

AUTOL



>>> CENTRALIZED LUBRICATION SYSTEMS



AUTOL TECHNOLOGY



LSC

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AL80/100/120 Series Centralized Lubrication Systems

Autol Technology Co.,LTD.

CONTENTS

1. Introduction.....	01
2. Structure and Principle.....	02
3. Technical Specifications.....	08
4. Installation Dimensions	12
5. Installation.....	16
6. System Debugging.....	17
7. Trouble and Troubleshooting.....	20
8. Maintenace.....	23
9. Transportaton and Storage	24
10.After-sales Service.....	24

1. Introduction

AL80, AL100, AL120 series centralized lubrication systems are the latest generation developed by Autol long-term market research and technical innovation, the systems have multiple technical invention patents and have been widely applied to the following fields such as wind energy, mining, machinery tools, textile, oil field, port, vehicle, construction and heavy machinery, etc.

The system delivers the metered grease to each lube points via whole grease supply system. The system plays an important role in reducing friction resistance, decreasing contact damage and lowering surface temperature of friction. And it also plays a role in anti-rust, shock absorption and sealing.

1.1 Product Models

AL80/AL100/AL120 series have two series products:

Stirring paddle type AL81/AL101/AL121;

Spring piston type AL82/AL102/AL122 .

The capacity of AL80 series pumps is 1L or 2L, suitable for the equipment with less lube points, less grease amount and longer lubricating period.

The capacity of AL100 series pumps is 2L, 4L, 6L or 8L, suitable for small and medium equipment with more lube points, large grease amount and short lubricating period.

The capacity of AL120 series pumps is 4L, 8L, 10L ,15L, 20L or 30L, suitable for medium and large equipment with more lube points, large grease amount and short lubricating period.

1.2 Application environment

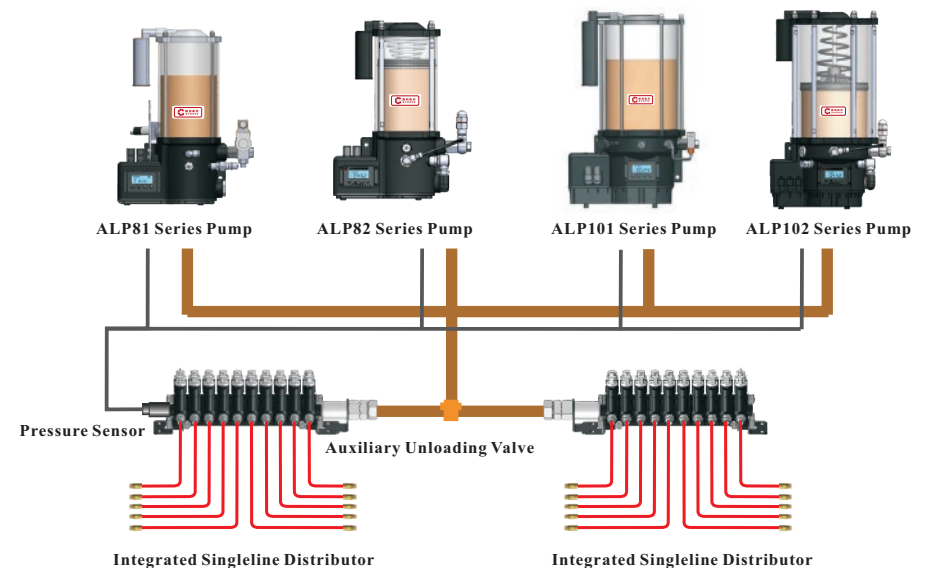
- a) Relative humidity: $\leq 95\%$
- b) Storage temperature: $-50\sim 80^{\circ}\text{C}$
- c) Working temperature:
 - AL81/AL101/AL121 $-20\sim 80^{\circ}\text{C}$
 - AL82/AL102/AL122 $-30\sim 80^{\circ}\text{C}$

2. Structure and Principle

AL80/AL100/AL120 series centralized lubrication systems are divided into two types: singleline centralized lubrication system and progressive centralized lubrication system.

