IWAKI PUMPS

IWAKI Magnetic Drive Pump

MDE Series (18.5~37kW-2P, 11~22kW-4P) ISO

Instruction Manual

⚠Read this manual before use of product

Thank you for selecting the Iwaki Magnetic Drive Pump type MDE. This instruction manual has been prepared to ensure correct and safe handling of the pump. Please read this manual carefully and thoroughly prior to operating the pump.
Pay special attention to the "Safety Instruction to Prevent Personal Injuries", "Warning" and "Caution" messages included in this manual.
This instruction manual should be kept by each end user and within reach of the actual operator, for quick reference when needed.

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Please contact the Iwaki sales office or Iwaki dealer for any inquiries or questions regarding this product.

Important instructions

For the Safe and Correct Handling of the Pump

- "Safety Instruction" section deals with important details about handling of the product. Before use, read this section carefully for the prevention of personal injury or property damage.
- Observe the instructions accompanied with "WARNING" or "CAUTION" in this manual. These instructions are very important for protecting users from dangerous situations.
- The symbols on this instruction manual have the following meanings:

⚠ **WARNING**	**Nonobservance or misapplication of "Warning" sections could lead to a serious accident which may result in death.**
⚠ **CAUTION**	**Nonobservance or misapplication of "Caution" sections could lead to personal injury or property damage.**

Types of Symbols



Indicates that "Warning" or "Caution" must be exercised. Inside this triangle, a concrete and practical image provided as a warning or caution message is depicted.



Indicates a prohibited action or procedure. Inside or near this circle, a concrete and practical image of the activity to be avoided is depicted.



Indicates an important action or procedure which must be performed or carried out without fail. Failure to follow the instructions herein can lead to malfunction or damage to the pump.

For Use of Our ATEX-Certifed Models in Explosive Environments

Use the attached additional instructions as well as this standard manual.

Export Restrictions

Technical information contained in this instruction manual might be treated as controlled technology in your countries, due to agreements in international regime for export control.

Please be reminded that export license/permission could be required when this manual is provided, due to export control regulations of your country.

Safety Section

⚠ WARNING

- **Damaged or deteriorated tools are very dangerous.** Use qualified and suitable tools only.


Caution

- **Use of protectors:** When disassembling, assembling, and conducting maintenance or when handling a dangerous type of liquid or a liquid of unknown property, be sure to wear safety gloves, a helmet, and protective shoes. In addition, when handling wet-end parts, always wear protective goggles, masks, etc.


Wear protective gear

- **To prevent death or injury from a falling pump,** make sure the rope or chain used for lifting the pump is not accidentally cut or disconnected during installation. Make sure the rope or the chain used to lift the pump has sufficient strength in relation to the pump load. Also, be sure not to stand underneath a lifted or suspended pump.


Caution

- **Lifting pump**
  When lifting the pump, apply a chain or belts to the eye bolts to keep the pump horizontal. Use an overhead crane or any other proper transporting machine. Two or more operators may be needed for ensuring safe transport depending on the pump size and weight.


Prohibited

- **Always turn off the power supply prior to servicing the pump.** Make special provisions so that no other operator mistakenly turns on the power supply while someone is working on the pump. In a noisy or poor visibility environment, display a sign near the power supply switch to notify others that someone is "WORKING" on the pump. Power supply mistakenly turned on during maintenance may lead to personal injury. Each operator must be especially careful of power supply operation.


Power off

- **To ensure greater safety, check and make sure that there is no one near the pump when switching on the power supply.** The pump is not equipped with an ON/OFF switch. Connecting the power cable or power plug supplies the power to the pump and starts the operation.


Caution

- **Run the pump at the specified power supply voltage on the nameplate only.** Otherwise, fire or electric shock may result.


Prohibited

- **If the pump operation is stopped due to a power failure or closure of discharge wire,** turn off the power switch at once. After normal conditions return, turn the switch on again.


Caution

- **Do not use the pump for anything that it is not designed to do.** User's failure to observe this instruction exempts Iwaki from any responsibility for personal injury or damage to the equipment or facility caused by the pump's misuse.


Prohibited

- **When handling a toxic or odorant liquid,** ventilate the working area well. In addition, the operator must wear protector gear (such as a safety mask, safety goggles, and protective gloves).


Wear protective gear

Safety Section

⚠ WARNING

- **Do not allow toxic substances such as lubricants, solvents, or similar substances to flow into the local sewage system or river systems.** Do not drain hazardous liquids such as chemical solutions discharged out of the pump directly onto the ground. Instead, drain such liquids into some kind of container. Observe the laws and regulations related to the application, handling, and processing of hazardous substances.


Prohibited

- **Do not pass under a raised pump.**
  Never pass under a raised pump. A serious injury could occur if the pump is accidentally dropped.



- **No remodeling!**
  Remodeling of the pump by the user may result in serious personal injury, electric shock, or damage to the pump. Do not attempt remodeling as it is very dangerous.


No Remodeling

- **Be careful with rotating elements.**
  Rotating elements such as the shaft, coupling, etc., can cause a serious personal injury by seizing fingers, hands, hair, etc. Be careful not to touch such rotating elements while the pump is in operation.


Caution

- When the pumps are used to transfer the dangerous liquids mentioned as below, the pumps always must be checked and watched so that the liquids can not be leaked. The operation of the pumps leaking the liquids may result in personal injury and/or explosion, fire accidents.
  - Explosive, fire-spreading and inflammable liquids
  - Corrosive and stimulus toxic liquids
  - Liquids detrimental to health



⚠ CAUTION

- **Qualified operators only!**
  The pump operator and pump operation supervisor must not allow any operators who have little or no knowledge of the pump to run operate the pump. Pump operators must have a sound knowledge of the pump and its operation.



- **For specified application only**
  The pump is designed and manufactured to the specifications agreed upon by the user and Iwaki. The use of a pump in any application other than those clearly specified may result in injury or damage to the pump. Use the pump strictly in accordance with the pump specifications and application range. If you change any specification, contact Iwaki or your dealer.


Prohibited

Safety Section

⚠CAUTION

- **Ventilate!**
  Poisoning may result during an operation which involves toxic or odorous liquid. Ventilate the operating site sufficiently.


Caution

- **Spill-out prevention measures**
  Appropriate protective measures should be taken against any spill-out accidents involving the operating liquid as a result of unexpected damage to the pump or the piping. Never discharge hazardous liquid, including, but not limited to, chemical liquid, over the ground or floor on the pump operating site. Follow local rules and regulations in disposing of hazardous substances.


Caution

- **Do not operate the pump dry.**
  Do not run the pump dry (without liquid inside the pump). Heat generated as a result of abrasion between elements inside the pump during operation without liquid may damage the inside of the pump. Operating the pump with the suction valve fully closed will result in dry operation.


Prohibited

- **Keep away from heat or flame.**
  Do not place any open flame or flammable object near the pump.


Prohibited

- **Do not stand on the pump.**
  Do not stand on the pump or use the pump as a step under any circumstances. Otherwise, you may experience a serious injury.


Prohibited

- **Do not touch the pump.**
  When the pump is used to feed a hot liquid, do not touch the pump or the piping with your bare hands during and immediately after operation as their surfaces are dangerously hot.


Caution

- **Arrange grounding!**
  Do not operate the pump without connecting the grounding wire. Otherwise, an electrical shock may result. Make sure the grounding wire is connected with the grounding terminal.


Earthing

- **Install an earth leakage breaker**
  The operation of a pump without using an earth leakage breaker may cause an electrical shock. Please install an optional leakage breaker in the system.


Electrical Shock

- **Countermeasures for static electricity**
  When low electric conductivity liquid such as ultra-pure water and hydro carbon or inactive fluor liquid (e.g. Fluorinert™) is handled, the static electricity may be generated in pump and liquid. (This electric charge does not happen if liquid is mixed with water.) The high electric charge may cause the spark and break down of pump in the worst case.



Safety Section

⚠CAUTION

- **Do not install or store the pump in the following places.**
  - Places where flammable gas, dust or material is used or placed.
  - Places where corrosive gas (chlorine gas or the like) is generated.
  - Places where the ambient temperature is extremely high (40 °C or higher) or extremely low, 0 °C or lower.
  - Places where the pump is exposed to extreme dust or humidity. (Excluding the outdoor type)
  - Places where vibrations occur.


Prohibited

- **Pump start-up**

  When connecting a power supply to the pump, make sure there is no person around the pump. The pump has no ON/OFF switch. The pump starts operation when the power is supplied by connecting the power supply cable.


Caution

- **Foreign matter**

  Should foreign matter enter the pump, turn off the power at once and remove the obstruction. Using the pump with foreign matter inside may cause damage to the pump or a malfunction.


Caution

- **Disposal of a used pump**

  Remove a chemical and flush it out before the pump is disconnected from piping. Dispose of any used or damaged pump in accordance with local rules and regulations. See page 60 to comply with the European Directive 2012/19/EU on waste electrical and electronic equipment.



- **The flange type motor is so heavy that it may fall over against the motor following disassembly of the pump. Make sure to support the motor by using a crane or other heavy-duty support system.**



- **When removing the split plate and rear casing assembly from the main unit, use a crane or other heavy-duty support system to assist in this purpose as these parts are very heavy.**



- **Handling of magnet coupling**

  The magnet used in the pump has a very high magnetic power. Be careful not to allow your fingers to be seized by the magnet or to allow the magnet near any electronic device which may be affected by the magnet's power.

  As a flange type driving magnet requires special equipment to hold it in place, do not remove it from the shaft. In case removal is necessary, contact Iwaki or your dealer.



- **Suspending pump operation for a prolonged period**

  When suspending pump operation for a prolonged period, drain the pump and clean inside the pump. Take appropriate measures to prevent the entrance of foreign matter into the pump. If the pump is not operated for a period longer than one year, replace the gasket and inspect inside the pump.



OUTLINE OF PRODUCT

1. Before Using Pump 7

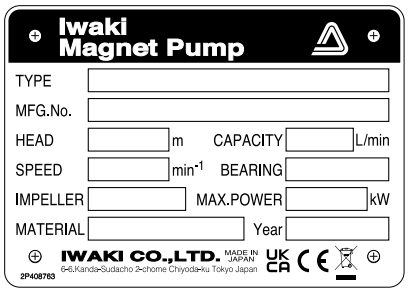
2. Operating Principle 7

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1. Before Using Pump



*The CE/UKCA markings on our product(s) are for us to market the product(s) into the European Union market / the Great Britain (England, Wales and Scotland) market, however, the CE/UKCA markings do not ensure any safety or conformity of the product(s) outside the EU/GB markets.
When the pump is incorporated into the equipment marketed in the EU/GB markets, such equipment must meet all the requirements of applicable directives/regulations.
In such a case, any person who places the equipment on the markets must carry CE/UKCA marks on the equipment as a manufacturer.

After unpacking, check the following points to confirm that the delivered product and its accompanying parts and elements are exactly what you ordered.

When lifting the pump please follow the procedure mentioned "2. Installation" of "Pump operation".

[1] Does the model indicated on the nameplate conform to your order?

[2] Has the pump unit or any part of it been damaged or bolts and nuts been loosened during delivery?

[3] MFG. No. shows the year the product was manufactured.

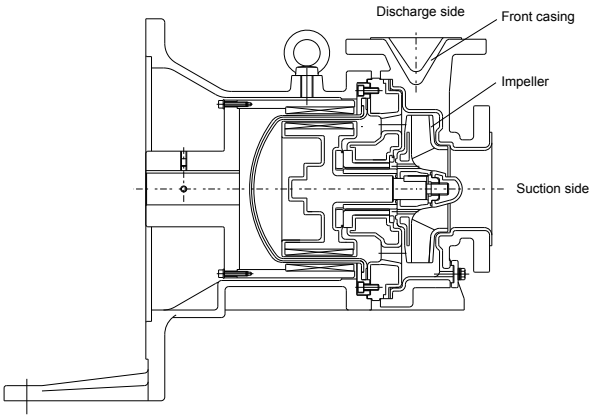
(e.g.1) When first numeral is "7".
7 × × 5 × × ×
The forth numeral of MFG.No. shows the product was manufactured.
"5" shows the product was manufactured in the year 1995.

(e.g.2) When first numeral is not "7".
× × 5 × × ×
The third numeral of MFG.No. shows the year the product was manufactured.

[4] Before connecting the power supply to the pump, detach the fan cover of the motor and manually check to ensure that the fan rotates smoothly by using your finger.

If you find anything wrong, please refer to the dealer you placed your order with.

2. Operating Principle



The MDE pump is a magnet-driven centrifugal type pump developed for various applications.
The impeller inside the pump chamber (front casing) is rotated by magnetic force to transfer liquid from the suction side to the discharge side.
The MDE type pump features excellent corrosion resistance, durability, and safety, and serves as a chemical pump for various processes. Most chemicals can be handled by the pump.

3. Identification Codes

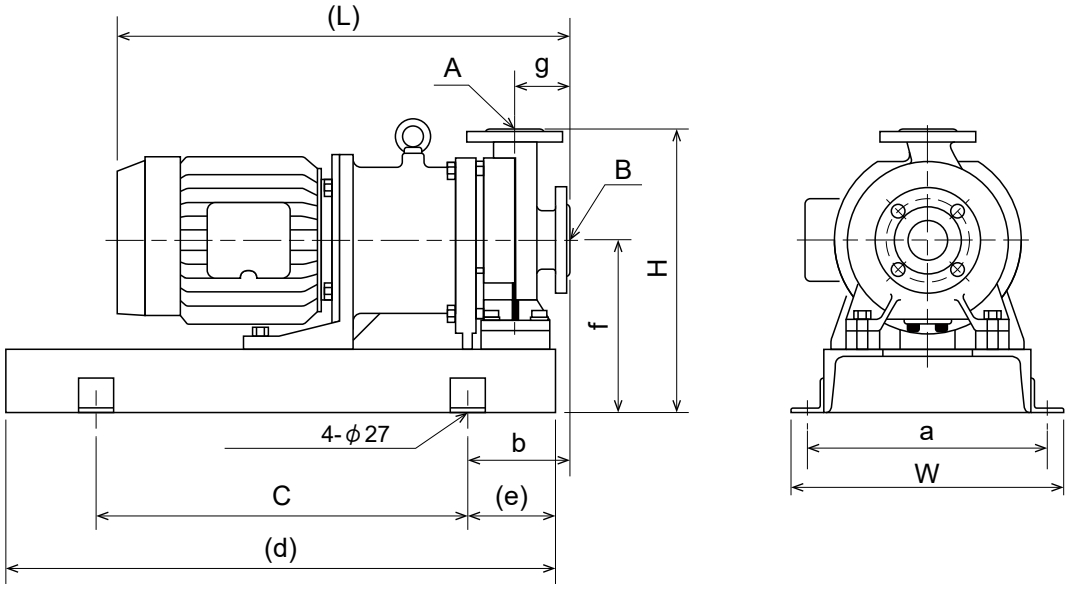
Example:

MDE 50 - 200 E K V F 185 I - D 2 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩	
① Nominal bore size	(Suction × Discharge) 50: 80A × 50A 65: 100A × 65A 125: 150A × 125A
② Nominal Impeller size	120 - 250
③ Materials of liquid-contact parts	E: ETFE
④ Materials of bearing and spindle	K: SiC
⑤ Material of O-ring	Z: KALREZ® V: FKM E: EPDM
⑥ Type of motor	C: Foot mount type motor F: Flange mount type motor
⑦ Motor output	110: 11 kW 150: 15 kW 185: 18.5 kW 220: 22 kW 300: 30 kW 370: 37 kW
⑧ Pump standard	I: ISO dimensions
⑨ Special version	A: Without drain, Standard D: With drain, Standard S: Without drain, Special version X: With drain, Special version
⑩ The number of motor poles	2: 2P 4: 4P

4. Specifications and Outer Dimensions

■ Outer dimensions in mm

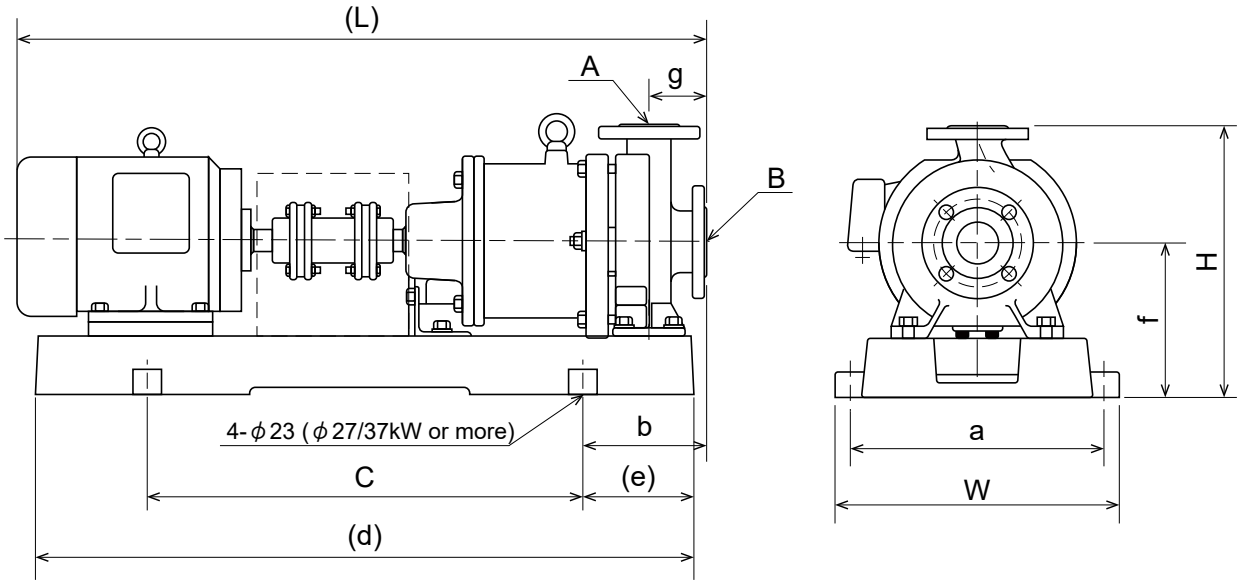
Flange mounted Motor type



Model	Motor Output (kW)	W	H	a	b	c	(d)	(e)	f	g	A	B	Mass W/O Motor (kg)
MDE50	18.5 kW-2P	610	555	550	275	740	1200	230	355	100	50A	80A	180
	22 kW-2P												185
	30 kW-2P												185
	37 kW-2P												190
MDE65	18.5 kW-2P				255						65A	100A	180
	22 kW-2P												185
	30 kW-2P												185
	37 kW-2P												190
MDE125	11 kW-4P		645		280					140	125A	150A	240
	15 kW-4P												245
	18.5 kW-4P												250
	22 kW-4P												250

