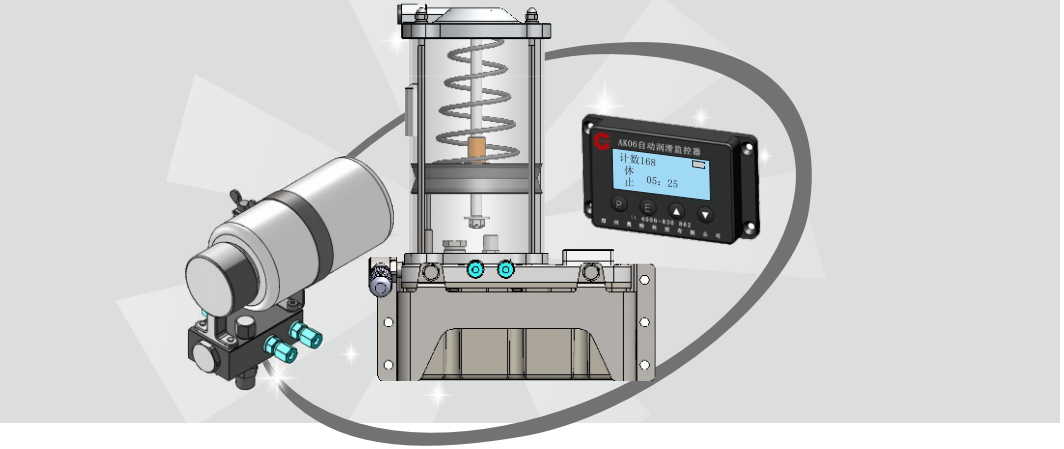
AUTOL

> > > CENTRALIZED LUBRICATION SYSTEMS



# Waste Grease Collection System Instructions for Use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# Catalog

# 1、Components of Waste Grease Collection System

The waste grease collection system is a positive waste cleaning and collection system, which may positively suck and centrally collect the waste grease from the bearing to effective improve solidified and accumulated waste grease within bearing to increase bearing life.

The system consists of supply pump, ALR series of grease suction and discharge unit and relevant system accessories. The supply pump supply grease to the system according to pre-defined time. The grease suction and discharge unit perform suction, discharge and collection of waste grease under action of grease.

## The supply pump

The supply pump provides grease power to the waste collection system, consisting of motor, gear pump, reversing valve, grease tank, monitor, power supply module and relevant accessories.

The supply pump is integrated with monitor to control the pump start/stop, grease reverse and with function of pressure test, alarm of malfunction, and low-temperature protection.

## The grease suction and discharge unit

The grease suction and discharge unit are the actuator of the system. Under the action of grease, the plunger reciprocates to vacuumize, allowing waste grease sucked and discharged to the collector.

Accessories include pipeline, pipe fitting, grease pressure sensor and electrical circuit. These accessories are connected to the supply pump and grease suction and discharge unit, forming a complete system.





