



Operation Manual

PRODUCT NAME

OIL TANK

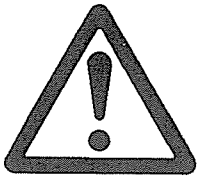
MODEL / Series / Product Number

ALT10
ALT10-S1/ALT10-S2
ALT20
ALT20-S1/ALT20-S2

SMC Corporation

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OIL TANK

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC), Japan Industrial Standards (JIS)*1) and other safety regulations*2).

*1) ISO 4414: Pneumatic fluid power -- General rules relating to systems
ISO 4413: Hydraulic fluid power -- General rules relating to systems
IEC 60204-1: Safety of machinery -- Electrical equipment of machines (Part 1: General requirements)
ISO 10218-1992: Manipulating industrial robots -- Safety
JIS B 8370: General rules for pneumatic equipment.
JIS B 8361: General rules for hydraulic equipment.
JIS B 9960-1: Safety of machinery -- Electrical equipment for machines. (Part 1: General requirements)
JIS B 8433-1993: Manipulating industrial robots - Safety. etc.

*2) Labor Safety and Sanitation Law, etc.



Caution

Operator error could result in injury or equipment damage.



Warning

Operator error could result in serious injury or loss of life.



Danger

In extreme conditions, there is a possibility of serious injury or loss of life.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results.

The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product.

This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly.

The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1) Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2) Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3) An application which could have negative effects on people, property, or animals requiring special safety analysis.

4) Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.



OIL TANK

Safety Instructions

Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*3)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

***3) Vacuum pads are excluded from this 1 year warranty.**

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).

2. Precautions

Design



Warning

1. If any oil leakage is not acceptable due to the operating environment, please contact SMC.

Selection



Warning

1. Mineral grease is used on the internal seals. The grease may flow to the outlet side. If this is not acceptable, please contact SMC.

Installation



Warning

1. Do not apply any impact, such as dropping or hammering, when the oil tank is transferred or installed. It will cause damage to the product and can cause a malfunction or leakage to occur.
2. Do not install the oil tank in a place with high humidity or high temperature.
Operation outside of the oil tank or fluid's operating range may cause damage to the product or a malfunction to occur.
3. Install the oil tank in a vertical mounting position. Poor performance or a malfunction can occur if the oil tank is installed horizontally or leaning to one side.
4. Avoid applying vibration to the oil tank. Poor performance, foaming, damage or a malfunction can occur if the oil tank is subject to vibration.
When the oil tank is used in a gravity-feed application and vented to atmosphere (without applying pressure), it is not necessary to connect piping to the AIR IN port. However, measures to prevent foreign matter from entering the vented port should be taken.
6. Make sure to hold the body of the oil tank when handling the product. Do not apply tensile force to the power supply cable. Failure or damage to the cable or connections can occur if excessive tensile force is applied to the power supply cable.
7. Avoid repeatedly bending or stretching the lead wire. Broken lead wires will result if bending stresses or tensile forces are applied to the lead wires. If the lead wire is damaged or a failure occurs, replace the damaged product with a new one.
8. Do not install the oil tank in a location where there is a strong magnetic field generator, such as around a large electric motor. Magnetic fields can cause the float switch to malfunction.
9. There is a clearance space between the ALT10 body and bracket. A small amount of movement between the ALT10 body and bracket is normal. If movement is not acceptable, please contact SMC.

Piping



Warning

1. Before installing the oil tank, flush or clean the piping and connections to remove any cutting chips, cutting oil, solid foreign matter, etc. from the piping. The oil tank can malfunction if foreign matter or moisture enters into it through piping or open ports. Contaminated fluid can cause a malfunction or damage to other product's or machinery downstream from the oil tank.
2. When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not enter the oil tank. If pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads to avoid having pipe tape enter into the ports and cause a malfunction.
3. Connect piping/fittings using the recommended torque while holding the product tightly.
If the tightening torque is insufficient, it will cause loosening or leakage at the connection. Damage to the threads or housing can occur if excessive torque is applied. Hold the oil tank securely while installing it, to avoid applying excessive force to the bracket, which could cause damage to the product or bracket.

