [mm]	Maximale Höhe H (Eigenschaft C) [mm]	Gefäßverbinder Zulauf Rücklauf G [G; Zoll]	Kondensatableitung G1 [G; Zoll]	Gefäßflansch F [DN]	Gefäßflansch F1 [DN]	Eigengewicht (wie geliefert, ohne Verpackung) (Eigenschaft C) [kg]
100	484 (484)	1050 (904)	1½"	½"	165		35 (27)
200	484 (600)	1560 (1081)	1½"	½"	165		31 (42)
300	600 (600)	1596 (1451)	1½"	½"	165		41 (56)
400	790 (790)	1437 (1293)	1½"	½"	165		62 (76)
500	790	1587	1½"	½"	165		70
600	790 (790)	1737 (1653)	1½"	½"	165		77 (97)
800	790	2144	1½"	½"	165		92
1000	790	2493	1½"	½"	165		106
1200	1000	2210	1½"	½"	165		291
1600	1000	2710	1½"	½"	165		346
2000	1200	2440	1½"	½"	165		431
2800	1200	3040	1½"	½"	165		516
3500	1200	3840	1½"	½"	165		626
5000	1500	3570	1½"	½"	165		1241
6500	1800	3500	1½"	½"	165	500	1711
8000	1900	3650	1½"	½"	165	500	1831
10000	2000	4050	1½"	½"	165	500	2026





14.1.2 Vessel: Operational characteristics

Nennkapazität [Liter]	Zulässiger Betriebsüberdruck [bar]	Testüberdruck [bar]	Mindesttemperatur (Bemessung) [°C]	Höchsttemperatur (Bemessung) [°C]	Zulässige dauerhafte Mindesttemperatur an der Membran [°C]	Zulässige dauerhafte Höchsttemperatur an der Membran [°C]
100 - 10000	3	4,72	0	120	0	70



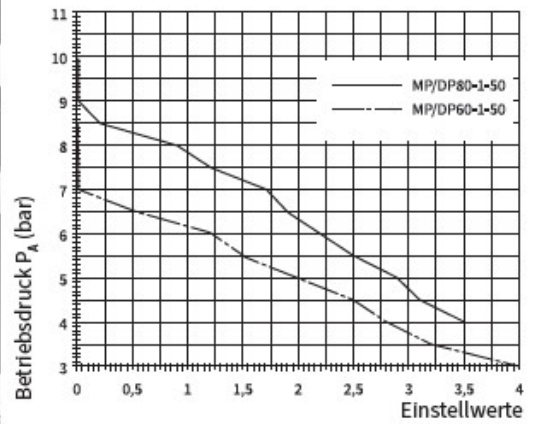
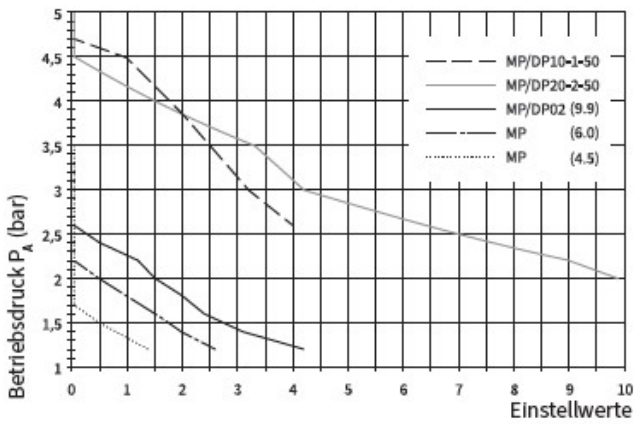
### 14.1.3 Pump module: Dimensions and weights

