NITTOH Power

ELECTRIC/HYDRAULIC PUMPS

UP-35DX-IN(L)

Operation and maintenance manual

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1 Safety Information

Three types of symbols are used in this instruction manual to ensure correct use of the product and to prevent harm to you or others or damage to property. The symbols and their meanings are as follows. Please read the text after understanding the contents carefully. NITTOH ZOHKI is not responsible for any damage or injury resulting from unsafe use of the product, lack of maintenance, or improper application of the system.
Cautions remarks used in this manual are classified as follows;

⚠ DANGER	If this symbol is ignored and the product is handled improperly, there is a high probability that the user will be killed or seriously injured.

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the user.

⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in injury to the user or property damage.

Cautions when installed

⚠ WARNING
■Install the unit stably. Since this pump uses a sealed tank, it can be used in all directions (diagonal, upside down, vertical, horizontal), but please do not place it on an unstable surface. However, do not place it on an unstable surface, as it may fall and cause injury. When installing the product at an angle, make sure to fix it firmly. ■Prepare the work environment. Remove any objects (high temperature, fire, movable objects, sharp objects, corrosive objects, etc.) around the work area where the pump is used that may cause injury or harm to the user.

⚠ CAUTION
■Avoid rain and moisture, and use the product in a place with as little dust as possible. ■Avoid direct sunlight in summer. The temperature of the hydraulic fluid may rise, causing problems with processing and equipment. ■For outdoor use in extremely cold weather, replace with hydraulic fluid of the proper viscosity. The viscosity of hydraulic fluid increases as the temperature of the fluid drops, which may cause problems with processing and equipment.

Precautions for use

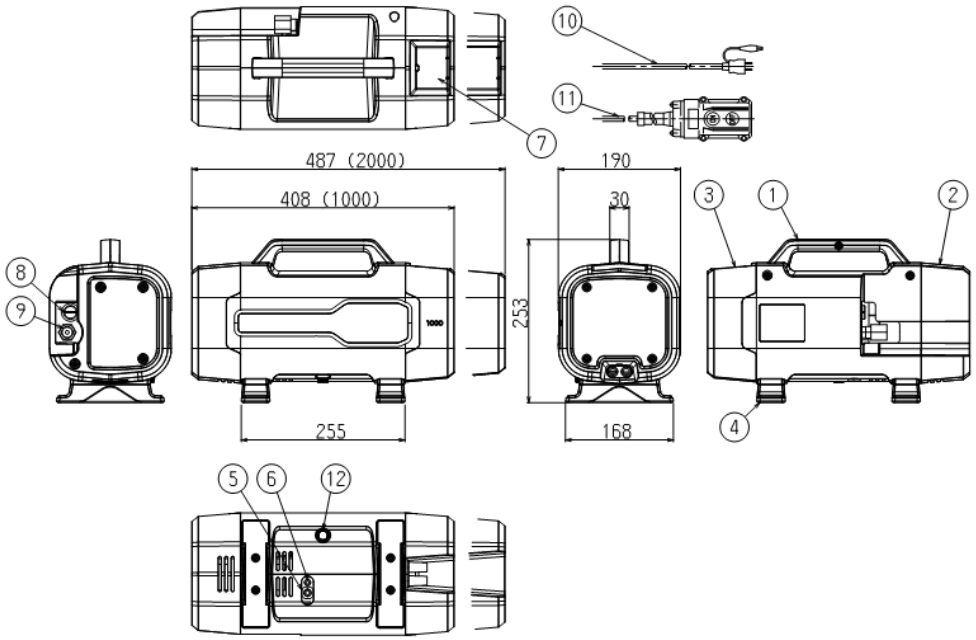
⚠ WARNING
■Take safety measures. Use protective equipment, work clothes, safety glasses, etc. to protect yourself when operating hydraulic equipment. ■Pay attention to the allowable pressure of the hydraulic circuit. Always work to ensure that the maximum permissible working pressure of the pump is less than the permissible pressure of other hydraulic equipment connected to it and less than the permissible load. ■Be careful of electric shock. Do not pull out the power plug with wet hands. Always use the grounding clip on the power plug to ground the unit when in use. Do not use this product near an electric welding machine or on grounded materials or equipment.

⚠ CAUTION
■The power supply is AC200-230V 50/60Hz single phase. Use of the wrong voltage may cause burnout or heat generation. Use of the product at a low voltage may result in burning or overheating. Be careful of voltage drops, especially when using a generator. ■When unplugging the power plug from the outlet, be sure to grab the power plug and pull it out. Pulling the cord and unplugging it from the outlet may cause disconnection or short circuit. ■When using auxiliary cords, please use 1.25 ㎟ or more thick cords so that the voltage will not drop, and the length should be within 10m.

