

CENTRALIZED LUBRICATING SYSTEM

LUBYACE

Single Line

**Daikin Single-pipe
Progressive Lubricating System**



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LUBYACE Single-pipe Progressive Lubricating System

Single Line Lubricating System in which High Consistency(NLGI#2) Grease can be used.

Overview

A single line lubricating system (LUBYACE) is a “single-pipe progressive operating type” lubricating system comprising a pump, distributing valves and a single branch pipe. This system reliably supplies “NLGI consistency #2 grease,” the ideal lubricant for the various bearings used in machine tools, industrial facilities, dump trucks and other transportation vehicles, under predetermined conditions given in the system specifications and piping plan.

Features

Simple

● Simple Piping Plan

A single-pipe progressive operating type branch system, that the main supply line piping consists of a single pipe, enables the piping plan to be very simple as a result.

Compact

● Lightweight Compact Design

The downsized design of the distributing valves makes them lightweight and compact. This makes installation work and handling easier.

Reliable

● Reliable Lubricating

Operating status can be checked visually on the operation indicator supplied with the distributing valve. Blockage and damage to the main supply line (branch supply line) can also be detected electrically by attaching a detection switch.

Easy maintenance

● No Filling Pump Needed for Replenishing Grease

Grease cartridges have been adopted for replenishment of grease. This means that operators can keep their hands clean and that contamination with air and foreign matter can be prevented. Grease cartridges can be attached easily by means of a screw-in mechanism.

System planning

● System Plans Matched to Various Applications

A diverse range of system plans can easily be formulated as there is an extremely wide range of pumps and distributing valves to choose from.

Applications



● Machine Tools



● Cranes
● Conveyors
● Transportation Equipment



● Printing Machinery



● Transportation Vehicles



● Presses
● Forging Presses



● Forming Equipment



● Food Processing Machinery
● Packaging Machinery



● General Industrial Machinery
and so on

System Specifications

Item	For Grease	For Oil
System pressure (MPa)	17	7
Lubricant used	NLGI consistency #0 to #2 (lithium-based)	*Mineral Oil equivalent to ISO VG 68 or 100
Operating temperature range (°C)	0 ~ +50 (No.2 grease)	- 5 ~ +50
	- 5 ~ +50 (No.0 to No.1 grease)	

*Be sure to use this pump indoors.

*The grease used is NLGI consistency number #0 to #2 for centralized lubrication.

*The grease used shall be unworked with the consistency of 240 or more at the operating temperature.

*Before using a lubricating oil with an oil viscosity of ISO VG100 or more, consult with us.

System Configuration

The LUBYACE system comprises a pump, distributing valves and piping.

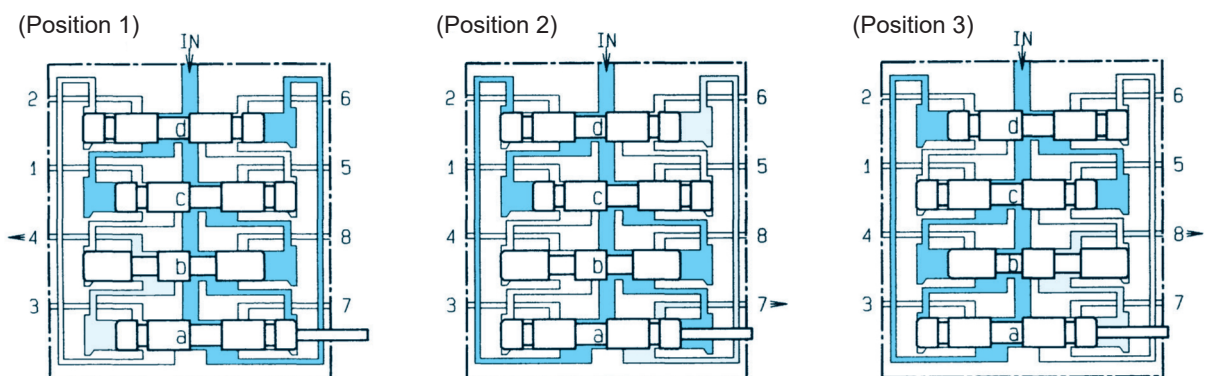
Lubricant is fed from the pump to operate the pistons of the distributing valves sequentially by metered operation to reliably lubricate the lubrication points.

There are two basic types of distributing valve connections, the 1-stage distributing valve system and the 2-stage distributing valve system. Systems are configured by applying these basic types to match the number of bearings (number of lubricating ports), piping and other factors.

Refer to page 12 for the basic configuration diagram for connecting distributing valves.

- 1-stage distributing valve system Lubrication is performed at a maximum of 12 ports with one distributing valve connected to the pump.
- 2-stage distributing valve system Lubrication is performed at a maximum of 144 ports with maximum 12 of 2nd stage distributing valves connected to the 1st stage distributing valve. However, with this system, the appropriate number of lubricating ports is set to be around 40.

Operating Principal of the Distributing Valves



When the four pistons are at the positions shown in the figure, piston "a" moves to the left to discharge specified quantity of lubricant to discharging port "4" when pressure is applied from supply port "IN".

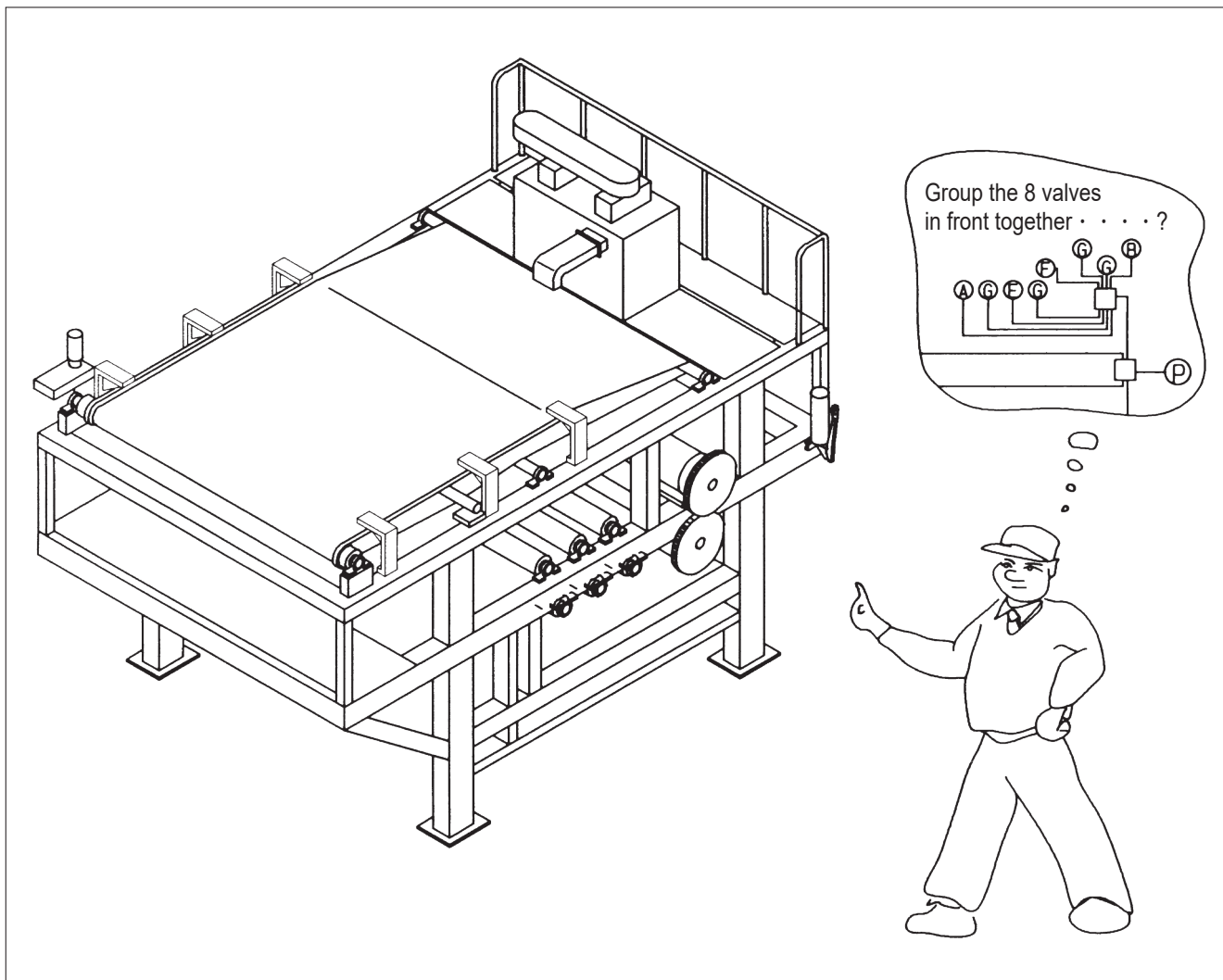
The next piston "d" moves to the right to discharge a metered quantity of lubricant from discharging port "7" from the passage that opened by movement of piston "a". Likewise, pistons "c" and "b" move successively to discharge metered quantities of lubricant from discharging ports "2" and "5".

Pistons "a", "d", "c", and "b" successively move completely symmetrically to the above operations to successively discharge metered quantities of lubricant to discharging ports "8", "3", "6" and "1" to complete the lubrication cycle.

SYSTEM PLANNING

Checking Specifications, Number and Layout of Bearings to be Lubricated by Centralized Lubrication

Having a good understanding of the bearing specifications for determining the lubricating amount and the layout of the bearings to be lubricated for determining the distributing valve connection method is a basic element of system configuration.



Determination of Lubricating Amount

The lubricating amount varies according to bearing specifications (type, load, clearance, sealed state, etc.), environmental conditions, and other factors.

When the bearing specifications of the machine to be lubricated are clearly known, consult with us or your agent.

(Note) When actual operation of the lubricating system is started, thoroughly observe the lubrication status and adjust the lubrication interval.

Selection of Distributing Valves

● Grouping of bearings

Look over all of the bearings to be lubricated by centralized lubrication (simply called “lubricating ports” from here on), and group them by individual lubricating ports that are located relatively close to each other.

● Selection of distributing valve

In the case of equal quantity lubrication, select a distributing valve that has a number of discharging ports matching the grouped number of lubricating ports.