Typ			Höhe [mm]	Länge [mm]	Breite [mm]	Anschluss Anschlussreihe (Gefäß) [G, Zoll]	Anschlus- ssystem [G, Zoll]	Nachfüll- anschluss [Rp, Zoll]	Eigengewicht (im Lieferzustand ohne Verpackung) [kg]
	MP M-2-50	(MM G4)	930	530	230	1" M	1 1/4" F	1/2"	22
	MP 2-3-50	(M02 G4)	930	530	230	1" M	1 1/4" F	1/2"	28
	MP 10-1-50	(M10 G4)	930	530	230	1" M	1 1/4" F	1/2"	35
	MP 20-2-50	(M20 G4)	930	570	230	1" M	1 1/4" F	1/2"	35
	MP 60-1-50	(M60 G4)	930	550	230	1" M	1 1/4" F	1/2"	53
	MP 80-1-50	(M80 G4)	930	550	230	1" M	1 1/4" F	1/2"	68
	MP 100-1-50	(M100 G4)	1000	550	230	1" M	1 1/4" F	1/2"	67
	MP 130-1-50	(M130 G4)	1190	610	230	1" M	1 1/4" F	1/2"	75
	DP M-2-50	(DM G4)	970	530	230	1" M	1 1/4" F	1/2"	29
	DP 2-3-50	(D02 G4)	970	600	480	1" M	1 1/4" F	1/2"	45
	DP 10-1-50	(D10 G4)	970	600	480	1" M	1 1/4" F	1/2"	61
	DP 20-2-50	(D20 G4)	970	600	480	1" M	1 1/4" F	1/2"	61
	DP 60-1-50	(D60 G4)	970	600	480	1" M	1 1/4" F	1/2"	61
	DP 80-1-50	(D80 G4)	980	600	480	1" M	1 1/4" F	1/2"	115
	DP 100-1-50	(D100 G4)	1000	600	480	1" M	1 1/4" F	1/2"	134
	DP 130-1-50	(D130 G4)	1190	600	480	1" M	1 1/4" F	1/2"	153

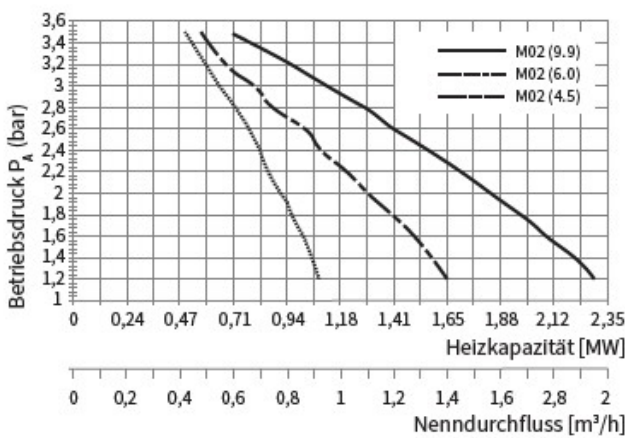
### 14.1.4 Pump module: Operational characteristics

Typ			Zulässiger Betriebsüberdruck [bar]	Zulässige minimale und maximale Medientemperatur [°C]	Zulässige minimale und maximale Umgebungstemperatur [°C]
	MP M-2-50	(MM G4)	6	3 / 70	3 / 40
	MP 2-3-50	(M02 G4)	10	3 / 70	3 / 40
	MP 10-1-50	(M10 G4)	10	3 / 70	3 / 50
	MP 20-2-50	(M20 G4)	10	3 / 70	3 / 40
	MP 60-1-50	(M60 G4)	10	3 / 70	3 / 50
	MP 80-1-50	(M80 G4)	16	3 / 70	3 / 50
	MP 100-1-50	(M100 G4)	16	3 / 70	3 / 50
	MP 130-1-50	(M130 G4)	16	3 / 70	3 / 50
	DP M-2-50	(DM G4)	6	3 / 70	3 / 40
	DP 2-3-50	(D02 G4)	10	3 / 70	3 / 40
	DP 10-1-50	(D10 G4)	10	3 / 70	3 / 50
	DP 20-2-50	(D20 G4)	10	3 / 70	3 / 40
	DP 60-1-50	(D60 G4)	10	3 / 70	3 / 50
	DP 80-1-50	(D80 G4)	16	3 / 70	3 / 50
	DP 100-1-50	(D100 G4)	16	3 / 70	3 / 50
	DP 130-1-50	(D130 G4)	16	3 / 70	3 / 50

#### 14.1.5 Manual control valve: Default values



Einstellwerte des Handventils M02 nach Pumpe, siehe Paragraph „Komponententeile“, Anlage [3,23].



