

INSTRUCTION MANUAL

Corrosion-resistant
Horizontal Magnet Pump

Version: 20241129

Y D – G U series
Y D – G T N series



Preface

Thank you very much for purchasing World Chemical's magnet drive pump. Please read this manual carefully. An adequate understanding of this manual is required to maximize the pump's performance and to assure safety and long-term efficiency. Store this manual where it can be easily accessed.

Table of contents

A. Safety	2
B. Unpacking check / Model Description	4
C. Install / piping precaution	6
D. Operational caution	8
E. YD-GU series: Assembly / Disassembly	9
F. YD-GTN series: Assembly / Disassembly.....	18
G. Troubleshooting	28
H. Warranty and Repair	30

Safety First

For your protection, and the protection of others, learn and always follow the safety rules outlined in this booklet. Observe warning signs on machines and act accordingly. Form safe working habits by reading the rules and abiding by them. **INSTALLATION, OPERATION AND MAINTENANCE MUST BE DONE BY THOROUGHLY QUALIFIED PERSONNEL IN STRICT ACCORDANCE WITH THIS MANUAL AND MUST COMPLY WITH ALL LOCAL, STATE AND FEDERAL DOCES.** Keep this booklet handy and review it form time to time to refresh your understanding of

the rules.

YD-GU/GTN has designed this pump for safe and reliable operation. However, like any mechanical device, the proper and safe performance of this equipment depends upon using sound and prudent operating, maintenance and servicing procedures performed by properly trained personnel. Instructions and safety procedures contained herein must always be followed. As such, we shall not be liable for any damages or delays caused by failure to observe any instructions or warnings in this manual.

DANGER

The use of the word “DANGER” always signifies an immediate hazard with a high likelihood of severe personal injury or death if instructions, including recommended precautions, are not followed.

MAGNETIC

The use of the word “MAGNETIC” indicates the persistent presence of a magnetic field. Such fields present immediate danger to individuals having electronic medical devices, metallic heart valves, metallic prosthetics or metallic surgical clips.

WARNING

The use of the word “WARNING” signifies the presence of hazards or unsafe practices which could result in severe personal injury or death if instructions, including recommended precautions, are not followed.

CAUTION

The use of the word “CAUTION” signifies possible hazards or unsafe practices which could result in minor injury, product or property damage if instructions and recommended precautions are not followed.



Enhance the protection of yourself, as well as your magnet drive pump, by following and using accepted engineering practices in the installation, operation and maintenance of this equipment. Listed below are some basics you should keep in mind in addition to your own company rules regarding installation, operation and maintenance.

Always pay constant attention to safety. Remember all pumps have the potential for danger.

Be aware of the following factors:

Recommended period of periodical check:

Check every 12 months or every 10,000 hours, whichever comes first.

- The temperature may get high.
- The pressure may get high.
- NEVER start the pump without proper priming water. (The casing must be full of liquid.)
- NEVER run the pump dry.
- NEVER operate the pump with the suction and/or discharge valve closed.
- NEVER use heat (risk of explosion) to disassemble any portion of the pump.
- NEVER change conditions of service without approval of us.
- NEVER remove "Warnings".
- Parts are rotating at high speed.
- High corrosive and/or toxic chemicals may be present.
- NEVER operate pump if there are visible signs of leakage.
- NEVER loosen flange connection while system is under pressure.
- ALWAYS make certain pressure gauges, indicating lights and safety devices are working.
- ALWAYS know where the EMERGENCY STOP is.

Cleaning Precautions

- NEVER attempt cleaning while pump is operating.
- ALWAYS remove casing drain and purge casing of liquid before service.
- ALWAYS stop the power source before service.
- ALWAYS have this service manual available during any installation or maintenance.
- ALWAYS make certain that no toxic or flammable fumes / vapors remain in the pump casing or surrounding area.
- ALWAYS clean up any spills immediately around the pump.

RECEIVING

All pumps are inspected prior to shipping and are well crated for safe transportation. We cannot, however, guarantee the safe arrival at the user's plant. Therefore, upon receipt of this equipment:

PACKING LIST ENCLOSED

■ Check that the model name, THD, Capacity, the motor specification in the nameplate is the same as the order.

■ If the pump will be stored in sub-freezing temperatures, the pump must be completely dried first.

■ If there are any parts missing or the pump is damaged, contact your supplier at once.

WARNING

These pumps use ceramic silicon carbide components. If the pump is dropped or subject to shock loads, this may damage internal ceramic components.

DANGER

Failure to properly lift and support equipment could result in serious injury or damage of the pump.



Section B – Unpacking check

MODEL DESCRIPTION

Discharge bore			Output		Model	Motor type	Wet Parts Kit material		Bearing material		Gasket material		Frequency	S.G.	Impeller bore		Special specification		
YD -			25	02	GU	3	-	T	F	-	K	P	5	1	-	123	-	MV	
									* SiC										
Discharge bore			Output		Model														
Code	Suc.	Dis.	Code	Output	Code														
25	40A	25A	01	0.75kW	GU														
			02	1.5kW															
			03	2.2kW															
			05	3.7kW															
40	50A	40A	01	0.75kW			GTN												
			02	1.5kW															
			03	2.2kW															
			05	3.7kW															
50	65A	50A	07	5.5kW		GTN													
			10	7.5kW															
			05	3.7kW															
			07	5.5kW															
40	50A	40A	10	7.5kW	GTN														
			05	3.7kW															
			07	5.5kW															
			10	7.5kW															
50	65A	50A	05	3.7kW			GTN												
			07	5.5kW															
			10	7.5kW															
			07	5.5kW															
41	50A	40A	10	7.5kW		GTN													
			15	11kW															
			20	15kW															
			25	18.5kW															
51	65A	50A	07	5.5kW	GTN														
			10	7.5kW															
			15	11kW															
			20	15kW															
65	80A	65A	25	18.5kW			GTN												
			07	5.5kW															
			10	7.5kW															
			15	11kW															
80	100A	80A	20	15kW		GTN													
			25	18.5kW															
			30	22kW															
			07	5.5kW															
125	150A	125A	10	7.5kW	GTN														
			15	11kW															
			20	15kW															
			25	18.5kW															
			30	22kW			GTN												
			40	30kW															

Gasket material

Code	Material
P	FEP +FKM (Standard)
E	EPDM (Option)

Frequency

Code	Frequency
5	50Hz
6	60Hz

WPK material

Code	Material
TF	ETFE

Specific gravity

Code	S.G.
0	1.0
1	1.1
2	1.2
3	1.3
4	1.4
5	1.5
6	1.6
7	1.7
8	1.8
9	1.9
G	2.0 and more

Special specification

Code	
M	Not standard motor
V	Not standard voltage
B	Specified color

Motor type

IE1	1
IE3	3

Liquid temperature (MAX) -30~120°C (antifreeze solution)

GENERAL GUIDELINE

Arrange piping to allow pump flushing prior to removal of the unit on services handling corrosive liquids.

When PTFE or similar lined pipe is used, carefully check the flange alignment. The following flange bolt torque values are should be used:

25A: 100kgf·cm (9.8N·m)

40A: 150kgf·cm (14.7N·m)

50A: 200kgf·cm (19.6N·m)

65A: 300kgf·cm (29.4N·m)

80A: 350kgf·cm (34.3N·m)

100A: 450kgf·cm (44.1N·m)

125A/150A: 900kgf·cm (88.2N·m)

Support the piping independently from the pump and line up naturally to the pump flanges.

Install properly sized pressure gauges in both the suction and discharge piping. The gauges will enable the operator to easily observe the operation of the pump, and determine if the pump is operating in conformance with the performance curve. If cavitations or other unstable operation should occur, widely fluctuating discharge pressure will be noted.

SUCTION PIPING

Use the reducer whose bore is bigger than the suction bore.

Be the suction pipe as short as possible.

Install the suction piping with a gradual rise to the pump to eliminate any air pockets.

Be the diameter of the suction pipe as large as or larger than the pump suction.

The height between the suction inlet to the liquid level is at least 50 cm and more.

Install a suction valve. It is used for only shut-off when the pump is not running, not for throttling or controlling flow. A flow control valve is installed in the discharge pipe.

When using a suction strainer, a net free area must be at least three times the suction pipe bore.

Check the suction strainer periodically and clean / replace.

DISCHARGE PIPING

The sluice valve and check valve are installed on the discharge pipe.

