

Motorized Gear Pump AMO-II-150S

INSTRUCTION MANUAL

- For your safety, read and understand this Manual thoroughly before handling the pump.
- Keep this Manual at a designated place for easy access at all times.

Introduction

■ System Application

This Motorized Gear Pump “AMO-II-150S-Type” is designed to lubricate each point on a machine by delivering relatively small amount of oil through a metering valve.

Do not use this system for any other purposes.

■ Marks used in Manual

In this Manual, safety precautions are provided using the marks below in order to prevent accidents which might cause injuries to human bodies. Be sure to carefully read these safety precautions to understand the contents thoroughly before handling the pump.

 WARNING	Indicates a potentially hazardous situation which, if ignored, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if ignored, may result in minor or moderate injury.

In addition to the above, the marks below will also appear in this manual. Please read the following explanation in order to handle the pump correctly.

	Indicates referential information or points to which special attention should be paid while handling the pump. If ignored, the pump and/or the machine could be damaged.
	Indicates referential information or points which are helpful for handling the pump.
	Indicates a reference clause.

■ Questions/Contacts

If any question or doubt arises concerning the contents of this Manual, contact following:

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■ Details of Contents

Details of all illustrations and specifications in this Manual are subject to change without prior notice for improvement and development of the pump.

■ Resale or Leasing

At the time of resale, leasing out or lending out the pump to the third party, make sure to include with the pump all the manuals and any other documents found supplied at the time of initial installation.

■ Disposal of Pump/Oil

Make sure to dispose pump or oil as designated by National laws and/or local regulations.

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1. Safety Precautions

1-1 Basic Safety Precautions



- Carefully read this Manual to understand the contents before handling the pump.
- Keep this Manual at a designated place for easy access at all times.
- This pump is handled by only personnel who have the knowledge and skill of its installation and adjustment.
- Never modify or change this pump without prior permission of LUBE.

1-2 Labels

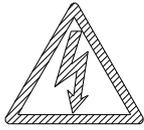
The following labels are affixed on the pump. If any label gets damaged or becomes illegible, contact LUBE immediately. A new one will be supplied at your own cost.



- Strictly observe the instructions on the labels affixed to the pump.
- Never remove from nor disfigure any labels on the pump.

1-2-1 Types of Labels

①



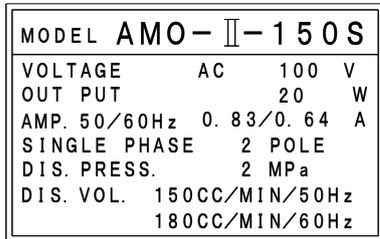
②



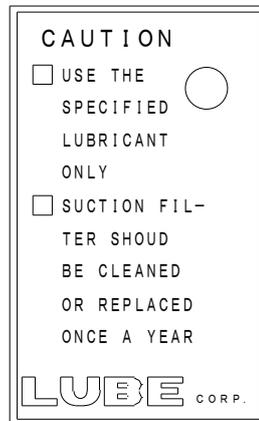
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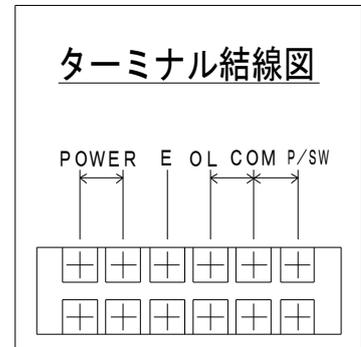
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⑤



