

## Wilo-SiBoost Smart 1 Wilo-Comfort-Vario COR-1 ...-GE, .../VR

**de** Einbau- und Betriebsanleitung  
**en** Installation and operating instructions

**fr** Notice de montage et de mise en service  
**nl** Inbouw- en bedieningsvoorschriften

Fig. 1a:

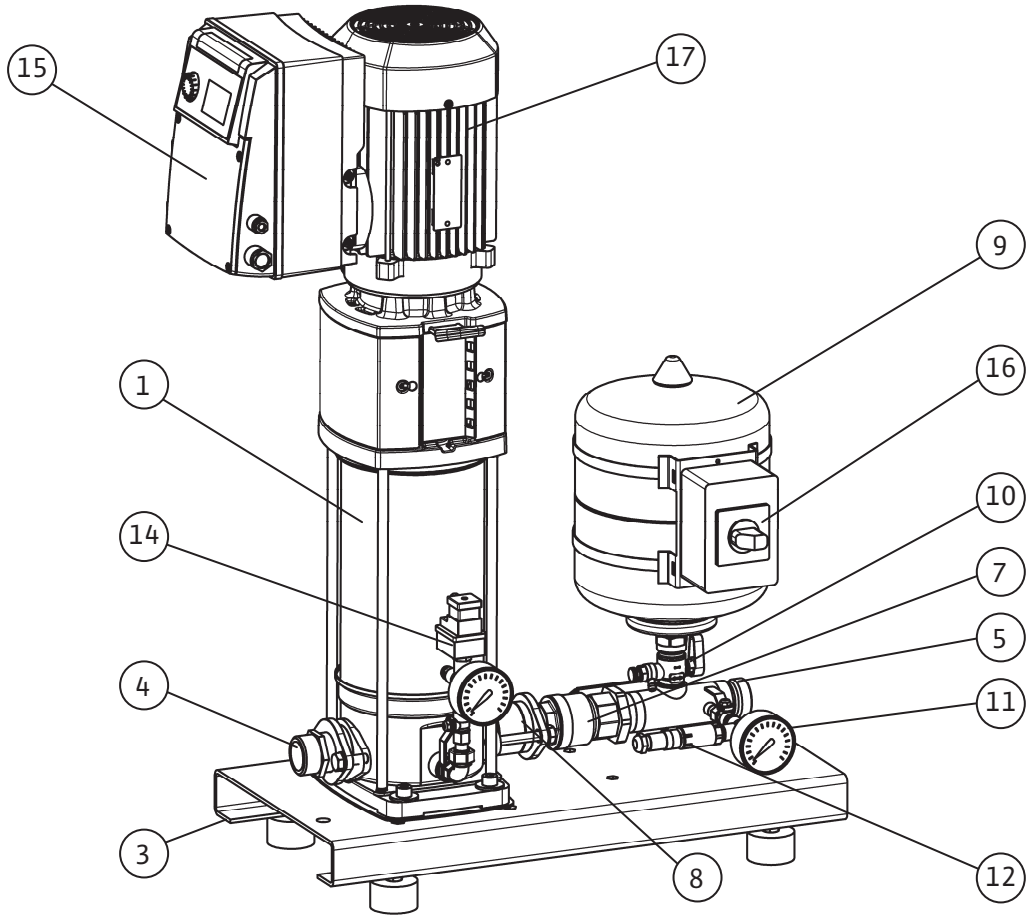


Fig. 1b:

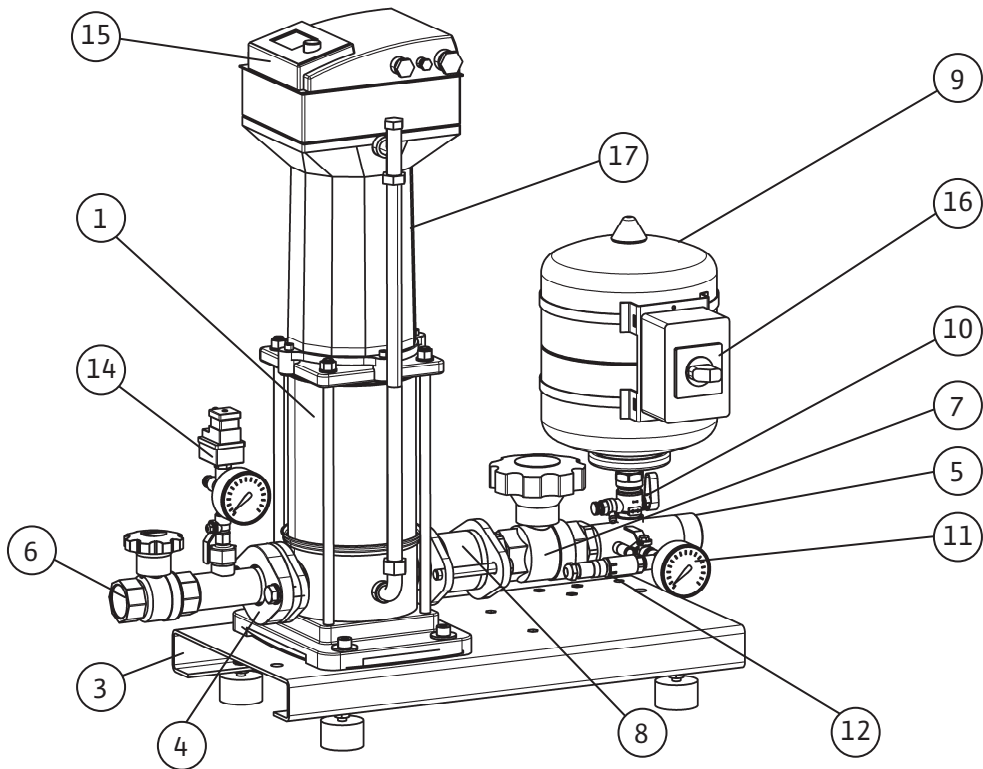


Fig. 1c:

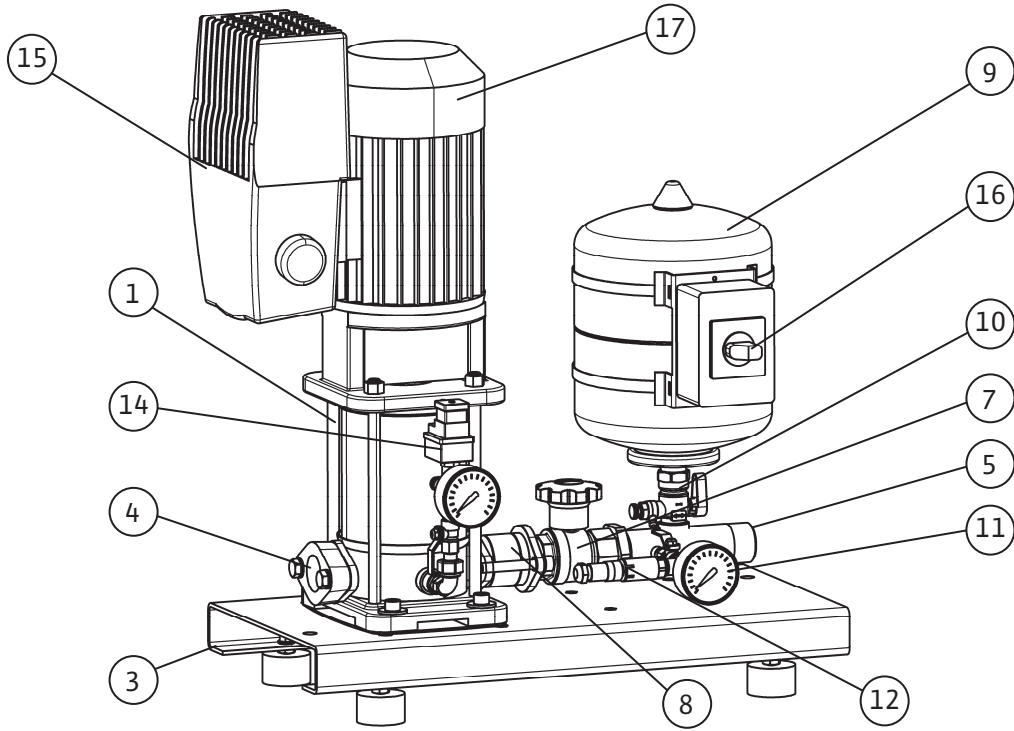


Fig. 1d:

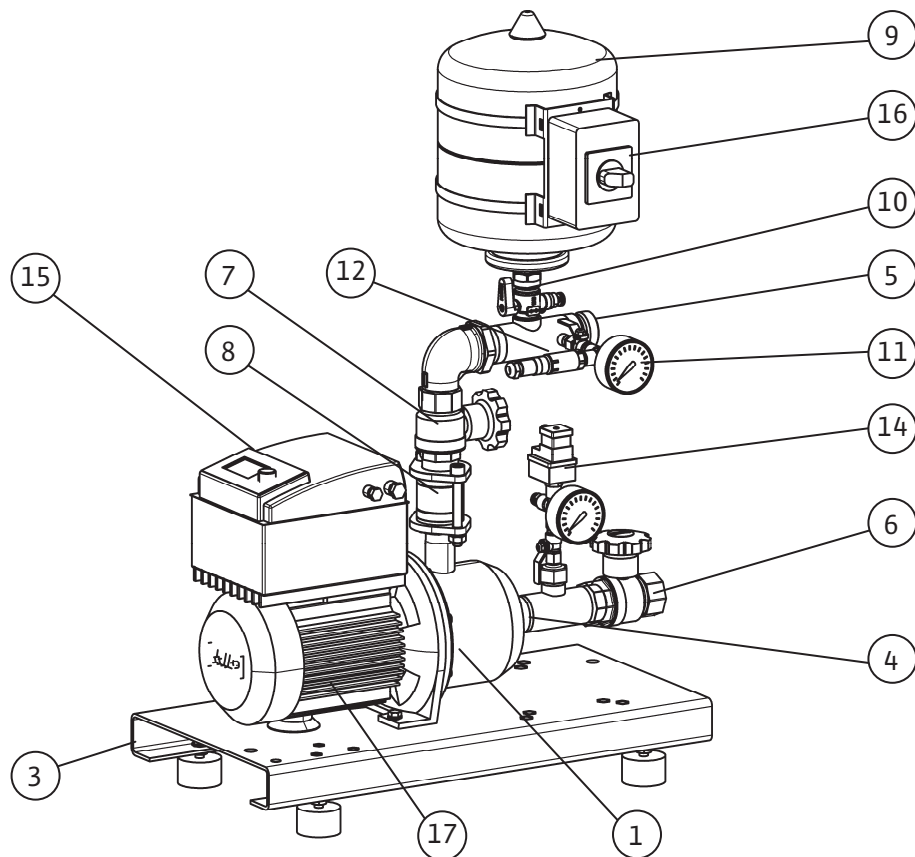


Fig. 1e:

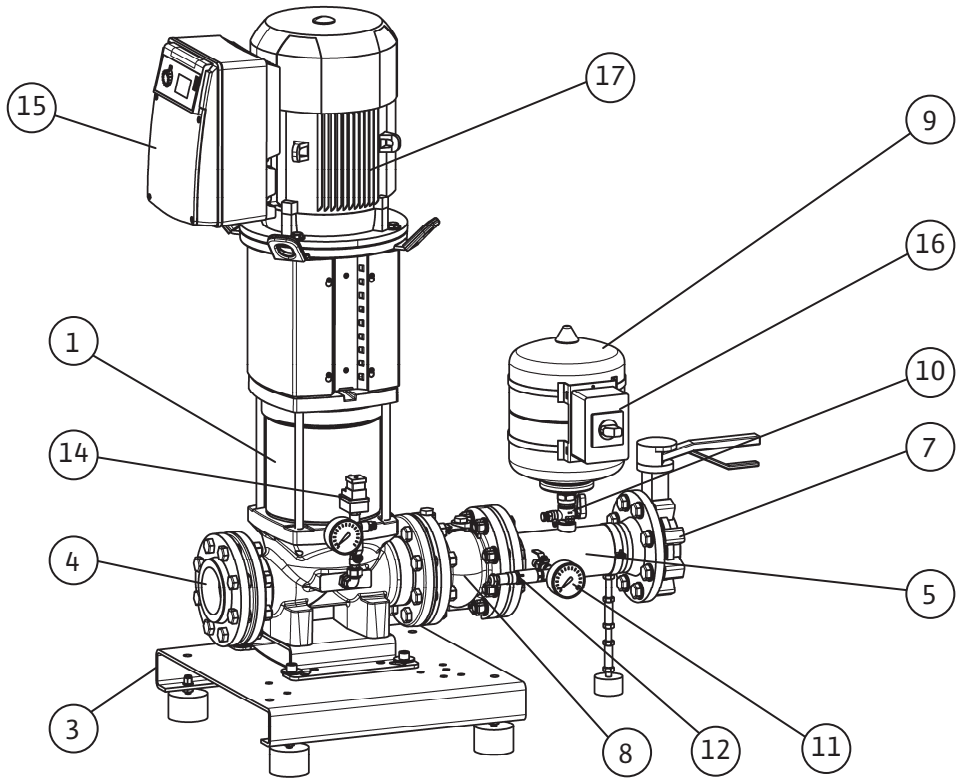


Fig. 1f:

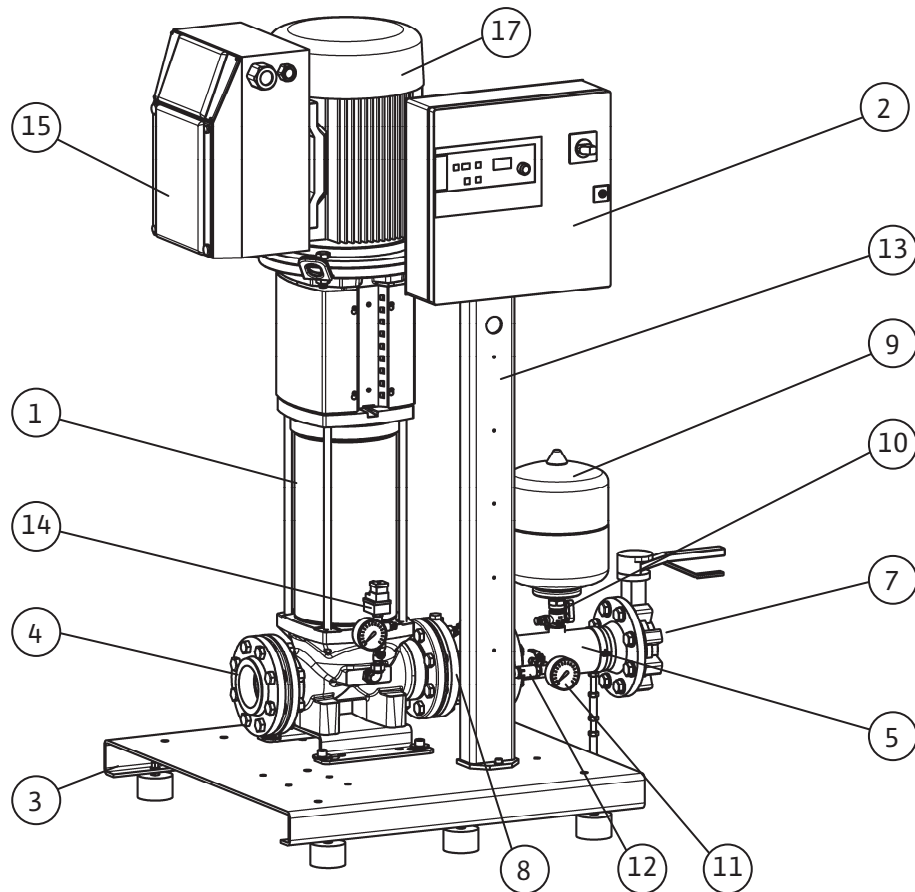


Fig. 2:

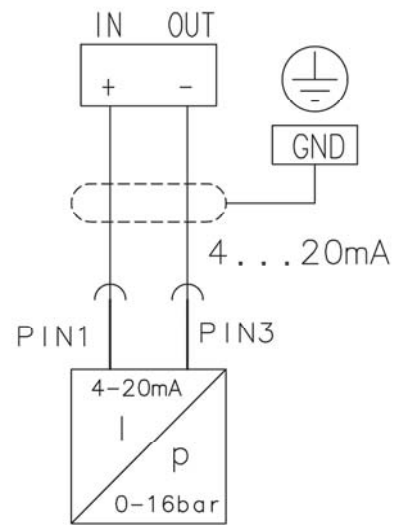
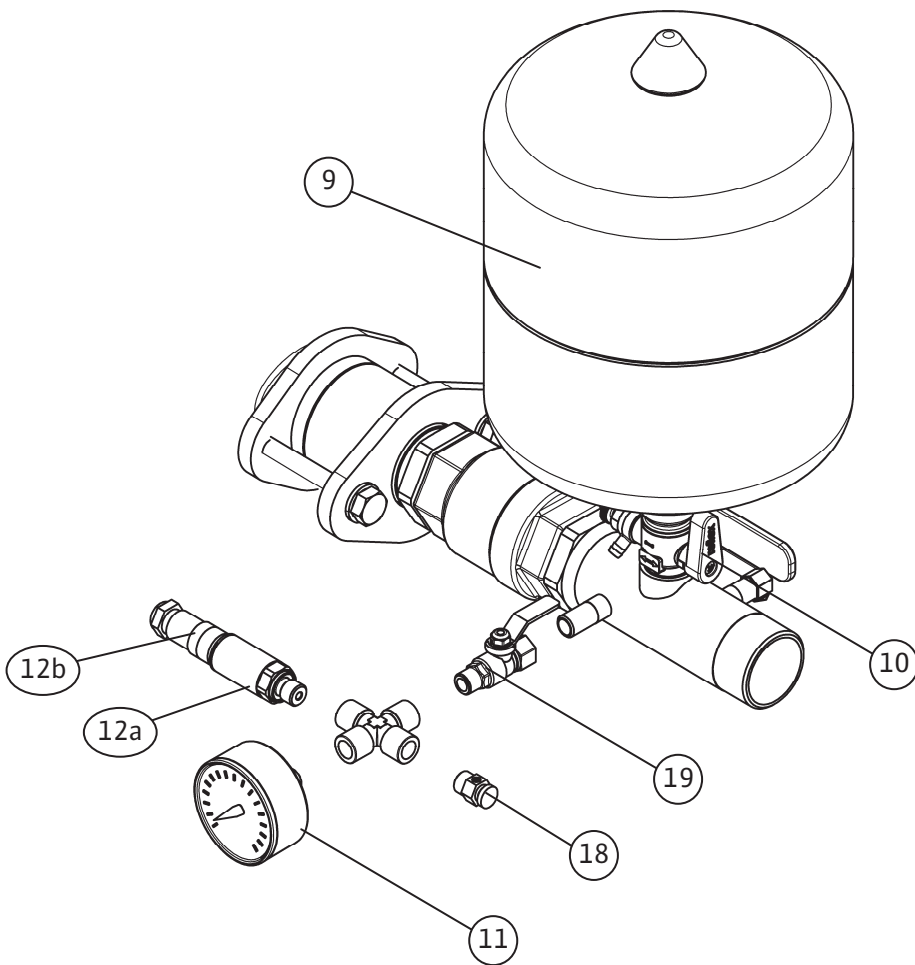
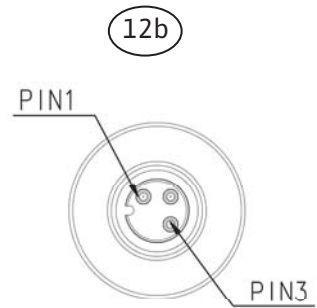
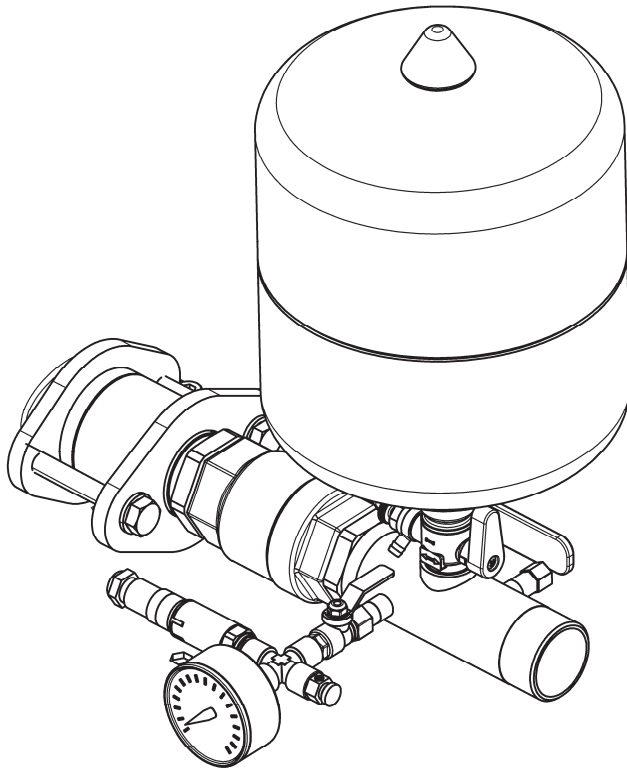


Fig. 3:

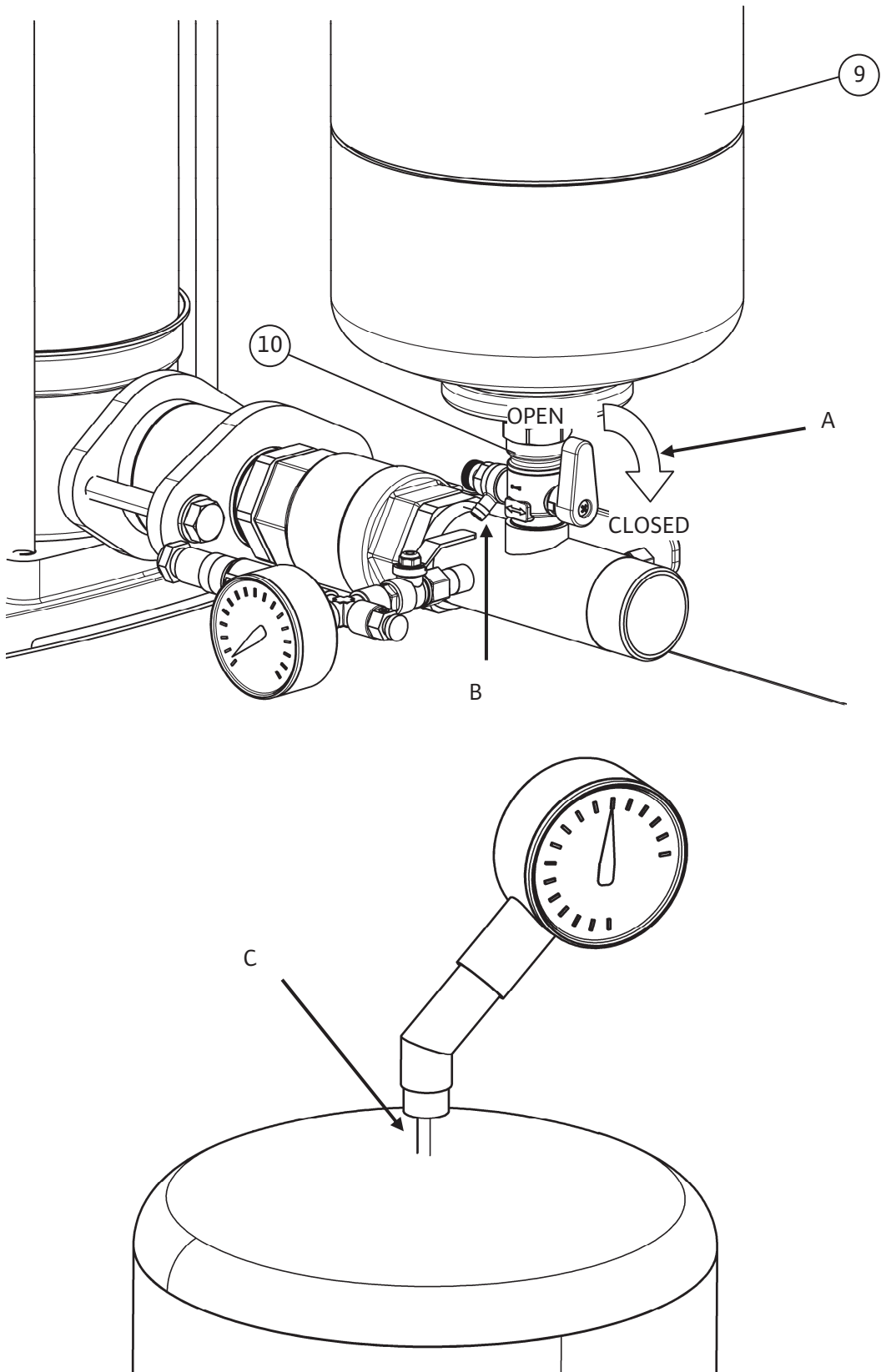


Fig. 4:

## Hinweis / advice / attention / atención

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

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

c → **PN<sub>2</sub> [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 <sub>2</sub>	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 <sub>2</sub>	7,5	8	8,5	9	9,5	10	10,5	11	11,5	12	12,5	13

1bar = 100000Pa = 0,1MPa = 0,1N/mm<sup>2</sup> = 10200kp/m<sup>2</sup> = 1,02kp/cm<sup>2</sup>(at) = 0,987atm = 750Torr = 10,2mWs

d → Stickstoffmessung ohne Wasser / Nitrogen measurement without water /  
 Mesure d'azote hors eau / Medida del nitrógeno sin el agua

e → **Achtung: Nur Stickstoff einfüllen / Note: Only fill in nitrogen /**  
**Nota: Remplir Seulement à l'azote / Nota: Completar solamente el nitrógeno**

Fig. 5a:

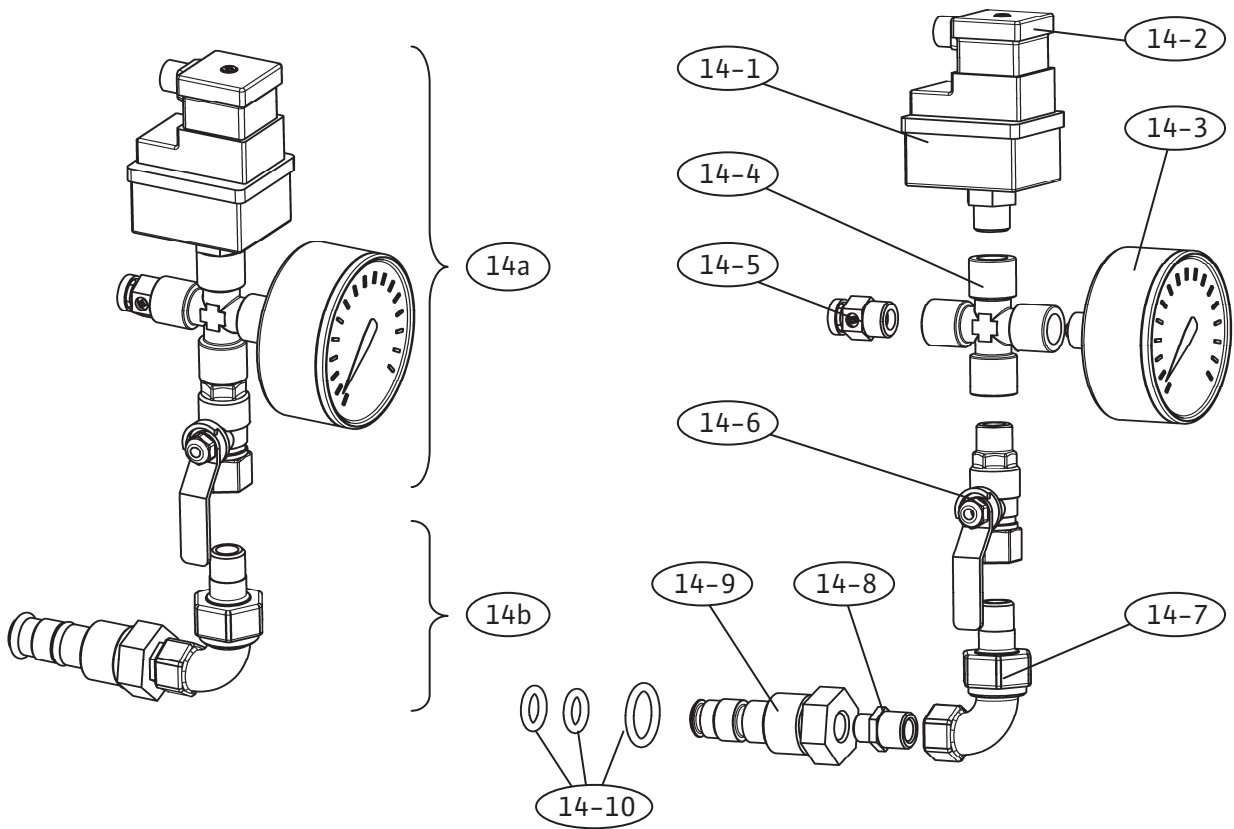
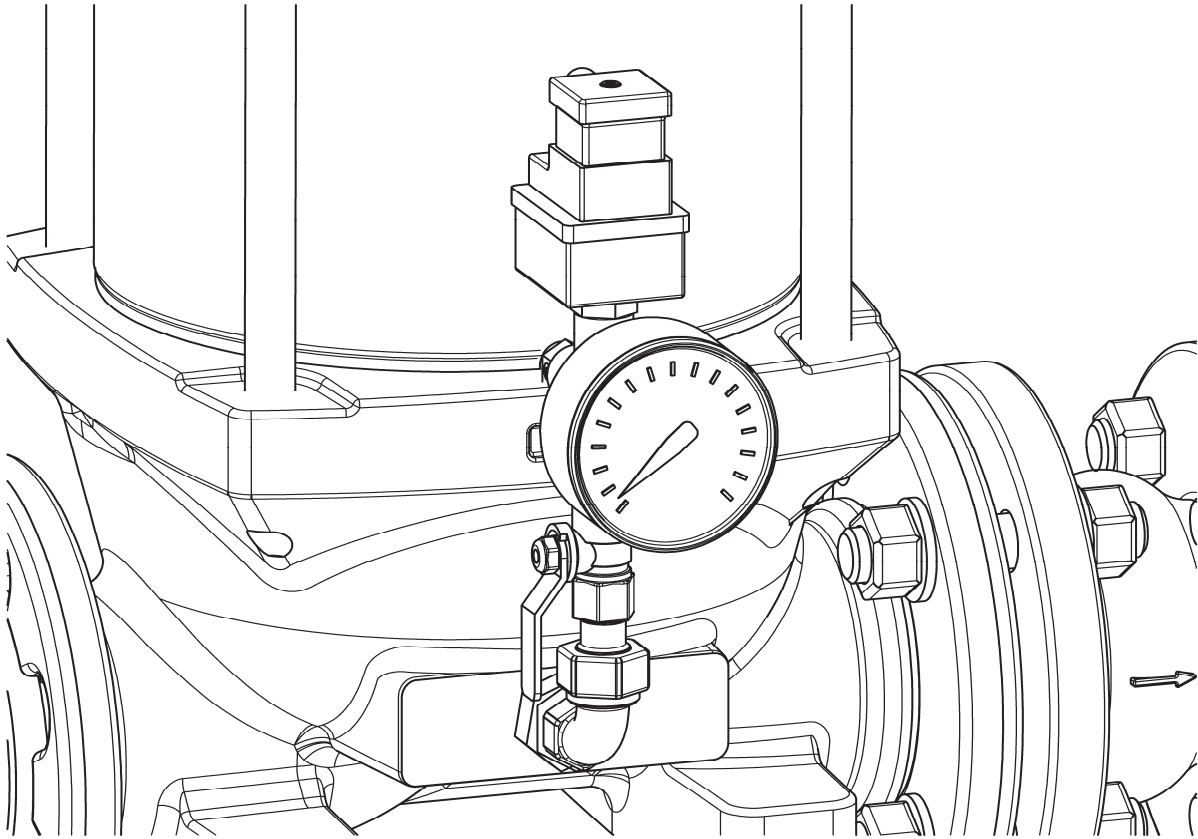




Fig. 5b:

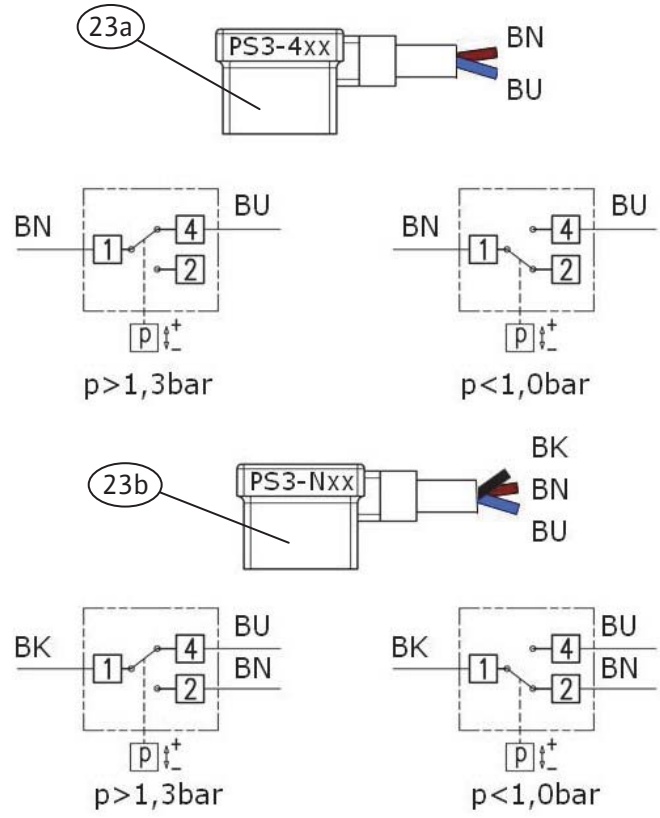
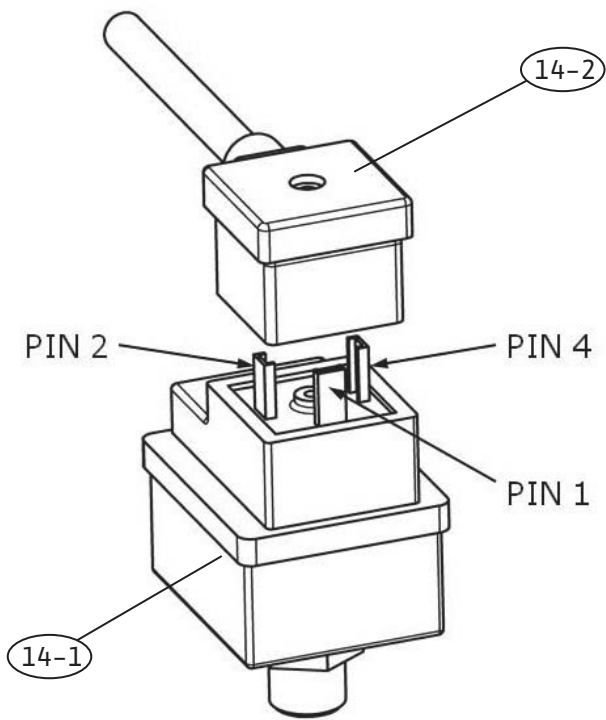


Fig. 6a:

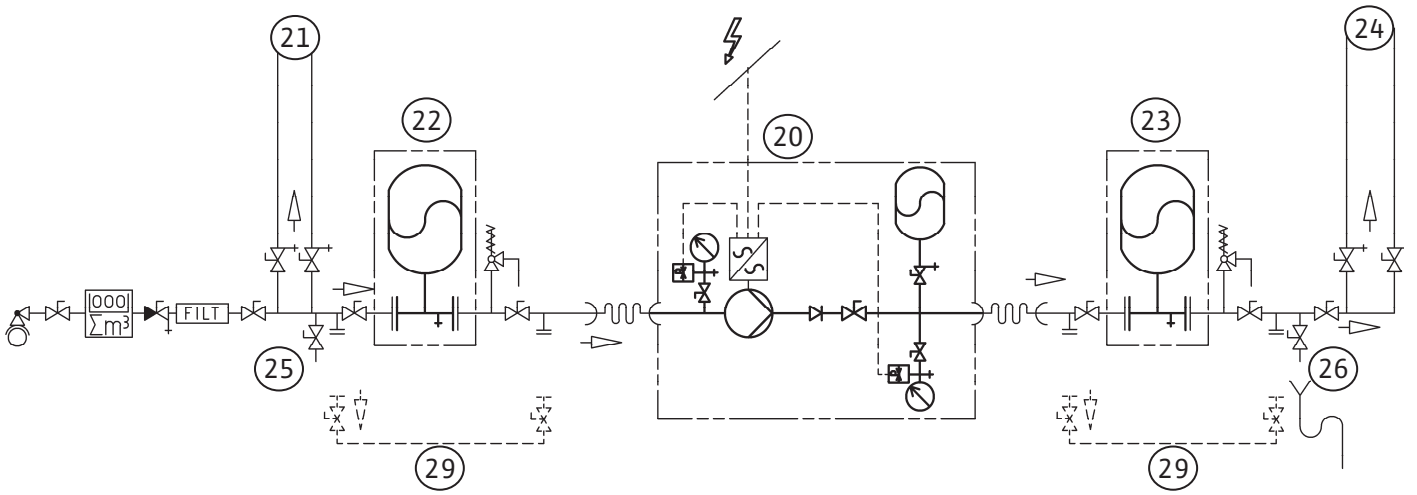


Fig. 6b:

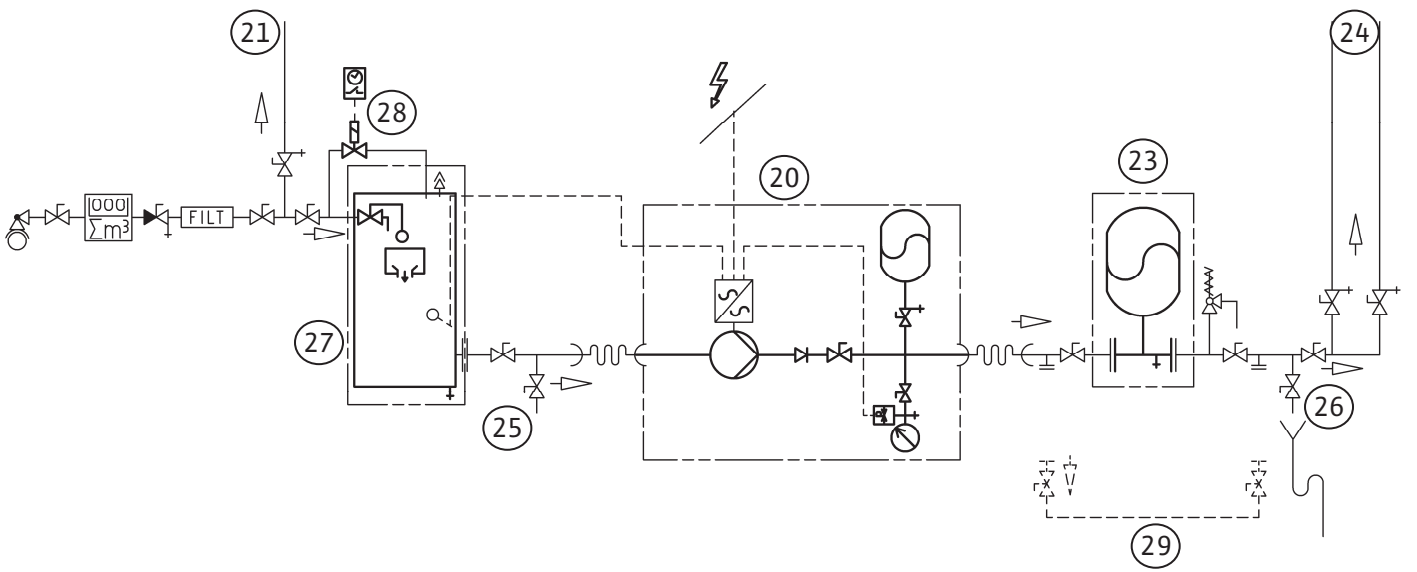


Fig. 7:

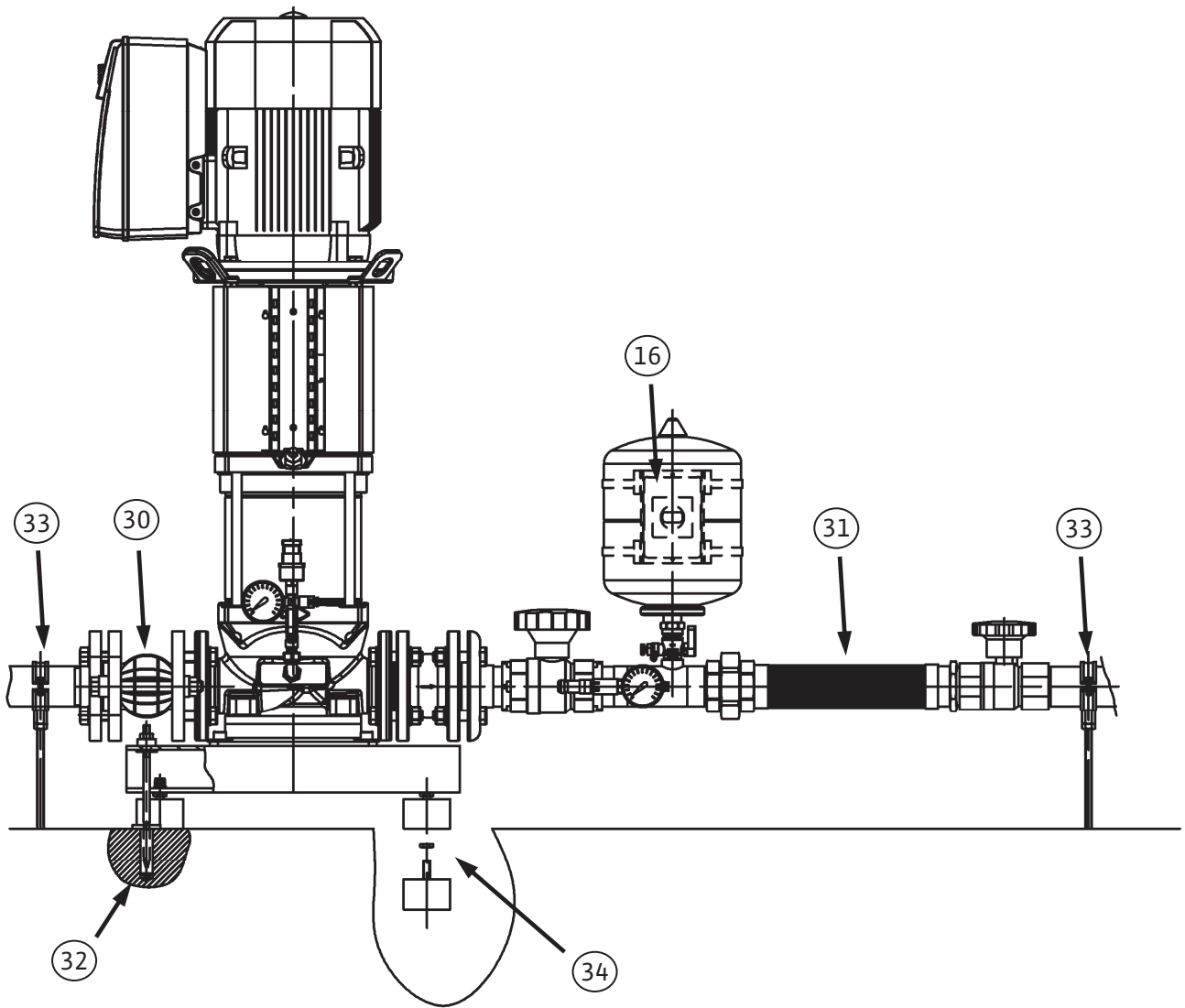
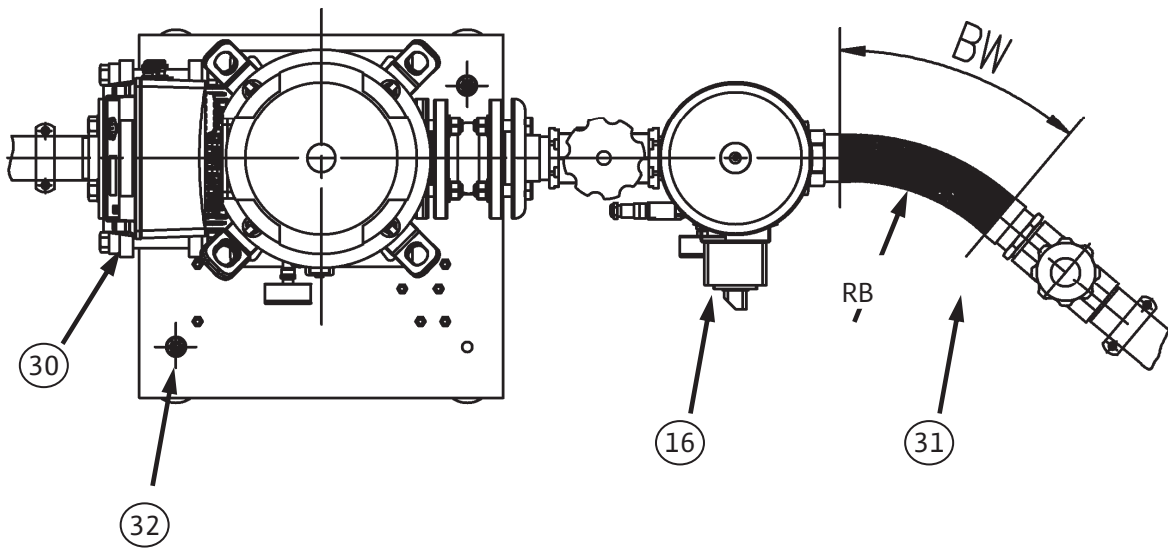