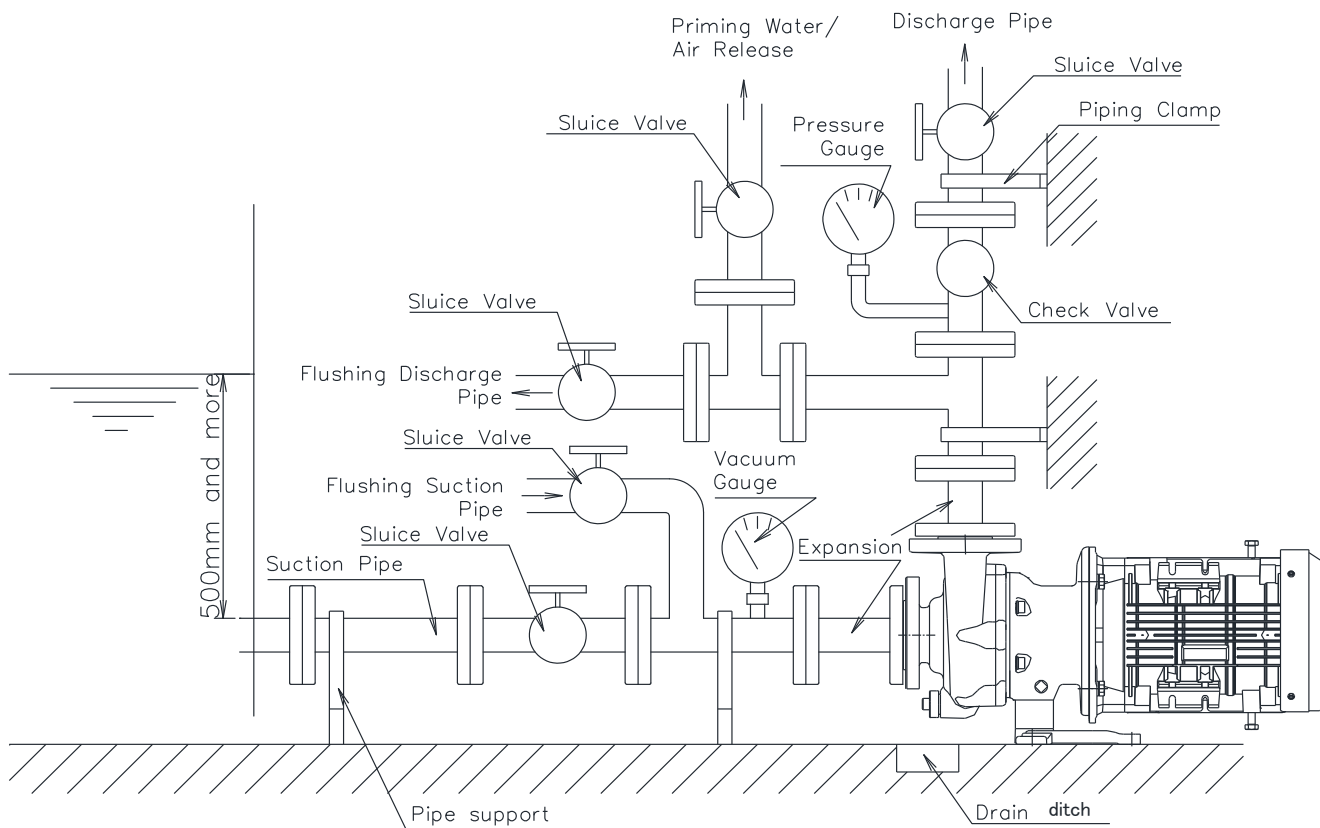
The sluice valve is used for the check of the flow and line close when inspecting the pump.

The check valve prevents the pump damage by water hammer.

CAUTION

It is good to install a throttling type valve in the discharge pipe. It is recommended to narrow down the valve in the discharge pipe to protect the pipe from water hammer due to the long pipe at high flow velocity.

Recommended piping



If it is possible for the piping to be expanded by high temperature liquid, the pump may be damaged by expansion.

Therefore, install the extendable or flexible joint to prevent the load to the pump at the expansion.

If the liquid level height is lower than the recommended value, the air may be drawn in from the suction inlet or difficult to be released, so it is recommend that a dry running prevention device is installed, or an air release valve and return piping are installed.

TRIAL RUN

1. Open the suction valve fully. The pump requires to be operated with full of liquid inside.

WARNING

Do not operate pump with suction valve closed. Operating pump more than a few minutes after suction valve closed may cause bearing failure. If such like operation, leave the pump for an hour and more and start the operation.

2. Fully open discharge valve and pour liquid in use. Turn back the discharge valve from 1/4 to 1/2 open to protect the pump and pipes damage by water hammer.

CAUTION

The operation with the discharge valve closed may cause the pump inside damage.

3. Check that the rotation is in the direction of the arrow on the casing by operation for only a moment. Even if it is the wrong direction, the pump is not damaged, but the performance is extremely decreased.

If the rotation is in reverse, switch two of the three phases in the three-phase power supply to change the direction of rotation. Make sure to power off before wiring it.

Rotational direction



The correct rotational direction is the lockwise as viewed from the motor fan cover.

CAUTION

Immediately observe the pressure gauge. If the discharge pressure is not quickly increased, stop the operation, re-prime and attempt to restart.

1. Start the pump.
2. Set flow rate and pressure by regulating the discharge valve.
3. Check the pump and piping to assure that there are no leaks.
4. Check and record the pressure gauge readings for future reference.

CAUTION

Never throttle pump by using the suction valve.

[The range of the liquid temperature]

The steam pressure, viscosity or corrosion is changed depends on the liquid temperature. In consideration of them, use the pump under the wide condition.

Application temperature

-30°C - 120°C (antifreeze solution)

[Minimum flow] **Pressures up to 2MPa**

Operate the pump over the figure as the below list.

Model	Minimum flow
25GU, 40GU, 50GU	10L/min
40GTN, 50GTN	
41GTN, 51GTN, 65GTN	20L/min
80GTN	60L/min
125GTN	300L/min

YD-GU

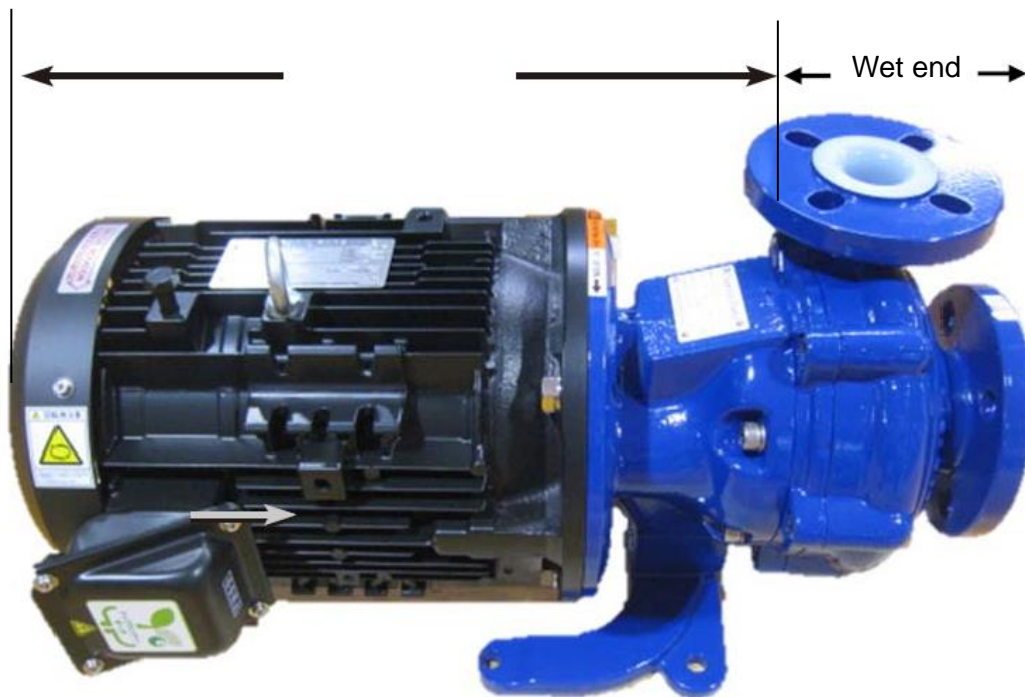
When disassembling and assembling by yourself, follow the procedure as below. It is possible to disassemble the pump in a state of connecting with pipe, but it is recommended to repair in our factory to prevent the SiC parts damage.

