

Installation

Check the following before beginning installation:

! WARNING

- Before insulation resistant measurement, always disconnect the power first.
- All electric work should performed by a qualified electrician and all national and local electrical codes must be observed.

1. Location

- (1) This pump should be installed indoors if it is to be used outdoors. Some type of roof or covering will be required to protect the pump from the weather.
- (2) Install where inspection and maintenance can be easily performed.
- (3) Provide suitable enclosure to prevent entry of unauthorized persons.
- (4) Install pump as close to water source as possible Suction height (from surface or liquid to center of pump) should be as low as possible, and suction piping should be short.
- (5) Suction head should be less than 6 meters in certain cases, such as with hot water, suction head must be lower. To minimize suction piping loss, excessive use of elbows and valves should be avoided.

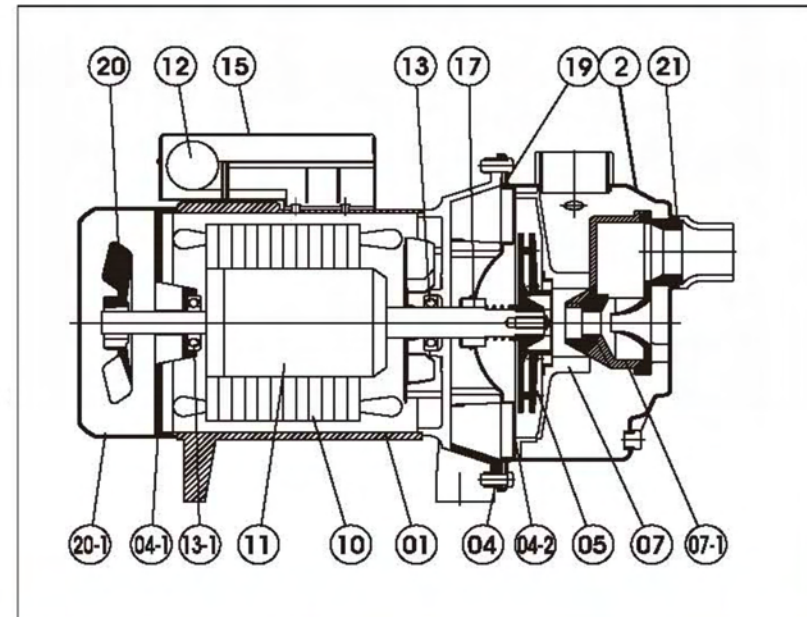
- b. Install a foot valve at the end of the suction piping to block the entrance of foreign matter.
- c. Suction piping should be inclined upward (over 11100) in relation the pump to prevent formation of air pockets. Pipe joints must be tight so that there will be no possibility of air suction.
- d. Keeps suction piping as short end straight as possible. Do not attach a sluice valve.
- e. Install the suction reducer as shown in Fig.1 to prevent the formation of air pockets. The suction reducer is available as a separate special accessory.
- (6) For the influx system, we recommend that you install a cut-off valve on the suction piping to facilitate disassembly and inspection.

2. Piping

- (1) Use adequate support for suction and discharge piping to prevent pump and motor from becoming off-center.
- (2) A check valve must be installed between the pump and the discharge valve in the following cases: when suction piping is long; when actual head is high; when pump is automatic; when water is being pumped to pressure tank; and when two or more pumps are in parallel operation.
- (3) Install an air-release valve in piping to prevent to unavoidable formation of air pockets due to construction. Note however, that an air-release valve must not be installed where pressure may drop below atmospheric pressure since the valve may suck in air instead of expelling it.
- (4) To reduce effect of water hammer install such a device as a quick-closing check valve.
- (5) Suction system
 - a. The end of the suction piping should be submerged to a depth of at least twice the diameter (D) of the piping, and should be at a distance between 1 to 15 times the diameter of the piping from the bottom of the pit.

Construction

SJ Series



No.	Description	Material
01	Motor casing	Aluminum
02	Pump casing	SUS 304
04	Bearing upper cover	FC-20/Aluminum
04-1	Bearing lower cover	BC-6
04-2	Plate	SUS 304
05	Impeller	PC+Fiber
07	Diffuser	PC+Fiber
07-1	Suction	Nozzle
10	Stator	
11	Rotor & shaft	SUS 410
12	Capacitor	
13-1	Bearing	
13-2	Bearing	
15	Terminal box	ABS
17	Mechanical seal	CE/CA
19	O-Ring	NBR
20	Motor coolingfan	N YLON 66
20-1	Fan cover	Steel

Operation

1. Before starting

To rotate by hand, remove the motor end cap and turn.

- (1) Prime the pump. Operating the pump without prime will cause breakdown. Open air-release valve and prime pump. If the piping is already full of water can be

supposed to be filled up to the discharge outlet, open the suction valve, discharge valve and air-release valve to prime.

- (2) Rotate the pump by hand when priming to remove the pump internal air from casing.

2. Operation

!CAUTION

Check rotation. Correct rotation is clockwise when viewed from top of motor. Pump should be started with gate valve closed, then the operator should open the valve gradually.

