NITTOH

ELECTRIC/HYDRAULIC PUMPS

UP-35RH-NC(L)

UP-35RH-NO(L)

UP-35RH-AR(L)

Operation and maintenance manual

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1 Safety Information

Read and follow all WARNINGS,CAUTIONS and INSTRUCTIONS included with each product to use the products correctly and to avoid personal injury or property damage during system operation. NITTOH ZOHKI CANN NOT BE RESPONSIBLE FOR DAMAGE OR INJYRY RESULTING FROM UNSAFE USE OF PRODUCTS, LACK OF MAINTENANSE OR INCORRECT SYSTEM APPLICATION.

Cautions remarks used in this manual are classified as follows;

⚠ DANGER	In case as the result of incorrect use in disregard of this remarks, imminent danger may happen, causing the risk of death or serious injury.

⚠ WARNING	In case as the result of incorrect use in disregard of this remarks, there will be s possibility that an operator will die or receive a serious wound.

⚠ CAUTION	In case as the result of incorrect use in disregard of this remarks, there will be a possibility that and operator will receive an injury or material damage only will happen.

Cautions when installed

⚠ WARNING
■Install a pump unit for better balance. Since the reservoirs of totally enclosed rubber structure are used in this series pumps, the pumps can be placed for use in every direction (slant, inversion or perpendicular). However, the pumps should be installed on stable places. When a pump is used aslant, fix it firmly with. Otherwise, it slide down, causing an injury. ■Prepare good working environment. Make sure all system components are protected form external sources of damage such as excessive heat, flame, moving machine parts, sharp edges, corrosive chemicals.

⚠ CAUTION
■Do not use the pump in the rain or on such wet or dusty places. ■Do not expose hydraulic system to the direct rays of the summer's sun. Be careful with unacceptable rise in hydraulic oil temperature, causing trouble of hydraulic equipment. ■In case the pumps are used outdoors in the extremely cold regions, exchange oil for hydraulic oil of proper viscosity. Increased viscosity due to drop in oil temperature, there is the possibility that equipment gets out of order.

Caution when used

WARNING

■Take safety measures.

When hydraulic equipment is operated, protect yourself with a personal safeguard, working clothes and shoes, safety spectacles, etc.

■Always check pressure limitations of hydraulic circuit.

Always confirm in advance that max. permissible working pressure of a hydraulic pump is lower than the pressure rating of the lowest rated component connected in the system.

■Be careful to avoid electric shock.

Do not pull power plug out with a wet hand. Use a grounded outlet or a plug adapter with a grounding attachment in order to protect the operator from electric shock. Do not operate the pump by the side of electric welder or do not place it on the earthed materials or equipment.

CAUTION

■Power supply is AC220V 50/60Hz single phase.

Make sure your line voltage must be the same as the voltage your pump is wired for.
Wrong voltage connection or voltage drop of your line shall cause burning or heating.
Be careful about voltage drop when used with an electric generator.

■When the power supply is disconnected, always grasp the power plug and pull it out.

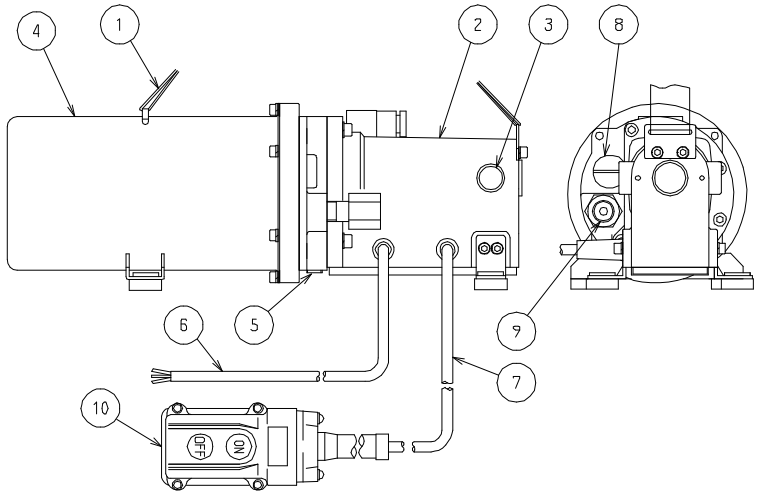
Disconnection by grasping the cord and pulling it out will cause breaking of a wire or a short circuit.

