

INSTRUCTION MANUAL  
OF  
MOTOR DRIVEN GREASE PUMP

UE-30, 40, 45A\*\*\*\*\*-10

This pump is used as a source of supply of grease for dual line centralized lubrication systems, and is the most suitable lubricating pump for relatively large facilities or machines.

### 1. Features

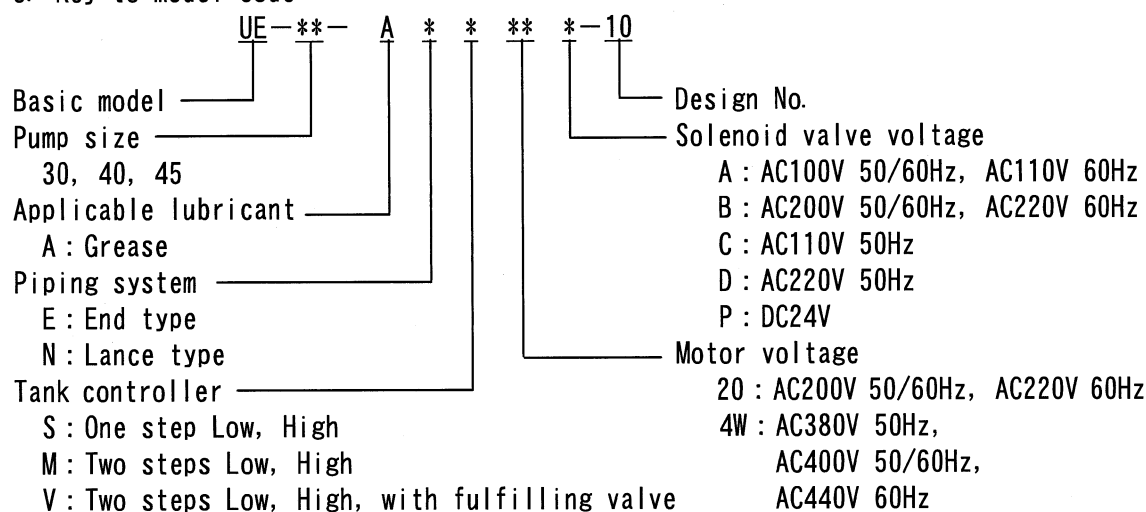
- (1) Because this pump uniquely uses three pistons, discharge volume becomes larger and working pressure becomes higher than previous U type pump.  
Besides, downsize of motor output leads to energy saving.
- (2) This pump can choose between three grade reduction ratio and discharge volume.
- (3) Because this tank uses piston follower plate, accurate control of quantity of oil is possible.

### 2. Specification

Model	Discharge volume cm <sup>3</sup> /min	Max. working pressure MPa	Tank capacity ℓ	Geared motor Output × Pole	Geared motor Reduction ratio
UE-30A*****-10	133/160	40	90	0.4kW×4P	1/60
UE-40A*****-10	200/240			0.4kW×4P	1/40
UE-45A*****-10	400/480			0.75kW×4P	1/20

Applicable grease : equivalent to Lithium type grease NLGI 0 to 1 (above -10°C)

### 3. Key to model code



### 4. Construction

- Geared motor
- PE-40A type Grease pump set
- T-90A-45 type Grease tank set
- JR-G01-6L type Relief valve (safety valve)
- SV03 type Solenoid controlled valve
- SP-R-500 type Pressure switch (is used for N: Lance type only)

## 5. Explanation of structure and operation

### 5-1 PE-40A type Grease pump (refer to Figure I, II)

The rotational force produced by the start of ① Motor is reduced by motor and ② Reduction gear is transmitted to ④ Eccentric through ③ Eccentric shaft. This rotational force is further converted by the eccentric motion of the eccentric into the reciprocating motion of ⑥ Pilot piston and ⑦ Main piston fixed at the tip of ⑤ Connecting rod.

As ⑥ Pilot piston and ⑦ Main piston are driven by a fixed difference in phase each other by ④ Eccentric, ⑦ Main piston sucks and feeds the grease, then ⑥ Pilot piston matches in this and works as a valve.

The grease is sucked from the suction port (A), (B) and (E) of ⑧ pump cylinder, and passes through the passage (C), (F) in the compression process of the piston, and is sent out to the discharge port (D).