In the case of unequal quantity lubrication, the discharging ports of the distributing valve sometimes must be grouped or a distributing valve having a discharging port factor of 6 sometimes must be selected. For this reason, consult with us.

Example of distributing valve connection on a system comprising 12 lubricating ports

1st stage distributing valve	LV312	LV3A6	LV302	LV303	LV304	LV3A4	LV302	LV302
2nd stage distributing valves	—	LV306 × 1pc	LV306 × 2pcs	LV304 × 3pcs	LV303 × 4pcs	LV308 × 1pc	LV305 × 1pc LV307 × 1pc	LV302 × 1pc LV310 × 1pc
Distributing valve assembly combination diagram								
Position of lubricating ports	12 ports are grouped together	Distributed in 2 locations with 6 ports each		Distributed in 3 locations with 4 ports each	Distributed in 4 locations with 3 ports each	Distributed in 2 locations, one has 4 ports, the other has 8	Distributed in 2 locations, one has 5 ports, the other has 7	Distributed in 2 locations, one has 2 ports (5 times of lubrication quantity), the other has 10
Lubrication Amount (%)	Equal quantity distribution					Approximately equal quantity distribution		Unequal quantity distribution

Note) For details on the definition of lubricating ratio, refer to the “Example of Number of Lubricating Ports, Distributing Valve Combination Table” on pages 13 and 14 of this catalog.

Selection of Pumps

- Manually operated pumps are generally used for systems with relatively low lubrication frequency (once/week or less) and low system requirements of lubrication quantity (ex. for 12 ports, total discharge quantity is approx. 1.56cm³/cycle). On the other hand, when automating the main machinery or when there are high system requirements of lubrication quantity and frequency, select motor driven pumps.
- When lubricating with grease, cartridge type pumps are recommended. However, when it is difficult to obtain a cartridge grease filled with the type of grease you use, adopt follower plate type pumps.

System Control Method

● Indicator-based cycle control

1-cycle lubrication system : 1-cycle operation of the indicator is detected by the detection switch (option) to control the motor driven pump.

Multi-cycle lubrication system : The number of cycles of the indicator is calculated by a counter for example, and the motor driven pump is controlled by an arbitrary number of cycles.

● Timer-based time control

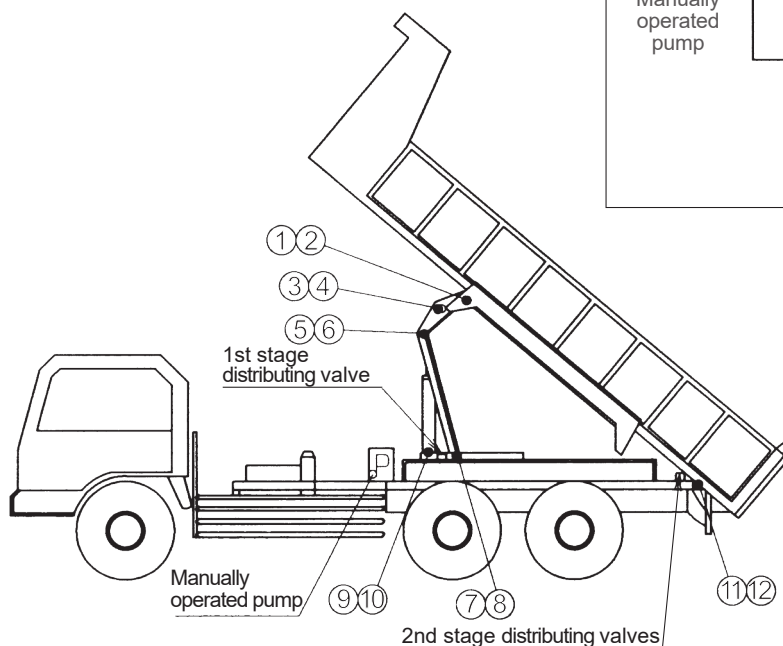
This is a lubrication method that controls the pump operation time with a timer in order to obtain the discharge quantity required by the system (i.e. total lubricating amount).

Generally, the 1-cycle lubrication system is adopted when the number of lubricating ports are not many and the lubricating amount per port is low. The multi-cycle lubrication system is adopted, if the system has many lubricating ports and the lubricating amount per port is high, or even with a small number of lubricating ports the bearing structure is special that require sealing with grease, and if a large lubricating amount is required under hard environmental conditions.

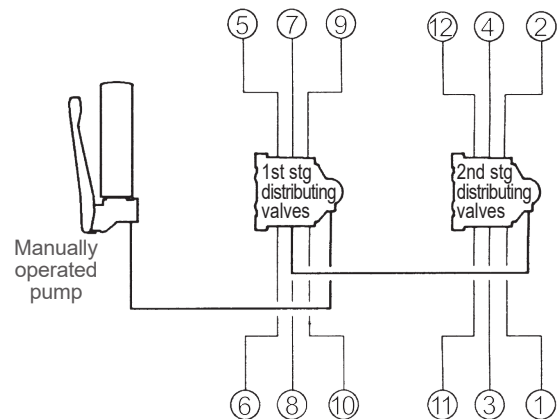
When a controller capable of handling a multi-cycle lubrication system or pump operating time lubrication system is needed, please consult with us.

Installation example

● Installation example on a 10t dump truck



● 10-ton dump truck piping system diagram



LUBYACE EQUIPMENT

Manually Operated Pump

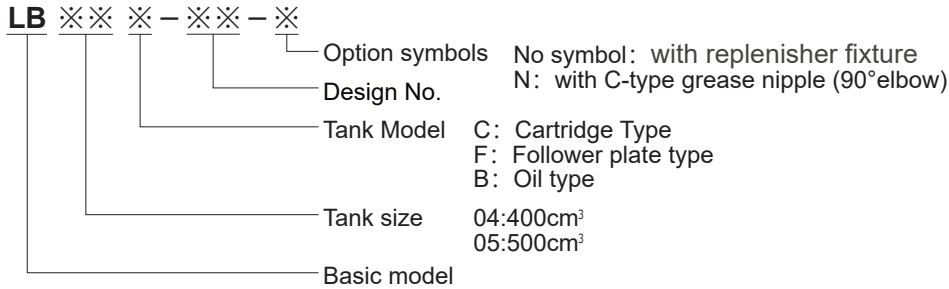
An Easy-to-operate Manually Operated Pump with an Easy-to-grip Handle

LB

Features

- Adopted extremely simple Single-line System with only one line of piping.
- High consistency (NLGI No.2) grease can be used.
- In the case of a cartridge-type tank, grease can be replenished keeping hands clean and preventing dust and foreign matters from entering.

Explanation of Model Symbols



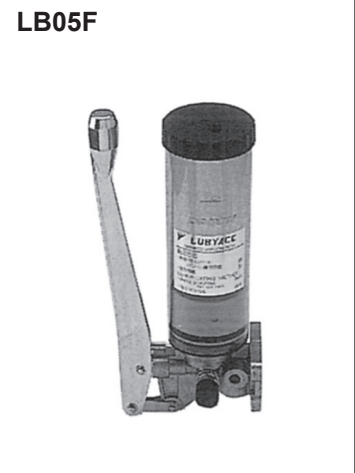
LB04C



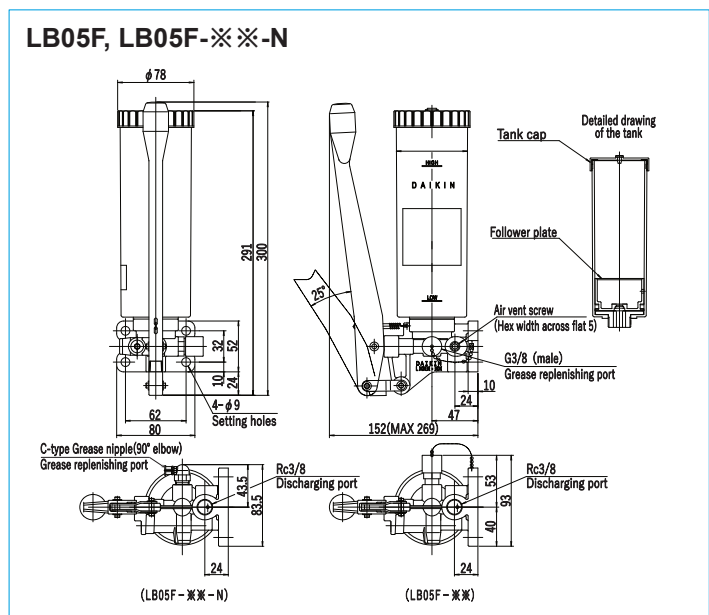
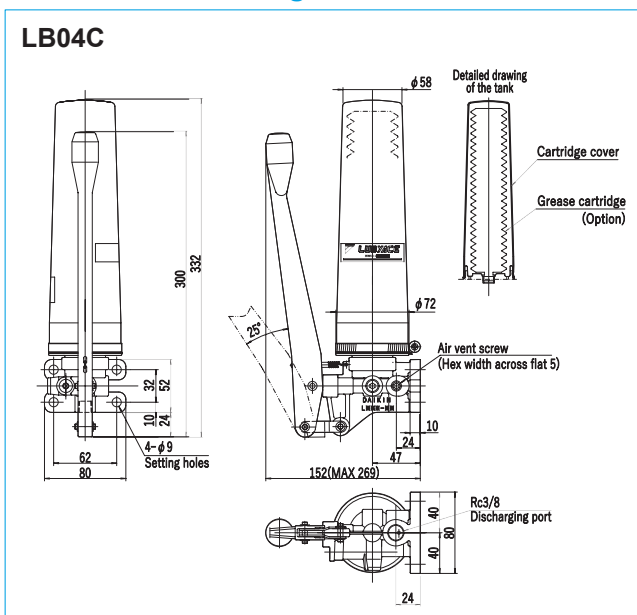
Specifications

Model	LB04C	LB05F	LB05F-※※-N	LB05B
Max. Operating pressure (MPa)	17			7
Discharge quantity (cm ³ /st)	0.6			
Tank specifications	Cartridge type (cm ³)	400	—	—
	Follower plate type (cm ³)	—	500	500
	Oil type (cm ³)	—	—	500
Lubricant used	NLGI consistency #0 to #2 (lithium-based)			ISO VG 68 or 100
Operating temperature range (°C)	0 to +50 (#2 grease)			-5 ~ +50
	-5 to +50 (#0 to #1 grease)			
Vibration resistance (G)	3.0	8.9		
Weight (kg)	1.0	1.1		