■ Outer dimensions in mm

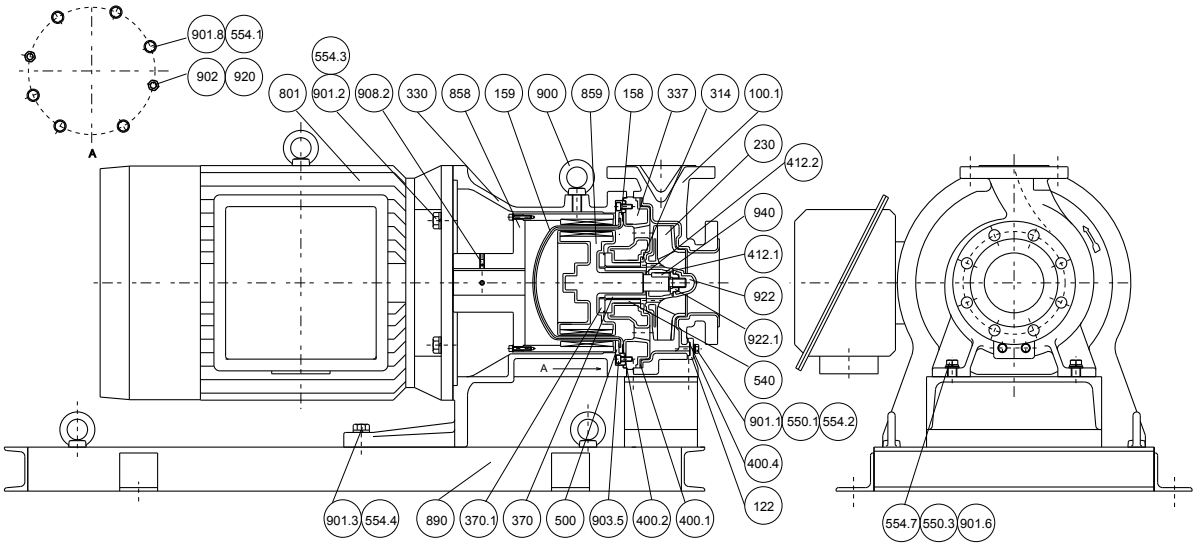
Foot mounted Motor type



Model	Motor Output (kW)	W	H	a	b	c	(d)	(e)	f	g	A	B	Total Mass including motor (kg)
MDE50	18.5 kW-2P	490	440	440	230	740	1135	198	240	100	50A	80A	220
	22 kW-2P		460						260				220
	30 kW-2P												220
	37 kW-2P	736	475	670	245	840	1250	205	275				205
MDE65	18.5 kW-2P	610	435	550	230				235		65A	100A	200
	22 kW-2P		455						255				205
	30 kW-2P												205
	37 kW-2P	736	475	670	245	940	1400	230	275				215

5. Names of Parts

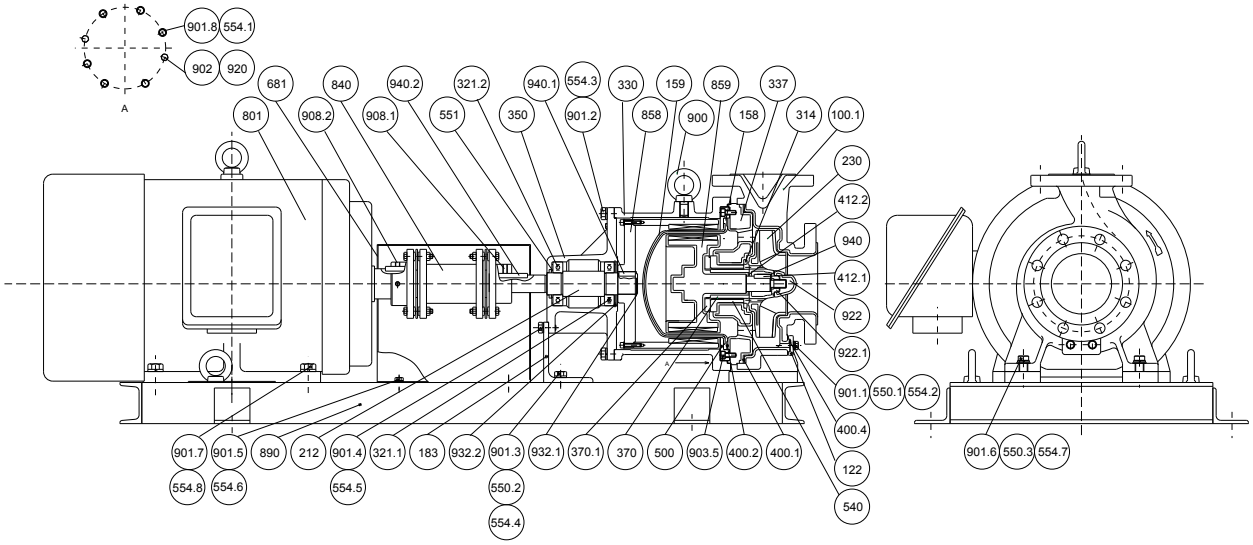
■ Flange mounted Motor type (MDE50•65)



No.	Parts Name	Q'ty	Material	Remark	No.	Parts Name	Q'ty	Material	Remark
100.1	FRONT CASING	1	ETFE+FCD400		554.3	SPRING WASHER	4/8	STNLS STEEL	
122	DRAIN PLATE	1	STEEL		554.4	SPRING WASHER	2	STNLS STEEL	M16
158	REAR CASING	1	PFA		554.7	SPRING WASHER	4	STNLS STEEL	M12
159	REAR CASING COVER	1	FRP		801	MOTOR	1		
230	IMPELLER	1	CFRETFE+STNLS STEEL		858	DRIVE MAGNET UNIT	1	RARE-EARTH+STEEL	
314	THRUST, IMPELLER	1	SiC		859	MAGNET CAPSULE UNIT	1	RARE-EARTH+PFA	
330	BRACKET	1	FCD400		890	BASE	1	STEEL	
337	SPLIT PLATE	1	PFA+FCD400		900	EYE BOLT	5	STEEL	M16
370	SLEEVE	1	SiC		901.1	HEX. HEAD BOLT	2	STNLS STEEL	M8 × 20
370.1	THRUST RING	1	SiC		901.2	HEX. HEAD BOLT	4/8	STNLS STEEL	
400.1	GASKET, FRONT	1	PTFE		901.3	HEX. HEAD BOLT	2	STNLS STEEL	M16 × 35
400.2	GASKET, REAR	1	PTFE		901.6	HEX. HEAD BOLT	4	STNLS STEEL	M12 × 35
400.4	GASKET, DRAIN	1	PTFE		901.8	HEX. HEAD BOLT	6	STNLS STEEL	M16 × 70
412.1	O-RING	1	See Note1		902	STUD BOLT	2	STNLS STEEL	M16
412.2	O-RING	1	See Note1		903.5	HEX. SOCKET HEAD BOLT	4	STNLS STEEL	M8 × 20
500	BACK UP RING	1	STNLS STEEL		908.2	HEX. SOCKET SET SCREW	2	STEEL	M8 × 10
540	BUSHING	1	SiC		920	NUT	2	STNLS STEEL	M16
550.1	PLAIN WASHER	2	STNLS STEEL	M8	922	IMPELLER NUT	1	CFRETFE+STNLS STEEL	
550.3	PLAIN WASHER	4	STNLS STEEL	M12	922.1	IMPELLER LOCK NUT	1	STNLS STEEL	
554.1	SPRING WASHER	8	STNLS STEEL	M16	940	KEY	1	STEEL	
554.2	SPRING WASHER	2	STNLS STEEL	M8					

Note1: Varies depending on pump type

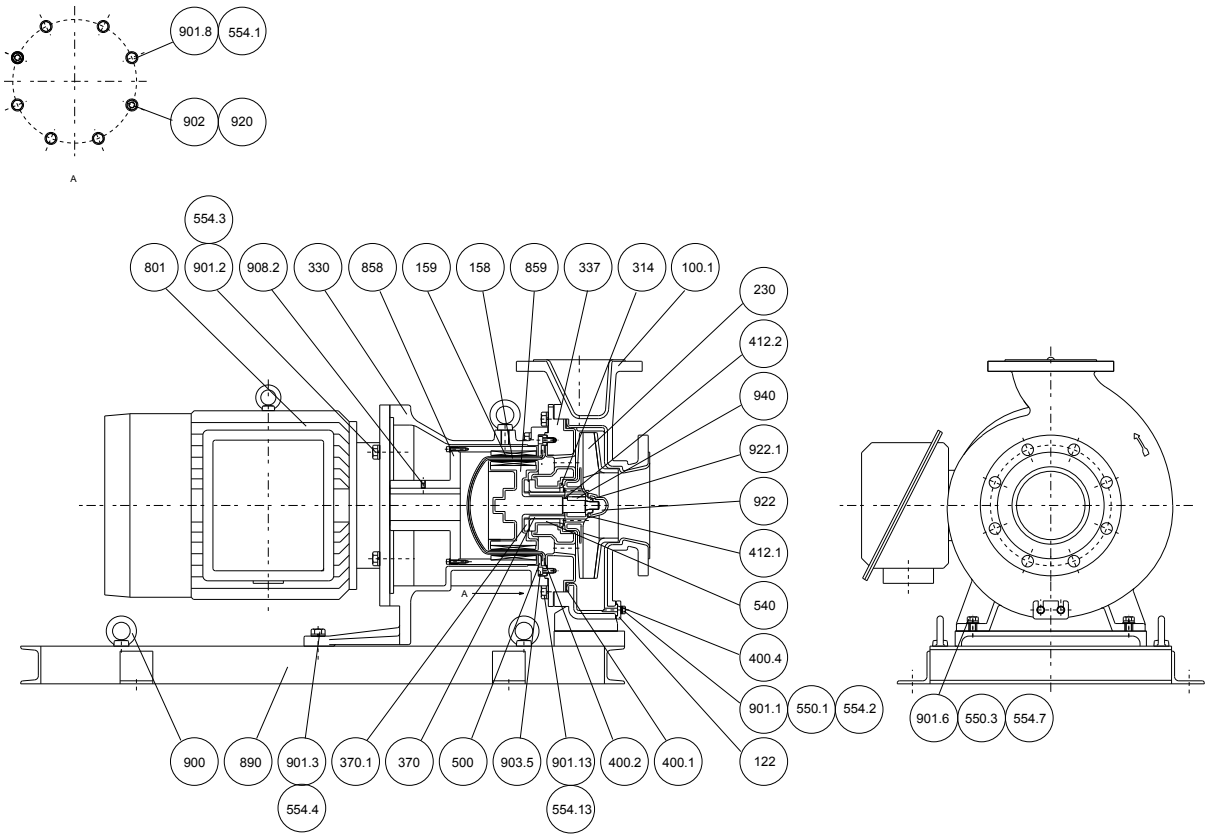
■ Foot mounted Motor type (MDE50•65)



No.	Parts Name	Q'ty	Material	Remark	No.	Parts Name	Q'ty	Material	Remark
100.1	FRONT CASING	1	ETFE+FCD400		554.6	SPRING WASHER	4	STNLS STEEL	M8
122	DRAIN PLATE	1	STEEL		554.7	SPRING WASHER	4	STNLS STEEL	M12
158	REAR CASING	1	PFA		554.8	SPRING WASHER	4	STNLS STEEL	
159	REAR CASING COVER	1	FRP		681	COUPLING COVER	1	STEEL	
183	SUPPORT	1	STEEL		801	MOTOR	1		
212	DRIVE SHAFT	1	STEEL		840	COUPLING	1		
230	IMPELLER	1	CFRETFE+STNLS STEEL		858	DRIVE MAGNET UNIT	1	RARE-EARTH+STEEL	
314	THRUST, IMPELLER	1	SiC		859	MAGNET CAPSULE UNIT	1	RARE-EARTH+PFA	
321.1	BALL BEARING	1			890	BASE	1		
321.2	BALL BEARING	1			900	EYE BOLT	5	STEEL	
330	BRACKET	1	FCD400		901.1	HEX. HEAD BOLT	2	STNLS STEEL	M8 × 20
337	SPLIT PLATE	1	PFA+FCD400		901.2	HEX. HEAD BOLT	4	STNLS STEEL	
350	BEARING HOUSING	1	FC200		901.3	HEX. HEAD BOLT	2	STNLS STEEL	M12 × 35
370	SLEEVE	1	SiC		901.4	HEX. HEAD BOLT	2	STNLS STEEL	M10 × 25
370.1	THRUST RING	1	SiC		901.5	HEX. HEAD BOLT	4	STNLS STEEL	M8 × 15
400.1	GASKET, FRONT	1	PTFE		901.6	HEX. HEAD BOLT	4	STNLS STEEL	M12 × 35
400.2	GASKET, REAR	1	PTFE		901.7	HEX. HEAD BOLT	4	STNLS STEEL	
400.4	GASKET, DRAIN	1	PTFE		901.8	HEX. HEAD BOLT	6	STNLS STEEL	M16 × 70
412.1	O-RING	1	See Note1		902	STUD BOLT	2	STNLS STEEL	M16
412.2	O-RING	1	See Note1		903.5	HEX. SOCKET HEAD BOLT	4	STNLS STEEL	M8 × 20
500	BACK UP RING	1	STNLS STEEL		908.1	HEX. SOCKET SET SCREW	2	STEEL	
540	BUSHING	1	SiC		908.2	HEX. SOCKET SET SCREW	2	STEEL	
550.1	PLAIN WASHER	2	STNLS STEEL	M8	920	NUT	2	STNLS STEEL	
550.2	PLAIN WASHER	2	STNLS STEEL	M12	922	IMPELLER NUT	1	CFRETFE+STNLS STEEL	
550.3	PLAIN WASHER	4	STNLS STEEL	M12	922.1	IMPELLER LOCK NUT	1	STNLS STEEL	
551	WAVE WASHER	1	SPRING STEEL		932.1	RETAINING RING	1	STEEL WIRE ROD	
554.1	SPRING WASHER	8	STNLS STEEL	M16	932.2	RETAINING RING	1	STEEL WIRE ROD	
554.2	SPRING WASHER	2	STNLS STEEL	M8	940	KEY	1	STEEL	
554.3	SPRING WASHER	4	STNLS STEEL	M12	940.1	KEY	1	STEEL	
554.4	SPRING WASHER	2	STNLS STEEL	M12	940.2	KEY	1	STEEL	
554.5	SPRING WASHER	2	STNLS STEEL	M10					