The pressurized grease goes into ⑩ Solenoid controlled valve, is sent to discharge port of line I, line II, as well as being sent to ⑨ Pressure gauge, ⑪ Relief valve, and is used to the confirmation of the discharge pressure, leads to drain of the tank in unusual high pressure.

Direction of drive shaft rotation of UE-45 type is counterclockwise and UE-30, 40 type is clockwise seeing from motor installation side. (refer to View B)

### 5-2 T-90A-45 type Grease tank (refer to Figure I)

To keep the up and down movements of grease level properly, the grease reservoir tank is provided with ⑬ Follower plate which moves up and down along the tank inner surface which following the increase and decrease of grease.

The grease level is confirmed by the mark of ⑭ Piston rod.

When it arrives at the lower limit due to the drop of grease level, ⑰ Low level limit switch is turned on by ⑯ Cam attached to the upper part of piston rod.

When it arrives at the upper limit due to rising of grease level, ⑱ High level limit switch is turned on by cam attached to ⑮ Cam rod.

By electric connection with limit switches, in addition to lamp indication or warning signal, automatic grease supply can be set.

⑲ Tank escape valve operates when the grease is supplied to tank, is set to certain pressure to avoid the damage of tank.

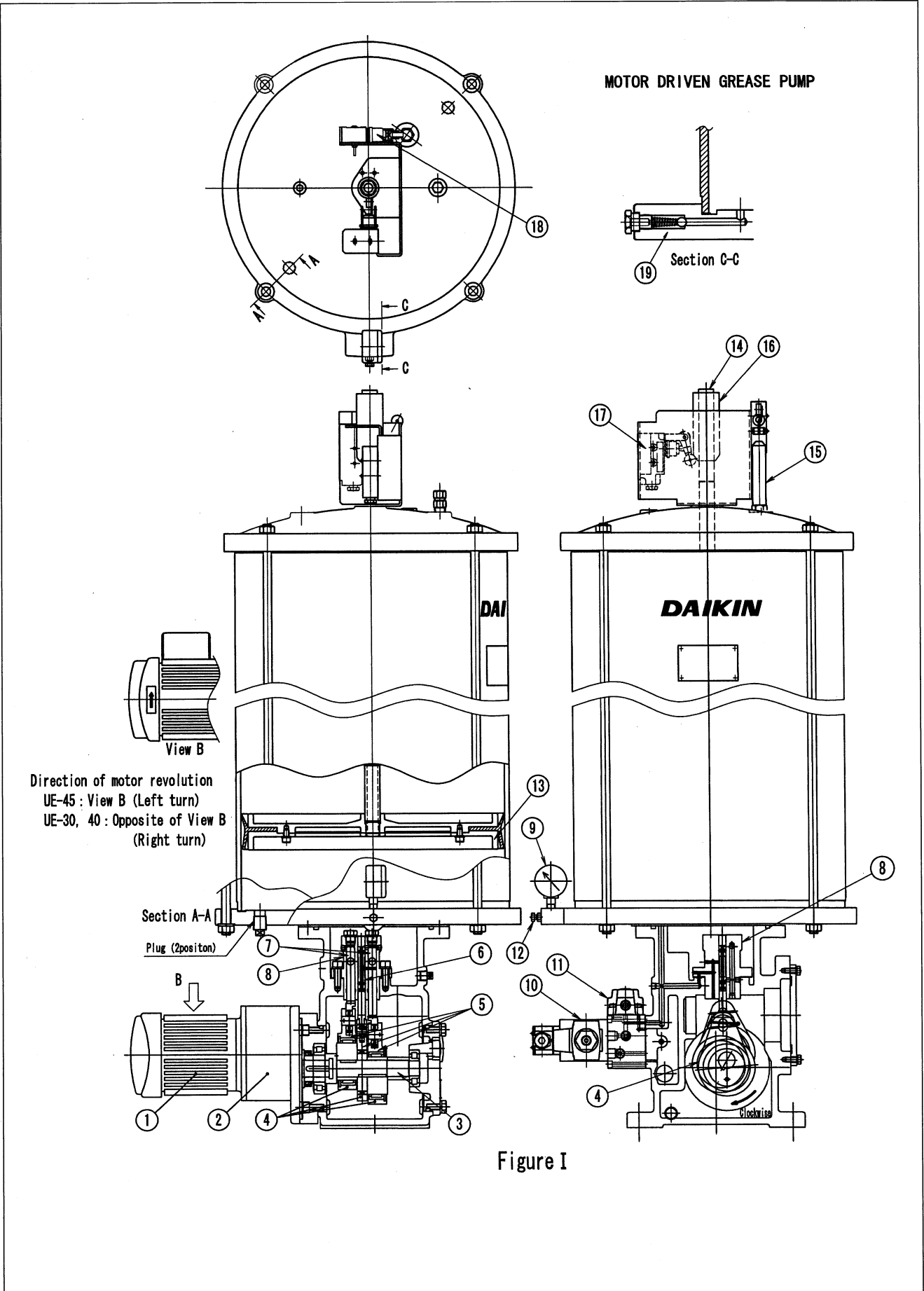
### 5-3 Two steps low level limit switch, two steps high level limit switch and fulfilling valve (refer to Figure III)

