Scot Pump

A WILO BRAND

MVI

Vertical, Multistage, Centrifugal Pump

Installation and Operating Instructions

MVI_IOM_020122

Fig. 1a – Model numbering information format

MVI – 750 – 4 /2 – 100HP – 405TSC – 304 – E – 230/460

- Motor Voltage
- EPDM elastomers (FKM also available upon request)
- Pump construction designation
- NEMA motor frame
- Pump Horsepower
- Number of Pump stages at reduced diameter
- Number of Pump stages at full diameter
- Pump gallons per minute ≤ BEP
- Vertical, high-pressure, multistage centrifugal pump, in-line design

Fig. 1b – Model nameplate information

1. Model numbering
2. Pump frequency
3. Pump horsepower
4. Motor specific RPM
5. Pump max rated head in feet
6. US gallons per minute duty point
7. Head in feet duty point
8. Max Pressure PSI / Max Temperature °F
9. Rated PEI_{CL}
10. Serial Number
11. Max. impeller diameter

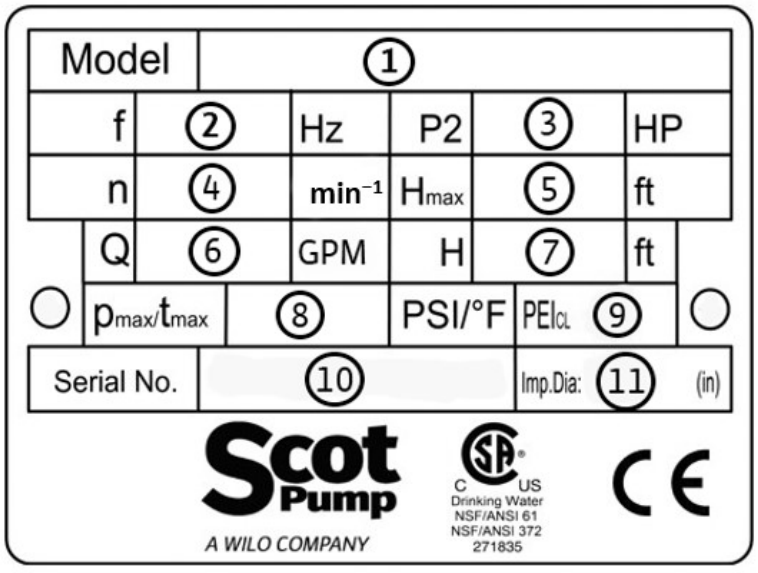
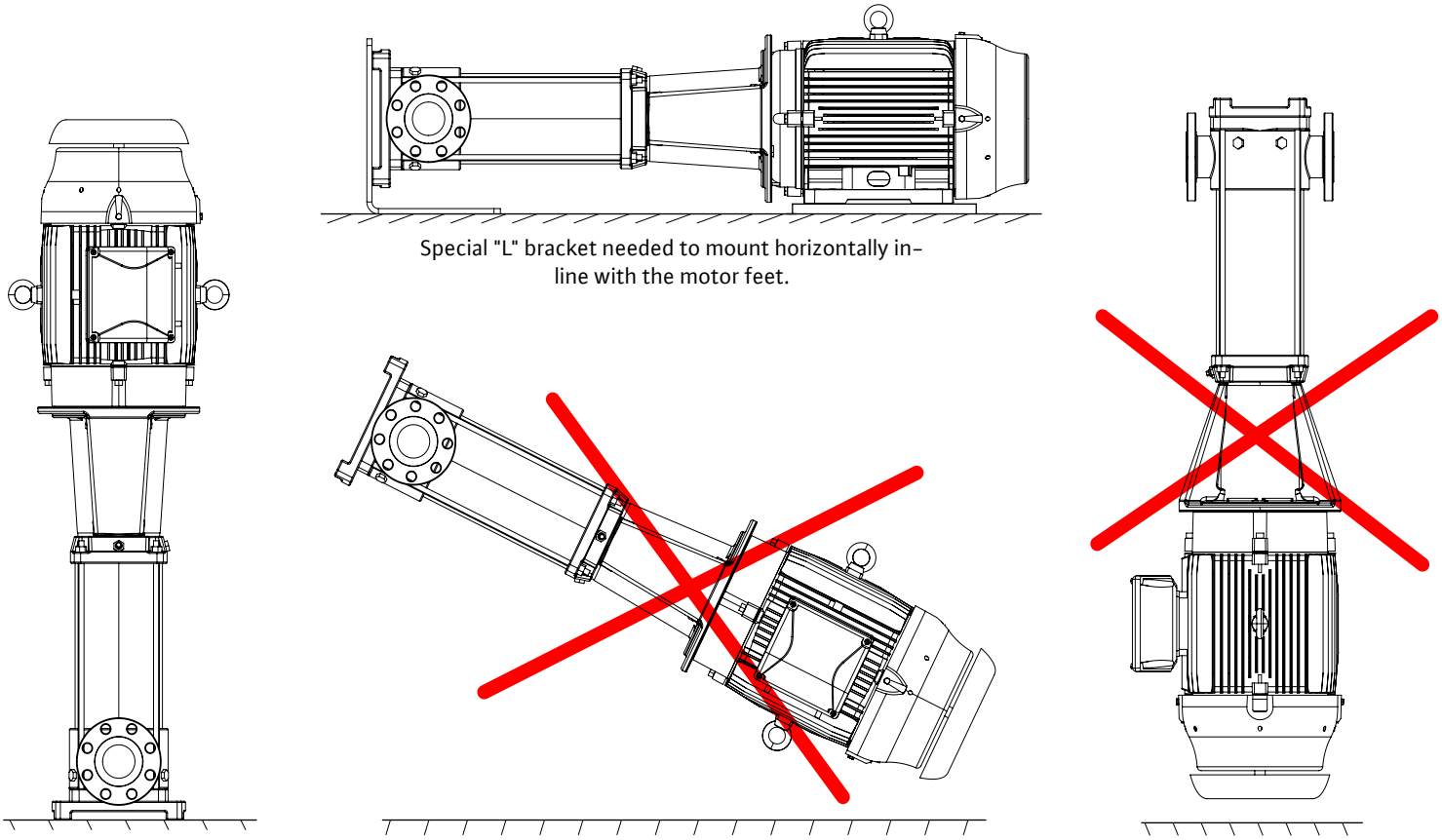
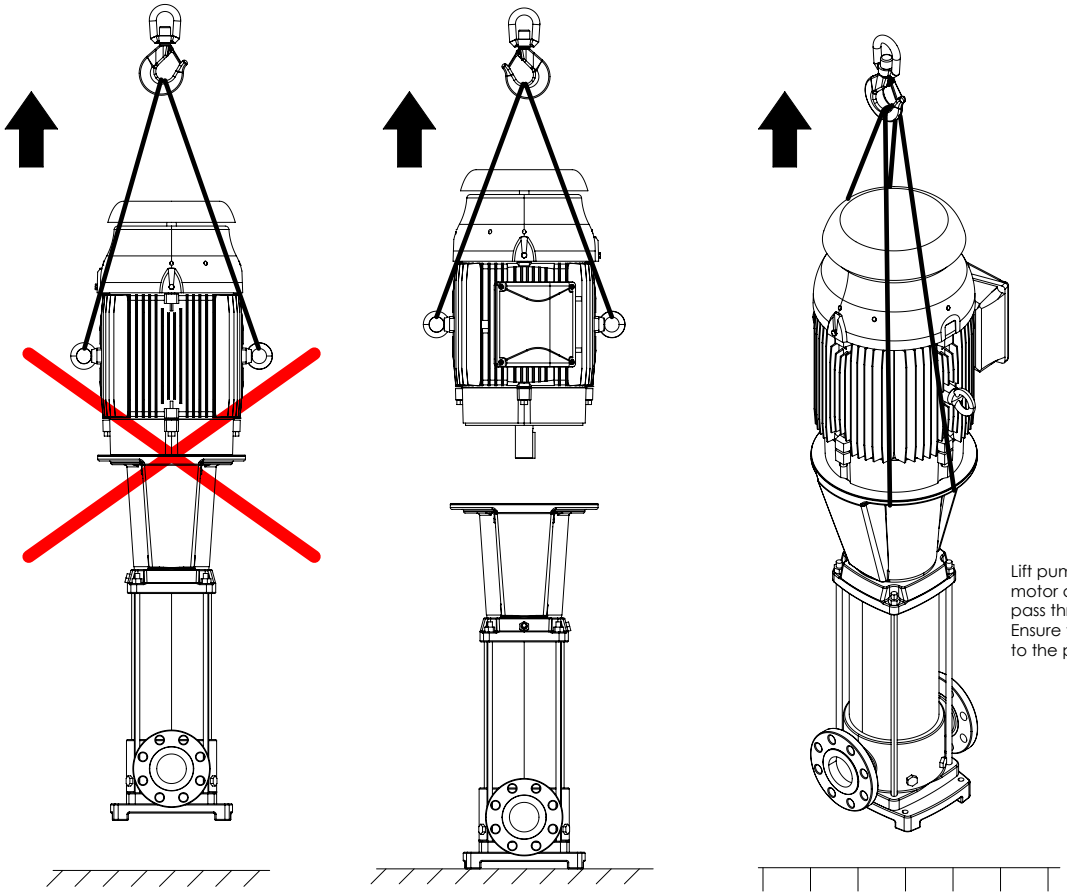


Fig. 2 – Proper Mounting



Special "L" bracket needed to mount horizontally in-line with the motor feet.

