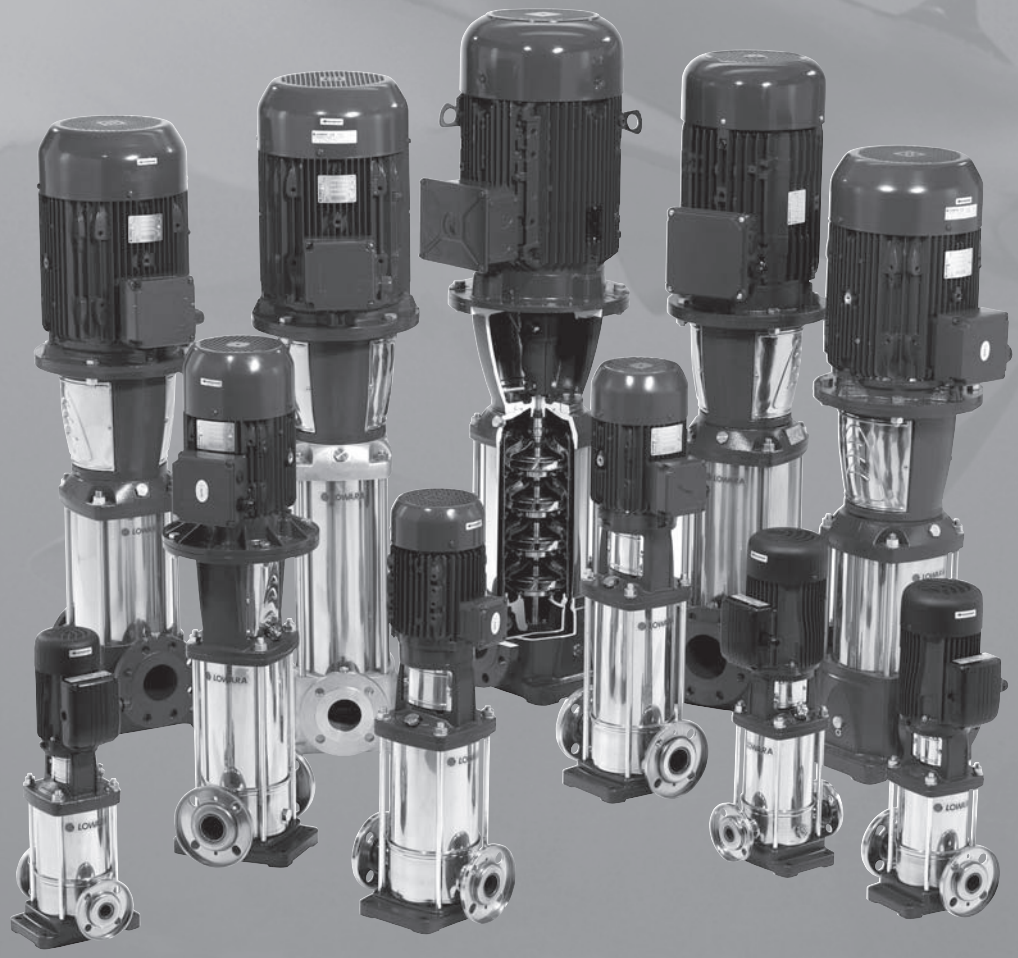
ITT

e-SV™ Series
1, 3, 5, 10, 15, 22, 33, 46, 66, 92, 125

Installation & Operating Instructions



Engineered for life

WARNINGS FOR THE SAFETY OF PEOPLE AND PROPERTY

Meaning of the symbols used in this manual

DANGER
Failure to observe this warning may cause personal injury and damage to property

ELECTRIC SHOCK
Failure to observe this warning may result in electric shock

WARNING
Failure to observe this warning may cause damage to the pump, system, panel or environment

Read the manual carefully before proceeding

Information for …	
… carriers	Specific information for carriers, handlers and warehouse personnel
… installers	Specific information for personnel in charge of installing the product in the system (plumbing and/or electrical aspects)
… users	Specific information for users of the product
…maintenance personnel	Specific information for personnel in charge of maintenance
… repair personnel	Specific information for repair personnel

1. Overview

The purpose of this manual is to provide the necessary information for proper installation, operation and maintenance of the pumps/electric pump units. The instructions and warnings provided below concern the standard version, as described in the sale documents. Special versions may be supplied with supplementary instructions leaflets. Please refer to the sale contract for any modifications or special version characteristics. Always specify the exact pump/electric pump unit type and identification code when requesting technical information or spare parts from the Sales and Service department. For instructions, situations or events not considered in this manual or in the sale documents, please contact the nearest Lowara Service Center.

2. Product Description

Information for installers and users

The SV range features vertical multistage non-self priming pumps which can be coupled to standard electric motors.
In the 1, 3, 5, 10, 15, 22SV series, all the metal parts that are in contact with the water are made of stainless steel. They are available in different versions according to the position of the suction and delivery ports and the shape of the connection flanges. In the 33, 46, 66, 92, 125SV series, some of the metal parts in contact with the water are made of stainless steel, others are made of cast iron. A special version is available, in which all the metal parts in contact with the water are made of stainless steel. If you have bought a pump without an electric motor, make sure that the motor used is suitable for coupling to the pump.

3. Applications

Information for installers and users

These pumps are suitable for civil and industrial water distribution systems, irrigation (agriculture, sports facilities), water treatment, boiler feed, parts washing, cooling - air conditioning - refrigeration and firefighting applications.

3.1 Working Limits

3.1.1 How to Read the Pump's Rating Plate

The drawings in section 11, **Fig.A** and **Fig.B**, show the essential data found on the rating plates for electric pump units and pumps.

3.1.2 Pumped Liquids, Pressures, Temperatures

This pump can be used to pump cold water, hot water, water with glycol.
The rating plate in **Fig.A** provides information regarding the gasket and mechanical seal materials (whose representation is depicted in **Fig.B**).

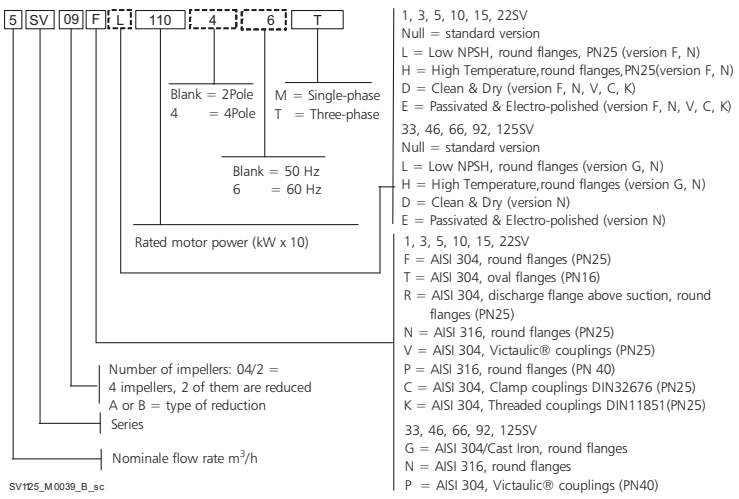
Fig.A KEY

1	Mechanical seal material identification code
2	Flow range
3	Head range
4	Minimum head
5	Speed
6	Frequency
7	Maximum operating pressure
8	Electric pump unit absorbed power
9	Pump / electric pump unit type
10	O-ring material identification code
11	Electric pump unit / Pump code
12	Protection class
13	Maximum liquid temperature
14	Motor nominal power
15	Rated Voltage
16	Manufacturing date and serial number

Fig.B KEY

1	B Resin impregnated carbon
	C Special resin impregnated carbon
	Q1 Silicon carbide
2	E EPDM
	T PTFE
	V FPM (FKM)
3	G 1.4401 (AISI 316)

Identification code on Rating Plate is exemplified below:

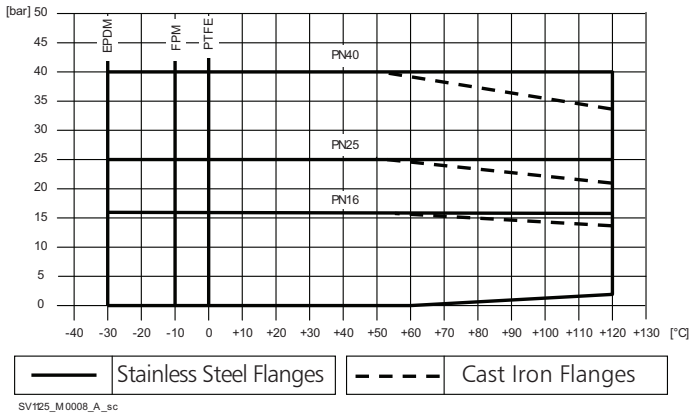


Do not use this pump/electric pump unit to handle flammable and/or explosive liquids..

WARNING Do not use this pump to handle liquids containing abrasive, solid or fibrous substances.

For special requirements, please contact the Sales and Service Department.
Depending on the pump model and on the temperature of the pumped liquid, the maximum operating pressure is shown in the following chart.

Liquid Temperature	Minimum	Maximum
- for standard version (EPDM gaskets):	- 30°C	+ 120 °C
- for special version (FPM gaskets):	- 10 °C	+ 120 °C
- for special version (PTFE gaskets):	0 °C	+ 120 °C
- for household and similar purposes (EN 60335-2-41):		+ 90 °C



3.1.3 Suction

In theory, a pump could suck water from a source located 10.33 meters lower than the pump's own installation level, but this does not happen because the pump offers its own intrinsic flow resistance, moreover the suction capacity is reduced as a result of flow resistance in the piping, height difference, liquid temperature and elevation above sea level.
A wrong choice in the altimetric placement of the pump could lead to cavitation.
With reference to **Fig. C** and given **Z** as the maximum height at which the pump can be installed, with reference to the level of the liquid source the following can be stated:

$Z = p_b \bullet 10{,}2 - NPSH - H_f - H_v - 0{,}5$ [m]

p_b	Barometric pressure in bar, in closed systems it shows system pressure
NPSH	Value in [m] of the pump intrinsic flow resistance
H_f	Total losses in [m] caused by passage of liquid through parts on the inlet side of the pump
0.50	Recommended safety margin in [m]
H_v	Steam pressure in [m] through the liquid Temperature T [°C] (for additional information → **Fig.C**)

With the meanings given in the above table it can be stated that:
If $Z \geq 0$ the pump can work with a maximum suction height equal to Z.
If $Z < 0$ the pump must be provided with an inlet pressure equal to –Z.
For additional information on SV-series performances → **Fig.D**

WARNING Do not use the pump if cavitation occurs, as its internal components could be damaged.

WARNING If hot water is pumped, guarantee an appropriate condition on the suction side to prevent cavitation.

WARNING Make sure that the sum of the pressure on the suction side (water mains, gravity tank) and the maximum pressure delivered by the pump does not exceed the maximum working pressure allowed (nominal pressure PN) for the pump (→ **Fig.E**).

$p_{1max} \leq PN - p_{max}$

With the following meaning of the symbols:

p_{max}	Maximum pressure delivered by the pump
p_{1max}	Maximum inlet pressure
PN	Maximum operating pressure

If a motor with an axially locked shaft (Lowara standard) is used, ensure that the above formula is fulfilled, if not please contact the Sales and Service Department.

3.1.4 Minimum nominal flow rate

WARNING Do not run the pump with the on-off valve shut on the delivery side for longer than a few seconds.

To determine minimum nominal flow rate → **Fig.G**

3.1.5 Number of starts per hour

For electric pump units coupled to motors supplied by Lowara, the maximum number of work cycles (starts and stops) in one hour is as follows:

kW	0.25	0.37	0.55	0.75	1.1	1.5	2.2	3
n	60							

kW	4	5.5	7.5	11	15	18.5	22	30	37	45	55
n	40			30		24		15		8	4

WARNING If a different motor is used instead of the standard one supplied by Lowara, check the relevant instructions to find out the maximum number of work cycles allowed.

3.1.6 Installation Site

WARNING Protect the pump/electric pump unit from the weather (rain, wind,…) and freezing temperatures. Provide adequate ventilation for motor cooling purposes.

Ambient temperature +0°C to +40°C.
Relative ambient humidity must not exceed 50% at +40°C.

WARNING For temperatures above +40°C and for installation sites located at elevations of over 1000 meters above sea level, the motor must be derated (the power it delivers must be decreased) to guarantee its proper cooling. The motor may have to be replaced with a more powerful one. Please check **Fig.H** and, when in doubt, please contact the Sales and Service Department.

If the relative air humidity conditions are high, please contact the Sales and Service Department.

Do not use the pump/electric pump unit in environments that may contain flammable/explosive or chemically aggressive gases or powders.

Provide adequate lighting and clearance around the pump/electric pump unit. Make sure it is easily accessible for installation and maintenance operations. Make sure that any fluid leaks or other events of this nature will not lead to flooding of the installation area and consequent submersion of the pump/electric pump unit.

3.1.7 Power Supply Requirements

WARNING Make sure that the supply voltages and frequencies are suited to the characteristics of the electric motor. Check the motor rating plate.

In general, the supply voltage tolerances for motor operation are as follows:

f [Hz]	~	UN [V]	±%	f [Hz]	~	UN [V]	±%
50	1	220-240	6	60	1	220-240	6
50	2	230/400	10	60	3	220/380	5
50	3	400/690	10	60	3	380/660	10

3.1.8 Sound Emission Level

See **Fig.I** , where P2 is the nominal rated motor power.

3.1.9 Special Applications

WARNING Please contact the Sales and Service Department in the following cases:

- if liquids with a density and/or viscosity value exceeding that of water (such as water and glycol mixture) must be pumped; as it may be necessary to install a more powerful motor
- if chemically treated water (softened, deionized, demineralized, …) must be pumped
- if the pump must be installed horizontally (→ section 9)

and for any situation other than the ones described, related to the nature of the liquid.

