INSTRUCTION MANUAL
OF
MOTOR DRIVEN GREASE PUMP

AKA-108(104)AKP-10

DAIKIN LUBRICATION PRODUCTS & ENGINEERING CO.,LTD.

To use this system safely, it is necessary to get basic knowledge of hydraulic, piping, electric, wiring, and of this equipment (the level authorized of your company).
Wrong operation may cause accident. To prevent these accidents, be sure to read this handling manual and drawing (construction drawing, circuit diagram), and after making sure to understand these contents enough, it can be controlled operation and maintenance.
To keep this equipment good condition, and to carry out safe operation and maintenance, be sure to meet rightly.

WARNING This sign shows suffering death or serious injury, in case of wrong operation.

CAUTION This sign shows suffering a serious or slight injury or occurring equipment damage, in case of wrong operation.

1. Caution at operation

WARNING Do not open a door of control panel and a cover of equipments because of danger during operation.
Keep always all doors closed except on maintenance, inspection or service.

CAUTION Do not touch movable parts of equipment because of danger during remote control operation.

CAUTION Do not put out the pipe or the plug absolutely except maintenance or inspection. Because of danger if it is high pressure inside be careful on working maintenance and inspection with following points.

2. Caution at maintenance and inspection

WARNING During maintaining and inspecting this equipment, turn off the control panel's main power switch, because of getting an electric shock.

WARNING In case of using plural different power source for equipment's source, confirm well and then turn off all power switch.

CAUTION When maintaining and inspecting this equipment, starting to loosen the fitting or plug slowly and discharge as leaking pressured grease in the pipe because of danger. If loosening at a time, burst open the plug or pipe by the inside pressure may cause serious injury.

CAUTION Be sure to inspect the lubrication condition of the bearing once a month, and confirm condition is normally.

1. General description

This motor driven grease pump is used for single line lubricating system (progress operated), is fit for medium scale lubricating system.

If it is use EK-type control panel and MX or M-type distributing valve together, low priced and reasonable automatic lubricating system is got, and these contribute efficient operation of machine equipment.

2. Special feature

・Simple pump mechanism

According to adopting geared motor, this system is efficient and simple pump mechanism.

・Simplify piston mechanism

According to adopting single piston and non-spring check valve, it is simple maintenance and inspect.

・High pressure lubricating, high reliance

Max lubricating pressure is 21 MPa, enough lubricating is guaranteed

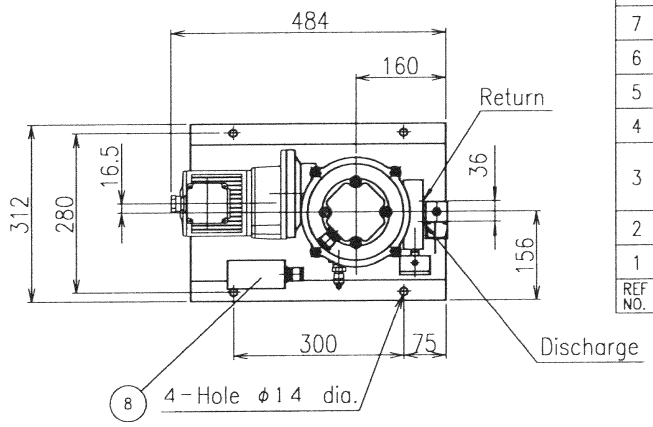
・Low priced auto lubricating

According to using EK-type control panel together, it is possible to lubricate easy and low priced.

Specification

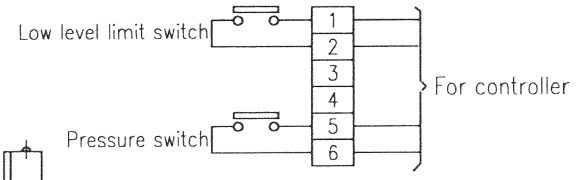
Division of Components	Item(Unit)	Type
		AKA-108(104)AKP-10
Pump	Discharge volume (cm^3/min)	30/36 (50/60Hz)
	Max. working Pressure (MPa)	21
Geared motor	Direction of revolution	Both direction
	Type	Total enclosed type・Flange type
	Output (kW)	0.1
	Number of poles (P)	4
	Reduction ratio	1/40
Tank	Tank capacity (ℓ)	8(4)
Limit switch	Low level limit switch	Z-15GW22-B
Pressure switch	Type	CE25N
	Pressure control range (MPa)	3 to 21
	Setting pressure (MPa)	17
Relief valve	Setting pressure (MPa)	23
Remarks	Piping system	Single line
	Applicable grease	#0 to #2-NLGI consistency
Mass (kg)		44(40)

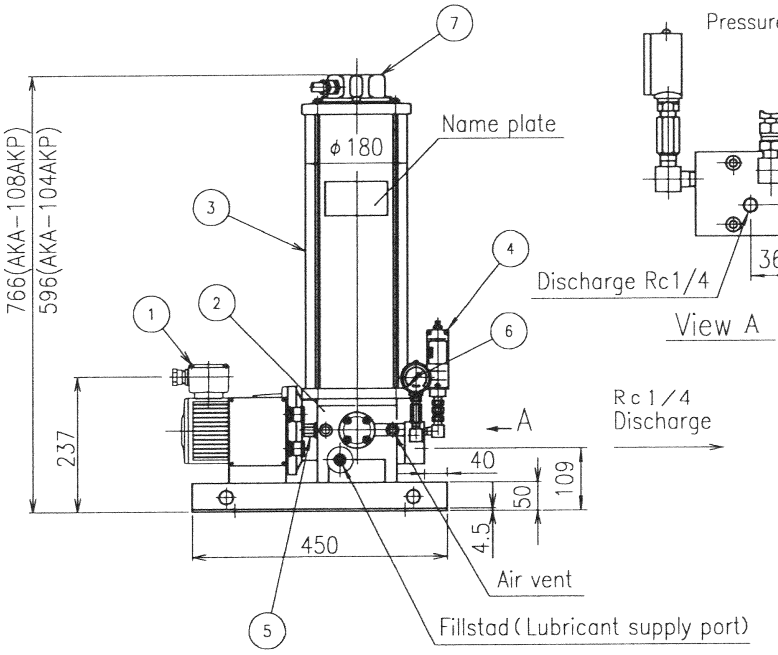
・Be sure to use the pump indoors.

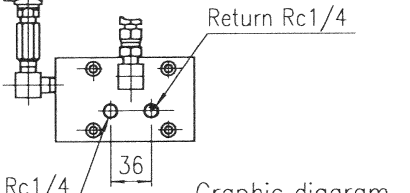


REF NO.	PART NO.	PART NAME	QTY.	REMARKS
8		Terminal box	1	6P
7	Z−15GW22−B	Low level limit switch	1	
6	FP1617−8	Pressure gauge	1	35MPa
5		Relief valve	1	
4	CE25N	Pressure switch	1	
3	T−08AP−L	Grease tank	1	for AKA−108AKP
	T−04AKP			for AKA−104AKP
2	GPE−08AK	Grease pump	1	
1		Geared motor	1	0.1kW×4P, 3φ (IP44)

