

# Motorized gear pump

AMS

# 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

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## System application

This motorized gear pump“ AMS ”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.

 <b>WARNING</b>	Indicates a potentially hazardous situation which, if ignored, could result in death or serious injury.
 <b>CAUTION</b>	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

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## 1-1 Basic safety precautions

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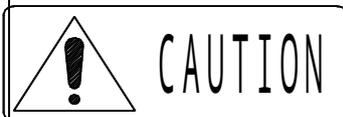


- Carefully read this manual to understand the contents before handling the pump.
- Keep this manual at a designated place for easy access at all times.
- This pump is handled by only personnel who have the knowledge and skill of its installation and adjustment.
- Never modify or change this pump without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

## 1-2 Labels

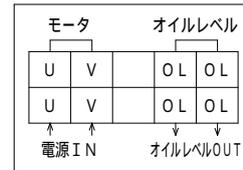
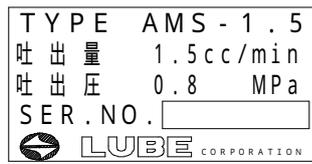
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The following labels are affixed on the pump.  
If any label gets damaged or becomes illegible, contact LUBE immediately. A new one will be supplied at your own cost.

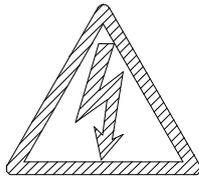
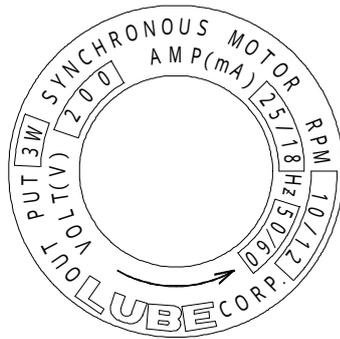


- Strictly observe the instructions on the labels affixed to the pump.