DANGER

Install the protective device or turn off the power to prevent a serious injury by starting the motor accidentally.

DANGER

Close all valves to control flow to and from the pump. Isolate the pump from the system and release any remaining system pressure.



Remove 4 cap screws for the bracket by using an 8 mm hex. wrench.



Firmly hold the drive end and quickly pull it away from the wet end. Pull the drive end back at least 15 cm.



Turn the drive end to the side to allow space for disassembly of the wet end

Needful tools

- ☑ 8 mm hex. wrench
- ☑ 19 mm wrench
(for drain flange)
- ☑ 5 mm T handle hex.
wrench
- ☑ Torque wrench

DANGER

Skin, eye and respiratory protection are required when handling hazardous and/or toxic fluids. When draining, precautions must be taken to prevent injury or environmental contamination.



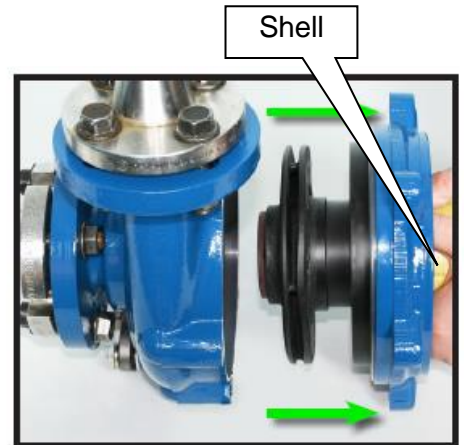
Remove the hex. bolts at the drain flange. Drain liquid inside and wash each component.

MAGNETIC

Pumps contain extremely strong magnets. The use of non-magnetic tools and work surface is highly recommended. The work area must be clean and free of any ferrous particles.



Loosen and remove 6 cap screws for the rear casing support by using a hex. wrench.



Grasp the shell part of the rear casing and pull it back in a straight line until it is clear of the casing.



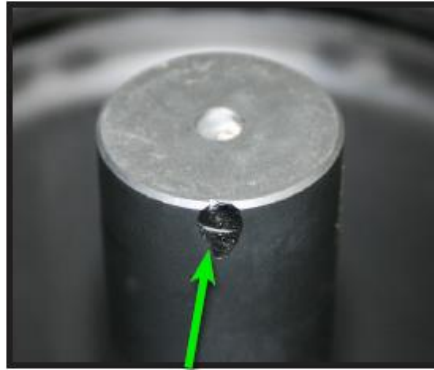
Remove the rear casing and impeller from the rear casing support.



Lift and remove the impeller from the rear casing.



Use a flashlight to check the inside of the rear casing.



Above picture shows a chipped shaft for example.

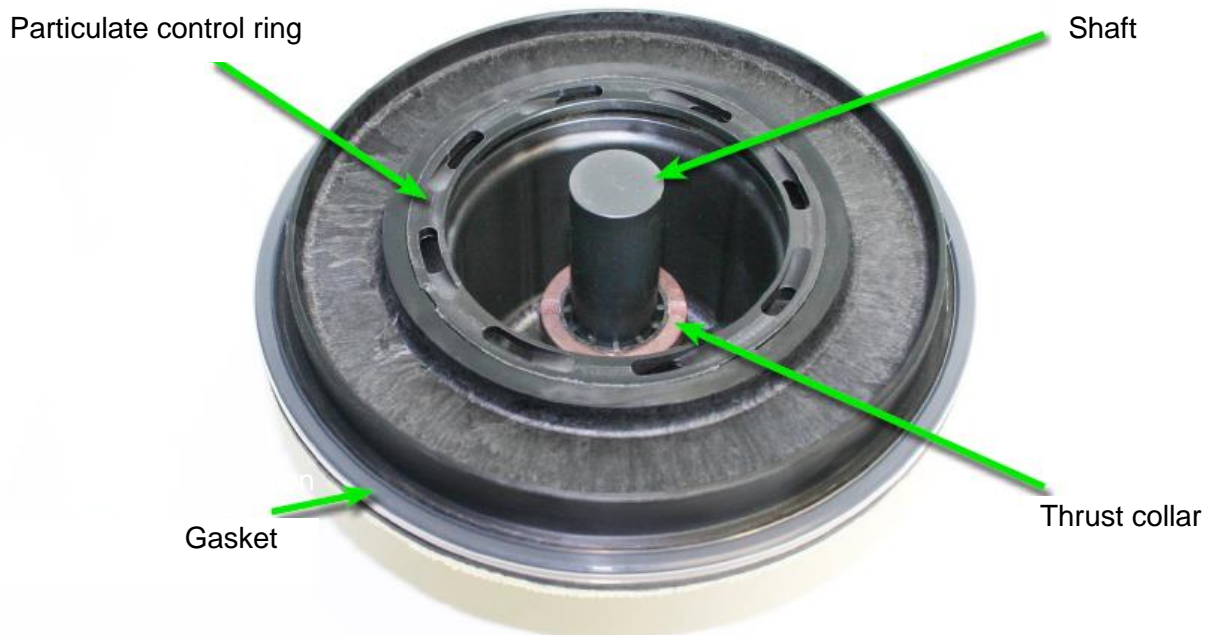


Clean and check the gasket.

When making an inspection inside the pump, check all silicon carbide (SiC) parts with no cracks, chips and scoring marks. Minor chips less than 0.5 mm are acceptable. Check all plastic parts with no scoring and cracks. Minor scratches or cuts less than 1 mm are acceptable.

Carefully clean and check the following parts:

“Rear Casing”



NOTE

The mouth ring for YD-GU is pressed in place to the impeller and is not user replaceable.

Impeller

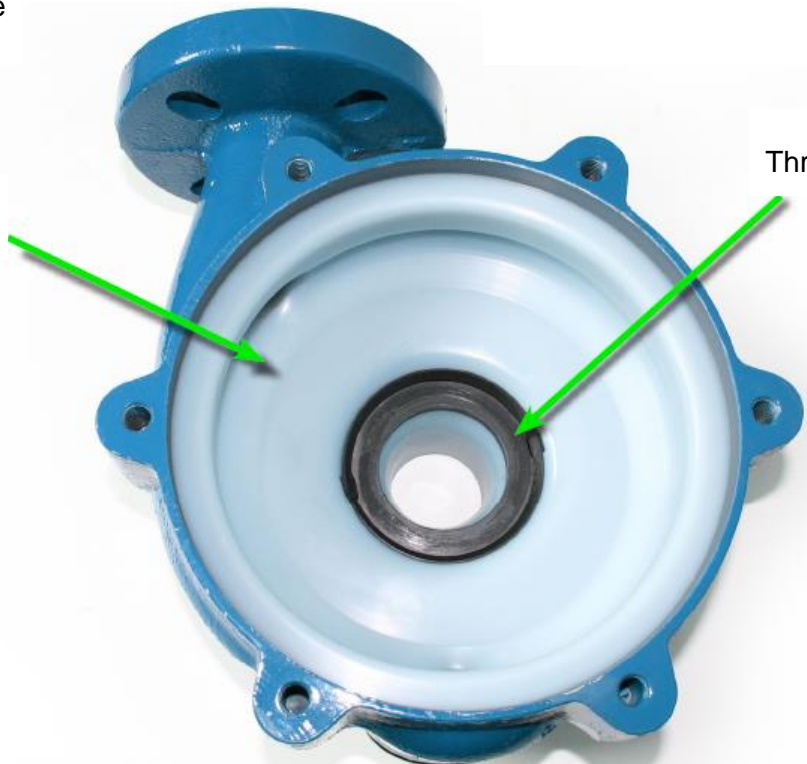
Mouth ring



Check that casing ETFE lining is not scraped, chipped or torn. When the casing lining is damaged, replacement of the casing is necessary.

Casing
ETFE lining

Thrust collar

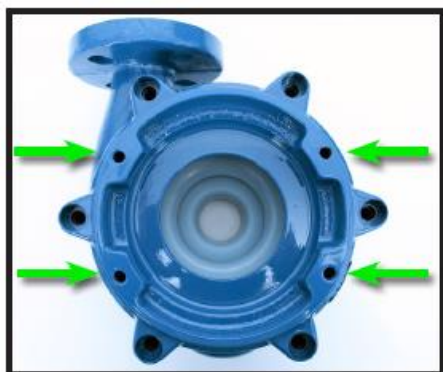




Position the impeller bearing on the pump shaft at the center of the rear casing and insert it slowly.