Note1: Varies depending on pump type

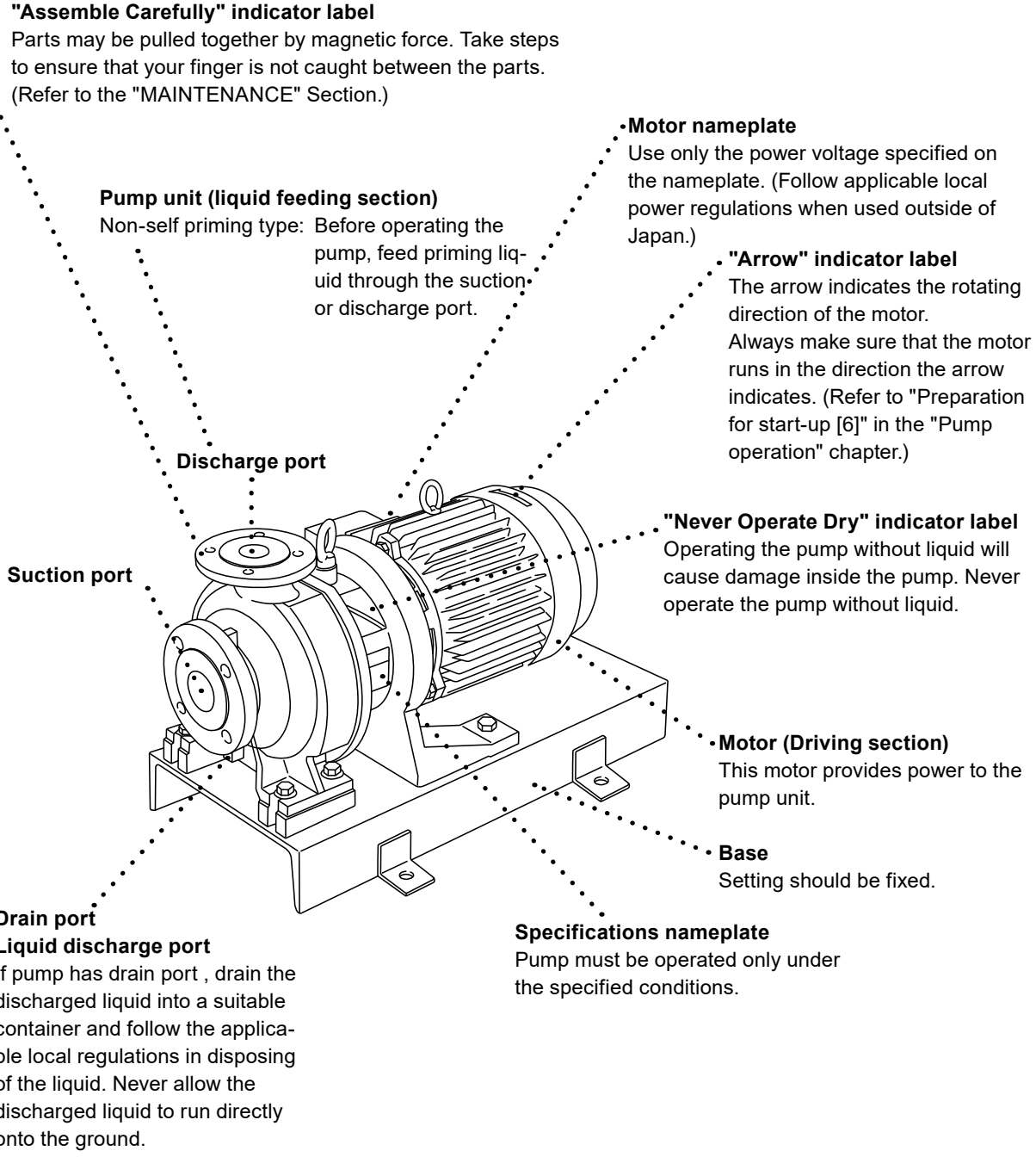
■ Flange mounted Motor type (MDE125)



No.	Parts Name	Q'ty	Material	Remark	No.	Parts Name	Q'ty	Material	Remark
100.1	FRONT CASING	1	ETFE+FCD400		554.4	SPRING WASHER	2	STNLS STEEL	M16
122	DRAIN PLATE	1	STEEL		554.7	SPRING WASHER	4	STNLS STEEL	M12
158	REAR CASING	1	PFA		554.13	SPRING WASHER	8	STNLS STEEL	M16
159	REAR CASING COVER	1	FRP		801	MOTOR	1		
230	IMPELLER	1	CFRETFE+STNLS STEEL		858	DRIVE MAGNET UNIT	1	RARE-EARTH+STEEL	
314	THRUST, IMPELLER	1	SiC		859	MAGNET CAPSULE UNIT	1	RARE-EARTH+PFA	
330	BRACKET	1	FCD400		890	BASE	1	STEEL	
337	SPLIT PLATE	1	PFA+FCD400		900	EYE BOLT	5	STEEL	M16
370	SLEEVE	1	SiC		901.1	HEX. HEAD BOLT	2	STNLS STEEL	M8 × 20
370.1	THRUST RING	1	SiC		901.2	HEX. HEAD BOLT	4/8	STNLS STEEL	
400.1	GASKET, FRONT	1	PTFE		901.3	HEX. HEAD BOLT	2	STNLS STEEL	M16 × 35
400.2	GASKET, REAR	1	PTFE		901.6	HEX. HEAD BOLT	4	STNLS STEEL	M12 × 35
400.4	GASKET, DRAIN	1	PTFE		901.8	HEX. HEAD BOLT	6	STNLS STEEL	M16 × 55
412.1	O-RING	1	See Note1		901.13	HEX. HEAD BOLT	8	STNLS STEEL	M16 × 30
412.2	O-RING	1	See Note1		902	STUD BOLT	2	STNLS STEEL	M16
500	BACK UP RING	1	STNLS STEEL		903.5	HEX. SOCKET HEAD BOLT	4	STNLS STEEL	M8 × 20
540	BUSHING	1	SiC		908.2	HEX. SOCKET SET SCREW	2	STEEL	M8 × 10
550.1	PLAIN WASHER	2	STNLS STEEL	M8	920	NUT	2	STNLS STEEL	M16
550.3	PLAIN WASHER	4	STNLS STEEL	M12	922	IMPELLER NUT	1	CFRETFE+STNLS STEEL	
554.1	SPRING WASHER	8	STNLS STEEL	M16	922.1	IMPELLER LOCK NUT	1	STNLS STEEL	
554.2	SPRING WASHER	2	STNLS STEEL	M8	940	KEY	1	STEEL	
554.3	SPRING WASHER	4/8	STNLS STEEL						

Note1: Varies depending on pump type

■ Description on Main Unit Body and Label



⚠CAUTION

When cleaning the pump, be careful not to wipe the labels or the pump body with solvent.

PUMP OPERATION

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1. Handling Instructions

(Observe all the following instructions to prevent injuries and accidents.)

⚠ WARNING

- When the pumps are used to transfer the dangerous liquids mentioned as below, the pumps always must be checked and watched so that the liquids can not be leaked. The operation of the pumps leaking the liquids may result in personal injury and/or explosion, fire accidents.
  - Explosive, fire-spreading and inflammable liquids
  - Corrosive and stimulus toxic liquids
  - Liquids detrimental to health

⚠ CAUTION

- **Read the following information prior to installing the pump.**
- **Protective wear:**
  When operating the pump or working near it, with the pump system loaded with chemical liquid, always wear protective clothing, face guard, goggles, and gloves. Further precautionary measures must be taken depending upon the type of liquid used.
- **Operating the pump dry (without supplying liquid to it) may cause seizure on wear of the inside of the pump section.**
- **Pump repair beyond the range specified in this instruction manual:**
  Do not try to disassemble or repair the pumps by yourself.
  *The pump must be repaired by trained and qualified operators only. When it needs to be disassembled and repaired, stop operation and contact the supplier for advice.

[1] Handle the pump carefully.

Strong impacts caused by dropping the pump on the floor or striking it may result in damage or faulty performance.

[2] Priming water

Be sure to fill the pump unit with feeding liquid as priming water before pump operation.

[3] Do not operate the pump in the following places.

- Places where the temperature falls below 0 ºC
- Places where corrosive gas or explosive gas (such as chlorine gas) is generated
- Places exposed to splashing water
- Places where the ambient temperature is 40 ºC or above
- Places where the humidity is excessively high. (Permissible humidity: 35-85 %RH)
- Places filled with or likely to be filled with explosive or corrosive atmosphere.
- Danger due to dust, fire, earthquake and/or any externally imposed shock.

* If the pump is kept out of operation for a period longer than a month, open the fan cover of the motor and manually rotate the fan using your finger once a month. If the pump is not operated for a period longer than one year, replace the gasket before starting the pump.

⚠ CAUTION

To prevent power from being supplied accidentally when or after the fan cover is detached from the motor, take effective measures to block the energization before carrying out the procedure below.

[4] Keep the pump away from fire

To prevent fire and explosions, do not place dangerous or inflammable substances near the pump.

[5] If pump is damaged

Do not operate a damaged pump, otherwise there may be electricity leakage or electric shocks.

[6] No remodeling

Never try to remodel the pump. This may cause a serious accident or damage.

[7] No disassembly or repair

Users are allowed to disassemble and repair the pump to the degree of the given description in "Disassembly and Assembly" in this manual.

[8] No dry running operation

Dry operation of the pump (pump operation without liquid inside) may cause damage to the pump internally. Never operate the pump dry. In the case of MDE type, the sliding parts are self-lubricated and self-cooled. If the pump is operated dry or with the suction-side valve closed, damage may result.

*Countermeasures to be taken in case of dry operation

1. Turn off the power switch of the pump immediately and leave the pump as it is for more than 1 hour.
2. Prime the pump and fill the pump with liquid.
   (Note that the pump should be supplied with liquid after leaving the pump empty for more than 1 hour. Sudden supply of liquid may cause a crack in the part due to quenching effects.)

[9] Points to be noted when starting and stopping pump

Pay close attention to the following points to avoid water hammer action when starting and stopping pump operation. When the discharge-side piping is very long, extra attention is required.

(1) When starting the pump, first prime it. Then, close the discharge valve completely and turn on the power switch. After starting up the pump, open the discharge valve gradually and set it to the desired operation level.

(2) When stopping the pump, first close the discharge valve slowly. Turn off the power switch only after completely closing the discharge valve.

⚠CAUTION

In this procedure, never try to stop the pump quickly using a solenoid valve, etc. Quick closure may cause water hammer action, and the excessive pressure will destroy the pump.

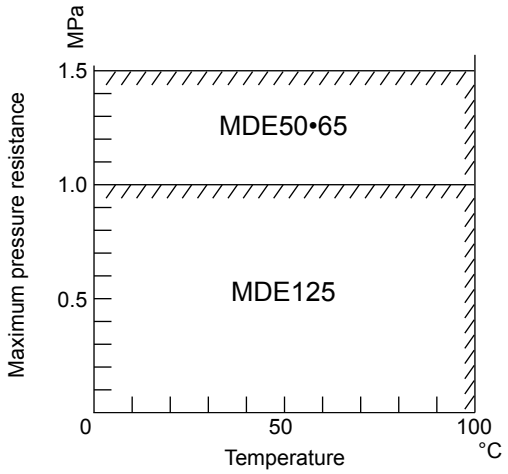
[10] Use of slurry liquid

As a general rule, the pump cannot be used for the feeding of slurry. If the user plans to use slurry, be absolutely certain to contact Iwaki first for consultation.

[11] Influence of specific gravity and viscosity of liquid on pump performance

If the specific gravity or viscosity of the liquid is higher than that of pure water, the shaft power, discharge volume, and pump head may vary somewhat. The delivered pump has been prepared to meet the specifications ordered by the user. To change the operating conditions after delivery, be sure to contact the supplier.

[12] Tolerable pressure limit



• Maximum pressure resistance

The table on the left shows the maximum pressure resistance of each model. Take care that the discharge pressure does not exceed the maximum pressure resistance.

[13] Intermittent operation

Frequent start/stop switching considerably shortens the service life of the pump. Try to limit the switching frequency to six times or less per hour.

[14] Temperature humidity fluctuation

Temperature fluctuation may not change the performance of the pump itself. However, the liquid may change in term of its viscosity, pressure, or corrosion resistance. Pay special attention to changes in liquid characteristics as a result of temperature fluctuation.

Liquid temperature range:	ETFE: 0-100 ºC
Ambient temperature range:	0-40 ºC
Humidity range:	35-85 %RH

* Refer to the corrosion resistance table for the temperature ranges recommended for various types of liquid. For inquiries or consultation, contact the dealer you placed your order with.

[15] Disengagement of magnet coupling

Though the motor is running, the liquid is not circulated. (The pressure gauge on the discharge side points to "0" point approximately.)

When the magnet coupling disconnects, stop the pump within 1 minute. If operation is continued with the coupling in the disconnected mode, the power of the coupling will decrease considerably.

[16] Operation within range of drooping head capacity curve

In the case of a pump which generates a drooping head capacity curve in a low-capacity range, do not operate the pump in the section where the line droops to the left. (Refer to the standard performance curve to verify the head capacity.) If the drooping section (left side) of the head capacity curve is part of the pump operation specifications, design the piping with the following points in mind.

① The discharge piping should have no water tank or air trap.

② The discharge amount should be adjusted with the valve installed near the discharge port.

2. Installation

[1] Installation position

- Install the pump as close to the suction tank as possible and in the lowest position available (for flooded suction).
- If the suction port of the pump is to be positioned higher than the suction tank (for suction lift), be sure to arrange for a foot valve in the priming pipe and suction pipe.

* The lift head depends upon the liquid properties, temperature, and length of the suction piping. For details of the setup, consult Iwaki or your dealer.

[2] Indoor and outdoor use

The pump can be operated either indoors or outdoors. However, safety measures should be taken so as not to expose the motor and power distribution unit to flooding or other natural hazards.

[3] Installation site

Select an installation site that is flat and free of vibrations caused by nearby machines. Space sufficient for maintenance work should be provided.

■ Lifting

When lifting the pump, please pay attention to the following points.

- Pump must be lifted horizontally using two bolts located at pump and motor.
- In the case that there is no lifting bolt at the motor, rope or such kind materials should be tightly winded to the motor to lift the pump horizontally.
- Please use lifting chain or rope which has enough strength enduring pump weight.
- To prevent any human body accident caused by the pump drop, please do not enter under the lifted pump.
- When lifting the pump, apply a chain or belts to the eye bolts to keep the pump horizontal. Use an overhead crane or any other proper transporting machine. Two or more operators may be needed for ensuring safe transport depending on the pump size and weight.

■ Foundation preparation (before pump installation)

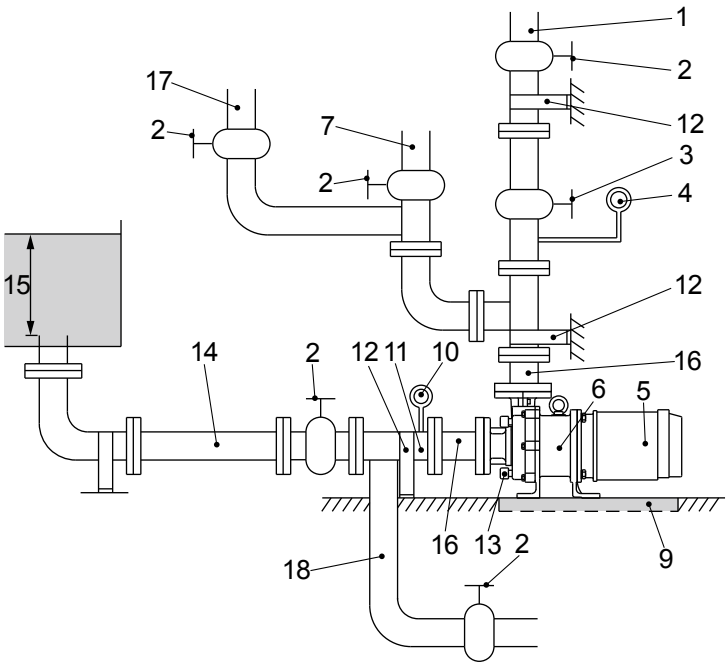
[1] The area for anchoring the pump must be greater than the area of the base. If the anchoring area is not enough, the base may be destroyed due to a concentrated load on it.

[2] If pump operation is to be subject to vibration (resonance with the piping, for example), provide an expansion joint between the pump and the piping. Otherwise, the piping, gauge, etc., may be damaged.

[3] Installation advice

- If the pump unit is not anchored to the foundation and if the motor unit is heavier than the pump unit, the entire pump leans towards to the motor. See page 57 as well.
- Use anchor bolts to fasten the pump base firmly.
- Install the pump horizontally.
- Sufficient space is required to allow cool air from the motor fan to circulate.
- Allow ample space around the pump for easy and efficient maintenance work.

Example of piping



(1) Discharge pipe (Support the pump to keep the pump free of piping load.)
(2) Valve
(3) Check valve
(4) Pressure gauge
(5) Motor
(6) Pump
(7) Air vent pipe
(9) Drain ditch
(10) Vacuum gauge
(11) Suction pipe (pipe diameter:D)
(The horizontal section should be as short as possible and there should be an ascending gradient of 1/100 toward the pump.)
(12) Pipe support
(13) Pump drain
(15) 2D, 500 mm or above
(16) Expansion joint
(17) Piping for flushing (Discharge side)
(18) Piping for flushing (Suction side)

■ Tightening of pipe flange

Connect the pump to pipework via inlet and outlet flanges according to the table below (This table is based on use of metal pipe flanges with rubber gaskets.).

Bolt size	Tightening torque (Reference value)
M16/M20	78.4/100 N•m

■ Suction piping

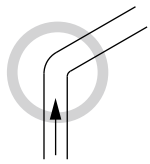
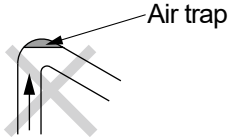
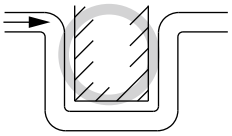
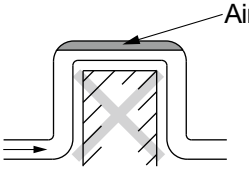
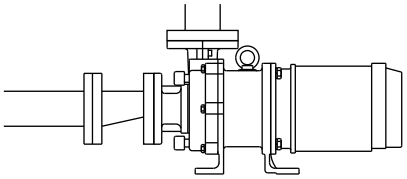
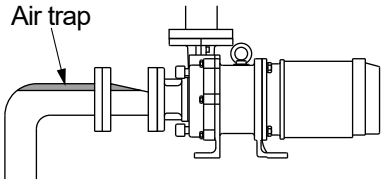
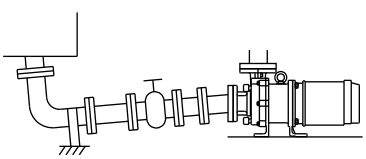
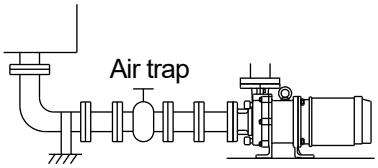
[1] The suction pipe should employ the flooded suction method if possible. The shortest and thickest pipe possible, with the minimum number of bends, should be used. Arrange a proper support under the suction pipe such as an expansion joint or the like so that the weight and thermal stress of the pipe are not applied to the pump.