■When a supplement cord is used, use only three-wire grounded cords of such sufficient gauge as 1.25mm² or more, its length of max. 10M, in order to avoid voltage drop or damage of the solenoid valves or electric motors.

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-35RH -NC(L) -NO(L) -AR(L)	Commutator and open type, 0.35KW 220V 50/60Hz single phase, "E" insulation, 2000rpm	1	70	2.0	0.2	Capacity 1.0L (2.0L) Usable 0.8L (1.6L)	1L 7.5Kg 2L (8.5Kg)

2 Description of components



①	Carying belt
②	Electric motor
③	Carbon brush
④	Tank cover
⑤	Relief valve
⑥	Power supply cord
⑦	Operation cord
⑧	Oil feeding plug
⑨	Delivery port PT3/8
⑩	Pendant switch

3 Instructions before use

3-1 Confirmation of all components for shipping damage or oil leakage. If any shipping damage is found, notify carrier at once. Shipping damage is not covered by warranty. The carrier is responsible for all repair or replacement costs resulting from damage in shipment.

3-2 Oil feeding plug ⚠ CAUTION

Oil feeding plugs (Code No.5) are always shut tightly when in shipment and even in use, because the tanks are totally enclosed type. Use them together with quick couplers with check valves.

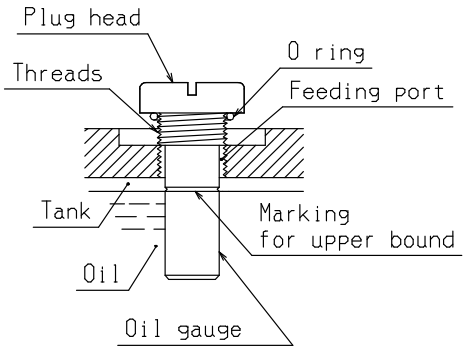
3-3 Confirmation of your power supply ⚠ WARNING

Power supply is AC110V or 220V 50/60Hz single phase. Make sure that a grounded outlet or a plug adapter with a grounding attachment must be used.

3-4 Confirmation of hydraulic oil ⚠ WARNING

Always check oil level before operation, with the connected cylinders fully retracted (extended if pull cylinders). In case oil is added with cylinders fully extended and then cylinders are retracted, the returned oil will overflow in the reservoirs, causing generation of high pressure in the reservoirs, confirm required oil volume in a reservoir as follows;

① Retract the connected cylinder fully.
② Pull power plug out.
③ Position the pump with the tank end down.
④ Turn oil feeding plug counter-clockwise and remove it.
⑤ Clean an oil gauge of the removed oil feeding plug with a piece of cloth and put it in the oil feeding port again to check oil level. Be careful with O ring.
⑥ It is OK if the reservoir is filled with oil, reaching up to the upper bound of the oil gauge. Replenish if oil is short.(See 5-1)hydraulic oil for the details.
⑦ Replace the oil feeding plug and screw it in by turning clockwise.



4 Operation

"**UP-35RH-NC**" with 2-way normally closed solenoid valve, pressure holding type.

1 Plug in the pump.
2 Depress the control "ON" switch to run the motor to advance the cylinder. If the switch is released, the motor stops and the plunger remains stopped for pressure holding.
3 To retract the plunger, depress the "OFF" switch to actuate the normally closed solenoid valve to return the oil. Note that it is not possible to stop the plunger on the way at descending stroke.