Place the impeller and the rear casing into the rear casing support.



Align the rear casing support that 4 inner bolt holes are on the right and left side of the pump as the above picture.



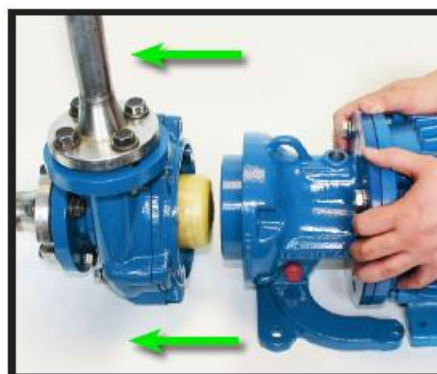
Insert the assembly as one piece straight into the casing.



Insert the spring washer & cap screw into the 6 bolt holes in this order.



Tighten 6 cap screws with the torque $27\text{N}\cdot\text{m}$.



Align the drive end and push it straight until the wet end.



Tighten 4 cap screws for the bracket with the torque $27\text{N}\cdot\text{m}$.

* The magnet force is very strong. Use a resin or wooden spacer not to get injured like catching a finger.



Face down the suction flange of the casing and insert the impeller into it.



Put the impeller in the predefined position and check the smooth rotation by hand.



Align the shaft of the rear casing with the bearing.

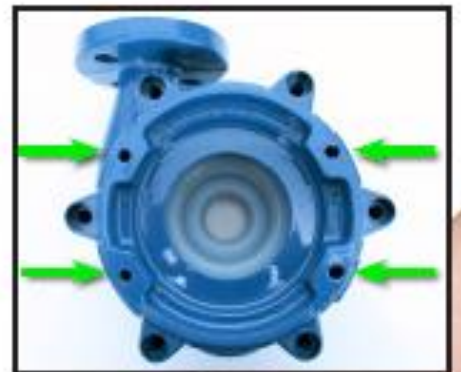
* Put the gasket in the predefined position before.



Insert the rear casing straight into the predefined position.



Put the rear casing support on the rear casing and align the holes as the above picture.



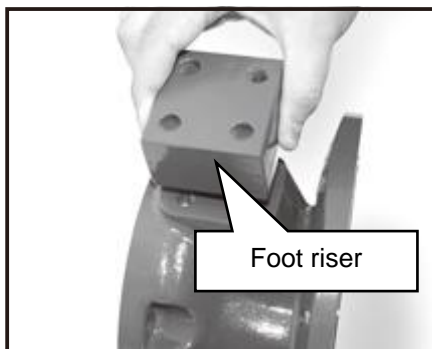
Align the rear casing support that 4 inner bolt holes are on the right and left side of the pump.



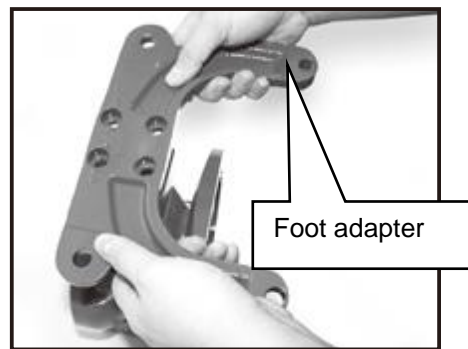
Insert the spring washer & cap screws into 6 bolt holes in this order.

Tighten the bolts by using a hex. wrench with the torque 27 N·m.





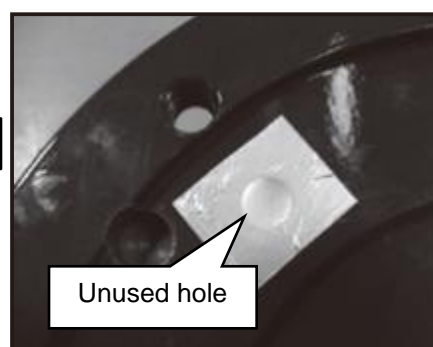
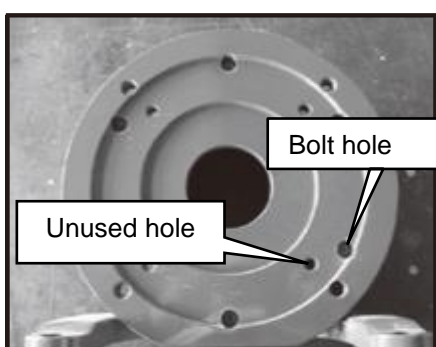
Position 4 holes of the foot riser with 4 holes of the bracket.
(Except YD-2502GU, YD-2503GU)



Position 4 holes of the foot adapter with 4 holes of the foot riser.



Tighten 4 cap screw by using a hex. wrench.



When using the bracket for 1.5 to 7.5 kW Motor frame, it is possible to flood into the motor flange through the unused bolt holes. Close the holes by aluminum tapes to prevent flooded. However, if the hole is the innermost, it is unnecessary to treat the waterproof.

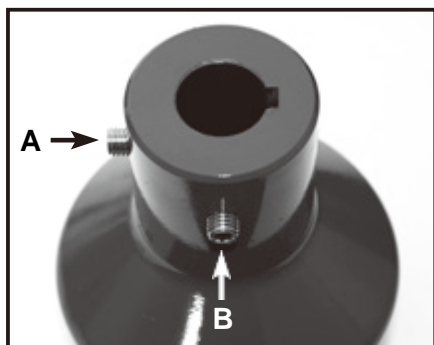
Lower the assembly onto the motor, aligning the 4 holes with the 4 motor mounting holes.



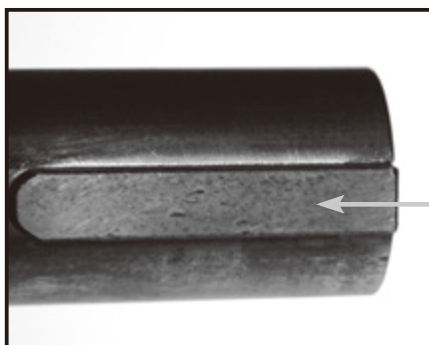
Insert and tighten 4 bolts to the bracket through the motor flange.



※When replacing the motor, waterproof the interface of the motor flange (Liquid gasket).



Note the position of the set screws in relation to the key groove before installation.



Align the key groove on the outer magnet with the key on the motor shaft.





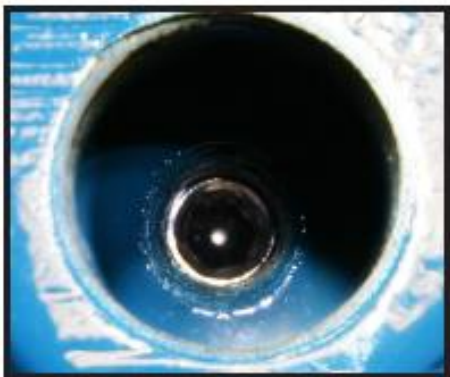
Lower the outer magnet onto the motor shaft.



Using a ruler or other straightedge, align the outer magnet alignment groove with the top edge of the bracket.



Turn the outer magnet until the groove points to the left. (when the foot adaptor is at the down position.)



Check the set screw (A) on the outer magnet.



Tighten the set screw (A) with the T-handle hex key.



Turn the outer magnet until the groove points down. (when the food adaptor is at the down position.)