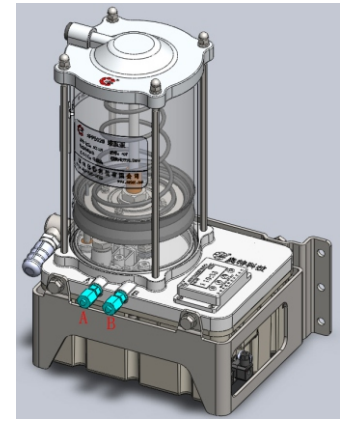


Figure 1-1
Figuration Drawing of Supply Pump

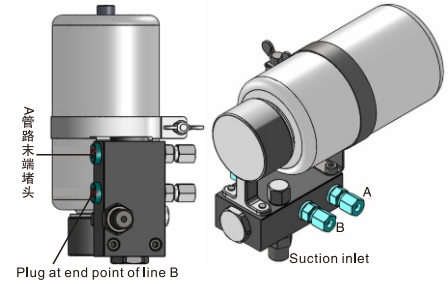
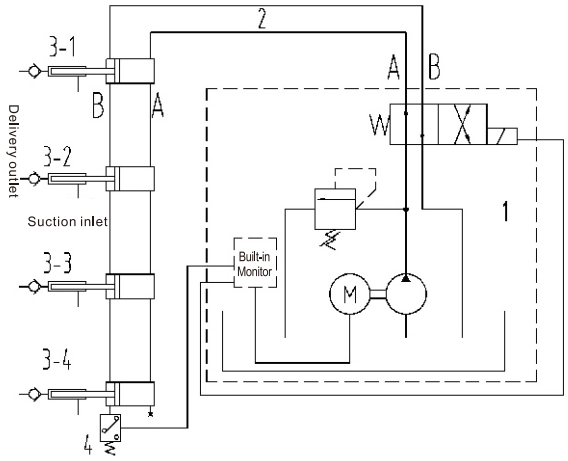



Figure 1-2
Figuration Drawing of Grease Suction and Discharge Unit

# 2、Operating Principle and Technical Data

Operating principle: The monitor controls the operation of the complete system. Controlled by the monitor, the motor is started to drive the gear pump to deliver grease. The reversing solenoid valve controls the directions of grease lines A and B. For system start, when the motor is starting, the reversing solenoid valve is not energized, and line A delivers grease, the plunger of the grease suction and discharge unit moves outward to deliver waste grease. When the pre-setting operating time is reached, the monitor controls that the reversing solenoid valve is energized for reversing, and the line B delivers grease to move the grease suction and discharge unit backward, forming vacuum in the plunger chamber, allowing the waste grease to enter into the plunger chamber under vacuum. After the preset operating time are reached, the system is shut down and the plunger of the grease suction and discharge unit stops the suction position to wait for the next operating cycle.



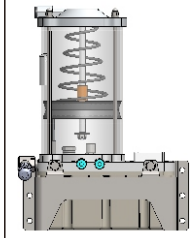
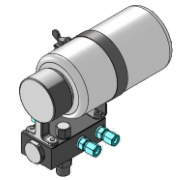

1.Supply pump 2.Accessories 3.The grease suction and discharge unit 4.oil pressure sensor

Figure 2-1 The waste grease collection system





**Technical Data:**

| | | |
|---|---|---|
| Waste grease collection system | Parameters of power supply | 230 VAC or 24 VDC |
| | Level of anti-corrosion | C4H |
| | Degree of protection | Ip65 |
| | Operating temperature | -40℃~70℃ |
| | Survival temperature | -45℃~80℃ |
| | Applicable altitude | ≤4000m |
|  Supply pump | Type of control | Controlled by built-in monitor |
| | Parameters of power supply | AC230V or DC24V |
| | Rated power | 40W |
| | Max. operating current | ≤0.3A（AC230V）；≤2.5A（DC24V） |
| | Parameters of power supply | 6.3Mpa |
| | Time of grease discharge | （1-99）min adjustable |
| | Time of grease suction | （1-99）min adjustable |
| | Off time | （1-30）h adjustable |
| | Display mode | LCD dynamic display: Count, off time, time of grease discharge, time of grease suction, temperature, level, diagnostic trouble code(DTC), etc. |
| | Capacity of grease tank | 2L |
| | Grease available | LS-46# grease （Note 1 |
| | Operating temperature | -40℃ ~ 70℃ |
| | Survival temperature | -45℃ ~ 80℃ |
|  The grease suction and discharge unit | Grease driven | Grease driven |
| | Volume of single operation of suction and discharge | 1.35ml (Theoretical) |
| | Vacuum | Operating cycle not greater than 25 times, vacuum at suction inlet not greater than - |
| | Operating temperature | -40℃ ~ 70℃ |
| | Survival temperature | -45℃ ~ 80℃ |
| | Method of grease collection | 0.5 L collection bottle or 4 L collection bucket, subject to installation space on site. |
| Accessories | Rated operating pressure | 20Mpa |
| | Burst pressure | 60Mpa |
| | Pipeline specifications | Φ4.0 × Φ8.6 |
| | Connector | KCJ-6 connector, removable |