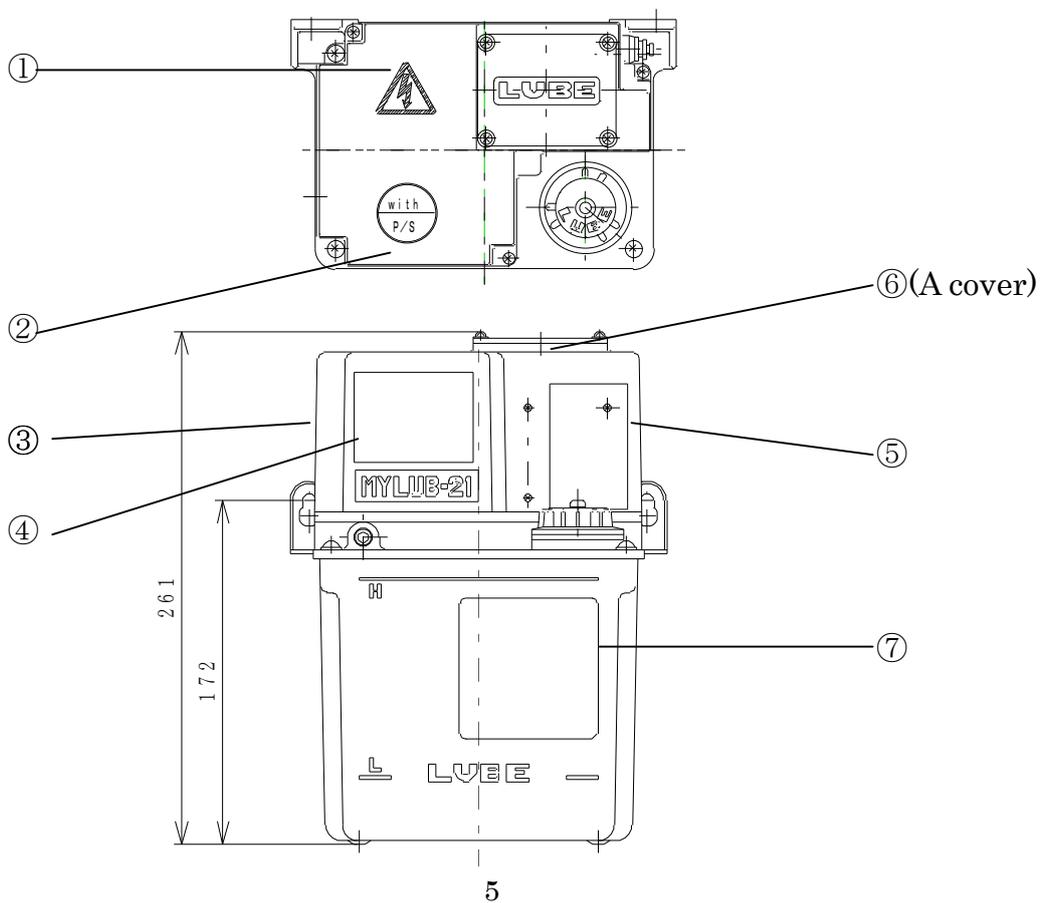
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⑦



1-2-2 Location of Labels



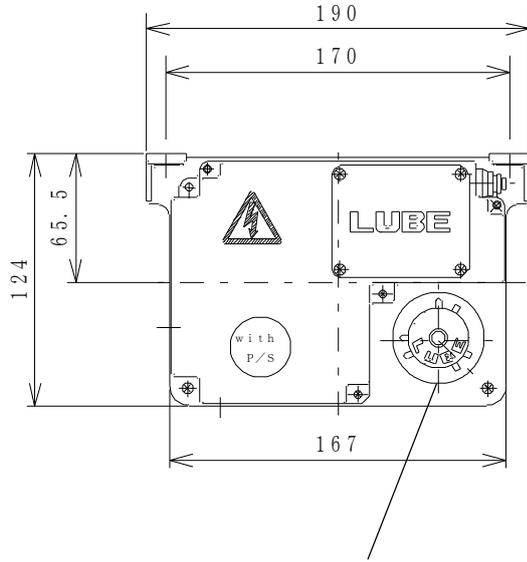
2. Specifications and Outline

2-1 Specification

Item		specification		
Power Supply		AC100V \pm 10%, ϕ 1	AC200V \pm 10%, ϕ 1	
Motor	Rated Voltage	AC100V \pm 10%, ϕ 1	AC200V \pm 10%, ϕ 1	
	Frequency	50/60Hz	50/60Hz	
	Rated Output	20W 50/60Hz	20W 50/60Hz	
	Rated Amperage	0.83A (50Hz) 0.64A (60Hz)	0.41A (50Hz) 0.33A (60Hz)	
	Insulated Kind	E kind		
	Direction of Rotation	Judging from the output spindle side, it is a clock direction		
Protector	Circuit protector	1A	0.5A	
Pump	Delivery	150ml/min(50Hz) 180ml/min(60Hz)		
	Discharge Pressure	2.0MPa (Relief valve set pressure)		
Abnormal output	Oil level switch	Contact type	A contact (on at low level)	
		Rated load	AC,DC200V,0.5A,30W whichever is smaller	
	Pressure switch	Contact type	A contact	
		Rated load	AC 120V/240V-135VA DC 28V,2A	
		Working pressure	1.7MPa	
		Returning pressure	0.9MPa	
Tank	Total capacity	1.8 litter, 3.0 litter		