2.1 Singleline Centralized Lubrication System

The system uses parallel structure. A pressure sensor is fixed at the end of a singleline distributor to real time detect the system status. When faults occur, the pressure sensor can transmit fault signals to the monitor, the monitor alarms and the pump stops. The grease amount required by each lube point can be set individually. If one branch of singleline distributor is blocked, the others won't be affected. The system has the advantages of easy expansion, uneasy blocking, easy maintenance, low maintenance cost and so on.



2.1.1 System Components

Singleline Centralized Lubrication System is composed of monitor, pump, compositive singleline distributor assembly, auxiliary unloading valve, pressure sensor, pipe bundles, wiring harness and accessories.

2.1.2 Working Principle

The system runs according to the preset program. When the pause countdown ends, the pump is activated, and the grease with pressure is pumped into singleline distributors through the supply line. The pressure sensor at the end of singleline distributors is activated and transmits the pressure signals to the monitor. The grease pressure in the supply line continues to rise until the pressure relief valve is open, which can ensure the grease to be delivered into each lube points. When the grease supply is finished, the pump stops working, the monitor count is added "1", and the high pressure in the supply line is relieved, the singline distributors is unloaded under the help of the auxiliary unloading valve, and the storage of metered grease is completed. The system enters next cycle.

2.2 Progressive Centralized Lubrication system

The progressive centralized lubrication system delivers grease alternately to each lube points via progressive distributor connected to the pump. A piston detector is fixed at the primary distributor to monitor the whole system status. When the pulses from the distributor piston is not detected, the piston detector will transmit the signal to the monitor, and then, the monitor alarms and the pump stops.

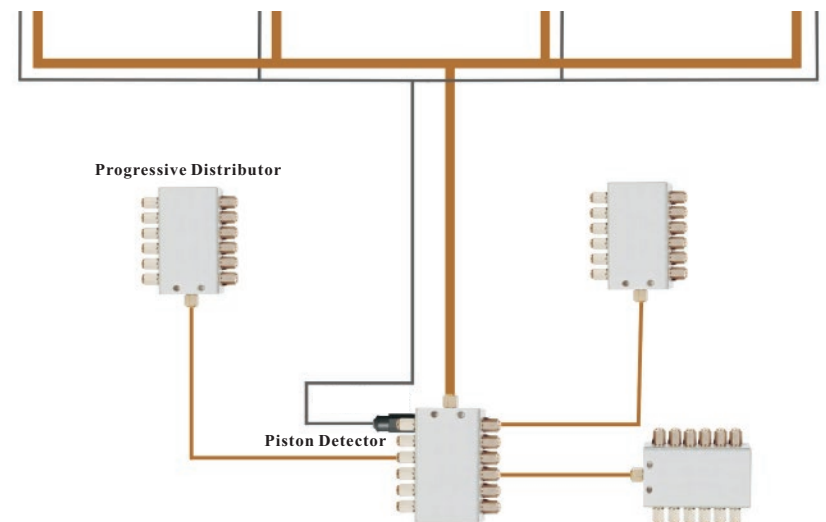
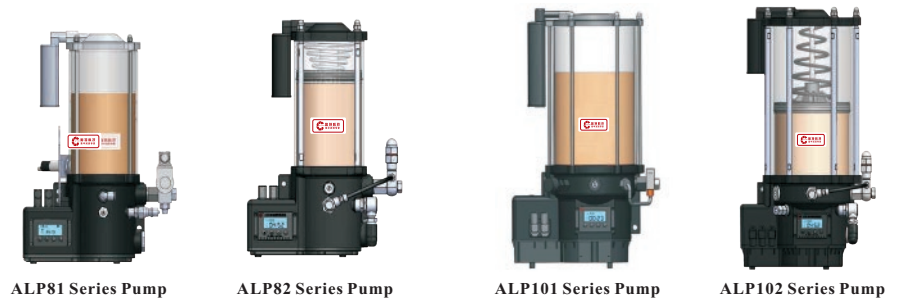
2.2.1 System Components

The system is composed of monitor, pump, primary progressive distributor, secondary progressive distributors, piston detector, pipe bundles, wiring harnesses and accessories.