Fig. 3 – Proper Lifting



Lift pump assembly and pump and motor assembly with lifting straps that pass through the motor stool. Ensure that the load is not applied to the pump shaft.

Fig. 4 – Allowable liquids to be pumped

Pumped fluid	"Fluid Concentration, temperature"	MVI 304 Stainless Steel		MVI 316 Stainless Steel	
		EPDM	Viton	EPDM	Viton
Acetic acid anhydride	77°F			●	
Alkaline cleaner		●			
Aluminium sulphate	10%,77°F				●
Ammonia water (A. hydroxide)	20%,104°F	●			
Ammonia hydrogen carbonate	10%,104°F	●		●	
Benzoic acid	10%,194°F				●
Boric acid	Unsaturated solution, 140°F				●
Butanol	140°F	●			
Calcium acetate	30%,122°F	●			
Calcium hydroxide	Saturated solution, 122°F	●			
Chromic acid	1%,68°F				●
Condensate	194°F	●			
Copper sulphate	Unsaturated solution, 140°F				●
Deionic (fully desalinated water)	122°F			●	
Ethanol	100%,68°F	●			
Ethylene glycol/ Diethylene glycol	40%, 158°F	●	●	●	●
Fixer	77°F				●
Formic acid	5%,68°F			●	
Fruit juice	122°F				●
Glycerine	50%,122°F	●			
Heating oil (Light)		●			●
Hydraulic oil	100%, 212°F		●		
Isopropanol		●			
Lactic acid	10%,68°F				●
Linoleic acid	100%,68°F	●			
Linseed oil	140°F		●		
Liqueur	140°F				●
Maize oil	176°F		●		
Maleic acid	50%,122°F				●
Methanol	100%,68°F	●			
Motor oil	100%,176°F	●			
Oil–water–mixture	212°F		●		

Fig. 4 – Continued

Pumped fluid	"Fluid Concentration, temperature"	MVI 304 Stainless Steel		MVI 316 Stainless Steel	
		EPDM	Viton	EPDM	Viton
Oxalic acid	1%,68°F			●	
Peanut oil	100%,176°F		●		
Phosphoric acid	20%,68°F			●	
Polyglycols	194°F		●		●
Polyethylene glycols	40%, 158°F	●			
Potassium carbonate	10%,140°F	●			
Potassium hydrogen carbonate	10%,140°F	●			
Potassium permanganate	5%,68°F			●	
Potassium sulphate	Unsaturated solution, 176°F			●	
Rapeseed oil	100%,176°F		●		
Silicone oil	100%		●		
Sodium carbonate	10%,140°F			●	
Sodium hydroxide	25%,122°F			●	
Sodium nitrate	Unsaturated solution, 176°F			●	
Sodium phosphate	5%, 212°F			●	
Sodium sulphate	10%,140°F			●	
Sulphuric acid	5%,77°F				●
Water					
Swimming pool water	95°F	●		●	
Deionic	122°F			●	
Distilled water	122°F			●	
Decarbonated water				●	
Soft water				●	
Heating water				●	
Boiler water				●	
Pure water				●	
Rinsing water		●		●	

Fig 5 – Maximum Operating Pressure and Inlet Pressure

Stages	Maximum Operating Pressure	Stages	Maximum Inlet Pressure
MVI 5			
2–27	363 psi	2–25	145 psi
		27	217 psi
MVI 15			
2–25	363 psi	2–17	145 psi
		19–25	217 psi
MVI 20			
2–24	363 psi	2–9	145 psi
		10–24	217 psi
MVI 50			
1–10	232 psi	1–5	116 psi
12–17	363 psi	6–17	145 psi
MVI 75			
1–8	232 psi	1–2	116 psi
9–12	363 psi	3–12	145 psi
MVI 100			
1 – 7	232 psi	1	116 psi
8 – 10	363 psi	2 – 10	145 psi
MVI 160			
1/1 –5	232 psi	1/1–2	58 psi
6/2–11/2	435 psi	3/2–6	145 psi
		7/2 – 11/2	217 psi
MVI 225			
1/1 – 4/2	232 psi	1/1 – 1	58 psi
4/1 – 8/1	435 psi	2/2–3	145 psi
		4/2 – 8/1	217 psi
MVI 320			
1/1–3	232 psi	1/1	58 psi
4/2 – 5/2	435 psi	1–2/1	145 psi
		2–5/2	217 psi
MVI 450			
1/1–3	232 psi	1/1 – 1	145 psi
4/2 – 4/1	435 psi	2/2 – 4/1	217 psi
MVI 600			
1/1 – 5/2	435 psi	1/1 – 1	145 psi
		2/2 – 3	217 psi
		4/2 – 5/2	290 psi
MVI 750			
1/1 – 4/1	435 psi	1/1	145 psi
		1/2	217 psi
		3/2 – 4/1	290 psi