"**UP-35RH-NO**" with 2-way normally open solenoid valve, auto-return type.

1 Plug in the pump.
2 Depress the control "ON" switch to run the motor to actuate the normally open solenoid valve, so the oil is delivered to advance the cylinder.
3 If the "ON" switch is released, the motor and solenoid valve stop and the oil is drained to retract the plunger automatically. (The no-marked switch button is not wired and does not work.)

"**UP-35RH-AR**" with differential pressure valve, auto-return type.

1 Plug in the pump.
2 Depress the control "ON" switch to run the motor to advance the plunger.
3 When the "ON" switch is released, the motor stops and the plunger retracts automatically. Note that the plunger starts to retract lately one beat after the "ON" switch is released, because the pump is fitted with the differential pressure valve, instead of a solenoid valve. (The no-marked switch button is not wired and does not work.)

5 Maintenance

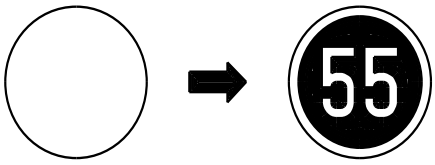
5-1 Hydraulic working oil

① Kind of oil

Use only Nittoh NHO-32 hydraulic oil or an approved, high-grade oil (ISO #32, viscosity : 32 cSt @40° C) with these pumps to promote long pump life.

② Oil temperature

Aptitude temperature for use of hydraulic oil is max. 55° C. In case color of the temperature seal attached to the tank has changed and indicated "55" as below, it has happened unacceptable rise in oil temperature. Stop working so as to decrease oils temperature or tank such a measure as installation of an oil cooler.



Normal condition In case unacceptable rise in oil temperature

③ Oil exchange ⚠ CAUTION

The frequency of oil change will depend upon general working conditions, severity of use and overall cleanliness. 300 hours (working time) of use or about 3 months is considered as a standard change interval. Periodically compare samples oh the reservoir oil with new oil and inspects oil color for contaminants or differences.

Remove oil feeding plug and tilt the pump to drain out old oil. Be careful that such impurities as dusts do not enter info the reservoir and new oil is filled up to the gauge level mark shown on pump. Precautions when oil changed are;

- Retract all cylinders fully to the return position.
- Do not fill with even a small quantity of replenishment of different kinds of oil.
- Be careful that impurities or foreign matter do not enter info new oil.

④ Others ⚠ WARNING

When oil enters into a eye, wash it away fully with clean water and consult a doctor immediately. In case oil enters into the skin of such a wound, wash it away with soapy water and consult a doctor without delay.

5-2 Pressure and piping

① Composition of hydraulic equipment system ⚠ WARNING

When a pump, high-pressure hose(s), cylinder, valve, couplings are connected together, always check product limitations regarding pressure ratings and load capacities. The system operating pressure must not exceed the pressure rating of the lowest rated component in the system.

② Pressure gauges

Always install or prepare a pressure gauge in-line form the pump in order to check pressure developed.

③ Piping ⚠ CAUTION

Use wrapping of Teflon tape on hoses fittings, valves and couplers. Make sure all hose connections are tight-use proper tools to tighten connections with reference to the following table. Do not over tighten the connections.

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)

Make sure that tape not shed into hydraulic system, causing damage. Trim loose ends.

5-3 High pressure hoses

① Hose installation  WARNING

Install hoses, leaving something in reserve, because high-pressure hoses expand and contract more or less when full pressure is applied. Be careful that the hoses do not rub against other solid materials.

Never allow the hoses to kink, twist, curl or bend so tightly that oil flow within hoses are blocked or restricted. Do not clamp the hoses, causing troubles.

② Hose handling  DANGER

Never drop heavy things against the hoses, causing bursting of hoses or serious accident. Do not subject the hoses to any potential hazard (fire, extreme heat or cold, heavy impact or sharp surfaces), which might rupture or weaken the hoses. Never pull hoses to move or lift equipment connected with hoses.