2.2.2 Working Principle

The system runs according to the preset program. When the pause

countdown ends, the pump is activated, and the grease with pressure is pumped into the primary distributor through the supply line. After that, the primary distributor delivers the grease into each lube points through the secondary distributors. When the grease supply time reaches the preset value, the pump stops working, and the system enters next cycle. The piston detector real-time detects the working status of the system. When the system works normally, the monitor count will be added "1". When the system works abnormally, the monitor alarms.



2.3 Structures and Principles of Main Components

2.3.1 Pumps

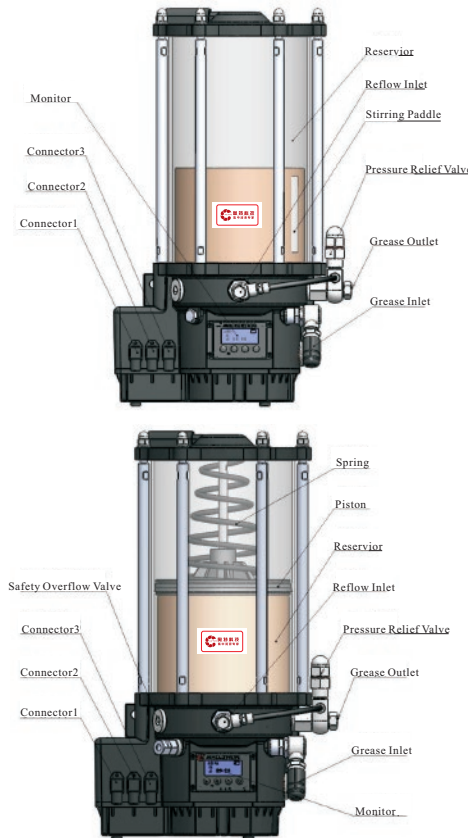
2.3.1.1 Structures

ALP series high pressure pumps have multiple patents technology, suitable for centralized lubrication of various equipment.

ALP series pumps are divided into two type: stirring paddle type and spring piston type.

Stirring Paddle Type Pump:

A stirring paddle is mounted in the reservoir. While the motor running, the grease is stirred by the paddle, moves down under gravity, after that, the grease is sent to suction port of piston pump by the scraper.



Spring Piston Type Pump:

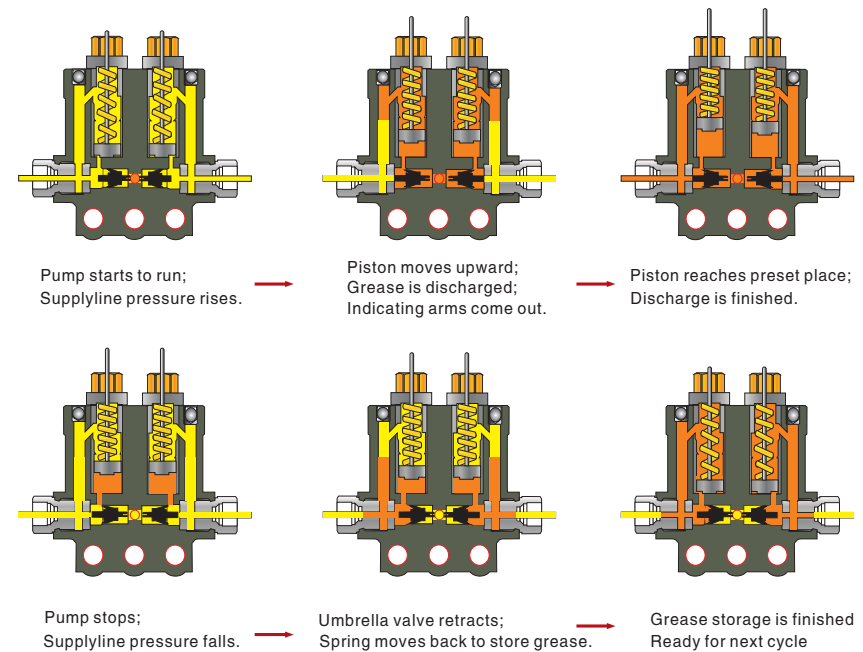
A spring piston is mounted in the reservoir. Under the action of spring, the grease is pressurized to the suction port of the piston pump by the plate.