3.1.10 Improper Use

If the pump/electric pump unit is used improperly, dangerous conditions may be created and personal injury and damage to property may be caused.

Here are a few examples of improper use:

- pumping liquids that are not compatible with the pump construction materials
- pumping hazardous (toxic, explosive, corrosive) liquids
- pumping liquids for drinking (wine, milk,……)
- installing the pump/electric pump unit in hazardous locations (explosive atmospheres)
- installing the electric pump unit in a location where the air temperature is very high and/or there is poor ventilation
- installing the electric pump unit outdoors where it is not protected against rain and/or freezing temperatures

An improper use of the electric pump unit /pump leads to the loss of the Warranty.

3.2 Warranty

Please refer to the sale contract for any information.

3.3 For UK market only (Installation Requirements and Notes)

A WRAS label on the product means it is a Water Regulations Advisory Scheme - Approved Product. This product is suitable to be used with cold potable water for human consumption.
For further information, please refer to IRNs R001 and R420 in the WRAS Water Fittings and Materials Directory (www.wras.co.uk).

4. Transportation and Storage

information for carriers

4.1 Transportation, Storing and Handling of the Packed Product

The pumps/electric pump units are packed in cartons or wooden crates having different dimensions and shapes. Check the outside of the package for evident signs of damage.

WARNING Some cartons (the supporting base is made of wood) are designed to be transported and handled in the vertical position. Other cartons, as well as the wooden crates, are designed to be transported and handled in the horizontal position. Protect the product against humidity, heat sources and mechanical damage (collisions, falls, …). Do not place heavy weights on the cartons.

Lift and handle the product carefully, using suitable lifting equipment. Observe all the accident prevention regulations.

The packed product must be stored at the following room temperature range: -5°C to +40°C.

4.2 Unpacking the Product

information for installers

Use suitable equipment. Observe all the accident prevention regulations in force. Lift and handle the product carefully, using suitable lifting equipment.

When the pump/electric pump unit is unpacked, check the outside of the package for evident signs of damage that may have occurred during transportation and storage.

4.2.1 Carton (for transportation in vertical position)

Remove the staples and open the carton. The pump/electric pump unit is secured to the wooden base by screws.

4.2.2 Carton (for transportation in horizontal position)

Remove the staples and open the carton. The pump/electric pump unit is secured to one of the sides by screws or straps.

4.2.3 Wooden Crate (for transportation in horizontal position)

Open the cover, pay attention to the nails and straps. The pump/electric pump unit is secured to one of the sides by bolts or straps.

4.2.4 Disposal of Packing Materials

If the packing container cannot be utilized for other purposes, dispose of it according to the sorted waste disposal regulations locally in force.

4.3 Handling the Product

Lift and handle the product carefully, using suitable lifting equipment. Observe the accident prevention regulations in force. Check the gross weight indicated on the package to select proper lifting equipment.

The product must be securely harnessed for lifting and handling → **Fig.F**.

To move the electric pump unit:

- Use straps surrounding the motor if the electric pump unit is equipped with the following motor power: 0.25÷4kW.
- Use ropes linked to the 2 flanges (or the 2 eyebolts, if provided) located near the mating zone between motor and pump with the following motor power: 5.5÷55KW
- Use eyebolts screwed onto the motor exclusively for handling the individual motor and not for handling the whole electric pump unit.

5. Installation

information for installers

The installation operations must be carried out by qualified and experienced personnel. Use suitable equipment and protections. Observe the accident prevention regulations in force.

Carefully read the installation limits specified in section 3.1.6.
Always refer to the local and/or national regulations, legislation and codes in force relating to the selection of the installation site and the water and power connections.

5.1.1 Position

Make sure that no obstructions or obstacles hinder the normal flow of the cooling air delivered by the motor fan. Make sure there is adequate clearance around the pump for the maintenance operations. Whenever possible, raise the pump slightly from the level of the floor. Carefully observe the diagrams provided in **Fig.J**.

5.1.2 Anchoring

Anchor the pump/electric pump unit securely with bolts to a concrete foundation or equivalent metal structure (shelf or platform). If the pump/electric pump unit is large-sized and needs to be installed near rooms inhabited by people, suitable vibration-damping supports should be provided to prevent the transmission of the vibrations from the pump to the reinforced concrete structure. The dimensions of the pump base and anchoring holes are shown in the diagrams in **Fig.L**.

5.1.3 Selecting the Suction and Delivery Pipes

Use pipes suited to the maximum working pressure of the pump.

In the case of an open circuit, make sure that the diameter of the suction pipe is suited to the installation conditions and that it is not smaller than the diameter of the suction port. Refer to the illustrations in section 3.1.3 and the diagrams in **Fig.K**.

Fig.K KEY

1	Pipe support so burden does not weigh on pump flange
2	On-off valve to avoid having to drain the system for maintenance, repair or pump replacement operations
3	Flexible pipe or union to avoid transmitting vibrations to the pipes
4	Non-return valve to prevent water backflow when pump is off, in case of positive suction head or closed loop system
5	Control panel
6	Do not install elbows near the pump ports
7	Provide a by-pass circuit if the pump must operate with the delivery side closed for more than a few seconds, in order to avoid overheating the water inside the pump
8	Use eccentric reducer adaptors if it is necessary to increase the diameter of the suction pipe
9	Use wide bends, avoid using elbows which cause excessive flow resistance
10	The piping must have a positive gradient to prevent the formation of air pockets
11	The diameter of the pipe must not be smaller than the diameter of the pump's suction port to prevent pump malfunctions
12	Use a foot valve in case of negative suction head
13	Make sure the height difference is not excessive in order to prevent pump malfunctions and damage
14	Make sure the foot valve is adequately submerged when the water is at minimum level. If the water level is too low, air suction could occur

5.1.4 Selecting the Foot Valve

Install a foot valve at the end of the suction pipe if the level of the liquid source is lower than the pump's. Refer to the illustrations in section 3.1.3 and the diagrams in **Fig.K**.

5.1.5 Selecting the Electric Control Panel

The motors must be suitably protected against overload and short circuits.

WARNING Make sure that the panel's electric ratings match those of the electric pump unit. Improper combinations may cause problems and fail to guarantee the protection of the electric motor.

If thermal relays are used, those that are sensitive to phase failure are recommended.

6. Start-up

information for installers

6.1 Water Connection

The water connections must be made by qualified installation technicians in compliance with the regulations in force.
In case of connection to the water system, the regulations issued by the competent authorities (municipality, public utility company) must be observed.

Authorities often require the installation of a backflow prevention device, such as a disconnector or check valve or disconnection tank.

The suction pipe must be perfectly sealed and watertight. If the pump/electric pump unit is installed near dwellings, suitable pipes or flexible unions should be provided to prevent the transmission of vibrations from the pump to the pipes. Install on-off valves on the suction and delivery sides to avoid having to drain the system before maintenance, repair or pump replacement operations can be performed. Whenever necessary, provide a by-pass circuit to prevent the overheating of the water inside the pump.
Refer to the illustrations in section 3.1.3 and the diagrams in **Fig.K**.

6.2 Electrical Connection

The electrical connections must be performed by a qualified installation technician in compliance with the regulations in force.

WARNING Make sure that the supply voltages and frequencies are suited to the characteristics of the electric motor. Check the motor rating plate. Provide suitable general protection against short circuits on the power line.

Before proceeding, make sure that all the connections (even those that are potential-free) are voltage-free. The power supply line must be provided with the following devices (unless otherwise specified by the local regulations in force:

- A short-circuit protection device
- A high-sensitivity differential device (30mA) providing additional protection against electric shock in case the grounding system is inefficient.
- A mains isolator switch with a contact gap of at least 3 millimeters.

Ground the system according to the regulations in force. First of all, connect the external protection conductor to the PE terminal, making sure that it is longer than the phase leads. The selection of the leads (gauge, material, sheath material,...) must take into account the actual operating conditions. Protect the electrical leads from too high temperatures, vibrations and collisions.

To facilitate the connection, the terminal board can be placed in one of the four 90° positions. To obtain the most convenient position for the connection of the power supply cables, remove the 4 adaptor/motor fastening bolts and rotate the motor to the desired position without removing the coupling between the motor shaft and the pump shaft. Replace the 4 bolts and tighten them. Remove the screws that fasten the terminal box cover and make the connections as shown on the back of the cover and in the diagrams in **Fig.M**.

6.2.1 Overload protection (single-phase motors)

The single-phase electric pump units, up to 1.5 kW power, have an automatic reset protection incorporated in the motor (motor protector). Be careful because the pump could start up suddenly once the motor winding has cooled down.

WARNING For versions with 2.2 kW and higher powers, an overload protection (thermal relay or motor protector) must be provided. If a different motor from the standard one Lowara provides is used, read the operating instructions to ensure whether the protection is provided or not.

Adjust the thermal relay or motor protector to the nominal current value of the electric pump unit or to the operating current if the motor is not used at full load.

6.2.2 Overload protection (three-phase motors)

WARNING Provide the overload protection (thermal relay or motor protector)

Adjust the thermal relay or motor protector to the nominal current value of the electric pump unit or to the operating current in case the motor is not used at full load. If the motor has a star-delta starting system, adjust the thermal relay to a value equal to 58% of the nominal current or operating current.

6.2.3 Protection against Dry Running

WARNING Avoid the possibility of dry running, i.e. the pump must not run without water inside it. Make sure that the electric panel is equipped with a dry running protection system to which a pressure switch or float switch or sensors or other suitable device must be connected.

If the pump sucks the water from the mains, a pressure switch can be installed on the suction side to switch off the pump in the event of low mains pressure (always refer to the regulations locally in force). If the pump sucks the water from a storage tank or reservoir, a float switch or sensors to switch off the pump in the event of low water level can be installed.

6.3 Priming

WARNING Fill the pump and suction pipes with water before starting the unit. Dry running can damage the pump.

Pay attention to the instructions contained in this chapter and to the diagrams in **Fig.Na** and **Fig.Nb** for placement of the plugs.

Fig.Na , Nb KEY

A	Fill plug with air valve (R3/8 for 1, 3, 5, 10, 15, 22SV, G 1/2 in all other cases)
B	Fill plug (R3/8 for 1, 3, 5, 10, 15, 22SV , G 1/2 in all other cases)
C	Drain plug (R3/8 for 10, 15, 22SV , G 1/2 in all other cases)
D	Plug for drum, if present (do not unscrew)
E	Gauge connection plug (R 3/8) only for 33, 46, 66, 92, 125SV
1	Fill plug with open air valve
2	Fill plug with closed air valve
3	Version without plug and drum
4	Version with plug but no drum (do not unscrew)
5	Version with plug and drum (do not unscrew)

Pay attention to **Fig.Pa** , **Fig.Pb** and to the KEY below for correct application of the procedures in 6.3.1 and 6.3.2.

Fig.Pa , Pb KEY

A	Fill and air plug
B	Drain plug
C	Fill plug
D	Funnel

6.3.1 Suction from a Higher Level or From the Water Mains (Positive Suction Head)

Shut the on-off valve located downstream from the pump.

6.3.1.1 1, 3, 5SV Series

Loosen the drain plug pin B to end of travel without forcing it. Remove the fill plug/air valve A and open the on-off valve upstream until the water flows out of the fill plug/air valve A. Tighten the drain plug pin B to the end of travel without forcing it. Replace the fill plug/air valve A.

6.3.1.2 10, 15, 22, 33, 46, 66, 92, 125SV Series

Remove the fill plug/air valve A and open the on-off valve upstream until the water flows out of the fill plug/air valve A. Close the fill plug/air valve A. Fill plug C can be used instead of plug A.

6.3.2 Suction from a Lower Level (Suction Lift)

Open the on-off valve located upstream from the pump and close the on-off valve downstream.

6.3.2.1 1, 3, 5SV Series

Loosen the drain plug pin B to end of travel without forcing it. Remove the fill plug/air valve A and fill the pump using a funnel until water flows out. Replace the fill plug/air valve A and tighten the drain plug pin B to the end of travel without forcing it .

6.3.2.2 10, 15, 22, 33, 46, 66, 92, 125SV Series

Remove the fill plug/air valve A and fill the pump using a funnel.Replace the fill plug/air valve A. Fill plug C can be used instead of plug A.

6.4 Checking the Rotation Direction of Three-Phase Motors

When the pump has been electrically connected (→ section 6.2) and primed (→ section 6.3), make sure the on-off valve downstream from the pump is closed.
Start the pump and check the direction of rotation through the coupling protection or through the motor fan cover (for the three-phase versions). The correct rotation direction is indicated by arrows on the adaptor, coupling and/or motor fan cover. If the rotation direction is incorrect, stop the pump, disconnect the power supply and exchange the position of two wires in the motor's terminal board or in the electric control panel.

6.5 Operation

Start the pump, keeping the on-off valve downstream from the pump closed. Open the on-off valve gradually. The pump must run smoothly and quietly.
If necessary, re-prime the pump. Check the current absorbed by the motor and, if necessary, adjust the setting of the thermal relay. Any air pockets trapped inside the pump may be released by turning the air screw.

WARNING If a pump installed in a location where freezing may occur remains inactive, drain it through the drain plugs. This operation is not necessary if suitable antifreeze has been added to the water.

Make sure that the drained liquid does not cause damage or injuries.

During operation, the outer surface of the pump (if hot liquids are being pumped) and the outer surface of the motor can exceed 40°C. Do not touch with parts of the body (e.g.: hands) and do not put combustible material in contact with the pump.

WARNING Please refer to **Fig.Q**, **Fig.R**, **Fig.S** for torques to be applied in threaded elements (bolts and plugs, mating between motor and adapter, mating between couplings).