Fig. 8a:

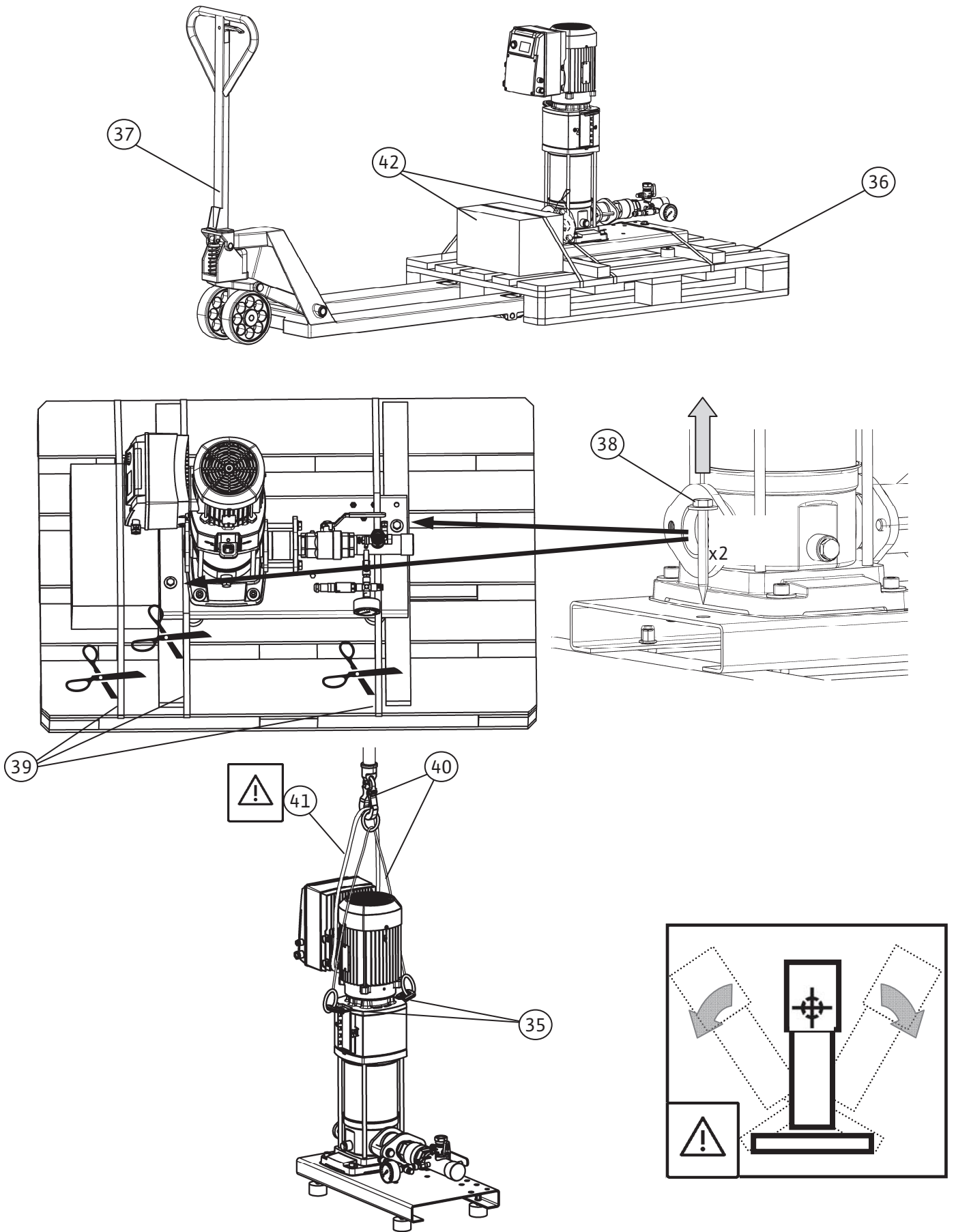


Fig. 8b:

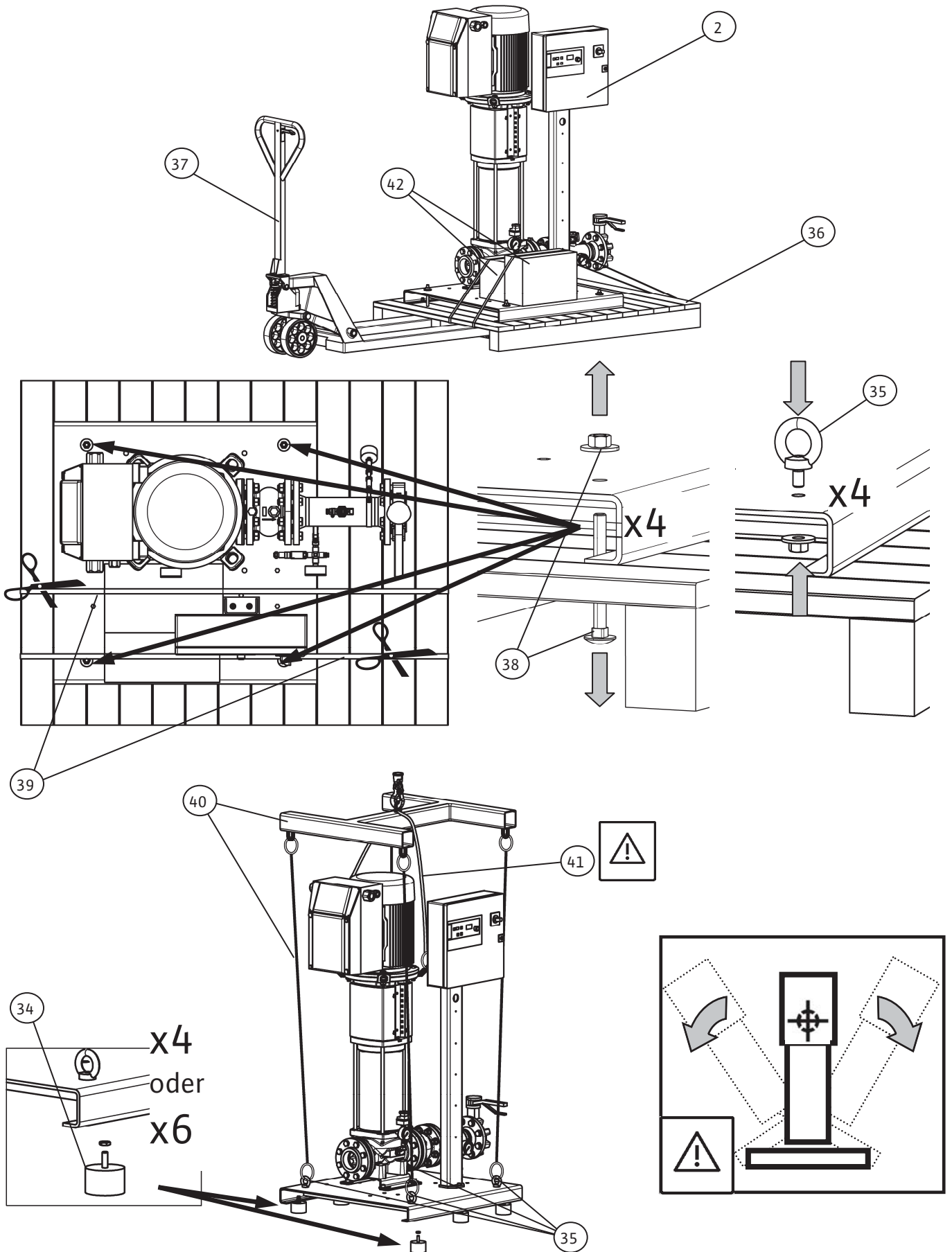


Fig. 9a:

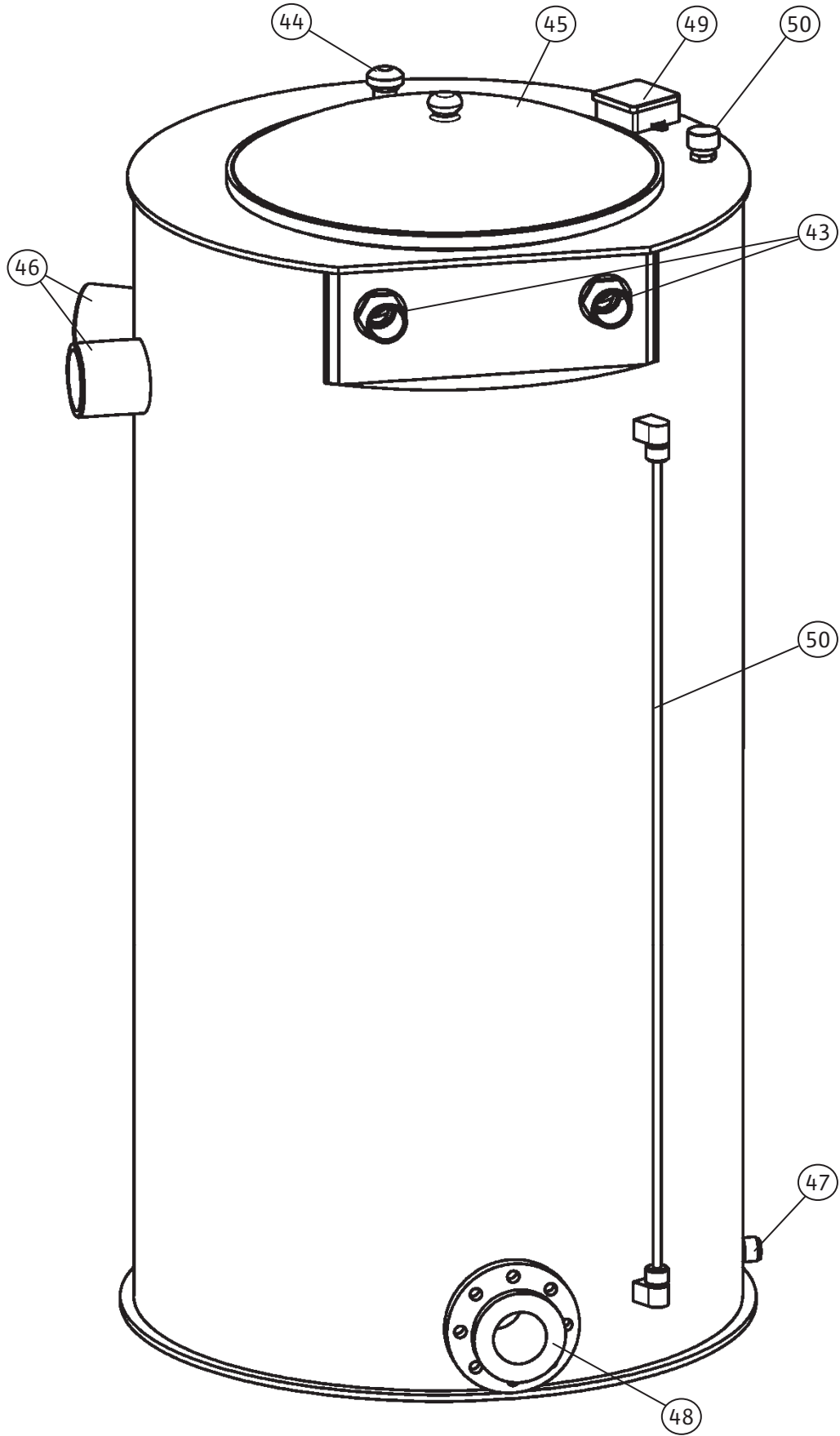
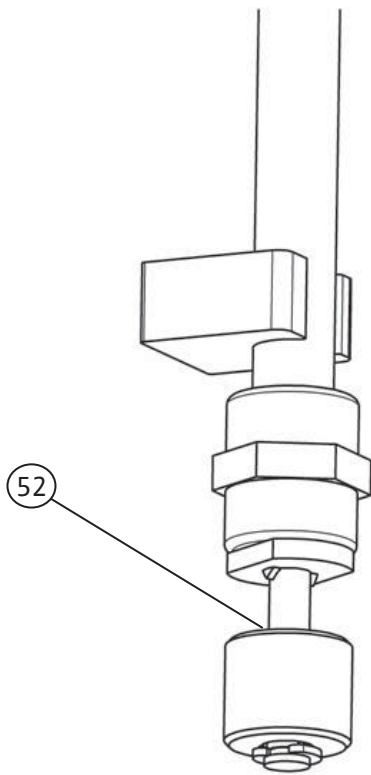
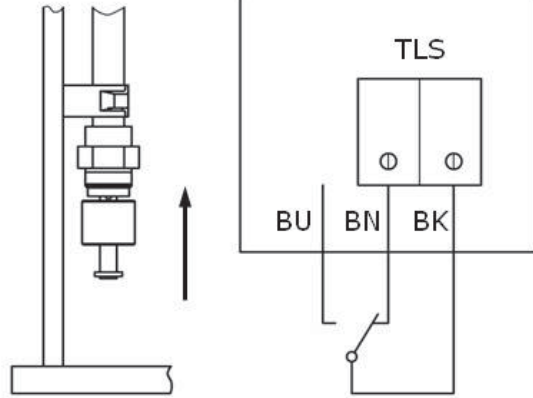