LB05F



Dimension drawings



Motor Driven Pump

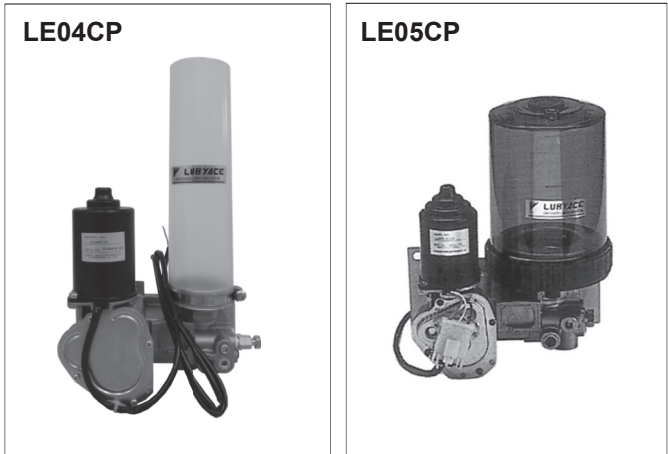
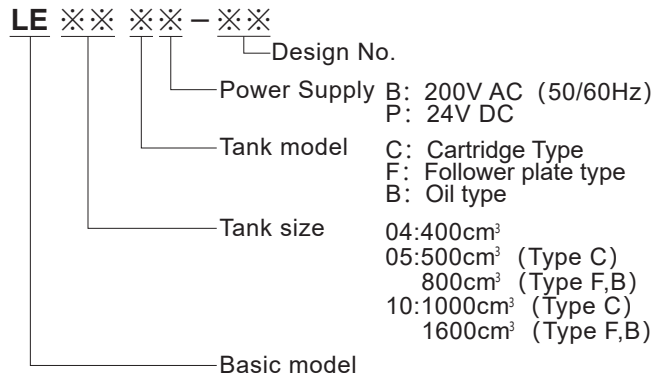
Easy-to-use Motor Driven Pump with a Wide Variety of Types

LE

■ Features

- Adopted extremely simple Single-line System with with only one line of piping.
- High consistency (NLGI No.2) grease can be used.
- Motor driven pumps save you a lot of labor to operate it.
- In the case of a cartridge type tank, grease can be replenished keeping hands clean and preventing dust and foreign matters from entering.

■ Explanation of Model Symbols

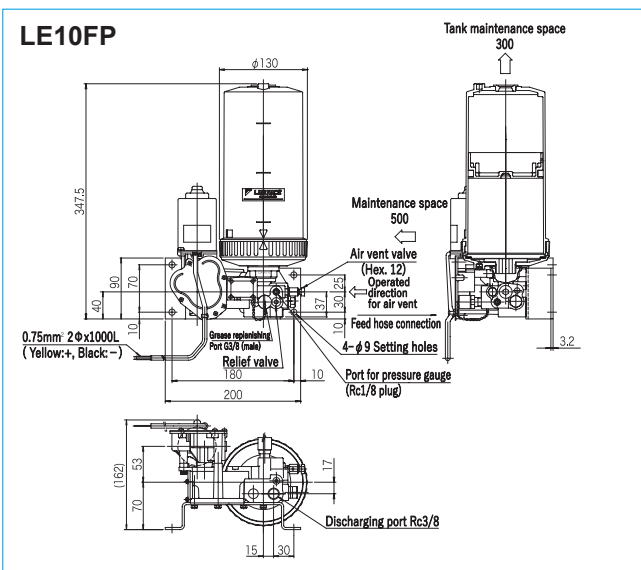
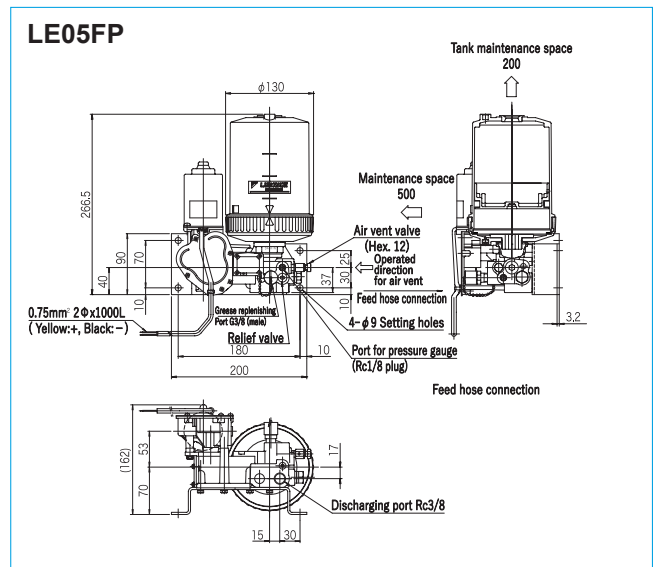
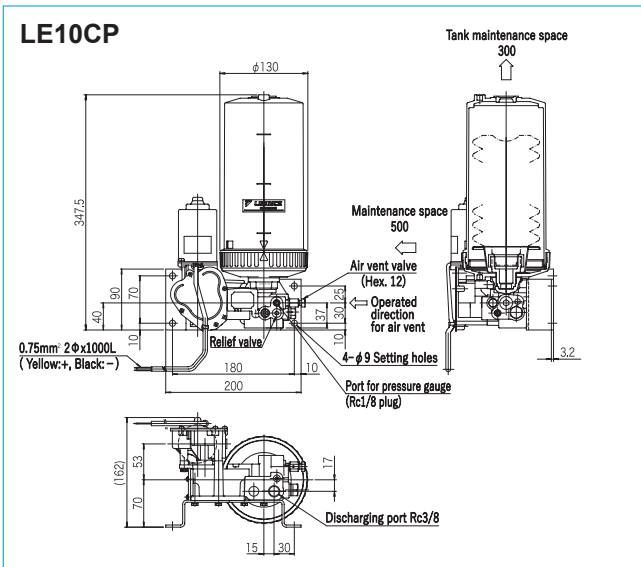
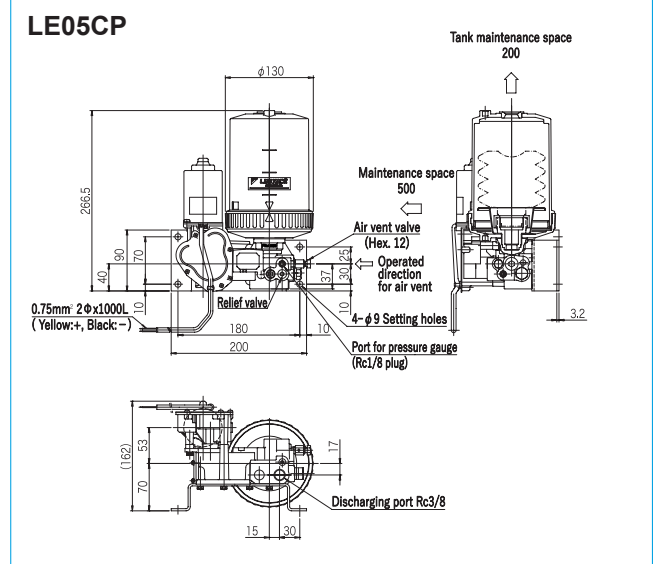
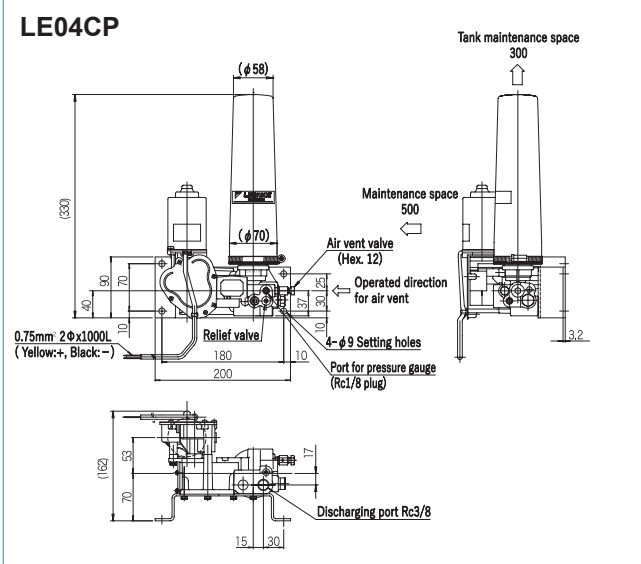


■ Specifications

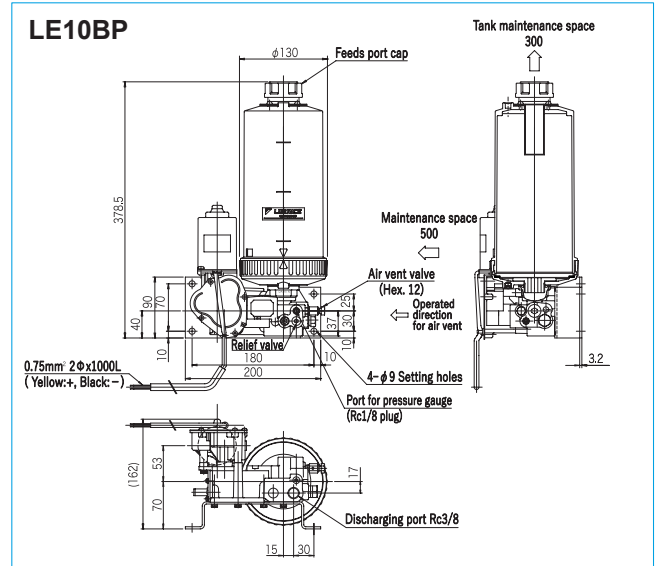
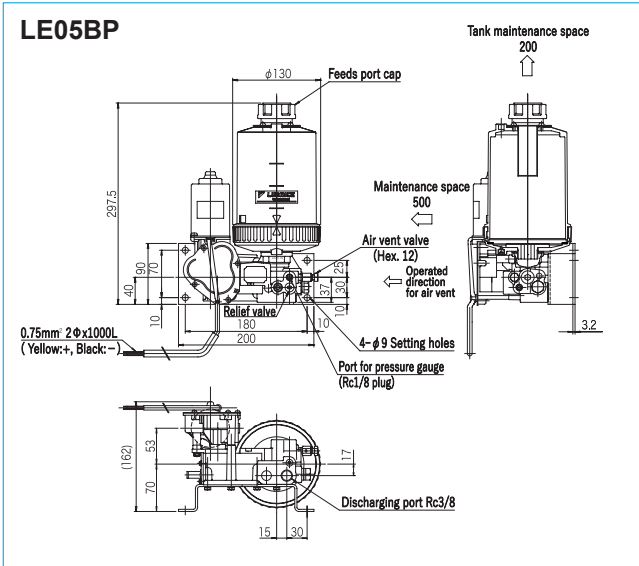
Model	LE04CP	LE05CP	LE10CP	LE05FP	LE10FP	LE05BP	LE10BP
Max. Operating pressure (MPa)	17					7	
Discharge quantity (cm ³ /st)	12.0						
Tank specifications	Cartridge type (cm ³)	400	500	1000	—	—	—
	Follower plate type (cm ³)	—	—	—	800	1600	—
	Oil type (cm ³)	—	—	—	—	—	800
Power Supply	Voltage	24V DC					
	Capacity (A)	3.0				2.0	
Lubricant used	NLGI consistency #0 to #2 (lithium-based)					ISO VG 68 or 100	
Operating temperature range (°C)	0 to +50 (#2 grease)					-5 to +50	
	-5 to +50 (#0 to #1 grease)						
Vibration durability (G)	3.0	8.9			3.0		
Protection Type	Drip-proof type (Note, however, that it must not be exposed to the outdoors.)						
Weight (kg)	3.0	3.3	3.4	3.3	3.4	3.3	3.4