Fig. 6a – MVI – 5, 15, 20, 50, 75, 100 Section View

MVI - 5, 15, 20, 50, 75, 100

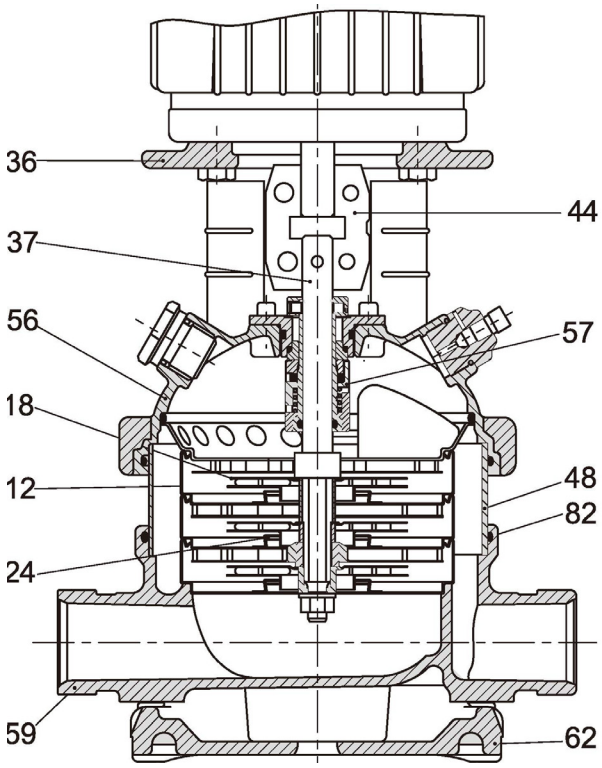


Fig. 6b – MVI – 160, 225, 320, 450 Section View

MVI - 160, 225, 320, 450

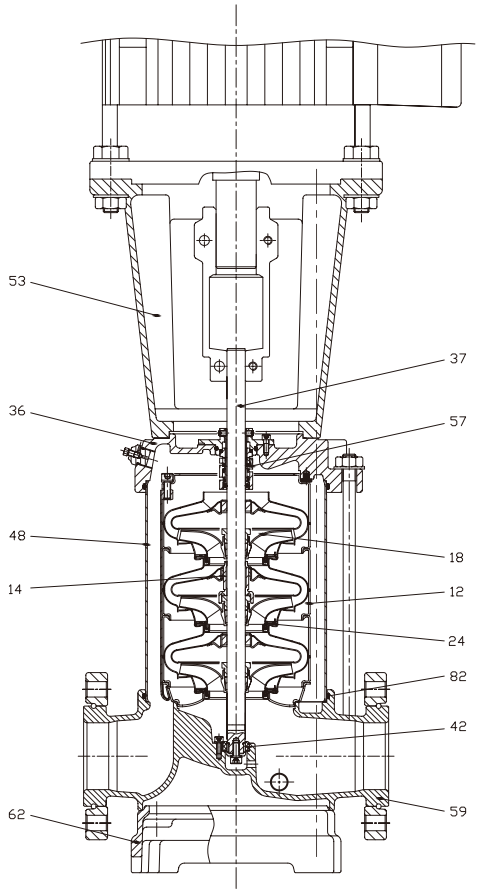


Fig. 6c – MVI – 600, 750 Section View

MVI - 600, 750

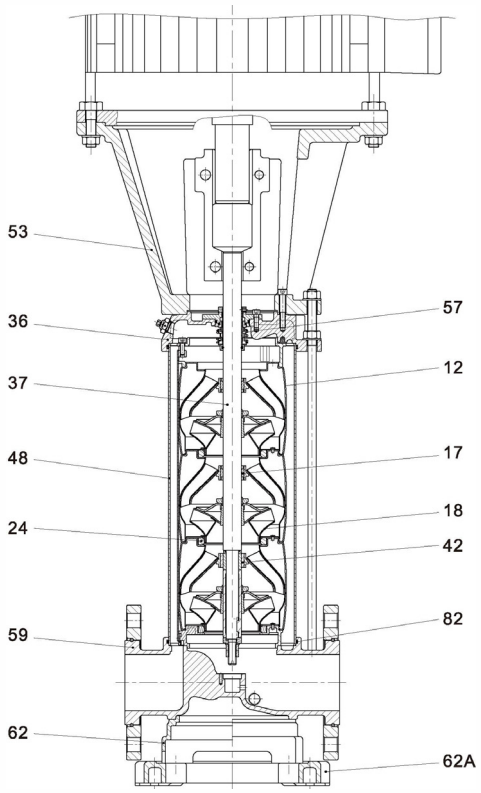


Fig. 7a – Proper Installation Clearances

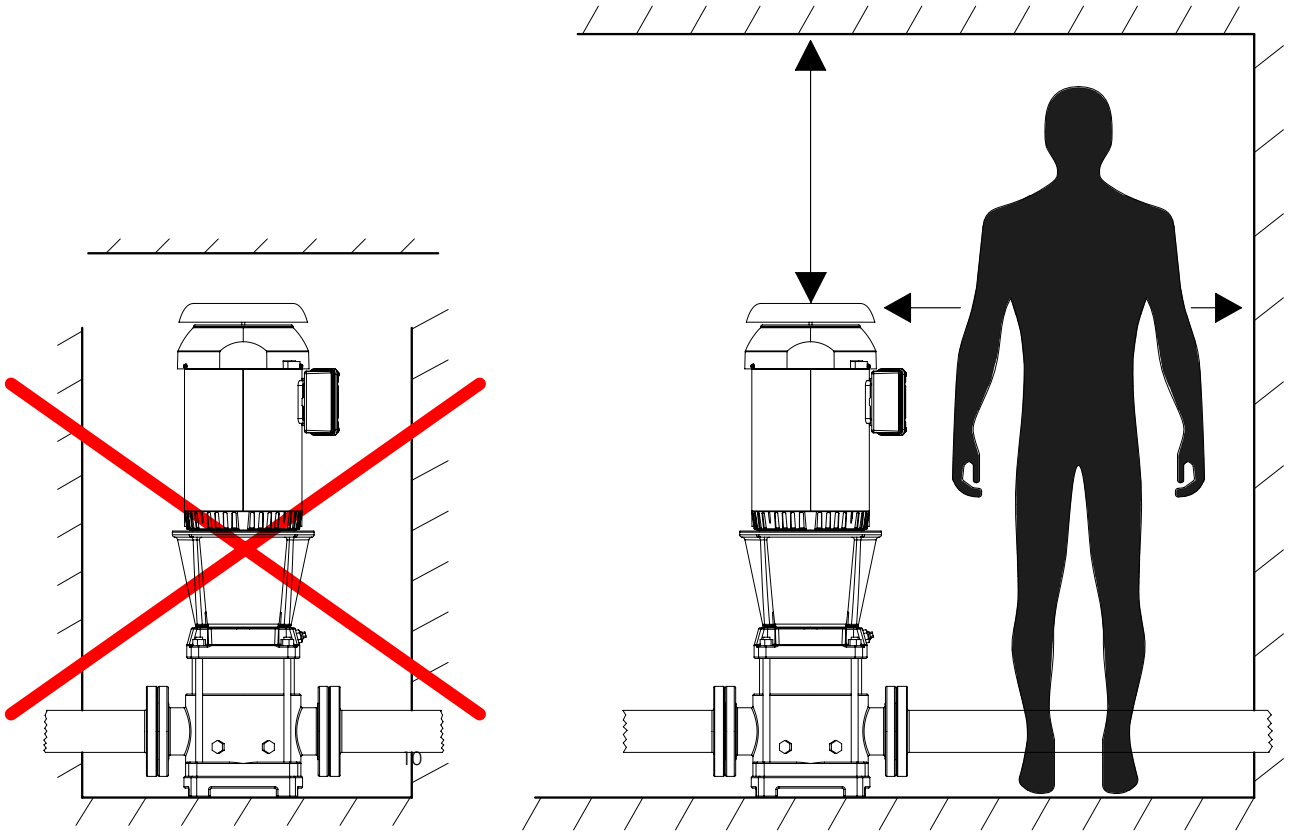


Fig. 7b – MVI – 5, 15, 20 Flange/Footprint

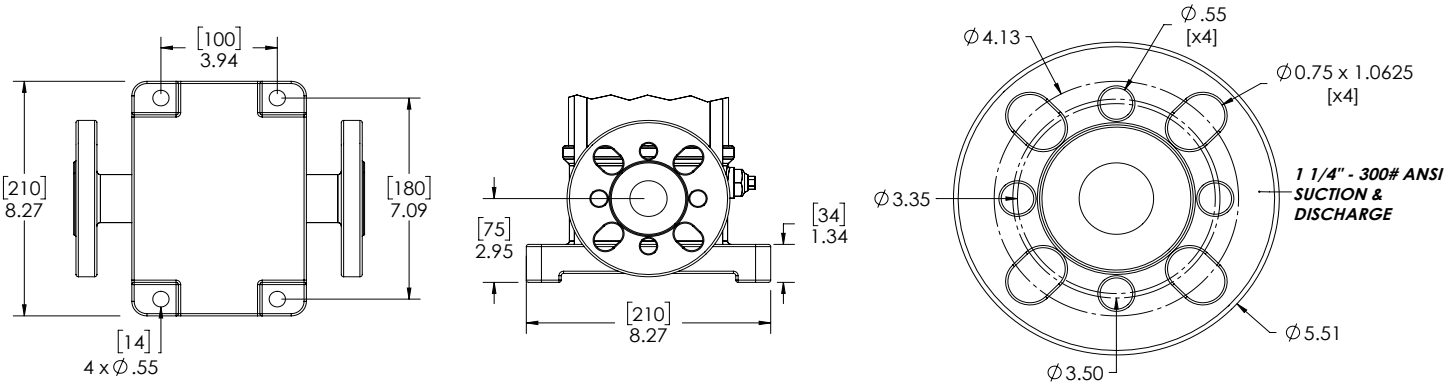


Fig. 7c – MVI – 50, 75, 100 Flange/Footprint

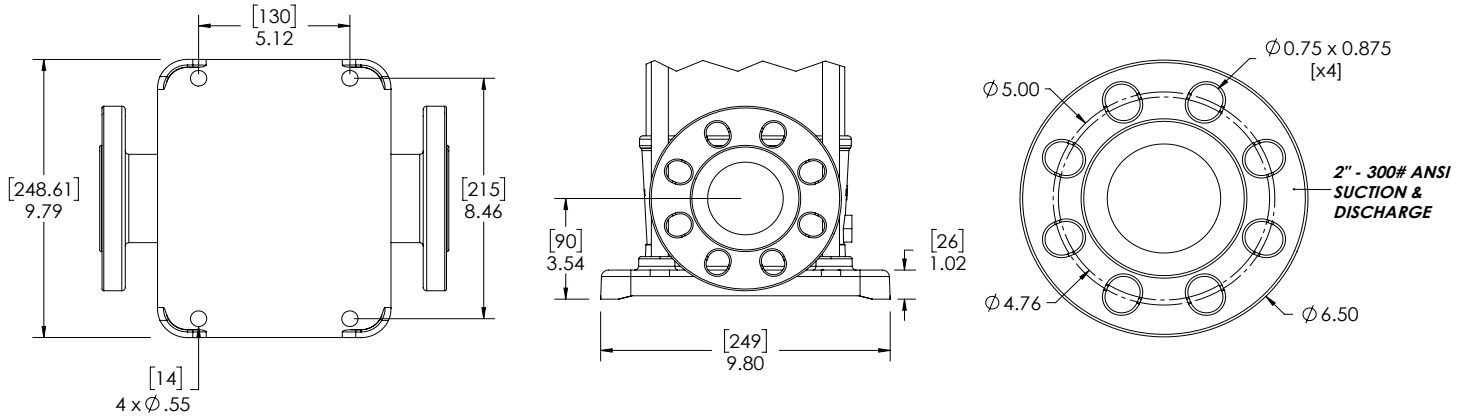


Fig. 7d – MVI – 160 Flange(s)/Footprint

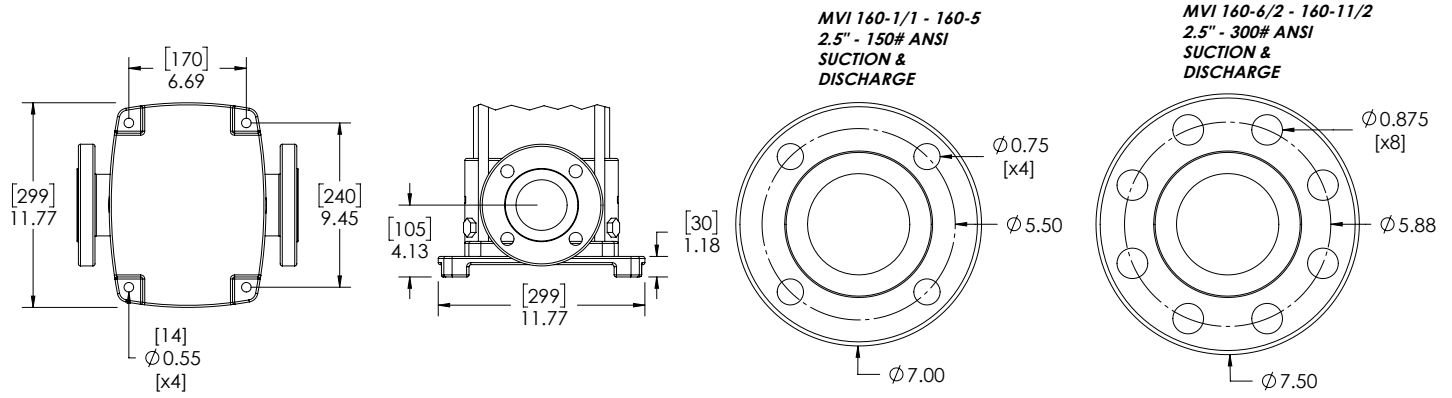


Fig. 7e – MVI – 225 Flange(s)/Footprint

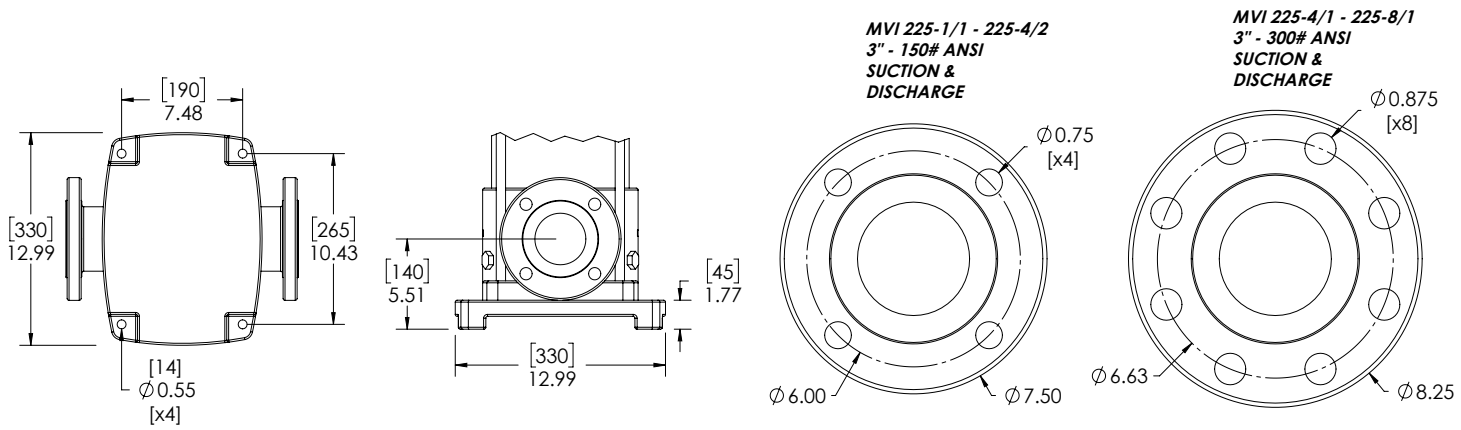


Fig. 7f – MVI – 320, 450 Flange(s)/Footprint

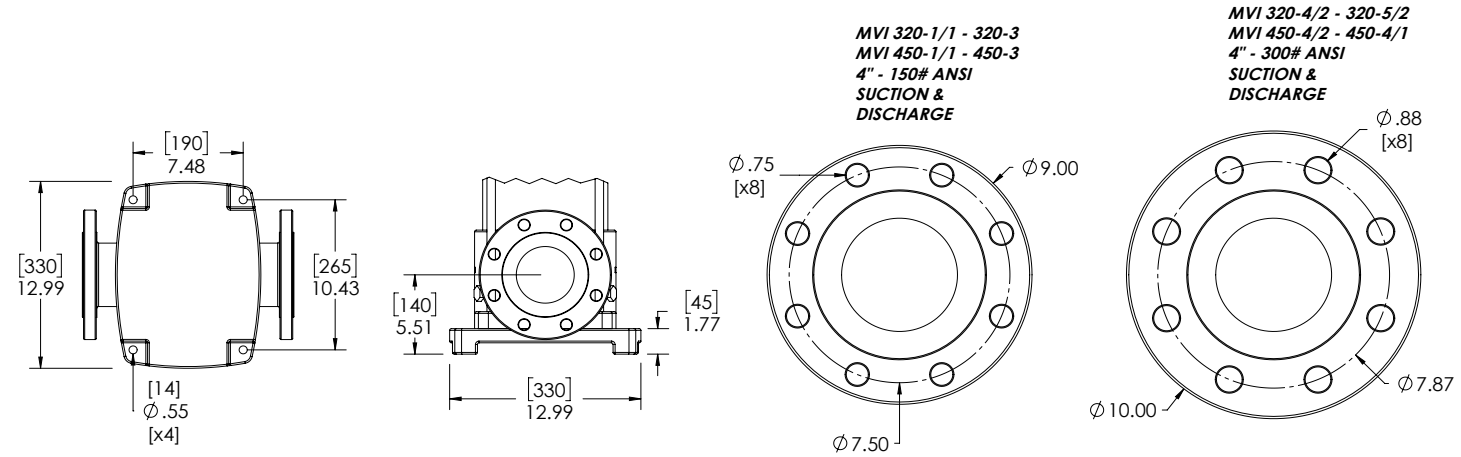


Fig. 7g – MVI – 600, 750 Flange(s)/Footprint

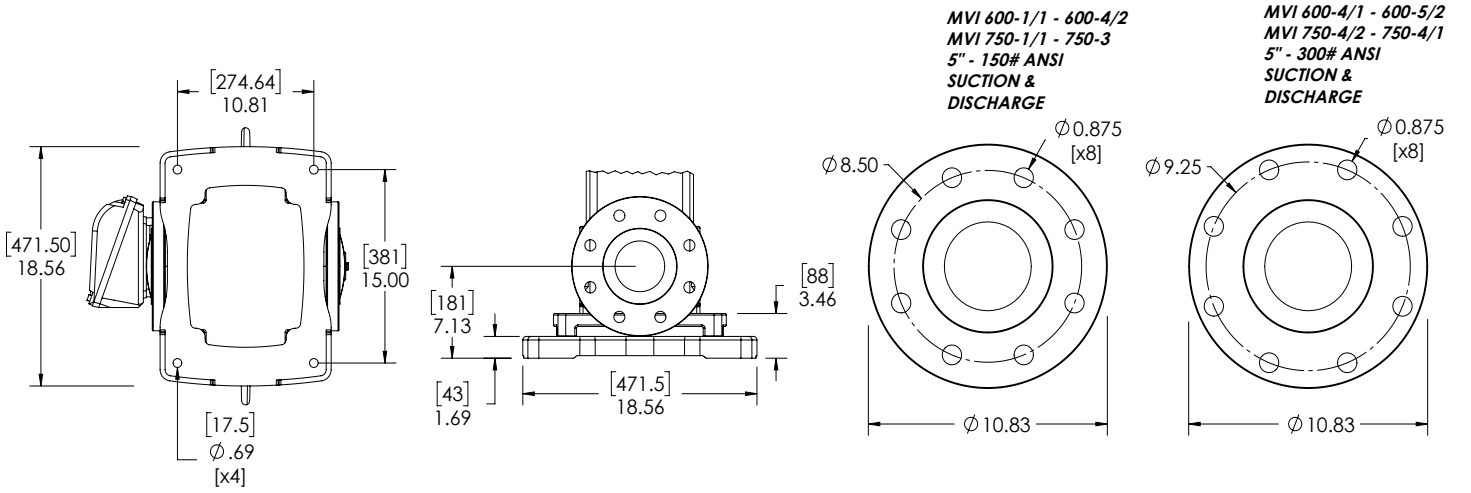


Fig. 7h – Storage tank or water main installation

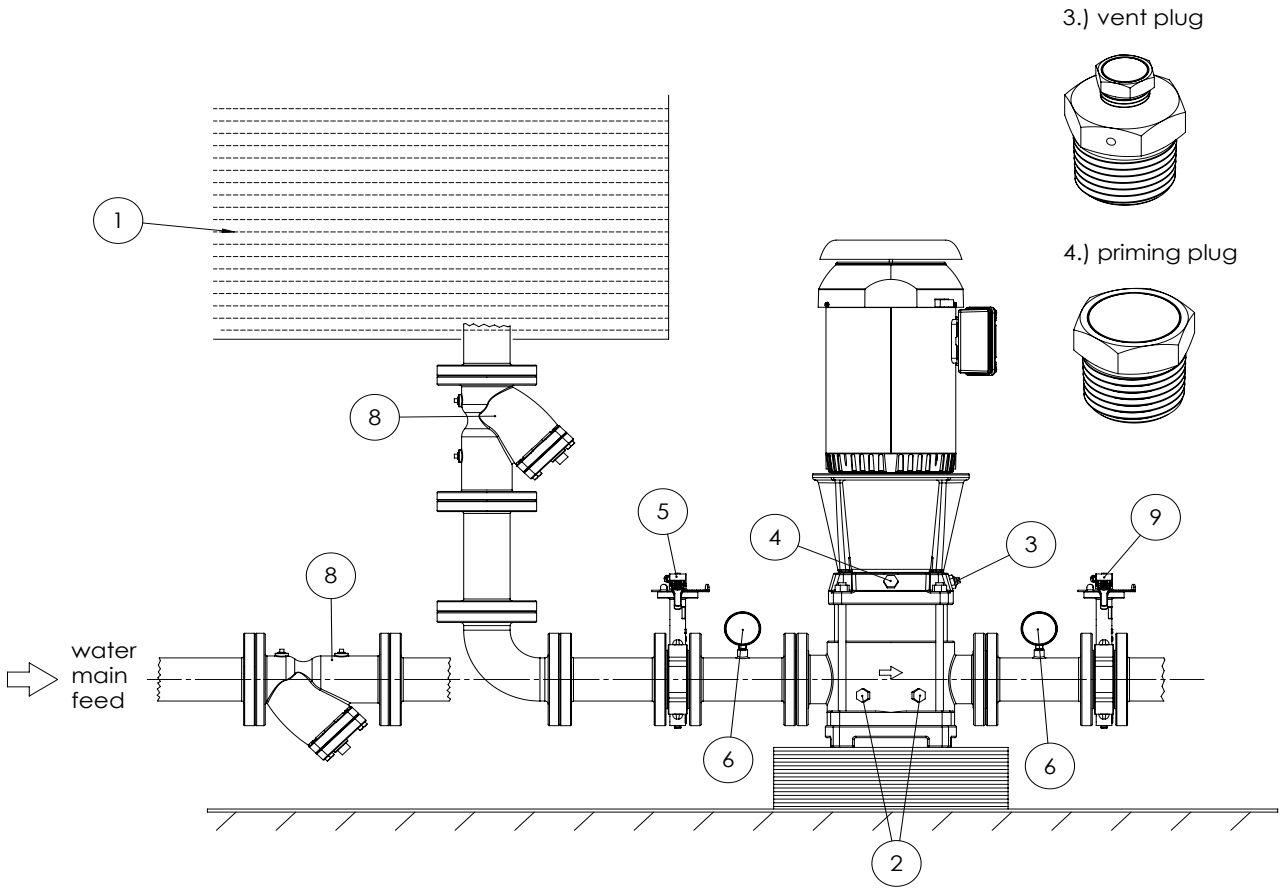


Fig. 7i – Suction lift installation

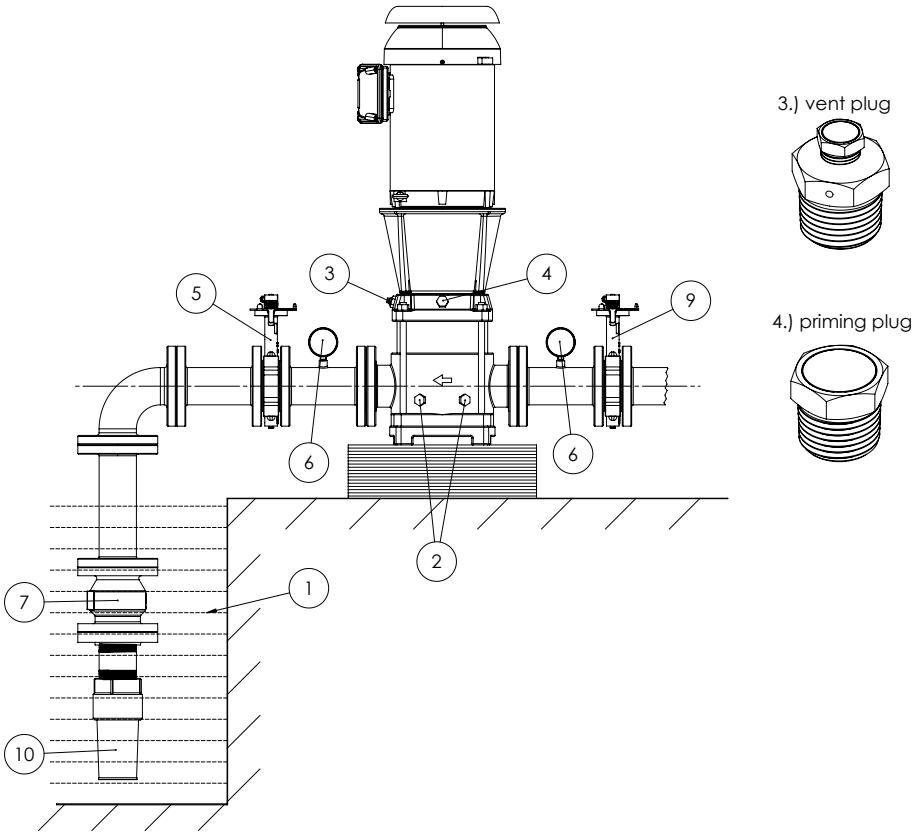


Figure 7j – Proper pump mounting

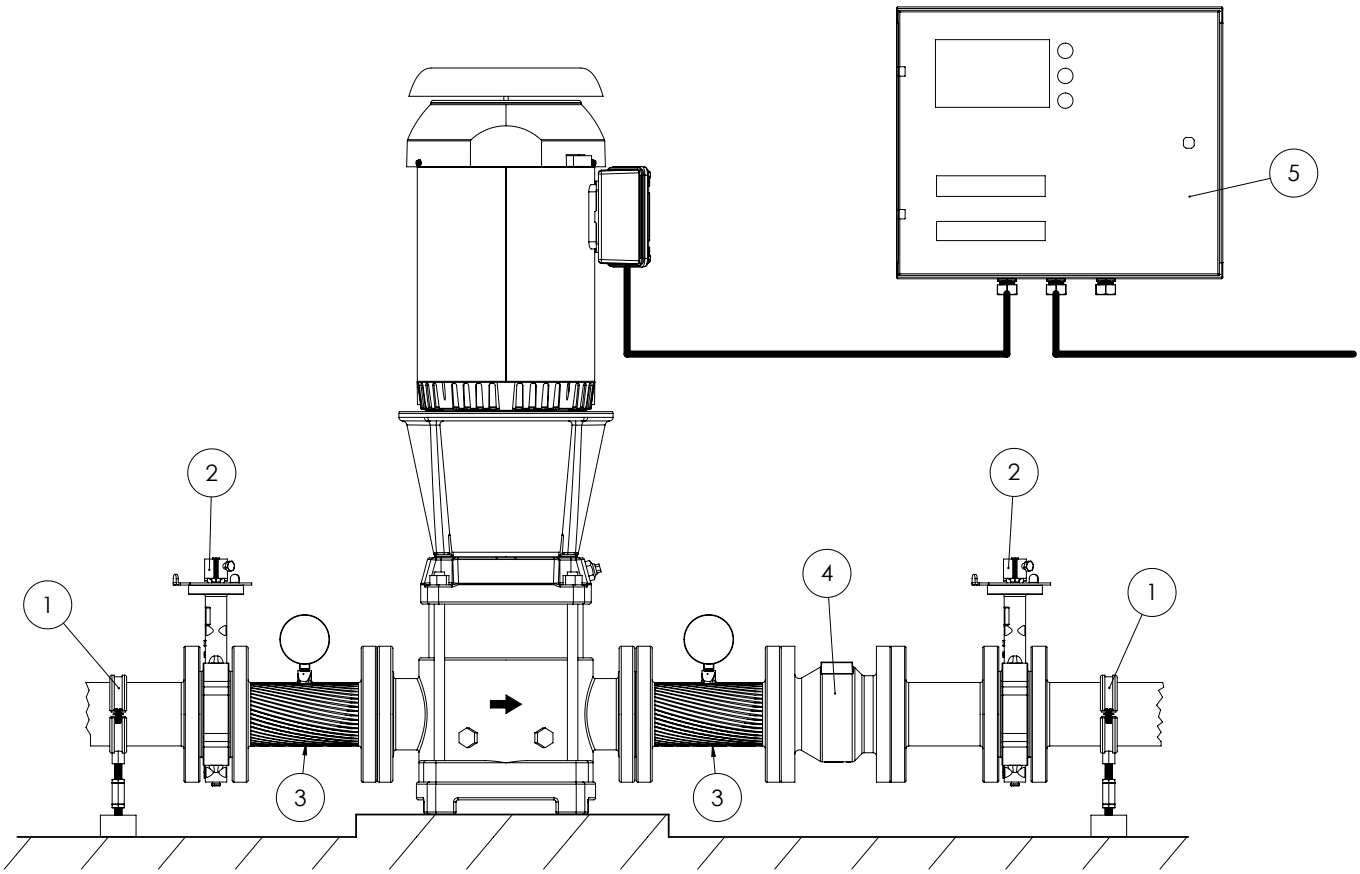


Fig. 7k – Proper piping

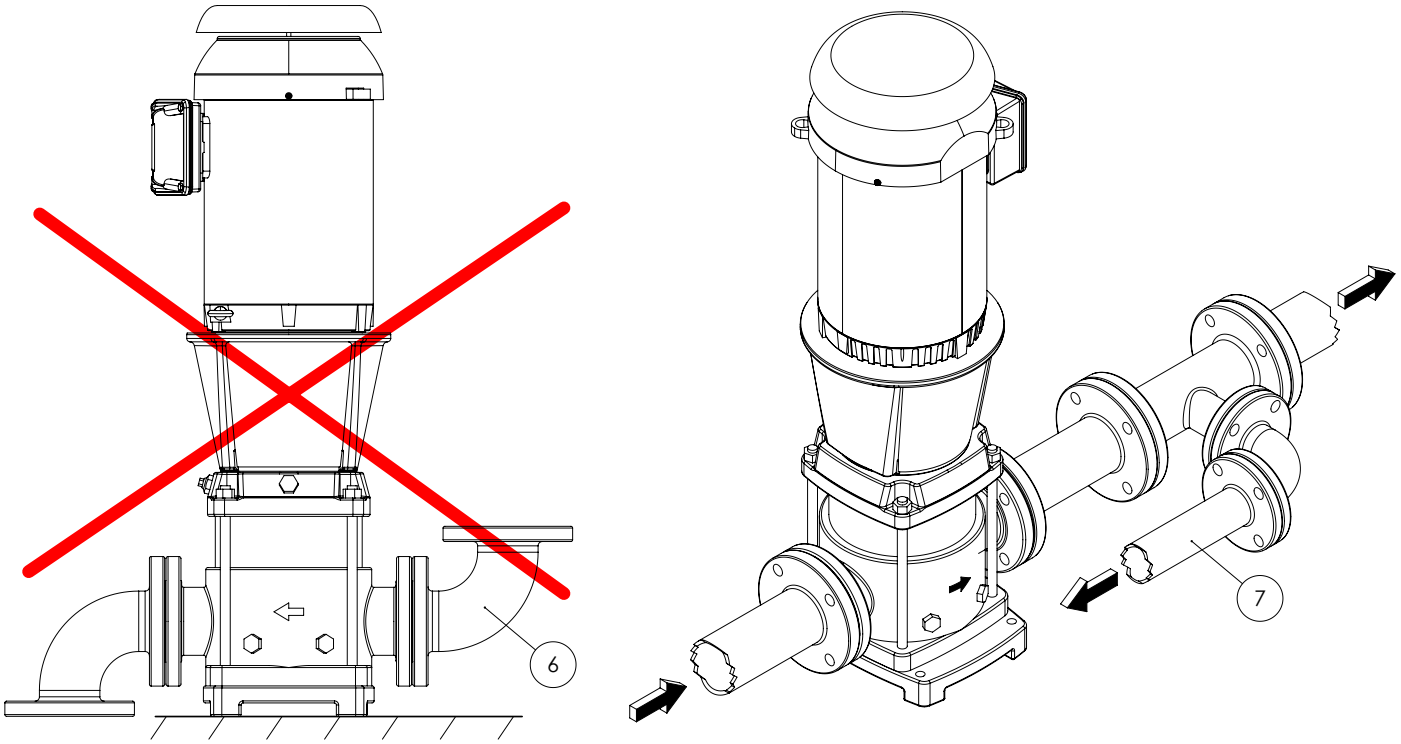
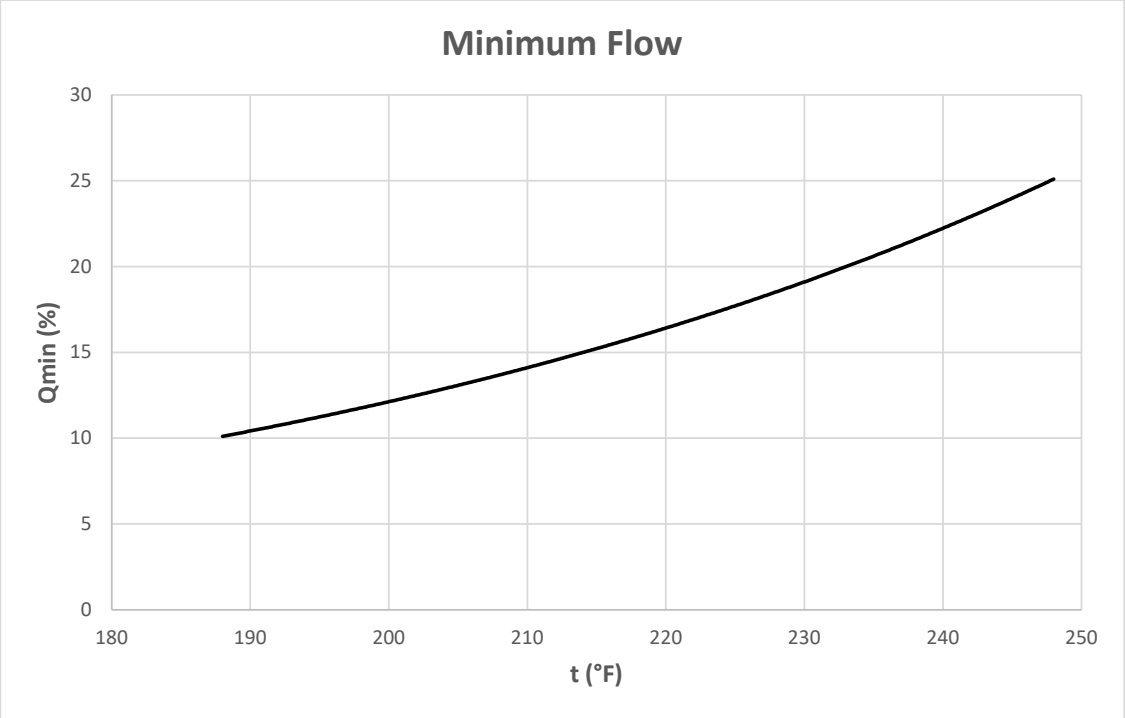


Fig. 8a – Minimum Flow



Tightening Torque Specifications

COUPLING BOLTS				
PUMP	**MOTOR FRAME**	**BOLT**	**in-lb**	**N-m**
MVI 5,15,20	56C	M6	115	13
	182TC	M8	274	31
	213TC	M10	549	62
MVI 50,75,100	56C	M6	115	13