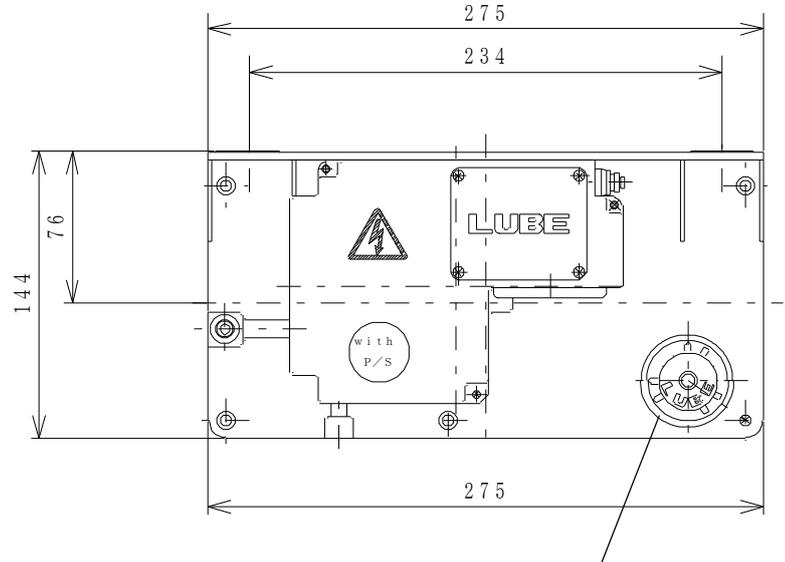
2-2 Name of Each Component

■ AMO-II-150S-1-P,
AMO-II-150S-2-P
(1.8ℓ with Tank)

