IWAKI PUMPS

IWAKI Magnetic Drive Pump

YMD Series

Instruction Manual (Europe Edition)

⚠Read this manual before use of product

Thank you for having selected IWAKI's Magnetic Drive Pump YMD Series. This instruction manual deals with the correct handling and operation procedures for the pump.
You are requested to read this manual prior to using the pump, to ensure safe and long operation.

Contents

This instruction manual should be kept on hand by the end user for quick reference. It is recommended that each user, after reading the instruction manual thoroughly, place it in a position close to the pump system and where it may be easily accessed by any user at any time whenever necessary.

SAFETY SECTION

For the Safe and Correct Handling of the Pump

- Before use of the pump, read carefully this "Safety Section" to prevent accidents and to avoid the damage or loss of other assets.
- Observe and abide by the instructions described in this "Safety Section". These instructions are very important for protecting pump users or other persons from hazard or from loss of assets.
- Meaning of symbols
  Following two symbols describe the extent of hazards and loss which may brought if the instructions are not observed or if the pump is wrongly used.

 **Warning**	**Nonobservance or misapplication of the contents of the "Warning" could lead to a death or heavy injury of person.**
 **Caution**	**Nonobservance or misapplication of the contents of the "Caution" could lead to a injury of person or damage of assets.**

Following two symbols describe the content to be observed.

	**Prohibited action or procedure is indicated. Inside or near this circle, a concrete activity to be prohibited is depicted.**
	**Action or procedure which must be performed without fail is indicated. Inside this circle, a concrete activity to be performed is depicted.**

⚠Export Restrictions

Information contained within this instruction manual may be considered controlled technology as set by the Japanese Ministry of Economy, Trade and Industry (METI). An export license issued by METI may be required when exporting or providing the manual to a 3rd party.

Safety Section

⚠ Warning

- **Magnet field danger**
  The magnet drive pumps contain very strong magnets. The strong magnet field could adversely affect persons who are assisted by electronic devices such as pacemakers etc.

- Always turn off power supply prior to maintenance works etc. Pay special attention so that no other operator turns on by mistake the power supply while someone is working on the pump. In a noisy or poor visibility environment, display a sign near power supply switch to notify other person that someone is "WORKING" on the pump. Power supply mistakenly turned on during maintenance works may lead to personal injury. Each operator must pay special attention.

Power off

- **Wear protectors**
  When piping is removed or pump is disassembled/assembled, wear protective gear such as safety goggles and protective gloves etc.

Wear protective gear

- **Lifting pump**
  When pump is lifted, apply chain or belt to eye bolt and motor to keep the pump & motor horizontally.

- **No remodeling**
  Remodeling of pump may result in serious personal injury or damage of the pump. Do not attempt remodeling pump because it is very dangerous.

No Remodeling

- **Dangerous liquid**
  When the pump is used to transfer dangerous liquids mentioned as below, the pump must always be checked and watched so that the liquid can not be leaked. The operation of pump leaking the liquid may result in personal injury, explosion or fire accident.
  - Explosive or flammable liquids
  - Corrosive or stimulus toxic liquids
  - Liquids harmful to human health

Safety Section

⚠ CAUTION

- **Attention to magnetic force**
  This pump employs strong magnets. Special attention must be paid not to be injured by attracting force of magnets. Follow the procedure "Disassembling and Assembling" when the maintenance works are done.

- **Do not run pump dry**
  Do not run pump dry (without liquid). If the pump run dry, heat is generated by rubbing, which causes pump damage. If the pump is operated with suction side valve closed, the pump runs dry.

Do not run dry

- **Qualified operator**
  The pump must be handled or operated by the person who has enough knowledge and well acquainted with the pump.

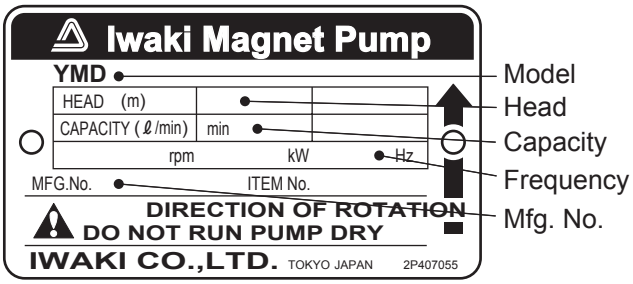
- **For specified application only**
  The use of pump in any application other than those clearly specified may result in the failure or damage of the pump.

- **Ventilate the site**
  When handling the liquid which may generate toxic gas, safety measures such as ventilation must be taken to prepare for the accidental liquid leakage.

- **Countermeasure to liquid flowing out**
  Protective measurement must be taken against liquid flowing out caused by damage of pump or pipe by accident. Also, appropriate measurement must be taken so that the liquid can not directly flow out on the ground.

- **Disposal of used pump**
  Disposal of used or damaged pump must be done in accordance with local laws and regulations. (Consult a licensed industrial waste products disposing company.)

1. Unpacking and inspection

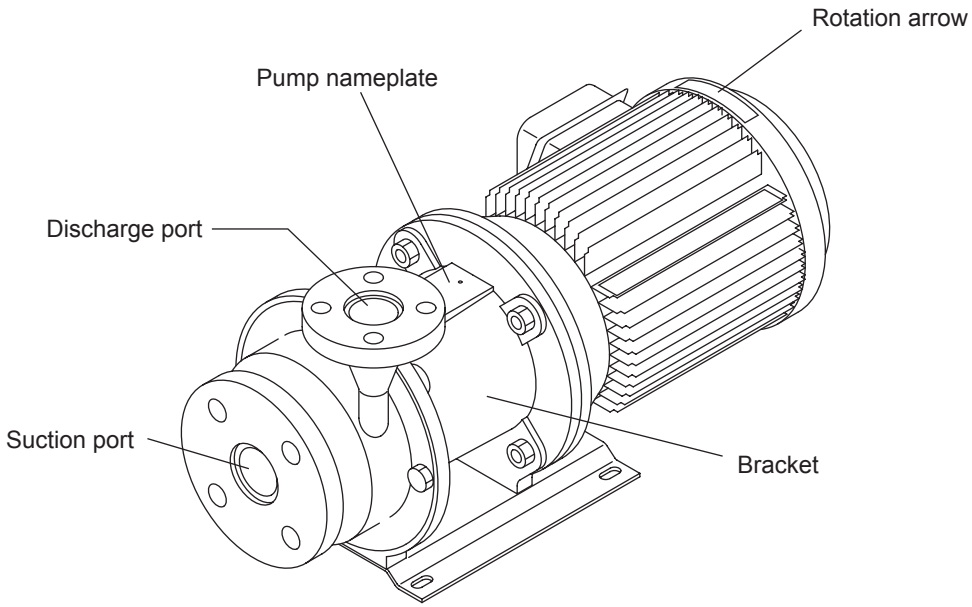


After unpacking of the pump, check the following points.

[1] If the product is ordered one.

Check model code, discharge capacity, head, voltage etc. which are written on nameplate of pump and motor to see if they conform to your order.

[2] If the product is not damaged or bolts are not loosened during transportation.



2. Model identification codes

YMD 32 - 160 - 165 K T - 40 S

① ② ③ ④⑤ ⑥ ⑦

① Nominal size
25, 32 & 40

② Casing size (Nominal)

③ Impeller diameter
Actual diameter in mm

④ Material of bearing
C : Carbon
K : SiC (available for models YMD32-200 & YMD40 only.)

⑤ O ring material
V : FKM
E : EPDM
T : FEP

⑥ Motor output
11 : 1.1kW 40 : 4.0kW
15 : 1.5kW 55 : 5.5kW
22 : 2.2kW 75 : 7.5kW

⑦ Special version code

3. Specifications

50Hz

Model	Connection Suction X Discharge	Nominal capacity m^3/hr(L/min)	Nominal head m	Motor	
				Output kW	Frame
YMD25-100-110	1"1/2×3/4"	6(100)	13	1.1	80
YMD25-100-120			17	1.1	80
YMD25-100-132			21	1.5	90
YMD32-125-110	1"1/2×1"1/4	12.5(208)	10	1.5	90
YMD32-125-120			14	1.5	90
YMD32-125-132			20	2.2	90
YMD32-160-140	50×32	12.5(208)	22	4	112
YMD32-160-152			26	4	112
YMD32-160-165			33	4	112
YMD32-160-180			42	4	112
YMD32-200-165	50×32	12.5(208)	22	5.5/7.5	132
YMD32-200-180			32	5.5/7.5	132
YMD32-200-195			47	5.5/7.5	132
YMD32-200-208			55	5.5/7.5	132
YMD32-200-220			62	5.5/7.5	132
YMD40-125-145	65×40	25(416)	19	4	112
YMD40-160-140	65×40	25(416)	14	5.5/7.5	132
YMD40-160-152			24	5.5/7.5	132
YMD40-160-165			30	5.5/7.5	132
YMD40-160-180			39	5.5/7.5	132
YMD40-200-165	65×40	25(416)	29	5.5/7.5	132
YMD40-200-180			36	5.5/7.5	132
YMD40-200-195			47	7.5	132
YMD40-200-208			55	7.5	132
YMD40-200-220	65×40	20(333)	63	7.5	132

Note1 : Flange connection is standard except YMD25-100 and YMD32-125.
Standard connection for these two models is BSPT male thread and flange is optional.
Note2 : The dimensions of flanges are in accordance with DIN standards.

Part name	Material
Front casing	1.4404 (equivalent to 316LS.S.)
Rear casing	1.4401 or 1.4404 (equivalent to 316 or 316LS.S.)
Spindle	1.4462 (equivalent to duplex S.S.), Cr_2O_3 coated 1.4401 or 1.4404 (equivalent to Cr_2O_3 coated 316 or 316LS.S.)
Split plate	1.4401 or 1.4404 (equivalent to 316 or 316LS.S.)
Magnet capsule	1.4404 (equivalent to 316LS.S.) on Duplex S.S.
Impeller	1.4581 + 1.4404 (equivalent to 316Nb + 316LS.S.)
Bearing	Carbon or SiC
O ring	FKM, EPDM or FEP

Note: Following materials are available for models YMD32-200 and YMD40-200.
Spindle: Cr_2O_3 coated 1.4401 or 1.4404 (equivalent to Cr_2O_3 coated 316 or 316L stainless steel)
Bearing: SiC

4. Conditions for the pump to be used

1) Pressure resistance of the pump

Maximum allowable pressure of the pump is 0.6MPa with FEP O ring and 1.0MPa with FKM and EPDM O ring. Do not put the pressure to the pump exceeding this pressure.