# 3、Installation

## 3.1 Overall Dimensions and Installation Dimensions of Components

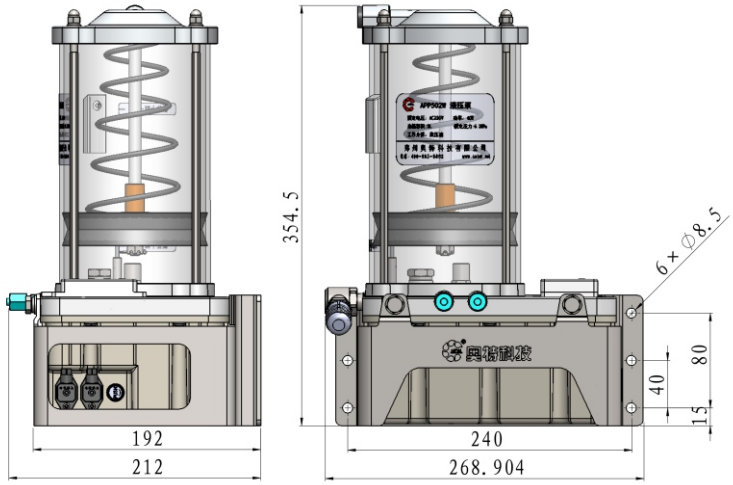



Figure 3–1 Overall Dimensions and Installation Dimensions of Supply Pump

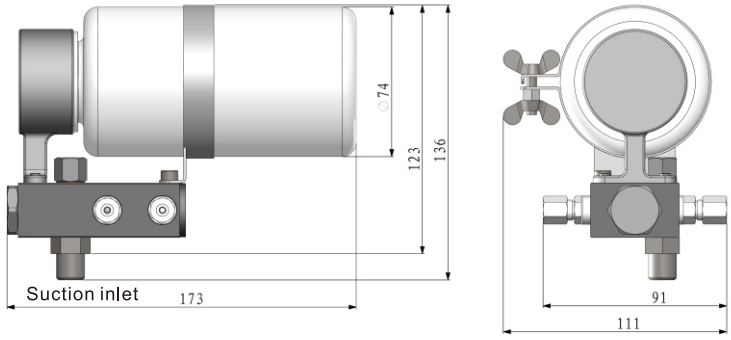



Figure 3-2 Overall Dimensions and Installation Dimensions of Grease Suction and Discharge Unit





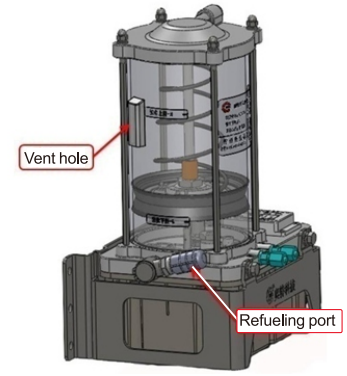



Figure 3-3 Schematic for Filling Port and Vent of Supply PumpFigure 3-4 Schematic for Installation Position of Filtering Element

