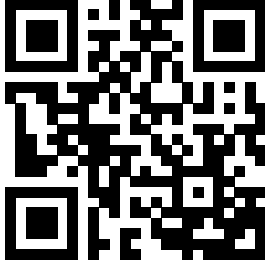


Wilo-SiBoost 2.0 Smart 1
Wilo-SiBoost Smart 1
Wilo-Comfort-Vario COR-1...-GE
Wilo-Comfort-Vario COR/T-1...-GE



en Installation and operating instructions



SiBoost2.0 Smart 1 Helix VE
<https://qr.wilo.com/494>



SiBoost Smart 1 Helix VE
<https://qr.wilo.com/679>



Comfort-Vario COR/T-1 Helix VE...-GE
<https://qr.wilo.com/646>

Fig. 1a

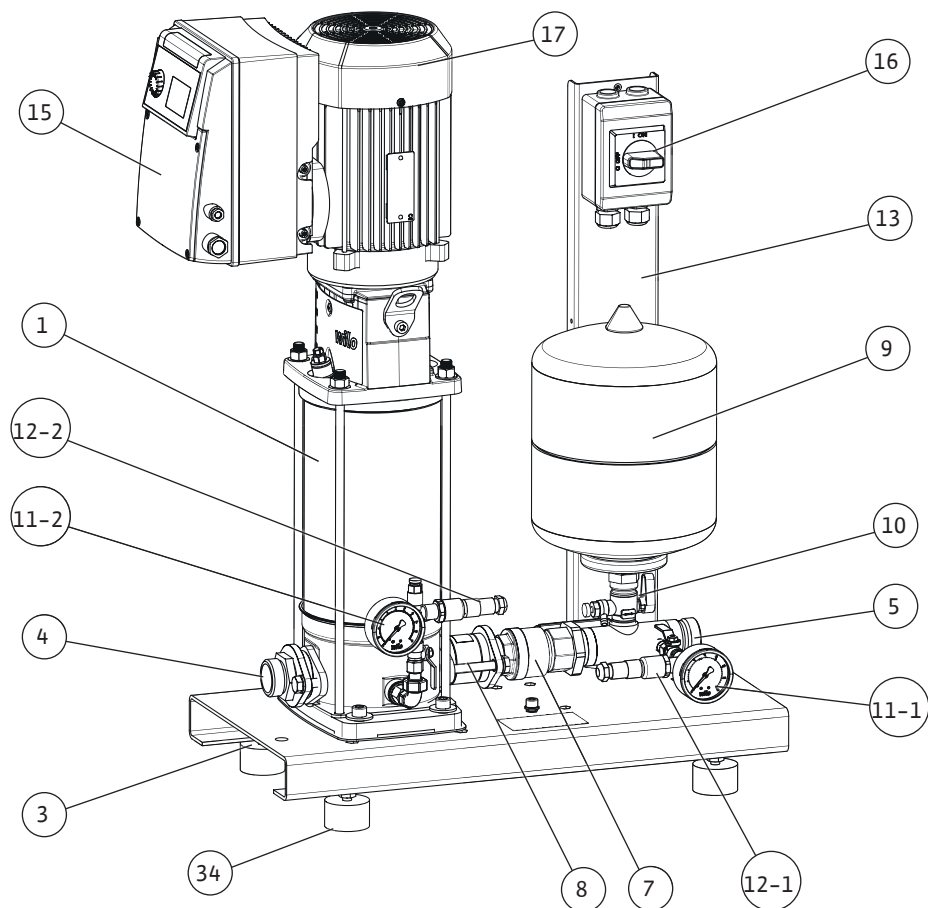


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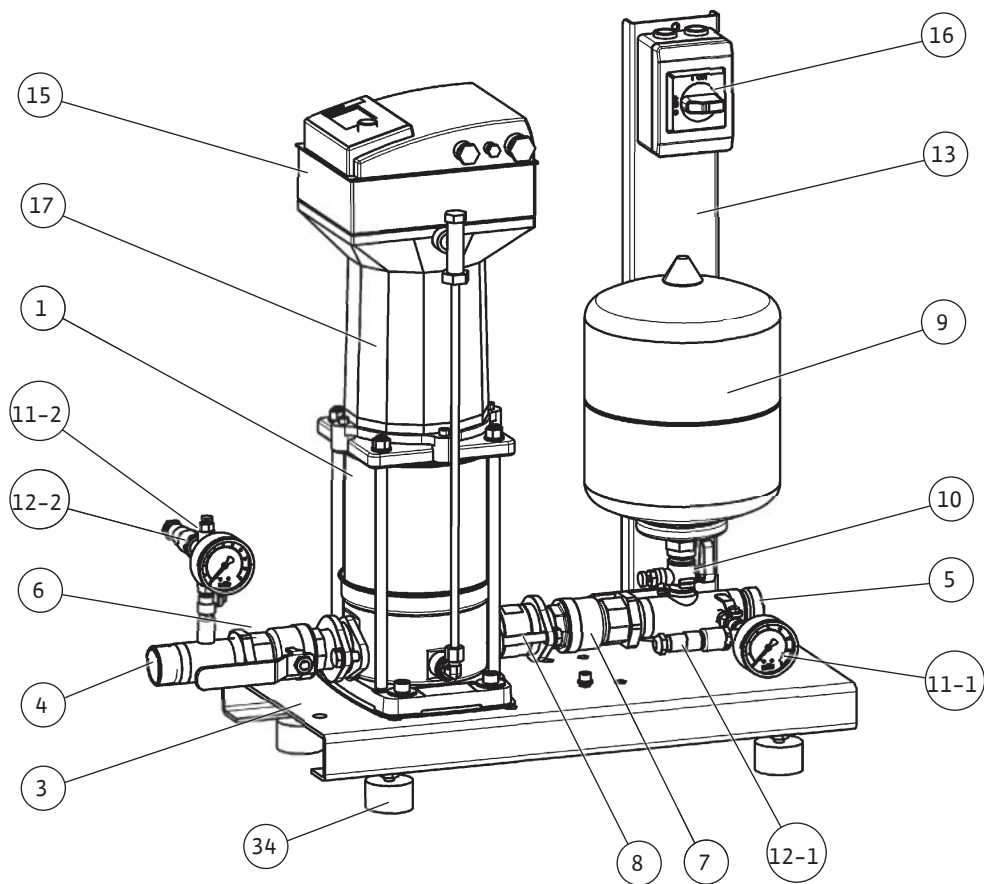


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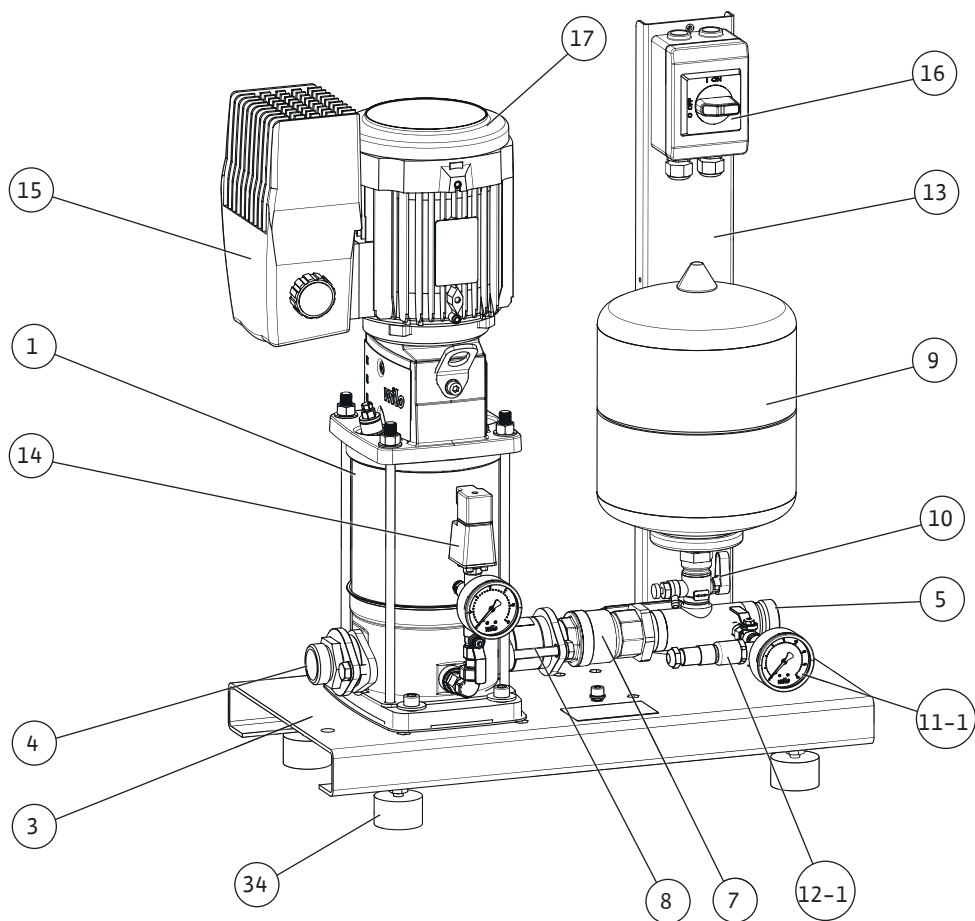


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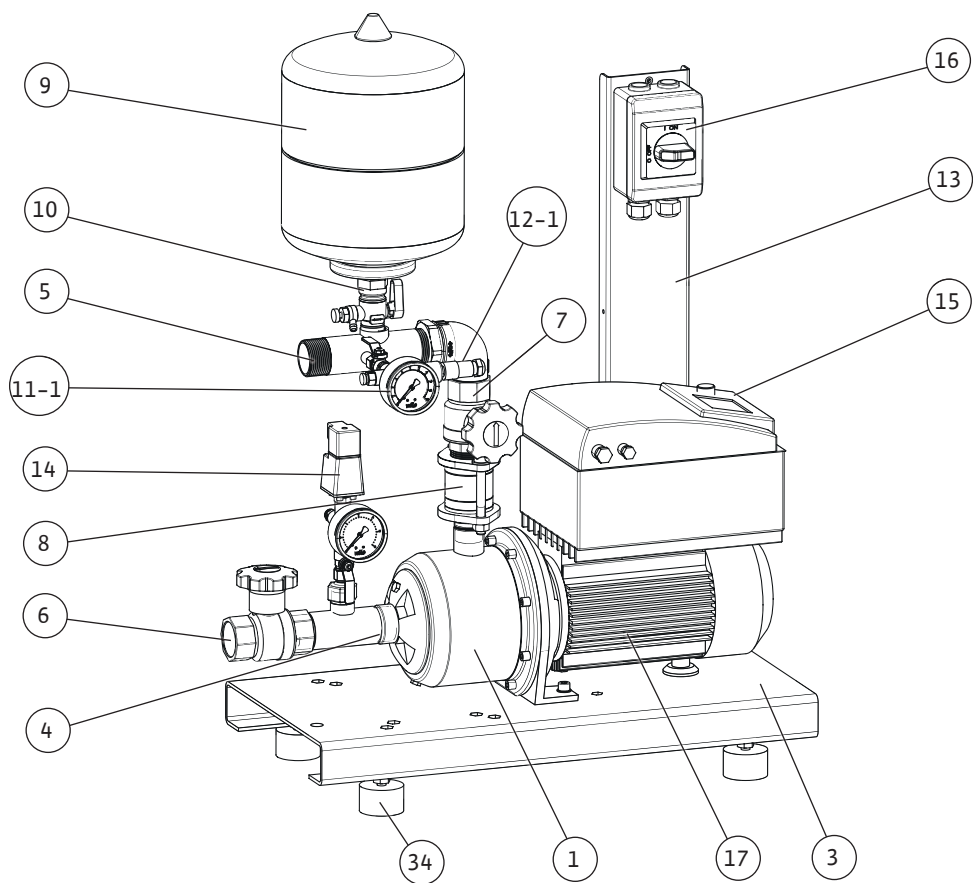


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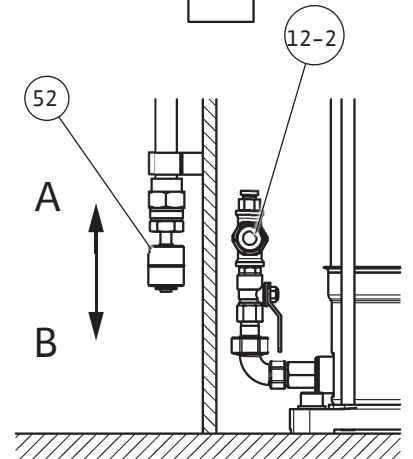
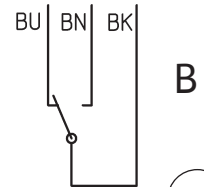
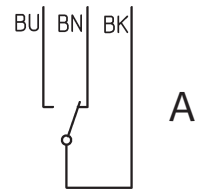
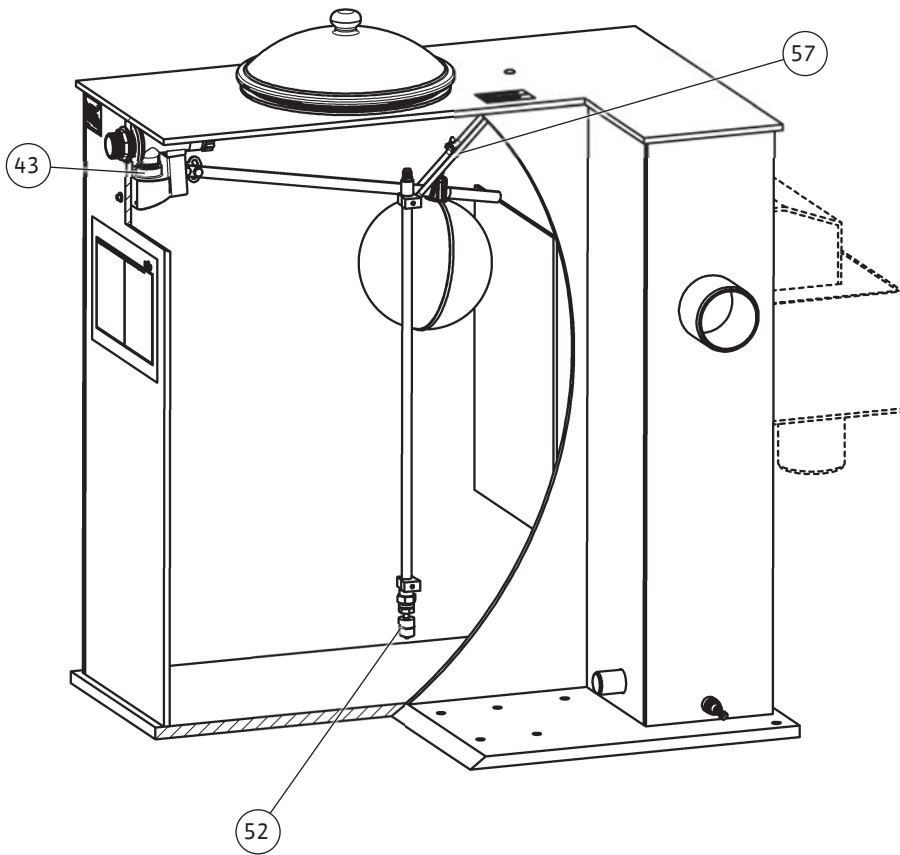
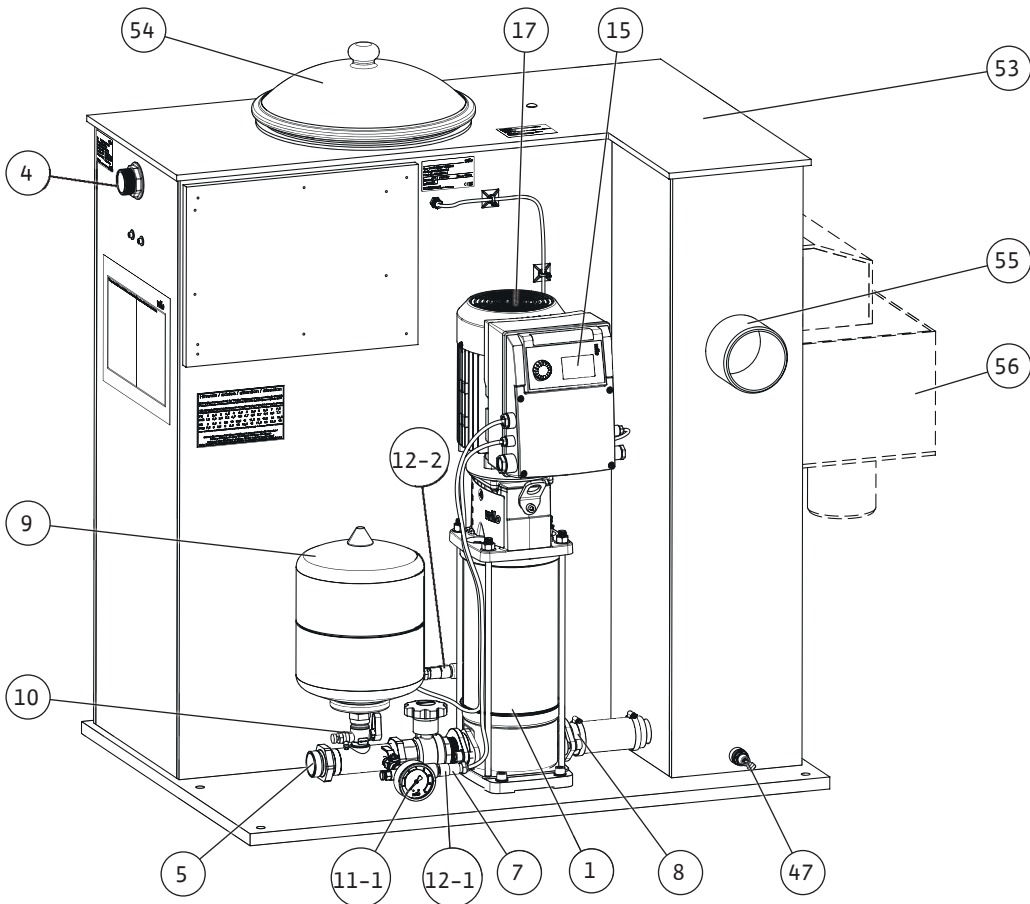


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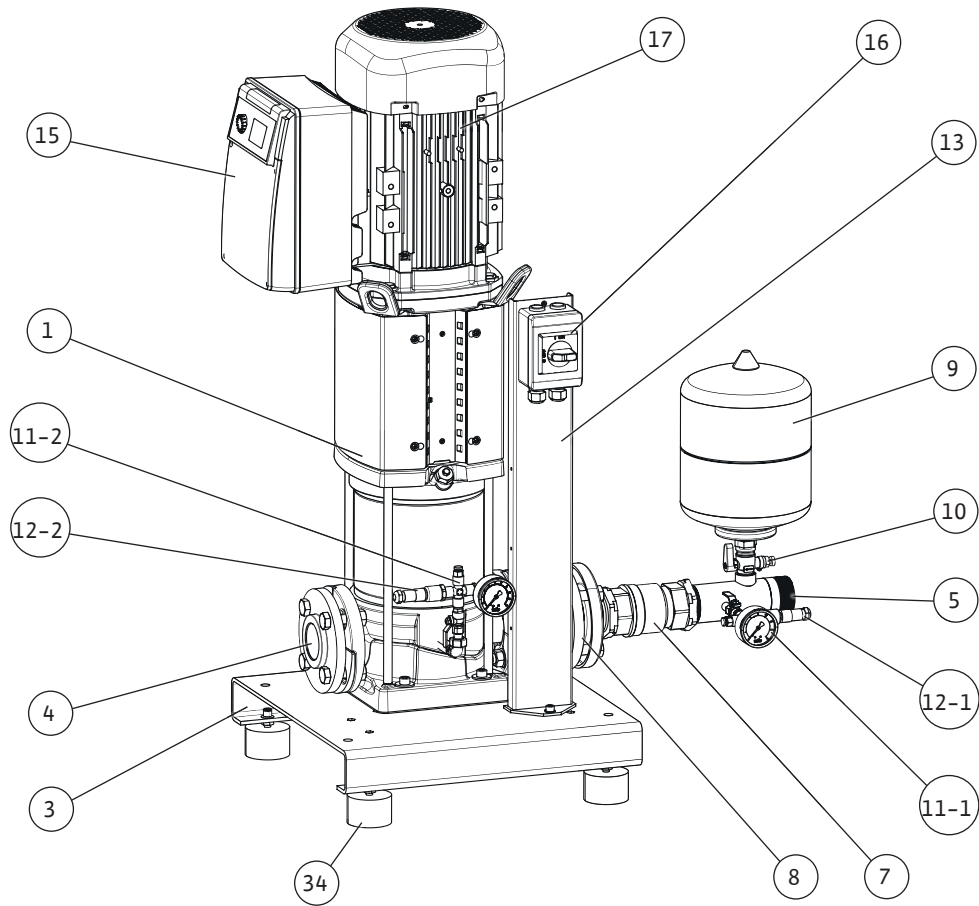


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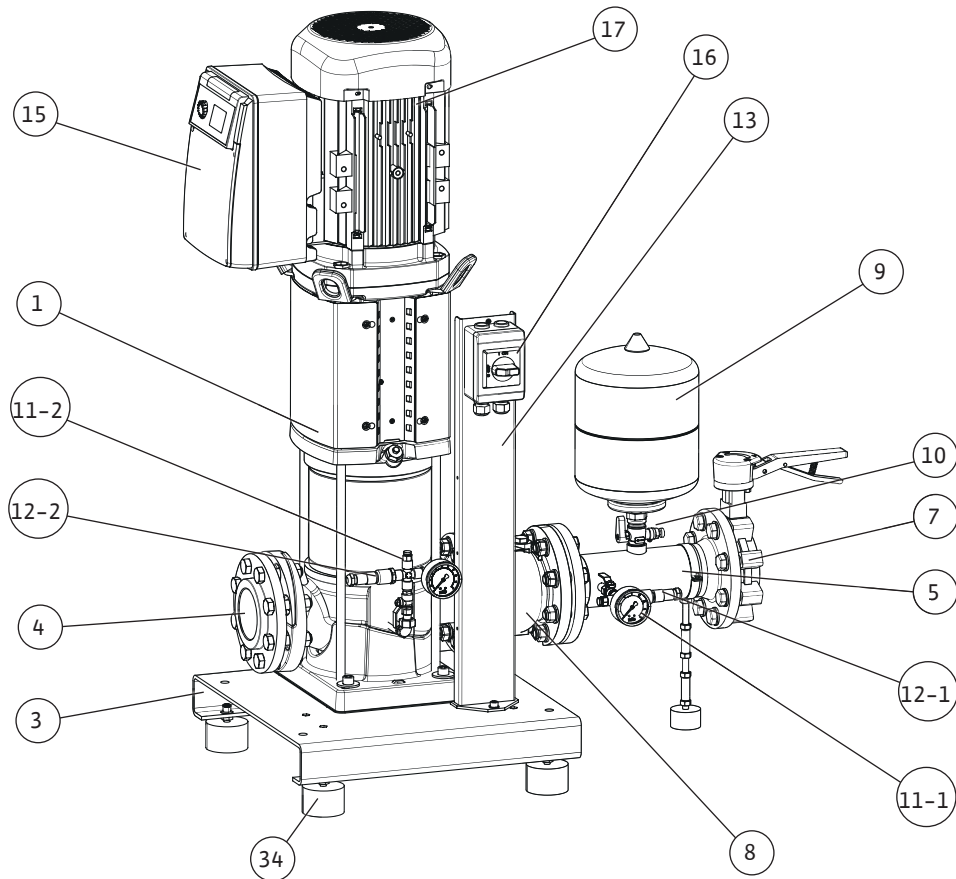