Recommended tightening torque Unit: N·m

Connection thread	1/8	1/4
Recommended tightening torque	7 to 9	12 to 14

4. Do not apply torsion or bending moments, other than the weight of the oil tank itself. The external piping should be supported separately to avoid damage to the oil tank. Non-flexible piping materials such as steel piping will be subject to excessive moment load and vibration. Use a flexible tube for an intermediate connection to prevent passing vibration and moment loads to the oil tank.

Air source

Warning

1. Only air can be supplied to the air supply port. It is not possible to use any other fluid but air. Never use an oil tank in an atmosphere where explosive liquids or gases are present. The oil tank does not have explosion-proof construction. An explosion can occur if the oil tank is used in the presence of explosive liquids or gases.
2. Corrosive gas cannot be used. Damage and leakage can occur if corrosive gas is present at the oil tank.
3. Use clean air.
Do not use compressed air which contains chemicals, synthetic oils, organic solvents or corrosive gases, etc., as this can cause damage or malfunction.
4. Use clean dry air to avoid contaminating the fluid and to avoid malfunctions and damage. Do not use compressed air which contains vapors from chemicals, synthetic oils, organic solvents or corrosive gases, etc., as this can cause damage or malfunctions to occur. Install an air filter on the inlet side of the oil tank. Install an air dryer or an after-cooler in front of the air filter if excessive condensate is present in the filter bowl. Do not use compressed air containing excessive condensate, as this can cause damage to the pneumatic equipment and lead to failure.

Oil

Warning

1. Review the compatibility of the oil with the product materials during selection of the products. Additives in oil can cause damage and swelling of rubber and plastic materials.
2. Oil viscosity must be within the range of 2 to 460 mm²/S (at 40 °C). Oil viscosity outside of the specified range can cause poor performance or a malfunction to occur.
* Examples of inapplicable fluids: volatile fluids such as alcohol, brake oil, water, water soluble cutting oil, grease
3. Use clean oil. When foreign matter such as iron particles is mixed into the fluid, it may cause poor performance or a malfunction to occur. Damage from contaminated oil can occur in products that are operating downstream of the oil tank.
4. To supply oil, rotate and open the oil supply plug in the counter-clockwise direction with a hexagon head wrench with width across flats of 8.

Float Switch and Wiring

Warning

1. The float switch has polarity. Verify the wiring polarity is correct before supplying power to the float switch.
2. Make sure to connect a load to the float switch before turning the power supply on.
The float switch will be instantly damaged if no load is connected.
3. Wiring should be kept as short as possible.
4. Check the insulation of the wiring.
Avoid defective insulation (crossed lines with other circuits, ground faults, defective insulation between terminals, etc.). If the insulation is defective, excessive current can flow through the float switch, which may cause damage to the float switch.
5. Use a crimped terminal for connecting the terminals of the lead wire. Loose connections and a malfunction can occur if crimped terminals are not used on the lead wires.
6. Tighten the float switch terminal screws of the ALT20-S and ALT20-S2 to 0.5Nm. Insufficient torque can cause the connections to come loose and lead to a malfunction. Excessive torque can cause screw breakage.
7. Inductive load
When inductance, such as when an electric motor coil and solenoid valve is used as a load, a counter electro motive force of several hundreds of volts will be generated when the contacts of the float switch are opened or closed. The electric discharge will dramatically reduce the life time of the contacts. To prevent it, an arc preventive circuit such as CR circuit, varistor and diode, is needed.

8. Capacitive load

When the product is used for capacitive load such as capacitor load, lumped load, cable load, a surge suppressor or protective resistor is necessary to protect the contact points due to a surge current larger than the contact capacity of the float switch.

