

Spray cooling system

MH20D-A

MH80

MH220

INSTRUCTION MANUAL

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



LUBE CORPORATION

Introduction

■ System application

This pneumatic lubrication spray cooling system “MH-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 spray cooling system.



Indicates a potentially hazardous situation which, if ignored, could result in death or serious injury.



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 spray cooling system correctly.



Indicates referential information or points to which special attention should be paid while handling the spray cooling system. If ignored, the spray cooling system and/or the machine could be damaged.



Indicates referential information or points which are helpful for handling the spray cooling system.



Indicates a reference clause.

■ Questions/Contacts

If any question or doubt arises concerning the contents of this manual, please contact the following.

■ Japan

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■ Changes in specifications

Details of all illustrations and specifications in this manual are subject to change without prior notice for improvement and development of the spray cooling system.

■ Resale or leasing

At the time of resale, leasing out or lending out the spray cooling system to the third party, make sure to include with the spray cooling system all the manuals and any other documents supplied with the spray cooling system.

■ Disposal of spray cooling system/Oil

Make sure to dispose spray cooling system 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 spray cooling system.
- Keep this manual at a designated place for easy access at all times.
- This spray cooling system is handled by only personnel who have the knowledge and skill of its installation and adjustment.
- Never modify or change this spray cooling system without prior permission of LUBE.

1-2 Labels

The following labels are affixed on the spray cooling system.

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 spray cooling system.
- Never remove from nor disfigure any labels on the spray cooling system.

1-2-1 Types of labels

①

DUALUBE	
型 式 / TYPE	MH80
最大使用空気圧力/MAXIMUM AIR PRESSURE	0.7MPa
通常使用圧力 / OPERATING PRESSURE	0.1~0.5MPa
使用粘度範囲/OIL VISCOSITY RANGE	2~100cSt
CODE NO.	22211
SERIAL NO.	01/04001

注 意	
(1)	液を補充する時は、空気供給を中止して給水口をゆっくり開け、タンク内の圧力を抜いてから行って下さい。
(2)	きれいな水（異物なし）および指定の防錆剤以外タンク内に入れないで下さい。

CAUTIONS	
(1)	REFILL THE REFINED WATER, AFTER DROP THE AIR PRESSURE.
(2)	PLEASE MAKE SURE TO FILL THE RESERVOIR WITH ONLY PURE WATER AND THE SPECIFIED ANTIRUST ADDITIVES.


LUBE

②



給油口をあけるときは
空気供給を中止してから
ゆっくりあけて下さい。
Stop supplying air
and slowly open
the lid before
refilling.

③

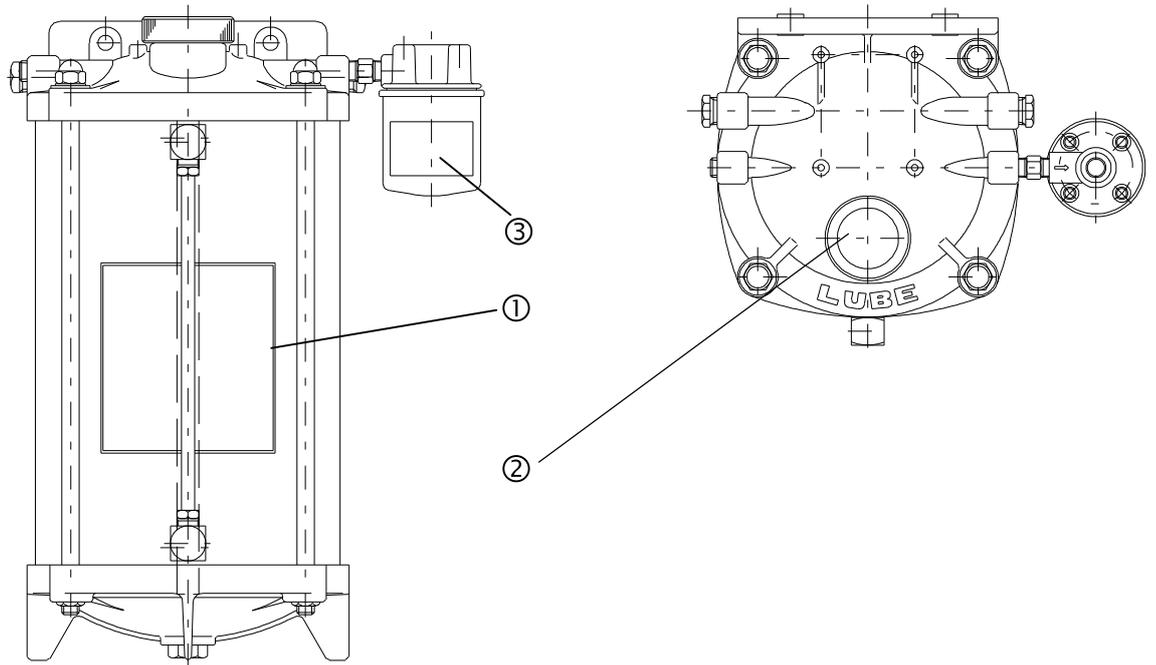
LINE FILTER	
TYPE FX-1	PRESSURE 1MPa (MAX)
CORD No. 109311	ELEMENT 40#
フィルターは年1回交換してください REPLACE FILTER ANNUALLY	
 CORPORATION TOKYO JAPAN TEL (03) -3204-8431 FAX (03) -3204-8520	

