Control No.	IM-037	Rev.	7

Instruction Manual

TEXEL®

Magnetic Drive Pump

MEP-040 / 050 models



SEIKOW CHEMICAL ENGINEERING & MACHINERY, LTD.

Thank you for purchasing Texel Corrosion Resistant Pump.
The pump is designed and manufactured for applications in which corrosion resistance is a priority. However, modifications in operating conditions or improper operations may result in unexpected incidents.
Please read this operation manual thoroughly before using and use the product in a proper way.

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Indication	What it means
Warning	A death or a severe injury may occur if the instruction is not followed.
Caution	Minor to moderate injury or property damage may occur if the instruction is not followed.
Information	Strongly recommended procedures to use the product more safely.

After reading this instruction manual, be sure to store it and keep it for reference at any time.

1. Things to be confirmed upon arrival

Upon arrival of the pump, please check and confirm followings:

(1) The specifications on the nameplate of the pump match the order specifications.
(2) All accessories are in place.
(3) All bolts and screws are securely fastened. Looseness may occur during transportation, so be sure to check the casing and drain bolts for looseness before trial operation.
(4) The pump has no visible damage during the transportation.
(5) Remove the motor fan cover and check that the motor fan can be turned easily by hand. If the rotation seems heavy or the fan does not turn, there may be some internal damage. Contact the vendor or supplier immediately.

Warning
If the pump is provided without motor, make sure that foreign matter around the inside of the bracket (028) before installing the motor.

2. Safety precautions

Like other high-speed or high-pressure machinery, a magnetic drive pump can be dangerous if it is not used properly. Special attention is required if a corrosive or hazardous chemical is used.
Instructions listed as "Warning" must be followed to avoid property damages or fatal accidents.

2.1. Transportation

The entire pump can be lifted using the eyebolt provided on the pump. However, ensure to secure the motor part with a suspension rope (nylon sling) prior to the operation for safety.

Warning
(1) An eyebolt or a hooking hole provided on the motor is rated only for the motor weight. Avoid suspending the entire pump using the hooking hole on the motor.
(2) If a special base (not specified in the contract or listed as standard) is set on the pump, do not suspend the pump using the eyebolt.

2.2. Confirmation

Before a test run after pump installation or a maintenance work, make sure that all bolts including drain bolts and casing bolts are securely fastened.

2.3. Application

The pump is designed and manufactured for the specific application and specifications designated in the contract. If the pump needs to be used for any other application, please consult with the vendor or supplier prior to such use.

3. Storage

While in storage, perform maintenance and inspections by following the instructions shown below until pump startup.

3.1. Short-term storage (less than 3 months)

(1) Do not remove the bore seal.
(2) Store the pump in a well-ventilated location without humidity. Also ensure to avoid wind-blown rainwater, leak from the roof, pool of water, etc.
(3) Protect the cable holes on the motor terminal box with a duct tape to close the gap and prevent dusts from entering the box.
(4) Avoid a location where there is a potential risk of pump damage due to surrounding equipment falling on the pump or due to a contact with other devices being transported. If it is not possible to avoid such locations, provide sufficient protections for the pump.
(5) Do not place heavy objects on the pump.
(6) In winter, there is a possibility of dew condensation and the dew being frozen inside the pump. Drain the liquid to avoid this.
(7) In case a pump that had been used needs to be stored, do the followings:
- ⊙ Clean the interior of the pump with fresh water.
- ⊙ Provide protections to the pump inlet and outlet to prevent infiltration of foreign materials.
- ⊙ If the sum of initial operation period and the storage period becomes longer than one year, replace the O-ring and inspect the interior of the pump before running it again.

3.2. Long-term storage (more than 3 months)

(1) Follow instructions (1) through (7) for the short-term storage stated above.
(2) Measure and record the insulation resistance at the time of delivery and check it regularly as the insulator of the motor may absorb moisture and the insulation resistance may drop. If the insulation resistance is dropped, dry the insulator following instructions from the manufacturer and provide protection against moisture. (Refer to the motor instruction manual.)

Warning
If the pump is run with poor insulation of the motor, a leak of electricity or other accident may occur. Ensure to check the insulation resistance regularly.

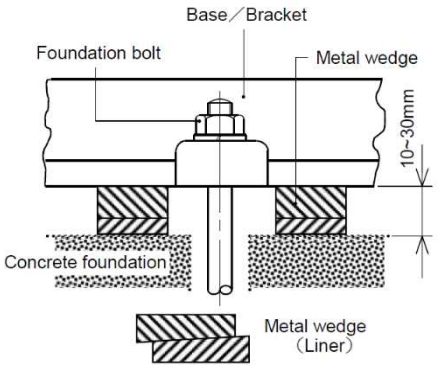
(3) Remove the motor fan cover once a month and turn the motor fan manually.
(4) If the pump is run after a period of one year or longer, ensure to replace the gasket with a new one.

4. Installation and Piping

4.1. Installation

(1) In principle, the pump should be installed on a concrete foundation. If it is not possible, the pump may be installed on a steel structure provided that the vibration during operation is prevented.
(2) Insert the foundation bolt into a bolt hole on the pump base or bracket, attach a nut tightly to the bolt head, and suspend it inside the foundation bolt hole.
(3) In case of a concrete foundation, insert a wedge in between the concrete and the base surfaces at four locations and keep the pump level.
(4) To check the levelness, use a level gauge on the upper surface of the pump outlet flange and check in all directions.
(5) After checking the levelness, fill the gaps between the concrete foundation and the base or the main unit with a fine mortar, as well as gaps in the foundation bolt holes. Ensure that everything is evenly bonded. (Fig. 4-1)
(6) Leave the pump as is for several days to let the mortar harden. Then tighten the nut on the foundation bolt.
(7) In case the pump is installed on a steel structure, bolts and nuts may be used, but make sure to fasten them tightly in a comparable manner.

Fig.4-1



4.2. Piping

Prior to connecting piping, confirm that the bore seal has been removed.

4.2.1. Piping load

(1) Support and secure pipes connected to the pump inlet and outlet at a location close to the pump to avoid undue load on the pump.
(2) In case metal pipes are used or the pipe length is long, use flexible joints instead of connecting pipes directly.
(3) Limit the piping load on the pump within the maximum allowable load specified in [7. Allowable Piping Load].