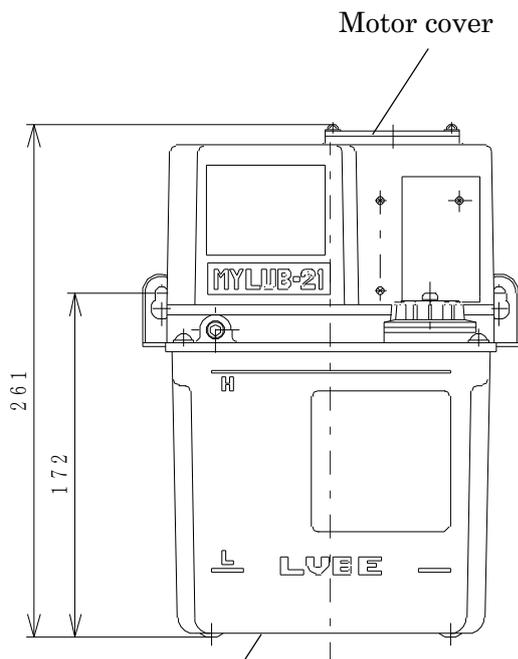


Refilling port

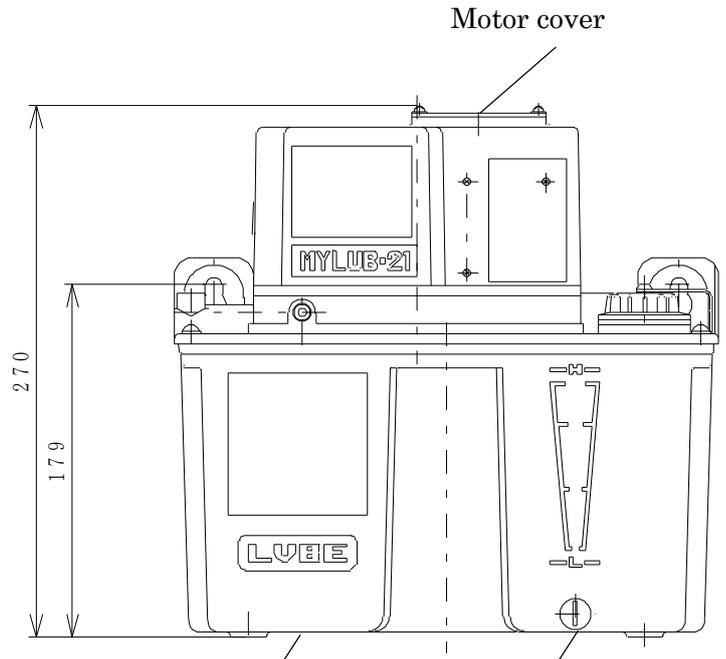
■ AMO-II-150S-1-P-3,
AMO-II-150S-2-P-3
(3.0ℓ with Tank)



Refilling port



Tank



Tank

Drain plug

3. Installation

3-1 Environmental Requirement

Be sure to this pump in the following environment.

- Ambient temperature : 0 ~ +40°C
- Humidity : 35 ~ 85% RH

3-2 Mounting Unit



Make sure to fix the pump firmly.
Insufficient mounting of the pump could fall itself and cause injury.

Be sure to fix the pump against the vertical and flat surface, which can sustain its weight sufficiently.

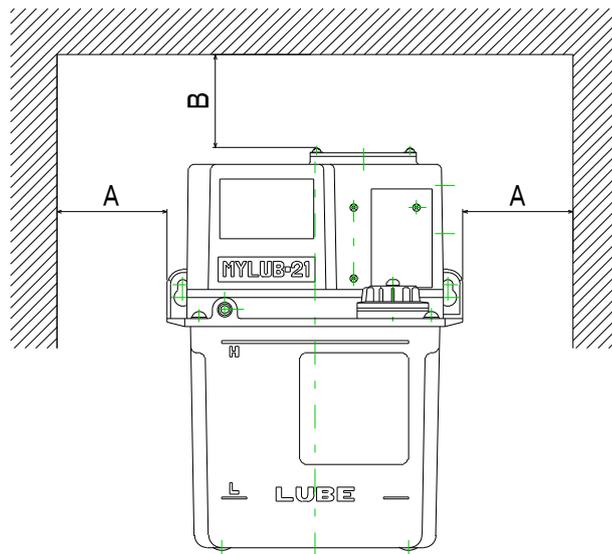
Mount and fix the pump firmly using two (2) M6 bolts (1.8ℓ with Tank) or M8 bolts (3.0ℓ with Tank).



LUBE recommends anti-vibration rubber to be applied when the pump is exposed to vibration.

Be sure to allow necessary space around the pump as shown on the next page for operation and maintenance.

■ Weight of the pump and required space



Pump model	Code number	Voltage (V)	Tank (ℓ)	Weight (kg) (see note below)	Required space (mm)
AMO-II-150S-1	202067	100	1.8ℓ	3.2	A:150 B:200
AMO-II-150S-2	202068	200			
AMO-II-150S-1-P	202071	100			
AMO-II-150S-2-P	202072	200			
AMO-II-150S-1-3	202069	100	3.2ℓ	4.0	A:150 B:200
AMO-II-150S-2-3	202070	200			
AMO-II-150S-1-P-3	202073	100			
AMO-II-150S-2-P-3	202074	200			



* : Note: The weight of oil is not included.

AMO-II-150S-1-P-3

Tank capacity Not:1.8ℓ
 3 :3.0ℓ
 Pressure switch P :It is
 Not:It is not
 Rated Voltage 1:100V
 2:200V

3-3 Wiring



WARNING

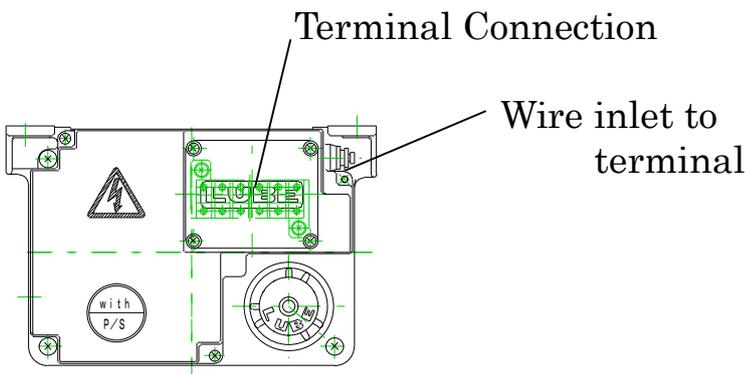
Only qualified personnel electrical work can connect wiring.