Should a hose ever burst or ruptured, immediately stop operating the pump before attempting to remedy the situation. Never attempt to grasp a leaking hose under pressure with your hands. The force of the escaping hydraulic fluid could cause serious and permanent injury.

5-4 Quick couplers

① Connections

Make sure that all couplers are connected properly. Incomplete coupling connections might cause partial or complete blockage of oil flow, resulting in trouble of hydraulic system.

② Handling  WARNING

Stop operating of the pump with a hose and coupler, but without a cylinder. The damaged coupler will cause accident. Do not disconnect the coupler sets, which are under pressure.

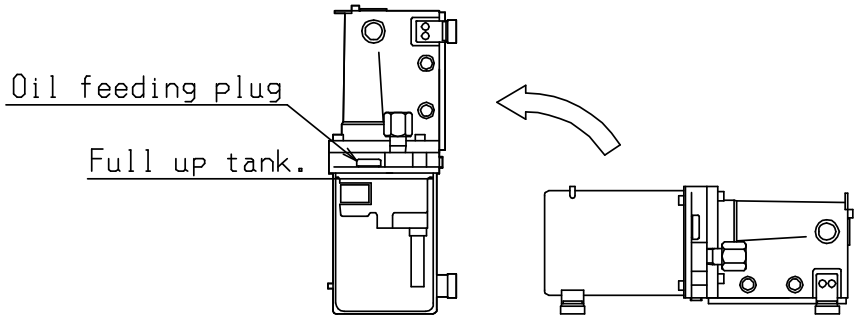
5-5 Bleeding air from the system

⚠ CAUTION

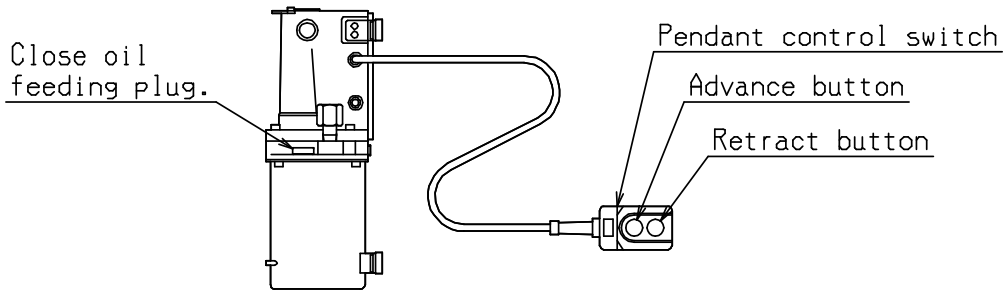
Reservoirs of UP-35RH-Series pumps are made of totally enclosed rubber tanks and tank covers. Rubber tanks are filled with oil, making no room for air accumulation. However, in case a new cylinder and / or new hose is connected with the pump, or oil is exchanged, air may accumulate in the hydraulic system. This air will cause the pump not deliver oil or the cylinder to respond in an unstable or slow manner. Be careful with air accumulation in the system. To remove this air;

① Is the tank full with oil?

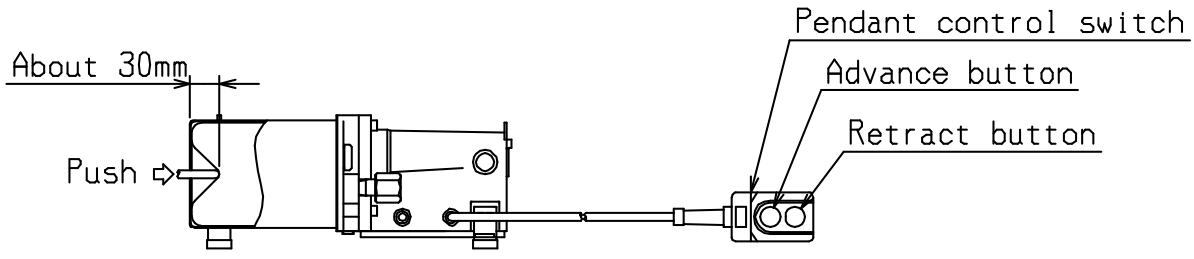
Make sure that the cylinder is retracted fully (otherwise, replenishment will become too much, resulting in damage of the oil tank) and position the pump with the oil tank end down as shown below. Remove the oil feeding plug and check oil volume. Replenish oil if the oil is not full. Replace the oil feeding plug.