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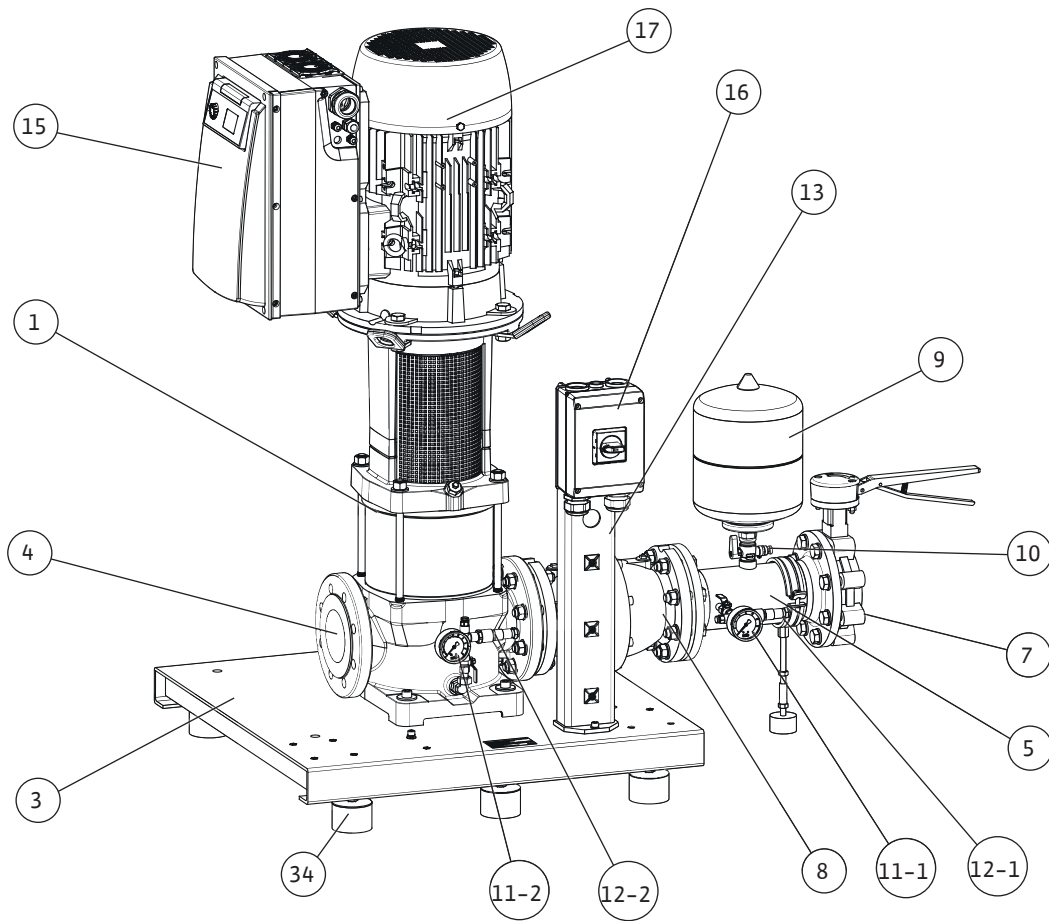


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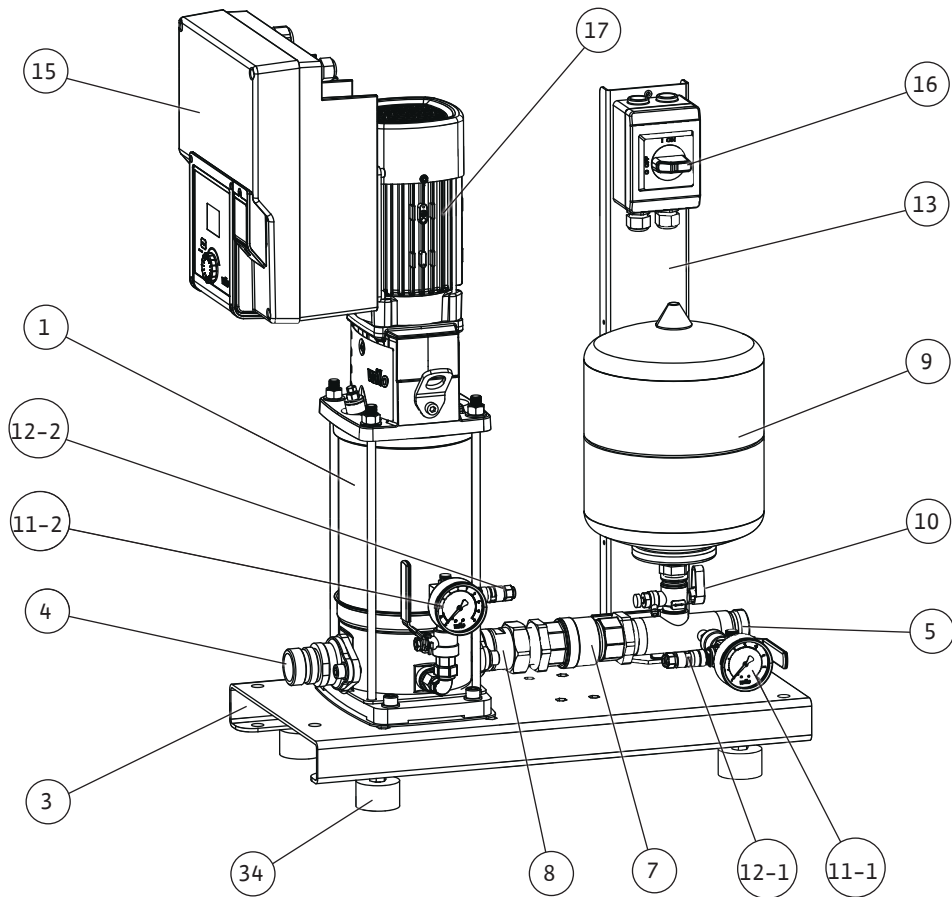


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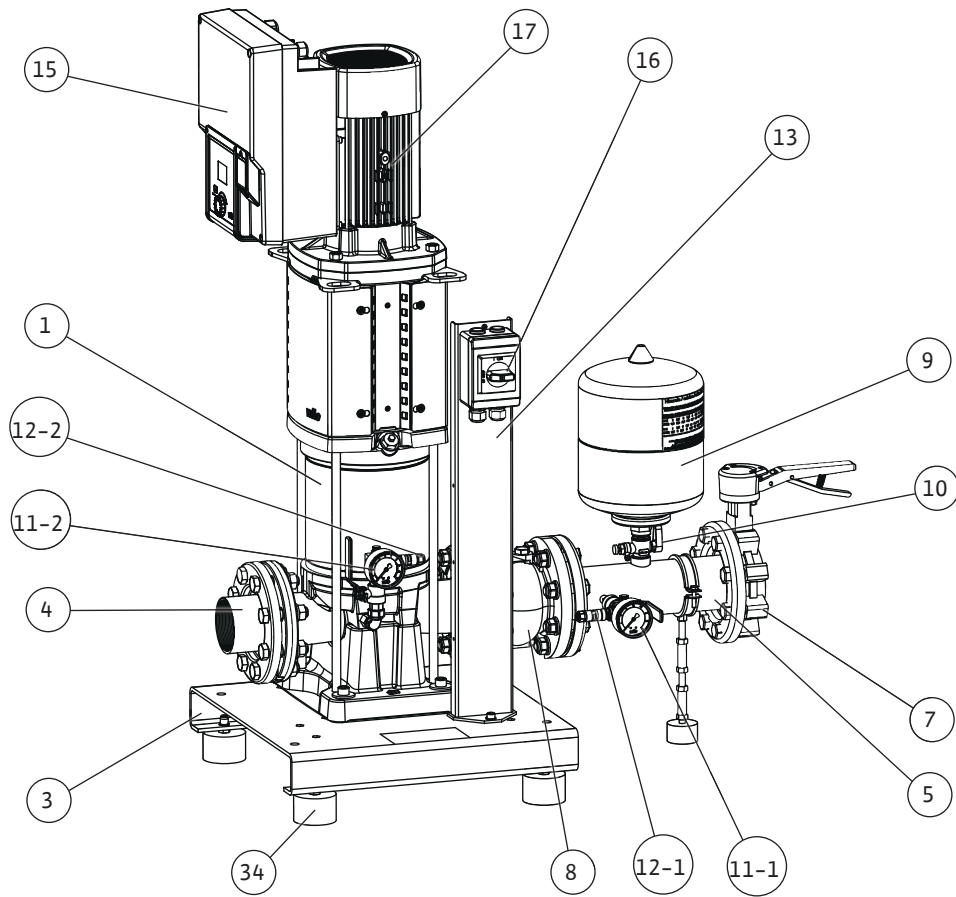


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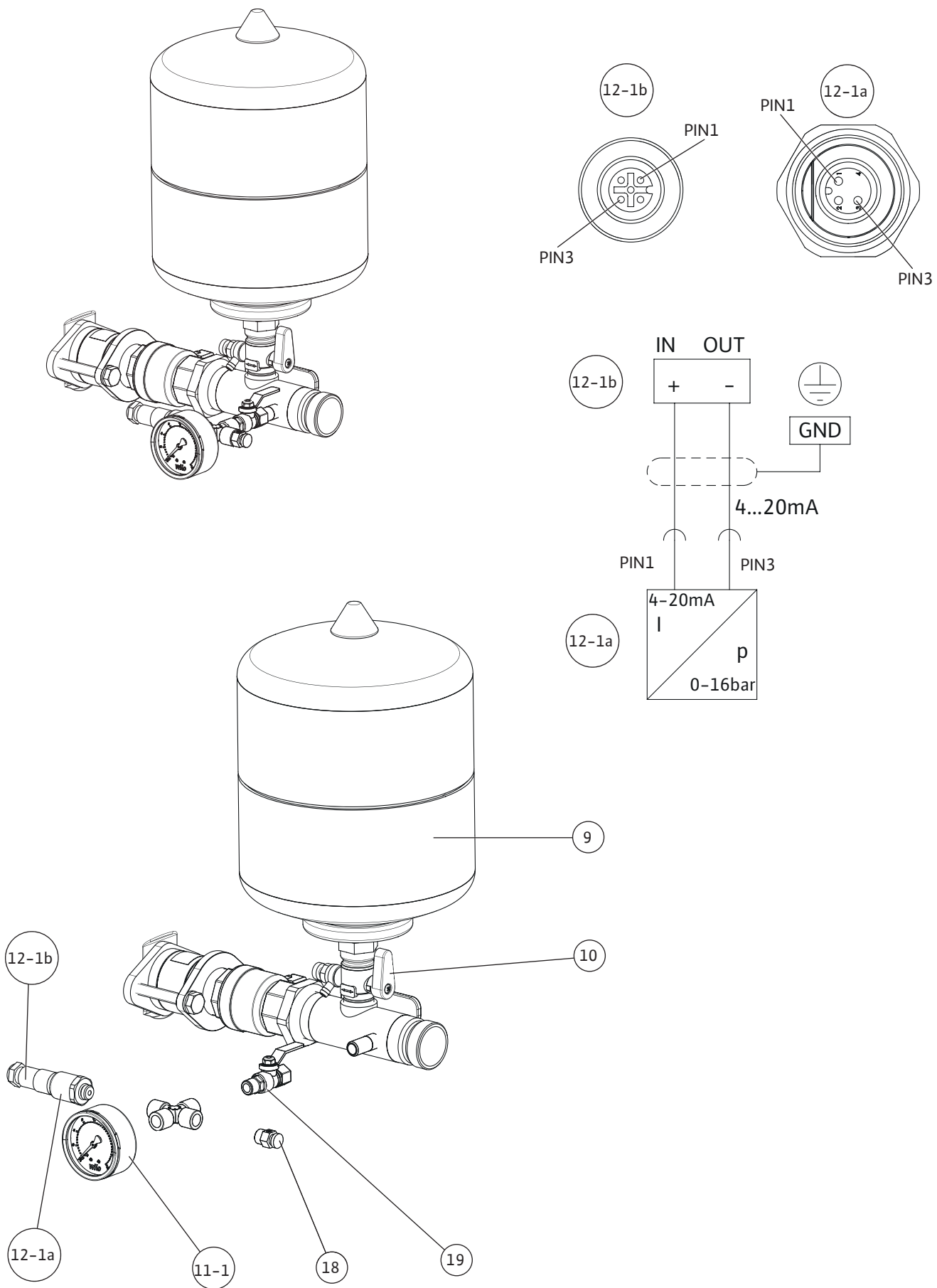


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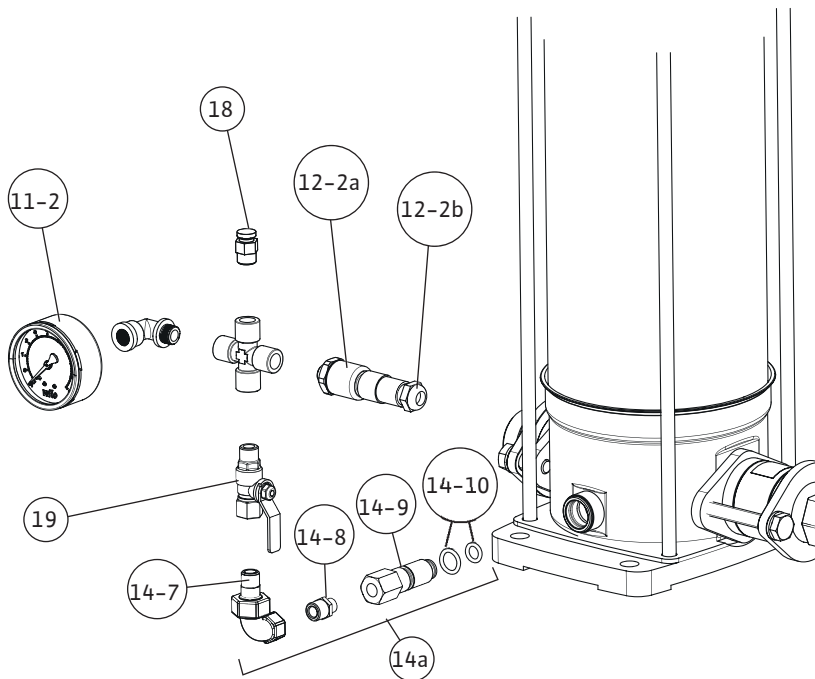
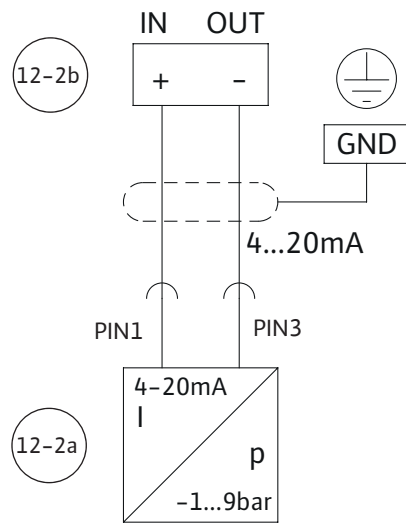
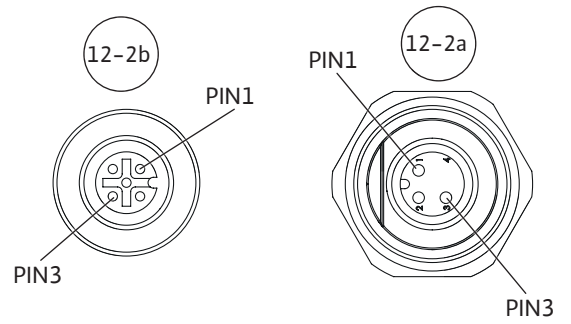
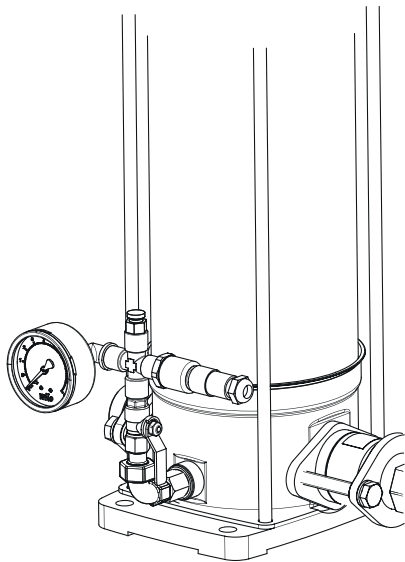


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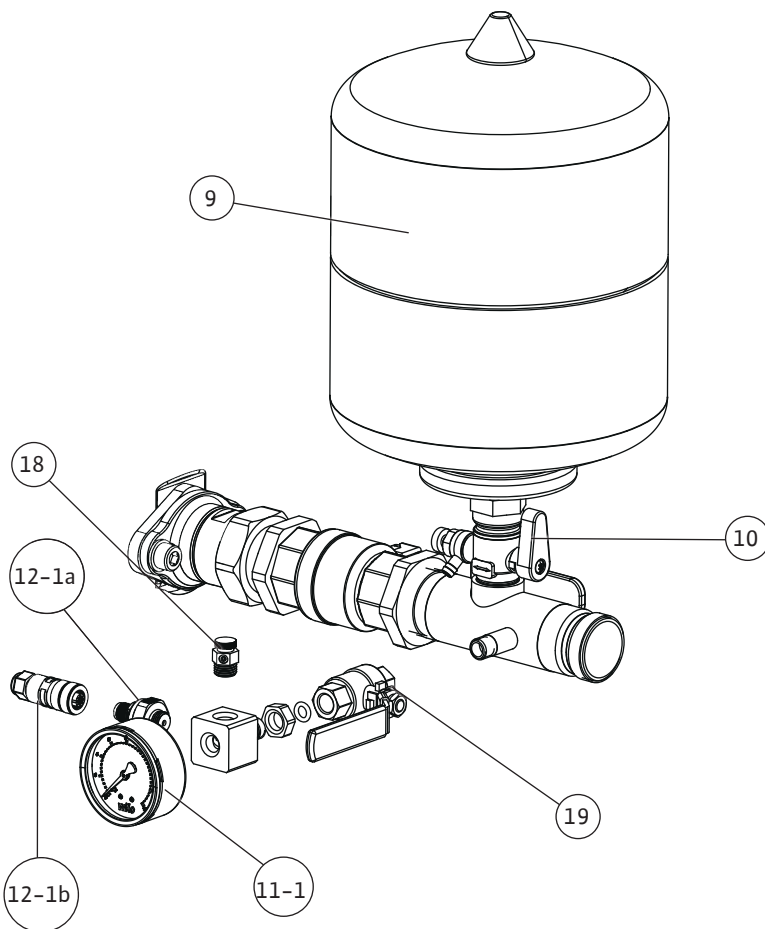
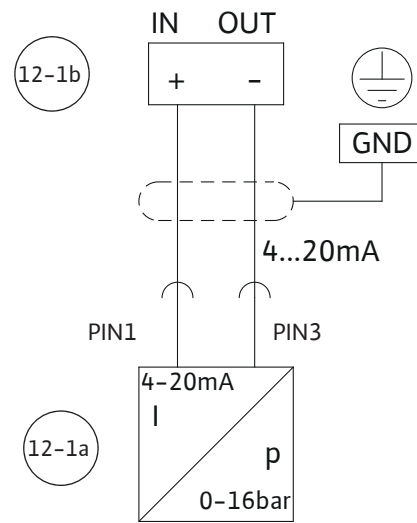
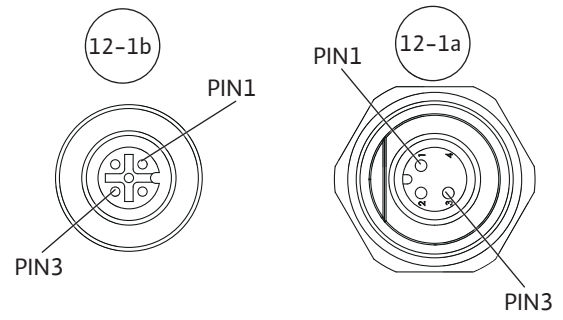
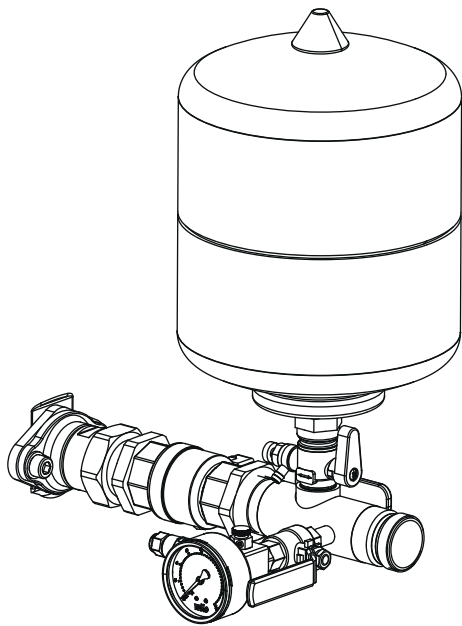


Fig. 2d

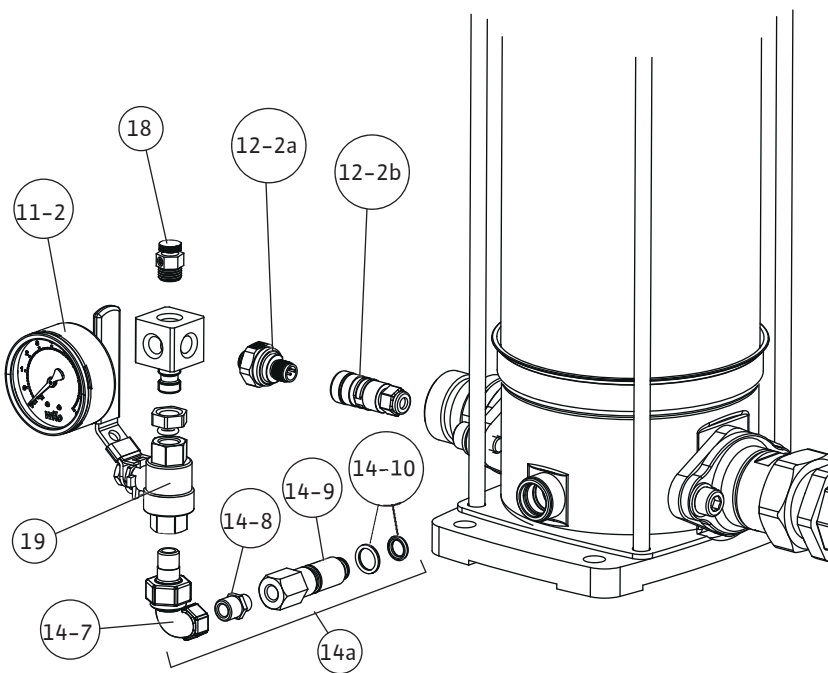
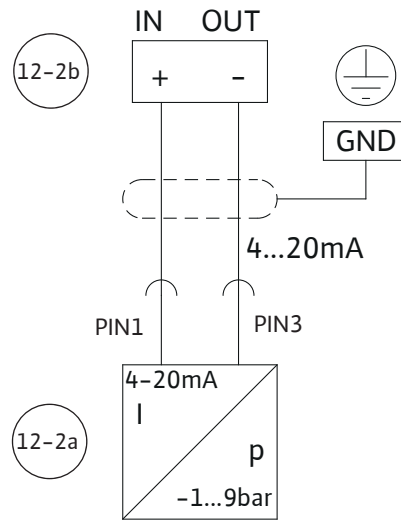
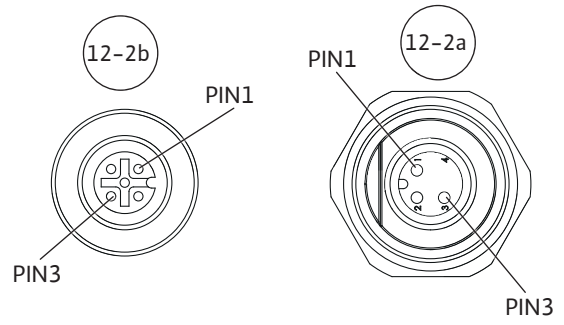
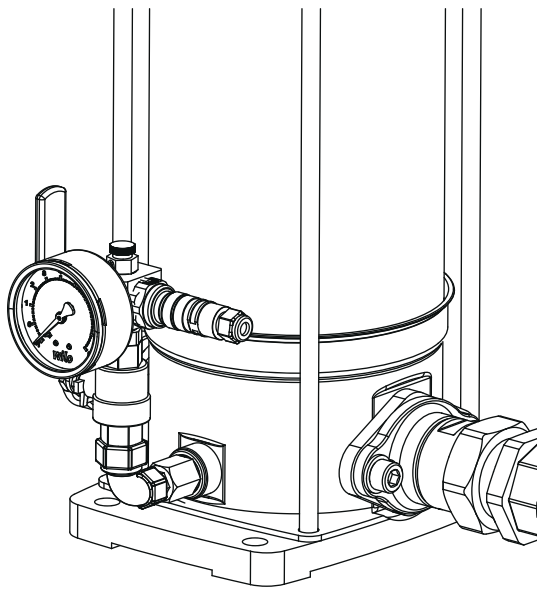