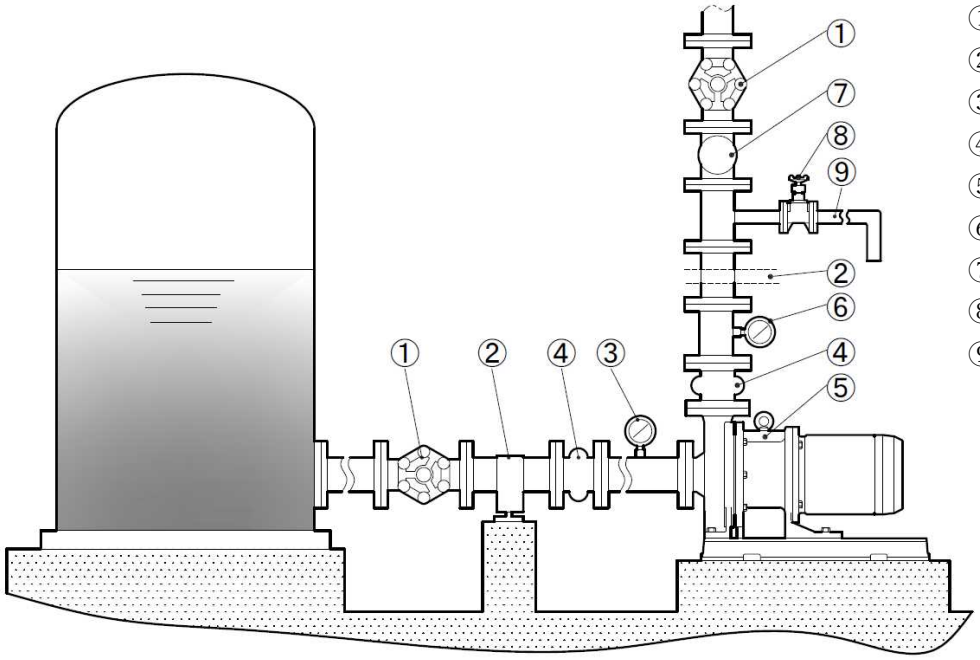
4.2.2. Suction piping (Fig. 4-2 and 4-3)

(1) Make the suction piping as short as possible. However, note that a valve and a short pipe (about 0.3m) must be attached to facilitate disassembling of the pump.
(2) Make the flange joint portion of the suction piping as short as possible.
(3) Since the suction piping will have a significant effect on $NPSH_{AV}$, give a thorough consideration on the pipe diameter, length, and attachments.
(4) Provide an upward gradient (approx. 1/50~1/100) on the piping from the supply surface of fluid to the pump to avoid air pocket. However, if the fluid is forced into the pump, the gradient on the piping should be downward toward the pump.
(5) Provide a dust screen on the supply tank.
(6) Ensure that the tip of the suction pipe is dipped sufficiently deep into the fluid to avoid air to be sucked in during the operation.
(7) Install the valve on the suction side with its handle positioned horizontally as air pocket may be formed while priming the pump.
(8) Limit the number of bends as little as possible and avoid providing a bend close to the pump inlet.
(9) If a reducer is used, use an eccentric type to avoid air pocket. If a concentric reducer is used, provide an air release on the larger bore side.
(10) If multiple pumps are installed for the same tank, provide an independent suction piping for each pump.

4.2.3. Discharge piping

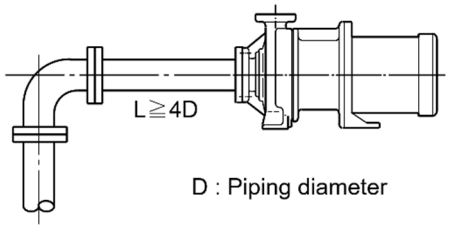
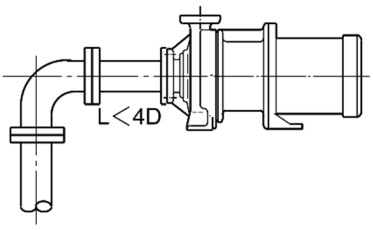
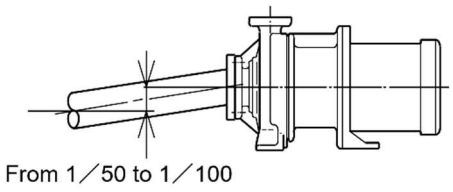
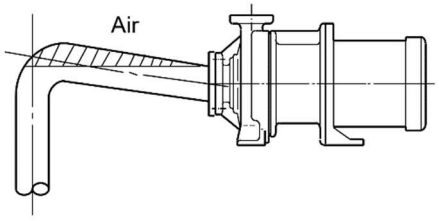
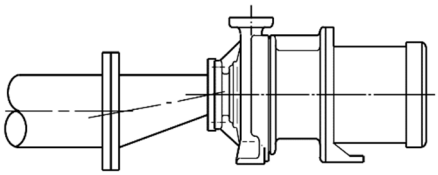
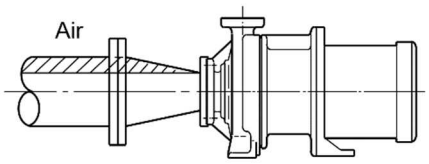
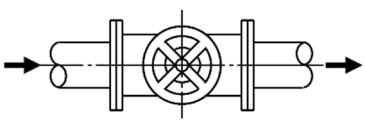
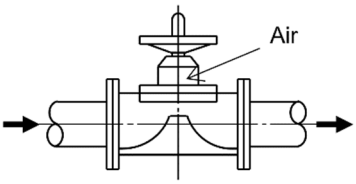
(1) Always provide a valve for the discharge piping.
(2) Since air pocket in the discharge piping may cause harmful effect, provide an air release whenever necessary.
(3) Even if the discharge piping is in the form of a siphon, ensure to place the highest position below the no-discharge water head.
(4) A check valve must be provided to prevent a back flow at the time of stopping the pump or in case the actual water head is extremely high to prevent a water hammer. However, since air can be entrapped below the check valve at the start of the pump, provide an air release. (Fig. 4-2)

Fig.4-2 Example of recommended piping



① Gate valve
② Pipe support
③ Vacuum gauge
④ Flexible joint
⑤ Pump
⑥ Pressure gauge
⑦ Check valve
⑧ Air vent valve
⑨ Air vent piping

Fig.4-3 Suction piping

Status	Correct	Incorrect
Vertical horizontal bend		
Inclined pipe		
Eccentric reducer		
Installation direction of gate valve		

5. Handling precautions

⚠ Caution

If the bearing material is SiC, confirm the rotational direction after the priming or after removing the motor. Even an instantaneous operation can cause damage.

5.1. Notes on the Start-up

(1) Remove the motor fan cover of the motor and confirm that the motor fan can be turned easily.
(2) Clean the supply tank and suction pipes as trash and/or scales that have entered the suction pipes during the pipe installation can cause a fatal damage.
(3) Confirm the rotational direction of the motor. (The direction is indicated on the casing.)
(4) Fully open the valve on the suction piping.
(5) Perform priming to fill the pump with the fluid completely. Discharge air using the discharge piping, to perform priming. If it is difficult to discharge air, turn the motor fan of the motor in the reverse direction manually three to four times.
(6) Start the pump with the discharge valve completely closed.
(7) If the pump is fully primed, the discharge pressure will rise immediately. Then open the discharge valve slowly and set the operational pressure or discharge rate at a desired level.