## 1-2-1 Types of labels



With oil level switch only





**注 意**

- 必ずアースをとって下さい。
- 新しい指定潤滑油を御使用下さい。
- サクションフィルターは年一回、交換または、洗浄してください。

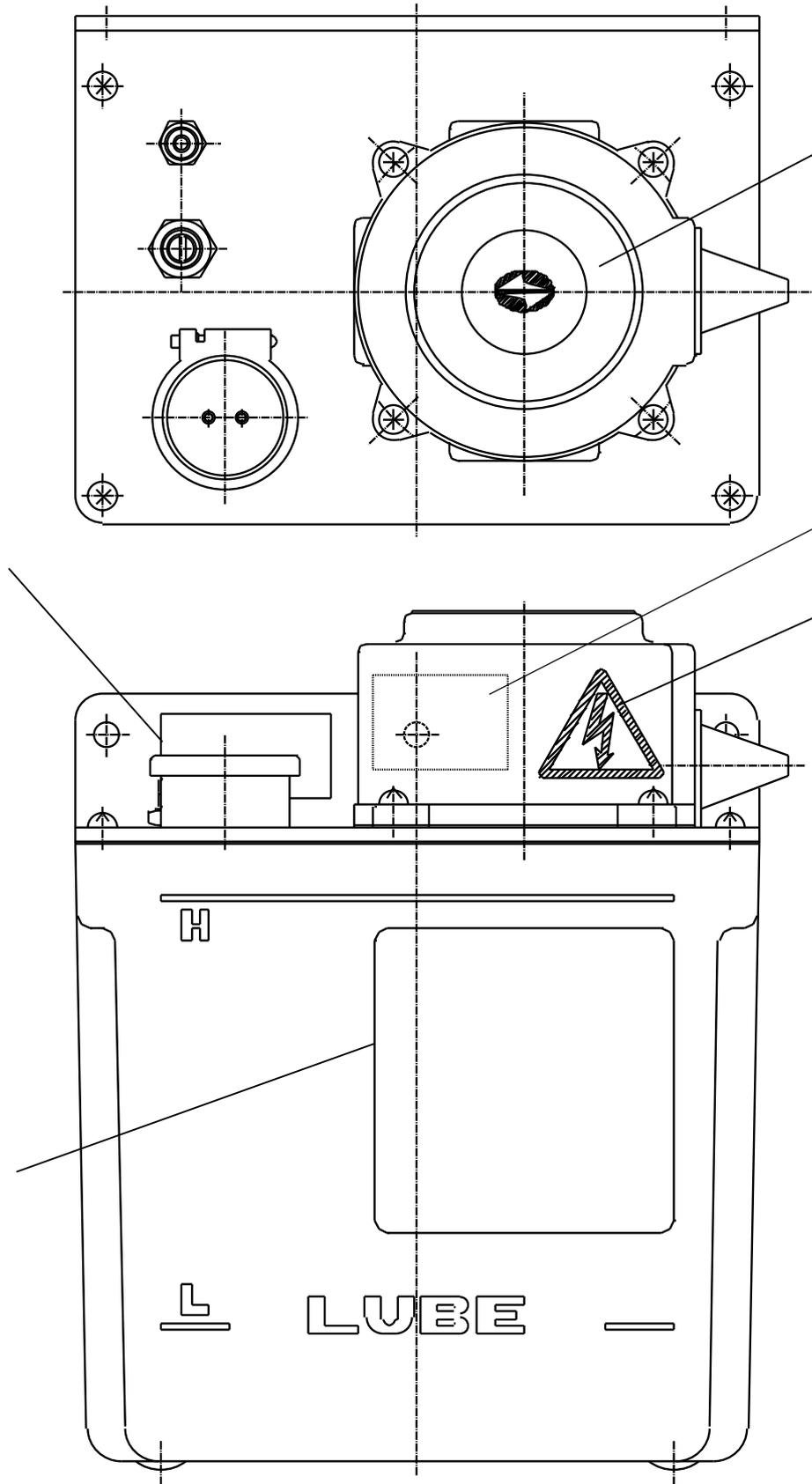
**CAUTION**

- Make sure to be grounded.
- Use the specified lubricant only.
- Suction filter should be cleaned or replaced once a year.