2) Slurry liquid

Basically the slurry liquid can not be handled by this pump but it may be handled by the pump with SiC bearing (K type) in condition of slurry concentration less than 5%, particle size 50 micron or smaller and hardness below 80Hs. Consult IWAKI for slurry liquid handling.

3) Specific gravity and viscosity of liquid

Shaft power, discharge capacity and head depend on the specific gravity and viscosity of the handled liquid. The pump is made according to the specifications informed by the purchaser. If the liquid or its condition is changed, consult IWAKI.

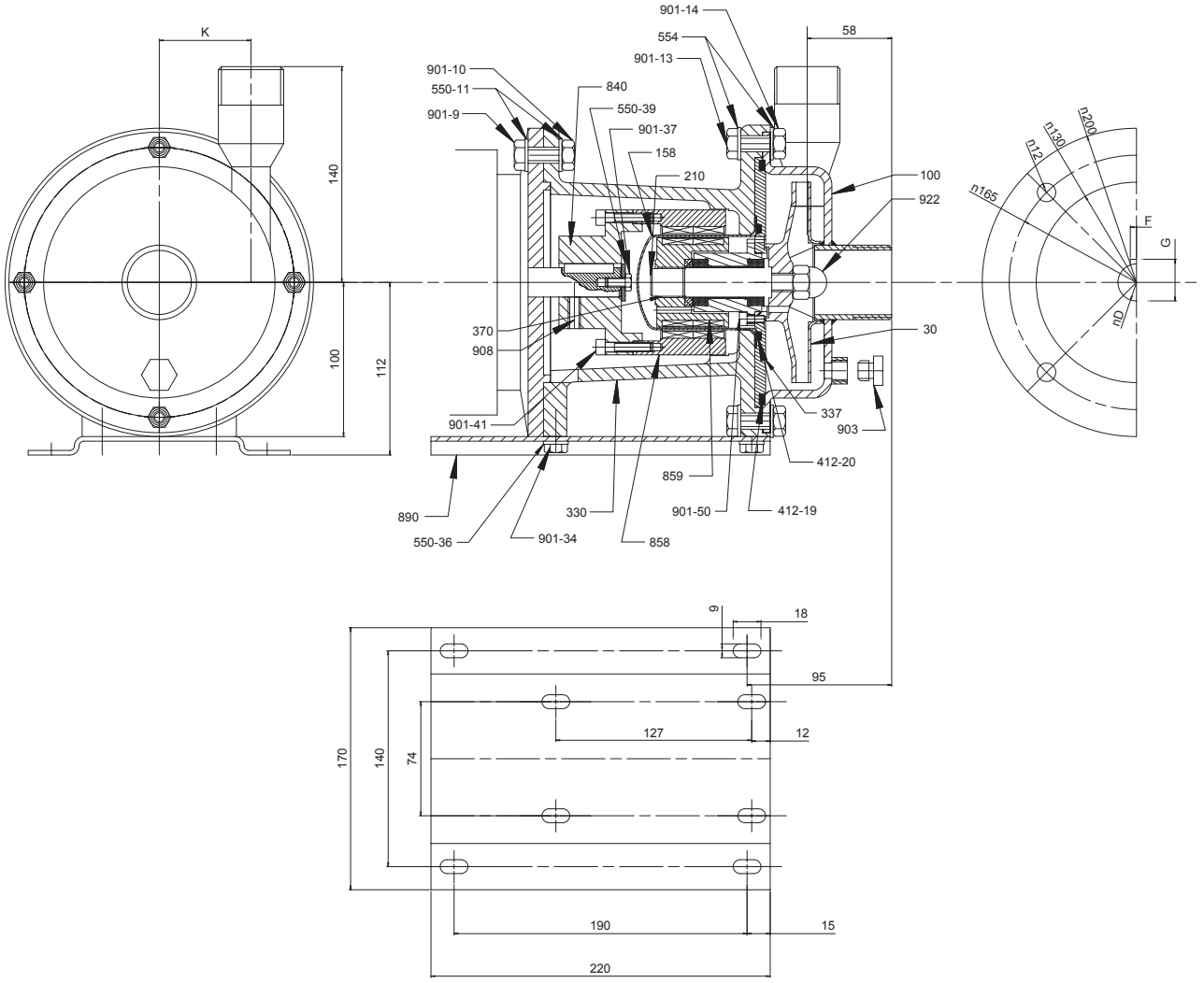
4) Influence by temperature

When the liquid temperature changes, its viscosity, vapor pressure and corrosion etc. change accordingly. Pay attention to these changes when the liquid temperature changes.

Temperature range of handled liquid : 0 – 120 deg. C
Range of ambient temperature : 0 – 40 deg. C
Range of ambient humidity : 35 – 85%RH

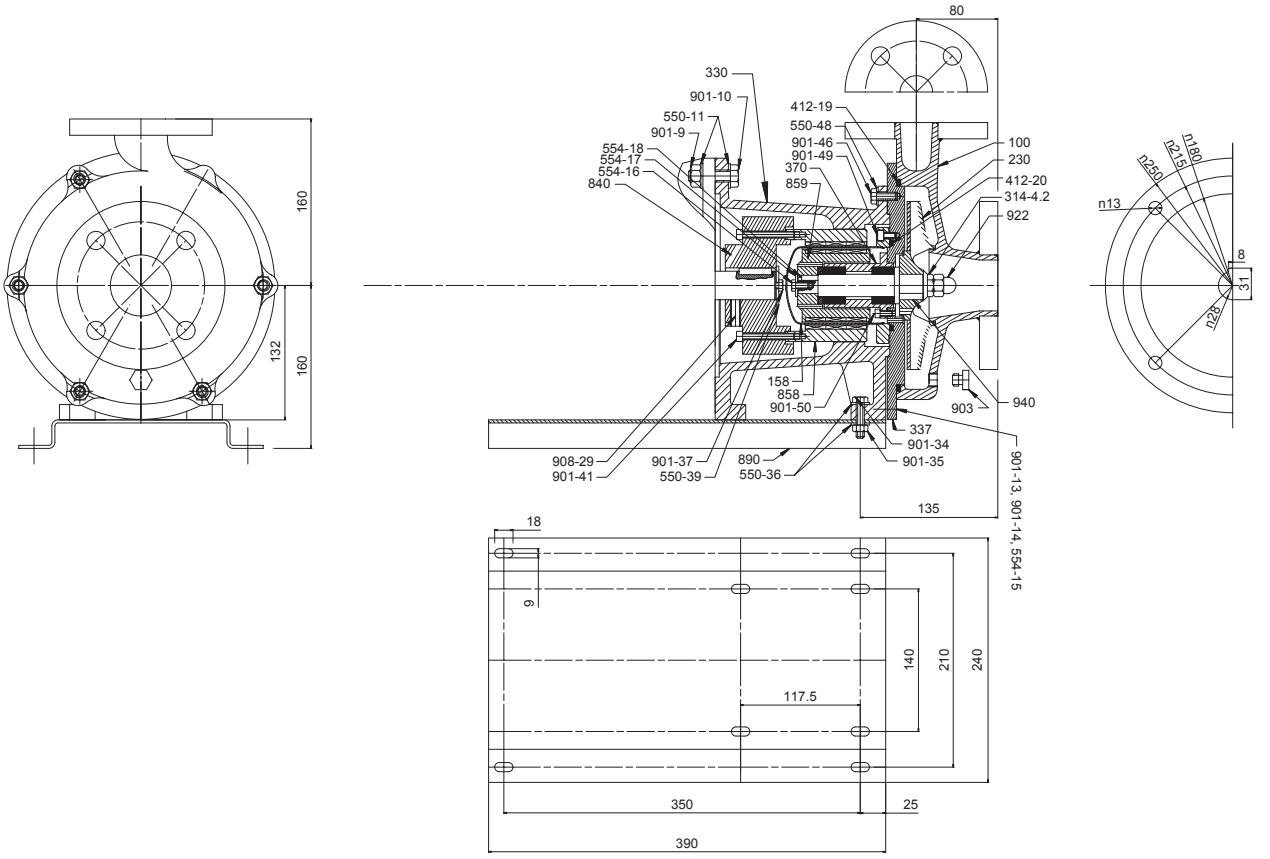
5. Construction and dimension

YMD25-100, YMD32-125



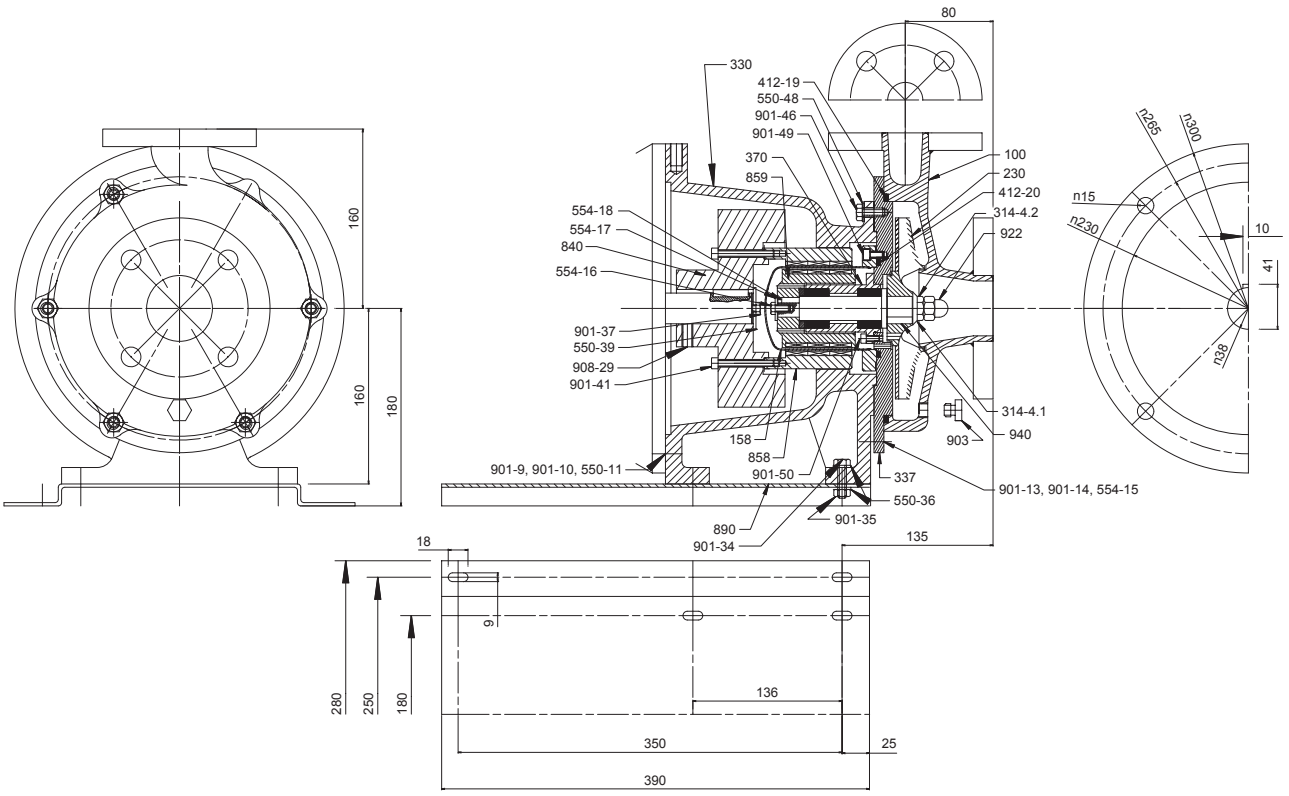
Item	Name	Material
100	Front casing	1.4404
230	Impeller	1.4581
330	Bracket	Cast Iron
922	Cap nut (impeller)	A4
337	Split plate	1.4404 + 1.4462 + Carbon or SiC
858	Drive magnet	Magnet + steel
859	Magnet capsule	Magnet + 1.4462 + SiC
158	Rear casing	1.4571
370	Tolerance ring	1.4310
210	Spindle	1.4462 or 1.4401 + Cr2O3
901-9	Bolt (bracket - motor) M10 × 40	A2
901-10	Nut M10	A2
550-11	Plain washer M10	A2
901-13	Bolt (front casing - split plate) M8 × 35	A2
901-14	Nut M8	A2
554-15	Spring washer M8	A2
412-19	Front casing O-ring	Viton or EPDM or FEP
412-20	Rear casing O-ring	Viton or EPDM or FEP
908-29	Setscrew M8 × 8	A2
890	Base plate	1.4301
901-34	Bolt (baseplate - bracket) M8 × 16	A2
550-36	Plain washer M8	A2
901-37	Bolt (drive ring - motor) fr80، M6 × 16 / fr90، M8 × 20	A2
550-39	Plain washer	A2
840	Drive ring	Fe370
901-41	Bolt (drive ring - drive magnet) M6 × 30	A2
901-50	Bolt (holder bearing - split plate) M5 × 10	A4
903	Drain plug BSPT 1 /4"	1.4401