⚠ Warning

Careful attention should be paid to the priming operation work, as idling or operation with poor priming may cause a fatal failure. If the discharge pressure drops, stop the pump and find the cause of the poor priming.

5.2. Notes on the Operation

(1) **Checking the Noise**
Sucking in air or objects from the suction pipe often cause an abnormal noise with vibrations. A fluctuation of the needle on the suction gauge is often caused by aeration.

(2) **Checking the Vibration**
A precaution is necessary for cavitation or vibration due to faulty installation. Always adjust the discharge rate using the discharge valve. Do not close the valve on the suction piping.

(3) **Checking the Operation status**
Please use the specified discharge flow and head. Do not use with extremely small or large discharge amount. If operated below the minimum discharge flow, the pump may be damaged due to insufficient lubrication and cooling of bearings and sliding parts.

Motor pole	Minimum flow
MEP-040	10 L／min
MEP-050	20 L／min

(4) **Others**
Pay attention to the discharge and suction pressure, flow rate, electric current value, etc. An abnormal fluctuation and/or a drop in these values often is a result of a solid matter being stuck or air being sucked in on the suction side.

5.3. Notes on the Stopping

(1) Normally, the pump should be stopped after completely closing the discharge valve. Closing the suction valve first may cause cavitation and may result in a seizure.
(2) In case of flooded suction, close the suction valve after stopping the operation.
(3) If the pump stops because of a power outage during an operation, first turn off the power switch and, at the same time, close the discharge valve manually.

5.4. Notes on the Operational interruption

If the operation is interrupted for a prolonged period, drain the pump. This is especially important in winter, when the fluid inside the pump could freeze and the resulting expansion of the liquid volume could cause a crack or breakage of the piping.

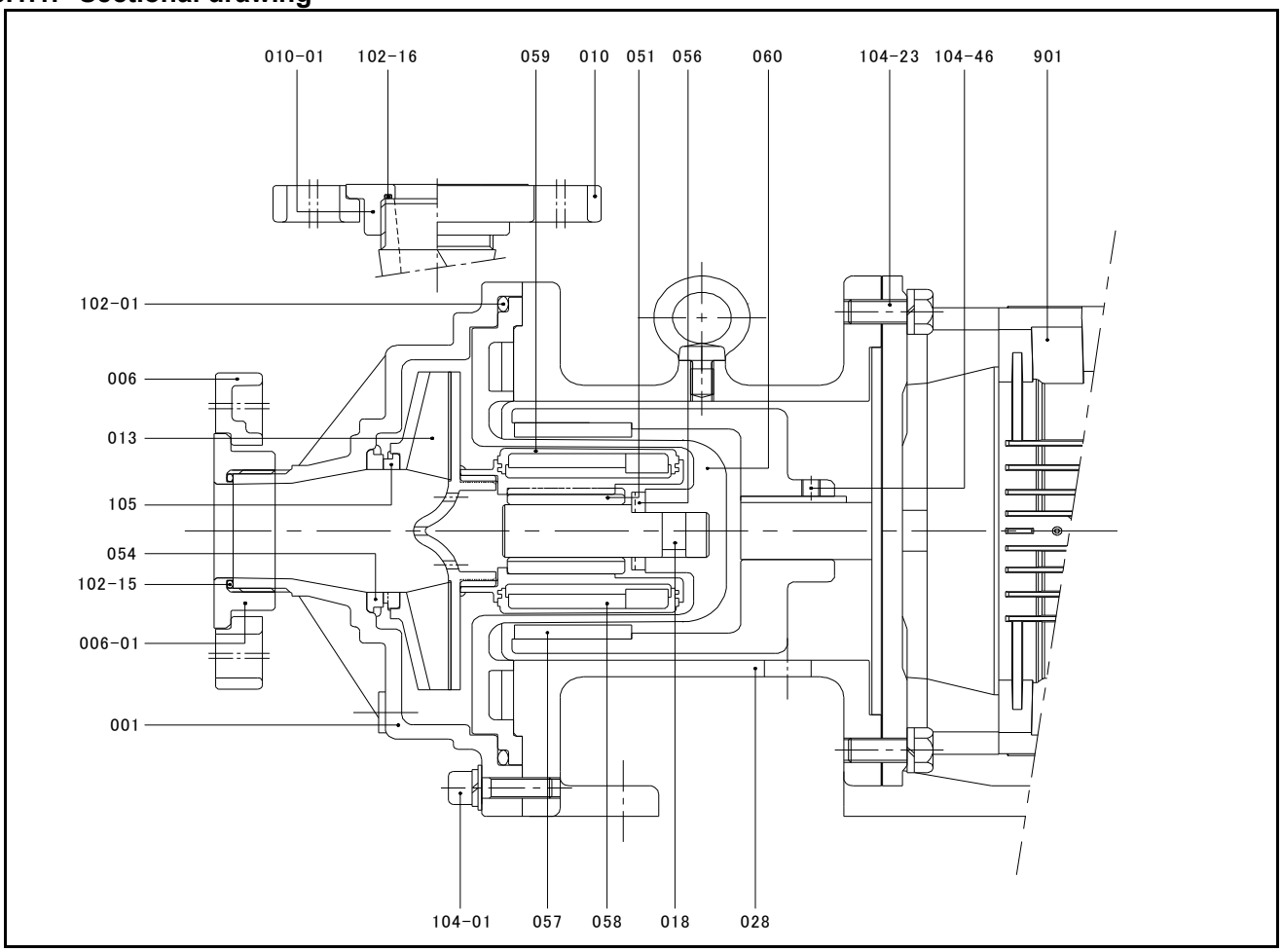
5.5. Others

(1) Run the auxiliary pump attached to the piping periodically to confirm its readiness for operation.
(2) A no-load operation of the pump will cause a seizure of the bearing and may result in a fatal accident and therefore, must be always avoided.