Automatic grease supply is possible. Supply line is connected to inlet of fulfilling valve, grease is supplied by open and shut of solenoid controlled valve unit (separately arranged). ⑰ Low level limit switch (33GL) is on and then grease supply is started, ⑱ High level limit switch (33GH) is on and then grease supply is completed. ⑳ Low-low level limit switch (33GLL) is used as "Tank empty" alarm in case of malfunction of low level limit switch, ㉑

High-high level limit switch (33GHH) is used as "Tank full" alarm in case of malfunction of high level limit switch.

㉒ Fulfilling valve is to prevent the overflow of grease in tank mechanically, shuts the supply line by pushing up the spool at the time of abnormal rising of follower plate.

In case of low level limit switch, high level limit switch and fulfilling valve is not automatically controlled in construction period or under trial run, and so on, supply grease from inlet of fulfilling valve.



Structure and operation of triple piston type pump

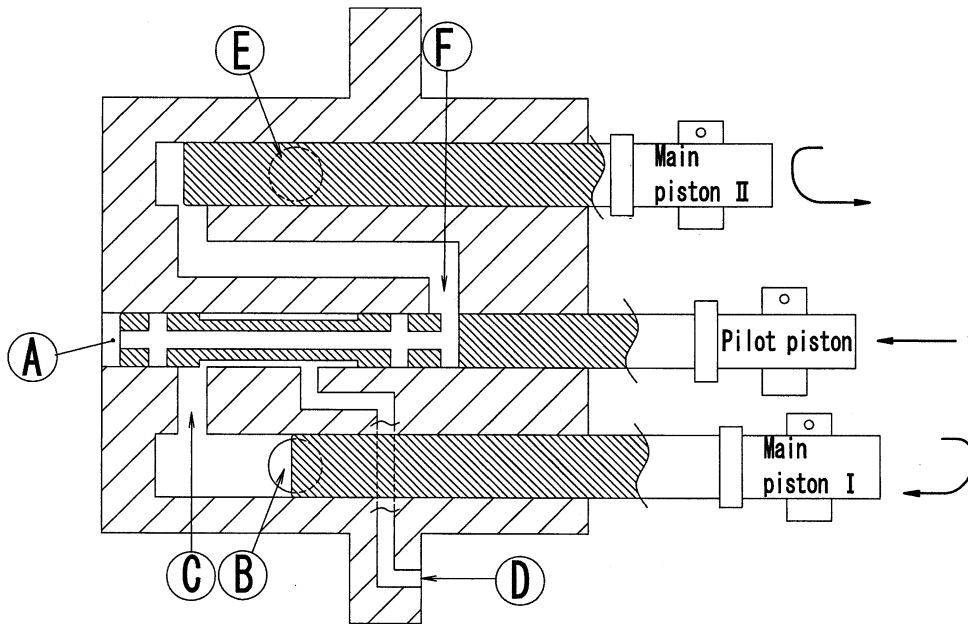
A, B and E : Suction port    C and F : Passage    D : Discharge port

Motion 1

Main piston I moves to discharge grease after sucking.

Pilot piston moves to left as a valve.

Main piston II moves to suck grease after discharging.