[2] Attach the coupling on the suction pipe carefully so as not to allow air inside the line. Air in the suction pipe may damage the system.

[3] If suction is not good (e.g., the suction tank is a vacuum, the suction head is large, or the suction pipe is long), the condition NPSHa > NPSHr + 0.5 m should be established. For the NPSHr level, refer to the standard performance curve.

[4] When using a bent pipe on the suction side, install a straight pipe with a length of 8 times the suction port diameter before the pump suction port. Provide the largest radius possible for the R of the bend.

[5] Do not allow any projection where air may be trapped along the suction pipe. The suction pipe should have an ascending gradient of 1/100 toward the pump.

Good conditions	Unacceptable conditions
Good 	No good 
Good 	No good 
Good 	No good 
Good 	No good 

[6] If the diameters of the pump suction port and the suction pipe are different, use an eccentric reducer pipe. Connect the eccentric reducer pipe so that the upper surface is level. In any case, never use a suction pipe with a diameter smaller than that of the suction port.

[7] It is also recommended, in the case of flooded suction, that a gate valve be installed on the suction pipe for easier overhaul inspection of the pump. Keep the gate valve fully open during ordinary pump operation, it is required to be closed only during an overhaul inspection.

[8] When circulating a dangerous liquid, arrange the flushing pipes so that internal cleaning is possible when disassembling the pump.

[9] The diameter of the suction pipe must be larger than that of the pump suction pipe.

[10] The end of the suction pipe should be located 500 mm lower than the liquid level.

[11] A screen should be provided at the inlet in the suction tank to prevent the entry of foreign matter into the suction pipe. The end of the suction pipe should be 1-1.5 D (D: diameter of suction pipe) or more away from the bottom of the suction tank. Note that the entry of foreign matter may cause the pump to malfunction.

[12] In the case of the suction lift method, install a foot valve on the suction pipe.

Note: The items [10], [11], and [12] above are applied to the suction lift method.

■ Discharge piping

[1] Use a support so that the weight of the pipe is not applied to the pump as load.

[2] If a method other than flooded suction is employed, install a priming pipe.

[3] If the pipe is too long, the piping resistance may increase, hampering the pump's performance. The diameter of the pipe should be determined by calculating the piping resistance.

[4] A check valve should be installed if any one of the following conditions is present. When selecting the check valve, consider the check valve pressure limit (including the influence of water hammer or back flow onto the pump).
① The discharge piping is very long
② The discharge lift exceeds 15 m
③ The end of the discharge pipe is 9 m higher than the surface of the suction tank
④ Several pumps are connected parallel to one another on the same piping

[5] It is recommended that a gate valve be installed on the discharge pipe for the adjustment of discharge volume and for the prevention of overload onto the motor. When installing both a check valve and a gate valve, the check valve should be positioned between the pump and the gate valve.

[6] Do not fail to install a pressure gauge on the discharge piping.

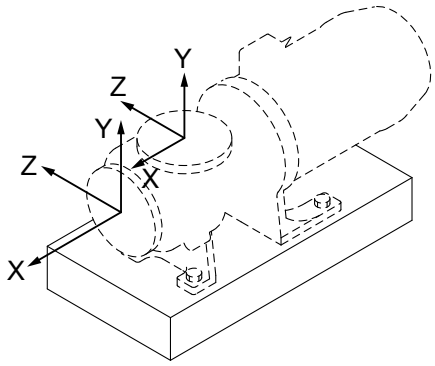
[7] Install an air vent valve if the discharge pipe is very long horizontally.

[8] Install a drain valve for the drainage of liquid if there is a chance that the liquid in the discharge pipe might freeze.

[9] Arrange an air bleeding piping for the removal of the air in the pump. The air bleeding piping should be set between the pump and a check valve.

■ Load of piping and momentum of piping for MDE

The permissible stress and moment applicable to pump connection arrangement are as shown below.
The piping should be designed and worked so that stress and moment, higher than those values indicated in the table, should not be applied to the pump.



Force of suction piping

Direction of load	Dia. of pipe (mm)		
	80	100	150
	kN	kN	kN
Fx	1.33	1.78	3.11
Fy	0.89	1.16	2.04
Fz	1.07	1.42	2.49

Force of discharge piping

Direction of load	Dia. of pipe (mm)		
	50	65	125
	kN	kN	kN
Fx	0.71	1.07	2.49
Fy: compression	0.89	1.33	3.11
Fy: tension	0.44	0.67	1.56
Fz	0.58	0.89	2.04

Moment of suction piping

Direction of load	Dia. of pipe (mm)		
	80	100	150
	kN•m	kN•m	kN•m
Mx	0.95	1.33	2.30
My	0.72	1.00	1.76
Mz	0.47	0.68	1.18

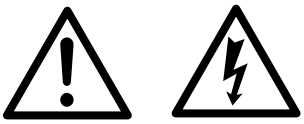
Moment of discharge piping

Direction of load	Dia. of pipe (mm)		
	50	65	125
	kN•m	kN•m	kN•m
Mx	0.35	0.95	2.30
My	0.46	0.72	1.76
Mz	0.23	0.47	1.18

3. Wiring

Electrical connections

ATTENTION



The electrical connection should be carried out by an authorized electrician in accordance with local regulations. Please make sure that the electrical data on the nameplate of the motor correspond to the electricity supply on which it will be used. Motors must be connected to a motor protection switch.

[1] Use an electromagnetic switch that conforms with the specifications (voltage, capacity, etc.) of the pump motor.

[2] If using the pump outdoors, waterproof the wiring to protect the switches from rainwater.

[3] Electromagnetic switches and push buttons should be installed reasonably distant from the pump.

[4] Make sure to start the pump by the use of Star Delta starter, invertor, or soft starter.

* Refer to the instruction manual of the motor issued by the motor maker for detailed handling instructions.

4. Protection

It is recommended to install the following monitoring devices to protect the pump.

1. Current sensor/Power sensor	The sensors monitor the motor load and stop the pump on the detection of load change.
2. Pressure sensor	The sensor monitors the starting pressure and stops the pump on the detection of pressure change.
3. Flow sensor	The sensor monitors the discharge flow and stops the pump on the detection of flow change.
4. Level sensor	The sensor monitors the liquid level and stops the pump when it falls below the specified level.

It is recommended to install two or more monitoring devices. The more monitoring devices are installed, the more possibility of protecting the pump.

The DRN series pump protector (an electric current sensing type abnormal operation preventive device) is also available as an option. Contact us for detail.

5. Operation Step

■ Operation instructions

[1] Never operate the pump dry or with the suction-side valve (gate valve) closed. Otherwise, the inside of the pump will be damaged.

[2] In the event of cavitation, stop the pump within a minute.
In addition, do not continue pump operation with air mixed into the suction side.

[3] If the magnet coupling disconnects, stop the pump within a minute. The power of the magnet coupling is reduced if operation is continued with the coupling disconnected.

[4] The temperature fluctuation should not exceed 80 °C through the operation modes of starting, stopping, and operating the pump.

[5] Before starting operation, close the discharge valve fully to prevent water hammer action upon start-up.

[6] Note that pump operation with the discharge valve closed fully over a long time will raise the temperature of the liquid inside the pump and finally damage the pump.

[7] In the event of a service power failure, turn off the power switch immediately and close the discharge valve.

[8] Make sure that intolerable pressure levels are not applied to the pump. Refer to page 18 "[12] Tolerable pressure limit" in "1. Handling Instruction."

[9] Maximum pump surface temperature
The max. pump surface temperature of each model is shown in the table. Arrange protective measures in accordance with the temperature levels.

Model	Liquid temperature (°C)	Maximum surface temperature when ambient temperature is at 40°C. (°C)
MDE100	100	95

[10] Sound generated by pump

The level of sound generated by each type of pump is shown in the table. Arrange muffling measures in accordance with the sound level.

(dB)

Model	MDE
Sound Level	95 dB

■ Preparation for start-up

Prepare the pump system as described below when starting the pump for the first time after installation or following a long suspension of pump operation.

[1] Clean inside the pipes and the tank well and supply liquid to the pump system.

[2] Retighten the flange connection bolts, base anchoring bolts, and other bolts if necessary. Retighten the bolts (901.8) which fasten the front casing and the bracket by applying a fastening torque of 100 N•m (1020 kgf•cm).

[3] After priming the pump, close the discharge valve completely.

[4] A step for flooded suction method:

Check the pressure inside the flooded-suction piping and ensure that the pump is filled with liquid. Next, force the remaining air inside the impeller out through the air-bleeding piping.

To get rid of air in the pump, detach the fan cover from the motor and rotate the fan manually.

⚠ CAUTION

To prevent power from being supplied accidentally when or after the fan cover is detached from the motor, take effective measures to block energization before carrying out air removal.

[5] A step for suction lift method:

Force the remaining air inside the impeller out through the air-bleeding piping while priming the pump.

To get rid of air in the pump, detach the fan cover from the motor and rotate the fan manually.

⚠ CAUTION

To prevent power from being supplied accidentally when or after the fan cover is detached from the motor, take effective measures to block energization before carrying out air removal.

[6] Activate the motor momentarily to check for the correct rotating direction of the motor. This momentary activation of the motor must be carried out only after you have confirmed that priming and air bleeding have been carried out. The correct direction of the motor rotation is indicated with an arrow on the pump. If the motor runs in the wrong direction, exchange the two connected wires in the 3-phase power plug.

■ Operating Procedures

Operate the pump in accordance with the following procedures.

<table>
<tr><th>No</th><th>Check and operation procedure</th><th>Remarks</th></tr>
<tr><td>1</td><td>• Open/close the valves.</td><td>• Suction valve: Open fully
• Discharge valve: Closed fully</td></tr>
<tr><td>2</td><td>• Prime the pump.</td><td>• Check to ensure that the pump is filled with liquid. (The pump must be filled with liquid before operation.) Make sure to discharge air from inside of the pump through air-bleeding piping.
• After completion of priming, close the discharge valve fully.</td></tr>
<tr><td>3</td><td>• Check the rotating direction. Activate the motor momentarily only.</td><td>• Turn ON the pump momentarily to check for the correct direction of rotation. Check the motor by looking at it through the fan cover to ensure that it is running in the direction indicated by the arrow on the motor (in a counterclockwise direction when viewed from the motor fan). Also check that the motor fan stops smoothly when the power supply is disconnected.

⚠ CAUTION
If the motor fan does not stop smoothly, the cause may be a locked pump.
Rotating the pump in the wrong direction for an extended period may cause damage to the pump.</td></tr>
<tr><td>4</td><td>• Turn ON the power to start the pump. Then, adjust the discharge pressure and the flow rate. Observe the following discharge rate.</td><td>• If the pump starts operation normally and the discharge pressure increases to reach the upper limit, open the discharge valve gradually to fix it at the specified level.
* Start to open the discharge valve gradually within 1 min. after the startup and adjust the discharge pressure while checking the pressure gage on the discharge side. (Otherwise, adjust the discharge rate while checking the flow meter.)

⚠ CAUTION
Opening the valve excessively results in an overload of the motor. Watch the current level carefully while opening the valve.</td></tr>
<tr><td>5</td><td colspan="2">The pump discharge rate must be at or higher than the value described below.
MDE50/MDE65: 50 L/min. or more
MDE125: 200 L/min. or more
• In the case of an auto operation, also, start up the pump with the discharge valve fully closed and open said valve gradually at that time (within 1 min. after startup).

⚠ CAUTION
The period allowed for pump operation with the discharge valve fully closed is 1 min. as a basic rule.</td></tr>
<tr><td>6</td><td>Points to be observed during pump operation:
When the pump enters a continuous operation, check the flow rate meter to ensure that the pump operates within the ranges of the specifications.</td><td>• If a flow rate meter is not available, check the discharge pressure, suction pressure and current value in consideration of the piping resistance.</td></tr>
<tr><td>Note</td><td colspan="2">If trouble should occur, turn OFF the power supply at once. Refer to "1. Causes of Trouble and Troubleshooting" in the Maintenance Section.</td></tr>
</table>

■ Stoppage

	Check/Operation Step	Remarks
1	• Close discharge valve gradually.	• Do not cause sudden closure with solenoid valve, etc., otherwise pump may be destroyed by water hammer action which is likely in case of long discharge piping.
2	• Turn off the power and stop pump operation.	• Observe carefully whether the motor fan slowly and smoothly stops rotating. ⚠ **CAUTION** **If not check inside of pump.**
3	Points to be observed when stopping pump • If the pump operation is stopped during cold weather, liquid in pump may freeze and damage pump. When circulating a dangerous liquid, carry out internal cleaning by using flushing piping. Then drain the liquid fully. • Be sure to remove all liquid after stopping pump. In case of short-term suspension of operation, which does not allow for removal of liquid, use band heater, etc., to prevent liquid inside from freezing. • In event of power failure, turn off power switch and close discharge valve.	

MAINTENANCE

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2. Maintenance and Inspection 34

3. Consumable Parts 37

4. Disassembly and Assembly 38

5. Mass of pumps 57

1. Causes of Trouble and Troubleshooting

Refer to "1. Causes of Trouble and Troubleshooting". Consult supplier for more information. If you find any troubles, turn off the power supply immediately.

Problem	Symptom on pump		Causes	Inspection and Measures
	When Discharge Valve is Closed	When Discharge Valve is Opened		
Liquid is not lifted.		Pressure gauge and vacuum gauge indicate 'zero'.	● Not enough priming water ● Dry operation.	○ Stop pump, feed sufficient priming water, and restart pump.
	Water goes down at once when priming is carried out.		● Foreign matter is clogging foot valve.	○ Clean foot valve. ○ Check whether seat is clogged with foreign matter.
	Pressure is reduced if discharge valve is opened after start-up step.	Points of pressure gauge and vacuum gauge swing but return to zero at once.	● Air enters through suction pipe or gasket section.	○ Check again whether connecting flange in suction piping is sealed airtight. ○ Check whether suction liquid level is abnormally lowered.
			● Magnet coupling has disconnected.	○ Stop pump and use screwdriver to check for easy and smooth rotation of motor fan. ○ Measure current level to check for overload condition. ○ Check whether the voltage level is normal. ○ Check for foreign matter between impeller and magnet capsule.
	Pointer of pressure gauge never goes up.		● Speed of pump is too low. ● Pump rotates in reverse direction.	○ Check wiring and motor and make necessary repairs. ○ Exchange wires.
Discharge volume is small.		Pointer of vacuum gauge indicates a high value.	● Strainer is clogged with foreign matter and liquid passage is blocked.	○ Eliminate the foreign matter in strainer.

Problem	Symptom		Causes	Inspection and Measures
	When Discharge Valve is Closed	When Discharge Valve is Opened		
Discharge volume is small.	Pointers of pressure gauge and vacuum gauge indicate normal values.	Pointer of vacuum gauge indicates extraordinarily high value.	● Air is trapped in suction pipe.	○ Inspect setup condition of suction pipe and modify it if necessary.
			● Inlet section of impeller unit is clogged with foreign matter.	○ Disassemble unit partially and eliminate foreign matter.
		Pointers of pressure gauge and vacuum gauge swing.	● Air enters through suction pipe or gasket section.	○ Check connecting section of suction pipe and tighten it if necessary.
			● Discharge side of pump is clogged with foreign matter.	○ Eliminate foreign matter in the pump. ○ Eliminate foreign matter or scale inside pipe.
		Pointer of vacuum gauge indicates a high value while that of pressure gauge indicates normal value.	● There is an air trap or resistance in suction pipe.	○ Check whether there is protruding section in suction pipe and take necessary measures.
		Pointer of pressure gauge indicates high value while that of vacuum gauge indicates normal value.	● There is a portion in discharge pipe that causes resistance, or actual head and loss of head are too high.	○ Check actual head and piping loss of discharge pipe and take necessary measures.
	Pointer of pressure gauge indicates low value and that of vacuum gauge indicates extraordinarily low value.	Pointers of pressure gauge and vacuum gauge indicate low values.	● Rotation direction is reversed.	○ Exchange wires.

Problem	Symptom		Causes	Inspection and Measures
	When Discharge Valve is Closed	When Discharge Valve is Opened		
Motor is overheated.			● Voltage is lowered. ● Overload. ● Ambient temperature is high.	○ Check whether the voltage and frequency levels are adequate. ○ Check whether the specific gravity and viscosity of liquid are adequate. ○ Improve air ventilation.
Discharge volume is suddenly lowered.		Pointer of vacuum gauge indicates high value.	● Strainer is clogged with foreign matter.	○ Eliminate foreign matter.
Pump vibrates.			● Foundation is defective. ● Anchor bolt is loose. ● Suction pipe is closed. Cavitation is caused. ● Wear or melting of pump bearing. ● Magnet capsule or spindle is damaged. ● Dynamic balance of drive magnet assembly fluctuates. ● Impeller and/or magnet capsule is in contact with fixing section. ● Wear of motor bearing.	○ Reinstall. ○ Retighten bolts. ○ Clean, and eliminate cause of cavitation. ○ Replace. ○ Replace. ○ Eliminate cause or replace. ○ Replace. ○ Replace bearing or motor.
Pump generates abnormal noise.		The indicator of the pressure gage/vacuum gage deflects conspicuously.	● Air enters through the suction pipe or the gasket. ● Cavitation is caused.	○ Check the connections on the suction pipe and retighten it as necessary. ○ Eliminate the cause of cavitation.
Current level fluctuates.		The pressure gage/vacuum gage indicator deflects conspicuously.	● Air enters through the suction pipe or the gasket. ● Cavitation is caused.	○ Check the connections on the suction pipe and retighten it as necessary. ○ Eliminate the cause of cavitation.