Fig. 3

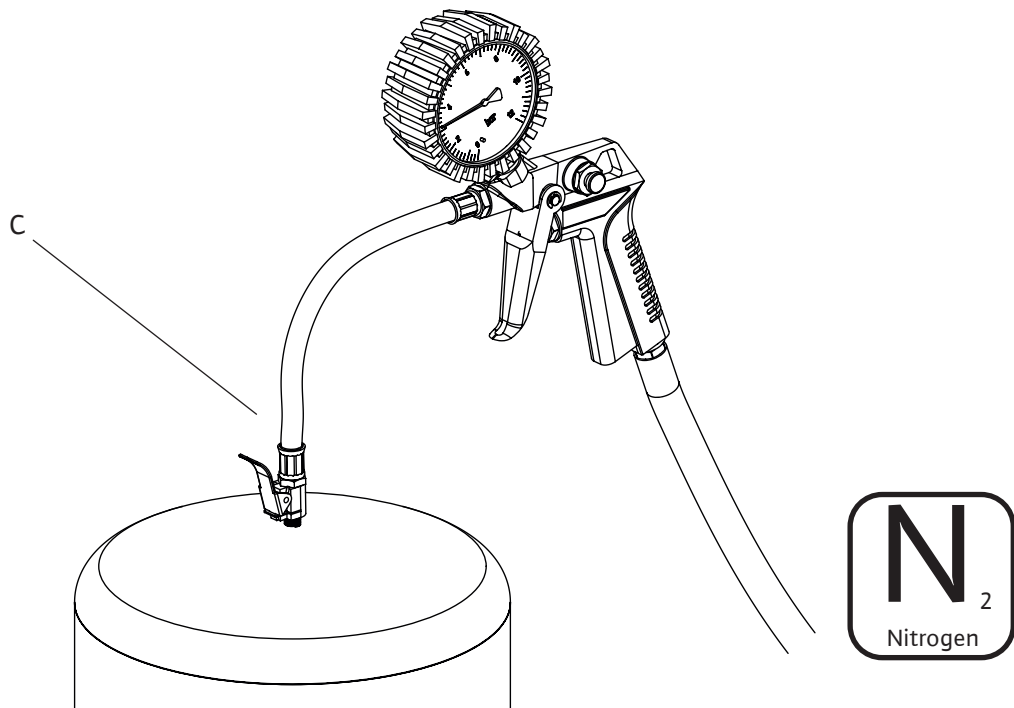
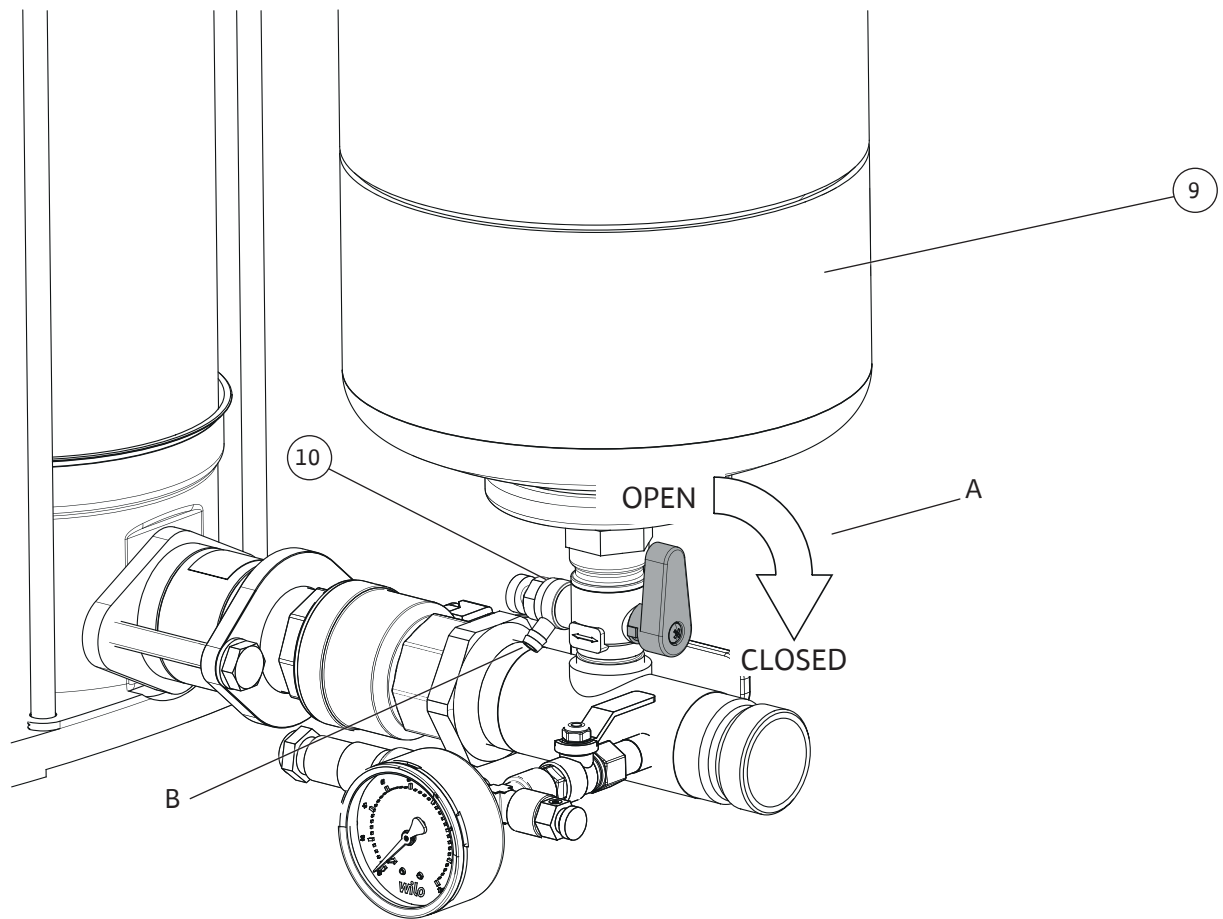


Fig. 4

Hinweis / advice / attention / atención

Stickstoffdruck entsprechend der Tabelle / Nitrogen pressure according to the table
 Pression d'azote conformément au tableau / Presión del nitrógeno según la tabla

PE [bar] Einschaltdruck / starting pressure / Pression de démarrage / Comenzar la presión

PN₂ [bar] Stickstoffdruck / Nitrogen pressure / Pression d'azote / Presión del nitrógeno

PE	2	2,5	3	3,5	4	4,5	5	5,5	6	6,5	7	7,5
PN ₂	1,8	2,3	2,8	3,2	3,7	4,2	4,7	5,2	5,7	6,1	6,6	7,1

PE	8	8,5	9	9,5	10	10,5	11	11,5	12	12,5	13	13,5
PN ₂	7,5	8	8,5	9	9,5	10	10,5	11	11,5	12	12,5	13

1bar = 100000Pa = 0,1MPa = 0,1N/mm² = 10200kp/m² = 1,02kp/cm²(at) = 0,987atm = 750Torr = 10,2mWs

Stickstoffmessung ohne Wasser / Nitrogen measurement without water /

Mesure d'azote sans l'eau / Medida del nitrógeno sin el agua

Achtung: Nur Stickstoff einfüllen / Note: Only fill in nitrogen /

Respect : Seulement l'azote remplir / Nota: Completar solamente el nitrógeno

Fig. 5a

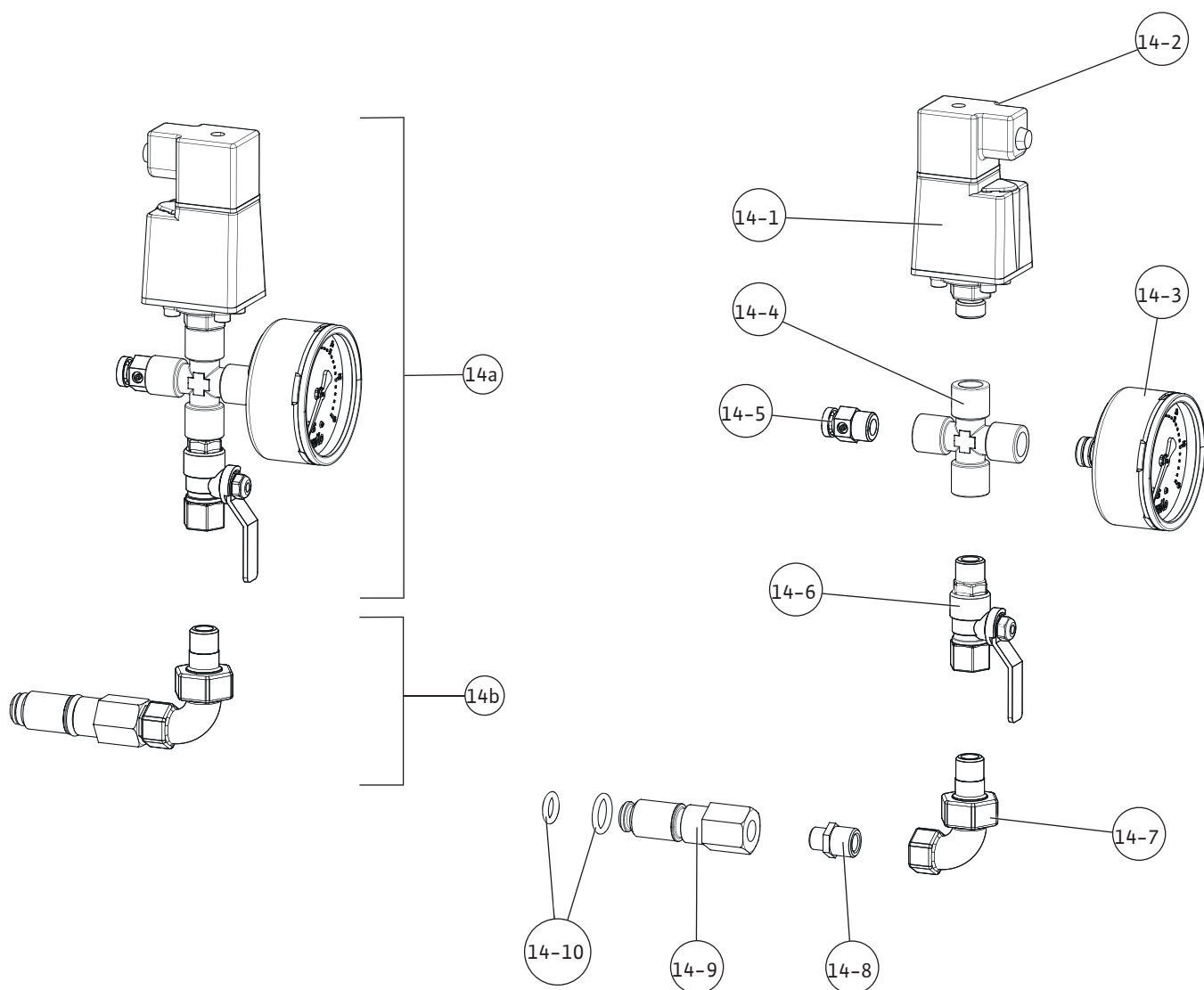
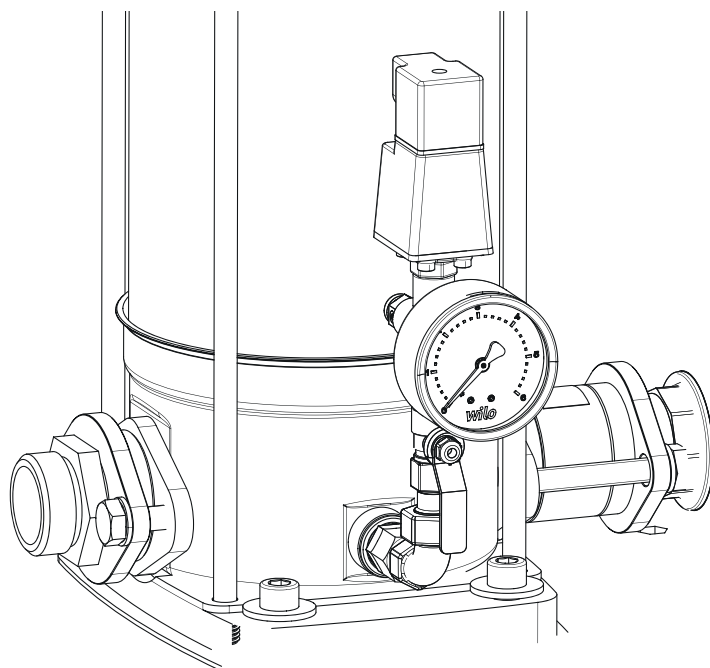


Fig. 5b

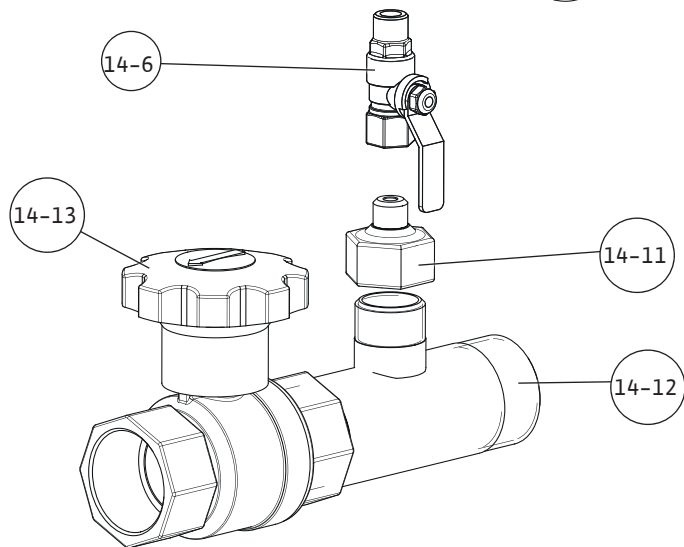
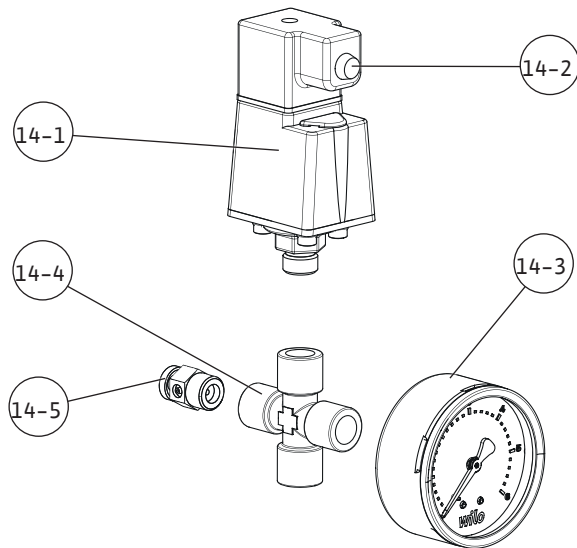
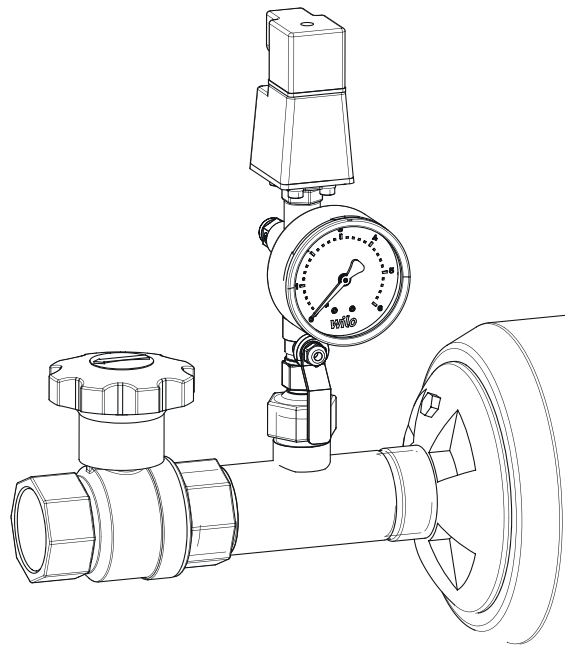


Fig. 5c

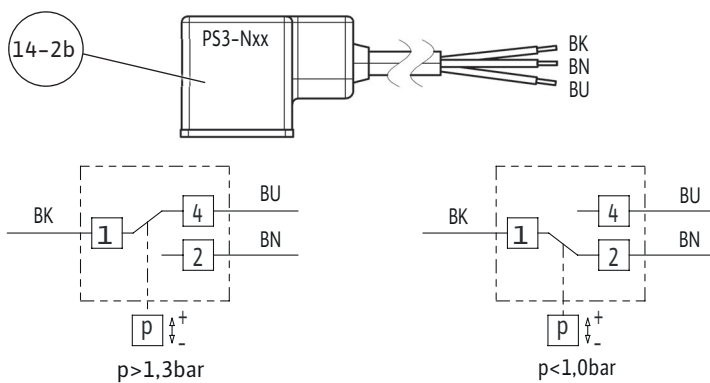
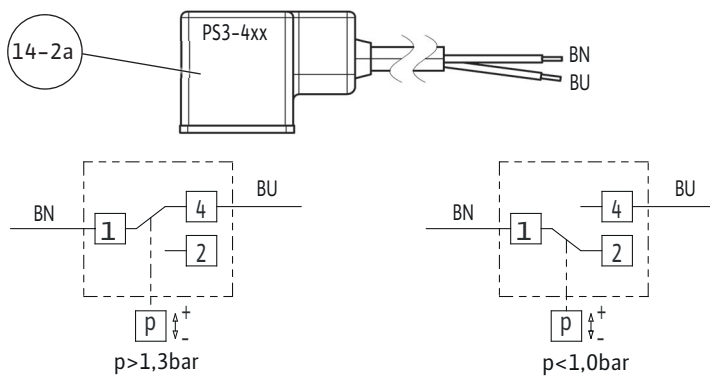
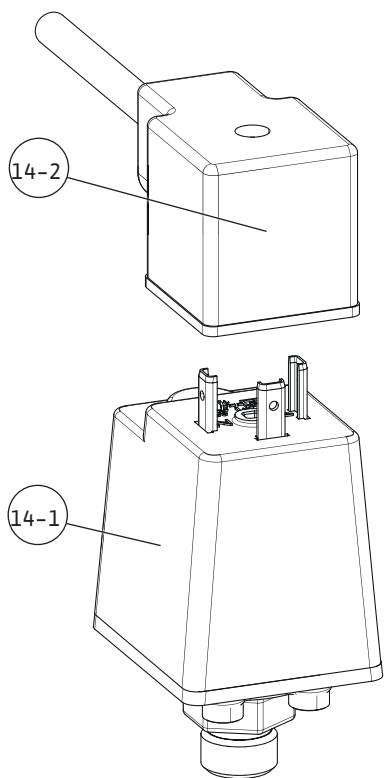