Terminal connection



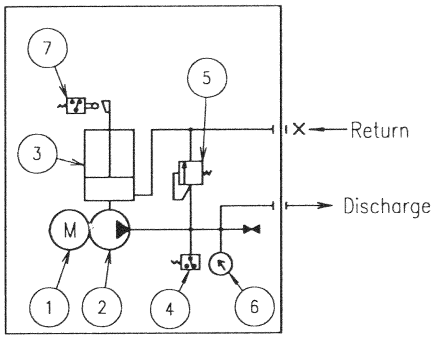




View A

Rc1/4
Discharge

Graphic diagram



3. Principle of operation

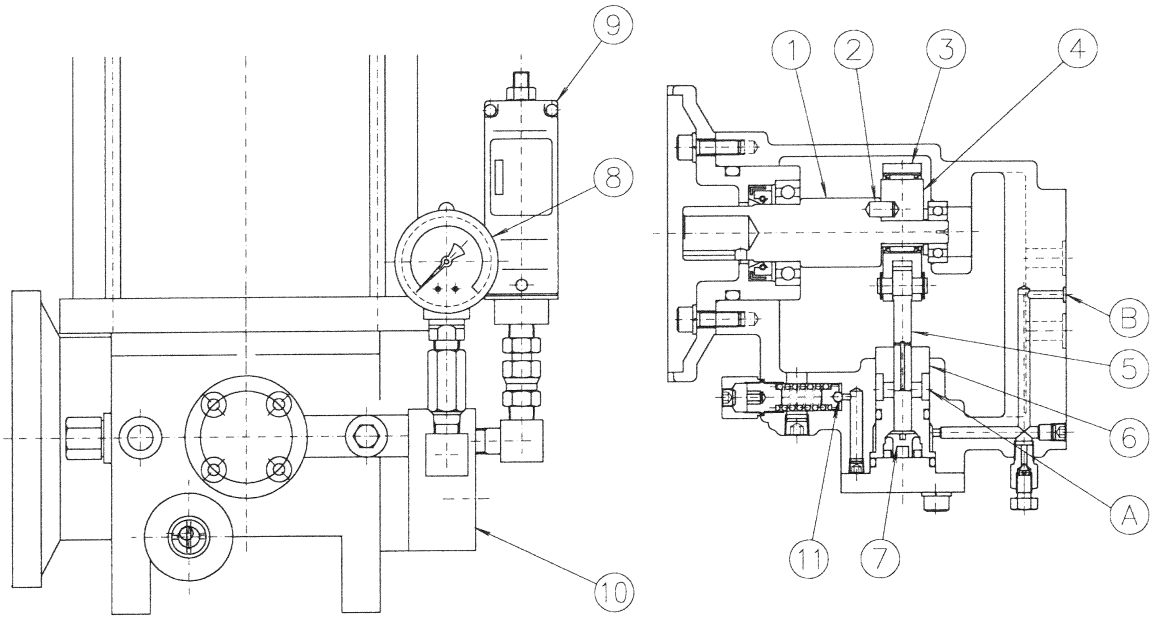
3-1 Pump Assembly

・The rotation power by operating geared motor is transmitted through ① Driving axle to ④ Eccentric which connected ② Pin.

Moreover this rotation power is changed to the reciprocated motion of ⑤ Piston installed top of ③ Connecting rod.

・Grease sucked from suction port Ⓐ of ⑥ Pump body is sent through ⑦ Check packing to discharge port Ⓑ by compressing progress of ⑤ Piston.

Pressurizing grease is sent with pressure to discharge port through ⑩ Discharge port block. At the same time, it is send to ⑧ Pressure gauge, ⑨ Pressure switch and ⑪ Safety valve, it is protect the pump to return grease to the tank, when confirming discharge pressure or at abnormal high pressure.



3-2 Tank Assembly

・Grease storage tank has ① Follower plate which keep grease level proper position, moving up and down inside the tank according to increase and decrease of the grease.

② Low level cam connected is connected with ④ Follower plate rod, and by two ③ Switch spring is kept up to bracket in order to move up and down.

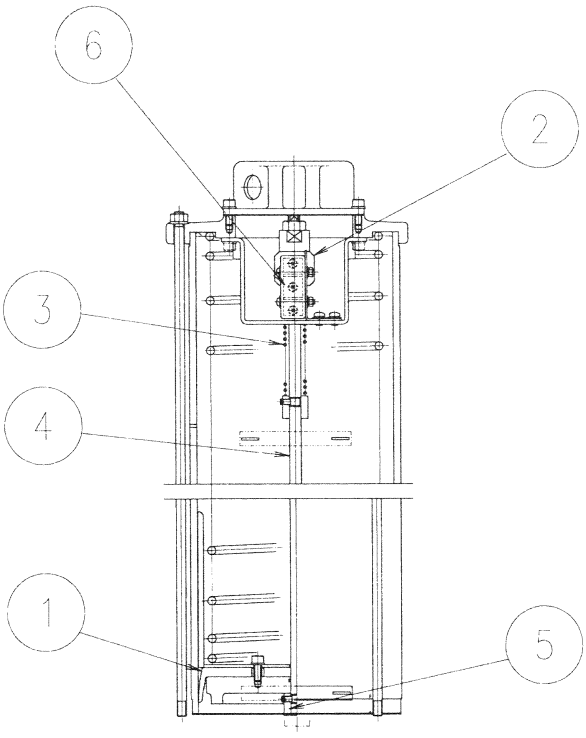
① Follower plate is different from ④ Follower plate rod, move up down according to the up and down motion of grease level, its position shows outline remaining of grease. Moreover, when remaining of grease is little and ① Follower plate comes to the lower end of ④ Follower plate rod, ① Follower plate pushes ④ Follower plate rod down by ⑤ Stopper and makes ⑥ Low level limit switch to work by ② Low level cam.

・When the Low level alarm is raised, stop the pump immediately and fulfill grease at once. If continuing operation with such situation, air comes into the pump and inside the lubricating system, it does not work well. So pay attention on this point.

3-3 Pressure Switch

・ It raises an alarm and notice abnormal situation when lubricating system pressure increases abnormally than normal lubricating pressure.

・Pressure is set up 17 MPa at delivery. If there is great difference from normal pressures, set up again max. lubricating pressure approximately plus 1 MPa through the year.



3-4 Safety Valve

・Safety valve is built in a pump housing side. This safety valve is installed to reduce pressure when the lubricant system is blocked by some reason and to release line pressure to tank so it protects the total lubricating system from abnormal high pressure.

4. Handling

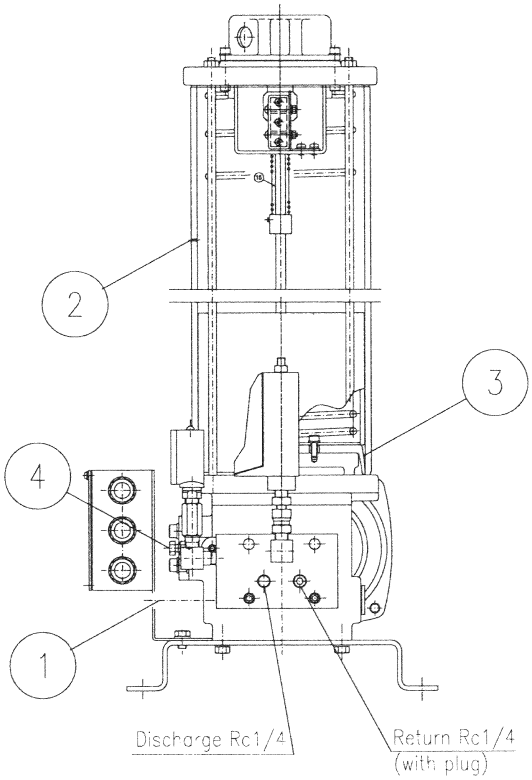
4-1 Select the Grease

Select the grease which is equivalent to #0 to #2-NLGI consistency (Lower limit: ASTM unworked penetration number of 240 at operating temperature) for centralized lubricating system.

4-2 Filling up Grease

In case of charging grease to the tank, be sure to use the charge pump from ① Filler port by the charge pump.

When charging to empty tank, keep to charge until grease comes out from ② Air vent of tank, pushing out air below ③ Follower plate.



4-3 Air ventilation of the pump

Loosen ④ Air vent valve and keep on drive the pump until grease with no babble comes out.

4-4 Return Port

In case it is necessary to return grease from lubricating system, connect pipe to this return port. Usually this port does not use.

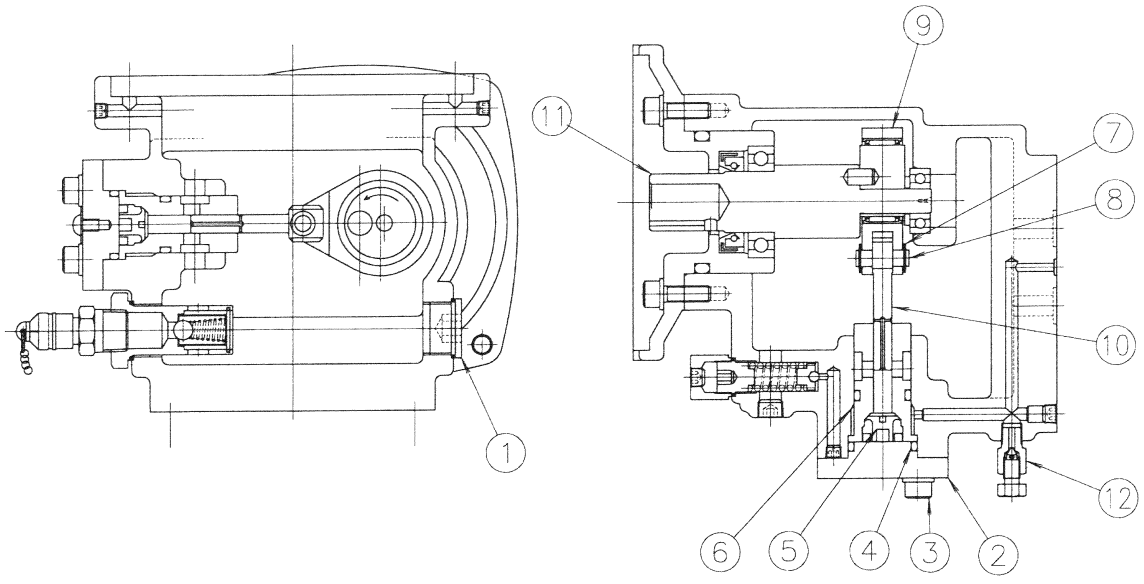
4-5 In case of pump pressure does not increase

- Loosen ④ Air vent valve to take out air.
- In case of pump pressure does not increase even after taking out air, remove the cover (see ② of next page) and pull out the check packing (see ⑤ of next page) check and wash it.
- Check if there is mistake on pipe connecting (see ⑧ of next page).
- Check if there is leakage from pipe, and then repair.