④

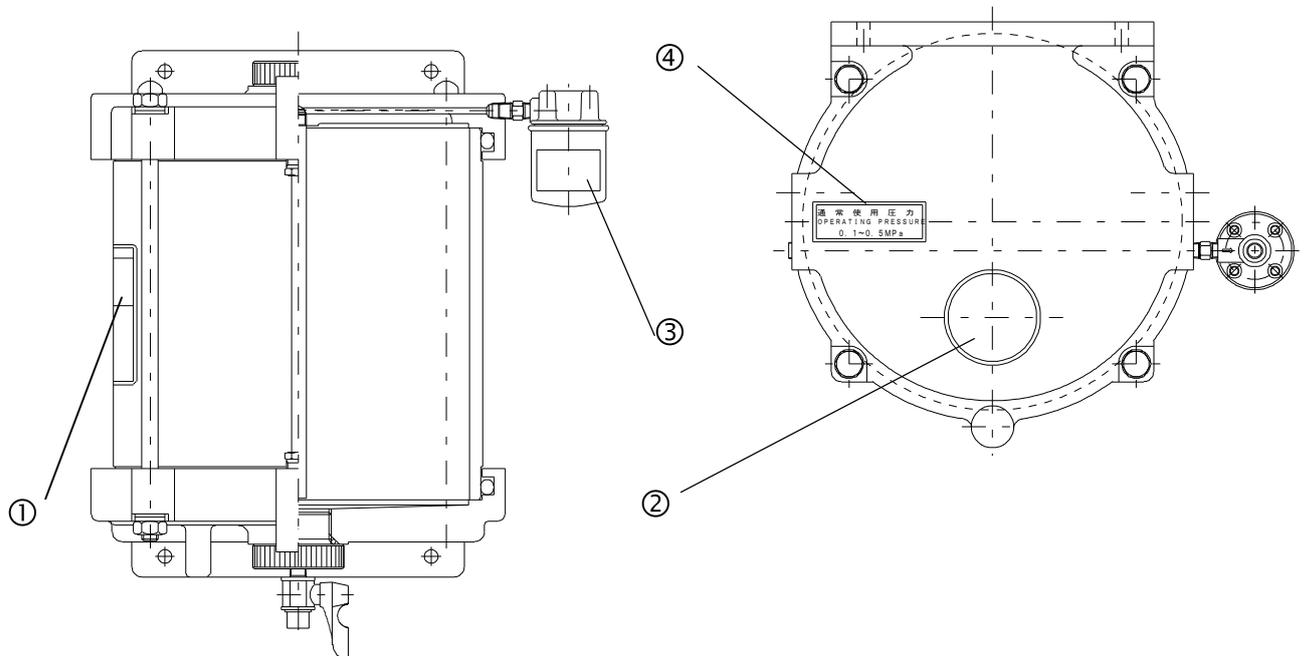
通常使用圧力 OPERATING PRESSURE 0.1~0.5MPa
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1-2-2 Location of Labels