2.3.1.2 Principle of Pumps

When the pump is activated, the motor drives the piston pump to move back and forth, and the grease in the reservoir is sucked into the piston pump and is pumped out during the reverse movement of the piston.

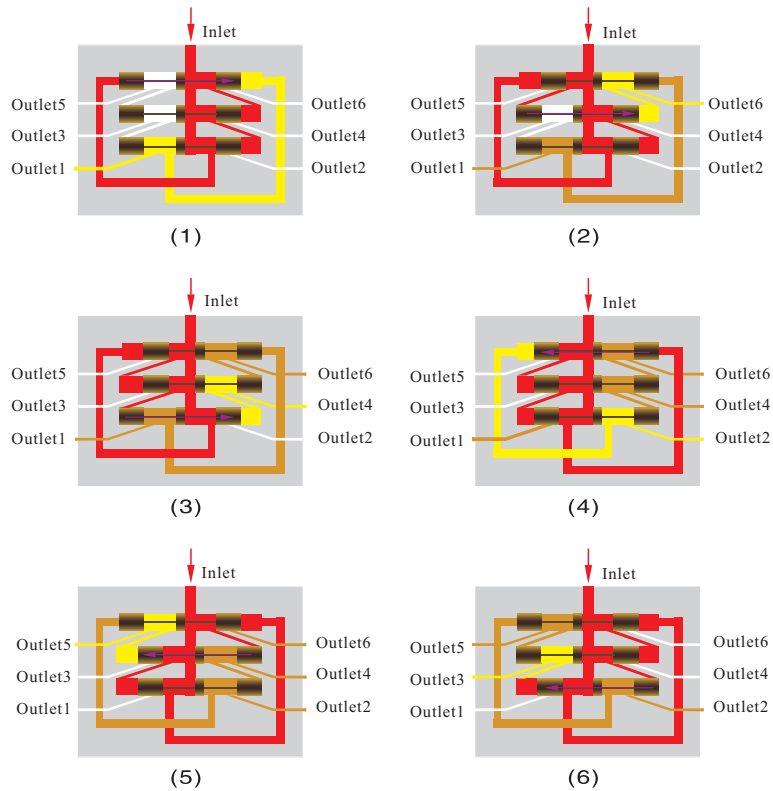
2.3.2 Singleline Distributor Assembly

The singleline distributor assembly has new integrated parallel structure, which is compact, easy to expand and effectively save installation space; the independent grease supply model ensures that the fault of any branch does not affect the other branches. The distributor has the advantages of high reliability, convenient and low cost maintenance.



2.3.3 Progressive Distributor

The pistons of progressive distributor move in order, deliver grease to lube points one by one. Through indicator stems, the status of the distributor can be observed at any time. Through the piston detector mounted on the primary distributor, the the whole system status can also be detected. Once there is a blockage, the monitor will alarm. According to demands, the grease into points can increase through combining several internal outlets of the distributor.



3. Technical Specifications

3.1 Pump

ALP100/ALP120 series pump is connected to a maximum of two pistons . Each piston has the same specifications and isn't listed again. Pumps have two series: Stirring-padde type, Spring type.

ALP81/ALP101/ALP121 Series Pump

Max Pressure: 35MPa;
 Norminal Flow Rate: 4.5ml/min;
 Grease: 0#, 1#, 2#;
 Temperature: -20~80°C;
 Power: DC24V/AC220V



ALP82/ALP102/ALP122 Series Pump

Max Pressure: 35MPa;
 Norminal Flow Rate: 4.5ml/min;
 Grease: 0#, 1#, 2#;
 Temperature: -30~80°C;
 Power: DC24V/AC220V



3.2 Monitor

There are two forms: Built-in and built-out.