5. Maintenance and adjustment

In case of it is caused by wear of pump pressure do not increase by long term driving, or discharge volume reduction, by following method, exchange the cylinder set.

1) First, remove ① Drain plug of pump housing and then extract grease within tank, then remove the geared motor and tank from pump a' ssy.
(Within tank, it is included a compressed spring. Be sure to remove the tank after grease extract completely.)
2) Next, by loosening four ③ Hexagon socket head screws, remove ② Cover of the pump side, and then take out an ④ "O" ring and a ⑤ Check packing.
3) Take out ⑥ Pump cylinder from the pump housing by patting it' s surface from pump housing inside.
4) Remove an ⑦ E-type snap ring, and then take off ⑩ Piston by drawing out a ⑧ Connecting pin and ⑨ Connecting rod.
5) Set up new piston to connecting rod, while inserting piston into a hole of pump cylinder, and then install the pump cylinder into the housing.
6) Install the check packing, the "O" ring and the cover after confirming ⑪ Driving axle rotates lightly, and then install a geared motor and tank.
7) After exchanging, be sure to loosen an air ⑫ Ventilation valve, keep on driving pump and ventilating until grease with no babble has come.



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2. Special feature

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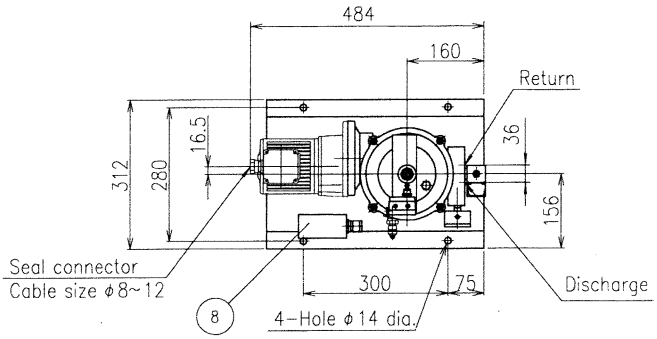
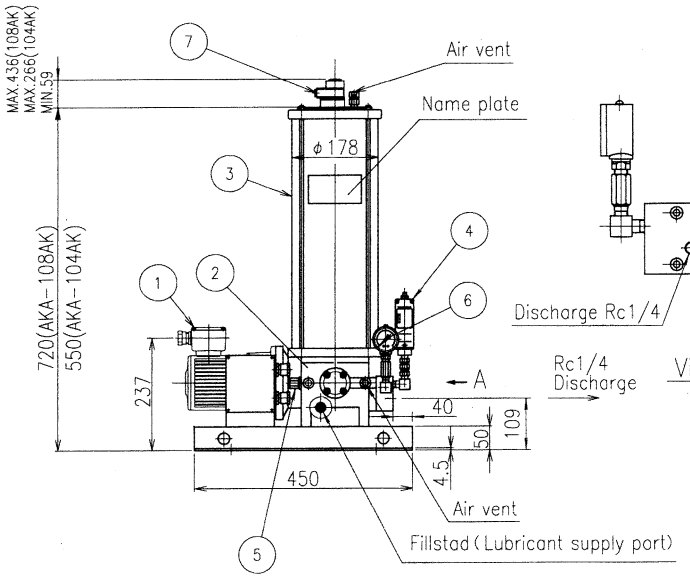
Specification

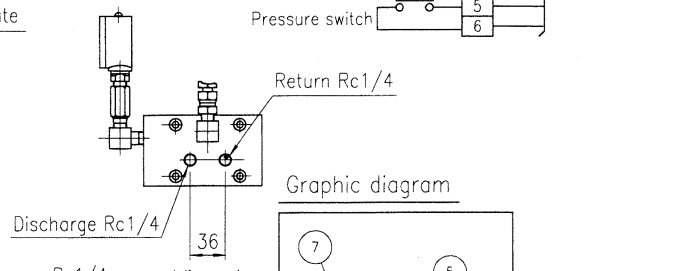
Division of Components	Item (Unit)	Type
		AKA-108 (104) AK-10
Pump	Discharge volume (cm^3/min)	30/36 (50/60Hz)
	Max. working Pressure (MPa)	21
Geared motor	Direction of revolution	Both direction
	Type	Total enclosed type・Flange type
	Output (kW)	0.1
	Number of poles (P)	4
	Reduction ratio	1/40
Tank	Tank capacity (ℓ)	8 (4)
Limit switch	Low level limit switch	ZC-N21
Pressure switch	Type	CE25N
	Pressure control range (MPa)	3 to 21
	Setting pressure (MPa)	17
Relief valve	Setting pressure (MPa)	23
Remarks	Piping system	Single line
	Applicable grease	#0 to #2-NLGI consistency
Mass (kg)		52 (48)

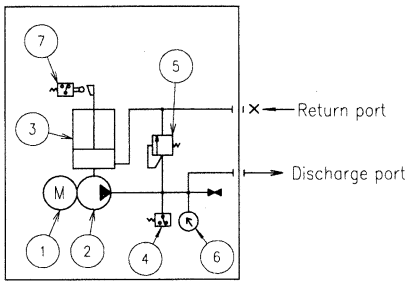
・Be sure to use the pump indoors.



REF. NO.	PART NO.	PART NAME	QTY.	REMARKS
8		Terminal box	1	6P
7	ZC-N21	Low level limit switch	1	
6	FP1617-8	Pressure gauge	1	35MPa
5		Relief valve	1	
4	CE25N	Pressure switch	1	
3	T-08A	Grease tank	1	for AKA-108AK
	T-04AK			for AKA-104AK
2	GPE-08AK	Grease pump	1	
1		Geared motor	1	0.1kW×4P, 3φ (IP44)







3. Principle of operation

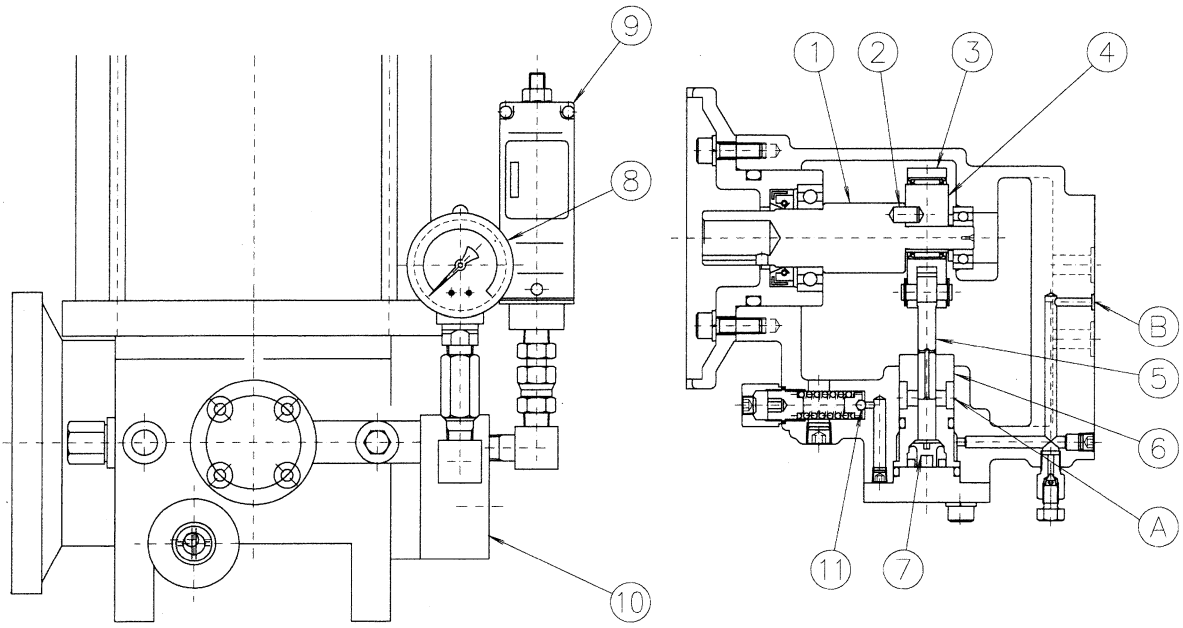
3-1 Pump Assembly

・The rotation power by operating geared motor is transmitted through ① Driving axle to ④ Eccentric which connected ② Pin.