	182TC	M8	274	31
	213TC	M10	549	62
	254TC	M10	549	62
MVI 160,225,320,450,600,750	182TC	M10	549	62
	213TC	M10	549	62
	254TC	M10	549	62
	284/6TSC	M10	549	62
	324/6TSC	M10	549	62
	364/5TSC	M16	885	100
	405TSC	M16	885	100

STAYBOLTS			
PUMP	**BOLT**	**in-lb**	**N-m**
MVI 5, 15, 20	M12	310	35
MVI 50, 75, 100	M16	708	80
MVI 600, 750	M16	1062	120

AIR VENT/DRAIN PLUG	
in-lb	**N-m**
310	35

IMPELLER NUT/LOCK NUT		
PUMP	**in-lb**	**N-m**
MVI 5, 15, 20	159	18
MVI 50, 75, 100	195	22
MVI 160,225,320,450	885	100
MVI 600, 750	1593	180

STRAP BOLT			
PUMP	**BOLT**	**in-lb**	**N-m**
MVI 50,75,100,160, 225, 320,450	M8	133	15

SHAFT END BOLT			
PUMP	**BOLT**	**in-lb**	**N-m**
MVI 160,225,320,450	M8	274	31

SHAFT END NUT			
PUMP	**BOLT**	**in-lb**	**N-m**
MVI 600, 750	M14	398	45

MOTOR BRACKET & PUMP HEAD BOLT			
PUMP	**BOLT**	**in-lb**	**N-m**
MVI 160,225,320,450	M10	549	62

MOTOR BRACKET BOLT		
BOLT	**in-lb**	**N-m**
M6	89	10
M8	106	12
M12	354	40
M16	708	80

1. General

1.1 About this document

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 standards valid at the time of going to print. **SPECIAL NOTE: ALL REFERENCES TO FIGURES WILL BE ON PAGES 2–13.**

1.2 Modeling information

Please refer to **Fig. 1a (page 2) – Model numbering information format**, for the reference concerning the model description.

1.3 Model nameplate information

Every MVI pump shall be shipped with a specific nameplate for the model ordered that includes all the information of the pump. Please refer to **Fig. 1b (page 2) –Model nameplate information .**