Handsteuerventil  
(Pos. 3.10; 3.11; Seite 19...21)

**Version MP**

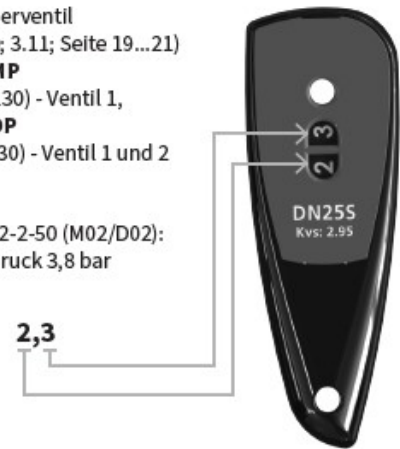
(M M ÷ M130) - Ventil 1,

**Version DP**

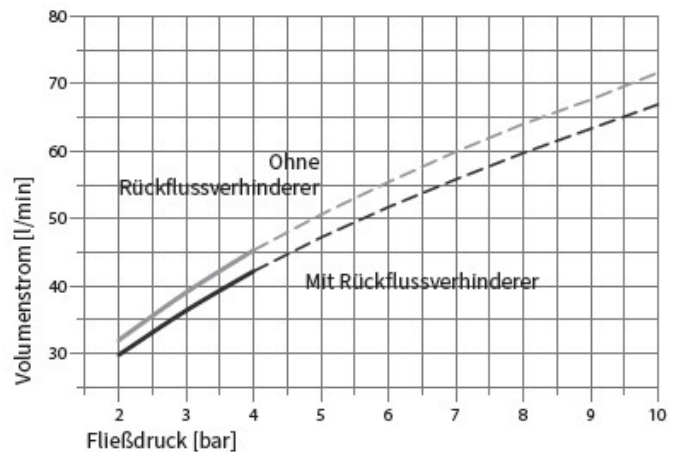
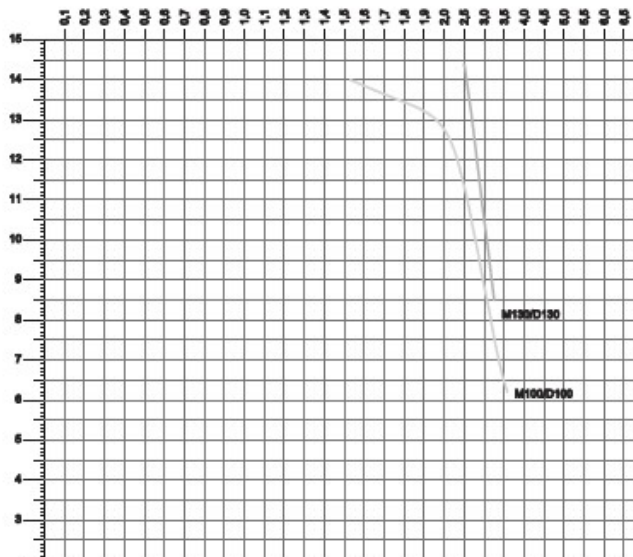
(D M ÷ D130) - Ventil 1 und 2