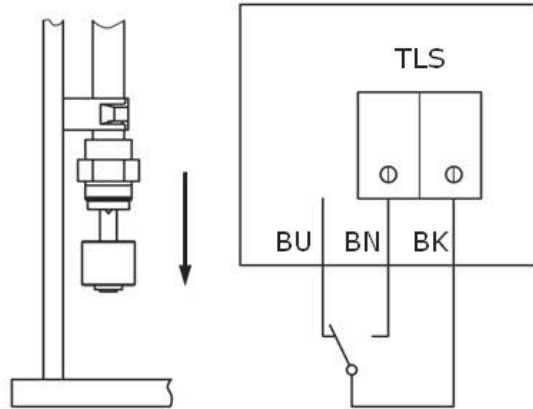
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B







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Fig. 1e	Example COR-1HELIX VE5202-GE
Fig. 1f	Example COR-1HELIX VE5204/VR
1	Pump
2	Control device (for some types)
3	Base frame
4	Inlet connection
5	Pressure pipe
6	Shut-off device on inlet side (optionally for some types)
7	Shut-off device on pressure side
8	Non-return valve
9	Diaphragm pressure vessel
10	Throughflow fitting
11	Pressure gauge
12	Pressure sensor
13	Mounting bracket for the fixation of the control device (for some types)
14	Low-water cut-out switchgear (WMS) (optional)
15	Frequency converter
16	Main switch (MS) (optional)
17	Motor

Fig. 2	Pressure sensor and diaphragm pressure vessel kit
9	Diaphragm pressure vessel
10	Throughflow fitting
11	Pressure gauge
12a	Pressure sensor
12b	Electrical connection, pressure sensor
18	Draining/venting
19	Stop valve

Fig. 3	Operation of throughflow fitting/pressure test Diaphragm pressure vessel
9	Diaphragm pressure vessel
10	Throughflow fitting
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14-5	Ventilation 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
PS3-4xx	Two-core connection cable, normally-closed function (opens when pressure drops)
PS3-Nxx	Three-core connection cable, two-way-switch function
BN	Brown
BU	Blue
BK	Black
	Connection in control device (see supplied terminal diagram)

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26	Drainage connection for flushing the system
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29	Bypass for inspection/maintenance only (not permanently installed)

Fig. 7	Installation example
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31	Flexible connection pipe (accessory)
32	Floor fixation with structure-borne noise insulation (by the customer)
33	Fixation of pipes, e.g. with pipe clips (by the customer)
34	Screw the vibration absorbers (included in scope of delivery) into the threaded inserts provided and secure them with counter nuts
BW	Bend angle for flexible connection pipe
RB	Bend radius for flexible connection pipe


Fig. 8a	Transport information example for system without control device (up to 7.5 kW)
Fig. 8b	Transport information example for system with control device (> 7.5 kW)
2	Control device
34	Screw the vibration absorbers (included in scope of delivery) into the threaded inserts provided and secure them with counter nuts
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36	Transport pallet/transport frame (example)
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38	Transport securing (screws)
39	Transport securing (strap)
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Core colours:	
BN	BROWN
BU	BLUE
BK	BLACK



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## 1 General

### About this document:

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

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

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

### EC declaration of conformity:

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

## 2 Safety

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

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

### 2.1 Indication of instructions in the operating instructions

#### Symbols:

**General danger symbol**



**Danger due to electrical voltage**



**NOTE**



#### Signal words:

**DANGER!**

**Acutely dangerous situation.**

**Non-observance results in death or the most serious of injuries.**

**WARNING!**

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

### CAUTION!

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

#### NOTE:

Useful information on handling the product. It draws attention to possible problems. Information that appears directly on the product, such as:

- Direction of rotation arrow,
  - Identification for connections,
  - Rating plate,
  - Warning sticker,
- must be strictly complied with and kept in legible condition.

### 2.2 Personnel qualifications

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

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

Non-observance of the safety instructions can result in risk of injury to persons and damage to the environment and the product/unit. Non-observance of the safety instructions results in the loss of any claims to damages. In detail, non-observance can, for example, result in the following risks:

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

### 2.4 Safety consciousness on the job

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

### 2.5 Safety instructions for the operator

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

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

### 2.6 Safety instructions for installation and maintenance work

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

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

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

### 2.7 Unauthorised modification and manufacture of spare parts

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

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

### 2.8 Improper use

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

## 3 Transport and interim storage

The pressure boosting system is supplied on one or more pallets or wooden transport frames (see examples in Fig. 8a and 8b), on transport boards or in a crate and is film-wrapped to protect it against moisture and dust. Transport and storage instructions applied to the packaging must be observed.

**CAUTION! Risk of property damage!**

**Use approved lifting gear to transport the unit (Fig. 8a and 8b). Ensure the stability of the load since, with this particular pump design, the centre of gravity is shifted to the top (top-heavy). Connect transport slings or ropes to the transport eyes provided (see Fig. 8a and 8b – item 35) or around the base frame. The pipes are not suitable to withstand loads and should not be used to secure loads in transit.**

**CAUTION! Risk of damage!**

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

The transport dimensions, weights and necessary passageways and transport areas of the system can be taken from the supplied installation plan or other documentation.

**CAUTION! Risk of detriment or damage!**

**The system must be protected by means of suitable measures against moisture, frost and heat and also mechanical damage!**

When receiving and 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 dropping the system or the like:

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

After removing the packaging, store or install the system according to the described installation conditions (see section titled Installation).





#### 4 Intended use

Wilo pressure boosting systems of the WILO SiBoost-Smart -1... and COR-1MVE... series are designed for water-supply systems which do without a standby pump. They are used for pressure boosting and pressure maintenance in commercial and private areas, such as for:

- Domestic water supply and cooling systems.
- Industrial water supply and cooling systems.
- Fire water supply systems for self-help without any normative specifications.
- Irrigation and sprinkling installations.
- The following standards and directives should be observed during planning and installation:
  - DIN 1988 (for Germany)
  - DIN 2000 (for Germany)
  - EU directive 98/83/EC
  - Potable water ordinance – TrinkwV2001 (for Germany)
  - DVGW directives (for Germany).

Make sure that the fluid to be pumped in the system will not corrode the materials used in the system either chemically or mechanically and that it does not contain any abrasive or long-fibre constituents.

Automatically controlled pressure boosting systems are supplied from the public potable water supply network either directly (connected directly) or indirectly (connected indirectly) via a break tank. These break tanks are sealed but are not pressurised, i.e. they are under only atmospheric pressure.

## 5 Product information

### 5.1 Type key

Example: SiBoost Smart 1HELIX VE606	
Wilo	Brand name
SiBoost	Product family: pressure boosting systems
Smart	Series designation
1	Number of pumps
HELIX	Pump series designation (see supplied pump documentation)
-VE	Pump design, vertical standard version
6	Rated flow rate of pump Q [m <sup>3</sup> /h]
06	Number of pump stages

Example: COR-1MVIE406-2G-GE	
CO	<b>CO</b> mpact pressure boosting system
R	Regulation (control) by frequency converter
1	With one pump
MVIE	Pump series designation (see also supplied pump documentation)
4	Rated flow rate of pump Q [m <sup>3</sup> /h]
06	Number of pump stages
-2G	Generation specification
GE	<b>GrundEinheit</b> (basic unit), i.e. without an additional control device Controlled by the pump's integrated frequency converter

Example: COR-1MWISE806-2G-GE	
CO	<b>CO</b> mpact pressure boosting system
R	Regulation (control) by frequency converter
1	With one pump
MWISE	Pump series designation (see also supplied pump documentation)
8	Rated flow rate of pump Q [m <sup>3</sup> /h]
06	Number of pump stages
-2G	Generation specification
GE	<b>GrundEinheit</b> (basic unit), i.e. without an additional control device Controlled by the pump's integrated frequency converter

Example: COR-1HELIX VE5203/3/VR	
CO	<b>CO</b> mpact pressure boosting system
R	Regulation (control) by frequency converter
1	With one pump
HELIX-VE	Pump series designation (see also supplied pump documentation)
52	Rated flow rate of pump Q [m <sup>3</sup> /h]
03	Number of pump stages
/3	Number of reduced stages
VR	Control device, in this case <b>Vario Regler</b> (controller)

Example: COR-1MHIE406-2G-GE	
CO	<b>CO</b> mpact pressure boosting system
R	Regulation (control) by frequency converter
1	With one pump
MHIE	Pump series designation (see also supplied pump documentation)
4	Rated flow rate of pump Q [m <sup>3</sup> /h]
06	Number of pump stages
-2G	Generation specification
GE	<b>GrundEinheit</b> (basic unit), i.e. without an additional control device Controlled by the pump's integrated frequency converter

Example: COR-1MVIE204EM2-GE	
CO	<b>CO</b> mpact pressure boosting system
R	Regulation (control) by frequency converter
1	With one pump
MVIE	Pump series designation (see also supplied pump documentation)
2	Rated flow rate of pump Q [m <sup>3</sup> /h]
04	Number of pump stages
EM2	Single-phase version with preset operating mode 2 – pressure control mode
GE	<b>GrundEinheit</b> (basic unit), i.e. without an additional control device Controlled by 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)
HS	Including main switch for switching the system on and off (power cut-off switch)

5.2 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 $\pm 10\%$ V (L1, L2, L3, PE) (with EM2 - 1~230 V $\pm 10\%$ V (L, N, PE)) (with M 1~230 V $\pm 10\%$ 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 or, if available, installation and operating instructions and wiring diagram for the control device.)
Insulation class	F
Protection class	IP 54
Power consumption P <sub>1</sub>	See rating plate of pump/motor.
Power consumption P <sub>2</sub>	See rating plate of pump/motor.
Sound-pressure level	Motor power (kW)
	0.55   0.75   1.1   1.5   2.2   3   4   5.5   7.5   11   15   18.5   22
dB(A)	61                      63                      67   71   72   74                      78                      81
Nominal diameters	
Suction/pressure pipe connection	Rp 1/R 11/4 (...1MHIE 2)  Rp 11/4/R 11/4 (...1MHIE 4) (..1MVIE 2) (..1MVIE 4) (..1HELIX VE 4) (..1HELIX VE 6)  Rp 11/2/R 11/2 (...1MHIE 8) (..1MVIE 8) (..1HELIX VE 10)  Rp 2/R 11/2(...1MHIE 16) (..1MVIE 16..-6) (..1HELIX VE 16)  DN 50/R 2 (...1MVIE 16)  Rp 2/R 2 (...1HELIX VE 22)  DN 65/R 2½ (...1MVIE 32)  Rp 2½/R 2½ (...1HELIX VE 36)  DN 80/DN 80 (...1MVIE 52)  Rp 3/DN 80 (...1HELIX VE 52)  DN 100/DN 100 (...1MVIE 70) (..1MVIE 95)  (Subject to change without prior notice / see also supplied installation plan)
Permitted ambient temperature	5 °C to 40 °C
Approved fluids	Pure water without settling sediments
Permissible fluid temperature	3 to 50 °C
Maximum permissible operating pressure	16 bar on the pressure side (see rating plate)
Max. permissible inlet pressure	Indirect connection (however max. 6 bar)
Further data...	
Diaphragm pressure vessel	8 litres

### 5.3 Scope of delivery

- Pressure boosting system,
- Box with accessories/accessories kit/add-on parts (Fig. 8a and 8b, item 42) if applicable
- Installation and operating instructions for the pressure boosting system
- Installation and operating instructions for the pumps
- Factory acceptance test certificate (in accordance with EN 10204 3.1.B)
- Installation and operating instructions for the control device if applicable
- Installation plan if applicable
- Electrical wiring diagram if applicable
- Installation and operating instructions for the frequency converter if applicable
- Additional sheet with the factory setting of the frequency converter if applicable
- Installation and operating instructions for the signal transmitter if applicable
- Spare parts list if applicable

### 5.4 Accessories

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

- Open break tank (example Fig. 10a),
- Larger diaphragm pressure vessel (on the suction or discharge side)
- Safety valve
- Dry-running protection system:
  - Protection against low water level (WMS) (Fig. 5a and 5b) in inlet mode (at least 1.0 bar) (supplied fitted to the pressure boosting system if part of the order)
  - Float switch
  - Low-water warning electrodes with level control relay
  - Electrodes for tank operation (special accessories on request)
- Main switch (Fig. 1a to 1f ; Fig. 8 – 16;)
- Flexible connection lines (Fig. 7 – 31)
- Expansion joints (Fig. 7 – 30)
- Threaded flanges
- Sound-insulating casing (special accessories on request)

## 6 Description of the product and accessories

### 6.1 General description

The system with its non-self-priming, vertically (MVIE, MVISE or Helix VE) or horizontally (MHIE) mounted **high-pressure multistage centrifugal pump** is supplied with all pipework installed as a compact unit ready for connection. The only connections that have to be made are for the inlet and pressure pipes and the electrical mains connection. Systems of the COR-1 and SiBoost Smart-1.. series (examples in Fig.1a to 1f) are installed on a galvanized steel base frame (3) with vibration absorbers (34).

It may also be necessary to install the supplied accessories ordered separately.

The systems can be connected to the water supply network either directly (diagram in Fig. 6a) or indirectly (diagram in Fig. 6b). When supplied with a self-priming pump (special version), it 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 taken from the supplied installation and operating instructions for the pump.