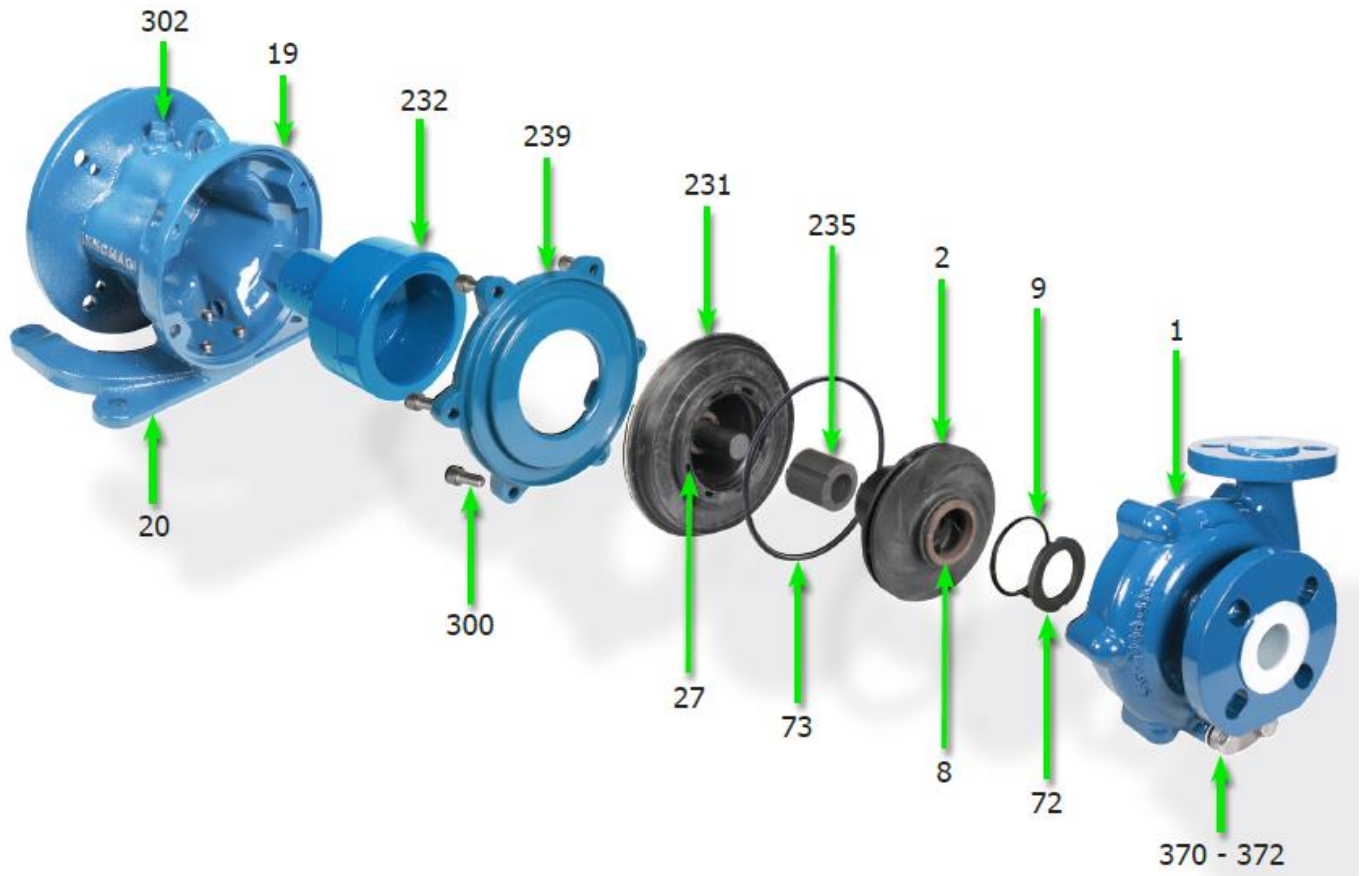
Tighten the second set screw (B). After that, attach the plug and cover it.



Lower the drive end and insert the wet end in a straight line.
* Magnetic force is strong and be careful not to pinch your finger. It recommends to use a resin or wood spacer.



Insert and tighten the 4 socket head cap screws to the bracket. Torque to 27 N·m.



Item No.	Qty	Part Name	Material
1	1	Front Casing Set	Ductile Iron / ETFE Lining
2	1	Impeller Set	CFR ETFE/ Neodymium Iron
8	1	Mouth Ring (Included #2)	SiC
9	1	Retaining Ring	CFR ETFE
19	1	Bracket	Ductile Iron
20	1	Food Riser / Food Adapter	Ductile Iron
27	1	Particulate Control Ring	CFR ETFE
72	1	Front Thrust Ring	SiC
73	1	Gasket	FEP / FKM Core / EPDM
231	1	Rear casing	CFR ETFE / Aramid Reinforced
	1	Shaft (Included #231)	SiC
	1	Rear Thrust Ring	CFR PTFE
232	1	Outer Magnet	Ductile Iron / Neodymium Iron
235	1	Bearing	SiC
239	1	Rear Casing Support	Ductile Iron
300	6+4	M10 Socket Cap Screw	SUS 304
302	1	Plug	SUS 304
370	1	Drain Flange	SUS 304
371	1	Drain Gasket	PTFE

YD-GTN

When disassembling or maintaining the pump by yourself, follow below steps.

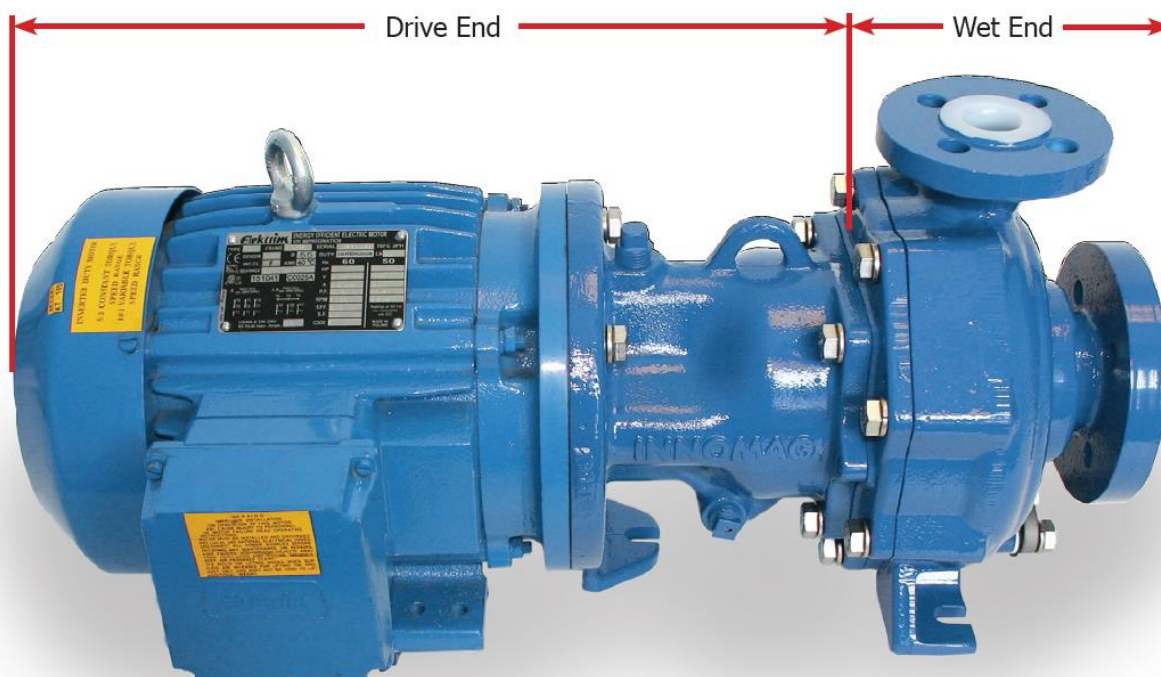
Disassembly is possible to be performed during piping, but it recommends to be repaired them in our factory to reduce the risk of damage of the SiC parts.

DANGER

Install the protective device or turn off the power to prevent a serious injury by starting the motor accidentally.

DANGER

Close all valves controlling flow to and from the pump. Isolate the pump from the system and relive any remaining system pressure.



Needful tools

- ✓ 24 mm Wrench
- ✓ 19 mm Wrench
- ✓ Jack Bolts:
Hex bolts
M16 x 120 (2pcs)
- ✓ 5 mm T handle hex
wrench
- ✓ Torque wrench



Remove the bolt connecting the front casing and bracket.



Remove 4 hex bolts on the bracket.

MAGNETIC

Pumps contain extremely strong magnets, so the use of non-magnetic tools and work place are highly recommended. Clean the work area to be free of any ferrous particles.



Separate the drive end from the wet end by evenly tightening 2 jack bolts.

Note: Jack bolts are not used for 40/50GTN.



Firmly hold the drive end, and quickly pull it away from the wet end. Pull the drive end back at least 15 cm.



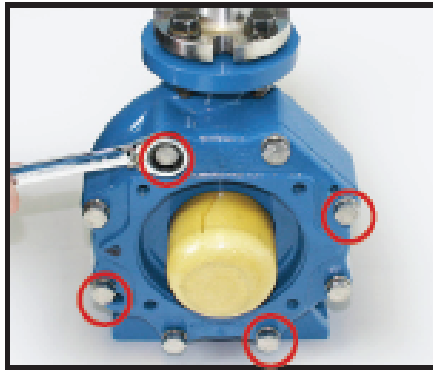
Turn the drive end off to the side to allow space for disassembly of the wet end.