2. Safety

These instructions contain important information which must be followed when installing and operating the pump. It is therefore imperative that they be read by both the installer and the operator before the pump is installed or operated.
Both the general safety instructions in this section and the more specific safety points in the following sections should be observed.

2.1 Instruction symbols used in this operating manual

Symbols

General danger symbol

Hazards from electrical causes

NOTE: ...

Signals words:

DANGER! Imminently hazardous situation. Will result in death or serious injury if not avoided.

WARNING! Risk of serious injury. 'Warning' implies that failure to comply with the safety instructions can potentially result in severe personal injury.

CAUTION! Risk of damage to the pump if improperly installed.

NOTE: Useful information on the handling of the product. It alerts the user to possible problems.

2.2 Personnel qualification

The personnel installing the pump must have the appropriate qualification for this work.

2.3 Possible risks incurred by failure to comply with the safety instructions

Failure to comply with the safety instructions could result in personal injury or damage to the pump or installation. Failure to comply with the safety instructions could also invalidate any claim for damages.
In particular, failure to comply with these safety instructions could give rise, for example, to the following risks:

- Failure of important pump or installation functions,
- Failure of specified maintenance and repair methods,
- Personal injury due to electrical, mechanical and environmental causes,
- Damage to property.

2.4 Safety precautions for the operator

The relevant accident precaution regulations must be observed. Dangers caused by electrical energy must be excluded. Local or general regulations [e.g. NEC,NEMA, etc.] and directives from local codes.

2.5 Safety precautions for inspection and installation

The operator must ensure that all inspection and installation work is carried out by authorized and qualified specialists who have carefully studied these instructions.
Work on the pump/unit must be carried out only with the pump disconnected (locked out) from the electrical supply and at complete standstill.
For proper mounting options concering the pump installation please refer to **Figure 2 (page 3) Proper Mounting.**

2.6 Unauthorized alterations and manufacture of spare parts

Alterations to the pump or installation may only be made in agreement with the manufacturer. The use of original spare parts and accessories authorized by the manufacturer will ensure safety. The use of any other parts may invalidate claims revoking the liability of the manufacturer.

2.7 Improper use

The proper operation of the pump or installation can only be guaranteed if it is used in accordance with the operating instructions. All values must neither exceed, nor fall below, the limit values given in the catalogue or data sheet.