Model	LE04CB	LE05CB	LE10CB	LE05FB	LE10FB	
Max. Operating pressure (MPa)	17					
Discharge quantity (cm ³ /st)	8.3/10 (at 50/60Hz)					
Tank specifications	Cartridge type (cm ³)	400	500	1000	—	—
	Follower plate type (cm ³)	—	—	—	800	1600
Motor	Power supply	200V AC, 50/60Hz, 3-phase				
	Number of poles, Output	4P, 25W				
	Rating	0.30/0.26A (10-minute rating)				
Lubricant used	NLGI consistency #0 to #2 (lithium-based)					
Operating temperature range (°C)	0 to +50 (#2 grease)					
	-5 to +50 (#0 to #1 grease)					
Vibration durability (G)	JIS D1601 Class-3 (3G)					
Protection Type	Drip-proof type (Note, however, that it must not be exposed to the outdoors.) IP53 or equivalent					
Weight (kg)	4.7	5.0	6.1	5.0	6.1	

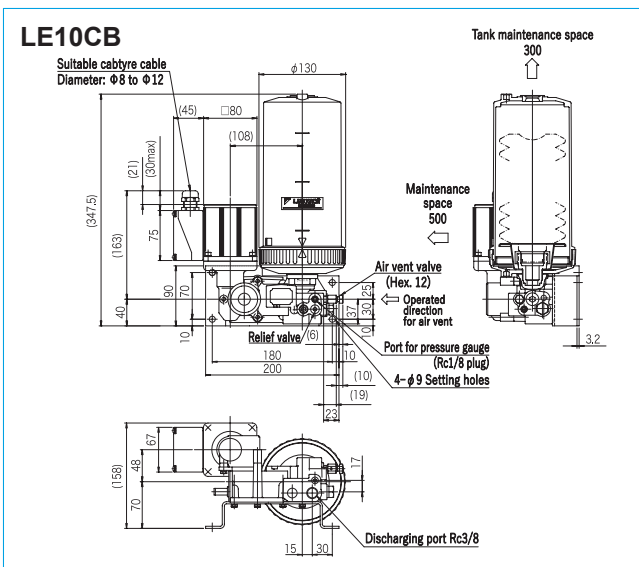
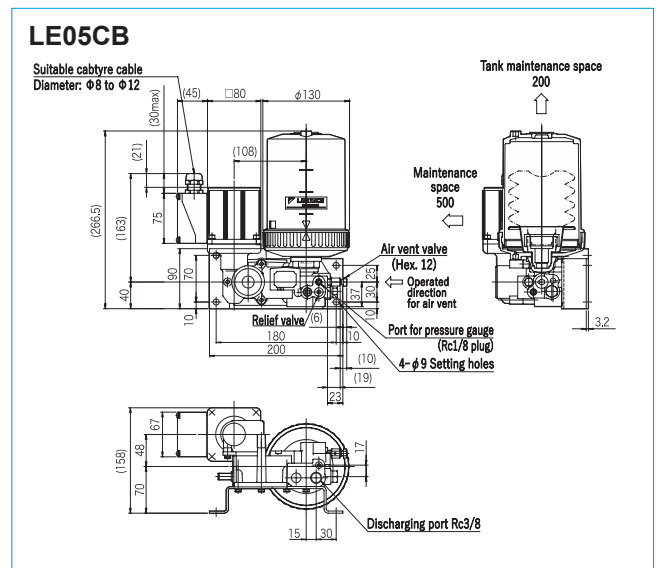
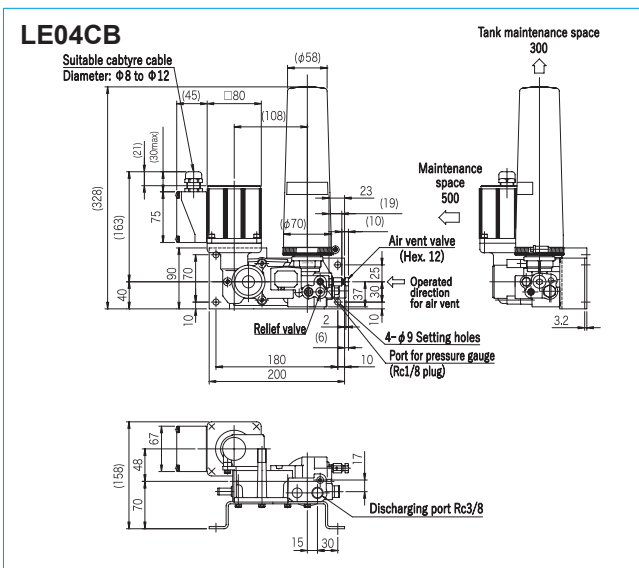
■ Dimension drawings (DC24V, for grease)



■ Dimension drawings (DC24V, for oil)



■ Dimension drawings (AC200V)



■ Grease Replenishing Method

For cartridge type

- Simply replacing the grease cartridge with new one save you labor.
- When replacing a grease cartridge, remove the cap from the grease cartridge (also remove the inside plug if present), and push out a small amount of grease from the mouth of the cartridge until it forms a small mound, and then screw in the cartridge to prevent air from getting inside.
- Consult with us when using lithium-based grease that is not available in a cartridge, or when using grease other than lithium-based grease.

For follower plate type

- On the follower plate type pump with grease nipple (option: N), replenish grease with a commercially available grease gun or continuous flow grease gun.
- On the follower plate type pump with replenisher fixture (no option symbol), replenish grease from a pail (16kg or 18kg) by the grease filling pump (FM3) described later.

For oil type

- To replenish oil, remove the tank cap and pass it through the strainer.
- Be sure to use mineral oil.

■ Handling Precautions

- Install the pump so that the tank is vertically upright.
- For air venting of the pump, loosen the air vent valve/screw (hexagon socket head plug R1/8) at the front of the pump. In the case of a manually operated pump, operate the handle, and, in the case of a motor driven pump, start up and operate the pump until all grease containing bubbles is pushed out and only fresh grease comes out from the pump.

□ MEMO

Distributing Valve

LV3※※

Compact Distributing Valves come with a Wide Selection of Ports and Operation Detection Functions

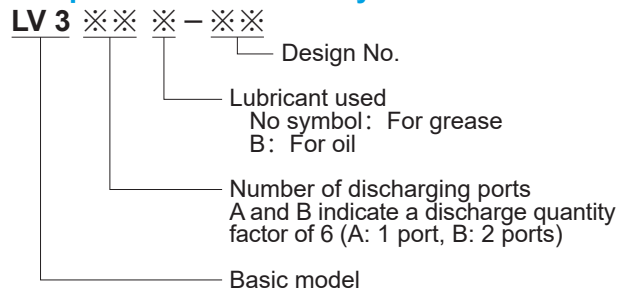
Features

- Light and compact design makes handling and installation work easier.
- Operating status can be checked visually on the indicator supplied with the distributing valve.
- Blockage and damage to the main supply line (branch supply line) can also be detected electrically by the detection switch sold separately.
- Lubrication cycle also can be checked.

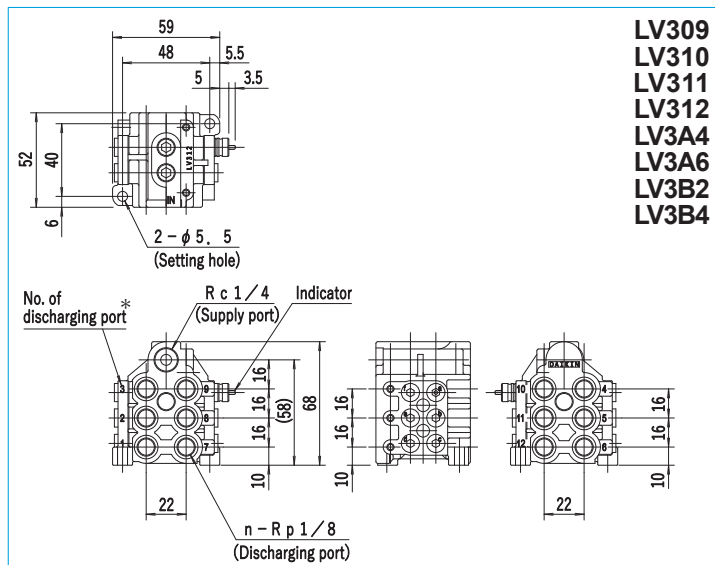
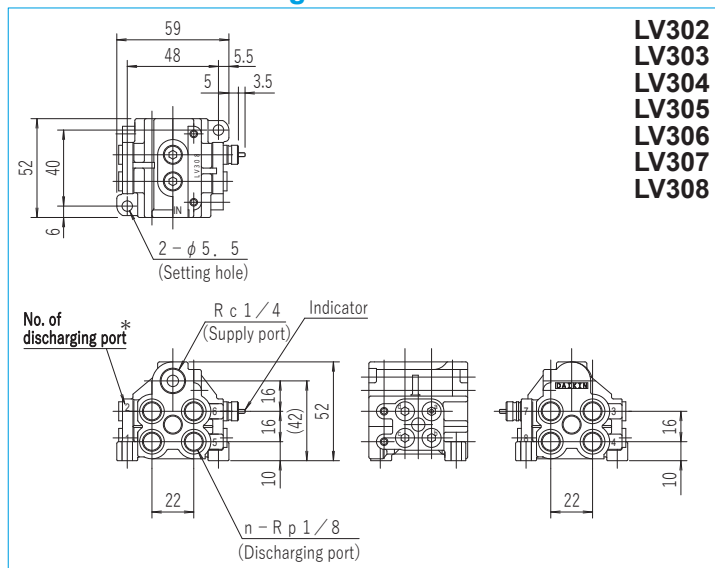
Specifications