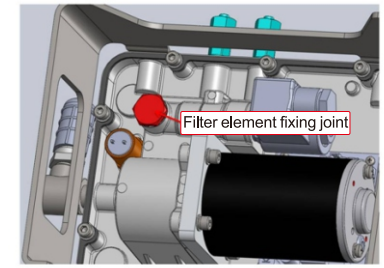



Figure 3–4 Schematic for Installation Position of Filtering Element

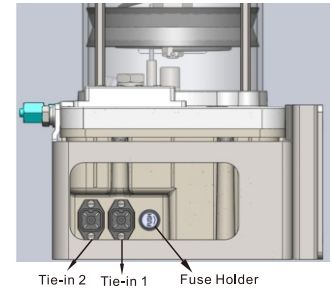



Figure 3-5 Schematic for Installation of Tie-ins

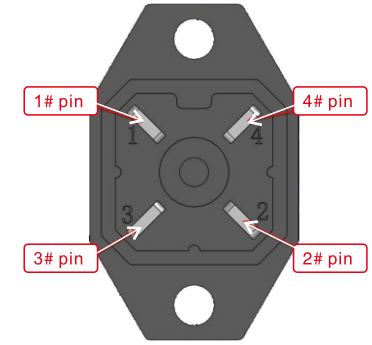



Figure 3-6 Schematic for Pins of Tie-ins

## 3.2 Installation Design

1 ) Determine the power voltage supplied for installation site (230 VAC or 24 VDC);

2)Determine the installation position of the system (rotary or non-rotary condition)

3) Form of waste grease collection: Designed with waste grease collection bottle. Note: Under rotary condition, a grease collection bottle must be used. Under non-rotary condition, collection bottle or bucket may be used, as needed.

4 ) Determine suction inlet installing dimensions (i.e. thread specifications of discharge outlet on bearing) .

5) Determine the quantity of the grease suction and discharge unit.

6) The parameters of the waste collection system are set according to the operating parameters of the lubrication system on site.

Note: The bearing sealing performance has great influence on system operation. In case of poor bearing sealing,it is recommended that the bearing seal should to be repaired before installation of waste grease system.





## 3.3 Precautions for Installation

1) Installation of supply pump: It shall be firmly and reliably installed on a site with less environmental pollution, away from the thermal source, electromagnetic radiation source, for easy maintenance, observation and operation. It must be reliably earthed.

2) Installation of a grease suction and discharge unit: The bolts fixing the grease suction and discharge unit must be tightened by a specified torque. The fixing bolts of the bearing discharge outlet will be clean and flushed with those of the grease suction and discharge unit. The direction of the grease suction and discharge unit will be good to the arrangement of grease lines and easy for later replacement of waste grease collector.

3) Installation of lines and relevant accessories: For installation of lines, ensure that the lines must be clean, avoiding pollution to inner wall of line. For straight lines, the actual length of lines shall be slightly longer than the length of straight line. If a line will pass through a sharp edge, it is necessary to protect the line with a corrugate conduit. An installed line will be fastened onto the equipment with nylon tie. The connectors are to be well press fitted and reliably sealed. For pipe connection on site, ensure that the ports A and B of the grease suction and discharge unit should correspond with the grease ports A and B respectively on the supply pump. The grease pressure sensor shall be connected to the end of line B. The line shall be installed firmly, reliably and away from electromagnetic radiation interference. The shielding layers of signal lines must be reliable earthed.

## 3.4 Explanation on Connection

The electrical connection of the waste grease collection system mainly means connection to supply pump. For a supply pump, 230 VAC, 24 VDC, monitor-free versions may be available, of which connection should be made as follows:

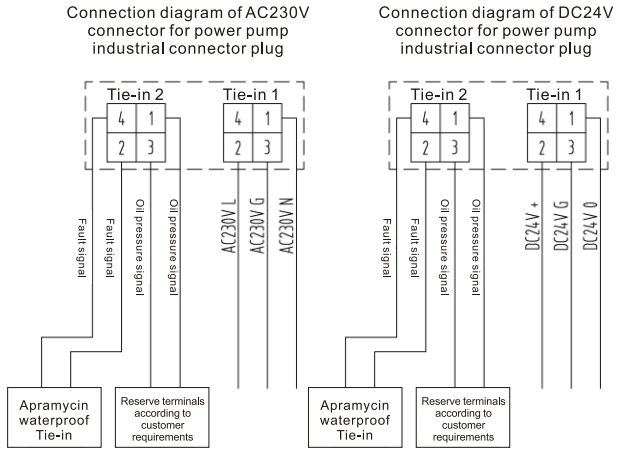



Figure 3–7 230 VAC Connection Diagram




Figure 3-8 24 VDC Connection Diagram

Note: For monitor–free version, the connection will be subject to customer's requirements.