Moreover this rotation power is changed to the reciprocated motion of ⑤ Piston installed top of ③ Connecting rod.

・Grease sucked from suction port Ⓐ of ⑥ Pump body is sent through ⑦ Check packing to discharge port Ⓑ by compressing progress of ⑤ Piston.

Pressurizing grease is sent with pressure to discharge port through ⑩ Discharge port block. At the same time, it is send to ⑧ Pressure gauge, ⑨ Pressure switch and ⑪ Safety valve, it is protect the pump to return grease to the tank, when confirming discharge pressure or at abnormal high pressure.



3-2 Tank Assembly

・Grease storage tank has ① Follower plate which keep grease level proper position, moving up-and-down inside the tank according to increase and decrease of the grease.

・② Low level cam connected by ③ Follower plate rod with ① Follower plate, and goes up and down according to the up-and-down motion of ③ Follower plate rod. Its position shows remaining of grease. Moreover, when remaining of grease is small, ② Low level cam makes ④ Low level limit switch work to raise an alarm.

・When the Low level alarm is raised, stop the pump immediately and fulfill grease at once. If continuing operation with such situation, air comes in the pump and inside the lubricating system, it does not work well. So pay attention on this point.

・Replenish the tank with grease, until the grease comes out from ⑤ Air vent hole. This ⑤ Air vent hole works to vent the air inside of the tank and to prevent extraordinary high pressurizing inside of the tank by over charging.

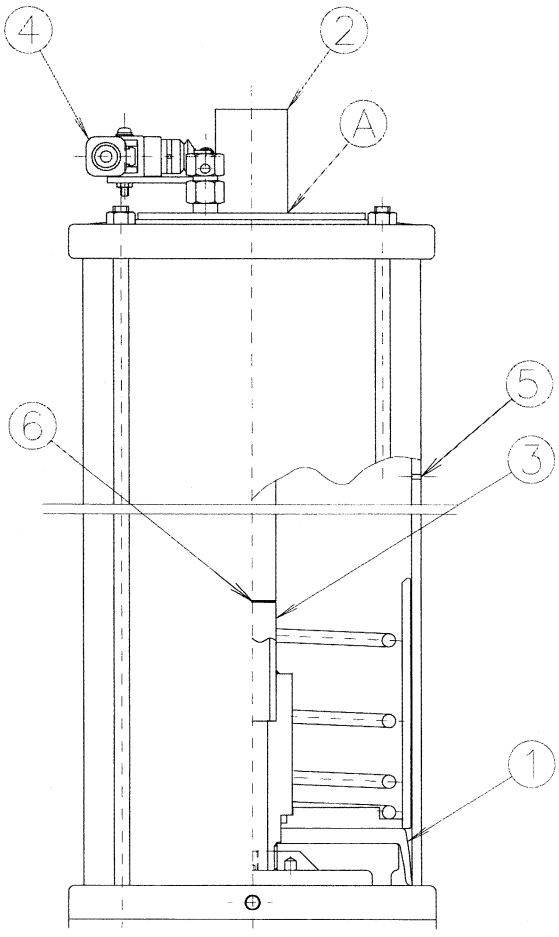
3-3 Pressure Switch

・It raises an alarm and notice abnormal situation when lubricating system pressure increases abnormally than normal lubricating pressure.

・Pressure is set up 17 MPa at delivery, if there is great difference from normal pressures, set up again max. lubricating pressure through the year + approximately 1 MPa.

3-4 Safety Valve

・Safety valve is built in a pump housing. This safety valve is installed to reduce pressure when the lubricant system is blocked by some reason and to release line pressure to tank so it protects the total lubricating system from abnormal high pressure.



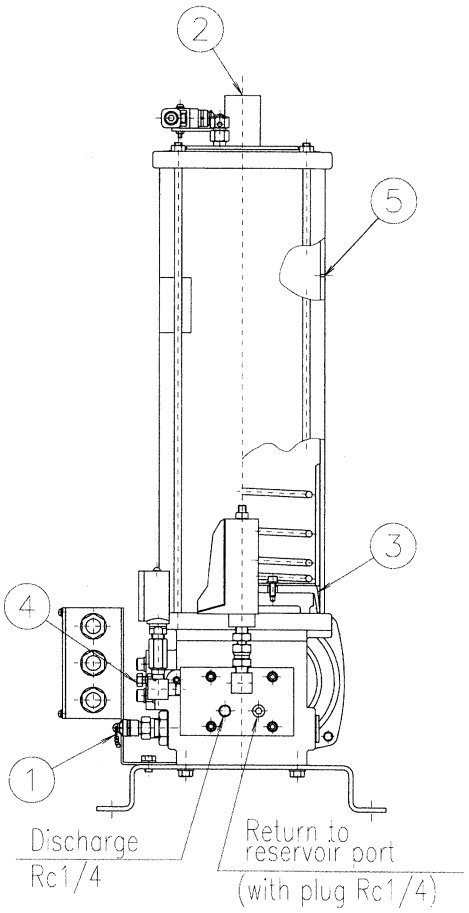
4. Handling

4-1 Select the Grease

Select the grease which is equivalent to #0 to #2-NLGI consistency (Lower limit: ASTM unworked penetration number of 240 at operating temperature) for centralized lubricating system.

4-2 Filling up Grease

In case of charging grease to the tank, be sure to use the charge pump from ① Filler port.
When charging to empty tank, by removing ② Hexagon socket set screws, charge grease pushing out air below ③ Follower plate.
When the grease comes out from ⑤ Air vent hole, charging grease should be stopped.



4-3 Air ventilation of the pump

Loosen ④ Air vent valve and with no on drive the pump until grease with no babble comes out.

4-4 Return Port

In case it is necessary to return grease from lubricating system, connect pipe to this return port. Usually this port does not use.

4-5 In case of pump pressure does not increase

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6) Install the check packing, the "O" ring and the cover after confirming ⑪ Driving axle rotates lightly, and then install a geared motor and tank.
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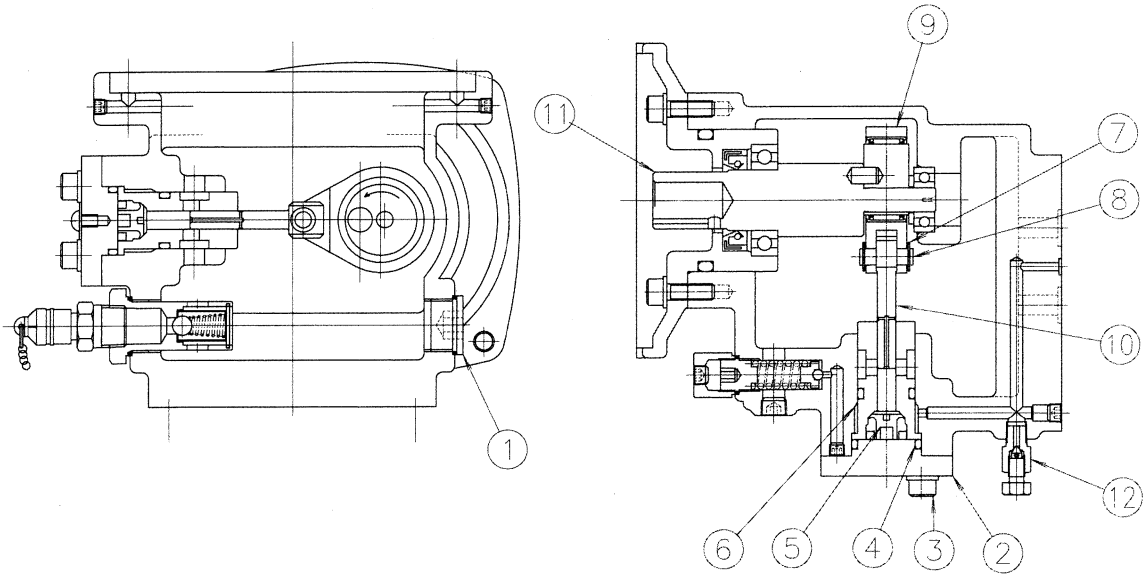

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AKA-125(115)AK-10

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2. Special feature

・Simple pump mechanism

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・Simplify piston mechanism

According to adopting single piston and non-spring check valve, it is simple maintenance and inspect.