3. Transport and interim storage

When receiving the material, check that there has been no damage during the transport. If shipping damage has occurred, take all necessary steps

with the carrier within the allowed time. Prior to installation of the pump, please check that all bolts are tightened that may have loosened during the transportation process (particularly between motor and motor bracket). Please handle the pump carefully so as not to damage the unit. Refer to Fig. 3 (page 3) – Proper Lifting for proper lifting procedures and guidelines.

CAUTION! Outside influences may cause damages !
If the delivered material is to be installed later on, store it in a dry place and protect it from impacts.

4. Application

4.1 Allowable pump liquids

This pump's basic function is to pump hot or cold water, water with glycol or other low viscosity fluids that contain no mineral oil, solid or abrasive substances or materials having long fibres. The manufacturer's approval is required for use to pump corrosive chemicals. Please refer to Fig. 4 (pages 4–5) –Allowable liquids to be pumped.

DANGER! Risk of explosion!
Do not use this pump to handle flammable or explosive liquids.

4.2 Application areas:

Water Supply and Pressure Boosting:
- Pressure boosting in buildings, hotels, residential complexes
- Pressure booster stations supply of water networks
- Pressure boosting for industrial water supply

Irrigation and Agriculture:
- Greenhouse
- Sprinkler irrigation
- Field irrigation (flooding)

Light Industry:
- Washing and cleaning systems
- Car washing facilities
- Fire fighting systems
- Process water systems
- Machine tools (cooling lubricants)

Water Treatment:
- Water softeners and de-mineralization
- Reverse Osmosis systems
- Filtration
- Ultra-filtration systems
- Distillation systems

Heating, Ventilation and Air-Conditioning:
- Boilers
- Induction heating
- Heat exchangers
- Refrigerators
- Cooling towers and systems
- Temperature control systems

5. Technical data

5.1 Technical data

– Maximum operating pressure please Refer to Fig. 5 (page 6) – Maximum Operating Pressure and Inlet Pressure
  • Maximum suction pressure: 145 PSI (10 BAR)

– Temperature range
  • Fluid temperature: 5 to 248°F (120°C)
  • Ambient temperature: 32 to 104°F (40°C)

WARNING
If ambient temperatures are above 104°F, or if the pump is located at elevations more than 3,281 feet (1,000 meters) above sea level, the motor's output must be decreased to compensate for less effective cooling, and may have to be replaced with a stronger motor.

5.2 Scope of Supply
- Multistage pump.
- Installation and operating instructions.

5.3 Accessories
Original accessories are available for the MVI range. The accessories must be ordered separately.

6. Description and function

6.1 Product description

Fig. 6a (page 7) – MVI – 5, 15, 20, 50, 75, 100 Section View
12 – chamber
18 – impeller
24 – neck ring
36 – pedestal
37 – shaft
44 – coupling
48 – outer sleeve
56 – cover, seal chamber
57 – mechanical seal
59 – pump volute
62 – baseplate
82 – O-ring

Fig. 6b (page 7) – MVI – 160, 225, 320, 450 Section View
12 – chamber
14 – bearing ring
18 – impeller
24 – neck ring
36 – cover, seal chamber
37 – shaft
42 – bottom bearing ring
48 – outer sleeve
53 – pedestal
57 – mechanical seal
59 – pump volute
62 – baseplate
82 – O-ring

Fig. 6c (page 8) – MVI – 600, 750 Section View
12 – chamber
17 – bearing ring

18 – impeller
24 – neck ring
36 – cover, seal chamber
37 – shaft
42 – bottom bearing ring
48 – outer sleeve
53 – pedestal
57 – mechanical seal
59 – pump volute
62 – baseplate
62A – baseplate
82 – O-ring

6.2 Design of product

- MVI pumps are vertical, high pressure, non-self priming pumps with inline connection based on multistage design.
- MVI pumps combine use of both high efficiency hydraulics and motors.
- All metallic parts in contact with water are made of stainless steel.

7. Installation and electrical connection

Installation and electrical work in compliance with any local codes and by qualified personnel only.

WARNING! Bodily injury!
Existing regulations for the prevention of accidents must be observed.

WARNING! Electrical shock hazard!
Dangers caused by electrical energy must be excluded.

7.1 Commissioning

Unpack the pump and dispose of the packaging in an environmentally responsible manner.

7.2 Installation

The pump must be installed in a dry, well ventilated and frost-free place. Always refer to the local or national regulations and codes relating to the selection of the installation site, the water and power connections, etc.

CAUTION! Possible damage of the pump!
- It is recommended that any welding and soldering work be done before installing the pump.
- Thoroughly flush the system before installing the pump.

WARNING! Risk of injury due to hot surfaces!
The pump must be positioned so that someone cannot come into contact with the hot pump surfaces while in operation.

- Install the pump on a flat concrete block using appropriate accessories. If possible, use an insulating material under the concrete block to avoid any noise and vibration transmission into the installation.

WARNING! Risk of fall!
The pump must be correctly screwed to the ground.

- Place the pump where it will be easy to reach, to facilitate inspection, replacement and removal work. The pump must always be installed perfectly upright on a sufficiently heavy concrete base. Refer to Fig.7a-page 8-Proper Installation Clearances.

CAUTION! Risk of parts inside the pump!
Take care to remove port covers of the pump housing before installation.

NOTE: Pumps may be pressure tested before shipment. Some water may remain in the pump. It is recommended, for hygienic purposes, rinse the pump before any use with potable water supply.

- The installation and connection dimensions (connection flanges and pump footprint) are given in Fig. 7b through Fig. 7g (page 9 – 10) – Flanges/Footprint.

- Lift the pump carefully so as not to damage the unit. Please refer to Fig. 3-page 3-Proper Lifting for procedures and guidelines.

WARNING! Tipping Hazard!
Vertical multistage pumps may have a high center of gravity. Make sure to secure the pump firmly to avoid risks.

WARNING! Risk of Damage!
Do not use the motor lifting lugs when lifting the entire pump: these are only designed to lift the motor alone. Refer to Fig. 3-page 3-Proper Lifting.

For elevated storage tank and water main applications please refer to Figure 7h-page 11-Storage tank or water main installation

For well or underground storage tank applications please refer to Fig. 7i-page 11-Suction lift installation.

-Use a foot valve (component 10 in Fig. 7i -page 11-Suction lift installation) in case of negative suction head.

7.3 Pipe connection

- Connect the pump to the system piping. For flanges refer to Fig. 7b through Fig. 7g (pages 8 – 10).

NOTE: Using elbows in any installation will increase the flow resistance. Wide bends will result in a lower flow resistance.

7.4 Anchoring

- The pump must be secured to a solid foundation by bolts through the holes in the base plate. Refer to the mounting footprint drawings in Fig. 7b through Fig. 7g (pages 8-10).

- The direction of fluid flow is indicated on the pump.
- Pump must be installed in such a way that it is not stressed by the pipework. Use pipe supports

if necessary (component 1 in Fig. 7j – page 12 – Proper pump mounting for pipe support) to avoid stresses on connections.
- It is advisable that isolation valves (component 2 in Figure 7j – page 12 –Proper pump mounting) are installed on the suction and discharge side of the pump.
- Use of expansion joints mitigates noise and vibration (component 3 in Fig. 7j–page 12–Proper pump mounting). If the pump needs to be operated with an on–off valve closed, install a bypass line to avoid damaging the pump. Do not place elbows next to the pump intake and discharge. Refer to **F**ig. 7k–page 12–Proper piping. Consult Hydraulic Institute 9.6.6 for best practice.

- The nominal cross–section of the suction pipe should be at least as large as that of the pump connection.
- A check valve (component 4 in Fig. 7j –page 12–Proper pump mounting) should be placed on the discharge pipe in order to protect the pump against hammer shock.
- For direct connection to a water main, a strainer (component 8 in Fig. 7h –page 11–Storage tank or water main installation) is recommended.
- For indirect connection via a tank, the suction pipe must have a strainer (component 8 in Fig. 7h–page 11–Storage tank or water main installation) to keep any impurities out of the pump.

7.5 Motor connection for bare–shaft pump (without motor)

- Remove coupling guards.

- Install the motor on the pump by using screws or bolts, nuts and handling devices provided with the pump: check motor power and dimension in Scot catalogue.

NOTE: Depending on fluid characteristics, motor power could be modified. Contact Scot Customer Service if needed.

- Close the coupling guards using all screws provided with the pump. Allow for sufficient space above the motor to facilitate proper motor cooling. Refer to Fig. 7a–page 8 – Proper Installation Clearances.

7.6 Electrical connections

DANGER! Danger of death!
National Electrical Codes (NEC), local codes and regulations must be followed.

WARNING! Electrical shock hazard!
All electrical work must be conducted by a qualified electrician! Make sure that the supply voltages and frequencies, and phase are suitable for the motor used.
• All electrical connections must be locked out before performing any electrical task. Assure that the control panel (component 5 in Fig. 7j–page 12–Proper pump mounting) conforms to local standards and regulations.
• For safe installation and operation, the motor must be properly grounded.

NOTE: Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the Manufacturer Instructions, National Electrical Code and any additional local codes.

- The electric characteristics (frequency, voltage, nominal current) of the motor–converter are mentioned on the pump identification sticker. Check that the motor complies with the mains supply used.
- Install correct electrical overloads and breakers to protect the installation mains voltage.