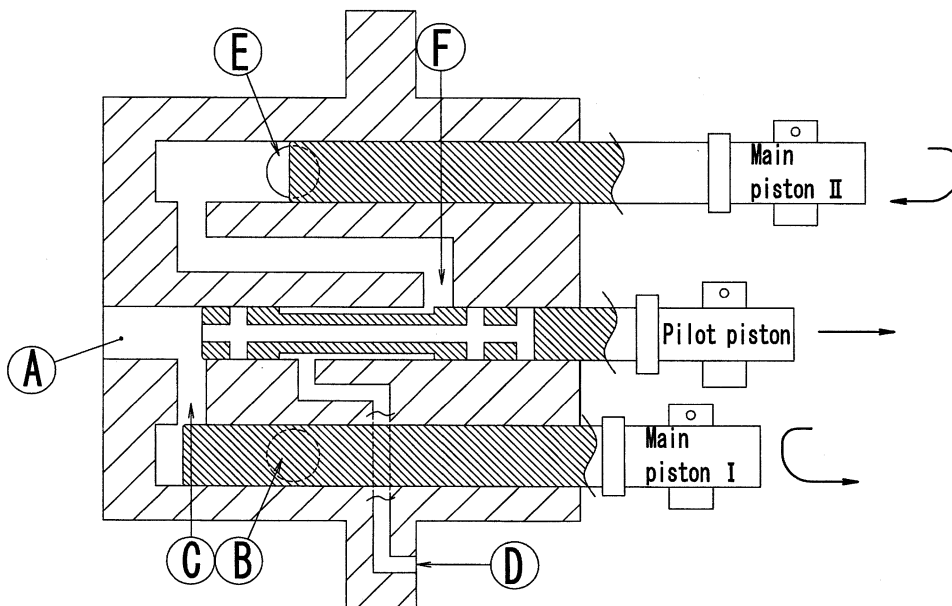


Motion 2

Main piston I moves to suck grease after discharging.

Pilot piston moves to right as a valve.

Main piston II moves to discharge grease after sucking.