WARNING For applicable Forces and Torques to the flanges please refer to **Fig.T**

Fig.Q KEY

A	Motor size
B	Adapter - motor screw
C	Coupling screw
Ø	Diameter
N•m	Driving torque

Fig.R, Fig.S KEY

A	Impeller locking screw
B	Tie rod nut
C	Drum locking plate screws (and diffuser bushings, 125SV only)
D	Mechanical seal housing lock screws (and diffuser, 125SV only)
E	Fill plug with air valve
F	Fill/drain plugs
G	Gauge connection plug
H	Round counter flange screws
I	Oval counter flange screws
Ø	Diameter
N•m	Driving torque

7. Maintenance, Service, Spare Parts

Information for maintenance personnel

Before performing any maintenance operations on the electric pump unit, make sure that the motor is voltage-free.

Maintenance operations must be performed by skilled and qualified personnel only. Use suitable equipment and protection devices. Observe the accident prevention regulations in force.
If pump must be drained, make sure that the drained liquid does not cause damage or injuries.

The pump is supplied with a calibrated fork-shaped shim designed to facilitate the motor coupling and replacement operations.

7.1 Routine Maintenance

The pump does not require any scheduled routine maintenance. In general, the checking of the following aspects, or some of them, at varying intervals depending on the operating conditions is recommended: pumped liquid leaks, delivery pressure, starts per hour, noise, triggering of the electrical protections (relays, fuses,…).
If the user wishes to draw up a maintenance schedule, related deadlines depend on the type of liquid pumped and on the operating conditions.

7.2 Extraordinary Maintenance

Extraordinary maintenance may be necessary in order to clean the liquid end or replace the mechanical seal and other worn parts.

7.3 Motor/Pump Coupling

The pump may be supplied without the electric motor. In this case the calibrated fork-shaped shim is already inserted between the adapter and the transmission coupling in order to keep the impeller stack in the correct axial position. To prevent damage during transportation, the pump shaft is held in position by Styrofoam and two plastic straps. The bolts and nuts needed to fasten the motor to the adaptor are not included. Refer to the diagrams in **Fig.U**, **Fig.V**.to couple the pump to the motor.

7.3.1 Selecting the Electric Motor

If the pump alone has been bought, without the motor, the safety of the coupled pump with a motor other than those described in Lowara's catalogue must be guaranteed by the person making the coupling.

Single-phase or three-phase motors whose size and power comply with the European standards can be used.

WARNING Use dynamically balanced motors, with half-sized key in the shaft extension (IEC 60034-14) and with normal vibration rate (N).

7.4 Replacing the Motor

Refer to the diagrams in **Fig.U**, **Fig.V**.
If the calibrated fork-shaped shim is not available, use a 5 ± 0.1 mm shim.

7.5 Mechanical Seals

Pumps	Basic characteristics of the mechanical seals
1, 3, 5SV	Nominal diameter 12 mm, unbalanced, right-hand rotation, K version (EN 12756)
10, 15, 22SV	Nominal diameter 16 mm, unbalanced, balanced with motor power ≥ 5.5kW , right-hand rotation, K version (EN 12756)
33, 46, 66, 92, 125SV	Nominal diameter 22 mm, balanced, right-hand rotation, K version (EN 12756)

7.5.1 Replacing the Mechanical Seal on 1, 3, 5, 10, 15, 22SV Series Pumps with motor power of 4kW or lower.

Contact the Sales and Service department.

7.5.2 Replacing the Mechanical Seal on 10, 15, 22SV (with motor power ≥ 5.5kW), 33, 46, 66, 92, 125SV Series Pumps

Refer to the diagrams in **Fig.X**.

7.6 Service

Please contact the Sales and Service Department for any request or information.

7.7 Spare Parts

WARNING Always specify the exact pump/electric pump unit type and identification code when requesting technical information or spare parts from the Sales and Service department.

Use only original spare parts to replace any worn or faulty components. The use of unsuitable spare parts may cause malfunctions, damage and injuries.

Refer to the diagrams in **Fig.Y, W, Z**.

8. Disposal

Information for installation and maintenance personnel

Observe the regulations and codes locally in force regarding sorted waste disposal.

9. Special Version - Horizontal Installation

Information for installers and users

If pump must be installed in the horizontal position, a special version and mounting brackets must be requested from the Sales and Service Department.

10. Troubleshooting

information for users and maintenance personnel

PROBLEM	PROBABLE CAUSE	POSSIBLE SOLUTION
The electric pump unit does not start. The main switch is on	No power supply	Restore the power supply
	Triggering of thermal protector incorporated in the pump (if any)	Wait for the pump motor to cool down
	Triggering of thermal relay or motor protector found in the electric control panel	Reset the thermal protector
	Pump or auxiliary circuits protection fuses blown	Replace fuses
	Triggering of protection device against dry running	Check the water level in the tank or the mains pressure. If everything is in order, check the protection device and its connection cables
The electric pump unit starts up but the thermal protector is immediately triggered or the fuses blow	Power supply cable is damaged	Check the components and replace as necessary
	Electric motor short circuit	
	Thermal protector or fuses not suited to the motor current	
	Motor overload	Check the operating conditions of the electric pump unit and reset the protection
The electric pump unit starts up but, after a short time, the thermal protector is triggered or the fuses blow	A phase in the power supply is missing	Check the power supply
	Power supply voltage not within the motor's working limits	Check the operating conditions of the electric pump unit
	The electric panel is situated in an excessively heated area or is exposed to direct sunlight	Protect the panel from heat sources and from the sun
The electric pump unit starts up but, after a varying period of time, the thermal protector is triggered	There are foreign bodies inside the pump, the impellers are jammed	Disassemble and clean the pump
	The pump's delivery rate is higher than the limit specified on the rating plate	Partially close the on-off valve located downstream until the delivery rate returns within the specified limits
	The pump is overloaded because it is sucking a dense and viscous liquid	Check the actual power requirements based on the characteristics of the pumped liquid, and replace the motor accordingly
	Worn motor bearings	Replace the bearings or the motor
The electric pump unit starts up but does not deliver the required flow	Wrong rotation direction (three-phase version)	Check the direction of rotation and, if necessary, exchange two phases in the motor or in the electrical panel
	Pump is not primed because not filled with water	Repeat the priming procedure and make sure there are no leaks in the mechanical seal
	Pump not primed due to tightness failure in suction pipe or foot valve	Check the suction pipe and foot valve for perfect tightness, make sure there are no leaks in the mechanical seal
	Air in the pipes or pump	Bleed the air
	Excessive suction lift or flow resistance in suction piping	Check the operating conditions of the pump. If necessary, decrease suction lift and/or increase the diameter of the suction pipe
	Piping or pump clogged	Disassemble and clean
	Valves locked in closed or partially closed position	Disassemble and clean, if necessary replace the valve.
The system's general protection cuts in	Short circuit	Check electrical system
The system's differential thermal-magnetic protection cuts in	Ground leakage	Check insulation of the electrical system components.
The pump rotates in the wrong direction when it is stopped	Leaks in suction pipe	Check and locate leaks Repair or replace components.
	Leaks in foot valve or check valve	
	Air in the suction pipe	Bleed the air
The pump starts up too frequently	Leaks in foot valve, check valve or system	Check and locate leaks. Repair or replace the components.
	Ruptured membrane or no air pre-charge in surge tank	See relevant instructions in surge tank manual
The pump vibrates and generates too much noise	Pump cavitation	Reduce the required flow rate by partially closing the on-off valve downstream from the pump. If the problem persists check the operating conditions of the pump (height difference, flow resistance, liquid temperature,….)
	Worn motor bearings	Replace bearings or motor
	Presence of foreign bodies inside the pump, between the impellers and diffusers	Disassemble and clean the pump

11. Tables and Drawings

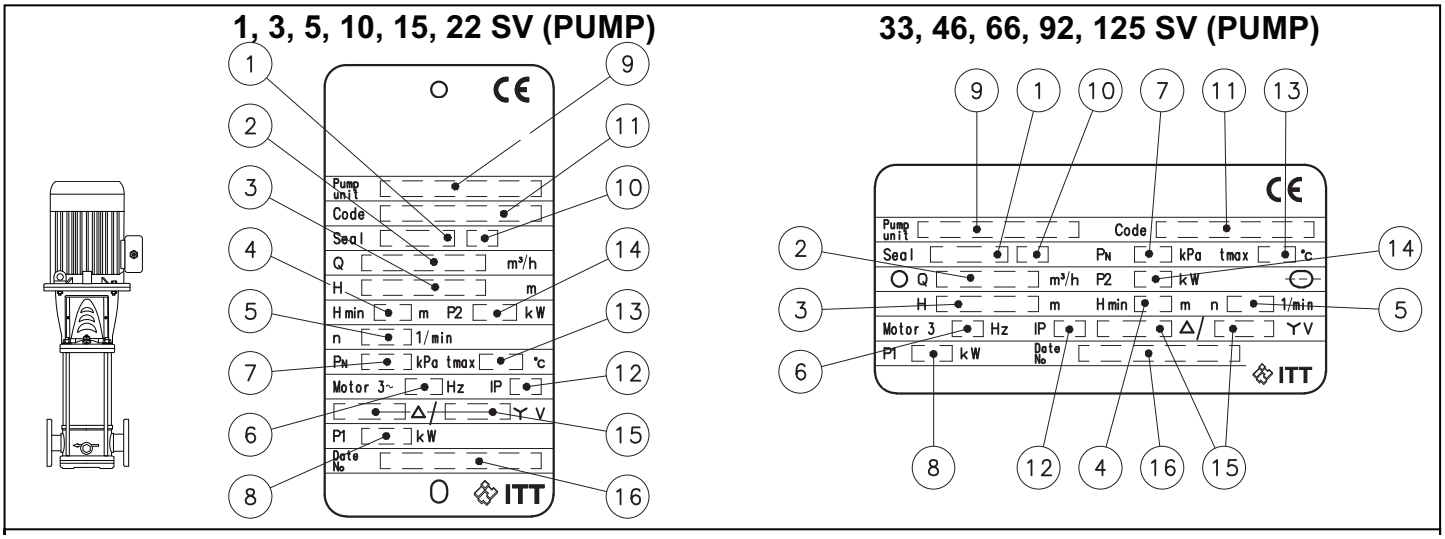


Figure A

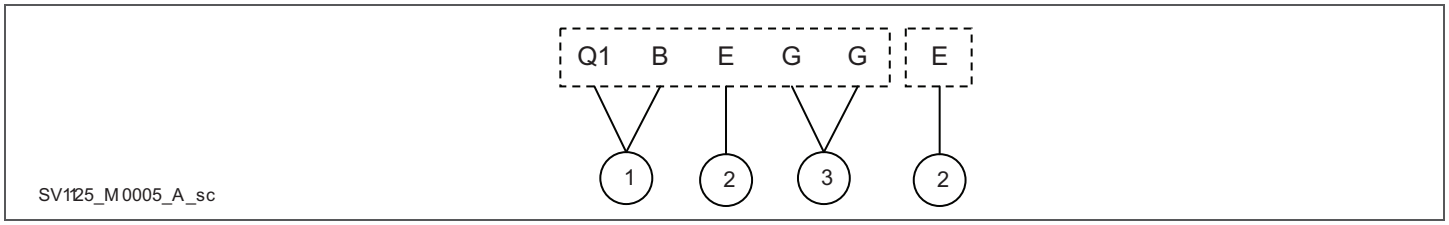
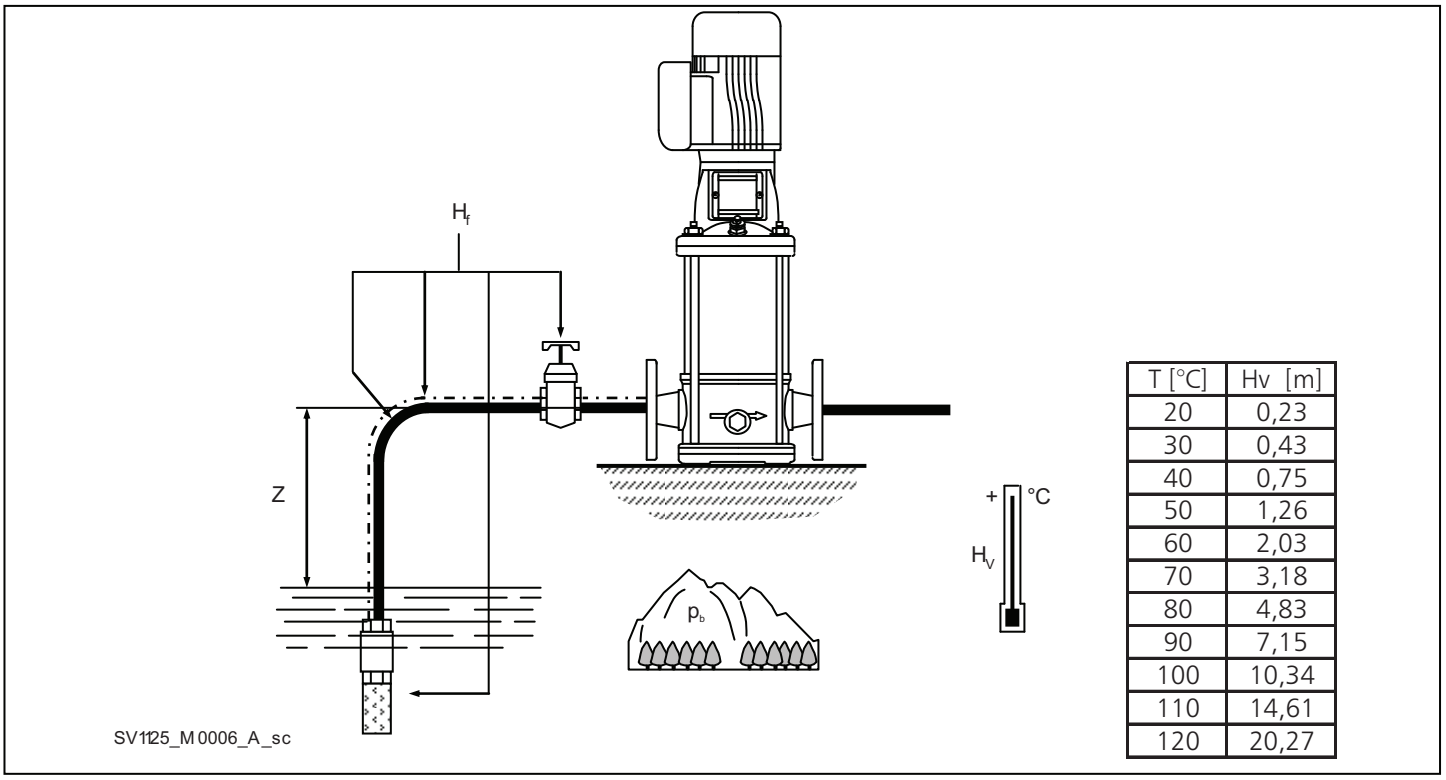
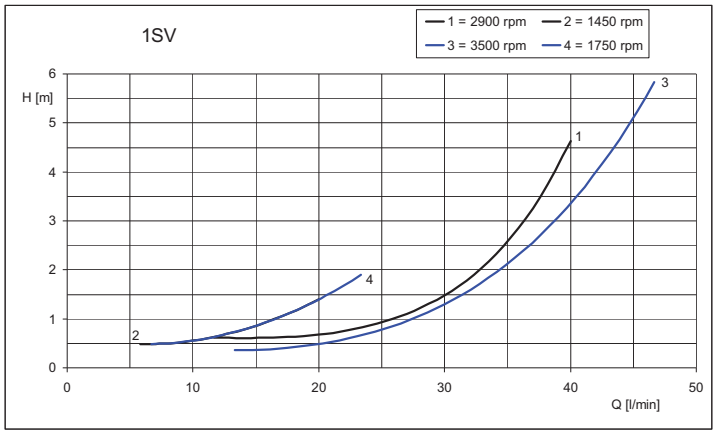