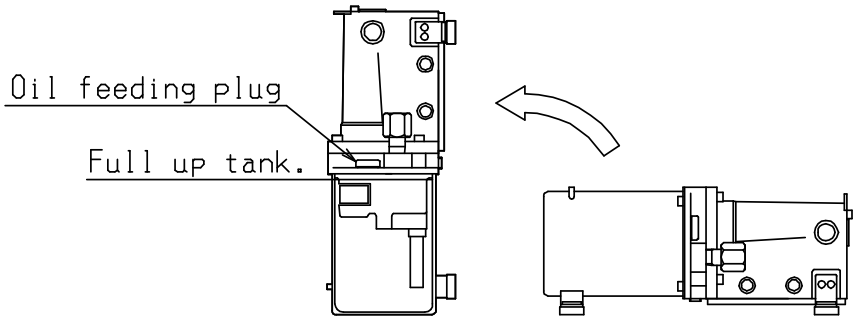
② In case even if the tank is full oil cannot be delivered to develop pressure, stand the pump with the tank end down and do inching operation (intermittent switching) with the pendant switch about 10 to 11 times.



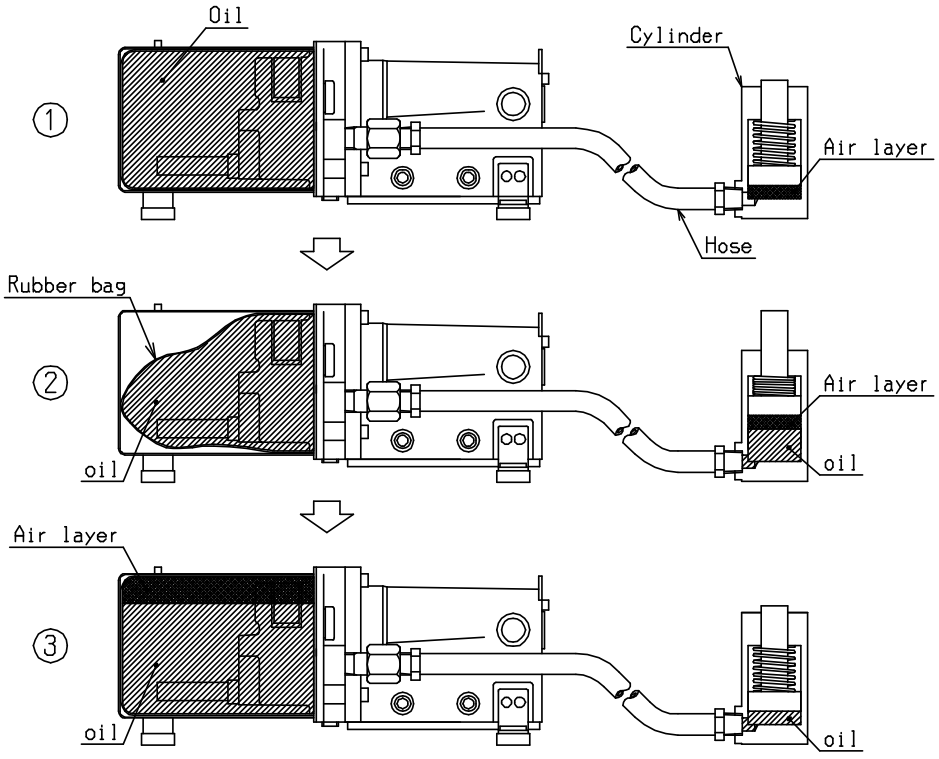
③ In case oil could not be delivered to develop pressure, place the pump horizontally (normal position) and push the rubber bag through the hole (8mm dia.) on the tank cover end with a rod having a round end, with attention that the rubber bag does not get hurt, and at the same time do inching operation with the pendant switch.