Specifications

Model,No	Electric motor	Hydraulic pump				Reservoir	Weight
		Max, Work pressure MPa		Flow Rate L/min(50Hz)			
		1st stage	2nd stage	1st stage	2nd stage		
UP-35DX -IN (L)	Commutator and open type, 0.35KW 200-230V 50/60Hz single phase, "E" insulation, 2000rpm	1	70	2.5	0.3	Capacity 1.0L (2.0L) Usable 0.8L (1.6L)	1L 10.5Kg 2L (12Kg)

2 Description of components



1	Pump body
2	Back Cover
3	Tank Cover
4	Pump Feet
5	Relief Valve
6	Air Relief Valve
7	Storage Box
8	Oil Feeding Plug
9	Discharge Port
10	Power Cord
11	Operation Cord
12	Fuse

3 Instructions before use

3-1 Please make sure that there is no damage or oil leakage during transportation.

3-2 ⚠ CAUTION Oil feeding plug

The tank (using a rubber tank) is a sealed type, so please use a sealed fueling plug. Also, be sure to use a coupler with a check valve.

3-3 ⚠ WARNING Check the power supply

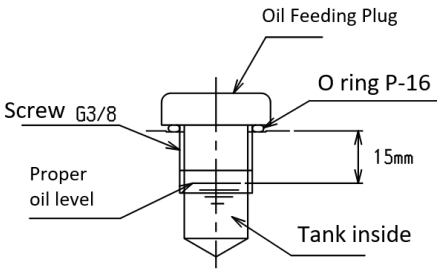
The power supply is AC200-230V (50/60Hz) single phase. Be sure to ground the unit when using it.

3-4 ⚠ WARNING Check the hydraulic oil

To check the oil level, use the following method.

Always check the amount of oil in the pump with the cylinder of the connected equipment fully returned before operation, and always use the correct amount. If oil is supplied when the cylinder lot of the connected equipment is out, there will be no place for the oil in the cylinder to return, and the oil will overflow, or high pressure will be generated in the tank, which is dangerous.

(1) Turn the cylinders of the connected devices back on completely.
(2) Unplug the power supply.
(3) Stand the pump upright with the oil tank side down.
(4) Turn the oil feeding plug with a flat-blade screwdriver in the semi-clockwise direction to remove it.
(5) Check the amount of oil from the removed oil supply port.



(6) If the oil fills up to the step in the oil supply cap, it is normal. (For the type of hydraulic fluid to be used, refer to the section 5-1) Hydraulic fluid.)
(7) Turn the oil supply plug clockwise to tighten it. Be careful not to damage the O-ring.

4 Operation

"UP-35DX-IN(L)" with 2-way normally closed solenoid valve, pressure holding and inching type.

1. When you press the ON button on the two-point control switch, the motor turns and oil is sent through the hose to the cylinder. When you release the switch button, the motor stops, the oil stops flowing, and the cylinder stops.

2. When you press the OFF button on the two-point control switch, the solenoid valve is activated and the oil in the cylinder returns to the tank. (The cylinder returns only when the OFF control switch is pressed, and stops returning when the switch is released. (An intermediate stop of return is possible.)

5 Maintenance

5-1 Hydraulic oil

① Type of oil
As a general rule, use genuine oil NHO-32 (1 liter). For urgent use, use high quality hydraulic oil (equivalent to ISO standard #32 viscosity : 32 cSt @40℃).

② Oil temperature
The proper operating temperature for hydraulic fluid is 55℃ or less. Stop working until the temperature drops to the proper level.

③ Oil change

⚠ CAUTION

Since hydraulic fluid deteriorates, replace the entire amount periodically. The oil should be replaced after 300 hours of operation or 3 months. To replace the oil, remove the oil plug, turn the pump at an angle to remove the oil, and fill the pump to the top of the oil plug, taking care not to let any impurities such as dust enter. The following are the three points to keep in mind when replacing.

*Make sure that the cylinder is completely back in place.
*Never add different kinds of oil, even if it is only a small amount.
*When refilling the oil, be careful not to mix in any foreign matter.

④ Other

⚠ WARNING

If oil gets into your eyes, rinse thoroughly with clean water. Rinse thoroughly with clean water and seek medical attention immediately. If oil gets into wounds or other skin areas, rinse with soapy water, stop bleeding, and seek medical attention immediately.

5-2 Pressure and piping

① Composition of hydraulic equipment system ⚠ WARNING

When combining pumps, high-pressure hoses, cylinders, couplers, valves, etc. to form a hydraulic system, make sure that the maximum working pressure of each device is the same. If a pump with a lower maximum working pressure is used, the maximum working pressure of the system should be adjusted to the lowest one.