YMD32-160



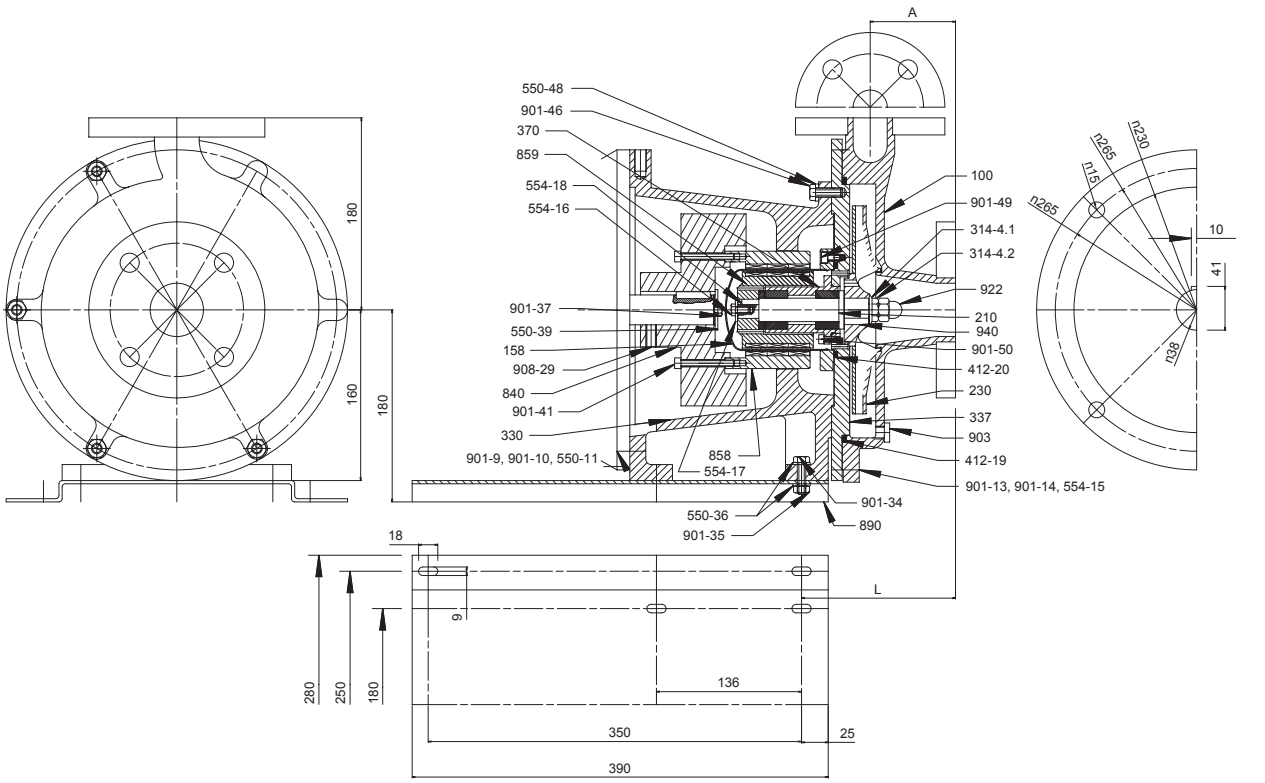
Item	Name	Qty	Material
100	Front casing	1	1.4404
230	Impeller	1	1.4581
330	Bracket	1	Cast Iron
922	Cap nut (impeller) M12	1	A4
314-4.2	Second nut impeller	1	1.4401
337	Split plate	1	1.4401
858	Drive magnet	1	Magnet + steel
859	Magnet capsule	1	Magnet + 1.4462 + SiC
158	Rear casing	1	1.4571
370	Bearing	1	1.4462 + carbon or SiC
210	Spindle	1	1.4462 or 1.4401 + Cr2O3
901-9	Bolt (bracket - motor) M12 × 40	4	A2
901-10	Nut M12	4	A2
550-11	Plain washer M12	8	A2
940	Impeller key 6 × 6 × 20	1	A4
901-13	Bolt (front casing - splitplate) M10 × 40 & M10 × 30	5 & 1	A2
901-14	Nut M10	5	A2
554-15	Spring washer M10	11	A2
554-16	Bolt (spindle) M6 × 12 left	1	A4
554-17	Washer (spindle) M6	1	A4
554-18	Spindle key 5 × 5 × 16	1	A4
412-19	Front casing O-ring	1	Viton or EPDM or FEP
412-20	Rear casing O-ring	1	Viton or EPDM or FEP
908-29	Setscrew M8 × 8	1	A2
890	Base plate	1	1.4301
901-34	Bolt (base plate - bracket) M8 × 35	4	A2
901-35	Nut M8	4	A2
550-36	Plain washer M8	8	A2
901-37	Bolt (drive ring - motor) M10 × 20	1	A2
550-39	Plain waher M10	1	A2
840	Drive ring	1	Fe370
901-41	Bolt (drive ring - drive magnet) M6 × 50	4	A2
901-46	Bolt (split plate - bracket) M8 × 16	5	A2
550-48	Plain washer M8	5	A2
901-49	Bolt (rear casing - split plate) M6 × 12	8	A2
901-50	Bolt (bearing - split plate) M5 × 12	5	A4
903	Drain plug BSPT 1/4"	1	1.4401

YMD40-125, YMD40-160



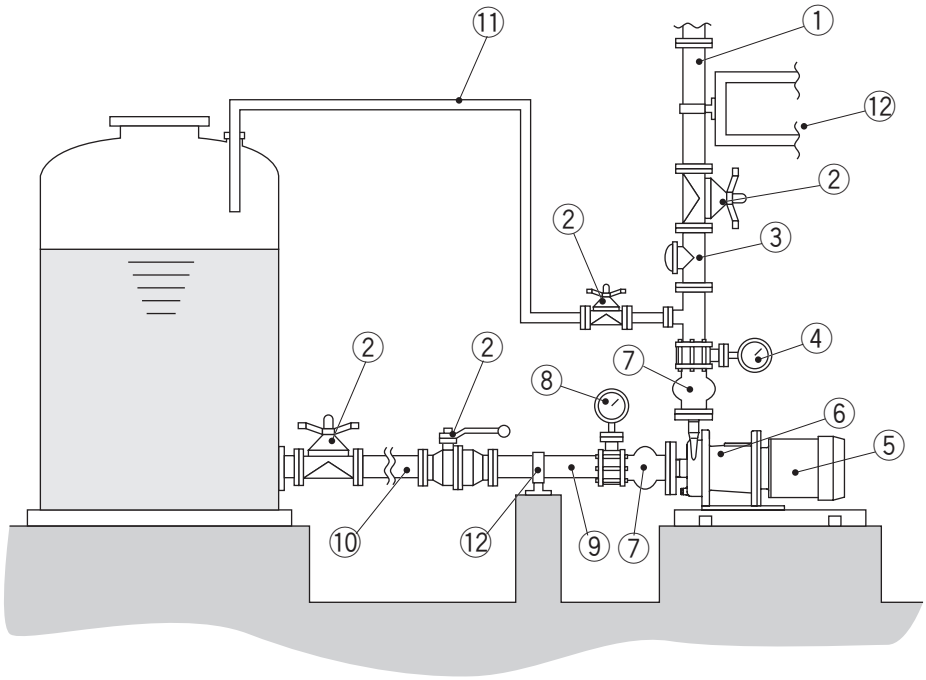
Item	Name	Qty	Material
100	Front casing	1	1.4404
230	Impeller	1	1.4581
330	Bracket	1	Cast Iron
922	Cap nut impeller M12	1	A4
314-4.2	Second nut impeller	1	1.4401
337	Split plate	1	1.4401
858	Drive magnet	1	Magnet + steel
859	Magnet capsule	1	Magnet + 1.4462 + SiC
158	Rear casing	1	1.4571
370	Bearings + housing	1	1.4462 + carbon or SiC
210	Spindle	1	1.4462 or 1.4401 + Cr2O3
901-9	Bolt (bracket - motor) M12 × 40	4	A2
901-10	Nut M12	4	A2
550-11	Plain washer M12	8	A2
940	Impeller key 6 × 6 × 20	1	A4
901-13	Bolt Frontcasing - split plate M10 × 40 & M10 × 30	5 & 1	A2
901-14	Nut M10	5	A2
554-15	Spring washer M10	11	A2
554-16	Bolt (spindle) M6 × 12 left	1	A4
554-17	Washer (spindle) M6	1	A4
554-18	Spindle key 5 × 5 × 16	1	A4
412-19	Front casing O-ring	1	Viton or EPDM or FEP
412-20	Rear casing O-ring	1	Viton or EPDM or FEP
908-29	Setscrew M8 × 8	1	A2
890	Base plate	1	1.4301
901-34	Bolt (base plate - bracket) M8 × 35	4	A2
901-35	Nut M8	4	A2
550-36	Plain washer M8	8	A2
901-37	Bolt (drive ring - motor) M10 × 20	1	A2
550-39	Plain washer	1	A2
840	Drive ring	1	Fe370
901-41	Bolt (drive ring - drive magnet) M6 × 50	4	A2
901-46	Bolt (split plate - bracket) M8 × 16	5	A2
550-48	Plain washer M8	5	A2
901-49	Bolt (rear casing - split plate) M6 × 12	8	A2
901-50	Bolt (holder bearing - split plate) M5 × 12	5	A4
903	Drain plug BSPT 1/4"	1	1.4401