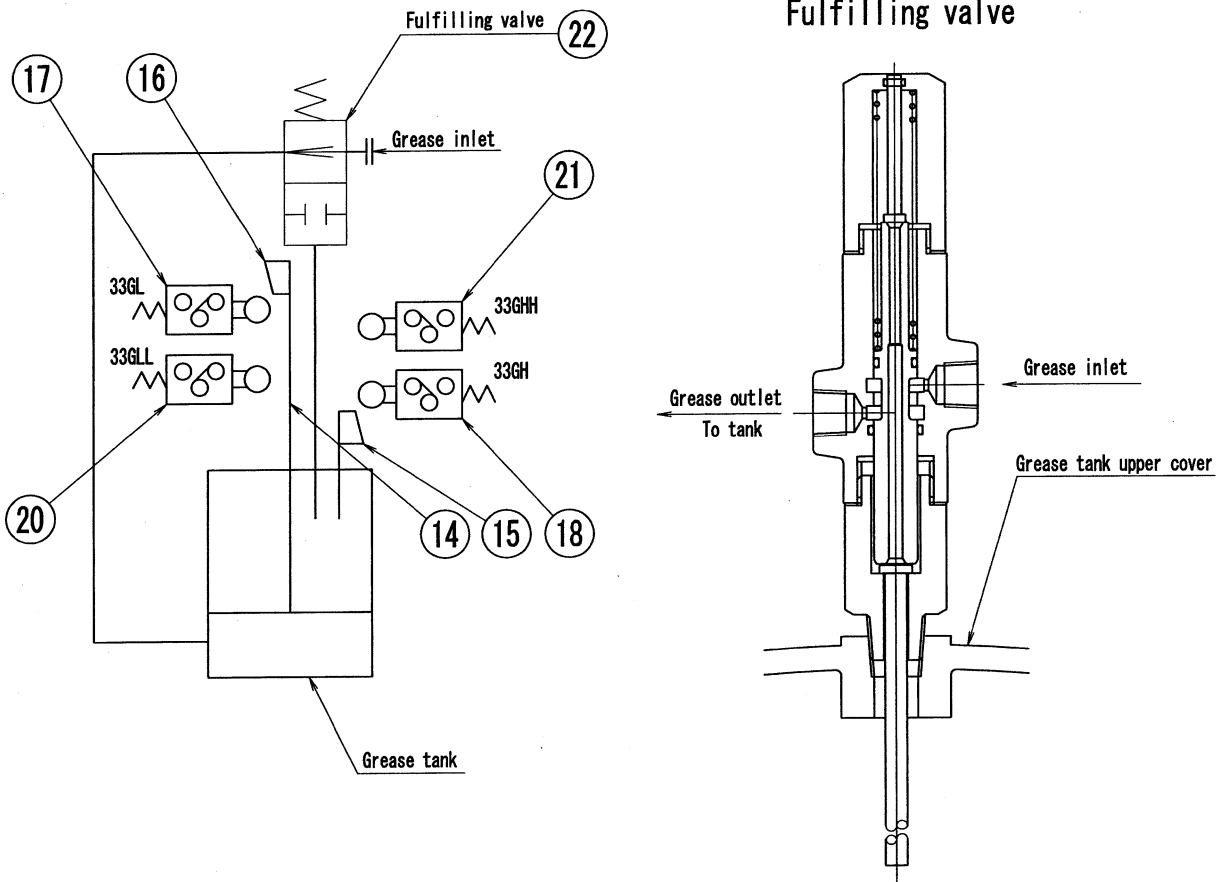


Figure III

## 6. Piping system

### 6-1 End type (refer to drawing Position 1 to 4)

Solenoid controlled valve is attached to pump and pressure control valve is connected to piping end.

Grease pressurized by pump flows through solenoid controlled valve and activates all the distributing valves. When the pressure increases to switching pressure (preset with pressure control valve), a signal is sent and solenoid controlled valve is operated. Upon completion of this switching operation, the residual pressure in main pipes and branch pipes are released into the tank.

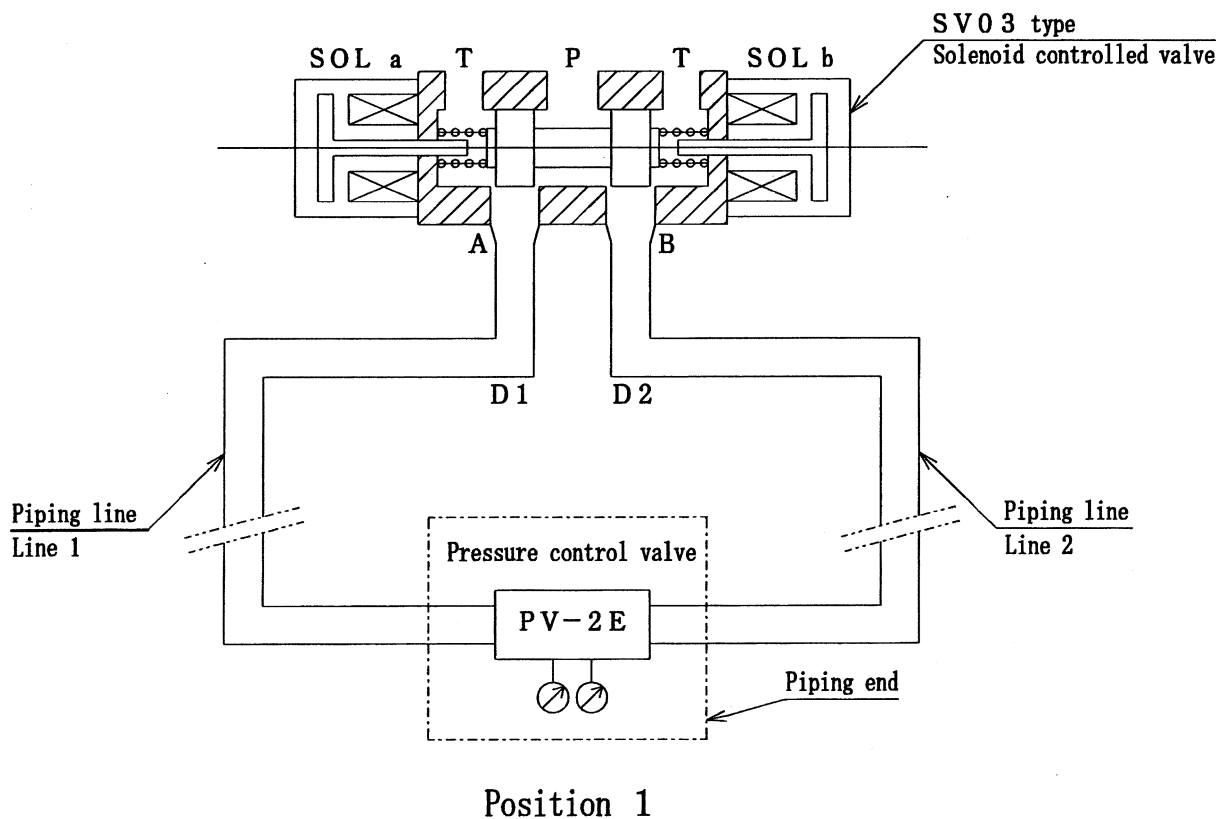
### 6-2 Lance type

Solenoid controlled valve is attached to pump and pressure switch is connected to pump outlet.