**Beispiel**

MP / DP 02-2-50 (M02/D02):  
Betriebsdruck 3,8 bar



#### 14.1.6 Topping up, flow rate





## 15 Annex 3

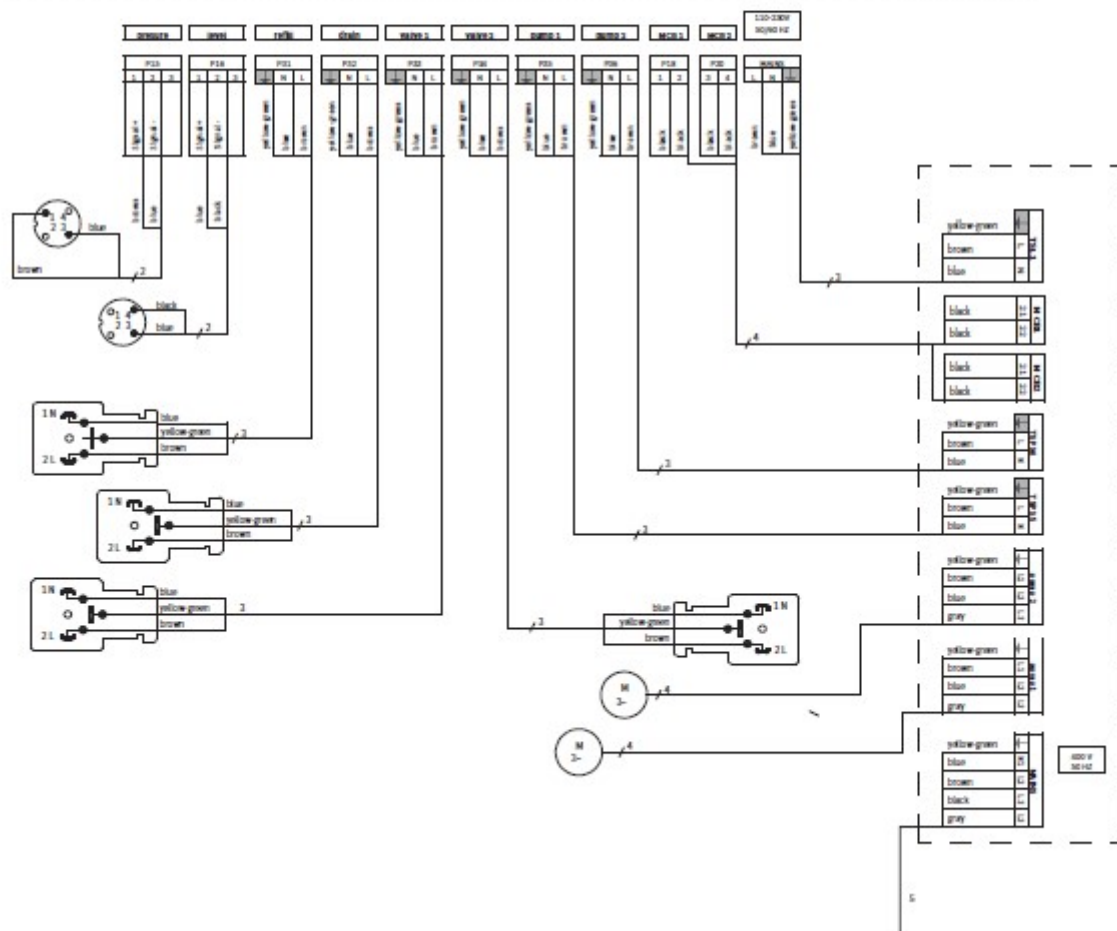
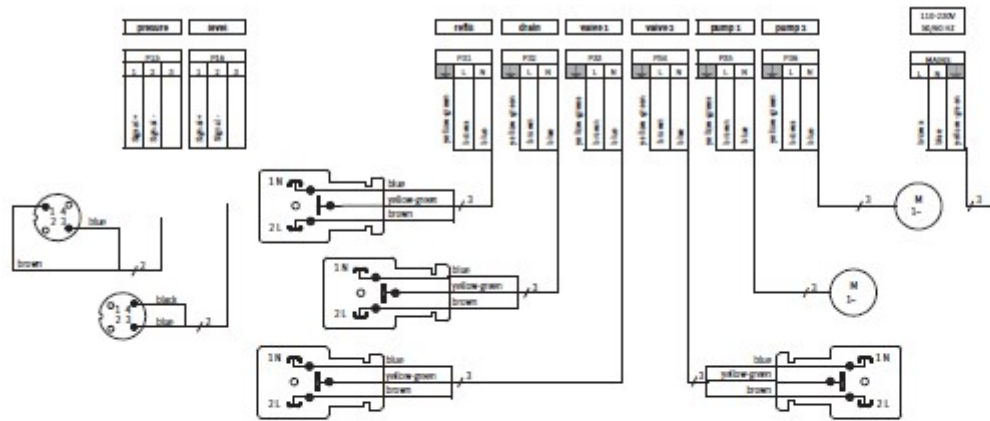
### 15.1 Technical data, information, electronics