Observe the relevant, applicable regulations and standards when using the potable water supply and/or fire extinguishing supply. **The systems must be operated and maintained in accordance with the relevant provisions (according to DIN 1988 (DVGW) in Germany) to ensure the permanent operational reliability of the water supply and prevent neither the public water supply nor other consumer installations from being detrimentally affected.** The respective applicable standards or directives (see application under section "Intended use") on the connection and type of connection to public water supply networks are to be observed. They may be supplemented by **regulations of the water supply companies (WVU) or the responsible fire protection authority.** In addition, the local conditions (e.g. a supply pressure that is too high or fluctuating considerably and which might require the installation of a pressure relief) must also be observed.

### 6.2 Components of the system

The system comprises several main components, which are described in the following. The scope of delivery includes separate installation and operating instructions for the relevant operating parts/components (see also supplied installation plan).

#### **Mechanical and hydraulic system components (Fig. 1a to 1f):**

The system is installed on a base frame(3) with vibration absorbers (34). It comprises a high-pressure multistage centrifugal pump (1) with a three-phase AC motor with an integrated frequency converter (15), with a shut-off device (7) and a non-return valve (8) installed on the pressure side. There is also an assembly that can be shut off with a pressure sensor (12) and pressure gauge (11) as well as an 8-litre diaphragm pressure vessel (9) with a throughflow fitting (10) that can be shut off (for throughput according to DIN 4807, part 5). A low-water cut-out switchgear (WMS) (14) can be optionally installed or retrofitted on the pump's drainage port or on the inlet pipe (see also Fig. 5a and 5b).

An optional main switch (16) is pre-installed at the factory and pre-wired with the motor of the pump for systems of the COR-1...GE-HS or SiBoost Smart1...-HS series. In this case the electrical connection must be established by means of this switch (see section "Electrical connection").

The scope of delivery of systems of the COR-1...VR series includes a control device (2) which is installed on the base frame by means of a standing console and ready wired with the electrical components of the system.

These installation and operating instructions describe the overall system in general only without going into a detailed description of the operation of the optional control device (see Section 7.3 and the accompanying documentation for the control device).

#### **High-pressure multistage centrifugal pump (1) with three-phase AC 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. Information on the pump and the setting and operation of the frequency converter is provided by the supplied installation and operating instructions.

#### **Pressure sensor/diaphragm pressure vessel kit (Fig. 2):**

Consists of:

- Diaphragm pressure vessel (9) with throughflow fitting (10)
- Pressure gauge (11)
- Pressure sensor (12a)
- Electrical connection, pressure sensor (12b)
- Draining/venting (18)
- Stop valve (19)

#### **Control device VR (2):**

The VR CVV control device is used to control and regulate some types of systems. Information on this control device is provided by the separate installation and operating instructions supplied for this purpose.

- Systems of series COR-1...GE or SiBoost Smart-1... do not have a separate control device. The system is controlled by the pump's integrated frequency converter (15). You can find out how to operate and handle the pump in the respective installation and operating instructions.

### **6.3 Function of the system**

Systems of the Wilo-Comfort-Vario or Wilo-SiBoost-Smart-1... series are equipped as a standard with a non self-priming horizontal or vertical high-pressure multistage centrifugal pump with three-phase AC motor (17) and integrated frequency converter (15). The pump is supplied with water via the inlet connection (4).

For suction mode from lower-lying tanks, a separate, vacuum-proof and pressure-resistant suction line with a foot valve should be installed. It should 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). It is switched on and off and controlled pres-

sure-dependently for this purpose. A pressure sensor (12) (see also Fig. 2) is used to monitor the pressure. The pressure sensor continuously measures the actual pressure value, converts it into an analogue current signal and transmits it to the frequency converter (15) of the pump or to the existing control device (2). Depending on the demand and the control mode, the frequency converter or control device switches the pump on or off or changes the speed of the pump until the set control parameters are reached. For a more precise description of the control mode, control process and setting options, refer to the installation and operating instructions for the pump or control device.

The diaphragm pressure vessel installed (9) (total capacity of approx. 8 litres) exercises a certain buffer effect on the pressure sensor and prevents oscillation of the control when switching the pump on and off. However, it also allows small amounts of water to be extracted (e.g. due to smallest leakages) from the available storage volume without switching on the pump. This reduces the switching frequency and stabilises the operating state of the system.



#### **CAUTION! Risk of damage!**

**To protect the mechanical seal or plain bearings, do not allow the pumps to run dry. Leakages may be caused by a pump running dry.**

A device for protection against low water level (WMS) (14) (for details, see Fig. 5a and 5b) is provided as an accessory for direct connection to the public water supply network. It monitors the existing supply pressure and sends a switching signal which is processed by the frequency converter or control device. The WMS kit is installed on the pump's drainage opening (an additional WMS connection kit (Fig. 5a, 14b) from the accessories range is required here) 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. If a Wilo break tank is used, a float switch (Fig. 9 a and 9b) is already included in the scope of delivery. For tanks provided by the customer, you can find various signal transmitters for subsequent installation in the Wilo range (e.g. WA65 float switch or low-water electrodes with level relays).



#### **WARNING! Health hazard!**

**Only materials that have no adverse effects on the quality of the water may be used for potable water systems!**

An additional main switch is provided optionally, which can be retrofitted on systems of the COR-1...GE and SiBoost Smart-1... series (see Fig 1a-1f and Fig. 8, item 16). This main switch is used to

disconnect the mains supply for maintenance and repair work on the system.

#### 6.4 Noise

Depending on the power requirements, the system is supplied with a wide variety of pumps which may vary considerably in terms of their noise and vibration characteristics. You can find the relevant data in Section 5.2, in the installation and operating instructions for the pump or in the catalogue specifications for the pump.



##### **WARNING! Health hazard!**

**In the event of sound–pressure levels of above 80 dB(A), the operating personnel and persons who are nearby must wear suitable hearing protection.**

## 7 Setup/installation

### 7.1 Installation site

- The pressure boosting system is installed in the technical control room or in a dry, well ventilated and frost–proof, separate room that can be locked (e.g. as required by DIN 1988).
- Adequately dimensioned floor drainage (drain connection or similar) must be provided in the installation room.
- No harmful gases may enter the room or be present there.
- Provide 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.
- The installation surface must be horizontal and flat. A slight adjustment in height of the vibration absorber in the base frame may be necessary to achieve stabilisation. If this is necessary, undo the counter nuts and unscrew the respective the vibration absorber slightly. Then re–tighten the counter nuts.
- The system is designed for a maximum ambient temperature of +0°C to 40°C at relative humidity of 50%.
- Installation and operation in the vicinity of living rooms and bedrooms is not recommended.
- To avoid the transmission of structure–borne noise and to ensure a stress–free connection to the upstream and downstream pipes, expansion joints (Fig. 7 – 30) with extension limiters or flexible connection lines (Fig. 7 – 31) should be used.

### 7.2 Installation

#### 7.2.1 Foundation/bearing surface

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



#### NOTE!

For transport reasons, the vibration absorbers may not be installed upon delivery. Before installing the system, make sure all the vibration dampers are installed and locked by the threaded nuts (see also Fig. 7; 8a and 8b – 34).

In the event of additional fixation to the floor by the customer (similar to the example in Fig. 8–32), make sure suitable measures are taken to avoid structure–borne noise transmission.

#### 7.2.2 Hydraulic connection and pipes

All hydraulic connection opening are sealed with protective caps or plugs at the factory. They are to be removed before beginning the connection work.



##### **CAUTION! Risk of detriment or damage!**

**Protective caps or plugs which have not been removed can cause blocking and damage the pump!**

For connections to the public potable water supply network, the requirements of the responsible local water supply company must be met. First perform all the welding and soldering work and the necessary flushing and, if necessary, disinfect the pipework and the supplied system (see 7.2.3) before connecting the system.

The customer's pipes must be installed without tension. Expansion joints with extension limiters or flexible connection lines are recommended for this purpose in order to avoid stress at the pipe connections and minimise the transmission of system vibrations to the building installation. In order to prevent transmission of structure–borne noise to the building, do not secure the piping to the system pipework (see Fig. 7 for example). The flow resistance of the suction line must be kept as low as possible (i.e. short pipe, few elbows and shut–off devices of sufficient size), otherwise the protection against low water level may be activated in the event of high flow rates due to severe pressure losses. (Observe the NPSH of the pump and avoid pressure losses and cavitation).

#### 7.2.3 Hygiene (TrinkwV 2001)

The supplied pressure boosting system meets the standards of current technology and in particular satisfies DIN 1988. It has been checked at the factory to make sure it functions correctly. Please remember that when used in the potable water applications, the complete potable water supply has to be handed over to the operator in a perfect state of hygiene.

Also observe the corresponding specifications in DIN 1988 Part 2 section 11.2 and the comments on the DIN. TwVO § 5, paragraph 4 requires that this also includes microbiological requirements, flushing if necessary and under some circumstances also disinfecting. The limit values to be observed can be taken from TwVO § 5.



**WARNING! Contaminated potable water is a health hazard!**

**Flushing the pipes and system reduces the risk of impairing the quality of the potable water! The water must be completely replaced after a long system standstill.**

Once the system has been delivered, install it in the intended installation location as soon as possible.

Always flush the system.

For simple flushing of the system, we recommend the installation of a T-connector on the consumer side of the system (if there is a diaphragm pressure vessel on the discharge side, directly downstream of it) upstream of the next shut-off device. Its branch, which is provided with a shut-off device, is used to drain into the waste water system during the flushing process and must be dimensioned according to the maximum flow rate of the pump (see also diagram in Fig. 6a and 6b). If it is not possible to achieve free drainage, the requirements of DIN 1988 T5 must be observed when connecting a hose, for example.

#### 7.2.4 Protection against dry running/low water level (accessory)

**To install the dry-running protection:**

- In the event of a direct connection to the public water supply network: screw in and seal the low-water protection device (WMS) on one of the connecting pieces provided for that purpose in the suction line (in the of retrofitting) or on the drainage connection of the pump (Fig. 5a). Additionally use the WMS connection kit for CO-1... for this purpose. Establish the electrical connection in accordance with the installation and operating instructions for the pump or in accordance with the installation and operating instructions and wiring diagram for the control device.
- In the event of an indirect connection using a Wilo break tank, a float switch for level monitoring is likewise already installed as a standard means of dry-running protection. All that is needed is the electrical connection to the control device of the system in accordance with the installation and operating instructions and wiring diagram for the control device. Also observe the operating instructions for the break tank.
- In the event of an indirect connection, i.e. for 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 or in accordance with the installation and operating instructions and wiring diagram for the control device.

- Alternative: you can use a level controller and install three submersible electrodes in the break tank. The arrangement is as follows:
  1. electrode should be positioned as an earth electrode just above the base of the tank (must always be submerged), for the lower switching level (low water).
  - 2. electrode approximately 100 mm above the draw-off connection. For the upper switching level (low water rescinded),
  - 3. electrode at least 150 mm above the lower electrode.
- The electrical connection between the level control device and the frequency converter of the pump or control device should be established in accordance with the installation and operating instructions and the wiring diagram for the level control device for the pump or control device.

#### 7.2.5 Main switch (accessories)

An optional manually operated main switch (16) which belongs to the scope of delivery (for systems of the COR-1...GE-HS or SiBoost 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 removed from service.

#### 7.2.6 Diaphragm pressure tank (accessory)

For transportation and hygienic reasons, the (8-litre) diaphragm pressure vessel which belongs to scope of delivery of the pressure boosting system may be delivered unmounted as accessories kit in the box (Fig. 10a and 10b – 42). Install the diaphragm pressure vessel (9) on the throughflow fitting (10) before commissioning (see Fig. 2 and 3).



**NOTE**

Make sure the throughflow fitting is not twisted. The fitting is installed correctly when the drain valve (see also Fig. 3) or the flow direction arrows printed on it are parallel to the manifold pipe. If an additional larger diaphragm pressure vessel has to be installed, observe the corresponding installation and operating instructions.

A throughflow diaphragm pressure vessel according to DIN 4807 must be installed for potable water installations. When installing a diaphragm pressure vessel, also make sure there is enough room for maintenance or replacement work.



**NOTE**

Diaphragm pressure vessels require regular testing according to the directive 97/23/EC (in Germany, also take into account the Operating Safety Ordinance §§ 15(5) and 17 as well as Annex 5).

Shut-off devices must be provided upstream and downstream of the vessel for tests and inspection and maintenance work on the piping. To prevent system downtimes, connections for a bypass can be provided upstream and downstream of the diaphragm pressure vessel. Such a bypass (as for

example in the diagrams Fig. 6a and 6b, item 29) must be completely removed at the end of the work to avoid stagnation of the water. Special maintenance and test instructions can be taken from the installation and operating instructions for the diaphragm pressure vessel concerned. The system conditions and pumping data of the system must be taken into account when selecting the size of the diaphragm pressure vessel.

When doing so, ensure there is sufficient flow through the diaphragm pressure vessel. The maximum flow rate of the pressure boosting system must not exceed the maximum permissible flow rate of the diaphragm pressure vessel connection (see table 1 or the specifications on the rating plate, and the installation and operating instructions for the vessel).

**Maximum permissible volume flow of diaphragm pressure vessel connection**

Nominal diameter	DN 20	DN 25	DN 32	DN 50	DN 65	DN 80	DN 100
Connection	(Rp 3/4")	(Rp 1")	(Rp 1 1/4")	Flange	Flange	Flange	Flange
Max. volume flow (m <sup>3</sup> /h)	2.5	4.2	7.2	15	27	36	56

Table 1

### 7.2.7 Safety valve (accessory)

A component-tested safety valve must be installed on the discharge side if the sum of the maximum possible supply pressure and the maximum delivery pressure of the pressure boosting system may exceed the permissible operating pressure of an installed system component. The safety valve must be designed to drain off the flow rate of the pressure boosting system when the operating pressure is 1.1 times the permissible level (design data can be taken from the data sheets/characteristic curves of the system). The outflowing water current must be safely drained away. The corresponding installation and operating instructions and the relevant provisions must be observed for the installation of the safety valve.

### 7.2.8 Non-pressurised break tank (accessory)

To connect the pressure boosting system indirectly to the public potable water supply network, it must be installed together with a non-pressurised break tank according to DIN 1988 (example in Fig. 10a). The same rules apply to the installation of the break tank as to the pressure boosting system (see 7.1). The entire base of the tank must be in contact with a solid bearing surface. The maximum volume of the tank concerned must be considered when designing the bearing capacity of the bearing surface. When installing, make sure there is sufficient space for inspection work (at least 600 mm above the tank and 1000 mm on the connection sides). The tank must not slant when full, because an uneven load can cause destruction.