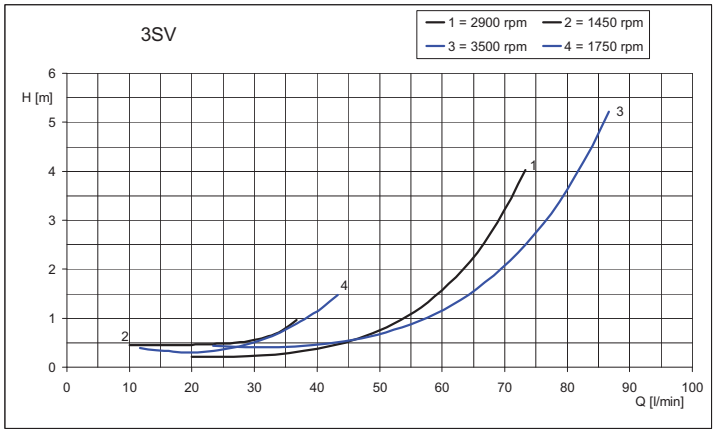
Figure B

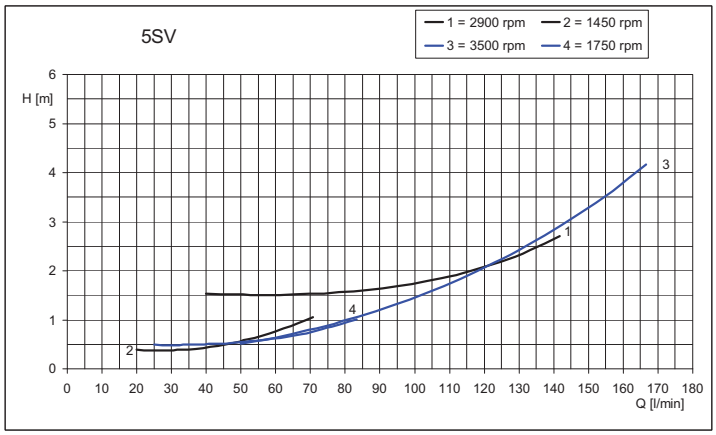


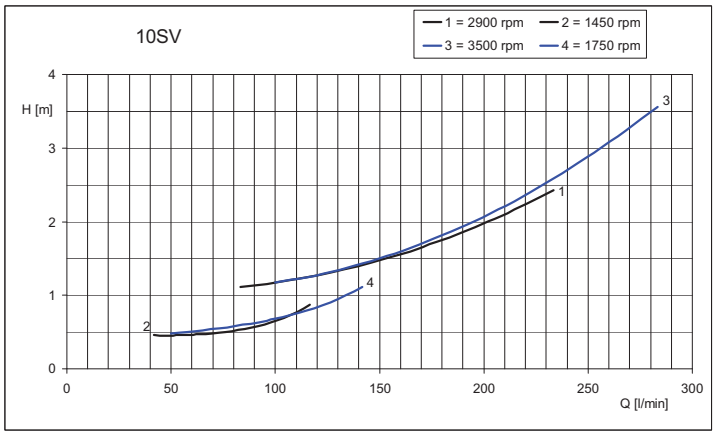
T [°C]	Hv [m]
20	0,23
30	0,43
40	0,75
50	1,26
60	2,03
70	3,18
80	4,83
90	7,15
100	10,34
110	14,61
120	20,27

Figure C

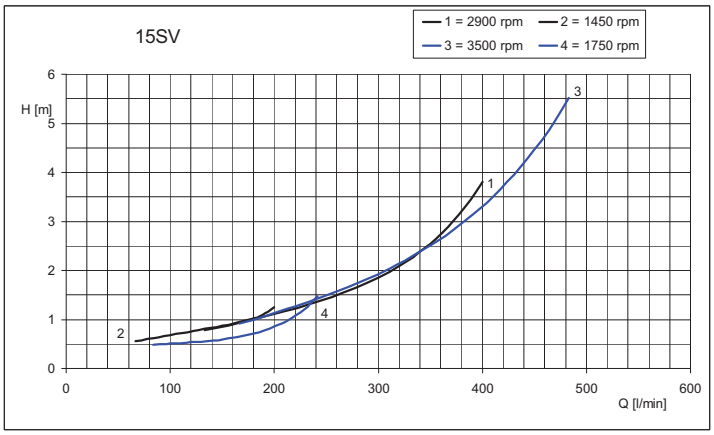


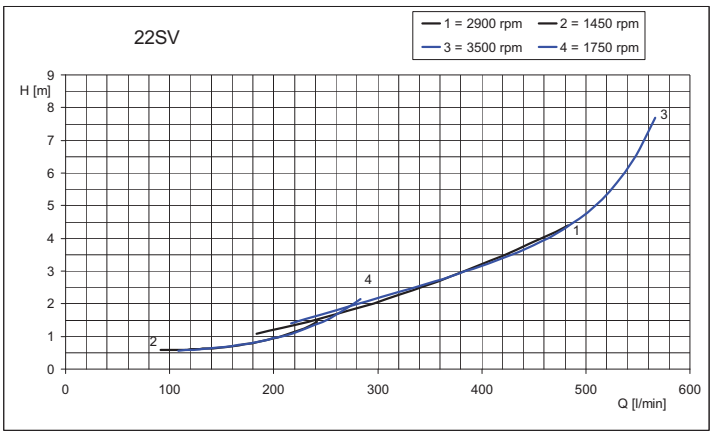


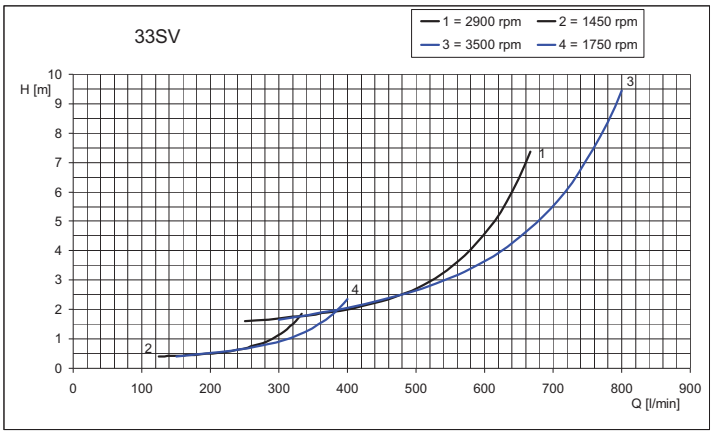


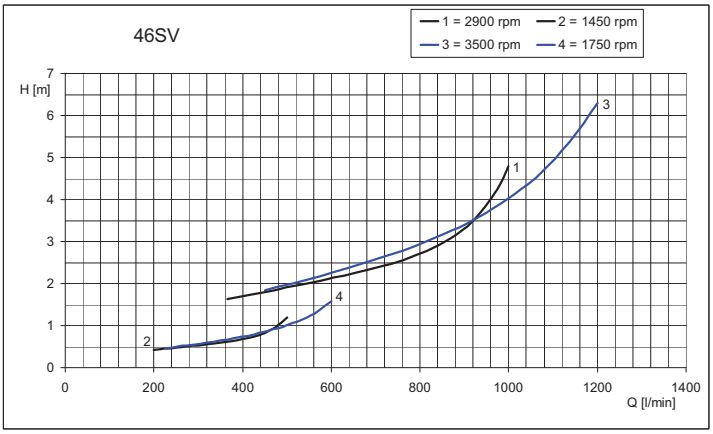


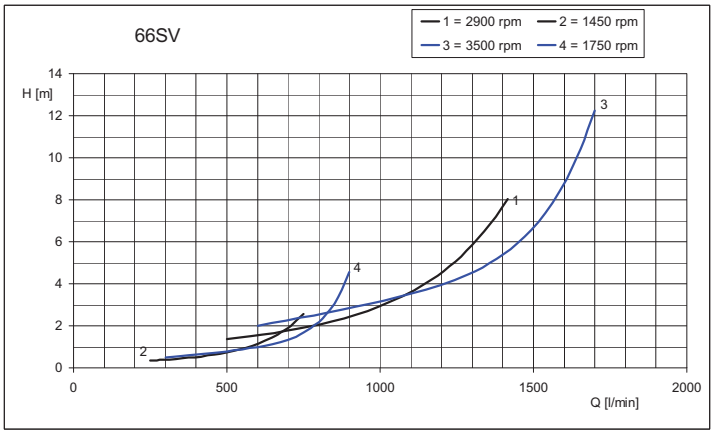
SV1125_M0045_A_OT (1)

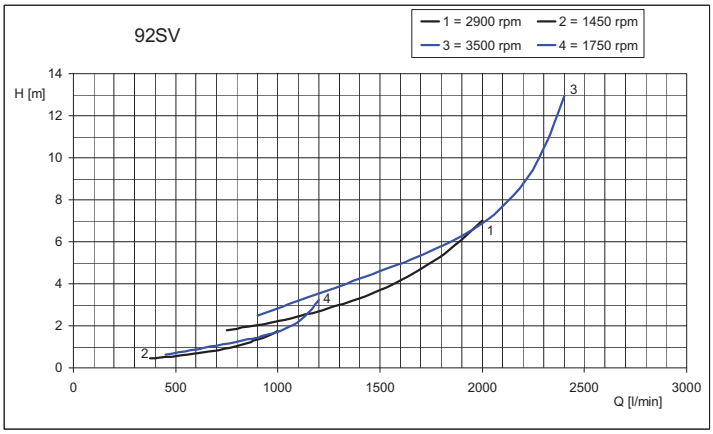


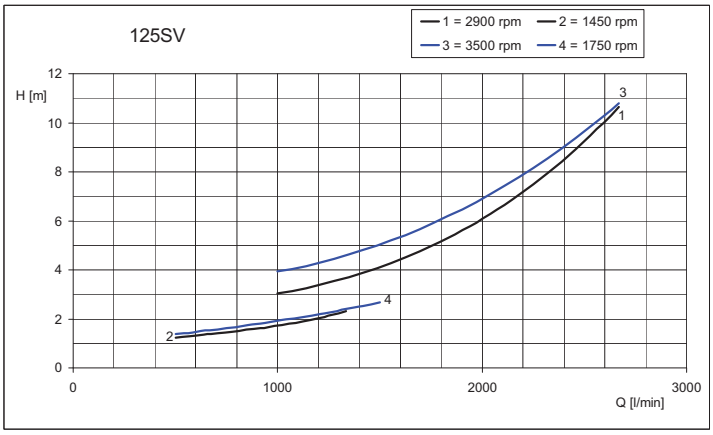












SV1125_M0045_A_OT (2)