Built-in monitor

Control Mode: ECU microcomputer control

Power Supply: DC24V/AC220V

Pause Interval: 1~30 hours

Operating Mode: Preset time

Signal Output: Liquid level, trouble



Built-out monitor

Control Mode: ECU microcomputer control

Power Supply: DC24V/AC220V

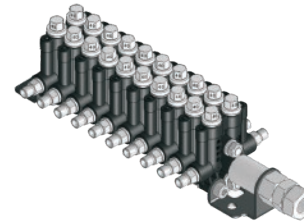
Pause Interval: 1~30 hours

Operating Mode: Preset time

Signal Output: Liquid level, trouble



Integrated Sigleline Distributor



Max Pressure: 25MPa

Output(ml/cy): 0.13, 0.2, 0.4, 0.6,
0.75, 1.0, 1.2, 1.5

Grease: NLGI 0#, 1#, 2#, 3#

Temperature: -30~80°C

Progressive Distributor



Max Pressure: 30MPa

Output: 0.2 ml/cy

Temperature: -30~80°C;

Max differential pressure between two outlets: 15MPa

Grease: NLGI 0#, 1#, 2#, 3#

Pressure Sensor:



Action Pressure: 5~40MPa adjustable

Contact type: Normally open;

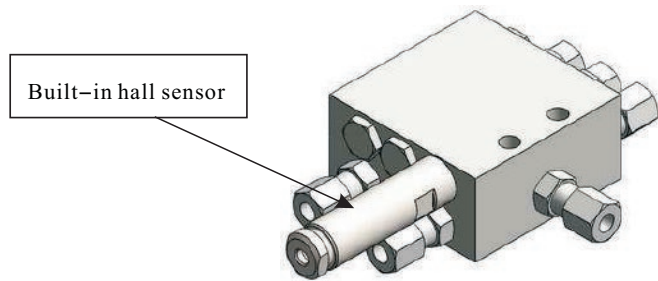
Normally closed (passive)



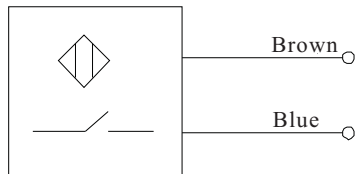
Action Pressure: 2.6MPa closed
 2.0MPa open
 Contact type: Normally open(passive)

Piston Detector:

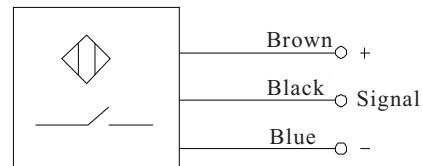
Detect strokes of pistons,send the pulse signals to the monitor.
 There are two types: two–wire and three wire.



Two–wire type supplys passive contacts:

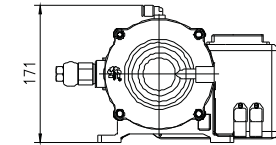
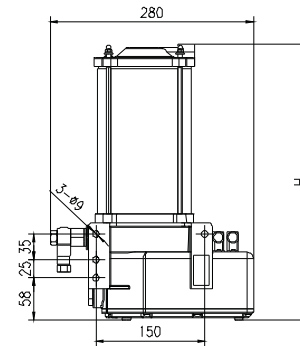


Three–wire type NPN:



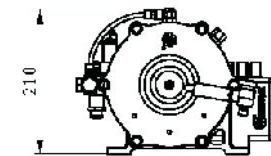
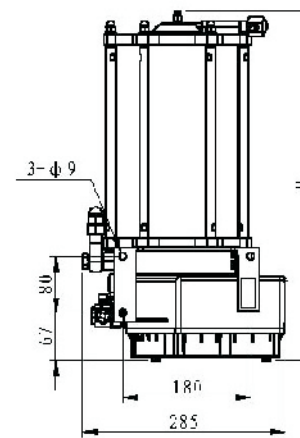
4. Installation Dimensions