Rotatory direction of a motor is only constant direction. Wiring please refer to terminal connection.

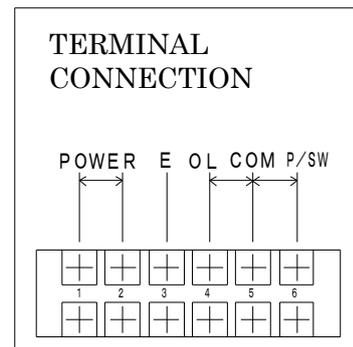
Make sure that you attach the terminal block to a good ground.

If the outgoing cord touches the outside surface of the equipment or other objects or if it comes in contact with the hand of the operator, use an insulated cord.

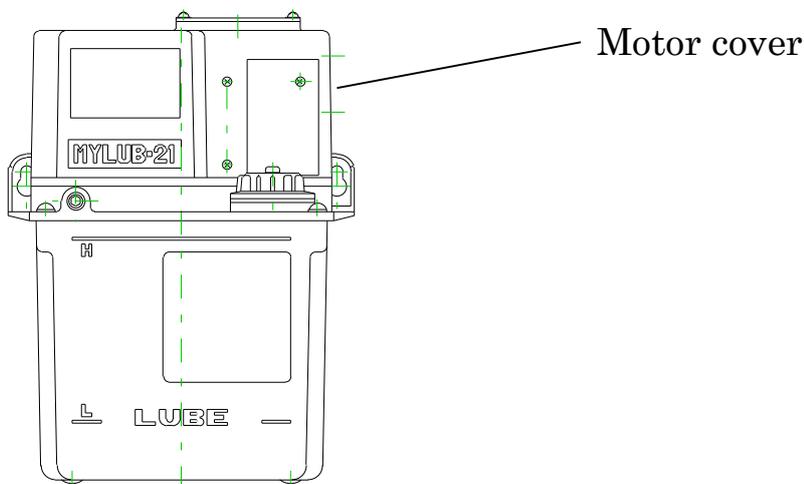
● Terminal



● Terminal Connection



※It is stuck on the inside of a terminal cover



3-4 Tubing connection

Connect tubing to the machine to the discharge Port (Rc1/8).



Use tubing good for the pressure 3.0 MPa or higher.

Fix the joint with hands and then tighten it 2/3 turns with a spanner.



Clamping torque please refer to “Tightening Level for Connecting Section”

After connection, make sure there is no grease leakage from the joint. Make sure to bleed air from the tubing and the pump after connection.

4. How to Control the Pump

4-1 Method of setting the timer

Install timer(s) on the machine and set the Discharge Timer and Interval cycle as defined below.

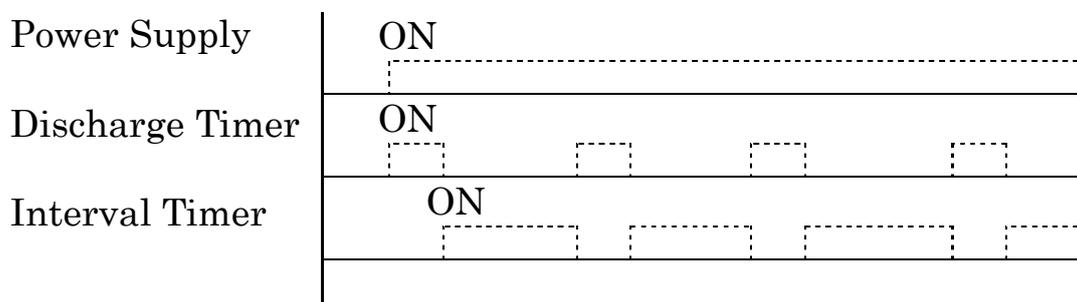


When set the continuous “ON”, discharge from the valve is made only one time and oil does not get to the lubrication points after that.