Model	LV 302	LV 303	LV 304	LV 305	LV 306	LV 307	LV 308	LV 309	LV 310	LV 311	LV 312	LV 3A4	LV 3A6	LV 3B2	LV 3B4	
Number of discharging ports	2	3	4	5	6	7	8	9	10	11	12	4	6	2	4	
Discharge quantity (cm ³ /st)	0.52	0.26	0.13									0.13	0.065			
Discharging port factor of 6	Number of ports		—													
	Discharge quantity (cm ³ /st)		1		2											
Max. operating pressure (MPa)	For grease						17						For oil			
	For oil						7						For grease			
Operating temperature range (°C)	For grease						0 to +50 (#2 grease) 、 -5 to +50 (#1 grease)						For oil			
	For oil						-5 to +50						For grease			
Lubricant used	For grease						NLGI consistency #0 to #2 (lithium-based)						For oil			
	For oil						Mineral oil equivalent to ISO VG 68 or 100						For grease			
Weight (kg)	0.25						0.33									

Explanation of Model Symbols



Dimension drawings



Discharging port positions

*No. of discharging port	1	2	3	4	5	6	7	8	9	10	11	12
Model												
LV302	●	●	●	●	○	●	●	○				
LV303	○	●	●	○	○	○	○	●				
LV304	○	●	●	○	○	○	○	○				
LV305	○	○	○	○	○	○	○	○				
LV306	○	○	○	○	○	○	○	○				
LV307	○	●	○	○	○	○	○	○				
LV308	○	○	○	○	○	○	○	○				
LV309	○	○	○	○	○	○	○	○	○	○	○	●
LV310	○	○	○	○	○	○	○	○	○	○	○	○
LV311	○	○	○	○	○	○	○	○	○	○	○	●
LV312	○	○	○	○	○	○	○	○	○	○	○	○
LV3A4	○	○	○	●	●	●	○	○	○	○	○	○
LV3A6	○	○	○	●	●	●	○	○	○	○	○	○
LV3B2	○	●	●	●	○	○	○	○	○	○	○	○
LV3B4	○	●	●	●	●	○	○	○	○	○	○	○

○ : Discharging port
◎ : Discharging port factor of 6
● : Plug locations

■ Handling Precautions

- Never plug the discharging ports (refer to discharging port positions in the figure on the previous page) of a distributing valve.
- To decrease the number of discharging ports, use the collective Attachment (T322) on page 16.
- Do not remove plugs that are already attached to distributing valves.
- Indicator detection switches (part code: LV3-K) can be attached to the distributing valves. However, these are installed by the customers as options.
- Ensure that there is no remaining back pressure at the discharging port for oil

■ Connection of distributing valves

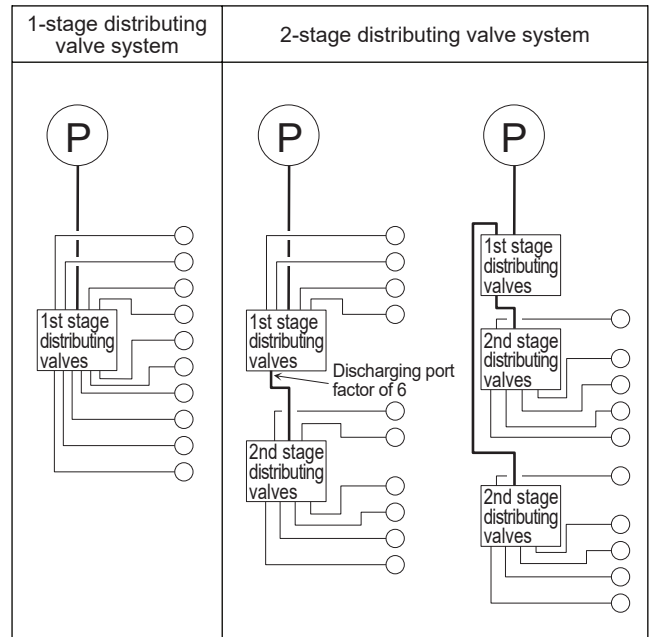
There are two types of distributing valve connection methods: the 1-stage distributing valve system for a small number of lubricating ports (max. 12) and the 2-stage distributing valve system for a large number of lubricating ports or distributed ports with dispersed lubricating points.

Distributing valves with discharging port factor of 6 (LV3A※, 3B※) are basically used as the 1-stage distributing valves, but other distributing valves can be used as either 1-stage or 2-stage distributing valves.

In the case of the 2-stage distributing valve system, if you want to supply the same amount of lubricant to each lubricating port with the minimum number of distributing valves to be used which is 2, use a distributing valve with discharging port factor of 6.

■ Basic configuration diagram for the connection

EX) Combination with equal lubrication when 10 lubrication ports are used.



■ Distribution valve combination table by number of lubrication ports (2 to 21 ports)

Combination of distributing valves			Number of lubricating ports / 2-stage distributing valve model, quantity and **lubricating ratio																				
Total number of distributing valves	Model # of the 1st stage distributing valve	The 2nd stage distributing valve	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
			1	Right column	Lubricating ratio	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎								
		Model LV	302	303	304	305	306	307	308	309	310	311	312										
		Quantity	1	1	1	1	1	1	1	1	1	1	1										
3	LV302	Lubricating ratio			◎	○	◎	○	◎	○	◎	○	◎	○	◎	○	◎	○	◎	○	◎		
		Model LV			302	302	303	303	304	304	305	305	306	306	307	307	308	308	309	309	310		
		Quantity			2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2		
		Model LV				303		304		305		306		307		308		309		310			
		Quantity				1		1		1		1		1		1		1		1			
4	LV303	Lubricating ratio					◎	○	◎	○	◎	○	◎	○	◎	○	◎	○	◎	○	◎		
		Model LV					302	302	302	303	303	303	304	304	304	304	305	305	305	306	306	306	
		Quantity						3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	
		Model LV						303	303		304	304		305	305		306	306		307	307		
		Quantity						1	2		1	2		1	2		1	2		1	2		
5	LV304	Lubricating ratio							◎	○	◎	○	◎	○	◎	○	◎	○	◎	○	◎		
		Model LV							302	302	302	302	303	303	303	303	304	304	304	304	305		
		Quantity								4	3	2	1	4	3	2	1	4	3	2	1	4	
		Model LV									303	303	303		304	304	304		305	305	305		
		Quantity								1	2	3		1	2	3		1	2	3			
6	LV305	Lubricating ratio									◎	○	◎	○	◎	○	◎	○	◎	○	◎		
		Model LV										302	302	302	302	302	303	303	303	303	303	304	
		Quantity											5	4	3	2	1	5	4	3	2	1	5
		Model LV											303	303	303	303		303	303	304	304		
		Quantity										1	2	3	4		1	2	3	4			
7	LV306	Lubricating ratio											◎	○	◎	○	◎	○	◎	○	◎		
		Model LV												302	302	302	302	302	302	303	303	303	
		Quantity													6	5	4	3	2	1	6	5	4
		Model LV														303	303	303	303	303		304	304
		Quantity													1	2	3	4	5		1	2	

**Lubricating ratio
 ◎ : Equivalent
 ○ : Approx. equivalent of 1.1 to 1.5 times
 △ : Unequal amount of 1.6 to 2.0 times
 ▲ : Unequal amount of 2.1 times or more
 There are many other combinations of unequal lubrication.

■ Distribution valve combination table by number of lubrication ports (21 to 40 ports)

Combination of distributing valves			Number of lubricating ports / 2-stage distributing valve model, quantity and **lubricating ratio																					
Total number of distributing valves	Model # of the 1st stage distributing valve	The 2nd stage distributing valve	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
3個	LV302	Lubricating ratio	○	◎	○	◎																		
		Model LV	310	311	311	312																		
		Quantity	1	2	1	2																		
		Model LV	311		312																			
		Quantity	1		1																			
4個	LV303	Lubricating ratio	◎	○	○	◎	○	○	◎	○	○	◎	○	○	◎	○	○	◎						
		Model LV	307	307	307	308	308	308	309	309	309	310	310	310	311	311	311	312						
		Quantity	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3						
		Model LV		308	308		309	309		310	310		311	311		312	312							
		Quantity		1	2		1	2		1	2		1	2		1	2		1	2				
5個	LV304	Lubricating ratio	○	○	○	◎	○	○	○	◎	○	○	○	◎	○	○	○	◎	○	○	○	◎		
		Model LV	305	305	305	306	306	306	306	307	307	307	307	308	308	308	308	309	309	309	309	309	309	310
		Quantity	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2
		Model LV	306	306	306		307	307	307		308	308	308		309	309	309		310	310	310		310	310
		Quantity	1	2	3		1	2	3		1	2	3		1	2	3		1	2	3		1	2
6個	LV305	Lubricating ratio	○	○	○	○	◎	○	○	○	○	◎	○	○	○	○	◎	○	○	○	○	○	◎	
		Model LV	304	304	304	304	305	305	305	305	305	306	306	306	306	306	307	307	307	307	307	307	308	
		Quantity	4	3	2	1	5	4	3	2	1	5	4	3	2	1	5	4	3	2	1	5	4	
		Model LV	305	305	305	305		306	306	306	306		307	307	307	307		308	308	308	308		308	308
		Quantity	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4		1	2
7個	LV306	Lubricating ratio	○	○	○	◎	○	○	○	○	○	◎	○	○	○	○	○	◎	○	○	○	○	◎	
		Model LV	303	303	303	304	304	304	304	304	304	305	305	305	305	305	305	306	306	306	306	306	306	
		Quantity	3	2	1	6	5	4	3	2	1	6	5	4	3	2	1	6	5	4	3	2	1	
		Model LV	304	304	304		305	305	305	305	305		306	306	306	306	306		307	307	307	307	307	
		Quantity	3	4	5		1	2	3	4	5		1	2	3	4	5		1	2	3	4	5	4