(1) MH20D-A



(2) MH80, MH220



2. Specifications and general information

2-1 Specifications

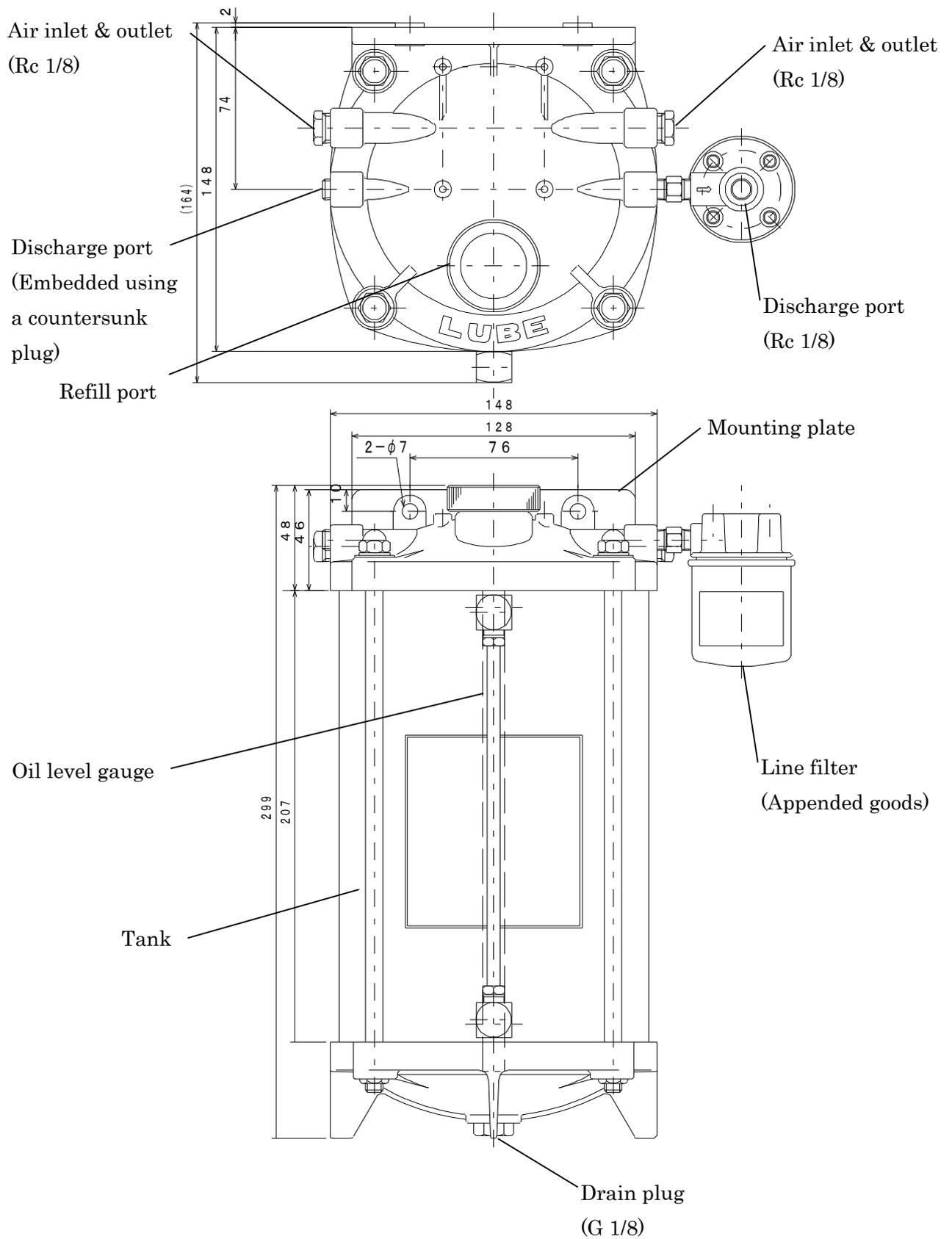
Item	Specifications		
Spray cooling system model	MH20D-A	MH80	MH220
Air input pressure (Max)	0.7 (MPa)		
Normal-use air input pressure	0.1~0.3 (MPa)	0.1~0.5 (MPa)	0.1~0.5 (MPa)
Tank total capacity	2.6 liters	7.7 liters	22.4 liters
Tank effective capacity	2.0 liters	6.4 liters	20.0 liters
Working viscosity	2~100 (mm ² /s)		
Line filter	40 (μ)		

* The filter is a line filter.