② Pressure gauges

Install a pressure gauge to check the pressure at all times, or make it readily available.

③ Piping ⚠ CAUTION

Wrap sealing tape around the tapered pipe screw when connecting it to the hose piping or to various valves and couplers. Refer to the taper screw tightening torque table below and be careful not to over-tighten.

NPT,PT sizes	Tightening torque N-m(kgf-m)
1/8”	13-14 (1.3-1.4)
1/4”	30-40 (3.0-4.0)
3/8”	60-70 (6.0-7.0)
1/2”	100-110 (10.0-11.0)

Do not allow any scraps of sealing tape to enter the hydraulic equipment. Failure to do so may result in damage.

5-3 High pressure hoses

① Hose installation ⚠ WARNING

The high pressure hose will expand and contract slightly when pressurized, so allow some room for expansion. Also, be careful not to rub against other hard objects.
Do not clamp the high pressure hose. The high pressure hose will stiffen and move to straighten when pressure is applied. Clamping the hose, especially at the bent part, may cause damage due to excessive force during pressurization. If the high-pressure hose is not handled properly, its life will be extremely short. In particular, it is susceptible to fire (high temperature), extreme bending, and twisting, so do not use it in high temperature environments, below the minimum bending radius, or while twisted.

② Hose handling ⚠ DANGER

Never drop objects into the high pressure hose. The impact of falling objects may cause the high pressure hose to burst, resulting in a serious accident.
Do not pull the high pressure hose with strong force. Dragging or carrying the pump, cylinder, etc. with the high pressure hose may cause damage to the high pressure hose, resulting in a serious accident.

5-4 Coupler

① Connection

Before connecting the coupler, make sure that there is no dust, sand, etc. attached to the connection part of the coupler. After connecting, pull the high-pressure hose to confirm the connection.

② Handling ⚠ WARNING

Do not pressurize the product with the coupler attached to the end of the high-pressure hose without installing the cylinder. If the coupler is damaged, a serious accident may result. If it is necessary to remove the coupler to check the operation and pressurize, avoid working in a direction where the coupler may pop out. Do not connect or disconnect the coupler while it is pressurized.

5-5 Air inclusion ⚠ CAUTION

The UP-35DX series has a sealed structure with a rubber tank inside the tank cover. When the tank is full of oil, there is no air ingress, but when a hose, cylinder, or other pressure equipment is connected, the air in the hose, cylinder, or other equipment may enter the pump. If air is mixed in the pump, the pressure will not rise, oil will not be discharged, and other problems will occur. In this case, follow the procedure below to restore the pump.

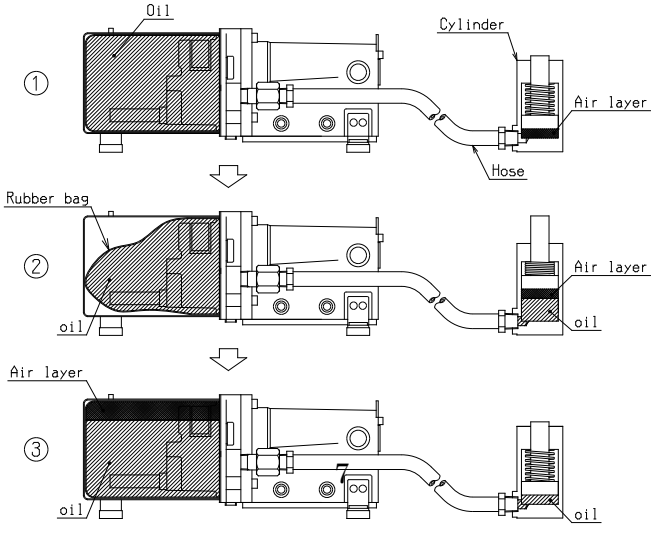
① Is the oil filled to the fullest level ?
Turn the pump upright (tank cover side down), open the oil supply valve, check the amount of oil, and refill the tank to the full level. (For precautions, refer to "5-1) Replacing the hydraulic fluid (3)".

② If the pump does not discharge or the pressure does not rise even after refilling with oil, press the operation switch and the return switch about 10 to 11 times repeatedly with the pump in the upright position.

③ If the discharge or pressure still does not increase, loosen the air release valve (No. 5 on page 3) at the bottom of the pump by about two turns, and press the operation switch and the return switch repeatedly about 10 to 11 times. After that, tighten the air release valve and operate the pump for confirmation.