The non-pressurised (i.e. under atmospheric pressure) closed PE tank which we supply as an accessory must be installed according to the transport and installation instructions supplied with the tank. In general, the following procedure applies: connect the tank without mechanical tension before commissioning. This means that the connection must be made using flexible components, like expansion joints or hoses. The tank overflow must be connected according to the applicable

regulations (DIN 1988/T3 or 1988-300 (draft) in Germany). Take suitable measures to prevent heat transmission through the connection lines. PE tanks of the WILO range are only designed to accommodate clean water. The maximum temperature of the water must not exceed 50 °C.

#### **Caution! Risk of property damage!**

**The tanks are designed statically for their nominal capacity. Subsequent changes can affect the static forces and cause impermissible deformations or even destruction of the tank.**

The electrical connection (protection against low water level) to the system's control device must also be established before the system is commissioned (see details in the installation and operating instructions for the pump or control device).

#### **NOTE!**

The tank must be cleaned and flushed before it is filled.

#### **Caution! Health hazard and risk of damage!**

**You must not walk on plastic tanks. Walking on the cover or subjecting it to loads can cause accidents resulting in damage.**



### 7.2.9 Expansion joints (accessories)

For the stress-free installation of the system, the pipes must be connected with expansion joints (see example in Fig. 7, 30). The expansion joints must be equipped with a structure-borne noise-insulating extension limitation to absorb the reaction forces that occur. The expansion joints must be installed without tension in the pipes. No alignment errors or pipe displacement must be compensated for with expansion joints. The screws should be tightened evenly crosswise during the installation. The ends of the screws must not project beyond the flange. In the event of welding work the expansion joints, they must be covered for protection (sparks, radiated heat). The rubber parts of expansion joints must not be painted and must be protected from oil. The expansion joints must be accessible for inspection within the system at any time and must therefore not be covered by the pipe insulation.



**NOTE!**

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

**7.2.10 Flexible connection lines (accessory)**

In the case of pipes with threaded connections, flexible connection lines can be used for stress-free installation of the pressure boosting system and in the event of slight pipe displacement (Fig. 7 - 31). The flexible connection lines from the Wilo range consist of a high quality stainless steel corrugated hose, sheathed with stainless steel braiding. A flat-sealing stainless steel screwed connection with a female thread is provided at one

end for installation on the pressure boosting system. A male pipe thread is provided at the other end to connect to further pipework. Depending on the size, certain maximum permissible deformation limits are to be met (see table 2 and Fig. 7). Flexible connection lines are not suitable for absorbing axial vibrations and compensating the corresponding movements. A suitable tool must be used to prevent kinking or twisting during the installation. In the event of angular displacement of the pipes, it is necessary to fixate the system to the floor, taking into account suitable measures to reduce the structure-borne noise. The flexible connection lines in the system must be accessible for inspection at any time and must therefore not be covered by the pipe insulation.

Nominal diameter of connection	Threaded screwed connection	Conical male thread	Permissible bend radius ∞up to RB in mm	Max. bend angle 0 to BA in °
DN 32	Rp 1 1/4"	R 1 1/4"	220	75
DN 40	Rp 1 1/2"	R 1 1/2"	260	60
DN 50	Rp 2"	R 2"	300	50
DN 65	Rp 2 1/2"	R 2 1/2"	370	40

Table 2

**NOTE!**

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

**7.2.11 Pressure reducer (accessory)**

The use of a pressure reducer is necessary in the event of pressure fluctuations in the inlet pipe of more than 1 bar or if the supply pressure fluctuation is so high that the deactivation of the system is necessary or the total pressure (supply pressure and pump delivery head at the zero volume point - see characteristic curve) of the system exceeds the rated pressure. The pressure reducer can only perform its function if there is a minimum pressure gradient 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 should be an installation section of approximately 600 mm on the supply pressure side.

plied installation instructions for the main switch. General points to be considered are listed in the following:

- The current type and voltage of the mains connection must comply with the details on the rating plate and wiring diagram of the pump and control device.
- The electrical connection line is to be dimensioned sufficiently according to the overall power of the system (see installation and operating instructions and the supplied electrical wiring diagrams for the pump or control device).
- The external fuse protection is to be implemented in accordance with DIN 57100/VDE0100 part 430 and part 523 (see installation and operating instructions and the supplied electrical wiring diagrams for the pump or control device).
- As a protective measure, the system must be earthed according to regulations (i.e. according to the local regulations and conditions). The connections intended for this purpose are identified accordingly (see also wiring diagram).

**DANGER! Risk of fatal injury!**

**As a protective measure against dangerous contact voltages:**

- **If the pressure boosting system is equipped with a frequency converter, a universal-current-sensitive residual-current device with a trigger current of 300 mA must be installed,**
- **The protection class of the system and of the individual components can be taken from the rating plates and/or data sheets.**
- **Further measures/settings etc. can be taken from the installation and operating instructions as well as the wiring diagram for the pump and/or control device and/or main switch.**

**7.3 Electrical connection****DANGER! Risk of fatal injury!**

**The electrical connection must be established in compliance with the local regulations (VDE regulations) by an electrical installation engineer approved by the local energy supply company.**

The corresponding installation and operating instructions and the supplied electrical wiring diagrams for the pump or control device must be observed for the electrical connection.

Systems of the COR-1...GE -HS or SiBoost Smart.1...HS series with optionally integrated main switch are connected to the mains supply by means of the main switch. Also observe the sup-



## 8 Commissioning/decommissioning

We recommend that the initial commissioning of the system is performed by Wilo's customer service. Contact your dealer, your nearest WILO representative or contact our central customer service department directly for details.

### 8.1 General preparations and control measures

- Check that all on-site wiring has been performed correctly, in particular the earthing, prior to the initial start-up.
- Check that the pipes joints are not under stress.
- Fill the system and subject it to a visual inspection for leakages,
- Open the shut-off devices at the pumps and in the suction and pressure piping.
- Open the pump venting screws and fill the pumps slowly with water to allow the air to escape completely.



**Caution! Risk of property damage!**

**Do not allow the pump to run dry. Dry running destroys the mechanical seal and leads to motor overloading.**

- In suction mode (i.e. negative level difference between the break tank and pump), fill the pump and the suction line via the opening in the venting screw (use a funnel if necessary).
- If a diaphragm pressure vessel (optional or accessory) is installed, check whether it is set to the correct supply pressure (see Fig. 3 and 4).
- To do so:
  - depressurise the vessel on the water side (close the flow-through fixture (A, Fig. 3) and allow the residual water to drain (B, Fig. 3)),
  - Check the gas pressure at the air valve (top; remove protective cap) of the diaphragm pressure vessel with an air pressure gauge (C, Fig. 3). If necessary, correct the pressure if too low (PN 2 = pump switch-on pressure p<sub>min</sub> less 0.2–0.5 bar) or value given in the table on the vessel (see also Fig. 3) by adding nitrogen (contact Wilo customer service).
  - If the pressure is too high, release nitrogen from the valve until the required value is reached. Reapply the protective cap,
  - Close the drain valve on the flow-through fixture and open the flow-through fixture.
- In the event of 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.



**DANGER! Risk of fatal injury!**

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

**The safety measures for the handling of pressurised vessels and technical gases must be observed.**

**The pressure specifications in this documentation (Fig. 4) are made in bar(!). If other units of pressure measurement are used, always be sure to convert the figures correctly!**

- In the case of an indirect connection, check that the water level in the storage tank is adequate, or with a direct connection, that the inlet pressure is adequate (minimum inlet pressure 1 bar)
- Correct installation of the correct dry-running protection (Section 7.2.4.)
- Position the float switch or electrodes for protection against low water level in the break tank to ensure the system is switched off at the minimum water level (Section 7.2.4).
- Check the motor protection switch in the control device (COR-1...VR only) to make sure the correct nominal current is set according to the specifications of the motor rating plate. Observe the installation and operating instructions for the control device when doing so.
- The pumps should run only briefly against the closed gate valve on the pressure side.
- Check and set the required operating parameters at the frequency converter of the pump and or control device in accordance with the supplied installation and operating instructions.

### 8.2 Protection against low water level (WMS)

The pressure switch (14-1) for the protection against low water level (WMS) (Fig. 5a and 5b) for monitoring the supply pressure is permanently factory-set to the thresholds 1 bar (deactivates if pressure below this value) and about 1.3 bar (starts up again when pressure goes above this value). It is not possible to change these settings.

### 8.3 Commissioning the system

Once all preparations have been made and all control measures taken in accordance with Section 8.1:

- The system is to be switched on by means of the optional main switch in the event of COR-1...GE-HS or SiBoost Smart-1...HS systems.
- The system is to be switched on by means of the main switch on the control device and the control set to automatic mode in the event of systems with VR CVV control device.
- The system is to be switched on by means of a separate main switch to be provided by the customer in the event of COR-1...GE systems (without main switch installed at the factory).

The pressure control system switches on the pump until the consumer piping is filled with water and the set pressure has been built up. If the pressure no longer changes (no consumer requirement within a preset time), the control switches off the pump. A precise description in this respect can be found in the installation and operating instructions for the pump or control device.



**Warning! Health hazard!**

**If the system has not been flushed up to now, it should be flushed thoroughly at the latest now (see Section 7.2.3).**

#### 8.4 Decommissioning the system

If the pressure boosting system has to be taken out of service for maintenance, repairs or other measures, proceed as follows.

- Switch off the voltage supply and secure it against being switched on again by unauthorised persons.
- Close the shut-off devices upstream and downstream of the system
- Shut off the diaphragm pressure vessel at the throughflow fitting and drain it
- Drain the system completely if necessary

#### 9 Maintenance

To guarantee maximum operational reliability at the lowest possible operating costs, we recommend that the system is checked and maintained regularly (see DIN 1988 standard). It is advisable to conclude a maintenance contract with a specialist company or with our central customer service. The following checks should be made regularly:

- Inspection of the operational readiness of the pressure boosting system
- Inspection of the mechanical seal of the pump. The mechanical seals require water for lubrication, that can leak out of the seal slightly. If this is noticeable, replace the mechanical seal.
- Inspection of the diaphragm pressure vessel (every 3 months is recommended) to make sure the correct supply pressure is set (see Fig. 3 and Fig. 4).



#### Caution! Risk of property damage!

**If the supply pressure is incorrect, the function of the diaphragm pressure vessel is not guaranteed, which increases the diaphragm wear and can cause system faults.**

- In this case, depressurise the vessel on the water side (close the flow-through fixture (A, Fig. 3) and allow the residual water to drain (B, Fig. 3)).
- Check the gas pressure at the diaphragm pressure vessel valve (top; remove protective cap) with an air pressure gauge (C, Fig. 3)

- If necessary, correct the pressure by filling nitrogen (PN2 = pump start-up pressure  $p_{min}$  minus 0.2–0.5 bar or value specified in the table on the vessel (Fig. 4) – Wilo customer service).
- If the pressure is too high, discharge nitrogen from the valve.



#### Caution!

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

**The safety measures for the handling of pressurised vessels and technical gases must be observed.**

**The pressure specifications in this documentation (Fig. 5) are made in bar. If other units of pressure measurement are used, always be sure to convert the figures correctly!**

- In the case of installations with a frequency converter, the inlet and outlet filter of the fan must be cleaned if they are very dirty. If the system is decommissioned for a long period, proceed as described in 8.4 and drain the pump by opening the drain plug at the pump base. (Also observe the corresponding section in the supplied installation and operating instructions for the pump)

#### 10 Faults, causes and remedies

Faults, particularly those affecting the pumps or the control system, should only be remedied by Wilo's customer service or a specialist company. NOTE!



The general safety instructions must be observed during any maintenance or repair work. Please also observe the installation and operating instructions for the pump and control device, in particular for the display of error messages!

The faults specified here are general faults. If errors are displayed on the display of the frequency converter or control device, make sure you observe the installation and operating instructions for these devices.

Fault	Cause	Remedy
Pump does not start	No mains voltage	Check the fuses, cables and connections.
	Main switch "OFF"	Switch on the main switch
	Water level in break tank too low, i.e. low-water level reached	Check the break tank's inlet valve/supply line.
	Low-water level switch has triggered	Check the inlet pressure.
	Low-water level switch defective	Check and, if necessary, replace the low-water level switch.
	Electrodes connected incorrectly or supply pressure switch set incorrectly	Check the installation or setting and correct it.
	Inlet pressure is above start-up pressure.	Check the default values and correct them if necessary.
	Shut-off device closed at pressure sensor/switch	Check and open the shut-off device if necessary.
	Start-up pressure set too high	Check the setting and correct it if necessary.

Fault	Cause	Remedy
	Fuse defective	Check fuses and replace if necessary
	Motor protection has triggered	Check the default values against the pump or motor data, measure the current values and correct the setting if necessary. Check the motor for defects and replace it if necessary.
	Contactors defective	Check it and replace it if necessary.
	Turn-to-turn fault in the motor	Check, if necessary replace motor or have repaired.
Pump does not shut down.	Strongly fluctuating inlet pressure	Check the inlet pressure and take measures to stabilise the inlet pressure if necessary (e.g. pressure reducers).
	Intake pipe blocked or shut off	Check the inlet pipe and remove the blockage or open the shut-off device if necessary.
	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 shut off the piping and vent the pumps if necessary.
	Impellers blocked	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 blocked	Check and remove the blockage or replace the non-return valve if necessary.
	Gate valve in the system closed or not sufficiently open	Check and open the shut-off device completely if necessary.
	Flow rate too high	Check the pump data and default values and correct them if necessary.
	Shut-off device closed at pressure sensor	Check and open the shut-off device if necessary.
	Switch-off pressure set too high	Check the setting and correct it if necessary.
	Incorrect direction of rotation of the motor	Check the direction of rotation and repair or replace the frequency converter module if necessary.
Switching frequency too high or fluctuating	Major fluctuations of the inlet pressure	Check the inlet pressure and take measures to stabilise the inlet pressure if necessary (e.g. pressure reducers).
	Intake pipe blocked or shut off	Check the inlet pipe and remove the blockage or open the shut-off device if necessary.
	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 sensor	Check and open the shut-off device if necessary.
	Incorrect supply pressure at diaphragm pressure vessel	Check the supply pressure and correct it if necessary.
	Valve at diaphragm pressure vessel closed	Check the valve and open it if necessary.
Switching difference set too low	Check the setting and correct it if necessary.	
Pump not stable and/or making unusual noises	Major fluctuations of the inlet pressure	Check the inlet pressure and take measures to stabilise the inlet pressure if necessary (e.g. pressure reducers).
	Intake pipe blocked or shut off	Check the inlet pipe and remove the blockage or open the shut-off device if necessary.