6. Maintenance and Inspection

6.1. Construction and Parts name

6.1.1. Sectional drawing



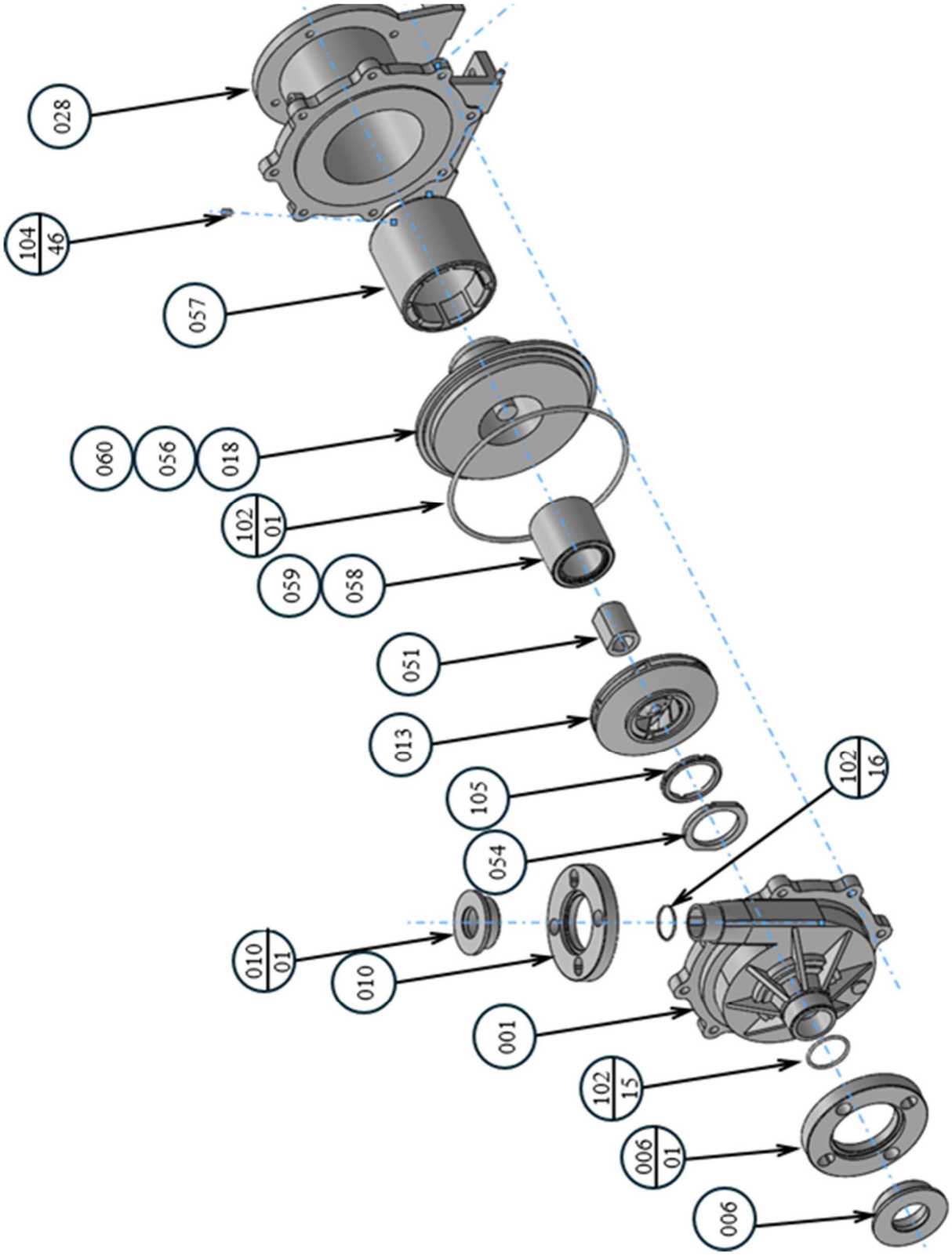
No.	Parts name	Material	Q'ty	Remarks
001	Casing	G-PP	1	
006	Suction flange	G-PP	1	
006-1	Suction flange adapter	G-PP	1	
010	Discharge flange	G-PP	1	
010-1	Discharge flange adapter	G-PP	1	
013	Impeller	G-PP	1	
018	Shaft	Alumina	1	
028	Bracket	FC200	1	
(038)	(Drain)	PP	1	※1
051	Bearing	Carbon	1	C-PTFE
054	Front thrust ring	Alumina	1	
056	Rear thrust ring	Alumina	1	

No.	Parts name	Material	Q'ty	Remarks
105	Mouth ring	Carbon	1	C-PTFE
057	Outer magnet	Permanent magnet	1	
058	Inner magnet	Permanent magnet	1	
059	Magnet lining	PP	1	
060	Rear casing	G-PP	1	
102-01	O-ring (casing)	FPM／EPDM	1	
102-15	O-ring (suction flange)	FPM／EPDM	1	
102-16	O-ring (discharge flange)	FPM／EPDM	1	
104-01	Casing bolt	SUS304	8	
104-23	Motor bolt	SUS304	4	
104-46	Outer magnet set screw	SCM	2	
901	Motor		1	

※1：The standard model does not have a drain.

※2： Eye-bolts cannot be fitted on the 0.4kW type.

6.1.2. Exploded view



6.2. Maintenance and Inspection

To operate the pump smoothly, it is recommended to implement a regular inspection program and keep the record. Shown below are general points of maintenance.

6.2.1. Routine inspection

Perform the following inspection and record the results.

(1) The fluid level of the supply tank
(2) The suction and discharge pressure
(3) The current of the motor and the bearing temperature
(4) Abnormal noise and abnormal vibration
(5) Leaks on flanges and O-ring

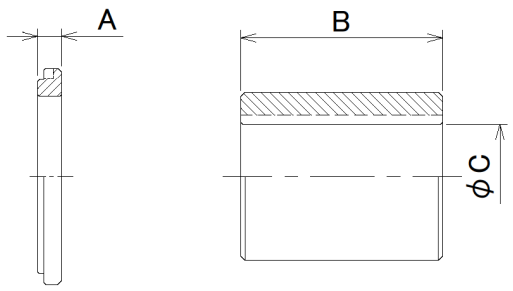
6.2.2. Regular inspection

Be careful in handling metals not to squeeze hands or fingers since the outer and inner magnets are extraordinarily strong (magnetic force).
Also, be extra careful in handling the shaft, bearings, and thrust rings as they have a potential risk of breakage and may cause serious injuries.

6.2.3. Abrasive limit of the Bearing

Status	A（mm）		B（mm）		C（mm）	
Model	040	050	040	050	040	050
At the time of delivery	50.0		26.0		6.0	7.0
At the time of replacement	49.0		27.0		5.0	6.0

Fig.6-1



Mouth ring　　Bearing

Components	Inspection item	Action／replacement timing
Casing	Accretion on the interface with the fluid	Wash
	Corrosion and swelling on the gasket	Replace if faulty
	Presence of cracks	Check the cause if present
	Presence of wears, rubbing, or cracks on the front thrust	Check the cause if present
Impeller	Accretion on the blades, presence of foreign matters	Wash
	Trace of contact	Check the cause if present
Inner magnet	Rubbing against the Rear casing	Check the cause if present
	Presence of cracks on the edge and cylinder inner surfaces	Check the cause if present
	Accretion on the interface with the fluid	Wash
	Wear on the bearing	Check the cause if abnormal
	Clogged cooling path on the bearing	Wash
Rear casing	Rubbing against the inner magnet	Check the cause if present
	Accretion on the interface with the fluid	Wash
	Presence of wears, rubbing, or cracks on the Rear thrust	Check the cause if present
Shaft	Presence of cracks	Check the cause if present
	Wear on the bearing	Check the cause if abnormal
Outer magnet	Rubbing against the rear casing	Check the cause if present
	Connection condition of the motor shaft, loose screws	Redo tightening at the proper position
Motor bearing	Presence of abnormal noise	Once every two years (※)

※ Follow the motor manual.