④ When the pump operates normally, be sure to refill the tank with oil to the full capacity. This is because air in the hoses, cylinders, and other hydraulic equipment is in the tank of the pump.

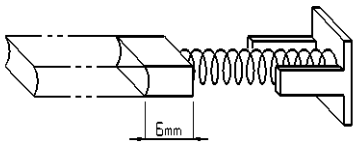
◎How does air accumulate in the pump (rubber tank) when hydraulic equipment is connected together? Always make sure that the oil tank is full before use.



5-6 Carbon brushes

① Cautions for use ⚠ WARNING

Always pay attention to the wear of the carbon brushes. When the carbon brush is worn down to 6mm or when the motor has been running for more than 150 hours, replace it with a new one. If worn brushes are used as they are, rectifying sparks will increase and cause failure. The material of the carbon brush has a great influence on the performance and life of the motor, so be sure to use a genuine carbon brush when replacing it.



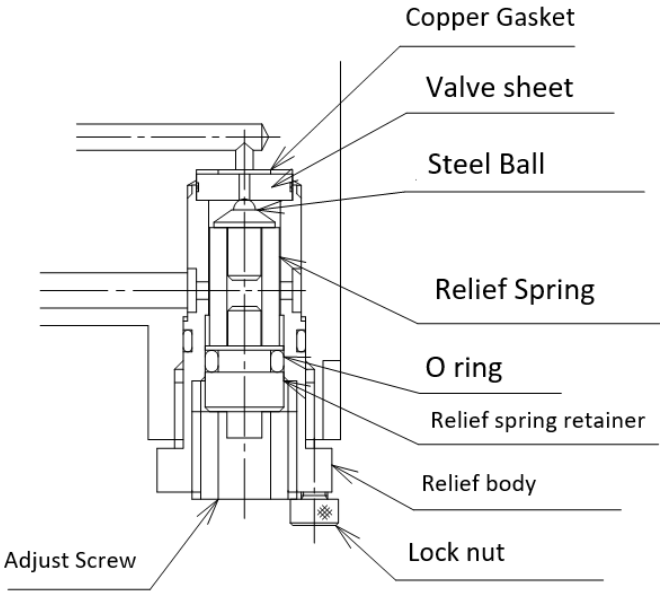
① How to change

First, turn off the power; remove the two rubber caps, then loosen and remove the mounting screws inside with a screwdriver to remove the carbon brush. Replace the brush with a new one and fix the screws and rubber cap.

5-7 Relief valve adjustment

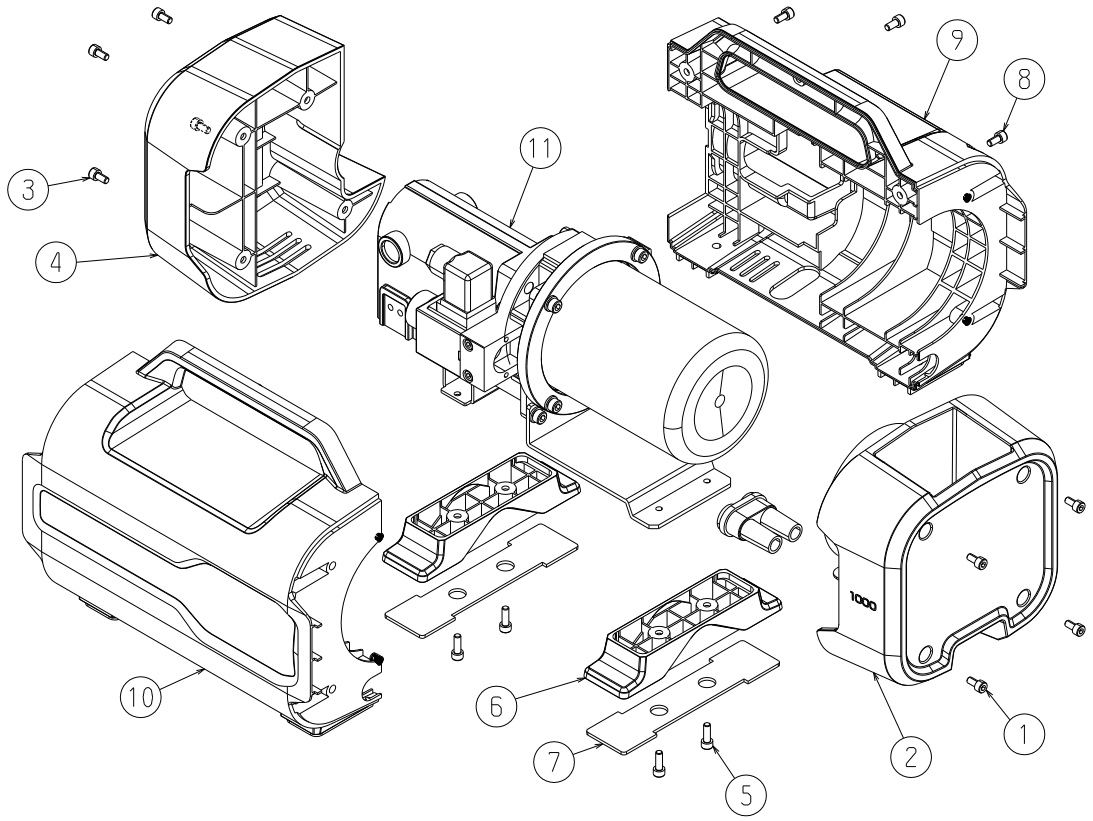
① Range of standard pressure adjustment available is form 58.8 to 68.6MPa. Loosen lock screw on the high-pressure relief valve and turn the adjusting screw a few turns counter-clockwise to decrease pressure setting to a lower desired pressure. Clockwise rotation of the adjusting screw will increase pressure. After setting pressure, replace the lock screw.