4.1 Pump



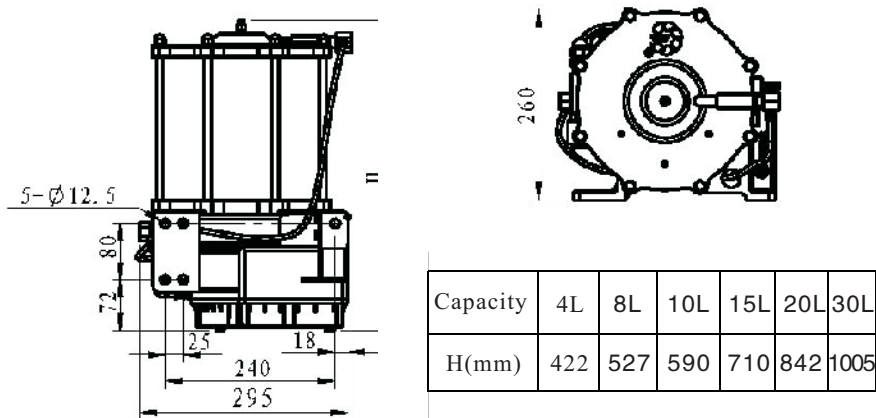
Capacity	1L	2L
H(mm)	317	378

ALP80 Series Pump Installation Dimensions



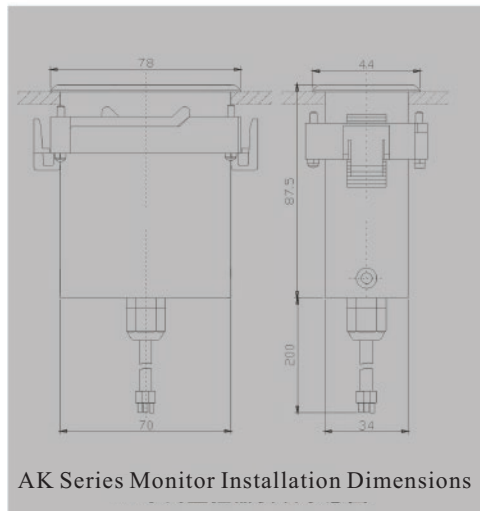
Capacity	2L	4L	6L	8L
H(mm)	345	493	593	693

ALP100 Series Pump Installation Dimensions

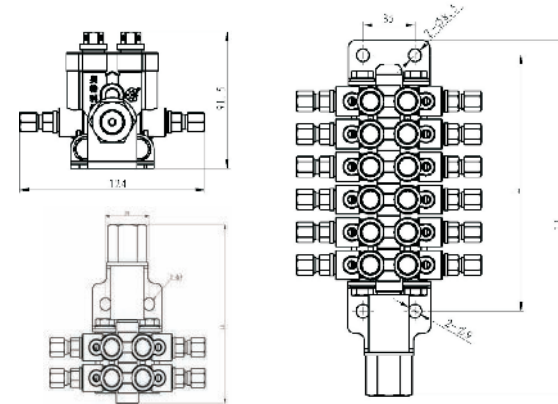


ALP120 Series Pump Installation Dimensions

4.2 Built-out Monitor

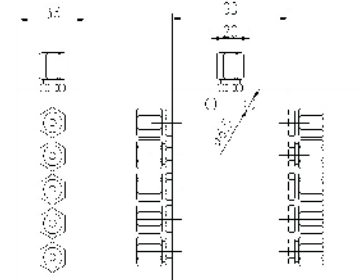


4.3 Integrated Singleline Distributor Assembly



Piece number	1	2	3	4	5	6	7	8	9	10
L(mm)	/	/	106	128	150	172	194	216	238	260
Ll(mm)	106	128	173	195	217	239	261	283	305	327