Maintenance



Warning

1. Maintenance should be performed according to the procedure indicated in the Operation Manual. Improper handling can cause damage and malfunction of equipment and machinery.
2. Make sure to confirm that no pressure is applied to this product and that electrical cables are disconnected before performing maintenance.
Electrical shock, electric leak or ignition due to a short circuit between live parts can occur if maintenance is performed while the product is electrically energized,
3. After the maintenance operations, make sure to confirm that specific functions are satisfied and there is no external leakage before operating the equipment.
4. Maintenance operations
Compressed air can be dangerous. Assembly, handling, repair and element replacement of pneumatic systems should be performed by a knowledgeable and experienced person.
5. Draining
Remove condensate from air filters regularly.
6. Removal of equipment, and supply/exhaust of compressed air
When components are removed, first confirm that measures are in place to prevent workpieces from dropping and/or equipment from running away, lubricated objects moving, etc. Turn off the supply pressure and electric power, and exhaust all compressed air and oil from the system.
7. Make sure to wear safety goggles and protection during maintenance.
8. Perform regular inspections and confirm normal operation. Otherwise it may be impossible to guarantee safety due to unexpected malfunction or erroneous operation.
9. Caution for use in an interlock system
Provide a double interlock, and perform regular checks to confirm proper operation.
10. Secure sufficient space for maintenance inspection.
It may not be possible to perform maintenance checks if there is not enough space.

3. Outline

The oil tank is a product to supply oil to an Impulse Lubricator (ALIP Series).

Features

1. It can be used in a gravity feed application with a port open to atmosphere (without applying pressure).
2. Metal is used as a material of the main parts so that various fluids may be used.
3. The lower limit of oil level in the tank (empty tank) can be detected by selecting a product with a float switch.
4. A strainer is built into the oil tank.

4. Specifications

Model	ALT10	ALT20
Tank capacity	160cm ³	1000cm ³
Oil viscosity (40 °C)	2 to 460mm ² /S	
Proof pressure	1.5MPa	
Maximum operating pressure *1	0.4MPa	
Ambient and operating fluid temperature	5 to 60°C	
Port size	AIR IN: Rc1/8 OIL OUT: Rc1/4	
Materials	ADC, ZDC aluminum die casting, Brass, Copper, Stainless steel, Steel, Polyacetal resin, NBR, Glass	

*1: When using the oil tank open to atmosphere, vent through the Air IN side.

With Float Switch Specifications

Model	ALT10-S1 ALT10-S2	ALT20-S1 ALT20-S2
Max. contact capacity	50 VAC, 50WDC	
Max. operating voltage	200VAC, 200VDC	
Max. operating current	0.5AAC, 0.5ADC	
Specific gravity of oil	0.6 or more	
Oil viscosity	5P or less	
Materials	Brass, Foam NBR + Phenol resin, Stainless steel	Polyacetal resin, Foam NBR + Phenol resin, Stainless steel, Brass
Lead wire	AWG22	—
Terminal block	—	Terminal screw : M3X6 Terminal thickness: 7

5. How to Order

ALT 10 - S1
 (1) (2)

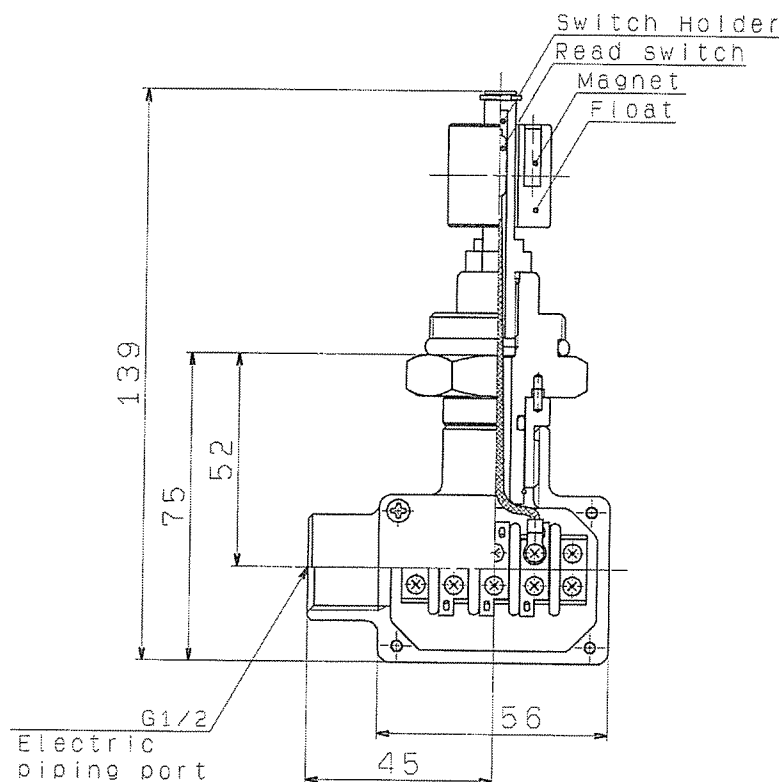
For (1) and (2), select one for each item.