Fig. 6a

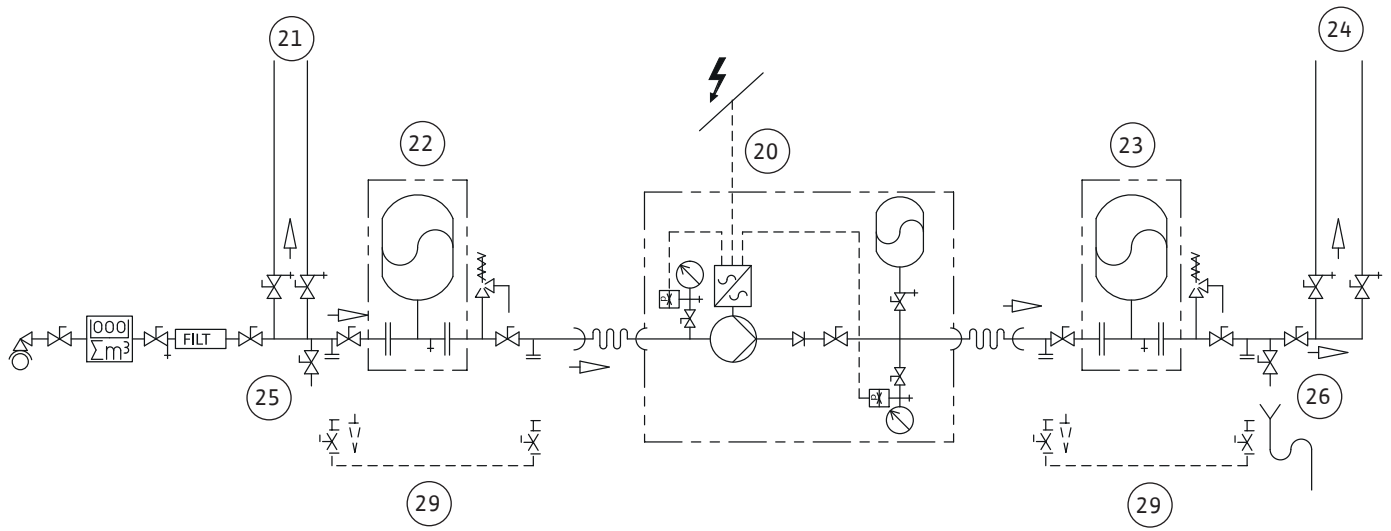


Fig. 6b

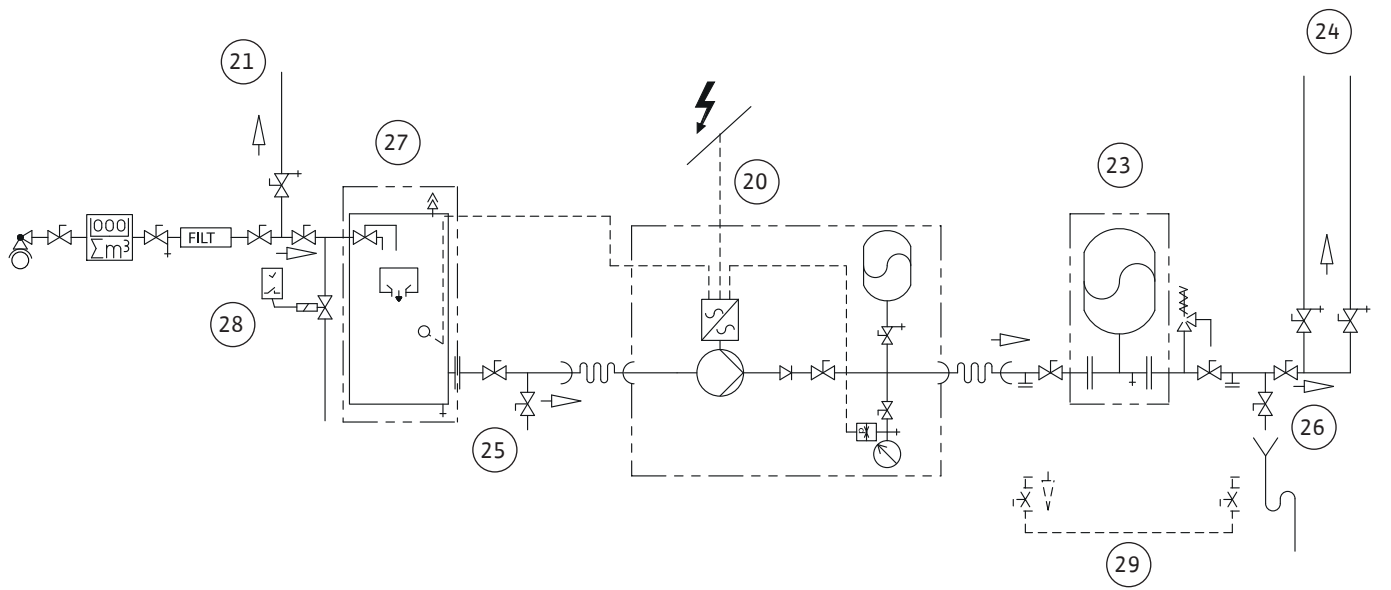


Fig. 8

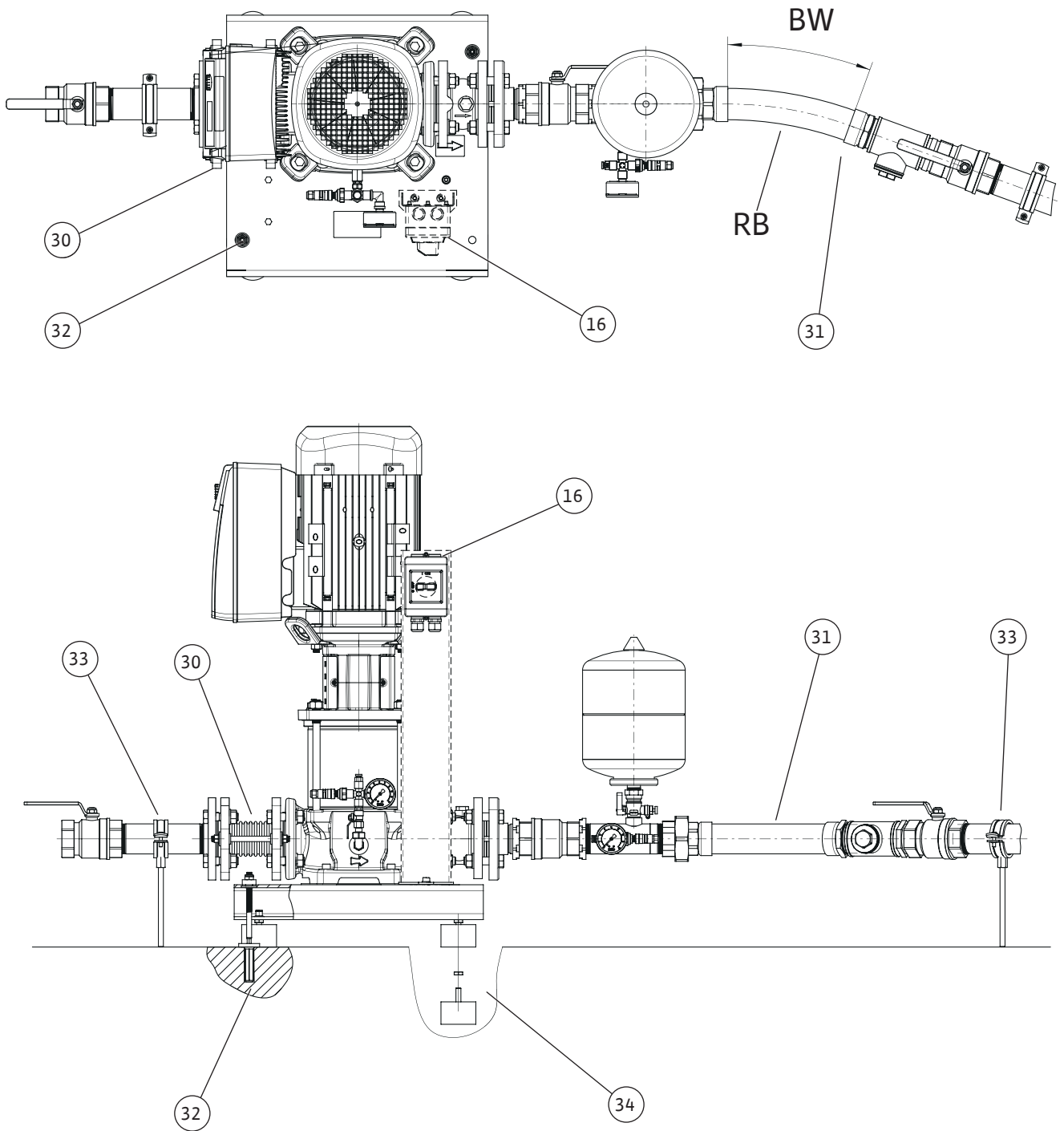


Fig. 9a

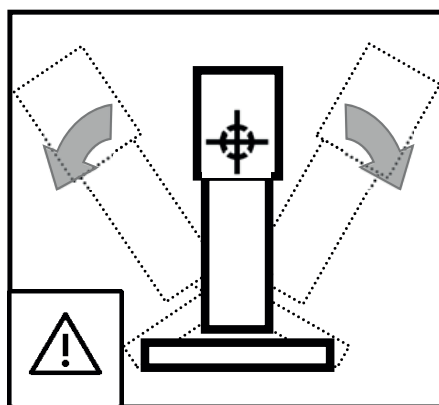
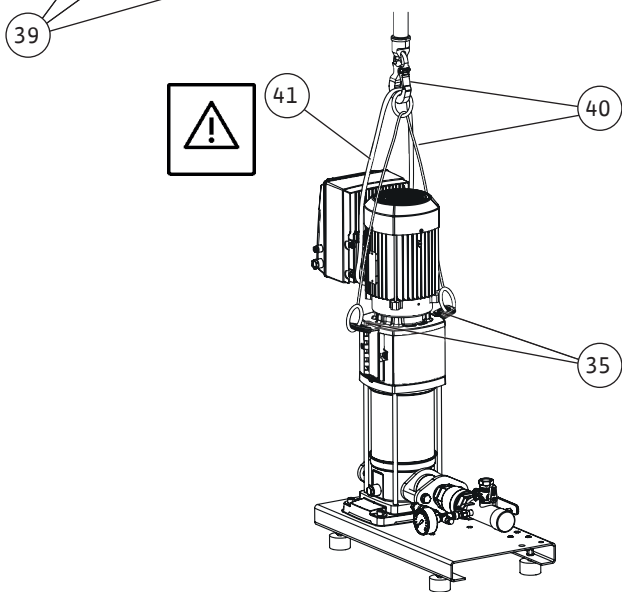
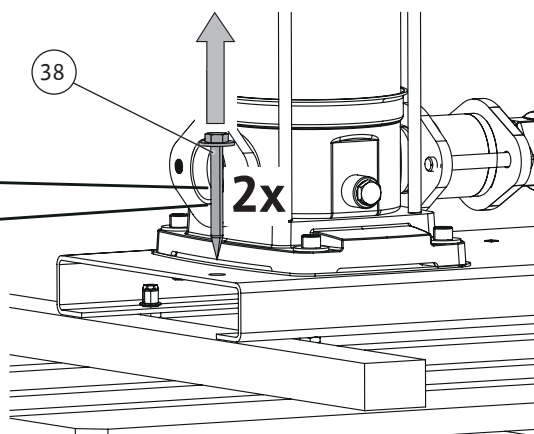
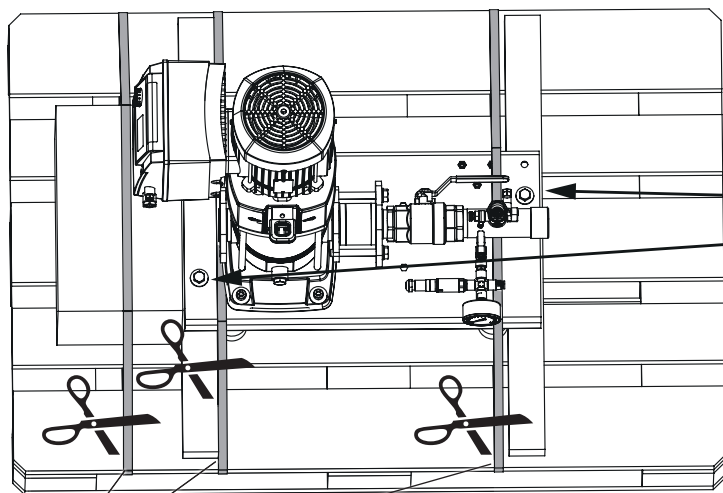
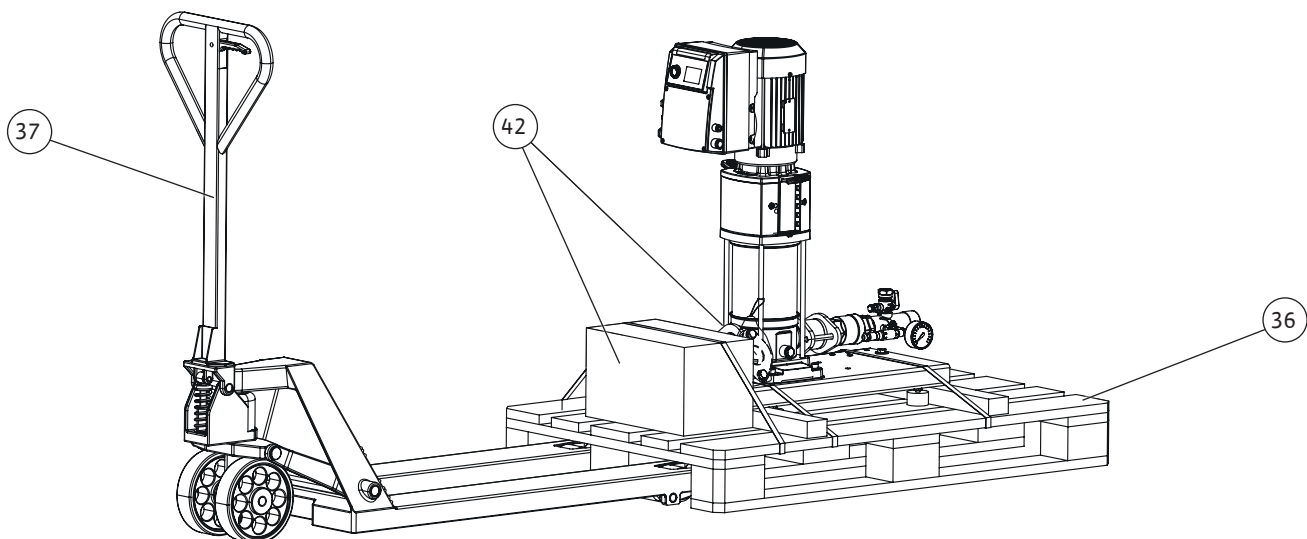


Fig. 9b

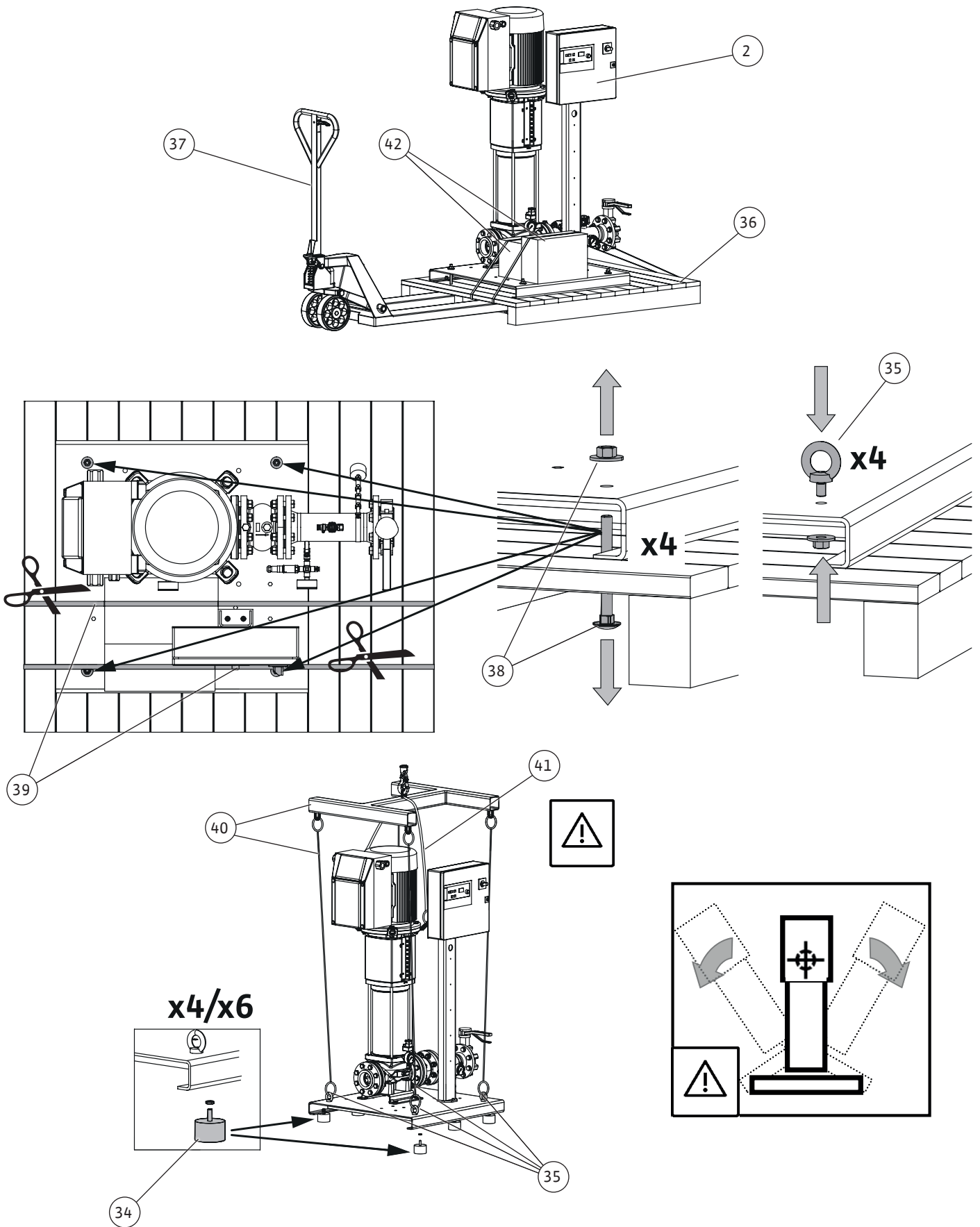


Fig. 10a

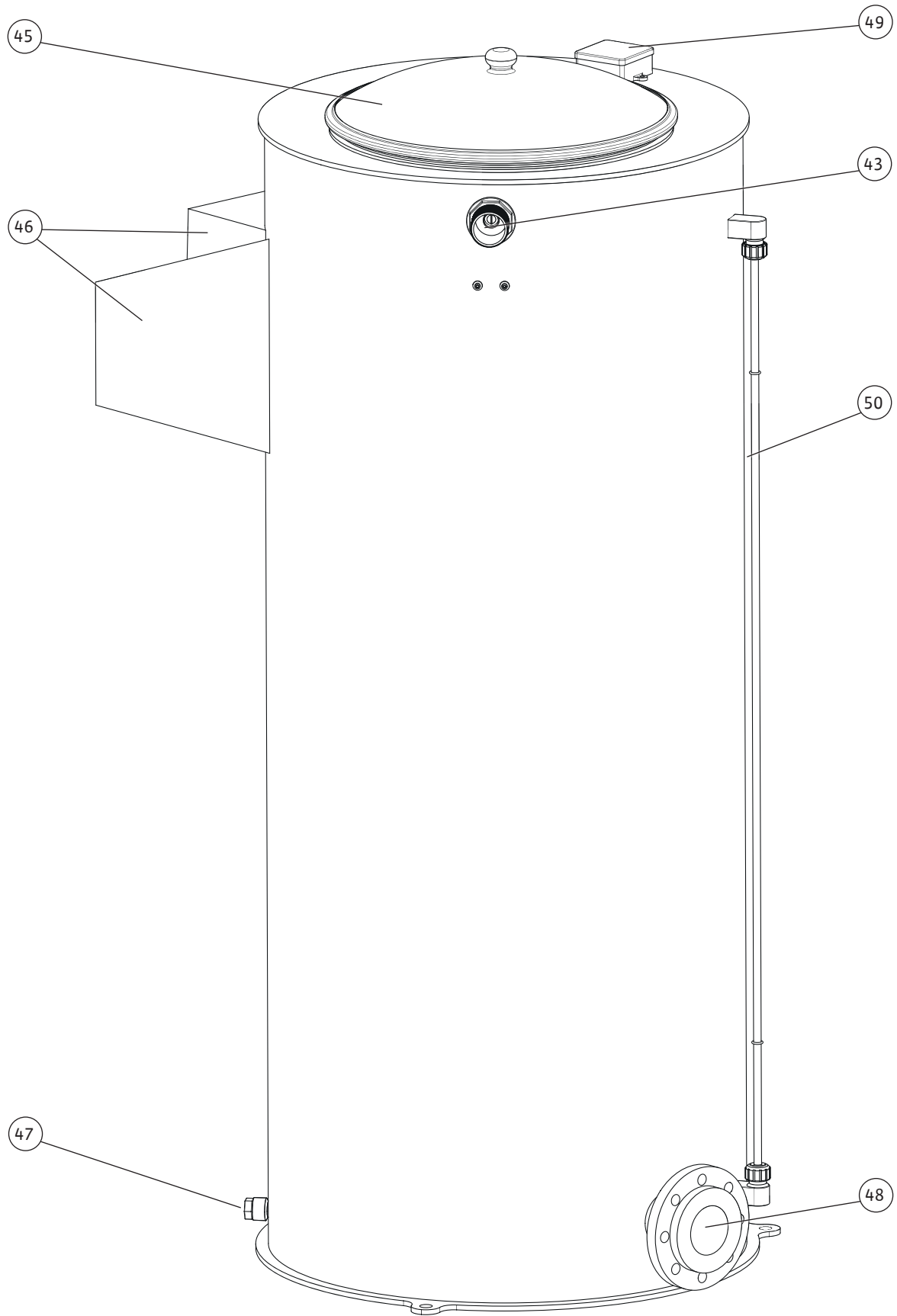


Fig. 10b

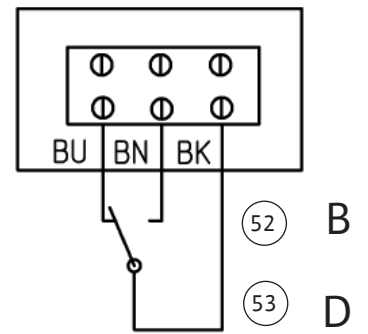
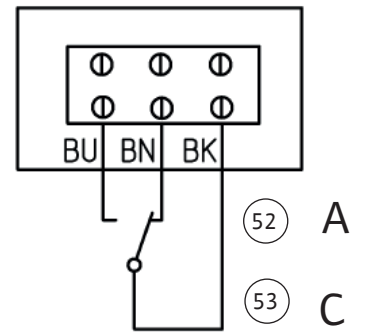
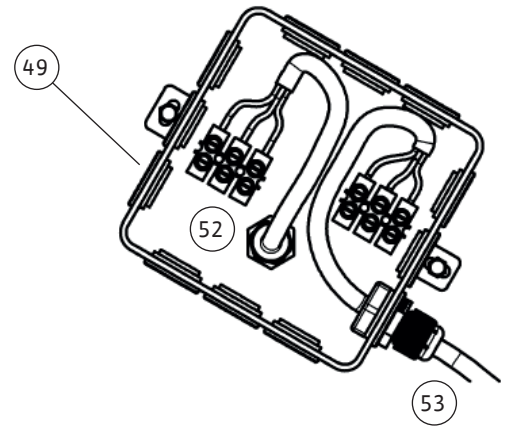
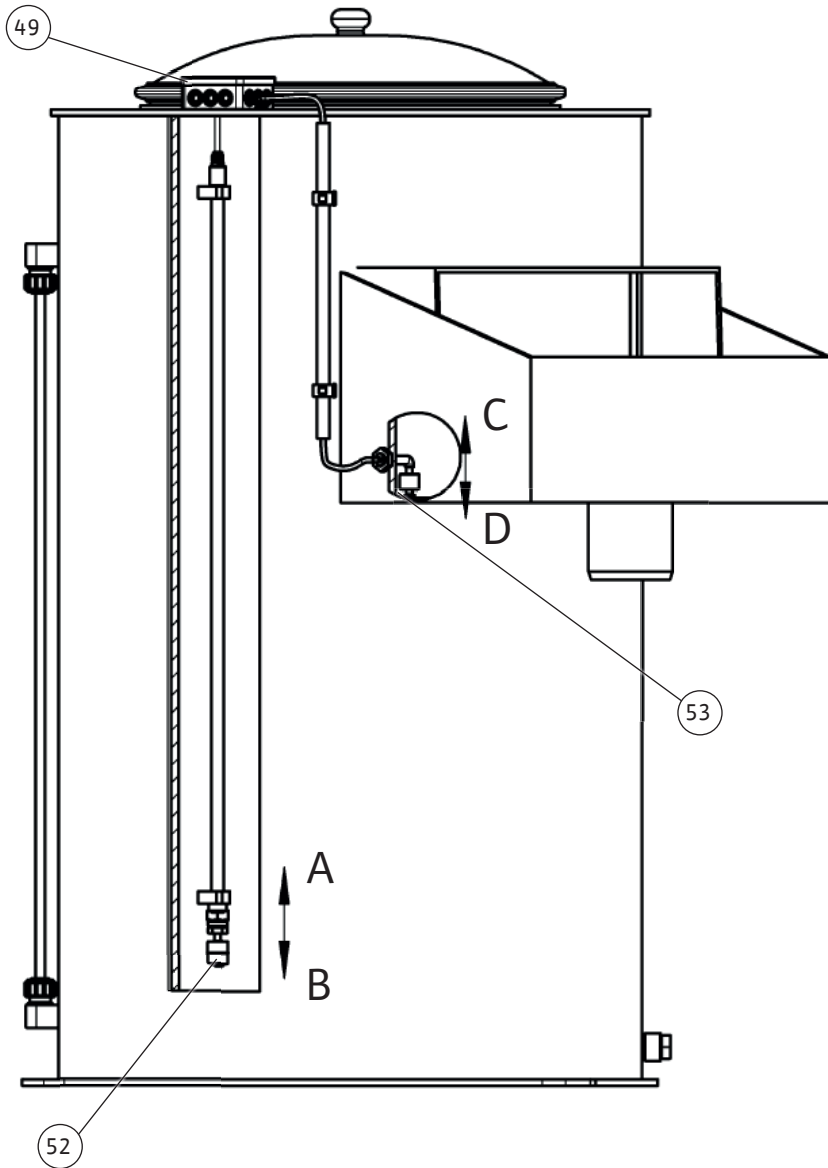




Table of Contents

1 General information	26	12.3 Protective clothing	63
1.1 About these instructions	26	12.4 Information on the collection of used electrical and elec- tronic products	63
1.2 Copyright	26	12.5 Batteries/rechargeable batteries	63
1.3 Subject to change	26	13 Appendix	65
1.4 Exclusion from warranty and liability	26	13.1 Captions.....	65
2 Safety	26		
2.1 Identification of safety instructions.....	26		
2.2 Personnel qualifications.....	28		
2.3 Electrical work	28		
2.4 Monitoring devices	28		
2.5 Transport.....	29		
2.6 Installing/dismantling.....	29		
2.7 During operation	29		
2.8 Maintenance tasks.....	30		
2.9 Operator responsibilities.....	30		
3 Application/use	30		
3.1 Intended use	31		
3.2 Improper use.....	31		
4 Product description	32		
4.1 Type key	32		
4.2 Technical data	33		
4.3 Scope of delivery.....	35		
4.4 Accessories	35		
4.5 Components of the system	36		
4.6 Function	38		
4.7 Navigation in the pump menus.....	41		
4.8 Noise characteristics	45		
4.9 Electromagnetic compatibility (EMC)	46		
5 Transport and storage	46		
5.1 Delivery.....	47		
5.2 Transport.....	47		
5.3 Storage	47		
6 Installation and electrical connection	47		
6.1 Installation site	48		
6.2 Installation	48		
6.3 Electrical connection	54		
7 Commissioning	55		
7.1 General preparations and control measures	56		
7.2 Protection against low water level (WMS).....	57		
7.3 Commissioning the system	58		
8 Shutdown/dismantling	58		
9 Maintenance	58		
9.1 Checking the pressure-boosting system	58		
9.2 Checking the supply pressure	59		
10 Faults, causes and remedies	59		
11 Spare parts	63		
12 Disposal	63		
12.1 Oils and lubricants.....	63		
12.2 Water-glycol mixture	63		

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 © 2023

The reproduction, distribution and utilization of this document as well as the communication of its contents to others without express authorization is prohibited. Offenders will be held liable for the 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 example representation of the device.