#### 15.1.1 Pump unit: Nominal values

Typ	Nennspannung	Bemessungsstrom [A]*	Bemessungsleistung [kW]	Externe Sicherungen T (K) [A]	Schutzklasse der Pumpeneinheit
MP M-2-50 (MM G4)	230 V ~1 N PE 50 Hz	0,43	0,09	16	IP44
MP 2-3-50 (M02 G4)	230 V ~1 N PE 50 Hz	2,77	0,62	16	IP44
MP 10-1-50 (M10 G4)	230 V ~1 N PE 50 Hz	4,4	0,75	16	IP44
MP 20-2-50 (M20 G4)	230 V ~1 N PE 50 Hz	7,2	1,1	16	IP44
MP 60-1-50 (M60 G4)	230 V ~1 N PE 50 Hz	7,4	1,1	16	IP44
MP 80-1-50 (M80 G4)	400 V ~3 N PE 50 Hz	3,4	1,5	16	IP44
MP 100-1-50 (M100 G4)	400 V ~3 N PE 50 Hz	4,75	2,2	16	IP44
MP 130-1-50 (M130 G4)	400 V ~3 N PE 50 Hz	6,4	3,0	16	IP44
DP M-2-50 (DM G4)	230 V ~1 N PE 50 Hz	0,86	0,18	16	IP44
DP 2-3-50 (D02 G4)	230 V ~1 N PE 50 Hz	5,54	1,24	16	IP44
DP 10-1-50 (D10 G4)	230 V ~1 N PE 50 Hz	8,8	1,5	16	IP44
DP 20-2-50 (D20 G4)	230 V ~1 N PE 50 Hz	14,4	2,2	16	IP44
DP 60-1-50 (D60 G4)	230 V ~1 N PE 50 Hz	14,8	2,2	16	IP44
DP 80-1-50 (D80 G4)	400 V ~3 N PE 50 Hz	6,8	3,0	16	IP44
DP 100-1-50 (D100 G4)	400 V ~3 N PE 50 Hz	9,5	4,4	16	IP44
DP 130-1-50 (D130 G4)	400 V ~3 N PE 50 Hz	12,8	6,0	16	IP44
MP 2-1-60 M02 G4	230 V ~1 N PE 60 Hz	4,10	0,60	16	IP44
MP 10-1-60 M10 G4	230 V ~1 N PE 60 Hz	5,80	0,67	16	IP44
MP 20-2-60 M20 G4	230 V ~1 N PE 60 Hz	7,98	1,33	16	IP44
MP 60-1-60 M60 G4	400 V ~3 N PE 60 Hz	3,10	1,50	16	IP44
MP 80-1-60 M80 G4	400 V ~3 N PE 60 Hz	3,10	1,50	16	IP44
MP 100-1-60 M100 G4	400 V ~3 N PE 60 Hz	4,50	2,20	16	IP44
MP 130-1-60 M130 G4	400 V ~3 N PE 60 Hz	6,20	3,00	16	IP44
DP 2-1-60 D02 G4	230 V ~1 N PE 60 Hz	8,20	1,20	16	IP44
DP 10-1-60 D10 G4	230 V ~1 N PE 60 Hz	11,60	1,36	16	IP44
DP 20-2-60 D20 G4	400 V ~3 N PE 60 Hz	5,96	2,66	16	IP44
DP 60-1-60 D60 G4	400 V ~3 N PE 60 Hz	6,20	3,00	16	IP44
DP 80-1-60 D80 G4	400 V ~3 N PE 60 Hz	6,20	3,00	16	IP44
DP 100-1-60 D100 G4	400 V ~3 N PE 60 Hz	9,00	4,40	16	IP44
DP 130-1-60 D130 G4	400 V ~3 N PE 60 Hz	12,40	6,00	16	IP44

\* Der Bemessungsstrom der Nachfülleinheit Flexfill-P - 1.2 A (0,3 kW)

## 15.1.2 Control unit: Connection diagrams







Pioneering for You



Local contact at  
[www.wilo.com/contact](http://www.wilo.com/contact)

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