# 4、System commissioning

4.1 Filling system pipelines: Remove the utmost plug from the lines A and B and run the supply pump. After grease runs from the line A, plug the end of the line a. Continue to run the system until reversing. After the grease runs from the end of the line B, plug it. Now, the system is filled with grease.4.2 Supply power makeup: After the pipeline is filled, it is necessary to vent the supply pump and fill with grease. Place the supply pump as vertical as possible and start to fill. When the piston moves to the upper level limit, the air will escape from the grease tank venting outlet. Fill with grease until the grease runs from the venting guide.Note: The filled grease must be correct and clean. After filling, the dust cap shall be installed to prevent pollution to the filling port.

Commissioning of supply pump operation: Set the 2P time (suction time) of the monitor by 3 min and the 3P time (discharge time) by 3 min. Then, run the supply pump and record the system pressure 'on' time (t). Next, set both 2P and 3P by ( t+1 ) min, where t will be subject to the next nearest integer.

1P is the off time of the system, used to control the operation cycle of the system within a specified time.The 1P time may be set according to Formula

4.1.Formula 4.1 $$T = \frac{h \times 1.35 \times (1-\eta) \times 24 \times 365}{Q}$$

Q is the annual consumption of grease ( ml )

h is the number of grease suction and discharge units;

t is the operating cycle of waste grease collection system;

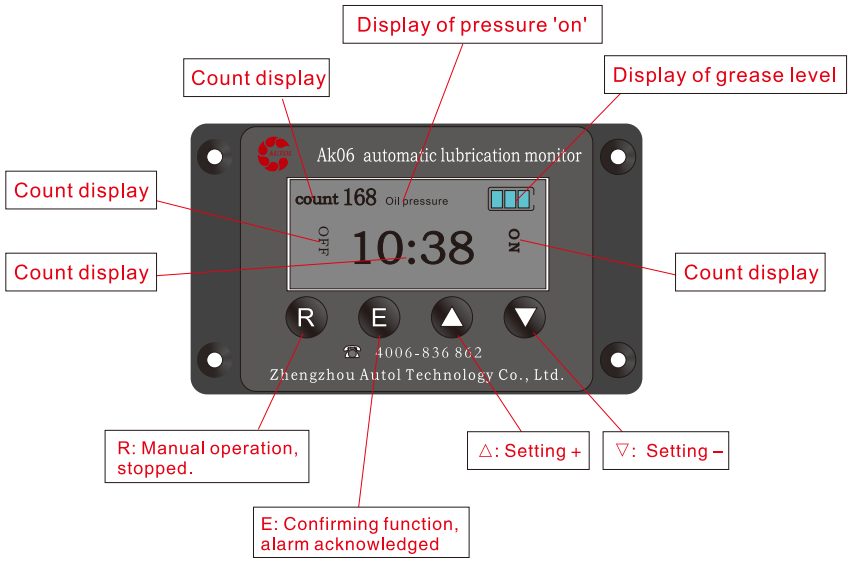
η is the efficient of the grease suction and discharge unit, taken by 20% to 80% depending on site conditions; reduced with better

lubrication.

4.1 4P is the temperature of the low-temperature protection, set according to technical agreement.

Continue operation for 2 to 3 times upon completion of setting. Observe the sealing performance of pipe fittings. In case ofleakage, stop immediately the commissioning and eliminate leakage.In case of leakage, stop immediately the commissioning and eliminate leakage.