Figure D

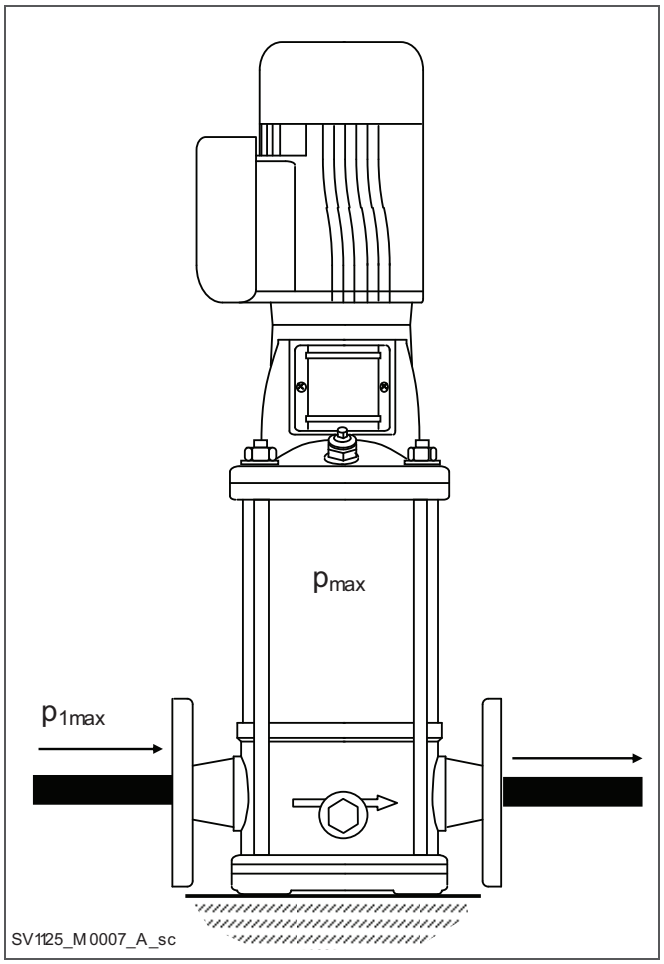


Figure E

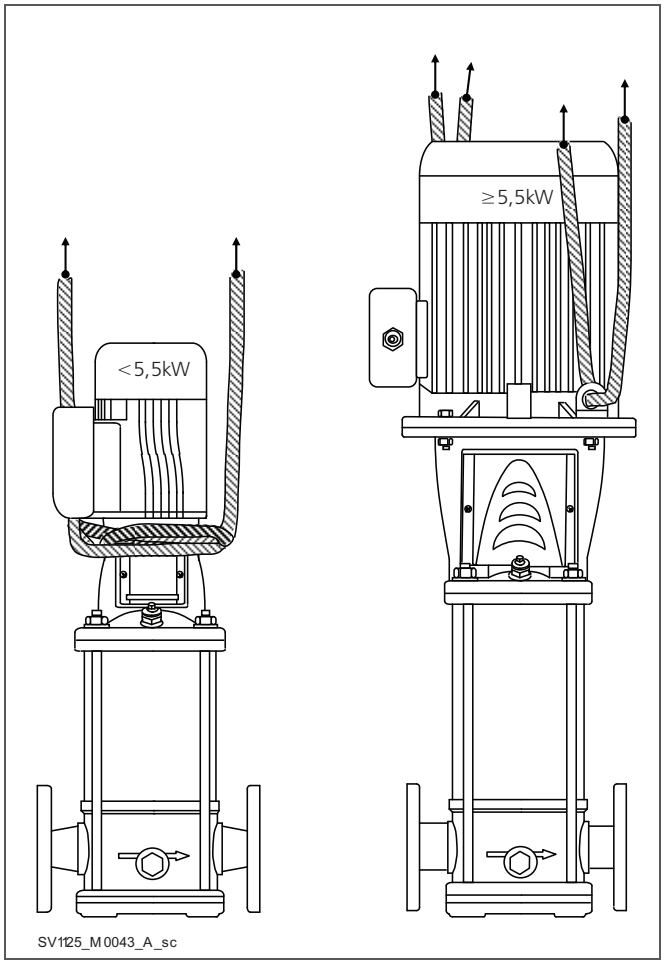


Figure F

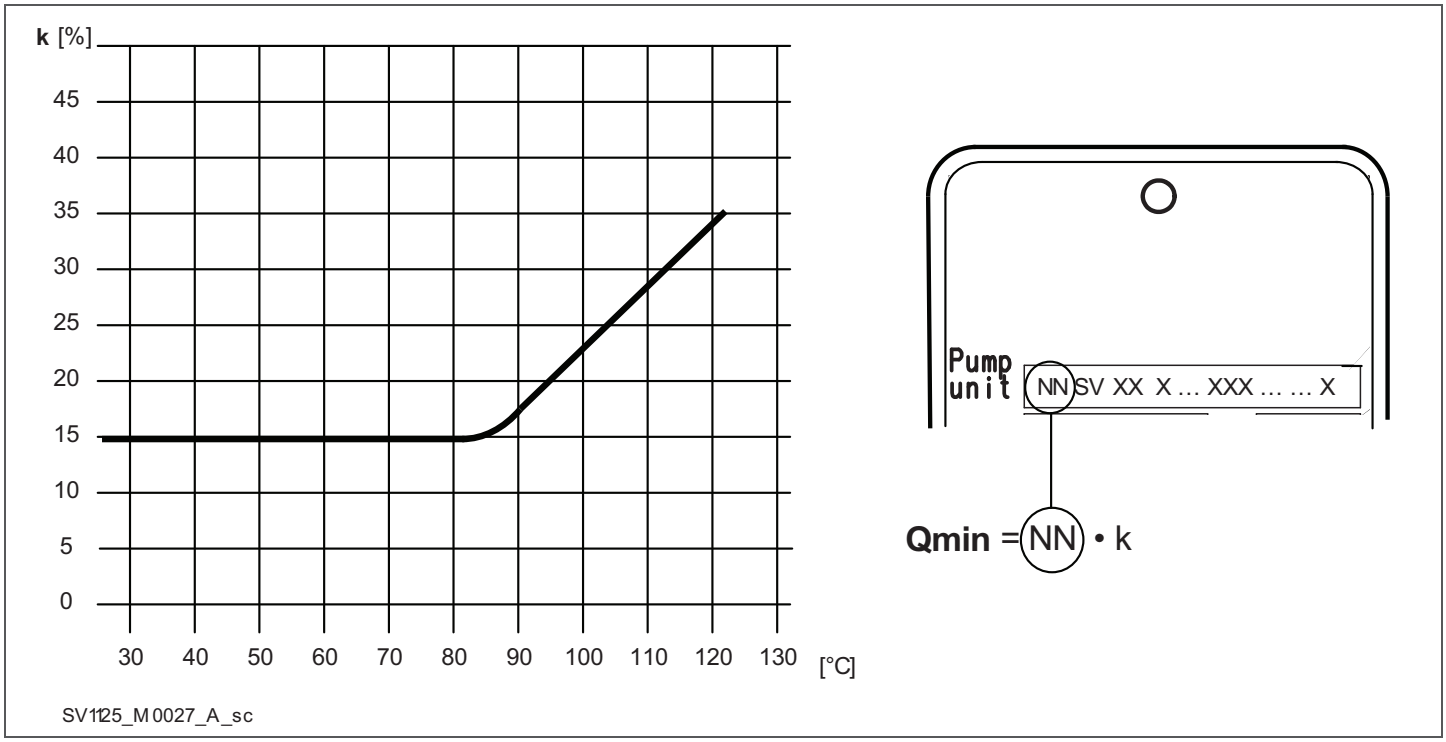


Figure G

		T (°C)								
		0	10	20	30	40	45	50	55	60
H (m)	0	1.00	1.00	1.00	1.00	1.00	0.95	0.90	0.85	0.80
	500	1.00	1.00	1.00	1.00	1.00	0.95	0.90	0.85	0.80
	1000	1.00	1.00	1.00	1.00	1.00	0.95	0.90	0.85	0.80
	1500	0.97	0.97	0.97	0.97	0.97	0.92	0.87	0.82	0.78
	2000	0.94	0.94	0.94	0.94	0.94	0.89	0.84	0.80	0.75

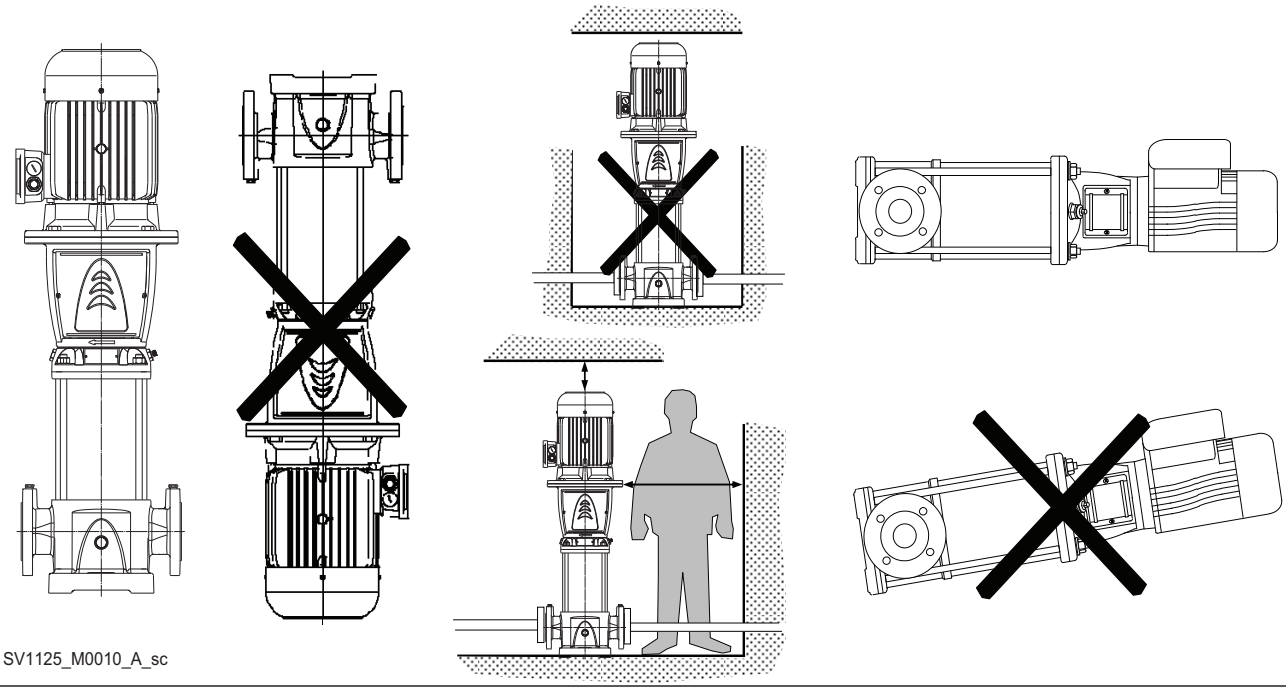
SV1125_M0028_A_ot

Figure H

POWER	MOTOR TYPE	50Hz 3 Phase 2-Pole		60Hz 3 Phase 2-Pole	
		EFF1	EFF2	EFF1	EFF2
kW	IEC SIZE*	dB (A)	dB (A)	dB (A)	dB (A)
0.37	71M	58	58	63	63
0.55	71M	58	58	63	63
0.75	80M	58	58	63	63
1.1	80M	61	58	66	63
1.5	90S	61	63	66	68
2.2	90L	64	63	69	68
3	100L	64	67	69	72
4	112M	65	68	70	73
5.5	132S	71	70	76	75
7.5	132S	71	70	76	75
11	160M	75	76	80	81
15	160M	75	76	80	81
18.5	160L	76	76	81	81
22	180M	76	79	81	84
30	200L	76	81	81	86
37	200L	81	81	86	86
45	225M	81	81	86	86
55	250M	83	82	88	87

*R = Reduced motor casing size with respect to shaft extension and related flange.
50Hz & 60Hz 3 Phase 4-Pole (Up to 7.5kW) & Single Phase 2-Pole (Up to 2.2kW) Motor Sound Level is <70 dB (A)

Figure H. Airborne noise emission by units equipped with Lowara supplied motor



SV1125_M0010_A_sc

Figure I

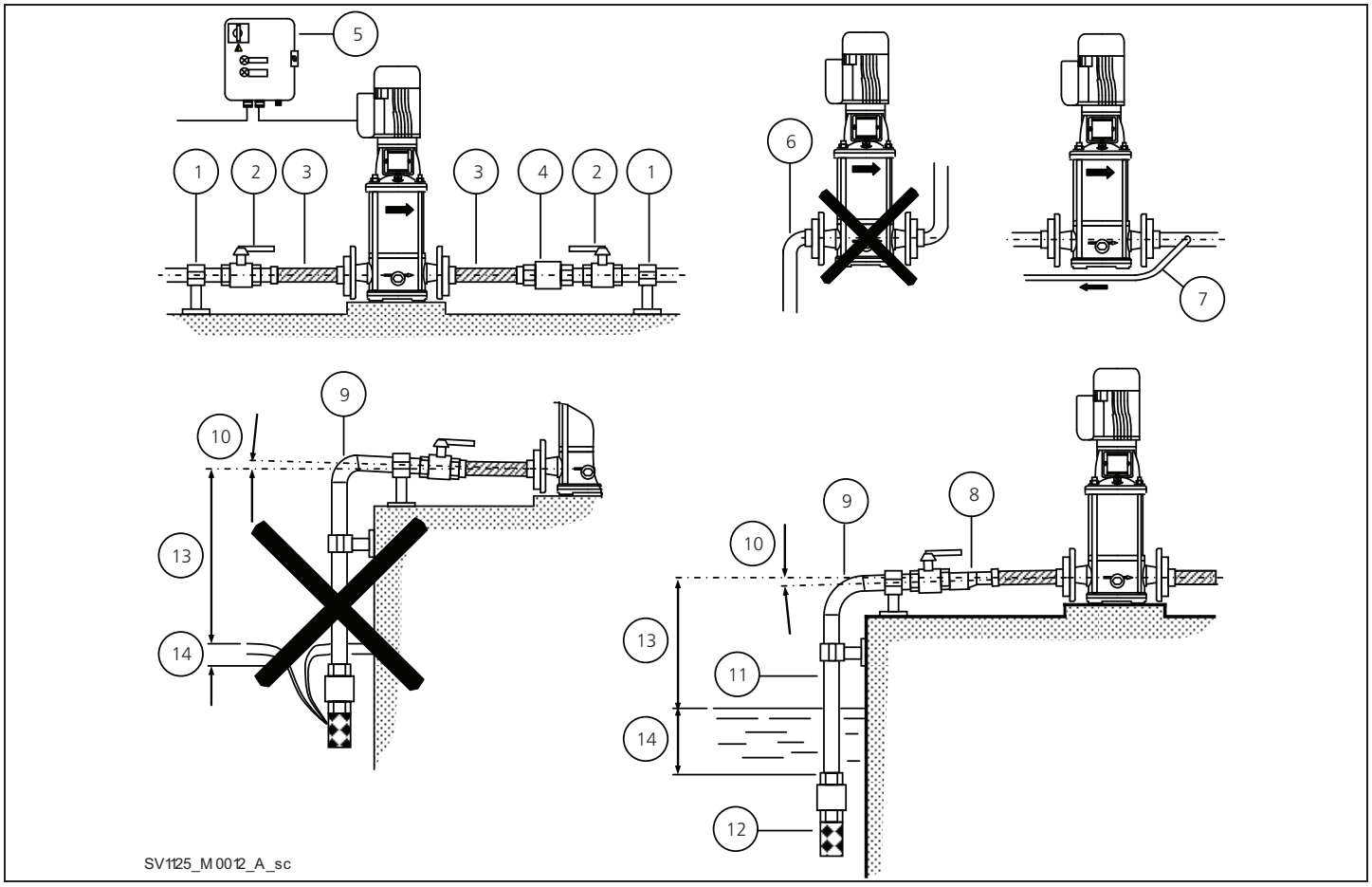


Figure J

	1, 3, 5SV	10, 15, 22SV	33SV	46, 66, 92SV	125SV
	[mm]				
L1	100	130	170	190	275
L2	180	215	240	265	380
L3	150	185	220	240	330
L4	210	245	290	315	450
Ø A	13		15		19
N	4				