Different kind of a spring is needed to adjust and set at lower pressure than the standard. Consult NITTOH authorized distributor.



Loosen the relief valve lock nut (hexagon 2.5mm) and turn the adjust screw (hexagon 6mm) to adjust the pressure to the set value. Turning the adjustment screw to the right will increase the pressure, and turning it to the left will decrease the pressure.
However, the standard product can be adjusted in the pressure range of 58.8 to 68.6 Mpa (600 to 700 kg/cm2). If you want to use it at a pressure lower than that, you will need to replace the spring, so please contact us.
Check the operation and tighten the lock bolt. The pressure may change when the lock bolt is tightened, so please check the set pressure again.

5-7 How to remove the cover



①	Fitting bolt M5×10 Hexagon socket head screw	⑦	Rubber sheet
②	Tank Cover	⑧	Fitting bolt M5×10 Hexagon socket head screw
③	Fitting bolt M5×10 Hexagon socket head screw	⑨	Side cover 1
④	Back Cover	⑩	Side Cover 2
⑤	Fitting bolt M5×15 Hexagon socket head screw	⑪	Pump body
⑥	Pump Feet		

Disassembly procedure of the cover

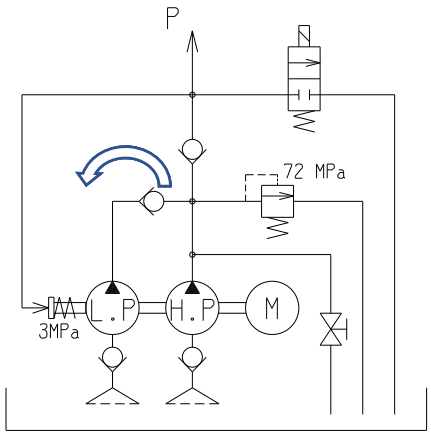
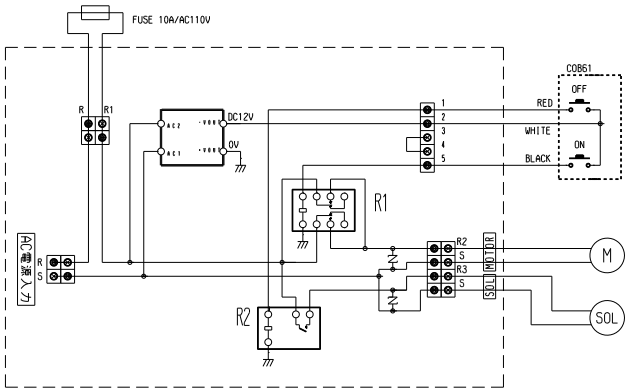
The cover cannot be removed if the hose etc. are connected to the outlet.

1. Remove the 4 fitting bolts ① and ③, and then remove ② tank cover , and ④ back cover.
2. Lay the pump down so that ⑨ the side cover 1 is on top.
3. Remove ⑤ the fitting bolts, and remove ⑥ the two pump feet. ⑦ Rubber sheet is glued.
4. Remove ⑧ the 3 mounting bolts.
5. Lift up and remove ⑨ the side cover 1.
6. Lift up and remove ⑪ the pump body.

Note that there are some wires connected to the pump.

For installation, reverse the above procedure, paying attention to the pump alignment and wiring.