		Symbol	Description
(1)	Capacity	10	160cm ³
		20	1000cm ³
+			
(2)	Float switch	Nil	Float switch none
		S1	Lowest limit ON
		S2	Lowest limit OFF

* A float switch can be added to an existing ALT10 by replacing the top cover with a top cover assembly that has a float switch. Refer to 9. Spare parts for the replacement part numbers (P11). A float switch can be added to an existing ALT20 by replacing the bowl with a bowl assembly that has a float switch. Refer to 9. Spare parts for the replacement part numbers (P12).

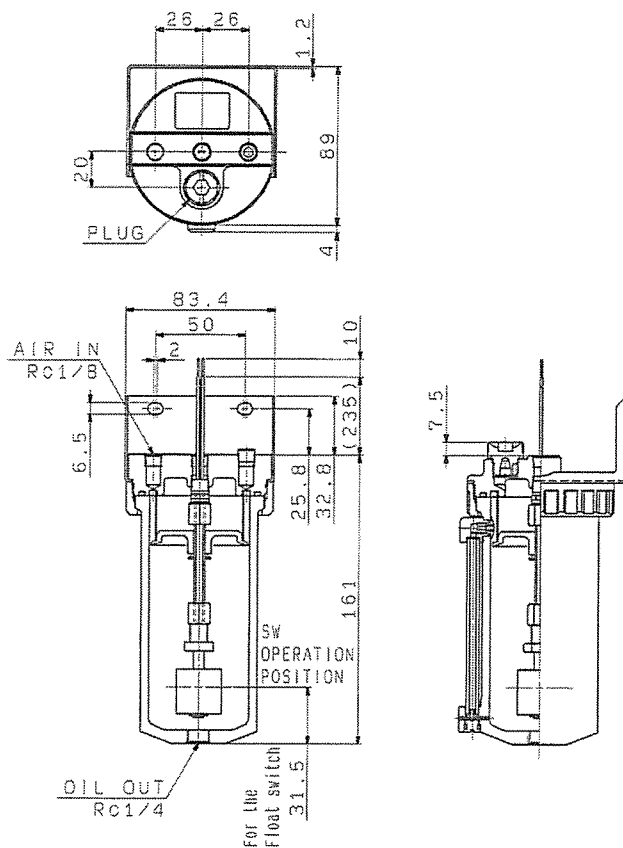
6. Float switch working principle

As the oil level changes in the bowl, the float raises and lowers with it. A magnet incorporated in the float creates a magnetic field that opens and closes a set of reed switch contacts in the switch holder, to open and close the circuit.