■ Distribution valve with discharging port factor of 6 combination table by number of lubrication ports (6 to 28 ports)

Combination of distributing valves			Number of lubricating ports / 2-stage distributing valve model, quantity and **lubricating ratio																								
Total number of distributing valves	Model # of the 1st stage distributing valve	The 2nd stage distributing valve	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28		
2個	LV3A4	Lubricating ratio	▲	△	○	○	◎	○	○	○	△	△	△														
		Model LV	302	303	304	305	306	307	308	309	310	311	312														
		Quantity	1	1	1	1	1	1	1	1	1	1	1														
		Model LV																									
		Quantity																									
2個	LV3A6	Lubricating ratio			▲	△	○	○	◎	○	○	○	△	△	△												
		Model LV			302	303	304	305	306	307	308	309	310	311	312												
		Quantity			1	1	1	1	1	1	1	1	1	1	1												
		Model LV																									
		Quantity																									
3個	LV3B2	Lubricating ratio	▲	▲	△	△	○	○	○	○	◎	○	○	○	○	○	○	△	△	△	△	△	△				
		Model LV	302	302	303	303	304	304	305	305	306	306	307	307	308	308	309	309	310	310	311	311	312				
		Quantity	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2				
		Model LV		303		304		305		306		307		308		309		310		311		312					
		Quantity		1		1		1		1		1		1		1		1		1		1					
3個	LV3B4	Lubricating ratio			▲	▲	△	△	○	○	○	○	◎	○	○	○	○	△	△	△	△	△	△	△			
		Model LV			302	302	303	303	304	304	305	305	306	306	307	307	308	308	309	309	310	310	311	311			
		Quantity			2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1			
		Model LV				303		304		305		306		307		308		309		310		311		312			
		Quantity				1		1		1		1		1		1		1		1		1		1			

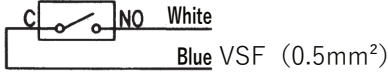
Detection Switch

Features

- The detection switch LV3-K detects the operating status of the distributing valve by attaching it to the indicator of the distributing valve.
- Blockage and damage to the main supply line (branch supply line) can be detected electrically by attaching this detection switch.
- This switch is installed by the customer on site.

Specifications

Rated contact current : DC30V 2A

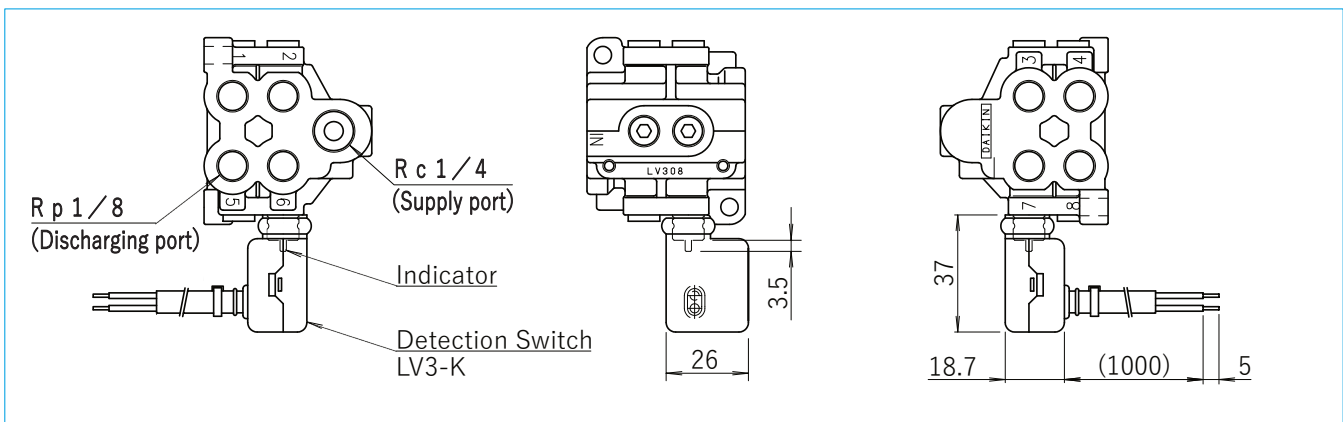


Protection Type : Drip-proof type

(Note, however, that it must not be exposed to the outside.)



Assembly drawings (ex. with LV308-12)

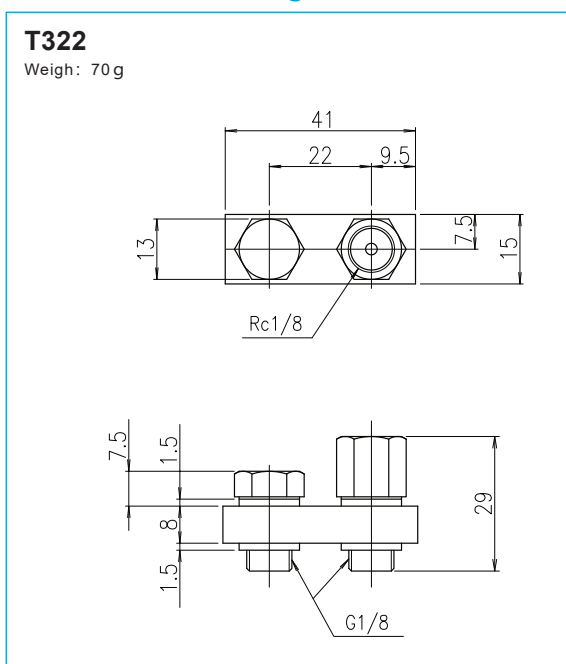


Collective Attachment

Features

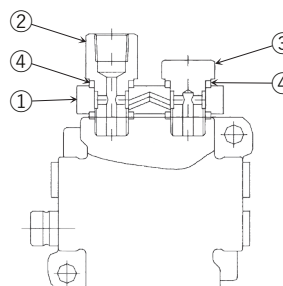
- The collective attachment T322 gathers adjacent discharging ports (2 ports).
- should be used when reducing the number of discharging ports or when double the amount of lubrication is required.

Dimension drawings



Assembly drawings

Discharge side Plug side



4	Copper gasket	4
3	Collective plug	1
2	Collective joint	1
1	Main body for 2 ports	1
Ref. No.	Parts name	QTY.

Note) Used between ports pitched of 22 mm.
Mount with a tightening torque of 1,300 to 1,500

Controller

Outstanding functions such as automatic operation, lubricant feed control, fault detection, and alarm output for performing system control

LC2MP



■ Features

- Since the lubrication timing and amount can be set in detail, you can use the machine with security by supplying the appropriate amount of lubrication at the right time according to the operating conditions of the machine.
- Unique system control ensures that high-viscosity grease can be supplied in low-temperature environments.

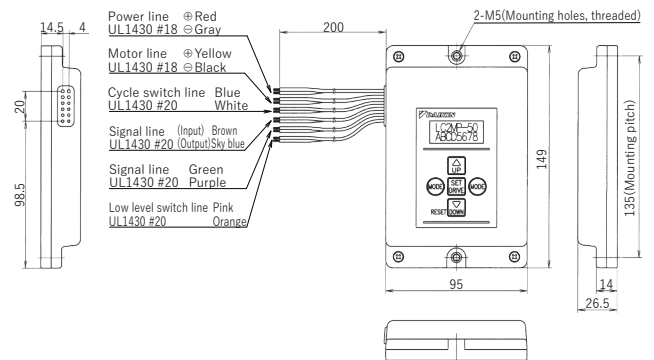
■ Specifications

Model	LC2MP-50-LA1
Power supply voltage (V)	DC24
Rated current value (A)	MAX6.5 (Pump current value)
Fuse capacity (A)	10
Operating temperature range (°C)	-20 ~ +60
Vibration durability	JIS D1601 Class 3 (8.9G)
Protection type	IP55

■ Dimension drawings

LC2MP-50-LA1

Weight: 0.3kg



The controller has the following function of detecting failures and lubrication count management.

Item	Abnormal pump pressurization	Abnormal high pressure	Overload error	Tank empty alarm
Phenomenon	Lubrication is not completed within the setting time. The cycle switch does not count up to the set number of times within the lubricating time.	The external pressure switch for high pressure alarm has been activated.	An overload (overcurrent) of the pump motor was detected.	The actual number of lubrication times has reached the set lubrication limit number. In case using a low level switch, the low level switch has been activated.
LCD (Flashing)	ERROR TIME UP	ERROR PRS/HIGH	ERROR OVERLOAD	EMPTY 04:48:45 <small>hh:mm:ss</small>

■ Basic Operation of Controller

The controller controls the pump motor according to the following procedure, and manages the entire lubricating system.

Automatic Operation

1) Power switch ON

When the power is turned on, the controller waits for the input of the drive signal. There is no display on the LCD at this point.

2) Lubrication interval time measurement

When the drive signal is input, the controller starts up, measuring the lubrication interval timer until the next lubrication, and enters the lubrication standby state. The LCD counts down the time until the next lubrication.

LCD examples



3) Lubrication (Pressurization)

The pump operates and lubrication starts, when the lubrication interval time reaches the preset time. The elapsed lubricating time and times counted by the cycle switch is displayed on the LCD.



4) Lubrication completed

When the cycle switch counts up to the set value, the pump stops, starts measuring the time until the next lubrication, and waits for it. (State 2) After that, repeat 2 to 4. The LCD screen counts down the time until the next lubrication.