④ If the pump works normally, air in the hose, cylinder and other system is collected in the tank and oil must be replenished.



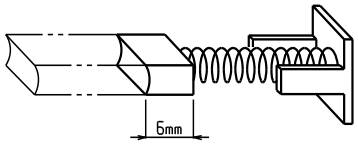
◎How air may accumulate in the pump (rubber tank) when hydraulic equipment are connected together with? Always check and confirm before use that the oil tank is full.



5-6 Carbon brushes

① Cautions when in use ⚠ WARNING

Always check the wearing condition of the carbon brushes. When the carbon brushes have been worn down and exchanging time has come, the motor will stop automatically. Replace when a carbon brush has been worn down to 6mm in length as shown below or working time of the motor is 150 hours or more subject to the conditions of their uses. Use only NITTOH carbon brushes with these pumps to promote long pump life. When they have been worn down, the spring exerts insufficient pressure to hold brush against the commutator.



② How to change

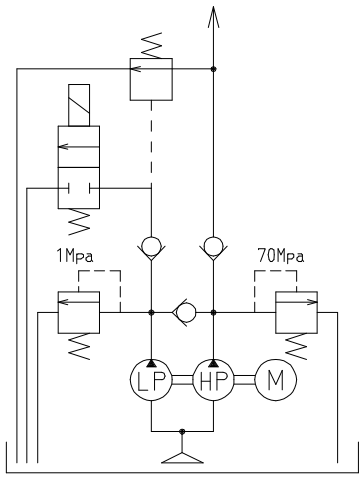
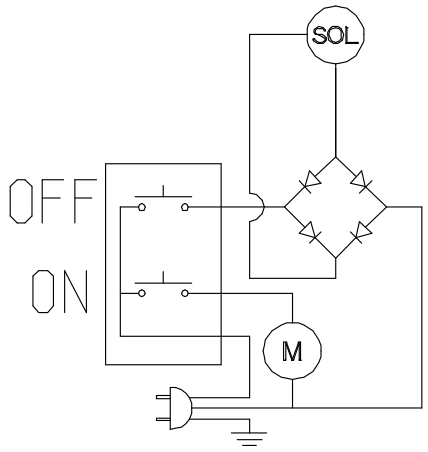
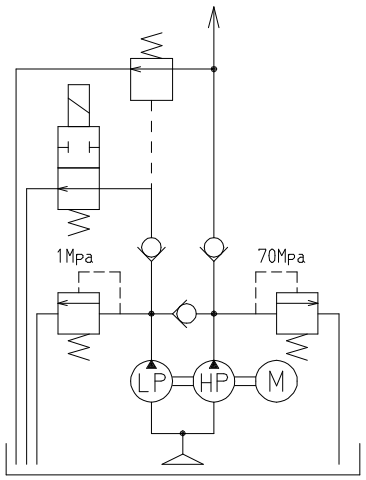
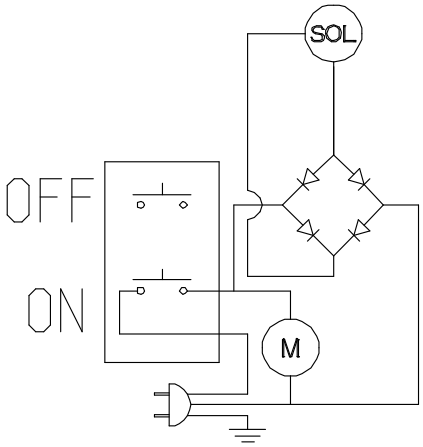
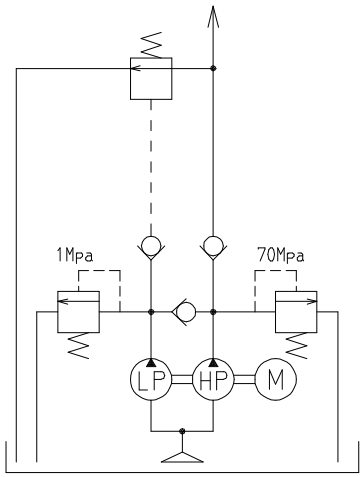
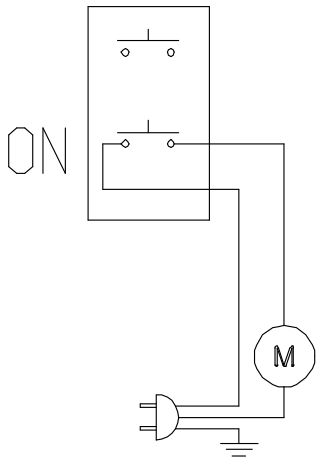
Firstly disconnect the power supply. Remove rubber caps on two places and loosen and remove fitting screws inside with a screw driver, so the carbon brushes can be taken out. Replace with new ones and fix the screws and rubber caps.