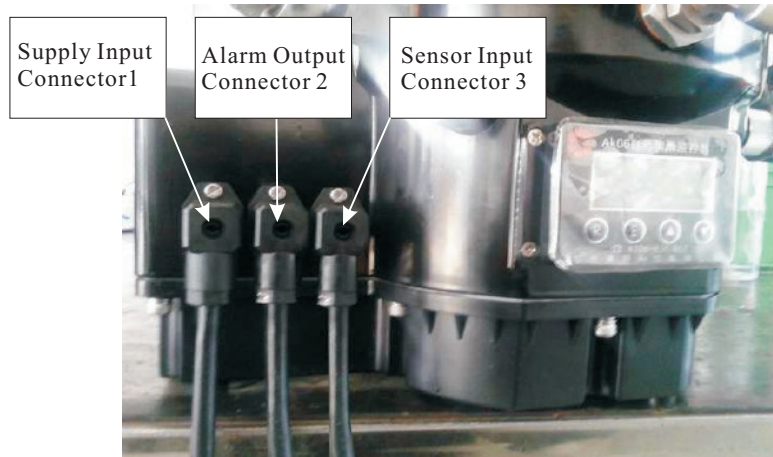
4.4 Progressive Distributor Assembly



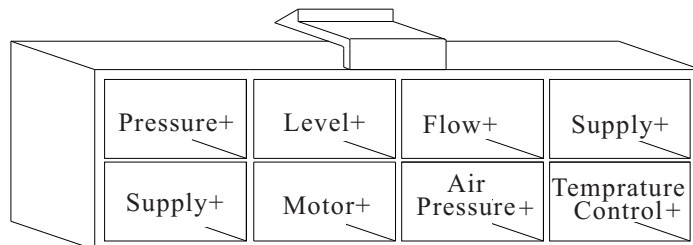
Outlet number	2	3	4	6	8	10	12	14	16	18	20
L(mm)	70	70	70	70	90	110	130	150	150	150	165

4.5 Electrical Interface

4.5.1 Connection Modes of Built-in Monitor



4.5.2 Connection Modes of Built-out Monitor



Connected to monitor,DJ7081-6.3-21 from direction of leads

5. Installation

5.1 Installation notices of pumps

- Live line installation is prohibited.
- Ensure the liquid level line on the tank clear and clean while installing.
- Pumps should be installed firmly at the place with less pollution, convenient greasing and maintenance, easy for observation and operation.
- Fixed surface should be flat, installation should be safe and reliable.

5.2 Installation notices of distributors

- Distributors should be installed firmly for convenient maintenance.
- All inlets and outlets in distributors should be kept clean.
- Distributors should be placed close to lube points(For composite singleline distributors, the length of the longest feed line is less than 5 miles; For progressive distributors, the length of the longest feed line is less than 25 miles;)

5.3 Installation notices of system tubing

- The tubes should be cut vertically in axial direction and avoid cracking, scratching, or even squashing.
- Tubing must be kept clean without contaminator.
- The tubing should be designed as short as possible to reduce pressure loss of the system and ensure pipeline unobstructed.
- The minimum bending radius: for 7.9*14.3 resin hose, it is R50; for 4.0*8.6 resin hose, it is R35.
- Pipe joint connection must be reliable, leakage is prohibited.

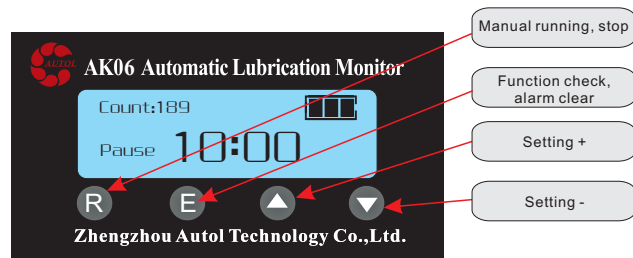
6. System Debugging

Fill grease with all pipelines before system debugging.

Press "R" key on the monitor to make the pump work completely, and after repeating 3–5 times, disconnect the most distant lube points to check if grease comes out. If no grease comes out, system trouble should be checked.

6.1 Built-in Monitor Instructions

Function Setting:



Parameters :

- 1P: Pause interval (1~30hours);
- 2P: If it is required that preset pressure is reached;
- 3P: Running time (1~60min) ;
- 4P: Standby temperature (-50℃~0℃).