6.3. Disassembly & Assembly

6.3.1. Notes on Disassembly

Warning

- There is a danger of injury resulting from the human body contacting the chemical during or after the disassembling operation.
- If a finger gets caught in between the inner or outer magnet and a metal when they attract each other, it may cause a serious injury.
- The pump is a rotational machine, and the worker may suffer a severe injury if the power is turned on with the rotor exposed during the disassembling operation.

(1) Wear appropriate protective gears (rubber gloves, protective goggles) before disassembling the pump.

(2) Be careful in handling the shaft and bearings as they are vulnerable to physical damage.

(3) Since the inner and outer magnets are strongly magnetized, pay attention to attraction of metallic dusts and metallic items.

6.3.2. Preparation for Disassembly

(1) Ensure the safety of operation such as securing the footing.

(2) Turn OFF the main power to prevent an accidental operation of the motor and place a sign to clearly indicate that a maintenance work is in progress so that no one would turn on the power.

(3) Close the valves on the suction/discharge piping completely and place a sign to clearly indicate that a maintenance work is in progress so that no one would release the valves.

(4) Drain liquid from the pump and piping using the drain provided on the pump. As for the procedures for draining, refer to the general example explained below and give a thorough consideration to the fluid and working environment involved.

1) Release the pump drain. (The drain of casing may not designed, it depends on the pump type)
2) Loosen the bolts on the discharge side drain connection slowly and evenly. If the fluid leaks from the drain during this operation, wait for the fluid to stop and retreat to a safe position until the fluid comes to a complete stop.

Warning

(1) If the bolts on the pump flange on the discharge side were loosened quickly, the fluid may scatter from the drain and cause a severe injury to the worker.
(2) It is dangerous to stand in front of the drain during the draining operation. Always check the standing position while proceeding with the operation.

(5) Repeat the step 2) described above and confirm that the drain operation is complete by lifting the piping with a screwdriver or a similar tool when the bolts are removed.

6.3.3. Disassembly

(1) Remove the casing bolts (104-01). If the casing does not have a drain, be extra careful as the fluid may spatter.



Photo 6- 1

(2) Pull out the impeller (013) and the inner magnet (058+059) towards the front.

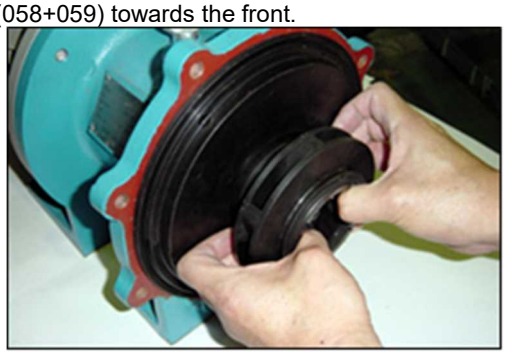


Photo 6- 2

(3) Pull out the rear casing (060) towards the front. If it is tight, stick a screwdriver or a similar tool into the gap along the circumference to remove it.



Photo 6- 3

6.3.4. Assembly

For assembly of the pump, follow the disassembly procedure in reverse order.

(1) Attach the motor to the bracket and tighten the motor bolts. In case of 0.4kW, set the bracket before setting the outer magnet and tighten the outer magnet set screw.

(2) Place the inner magnet and impeller on to shaft.



Photo 6- 4

(3) Set the O-ring onto the casing.



Photo 6- 5

(4) Place the casing with O-ring to the bracket and tighten the casing bolts at 15 N・m (±3%).

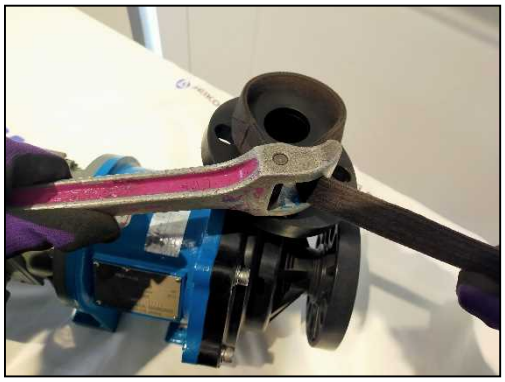
Warning

If a finger gets caught in between the inner/outer magnet and a metal when they attract each other, it may cause a serious injury.

(5) Upon completion of assembling, remove the motor fan cover of the motor and confirm that the motor fan can be turned easily by hand. If the motor fan does not turn or its turn seems heavy, it will be necessary to disassemble the pump and ensure to assemble it properly.

6.3.5. Assembly Flange

Install suction flange adapter and discharge flange adapter onto the casing using a belt wrench or similar tool. Since the threaded part is made of resin, please be care not to tighten too much.



6.3.6. Replacement of the Motor and the Outer magnet

(1) For dismounting the motor from the bracket, hang the motor by using an eyebolt equipped (or Nylon sling) on it for the safety first.



Photo 6- 6

(2) Remove the motor bolts (104-23) and possibly the motor liner bolts (104-33) if there are.



Photo 6- 7

(3) Pull out the motor from the bracket. In case of 0.4 kW motor, detach the outer magnet(057) at first.

(4) Place the motor upright on the floor with its motor fan cover, which has been removed from the bracket, facing down.

(5) Loosen the outer magnet set screws (104-46).



Photo 6- 8

(6) Pull out the outer magnet (057) from the motor shaft.



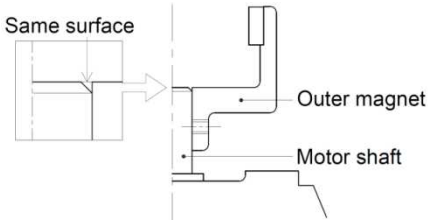
Photo 6- 9

(7) To install, insert the outer magnet (057) into the motor shaft and tighten the outer magnet set screws (104-46) observing the torque.

Screw size	Torque （N・m）
M6	6.5（±3%）
M8	15（±3%）

While doing so, align the bottom of outer magnet and the top of the motor shaft. (Fig. 6-2)

Fig.6-2



6.3.7. Replacement of the Impeller and the Inner magnet

The impeller is placed on to the inner magnet by rugged clutched and welded at two (2) places. For replacing the impeller or inner magnet, cut these welded portions off by using a knife, portable grinder, etc. For attaching the impeller the on to the inner magnet, weld them at two (2) places.