Optional Operation

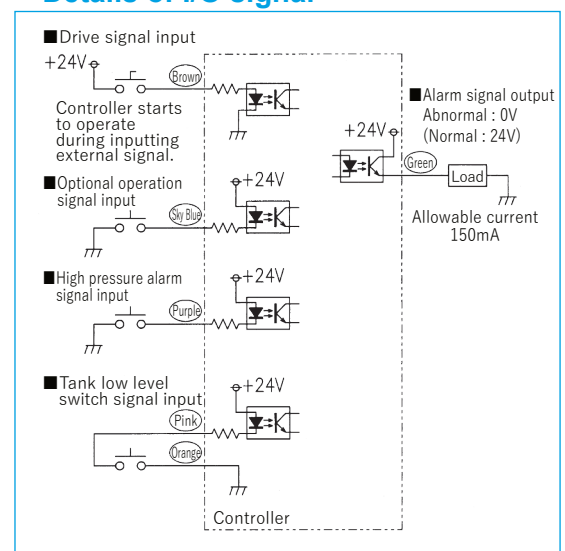
A lubrication process until reaching the number of cycles set on the cycle switch can be performed once at any timing independent of the timer. After completion of the lubrication, the integrated value of the lubricating interval timer is reset, and measurement of the timer for the next automatic operation starts. The elapsed lubricating time will be displayed on the LCD continuously.



End of Operation

When the operation signal of the main machinery is turned off, the controller stops the pump operation regardless of whether lubrication is in progress or standby (in measuring interval time). And it memorizes the integrated time of the lubricating interval timer then shuts off the power supply to itself automatically. Furthermore, even after power supply to the controller is turned off, the integration content of the interval time timer and settings are held in controller's memory, and when the next drive signal is input, the timer will count cumulatively from the last time it was shut off.

■ Details of I/O signal



Auxiliary equipment for the lubrication system has also been enhanced to make it even easier to use.

Filling pump

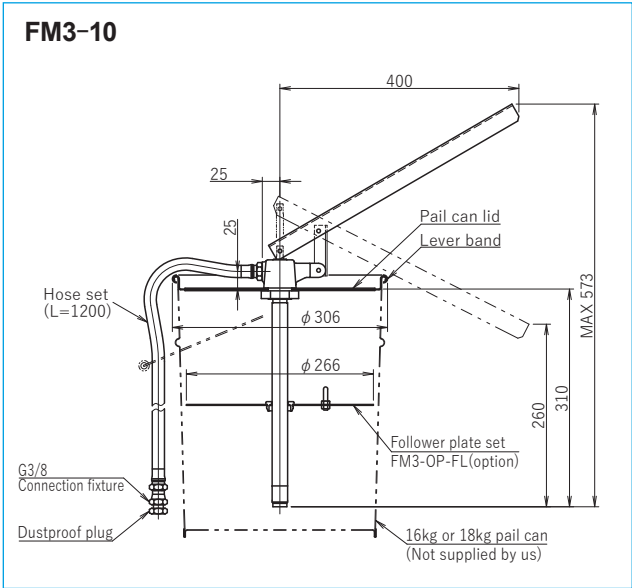
FM3

The filling pump FM3-10 is for replenishing grease directly from commercially available 16kg or 18kg pail cans to the tank of the manually operated pump (LB05F) and the motor driven pump (LE※※F) that are designed in a follower plate type tank structure with replenisher fixture.

Specifications

Discharge quantity (cm ³ /st)	9.0
Discharge pressure (MPa)	4.4
Operating temperature range (°C)	-10 ~ 50
Grease container used	JIS Z 1620 16 or 18 kg pail can
Handle operating force (N)	147
Weight (kg)	2.4

Use the follower plate set (FM3-OP-FL) in the dimension drawing when filling NLGI consistency No. 2 grease (lithium-based) at 5°C or less.



* Follower plate set FM3-OP-FL (option)

Grease cartridges (Lithium-based)

G-KL, GKL, GSL

We have prepared the following as genuine grease cartridge, but there are various general commercial products that can be obtained directly from oil manufacturers, so you can use them. Consult with us when using grease other than lithium-based grease or grease that is not available in a cartridge.

Genuine grease cartridge containing 400cm³

NLGI consistency No.1

G-KL1 (Kyodo Yushi)

Genuine grease cartridge containing 500 and 1000cm³

NLGI consistency No.1

GKL-1-100 (1,000cm³) (Kyodo Yushi)
GKL-1-050 (500cm³) (Kyodo Yushi)
GSL-1-100 (1,000cm³)

NLGI consistency No.2

GKL-2-100 (1,000cm³) (Kyodo Yushi)
GKL-2-050 (500cm³) (Kyodo Yushi)
GSL-2-100 (1,000cm³) (Shell Lubricants Japan)
GSL-2-050 (500cm³) (Shell Lubricants Japan)



PIPING PLANNING

Appropriate piping design takes advantage of centralized lubrication system functionality

Piping Standards

Supply Lines	System pressure MAX (MPa)	*Piping materials	Pipe diameter	Remarks
Main	17	Steel or copper pipe	$\phi 8 \times \phi 6$	Pipe connecting the pump and the 1st stage distributing valve
Branch	17	Steel or copper pipe	$\phi 6 \times \phi 4$	Pipes connecting the 1st stage and the 2nd stage distributing valve
Discharge	4	Polyethylene tube or copper pipe	$\phi 6 \times \phi 4$ $\phi 4 \times \phi 2.6$	Pipe connecting distribution valve and bearing (lubrication surface)

*For piping materials, fittings, etc., refer to the "LUBYACE System Standard Piping Material Diagram" on P.19.

Determination of pipe length

The allowable piping length is determined by the pipe diameter, grease consistency and pressure loss (piping resistance) under environmental conditions such as environmental temperature. Obtain the allowable length of each pipe from the following, and determine the setting position of the pump and distributing valve so that it is within the allowable range.

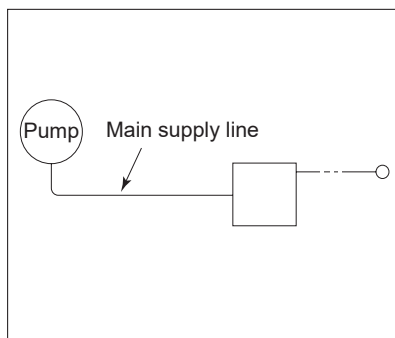
Determination Procedure of the equipment setting position

(1) Pipe connecting the pump and the 1st stage distributing valve

There is a difference in the allowable length between the 1-stage distributing valve system and the 2-stage distributing valve system as the main supply line only should be considered for 1-stage distribution valve system and branch supply line for 2-stage distribution valve system.

•The 1-stage distributing valve system

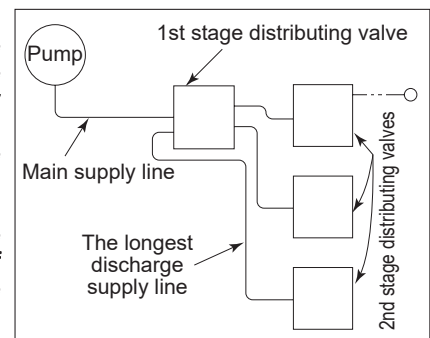
Determine the setting position of the pump so that the length of the main supply line is within the allowable length shown in Table 1.



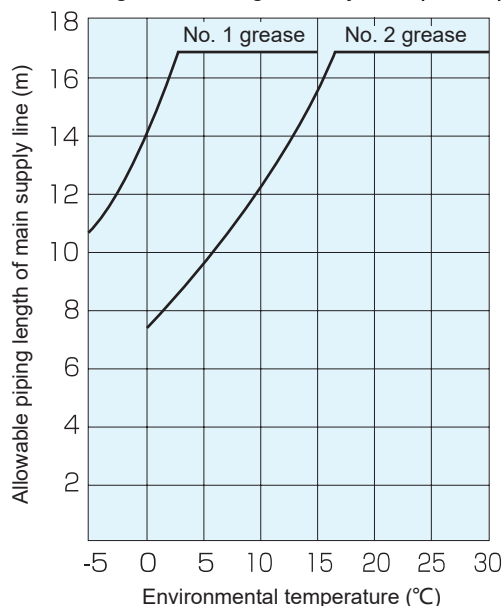
•The 2-stage distributing valve system

Determine the setting position of the pump and 1-stage distributing valve so that the total length of the main supply line and the longest branch supply line is within the allowable length shown in Table 2.

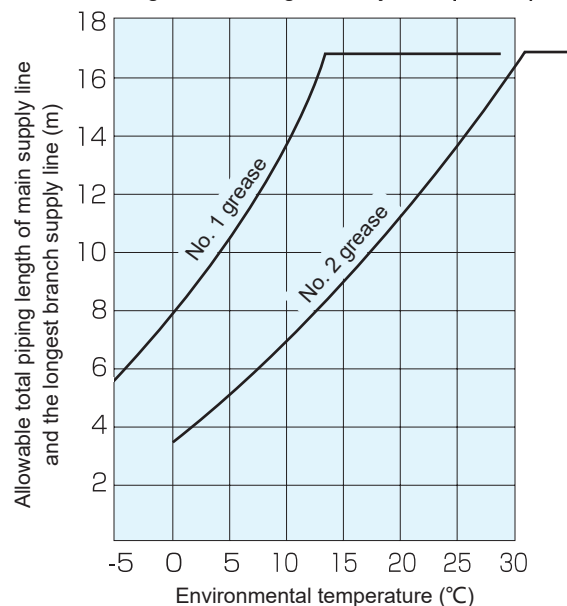
(Table 2 shows the allowable length when the length ratio of the main supply line and the branch line is 1:1.)