TOKYO JAPAN 03-3204-8431  
<http://www.lube.co.jp>



1-2-2 Location of labels



With oil level switch only

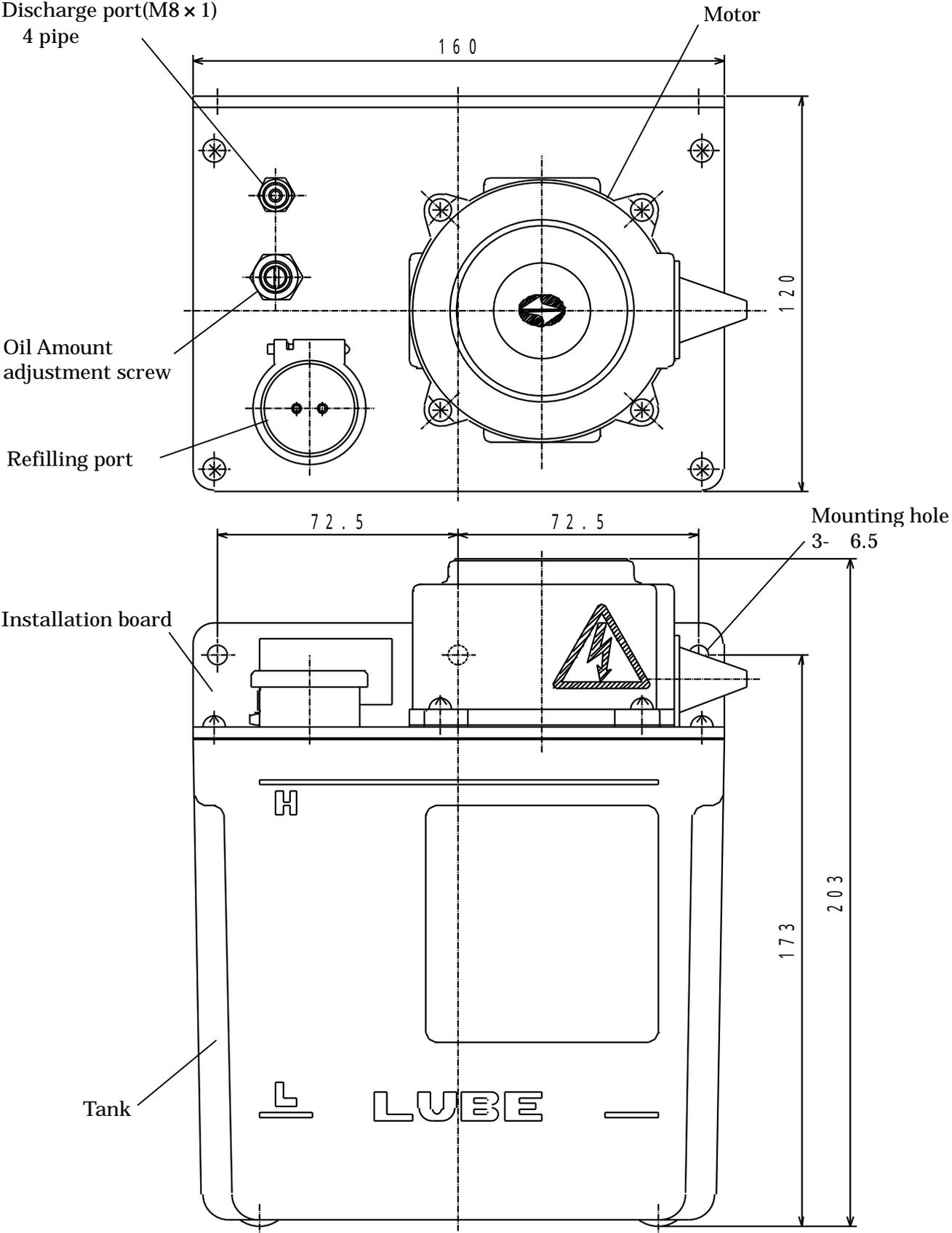
## 2. Specifications and outline

### 2-1 Specification

Item		Specification				
Power supply		100V AC $\pm$ 10%, 1	200V AC $\pm$ 10%, 1			
Motor	Rated voltage	100V AC $\pm$ 10%, 1	200V AC $\pm$ 10%, 1			
	Frequency	50 / 60Hz		50 / 60Hz		
	Rated amperage	0.050A(50Hz) 0.042A(60Hz)		0.025A(50Hz) 0.018A(60Hz)		
	Rated output	3W				
	Rotational speed	AMS-1 AMS-3	10/12 RPM (50/60Hz)	AMS-6	20/24 RPM (50/60Hz)	
	Direction of rotation	Judging from the output spindle side, it is a clockwise				
Pump	Delivery	AMS-1	1.25m ℓ /min (50Hz) , 1.5m ℓ /min (60Hz)			
		AMS-3	2.5m ℓ /min (50Hz) , 3m ℓ /min (60Hz)			
		AMS-6	5m ℓ /min (50Hz) , 6m ℓ /min (60Hz)			
	Discharge pressure	0.8MPa(Relief valve set pressure)				
Tank	Effective capacity	1.8 ℓ				
Oil level switch	Rated load	200V AC,DC				
	Contact capacity	0.5A, 30W whichever is smaller				
	Contact type	A contact				

With oil level switch only

# 2-2 Name of each component



# 3. Installation

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## 3-1 Environmental requirement

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Be sure to this pump in the following environment.

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

## 3-2 Mounting unit

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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.

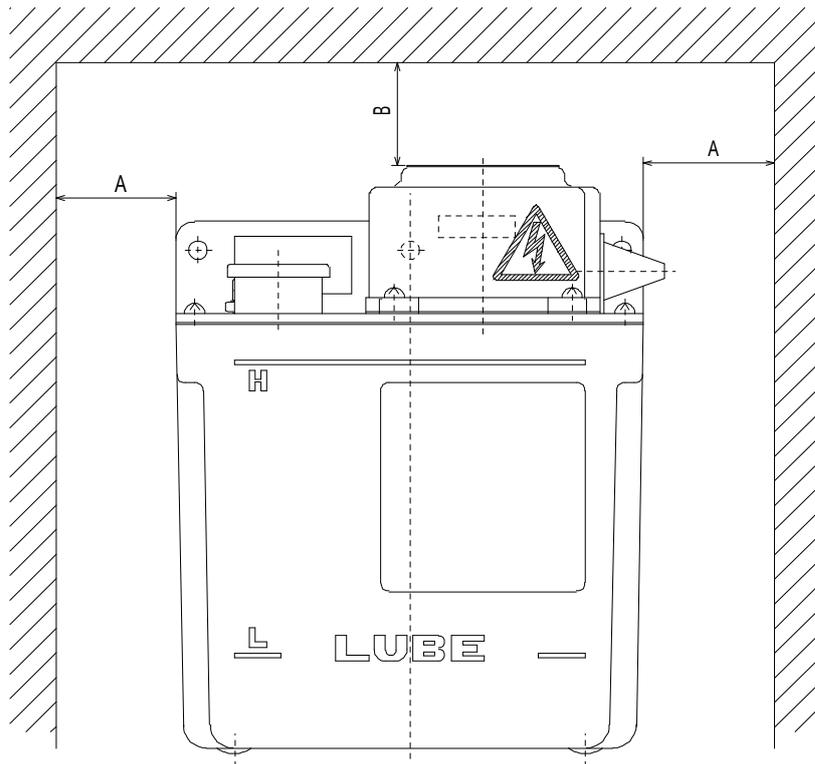
Mount and fix the pump firmly using three (3) M6 bolts.