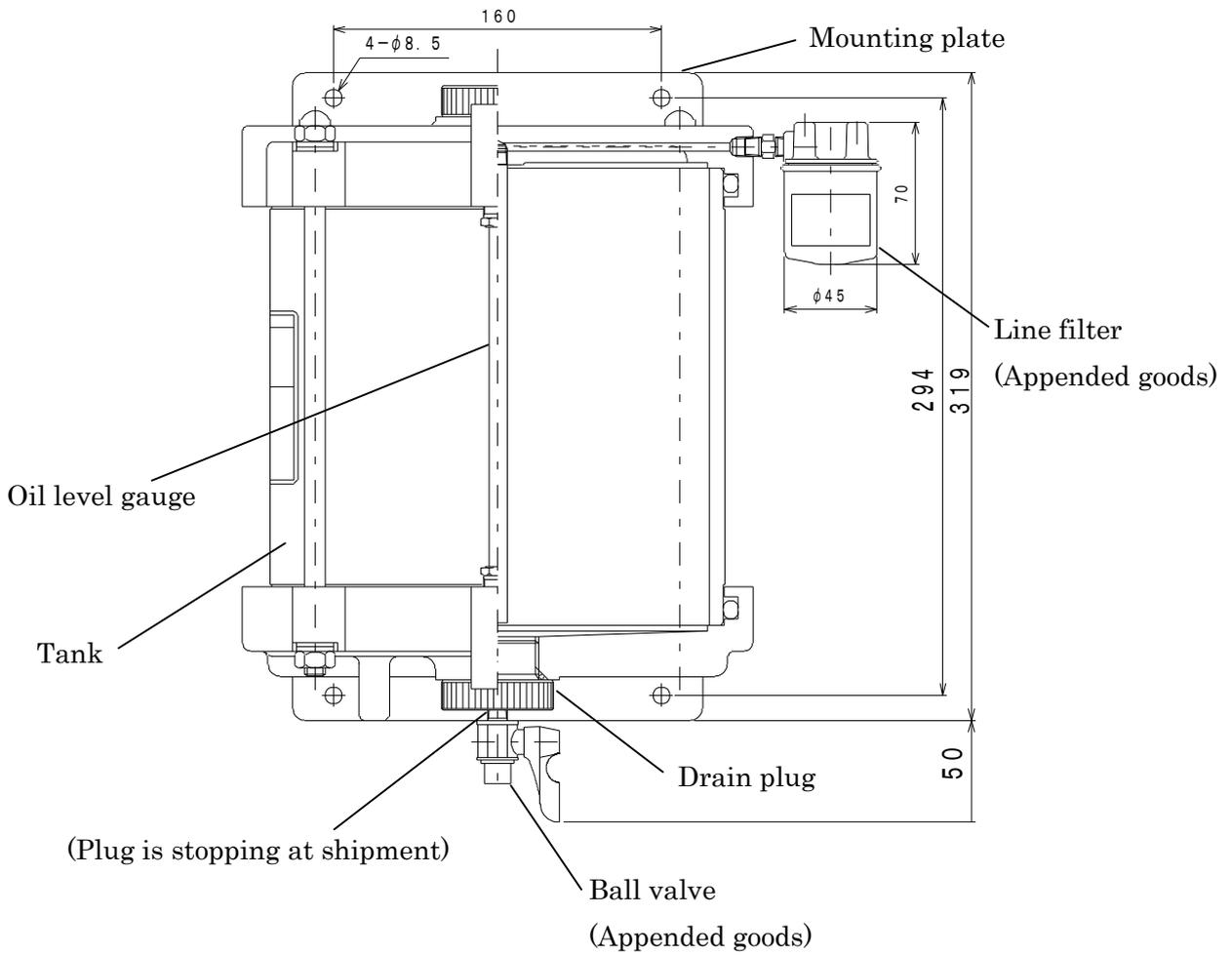
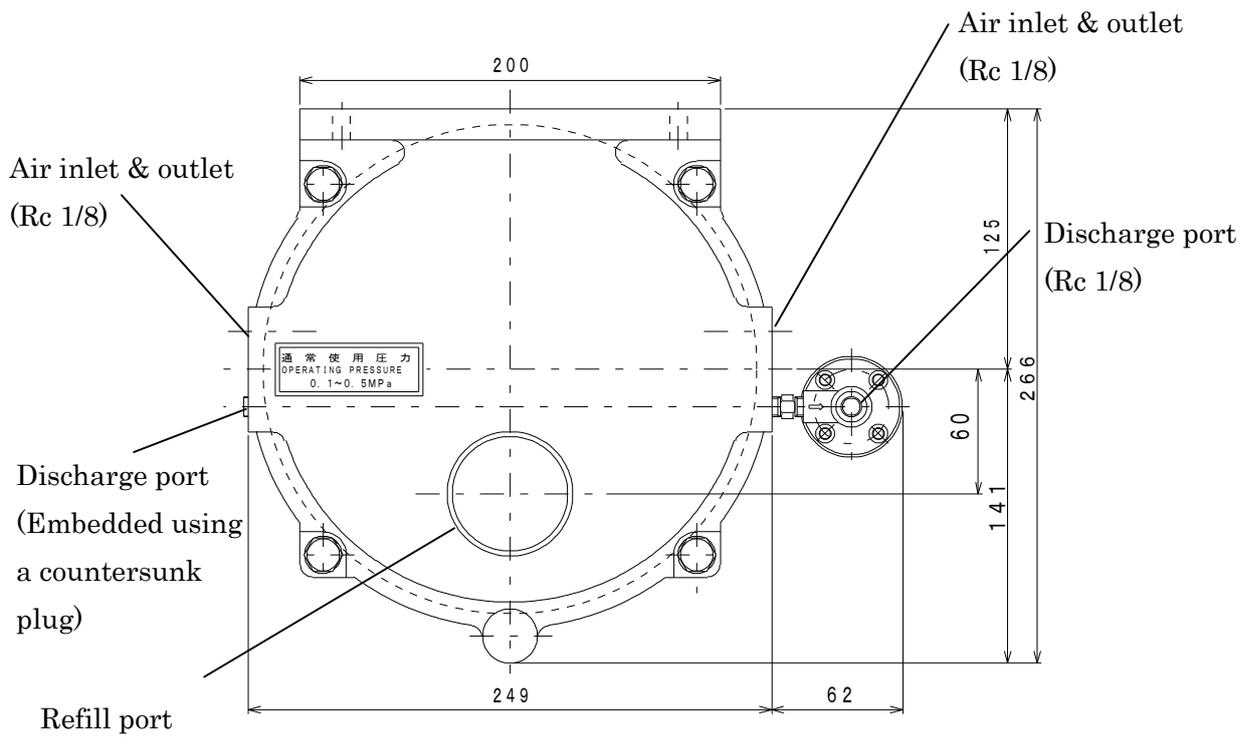
* The oil level switch is set optionally.