6 Circuits

Hydraulic Circuit	Electrical diagram
	

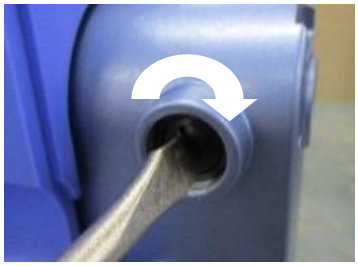
How to change the carbon brush

1. Remove the back cover.

2. Remove the carbon brush mounting screw with a screwdriver.

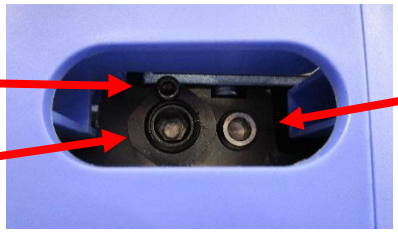
3.Pull out the carbon brush and insert a new carbon brush.

4. Use the screw threads to set it so that it is stuck in the back.

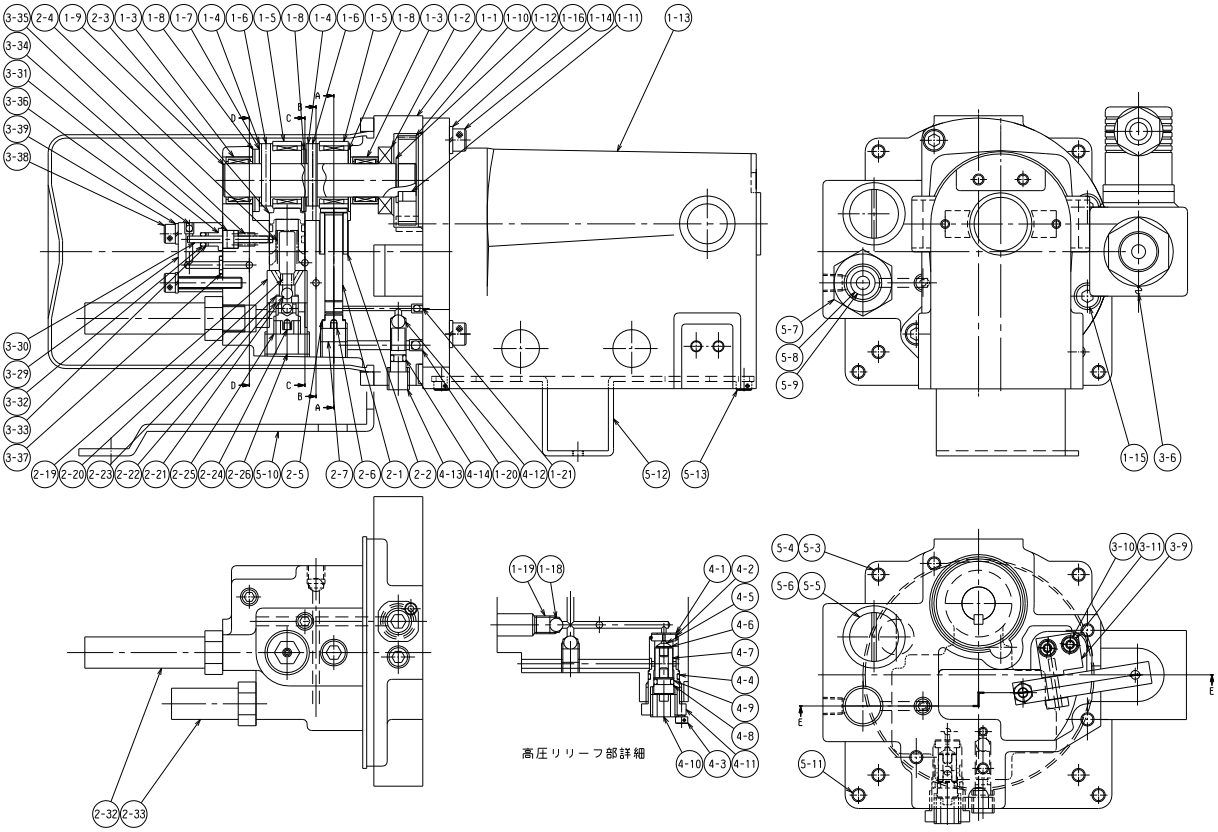


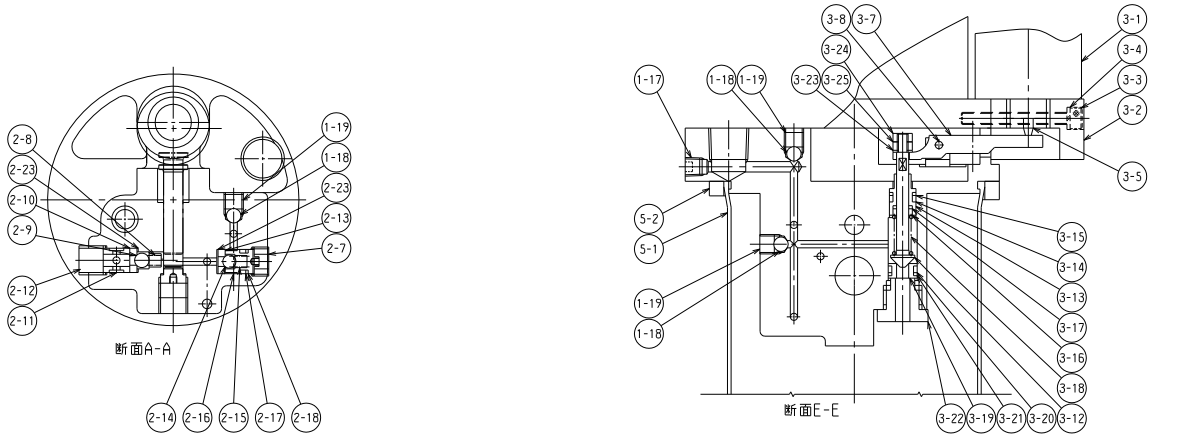
5. Screw in the carbon brush mounting screw. If there is any uncomfortable feeling when screwing in, do not screw it in but remove it again. There is a possibility that the metal part of the carbon brush will be deformed.

Relief valve & Air relief valve



7 Construction drawings





8 Parts list

No.	Part No.	Description
Driving section		
1-1		Base plate
1-2	AC0598A00	Oil seal
1-3	TLA1512Z	Bearing
1-4		Eccentric collar
1-5	RNAF273013	Bearing
1-6	φ4×28	Spring Pin
1-7	NTB1528	Thrust bearing
1-8	AS1528	Thrust Washer
1-9		Shaft
1-10		Second gear
1-11		Key
1-12	G-15	G ring
1-13	AS1528	Motor
1-14	M6×20CAP	Fitting bolt 1
1-15	PCB M6×15	Fitting bolt 2
1-16	M6	Washer
1-17	PT1/16	Plug
1-18	φ6	Steel ball
1-19	M8×6	Hollow set
1-20	MB700-050	Expander
1-21	MB700-040	Expander
Pump section		
2-1		High pressure piston
2-2		Piston spring
2-3		Low pressure piston
2-4		Piston spring
2-5		Cupper packing
2-6		High pressure plug
2-7		Pushing screw
2-8		High pressure suction spring
2-9	φ6	Steel ball
2-10		Valve sheet
2-11		Pushing valve sheet
2-12	MSW12	Pushing screw
2-13		Valve sheet