Grease pressurized by pump flows through solenoid controlled valve and activates all the distributing valves. When the pressure increases to switching pressure (preset with pressure switch), a signal is sent and solenoid controlled valve is operated. Upon completion of this switching operation, the residual pressure in main pipes and branch pipes are released into the tank.

### Position 1 (stopped state)

Before operating the pump, ports A and B are open to the tank, and therefore ports of piping line (Line 1, Line 2), D1 and D2 are also open to the tank.

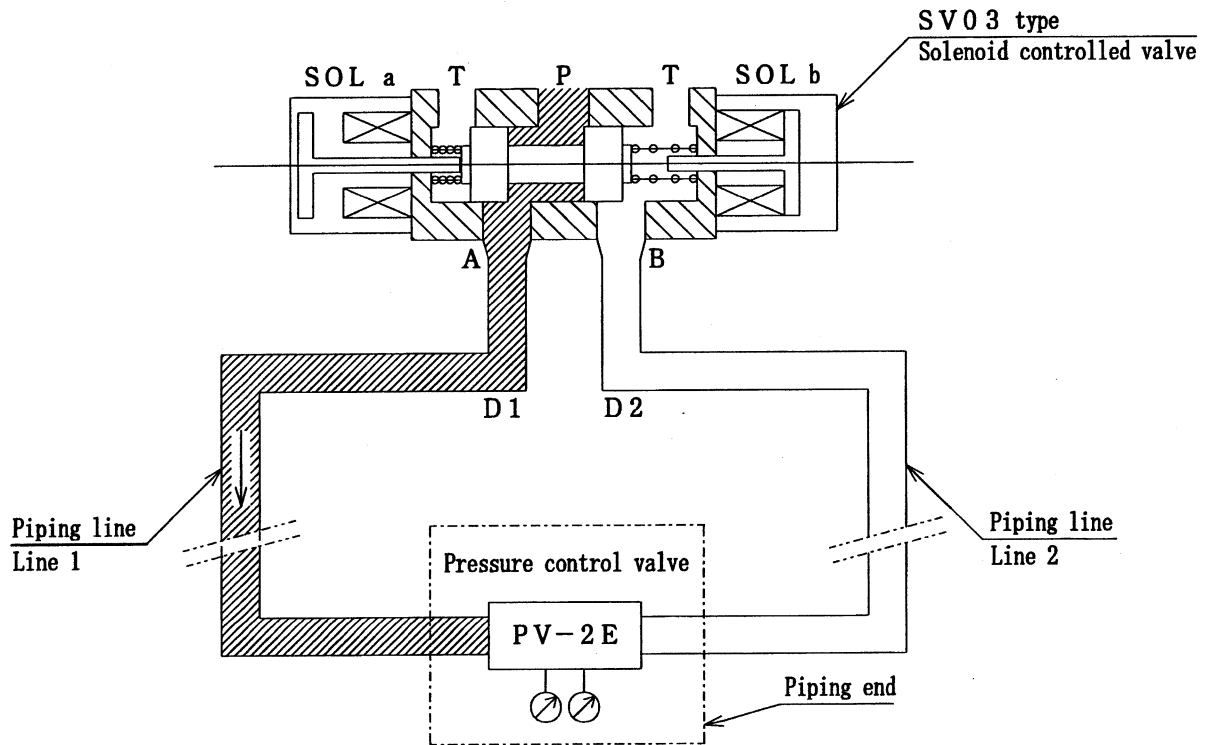


**Position 2 (grease being delivered to Line 1)**

Activate the pump to energize the solenoid valve SOL b. Pressurized grease flows through port A (outlet of the solenoid controlled valve) and discharges to port D. (Note 1)

Pressurized grease discharged from Line 1 activates all the distributing valves. Pressure in Line 1 rapidly increases and is transmitted to the pressure control valve (PV-2E). When the pressure reaches the preset value, the switch turns ON and sends a signal to demagnetize SOL b and stop the pump.