2. Maintenance and Inspection

■ Daily inspection

[1] Check whether the pump operates smoothly, without generating any abnormal noise or vibration.

[2] Check the level of the liquid in the suction tank and the suction pressure.

[3] Compare the discharge pressure and electric current measured during operation with the values indicated on the motor nameplate for the verification of normal pump load.

* Note that the values indicated on the pressure gauge vary in proportion to the specific gravity of the liquid. The cock of the pressure gauge or vacuum gauge must be opened only when measurement is carried out. It must be closed upon the completion of each measurement. If the cock remains open during pump operation, the meter mechanism may be affected by abnormal pressure caused by water hammer action.

[4] If a spare pump is available, activate it from time to time to keep it ready for use any time.

[5] Check to be sure there is no liquid leakage in the pump before operating it. If leakage is detected, never try to operate the pump.

[6] Check to be sure the discharge pressure, discharge flow rate, and motor power supply voltage do not fluctuate during pump operation. If considerable fluctuation of the respective values occurs, refer to "1. Causes of Trouble and Troubleshooting" for correct measures.

■ Periodic inspection

To ensure efficient and smooth operation of the pump, carry out periodic inspections by following the procedures described below. When inspection, overhauling, or repair work is necessary, stop the pump operation and contact the supplier.

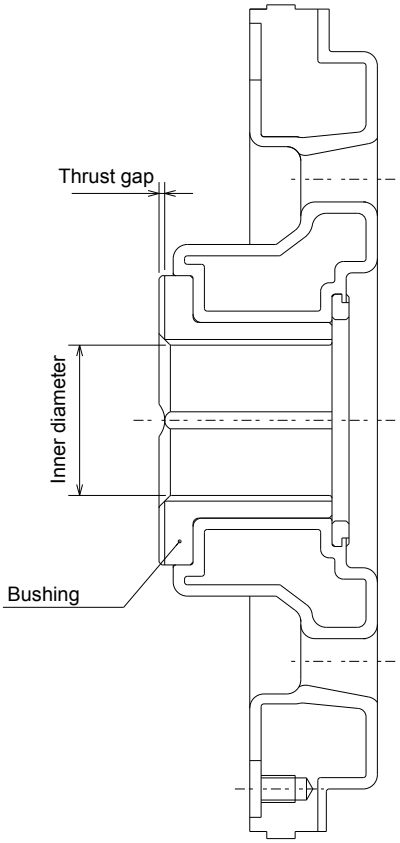
The overhauling and repair work for Iwaki pumps must be performed by qualified personnel who have been trained and certified by the pump supplier. User's failure to observe this instruction exempts Iwaki from the responsibility for personal injury or damage to the equipment or facility which result from its misuse.

Inspection Timing	Part Name	Check Points
Every 6 months * Inspection record should be kept.	Drive magnet unit	● Are there slide-scratches? ● Is housing fixed normally? Is hex socket set screw loose? ● Are inner perimeter of magnet and motor shaft coaxial? (Max. eccentricity: 1/l0 mm)
	Rear casing, Rear casing cover	● Are there slide-scratches? ● Are there cracks on liquid end part? ● Stains in rear casing. ● Expansion of gasket or cracks.
	Magnet capsule unit	● Are there a slide-scratches in the rear section or in the cylindrical body? ● Are there cracks in resin of rear section or in cylindrical body? ● Wear of sleeve or cracks. (Measure dimensions.) ● Expansion of O ring or cracks.
	Impeller	● Wear of thrust bearing. (Measure dimensions.) ● Are there cracks? ● Are there cavitation marks? ● Stains or clogging inside impeller. ● Dimensional change in impeller. ● Clogging balance hole.
	Front casing	● Stains in liquid contacting part. ● Are there cracks? ● Is drain clogged? ● Are there expansion or cracks on gasket? ● Slide-scratches in unlikely position.
	Split plate	● Stains in liquid contacting part. ● Are there cracks? ● Slide-scratches in unlikely position. ● Wear of bearing or cracks. (Measure dimensions) ● Wear of thrust bearing or cracks. (Measure dimensions)

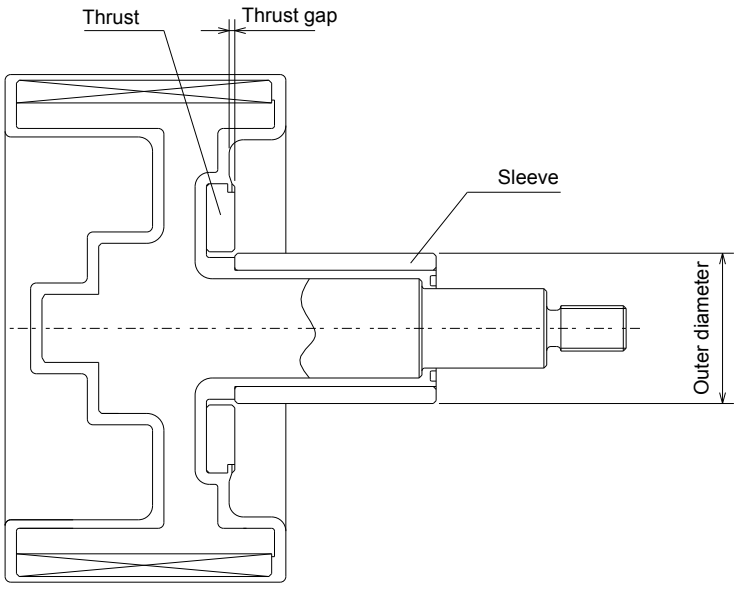
■ Wear limit of sliding parts

* Replace the parts with new ones when the dimensional difference between the inner diameter of the bearing and the outer diameter of the sleeve exceeds 1 mm, irrespective of the guideline indicated below.

Name of part			Upon shipment	Upon replacement
Magnet capsule assembly	Sleeve	Outer diameter	53	52
	Thrust	Thrust gap	2	1
Split plate assembly	Bushing	Inner diameter	53	54
		Thrust gap	2	1



Split plate assembly



Magnet capsule assembly

3. Consumable Parts

Parts listed below are consumable parts. The parts must be replaced according to the time to be replaced shown as below. When placing an order, supply the following information.

① Name of parts and parts code.

② Pump model number and manufacturing number (as indicated on the pump nameplate)

③ Drawing number if you have received the Iwaki-approved drawing

Parts No.	Type	Name of parts	Material	Parts code						Time to be replaced
				2P	18.5 kW	22 kW	30 kW	37 kW		
				4P		11 kW	15 kW	18.5 kW	22 kW	
314 337 540	MDE50•65	Split plate ASSY	SiC+ PFA+FCD400	MDE 0709						10,000 hours operation time
	MDE125			MDE 0710						
370 370.1 859	All types	Magnet capsule ASSY	SiC+ PFA+Rare earth	MDE 0514		MDE 0515	MDE 0516	MDE 0517	MDE0517	
400.1	MDE50•65	Gasket	PTFE	MDE 0484						
	MDE125		PTFE	MDE 0711						
400.2	All types	Gasket	PTFE	MDE 0485						
400.4	All types	Gasket	PTFE	MDE 0149						
412.1	All types	O ring	KALREZ®	MDE 0704						
			FKM	MDE 0706						
			EPDM	MDE 0708						
412.2	All types	O ring	KALREZ®	MDE 0703						
			FKM	MDE 0705						
			EPDM	MDE 0707						

Note 1. Time to be replaced mentioned as above is based on pumping clear water at ambient temperature. The time to be replaced depends on the characteristics, temperature and other condition of pumped liquid.

2. Split plate ass'y and magnet capsule ass'y must be replaced at the time of wear limit of sliding parts shown on page 36 regardless of the time to be replaced shown as above.

3. Gasket and O ring must be replaced every time when pump is disassembled regardless of the time to be replaced shown as above.

4. Parts No. corresponds to that of construction drawings on pages 11, 12 and 13.

4. Disassembly and Assembly

■ Disassembly and assembly of MDE50/65 type pump (built with a flange motor)

⚠WARNING

- **Wear protectors**
  If you touch or otherwise come into contact with certain types of hazardous chemical liquids, including but not limited to chemicals, you may experience serious injury to those parts of the body so exposed. Wear appropriate protective equipment (protective mask, goggles, gloves, etc.) during pump operation.


Wear protective gear

- **Turn OFF the power supply**
  If you work with the pump with the power supply connected ON, an electric shock or other type of accident may result. Before starting the work, make sure to turn off the main power supply and stop the pump and the entire pump system.


Power off

- **Ventilation**
  Fumes or vapours can be hazardous with certain solutions. Also, a harmful fluorine gas is given off when a fluoroplastic part of this product is heated to a high temperature and eventually decomposed. Ensure proper ventilation at the operation site.


Caution

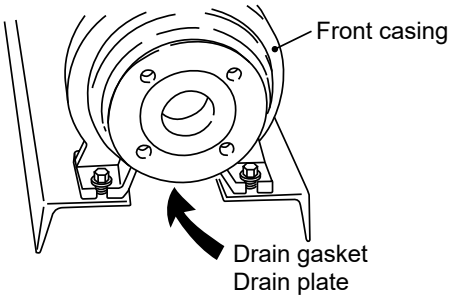
[Points to be observed before disassembly/assembly]

► The magnet used in the pump has a very high magnetic power. Be careful not to allow your fingers to be seized by the magnet and related parts during the disassembly and assembly processes. Pay attention to the magnet section so that metal pieces or metal powder does not adhere thereto.
► Do not allow the magnet near any electronic device which may be affected by magnetic power.
► Before starting the disassembly and assembly processes, close the suction valve and the discharge valve.
► Risk of burning. Pump and pipe surface temperature rise high along with liquid temperature. Do not touch the pump or pipe surface directly in or right after operation.

Tool list

The following tools are necessary to disassemble and assemble the pump.

No.	Tools		Pump models	Q'ty/Remarks
			MDE65/80/125	
1	Spanner	N.Dia.	13 mm, 19 mm, 24 mm	1 each
		Size	M8, M12, M16	
2	Hex wrench	N. Dia.	5, 6 mm	1 each/M6 size wrench is for the long coupling type
		Size	M6, M8	
3	Bearing press (plastic round bar)		ø60×80L	1 each/ flat bar end
4	Plastic welder or industrial dryer		-	1
5	Handpress		-	1
6	Plastic hammer		-	1
7	Puller		-	1
8	Torque wrenches		-	One 38 N•m, the other 100 N•m
9	Bars		-	Two 300 mm length bars
10	Guide bolts		-	-
11	Hex bolts		M16×100	2

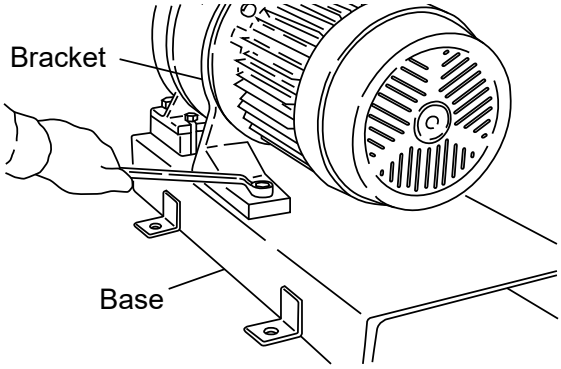


■ Disassembly

[1] Remove the hex head bolt (901.1) and drain plate (122) to discharge the liquid inside the casing. In the case of "drainless type," neutralize the liquid inside the casing or wash inside the casing with pure water before disassembly.

⚠WARNING

If you touch or otherwise come in contact with certain types of hazardous chemical liquid, including but not limited to chemicals, you may experience serious injury to those parts of the body so exposed. Wear appropriate protective equipment (protective mask, goggles, gloves, etc.)



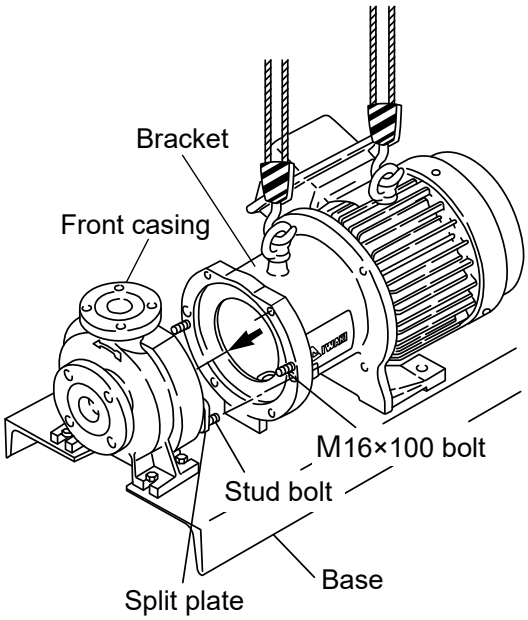
⚠WARNING

Loosen the hex head bolt slowly. Otherwise, the liquid may splash out and cause a serious injury.

⚠CAUTION

Make sure the pressure is removed from piping or the pump before disconnecting plumbing or disassembly of the pump.

[2] Remove the hex head bolt (901.3) which fixes the bracket (330) in place. Then, remove the hex head bolt (901.8) and nut (920).



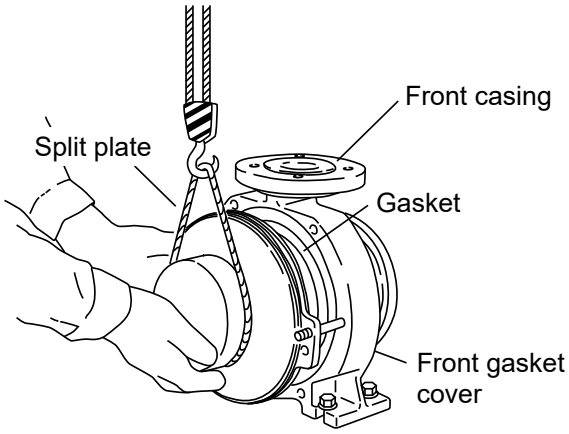
[3] Screw in the two attached bolts (M16×100) through the screw holes in the bracket (330) from the motor side to drive out the screwed split plate (337) to get the split plate separated off the bracket.
Rotate the bolts alternately. When the split plate (337) is driven out sufficiently, hold the split plate and lift the motor and pump units with a crane. Pull the bracket away from the motor and change the direction of the bracket over the base.

⚠CAUTION

Handle the motor very carefully as it is very heavy.

⚠CAUTION

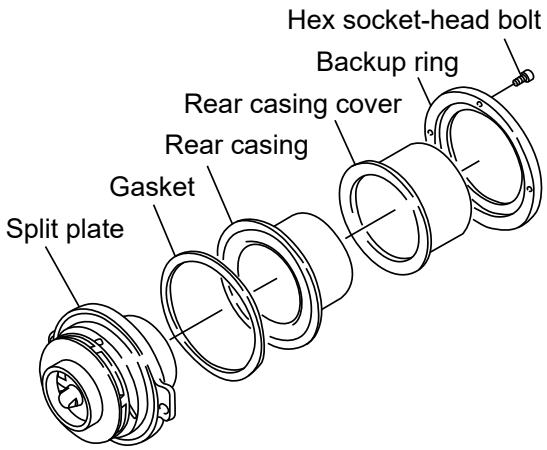
The flange type motor is so heavy that it may fall over to the motor side after disassembly of the pump. Make sure to support the motor by using a crane or the like.



[4] Insert a flat-blade screwdriver into the engagement surface between the split plate (337) and the front casing (100.1) while lifting the rear casing up by a crane to detach them from each other. Be careful not to scratch the sealing surface or the gasket (400.1). Handle the split plate assembly very carefully as it is very heavy.

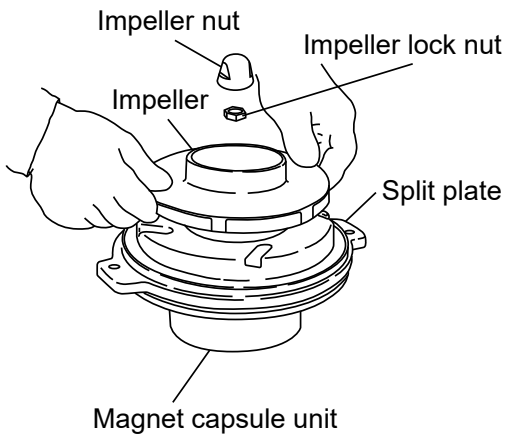
⚠CAUTION
Be careful not to scratch the sealing surface.

⚠CAUTION
When removing the split plate and rear casing assembly from the main unit, use a crane or the like to hold them as they are very heavy.



[5] Remove the hex socket-head bolt (903.5) and detach the backup ring (500) from the split plate (337). Then, detach the rear casing (158) and rear casing cover (159) while paying attention not to scratch the gasket surface.

⚠CAUTION
Be careful not to scratch the sealing surface.



[6] Rotate the impeller nut (922) counterclockwise to remove it. Next, remove the impeller lock nut (922.1). Then, remove the impeller (230) from the split plate and magnet capsule unit (859).