2-2 Description of each part

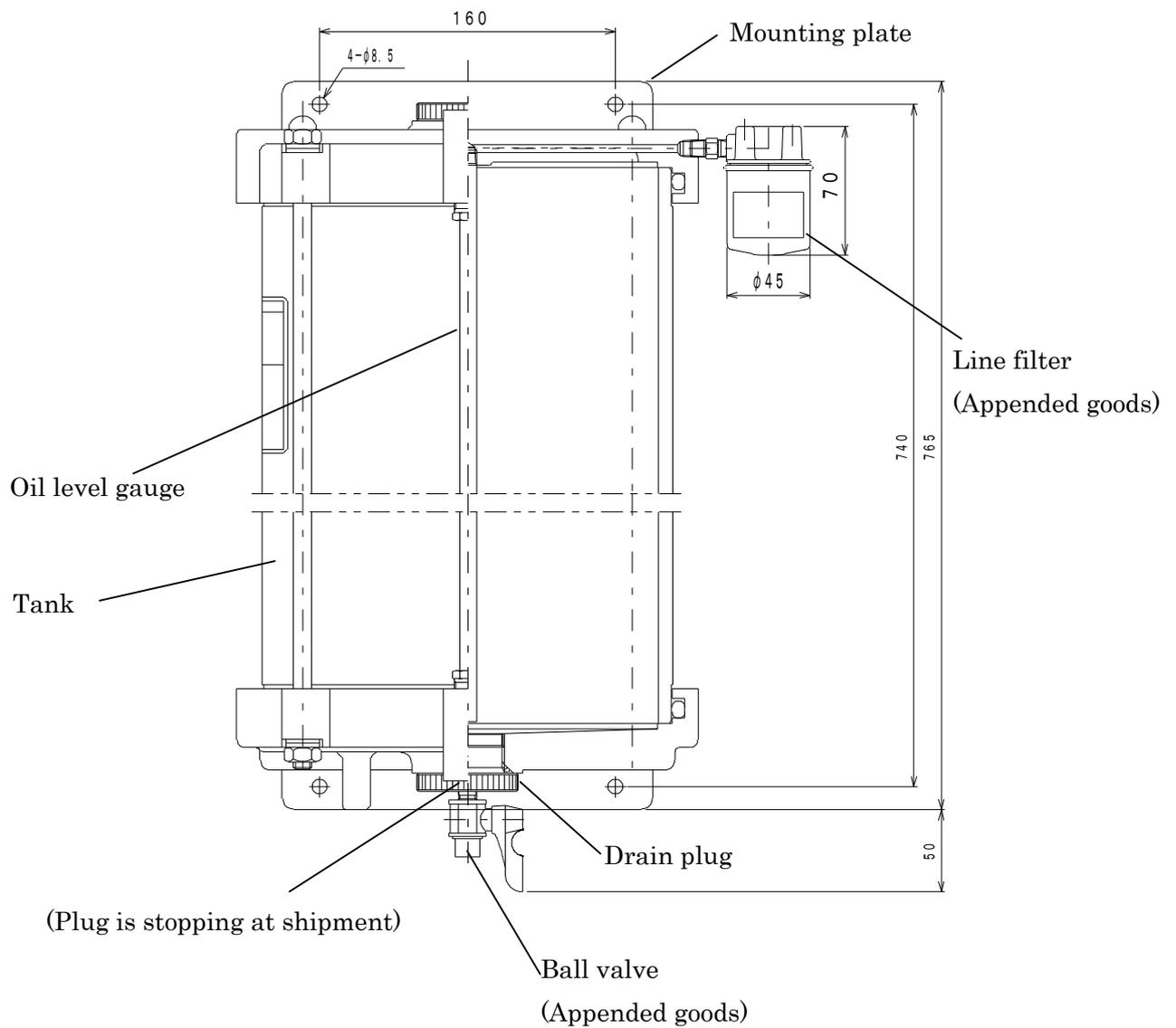
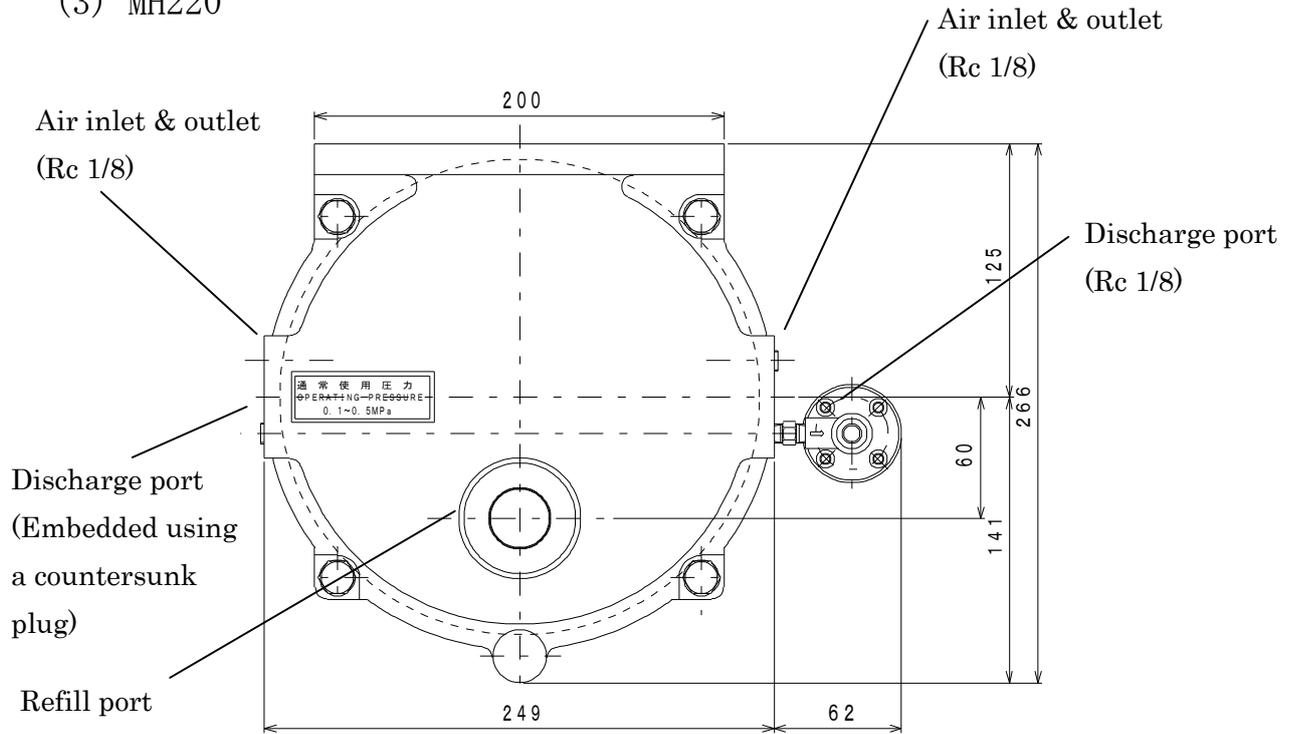
(1) MH20D-A



(2) MH80



(3) MH220



3. Installation

3-1 Environmental requirement

Be sure to this spray cooling system in the following environment.