YMD32-200, YMD40-200



Item	Name	Qty	Material
100	Front Casing	1	1.4404
230	Impeller	1	1.4581
330	Bracket	1	Cast Iron
922	Cap nut (impeller) M12	1	A4
314-4.2	Second nut impeller	1	1.4401
337	Split plate	1	1.4401
858	Drive magnet	1	Magnet + steel
859	Magnet capsule	1	Magnet + 1.4462 + SiC
158	Rear casing	1	1.4571
370	Bearing	1	1.4462 + SiC
210	Spindle	1	1.4401 + Cr2O3
901-9	Bolt (bracket - motor) M12 × 55	4	A2
901-10	Nut M12	4	A2
550-11	Plain waher M12	8	A2
940	Impeller key 6 × 6 × 20	1	A4
901-13	Bolt (front casing - split plate M10 × 40 & M10 × 25	4 & 2	A2
901-14	Nut M10	4	A2
554-15	Spring washer M10	10	A2
554-16	Bolt (spindle) M6 × 12 left	1	A4
554-17	Washer M6	1	A4
554-18	Spindle key 5 × 5 × 16	1	A4
412-19	Front casing O-ring	1	Viton or EPDM or FEP
412-20	Rear casing O-ring	1	Viton or EPDM or FEP
908-29	Setscrew M8 × 8	1	A2
890	Base plate	1	1.4301
901-34	Bolt (base plate - bracket) M8 × 35	4	A2
901-35	Nut M8	4	A2
550-36	Plain washer M8	8	A2
901-37	Bolt (drive ring - motor) M12 × 20	1	A2
550-39	Plain washer	1	A2
840	Drive ring	1	Fe370
901-41	Bolt (drive ring - drive magnet) M6 × 50	4	A2
901-46	Bolt (split plate - bracket) M8 × 20	6	A2
550-48	Plain washer M8	6	A2
901-49	Bolt (rear casing - split plate) M6 × 12	8	A2
901-50	Bolt (holder bearing - split plate) M5 × 12	5	A4
903	Drain plug BSPT 1/4"	1	1.4401

6. Installation



① Discharge piping
② Gate valve
③ Check valve
④ Pressure gauge
⑤ Motor
⑥ YMD pump
⑦ Expansion joint
⑧ Vacuum gauge
⑨ Suction side straight pipe
⑩ Suction piping
⑪ Air vent piping
⑫ Pipe support

Recommended example of piping

1. Installation site

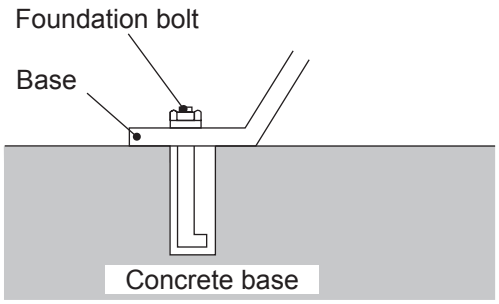
- Install the pump on the flat and rigid foundation which can not be influenced by torsion and vibration.
- Keep the enough space around the pump to remove the motor backward and to disassemble and assemble the pump.
- Foundation area should be larger than pump base.

2. Place to be installed

- Install the pump as close to the suction tank as possible and as a flooded suction.
- In case of suction lift piping, install the priming piping and foot valve at the end of suction piping.

3. Foundation

- Refer to the illustration below for the mounting on concrete foundation.



7. Piping

7-1. Tightening of pipe flange

Connect the flanges of piping to the suction and discharge flanges of pump with M12 or M16 bolts at tightening torque shown below.

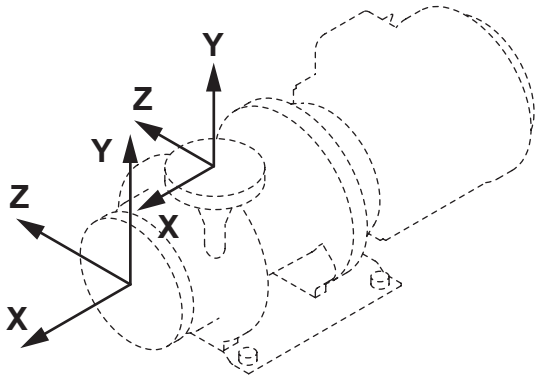
Tightening torque of pump flange

Bolt size	Tightening torque
M12	55 N·m
M16	79 N·m

Note: The figures are with metallic pipe flange and with rubber gasket

7-2. Pipe load and moment

Pipe load and moment put on the pump should not exceed the figures shown below.



Allowable pipe load put on pump flange

Direction of load	Load kN	
	Discharge flange	Suction flange
Fx	0.15	0.10
Fy (Pression/Tension)	0.20/0.10	0.15
Fz	0.15	0.15

Allowable moment on pump flange

Direction of load	Load kN	
	Discharge flange	Suction flange
Mx	0.05	0.10
My	0.10	0.05
Mz	0.10	0.10

7-3. Suction piping

(1) Flooded suction
Flooded suction is recommended.

(2) Pipe diameter
Pipe diameter should be larger than pump inlet bore.

(3) Shortest piping
Employ less bends and shortest piping length.

(4) Straight piping
Employ straight pipe longer than 500mm just before pump inlet port.

(5) Air pocket in piping
Do not allow any projection in piping where air may be trapped along the suction pipe.
Suction pipe should have an ascending gradient of 1/100 toward the pump.

(6) Different diameter of pipes
If diameter of pump suction port is different from that of suction pipe, use the eccentric reducer pipe. Connect the eccentric reducer pipe so that upper side is level. Residual air may not go out if it is mounted in reverse.

(7) Gate valve in suction side
In case of flooded suction, install gate valve in suction piping. It is needed when the pump is disassembled and inspected.

(8) Piping for flushing
Install pump flushing piping in case that the dangerous liquid will be handled.

(9) End of suction piping
The end of suction pipe always should be located 500 mm or more below the liquid level.

(10) In case of suction lift piping
- The end of suction piping should be 1 to 1.5 times of pipe diameter or more away from the bottom of suction tank.
- Install foot valve or check valve in suction piping.

(11) Pipe support
Install the pipe support so that the weight of pipe can not be directly loaded to the pump.

(12) Pipe connection
Pipes must be connected securely so that the air can not be sucked in. If the sealing is not perfect, air is sucked in, which causes pump damage.

7-4. Discharge piping

(1) Pipe diameter

In case the discharge piping is long, the specified performance may not be obtained because of unexpected pipe resistance if the pipe diameter is the same as pump bore. Calculate the pipe resistance in advance to decide proper diameter of pipe.

(2) Gate valve

Install the gate valve in discharge piping to adjust flow rate and to protect motor from over loading. If the check valve is also installed, recommended arrangement is : Pump → Check valve → Gate valve

(3) Pressure gauge

Install a pressure gauge in discharge piping to check the operating conditions such as discharge head etc.

(4) Check valve

Check valve must be installed in the following cases.

- Discharge piping is longer than 15 to 20 meters.
- Actual head exceeds 15 meters.
- Height difference between liquid level and discharge pipe end exceeds 9 meters.
- When two pumps are used in parallel.

(5) Air vent

If horizontal discharge piping is longer than 15 to 20 meters, install air vent on the way.

(6) Drain

If the liquid must be drained to protect from freezing, install the drain valve.

(7) Pipe support

Install the pipe support so that the pipe weight can not be loaded to pump.

(8) Priming piping

Install piping for priming in case of suction lift.

8. Electrical wiring

Electrical works or wiring must be carried out by qualified and authorized person according to local law or regulation.

- Use the electromagnetic switch which conforms to motor specifications such as voltage and capacity etc.
- If pump is installed outdoor, wiring must be done so that water can not get into switch.
- Electromagnetic switch and push-button switch must securely installed apart from the pump.

9. Precautions on operation

⚠ CAUTION

- Never operate pump dry or with suction side valve closed.
- After the pump ran dry, leave the pump one hour or more for cooling down to start it once again. If the liquid flows into the pump just after the pump ran dry, SiC or carbon parts are cracked due to heat shock.
- Check the direction of rotation of pump. Clockwise seen from motor fan is correct direction. If operated in reverse, pump may be damaged.
- Stop the pump within one minute if it is operated in cavitation.
- Do not run pump with air sucking in.
- If magnetic coupling is disconnected, stop the pump within one minute.
  If the pump continues to run with coupling disconnected, coupling torque is weakened and heat is generated.
- Intermittent operation
  Frequent repetition of stop/start is not recommended. Stop/start repetition must be limited to six times an hour.
- Temperature change at starting, stopping and operating of pump must be within 80 deg. C.
- Fully close the discharge valve when pump is started to avoid water hammer.
- If the pump is operated with discharge valve closed for a long time, the liquid temperature inside the pump rises, which may cause pump damage. Do not run the pump for more than one minute with discharge valve closed.
- If power is interrupted while pump is running, switch off pump and close discharge valve.
- Pay attention so that discharge pressure can not exceed pump allowable pressure of 1 MPa.
- Observe the allowable minimum flow rate. If the pump is operated below the allowable minimum flow rate, bearing or rubbing parts may be seizured due to lack of lubrication and cooling.
  Allowable min. flow rate : 1.2M^3/hr for YMD25-100 & YMD32-125
  3.0M^3/hr for YMD32-160 ~ YMD40-200
- When high temperature liquid is transferred, pump surface becomes very hot. Take protective measure against burn.