⚠CAUTION
The magnet used in the pump has high magnetic power. Be careful not to allow your fingers to be seized by the magnet. Do not allow the magnet near any electronic device which may be affected by the magnet's power.

⚠CAUTION
Handle these parts carefully so as not to scratch their surfaces. Wrap them in cloth or the like to protect them against scratches when storing them in place.

■ Assembly

The pump should be assembled by carrying out the steps involved in disassembly in reverse. Additionally, pay attention to the following instructions.

• Replacement of O ring, gasket, etc.
Make sure to replace the O ring and gasket with new ones in the assembly process. Pay special attention so as not to forget to install them. Install them without causing twisting or creating damage through pressing their edges with or inside other parts.

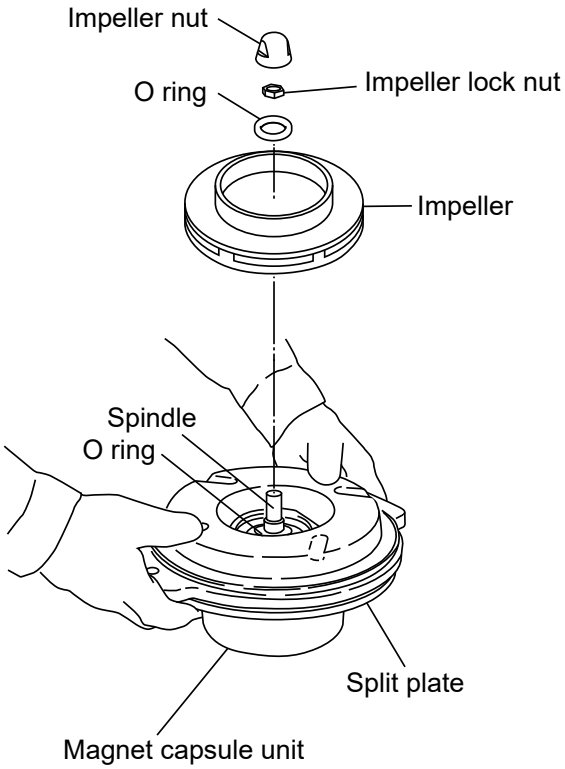
* Clean the sealing surfaces before attaching these parts in place and be careful not to allow dust or scratches between them.

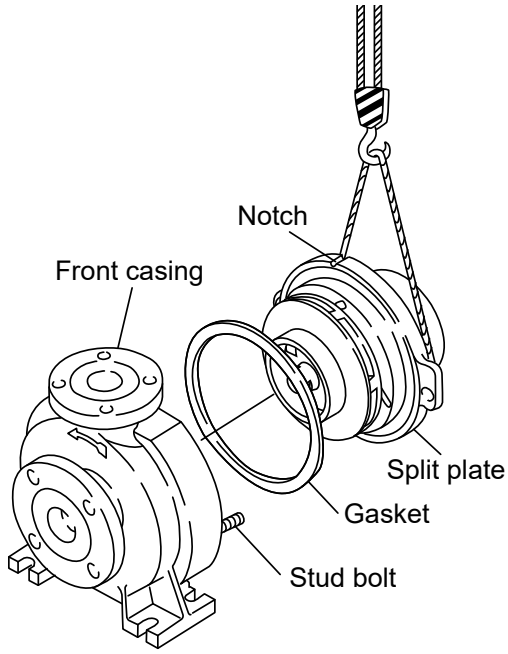
• Fastening bolts
Fasten the respective fastening bolts by applying an equal torque to them in a diagonal order among the bolts.

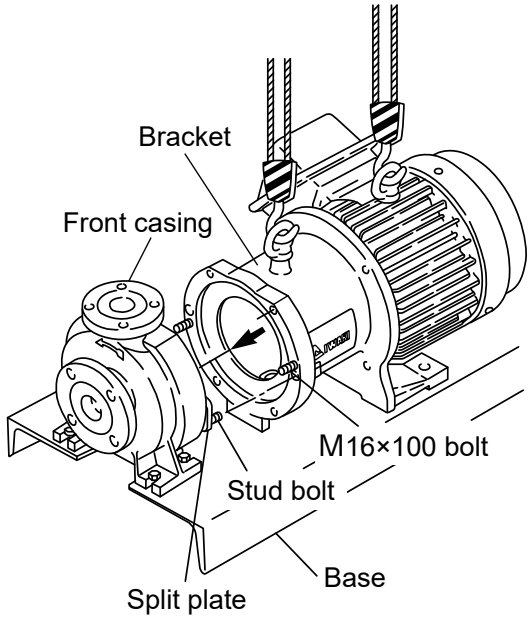
• Cleaning of magnet can
Foreign matter such as magnetic sand may adhere to the magnet can. Be sure to eliminate such foreign matter before undertaking the assembly process.

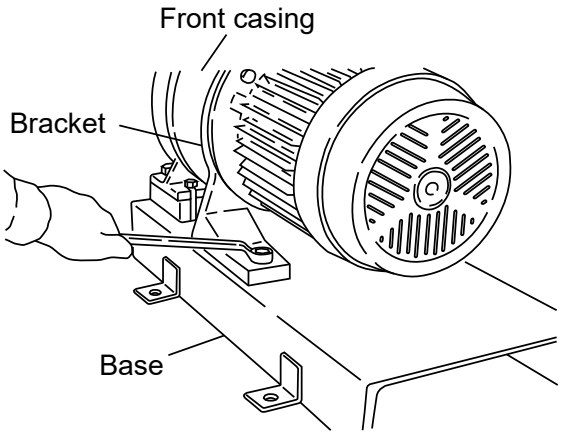
• Handling of SiC bushing
Apply a light coat of fluororesin grease on the thrust sliding surface of the sleeve. Apply the least amount of grease and spread it evenly all over the surface. (After applying the grease, wipe off the grease with a clean cloth.)
Absence of a coat of grease may result in the wear of the sliding parts in a short time. An excessive amount of grease or application of the grease in a peripheral direction may cause an overload.

[1] Assemble the split plate (337) from the spindle side of the magnet capsule unit (859). Be careful not to scratch the sleeve (370) or the sliding surface of the bushing (540). Next, install the O ring (412.2) on the magnet capsule unit (859) and insert the impeller (230) and key (940) to the magnet capsule unit. Hold the magnet capsule unit so as not to allow it to run. Then, fasten the impeller lock nut (922.1) by applying a torque of 50 N•m (519 kgf•cm).
Then, insert the O ring (412.1) into the impeller and fasten the impeller nut (922) by applying a torque of 40 N•m (408 kgf•cm) to it.
* When assembling the O ring, apply a film of Teflon grease so that the O ring will not drop off.
* Apply Teflon grease to the metal parts of the impeller and the magnet capsule so that they can be inserted smoothly.
* Check to ensure that there is 1 to 2 mm of play between the split plate and the impeller in the axial direction.









[2] After assembling the gasket (400.2) and the rear casing cover (159) to the rear casing (158), fasten the hex socket-head bolts (903.5) inserted from behind the split plate (337) to the backup ring (500).
* When assembling the gasket, apply a film of Teflon grease so that the gasket will not drop off.

[3] Insert the gasket (400.1) into the front casing (100.1) and attach the split plate (337) assembly over them.
* Screw in the stud bolts (902) in two locations in the front casing. Next, position the notch for positioning of the split plate to the top. Then, insert the parts along the stud bolts. Use a crane to support the split plate assembly because the assembly is very heavy.

[4] Set the attached bolts (M16x100) fully into the bracket in advance.

⚠CAUTION

Remove any foreign matter on the drive magnet unit. Use only the attached bolts. Otherwise, the magnet capsule may be pulled by the magnet force and damage the part.

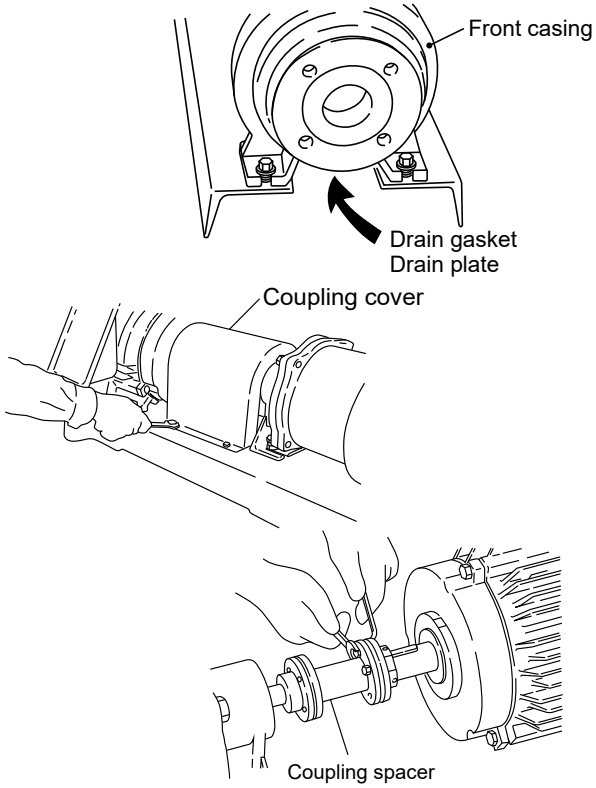
[5] Use a crane to lift the pump and the motor over the base. Adjust the direction of the bracket so that the bracket and the front casing (100.1) will be aligned. Insert the bracket along the stud bolts (902). Turn the attached bolts slowly and alternately (M16×100) to remove them backward so that the bracket will be set onto the front casing.

⚠CAUTION

Be careful not to get your fingers caught between the parts to be assembled.

[6] Fix the front casing (100.1) and the bracket (300) firmly by fastening the hex head bolts (901.8) and nuts (920). Tighten all the bolts fully by applying an equal torque in small increments in a diagonal order among the bolts.
---Fastening torque: 100 N•m
* Retighten the bolts periodically to secure the connection between the front casing and the bracket. Loosen the hex head bolts (901.3) first when retightening them.

■ Disassembly and assembly of MDE50/65 type pump (built with a coupling motor)



■ Disassembly

[1] Remove the hex head bolt (901.1) and drain plate (122) to discharge the liquid inside the casing.
*In the case of "drain-less type," neutralize the liquid inside the casing or wash inside the casing with pure water before disassembly.

⚠WARNING

If you touch or otherwise come in contact with certain types of hazardous chemical liquid, including but not limited to chemicals, you may experience serious injury to those parts of the body so exposed. Wear appropriate protective equipment (protective mask, goggles, gloves, etc.)

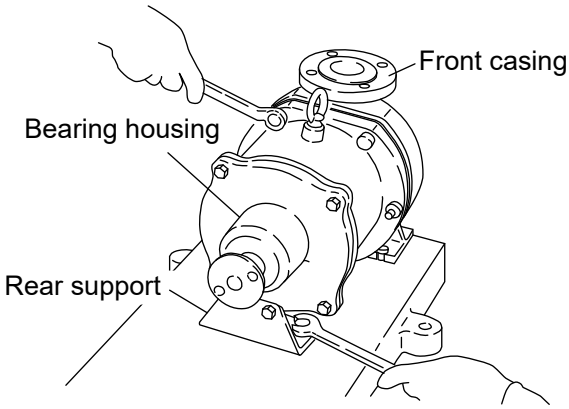
⚠WARNING

Loosen the hex head bolt slowly. Otherwise, the liquid may splash out and cause a serious injury.

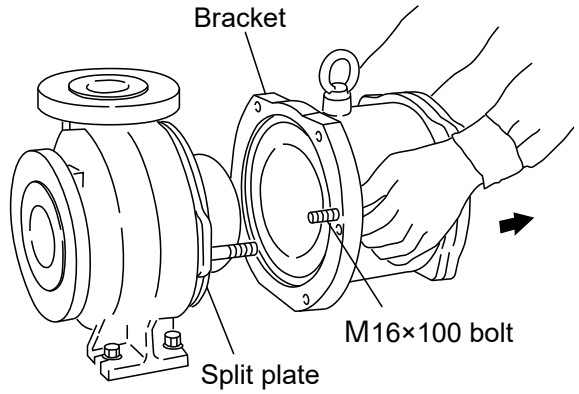
⚠CAUTION

Make sure the pressure is removed from piping or the pump before disconnecting plumbing or disassembly of the pump.

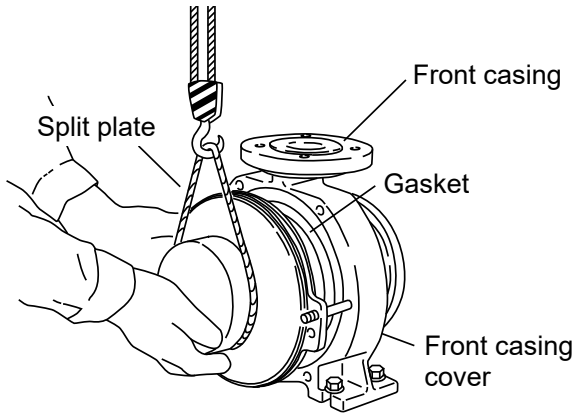
[2] Remove the hex head bolt (901.5) to detach the coupling cover (681). Next, remove the installation bolt of the coupling to remove the coupling spacer.



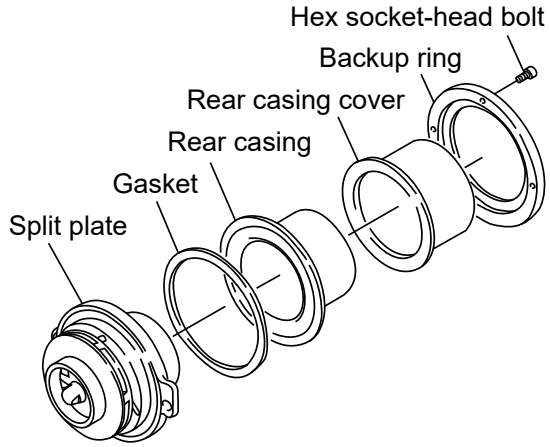
[3] Remove the hex head bolts (901.3) on the rear support (183) of the bearing housing (350). Next, remove the hex head bolts (901.8) and nuts (920) on the front casing.



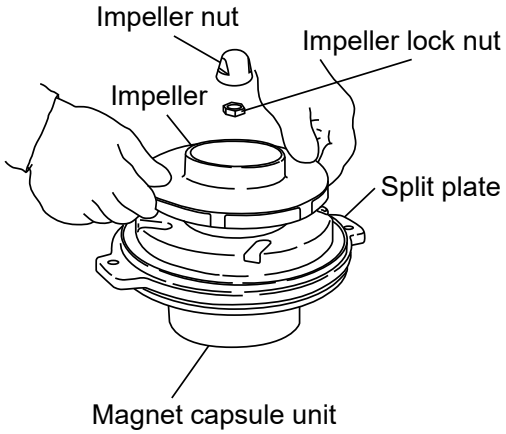
[4] Screw in the two attached bolts (M16×100) through the screw holes in the bracket (330) to drive the screwed split plate (337) to separate it from the bracket.
* Rotate the bolts alternately. When the split plate (337) is driven out sufficiently, hold the split plate and lift the bracket with a crane. Pull the bracket away from the motor and change the direction of the bracket over the base.



[5] Insert a flat-blade screwdriver into the engagement surface between the split plate (337) and the front casing (100.1) while lifting the rear casing up by a crane to detach them from each other. Be careful not to scratch the sealing surface or the gasket (400.1). Handle the split plate assembly very carefully as it is very heavy.



[6] Remove the hex socket-head bolt (903.5) and detach the backup ring (500) from the split plate (337). Then, detach the rear casing (158) and rear casing cover (159) while paying attention not to scratch the gasket surface.



[7] Rotate the impeller nut (922) counterclockwise to remove it. Next, remove the impeller lock nut (922.1). Then, remove the impeller (230) from the split plate and magnet capsule unit (859).

⚠CAUTION

The magnet used in the pump has high magnetic power. Be careful not to allow your fingers to be seized by the magnet. Do not allow the magnet near any electronic device which may be affected by the magnet's power.

⚠CAUTION

Handle these parts carefully so as not to scratch their surfaces. Wrap them in cloth or the like to protect them against scratches when storing them in place.

■ Assembly

The pump should be assembled by carrying out the steps involved in disassembly in reverse. Additionally, pay attention to the following instructions.

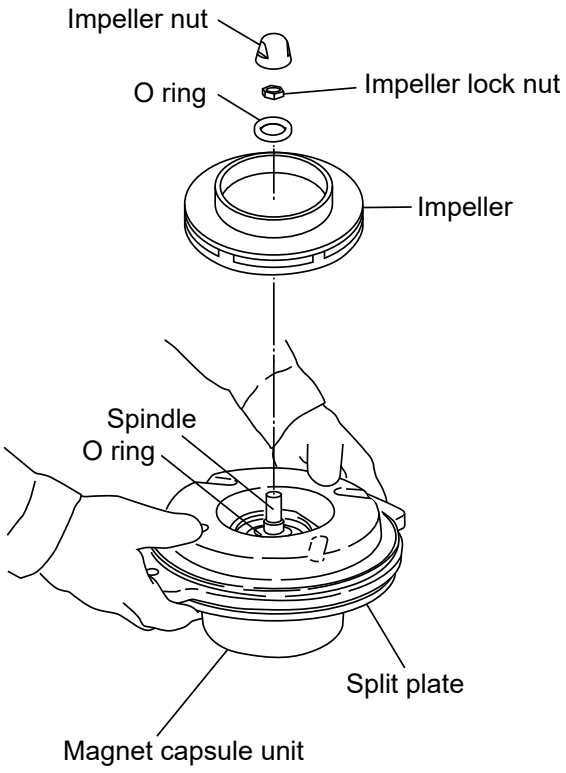
• Replacement of O ring, gasket, etc.
Make sure to replace the O ring and gasket with new ones in the assembly process. Pay special attention so as not to forget to install them. Install them without causing twisting or creating damage through pressing their edges with or inside other parts.