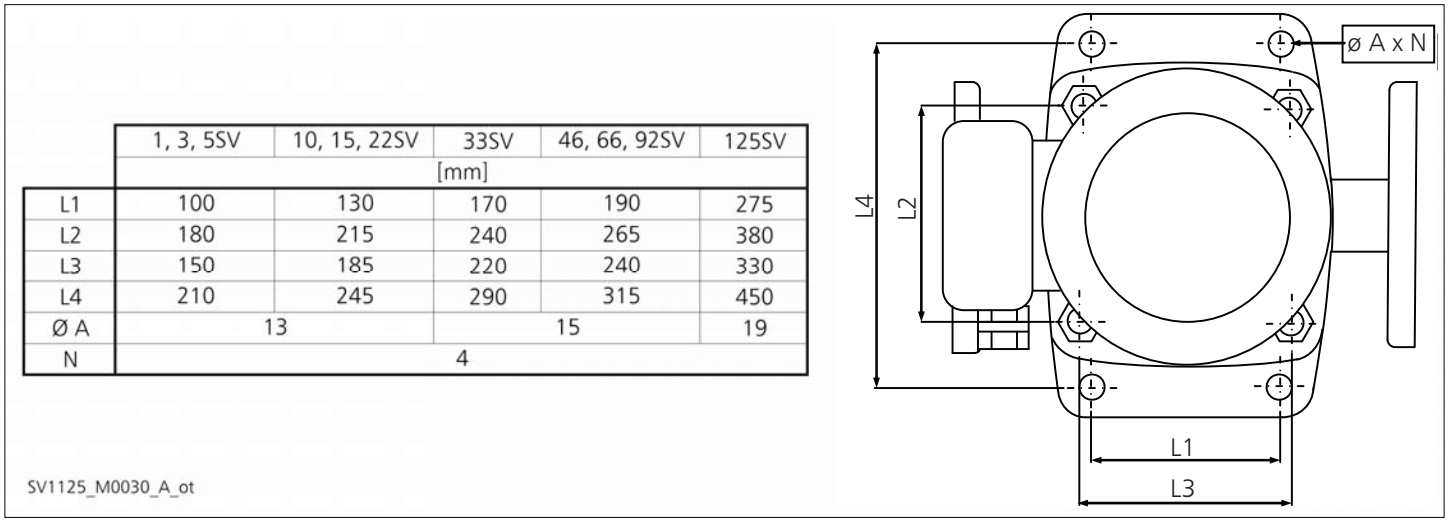


Figure K

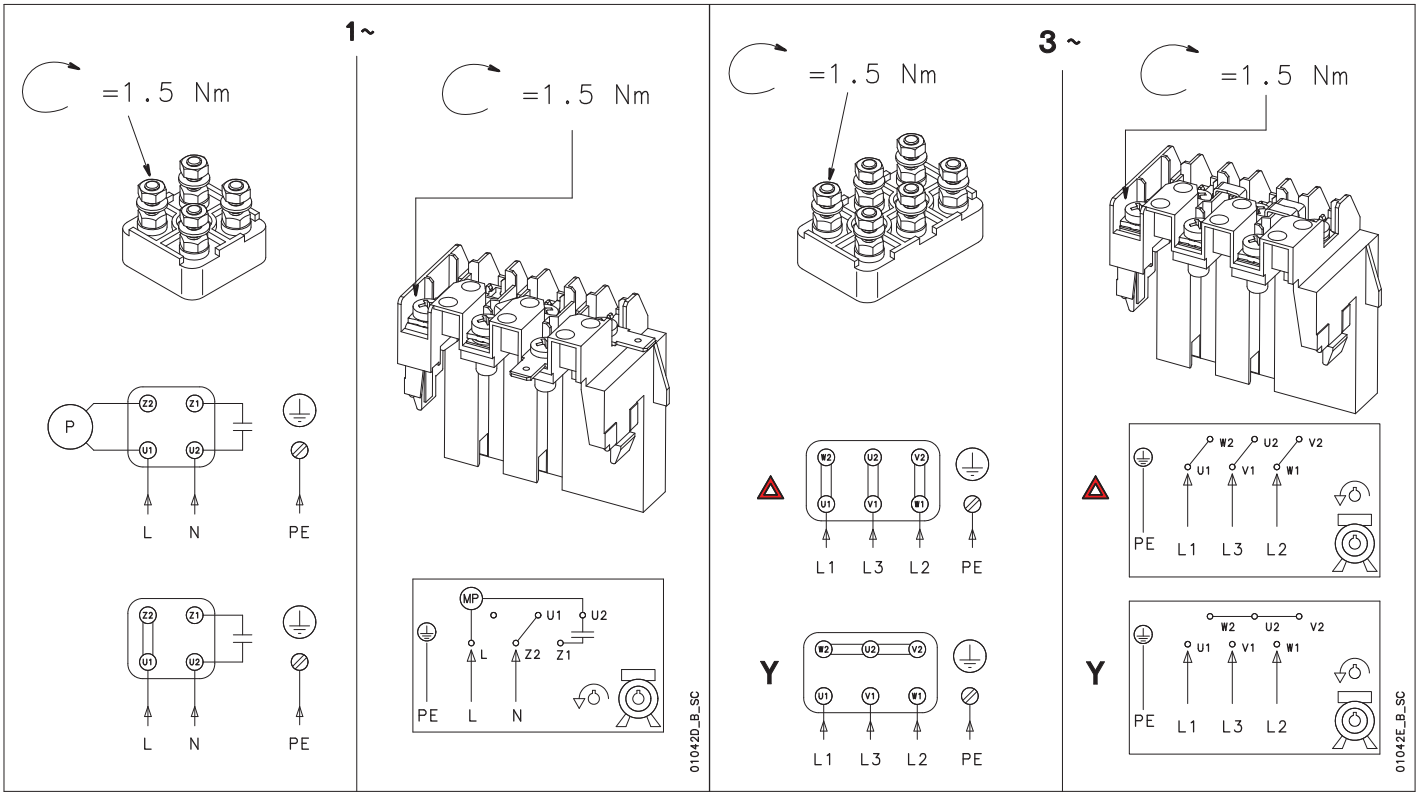


Figure L

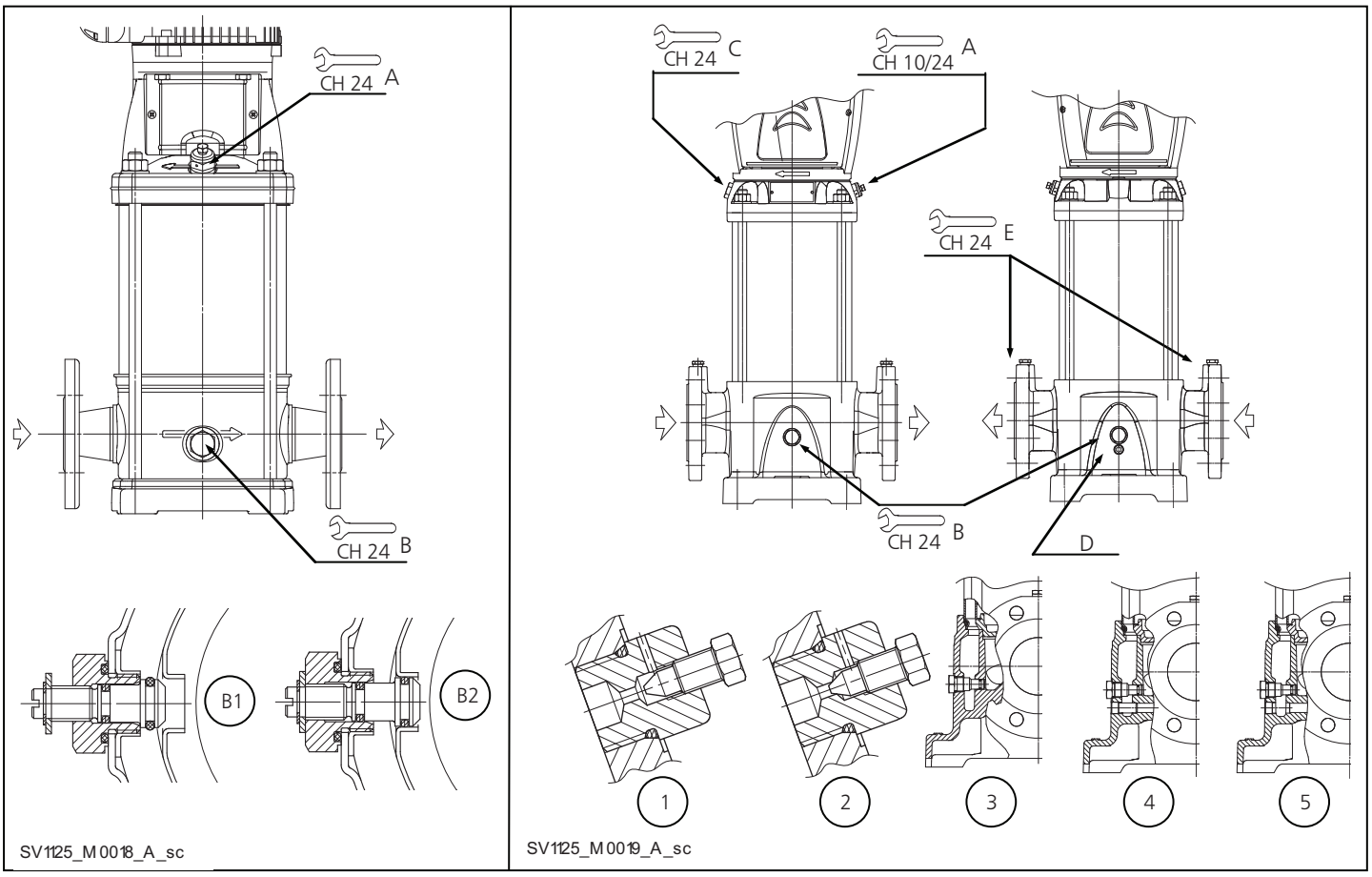
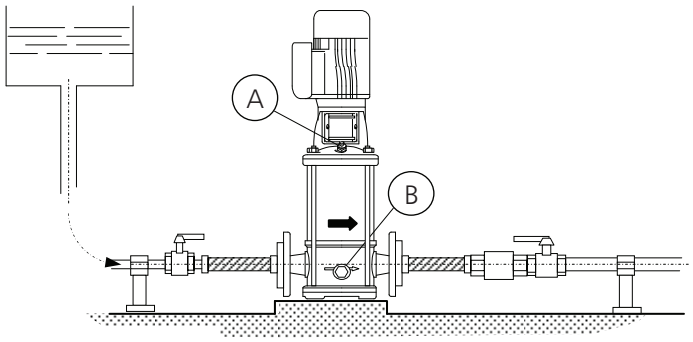


Figure Na

Figure Nb

1, 3, 5SV	10, 15, 22, 33, 46, 66, 92, 125SV



SV1125_M0014_A_sc

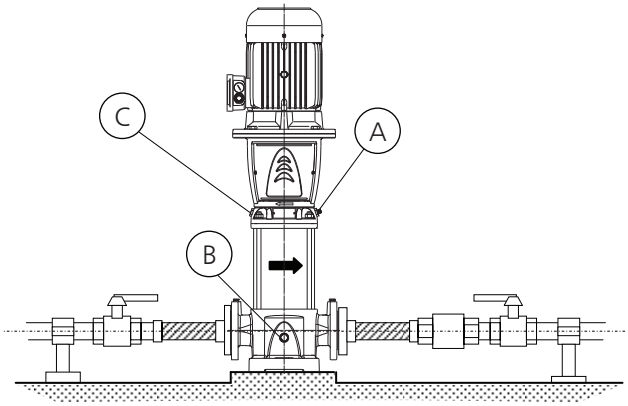
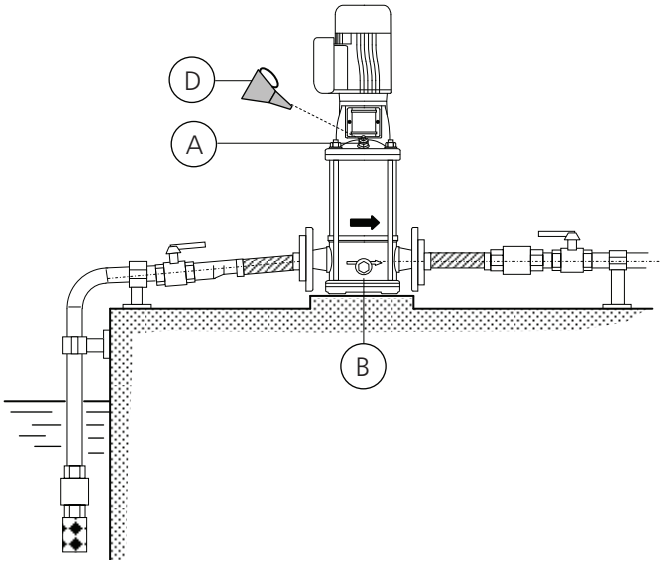