DANGER

When handling hazardous and/or toxic fluids, skin, eye and respiratory protection are required. If pump is being drained, precautions must be taken to prevent injury or environmental contamination.



Remove hex. bolts on the drain flange and drain the pump and individually decontaminate each component.



Loosen all 8 hex bolts and remove the 4 highlighted bolts above. Leave the other 4 bolts loose but still attached to the casing.

NOTE

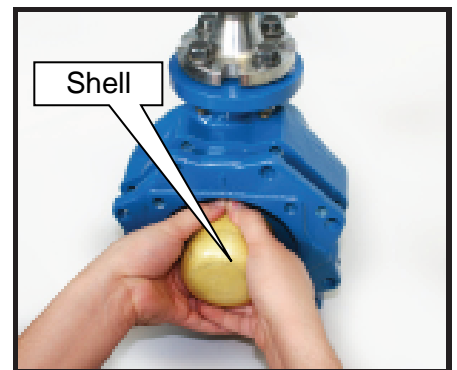
Visually inspect the rear casing support. If it appears loose then you can remove all the bolts and skip the following step. However, if the pump has been in service for a long period of time, it is very common for the rear casing support to be stuck to the casing. In this case, use the following procedure.



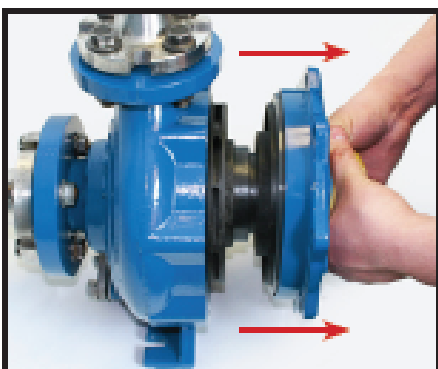
Insert 2 of the bolts you just removed into the jack bolt holes highlighted above and evenly tighten them until the ring break free. Remove all the remaining bolts.

CAUTION

For larger pumps we recommend having two people perform the following procedures in order to decrease the chance of breaking the SiC.



Firmly hold the rear casing shell and use your index fingers and thumbs to support the rear casing support.



Pull the assembly back in a straight line until it is clear of the casing.

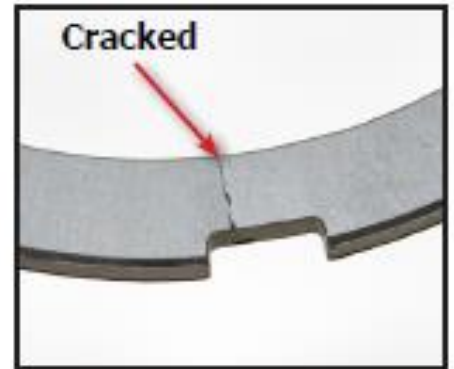


Remove the rear casing and I impeller set from the rear casing support.

Note: Optional, maybe very difficult on pumps in service for long periods of time.



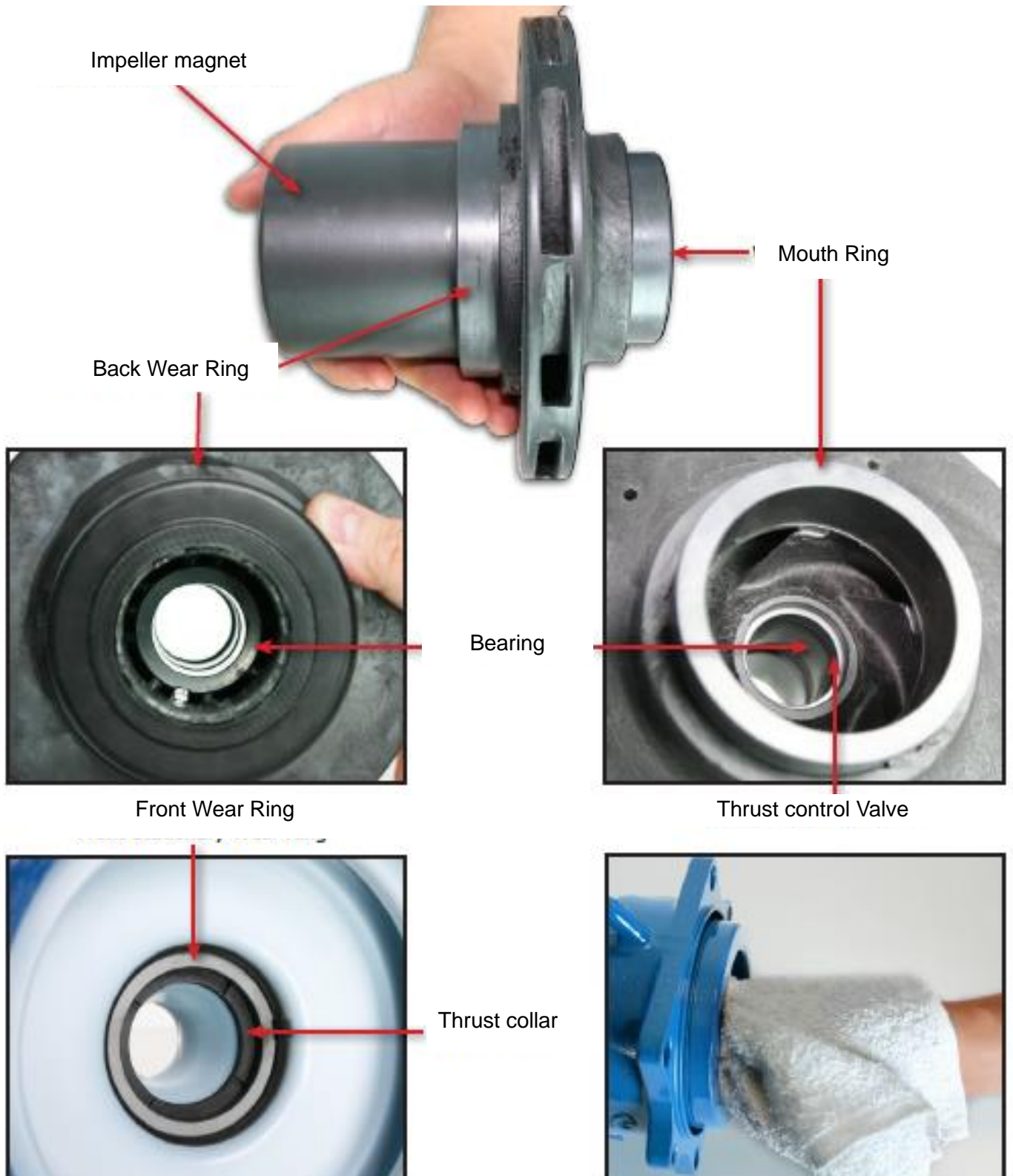
Lift and remove the Impeller set from the rear casing.



When inspecting the pump internals, check all Silicon Carbide (SiC) parts for cracks, chips and scoring marks. Minor chips less than 0.5 mm are acceptable. Inspect all plastic parts for scoring and cracks. Minor scratches or cuts less than 1 mm are acceptable. Wipe the gasket clean. If replacement of any part is required, have a contact with our distributor or us.

Clean with care and inspect the following parts:



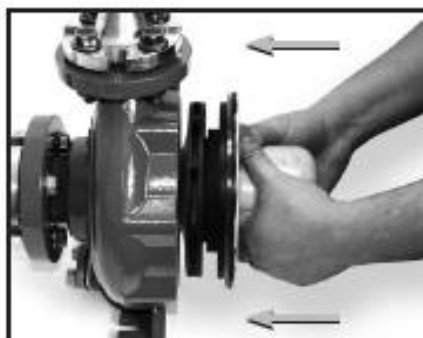


Inspect the casing liner for any abrasion, cracks or delimitation. The casing replacement is necessary if the lining is breached.

Wipe the inside of the outer magnet assembly clean.



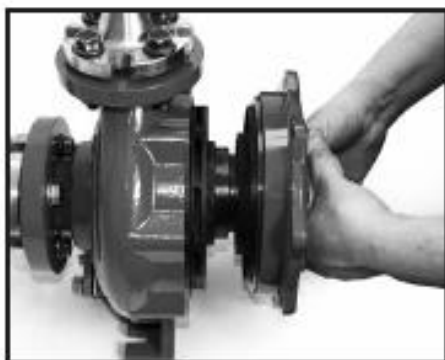
Align and slide the bearing of the impeller set onto the pump shaft located inside the rear casing.