Liquid temp.	Max. pump surface temp. (at amb. temp. 40 deg.C)
120 deg. C	110 deg. C

10. Operation (Starting)

1. Fully close discharge valve and fully open suction valve.
2. Fill liquid into pump
   - In case of flooded suction, confirm if suction valve is fully opened.
   - In case of suction lift, prime to fill liquid into suction piping.
3. Check rotating direction of motor.
   - Start motor momentarily (within a second) to check direction. Direction is shown on "arrow" mark on pump. (Clockwise seen from motor fan side)
   - Also check if motor fan smoothly stops when switched off. If it does not stop smoothly, pump rotating parts may be locked. Check the rotating parts.
4. Air vent operation
   - Before pump operation, vent the air in the pump.
   - Fully open the valve in air vent piping and repeat one second running for three to five times.
   - After the air vent running, fully close the discharge valve.

     Note: In case air vent piping is not equipped, open the discharge valve to repeat one second running several times.
5. Starting pump
   - Start pump with discharge valve fully closed. (Maximum one minute)
   - Confirm that discharge pressure rises to shut-down pressure.
   - Gradually open discharge valve to get specified pressure (capacity).

     Note: Pay attention to over-load caused by excessively opened valve.

11. Pump stopping

1. Slowly close the discharge valve
   Quick closing of valve may cause water hammer and pump damage.
2. Switch off and stop the pump
   Confirm if pump stops smoothly. If pump stops suddenly and not smoothly, inspection is needed.
3. When the pump is stopped for a long period, anti freezing measure must be taken so that the liquid can not be frozen in the pump or piping.

12. Troubleshooting

Troubles	Symptom on pump		Cause	Check & countermeasures
	When disch. valve closed	When disch. valve opened		
Liquid can not be sucked		Press. gauge & vacuum gauge indicate zero.	• Lack of priming liquid • Dry running	• Stop pump and replenish pump with liquid to re-start.
	Primed liquid drops quickly		• Foot valve is clogged by foreign matters.	• Clean foot valve • Check if foreign matters are not adhered to valve seat.
	After starting, pressure drops as soon as discharge valve is opened.	Pressure gauge vibrates and drops to zero.	• Air is sucked from suction pipe or gasket.	• Check if connected flanges are completely sealed. • Check if liquid level of tank is not excessively lowered.
			• Disconnected magnet coupling	• Check amperage to see if motor is not overloaded. • Check if foreign matters do not lock impeller or magnet capsule • Check if voltage is normal.
	Press. gauge shows low pressure		• Low pump speed • Reverse rotation	• Check wiring or motor. • Interchange wiring connection.
Discharge capacity is small.	Pressure gauge & vacuum gauge indicates normal figure.	Vacuum gauge indicates high figure.	• Strainer is clogged by foreign matters.	• Remove foreign matters.
		Vacuum gauge indicates very high figure.	• Air pocket in suction piping	• Check and remedy suction piping.
			• Foreign matters are clogged at impeller inlet.	• Remove foreign matters.
		Pressure gauge & vacuum gauge vibrate.	• Air is sucked in from suction pipe or gasket.	• Check connection part of pipes and retighten it.
			• Foreign matters clog at discharge side.	• Remove foreign matters. • Remove foreign matters or scales in piping.
		Vacuum gauge indicates hign but pressure gauge indicates normal.	• There are resistance such as air pocket etc. in suction piping.	• Check if there is not protruded section in suction piping.

Troubles	Symptom on pump		Cause	Check & countermeasures
	When disch. valve closed	When disch. valve opened		
Discharge capacity is small.	Pressure gauge & vacuum gauge indicates normal figure.	Pressure is high but vacuum is normal.	• Too high actual head or too large pipe resistance	• Check actual head of discharge piping and loss of pipe resistance.
	Pressure is low and vacuum is very low.	Pressure is low and vacuum is low.	• Motor rotates in reverse	• Interchange motor wiring.
Motor is overheated.			• Lowered power voltage	• Check voltage or frequency.
			• Overload	• Check density and viscosity of liquid
			• Too high ambient temperature	• Ventilate
Discharge capacity is rapidly reduced.		Vacuum gauge indicates high figure.	• Foreign matters clog suction piping.	• Remove foreign matters.
Pump vibrates.			• Foundation is not perfect.	• Re-install the pump.
			• Loosened mounting bolts.	• Re-tighten
			• Cavitation occurs.	• Resolve the reason of cavitation.
			• Worn or melted bearing	• Replace
			• Broken magnet capsule or spindle	• Replace
			• Bad dynamic balance of drive magnet	• Resolve the reason or replace
			• Worn bearing of motor	• Replace bearing or motor

13. Maintenance & inspection

⚠ Warning

- Magnetic force is very strong. Pay attention when you handle the magnet capsule or driving magnet so that fingers can not be injured by attraction of magnets.
- The persons who are assisted by electronic devices such as pacemakers etc. are prohibited to approach the magnet capsule and drive magnet.

13-1. Periodical inspection (Once a six months)

Parts name	Inspection items	Countermeasures
Drive magnet	• If there is no rubbed trace.	• If abnormality is found, consult dealer.
	• If drive magnet housing is correctly mounted or if hex. bolts are not loosened.	• Re-mount the drive magnet to motor shaft or re-tighten the bolt.
	• Decentering of magnet and motor shaft. (Max. 0.1 mm)	• Re-tighten bolts or replace drive magnet. (Consult dealer if replacement is needed.)
Rear casing	• Rubbed trace in inner surface.	• If abnormality is found, consult dealer.
	• If there is no cracks.	• If crack is found, replace.
	• Dirty inside.	• Cleaning
Magnet capsule	• If there is no rubbed trace.	• If abnormality is found, consult dealer.
	• If there is no cracks.	• If abnormality is found, consult dealer.
	• Measure the bearing inner diameter.	• Replace if worn excessively.
	• If impeller is securely fixed to magnet capsule.	• If loosened, replace or consult dealer.
Impeller	• If there is no cracks.	• Replace if cracked.
	• If there is no trace of cavitation.	• Resolve the reason.
	• Dirt or clogged inside of impeller.	• Clean
	• Change of dimension.	• Replace if abnormality is found.
Front casing	• Dirty wet-end.	• Clean
	• If there is no cracks.	• Replace if abnormality is found.
	• Clogged drain.	• Clean
	• If there is no swelling or cracks in O ring.	• Replace if abnormality is found.
	• If there is no rubbed trace.	• Consult if abnormality is found.
Spindle	• If there is no crack.	• Replace if abnormality is found.
	• Wear against bearing	• Replace if excessively worn.
Bearing unit	• Wear of bearing	• Replace if excessively worn.

13-2. Consumable parts

Bearing (540), spindle (210), magnet capsule (859), tolerance ring (370) (for YMD25-100 & YMD32-125) and O ring (412-19 &412-20) are consumable parts. Replace them according to the procedure shown as below.

● Life time of bearing and spindle (Time to be replaced)

Model	Inner diameter of bearing		Outer diameter of spindle	
	New one	Wear limit	New one	Wear limit
YMD25-100 & YMD32-125	20 mm	20.5 mm	20 mm	19.5 mm
YMD32-160 to YMD40-200	22 mm	22.5 mm	22 mm	21.5 mm

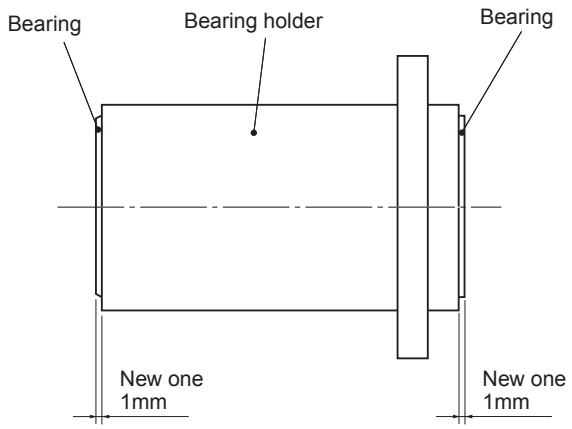
Note 1. Even if the wear of each part is within the above figures, when the clearance between inner diameter of bearing and outer diameter of spindle becomes 0.5 mm or more, replace them according to the following instruction.

Carbon bearing type (C type) : Replace either one of bearing and spindle which is worn more (normally it is the bearing) by new one.

SiC bearing type (K type) : Replace both bearing and spindle by new ones.

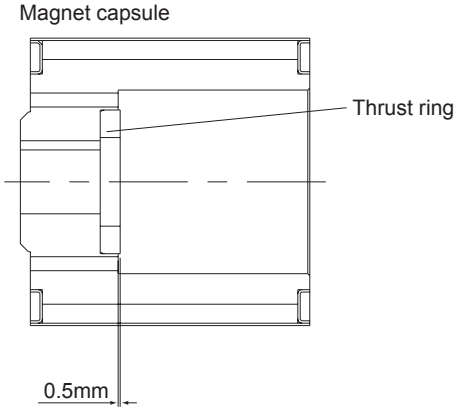
2. Generally, a rubbing part such as bearing may be worn a bit in a short time after the start of operation but this is not abnormal but initial wear.

● Life time of bearing (Time to be replaced)



Projection of bearing from bearing holder is 1 mm for the new one. Replace the bearing unit before the 1 mm projection disappears.

● Life time of magnet capsule (859)



Projection of thrust ring of magnet capsule is 0.5 mm for the new one. Replace the magnet capsule before the 0.5 mm projection disappears.

Replace tolerance ring (370) and O ring (412-19 & 412-20) every 10,000 hours running time or every time when the pump is disassembled.

14. Disassembling and assembling

⚠ Warning

- **Magnet field danger**
  The magnet drive pumps contain strong magnets. The strong magnet field could adversely affect persons who are assisted by electronic devices such as pacemakers etc.
- **Magnet force danger**
  Magnet force is strong. Pay attention so that the fingers etc. can not be pinched.
- **Wear protectors**
  If you touch or come in contact with any type of hazardous chemical liquid, including but not limited to chemicals a serious injury. Wear protective gear (protective mask, gloves, etc.) during the pump operation.
- **Turn off the power supply**
  Working without disconnecting the power supply may cause an electrical shock. Before engaging upon any working procedures involving the pump, make sure to turn the power supply switch off and to stop the pump and other related devices.

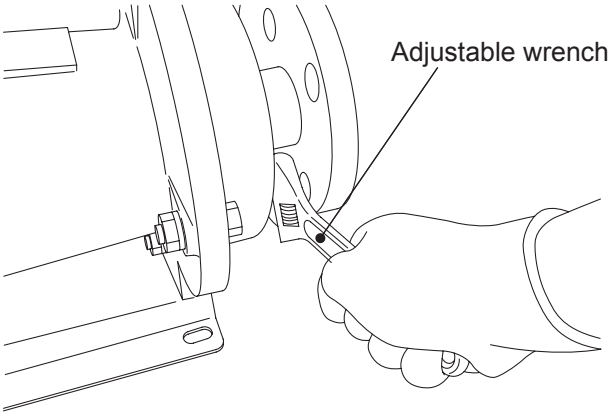
⚠ Caution

- **Attention to magnet**
  Magnet force is strong. Pay attention so that the iron powder or pieces can not be attracted.
  Magnetic card data may be broken by the magnet. Do not put it close to the magnet.