2-14	φ5	Steel ball
2-15	WF5-10	High pressure check spring
2-16		Check retainer
2-17	P-7	O ring
2-18	P-7 bias	Back up ring
2-19		Low pressure suction holder
2-20	WF5-10	Low pressure suction spring
2-21	φ5	Steel ball
2-22		Valve sheet
2-23		Cupper packing
2-24		Suction retainer
2-25	MSW12-6	Pushing screw
2-26	MSWA20	Pushing screw
2-27	WF5-10	Low pressure check spring
2-28	φ5	Steel ball
2-29		Cupper packing
2-30		Retainer F
2-31	MSWAS12-6	Pushing screw
2-32		Low pressure suction filter
2-33		High pressure suction filter
Returning section		
3-1	NW-22B	Solenoid
3-2		Base block
3-3	M5×45	Fitting bolt
3-4	M5	Spring washer
3-5		Push pin
3-6	φ3×8	Spring pin
3-7		Lever
3-8	MS3-25	Straight Pin
3-9		Lever support
3-10	M4×10 CAP	Fitting bolt
3-11	M4	Spring washer
3-12		Poppet
3-13		Sleeve
3-14	P-8	O ring
3-15	P-8 bias	Back up ring
3-16	P-5	O ring
3-17	P-5 bias	Back up ring
3-18	WH8-20	Spring
3-19		Valve sheet
3-20	P-9	O ring
3-21	P-9 bias	Back up ring
3-22		Valve sheet pushing screw
3-23	M4	Washer
3-24	M4.5×P0.75	Hexagon nut
3-25	M4	Tooth lock washer
3-26	-	-
3-27	-	-
3-28	-	-
3-29		Push pin holder
3-30	φ3×15.8	Push pin
3-31		Push pin spacer
3-32	P-3	O ring
3-33	P-3 endless	Back up ring
3-34		Stopper pin
3-35	WB6-10	Spring
3-36	MB700-040	Expander
3-37	P-5	O ring
3-38	M5×30	Fitting bolt
3-39	M5	Spring washer
Relief valve section		
4-1		Cupper packing
4-2		Valve sheet
4-3		High pressure relief
4-4	S-12	O ring
4-5	φ2.5	Steel ball
4-6		Relief ball receiver
4-7		High pressure spring
4-8		Spring pushing
4-9	P-6	O ring
4-10	MSWA12	Pushing screw