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

These installation and operating instructions set out safety instructions for preventing personal injury and damage to property. These safety instructions are shown differently:

- Safety instructions relating to personal injury start with a signal word, are **preceded by a corresponding symbol** and are shaded in grey.



DANGER

Type and source of the danger!

Consequences of danger and instructions for avoidance.

- Safety instructions relating to property damage start with a signal word and are displayed **without** a symbol.

CAUTION

Type and source of the danger!

Consequences or information.

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 as well as to total loss.
- **NOTICE!**
Useful information on handling the product

Markups

- ✓ Prerequisite
- 1. Work step/list
 - ⇒ Notice/instructions
 - ▶ Result

Symbols

These instructions use the following symbols:



General danger symbol



Danger caused by electric voltage



General warning symbol



Warning – suspended loads



Personal protective equipment: wear a safety helmet



Personal protective equipment: wear hearing protection



Personal protective equipment: wear safety footwear



Personal protective equipment: Wear protective gloves



Useful information

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 Monitoring devices

The following monitoring devices must be provided on-site:

Circuit breaker

- Design the power and switching characteristics of the circuit breakers according to the rated current of the connected product.
- Observe local regulations.

Motor protection switch

- Product without plug: install a motor protection switch! The minimum requirement is a thermal relay/motor protection switch with temperature compensation, differential trip and re-activation lock according to local regulations.
- Instable mains supply systems: if necessary, install further protective devices on-site (e.g. overvoltage, undervoltage or phase failure relays, etc.).

Residual-current device (RCD)

- Install a residual-current device (RCD) in accordance with the regulations of the local energy supply company.
- If people can come into contact with the device and conductive fluids, install a residual-current device (RCD).
- For systems/pumps with frequency converters, use a universal-current-sensitive residual-current device (type B RCD).

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 Installing/dismantling

- Wear the following protective equipment:
 - Safety footwear
 - Safety gloves for protection against cuts
- Locally applicable laws and regulations on work safety and accident prevention must be complied with.
- Disconnect device from the mains and secure it against being switched on again without authorisation.
- All rotating parts must stop.
- Clean the device thoroughly.

2.7 During operation

- Wear protective equipment according to work regulations.
- Demarcate and cordon off the working area.
- No persons are allowed in the working area during operation.

- Depending on the process, the product is activated and deactivated using separate controls. Product may automatically activate following power cuts.
- Superior must be informed immediately of any faults or irregularities.
- Operator must switch product off immediately if faults occur.
- Open all gate valves in the inlet and pressure pipe.
- Ensure protection against dry running.

2.8 Maintenance tasks

- Wear the following protective equipment:
 - Safety footwear
 - Safety gloves for protection against cuts
- Disconnect device from the mains and secure it against being switched on again without authorisation.
- Ensure cleanliness, dryness and good lighting in the work area.
- Only carry out maintenance tasks described in these installation and operating instructions.
- Only original parts of the manufacturer may be used. The use of any non-original parts releases the manufacturer from any liability.
- Collect any leakage of fluid and operating fluid immediately and dispose of it according to the locally applicable guidelines.
- Clean the device thoroughly.

2.9 Operator responsibilities

- Provide installation and operating instructions in a language which the personnel can understand.
- Make sure that the personnel have received the required training for the specified work.
- Provide protective equipment. Ensure that the protective equipment is worn by personnel.
- Ensure that safety and information signs mounted on the device are always legible.
- Train the personnel on how the system operates.
- Eliminate any risk from electrical current.
- Demarcate and cordon off the working area.
- Define a personnel work plan for safe workflow.
- Carry out a sound pressure measurement. From a sound-pressure level of 85 dB(A) upward, wear hearing protection. Include a note in the work regulations!

Observe the following points when handling the device:

- Use is not permitted for persons under the age of 16.
- Persons under the age of 18 must be supervised by a technician!
- Use is not permitted for persons with limited physical, sensory or mental capacities!

3 Application/use

3.1 Intended use

Function and application

Wilo pressure-boosting systems from the Wilo-SiBoost Smart 1, SiBoost2.0 Smart 1..., COR-1... and COR/T-1... series are designed for water supply systems for pressure boosting and pressurisation that do not need a standby pump. The system is used as:

- Domestic water supply and cooling systems
- Industrial water supply and cooling systems
- Fire water supply system for self-help without any normative specifications
- Irrigation and sprinkling installation

Design and installation are based on the following standards and directives:

- DIN 1988 (for Germany)
- DIN 2000 (for Germany)
- EU Directive 98/83/EC
- Drinking Water Ordinance – TrinkwV2001 (for Germany)
- DVGW directives (for Germany)

The SiBoost Smart 1, SiBoost2.0 Smart 1... and COR-1... type automatically controlled pressure-boosting systems are supplied from the public drinking water supply network either directly (connected directly) or indirectly (connected indirectly) via a break tank. The break tanks (see range of accessories) are closed but are not pressurised, i.e. they are only under atmospheric pressure. The COR/T... system series is supplied with an integrated break tank and is therefore already prepared for indirect connection to the water supply network.

Current design, installation and application instructions for Wilo pressure-boosting systems can also be found for instance, in the Wilo manual "Tips and tricks Booster" and other Wilo manuals and brochures on pump and system technology on the Wilo website.

For your safety

- Completely reading and following all instructions in these installation and operating instructions
- Observing the statutory accident prevention and environmental regulations
- Complying with inspection and maintenance regulations
- Complying with in-house regulations and instructions

The pressure-boosting system is built according to the manufacturer's specifications as well as the state of the art and the recognised safety regulations. However, in the event of incorrect operation or misuse, danger to life and limb of the operator or third parties or damage to the system itself and other material assets may occur.

The safety devices on the pressure-boosting system are designed in such a way that there is no risk to the operating personnel when the system is used as intended.

The pressure-boosting system may only be used in technically fault-free condition and in accordance with its intended use, in a safety-conscious and hazard-conscious manner and in compliance with these installation and operating instructions. Faults that may affect safety must be rectified immediately by qualified personnel.

3.2 Improper use

Possible misuse

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

- Pumping fluids that chemically or mechanically attack the materials used in the system
- Pumping fluids that contain abrasive or long-fibre components
- Pumping fluids that are not intended for this purpose by the manufacturer

Persons under the influence of intoxicating substances (e.g. alcohol, drugs, narcotics) are not authorised to operate, maintain or modify the pressure-boosting system in any way.

Improper use

Improper use occurs when parts other than those specified in the intended use are processed in the pressure-boosting system. Modification of the components of the pressure-boosting system also leads to improper use.

All spare parts must comply with the technical requirements specified by the manufacturer. There is no guarantee that third-party parts are designed and manufactured in accordance with appropriate safety and operational requirements. This is always guaranteed when using original spare parts.

Modifications to the pressure-boosting system (mechanical or electrical changes to the function sequence) invalidate any liability on the part of the manufacturer for any resulting damage. This also applies to the installation and adjustment of safety devices and valves as well as the modification of load-bearing parts.

4 Product description

4.1 Type key

Example	Wilo-SiBoost Smart 1 Helix VE 606
Wilo	Brand name
SiBoost	Product family: pressure-boosting systems
Smart	Series designation
1	Number of pumps
Helix	Pump series designation (see attached pump documentation)
VE	Pump design, vertical electronic version
6	Rated volume flow Q [m ³ /h]
06	Number of pump stages

Example	Wilo-SiBoost Smart 1 Helix VE 405/EM2
Wilo	Brand name
SiBoost	Product family: pressure-boosting systems
Smart	Series designation
1	Number of pumps
Helix	Pump series designation (see attached pump documentation)
VE	Pump design, vertical electronic version
4	Rated volume flow Q [m ³ /h]
05	Number of pump stages
/EM2	Single-phase version with preset operating mode 2 – pressure control mode

Example	Wilo-SiBoost Smart 1 MWISE 806
Wilo	Brand name
SiBoost	Product family: pressure-boosting systems
Smart	Series designation
1	Number of pumps
MWISE	Pump series designation (see attached pump documentation)
8	Rated volume flow Q [m ³ /h]
06	Number of pump stages

Example	Wilo-SiBoost2.0 Smart 1 Helix VE1603/3kW
Wilo	Brand name
SiBoost	Product family: pressure-boosting systems
2.0	Generation labelling
Smart	Series designation
1	Number of pumps
Helix	Pump series designation (see attached pump documentation)
VE	Pump design, vertical electronic version
16	Rated volume flow Q [m ³ /h]
03	Number of pump stages
3kW	Power P2 (for distinction purposes in event of same number of stages)

Example	Wilo-COR/T-1 Helix VE 410-GE
Wilo	Brand name

Example	Wilo-COR/T-1 Helix VE 410-GE
CO	Compact pressure-boosting system
R	Regulation (control) by frequency converter
/T	With integrated break tank for system separation
1	Number of pumps
Helix	Pump series designation (see attached pump documentation)
VE	Pump design, vertical electronic version
4	Rated volume flow Q [m ³ /h]
10	Number of pump stages
GE	Basic unit, i.e. without an additional control device The system is controlled with the pump's integrated frequency converter.

Example	Wilo-COR-1 MVIE 7004/2-GE
Wilo	Brand name
CO	Compact pressure-boosting system
R	Regulation (control) by frequency converter
1	Number of pumps
MVIE	Pump series designation (see attached pump documentation)
70	Rated volume flow Q [m ³ /h]
04	Number of pump stages
/2	Number of reduced stages
GE	Basic unit, i.e. without an additional control device The system is controlled with the pump's integrated frequency converter.

Example	Wilo-COR-1 MHIE 406-2G-GE
Wilo	Brand name
CO	Compact pressure-boosting system
R	Regulation (control) by frequency converter
-1	Number of pumps
MHIE	Pump series designation (see attached pump documentation)
4	Rated volume flow Q [m ³ /h]
06	Number of pump stages
2G	Generation labelling
GE	Basic unit, i.e. without an additional control device The system is controlled with the pump's integrated frequency converter.

	Additional designations for additional options pre-installed at the factory
WMS	Including WMS kit (low-water cut-out switchgear for operation with supply pressure)
MS	Including main switch for switching the system on and off (power cut-off switch)

4.2 Technical data

Max. volume flow	see catalogue/data sheet
Max. delivery head	see catalogue/data sheet
Speed	900 – 3600 rpm (variable speed)
Mains voltage	3~ 400 V ±10 % V (L1, L2, L3, PE) (with EM2 - 1~230 V ±10 % V (L, N, PE)) See rating plate of pump/motor
Rated current	See rating plate of pump/motor
Frequency	50 Hz (60 Hz)

Electrical connection	(See installation and operating instructions for the pump and installation and operating instructions and circuit diagram for the control device (if available))	
Insulation class	F	
Protection class	IP54	
Power consumption P_1	See rating plate of pump/motor	
Power consumption P_2	See rating plate of pump/motor	
Pumps with glanded motors sound-pressure level	Rated power (kW)	dB(A) <small>tolerance +3dB(A)</small>
	0.55	66
	0.75	68
	1.1	70
	1.5	70
	2.2	70
	3	71
	4	71
	5.5	72
	7.5	72
	11	78
	15	78
	18.5	81
22	81	
Pumps with glandless motors sound-pressure level	Rated power (kW)	dB(A) <small>tolerance +3dB(A)</small>
	1.1	53
	2.0	55
Nominal diameters	Rp1 / R1¼	(..1 MHIE 2)
Connection Inlet/discharge line SiBoost Smart 1.../ COR-1...	Rp1¼ / R1¼	(..1 MHIE 4)
		(..1 MWISE 2)
		(..1 MWISE 4)
		(..1 Helix VE 4)
		(..1 Helix VE 6)
		(..1 MHIE 8)
	Rp1½ / R1½	(..1 MWISE 8)
		(..1 Helix VE 10)
		(..1 MHIE 16)
	Rp2 / R1½	(..1 Helix VE 16)
		(..1 Helix VE 22)
	Rp2 / R2	(..1 Helix VE 36)
	Rp2½ / R2½	(..1 Helix VE 52)
Rp3 / DN 80	(..1 MVIE 70)	
DN 100/DN 100	(..1 MVIE 95)	
	DN...: Flange connection according to EN 1092 (PN 16)	
R...: Male thread according to EN 10226-1		
Rp...: Female thread according to EN 10226-1		

Inlet/discharge line SiBoost2.0 Smart 1...	G1¼ / R1¼	(..1 Helix VE 2) (..1 Helix VE 4) (..1 Helix VE 6)
	G1½ / R1½	(..1 Helix VE 10)
	G2 / R1½	(..1 Helix VE 16)
	G2 / R2	(..1 Helix VE 22)
	G2½ / R2½	(..1 Helix VE 36)
	G3 / DN 80	(..1 Helix VE 52)
	DN...: Flange connection according to EN 1092 (PN 16) G...: Female thread according to EN 228-1 R...: Male thread according to EN 10226-1	
Inlet/discharge line COR/T-1...	G1¼/G1¼	(..1 Helix VE 4) (..1 Helix VE 6)
	G...: Male thread according to EN 228-1	
(Subject to change without prior notice/see also the installation plan provided)		
Permitted ambient temperature	5 °C to 40 °C	
Permissible fluids	Pure water without settling sediments	
Permissible fluid temperature	3 °C to 50 °C (SiBoost/SiBoost2.0.../COR-1...) 3 °C to 40 °C (COR/T-1...)	
Max. permissible operating pressure	on the discharge side 16 bar (Helix VE, MVIE) 10 bar (MHIE) (see rating plate)	
Max. permissible inlet pressure	Indirect connection (max. 6 bar)	
Diaphragm pressure vessel	8 l	

4.3 Scope of delivery

The automatically controlled Wilo pressure-boosting systems SiBoost Smart 1, SiBoost2.0 Smart 1, COR-1... and COR/T-1... are supplied ready for connection.

As a compact unit with integrated control, they contain a non-self-priming, multistage vertical (Helix VE, Helix2.0 VE, MVISE) or horizontal (MHIE) high-pressure multistage centrifugal pump.

The pump is installed on a base frame (SiBoost Smart 1, SiBoost2.0 Smart 1, COR-1) or a baseplate (COR/T) with all pipework.

Measures required on-site:

- Make the connections for the inlet and pressure pipes.
- Establish the electrical mains connection.
- Install the supplied accessories ordered separately.

4.3.1 Standard version scope of delivery

- Pressure-boosting system
- Installation and operating instructions for the pressure-boosting system
- Installation and operating instructions for the pumps
- Factory test protocol
- Box with accessories/accessories kit/add-on parts (Fig. 9a and 9b, item 42), if applicable

4.3.2 Special version scope of delivery

- Installation plan, if applicable
- Electrical circuit diagram, if applicable
- Installation and operating instructions for the control device, if applicable
- Installation and operating instructions for the frequency converter, if applicable
- Supplementary sheet with the factory settings for the frequency converter, if applicable
- Installation and operating instructions for the signal transmitter, if applicable
- Spare parts list, if applicable

4.4 Accessories

Accessories must be ordered separately as required. The accessories from the Wilo range include the following:

- Open break tank (Fig. 10a)

- Larger diaphragm pressure vessel (on the inlet or discharge side)
- Safety valve
- Dry-running protection:
 - protection against low water level (WMS) (Fig. 5a to 5c), in inlet mode (at least 1.0 bar) for COR-1 MHIE (Fig. 5b) and SiBoost Smart 1...EM2 (Fig. 5a) systems (is supplied fitted to the pressure-boosting system if part of the order).
 - For SiBoost Smart 1..., SiBoost2.0 Smart 1 Helix VE... and COR-1 MVIE... systems: a supply pressure sensor is fitted on the suction side as standard, functioning as a low-water cut-out switchgear during operation with supply pressure (Fig. 2b, 2d).
 - For COR/T-1... systems: a float switch that switches the pump off when there is a water shortage (Fig. 1e, Item 52) and a pressure sensor on the suction side (Fig. 1e, Item 12-2) that switches the pump back on when the supply pressure reaches at least 0.3 bar, are installed in the break tank as standard.
 - Float switch
 - Low-water electrodes with a level relay
 - Electrodes for tank operation (special accessories on request)
- Main switch (Fig. 1a to 1j, Item 16)
- Flexible connection pipes (Fig. 8, Item 31)
- Compensators (Fig. 8, Item 30)
- Threaded flanges
- Sound-insulating unit casing (special accessories on request)

4.5 Components of the system



NOTICE

These installation and operating instructions contain a general description of the complete system.



NOTICE

For detailed information about the pump in this pressure-boosting system, see the enclosed installation and operating instructions for the pump.

4.5.1 Connection

The pressure-boosting systems SiBoost Smart 1, SiBoost2.0 Smart 1... and COR-1... can be connected to the public water supply network in two ways:

- Direct connection (Fig. 6a).
- Indirect connection (Fig. 6b).

When supplied with a self-priming pump (special version), this may be connected to the public water supply network only indirectly (system separation by a non-pressurised break tank).

- Information on the pump type used can be found in the attached installation and operating instructions for the pump.

The pressure-boosting system COR/T-1... is intended for indirect connection to the public water supply network by means of the integrated break tank with level-dependent replenishment and system separation (similar to diagram in Fig. 6b).

4.5.2 Components of the pressure-boosting system

The complete system is made up of various main components.



NOTICE

Observe the respective installation and operating instructions for the individual component.

Mechanical and hydraulic system components SiBoost Smart 1, SiBoost2.0 Smart 1 and COR-1... (Fig. 1a to 1d and 1f to 1j):

The system is installed on a base frame (3) with oscillation absorbers (34). It consists of a high-pressure multistage centrifugal pump (1) with a three-phase current motor with an integrated frequency converter (15), with a shut-off valve (7) and a non-return valve (8) installed on the discharge side. There is also an assembly, which can be shut off, with a pressure sensor (12-1) and pressure gauge (11-1) as well as an 8-litre diaphragm pressure ves-

sel (9) with a throughflow fitting (10) that can be shut off (for flow through according to DIN 4807, part 5).

An assembly that can be shut off having a further pressure transmitter (12-2) and pressure gauge (11-2) is installed on the pump's drain connection or on the pipework on the inlet side as standard for SiBoost/SiBoost2.0 Smart 1 Helix... and MVISE... as well as COR-1 MVIE...GE systems (Fig. 2b, 2d).

A low-water cut-out switchgear (WMS) assembly (14) can be optionally installed or retrofitted on the pump's drain connection or on the inlet pipe for systems in the COR-1 MHIE...GE and SiBoost Smart 1 Helix VE...EM2 series (Fig. 5a, 5b).

An optional main switch (16) is pre-assembled at the factory and pre-wired with the motor of the pump for systems in the COR-1...GE-HS and SiBoost/SiBoost2.0 Smart 1...-HS series. In this case, the electrical connection must be established by means of this switch (see section "Electrical connection [► 54]"). For customer-specific systems, the scope of delivery may include an additional control device, which is installed on the base frame with an upright support bracket and wired to the electrical components of the system.

Mechanical and hydraulic system components COR/T-1...(Fig. 1e):

The system components are mounted on a plastic baseplate belonging to the integrated break tank (53). The system consists of a high-pressure multistage centrifugal pump (1) with a three-phase current motor (17) with an integrated frequency converter (15), with a shut-off valve (7) and a connection pipe (5) installed on the discharge side. There is an assembly, which can be shut off, with a pressure sensor (12-1) and pressure gauge (11-1) as well as an 8-litre diaphragm pressure vessel (4) with a throughflow fitting (6) that can be shut off (for flow through according to DIN 4807, part 5). A non-return valve (8) as well as the connection to the tank with a hose are mounted on the inlet side. A float switch (52) is installed in the break tank as a signal transmitter for protection against low water level. The water from the supply mains is fed (4) into the break tank via a level-dependent opening and closing float valve (43).

These installation and operating instructions describe the overall system in general, without going into a detailed description of the operation of an additional control device (see section Commissioning [► 58] and the accompanying documentation for the control device).

High-pressure multistage centrifugal pump (1) with three-phase current motor (17) and frequency converter (15):

Different types of high-pressure multistage centrifugal pumps are installed in the system depending on the application and the performance parameters required.



NOTICE

Detailed instructions for the pump and operation of the frequency converter can be found in the attached installation and operating instructions for the pump or the drive.

Diaphragm pressure vessel kit (Fig. 3):

Consists of:

- diaphragm pressure vessel (9) with closable throughflow fitting (10) and drain valve

Pressure sensor kit on the discharge side for all types (Fig. 2a or Fig. 2c)

Consists of:

- pressure gauge (11-1)
- pressure sensor (12-1a)
- electrical connection, pressure sensor (12-1b)
- drain/venting (18)
- stop valve (19)

Pressure sensor kit on the inlet side (Fig. 2b) (for SiBoost Smart 1 Helix VE.../MVISE... and COR-1 MVIE...GE) and (Fig. 2d) (for SiBoost2.0 Smart 1 Helix VE...)

Consists of:

- pressure gauge (11-2)
- pressure sensor (12-2a)
- electrical connection, pressure sensor (12-2b)

- drain/venting (18)
- stop valve (19)

Control device

Systems from the SiBoost Smart 1, SiBoost2.0 Smart 1..., COR- 1...GE and COR/T-1...GE series do not have a separate control device. The system is controlled by the pump's integrated frequency converter (15).



NOTICE

Detailed instructions for the operation and handling of the frequency converter can be found in the attached installation and operating instructions for the pump and the drive.

An additional control device is used to control and regulate some customer-specific types of systems.



NOTICE

Detailed instructions for the type of control device used in the pressure-boosting system can be found in the attached installation and operating instructions and the associated wiring circuit diagram.

4.6 Function



WARNING

Risk of damage to your health!

Risk of damage to your health due to contaminated drinking water.

- Use only materials that ensure the required water quality for drinking water installations.
- To reduce any impairment of the drinking water quality, flush the pipes and system.
- If commissioning the system after a longer period of downtime, replace the water.

CAUTION

Risk of damage to property!

Dry running can lead to the pump developing leakages and to motor overload.

- Ensure that the pump does not run dry to protect the mechanical seal and the plain bearings.

4.6.1 Description

The system with its non-self-priming, vertically (Helix VE, Helix2.0 VE, MVIE or MVICE) or horizontally (MHIE) mounted high-pressure multistage centrifugal pump with frequency converter is supplied with all pipework installed as a compact unit ready for connection. Connections for the inlet and discharge line as well as the electrical mains connection must be established.

Systems from the SiBoost Smart 1, SiBoost2.0 Smart 1... and COR- 1... series (examples Fig. 1a to 1d and 1f to 1j) are mounted on a galvanised steel base frame (3) with vibration absorbers (34).