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Max lubricating pressure is 21 MPa, enough lubricating is guaranteed

・Low priced auto lubricating

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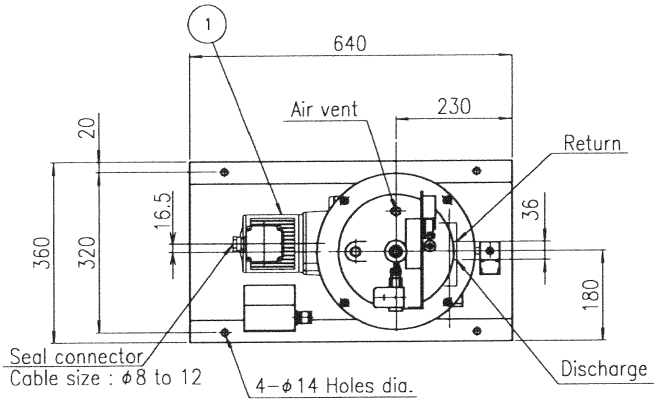
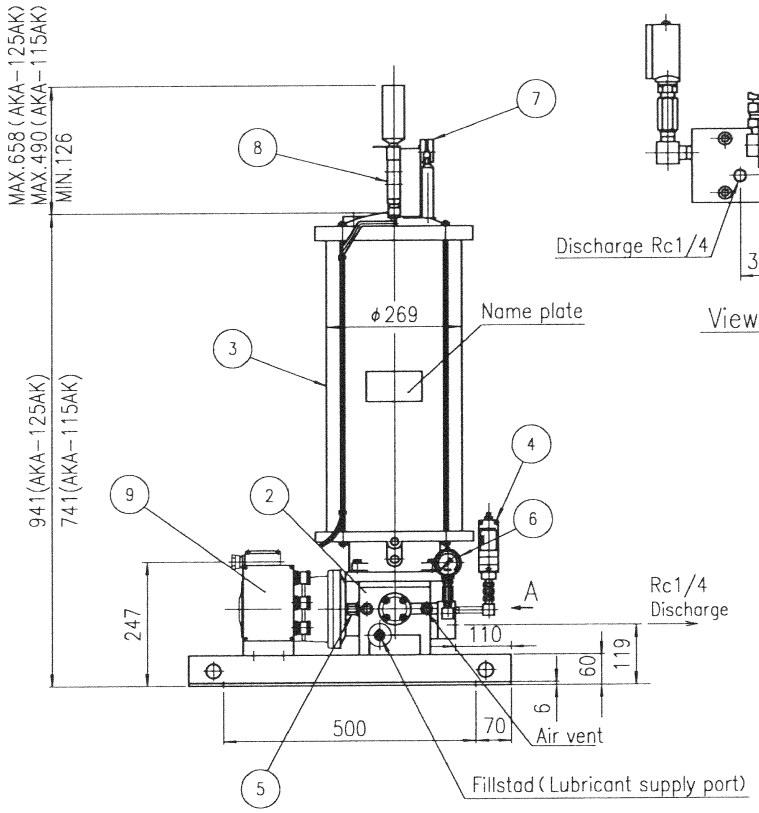
Specification

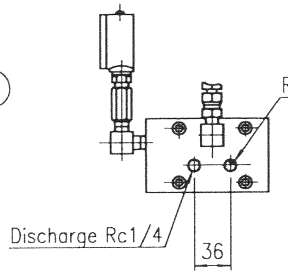
Division of Components	Item(Unit)	Type
		AKA-125(115)AK-10
Pump	Discharge volume (cm^3/min)	30/36 (50/60Hz)
	Max. working Pressure (MPa)	21
Geared motor	Direction of revolution	Both direction
	Type	Total enclosed type・Flange type
	Output (kW)	0.1
	Number of poles (P)	4
	Reduction ratio	1/40
Tank	Tank capacity (ℓ)	25(15)
Limit switch	Low level limit switch	ZE-NA2-2
	High level limit switch	ZE-NA2-2
Pressure switch	Type	CE25N
	Pressure control range (MPa)	3 to 21
	Setting pressure (MPa)	17
Relief valve	Setting pressure (MPa)	23
Remarks	Piping system	Single line
	Applicable grease	#0 to #2-NLGI consistency
Mass (kg)		102(92)

・Be sure to use the pump indoors.

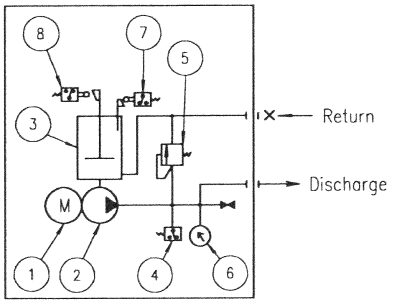


REF. NO.	PART NO.	PART NAME	QTY.	REMARKS
9		Terminal box	1	8P
8	ZE−NA2−2	Low level limit switch	1	
7	ZE−NA2−2	High level limit switch	1	
6	FP1617−8	Pressure gauge	1	35MPa
5		Relief valve	1	
4	CE25N	Pressure switch	1	
3	T−25A	Grease tank	1	for AKA−125AK
	T−15A			for AKA−115AK
2	GPE−08AK	Grease pump	1	
1		Geared motor	1	0.1kW×4P, 3φ (IP44)

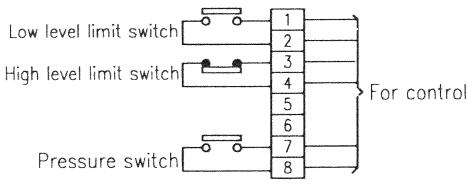




Graphic diagram



Terminal connection



3. Principle of operation

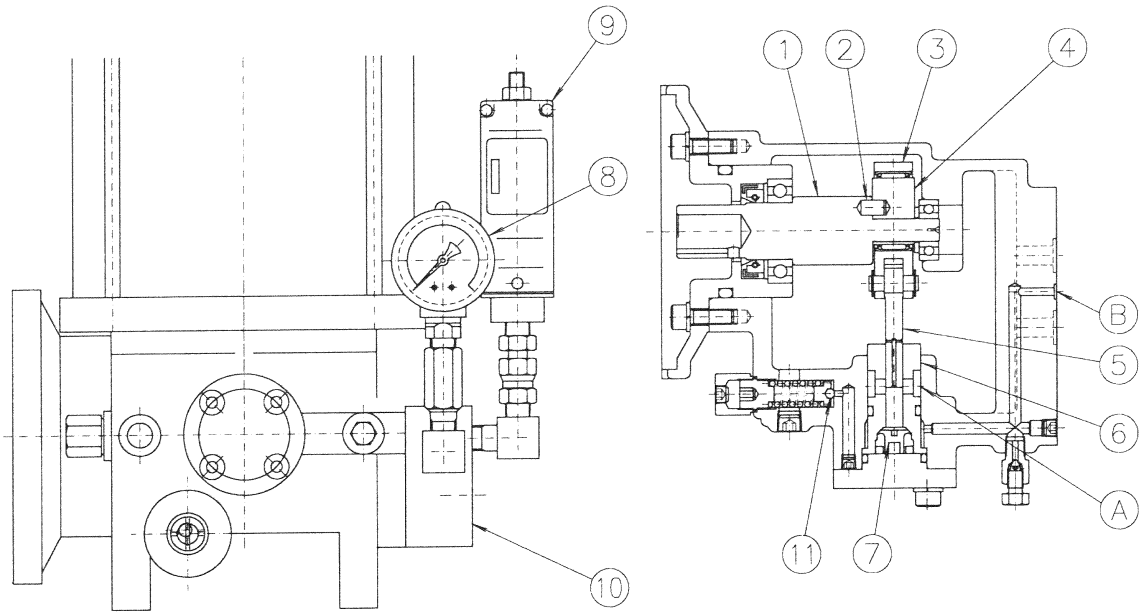
3-1 Pump Assembly

・The rotation power by operating geared motor is transmitted through ① Driving axle to ④ Eccentric which connected ② Pin.

Moreover this rotation power is changed to the reciprocated motion of ⑤ Piston installed top of ③ Connecting rod.

・Grease sucked from suction port Ⓐ of ⑥ Pump body is sent through ⑦ Check packing to discharge port Ⓑ by compressing progress of ⑤ Piston.