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

3-2 Mounting unit



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



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

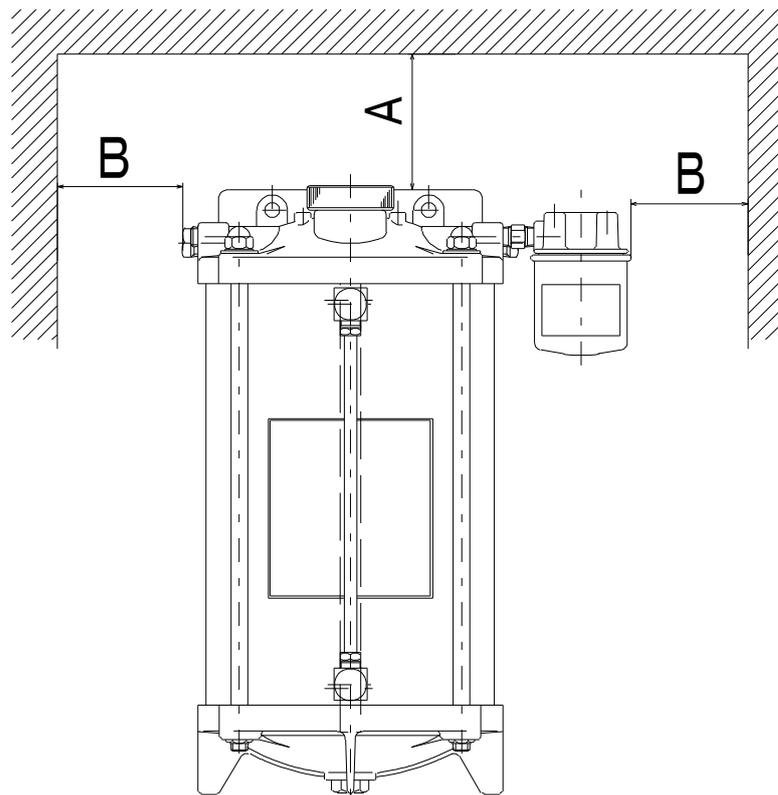
- MH20D-A
Mount and fix the spray cooling system firmly using two (2) M6 bolts.
- MH80 & MH220
Mount and fix the spray cooling system firmly using four (4) M8 bolts.



LUBE recommends anti-vibration rubber to be applied when the spray cooling system is exposed to vibration.

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

■ Weight of the spray cooling system and required space



Spray cooling system model	Code number	Weight (kg) (see note below)	Required space (mm)
MH20D-A	222138	3.3	A: 150 B: 150
MH80	222211	10.0	
MH220	222212	16.0	



Note: The weight of oil is not included.

3-3 Wiring



A qualified electrical engineer must do wiring work only.

This spray cooling system has no electric wiring. In installing electric wiring for the air supply controller, follow the instructions given in its operation manual.

3-4 How to connect pipes

Connect the line filter to be lubricated to the spray cooling system discharge port (Rc 1/8).

Connect the spray jet nozzle to be lubricated to the line filter discharge port (Rc 1/8).



As the main line pipe, use a high-strength pipe that can withstand the operating pressure of more than 2.0MPa.

First tighten the pipe by hand until it does not turn any further. Then set a wrench on the pipe and turn the wrench two to three full revolutions to further tighten the pipe.



For information on proper tightening torque, refer to “Pipe tightening torque.”

After piping work is complete, make sure that there is no leakage of oil from joints.

4. Controlling the spray cooling system

Discharge timer and interval timer of spray cooling system control the supply air with solenoid valve etc. Please set the opening and shutting cycle such as the solenoid valve.

The operating time and no operating time are not limited.

Within the operating time of the spray cooling system, oil is discharged continuously.



Be sure to adjust the pressure of the supply air. Applying the air pressure of 0.7MPa or more to the spray cooling system may cause air leakage or damage to the system, resulting in an explosion.



Use the pressure-reducing valve for the adjustment of airflow, and the adjusting screw of spray jet for the flow control of using oil.

Adjust the mist volume by watching the mist condition from jet tip (Top of jet nozzle).



Please use spray jet nozzle, spray block, dual hose etc. as a piping parts of spray cooling system.

5. Lubricating oil and refilling

5-1 Lubricating oil to be used

Use industrial lubricating oil in the range from 2 to 100 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.

Recommended oil: LUBFIT

LF10 • LF15 • LF15B • LF20



Please consult when you use the special oil.



Please examine the selection of the liquid medicine referring to “Material of used parts”.

5-2 Refilling lubricating oil

Refill the tank with oil when the level gauge indicates the lowest level.

In case of using oil level switch, refill oil when signal for low oil level turns on.



Stop the supply air when you replenish oil.

Air pressure remains in the tank of the spray cooling system. Discharge the air through the spray jet nozzle or the like to remove the pressure from the tank.



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



Please use the one that doesn't contain iron oxide etc. for water that dilutes the emulsifying oil. Rust occurs in the spray cooling system, and as a foreign material, causes a clogged nozzle, precluding the discharge of air.

Refill it through the refill port that you find above the spray cooling system flange.

Please insert replenishment to the highest level.



Please open the refill port after pulling out air in the tank.