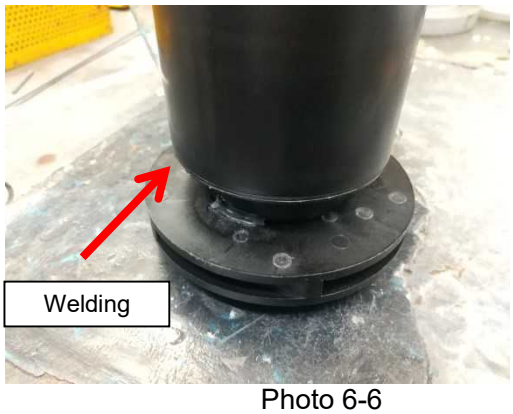


Photo 6-6

6.3.8. Replacement of the Bearing

When removing the bearing from inner magnet, after detaching the impeller from the inner magnet mentioned in paragraph 5, place a round stick (of diameter around 35mm) behind the bearing (from the direction of the impeller) and hammer it slowly with a resin mallet. When mounting the bearing in position, align the flat faces on the shaft and inner magnet bore, and hammer it lightly, by using a piece of cloth to protect from damage, into position with a resin mallet.



Photo 6- 6

6.3.9. Replacement of the Front thrust ring and the Mouth ring

Since these parts are secured by holding tabs, melt those holding tabs with a hot-air welder and raise them before removing the parts.

To set new parts, align the notch on respective parts, melt the holding tabs with a hot-air welder, and crush them with a round rod to secure the parts firmly.



Photo 6- 7



Photo 6- 8

6.4. Placing Parts order

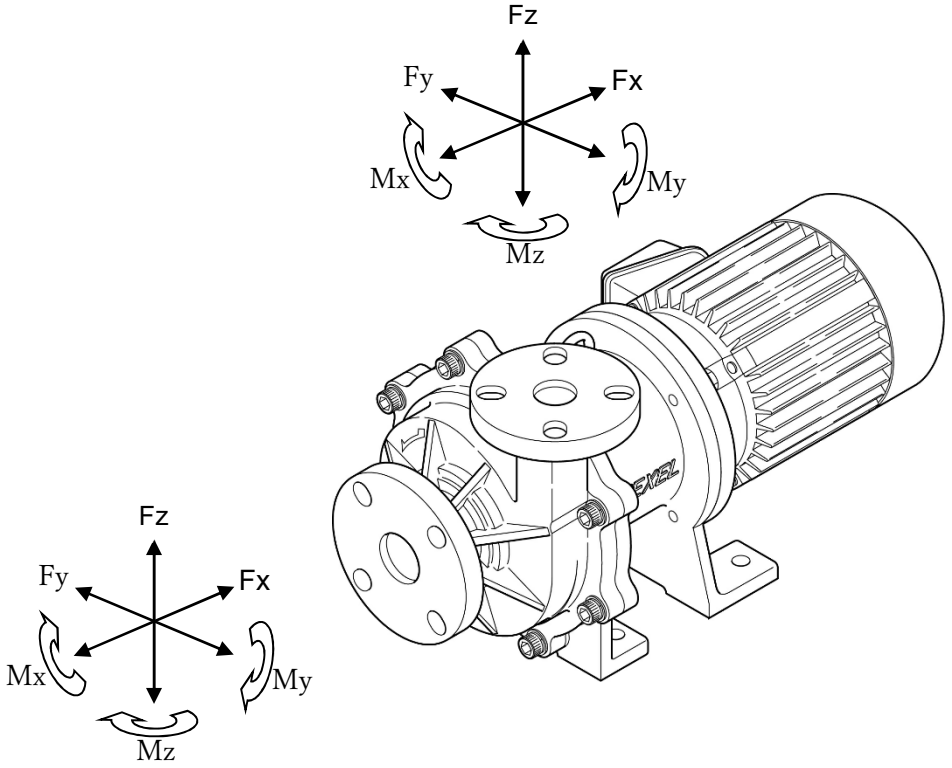
When placing parts order, please have the pump model, serial number, parts name and ID number contact the vendor or supplier. A nameplate is placed on the bracket.

⚠Caution

Do not reuse damaged parts.

7. Allowable Piping Load

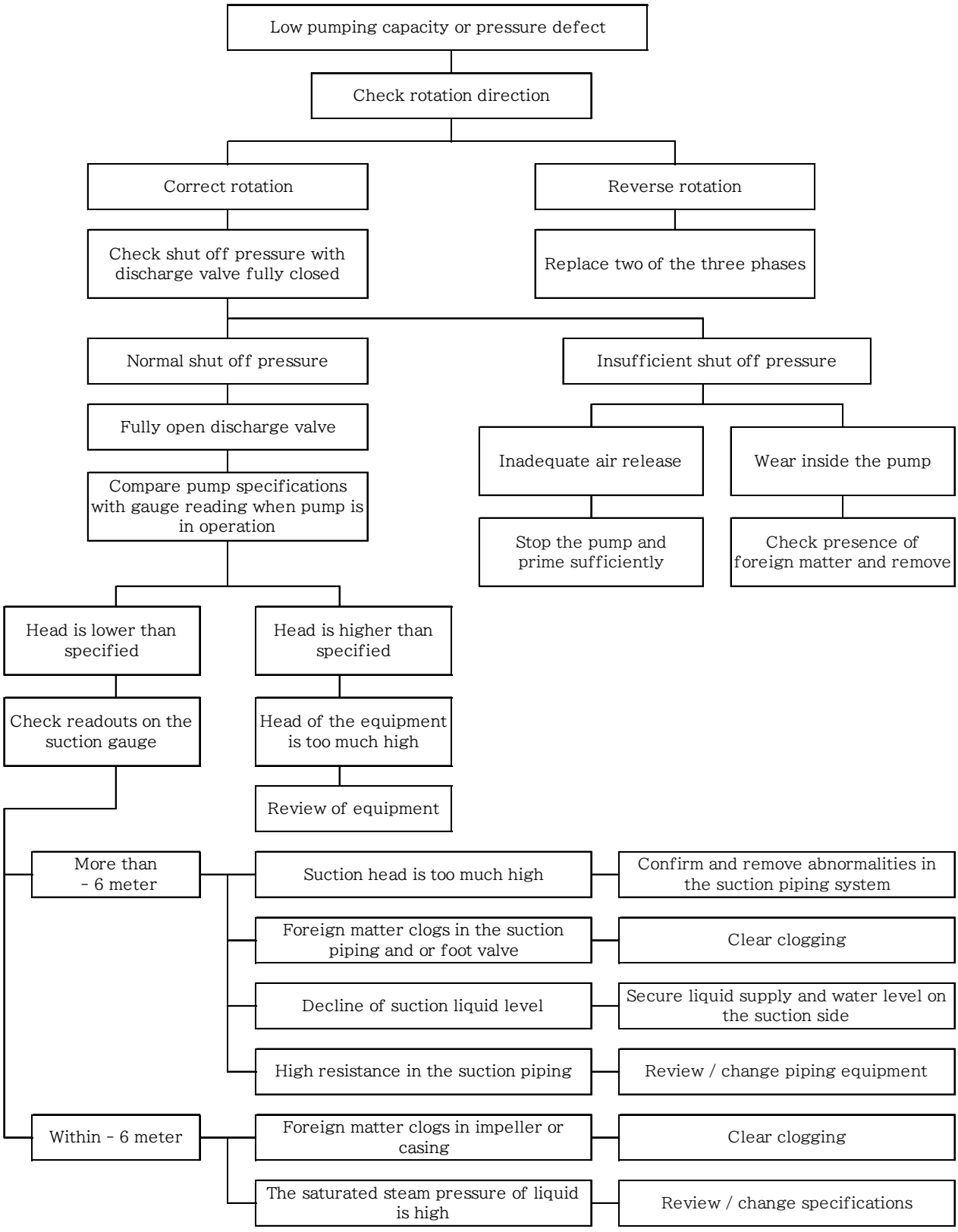
When connecting the pipes, the load and moment of the pipes applied to the pump should not exceed the values in the table below.