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.

6 Circuits

UP-35RH-NC Hydraulic Circuit	Electric Circuit
	
UP-35RH-NO Hydraulic Circuit	Electric Circuit
	
UP-35RH-AR Hydraulic Circuit	Electric Circuit
	

7 Construction drawings

8 Parts list

No.	Part No.	Description
Driving portion		
1-1	2P50296	Base plate
1-2	AC0598A0	Oil seal
1-3	4P51380	Eccentric collar
1-4	RNAF223013	Ball bearing
1-5	ϕ 4×28	Spring pin
1-6	4P51417	Shaft
1-7	MPU-100	Electric motor
1-8		Gear
1-9		Key
1-10	G-15	G ring
1-11	TLA1512	Ball bearing
1-12	NTB1528	Thrust bearing
1-13	AS1528	Thrust washer
1-14	M6×20	Set screw 1
1-15	4P51474	Blind rubber plug
1-16	4P53078	Leg stay
1-17	M5×10	Fitting bolt
1-18	4P51667	Belt peg
1-19	M5×10	Fitting bolt
1-20		Carbon brush
Pump portion		
2-1	4P51418	Low pressure piston
2-2	4P51419	Rubber washer
2-3	WH13-20	Spring
2-4	4P51738	High pressure piston
2-5	WR5-10	Spring
2-6	ϕ 6	Steel ball
2-7	ϕ 5	Steel ball
2-8	ϕ 5.5	Steel ball
2-9	4P51387A	Spring
2-10	WF5-10	Spring
2-11	4P51457	Retainer A
2-12	4P51458	Retainer B
2-13	4P53933	Retainer F
2-14	4P50636	Copper packing
2-15	MSWA-12	Screw 1
2-16	MSW-12	Screw 2
2-17	MSWA-12-6	Screw 3
2-18	PT1/16	Blind plug
2-19	4P51460	Hi pressure blind cover
2-20	4P52529	Spacer
2-21	4P54064	Retainer H
Returning portion		
3-1-1	4P51423	Return piston (NCNO)
3-1-2	4P51976	Return piston (AR)
3-2	P-12	O ring
3-3	4P51424	Accum piston
3-4	P-7	O ring
3-5	TM8-15	Spring
3-6	4P51426	Return push pin
3-7	4P51425	Lever
3-8	M4	Lock nut
3-9	M4×20	Adjusting screw
3-10	MS4-40	Fulcrum pin
3-11	4P51427	Push pin 1
3-12	MYA-6	Oil seal
3-13	E-50	Set ring
3-14	WM13-20	Spring
3-15	ϕ 3×8	Spring pin
3-16	4P51476	Push pin 2
3-17	WL8-20	Spring
3-18	SUS ϕ 1.5	Sub push pin
3-19	4P51462	Auto return blind plug
3-20	P-3	O ring
3-21	4P54007	Fitting plate
3-22	SS-102-553	DC solenoid
3-23	M3×5	Fitting bolt
3-24	4P51803	Pilot needle
3-25	M6	Washer
3-26	AWS12-35	Return spring
3-27	M6×20	Fitting bolt
3-28	S2VB-10	Rectifier bridge
3-29	M3×8	Fitting bolt
3-30	M3	Nut