Pressurizing grease is sent with pressure to discharge port through ⑩ Discharge port block. At the same time, it is send to ⑧ Pressure gauge, ⑨ Pressure switch and ⑪ Safety valve, it is protect the pump to return grease to the tank, when confirming discharge pressure or at abnormal high pressure.



3-2 Tank Assembly

・Grease storage tank has ① Follower plate which keep grease level proper position, moving up-and-down inside the tank according to increase and decrease of the grease.

・② Low level cam connected by ③ Follower plate rod with ① Follower plate, and goes up and down according to the up-and-down motion of ③ Follower plate rod. Its position shows remaining of grease. Moreover, when remaining of grease is small, ② Low level cam makes ④ Low level limit switch work to raise an alarm.

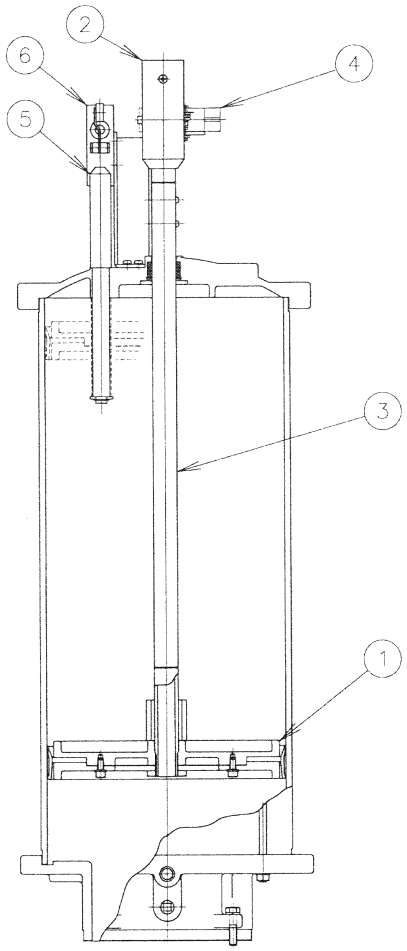
・When the Low level alarm is raised, stop the pump immediately and fulfill grease at once. If continuing operation with such situation, air comes in the pump and inside the lubricating system, it does not work well. So pay attention on this point.

・According to charging grease, ① Follower plate goes up. When the tank becomes full, ⑤ High level cam is pushed up by ① Follower plate, makes ⑥ High level limit switch work to inform that charging grease is finished.

3-3 Pressure Switch

・It raises an alarm and notice abnormal situation when lubricating system pressure increases abnormally than normal lubricating pressure.

・Pressure is set up 17 MPa at delivery, if there is great difference from normal pressures, set up again max. lubricating pressure through the year + approximately 1 MPa.



3-4 Safety Valve

・Safety valve is built in a pump housing . This safety valve is installed to reduce pressure when the lubricant system is blocked by some reason , and to release line pressure to tank so it protects the total lubricating system from abnormal high pressure.

4. Handling

4-1 Select the Grease

Select the grease which is equivalent to #0 to #2-NLGI consistency (Lower limit: ASTM unworked penetration number of 240 at operating temperature) for centralized lubricating system.

4-2 Filling up Grease

In case of charging grease to the tank, be sure to use the charge pump from ① Filler port. When charging to empty tank, by removing ② Hexagon socket set screws, charge grease pushing out air below ③ Follower plate.

4-3 Air ventilation of the pump

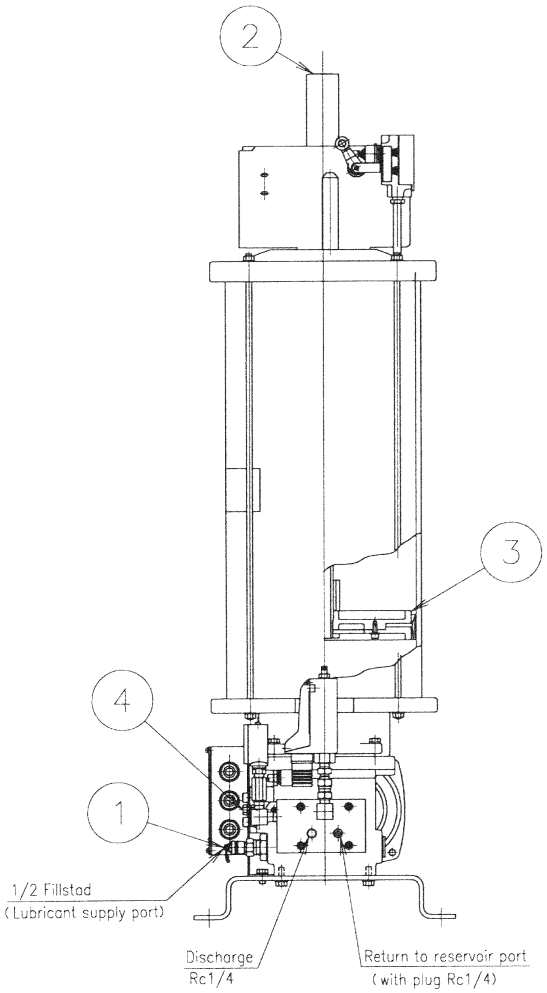
Loosen ④ Air vent valve and with no on drive the pump until grease with no babble comes out.

4-4 Return Port

In case it is necessary to return grease from lubricating system, connect pipe to this return port. Usually this port does not use.

4-5 In case of pump pressure does not increase

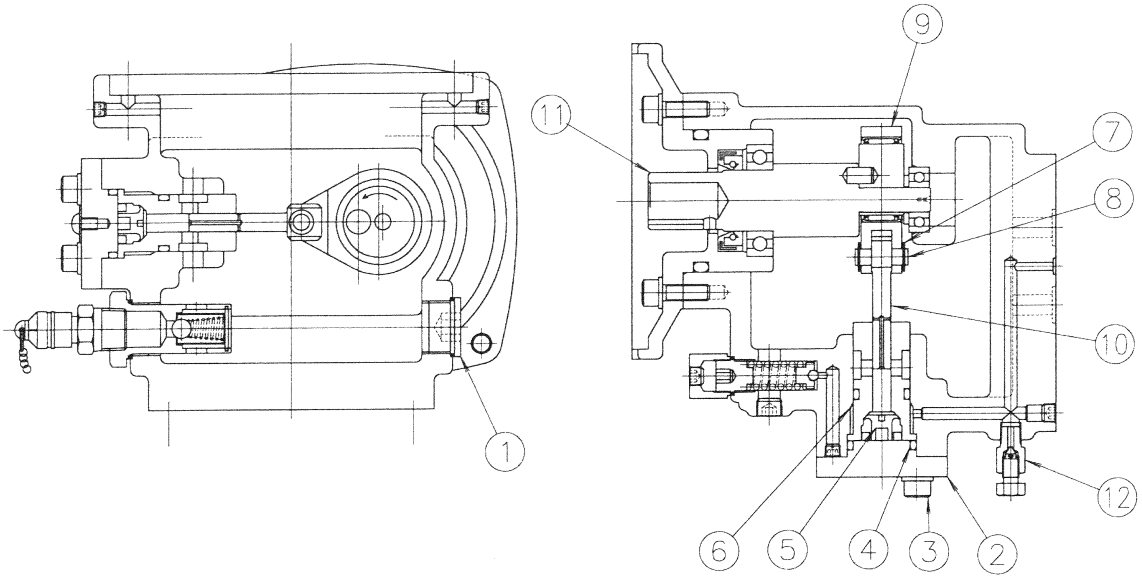
- Loosen ④ Air vent valve to take out air.
- In case of pump pressure does not increase even after taking out air, remove the cover (see ② of next page) and pull out the check packing (see ⑤ of next page) check and wash it.
- Check if there is mistake on pipe connecting (see ⑧ of next page).
- Check if there is leakage from pipe, and then repair.



5. Maintenance and adjustment

In case of it is caused by wear of pump pressure do not increase by long term driving, or discharge volume reduction, by following method, exchange the cylinder set.

1) First, remove ① Drain plug of pump housing and then extract grease within tank, then remove the geared motor and tank from pump a' ssy.
(Within tank, it is included a compressed spring. Be sure to remove the tank after grease extract completely.)
2) Next, by loosening four ③ Hexagon socket head screws, remove ② Cover of the pump side, and then take out an ④ "O" ring and a ⑤ Check packing.
3) Take out ⑥ Pump cylinder from the pump housing by patting it' s surface from pump housing inside.
4) Remove an ⑦ E-type snap ring, and then take off ⑩ Piston by drawing out a ⑧ Connecting pin and ⑨ Connecting rod.
5) Set up new piston to connecting rod, while inserting piston into a hole of pump cylinder, and then install the pump cylinder into the housing.
6) Install the check packing, the "O" ring and the cover after confirming ⑪ Driving axle rotates lightly, and then install a geared motor and tank.
7) After exchanging, be sure to loosen an air ⑫ Ventilation valve, keep on driving pump and ventilating until grease with no babble has come.