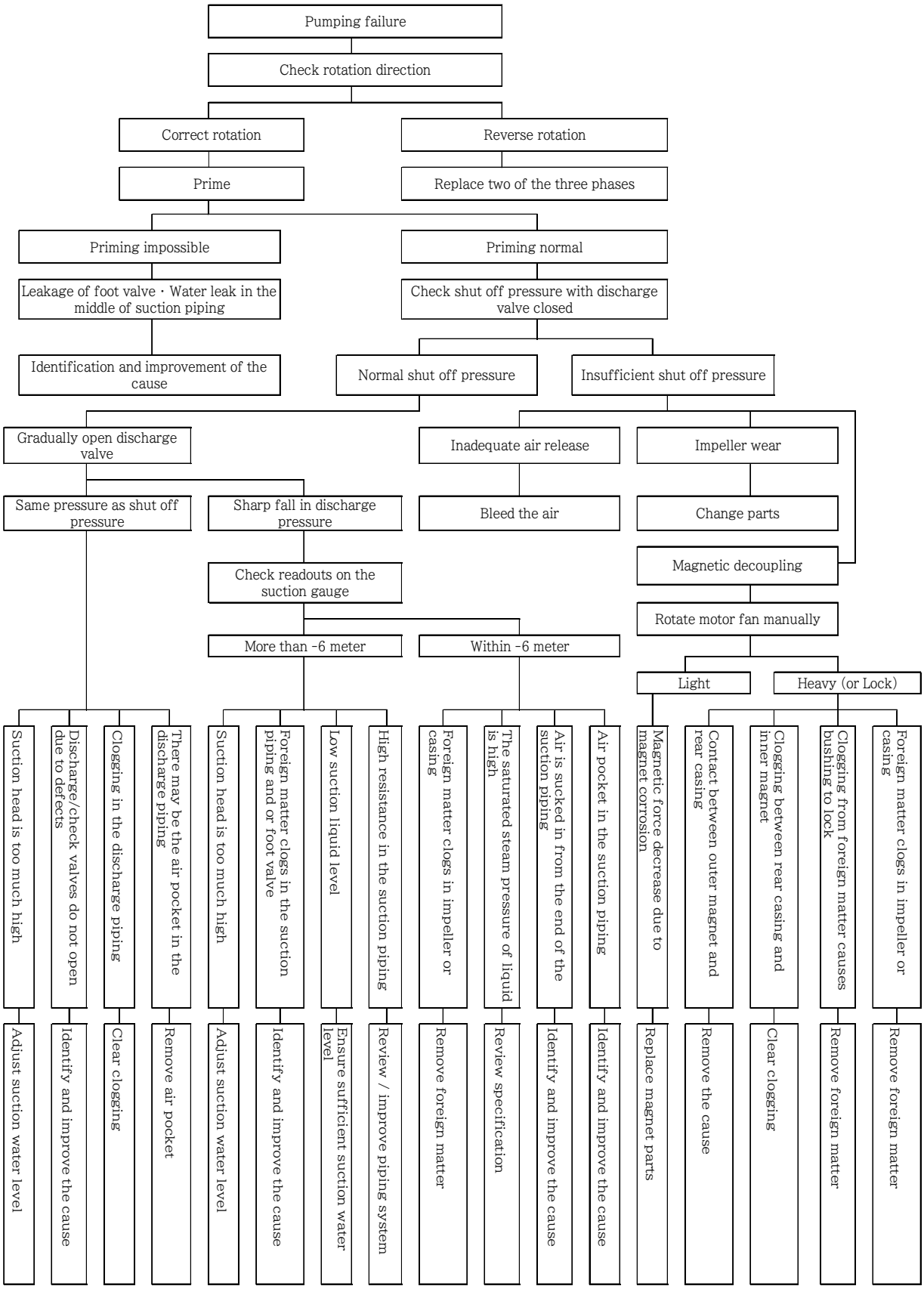
MODEL	SUCTION						DISCHARGE					
	FORCE (N)			MOMENTS (N·m)			FORCE (N)			MOMENTS (N·m)		
	Fx	Fy	Fz	Mx	My	Mz	Fx	Fy	Fz	Mx	My	Mz
MEP-040	117.6	117.6	98	98	49	98	117.6	98	117.6	98	49	98
MEP-050												