Tool list

Tool	Q'ty
Adjustable wrench	1
Wrench (17 mm)	2
Offset wrench or socket wrench (19 mm)	1
Puller	1
Hexagon wrench (4 mm, 5 mm)	1 each
Belt wrench	1
Hand press	1
Metal spacer (W10 x T2 x L50)	2

14-1. Disassembling (Models YMD25-100 & YMD32-125)

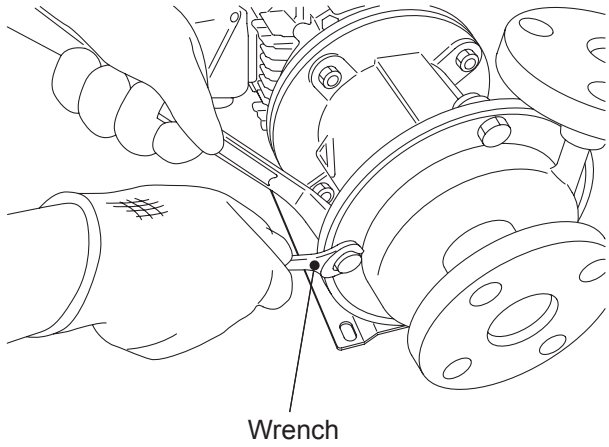


Refer to exploded view on page 28.

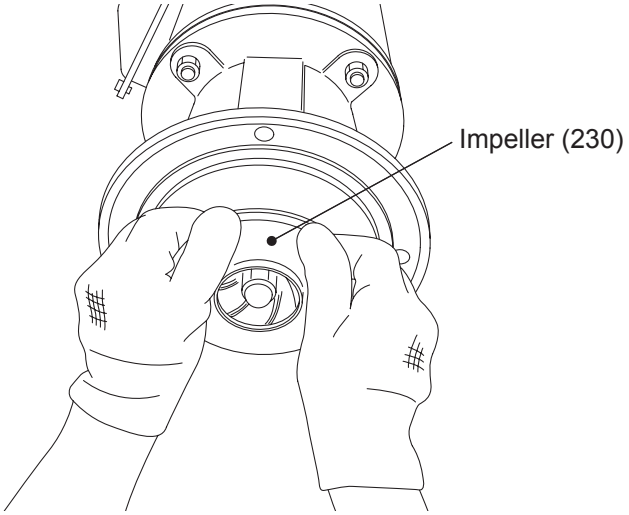
1) Using adjustable wrench, remove a drain plug (903) to drain the liquid in pump.

⚠ Warning

Do not loosen the bolt (901-13) which fix the casing until liquid is drained completely. Otherwise, you may be injured by the splashed liquid.



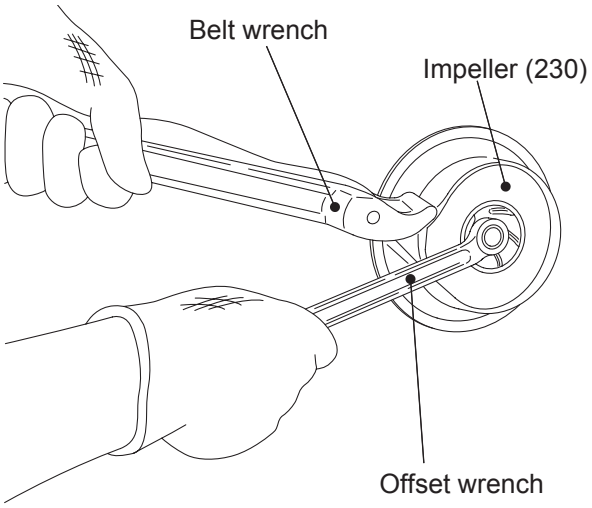
2) Using wrench, remove the bolt (901-13) and nut (901-14) which fix casing.



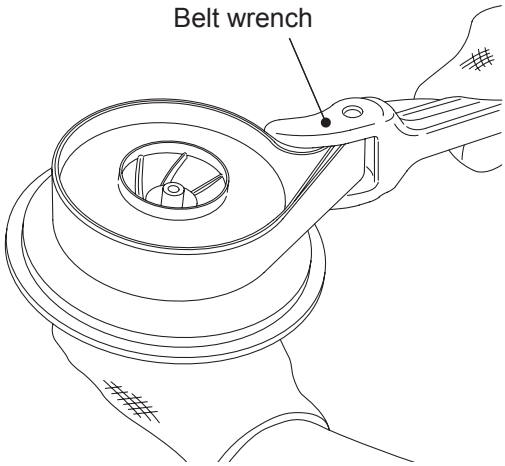
3) Remove pump unit (front casing (100) to rear casing (158)) from bracket (330).

⚠ Caution

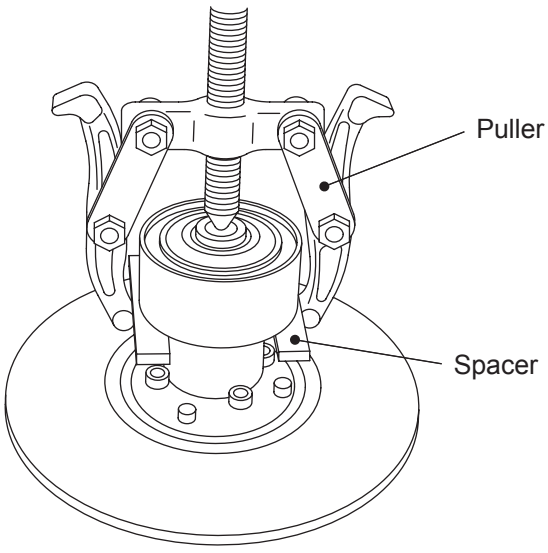
Pay attention for your fingers not to be pinched because of strong magnet force.



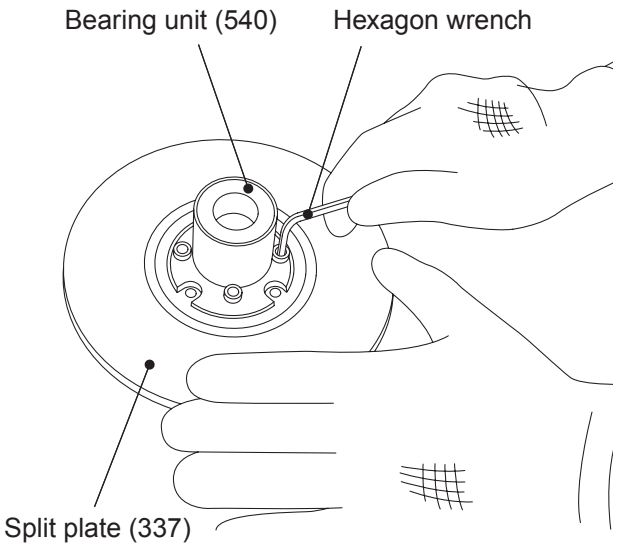
4) Using belt wrench and offset wrench, remove impeller nut (922).



5) Using belt wrench, remove impeller (230) by turning it to left.



6) Using puller, remove spindle (210) from magnet capsule (859). Apply metal spacer between magnet capsule and puller not to damage magnet capsule. Remove tolerance ring (370) from spindle (210).



7) Remove hex. socket head bolt (901-50) which fix bearing unit (540) to split plate (337).

14-2. Assembling (YMD25-100 & YMD32-125)

1) Put bearing unit (540) on split plate (337) and fix them with hex. socket head bolt (901-50).
2) Mount tolerance ring (370) on spindle (210).
   Note: Replace by new tolerance ring every time when pump is disassembled and assembled.
3) Insert spindle (210) through split plate (337) with bearing unit (540) from front side.
4) Using hand press, put magnet capsule (859) on the part of spindle where tolerance ring (370) is mounted.
   Note: Check if spindle can turn after magnet capsule is mounted. Spindle can move back and forth by approx. 0.5mm).
5) Screw in impeller (230) and impeller nut (922) into spindle (210). Check impeller and impeller nut are not loosened.
6) Mount rear casing (158) to bracket (330).
7) Put O ring (412-20) on the groove of back side of split plate (337) and mount them on bracket (330) on which rear casing (158) is mounted.
8) Put O ring (412-19) on the groove of front side of split plate (337) and mount front casing (100) on bracket (330) and tighten them provisionally with bolt (901-13) and nut (901-14).
9) Tighten bolts (901-13) evenly and diagonally at tightening torque of 18.0 N.m.
   Pay attention to threads which are apt to be bitten.

⚠ Warning

Magnet capsule (859) is strongly attracted to motor side by magnet force. Take care not to pinch your fingers.

⚠ Caution

Remove iron powder or foreign matters which are adhered to magnet capsule (859).

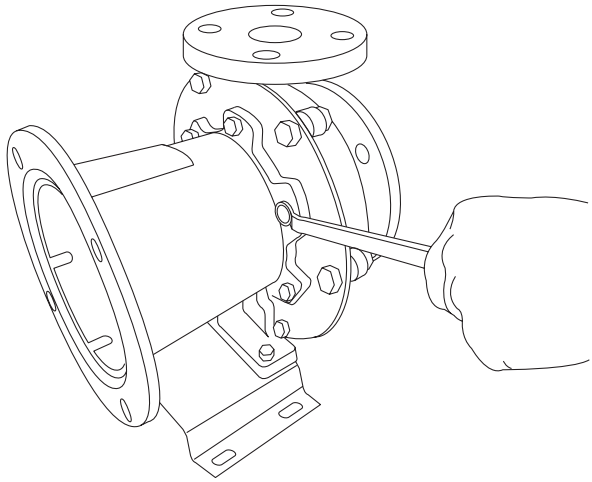
⚠ Caution

Check that there is no dust or scratch on O ring and sealing surface on which O ring is put. Replace parts if you find any scratch on them.

Tightening torque of bolt

Bolt	Tightening torque (N.m)	Remarks
901-13	24.0	M10
901-50	2.8	M5
922	42.1	M12
230 (for Impeller)	16.0	M12

14-3. Disassembling (YMD32-160 ~ YMD40-200)



Refer to exploded view on page 29.