4-11	M3×6	Lock screw
4-12	φ6	Steel ball
4-13		Ball pushing
4-14	P-4	O ring
Tank section		
5-1		Rubber tank 1L
5-2		Fixed tank ring
5-3	M6×20	Fitting bolt
5-4	M6	Spring washer

5-5		Oil feeding plug
5-6	P-16	O ring
5-7		Discharge nipple
5-8	TSC-14	Coin filter
5-9	O-14	Snap ring
5-10		Pump stay tank side
5-11	M6×10	Fitting bolt
5-12		Pump stay motor side
5-13	M4×10	Firring bolt

9 Trouble shooting guide

⚠ WARNING To avoid injury, repairs and troubleshooting should be performed by qualified personnel familiar with this type of equipment. Use appropriate gauges and equipment.

Problems	Possible Causes	Remedies
Motor does not run ⚠ WARNING Disconnect power supply before disassembly or repair.	(1) No supply voltage. (2) Broken lead wire or defective power cord plug. (3) Defective switches. (4) Worn carbon brushes. (5) Defective motor. (6) Defective remote switch. (7) Unit is not plugged in.	(1) Check line voltage. (2) Replace defective part. (3) Check switches. (4) Replace carbon brushes. (5) Repair or replace motor. (6) Repair or replace switch. (7) Plug in unit.
Abnormal noise of motor.	(1) Damage or pump or motor. (2) Damage of ball bearings, etc.	(1) Repair or replace unit. (2) Replace ball bearings.
Motor runs, but cylinders do not advance or retract.	(1) Damage of release valve. (2) Oil level is too low. (3) Air in system. (4) Filter plugged or dirt in pump. (5) Damage of pump body. (6) Damage or out of adjustment of relief valve.	(1) Repair or replace it. (2) Fill reservoir to 1/2 of level gauge with all cylinders retracted. (3) Bleed the system. (4) Pump filter should be cleaned and if necessary, pump should be dismantled and cleaned. (5) Repair pump. (6) Repair or readjust as needed.
Cylinders works, but full pressure is not built up.	(1) Damage of release valve. (2) Air in system. (3) Damage of pump body. (4) Lowering of set pressure or damage of relief valve.	(1) Repair or replace. (2) Bleed the system. (3) Repair pump. (4) Readjustment of set pressure or repair of relief valve.
Cylinders works, but their speed too slow, partially or erratically.	(1) Damage of release valve. (2) Air in system. (3) Unacceptable rise in oil temperature. (4) Damage of pump body.	(1) Repair or replace. (2) Bleed the system. (3) Stop operation or install oil cooler. (max. 55℃) (4) Repair pump.
Cylinders do not retract.	(1) Damage of release valve. (2) Damage of return springs of cylinders or quick couplers.	(1) Repair or replace. (2) Repair or replace springs or couplers.
Oil leaks.	Damage seals, seats or steel balls.	Replace them.
Short circuit.	(1) Damage cords. (2) Bad insulation of electric parts.	(1) Replace. (2) Replace.

10 Warranty

10-1) Warranty period

For general defects and failures, 365 days from the last day of the month of manufacture.
Example: If the pump was purchased on January 1, 2019, the warranty period will be until January 31, 2020.

10-2) Warranty conditions

NITTOH products and components are warranted against damage to products and components due to defects in materials and workmanship, with the following exceptions This warranty provides for the repair and replacement of the product or component parts at no charge. In the event of a malfunction within the warranty period, please present this warranty card and contact your dealer or nearest Nittoh sales office.

10-3 Exceptions to the Warranty

Warranty claims will not be accepted for damage or malfunction caused by the following reasons

Misuse or improper use, fair wear and tear, incorrect or careless operation, improper storage, chemical or electrical effects, climatic or other effects that cannot be specifically linked to manufacturing defects

We are not responsible for packing, springs, etc. and the following items.

Modification or processing of the product carried out by the purchaser without prior notice or consent to us.
Harsh and very frequent use of the product deviating from its specifications.
Damage caused by incorrect installation or assembly by the purchaser or a third party.
Failure due to natural disasters.
Damage caused by fire, submersion, dropping, or other accidents.