Fault	Cause	Remedy
	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 shut off the piping and vent the pumps if necessary.
	Air in the pump	Vent the pump, check the suction line for leakages and seal it if necessary.
	Impellers blocked	Check the pump and replace it or have it repaired if necessary.
	Flow rate too high	Check the pump data and default values and correct them if necessary.
	Incorrect direction of rotation of the motors	Check the direction of rotation and repair or replace the frequency converter module if necessary.
	Mains voltage: a phase is missing	Check the fuses, cables and connections.
	Pump not adequately secured 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 become too warm	Air in the inlet	Check and shut off the piping and vent the pumps if necessary.
	Gate valve in the system closed or not sufficiently open	Check and open the shut-off device completely if necessary.
	Impellers blocked	Check the pump and replace it or have it repaired if necessary.
	Non-return valve blocked	Check and remove the blockage or replace the non-return valve if necessary.
	Shut-off device closed at pressure sensor	Check and open the shut-off device if necessary.
	Switch-off point set too high	Check the setting and correct it 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, if necessary replace motor or have repaired.
Current consumption too high	Mains voltage: a phase is missing	Check the fuses, cables and connections.
	Non-return valve leaking	Check and replace the seal or non-return valve if necessary.
	Flow rate too high	Check the pump data and default values and correct them if necessary.
	Turn-to-turn fault in the motor	Check, if necessary replace motor or have repaired.
Motor protection switch triggers	Mains voltage: a phase is missing	Check the fuses, cables and connections.
	Non-return valve defective	Check and replace the non-return valve if necessary.
	Flow rate too high	Check the pump data and default values and correct them if necessary.
	Contactors defective	Check it and replace it if necessary.
	Turn-to-turn fault in the motor	Check, if necessary replace motor or have repaired.
Pump generates no or insufficient power	Mains voltage: a phase is missing	Check the fuses, cables and connections.
	Major fluctuations of the inlet pressure	Check the inlet pressure and take measures to stabilise the inlet pressure if necessary (e.g. pressure reducers).
	Intake pipe blocked or shut off	Check the inlet pipe and remove the blockage or open the shut-off device if necessary.
	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.	

Fault	Cause	Remedy
	Air in the inlet	Check and shut off the piping and vent the pumps if necessary.
	Impellers blocked	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 blocked	Check and remove the blockage or replace the non-return valve if necessary.
	Gate valve in the system closed or not sufficiently open	Check and open the shut-off device completely if necessary.
	Low-water level switch has triggered	Check the inlet pressure.
Pump generates no or insufficient power	Incorrect direction of rotation of the motor	Check the direction of rotation and repair or replace the frequency converter module if necessary.
	Turn-to-turn fault in the motor	Check, if necessary replace motor or have repaired.
Dry-running protection switches off although water is present	Major fluctuations of the inlet pressure	Check the inlet pressure and take measures to stabilise the inlet 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.
	Flow rate too high	Check the pump data and default values and correct them if necessary.
	Electrodes connected incorrectly or supply pressure switch set incorrectly	Check the installation or setting and correct it.
	Low-water level switch defective	Check and, if necessary, replace the low-water level switch.
Dry-running protection does not switch off in spite of low water	Electrodes connected incorrectly or supply pressure switch set incorrectly	Check the installation or setting and correct it.
	Low-water level switch defective	Check and, if necessary, replace the low-water level switch.

**NOTE!**

You can find information on pump or control device faults not dealt with here in the supplied documentation for the components concerned.

**If the operating fault cannot be remedied, please consult a specialist company or your nearest Wilo customer service or representative.**

**11 Spare parts**

Spare parts or repairs may be ordered from local specialist retailers or Wilo customer service. To avoid queries and incorrect orders, all data of the rating plate should be submitted for each order.

**Subject to change without prior notice!**







**DE EG – Konformitätserklärung**  
**EN EC – Declaration of conformity**  
**FR Déclaration de conformité CE**

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

Hiermit erklären wir, dass die Nassläufer-Umwälzpumpen der Baureihe :  
*Herewith, we declare that the glandless circulating pumps of the series:*  
*Par le présent, nous déclarons que les circulateurs des séries :*

**CO(R)- ... Helix V ...**  
**COR- ... Helix VE ...**  
**SiBoost Smart Helix V(E)**  
**SiBoost Smart Helix EXCEL**

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

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

**EG-Maschinenrichtlinie**

**2006/42/EG**

**EC-Machinery directive**

**Directives CE relatives aux machines**

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

**Elektromagnetische Verträglichkeit – Richtlinie**

**2004/108/EG**

**Electromagnetic compatibility – directive**

**Compatibilité électromagnétique – directive**

angewendete harmonisierte Normen, insbesondere:  
*as well as following harmonized standards:*  
*ainsi qu'aux normes harmonisées suivantes:*

**EN ISO 12100, EN 60204-1,**  
**EN 61000-6-1,**  
**EN 61000-6-2,**  
**EN 61000-6-3,**  
**EN 61000-6-4**

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

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

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<p><b>NL</b> <b>EG-verklaring van overeenstemming</b> Hiermede verklaren wij dat dit aggregaat in de geleverde uitvoering voldoet aan de volgende bepalingen:  <b>EG-richtlijnen betreffende machines 2006/42/EG</b> <b>Elektromagnetische compatibiliteit 2004/108/EG</b> gebruikte geharmoniseerde normen, in het bijzonder: zie vorige pagina</p>	<p><b>IT</b> <b>Dichiarazione di conformità CE</b> Con la presente si dichiara che i presenti prodotti sono conformi alle seguenti disposizioni e direttive rilevanti:  <b>Direttiva macchine 2006/42/EG</b> <b>Compatibilità elettromagnetica 2004/108/EG</b> norme armonizzate applicate, in particolare: vedi pagina precedente</p>	<p><b>ES</b> <b>Declaración de conformidad CE</b> Por la presente declaramos la conformidad del producto en su estado de suministro con las disposiciones pertinentes siguientes:  <b>Directiva sobre máquinas 2006/42/EG</b> <b>Directiva sobre compatibilidad electromagnética 2004/108/EG</b> normas armonizadas adoptadas, especialmente: véase página anterior</p>
<p><b>PT</b> <b>Declaração de Conformidade CE</b> Pela presente, declaramos que esta unidade no seu estado original, está conforme os seguintes requisitos: <b>Directivas CEE relativas a máquinas 2006/42/EG</b> <b>Compatibilidade electromagnética 2004/108/EG</b> normas harmonizadas aplicadas, especialmente: ver página anterior</p>	<p><b>SV</b> <b>CE- försäkran</b> Härmed förklarar vi att denna maskin i levererat utförande motsvarar följande tillämpliga bestämmelser: <b>EG-Maskindirektiv 2006/42/EG</b> <b>EG-Elektromagnetisk kompatibilitet – riktlinje 2004/108/EG</b> tillämpade harmoniserade normer, i synnerhet: se föregående sida</p>	<p><b>NO</b> <b>EU-Overensstemmelseserklæring</b> Vi erklærer hermed at denne enheten i utførelse som levert er i overensstemmelse med følgende relevante bestemmelser: <b>EG-Maskindirektiv 2006/42/EG</b> <b>EG-EMV-Elektromagnetisk kompatibilitet 2004/108/EG</b> anvendte harmoniserte standarder, særlig: se forrige side</p>
<p><b>FI</b> <b>CE-standardinmukaisuusseloste</b> Ilmoitamme täten, että tämä laite vastaa seuraavia asiaankuuluvia määräyksiä: <b>EU-konedirektiivit: 2006/42/EG</b> <b>Sähkömagneettinen soveltuvuus 2004/108/EG</b> käytetyt yhteensovitettut standardit, erityisesti: katso edellinen sivu.</p>	<p><b>DA</b> <b>EF-overensstemmelseserklæring</b> Vi erklærer hermed, at denne enhed ved levering overholder følgende relevante bestemmelser: <b>EU-maskindirektiver 2006/42/EG</b> <b>Elektromagnetisk kompatibilitet: 2004/108/EG</b> anvendte harmoniserede standarder, særligt: se forrige side</p>	<p><b>HU</b> <b>EK-megfelelőségi nyilatkozat</b> Ezennel kijelentjük, hogy az berendezés megfelel az alábbi irányelveknek: <b>Gépek irányelv: 2006/42/EK</b> <b>Elektromágneses összeférhetőség irányelv: 2004/108/EK</b> alkalmazott harmonizált szabványoknak, különösen: lásd az előző oldalt</p>
<p><b>CS</b> <b>Prohlášení o shodě ES</b> Prohlašujeme tímto, že tento agregát v dodaném provedení odpovídá následujícím příslušným ustanovením:  <b>Směrnice ES pro strojní zařízení 2006/42/ES</b> <b>Směrnice o elektromagnetické kompatibilitě 2004/108/ES</b>  použité harmonizační normy, zejména: viz předchozí strana</p>	<p><b>PL</b> <b>Deklaracja Zgodności WE</b> Niniejszym deklarujemy z pełną odpowiedzialnością, że dostarczony wyrób jest zgodny z następującymi dokumentami:  <b>dyrektywą maszynową WE 2006/42/WE</b> <b>dyrektywą dot. kompatybilności elektromagnetycznej 2004/108/WE</b> stosowanymi normami zharmonizowanymi, a w szczególności: patrz poprzednia strona</p>	<p><b>RU</b> <b>Декларация о соответствии Европейским нормам</b> Настоящим документом заявляем, что данный агрегат в его объеме поставки соответствует следующим нормативным документам: <b>Директивы ЕС в отношении машин 2006/42/EG</b> <b>Электромагнитная устойчивость 2004/108/EG</b>  Используемые согласованные стандарты и нормы, в частности: см. предыдущую страницу</p>
<p><b>EL</b> <b>Δήλωση συμμόρφωσης της ΕΕ</b> Δηλώνουμε ότι το προϊόν αυτό ο' αυτή την κατάσταση παράδοσης ικανοποιεί τις ακόλουθες διατάξεις: <b>Οδηγίες ΕΚ για μηχανήματα 2006/42/ΕΚ</b> <b>Ηλεκτρομαγνητική συμβατότητα ΕΚ-2004/108/ΕΚ</b> Εναρμονισμένα χρησιμοποιούμενα πρότυπα, ιδιαίτερα: βλέπε προηγούμενη σελίδα</p>	<p><b>TR</b> <b>CE Uygunluk Teyid Belgesi</b> Bu cihazın teslim edildiği şekliyle aşağıdaki standartlara uygun olduğunu teyid ederiz: <b>AB-Makina Standartları 2006/42/EG</b> <b>Elektromanyetik Uyumluluk 2004/108/EG</b> kismen kullanılan standartlar için: bkz. bir önceki sayfa</p>	<p><b>RO</b> <b>EC-Declarație de conformitate</b> Prin prezenta declarăm că acest produs așa cum este livrat, corespunde cu următoarele prevederi aplicabile: <b>Directiva CE pentru mașini 2006/42/EG</b> <b>Compatibilitatea electromagnetică – directiva 2004/108/EG</b> standarde armonizate aplicate, îndeosebi: vezi pagina precedentă</p>
<p><b>ET</b> <b>EÜ vastavusdeklaratsioon</b> Käesolevaga tõendame, et see toode vastab järgmistele asjakohastele direktiividele: <b>Masindirektiiv 2006/42/EÜ</b> <b>Elektromagnetilise ühilduvuse direktiiv 2004/108/EÜ</b> kohaldatud harmoneeritud standardid, eriti: vt eelmist lk</p>	<p><b>LV</b> <b>EC - atbilstības deklarācija</b> Ar šo mēs apliecinām, ka šis izstrādājums atbilst sekojošiem noteikumiem: <b>Mašīnu direktīva 2006/42/EK</b> <b>Elektromagnētiskās savietojamības direktīva 2004/108/EK</b> piemēroti harmonizēti standarti, tai skaitā: skatīt iepriekšējo lappusi</p>	<p><b>LT</b> <b>EB atitikties deklaracija</b> Šiuo pažymima, kad šis gaminytis atitinka šias normas ir direktyvas:  <b>Mašinų direktyvą 2006/42/EB</b> <b>Elektromagnetinio suderinamumo direktyvą 2004/108/EB</b> pritaikytus vieningus standartus, o būtent: žr. ankstesniame puslapyje</p>
<p><b>SK</b> <b>ES vyhlášení o zhode</b> Týmto vyhlasujeme, že konštrukcie tejto konštrukčnej série v dodanom vyhotovení vyhovujú nasledujúcim príslušným ustanoveniam: <b>Stroje - smernica 2006/42/ES</b> <b>Elektromagnetická zhoda - smernica 2004/108/ES</b> používané harmonizované normy, najmä: pozri predchádzajúcu stranu</p>	<p><b>SL</b> <b>ES – izjava o skladnosti</b> Izjavljamo, da dobavljene vrste izvedbe te serije ustrezajo sledečim zadevnim določilom:  <b>Direktiva o strojih 2006/42/ES</b> <b>Direktiva o elektromagnetni združljivosti 2004/108/ES</b> uporabljeni harmonizirani standardi, predvsem: glejte prejšnjo stran</p>	<p><b>BG</b> <b>EO-Декларация за съответствие</b> Декларираме, че продуктът отговаря на следните изисквания:  <b>Машинна директива 2006/42/EO</b> <b>Електромагнитна съвместимост – директива 2004/108/EO</b> Хармонизирани стандарти: вж. предната страница</p>
<p><b>MT</b> <b>Dikjarazzjoni ta' konformità KE</b> B'dan il-mezz, niddikjaraw li l-prodotti tas-serje jissodisaw id-dispożizzjonijiet relevanti li ġejjin: <b>Makkinarju – Direttiva 2006/42/KE</b> <b>Kompatibilità elettromanjetika – Direttiva 2004/108/KE</b> b'mod partikolari: ara l-paġna ta' qabel</p>	<p><b>HR</b> <b>EZ izjava o skladnosti</b> Ovim izjavljujemo da vrste konstrukcije serije u isporučenoj izvedbi odgovaraju sljedećim važećim propisima: <b>EZ smjernica o strojevima 2006/42/EZ</b> <b>Elektromagnetna kompatibilnost – smjernica 2004/108/EZ</b> primijenjene harmonizirane norme, posebno: vidjeti prethodnu stranicu</p>	<p><b>SR</b> <b>EZ izjava o usklađenosti</b> Ovim izjavljujemo da vrste konstrukcije serije u isporučenoj verziji odgovaraju sledećim važećim propisima: <b>EZ direktiva za mašine 2006/42/EZ</b> <b>Elektromagnetna kompatibilnost – direktiva 2004/108/EZ</b> primenjeni harmonizovani standardi, a posebno: videti prethodnu stranu</p>

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