Systems from series COR/T-1 (Fig. 1e) are mounted on a plastic baseplate together with a plastic break tank.

The supplied accessories ordered separately must be installed.

- Observe the relevant applicable regulations and standards when using the system for drinking water supply and/or fire extinguishing supply.
- The systems must be operated and maintained in accordance with the relevant provisions (in Germany according to DIN 1988 (DVGW)) so that the operational reliability of the water supply is permanently guaranteed and neither the public water supply nor other consumption installations are detrimentally affected.

- The applicable standards and directives (see Application/use) on the connection and connection type to public water supply networks must be observed. They may be supplemented by regulations of the water supply companies (WVU) or the responsible fire protection authority.
- The local conditions (e.g. a supply pressure that is too high or fluctuating considerably and which might require the installation of a pressure reducer) must also be observed.

Systems from the Wilo SiBoost Smart 1, SiBoost2.0 Smart 1 or Wilo-Comfort-Vario COR and COR/T series are fitted with a non-self-priming horizontal or vertical high-pressure multistage centrifugal pump with a three-phase current motor (17) and an integrated frequency converter (15) as standard. The pump is supplied with water via the inlet connection (4).

For suction mode (SiBoost Smart 1, SiBoost2.0 Smart 1 or COR-1...) from lower-lying tanks, a separate, vacuum-proof and pressure-resistant suction line with a foot valve should be installed. It must be positioned at a constant upward inclination from the tank to the pump connection.

The pump increases the pressure and pumps the water to the consumer through the pressure pipe (5). To do this, it is switched on and off and/or controlled according to the pressure. One or two pressure sensors (12-1 and 12-2) are intended to monitor the pressure (depending on the type of system) (see also Fig. 2a to 2d). The pressure sensor or sensors continuously measure(s) the actual pressure value, convert(s) it into an analogue current signal and transmit(s) it to the frequency converter (15) of the pump (or if available the control device). Depending on the demand and the control mode, the frequency converter (or the control device) switches the pump on or off or changes the speed of the pump accordingly until the set control parameters are reached. For a more precise description of the control mode, control process and setting options, please see the installation and operating instructions for the pump and/or the control device.

SiBoost Smart 1, SiBoost2.0 Smart 1 Helix VE.../MVICE... or COR-1 MVICE...GE series systems with frequency control on the pump and an installed pressure sensor on the inlet side (pump housing or suction line) can operate in p-v mode. For this purpose, special settings are possible and/or required on the frequency converter of the pump. For a more precise description of this control mode, the control procedure and setting options, please see section "p-v mode ► 40" (SiBoost Smart) and separate documentation on the pump/drive (SiBoost2.0 Smart).

The diaphragm pressure vessel installed (9) (total capacity of approx. 8 litres) exercises a buffer effect on the pressure sensor and prevents oscillation of the control when switching the pump on and off. It guarantees low water extraction (e.g. due to smallest leakages) from the available storage volume without switching on the pump. The switching frequency is reduced and the operating state of the system is stabilised.

On SiBoost Smart 1, SiBoost2.0 Smart 1 Helix VE.../MVICE... or COR-1 MVICE...GE series systems, the supply pressure is continuously monitored by the pressure sensor on the inlet side and transmitted to the frequency converter as a current signal. If the supply pressure is too low, the system detects a fault and the pump is stopped.

On COR-1 MHIE...GE and SiBoost Smart 1 Helix VE...EM2 series systems, a low-water protection device (WMS) (14) (Fig. 5a and 5b) is provided as an accessory for direct connection to the public water supply network. It monitors the available supply pressure and sends a switching signal which is processed by the frequency converter and/or control device. The WMS kit is installed on the pump's drainage opening (WMS connection kit (Fig. 5a, 14b) from the accessories range also required) or at an installation point to be provided in the inlet pipe.

In the case of an indirect connection (system separation by non-pressurised break tank), a level-dependent signal transmitter must be provided and installed in the break tank as a dry-running protection device. When using a Wilo break tank, a float switch (Fig. 10b, Item 52) is already included in the scope of delivery.

COR/T series systems that are fitted with an unpressurised break tank for system separation have a float switch (Fig. 1e item 52), which is already installed as a low-water signal transmitter in the tank.

For tanks provided by the customer, there are various signal transmitters for subsequent installation in the Wilo range (e.g. WA65 float switch or low-water electrodes with level relay).

An additional main switch is optionally available which can be retrofitted in all systems in the series COR-1...GE or SiBoost Smart 1, SiBoost2.0 Smart 1... (see Fig. 1a-1j and Fig. 8,

Item 16). The main switch is used to disconnect the mains supply for maintenance and repair work on the system.

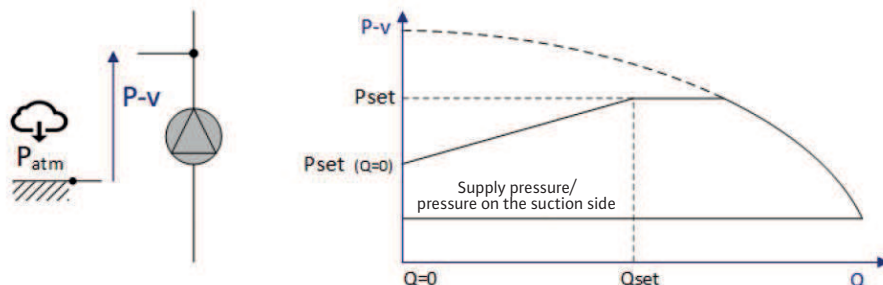
4.6.2 p-v control operating mode



NOTICE

Only applies to SiBoost Smart 1 / COR-1.

- For SiBoost2.0 Smart 1, see separate documentation for the drive.



Alongside the operating modes “Speed control”; “Constant pressure: p-c”; “Constant differential pressure Δp -c”; “PID control” and “Variable differential pressure Δp -v” described in more detail in the installation and operating instructions for the pump, a control mode “Variable pressure p-v” (hereinafter referred to as just p-v control), described in more detail below, can be set via the user interface of the frequency converter in the menu (see Navigation in the pump menus [► 41]).

In the “p-v control” operating mode, the frequency converter alters the delivery pressure of the pump as a linear function of the volume flow to be conveyed through the system (right-hand diagram). The use of one pressure sensor each on the suction and discharge side is required for this operating mode. A relative pressure sensor is used on the discharge side of the pump, and both a relative pressure sensor (standard ex-works) and an absolute pressure sensor can be used on the suction side of the pump.

The relative pressure sensor with a measurement range of -1 bar to 9 bar, which is mostly used at the factory, is depicted in the menu 5.4.0.0 “IN2” as an absolute pressure sensor [5.4.4.0 = ABS] from 0 to 10 bar [5.4.3.0 = 10 bar]. (Accuracy of the sensors $\leq 1\%$ and application between 30 % and 100 % of the respective measurement range). A relative pressure sensor measures the pressure in relation to atmospheric pressure (left-hand diagram). An absolute pressure sensor measures the pressure in relation to zero pressure in a vacuum.

- The value for (Pset) is set manually via menu item 1.0.0.0.
- The value for (Qset) is set manually via menu item 2.3.3.0.
- The value for the zero flow rate (Pset(Q=0)) is set manually via menu item 2.3.4.0.

In the p-v operating mode, the control detects a zero volume delivery, triggering the deactivation of the pump.

Recommendation for commissioning:

- Set the set pressure at the desired volume flow point (Pset) to 60 to 80 % of the pump’s maximum pressure.
- Set the volume flow (Qset) to the pump’s rated volume flow.
- Set the desired pressure at zero delivery (Pset(Q=0)) to 90 % of Pset.

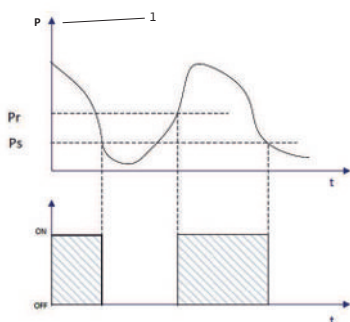
Low-water cut-out switchgear

1 Pressure on the suction side

For this operating mode, the pressure sensor on the inlet side is also used as a low-water cut-out switchgear, triggering the deactivation of the pump if the set cut-off pressure (Ps) is undershot. The pump is started if the inlet pressure rises above the set restart pressure (Pr). The cut-off pressure (Ps) measured at the inlet side is set at the factory to 1 bar and the restart pressure (Pr) is set at the factory to 1.3 bar. (Relative pressure).

- In order to disable this function, set Ps to the smallest possible value (-1.0 bar relative pressure).

In order to avoid excessively frequent deactivation and reactivation cycles, a deviation of 0.3 bar between the cut-off pressure (Ps) and restart pressure (Pr) is recommended.



**NOTICE**

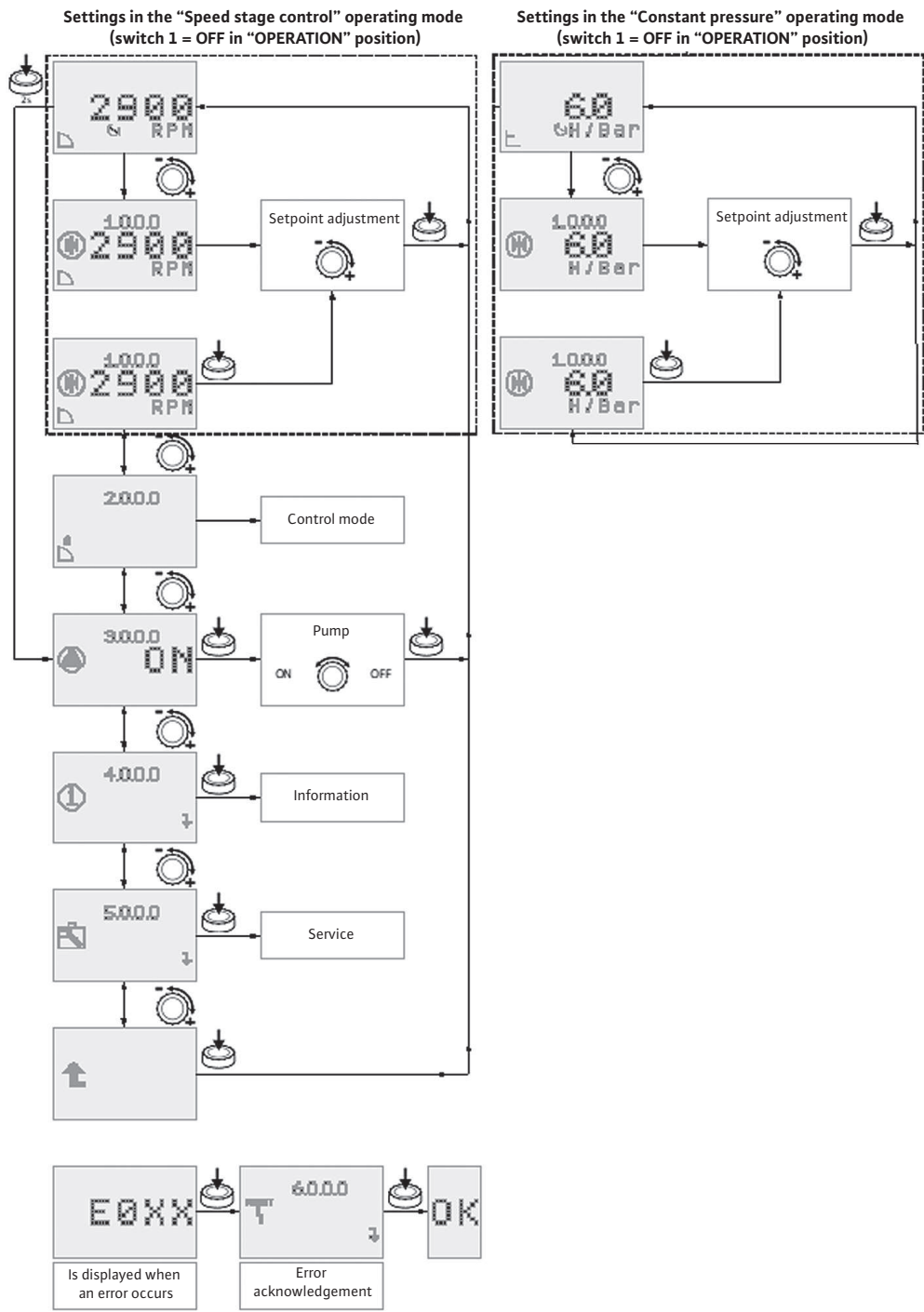
Relative pressure sensors are installed at the factory as standard, i.e. all pressures are measured in relation to atmospheric pressure.

When connecting the system to a break tank, i.e. indirect connection (Fig. 6b), it can be expedient to set the value for the cut-off pressure (P_s) to -0.6 bar and the restart pressure (P_r) to 0.0 bar. The use of an additional float switch that is installed in the break tank (for break tanks from the Wilo range of accessories) or that has to be installed (for tanks provided by the customer) is recommended to protect the tank from being drained.

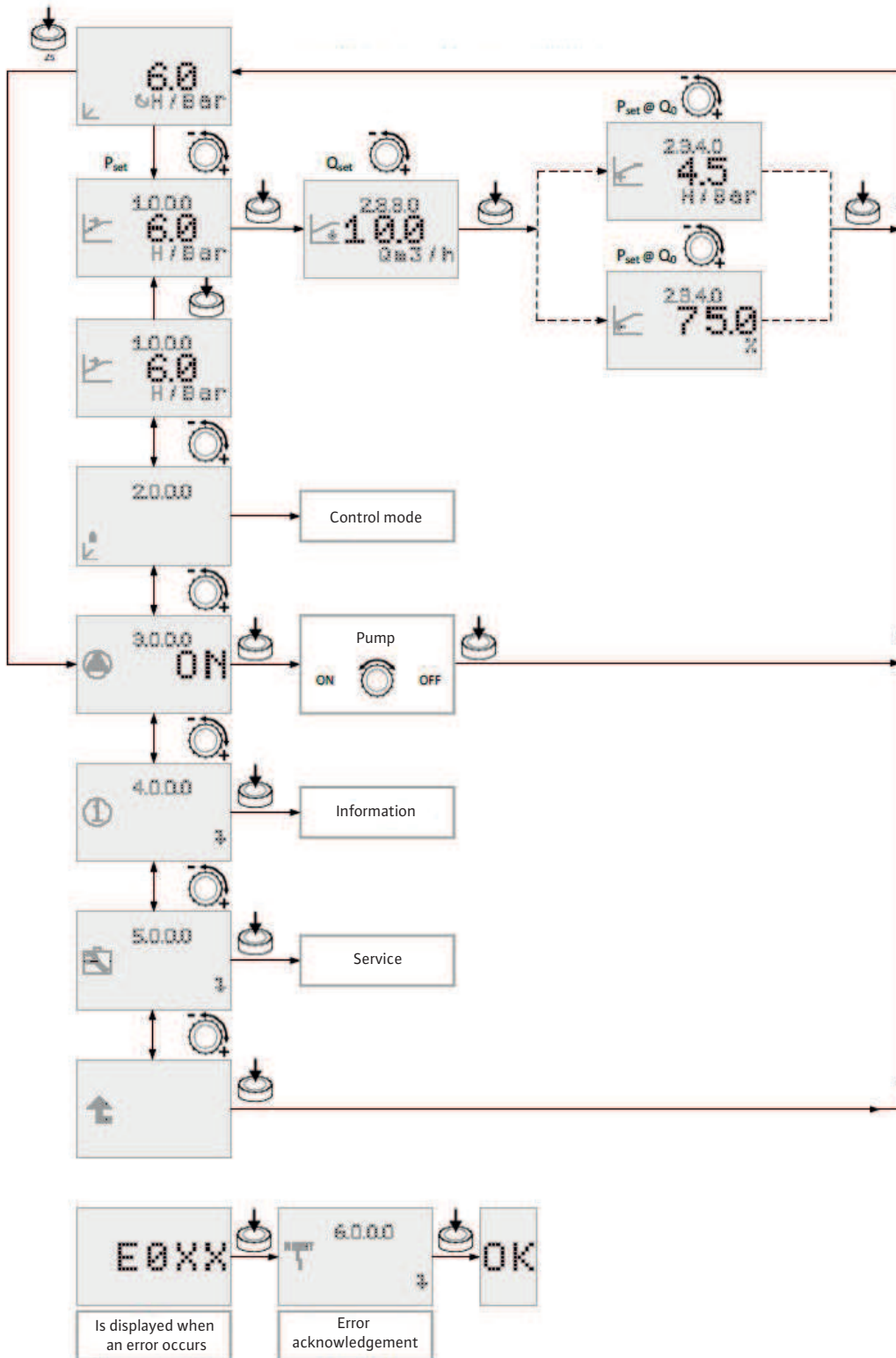
4.7 Navigation in the pump menus**NOTICE**

Only applies to SiBoost Smart 1 / COR-1.

- For SiBoost2.0 Smart 1, see separate documentation for the drive.
-



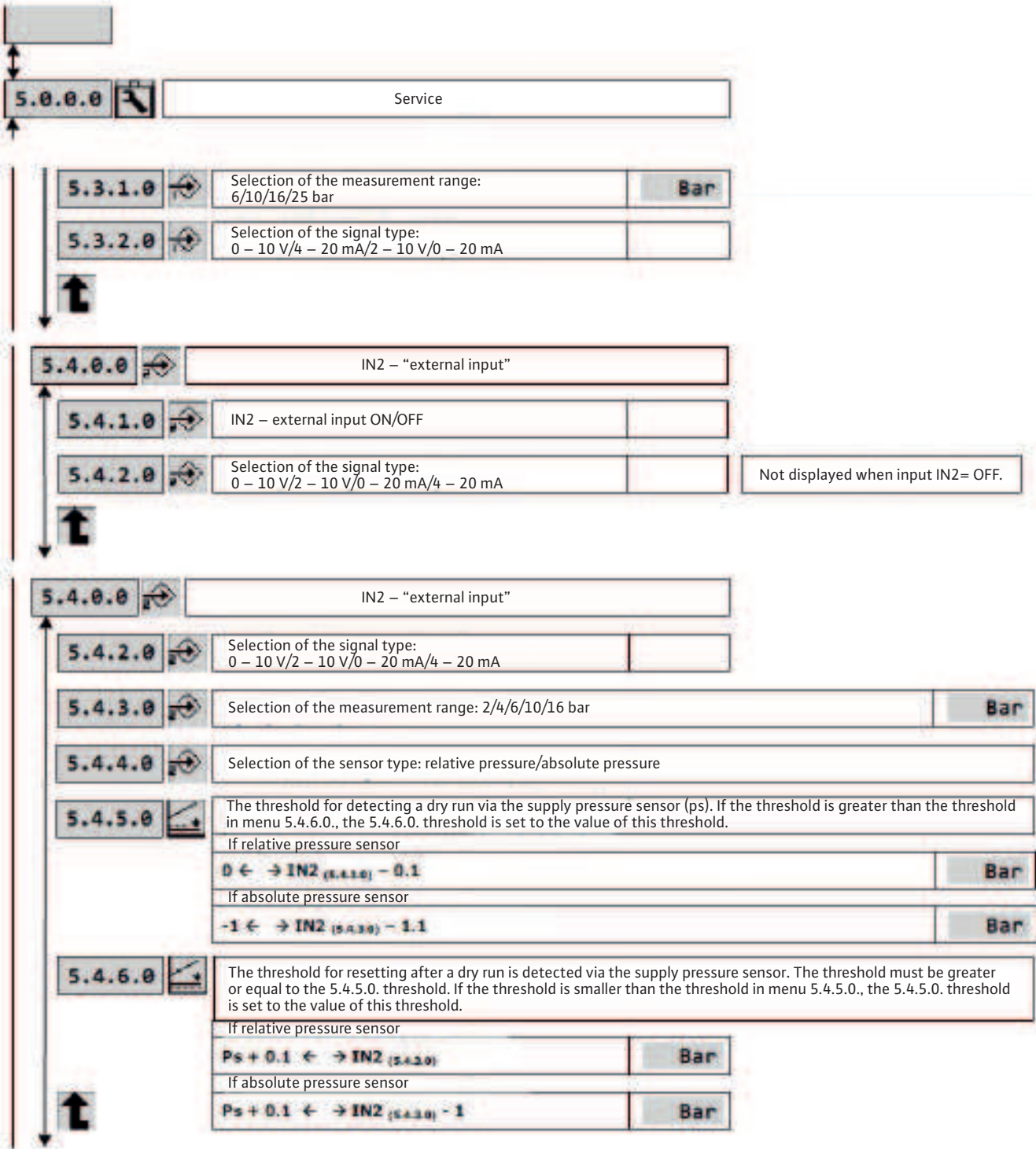
Settings in the "p-v control" operating mode
(switch 1 = OFF in "OPERATION" position)



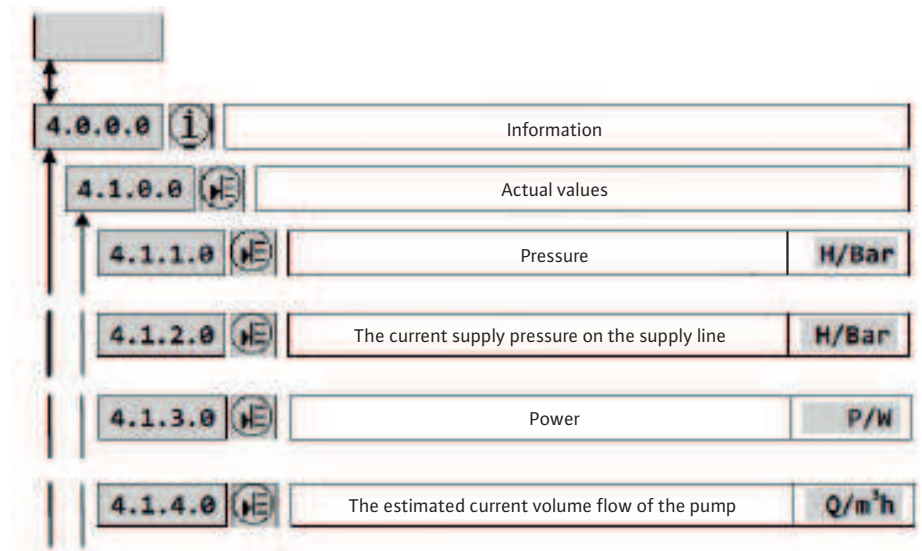
A pressure sensor installed on the suction side generally indicates a factory-configured p-v control.

- Adjust the system-related parameters during commissioning.
 - Pressure setpoint (Pset) for rated volume flow (1.0.0.0)
 - Rated volume flow (Qset) (2.3.3.0)
 - Setpoint in the event of zero flow (Pset(Q=0)) (2.3.4.0)
- Further information on the pump menu can be found in the attached documentation for the pump or the drive.

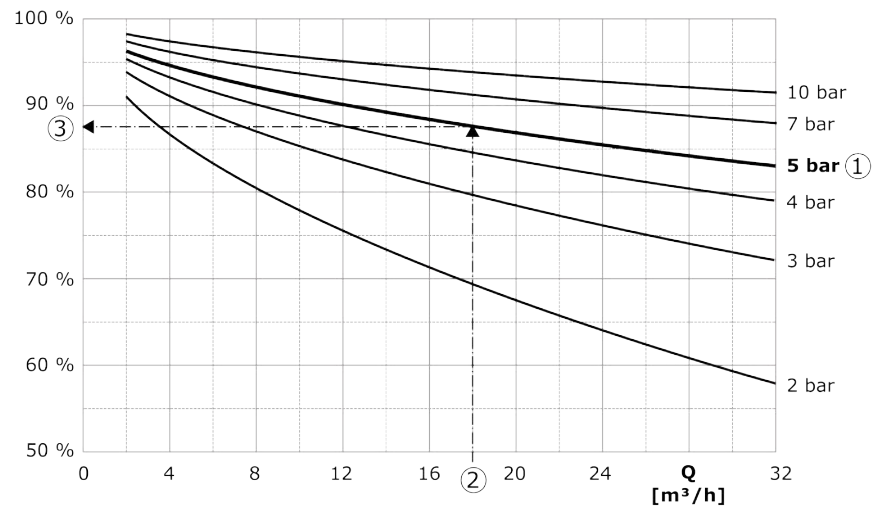
SETTINGS IN THE "EXPERT" MENU



Displays in the menu "Information"



Setpoint in the event of zero flow



The graph shows typical default values for the setpoint at zero flow.