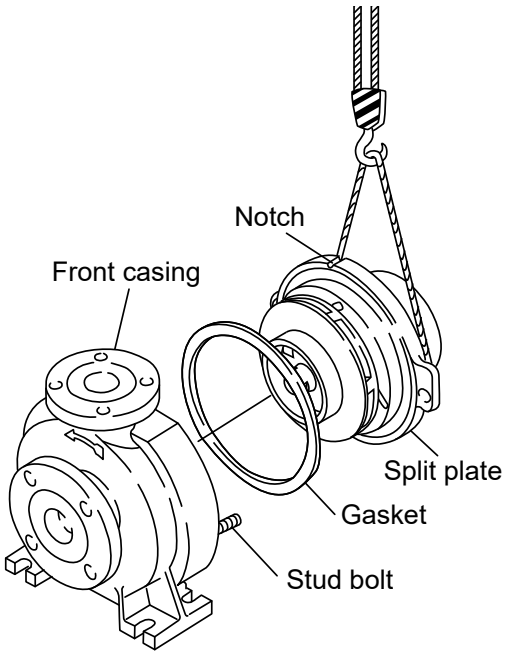
* Clean the sealing surfaces before attaching these parts in place and be careful not to allow dust or scratches between them.

• Fastening bolts
Fasten the respective fastening bolts by applying an equal torque to them in a diagonal order among the bolts.

• Cleaning of magnet can
Foreign matter such as magnetic sand may adhere to the magnet can. Be sure to eliminate such foreign matter before undertaking the assembly process.

• Handling of SiC bushing
Apply a light coat of fluororesin grease on the thrust sliding surface of the sleeve. Apply the least amount of grease and spread it evenly all over the surface. (After applying the grease, wipe off the grease with a clean cloth.)
Absence of a coat of grease may result in the wear of the sliding parts in a short time. An excessive amount of grease or application of the grease in a peripheral direction may cause an overload.

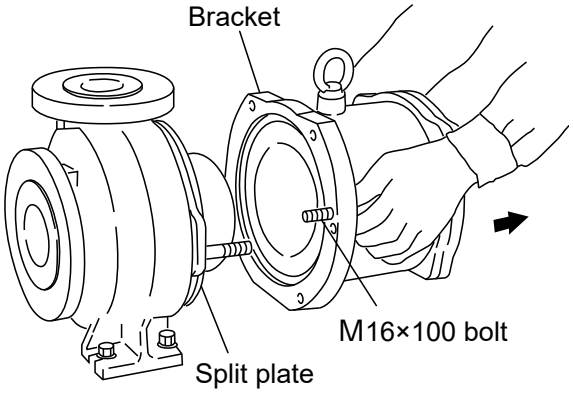




[8] Assemble the split plate (337) from the spindle side of the magnet capsule unit (859). Be careful not to scratch the sleeve (370) or the sliding surface of the bushing (540). Next, install the O ring (412.2) on the magnet capsule unit (859) and insert the impeller (230) and key (940) to the magnet capsule unit. Hold the magnet capsule unit so as not to allow it to run. Then, fasten the impeller lock nut (922) by applying a torque of 50 N•m (519 kgf•cm).
Then, insert the O ring (412.1) into the impeller and fasten the impeller nut (922) by applying a torque of 40 N•m (408 kgf•cm) to it.
* When assembling the O ring, apply a film of Teflon grease so that the O ring will not drop off.
* Apply Teflon grease to the metal parts of the impeller and the magnet capsule so that they can be inserted smoothly.
* Check to ensure that there is 1 to 2 mm of play between the split plate and the impeller in the axial direction.

[9] After assembling the gasket (400.2) and the rear casing cover (159) to the rear casing (158), fasten the hex socket-head bolts (903.5) inserted from behind the split plate (337) to the backup ring (500).
* When assembling the gasket, apply a film of Teflon grease so that the gasket will not drop off.

[10] Insert the gasket (400.1) into the front casing (100.1) and attach the split plate (337) assembly over them.
* Screw in the stud bolts (902) in two locations in the front casing. Next, position the notch for positioning of the split plate to the top. Then, insert the parts along the stud bolts. Use a crane to support the split plate assembly because the assembly is very heavy.



[11] Set the attached bolts (M16×100) fully into the bracket in advance.

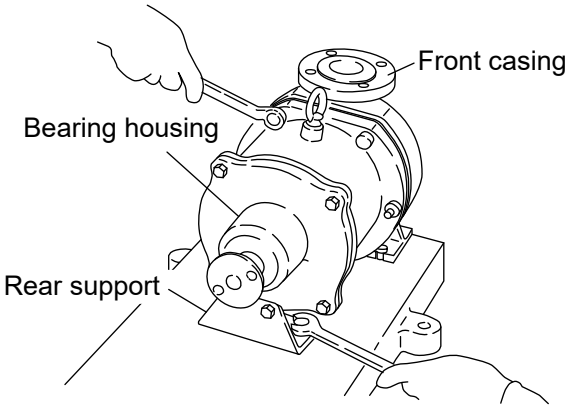
⚠CAUTION

Remove any foreign matter on the drive magnet unit. Use only the attached bolts. Otherwise, the magnet capsule may be pulled by the magnet force and damage the part.

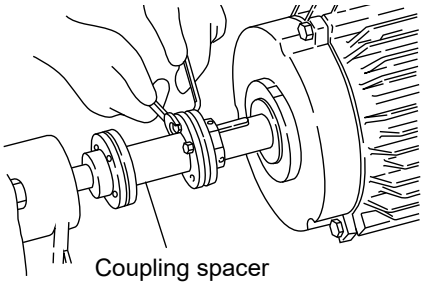
[12] Hold the bracket lifted with a crane over the base. Next, adjust the direction of the bracket so that the bracket and the front casing (100.1) will be aligned. Insert the bracket along the stud bolts (902). Turn the attached bolts slowly and alternately (M16×100) to remove them backward so that the bracket will be set onto the front casing.

⚠CAUTION

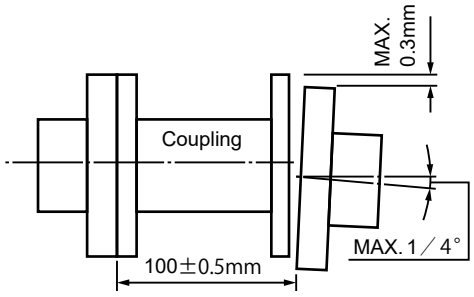
Take steps to ensure that your fingers or hand are not caught by the magnet or the parts during the assembly process.



[13] Fix the front casing (100.1) and the bracket (330) by fastening the hex head bolts (901.8) and nuts (920). Tighten all the bolts fully by applying an equal torque in small increments in a diagonal order among the bolts.
--- Fastening torque: 100 N•m
* Retighten the bolts periodically to secure the connection between the front casing and the bracket. Loosen the hex head bolts (901.3) first when retightening them.

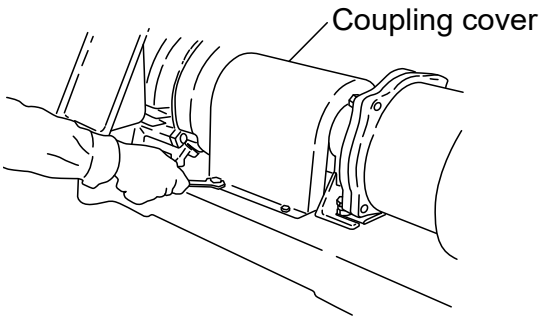


[14] Install the rear support (183) on the base (890). Then, connect the pump unit and the motor (800) by using the coupling spacer.



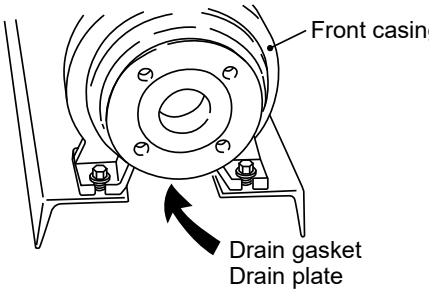
[15] Center the coupling within the following adjustment ranges.

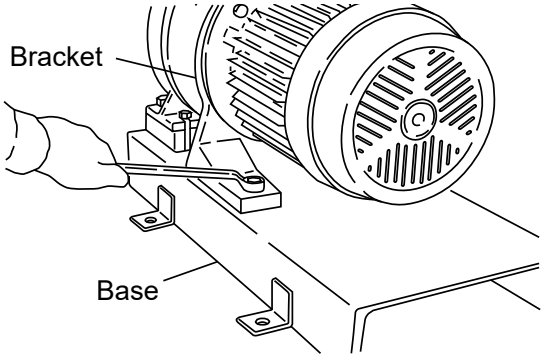
Coupling Fastening torque	18.5-22 kW	21.5 N•m
	30-45 kW	41.5 N•m



[16] After centering adjustment, attach the coupling cover (681) in place.

■ Disassembly and assembly of MDE125 type pump (built with a flange motor)





■ Disassembly

[1] Remove the hex head bolt (901.1) and drain plate (122) to discharge the liquid inside the casing. In the case of "drainless type," neutralize the liquid inside the casing or wash inside the casing with pure water before disassembly.

⚠WARNING

If you touch or otherwise come in contact with certain types of hazardous chemical liquid, including but not limited to chemicals, you may experience serious injury to those parts of the body so exposed. Wear appropriate protective equipment (protective mask, goggles, gloves, etc.).

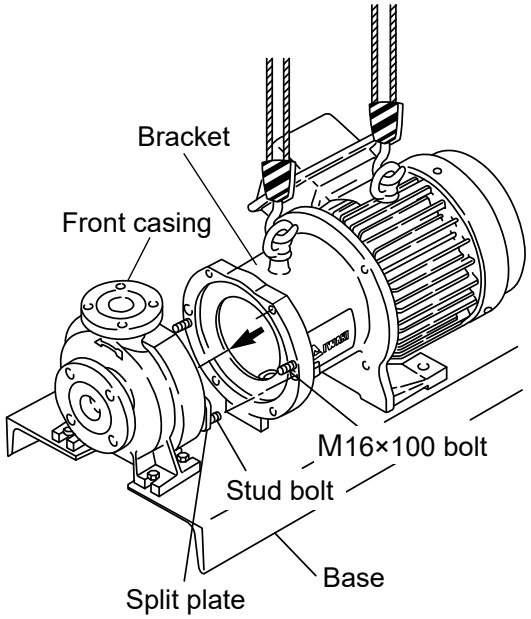
⚠WARNING

Loosen the hex head bolt slowly. Otherwise, the liquid may splash out and cause a serious injury.

⚠CAUTION

Make sure the pressure is removed from piping or the pump before disconnecting plumbing or disassembly of the pump.

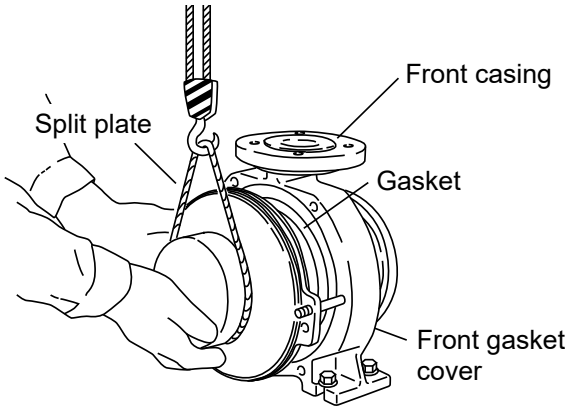
[2] Remove the hex head bolt (901.3) which fixes the bracket (330) in place. Then, remove the hex head bolt (901.8) and nut (920).



[3] Screw in the two attached bolts (M16×100) through the screw holes in the bracket (330) from the motor side to drive out the screwed split plate (337) to get the split plate separated off the bracket.
Rotate the bolts alternately. When the split plate (337) is driven out sufficiently, hold the split plate and lift the motor and pump units with a crane. Pull the bracket away from the motor and change the direction of the bracket over the base.

⚠CAUTION
Handle the motor very carefully as it is very heavy.

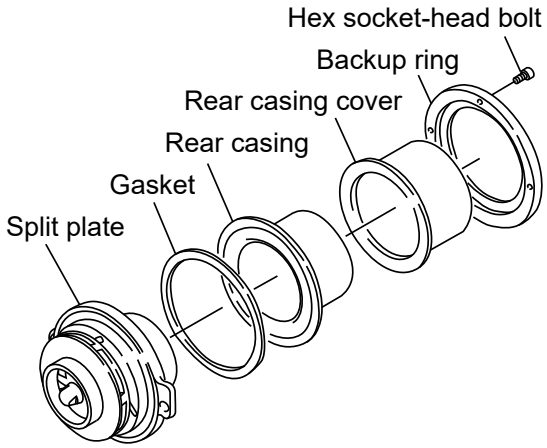
⚠CAUTION
The flange type motor is so heavy that it may fall over to the motor side after disassembly of the pump. Make sure to support the motor by using a crane or the like.



[4] Remove the hex head bolt (901.13) which fixes the split plate (337). Insert a flat-blade screwdriver into the engagement surface between the split plate (337) and the front casing (100.1) while lifting the rear casing up by a crane to detach them from each other. Be careful not to scratch the sealing surface or the gasket (400.1). Handle the split plate assembly very carefully as it is very heavy.

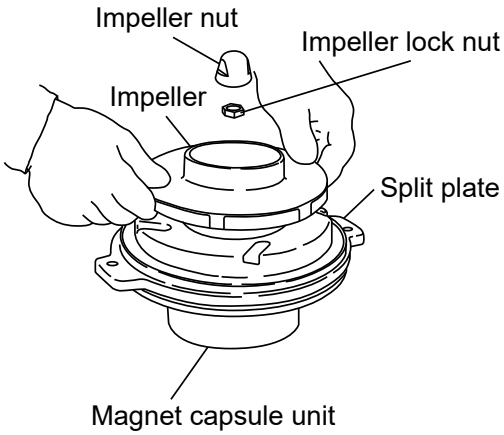
⚠CAUTION
Be careful not to scratch the sealing surface.

⚠CAUTION
When removing the split plate and rear casing assembly from the main unit, use a crane or the like to hold them as they are very heavy.



[5] Remove the hex socket-head bolt (903.5) and detach the backup ring (500) from the split plate (337). Then, detach the rear casing (158) and rear casing cover (159) while paying attention not to scratch the gasket surface.

⚠CAUTION
Be careful not to scratch the sealing surface.



[6] Rotate the impeller nut (922) counterclockwise to remove it. Next, remove the impeller lock nut (922.1). Then, remove the impeller (230) from the split plate and magnet capsule unit (859).

⚠CAUTION

The magnet used in the pump has high magnetic power. Be careful not to allow your fingers to be seized by the magnet. Do not allow the magnet near any electronic device which may be affected by the magnet's power.

⚠CAUTION

Handle these parts carefully so as not to scratch their surfaces. Wrap them in cloth or the like to protect them against scratches when storing them in place.

■ Assembly

[1] The pump should be assembled by carrying out the steps involved in disassembly in reverse. Additionally, pay attention to the following instructions.

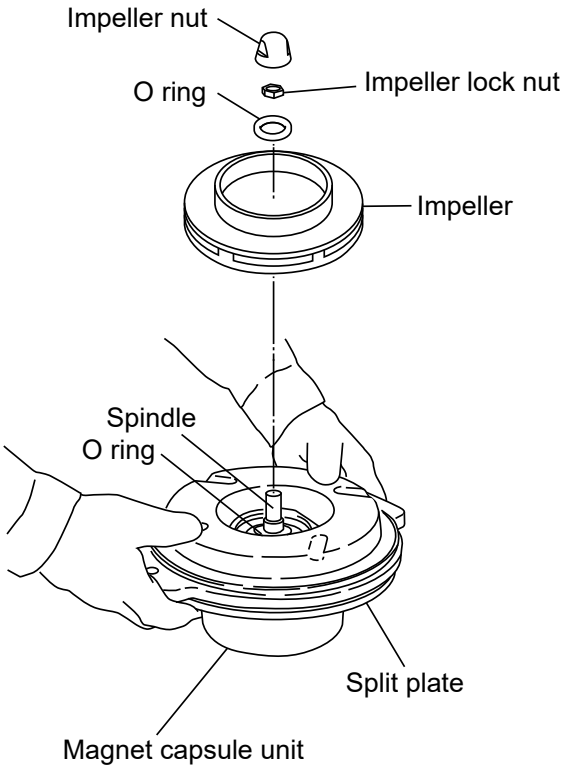
• Replacement of O ring, gasket, etc.
Make sure to replace the O ring and gasket with new ones in the assembly process. Pay special attention so as not to forget to install them. Install them without causing twisting or creating damage through pressing their edges with or inside other parts.