Note 1) Line 2 is opened from port D (discharge port) to the tank.

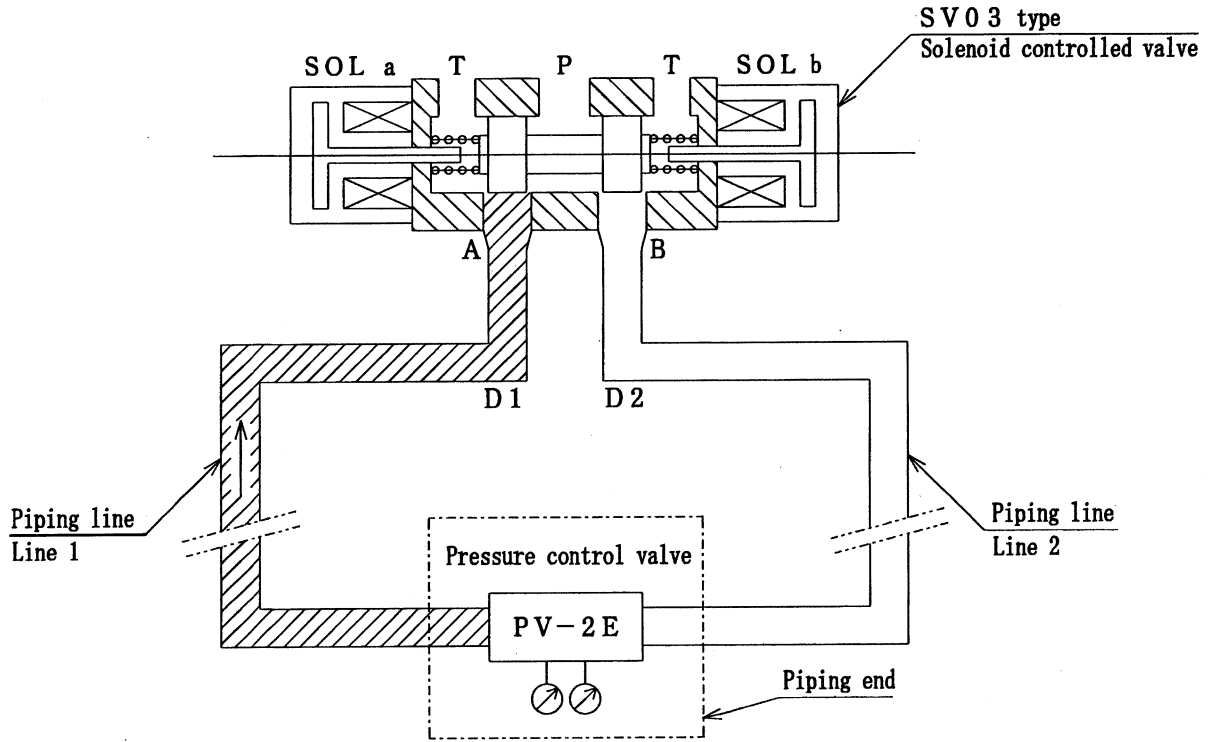


Position 2



Position 3 (completion of grease delivery to Line 1)

After SOL b is demagnetized, port A is connected to the tank through port T. Pressure in port A is released to the tank through port T (solenoid) and rapidly decreases. Pressure in all the ports is released and the state shifts to Position 4.