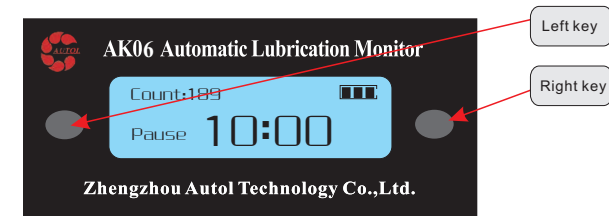
Instructions:

Press ▲ and ▼ together for over 4 seconds, then press “E” and enter into setting interface, Press “E” again and again and select “1P, 2P, 3P, 4P” separately, then confirm.

Notes:

The monitor has maloperation prevention function. The system will be locked again after exiting the setting mode for 10 seconds or not entering the setting mode in 10 seconds.

6.2 Built-out Monitor Instructions



Parameters :

- 1P: Pause interval (1~30 hours);
- 2P: If it is required that preset pressure is reached;
- 3P: Running time (1~60min) ;
- 4P: Standby temperature (-50℃~0℃);

Instructions:

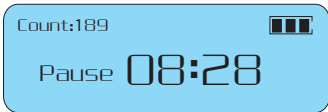
Press right key (don't loosen), then press left key over 4 seconds; after that, loosen right key firstly, then loosen left key, enter 1P setting interface, set pause interval via left key. Then, press right key and convert to 2P setting interface.

Notes:

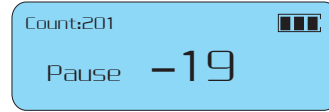
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6.3 Setting Interface

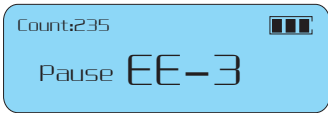
6.3.1Pause Display



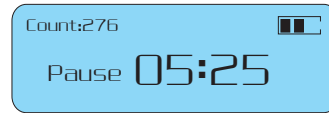
6.3.2 Low Temperature Standby



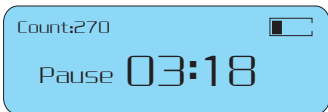
6.3.3Alarm for pressure not enough



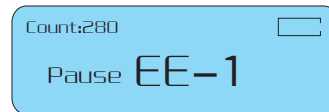
6.3.4 Low Liquid Level Alarm



6.3.5 Low Liquid Level Alarm



6.3.6Alarm for Lack of Grease



7. Trouble and Troubleshooting

Trouble	Reason	Troubleshooting
Pump not working	Motor not working	Check power and motor
	Air in pump	Exhaust air
Low pressure	Fittings leaked	Check and handle
	Pressure relief valve broken	Replace
Fault code EE-3 Pressure not enough (Singleline)	Pressure sensor broken	Replace
	Pressure connector loose	Connect
Fault code EE-3 Pulse not detected (progressive)	Piston dectector broken	Replace
	Distributor blocked	Check and replace

8. Maintenance

1. Activate the pump manually, and check if it works normally.
2. Check if there is any leakage or rupture in pipelines and if grease is delivered into each lube point.
3. Check if pipe bundles and wiring harnesses are fastened firmly.
4. During maintenance of lubrication system, the disassembled parts (sealed by combination gaskets and copper gaskets, etc.) should be replaced by new combination gaskets and copper gaskets while reassembled together.
5. While NPT/R parts are reassembled, the original Teflon tape and sealant should be cleared away, and new sealing materials need reusing.
6. Remove all dirt from the whole lubrication system and clear grease dirt near lube points.
7. Check the remaining grease in the tank and refill it in time.
8. Do the maintenance records on time.

It is suggested that the above maintenance requirements should be included into the maintenance specifications of the whole machines.

Notes:

The warranty doesn't cover user damage. If you have any question during operation, welcome to call to consult.

9. Transportation and Storage

9.1 Transportation

No upside down, no crash, during the shipment.

9.2 Storage

9.2.1 Products should be stored in the ventilated, dry warehouse free from direct sunlight and without corrosive gases.

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

9.2.3 Products should be kept in order and inversion is prohibited.

The packing box should be keep a distance of at least 100mm with the ground and the wall.



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