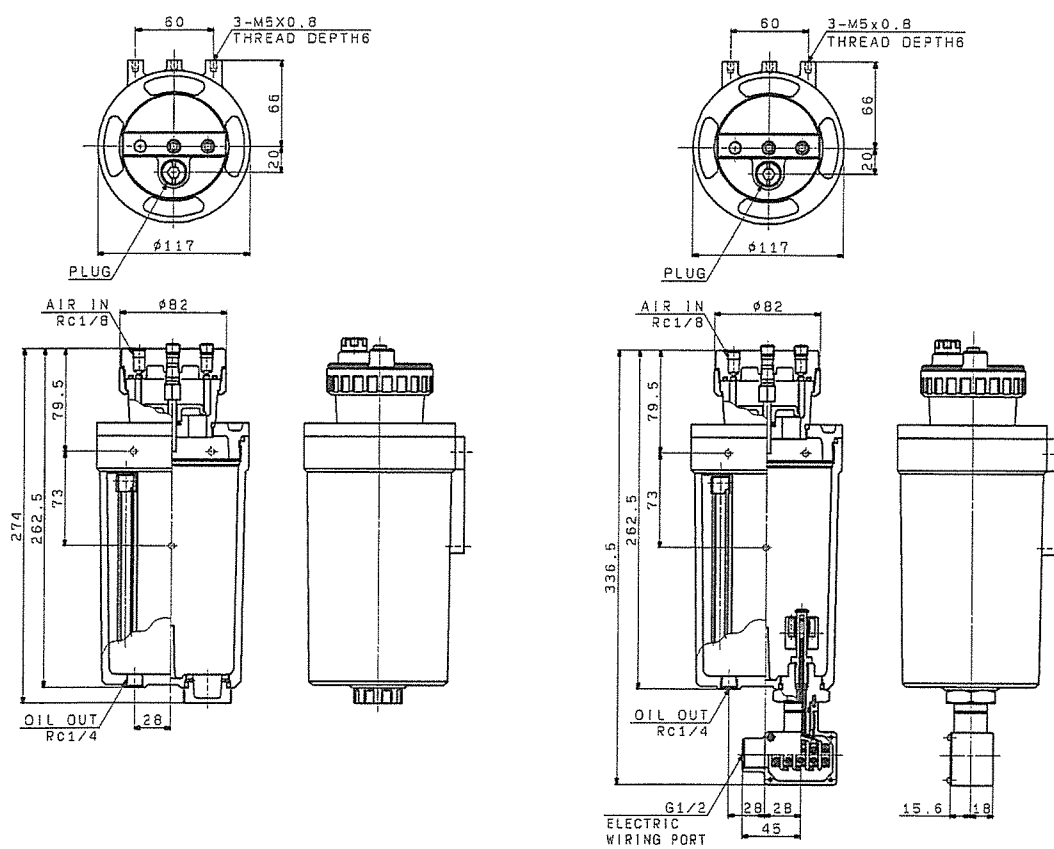
7. Outline dimensions

ALT10
ALT10-S1,S2



ALT20

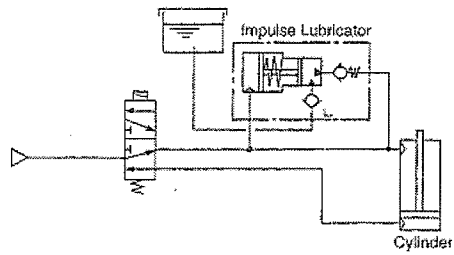
ALT20-S1,S2



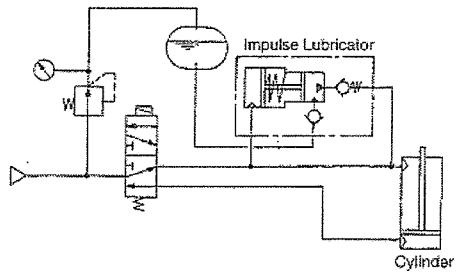
8. Piping Examples

- Oil tank

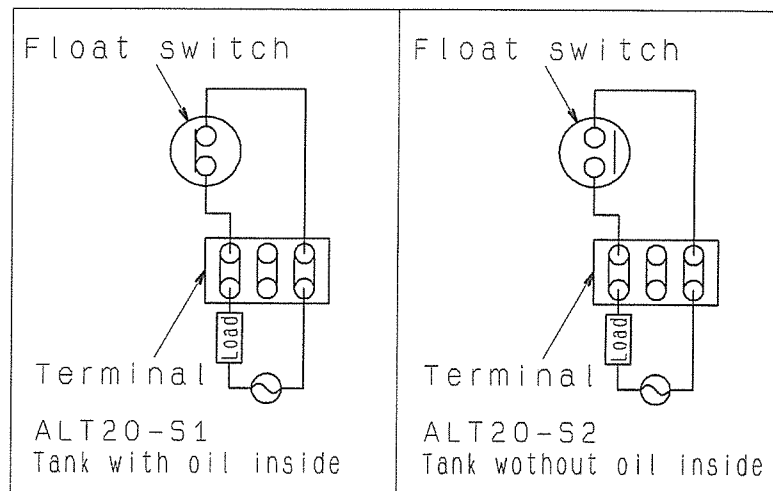
• No pressurized tank



• Pressurized tank

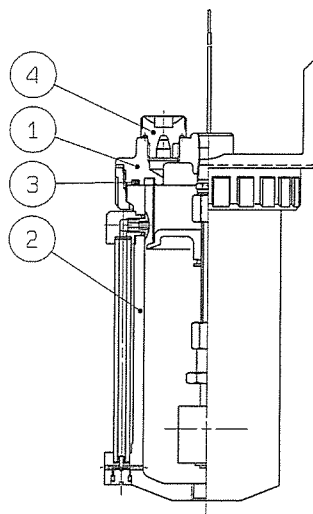


- Float switch



9. Parts list

ALT10



Main parts

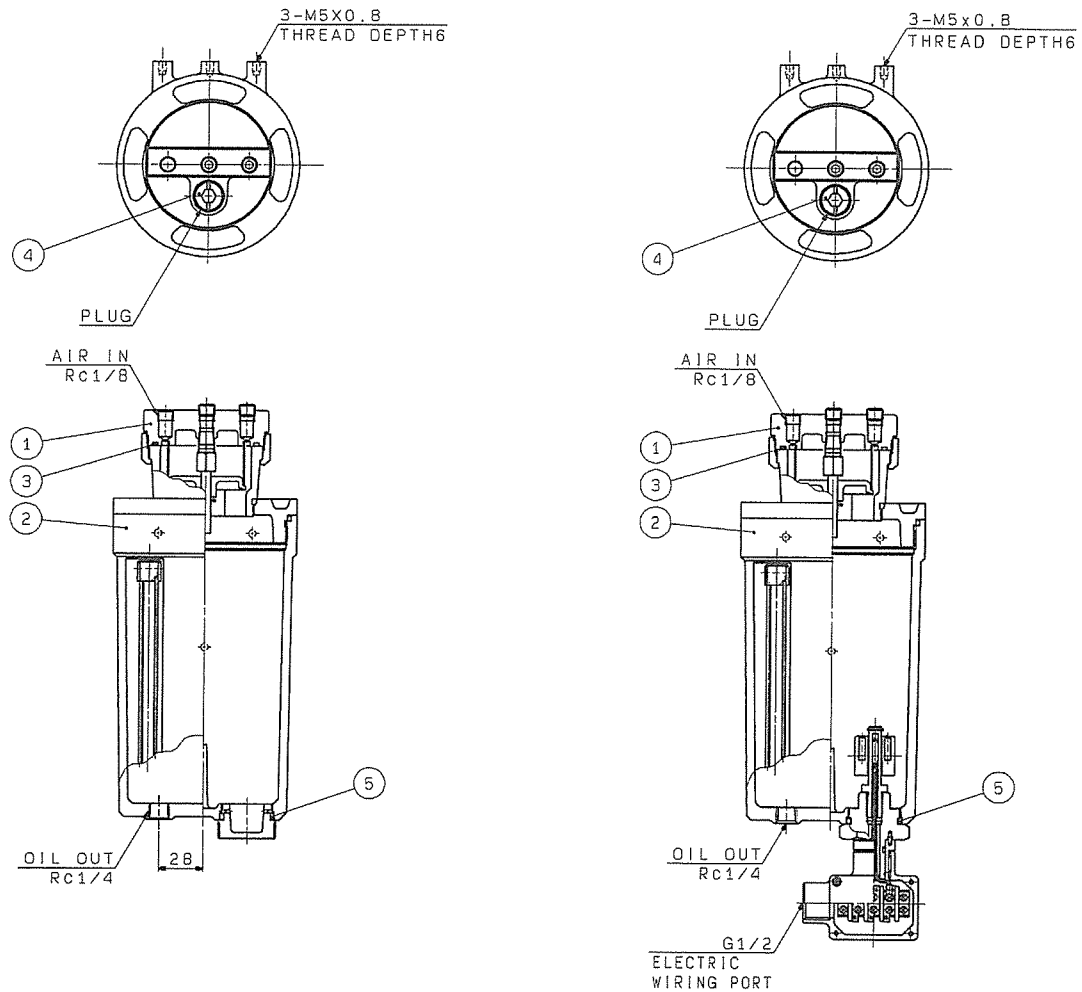
No.	Description	Material	Remarks
(1)	cover	Aluminum casting	Platinum silver coated
(2)	Bowl	Aluminum die casting	Platinum silver coated

Spare parts

No.	Description	Material	Component No.		
			ALT10	ALT10-S1	ALT10-S2
(1)	cover assembly Note 1	—	12761A	12761A-S1	12761A-S2
(2)	Bowl assembly	-	AL-8-10		
(3)	O-ring	NBR	113136		
(4)	plug assembly	—	12314PA		

Note 1) The top cover assembly includes the O-ring (3) and oil supply plug assembly (4).