- ① Power supply from the machine controller for the pump “ON”.
- ② Discharge timer “ON”. (Timer on the machine)
 - Pump discharge time :Less than 90 second
- ③ Interval timer “ON”. (Timer on the machine)
 - Pump interval time :More than 2 minute
- ④ Repeat from ② to ③.



Please keep absolutely quiet about a pump discharge condition. Temperature of a motor rises a discharge condition when it runs outside, and a pump stops.



4-2 Abnormal output

(1) Low oil level

When the oil level gets to the low level position, low level switch works and outputs the signal.



Refer to “5.Lubricating oil and refilling”.

(2) Pressure abnormality

When the pressure in the main tube increases to over 1.7MPa during pump operation, pressure switch operates and outputs the signal.

When there is no output, it is pressure abnormality.



To check and take necessary steps for the failure of insufficient discharge pressure, refer to “6-2 Troubleshooting”.

4-3 Pump protector

The pump is equipped with a circuit protector to protect the pump.

When the circuit protector trips, after removing the cause, press the recovery button.

When the circuit protector is operated, always make sure to operate the pump with the RESET & FEED key to check for correct operation.

5. Lubricating oil and refilling

5-1 Lubricating oil to be used

Use industrial lubricating oil in the range from 68 to 1800 mm²/s of ISO viscosity.



Do not use any lubricating oil other than that which has been recommended.

Use lubricating oil of the same grade made by the same manufacturer.

5-2 Refilling lubricating oil

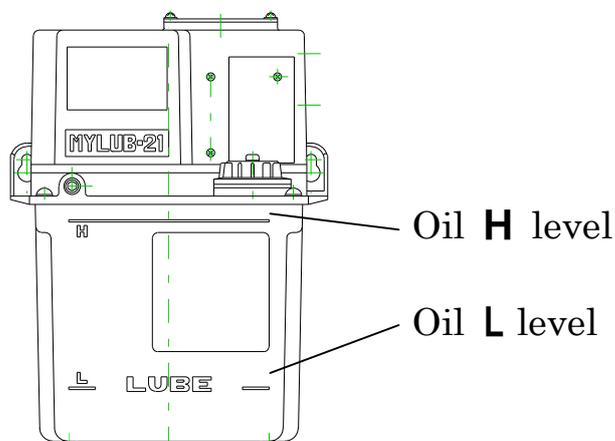
Refill lubricating oil when the level gauge on the tank shows “L”. In case of using oil level switch, refill oil when signal for low oil level turns on.



Use new lubricating oil. If lubricating oil contains any foreign substances, clogging may occur, causing the pump to stop discharging oil.



If lubricating oil overflows or leaks, wipe off the overflowing or leaking oil.



6. Maintenance



Before conducting maintenance on the pump, turn off the power and make sure that the pump is not operating. Conducting maintenance with the power turned on will increase the risk of the operator getting an electric shock or the fingers being pinched in moving parts of the pump drive unit. Also make sure that the supply of air is cut at the air supply source.

6-1 Suction filter

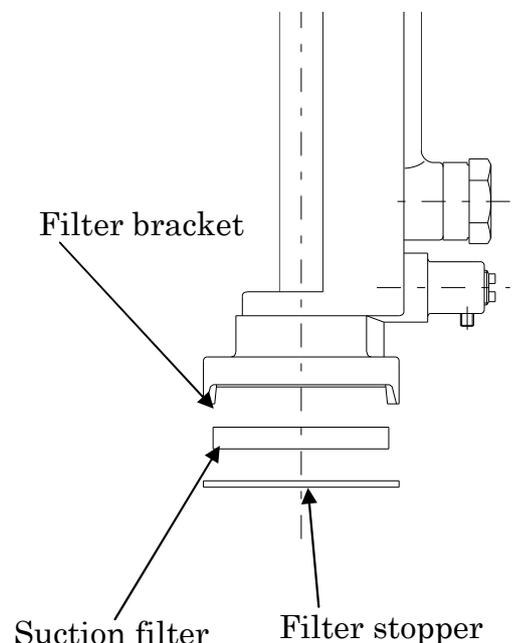


Replace or clean filter once a year.