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	Weight (kg) (see note below)	Required space (mm)
AMS-1-1	102401	1.8	A:150 B:200
AMS-1-2	102402		
AMS-1-1L	102403		
AMS-1-2L	102404		
AMS-3-1	102405	1.8	A:150 B:200
AMS-3-2	102406		
AMS-3-1L	102407		
AMS-3-2L	102408		
AMS-6-1L	112094	1.8	A:150 B:200
AMS-6-2L	112095		



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

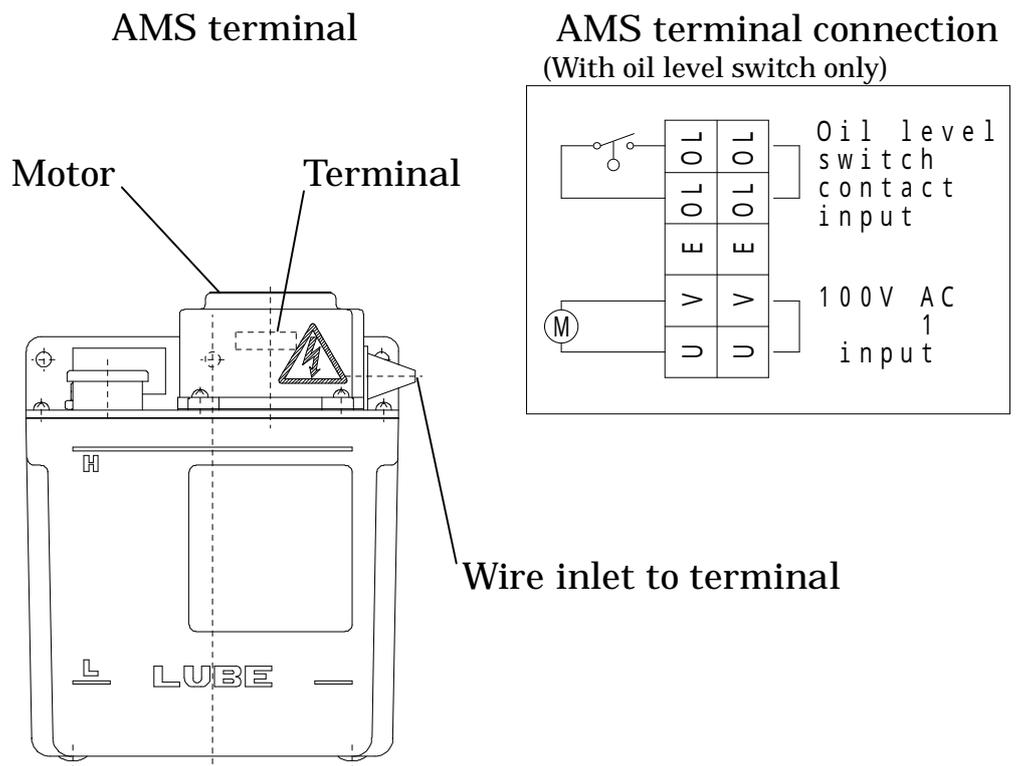
# 3-3 Wiring

	<p>Only qualified personnel electrical work can connect wiring.</p>
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The direction of motor rotation is clockwise from output axis side.