NOTE: Install a circuit–breaker for user protection, it must have a delay effect. Adjust it according to the current mentioned on the motor nameplate.

- Use power cables conforming to NEMA and NEC standards.

Connection terminal allocation
- Loosen the screws and remove the converter cover.
- Refer to wiring diagram inside the motor junction box.

8. Start up

8.1 System filling – Venting

CAUTION! Possible damage of the pump!
Never operate the pump dry. The system must be filled before starting the pump.

8.1.1 Venting – (Fig. 7h–page 11–Storage tank or water main installation)

- Close the two isolation valves (components 5 and 9 in Fig. 7h–page 11–Storage tank or water main installation).
- Unscrew the air bleed screw in the vent plug (component 3 in Fig. 7h–page 11–Storage tank or water main installation).
- Slowly open the isolation valve on the suction side (component 5 in Fig. 7h–page 11–Storage tank or water main installation).
- Retighten the air–bleed screw when air escapes at the air bleed screw and the pumped liquid flows.

WARNING!
When the pumped liquid is hot and the pressure high, the stream escaping at the air bleed screw may cause burns or other injuries.

- Open the isolation valve on the suction side completely.
- Start the pump and check if the direction of rotation matches the one printed on pump volute.

CAUTION! Possible damage of the pump!
Incorrect rotation will cause poor pump performance and cause possible pump damage.

8.1.2 Air evacuation process – Pump in suction lift

- Close the isolation valve on the discharge side (component 9 in Fig. 7i-page 11-Suction lift installation).
- Open the isolation valve on the suction side(component 5 in Fig. 7i-page 11-Suction lift installation).
- Remove the priming plug (component 4 in Fig. 7i -page 11-Suction lift installation).
- Fill the pump and the suction pipe with water.
- Make sure that there is no air in the pump and in the suction pipe: refill until the complete removal of air is achieved.
- Close the filling plug (component 4 in Fig. 7i -page 11-Suction lift installation)
- Start the pump and check if the direction of rotation is correct.
- Immediately open the isolation valve (component 9 in Fig. 7i-page 11-Suction lift installation) on the discharge side a little, to assure the proper prime. Once assured, open the valve entirely.

CAUTION! Possible damage of the pump!
Incorrect rotation will cause poor pump performance and cause possible pump damage.

WARNING! Risk of burning!
When the pumped liquid is hot and the pressure high, the stream escaping at the air bleed screw may cause burns or other injuries.

8.2 Starting up

CAUTION! Possible damage of the pump!
The pump must not operate at zero flow (closed discharge valve).

To prevent overheating of the internal pump components, the pump should not be used at flows below the minimum flow rate.

The curve in Fig. 8a-page 13-Minimum Flow shows the minimum flow rate as a percentage of the nominal flow rate in relation to the liquid temperature.

WARNING! Risk of injury!
When the pump runs, coupling guards must be in place, tightened with all appropriate screws.

WARNING! Noise!
Noise emitted by pumps could be very high; hearing protection must be used in case of extended operation in close proximity to the pump.

WARNING!
Installation must be designed in order that no one is injured in case of fluid leakage.

8.3 Minimum Inlet Pressure – NPSH

To avoid cavitation, make sure that there is a minimum pressure on the suction side of the pump.Refer to the pump's NPSHR curve.

WARNING! Risk of scalding!
Pressurized water can easily turn into steam when venting, creating a condition where scalding may occur.

9. Maintenance

All servicing should be performed by an authorized service representative!

WARNING! Electrical shock hazard!
Dangers caused by electrical energy must be excluded.
All electrical work must be performed after the electrical supply has been locked out and secured against unauthorized switching.

WARNING! Risk of scalding!
At high water temperatures and system pressure close isolating valves before and after the pump. First, allow pump to cool down.

General Notes:

- The pump does not have a recommended maintenance schedule.
- The seals are wear parts easily replaced by cartridge seal kits.
- Always keep the pump perfectly clean.
- Repairs to the electric motors are to be handled only by Authorized agents.
- If you order a complete pump with motor, please refer to the motor manual for additional information.

9.1 Service of Mechanical Seal Instructions

Step 1: Remove the screws holding the coupling guards and remove the guards.

Step 2: Unscrew the allen screws out of the couplings and remove the coupling halves.

Step 3: Unscrew the four screws holding the seal carrier and remove the carrier.

Step 4: Losen the allen screws holding the seal about one-half turn. Do not remove the screws.

Step 5: Lift the seal straight up and off the pump shaft. The cartridge seal will come off as an assembly.

Step 6: Service or replace mechanical seal.

Step 7: Lubricate the shaft seals and O-rings. Install the seal on the pump shaft making sure that it seats on the pump head.

Step 8: Slide the seal carrier down the shaft until it seats solidly on the shaft seal flange. Grease the threads on the socket head bolts and cross tighten them to 46 ft-lbs. torque.

Step 9: Cross tighten the allen screws holding the seal to the shaft to six ft-lbs. torque.

Step 10: Lift the pump shaft and insert the shaft spacer under the seal flange.

Step 11: Install the coupling with the bottom portion sitting on the top of the shaft spacer. Install allen screws and loosely tighten all four of them.

10. Faults, causes and remedies

WARNING! Electrical shock hazard!

Faults	Possible causes	Remedies
Pump does not run when the motor starter is activated.	Supply failure or no power supply.	Check connections or restart the power supply.
	Main contacts in motor starter are not making contact or the motor coils are defective.	Reconnect or replace contacts or magnetic coil.
	Pump or auxiliary circuit protection fuses blown.	Replace fuses.
	Pump or piping system may be obstructed causing a jam.	Clear the obstruction and restart pump.
	Motor may have failed.	Replace the motor.
	Motor protector or thermal relay has tripped out.	Reset the motor or thermal protector.
	Tripping of anti-dry running protection (Provided by others).	Check the water level in the tank or the water system pressure. If everything is in order, check the protection device and its connection cables.
Starter overload trips immediately when the power is switched on.	Overload setting is too low.	Set the motor starter correctly.
	The cable connection is loose or faulty.	Fasten or replace the cable connection.
	Fuse is blown.	Replace fuse and try starting again.
	Pump is jammed by an obstruction.	Check and clean obstruction from system.
	Contacts in overload are faulty.	Replace motor starter contacts.
	The motor winding is defective.	Replace the motor.
	Low voltage (Especially at peak time).	Check the power supply.
The pump starts but, after a short time, the thermal protector trips out or the fuses blow.	The voltage is not within the motor's operating limits.	Check the operating conditions of the pump.
	The control panel is situated in an excessively heated area or is exposed to direct sunlight.	Protect the control panel from heat sources and from the sun.
	A phase in the power supply is missing.	Check the power supply.
The pump starts up but, after a period of time, the thermal protector trips.	Worn motor bearings causing motor to overheat.	Replace motor bearings.
	The pump's delivery rate is higher than the specified rate on the pump nameplate.	Partially close the on-off valve located discharge side until the delivery rate returns to within the specified limits.
	There are obstructions inside the pump or pumping system.	Disassemble and clean the pump and piping.
	Less viscous liquids may cause the motor to work too hard and overload the motor, causing the motor to overheat.	Check the actual power requirements based on the characteristics of the liquid being pumped, and replace the motor accordingly.

Faults	Possible causes	Remedies
Pump runs but no water delivered.	Pump is not primed with liquid.	Fill the pump with the liquid to be pumped.
	The pump, suction or discharge pipes are blocked by solids in the liquid being pumped.	Clean the pump, suction or discharge pipe.
	The foot or check valve is blocked or has failed.	Replace the foot or check valve.
	The suction pipe leaks.	Repair or replace the suction pipe.
	The air is in the suction pipe or pump.	Remove trapped air from system.
	Motor operating in wrong direction (three-phase motor).	Change the direction of rotation of the motor by reversing motor connections.
The frequency of pump start-up is too high.	Leakage in the foot valve, check valve or system.	Repair or replace the components.
	Ruptured membrane or no air pre-charge in surge tank.	See relevant instructions in surge tank's manual.
Vibration and noise	Cavitation	Reduce the required flow or improve the operating conditions of the pump (suction conditions, head, flow resistance, liquid temperature, viscosity, etc.).
	Worn motor bearings.	Replace the bearings or the motor.
	Operation with frequency converter.	Consult a qualified engineer from the supplier of the frequency converter.
	Check vibration and noise damping devices	Replace vibration & noise dampers, if worn.

11. Spare parts

Spare parts may be ordered via the local Scot Pump distributor.
To avoid any questions or wrong orders, all data of the name plate should be mentioned when ordering, including date codes.

CAUTION! Danger of material damage!
Pump performance can only be guaranteed when original spare parts are used.

- Only use original spare parts.

12. Disposal

Information on the collection of used electrical and electronic products.

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

NOTICE: Disposal in domestic waste is forbidden!

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

- Only hand over these products at designated, certified collecting points.
- Observe the locally applicable regulations! Please consult your local municipality, the nearest waste disposal site, or the dealer who sold the product to you for information on proper disposal.

Subject to technical alterations!

wilo

WILO USA LLC
+1 262 204-6600
www.wilo-usa.com
info.us@wilo.com

Wilo Canada Inc.
+1 403 276-9456
www.wilo-canada.com
info@wilo-canada.com

Scot Pump
+1 262 377-7000
www.scotpump.com
scot.sales@wilo.com

Pioneering for You