Insert the assembled impeller and rear casing with adjustment the mouth ring and wear ring. Then, hold the assembly and insert the rear casing support.

CAUTION

With larger pumps, we highly recommend following the shop assembly procedure on the following page to eliminate the chance of damaging the SiC. Due to the brittle nature of SiC, all assemblies must be handled with care to avoid chipping or cracking. Thoroughly clean all parts before assembly. Make sure all parts are free of dirt, metallic particles, etc.



If the rear casing support cannot be separated from the rear casing, it is possible to insert this assembly for one piece. Adjust the arrow on the rear casing support as above picture.



Tighten 8 hex cap screws with lock washer.



Torque the bolts to the specification on the torque table.

Bolt size	Torque: kgf·cm (N·m)
M10	275 (27)
M12	620 (61)
M16	1200 (117)



Extend the jackscrews on the drive end. Align the drive end and push it in until the jackscrews meet the wet end.



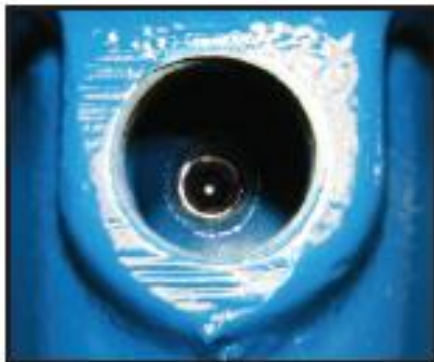
Retract the jackscrews until the two pump halves are mated. Insert and tighten the 4 bracket hex bolts to the torque given in the torque table in this page.

MAGNETIC

The Outer magnet contains very strong magnets. Use caution inserting the jackscrew and plate. Under normal circumstances a visual inspection and wiping clean the inside of the outer magnet is sufficient.



Remove the metal pipe plug from the top of the bracket.



Locate the 2 set screws on the outer magnet.



Loosen the 2 set screw.



Check the 2 screw holes at the center of the outer magnet.



Attach 2 screws on the top by using a tool.



Pull out the outer magnet from the motor shaft by using a tool.



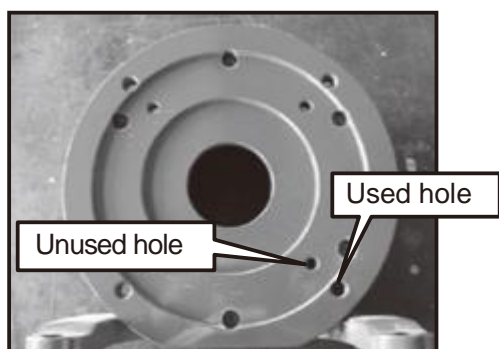
Carefully remove the outer magnet.



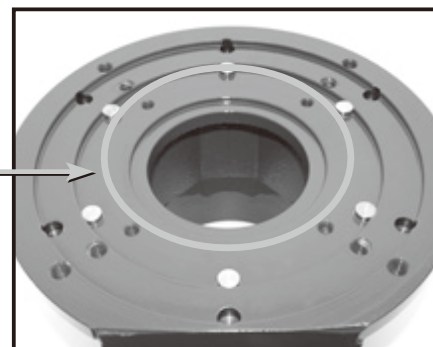
Remove 4 bolts from the bracket.



Remove the bracket from the motor.



When using the bracket which frame is 1.5kW – 7.5kW, flood may occur from unused bolt holes, so close them with aluminum tapes for water proof. However, if they are in the most inner position, it is not needed.



Attach the bracket with the motor and adjust the motor flange and the bracket. Positioning pins (in same cases there is not any pins.) depend on the motor frame.

※When replacing the motor, waterproof the interface of the motor flange (Liquid gasket).



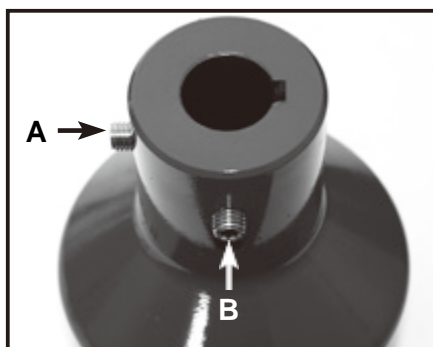
Adjust the position of the motor and bracket.



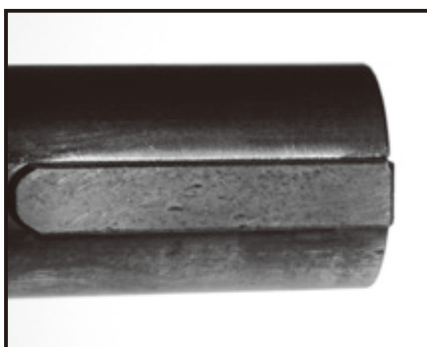
Insert 4 hex. bolts and tighten them by hand.



Tighten them by a wrench.



Check the position of the bolt and key groove before fixing.



Position the key groove of the outer magnet and motor shaft and insert it.





Locate the alignment groove on the outer magnet.



Use a ruler, straight edge or visually align the groove with the bracket.



Rotate the outer magnet until the motor key point down, when the food adapter is down.



Locate the first set screw (A).



Tighten the first set screw with the T-handle Allen wrench.



Rotate the outer magnet until the motor key points to the right, when the food adapter is down.



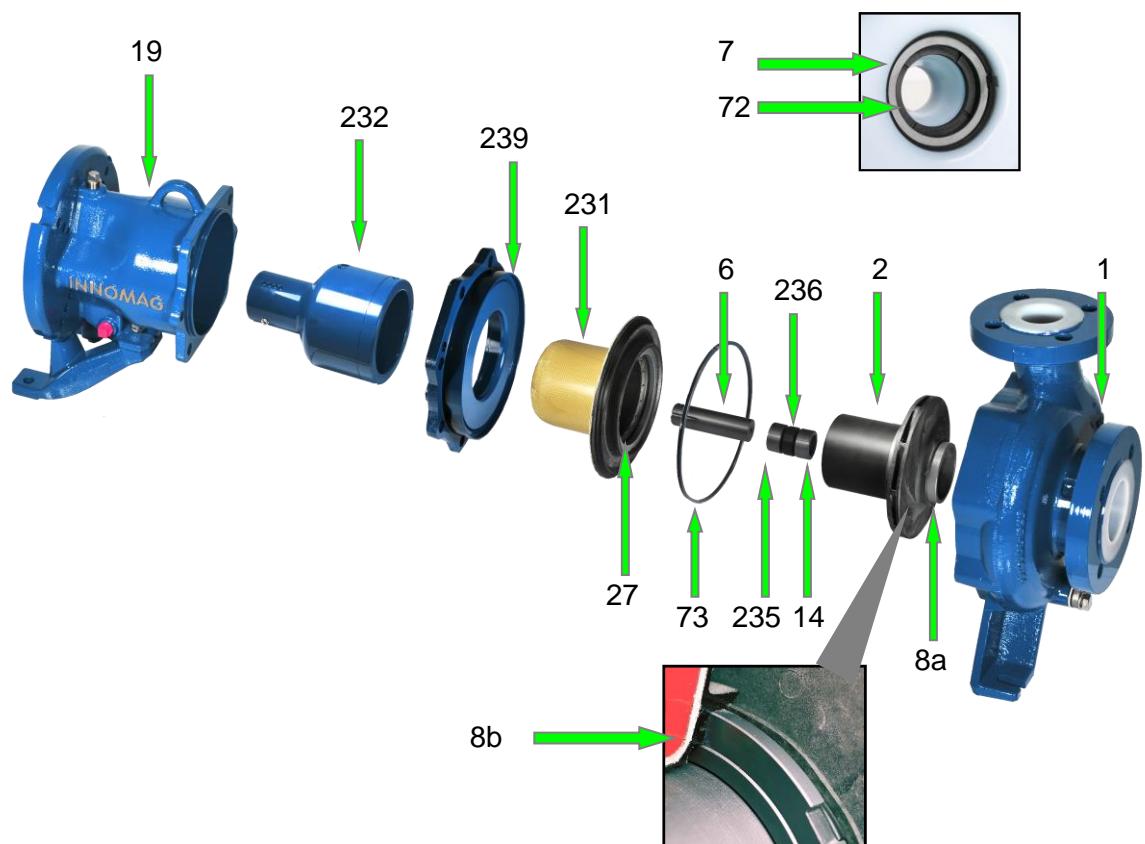
Locate the second set screw (B).