- (1) Close the air-release valve and discharge valve after priming has been completed. If there is a suction valve, open completely.
- (2) Turn operation switch in and off two or three times to check operating condition.
- (3) Begin continuous operation and gradually open discharge valve.
- (4) Check the pressure, current, vibration and noise (refer to Maintenance and service) are at normal levels. Both the pressure gauge and compound gauge cocks should be kept closed except at specified times. Leaving them open may lead to malfunction.
- (5) If there is no check valve on the discharge piping, close the discharge sluice valve slowly when stopping pump operation. Turn of operation switch after the sluice valve has been completely closed.
- (6) Subsequent operation can proceed without checks, if all conditions are normal.

Maintenance and Service

! WARNING

- Disconnect power cable from power source before servicing unit.
- Normal maintenance should be done by qualified personal.

Check pressure, output, voltage, current, vibration, and other specifications. Unusual readings may indicate a problem requiring immediate service. Contact your local representative as soon as possible.

1. Daily inspection

- (1) Pressure or current variations, abnormal vibration or noise are signs of malfunction. Refer to troubleshooting and make necessary repairs as soon as possible. We recommend that you keep record of daily operating conditions so that you will be able to detect early signs of trouble.
- (2) The maximum allowable bearing operating temperature should not exceed 80°C.
- (3) There should be no leakage if shaft sealing mechanical seal is normal.

2. Carefully observe the following:

- (1) Operating the pump for an extended period of time with the discharge valve closed with eventually cause pump component to be damaged.
- (2) Too frequent starting and stopping of the pump will eventually cause damage. Keep pump starting frequency to a minimum.
- (3) Be sure to turn off operation switch in event of power failure. It is dangerous to leave the switch on as the pump will suddenly start when power is restored.

3. Carefully observe the following when the pump is to be stored or remain idle for any length of time:

- (1) Water remaining inside an idle pump will freeze in cold weather and cause the pump casing to burst. Be sure to insulate pump or drain water completely.
- (2) Operate any auxiliary pumps occasionally to maintain best usable condition.

4. Replaceable parts

- (1) Replace parts indicated in following chart as necessary.

Replaceable part	Mechanical Seal
Replacement guide	When there is leakage
Average replacement frequency	

Replaceable part	"O" ring
Replacement guide	When disassembling to inspection
Average replacement frequency	

Troubleshooting

!CAUTION

All service should be done by factory trained or qualified personnel only.

Trouble	Cause	Remedy
Motor does not start	(1) Motor malfunction (2) Power source malfunction (3) Rotating parts in contact, rusted, burnt out. (4) Foreign matter clogging contacting parts	(1) Repair motor (2) Inspect, repair, or consult power company (3) Manually rotate, reassemble. Have-repaired in special shop. (4) Remove foreign matter
Pump is operating but there is no water discharge. Does not obtain specified discharge volume	(1) Pump not primed (2) Valve closed, insufficiency open (3) Excessive piping loss (4) Suction height too high for pump (5) Cavitations (6) Rotation direction reserved (7) Rotation speed low <ul style="list-style-type: none"> ● Wrong number of poles in motor ● 60 Hz pump being used in 50 Hz area ● Voltage drop (8) Impeller clogged (9) Piping clogged (10) Air suction (11) Foot valve or suction piping end not submerged sufficiently (12) Discharge piping leakage (13) Impeller corroded (14) Impeller worm (15) Casing being warm (16) Liquid temperature too high. Volatile liquid.	(1) Prime (2) Open valve (3) Re-examine original plan (4) Consult specialist (5) Correct rotation direction (6) Check with tachometer <ul style="list-style-type: none"> ● Check nameplate and change ● Check power source and remedy (7) Remove foreign matter (8) Inspect, repair suction piping, shaft sealing (9) Extend suction piping and submerge end to submerge end to sufficient depth. (10) Inspect, repair (11) Check quality of liquid and consult specialist (12) Replace impeller (13) Replace casing ring (14) Re-examine original plan
Water discharge but soon stops	(1) Insufficient priming (2) Air suction (3) Air pocket in suction piping (4) Suction height too high for pump	(1) Prime sufficiently (2) Inspect, repair suction piping, shaft sealing (3) Reinstall piping (4) Re-examine original plan
Overloads (over current)	(1) Head low. Excessive volume flow. (2) Rotation speed low <ul style="list-style-type: none"> ● Wrong number of poles in motor ● 50 Hz pump being used in 60Hz area (3) Rotating parts in contact. Shaft bent (4) Liquid density, viscosity too high	(1) Partially close discharge valve (2) Check with tachometer <ul style="list-style-type: none"> ● Check nameplate and change (3) Have repaired in specialist shop (4) Re-examine original plan
Pump vibrates Excessive noise	(1) Piping vibration (2) Rotation direction reserved (3) Rotating parts in contact. Shaft bent (4) Cavitations (5) Excessive discharge volume (6) Insufficient discharge volume (7) Excessive pump operation with discharge valve insufficiently open	(1) Reinforce piping support (2) Check with arrow and rewire (3) Have repaired in specialist shop (4) Consult specialist (5) Partially close discharge valve (6) Operate specified flow level (7) Open sufficiently
Leakage from shaft seal	(1) Damage mechanical seal (2) Shafts sive influx pressure (3) Shaft bent stallation of packing	(1) Replace piping support (2) Replace with new pars (3) Have repaired in special shop

Installation

3. Electrical Wiring

! WARNING

- Check that the power is locked off and disconnected before working on pump.
- All electric work should performed by a qualified electrician and all national and local electrical codes must be observed.