Example:

- Based on the reference setpoint (1), the characteristic curve to be used is selected (here: 5 bar).
- The point of intersection between this characteristic curve and the maximum volume flow of the system (2) (here 18 m³/h) is used to determine the relative setpoint at zero flow (3) (here 87.5 %). The setpoint at zero flow is 4.4 bar (=5 bar x 0.875).



NOTICE

When using a diaphragm pressure vessel installed on the discharge side, use the "setpoint at zero flow" as the described "pump switch-on pressure p_{min} " (see General preparations and control measures [► 56] and Fig. 4).

4.8 Noise characteristics



WARNING

Risk of injury from a lack of protective equipment!

In case of sound-pressure levels above 80 dB(A), there is a risk of hearing impairments.

- Wear suitable hearing protection during operation.

Depending on the power requirements, the system is supplied with a wide variety of pumps which vary considerably in terms of their noise and oscillation characteristics. You can find the relevant data in the Technical data [► 33], in the installation and operating instructions for the pump and in the catalogue specifications for the pump.

4.9 Electromagnetic compatibility (EMC)

The individual components (pumps with frequency converter and control device) of this system meet the requirements of the EMC directives and relevant standards.



NOTICE

Observe the respective installation and operating instructions for the individual component.

- Note the following for the overall system:



NOTICE

This professionally used device does not comply with the limit values for harmonic currents of EN 61000-3-12 and IEC 61000-3-12.

For this reason, the responsible energy supply company must be asked to approve the connection.

For further information and installation notes, see Annex 8.3 of EN IEC 61800-3.

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 stop lugs (Fig. 9a, 9b, Item 35) or the base frame for fixation.
- Ensure stability of the load since, with the vertical pump design, the centre of gravity is shifted to the top range (top-heavy, Fig. 9a, 9b).

CAUTION

Risk of damage to property due to incorrect loading!

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

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 [► 47]).

5.1 Delivery

The pressure-boosting system is fixed on a pallet (Fig. 9a, 9b, Item 36), on transport boards or in a crate and is foil-wrapped to protect it against moisture and dust.

- 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.
- When receiving and before unpacking the pressure-boosting system and the supplied accessories, first check the packaging for damage.

If damage is found which may have been caused by the system having fallen or similar impacts:

- check the pressure-boosting system and accessories for possible damage, and
- notify the delivery company (forwarding agent) or our customer service, even if you do not find any obvious damage to the system or its accessories.

5.2 Transport

The system is packed in plastic wrap to protect it against moisture and dirt.

- 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.
- Attach lifting slings to base frame:
 - Transport with forklift
 - Transport with lifting gear.
 - Fixation lugs on base frame: Sling chain with sling hook with safety latch.
 - Screw in the loosely supplied ring eyelets: Sling chain or polyester webbing sling with shackle.
- Permissible angle specification for the lifting sling
 - Fixation with sling hook: $\pm 24^\circ$
 - Fixation with shackle: $\pm 8^\circ$
 - If the angle specifications cannot be complied with, use a spreader beam.

5.3 Storage

- Place the system 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

Risk of damage to your health!

Risk of damage to your health due to contaminated drinking water.

- No materials that have adverse effects on the quality of the water may be used for drinking water installations.
- Flushing the pipes and system reduces any impairment of the drinking water quality.
- If the system is not used for a longer period of time, replace the water.

6.1 Installation site

Requirements for the installation location:

- Dry, well ventilated and frost-resistant.
- Separate and lockable (e.g. requirement of DIN 1988 standard).
- Sufficiently sized floor drainage (e.g. sewer connection). A floor drainage system is mandatory for the COR/T-1 series.
- Free of harmful gases and secured against gas ingress.
- Maximum ambient temperature of +0 °C to 40 °C at a relative humidity of 50 %.
- Horizontal and level installation surface.
- Slight height adjustment for stabilisation possible with the vibration absorbers in the base frame (Fig. 8, Item 34):

1. Loosen the counter nut.
2. Turn the appropriate vibration absorber out or in.
3. Fix the counter nut again.

Also note:

- Ensure adequate space for maintenance work. The main dimensions can be found in the supplied installation plan. The system should be freely accessible from at least two sides.
- Wilo advises against installation and operation near living rooms and bedrooms.
- To avoid the transmission of structure-borne noise and to ensure a stress-free connection to upstream and downstream pipes, compensators (Fig. 8 – Item 31) with extension limiters or flexible connection pipes (Fig. 8 – Item 30) must be used.

6.2 Installation



DANGER

Danger of death due to electrical current!

Improper conduct when carrying out electrical work can lead to death due to electric shock!

- Only have electrical connection established by an electrician approved by the local energy supply company.
- Observe applicable local regulations.
- Before swapping the phases, switch off the main switch of the system and secure it against unauthorised restarting.

6.2.1 Foundation/bearing surface

The pressure-boosting system is designed for installation on a level concrete floor. The base frame is mounted on height-adjustable vibration absorbers as means of insulation against structure-borne noise.



NOTICE

For transport reasons, the vibration absorbers may not be installed upon delivery. Before installing the pressure-boosting system, check that all the vibration absorbers are fitted and locked by the threaded nut (Fig. 8; 9a and 9b – Item 34).

If the customer also wants to fasten the installation to the floor (Fig. 8 – Item 32), suitable measures must be taken to avoid structure-borne noise transmission.

CAUTION

Property damage caused by dust caps or plugs that have not been removed!

Dust caps or plugs that have not been removed can cause clogging and damage the pump.

- Check all connections and remove any remaining leftover packaging, dust caps and plugs.

- For connections to the public drinking water supply network, observe the requirements of the responsible local water supply company.

Prerequisites:

- Completion of all welding and soldering work
- Carrying out required rinsing
- If necessary, disinfect the pipeline system and the delivered pressure-boosting system (hygiene according to local regulations (in Germany, according to TrinkwV 2001))

On-site piping installation must be completed voltage-free. Compensators with extension limiters or flexible connection pipes are suitable to avoid tension of the pipe adaptors. Transmission of system oscillations to the building installation is minimised.

In order to prevent the transmission of structure-borne noise to the building structure, do not fix the pipe clamps to the pressure-boosting system pipework (Fig. 9, 10, Item C).

Flow resistance

Keep the flow resistance of the inlet and suction line as low as possible:

- Short, horizontal piping if possible
- Avoidance of air suction (pressure and vacuum-proof pipes)
- Correct nominal diameter (at least same size as system connection)
- Minimal bends
- Sufficiently large shut-off valves
- Avoid automatic extractors
- Keep the flow resistance of the inlet and suction line as low as possible:

Otherwise, the protection against low water level may be activated due to severe pressure losses in the event of high volume flows:

- Observe the NPSH of the pump
- Keep pressure losses low or avoid them
- Avoid cavitation

Hygiene

Installations in the drinking water supply are subject to special hygiene requirements.

- Observe all locally applicable regulations and measures for drinking water hygiene.

This description follows the German Drinking Water Ordinance (TwVO) in its applicable version.

The supplied pressure-boosting system meets the standards of current technology (in particular DIN 1988) and was checked at the factory to make sure it functions correctly. When used in drinking water applications, the complete drinking water installation has to be handed over to the operator in a perfect state of hygiene.

The following applies here:

- DIN 1988, part 400 and the commentaries on the standard.
- TwVO § 5. Paragraph 4 microbiological requirements: Flushing or disinfecting the system.

The limit values to be observed can be taken from TwVO § 5.



NOTICE

The manufacturer recommends flushing the system for cleaning.

Preparing system flushing

1. Installation of a T-connector on the end discharge side of the pressure-boosting system (if there is a diaphragm pressure vessel on the discharge side, immediately downstream of it) upstream of the next shut-off device (Fig. 6a and 6b Item 26).
2. Fit the branch with a shut-off device for draining the flushing fluid into the wastewater system during flushing.
3. Nominal diameter of the branch must be adapted according to the maximum volume flow of the pressure-boosting system.
4. If it is not possible to achieve free drainage, such as when connecting a hose, the requirements of DIN 1988 200 must be observed.

6.2.3 Install accessories

Install protection against low water level

In the event of a direct connection to the public water supply network:

- For SiBoost Smart 1 Helix VE..., SiBoost2.0 Smart 1 Helix VE.../MVICE... and COR-1 MVIE...GE series systems, a kit with a pressure sensor that monitors the input pressure and forwards it to the control device as a current signal is installed on the suction side. No additional accessories are necessary.
- For COR-1 MHIE...GE and SiBoost Smart 1 Helix VE...EM2 series systems, screw in the low-water protection device (WMS) on one of the connection ports provided for that purpose into the suction line (in the case of retrofitting) or on the drainage connection of the pump (Helix VE) and seal it (Fig. 5a). Additionally use the WMS kit for CO-1... for this purpose. For MHIE pumps, the WMS kit is installed on the suction side as shown in the figure (Fig. 5b).
- Establish the electrical connection in accordance with the installation and operating instructions for the pump and in accordance with the installation and operating instructions and circuit diagram for the control device.
- For COR/T series systems, a float switch is installed in the tank as a low-water signal transmitter and wired to the pump's frequency converter. No additional accessories are necessary.

In the event of indirect connection:

- If a Wilo break tank is used, a float switch for level monitoring is provided as standard as a means of protection against low water level. Establish the electrical connection to the frequency converter of the pump and/or control device of the system in accordance with the installation and operating instructions and circuit diagram for the control device. Observe the installation and operating instructions of the break tank.
- In the event of operation with tanks provided by the customer: Install the float switch in the tank so that the "low water" switching signal is transmitted if the water level drops to approximately 100 mm above the draw-off connection. Establish the electrical connection in accordance with the installation and operating instructions for the pump and in accordance with the installation and operating instructions and circuit diagram for the control device.
- Alternatively: Install level controller and three submersible electrodes in the break tank. The arrangement must be made as follows:
 - Position the first electrode (earth electrode) just above the base of the tank. The electrode must always be immersed.
 - Position the second electrode (for the lower switching level (low water)) approx. 100 mm above the draw-off connection.
 - Position the third electrode (for the upper switching level (no longer low water)) at least 150 mm above the lower electrode.
 - Establish electrical connection between the level control device and the frequency converter of the pump or control device in accordance with the installation and operating instructions and circuit diagram for the level control device and for the pump or control device.



NOTICE

Observe the respective manufacturer's documentation for the component.

Install main switch

A manually operated main switch (16) which is optionally included in the scope of delivery (for systems from the COR-1...GE-HS, SiBoost Smart 1...HS and SiBoost2.0 Smart 1...HS series) is used to connect and disconnect the electrical power supply for maintenance work on the pump or other components which need to be temporarily taken out of service.



NOTICE

Observe the respective manufacturer's documentation for the component.

Install diaphragm pressure vessel



NOTICE

Diaphragm pressure vessels require regular testing according to Directive 2014/68/EU (in Germany, also take into account the Ordinance on Industrial Safety and Health §§ 15(5) and 17 as well as Annex 5).

The diaphragm pressure vessel (8 litre) – which is part of the scope of delivery – is delivered unmounted as an accessories kit for transportation and hygienic reasons (box Fig. 9a, 9b, Item 42). Install the diaphragm pressure vessel (9) on the throughflow fitting (10) prior to commissioning (Fig. 2a, 2c, 3).



NOTICE

Do not twist the throughflow fitting. The fitting is installed correctly when the drain valve (Fig. 3, B) or the flow direction arrows printed on it are parallel to the pipe.



NOTICE

Observe the respective manufacturer's documentation for the component.

Install additional diaphragm pressure vessel

- Install a throughflow diaphragm pressure vessel according to DIN 4807 in drinking water installations.
- Make sure there is enough room for maintenance or replacement work.
- To prevent system downtimes during maintenance work, install connections for a bypass upstream and downstream of the diaphragm pressure vessel.
- At the end of the maintenance work, the bypass (Fig. 6a, 6b, Item 29) must be completely removed to avoid stagnation of the water.



NOTICE

Observe the respective manufacturer's documentation for the component.

The respective system conditions and the system pumping data must be taken into account when selecting the size of the diaphragm pressure vessel. Ensure there is sufficient flow through the diaphragm pressure vessel.

The maximum volume flow of the pressure-boosting system must not exceed the maximum permissible volume flow of the diaphragm pressure vessel connection (the following table or the specifications on the rating plate and the installation and operating instructions for the tank).

Nominal diameter	DN 20	DN 25	DN 32	DN 50	DN 65	DN 80	DN 100
Connection	(Rp3/4")	(Rp1")	(Rp1 1/4")	Flange	Flange	Flange	Flange

Nominal diameter	DN 20	DN 25	DN 32	DN 50	DN 65	DN 80	DN 100
Max. volume flow (m ³ /h)	2.5	4.2	7.2	15	27	36	56

Install safety valve

Installing a safety valve on the end pressure side is necessary if the operating pressure of an installed system component exceeds the maximum permissible value. This is the case if the sum of the maximum possible supply pressure and the maximum delivery pressure of the pressure-boosting system exceeds the permissible operating pressure. The safety valve must be designed so that it will drain off the volume flow occurring in the pressure-boosting system when the positive operating pressure is 1.1 times the admissible level.



NOTICE

Refer to the data sheets and characteristic curves of the pressure-boosting system for the design of the data.

- Securely drain off the outflowing water flow.



NOTICE

Observe the respective manufacturer's documentation for the component.

Install the non-pressurised break tank



WARNING

Risk of injury

Walking on or subjecting areas to load that are not intended for this purpose can lead to accidents and damage

- Walking on plastic containers/the cover is prohibited.

CAUTION

Risk of damage to property

Changes to non-pressurised break tanks can lead to impairment of the statics and to inadmissible deformations or damage to the tank.

- Note that non-pressurised break tanks are statically designed for the nominal capacity.



NOTICE

Clean and flush the non-pressurised break tank before filling it.

To connect the pressure-boosting system indirectly to the public drinking water supply network, install the system together with a non-pressurised break tank according to DIN 1988 (Fig. 10a). The rules for installing the pressure-boosting system apply to the installation of the break tank as well (Installation site [► 48]).

1. The entire base of the tank must be in contact with a solid bearing surface.
2. The maximum volume of the tank concerned must be considered when designing the bearing capacity of the bearing surface.
3. Ensure there is sufficient space for inspection work (at least 600 mm above the tank and 1000 mm on the connection sides).
4. Avoid tilting the tank when full, because an uneven load causes damage.

The non-pressurised (i.e. under atmospheric pressure), closed PE tank (accessory) must be installed according to the transport and installation instructions supplied.

1. Connect the tank without mechanical tension before commissioning. Make the connection with flexible components such as compensators or hoses.
2. The tank overflow must be connected according to the applicable regulations (in Germany, DIN 1988/T3 and 1988-300).
3. Take suitable measures to prevent heat transmission through the connection pipes.



NOTICE

PE tanks from the Wilo range are only designed to collect clean water.

- Clean and flush the tank before filling it.
- Maximum temperature of the water must not exceed 40 °C (see tank documentation).

4. The electrical wiring (float switch for protection against low water level) to the frequency converter of the pump or the control device must be connected before the pressure-boosting system is commissioned.



NOTICE

Observe the respective manufacturer's documentation for the component.

Install the compensators



NOTICE

Compensators are subject to wear. It is necessary to regularly check for cracks or blisters, exposed fabric or other defects (see recommendations in DIN 1988).

For stress-free installation of the pressure-boosting system, connect the pipes using compensators (Fig. 8, Item 30). The compensators must be equipped with a structure-borne noise-insulating extension limiter to absorb the reaction forces that occur.

1. Install the compensators stress-free in the pipes. No alignment errors or pipe displacement must be compensated for with compensators.
2. Tighten screws evenly and diagonally. The ends of the screws must not project beyond the flange.
3. If welding work is done near the compensators, they must be covered for protection (sparks, radiated heat). Do not paint rubber component of compensators and protect against oil.
4. Compensators must be accessible for inspection at any time and must not be covered by the pipe insulation.



NOTICE

Observe the respective manufacturer's documentation for the component.

Install the flexible connection pipes



NOTICE

Flexible connection pipes are subject to wear in operation. Regular checks for leakages or other defects are necessary (see recommendations of DIN 1988).

The flexible connection pipes in the Wilo range consist of a high-quality stainless steel corrugated hose with stainless steel braiding. In the case of pipes with threaded connections, use for stress-free installation of the pressure-boosting system and in the event of slight pipe displacement (Fig. 8, Item 31).

1. Fit the flat-sealing stainless steel screwed connection with female thread to the pressure-boosting system.
2. Install the male pipe thread on the onward pipework.

Observe the following during installation:

- Depending on the respective size, observe the maximum permissible deformations (bend radius RB, bend angle RW) according to the following table (Fig. 8).
- A suitable tool must be used to avoid kinking or twisting during installation.
- In the event of angular displacement of the pipes, fix the system to the floor, taking into account suitable measures for reducing the structure-borne noise.
- Flexible connection pipes must be accessible for inspection at any time and must not be covered by the pipe insulation.

Nominal diameter Connection	Thread of screwed connection	Tapered male thread	Max. bend radius RB in mm	Max. bend angle BW in °
DN 32	Rp1 1/4"	Rp1 1/4"	250	60
DN 40	Rp1 1/2"	Rp1 1/2"	260	60
DN 50	Rp2"	Rp2"	300	50
DN 65	Rp2 1/2"	Rp2 1/2"	370	40

Install the pressure reducer

The use of a pressure reducer becomes necessary:

- In case of pressure fluctuations in the inlet pipe > 1 bar.
- In the event of a pre-pressure fluctuation that is so great that the system must be shut down.
- If the total pressure (supply pressure and pump delivery head at zero flow point) exceeds the rated pressure.



NOTICE

Refer to the data sheets and characteristic curves of the pressure-boosting system for the design of the data.

The pressure reducer requires a minimum pressure drop of approx. 5 m or 0.5 bar. The pressure downstream of the pressure reducer (back-pressure) is the basis for the total delivery head calculation of the pressure-boosting system. When installing a pressure reducer, there must be an installation section of approximately 600 mm on the supply pressure side.



NOTICE

Observe the respective manufacturer's documentation for the component.

6.3 Electrical connection



DANGER

Danger of death due to electrical current!

Improper conduct when carrying out electrical work can lead to death due to electric shock!

- Only have electrical connection established by an electrician approved by the local energy supply company.
- Observe applicable local regulations.
- Before swapping the phases, switch off the main switch of the system and secure it against unauthorised restarting.



NOTICE

To make the electrical connection, the corresponding installation and operating instructions and attached electrical wiring diagrams must be observed.

Systems from the COR-1...GE -HS, SiBoost Smart 1...HS and SiBoost2.0 Smart 1...HS series with optionally integrated main switch are connected to the mains supply by means of the main switch.

- Observe the attached installation instructions for the main switch.

Points to be taken into account:

- Technical electrical current type, voltage and frequency of the power supply network must match the details on the rating plate of the control device and the pump.
- Electrical connection cables must be adequately dimensioned for the total power of the pressure-boosting system (see rating plate, installation and operating instructions and attached electrical wiring diagrams).
- External fuse protection of the connection cable for the pressure-boosting system must be provided in accordance with the applicable local regulations (e.g. VDE0100, part 430) in compliance with the details in the installation and operating instructions.
- As a protective measure, the pressure-boosting system must be earthed according to regulations (i.e. according to the local regulations and circumstances). Connections intended for this purpose must be identified.
- Contact the energy supply company [► 46] to ensure the system is electromagnetically compatible.

Additional protection against dangerous contact voltages

- For a pressure-boosting system fitted with a frequency converter, a universal-current-sensitive residual-current device Type B (RCD-B) with a trigger current of 300 mA should be installed.
- The protection class of the system and of the individual components can be taken from the rating plates and/or data sheets.



NOTICE

Observe the corresponding installation and operating instructions and the attached electrical wiring diagrams.

7 Commissioning



DANGER

Danger of death due to electrical current!

Improper conduct when carrying out electrical work can lead to death due to electric shock!

- Only have electrical connection established by an electrician approved by the local energy supply company.
- Observe applicable local regulations.
- Before swapping the phases, switch off the main switch of the system and secure it against unauthorised restarting.



DANGER

Danger of death as supply pressure is too high!

Excessive supply pressure (nitrogen) in the diaphragm pressure vessel can lead to damage or destruction of the vessel and thus to personal injury.

- Observe the safety measures for handling pressurised vessels and technical gases.
- The pressures in these installation and operating instructions (Fig. 3 and 4) are given in **bar**. If other units of pressure measurement are used, convert the figures correctly.



WARNING

Foot injuries due to a lack of protective equipment!

Danger of (serious) injuries during work.

- Wear safety shoes.

CAUTION

Risk of damage to property!

Dry running can lead to the pump developing leakages and to motor overload.

- Ensure that the pump does not run dry to protect the mechanical seal and the plain bearings.



NOTICE

We recommend that the initial commissioning of the system is performed by the Wilo customer service department.

- Contact your dealer, your nearest Wilo representative or the Wilo customer service department.



NOTICE

Automatic activation after power cut

Depending on the process, the product is switched on and off using separate controls. The product may automatically switch on following power cuts.

7.1 General preparations and control measures

- Check that all on-site wiring has been performed correctly, in particular the earthing, prior to initial activation.
- Check that the pipe adaptors are not under stress.
- Fill the system and carry out a visual inspection for leakages.
- Open the shut-off valves at the pump and in the suction and discharge line.
- Open the pump venting screws and fill the pump slowly with water to allow the air to escape completely. Close the venting screws once the pump has been fully vented.
- In suction mode (i.e. negative level difference between break tank and pump), the pump and the suction line must be filled via the opening in the venting screw (use a funnel).
- When a diaphragm pressure vessel (optional or accessory) is installed, check that the diaphragm pressure vessel is set to the correct supply pressure (Fig. 3 and 4). To do so:
 1. Depressurise the tank on the water side:
 - ⇒ Close the flow-through fixture (Fig. 3 – Item A).
 - ⇒ Allow the residual water to escape via the drain (Fig. 3 – Item B).
 2. Check gas pressure at the air valve (top, remove dust cap) of the diaphragm pressure vessel with an air pressure gauge (Fig. 3 – Item C):
 - ⇒ If the pressure is too low (PN 2 = pump switch-on pressure p_{\min} minus 0.2 – 0.5 bar or value given in the table on the tank (Fig. 4)), correct by having it filled with nitrogen by the Wilo customer service.
 - ⇒ If the pressure is too high: Release nitrogen from the valve until the required value is reached.
 3. Put the dust cap back on.
 4. Close the drain valve on the flow-through fixture
 5. Open the flow-through fixture.
- For system pressures > PN 16, the manufacturer's filling instructions should be observed for the diaphragm pressure vessel in accordance with the installation and operating instructions.

- In the case of an indirect connection, check that the water level in the break tank is adequate, or with a direct connection, that the inlet pressure is adequate (minimum inlet pressure 1 bar).
- Check correct installation of the right dry-running protection (see protection against low water level).
- Position the float switch and electrodes in the break tank for the protection against low water level so that the pressure-boosting system is switched off at minimum water level (see protection against low water level).

If a control device is available (special version):

- Check the motor protection switch in the control device (if available) to make sure that the correct rated current is set according to the specifications on the motor rating plate.
- Check and set the operating parameters required on the frequency converter and control device according to the attached installation and operating instructions.



NOTICE

Observe the respective installation and operating instructions for the individual component.