8. Troubleshooting

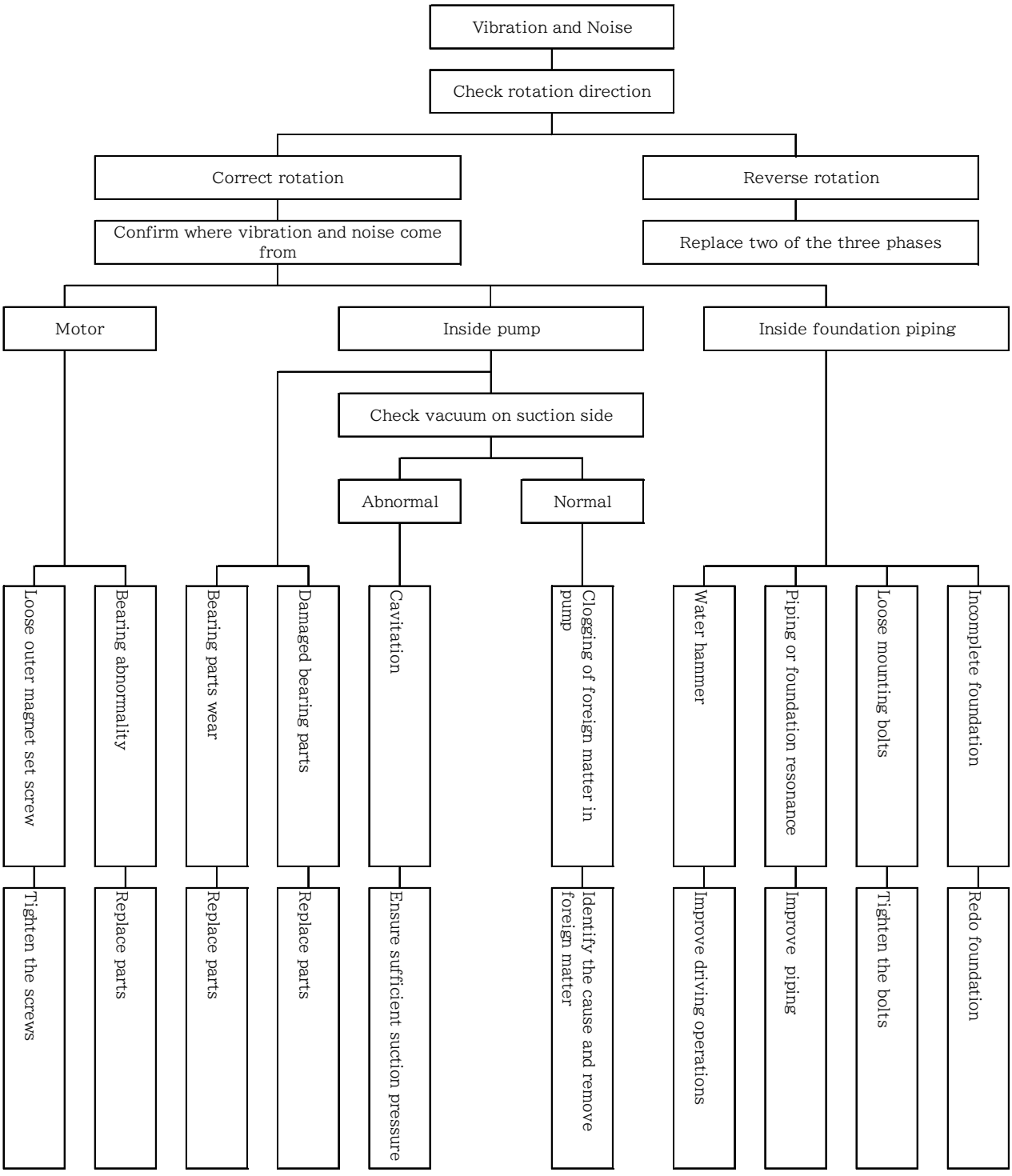
8.1. Insufficient flow／Pressure



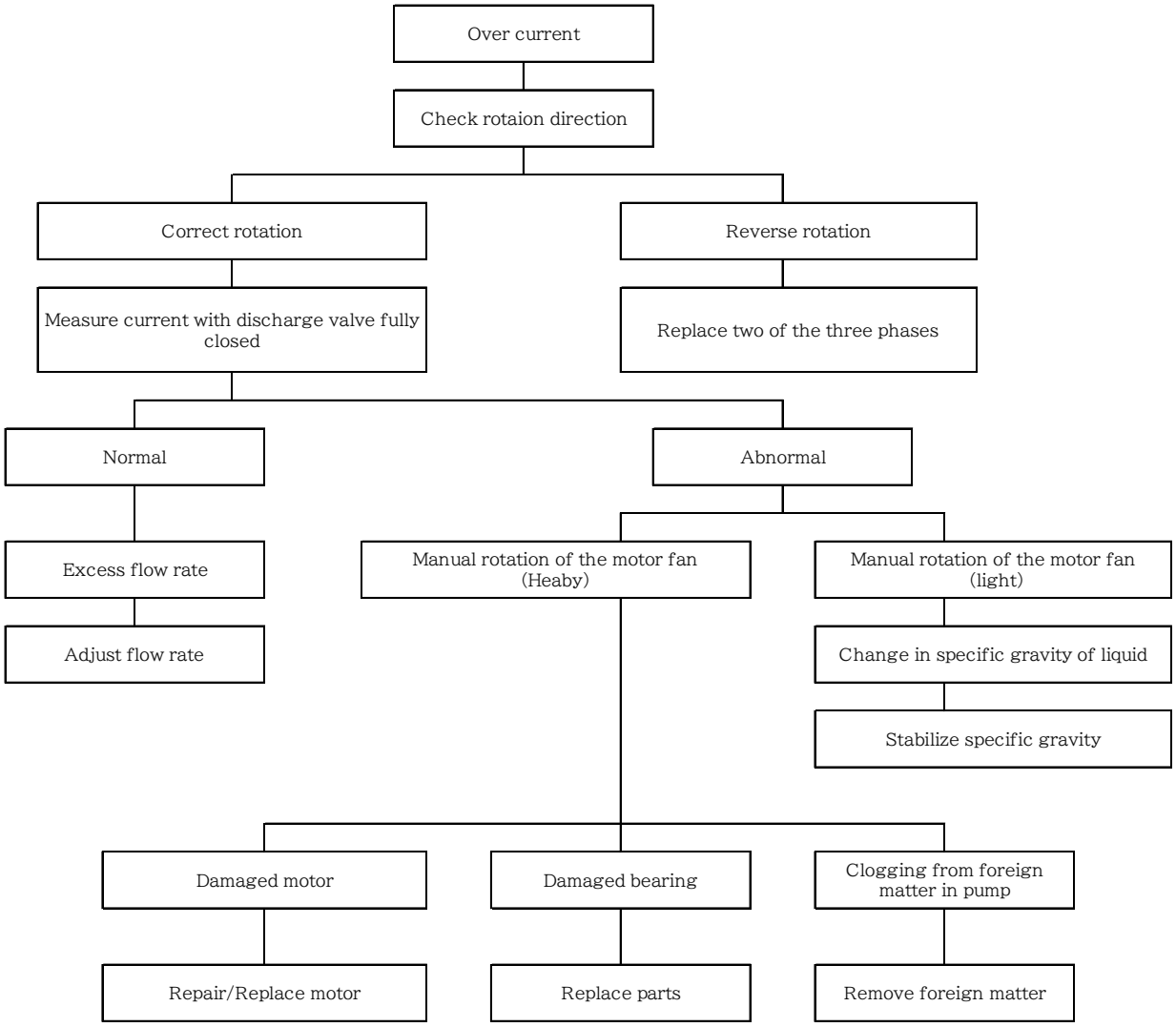
8.2. Pumping failure



8.3. Vibration and Noise



8.4. Over current



9. Warranty period and Coverage

1. Warranty period: One year from the date of delivery.
2. Free repair: Within the warranty period, we will provide free support for failures and damages caused by defects in our design and manufacturing. We will bear the cost of repaired parts and dispatching an engineer, but will not cover any other cost.
3. Paid repair: Repairs for failures/damages due to the following causes.
   - Repair of products after warranty period has expired.
   - Repair of failures and damages caused by incorrect handling.
   - Damage due to disasters such as earthquakes and fires and force majeure
   - Use of parts other than those specified by us.
   - Repair or modification by anyone other than us or a person designated by us.
4. The materials we have used mean the materials we can recommend. Please note that we do not guarantee chemical corrosion or fluid wear of the materials used.
5. We are unable to compensate for various expenses resulting from accidents of delivered products, secondary damage such as damage to other equipment, devices and equipment, and expenses required for restoration.