INSTRUCTION MANUAL
OF
MOTOR DRIVEN OIL PUMP

AKA-108(104)BKP-10

DAIKIN LUBRICATION PRODUCTS & ENGINEERING CO.,LTD.

To use this system safely, it is necessary to get basic knowledge of hydraulic, piping, electric, wiring, and of this equipment (the level authorized of your company).
Wrong operation may cause accident. To prevent these accidents, be sure to read this handling manual and drawing (construction drawing, circuit diagram), and after making sure to understand these contents enough, it can be controlled operation and maintenance.
To keep this equipment good condition, and to carry out safe operation and maintenance, be sure to meet rightly.

WARNING This sign shows suffering death or serious injury, in case of wrong operation.

CAUTION This sign shows suffering a serious or slight injury or occurring equipment damage, in case of wrong operation.

1. Caution at operation

WARNING Do not open a door of control panel and a cover of equipments because of danger during operation.
Keep always all doors closed except on maintenance, inspection or service.

CAUTION Do not touch movable parts of equipment because of danger during remote control operation.

CAUTION Do not put out the pipe or the plug absolutely except maintenance or inspection. Because of danger if it is high pressure inside be careful on working maintenance and inspection with following points.

2. Caution at maintenance and inspection

WARNING During maintaining and inspecting this equipment, turn off the control panel's main power switch, because of getting an electric shock.

WARNING In case of using plural different power source for equipment's source, confirm well and then turn off all power switch.

CAUTION When maintaining and inspecting this equipment, starting to loosen the fitting or plug slowly and discharge as leaking pressured grease in the pipe because of danger. If loosening at a time, burst open the plug or pipe by the inside pressure may cause serious injury.

CAUTION Be sure to inspect the lubrication condition of the bearing once a month, and confirm condition is normally.

1. General description

This motor driven oil pump is used for single line lubricating system (progress operated), is fit for medium scale lubricating system.

If it is use EK-type control panel and MX or M-type distributing valve together, low priced and reasonable automatic lubricating system is got, and these contribute efficient operation of machine equipment.

2. Special feature

・Simple pump mechanism

According to adopting geared motor, this system is efficient and simple pump mechanism.

・Simplify piston mechanism

According to adopting single piston and non-spring check valve, it is simple maintenance and inspect.

・High pressure lubricating, high reliance

Max lubricating pressure is 10 MPa, enough lubricating is guaranteed

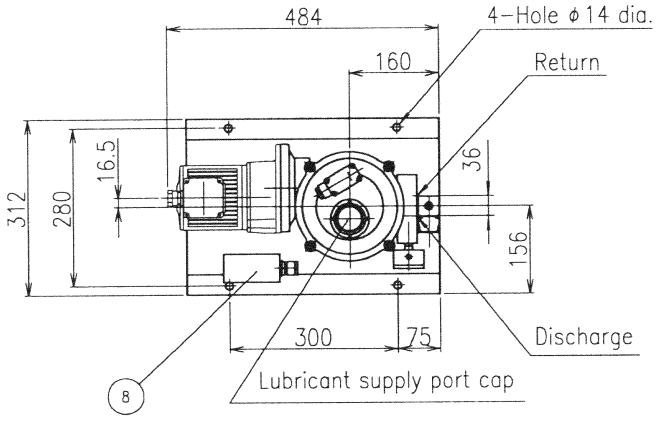
・Low priced auto lubricating

According to using EK-type control panel together, it is possible to lubricate easy and low priced.

Specification

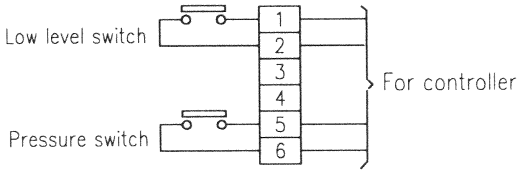
Division of Components	Item(Unit)	Type
		AKA-108(104)BKP-10
Pump	Discharge volume (cm^3/min)	30/36 (50/60Hz)
	Max. working Pressure (MPa)	10
Geared motor	Direction of revolution	Both direction
	Type	Total enclosed type・Flange type
	Output (kW)	0.1
	Number of poles (P)	4
	Reduction ratio	1/40
Tank	Tank capacity (ℓ)	8(4)
Limit switch	Low level limit switch	6941-3-131549
Pressure switch	Type	CE25N
	Pressure control range (MPa)	3 to 10
	Setting pressure (MPa)	8
Relief valve	Setting pressure (MPa)	13
Remarks	Piping system	Single line
	Applicable grease	Hydraulic oil
Mass (kg)		44(40)

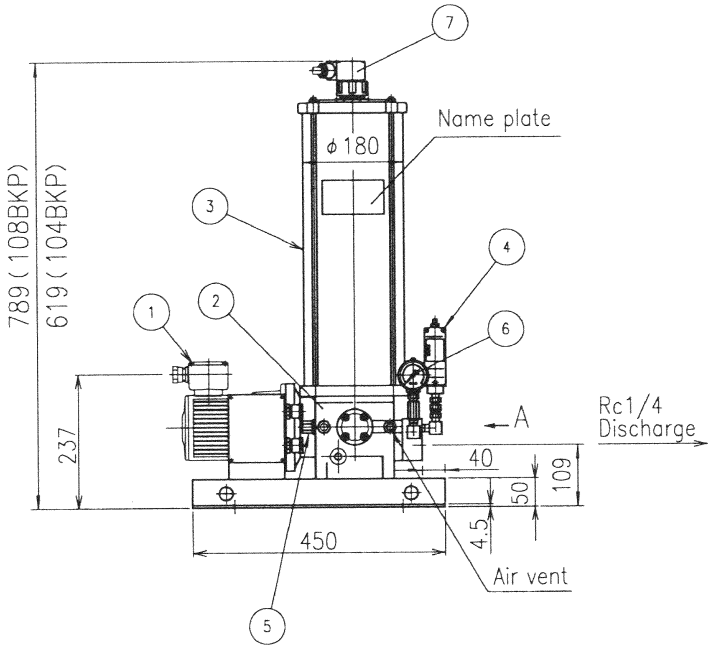
・Be sure to use the pump indoors.

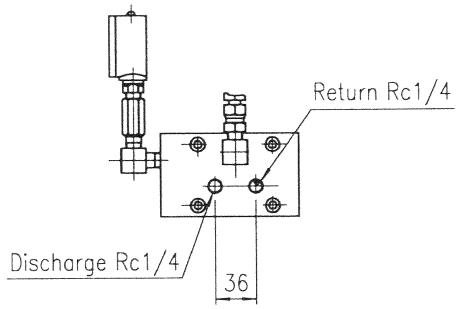


REF NO.	PART NO.	PART NAME	QTY.	REMARKS
8		Terminal box	1	6P
7	6941-3-131549	Low level limit switch	1	
6		Pressure gauge	1	20MPa
5		Relief valve	1	
4	CE25N	Pressure switch	1	
3	T-108BP-L	Oil tank	1	for AKA-108BKP
	T-104BP-L			for AKA-104BKP
2	GPE-08BK	Oil pump	1	
1		Geared motor	1	0.1kW×4P, 3φ (IP44)