Figure Pa

1, 3, 5SV	10, 15, 22, 33, 46, 66, 92, 125SV



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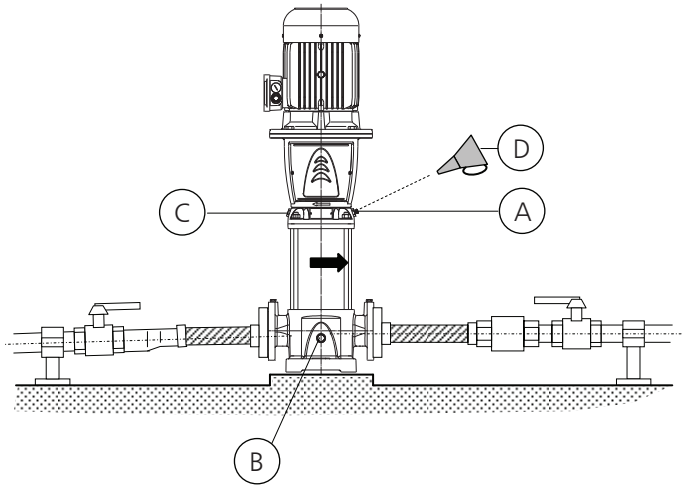


Figure Pb

	A		B		C		D		E		F		G		H		I	
	Ø	N•m	Ø	N•m	Ø	N•m	Ø	N•m	Ø	N•m	Ø	N•m	Ø	N•m	Ø	N•m	Ø	N•m
1SV	M 8	20	M 12	25	-	-	-	-	-	-	G3/8	25	-	-	M 12	50	M 10	30
3SV																		
5SV															M16	100	M 12	50
10SV	M 10	35	M 14	30			M 8	25										
15SV																		
22SV																		
33SV	M 12	55	M 16	60	M 6	8	M 10	35	G1/2	40	G1/2	40	R3/8	40	M20	200	-	-
46SV															M16	100		
66SV-PN16															M20	200		
66SV-PN25															M16	100		
92SV-PN16															M20	200		
92SV-PN25															M16	100		
125SV-PN16															M24	350		
125SV-PN25																		

SV1125_M0040_A_ot

Figure Q

A		71	80	90	100	112	132	160	180	200	225	250
B	Ø	M 6		M 8			M 12	M 16				
	N•m	6		15			50	75				
CH	⬢	10		13			19	24				

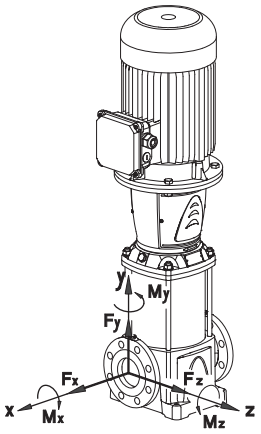
SV1125_M0041_A_ot

Figure R

		1, 3, 5, 10, 15, 22SV					1, 3, 5SV	10, 15, 22SV		33, 46, 66, 92, 125SV						
A		71	80	90	100	112	132	132	160	90	100	112	132	160	180	200	225	250
C	Ø	M 6			M 8		M8	M 10		M 10			M 12					
	N•m	15			25		25	50		50			75					
CH	⬡	5			6		6	8		8			10					

SV1125_M0042_A_ot

Figure S



PUMP TYPE	DN	Forces (N)			Moments (Nm)		
		Fx	Fy	Fz	Mx	My	Mz
1-3 SV	25	200	180	230	240	160	190
5 SV	32	260	240	300	310	210	250
10 SV	40	330	300	370	390	270	310
15-22 SV	50	450	400	490	420	300	340
33 SV	65	1800	1700	2000	1500	1050	1200
46 SV	80	2250	2050	2500	1600	1150	1300
66-92 SV	100	3000	2700	3350	1750	1250	1450
125 SV	125	3700	3300	4100	2100	1500	1750