## 5、Monitoring Setting

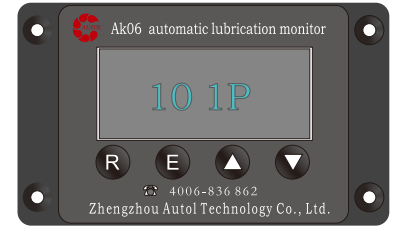






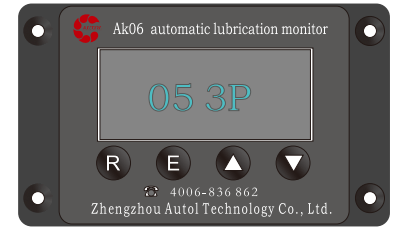

Instructions for operation of built-in monitor

Press both ▲ and for 4 s or longer to enter into the setting mode. Briefly press the "E" in turn to choose the setting items “1P, 2P,3P and 4P” Briefly press the "E" to enter into the setting interface for confirmation after entering into the setting mode.

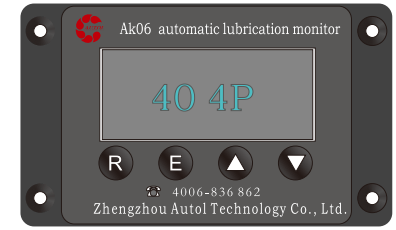



1P: Briefly press the " ▲" or "▼ " to select the off time (1 to 30 h);


2P: Briefly press the " ▲" or " ▼ " to select the suction time (1 to 99 min);



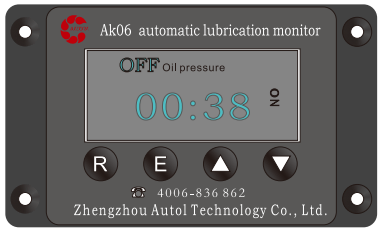

3P: Briefly press the " ▲" or " ▼ " to select the Oil discharge time (1 to 99 min);




4P: Briefly press the " ▲" or " ▼ " to select temperature (–50℃~0℃);

The screen will be locked again after 10 s of exiting from the mode of setting or if you do not enter into the mode of setting within 10s.When the monitor is under the OFF state, briefly press the key R for manual start and press it again for manualstop. In case of occurrence of alarm message, briefly press the key E to acknowledge the alarm. The monitor operation and alarm status are described as follows:


OFF state

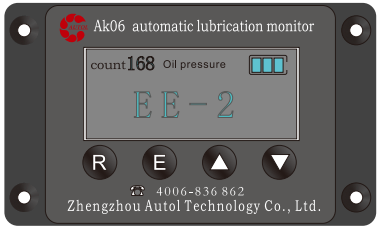



Operating status (not pressure "ON")

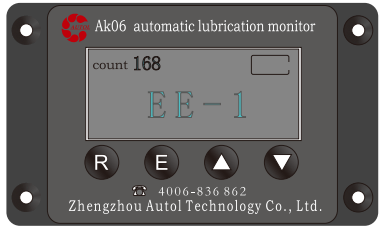

Operating status (not pressure "ON")


Warning lack of grease (displayed at OFF state)


Warning lack of grease (displayed at OFF state)




Fault alarm (pressure not on)




Warning lack of grease





## 6、System Spot Checking and Maintenance

For the waste grease collection system, it is recommended that spot checking is performed once three months, depending on actual operating conditions.

6.1 Record the times of operation and check whether they are correct.

6.2 Manually start the system and observe the pressure 'on' time of the system.

6.3 Observe grease level to determine whether consumption is normal.

6.4 Check possible leakage from pipe fittings.

6.5 Check the grease suction effect of the grease suction and discharge unit and waste grease in the grease collector.

6.6 Make correct records of spot checking.

6.7 The waste grease collection system is maintained based on spot checking. Replace the broken or leaking pipelines (if any). Drain or replace immediately waste grease collector if it is full.

For the supply pump of the waste grease collection, replace the filtering element once two years. Handle with care when replacing the filtering element. Upon completion of replacement, remove grease from the lower cover of the pump. And, check that the tie-ins are connected firmly.For replacement of filtering element, remove the supply pump and place it upside down. Open the pump lower cover by handling with care, avoiding wire loosening. Then, unscrew the fixing bolts from the filtering element and remove the filtering element. Upon completion of replacement, handle with care and tighten the bolts by a tightening torque of 30 Nm.