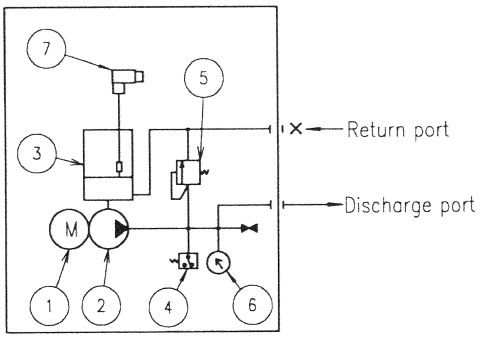
Terminal connection







Graphic diagram



3. Principle of operation

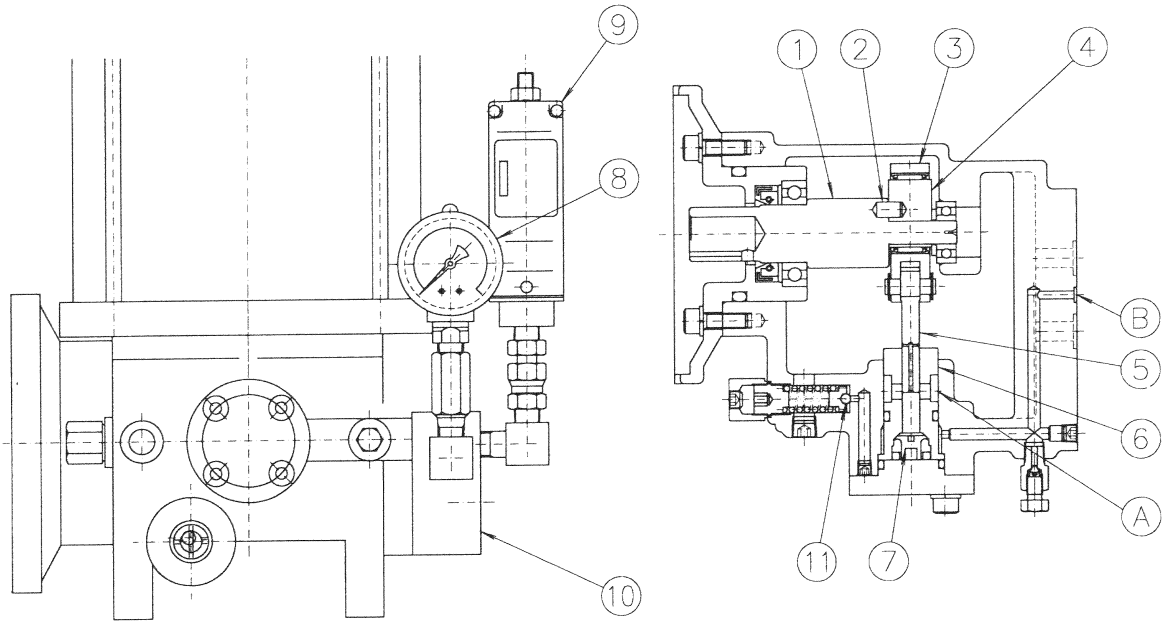
3-1 Pump Assembly

・The rotation power by operating geared motor is transmitted through ① Driving axle to ④ Eccentric which connected ② Pin.

Moreover this rotation power is changed to the reciprocated motion of ⑤ Piston installed top of ③ Connecting rod.

・Oil sucked from suction port Ⓐ of ⑥ Pump body is sent through ⑦ Check packing to discharge port Ⓑ by compressing progress of ⑤ Piston.

Pressurizing oil is sent with pressure to discharge port through ⑩ Discharge port block. At the same time, it is send to ⑧ Pressure gauge, ⑨ Pressure switch and ⑪ Safety valve, it is protect the pump to return oil to the tank, when confirming discharge pressure or at abnormal high pressure.



3-2 Tank Assembly

・Oil storage tank has oil filler port with breezer for filling oil and ① Low level limit switch.

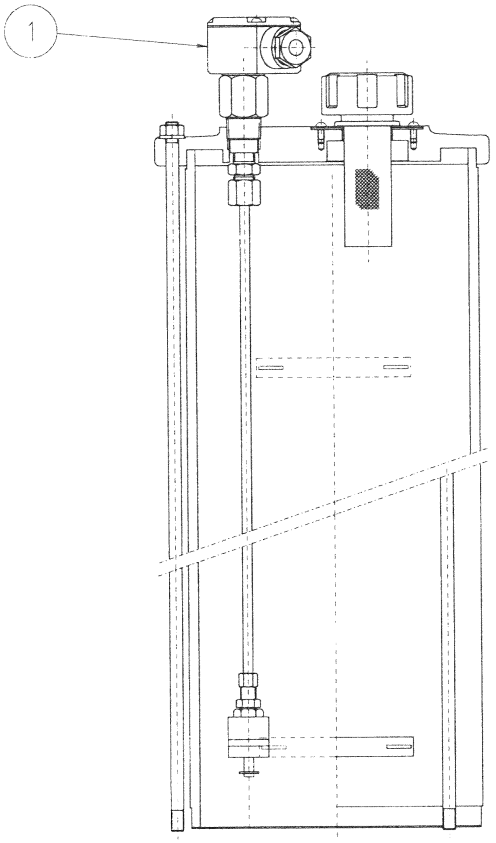
・① Low level limit switch is floating type, when oil level has arrived at Low level position, ① Low level limit switch works to raise an alarm.

・When the Low level alarm is raised, stop the pump immediately and fulfill oil at once. If continuing operation with such situation, air comes in the pump and inside the lubricating system, it does not work well. So pay attention on this point.

3-3 Pressure Switch

・It raises an alarm and notice abnormal situation when lubricating system pressure increases abnormally than normal lubricating pressure.

・Pressure is set up 8 MPa at delivery, if there is great difference from normal pressures, set up again to max. oil pressure through the year plus approximately 1 MPa.



3-4 Safety Valve

・Safety valve is built in a pump housing . This safety valve is installed to reduce pressure when the lubricant system is blocked by some reason and to release line pressure to tank so it protects the total lubricating system from abnormal high pressure.

4. Handling

4-1 Applicable oil

Hydraulic oil

4-2 Filling up oil

Oil should be charged from ① Filler port on upper part of tank.

4-3 Air ventilation of the pump

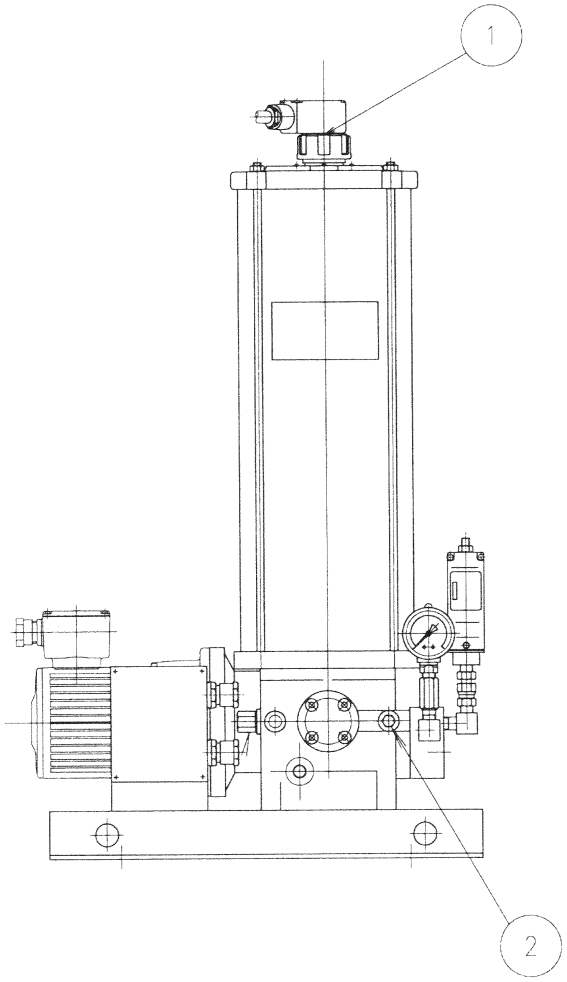
Loosen ② Air vent valve and with on drive the pump until oil with no babble comes out.

4-4 Return Port

In case it is necessary to return oil from lubricating system, connect pipe to this return port. Usually this port does not use.

4-5 In case of pump pressure does not increase

- Loosen ② Air vent valve to take out air.
- In case of pump pressure does not increaseeven after taking out air, remove the cover and pull out the check packing, check and wash it.
- Check if there is mistake on pipe connecting.
- Check if there is leakage from pipe, and then repair.



5. Maintenance and adjustment

In case of it is caused by wear of pump pressure do not increase by long term driving, or discharge volume reduction, by following method, exchange the cylinder set.

1) First, remove ① Drain plug of pump housing and then extract oil within tank, then remove the geared motor and tank from pump a' ssy.
2) Next, by loosening four ③ Hexagon socket head screws, remove ② Cover of the pump side, and then take out an ④ " O " ring and a ⑤ Check packing.
3) Take out ⑥ Pump cylinder from the pump housing by patting it' s surface.
4) Remove an ⑦ E-type snap-ring, and then take off ⑩ Piston by drawing out a ⑧ Connecting pin and ⑨ Connecting rod.
5) Set up new piston to connecting rod, while inserting piston into a hole of pump cylinder, and then install the pump cylinder into the housing.
6) Install the check packing and the cover after confirming ⑪ Driving axle rotates lightly, and then install a geared motor and tank.
7) After exchanging, be sure to keep pump driving and ⑫ Ventilating until oil with no babble has come.