Proper lubrication cannot be expected if the suction filter is clogged or become dirty because oil may not sucked well Clogged or dirty suction filter may cause over load, too.

Replacement of suction filter

- 1) Tank off pump from tank
- 2) Hold the filter stopper located under the filter bracket using your fingers to remove it from the filter bracket.
- 3) Remove the suction filter located filter bracket in the filter bracket.
- 4) Replace or clean filter.
- 5) Insert the suction filter into the filter bracket.
- 6) Set the filter stopper by inserting both its ends into the holes of the filter bracket firmly.
- 7) Set pump on the tank.



6-2 Troubleshooting

When troubles occur, take the measures as defined in the chart below.

Trouble	Cause	Measures to take
No oil discharged from pump	Low oil level	Refill the same oil in use  Refer to “5. Lubricating oil and refilling”
	Clogged suction filter	Clean or replace filter, or change oil to new oil  Refer to “6-1 Suction filter”
	Damage in the tubing inside the pump (Twisted, crashed, or disconnected)	Tighten or replace the connecting parts
	Viscosity is too high, so that oil can not be sucked	Recheck oil in use and replace it to proper oil  Refer to “5. Lubricating oil and refilling”
Pressure in main tubing is not built up	No oil discharged from pump due to any of above causes	Refer to above measures
	Air in the tubing	Take off closure plug(s) at the end and operate pump and bleed air in tubing
	Foreign particle(s) at the ball seating section of relief valve	Contact LUBE
	Pump discharge low pressure due to relief valve wrong pressure setting	Contact LUBE  The relief valve pressure has been set before shipment

Trouble	Cause	Measures to take
Pressure in main tubing is not built up	Oil leaking from pump discharge port or pipe connection parts on machine (Due to looseness or excessive tightness)	Tighten them with proper torque or re-pipe them  For proper torque refer to “Tightening Level for Connecting Sections” of the next page
	Damaged tubing	Replace damaged tubing
Air in the system	Air in the system due to above reasons	Refer to above measures for “Air in the pump” and “Air in the tubing”
	Due to low level of oil in tank, air is introduced into pump	Refill tank with same or equivalent oil and then bleed air
	Bad tubing connection	Tighten the connecting part or replace it
No oil discharged from valve(S)	Pressure does not increase	Refer to above measures for “Pressure in main tubing is not built up”

■ Tightening Level for Connecting Section

	Tightening level	Reference torque (N·m)
OD 4mm nylon pipe (Valve discharge port)	Turn compression bushing with hands until it stops and then tighten it 2/3 turn with a spanner ,etc	3.5
OD 4mm copper tubing & steel tubing (Valve discharge port)	Turn compression bushing with hands until it stops and then tighten it 2/3 turn with a spanner ,etc	4.1
OD 6mm copper tubing & steel tubing (Undercut joint)	Turn the nut part with hands until it stops and then tighten it 2/3 turn with a spanner ,etc	3.5
OD 6mm copper tubing & steel tubing (Undercut joint)	Turn the nut part with hands until it stops and then tighten it 2/3 turn with a spanner ,etc	4.1
Taper screw for tubing Rc1/8 (Pump discharge port & junction)	Turn the undercut joint with hands until it stops and then tighten it two and a half to three turns with a spanner ,etc	7.1

Appendix. Oil Contamination

Causes and Measures

■ Causes

Causes for contamination can be divided into two categories.

- Before the completion of installation
Foreign particles in the tubing or pump tank.
(Manufacturing defects of the assembly parts or connecting parts and unconformity during construction.)
- During operation
Foreign particles from outside or generated inside of the system.
(Condensation of the moisture in the air due to change in temperature or sludge by oxidation of lubrication oil itself.)

■ Measures

1. Clean the tank and remove the foreign particles.
2. Keep the oil for refilling in the proper place.
If the system is installed and/or oil is stored outdoors, proper care must be taken since introduction of dust or rain into the oil would lead to system malfunction.