7.2 Protection against low water level (WMS)

7.2.1 For operation with supply pressure

Systems SiBoost Smart 1..., SiBoost2.0 Smart 1... and COR-1... with pump from the series Helix VE and MWISE and operating mode “p-v-control”

The pressure sensor installed on the inlet side (Fig. 2b) also acts as a signal transmitter for monitoring supply pressure and protection against low water level. The pressure value for switching off (P_s) and switching back on (P_r) can be set on the frequency converter. More details in section “p-v mode”.

Factory settings:

- 1 bar: Deactivation in case of undershoot (P_s)
- Approx. 1.3 bar: Reactivation in case of overshoot (P_r)



NOTICE

From systems in the series SiBoost2.0, observe separate drive instructions.

If another pressure switch is used as the low-water signal transmitter, observe the accompanying description about its configuration options. The necessary frequency converter settings for this are to be taken from the installation and operating instructions provided separately for the drive.



NOTICE

Observe the respective manufacturer's documentation for the component.

Systems without “p-v control” operating mode

The pressure switch for the optional low-water cut-out switchgear (WMS) kit (Fig. 5a, 5b, 5c) for monitoring the supply pressure is permanently set in the factory. It is not possible to change this setting.

- 1 bar: Deactivation in case of undershoot
- Approx. 1.3 bar: Reactivation in case of overshoot

When using another pressure switch as the low-water signal transmitter, observe the accompanying description about its configuration options.



NOTICE

Observe the respective manufacturer's documentation for the component.

7.2.2 For operation with break tank (inlet mode)

With Wilo break tanks, the level-dependent low-water monitoring is performed via a float switch (see example Fig. 10a, 10b).

- Connect the float switch before commissioning in the control device.
- For systems with pumps from the series Helix VE, the setting for the protection against low water level may need to be deactivated via the pressure sensor on the suction side.



NOTICE

Observe the respective installation and operating instructions for the individual component.

7.2.3 Systems from the COR/T series

COR/T series systems are shut down due to low water when the water level falls below the lower switching point of the low-water signal transmitter (Fig. 1e, 52 level B). The system is restarted once the water level reaches the upper switching point of the low-water signal transmitter (Fig. 1e, 52 level A) and once a minimum supply pressure of 0.3 bar on the pressure sensor on the suction side has been reached. These settings are not intended to be changed.

7.3 Commissioning the system



WARNING

Risk of damage to your health!

Risk of damage to your health due to contaminated drinking water.

- Ensure that pipe and system flushing has been carried out.
- If the system is not used for a longer period of time, replace the water.

Once all preparations and control measures have been carried out according to “General preparations and control measures” section:

- for systems COR-1...GE-HS and SiBoost Smart 1... and SiBoost2.0 Smart 1...HS: activate the system with an optional main switch.
- for systems with an additional control device, activate the system with the main switch on the control device and set the control to automatic mode.
- for COR-1...GE systems (without factory main switch), activate the systems with a separate main switch to be provided on-site.

The pressure control system switches on the pump until the consumer piping is filled with water and the set pressure has built up. If the pressure no longer changes (no consumer requirement within a preset time), the control system switches off the pump.

- Refer to the installation and operating instructions for the pump and control device for a precise description.
- See also: General preparations and control measures [► 56].

8 Shutdown/dismantling

In case of maintenance or repair, take the pressure-boosting system out of operation as follows:

1. Switch off the voltage supply and secure it against unauthorised reactivation.
2. Close the shut-off valve upstream and downstream of the system.
3. Shut off the diaphragm pressure vessel at the throughflow fitting and drain it.
4. Drain the system completely if necessary.

9 Maintenance

9.1 Checking the pressure-boosting system

To guarantee maximum operational reliability at the lowest possible operating costs, we recommend regular inspection and maintenance of the pressure-boosting system (see DIN 1988). It is advisable to enter into a maintenance contract with a specialist company or with the Wilo customer service department. The following checks must be carried out on a regular basis:

- Inspection of the pressure-boosting system's readiness for operation.
- Inspection of the mechanical seals on the pumps. The mechanical seals need water for lubrication, which can leak out of the gasket slightly. If water leakage is noticeable, the mechanical seal must be replaced.

- Optional: Check the diaphragm pressure vessel (a 3-month cycle is recommended) for correct supply pressure setting and impermeability (Fig. 3 and 4).

9.2 Checking the supply pressure

CAUTION

Risk of damage to property through incorrect supply pressure!

Incorrect supply pressure influences the functionality of the diaphragm pressure vessel and can lead to increased wear of the diaphragm and to system malfunctions. Excessive supply pressure will damage the diaphragm pressure vessel.

- Check supply pressure.

- Depressurise the diaphragm pressure vessel on the water side (close the flow-through fixture (Fig. 3 – Item A) and allow the residual water to escape through the drain (Fig. 3 – Item B)).
- Check the gas pressure at the diaphragm pressure vessel valve (top, remove dust cap) with an air pressure gauge (Fig. 3 – Item C).
- If necessary, correct the pressure by filling with nitrogen. (PN 2 = pump switch-on pressure p_{\min} minus 0.2 – 0.5 bar or value given in the table on the tank (Fig. 4) – Wilo customer service).
- If the pressure is too high, release nitrogen from the valve.

At the frequency converter, the inlet and outlet filters of the fan must be cleaned if they are very dirty.

If the system experiences downtime due to shutdown for a prolonged period, proceed as described in Shutdown/dismantling [► 58] and drain the pump by opening the drain plug at the pump support foot.

10 Faults, causes and remedies



NOTICE

- Have faults, particularly those affecting the pumps or the control unit, remedied exclusively by the Wilo customer service or a specialist company.



NOTICE

- The general safety instructions must be observed during any maintenance or repair work.
- Observe installation and operating instructions of the pump, the control device and the drive.

The faults specified here are general faults.

- If errors are displayed on the display of the frequency converter or control device, observe the installation and operating instructions for these devices.

Fault	Cause	Remedy
Display on the control device or frequency converter incorrect		Observe the installation and operating instructions for the control device and the pump.
Pump does not start	No mains voltage	Check the fuses, cables and connections.
	Main switch "OFF"	Switch on the main switch.
	Water level in the break tank too low, i.e. low-water level reached	Check the inlet valve/supply line of the break tank.
	Low-water level switch has triggered	Check inlet pressure.
	Low-water level switch or pressure sensor on the inlet side defective	Check and, if necessary, replace the low-water level switch or pressure sensor.
	Electrodes connected incorrectly or supply pressure switch set incorrectly	Check the installation and setting and correct as required.

Fault	Cause	Remedy
	Inlet pressure is above start-up pressure	Check the default values, correct if necessary.
	Shut-off device closed at pressure sensor/ pressure switch	Check and open the shut-off valve.
	Start-up pressure set too high	Check the setting, correct if necessary.
	Fuse defective	Check the fuse protection and replace it if necessary.
	Motor protection has triggered	Check the default values against the pump and motor data, measure the current values and correct the setting if necessary. Check the motor for defects, replace if necessary.
	Power contactor defective	Check and replace it if necessary.
	Turn-to-turn fault in the motor	Check, if necessary, replace motor or have it repaired.
Pump does not shut down	Major fluctuations of the inlet pressure	Check the inlet pressure and take measures to stabilise the supply pressure if necessary (e.g. pressure reducers).
	Inlet pipe clogged or shut off	Check the inlet pipe and, if necessary, remove the clogging or open the shut-off valve.
	Nominal diameter of the inlet pipe too small	Check the inlet pipe and increase the cross-section of the inlet pipe if necessary.
	Inlet pipe installed incorrectly	Check the inlet pipe and change the pipe routing if necessary.
	Air in the inlet	Check and, if necessary, seal the piping and vent the pumps.
	Impellers clogged	Check the pump and replace it or have it repaired if necessary.
	Non-return valve leaking	Check and replace the seal or non-return valve if necessary.
	Non-return valve clogged	Check and remove the clogging or replace the non-return valve if necessary.
	Gate valve in the system closed or not sufficiently open	Check and open the shut-off valve completely if necessary.
	Volume flow too high	Check the pump data and default values, correct if necessary.
	Shut-off device closed at pressure transmitter	Check and open the shut-off valve if necessary.
	Switch-off pressure set too high	Check the setting, correct if necessary.
	Incorrect direction of rotation of the motor	Check the direction of rotation and repair or replace the frequency converter if necessary
Switching frequency too high or fluttering	Major fluctuations of the inlet pressure	Check the inlet pressure and take measures to stabilise the supply pressure if necessary (e.g. pressure reducers).
	Inlet pipe clogged or shut off	Check the inlet pipe and, if necessary, remove the clogging or open the shut-off valve.
	Nominal diameter of the inlet pipe too small	Check the inlet pipe and increase the cross-section of the inlet pipe if necessary.
	Inlet pipe installed incorrectly	Check the inlet pipe and change the pipe routing if necessary.
	Shut-off device closed at pressure transmitter	Check and open the shut-off valve if necessary.
	Incorrect supply pressure at diaphragm pressure vessel	Check the supply pressure, correct if necessary.
	Valve at diaphragm pressure vessel closed	Check valve, open if necessary.
	Switching difference set too low	Check the setting, correct if necessary.

Fault	Cause	Remedy
Pump is not stable and/or making unusual noises	Major fluctuations of the inlet pressure	Check the inlet pressure and take measures to stabilise the supply pressure if necessary (e.g. pressure reducers).
	Inlet pipe clogged or shut off	Check the inlet pipe and, if necessary, remove the clogging or open the shut-off valve.
	Nominal diameter of the inlet pipe too small	Check the inlet pipe and increase the cross-section of the inlet pipe if necessary.
	Inlet pipe installed incorrectly	Check the inlet pipe and change the pipe routing if necessary.
	Air in the inlet	Check and, if necessary, seal the piping and vent the pump.
	Air in the pump	Vent the pump, check the impermeability of the suction line and seal it if necessary.
	Impellers clogged	Check the pump and replace it or have it repaired if necessary.
	Volume flow too high	Check the pump data and default values, correct if necessary.
	Incorrect direction of rotation of the motor	Check the direction of rotation, repair or replace frequency converter if necessary.
	Mains voltage: A phase is missing	Check the fuses, cables and connections.
	Pump not adequately fixed to base frame	Check the fixation and re-tighten the fastening screws if necessary.
	Bearing damage	Check the pump/motor and replace it or have it repaired if necessary.
	Motor or pump getting too hot	Air in the inlet
Gate valve in the system closed or not sufficiently open		Check and if necessary, fully open the shut-off valve.
Impellers clogged		Check the pump and replace it or have it repaired if necessary.
Non-return valve clogged		Check and remove the clogging or replace the non-return valve if necessary.
Shut-off device closed at pressure transmitter		Check and if necessary, open shut-off valve.
Deactivation point set too high		Check the setting, correct if necessary.
Bearing damage		Check the pump/motor and replace it or have it repaired if necessary.
Turn-to-turn fault in the motor		Check and replace motor or have it repaired if necessary.
Mains voltage: A phase is missing		Check the fuses, cables and connections.
Current consumption too high		Non-return valve leaking
	Volume flow too high	Check the pump data and default values, correct if necessary.
	Turn-to-turn fault in the motor	Check and replace motor or have it repaired if necessary.
	Mains voltage: A phase is missing	Check the fuses, cables and connections.
Motor protection switch triggers	Non-return valve defective	Check and replace the non-return valve if necessary.
	Volume flow too high	Check the pump data and default values, correct if necessary.
	Power contactor defective	Check and replace it if necessary.
	Turn-to-turn fault in the motor	Check and replace motor or have it repaired if necessary.

Fault	Cause	Remedy	
	Mains voltage: A phase is missing	Check the fuses, cables and connections.	
Pump generates no or insufficient power	Major fluctuations of the inlet pressure	Check the inlet pressure and take measures to stabilise the supply pressure if necessary (e.g. pressure reducers).	
	Inlet pipe clogged or shut off	Check the inlet pipe and, if necessary, remove the clogging or open the shut-off valve.	
	Nominal diameter of the inlet pipe too small	Check the inlet pipe and increase the cross-section of the inlet pipe if necessary.	
	Inlet pipe installed incorrectly	Check the inlet pipe and change the pipe routing if necessary.	
	Air in the inlet	Check and, if necessary, seal the piping and vent the pumps.	
	Impellers clogged	Check the pump and replace it or have it repaired if necessary.	
	Non-return valve leaking	Check and replace the seal or non-return valve if necessary.	
	Non-return valve clogged	Check and remove the clogging or replace the non-return valve if necessary.	
	Gate valve in the system closed or not sufficiently open	Check and if necessary, fully open the shut-off valve.	
	Low-water level switch has triggered	Check inlet pressure.	
Dry-running protection switches off although water is present	Incorrect direction of rotation of the motor	Check the direction of rotation, repair or replace frequency converter if necessary.	
	Turn-to-turn fault in the motor	Check and replace motor or have it repaired if necessary.	
	Major fluctuations of the inlet pressure	Check the inlet pressure and take measures to stabilise the supply pressure if necessary (e.g. pressure reducers).	
	Nominal diameter of the inlet pipe too small	Check the inlet pipe and increase the cross-section of the inlet pipe if necessary.	
	Inlet pipe installed incorrectly	Check the inlet pipe and change the pipe routing if necessary.	
	Volume flow too high	Check the pump data and default values, correct if necessary.	
	Electrodes connected incorrectly or supply pressure switch set incorrectly	Check the installation and setting and correct as required.	
	Low-water level switch or pressure sensor on the inlet side defective	Check and replace the low water switch or pressure sensor if necessary.	
	Dry-running protection does not switch off in spite of low water	Electrodes connected incorrectly or supply pressure switch set incorrectly	Check the installation and setting and correct as required.
		Low-water level switch or pressure sensor on the inlet side defective	Check and replace the low water switch or pressure sensor if necessary.

Additional fault table for the pump in p-v mode (see the pump installation and operating instructions for further information)

For SiBoost2.0 systems, observe the additional installation and operating instructions for the drive.

Error code	Ramp time before error message	Time before processing the error after message	Wait time before automatic reactivation	Max. errors within 24 hours	Fault Potential Causes	Remedy	Wait time before reset
E043	~ 5 s	0 s	unlimited	1	The sensor cable IN2 is open-circuit	Check that power supply and wiring of the sensor are correct	60 s

Error code	Ramp time before error message	Time before processing the error after message	Wait time before automatic reactivation	Max. errors within 24 hours	Fault Potential Causes	Remedy	Wait time before reset
E062	~ 10 s	0 s	0 s, if malfunction is suppressed	unlimited	Pressure on the inlet/suction side too low	Check the supply pressure/pressure on the suction side and setting of the cut-off pressure (Ps) in the event of low water	0 s
					Difference between restart pressure (Pr) after low water and cut-off pressure (Ps) in the event of low water	Check and adjust settings (Pr) and (Ps): Pr - Ps > 0.3 bar	0 s

You can find information on faults to the pump or the control device not dealt with here in the attached installation and operating instructions for the components concerned.

- If a fault cannot be repaired, contact an installer or Wilo customer service centre.

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 Oils and lubricants

Operating fluid must be collected in suitable tanks and disposed of in accordance with the locally applicable guidelines. Wipe up drips immediately!

12.2 Water-glycol mixture

The operating fluid complies with Water Hazard Class 1 of the German Administrative Regulation of Substances Hazardous to Water (VwVWS). When disposing of it, the locally applicable guidelines (e.g. DIN 52900 on propanediol and propylene glycol) must be observed.

12.3 Protective clothing

Used protective clothing must be disposed off in accordance with the locally applicable guidelines.

12.4 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.

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

- 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 for more information about recycling.

12.5 Batteries/rechargeable batteries

Batteries and rechargeable batteries must not be disposed of with domestic waste and they must be removed before product disposal. End consumers are legally obliged to return all used batteries and rechargeable batteries. For this purpose, you can return used batteries

and rechargeable batteries free of charge at municipal collection points or specialist retailers.



NOTICE

Disposal in domestic waste is prohibited!

Batteries and rechargeable batteries affected are marked with this symbol. The identifier for the heavy metal they contain is displayed beneath the graphic:

- **Hg** (mercury)
 - **Pb** (lead)
 - **Cd** (cadmium)
-

13 Appendix

13.1 Captions

Fig. 1a Example SiBoost Smart 1 Helix VE 606
 Fig. 1b Example SiBoost Smart 1 MWISE 406
 Fig. 1c Example SiBoost Smart 1 Helix VE 405-EM2
 Fig. 1d Example COR-1 MHIE 403-2G-GE
 Fig. 1e Example COR/T-1 Helix VE 606-GE
 Fig. 1f Example SiBoost Smart 1 Helix VE 2203-ES
 Fig. 1g Example SiBoost Smart 1 Helix VE 5202-ES
 Fig. 1h Example COR-1MVE7002-GE
 Fig. 1i Example SiBoost2.0 Smart 1 Helix VE407
 Fig. 1j Example SiBoost2.0 Smart 1 Helix VE5202

1	Pump
3	Base frame
4	Inlet connection
5	Discharge line
6	Shut-off valve on the inlet side (optionally for some types)
7	Shut-off valve on the discharge side
8	Non-return valve
9	Diaphragm pressure vessel
10	Throughflow fitting
11-1	Pressure gauge (on the discharge side)
11-2	Pressure gauge (on the inlet side)
12-1	Pressure sensor (on the discharge side)
12-2	Pressure sensor (on the inlet side)
13	Mounting bracket for fixation of the main switch (MS) (optional) or control device (special feature)
14	Low-water cut-out switchgear (WMS), optional
15	Frequency converter
16	Main switch (MS) (optional)
17	Motor
34	Oscillation absorber
43	Float valve (inlet)
47	Drain
52	Low-water signal transmitter/float switch
A	Tank full, contact closed (water not low)
B	Tank empty, contact open (low water)
	Core colours
BN	BROWN
BU	BLUE
BK	BLACK
53	Break tank (COR/T)
54	Inspection opening/cover
55	Operational overflow (pipe socket)
56	Overflow box (optional)
57	Float valve securing mechanism (to be removed before commissioning)

Fig. 2a Example pressure sensor (on the discharge side) and diaphragm pressure vessel kit

9	Diaphragm pressure vessel
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Fig. 2a Example pressure sensor (on the discharge side) and diaphragm pressure vessel kit

10	Throughflow fitting
11-1	Pressure gauge
12-1a	Pressure sensor
12-1b	Electrical connection, pressure sensor
18	Drain/venting
19	Stop valve

Fig. 2b Example pressure sensor (on the suction side) kit

11-2	Pressure gauge
12-2a	Pressure sensor
12-2b	Electrical connection, pressure sensor
18	Drain/venting
19	Stop valve

Fig. 2c Example pressure sensor (on the discharge side) and diaphragm pressure vessel kit (SiBoost2.0)

9	Diaphragm pressure vessel
10	Throughflow fitting
11-1	Pressure gauge
12-1a	Pressure sensor
12-1b	Electrical connection, pressure sensor
18	Drain/venting
19	Stop valve

Fig. 2d Example pressure sensor (on the suction side) kit (SiBoost2.0)

11-2	Pressure gauge
12-2a	Pressure sensor
12-2b	Electrical connection, pressure sensor
18	Drain/venting
19	Stop valve

Fig. 3 Throughflow fitting operation/pressure testing of the diaphragm pressure vessel

9	Diaphragm pressure vessel
10	Throughflow fitting
A	Open/close
B	Drain
C	Check the supply pressure (nitrogen! – N ₂)

Fig. 4 Reference table nitrogen pressure diaphragm pressure vessel (example)

a	Nitrogen pressure according to the table
b	Start-up pressure base-load pump in PE (bar)
c	Nitrogen pressure in bar PN 2 (bar)
d	Notice: Nitrogen measurement without water
e	Notice: Caution! Fill with nitrogen only

Fig. 5a Low-water cut-out switchgear (WMS) kit mounted on drain connection (Helix VE; MVIE)**Fig. 5b Low-water cut-out switchgear (WMS) kit mounted on inlet-side pipework (MHIE; MVISE)****Fig. 5c Electrical connection options/WMS switching logic**

14 a	WMS kit
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Fig. 5a Low-water cut-out switchgear (WMS) kit mounted on drain connection (Helix VE; MVIE)

Fig. 5b Low-water cut-out switchgear (WMS) kit mounted on inlet-side pipework (MHIE; MVICE)

Fig. 5c Electrical connection options/WMS switching logic

14-1	Pressure switch (type PS3)
14-2	Plug (PS3-Nxx or PS3-4xx versions)
14-2a	PS3-4xx two-core connection cable, normally-closed function (opens when pressure drops)
14-2b	PS3-Nxx three-core connection cable, changeover contact function
14-3	Pressure gauge
14-4	Distributor/fitting
14-5	Air vent valve
14-6	Stop valve
14 b	WMS connection kit
14-7	Screwed connection
14-8	Fitting
14-9	Pump drainage screw
14-10	O-ring seals
14-11	Thread adapter
14-12	Inlet-side pipework
14-13	Shut-off valve
BN	BROWN
BU	BLUE
BK	BLACK
	Connection in control device (see supplied terminal diagram)

Fig. 6a Example of a direct connection (hydraulic diagram)

Fig. 6b Example of an indirect connection (hydraulic diagram)

20	System SiBoost Smart 1, SiBoost2.0 Smart 1, COR-1...
21	Consumer connections upstream of the pressure-boosting system
22	Diaphragm pressure vessel (accessory) on the inlet side with bypass
23	Diaphragm pressure vessel (accessory) on the discharge side with bypass
24	Consumer connections downstream of the pressure-boosting system
25	Infeed connection for flushing the system
26	Drainage connection for flushing the system
27	Non-pressurised break tank (accessory) on the inlet side
28	Flushing apparatus for inlet connection of the break tank
29	Bypass for inspection/maintenance (not permanently installed)

Fig. 8 Installation example

16	Main switch (MS) (optional)
30	Compensator with extension limiters (accessory)
31	Flexible connection pipe (accessory)
32	Floor fixation with structure-borne noise insulation (provided by the customer)
33	Fixing the pipes downstream of the pressure-boosting system, e.g. with pipe clamps (provided by the customer)
34	Screw the oscillation absorbers (included in scope of delivery) into the threaded inserts provided and secure them with counter nuts
RW	Bend angle for flexible connection pipe
RB	Bend radius for flexible connection pipe

Fig. 9a Transport information example for system without control device (up to 7.5 kW)**Fig. 9b Transport information example for system with control device (> 7.5kW)**

2	Control device
34	Screw the oscillation absorbers (included in scope of delivery) into the threaded inserts provided and secure them with counter nuts
35	Eye bolts/transport lugs for the attachment of lifting slings
36	Transport pallet/transport frame (example)
37	Transport equipment – (example – pallet truck)
38	Transport securing (screws)
39	Transport securing (strap)
40	Lifting equipment (example – crane gear (Fig. 9a), load bar (Fig. 9b))
41	Protective wrapper (lifting strap example)
42	Box/bag with accessories/accessories kit (e.g. diaphragm pressure vessel, counter flanges, oscillation absorbers etc.)

Fig. 10a Break tank (accessory example)

43	Inlet (with float valve (accessory))
45	Inspection opening
46	Overflow: Ensure adequate drainage. Provide siphon or valve to prevent ingress of insects. No direct connection to the sewer system (free drainage according to EN 1717)
47	Drain
48	Extraction (connection for pressure-boosting system)
49	Terminal box for low-water signal transmitter and/or overflow signal transmitter
50	Level display

Fig. 10b Low-water signal transmitter (float switch) with connection diagram

49	Terminal box for low-water signal transmitter and/or overflow signal transmitter
52	Low-water signal transmitter/float switch
A	Floater top, tank full, contact closed (water not low)
B	Floater bottom, tank empty, contact open (low water)
53	Overflow signal transmitter/float switch
C	Floater top, overflow alarm
D	Floater bottom, no overflow alarm
	Core colours
BN	BROWN
BU	BLUE
BK	BLACK







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