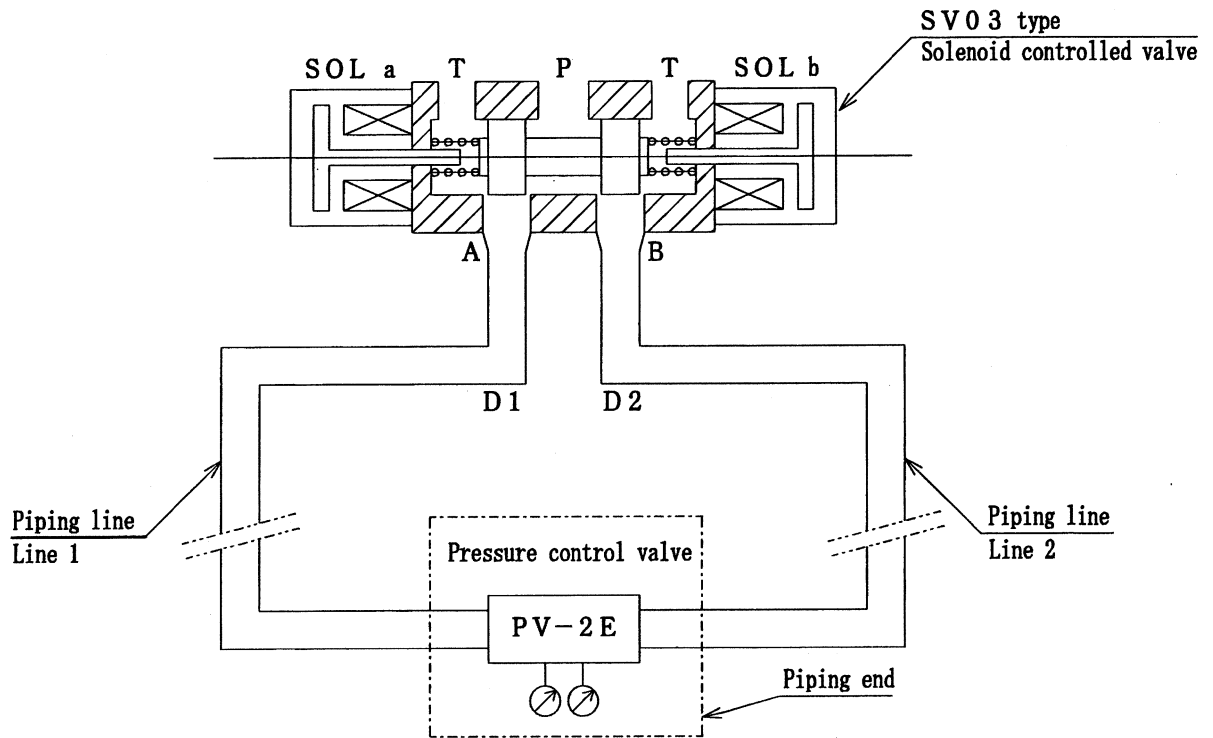
Position 3

## Position 4 (stopped state)

After operation on Line 1 (SOL b), wait for Line 2 operation.

When it starts, the solenoid valve SOL a is energized, the pump is activated and delivery by Line 2 is operated.

This time, movement is quite reverse to Line 1 (SOL b).



Position 4

#### 7. Cautions for Handling

- 1) Take care so that dust or air bubbles are not mixed in grease used.  
At the first operation or when air bubbles are mixed in, operate with loosening ⑫ Air vent valve (on Figure 1). After the air bubbles are disappeared, close air vent valve again.
- 2) At the first time of filling grease, open the air vent plug at the top of piston to remove air from the pump housing and the tank completely. After the pump housing and lower part of tank follower plate is completely filled with grease that flows out from the two holes on bottom face at the bottom cover, close the air vent plug.
- 3) Make sure that the crank chamber is filled with lubricating oil before starting the pump. Lubricating oil should gear oil, Class 2 ISO VG220 JISK2219, or the equivalent. Fill oil up to the specified oil level, and change it every 2,000 hours.
- 4) Opening pressure of relief valve is set on 45MPa.

#### 8. Maintenance and adjustment

If the pressure does not rise in long time operation, or discharge amount decreases, possibly resulting from wear of the pump cylinder set, adjust in the following procedure.

- 1) Remove the drain plug in crank chamber of the pump housing and draw gear oil out.
- 2) Loosen piston hole plug at the upper part of cylinder from upper side of the pump housing, remove 4 bolts of pump cylinder and pull the cylinder up.
- 3) Remove the cover with the oil level gauge, pull the eccentric shaft out from the cover hole. The eccentric, piston, connecting rod assembly and worm gears are taken out together.  
Continuously, remove the opposite cover.
- 4) Insert new pump cylinder from upper side and lightly tighten by bolts.
- 5) Exchange main piston and pilot piston for new one, set in connecting rod. Assemble them into the eccentric shaft as same as before disassembly, from the cover hole insert two pistons into the pump cylinder.
- 6) Pour a small quantity of gear oil from top of pump housing and turn to clockwise by hands.

It is good condition that the worm is rotated smoothly, at a certain point (when the main piston blocks inlet port) rotation of the worm grows slightly heavy.