1) Using adjustable wrench, remove drain plug (903) to drain the liquid in pump.
2) Using wrench, remove bolts (901-46) which fix pump unit to bracket (330). (See picture on left.)
3) Remove pump unit from bracket (330).

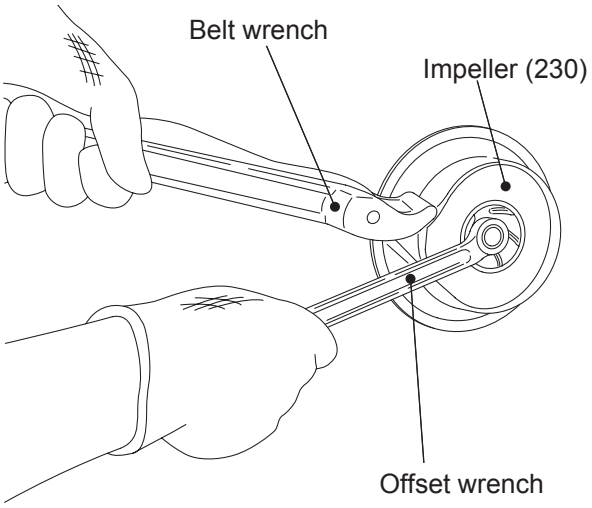
⚠ Warning

If motor and drive magnet (858) is mounted on bracket (330), pay attention to strong magnet force when pump unit is removed from bracket (330).

4) Remove bolt (901-13) and nut (901-14) to remove front casing (100) together with O ring(412-19).

⚠ Warning

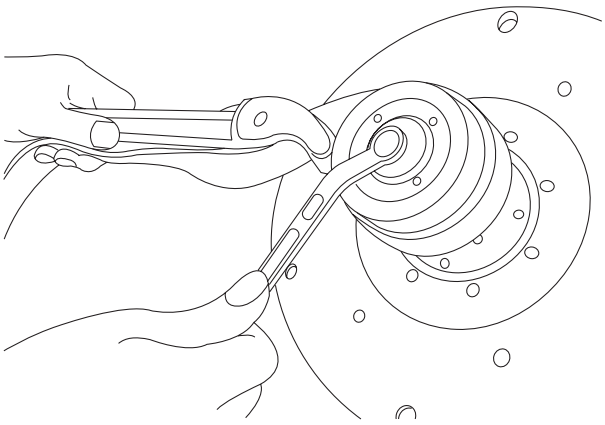
Confirm there is no liquid in pump when bolt is removed. Otherwise you may be injured by liquid which flows out.



5) Using belt wrench and offset wrench, remove impeller nut (922), second nut (314-4.2). (See picture on left.)
6) Remove impeller (230) and key (940).
7) Using hex. wrench, remove bolt (901-49) to remove rear casing (158) from split plate (337).

⚠ Caution

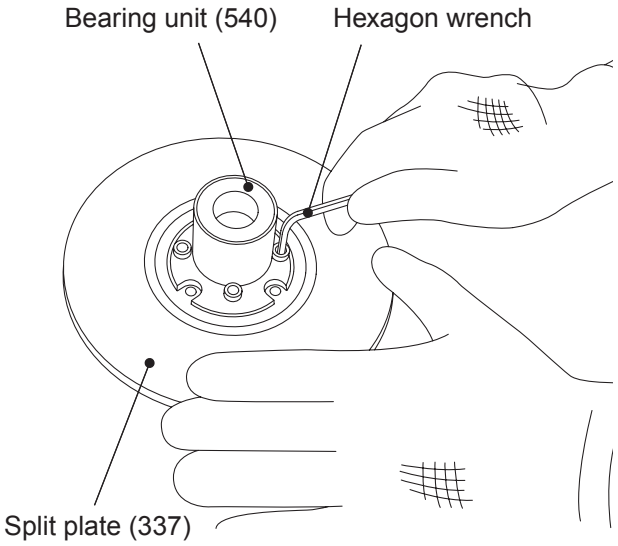
Pay attention to hex. wrench which is attracted to magnet inside rear casing.

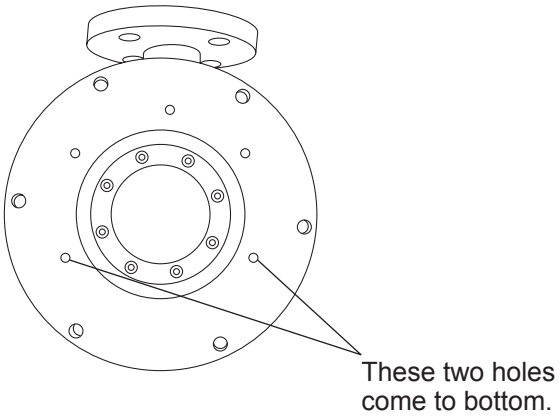


8) Fixing magnet capsule (859) with belt wrench, turn bolt (554-16) to right to remove it with washer (554-17) and to remove magnet capsule (859) and spindle (210) together with key (554.18). (See picture on left.)
9) Remove O ring (412-20) from split plate.

10) Remove bolt (901-50) to remove bearing unit (540) from split plate (337).

14-4. Assembling (YMD32-160 ~ YMD40-200)





1) Mount bearing unit (540) to split plate (337) and fix it with bolt (901-50). (See picture on left.)
2) Mount O ring (412-20) to split plate (337).
3) Insert spindle (210) into split plate (337) and bearing unit (540). (Male thread side of spindle is oriented to front.)
4) Put key (554-18) to spindle (210), insert magnet capsule (859) into spindle (210) and fix them with bolt (554-16) and washer (554-17). Turn bolt to left to tighten.
5) Mount rear casing (158) to split plate (337) on which O ring (412-20) is mounted and fix them with bolt (901-49).

⚠ Caution

Pay attention hex. wrench is strongly attracted by magnet inside of rear casing.

6) Put key (940) to front side of spindle (210), insert impeller (230) and tighten it with second nut (314-4.2), impeller nut (922) and washer (314-4.1).
7) Put O ring (412-19) to front casing (100).
8) Mount the unit assembled from rear casing (158) to impeller (230) to front casing (100), and fix them diagonally with bolt (901-13) and nut (901-14).

Note: Pay attention to positions of bolt holes on split plate. See picture on left.

Note: Pay attention for O ring not to be bitten between split plate and front casing.

9) Mount pump unit (assembled from rear casing (158) to front casing (100)) to bracket (330) and diagonally fix it with bolt (901-46).

⚠ **Attention**

Pump unit is strongly attracted by magnet force especiall when motor/drive magnet (858) is mounted on bracket (330).

Note: Remove iron powder or foreign matters which are adhered to magnet capsule.

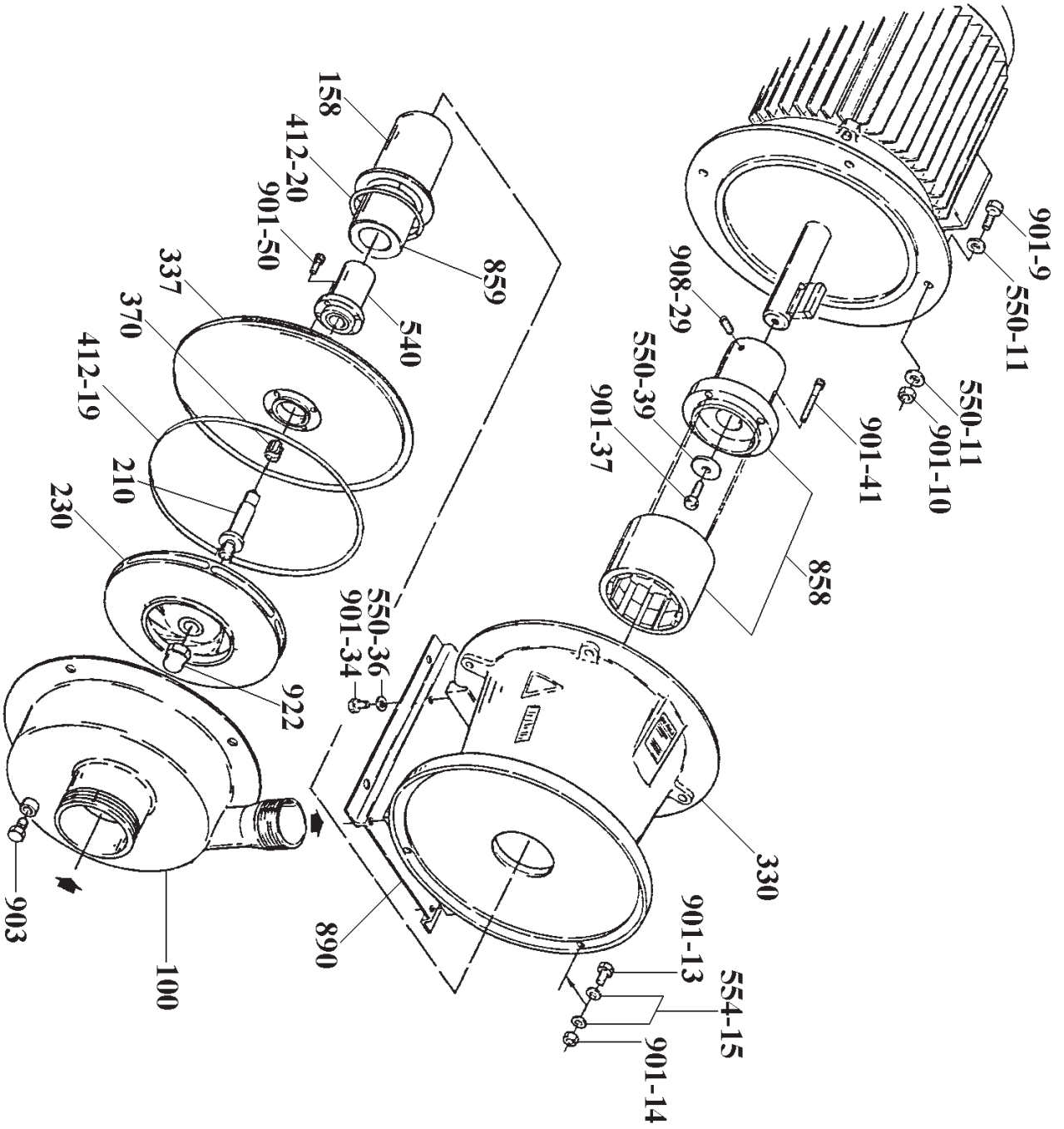
Note: Check that there is no dust or scratch on O ring and on sealing surface on which O ring is mounted. Replace by new O ring if you see scratch on them.