Terminal connection is attached to oil level switch type. See the diagram below for the proper wiring.

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.



## 3-4 Tubing connection

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Connect tubing to the machine to the discharge port (M8 × 1).



Use tubing good for the pressure 2 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.



Discharge pressure of a pump is adjusted to reasonable pressure (0.8MPa) at a relief valve. Please do not change discharge pressure.

## 4. How to control the pump

Install timer(s) on the machine and set the discharge timer and interval cycle as defined below.

The operating time and nonoperating time are not limited. Within the operating time of the pump, oil is discharged continuously.

The oil amount adjustment screw is set to the full discharge position (maximum discharge amount) when delivered from the factory.

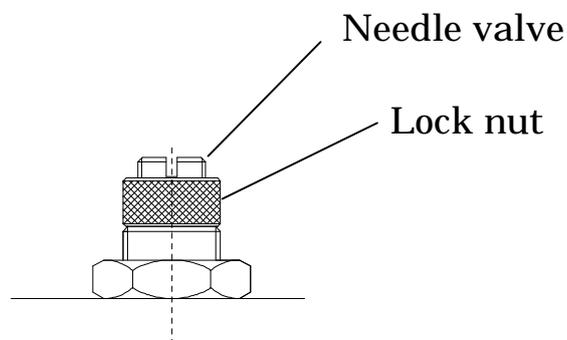
Adjust the oil amount as follows

- 1 ) Loosen the lock nut by turning it counterclockwise.
- 2 ) Loosen the needle valve by turning it counterclockwise using a flathead screwdriver to determine the oil amount.
- 3 ) Tighten the lock nut by turning it by hand clockwise.



Adjusting the discharge amount using the oil amount adjustment screw may decrease the oil amount discharged from the discharge outlets extremely. During piping, adjust the discharge amount while checking it.

Oil amount adjustment screw



# 5. Lubricating oil and refilling

## 5-1 Lubricating oil to be used

Use industrial lubricating oil in the range from 32 to 1300 mm<sup>2</sup>/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.



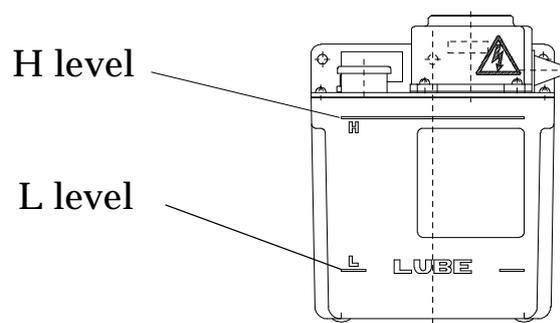
Use new lubricating oil. If lubricating oil contains any foreign substances, clogging may occur, causing the pump to stop discharging oil.

Refill it through the refill port that you find above the pump flange.

Please insert replenishment to “H” level.



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



# 6. Maintenance

## 6-1 Suction filter

Replace or clean filter once a year.



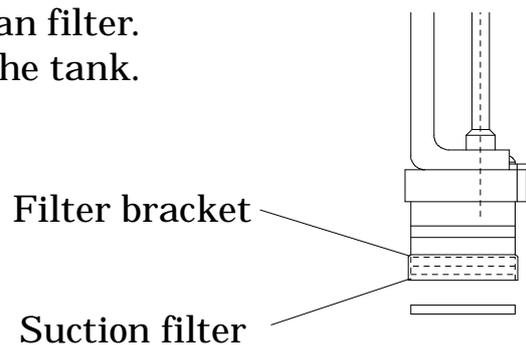
Before conducting maintenance on the pump, turn off the power and make sure that the pump is not operating. Conducting maintenance with the power turned on will increase the risk of the operator getting an electric shock or the fingers being pinched in moving parts of the pump drive unit.



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

### Replacement of suction filter

- 1) Take off from tank.
- 2) Remove the suction filter located filter bracket in the filter bracket.
- 3) Replace or clean filter.
- 4) 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
No oil discharged from valve(S)	Pressure does not increase	Refer to above measures for “Pressure in main tubing is not built up”
	Viscosity is too high, so the reaming pressure are not relieved completely	Check oil and change oil to proper oil ☞ Refer to “5. Lubricating oil and refilling”

### 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
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.