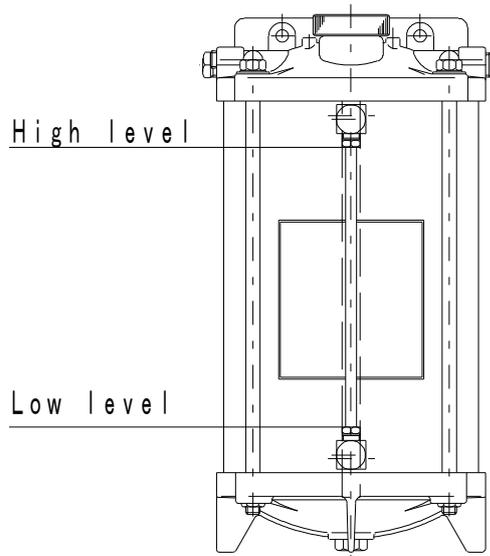


Tighten the refill port to the last minute firmly. Otherwise, air blows out from the tank or the refill port pops out by the air pressure.



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

Position at oil level



Be sure to check air leakage and oil leakage before using this system.

6.Maintenance

6-1 Line filter

Replace the suction filter once a year or clean it periodically.



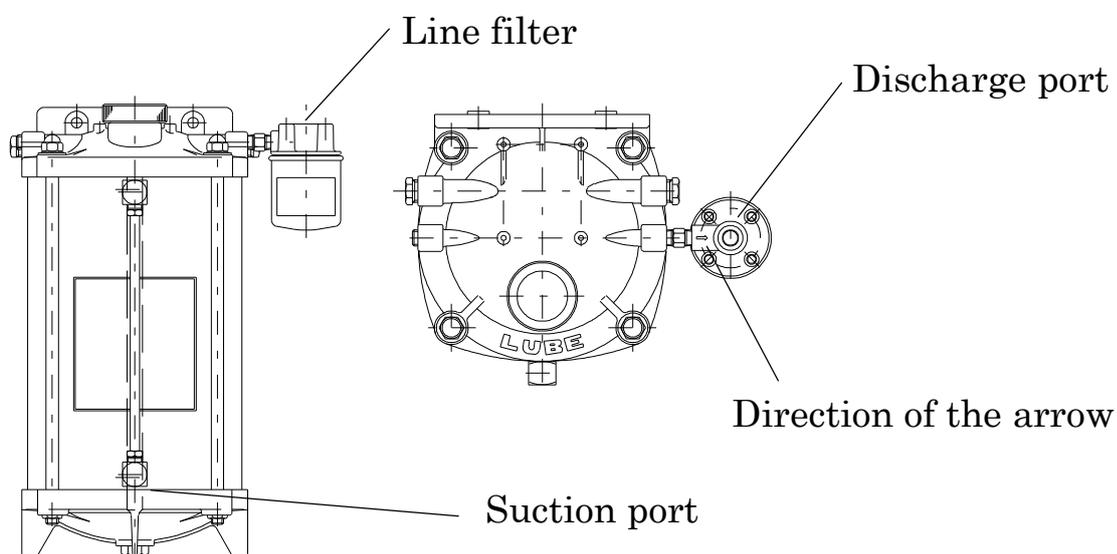
Before maintaining the spray cooling system, be sure to stop the supply air and make sure that the air pressure in the spray cooling system is zero. Otherwise, air blows out from the spray cooling system or piping, or parts are popped out.



If the line filter is clogged or tainted, it will suck less oil, causing the decrease of the spray amount.

There is the flowing direction in the line filter.

To install the line filter, install it in the direction of the arrow on the connection port.



6-2 Troubleshooting

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

Trouble	Cause	Measures to take
No oil discharged from spray cooling system	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 spray cooling system (Twisted, crashed, or disconnected)	Tighten or replace the connecting parts
	The air pressure is low	Correct the setting proper valve
	Air leakage from piping connections	Tighten them with proper torque or re-pipe them ☞ For proper torque refer to “Tightening Level for Connecting Sections” of the next page
	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”
No oil discharged from spray jet nozzle	No oil discharged from spray cooling system due to any of above causes	Refer to above measures
	Clogged spray jet nozzle	Tighten or replace the connecting spray jet nozzle
	Leaking from spray jet nozzle connections	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

■ Tightening level for connecting section

	Tightening level	Reference torque (N • m)
OD 4mm nylon pipe	Turn compression bushing with hands until it stops and then tighten it 2/3 turn with a spanner, etc	3.5
OD 6mm 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 4mm 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

■ Material of used parts

Material of the main parts used for spray cooling system.

Flange	····	ADC-2, AC2B
Tank	····	A5052TD
Gasket	····	NBR
Oil gauge	····	Nylon tube
Others	····	C3604BD, SS41B (Galvanizing)

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 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.