Tightening torque of bolt and nut

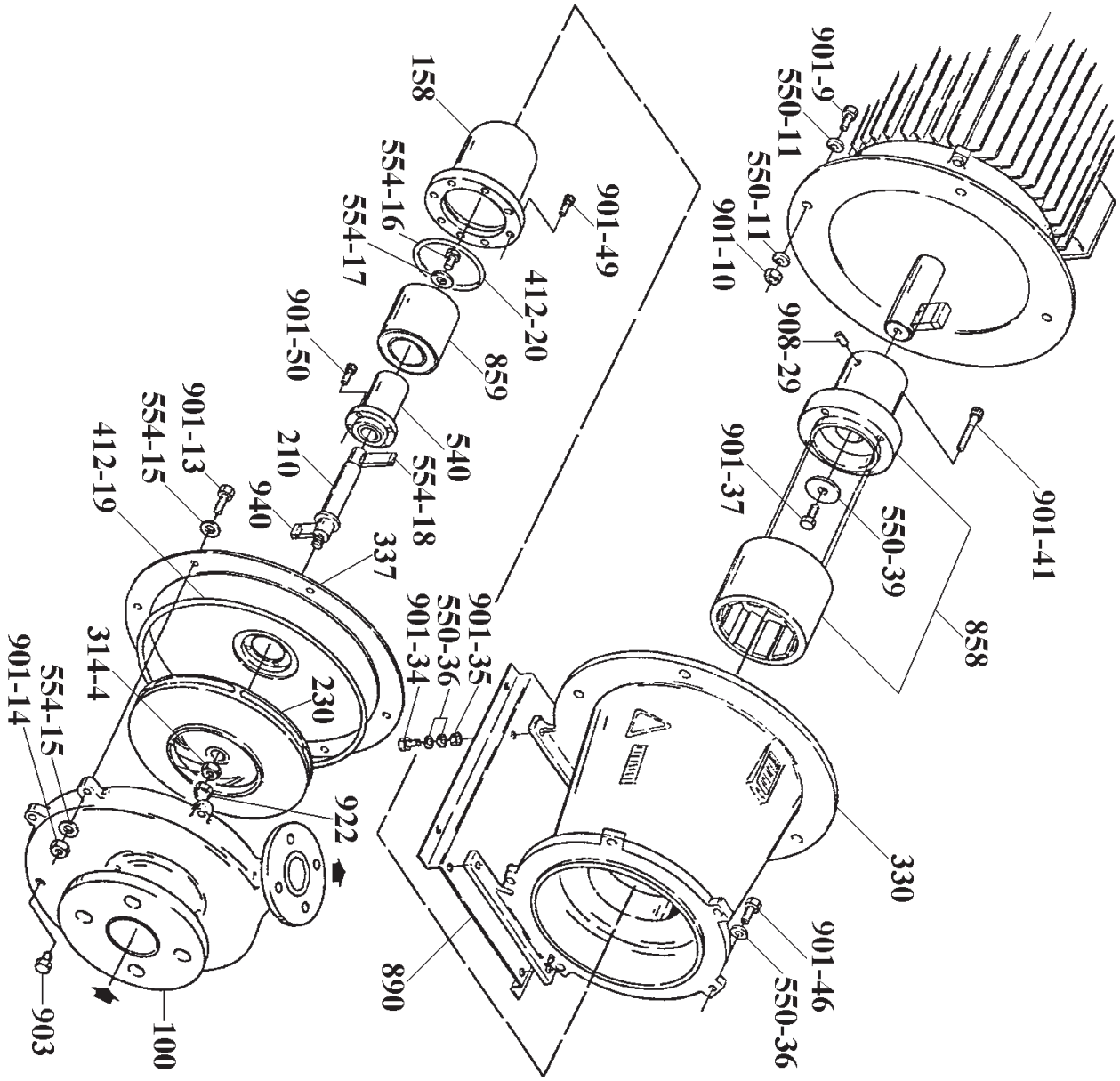
Bolt	Tightening torque (N.m)	Remarks
901-46	12.0	M8
901-49	4.8	M6
901-50	2.8	M5
901-13	24.0	M10
554-16	4.8	M6
314-4	42.1	M12
922	42.1	M12

15. Exploded view

YMD25-100, YMD32-125



YMD32-160 ~ YMD40-200



16. Parts list

YMD25-100 & YMD32-125

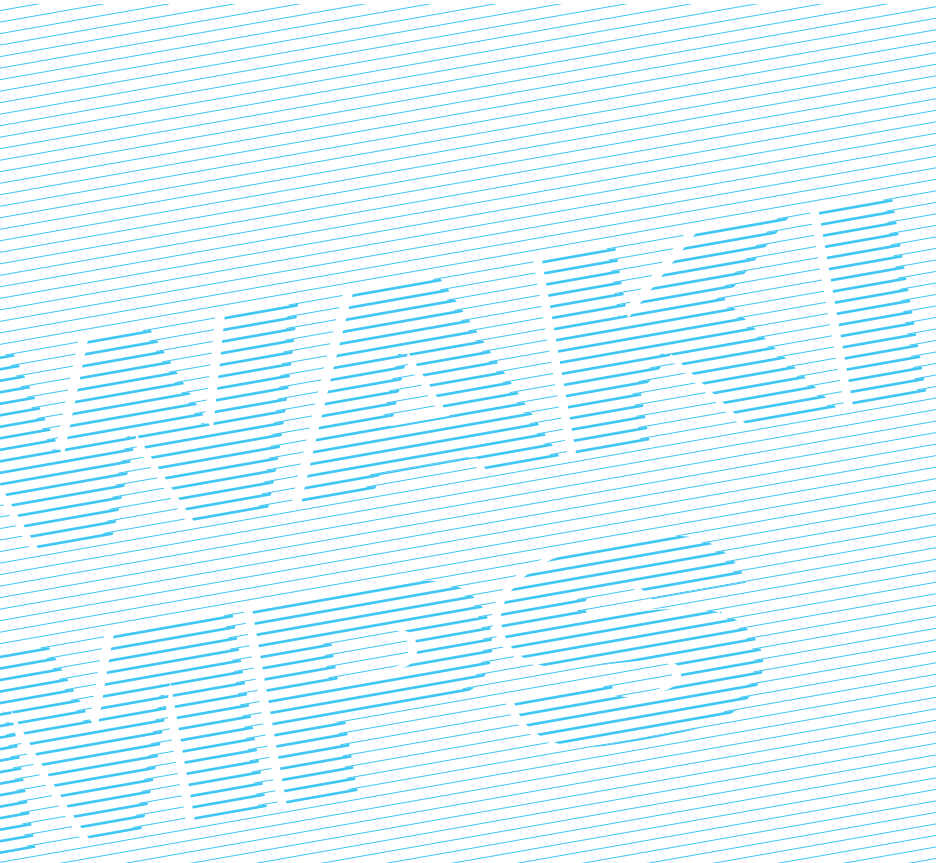
Parts No.	Parts name	Q'ty/pump
903	Drain plug	1
100	Front casing	1
922	Cap nut (Impeller)	1
230	Impeller	1
210	Spindle	1
412-19	Front casing O ring	1
370	Tolerance ring	1
337	Split plate	1
540	Bearing + Bearing holder	1
901-50	Bolt (bearing holder - split plate)	4
859	Magnet capsule	1
412-20	Rear casing O ring	1
158	Rear casing	1
901-13	Bolt (front casing - split plate)	4
901-14	Nut	4
554-15	Spring washer	8
330	Bracket	1
890	Base plate	1
901-34	Bolt (base plate - bracket)	4
550-36	Plain washer	4
858	Drive magnet + drive ring	1
901-37	Bolt (Drive ring - motor)	1
550-39	Plain washer	1
901-41	Bolt (Drive ring - drive magnet)	4
908-29	Set screw	2
901-9	Bolt (Bracket - motor)	4
901-10	Nut	4
550-11	Plain washer	8

Note: See construction drawing on page 7 for size of bolt and screw.

YMD32-160 ~ YMD40-200

Parts No.	Parts name	Q'ty/pump
903	Drain plug	1
100	Front casing	1
922	Cap nut (Impeller)	1
314-4	Second nut impeller	1
230	Impeller	1
412-19	Front casing O ring	1
337	Split plate	1
901-13	Bolt (front casing - split plate)	6
901-14	Nut	4
554-15	Spring washer	10
210	Spindle	1
940	Impeller key	1
554-18	Spindle key	1
540	Bearing holder + bearing	1
901-50	Bolt (bearing holder - split plate)	5
859	Magnet capsule	1
554-16	Bolt (spindle)	1
554-17	Washer	1
412-20	Rear casing O ring	1
158	Rear casing	1
901-49	Bolt (rear casing - split plate)	8
901-46	Bolt (split plate - bracket)	6
550-36	Plain washer	8
330	Bracket	1
901-34	Bolt (base plate - bracket)	4
901-35	Nut	4
550-36	Plain washer	8
890	Base plate	1
858	Drive ring + drive magnet	1
901-37	Bolt (drive ring - motor)	1
550-39	Plain washer	1
901-41	Bolt (drive ring - drive magnet)	4
908-29	Set screw	1
901-9	Bolt (bracket - motor)	4
901-10	Nut	4
550-11	Plain washer	8

Note: See construction drawing on page 8, 9 & 10 for size of bolt and screw.



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Finland	IWAKI Suomi Oy	TEL : (358)9 2745810	FAX : 9 2742715	Taiwan	IWAKI Pumps Taiwan Co., Ltd.	TEL : (886)2 8227 6900	FAX : 2 8227 6818
France	IWAKI France S.A.	TEL : (33)1 69 63 33 70	FAX : 1 64 49 92 73	Taiwan	IWAKI Pumps Taiwan (Hsin-chu) Co., Ltd.	TEL : (886)3 573 5797	FAX : (886)3 573 5798
Germany	IWAKI EUROPE GmbH	TEL : (49)2154 9254 0	FAX : 2154 9254 48	Thailand	IWAKI (Thailand) Co.,Ltd.	TEL : (66)2 322 2471	FAX : 2 322 2477
Holland	IWAKI EUROPE NL Branch	TEL : (31)547 293 160	FAX : 547 292 332	U.K.	IWAKI Pumps (UK) LTD.	TEL : (44)1743 231363	FAX : 1743 366507
Hong Kong	IWAKI Pumps Co., Ltd.	TEL : (852)2 607 1168	FAX : 2 607 1000	U.S.A.	IWAKI AMERICA Inc.	TEL : (1)508 429 1440	FAX : 508 429 1386
Indonesia	IWAKI Singapore (Indonesia Branch)	TEL : (62)21 690 6606	FAX : 21 690 6612	Vietnam	IWAKI pumps Vietnam Co.,Ltd.	TEL : (84)613 933456	FAX : 613 933399

T517-2 '11/09