ALT20



Main parts

No.	Description	Material	Remarks
(1)	cover	Aluminum casting	Platinum silver coated
(2)	Bowl	Aluminum die casting	Platinum silver coated

Spare parts

No.	Description	Material	Part No.		
			ALT20	ALT20-S1	ALT20-S2
(1)	cover assembly Note 1	—	12761A		
(2)	Bowl assembly Note 2	—	800147A-8	800147A-8-S1	800147A-8-S2
(3)	O-ring	NBR	113136		
(4)	plug assembly	—	12314PA		
(5)	plug assembly	—	81011-5PA	—	—
	Float switch	—	—	IS400-1	IS400-2

Note 1) The top cover assembly includes an O-ring (3) and oil supply plug assembly (4).

Note 2) The bowl assembly includes a float switch.

10. Trouble shooting

Oil tank

Type	Content of failure	Possible causes	Countermeasures
Oil discharge	The product does not discharge oil.	1. For the open to atmosphere type (with no pressure applied), the air IN port is closed or blocked.	1. Open the air IN port to vent the oil tank to atmosphere.
		2. Pressure applied to the oil in the tank is too low.	2. Increase the pressure applied to the oil in the tank to 0.4MPa. When the product is used in a system, pressurize the ALT and verify oil is discharging from the oil OUT port.
Oil leakage Note 1	Oil leaks from between the top cover and bowl.	1. The bowl o-ring is damaged.	1. Replace the bowl O-ring with a new one.
	Oil leaks from the glass tubing.	1. The glass tubing or O-ring is damaged.	1. Replace the bowl assembly with a new one.
	Oil leaks from the oil OUT port.	1. The fitting is not tightened securely.	1. Check for thread sealant and tighten the fitting to the correct torque.
		2. The oil used is not compatible with the fitting materials.	2. Select compatible oil and fitting materials.

Note 1) When oil is stuck to the external surface of the product or when oil leakage occurs, they may have been caused by oil that is splashed over in the operating environment or by oil dropped from the oil supply port when filling the oil tank. Wipe off the oil residue and re-check for leakage.

Float switch

Type	Content of failure	Possible causes	Countermeasures
The float switch does not operate	Normally ON	1. It has a short-circuit at the wire connection, or the wiring polarity is incorrect.	1. Connect the wires correctly.
		2. The switch contacts are welded together.	2. Change the load, or install a protective circuit.
	Normally OFF	1. The magnet inside the float is influenced by a strong magnetic field.	1. Change the location of the oil tank or install a magnetic force shield so that the magnetic force does not influence the float switch.
		2. The float has a magnetic substance sticking to it.	2. Avoid any magnetic substances mixing into the oil.
		3. The wires are disconnected, or are connected incorrectly.	3. Connect the wires correctly.
		4. The switch contacts are burned out.	4. Avoid large current flowing through the switch.
	Float does not follow the oil level.	1. The buoyancy of the float is insufficient.	1. Check the specific gravity of the liquid used, and select the applicable float switch.
		2. The float is stuck to the product body due to material sticking to the float.	2. Remove the foreign matter.
		3. The float is deformed.	3. Set the operating pressure to not more than 1MPa.
Intermittent operation		1. The oil surface inside of the bowl is rippling or foaming.	1. Change the location of the oil tank, or suppress vibration of the oil tank.
		2. The magnet inside the float is influenced by a strong magnetic field.	2. Change the location of the oil tank or install a magnetic force shield so that the magnetic force does not influence the float switch.

Revision history	
A	P11 Part number change(12761-S1→ 12761A-S1,12761-S2→12761A-S2) Februuary. 2013

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
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