Tighten the second set screw with the T-handle Allen wrench.



Replace the metal plug on the bracket and the drive end is complete.



Item No.	Qty	Part Name	Material
1	1	Front Casing Set	Ductile Iron / ETFE Lining
2	1	Impeller set	CFR ETFE/ Neodymium Iron
6	1	Shaft	SiC
7	1	Front Wear Ring	SiC
8a	1	Mouth Ring	SiC
8b	1	Rotating Back Wear Ring	SiC
14	1	Thrust Control Valve	SiC
19	1	Bracket	Ductile Iron
27	1	Stationary Back Wear Ring	SiC
72	1	Thrust Collar	SiC
73	1	Gasket	PEP / FKM Core
231	1	Rear Casing	CFR ETFE / Aramid Reinforced
232	1	Outer Magnet	Ductile Iron / Neodymium Iron
235	2	Bearing	SiC
236	1	Bearing Spacer	PTFE
239	1	Rear Casing Support	Ductile Iron

Problem	Symptoms	Cause	Remedy
Liquid is not being pumped.	No suction or discharge pressure. Pump power usage is very low.	Pump not primed	Re-prime pump and verify that suction pipe is full of liquid. Check the suction pipe for high points that can trap air.
	Suction gauge reads much lower than normal.	Suction pipe clogged	Confirm that any suction valves or control valves are not stuck shut. Inspect suction pipe for blockage.
	Suction gauge reads normal. Pump generates full discharge pressure but no flow.	Discharge pipe clogged	Confirm that any discharge valves or control valves are not stuck shut. Inspect discharge pipe for blockage.
	Discharge pressure is only slightly higher than suction pressure.	clogged impeller	Open pump and clear blockage from impeller.
	No discharge pressure. Pump makes a loud buzzing noise. Increased vibration.	De-coupled impeller	Shut off pump. Verify that the motor spins smoothly by hand. If motor will not spin by hand, open pump for inspection. If motor spins by hand, confirm that the impeller is sized for operating conditions and liquid specific gravity. Verify the viscosity of the liquid is not too high. Impeller or outer magnet may be weakened if overheated.
	Pump generates full discharge pressure but no flow. Pump casing and pipes immediately before and after pump heat up.	Head requirement higher than anticipated / Undersized impeller	Confirm than discharge line is not blocked or valve is not stuck shut. Pump may require a larger impeller to overcome system head.
Pump not delivering desired head or flow	Suction pressure is negative. (Gauge pressure) Discharge pressure is lower than normal.	Air leak in suction line	Locate and seal the air leak.
	Discharge pressure is lower than normal. Flow rate is decreased. Pump is noisy. Increased vibration.	Insufficient NPSH	Check liquid level in suction tank. Check suction piping for restrictions, or obstructions. Verify vapor pressure and temperature of process liquid. Pump should be located as close to the source as possible.
	Discharge pressure is lower than normal. Flow is reduced.	Backwards rotation	Verify motor rotation and correct if necessary.
	Pump does not reach desired flow rate.	Head requirement higher than anticipated / Undersized impeller	Increase impeller size or motor speed
	Suction gauge is very low.	Strainer device is full / clogged (if equipped).	Clean / empty strainer basket.
Pump starts, then stops pumping	Discharge pressure rises then falls. Pump power usage is very low after pressure drops.	Pump not properly primed	Re-prime pump and verify that suction pipe is full of liquid. Verify there are no high points in suction pipe that can trap air.
	Discharge pressure rises then falls. Pump makes a loud buzzing noise. Increased vibration.	De-coupled impeller	Confirm that the impeller is sized for operating conditions and liquid specific gravity. Verify the viscosity of the liquid is not too high. Impeller assembly or outer magnet may be weakened if overheated.
	Pump operated normally but stops pumping & loses prime. Pump will not run until priming chamber is re-filled.	Suction pipe volume too large for priming chamber	Calculate volume of the suction pipe. It is recommended that the priming chamber volume should be 3 times the suction pipe volume. Decrease suction pipe volume. Move pump closer to source.

Problem	Symptoms	Cause	Remedy
Pump uses excessive power	Burning smell coming from back of pump	Outer magnet installed improperly	Confirm that the groove on the outer drive lines up with the edge of the Bracket.
	Decreased flow. High power consumption. High vibration. Noisy operation.	Damaged or broken wear ring	Inspect the pump and replace damaged components.
	Pump delivers the required flow and head but power consumption is high. High discharge pressure.	Specific Gravity or viscosity higher than expected.	Determine liquid viscosity and specific gravity. Verify the actual power consumption is correct.
	Pump delivers the required head, operates normally. Discharge pressure will be lower if head requirement is lower than anticipated.	Flow is higher than expected. Required head is lower than rated head.	Verify flow with instrumentation or batch cycle time and adjust as needed.
	Pump will produce the rated flow. Discharge head may be decreased. Power will be higher.	Clogged thrust balancing passages in impeller.	Open pump and clean blockage from grooves in between the impeller and bushings.
Pump is noisy or vibrates	No discharge pressure. Pump makes a loud buzzing noise. Increased vibration.	De-coupled impeller	Shut off pump. Verify that the motor spins smoothly by hand. If motor will not spin by hand, open pump for inspection. If motor spins by hand, confirm that the impeller is sized for operating conditions and liquid specific gravity. Verify the viscosity of the liquid is not too high. Impeller or outer magnet may be weakened if overheated.
	Flow and head are normal. Pump or pipes vibrate.	Piping or pump not properly anchored.	Tighten mounting bolts on pump feet and base plate. Confirm that the suction and discharge pipes are properly supported per Hydraulic Institute recommendations.
	Discharge pressure is lower than normal. Flow rate is decreased. Pump is noisy. Increased vibration.	Insufficient NPSH / pump is cavitating.	Check liquid level in suction tank. Check suction piping for restrictions, or obstructions. Verify vapor pressure and temperature of process liquid. Pump should be located as close to the source as possible.
	Discharge pressure may be lower than normal. Flow rate may be decreased. Increased vibration.	Partially clogged impeller is unbalanced.	Open pump and clear blockage from impeller.

Warranty / Repair

1. Warranty period and coverage

- (1) The warranty period is 12 months from dispatched from our factory.
- (2) During warranty period, if the pump breaks down or is damaged at the use under the condition instructed in this manual due to manufacturing defect(s), the failure parts are repaired free of charge.
- (3) Even if the failure occurs within the warranty period, the followings are repaired or replaced for compensation in principle.
 - Breakdown or damage due to different use or safekeeping from the instructions in this manual.
 - Breakdown or damage due to incorrect use or unjust repair or modification.
 - Breakdown or damage as result of pollution, salt damage, gas damage, abnormal voltage or undesigned power (voltage, frequency) as well as fire, earthquake, flood disaster, lightning strike or other natural disaster.
 - Abrasion or degradation of consumable parts like a Gasket or O-ring.
 - Breakdown or damage during transportation, for relocation or fall after your purchase
- (4) We cannot be responsible for the break down or damage of the customer-specified pump.
- (5) Irregularities or breakdowns due to chemical or hydrodynamic corrosion by liquid are not covered under the warranty. The material chosen at the time of the contract is only a recommendation. We do not guarantee the chemical resistance of the material.
- (6) If the determination of the cause for the breakdown or damage is questionable, it attributes to the negotiation between the customer and us.
- (7) Expenses or other damage incurred as a result of breakdowns at the use under the different condition from the instruction in this manual are not covered under the warranty.

2. Repair

Notice:

For repair, consult the supplier. When returning a pump, thoroughly clean and pack the wet parts kit.

If irregularities are detected during operation, stop the operation immediately for check. (Refer to the section on “troubleshooting”).

- (1) Consult your supplier or us for repair.
- (2) Read this manual again and re-check before requesting repair.
- (3) When visiting to a distance location for repair, the travel expenses are charged.
- (4) Inform the followings when requesting repair.
 - Model name and serial number
 - Use duration and condition
 - Damages parts and condition
 - Liquid (Name, Specific gravity, Temperature, Slurry)

If liquid leaks during transportation, it is very dangerous, so make sure to clean inside thoroughly. When ordering replaced parts, specify the name in the parts name list (P17,27).

Although, inform the parts' number and material, too.

Installation record

Model:	
Purchase date:	Serial number:
Start date:	Supplier: