

Original Instructions **CE**

# OPERATION MANUAL

## GREASE LUBRICATOR

<b>SKR110A50PAL</b>	<b>ITEM</b>	<b>No.881122</b>
<b>SKR110A50PAL-SL</b>	<b>ITEM</b>	<b>No.881123</b>
<b>SKR110A50PAL-PL</b>	<b>ITEM</b>	<b>No.881204</b>
<b>SKR110A50PAL-SL-PL</b>	<b>ITEM</b>	<b>No.881205</b>
<b>SKR110A50PAL-SW</b>	<b>ITEM</b>	<b>No.881209</b>
<b>SKR110A50PAL-SL-SW</b>	<b>ITEM</b>	<b>No.881210</b>



### **WARNING**

Prior to operating this pump, be sure to read this operation manual for safety. After reading the manual, please keep it at hand any time for your quick reference.

# YAMADA CORPORATION



## EC DECLARATION OF CONFORMITY

Name of company : YAMADA CORPORATION

Address : 1-1-3, Minami-Magome, Ota ku, Tokyo, 143-8504 Japan

declares, in sole responsibility, that the following product

Equipment : GREASE LUBRICATOR

Type : SKR110A50PAL series

Referred to in this declaration conforms with the following standard(s) or directive(s) :

- Directive 2006/42/EC
- EN-ISO 12100:2010
- EN 809:1998 + A1:2009

YAMADA CORPORATION will keep on file for review the following technical documentation :

- operating instructions as required
- plans
- description of measures designed to ensure conformity
- other technical documentation

Importer / Authorized Representative in EU

Name of company : YAMADA EUROPE B.V.

Atsushi Yamaguchi (Managing Director)

Address : Aquamarijnstraat 50, 7554 NS Hengelo (O), The Netherlands

Place and date issued : Sagamihara Factory / December 16, 2019

Name and signature as well as position of undersigned :

Kotaro Yamada (Director, Sagamihara Factory)



*K. Yamada*

## - Preface

This product is a grease pump equipped with 110 type high performance air powered pump on a pail can dolly with air lift. It is best suited to fill products in the production line with grease as well as grease up vehicle and construction equipment and maintain various devices and facilities in all areas.

Materials other than grease (such as putty and adhesive) cannot be used with this machine.

## - For Safe Operation

This document describes the items that are important for the user to operate this product safety, correctly, and efficiently. Before operating this product, read this manual thoroughly, in particular, "Warnings and Cautions" at the beginning of this manual, with a good understanding of its contents. Keep this manual carefully in an easy-to-access place so that the user may refer to it whenever necessary.

## - Warnings and Cautions

To use this product safely, be sure to observe the contents of the following description. In this manual, warnings and cautions are indicated by using symbols. These symbols are intended to prevent death or serious injury that may be caused to the operator or those who are around the product and damage that may be caused to the articles that are around the product, as well as to use the product safely and correctly. Each symbol is indicated and has a meaning as shown below. Read the description with a good understanding of its contents.



**WARNING** : This indicates the existence of potential hazard which, if not avoided, will result in death or serious injury.



**CAUTION** : This indicates the existence of potential hazard which, if not avoided, may result in bodily injury or in physical damage.

To indicate the contents of danger and damage, the following symbols are used together with the above indications.



This symbol indicates an act that is prohibited (prohibition). The concrete contents of prohibition are indicated by the side of the indication.




















This symbol indicates the contents that must be observed. The concrete contents of observance are indicated by the side of the indication.








## - Precautions on Use

The following warnings and cautions are very important. Be sure to observe them.

### **WARNING**

-  - Keep your face away from the exhaust and discharge ports. Material may suddenly come out. There is a possibility of losing eyesight if it strikes eyes.
-  - Keep your face and hands away from the outlet when handling the check valve. Air-containing material may suddenly come out. There is a possibility of losing eyesight and injuring the hand.
-  - Do not aim exhalation part of this product at any person. Residual pressure may be left inside the gun even when the pump is not in operation. There is a possibility of losing eyesight if it strikes eyes.
-  - Gasoline is a high volatile fuel. Do not use it to clean the pump in any case, otherwise ignition or explosion may be caused.
-  - Modification of this pump may lead to death, bodily injury, or a failure. Do not modify it in any case because it involves a risk.
-  - Do not ride this product. There is a risk of falling.
-  - The operator and maintenance engineer should read the operation manual thoroughly before operating this product and performing maintenance in respect of this product.
-  - Always wear proper safety equipments (facemask, ear plugs, and safety shoes, etc.) when installing, operating, and disassembling this product.
-  - Make sure the casters are locked during and after work to prevent unexpected movement of this product. Also, do not use or leave this product in a slope or any unstable locations. The product, if not locked, may move unpredictably, causing property damage or facility pollution. The user has a responsibility for such secondary accidents.
-  - Make ground connection when working with flammable material or in explosive atmosphere. Rapid pumping of material can result in static electrical charge. Also, be sure to provide proper ventilation where a flammable atmosphere may exist.
-  - Execute the daily checkup.
-  - Use this product according to the product specification.
-  - Install a valve (for stop in emergency) or regulator to the air supply pipe to keep supply air pressure under 0.7 MPa.
-  - If there is any danger or abnormality, discontinue pump operation and refer to Troubleshooting to solve the problem.
-  - Stop pump operation immediately when a drum becomes empty. Running the pump dry will cause excessive vibration, resulting in reduction of pump life and damage to other equipment.
-  - Before maintenance involving disassembly, be sure to shut off air supply to the pump and release residual air pressure and material pressure in the tubes and pump. Failure to do so may result in material gushing out.
-  - Do not discharge material directly onto the ground. Dispose of harmful materials according to the requirements specified in SDS or local regulations. Also, dispose of this product according to the local regulations after removing residual material from inside this product. (Please contact industrial waste disposal service.)

 **CAUTION**

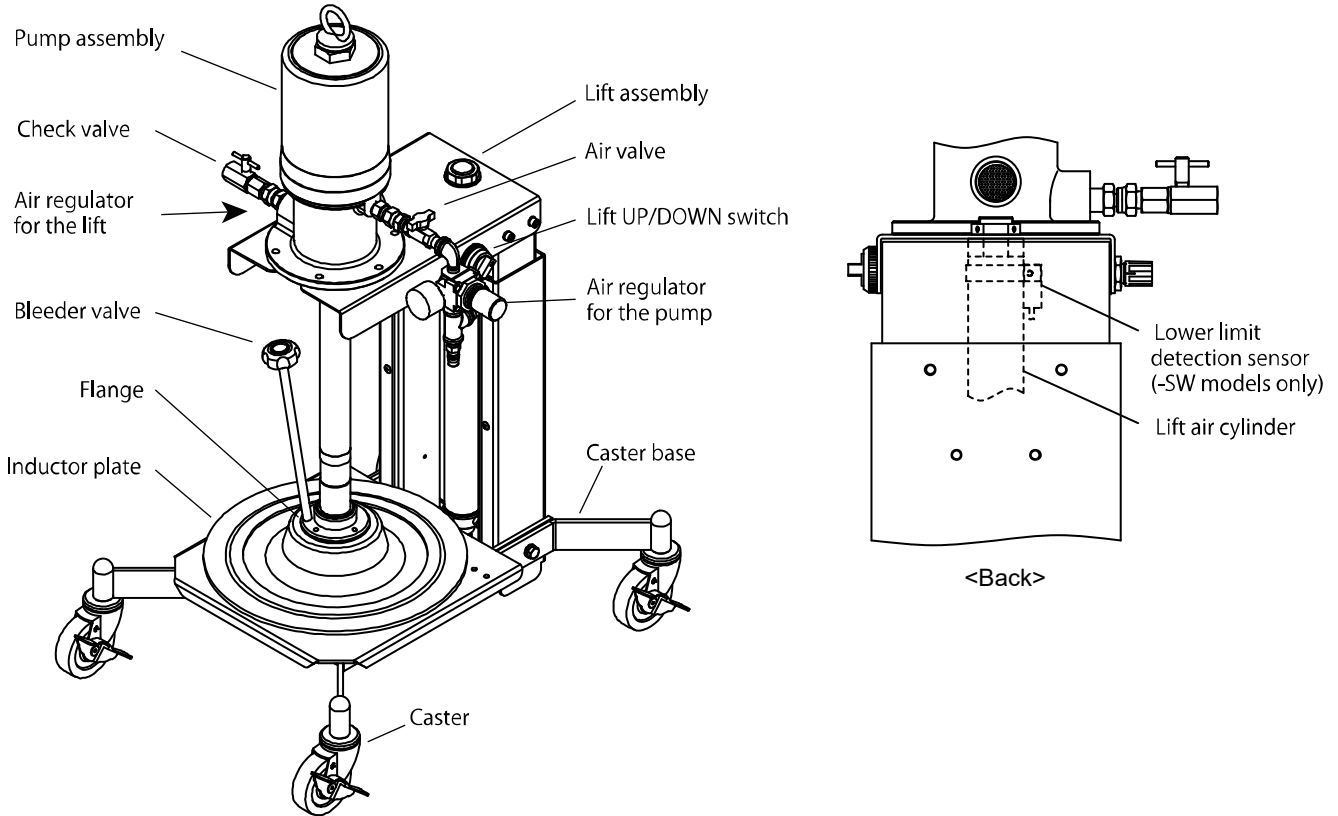
-  - Keep hands and fingers away from this product during operation to avoid injury from moving parts.
-  - Use this product for the material suitable for the specification. Parts may be corroded and material leak from the damaged parts can lead to environmental pollution. Also, follow handling notes (SDS) of the manufacturer about the handling of the material used.
-  - Take protective measures against rainwater and dust. It is likely to lead to the pollution of the material.
-  - Watch your step around this product to avoid tripping over the base and casters.
-  - Be careful about your hands when installing a pail. The edges of the cabinet and pail may cause hand injury. Also, be careful about your posture when moving the pump to avoid back injury.
-  - Do not touch the surfaces of the pump and the hose when pumping high-temperature material. Risk of burns exists.
-  - Shut off air source after work and nighttime, holidays, or when the pump is not in use for a while. Also, open the valve at the discharge port to release residual pressure in the pump and hoses. Failure to do so may result in damage to the hoses or facility pollution due to leak from the valve. The use has a responsibility for such secondary accidents.

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# 1. Part Names



## 1.1 Part Names



## 1.2 Contents of Package

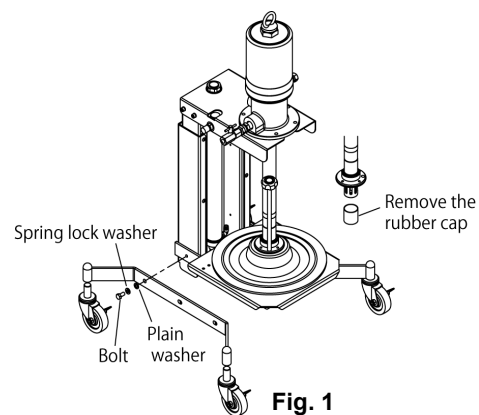
The main devices and the accessories are packed in different cases in one cardboard box. Please make sure no damage during shipment and no missing accessories after unpacking as soon as possible. Please make sure no loose screws, piping connections, and fastener components. Please retighten if any screws, piping connections, and fastener components are loose.

## 2. Preparations before Use

 <b>CAUTION</b>	
	<ul style="list-style-type: none"><li>- Apply sealing compound or sealing tapes to the male screws and tighten tightly when the pipes are connected. Be careful not to allow the sealing materials to enter the piping. Do not apply the tip of the terminal (two thread ridges) to maintain conductive property of the ground. (However, no applying is necessary if it will be connected to the hose union.) Check that there is no leakage or electrical continuity in each part after connecting the piping.</li></ul>

## 2.1 Assembling the machine

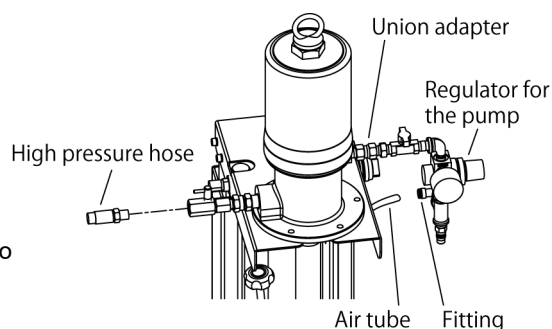
- 1) Casters are packed separately. Insert them into the caster base and fix them with the accompanying bolts, plain washers, and spring lock washers. (Fig. 1)
- 2) The rubber cap is put on the suction section of the pump (inside the inductor plate) for protection.  
**Be sure to remove this rubber cap before using the machine.**
- 3) Install the accompanying air regulator onto the union adapter located at the air inlet of the pump. Then please be sure to fix them. (Fig. 2)



- 4) Install the accompanying air tube for the lift to the fitting at the air inlet of the pump. Make sure it will not be pulled out. (Fig. 2)
- 5) Connect a high-pressure grease hose to the grease outlet (check valve) and tighten it firmly. (Fig. 2)

### <NOTE>

- A high-pressure grease hose is not provided in this product. Purchase our designated genuine hose separately. It is possible to install a high-pressure grease gun or metering valve to the hose outlet. Select and purchase appropriate dispensing equipment depending on the intended use.



- 6) Install the accompanying air coupler onto the air hose connected to the compressor, and fix it with the hose band etc.

## 2.2 Preparation of Lower limit detection sensor (-SW models only)

**⚠ CAUTION**

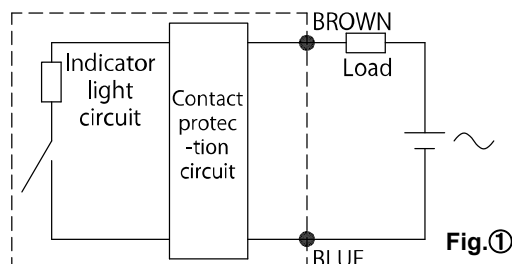
! - Wire the lead wire of the Lower limit detection sensor carefully so that load (pulling, hooking, etc.) will not be applied during lift operation.

In case of models with Lower limit detection sensor, it is necessary to prepare electrical wiring etc. beforehand. Connect the lead wire to the input side of the PLC or relay, referring to the Lower limit detection sensor circuit of Fig.① When the load voltage is direct current (DC), pay attention to the color of the lead wire (brown = +, blue = -).

### Specification of Lower limit detection sensor

Load voltage*	DC24V	AC100V	AC200V
Load current range	5 - 50 mA	5 - 25 mA	5 - 12.5 mA
Internal voltage drop	2.4V or less (~20mA) / 3.5V or less (~50 mA)		
Indicator light	Red LED lights when "ON"		
Lead wire length	0.5 m		

\* Load voltage DC12V can also be used, however, please take into consideration the internal voltage drop and check that the load operates.



The Lower limit detection sensor at the time of delivery is set near the stroke end of the lift air cylinder (Fig.③), so it must be changed according to the depth of the pail can.

The Lower limit detection sensor can slide up and down by loosening the screw in Fig.③

For the position of the lower limit, take into consideration the variation of the depth of the pail can, please set it by margin. If there is no margin at the lower limit position, the sensor reaches the bottom of the can without detecting the lower limit, and if the control to stop the pump at the time of detection of the lower limit is performed, the pump does not stop, and may keep dry running.

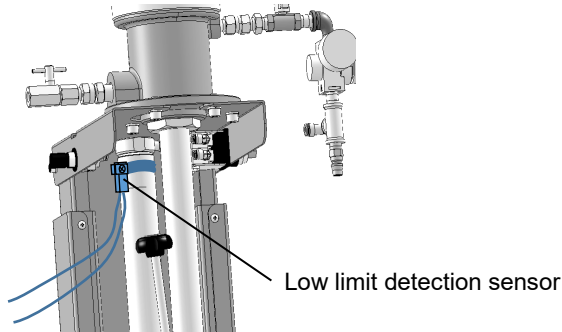


Fig. ②

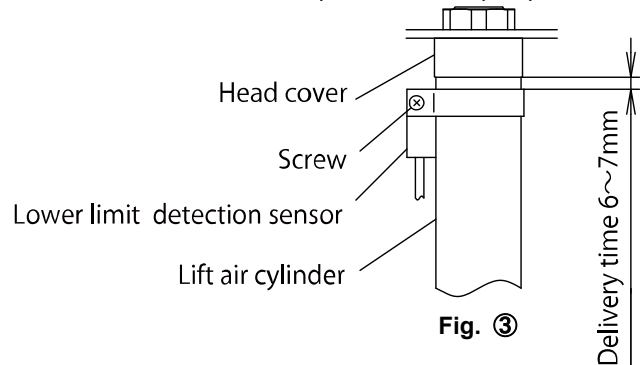


Fig. ③

Refer to the following procedures to adjust the position of the lower limit detection sensor.

<To prepare and adjust a virtual can bottom jig>

- Check the distance from the bottom of the can to the inner bottom of the pail can (see Dimension A in Fig.④.)
- Prepare a virtual can bottom jig (a size of  $\phi 240$  or more and a rigid material) with thickness of  $A + \alpha$  (this  $\alpha$  refers to the extra height in consideration of various depths of pail cans). (Fig.⑤)
- Raise the lift (for operation of the lift, see " 2.3 Setting a grease pail ") and place the jig directly under the inductor plate.
- Lower the lift and lower the inductor plate onto the jig.
- Loosen the sensor mounting screw and slide it into the position sensed by the sensor and tighten the screw to secure it. (Fig.③)
- Raise the lift, remove the jig, lower the lift, and complete.

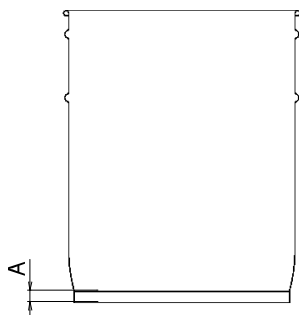


Fig. ④

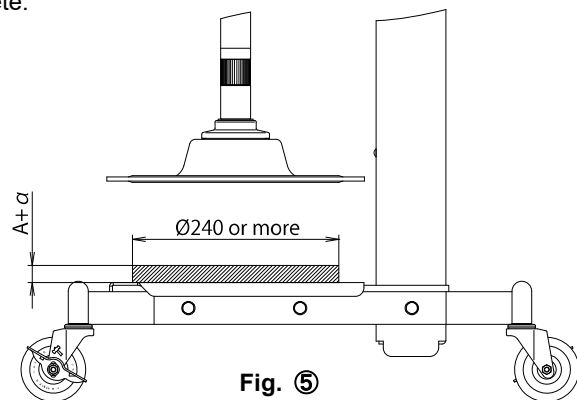


Fig. ⑤

<Method of adjustment on a pro forma basis>

- Check the distance from the bottom of the can to the inner bottom of the pail can (see Dimension A in Fig.④.)
- The width of the lift base and the lower surface of the inductor plate at the lowest lift limit is about 9 mm (reference value). (Fig.⑥)
- Loosen the sensor mounting screw, slide the sensor downward by the following calculated value, and tighten the screw to fix it. (Fig.③)

Dimension  $A - 9 \text{ mm} + \alpha$  (this  $\alpha$  refers to the extra height in consideration of various depths of pail cans)

- Check the timing of the lower limit detection during actual use, and adjust the sensor position when necessary.

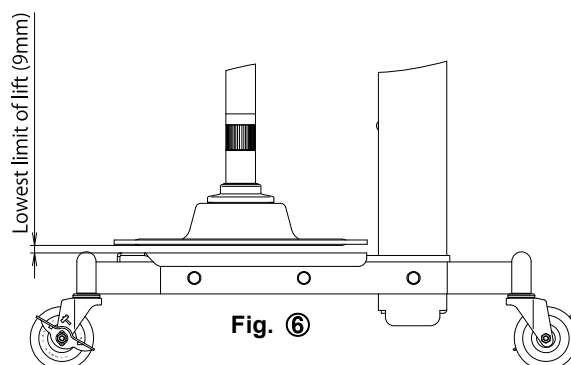


Fig. ⑥

## 2.3 Setting a grease pail

- 1) Remove the bleeder plug from the inductor plate. (Fig. 3)
- 2) Shut off the air valve of the pump unit. Then, turn the controls of both regulators (pump and lift) to the left (counterclockwise) to loosen them. (Fig. 3)  
Set the control of the lift up/down switch to "DOWN". (Fig. 4)

### <NOTE>

- The air regulator allows you to adjust the pressure of air to be supplied to the pump, and it reduces the waste motions of the pump: it improves the operability of the pump and extends the life of the pump.

To adjust the air pressure with the air regulator, turn the control to the right. The air pressure increases (the pointer of the pressure gauge moves from "0" to the larger value). When you turn the control to the left, the air pressure decreases (the pointer of the pressure gauge returns to "0").

- 3) Connect the air hose prepared at Section 2.1 6) to the air supply inlet, and supply air to the machine. (Fig. 5)
- 4) Turn the control of the lift air regulator gradually to the right (clockwise) to set the indicator at 0.4 - 0.5 MPa (within normal service pressure). (Fig. 6)
- 5) Switch the control of the lift up/down switch to "UP". The lift moves upwards. (Fig. 7)  
When the lift moves upwards, it means that you have made the preparation for setting a grease pail.
- 6) Remove the lid of a new grease pail, and set the pail onto the base section of the pump unit properly.

### <NOTE>

- If a pail is not properly set, grease is not discharged. Be sure to set it on the correct position.

- 7) Switch the control of the lift up/down switch to "DOWN". The lift slowly moves down due to the pump's own weight. Adjust the position of the pail so that the inductor plate can be set normally. (Fig. 8)

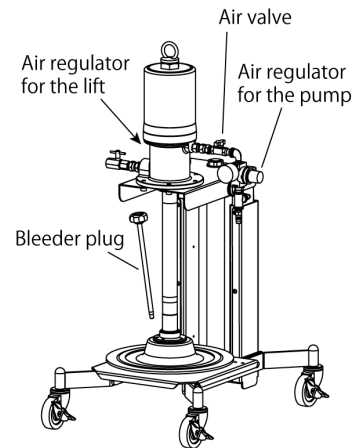


Fig. 3

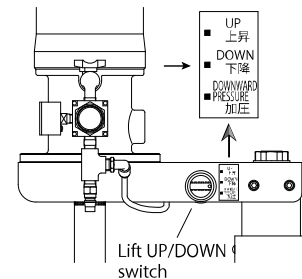


Fig. 4

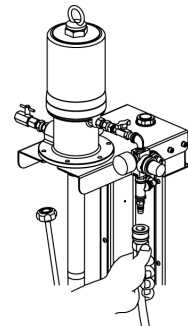


Fig. 5

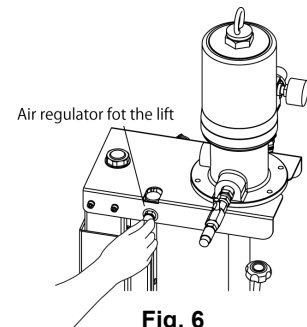


Fig. 6

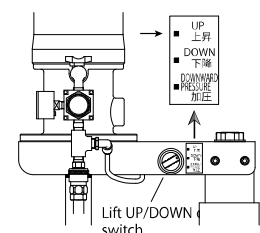


Fig. 7

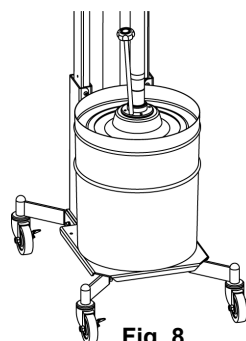


Fig. 8



## CAUTION



- Do not put your hands and fingers between a pail and the inductor plate to prevent injuries from being caught.

- 8) Switch the control of the lift up/down switch to "DOWNWARD PRESSURE". (Fig. 9)  
Once grease pressurized by the inductor plate comes out of the bleeder plug hole, switch the control of the up/down switch to "DOWN" to stop pressurizing temporarily and install the air bleeder plug.

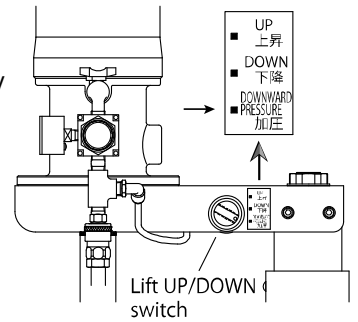


Fig. 9

**⚠ CAUTION**

! - When you simply want to lower the lift, do NOT set the control switch to the "DOWNWARD PRESSURE" to move the lift.

## 2.4 Bleeding air from grease

**⚠ WARNING**

⊘ - Keep your face and hands away from the outlet when handling the check valve. Air-containing material may suddenly come out. There is a possibility of losing eyesight and injuring the hand.

**<NOTE>**

- Unlock the control of the regulator by pulling it before turning it for pressure setting. Once you set the air pressure, press the control in to lock it.

- 1) Make sure that the valve at the discharge outlet is closed.
- 2) Open the air valve and turn the control of pump air regulator gradually to the right (clockwise). The pump will start at 0.2MPa and run for a while until the pump and hose are filled with grease. (Fig.10)
- 3) At first, air is mixed in grease, which is not ready for use. Open the check valve at the discharge outlet and allow the trapped air to escape completely from the small hole at the bottom of the valve. At this time, put some paper to protect your hand from grease and dispose of discharged grease. (Fig.11)

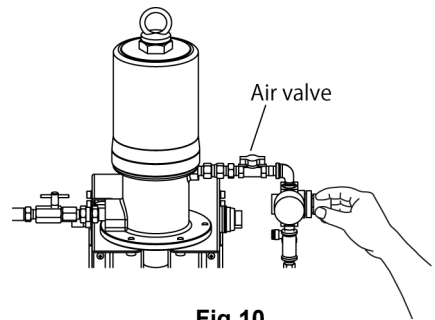


Fig.10

**<NOTE>**

- Grease mixed with air is clouded.
- 4) After purging the trapped air from grease, tighten the check valve firmly.

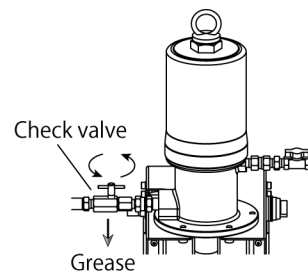


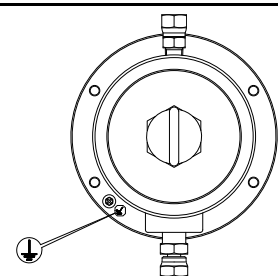
Fig.11

## 2.5 Connecting the ground wire

**⚠ WARNING**

! - Make ground connection when working with flammable material or in explosive atmosphere. Rapid pumping of material can result in static electrical charge. Also, be sure to provide proper ventilation where a flammable atmosphere may exist.






- 1) When installing the pump, be sure to connect the ground wire at the specified position.
- 2) Also connect ground wires to peripheral equipment and piping.
- 3) Use 2.0mm<sup>2</sup> minimum ground wire.



Position for connecting the ground wire

### 3. How to Use

## WARNING

-  - Do not operate the gun lever with the discharge port facing to another person during machine operation in any case. A direct hit against the human body may result in an accident such as skin damage.
-  - The maximum supply air pressure of this machine is 0.7 MPa. Using the machine with a supply air pressure exceeding this limit will lead to death or bodily injury or physical damage due to machine breakage. Be sure to adjust the supply air pressure below 0.7 MPa.
-  - After the end of daily work, at night, and on holidays, be sure to shut off the supply air to this machine to release the gun so as to bleed the internal pressure. Any secondary accident such as pollution of installation, due to pump operation driven by worn-away packing or hose without shutting off the supply air, shall be attributable to the user's responsibility.
-  - During machine operation or after completion of movement, be sure to lock the caster brake for locking.
-  - When the lift stops due to a foreign object caught in the sliding part, be sure to move the lift to the opposite direction BEFORE removing an object. The lift may suddenly start moving if a foreign object is removed directly.

- 1) Adjust the air regulator for the lift to set the pointer of the pressure gauge so that it can indicate a value from 0.4 - 0.5 MPa with following the description of "NOTE" below. (Fig.12)

#### <NOTE>

- If the viscosity of the material is high or climate is cold, please switch the control of the lift up/down switch to "PRESS". Pressure can be adjusted by the air regulator for the lift in accordance with the viscosity of the material (up to 0.7 MPa). If the pressure is too high, the material may leak from packing of the inductor plate. Please set the optimum pressure while operating (if the work is aborted, switch the control of the lift up/down switch to "DOWN").
- Material viscosity varies with changes in temperature. It is recommended to make a note of appropriate pressure for each season.

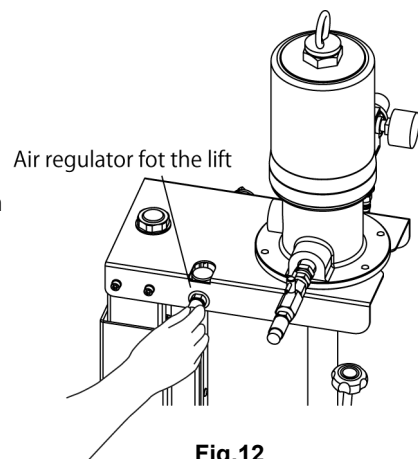


Fig.12

- 2) Adjust the air regulator for the pump to set the pressure supplied to the pump to 0.2 - 0.7 MPa. (Fig.13)
- 3) When you open the valve located at the end of the hose, grease is discharged and the pump automatically starts operating. Check to see if grease is discharged normally before using the machine.
- 4) Once you close the valve, the pump will stop discharging grease and automatically stop running. As long as air is supplied, the pump discharges the desired amount of grease by opening the valve.
- 5) If the pump starts operating wildly during work, there may be no grease in the set pail or the pump may operate without discharging any grease due to an air pocket generated. Stop operating the pump immediately, and inspect it.
- 6) After finishing your work, be sure to stop supplying air to the machine, and open the valve of the grease discharge outlet (a little amount of grease is discharged) to release the pressure from the hose and pump.

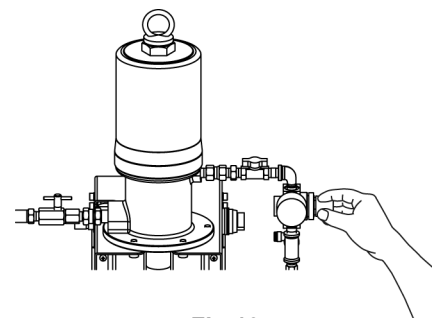


Fig.13

### 3.1 Operation for using a high-pressure grease gun

To supply grease to a grease nipple, you have to separately purchase a high-pressure grease gun (part number: 851985) for the outlet valve.

- 1) Follow the operation steps 1) and 2) of the section “3. How to Use” described above to set each regulator.
- 2) Wipe the grease nipple to be used for greasing cleanly. After that, push the chuck at the end of the grease gun against the nipple to perform chucking as vertically as possible. (Fig.14)
- 3) Pull the gun lever to supply grease. When grease is normally injected, old grease will be squeezed out from the groove or clearance near the nipple.
- 4) After completion of grease supply, release the gun lever. The pump will be automatically stopped.
- 5) Remove the chuck at the end of the grease gun. Since pressure is applied to the chuck, the head of the nipple may be broken if it is suddenly pulled. Incline the chuck to bleed the internal pressure, and the chuck can be easily removed. (Fig.15)
- 6) As long as the grease gun is left under pressure, you can do a grease job by pulling the lever of the gun.

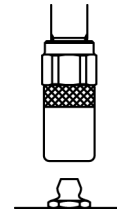


Fig.14

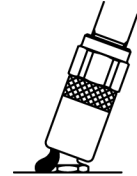


Fig.15

### 3.2 Replacing a grease pail

- 1) When the amount of the remaining grease in a pail draws to an end, the pump operates wildly without discharging any grease. Stop your work immediately, and turn the control of the air regulator for the pump to the left to return the pressure of the air supplied to the pump to “0”. The pump stops operating.
- 2) Loosen the bleeder plug to remove it.
- 3) When you switch the control of the lift up/down switch to “UP”, the pump moves upwards, when the pail set on the machine moves upwards at the same time. Pry the pail away from the machine. (Fig.16)

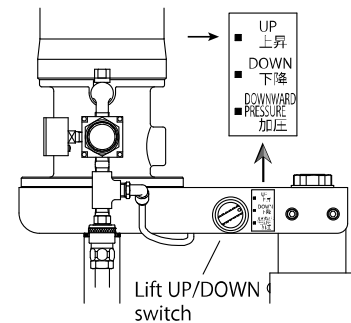


Fig.16

#### <NOTE>

- After removing the pail, remove the air coupler located at the air supply inlet for your safety, and stop supplying air to the unit.
- 4) Follow the section “2.2 Setting a grease pail” to set a new grease pail.
  - 5) After replacing the grease pail with a new one, check to see if there is no air mixed into the grease before using the machine by following the section “2.3 Bleeding air from grease”.

## 4. Maintenance and Inspection

### 4.1 Troubleshooting and Corrective measures

If the pump operation becomes unstable or trouble is caused to its grease discharge during operation, make a check according to the following procedure.

PROBLEM	POSSIBLE CAUSE	REMEDY
Pump doesn't run.	Compressor is off.	Turn on compressor.
	Valve on air piping is closed.	Open valve.
	Air pressure setting is under 0.2 MPa.	Set air pressure to 0.2 - 0.7 MPa or above.
	Valve on material outlet is closed.	Open valve.
	Delivery pipe is clogged.	Replace clogged components or remove foreign object.
	Air is leaking from air motor.	Contact us for service.
	(-SW models only) Mounting position of Lower limit detection sensor is misaligned or malfunction of related control equipment (PLC, solenoid valve, wiring, etc.).	Correct the sensor to the proper mounting position, or repair the control equipment.
Pump doesn't stop.	Material is leaking from exhaust outlet of air motor.	Contact us for service.
	Valve at the material outlet is open.	Close valve.
	Leak occurs in delivery pipe.	- Retighten loose parts. - Replace damaged part.
	Valve component in lower pump is worn out.	Replace worn part.
	(-SW models only) Mounting position of Lower limit detection sensor is misaligned or malfunction of related control equipment (PLC, solenoid valve, wiring, etc.).	Correct the sensor to the proper mounting position, or repair the control equipment.
Discharge pressure or discharge amount is not enough.	Amount of supply air is not enough.	Replace air tube with thicker one or inspect air compressor.
	Seat surface of piston valve in lower pump is defective. (wear of seat surface, inclusion of foreign material) or packings are damaged.	Replace damaged part or remove foreign object.
	Seat surface of foot valve in lower pump is defective. (wear of seat surface, inclusion of foreign material)	Replace damaged part or remove foreign object.
Pump doesn't draw material.	Pail is empty.	Fill up or replace pail.
	Air pocket is trapped in a pail.	Set control switch to "DOWNWARD PRESSURE".
	Connecting part of lower pump is loose.	Retighten loose part.
	Seat surface of piston valve in lower pump is defective. (wear of seat surface, inclusion of foreign material) or packings are damaged.	Replace damaged part or remove foreign object.
	Seat surface of foot valve in lower pump is defective. (wear of seat surface, inclusion of foreign material)	Replace damaged part or remove foreign object.
Material contains air bubbles even after bleeding	Internal diameter of pail is larger than specified.	Use JIS-approved pail.
	Air release plug is loosened.	Secure air release plug.
	Packing of inductor plate is deteriorated.	Replace packing.
	- Fasteners are loosened.	- Retighten loosened parts.
	- O ring or backup ring is damaged.	- Replace damaged part.
Lift doesn't move up/down.	Compressor is off.	Turn on compressor.
	Air supply is off.	Turn on air supply.
	Air pressure setting is under 0.4 MPa.	Set air pressure to 0.4 - 0.5 MPa or above.
	Air tube is not connected to lift operation valve.	Connect air tube.
	Air tube connected to lift operation valve is damaged.	Replace damaged part.
	Lift rail is defective. (damage of rail, inclusion of foreign material, loosening of threaded part)	Contact us for service.
	A foreign substance is caught by the lift elevating section.	Remove the foreign substance.
	Cylindrical section of air cylinder or rod is deformed.	Contact us for service.
Pail surface is uneven.	Use straight side pail.	

## 4.2 Maintenance and Inspection

### [Lubrication]

For lubrication of the pump, perform oiling once every 10 days with lubricating oil. Supply the lubricating oil as following.

- 1) Remove the air regulator.
- 2) Inject a few drops of lubricating oil (approx. 0.5mL) into the air supply port. (Fig.17)

### <NOTE>

- Use turbine oil class 1 ISO VG32 or equivalent as the lubricating oil.

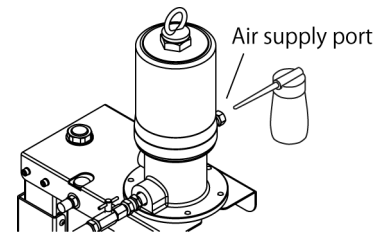


Fig.17

### [Inspection]

The hose is a consumable part. Check it periodically. If any blemish or leakage is found, replace the hose little earlier. The packing and slide portion parts of the pump are worn away. Check and replace them once a year.

## 4.3 Disassembly and Assembly

When the pump operation becomes defective or stops, do not disassemble the pump thoughtlessly but judge the condition carefully by referring to the item pertaining to “4.1 Troubleshooting and Corrective Measures”.

The air motor that is not brought into direct contact with the material becomes defective rarely, so it does not need to be disassembled. If disassembly is required, ask the dealer to disassemble the air pump.

## ⚠ WARNING



- Gasoline is a high volatile fuel. Do not use it to clean the pump in any case, otherwise ignition or explosion may be caused.



- When washing parts, do not use such a liquid as corrodes aluminum, copper alloy, iron, etc.



- When disassembling and checking the pump, be sure to stop the supply air and open the outlet valve to release the internal pressure of the pump beforehand.

### [Separating the air motor from the lower pump]

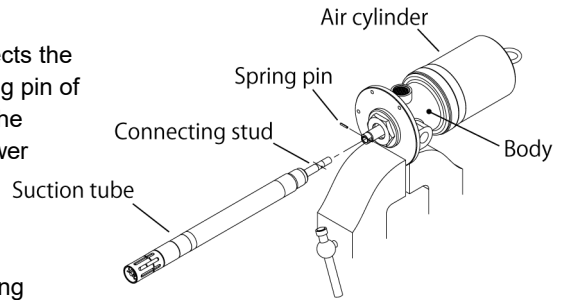
- 1) Shut off the air that is supplied to the pump and bleed the internal pressure of the pump.
- 2) Remove the high pressure hose and the air coupler from the pump.
- 3) Unscrew 5 bolts connecting the pump assembly and the lift assembly. Then, slide the pump assembly forward to separate it from the lift.
- 4) Secure the air motor of the pump assembly in a vise. Unscrew 4 bolts connecting the flange at the bottom of the pump and the inductor plate to remove the inductor plate from the pump.

### <NOTE>

- The air cylinder is easily damaged. Do not fix it on the vise in any case.

- 5) Set a pipe wrench on the knurling section of the suction tube of the lower pump and unscrew it.

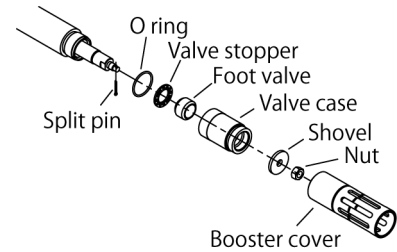
- 6) Pull out the suction tube, and the connecting stud that connects the piston rod of the air motor becomes visible. Pull out the spring pin of the connecting section and unscrew the connecting stud or the lower pump, and the air motor can be separated from the lower pump. (Fig.18)



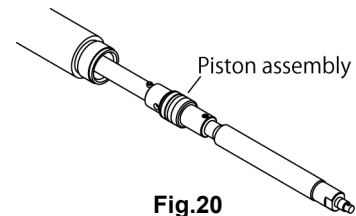
**Fig.18**

**[Disassembling and inspecting the lower pump]**

- 7) Secure the suction tube in a vise and remove the retaining ring fastening the flange to separate the flange from the suction tube.
- 8) Set a pipe wrench on the booster cover. Unscrew the suction tube and remove the split pin, nut and shovel. (Fig.19)
- 9) Likewise, set a pipe wrench on the valve case and unscrew it. The valve stopper and the foot valve (a part of the plunger assembly) can be removed.
- 10) Pull out the plunger rod from the suction tube by holding it. The piston and connecting rod assembly can be pulled out. (Fig.20)
- 11) Pull out the spring pin that connects between the connecting rod and the plunger, and take out the plunger. Wash the plunger and check it for blemish and wear. (Fig.21)



**Fig.19**

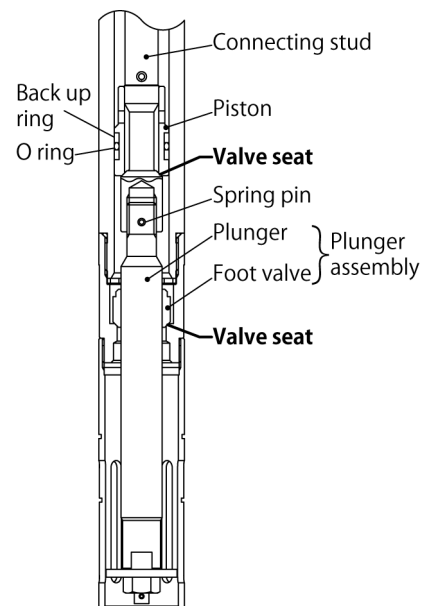


**Fig.20**

**<NOTE>**

- The plunger is an assembly for mating with the valve. Insert the foot valve in the plunger, and check if it can smoothly slide. These two parts, if they are blemished, must be replaced as an assembly.

- 12) The portions with which the lower part of the piston and the connecting stud come into contact form a seat surface. Check them for blemish. (Fig.21)
- 13) Wash and check each disassembled part. If any blemish or wear is found, replace the part with a new one.
- 14) For assembling, reverse the disassembling procedure. In particular, perform assembling taking care about the directions of the foot valve.



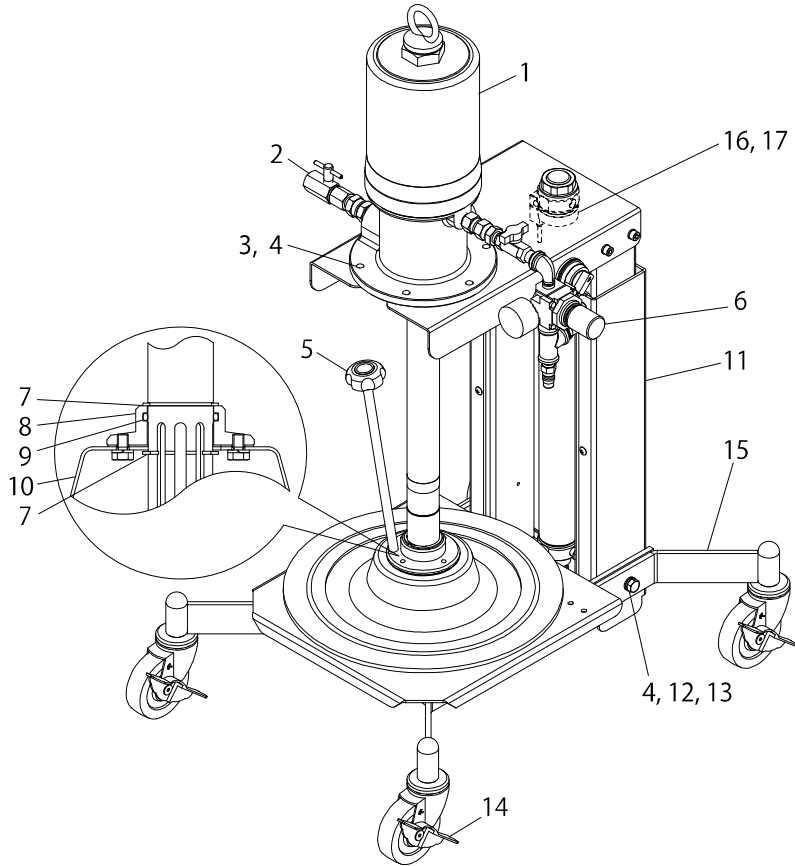
**Fig.21**

**[Disassembling the air motor]**

The air motor is not easily adjusted at assembly. If an air motor failure is found at "4. maintenance and inspection", ask the dealer to repair the air motor.

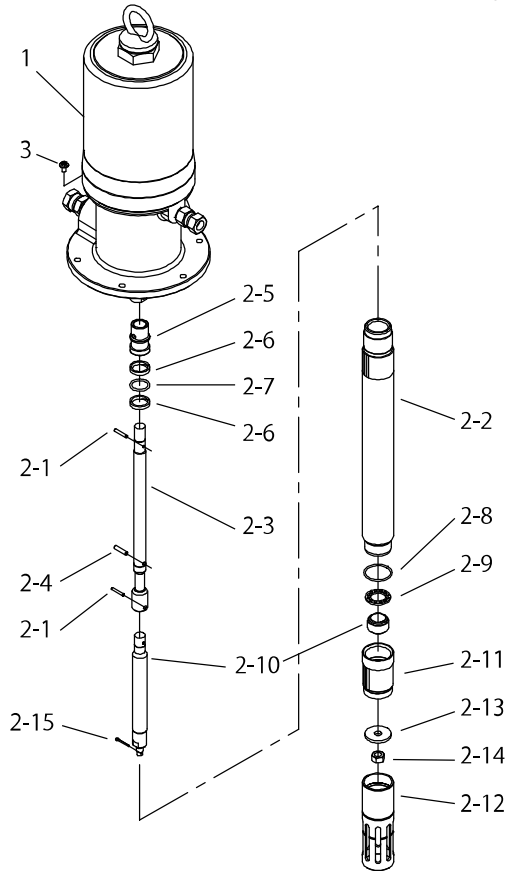
## 5. Parts Disassembly Drawing and Parts List

5.1 881122 SKR110A50PAL/881123 SKR110A50PAL-SL  
 881204 SKR110A50PAL-PL/881205 SKR110A50PAL-SL-PL  
 881209 SKR110A50PAL-SW/881210 SKR110A50PAL-SL-SW



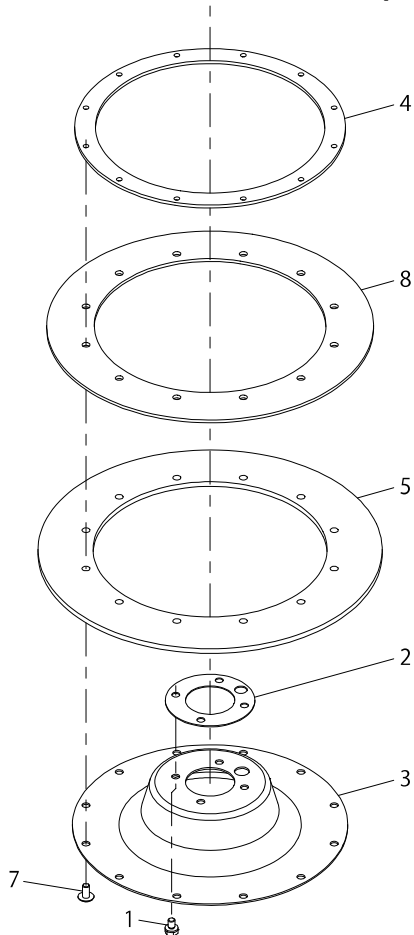
No.	Parts No.						Description	Qty
	881122	881123	881204	881205	881209	881210		
1	851728	851999	851728	851999	851728	851999	Pump assembly	1
2	800431	←	←	←	←	←	Check valve assembly	1
3	619145	←	←	←	←	←	Socket head cap screw	5
4	631420	←	←	←	←	←	Spring lock washer	11
5	804942	←	←	←	←	←	Air releaser assembly	1
6	804941	←	←	←	←	←	Regulator assembly	1
7	630867	←	←	←	←	←	S type snap ring	2
8	710995	←	←	←	←	←	Flange	1
9	640132	←	←	←	←	←	O ring	1
10	802629	←	805143	←	802629	←	Inductor plate assembly	1
11	854662	←	←	←	←	←	Lift assembly	1
12	631013	←	←	←	←	←	Plain washer	6
13	611145	←	←	←	←	←	Bolt	6
14	681696	←	←	←	←	←	Caster with brake	4
15	831384	←	←	←	←	←	Caster base	2
16	----	----	----	----	687043	←	Switch	1
17	----	----	----	----	687044	←	Bracket	1

### 5.2 851728 / 851999 Pump assembly



No.	Parts No.		Description	Q'ty
	851728	851999		
1	802497	←	Air motor	1
2-1	632773	←	Spring pin	2
2-2	710617	←	Cylinder tube	1
2-3	710618	←	Connecting stud	1
2-4	632792	←	Spring pin	1
2-5	710619	←	Piston	1
2-6	771367	←	Back up ring	2
2-7	682926	←	O ring	1
2-8	682922	←	O ring	1
2-9	701600	←	Valve stopper	1
2-10	802499	802751	Plunger assembly	1
2-11	710620	←	Valve case	1
2-12	710621	←	Booster cover	1
2-13	710622	←	Shovel	1
2-14	627012	←	Nut	1
2-15	632032	←	Split pin	1
3	682636	←	Screw	1

### 5.3 802629 / 805143 Inductor plate



No.	Parts No.		Description	Q'ty
	802629	805143		
1	682507	←	Bolt	4
2	771433	←	Gasket	1
3	795082	——	Inductor plate	1
	——	716718	Follow plate	1
4	——	716719	Plate	1
5	——	770114	Packing	1
7	——	603032	Screw	12
8	——	770115	Packing	1

## 6. Specifications

### ■ Engineering Data

Type	SKR110A50PAL			SKR110A50PAL-SL		
	(BASIC)	-PL	-SW	(BASIC)	-PL	-SW
ITEM No.	881122	881204	881209	881123	881205	881210
PUMP (PUMP RATIO)	851728 SKR110A50 (50×1)			851999 SKR110A50-SL (50×1)		
INDUCTOR PLATE ASSEMBLY	802629 IDP-110SAL	805143 IDP-PAL/PL	802629 IDP-110SAL	802629 IDP-110SAL	805143 IDP-PAL/PL	802629 IDP-110SAL
MATERIAL CONNECTION	DISCHARGE PORT Check valve G1/4					
AIR CONNECTION	SUPPLY PORT Air coupler PS-20PM					
COMPATIBLE MATERIALS	Grease *3 NLGI No.00 - 3			Silicone grease Worked penetration : 200 - 320		
APPLICABLE CONTAINERS	JIS Z 1620 steel pail T, S type 1, 2 or equivalent, or plastic container similar					
OPERATING AIR PRESSURE	0.2 - 0.7 MPa					
MAXIMUM OPERATING NOISE	A-WEIGHTED SOUND PRESSURE LEVEL *1 80 dB					
	A-WEIGHTED SOUND POWER LEVEL *2 92 dB					
AMB. TEMP. RANGE	TEMP. AMBIENT 0 - 40 °C					
	TEMP. MATERIAL 0 - 40 °C					
WEIGHT	34 kg	35 kg	34 kg	34 kg	35 kg	34 kg

\*1 Measurement method of A-weighted sound pressure level is based on ISO 1996.

\*2 Measurement method of A-weighted sound power level is based on ISO 3744.

\*3 Usable range of NLGI No. is a rough indication. The range may be different depending on property of the grease.

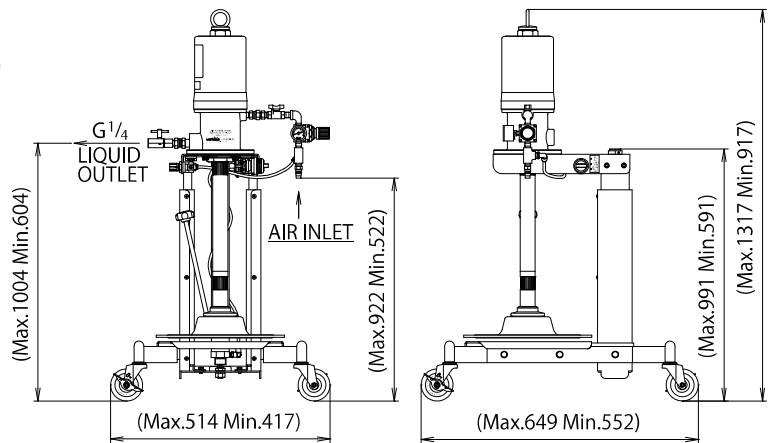
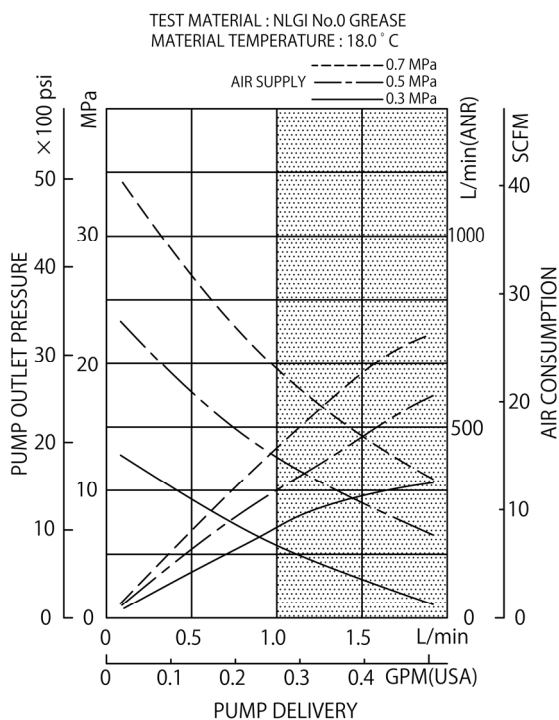
The range may be different depending on property of the grease.

### ■ Performance Curve (only the pump)

### ■ Dimensions

#### <NOTE>

- The continuous pump operation should be avoided if the desired delivery is in the range shaded in the figure below.



## 7. Limited Warranty

If an abnormality occurs during normal operation in accordance with the operating instructions and other operating cautions within the warranty period (12 months after date of purchase) that can be attributed to a manufacturing defect, the defective parts of this product will be serviced or the product will be replaced free of charge. However, this warranty will not cover compensation for incidental damage or any malfunction listed below.

### 1. Warranty period

This warranty will be valid for a period of 12 months after the date of purchase.

### 2. Warranty

If, during the warranty period, any of the material of the genuine parts of this product or the workmanship of this product is found defective, and is so verified by our company, the servicing cost will be fully born by our company.

### 3. Exclusion

Even during the warranty period, this warranty does not cover the following.

- 1) Malfunction arising from use of parts other than manufacturer-specified genuine parts
- 2) Malfunction arising from misuse or operating errors, or lack of storage or maintenance care
- 3) Malfunction arising from use with a fluid that may cause corrosion, inflation or dissolution of the component parts of the product
- 4) Irregularity arising from repair made by other than by our firm, our regional office, dealer or authorized service personnel
- 5) Malfunction arising from modification of the product by other than authorized service personnel
- 6) Wear and tear of parts that must be regularly replaced in the course of normal operation, such as packings, O-rings and hose.
- 7) Malfunction and/or damage due to use with incorrect voltage.
- 8) Malfunction and/or damage due to transportation, moving or drop page of the product after purchase
- 9) Malfunction and/or damage due to fire, earthquake, flood or other force majeure
- 10) Malfunction arising from use of compressed air that contains impurities or excessive moisture, or use of gases or fluids other than the specified compressed air
- 11) Malfunction arising from use of excessively abrasive material or of inadequate grease.

Furthermore, this warranty does not cover the rubber parts, or other parts used in this product and its accessories, which are subject to wear in normal operation.

- hoses
- packings
- cords

### 4. Parts

Parts for this product will be kept available for 5 years after discontinuation of production. Once 5 years have elapsed after close of production, availability of parts for this product cannot be guaranteed.

**MEMO.**



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