•The 1-stage distributing valve system (table 1)



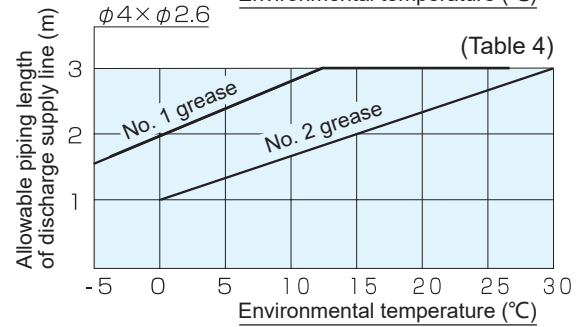
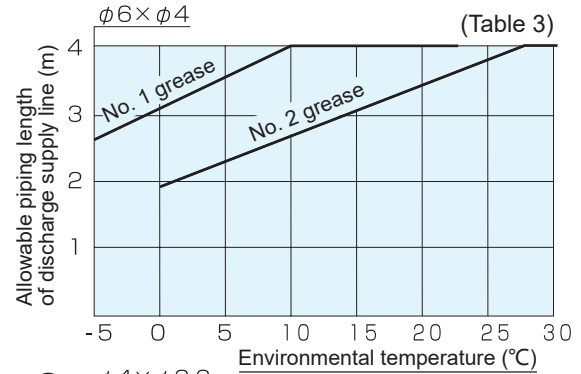
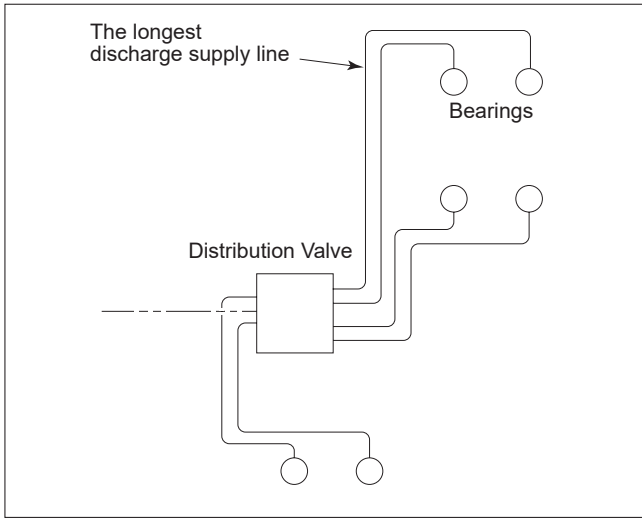
•The 2-stage distributing valve system (table 2)



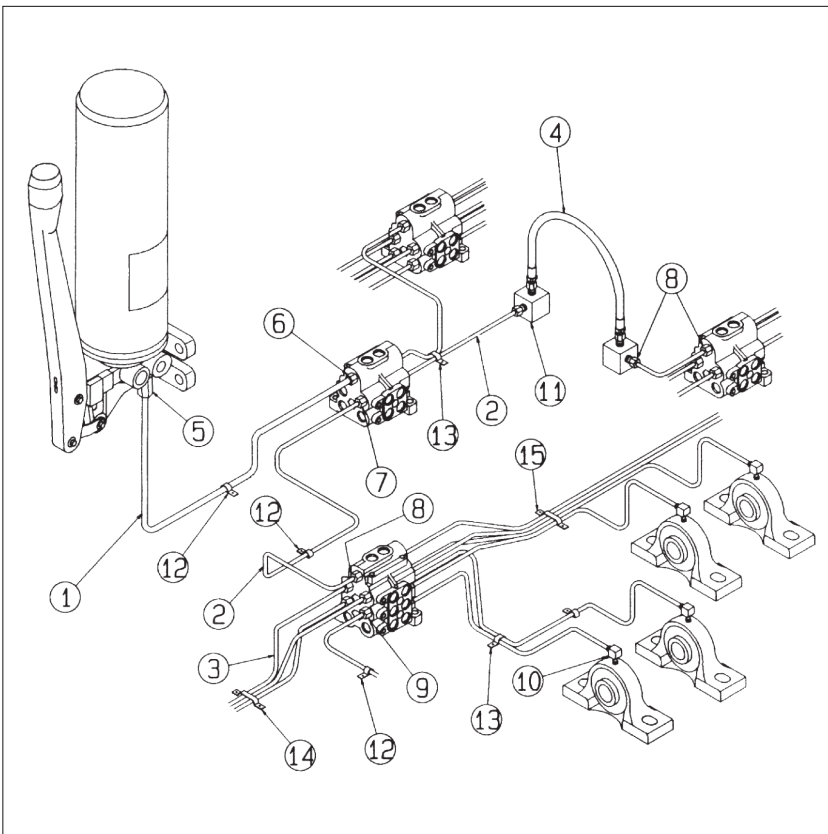
- When using No. 0 grease, the piping can be about 60% longer than the No. 1 grease piping length.
- When using oil (equivalent to machine oil), the main supply line (branch supply line) $\phi 6 \times \phi 4$ can be piped up to a maximum length of 21m, and the discharge supply line $\phi 4 \times \phi 2.6$ 4m.

(2)Distributing valve (determination of discharge supply line length)

Determine the setting position of the distribution valve so that the longest discharge supply line is within the allowable length shown in Table 3 and 4.



LUBYACE system standard piping material diagram



Note) The recommended tightening torque for the piping connection port of the equipment is as follows;

Screw diameter	Tightening torque N · cm
Rc3/8	3000~3500
Rc1/4	1700~2000
Rc1/8	800~1000
Rp1/8	1000~1200

Note) Use the recommended models and parts number for fittings.

Ref No.	Parts Name	Dimension and Material	Model
1	Main supply line	$\phi 8$ Copper pipe	
2	Branch supply line	$\phi 6$ Copper pipe	
3	Discharge supply line	$\phi 6$ Polyethylene tube	60PLYT
		$\phi 4$ Polyethylene tube	40PLYT
4	Main supply line and branch supply line for movable parts	1/4 Rubber hose for high pressure	
5	Fittings	For pump discharge port	$\phi 8 \times 3/8$ T203-B3
		For supply port of 1st stage distributing valve	$\phi 8 \times 1/4$ T203-B2
6	Fittings	For discharge port of 1st stage distributing valve	$\phi 6 \times 1/8$ T203-A1
		For supply port of 2nd stage distributing valve	$\phi 6 \times 1/4$ T203-A2
7	Fittings	For discharge port of 2nd stage distributing valve	$\phi 6 \times 1/8$ P61A
			$\phi 4 \times 1/8$ P41A
8	Fittings	$\phi 6 \times 1/8$	Straight P61A
			elbow P61EA
		$\phi 4 \times 1/8$	Straight P41A
			elbow P41EA
9	Fittings	For connection to bearings	$\phi 6 \times 1/8$ Straight P61A
			$\phi 6 \times 1/8$ elbow P61EA
			$\phi 4 \times 1/8$ Straight P41A
10	Fittings	For connection to bearings	$\phi 4 \times 1/8$ elbow P41EA
11	Pipe anchor block		T1927-2
12	Piping band	For $\phi 8 \times 1$ pipe	T606-B1
		For $\phi 6 \times 1$ pipe	T606-A1
		For $\phi 4 \times 1$ pipe	T21-N1
13	Piping band	For 2 pipes	For $\phi 6 \times 2$ pipes T606-A2
			For $\phi 4 \times 2$ pipes T21-N2
14	Piping band	For 3 pipes	For $\phi 6 \times 3$ pipes both sides mounting type T606-A3
			For $\phi 4 \times 3$ pipes both sides mounting type T21-N3
15	Piping band	For 4 pipes	For $\phi 6 \times 4$ pipes T606-A4
			For $\phi 4 \times 4$ pipes T21-N4

MEMO

When Inquiring With Us

■ Please inform us of the following items when inquiring about lubricating equipment.

1. The overall drawing or a sketch including overall dimensions of the machine equipment
2. Quantity and location of lubrication points
In particular, please specify the points to be lubricated on the drawing (sketch).
3. Types and characteristics of the above lubrication points
 - (a) Types of bearings and sliding parts (flat bearings, ball bearings, etc.)
 - (b) Dimensions and number of revolutions
 - (c) Whether the lubrication ports are fixed, movable, or rotatable, the movement, and the number of revolutions
 - (d) diameter of the lubrication ports' thread
 - (e) Special attentions to be paid in determining the amount of lubrication
 - (f) Types of lubricants (grease and oil)
4. In case the product will be exposed to high or low temperatures (50°C or higher, 0°C or lower), provide us the detailed information of the environment.
5. Whether it will be for outdoor or indoor, or particular status environment.
6. Planned pump type and control method.
Pneumatic/hydraulic pump, fully automatic control, semi-automatic control, with/without control panel, with/without spare pump.
7. Plans or instructions for the location of pumps and main pipes.
8. Power supply for motor driven pump control panel (voltage, frequency)
9. Special requirements regarding the control panel (remote display, remote operation, etc.)
10. Specification of drive pneumatic source and hydraulic source
11. Other important points regarding quotations
(If you do not specify about items 3, 4 and below, we will estimate based on our standards.)
12. Drawings, documents and their number of copies to be submitted for quotation.
Note that, if construction is included, please specify the following items.
 1. Construction site
 2. Scope of construction (In principle we do not provide electricity or foundation work.)
 3. Supplies
For example, electricity, water (if nearby), lubricants used, oxygen, acetylene, etc.

Safety Precautions

This section describes items that require special attention for the safety of the lubrication system before using this product.

The safety precautions listed here are intended to prevent injury or damage to the customer. In addition, the precautions are divided into two categories, "Warning" and "Caution", according to what may occur if the product is handled incorrectly. Be sure to follow all of these instructions as they include important safety information.

Warning

In case where the product operation is mishandled ignoring this indication, a dangerous situation may occur leading to fatal or serious injuries.

Caution

In case where the product operation is mishandled ignoring this indication, a dangerous situation may occur leading to injuries or property damage.

Warning

1. Turn off the power switch on the control panel before installing, removing, or repairing the product. Otherwise, the pump will automatically operate, causing the grease to leak and stain the surroundings.
2. Do not step on the lubricating equipment, piping, etc. attached to the machine as a foothold or pull as a handrail. It may cause slips and falls or damage the lubrication system.
3. Do not disassemble or remodel the lubrication equipment. Please consult us if necessary. In the unlikely event that maintenance work is required at the site, it should be performed by a person with specialized knowledge (Hydraulic adjuster level 2).
4. Injury may occur when handling lubricating equipment, so wear protective equipment depending on the situation.

Caution

1. When venting air from the pump, protect it with a plastic bag and so on. Grease (oil) mixed with air may scatter and get into your eyes or stain the surroundings.
2. Use protective equipment when handling grease. If it gets in your eyes or touches your skin, it may cause visual impairment or inflammation.
3. Carry out periodic inspections of the lubrication system (grease/oil consumption control, operation check, etc.). If you forget inspections, it may cause machine failure due to seizure in bearings, etc.
4. Use the product within the rated specifications and the usable environmental conditions. Using the product outside of the rated specifications or in a special atmosphere (next to fire, explosive atmosphere, etc.) may cause mechanical failure or fire.

Point of contact



**DAIKIN LUBRICATION PRODUCTS &
ENGINEERING CO., LTD.**

<https://www.daikin-lubrication.co.jp/en/>