Upon completion of replacement, clean the parts and re-assemble the pump lower cover.

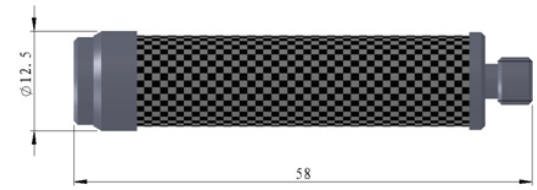
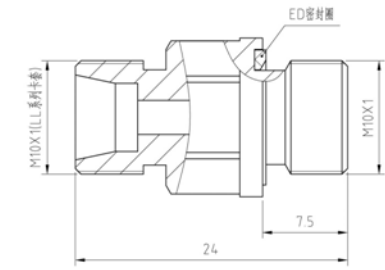
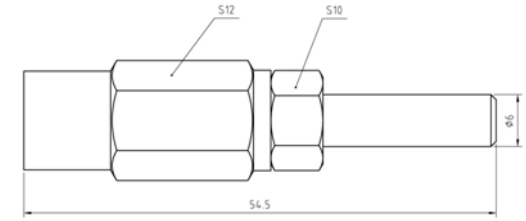
# 7、Troubleshooting

| Troubles | Causes | Remedies |
|---|---|---|
| A. No waste grease in the waste grease collector | Failure to bearing seal | Replace the bearing seal. |
| | Poor lubrication of bearing | Improve lubrication of bearing |
| | The supply pump not working | Troubleshoot the supply pump. |
| | Faulty pipeline | Faulty discharging pipeline |
| B. Deteriorated grease of supply pump | Failure to filtering pump of supply pump | Clean the supply pump and pipelines. Replace the filtering element. |
| | Unacceptable grease used | Clean the supply pump and pipelines. Use acceptable grease. |
| C. Too low level of supply pump | Leaky pipeline | Find the leakage point and replace with new pipeline. |
| D. Alarm of faulty supply pump | Damaged pressure sensor | Replace the pressure sensor. |
| | Damaged gear pump | Replace the gear pump. |
| | Damaged motor | Replace the motor. |
| | Too low grease level. | Refer to Trouble C. |
| E. Supply pump unable to be started | No power input | Ensure that the power supply is correct. |
| | Damaged monitor | Replace the monitor. |
| F. Single grease suction and discharge unit not working | Plunger or piston of the grease suction and discharge unit locked | Replace the grease suction and discharge unit not working. |
| F. All grease suction and discharge units not working | Pipelines unable to be pressurized on. | Refer to Troubles D and E. |
| | Pipelines able to be pressurized on but grease circuit unable to be exchanged | Damaged solenoid operated directional valve. Replace the solenoid operated directional valve. |
| H. Monitor not or abnormally displayed | Electromagnetic or static-electricity interference | Disconnect and re-connect. |
| | Incorrect or loosened connection | Check that the connection is correct and firm. |
| | Damaged monitor | Replace the monitor. |





# 8、Common Accessories of Maintenance

| | |
|---|---|
| Filtering element |   |
| Grease collector (0.5 L) |   |
| 24°cone thru joint |   |
| Removable thru connector |   |

# 9. Transport and storage

**9.1 Transport**

9.1.1 During loading and unloading,be careful and avoid upside down.

9.1.2 During loading/unloading and transportation, avoid collision with other items.

**9.2 Storage**

9.2.1 The products should be stored in a ventilated and dry warehouse free from direct sunlight and without corrosive gasin the air.

9.2.2 Close all open pipelines to prevent dust and impurities from entering.

9.2.3 The products should be packed neatly in the warehouse and ensure the ventilation, meanwhile pay attention to the logo on the packing box and avoid upside down.The packing box should keep a distance of at least 100mm from the ground and wall.

# 10. After-sales service

Zhengzhou Autol Technology CO.,LTD has sales service network all over the country, with more than 70 after-sales service staff across the country

National after-sales service hotline:

400-683-6862

800-883-6862