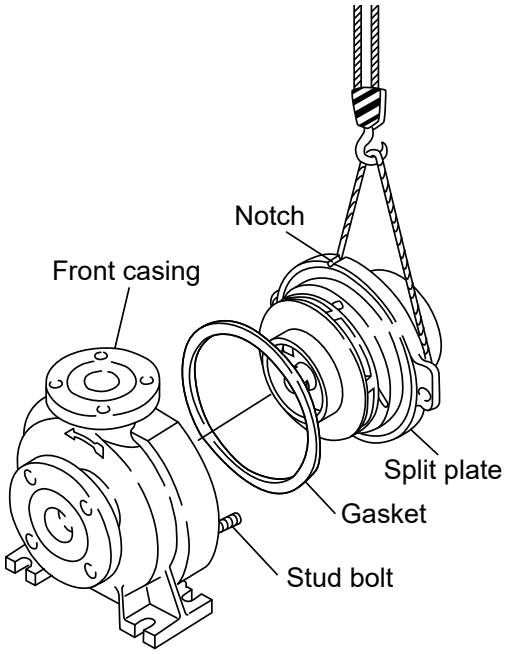
* Clean the sealing surfaces before attaching these parts in place and be careful not to allow dust or scratches between them.

• Fastening bolts
Fasten the respective fastening bolts by applying an equal torque to them in a diagonal order among the bolts.

• Cleaning of magnet can
Foreign matter such as magnetic sand may adhere to the magnet can. Be sure to eliminate such foreign matter before undertaking the assembly process.

• Handling of SiC bushing
Apply a light coat of fluororesin grease on the thrust sliding surface of the sleeve. Apply the least amount of grease and spread it evenly all over the surface. (After applying the grease, wipe off the grease with a clean cloth.)
Absence of a coat of grease may result in the wear of the sliding parts in a short time. An excessive amount of grease or application of the grease in a peripheral direction may cause an overload.





[2] Assemble the split plate (337) from the spindle side of the magnet capsule unit (859). Be careful not to scratch the sleeve (370) or the sliding surface of the bushing (540). Next, install the O ring (412.2) on the magnet capsule unit (859) and insert the impeller (230) and key (940) to the magnet capsule unit. Hold the magnet capsule unit so as not to allow it to run. Then, fasten the impeller lock nut (922) by applying a torque of 50 N•m (519 kgf•cm).
Then, insert the O ring (412.1) into the impeller and fasten the impeller nut (922) by applying a torque of 40 N•m (408 kgf•cm) to it.

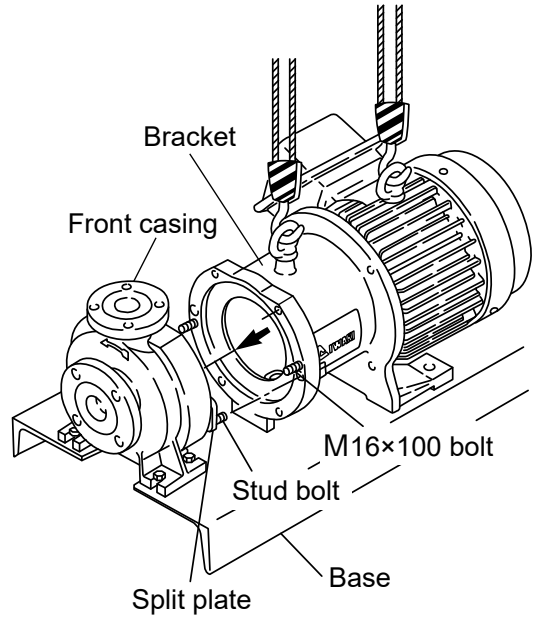
* When assembling the O ring, apply a film of Teflon grease so that the O ring will not drop off.
* Apply Teflon grease to the metal parts of the impeller and the magnet capsule so that they can be inserted smoothly.
* Check to ensure that there is 1 to 2 mm of play between the split plate and the impeller in the axial direction.

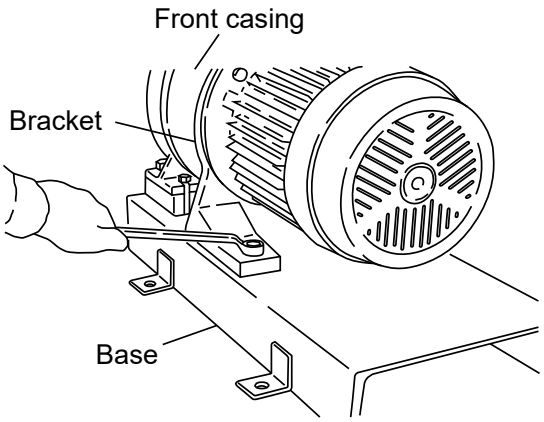
[3] After assembling the gasket (400.2) and the rear casing cover (159) to the rear casing (158), fasten the hex socket-head bolts (903.5) inserted from behind the split plate (337) to the backup ring (500).

* When assembling the gasket, apply a film of Teflon grease so that the gasket will not drop off.

[4] Insert the gasket (400.1) into the front casing (100.1) and attach the split plate (337) assembly over them.
Fix the front casing (100.1) and split plate (337) firmly by fastening the hex head bolts (901.13). Tighten all the bolts fully by applying an equal torque in small increments in a diagonal order among the bolts.
--- Fastening torque: 100 N•m

* Position the notch for positioning of the split plate to the top. Use a crane to support the split plate assembly because the assembly is very heavy.





[5] Set the attached bolts (M16×100) fully into the bracket in advance.

⚠CAUTION

Remove any foreign matter on the drive magnet unit. Use only the attached bolts. Otherwise, the magnet capsule may be pulled by the magnet force and damage the part.

[6] Use a crane to lift the pump and the motor over the base. Adjust the direction of the bracket so that the bracket and the front casing (100.1) will be aligned. Insert the bracket along the stud bolts (902). Turn the attached bolts slowly and alternately (M16×100) to remove them backward so that the bracket will be set onto the front casing.

⚠CAUTION

Be careful not to get your fingers caught between the parts to be assembled.

[7] Fix the front casing (100.1) and the bracket (300) firmly by fastening the hex head bolts (901.8) and nuts (920). Tighten all the bolts fully by applying an equal torque in small increments in a diagonal order among the bolts.
---Fastening torque: 100 N•m
* Retighten the bolts periodically to secure the connection between the front casing and the bracket. Loosen the hex head bolts (901.3) first when retightening them.

■ Drive magnet demounting of MDE50/65/125 type pump (built with a flange motor)

Take the following steps to demount the drive magnet from the motor.

- Remove the pump head from the bracket. See the disassembly section on the previous pages.
- Remove the bolts (901.2) and the bracket from the motor.
- Demount the drive magnet from the motor shaft.

■ Drive magnet mounting of MDE50/65/125 type pump (built with a flange motor)

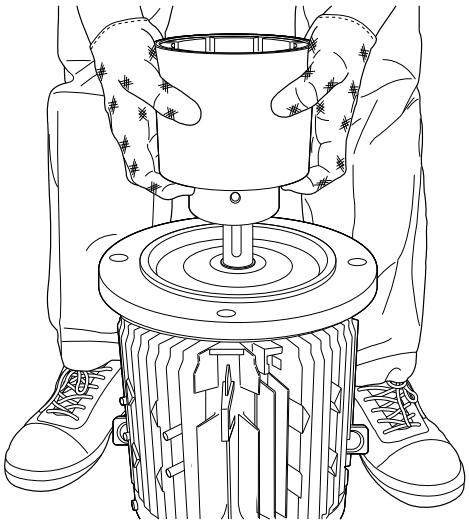
(1) Make sure the motor is electrically-disconnected in advance. If the motor were to run in this process, personal injury would result.

(2) Clean the motor shaft surface and the shaft hole of the drive magnet. Use a sand paper or sand blaster to remove burrs if necessary. Be careful not to drop the drive magnet, or it may break.

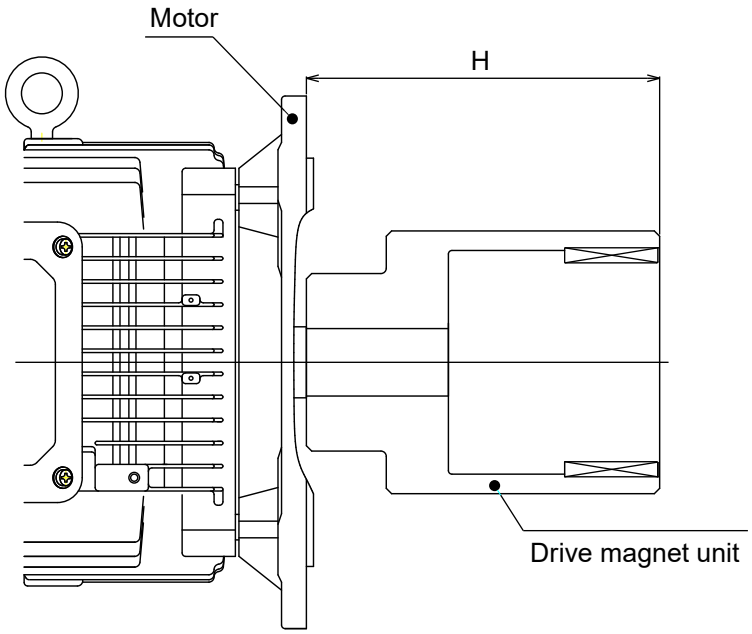
(3) Adjust the depth of the hex. socket set screws in the drive magnet, so they will not hinder the insertion of the magnet to the motor shaft.

(4) Mount the key to the motor shaft in place beforehand.

(5) Slide the drive magnet down to the motor shaft until it bottoms out. If burrs or debris disturbs insertion, remove the drive magnet once and remove them. Also, adjust the key position if necessary.

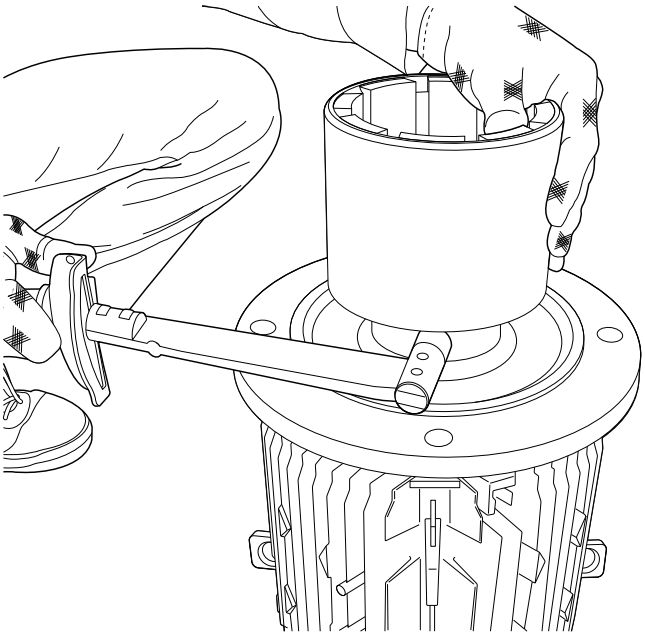


(6) Check the dimension “H” is proper. Adjust the position of the drive magnet if necessary.



Model	Motor output [kW]	Poles	H [mm]
MDE	11	2 or 4	275
	15		275
	18.5		275
	22		275
	30		275
	37		275

(7) Tighten the hex. socket set screws by the rated torque shown below to fix the drive magnet position. Application of the LOCTITE #243 onto the screw threads is required.



Motor output	Tightening torque	Adhesive application	Adhesive agent
All	15 N•m	Required	LOCTITE #243

(8) Check the drive magnet is fixed tight and won't loose the connection in operation.

(9) Remount the bracket to the motor.

Note: Always fit the "single" bracket part to the motor, not the combination of the bracket and the pump head (driven magnet). There is a very strong magnetic force between the drive magnet and the driven magnet. To reduce the risk of personal injury which could happen when both parts are unexpectedly and strongly pulled together, be sure to mount the bracket first to the motor, and then the pump head (driven magnet) to the bracket, on the step by step basis!
To take apart the bracket and the pump head, see the disassembly sections on the previous pages as well.

5. Mass of pumps

The table below shows the pump weight at each model. The motor weight is not included.

Model code	Motor output	Number of poles	Weight
MDE65	18.5	2	165 kg
	22	2	175 kg
	30	2	245 kg
	37	2	245 kg
	45	2	245 kg
MDE80	18.5	2	170 kg
	22	2	175 kg
	30	2	245 kg
	37	2	245 kg
	45	2	245 kg
MDE125	11	4	225 kg
	15	4	220 kg
	18.5	4	235 kg
	22	4	235 kg
	30	4	265 kg

*The pump weights represent the pump unit only and do not include the motor weight.

*Some pump models have more weight (a larger frame) to have a flame-proof motor or an increased-safety explosion-proof motor.

*See our approval drawing of the pump plus motor as well for total weight information.

EC DECLARATION OF CONFORMITY

A copy of the original Declaration of Conformity

(SUPPLIER'S NAME)

WE

IWAKI CO.,LTD.

(ADDRESS)

6-6 2-CHOME KANDA-SUDACHO CHIYODA-KU TOKYO JAPAN

(PRODUCT)

DECLARE UNDER OUR SOLE RESPONSIBILITY THAT THE PRODUCTS

MAGNETIC DRIVE PUMP

(MODEL NAME)

MDE SERIES

TO WHICH THIS DECLARATION RELATES ARE IN CONFORMITY

WITH THE FOLLOWING STANDARDS OR DIRECTIVES AS FAR AS APPLICABLE

(DIRECTIVES)

MACHINERY DIRECTIVE 2006/42/EC (ANNEX IIA)
RoHS DIRECTIVE 2011/65/EU

(STANDARDS)

EN ISO12100: 2010 EN809: 1998 + A1: 2009 EN IEC63000: 2018

(A PERSON WHO IS AUTHORISED TO COMPILE THE TECHNICAL FILE IN THE COMMUNITY)

IWAKI EUROPE GMBH
SIEMENSRING 115 D-47877 WILLICH GERMANY

NOTE: THIS DECLARATION BECOMES INVALID IF TECHNICAL OR OPERATIONAL MODIFICATIONS ARE INTRODUCED WITHOUT THE MANUFACTURER'S CONSENT.

T. Sawada.

TSUTOMU SAWADA

DEPUTY SENIOR GENERAL MANAGER,

QUALITY ASSURANCE HEAD OFFICE

Tokyo, Sep. 2, 2021

(PLACE AND DATE OF ISSUE) **(NAME AND SIGNATURE OR EQUIVALENT MARKING OF AUTHORIZED PERSON)**

DOCUMENT NO. IS-51K-495-4

UK DECLARATION OF CONFORMITY

A copy of the original Declaration of Conformity

(SUPPLIER'S NAME)

WE

IWAKI CO.,LTD.

(ADDRESS)

6-6 2-CHOME KANDA-SUDACHO CHIYODA-KU TOKYO JAPAN

(PRODUCT)

DECLARE UNDER OUR SOLE RESPONSIBILITY THAT THE PRODUCTS

MAGNETIC DRIVE PUMP

(MODEL NAME)

MDE SERIES

TO WHICH THIS DECLARATION RELATES ARE IN CONFORMITY WITH THE FOLLOWING REGULATIONS OR STANDARDS AS FAR AS APPLICABLE

(REGULATIONS)

S.I. 2008/1597 SUPPLY OF MACHINERY (SAFETY)
S.I. 2012/3032 RESTRICTION OF HAZARDOUS SUBSTANCES

(STANDARDS)

EN ISO12100: 2010 EN809: 1998 + A1: 2009 EN IEC63000: 2018

(A PERSON WHO IS AUTHORISED TO COMPILE THE TECHNICAL FILE IN THE GB MARKET)

SENSYS LIMITED
UNIT 9 POND CLOSE WALKERN ROAD
STEVENAGE HERTS SG1 3QP UK

NOTE: THIS DECLARATION BECOMES INVALID IF TECHNICAL OR OPERATIONAL MODIFICATIONS ARE INTRODUCED WITHOUT THE MANUFACTURER'S CONSENT.

T. Sawada.

TSUTOMU SAWADA

SENIOR GENERAL MANAGER,

QUALITY ASSURANCE HEAD OFFICE

Tokyo, Jun. 6, 2023

(PLACE AND DATE OF ISSUE) **(NAME AND SIGNATURE OR EQUIVALENT MARKING OF AUTHORIZED PERSON)**

DOCUMENT NO. IS-51K-596-1

CE/UKCA conformity

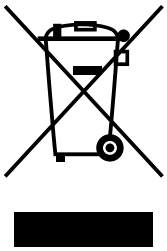
■ **Information on CE/UKCA conformity of pump units when the motor is fitted by the customer (dealer/operator)**

We hereby confirm the CE/UKCA conformity of our pump unit provided that the following criteria about intended use are satisfied as described in this instruction manual:

- Motor conformity in accordance with any relevant EC directives/UKCA regulations which are currently effective.
- The dimensions of a required motor flange and shaft must fit the specified pump.
- The motor must be installed to the pump according to this instruction manual.
- Guaranteed grounding
- The pump must not be repainted over our original upper coating.

Any reseller or dealer who connects the pump with a motor and markets it as a complete unit must conform to all relevant EC directives/UKCA regulations. In such cases, the reseller or dealer then becomes the manufacturer.

Waste Electrical and Electronic Equipment (WEEE)



In accordance with the European Directive 2012/19/EU on waste electrical and electronic equipment, this product features the crossed-out wheelie bin symbol. When this product is disposed of in household wastes, toxic components included in it can cause major environmental and human health problems. Use appropriate waste collection systems for recovery and recycling. Contact your local distributor or nearest Iwaki company for the detailed collection systems.

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