Relief valve portion		
4-1	Tl8-15	Relief spring low
4-2	M12×P1.5	Lock nut
4-3	4P51889	Ball receiver
4-4	TB8-15	Relief spring high
4-5	P-6	O ring
4-6	4P51980	Relief spring retainer
4-7	M5×5	Lock screw
4-8	ϕ 2.5	Steel ball
4-9	ϕ 1/4	Steel ball
Tank portion		
5-1	3P50374	Rubber tank 1L
5-2	3P50375	Tank cover 1L
5-3	4P51430	Belt peg 1L
5-4	4P53043	Leg stay 1L
5-5	C-30-CS-1	Rubber leg
5-6	4P51520	Oil feeding plug
5-7	P-16	O ring
5-8	4P51431	Filter
5-9	M6×10	Fitting screw
5-10	3P50527	Rubber tank 2L
5-11	3P50528	Tank cover 2L
5-12	4P52413	Belt peg 2L
5-13	4P53114	Leg stay 2L
5-14	M5×10	Fitting screw
5-15	3P50529	Spacer
5-16	G-100	O ring
5-17	M6×15	Fitting screw
Electrical parts portion		
6-1		Protection tube
6-2		Pendant control switch
6-3		Power cord
6-4	3P50476	Muffler
6-5	M4×5	Fitting screw
6-6	4P51815	Dashboard 2
6-7	4P51814	Dashboard 1
6-8		Cord clip
6-9	M4×10	Fitting bolt
6-10	St4.2×9.5	Fitting bolt
P-relief valve portion		
7-1	4P50621	Adjusting screw
7-2	4P50624	Valve
7-3	4P51711	Relief valve body
7-4	M12×P1.25	Lock nut
7-5	4P50623	Spring

9 Trouble shooting guide

⚠ WARNING

●To prevent injuries, any repair work or trouble-shooting must be done by qualified personel familiar with this kind of equipment. Use the proper gauges and device.

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 partd. (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

9-1 Warranty period

It is for one year from purchase.

9-2 Warranty

All NITTOH products and parts, with the exception mentioned below, are warranted against defects in materials and workmanship, which results in damage to products and parts. This warranty shall cover repair and/or replacement of the products or components/parts free of charge. To qualify for warranty consideration, return the NITTOH product, freight prepaid, to a NITTOH factory. Refer to the NITTOH STANDARD EXPRESS WARRANTY for the details.

9-3 Warranty exceptions

No warranty claim will be accepted for damage or breakdown arising for any of the following reasons.

"Abuse or improper use, fair wear and tear, faulty or negligent operation, improper storage, chemical/ electrical influences or climatic or other effects which can not be related specially to faults in manufacture"

No liability is accepted for packing seals, springs, and/ or the like, and the following:

◎ Alterations or remodeling on the products undertaken by the purchasers without any prior notice and agreement to NITTOH.
◎ Severe and very highly frequent use, deviating from product specifications.
◎ Damage due to faulty installation or assembly by purchasers or third parties.
◎ Damage from natural disaster.
◎ Damage from such accidents as fire, submersion, dropping, etc.