1-125sv-forza-FNG-en_a_td_a_td

Figure T

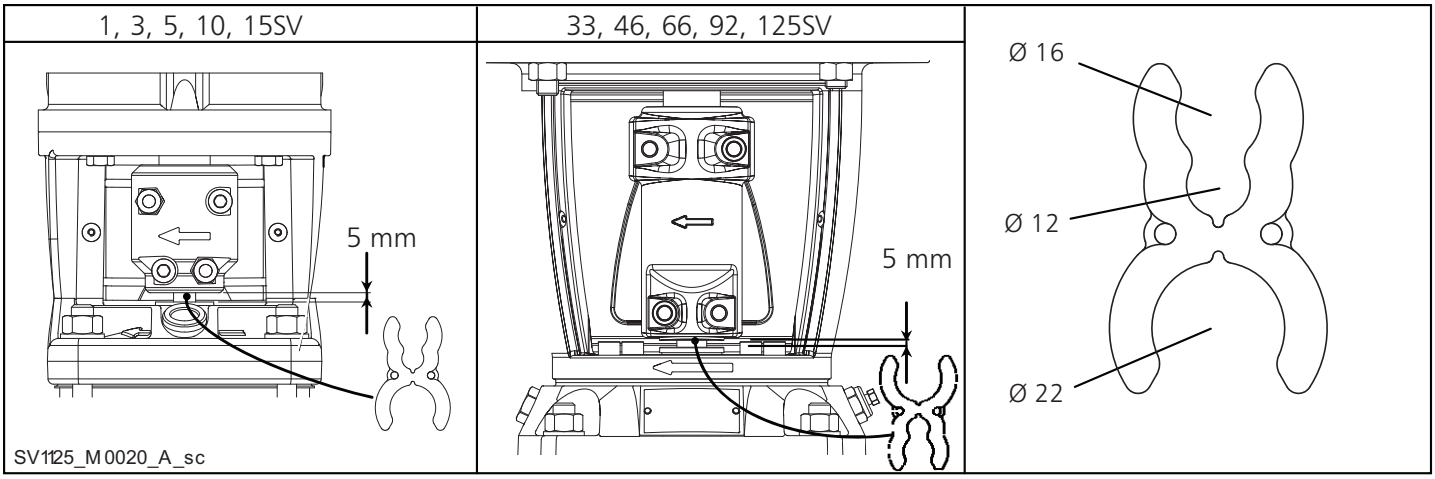


Figure U

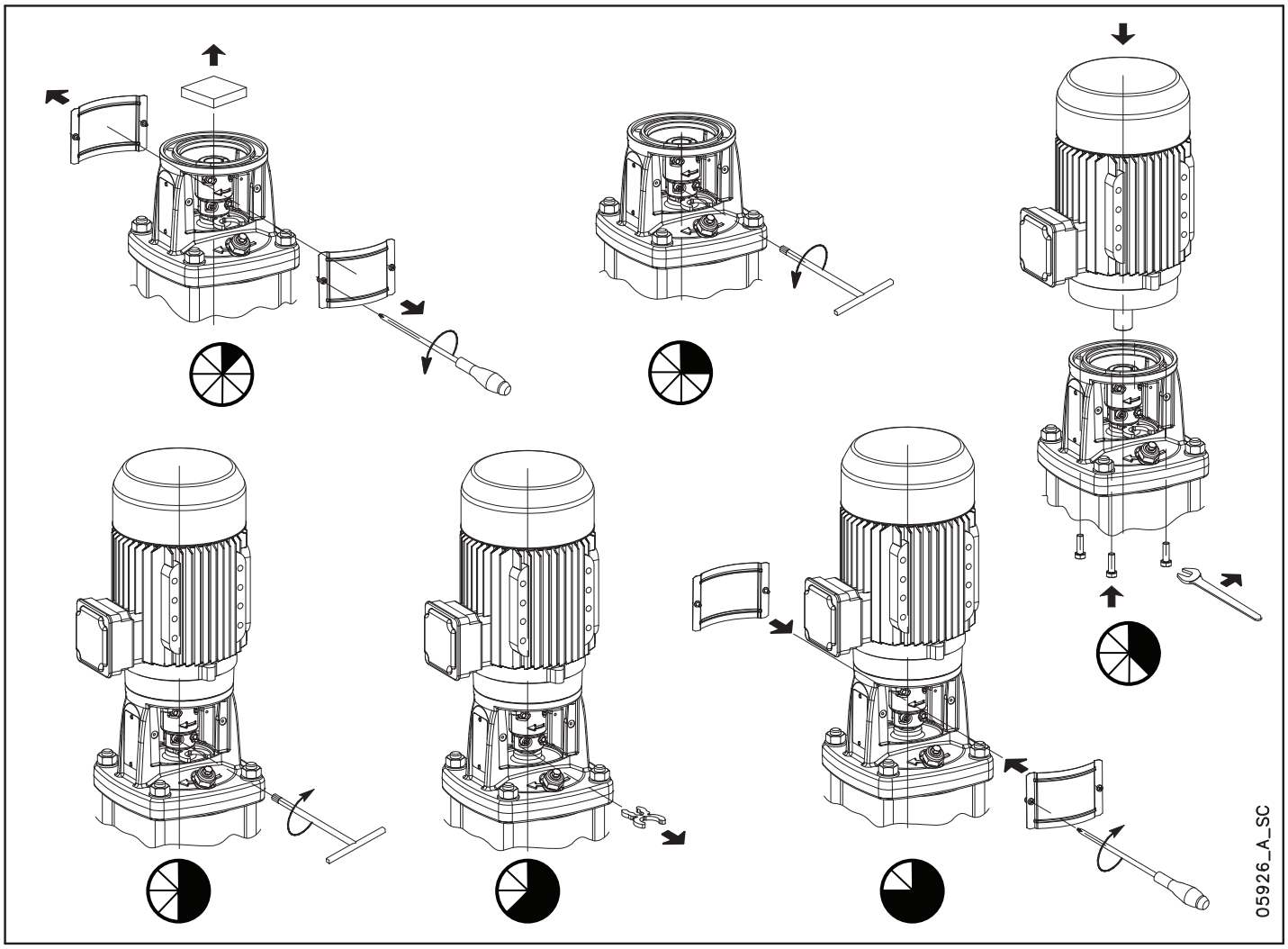


Figure V

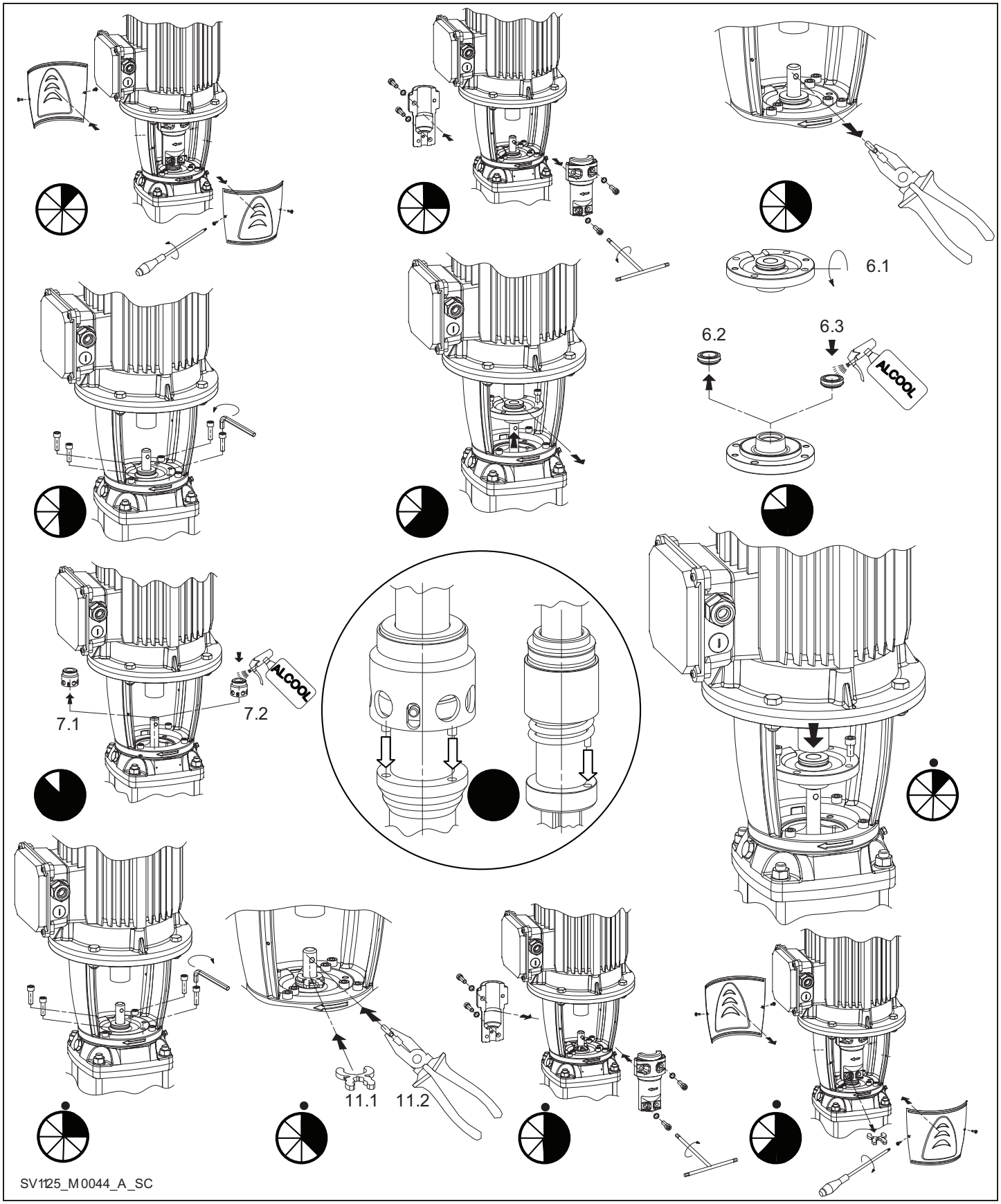


Figure X

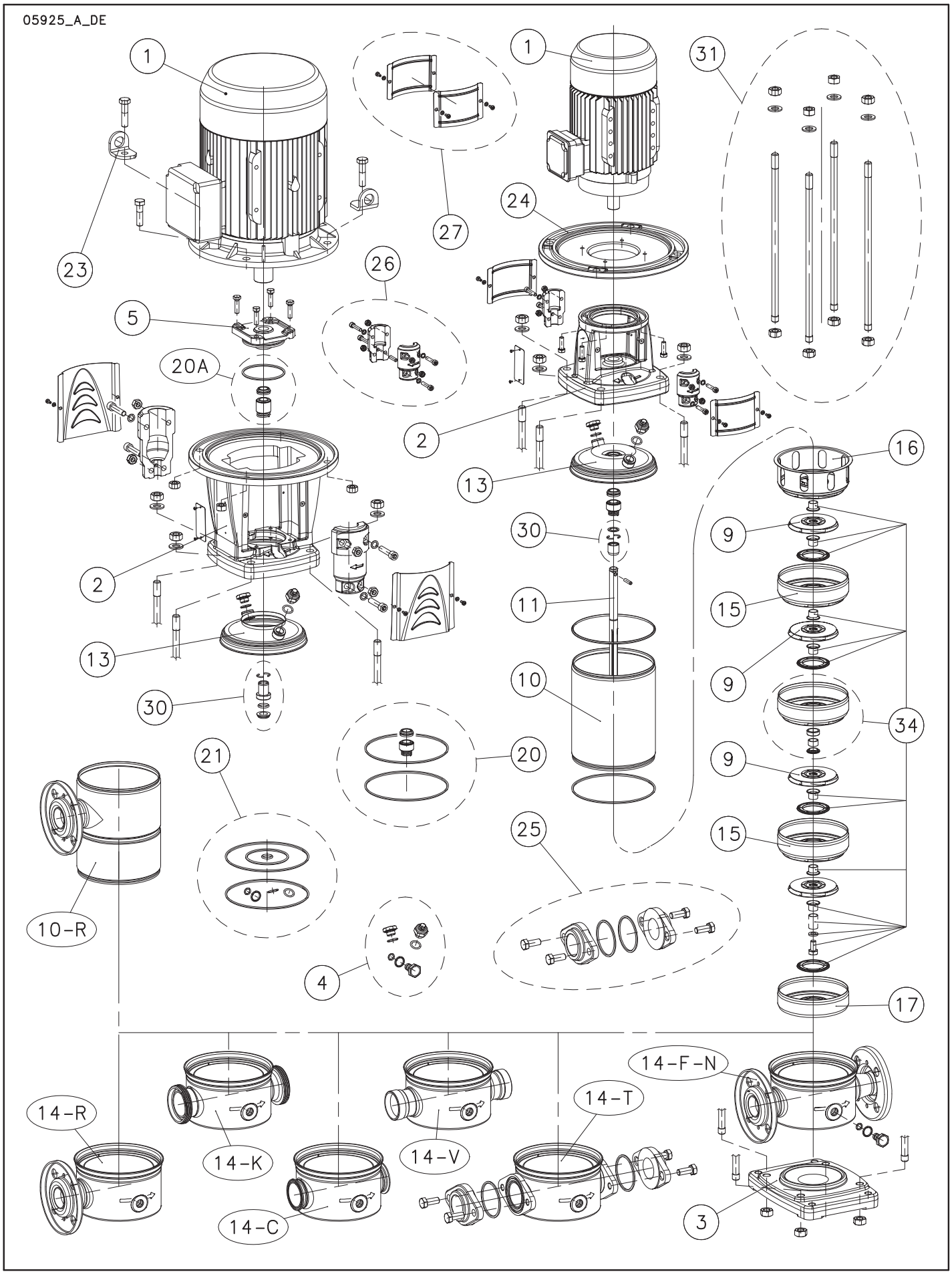


Figure Y 1, 3, 5, 10, 15, 22 SV

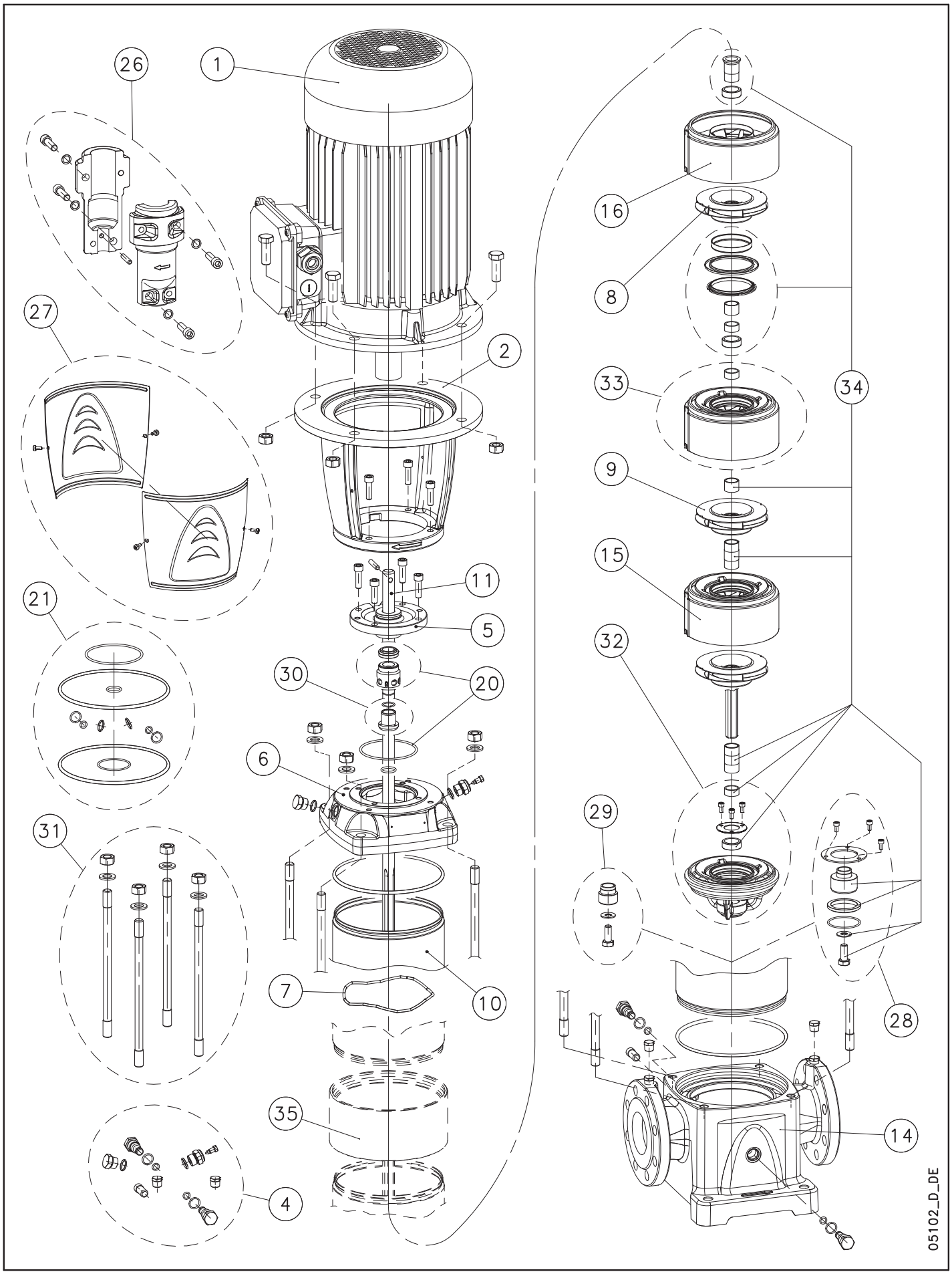


Figure W 33, 46, 66, 92SV

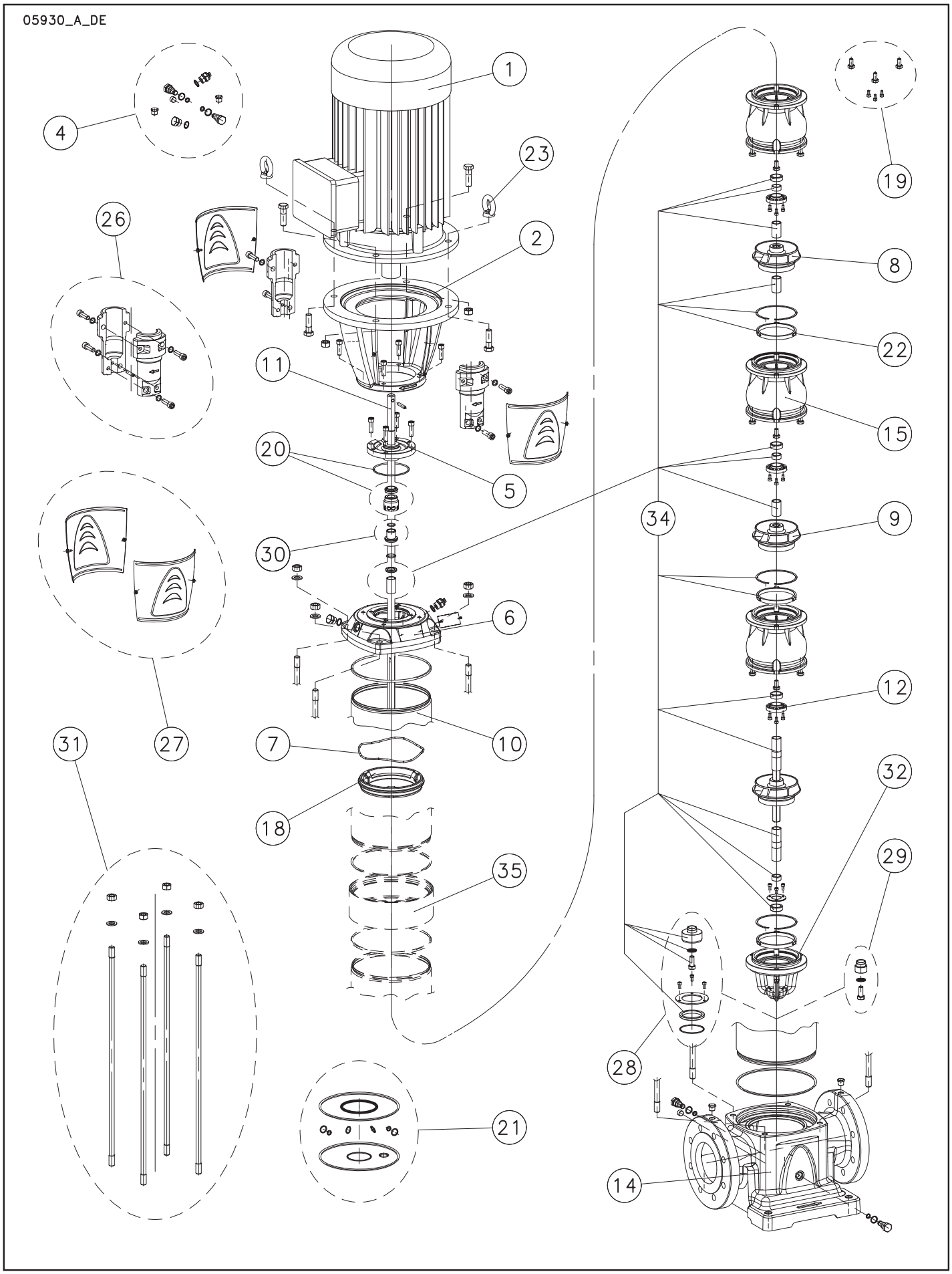


Figure Z 125SV

N.	Description
1	Motor
2	Adapter
3	Base
4	Plug kit + O Ring
5	Seal housing plate
6	Upper head
7	Diffusers stack spring
8	Impeller (reduced diameter)
9	Impeller (full diameter)
10, 10-R	Sleeve
11	Shaft
12	Bush locking cover
13	Upper pressed holder with connections
14, 14-[redacted]	Pump body F, N, R, K, C, V, T type
15	Diffuser kit
16	Last stage diffuser kit
17	First stage box
18	Adapter ring
19	Diffuser bolts kit
*20, 20-A	Mechanical seal
*21	O ring kit
22	Diffuser wear ring support ring
23	Lifting ring
24	Flange for motor
25	Oval counterflanges + O Ring
26	Pair of half-couplings kit
27	Coupling guard
28	Thrust drum and impeller stack locking kit
29	Impeller stack locking kit
30	Seal bush kit
31	Tie rods kit
32	Lower support and bush kit
33	Diffuser and bush kit
34	Wear parts kit
35	Ring for sleeve
*	Recommended spare parts

ITT

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