!CAUTION

Measure the insulation resistance. The value shoule be more than 1 mega ohm. While making the Measurement keep the power supply cable off the ground

!CAUTION

Before installation check rotation. Correct rotation is clockwise when viewed from motor side. Reard ELECTRICAL WIRING.

- (1) Refer to Fig. 2 for correct wiring it is important that wining be correct and that motor is properly grounded.
- (2) Check the following points before tuning on operation switch
 1. Is the fuse the right type?
 2. Is the wiring correct?
 3. Has motor been grounded?
- (3) With a three-phase motor check for a loose or completely detached connection. Operating on only two terminals will result in phase omission, casing motor bum out.
- (4) Terminal voltage in motors bearing the nameplate may be within $\pm 10\%$ of the rated voltage. Exceeding this range will lead to breakdown.
- (4) Overloading the motor beyond the prescribed limit will reduce its efficiency, is not economical and will eventually lead to motor malfunction. We recommend that a protective motor relay be installed to prevent burnout caused by overloading.

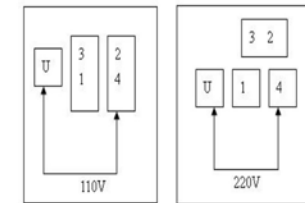


Fig.2

Disassembly and Assembly

!CAUTION

All service should be done by factory trained or qualified personnel only.
Be sure to cut off power source before beginning disassembly

1. Disassembly

When disassembling pump, have a piece of cardboard or plywood ready to place the parts on as you work. Do not pile parts on top of each other. They should be laid out neatly in rows the "O" ring can not be used again once they are removed. Have replacement parts ready. Disassemble in the following order, referring to the sectional view.

Be sure to cut off power source before beginning disassembly.

- (1) Drain all water from casing
- (2) Remove the casing cover bolts, and remove casing cover and motor from casing. You will now be able to inspect the inside of the pump. Check for wear and other abnormal signs. Replace casing ring when wear approaches 1mm.
- (3) Remove impeller nut (right hand thread) and impeller washer (some models do not have one), and remove impeller from casing. If the impeller is rusted and will not come loose, tap its end lightly with a wooden hemmer to release.
- (4) Remove the impeller key from the extension shaft. At this point in disassembly, the fixed portion of the mechanical seal is attaches to the casing cover and the rotating portion to the main shaft in the casing cover with a screw driver of similar tool.
- (5) Remove the bracket bolts, and remove the bracket from the motor.
- (6) Remove the extension shaft and take-out from the motor.

2. Assembly

Re-assemble in reverse order of disassembly.

Re-assemble of following points.

- (1) Mechanical seal type: Wipe contacting part of mechanical with a dry cloth.
- (2) Replace "O" ring with a new one.
- (3) Replace all parts that are excessively worn or damaged.
- (4) Tighten all bolts evenly.

Please obtain "O" rings and other parts from pump dealer. The table of dimensions is given in "Maintenance".

Instruction Manual

Stainless Steel Jet Pump

MODEL: SJ



Safety Information and Instruction

! WARNING

- Before handling this pump, always disconnect the power first. No open flame or use sparkable electrical devices or flames in a septic (gaseous) or possible septic sump.
- Do not work under heavy suspended object unless there is positive support under it to stop its fall in event of sling or hoist failure. Disregard of this warning could result in personal injury.
- This pump should only be service by a qualified person or factory trained person

!CAUTION

This instruction manual includes necessary items for installation, operation and maintenance. Read this manual carefully to ensure correct installation, operation and maintenance. Be sure to keep this instruction manual on hand for future reference.

Design of this Milano pump is based on superior engineering and long experience. To prevent trouble and provide satisfied operation and long life, it is important to understand the Milano pump thoroughly by careful study of this manual. If any questions arise regarding this manual, please direct them to us.

Specifications

!CAUTION

Be careful not to exceed the given specification in the use of your product.

Check the following points upon receipt of your pump:

- (1) Is the pump exactly what you ordered? Check the nameplate. It is especially important that you check whether the pump is to be used with 50Hz.
- (2) Has any damage occurred during shipment? Are there any bolts or nuts loose?

- (3) Have all necessary accessories been supplied? (For a list of standard accessories see Construction).

We recommend that you keep a spare pump in hand in case of emergencies. Keep this instruction manual in a safe place for future reference.

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