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2019.07

**Automatic Lubrication Systems for  
Commercial Vehicles**

# About Us

## A WORLD LEADING BRAND IN CENTRALIZED LUBRICATION SOLUTION

### No.1 CLS Brand in China

Autol is the No.1 brand of centralized lubrication system in China with annual production capacity up to 200,000 units. Autol is an only organization establishing "Work Station for Academicians of Healthy Management of Smart Equipment Lubrication" in the centralized lubrication system industry.

### 9 Testing Laboratories

Autol has 9 product testing laboratories including Hydraulic R&D Testing Laboratory, Bearing Lubrication Laboratory, Environment Laboratory, Reliability Laboratory, Electronic and Electrical Laboratory, Hydraulic Quality Laboratory, Precise Measurement Room, Oil Testing and Analysis Laboratory and Materials Testing and Analysis Laboratory.

### We Export Products More Than 40 Countries and Regions

Autol exports products to more than 40 countries and regions and are highly appraised by overseas customers. Autol has offices in Germany, India and Philippines, sets up Lubmann research institute in Germany to accelerate its development of globalization.



### Autol Full-time R&D Team includes 85 Engineers.

Autol has full-time 85 engineers, including 1 academician, 5 doctors, 10 masters and other personnel with special expertise. It has established a long-term strategic partnership with such well-known universities and institutes such as Tsinghua University, PLA Information Engineering University, Tianjin Research Institute for Advanced Equipment.

### More Than 100 Technical Patents

Autol centralized lubrication system products have applied for more than 100 technical patents at home and abroad. They are widely applied to commercial vehicles, wind power generation, construction machinery, military machinery, metallurgy, port machinery, etc.

### More Than 500,000 Units of Lubrication in Service

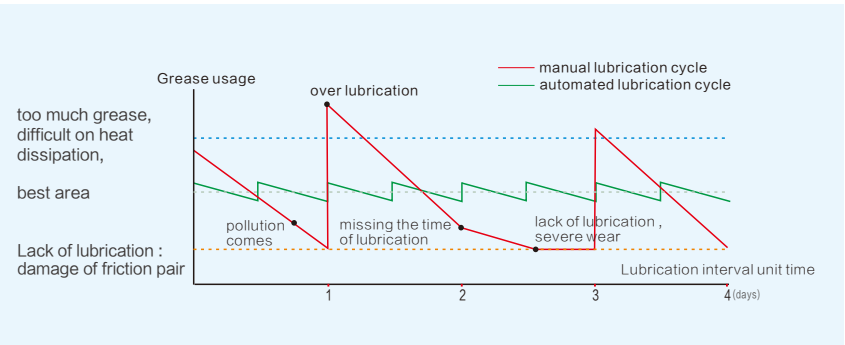
Up to now, more than 500,000 units of Autol lubrication equipment are in service, which are widely distributed in commercial vehicles, wind power, construction machinery.

# Value of Autol Centralized Lubrication Solution

It features long time interval of maintenance and repair, reduced costs of spare parts, increased operating hours and high operating efficiency.

Good lubrication may prolong equipment maintenance interval, reduce frequency of maintenance and repair, and therefore save maintenance materials, reduce downtime and increase operating efficiency.

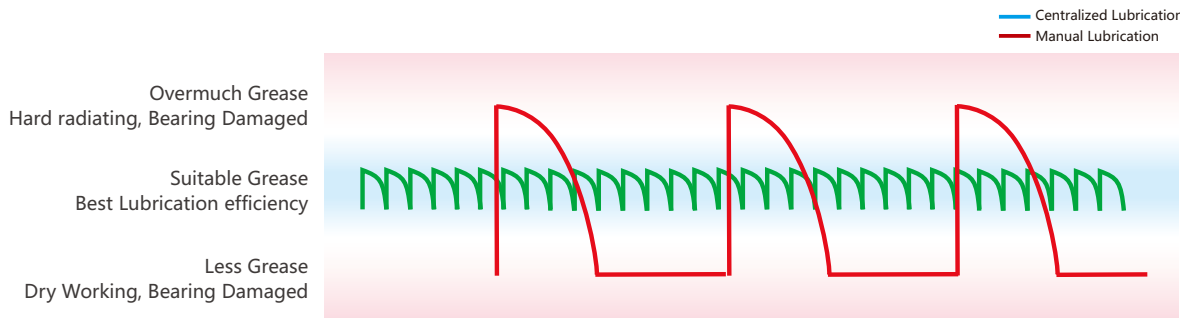
Comparison between manual lubrication and automated lubrication on same lubrication cycle



comparisons on project	manual lubrication	Automated lubrication	Benefits of Automated lubrication
grease cost	20 days/1kg/time 18times/year	0.625 days/0.08kg/time	save grease cost about USD 37.00 per equivalent cycle
lubrication labor cost	standard project 18 times/year 20 days/2 hours/usd 4.50/time	manpower free	save labor cost about USD 160 per equivalent cycle
save fuel costs	long-term friction ,strenuous operation,increased fuel consumption	Convenient operation	saving 1-3% fuel per 100,000 kilometers,about USD 573
maintenance cost	Frequent maintenance, decrease bus operating rate	No need for frequent maintenance	save 6 times basic maintenance check, 2 times deep maintenance check per year, estimated benefits about USD 420

The service life of the lubrication parts could increased by 60% and above.

For the conventional manually operated lubrication, the grease filled is uneasily controlled and leakage from grease nipple, dust, etc. will be entrapped into the friction pair causing worse wear. For the centralized lubrication system, the grease lines are fully enclosed to ensure clean lubrication. The service life of the lubrication parts could increased by 60% and above due to grease supply at fixed time, fixed amount and high frequency.



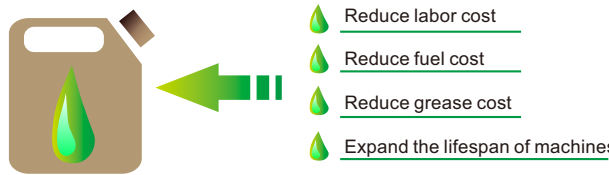
Mechanic automation could save labor by 95% for realization of safety production.

During equipment operation, lubrication at fixed time, point and amount could save labor by 95%, reducing work on equipment under complicated operating conditions and ensuring safety of work.

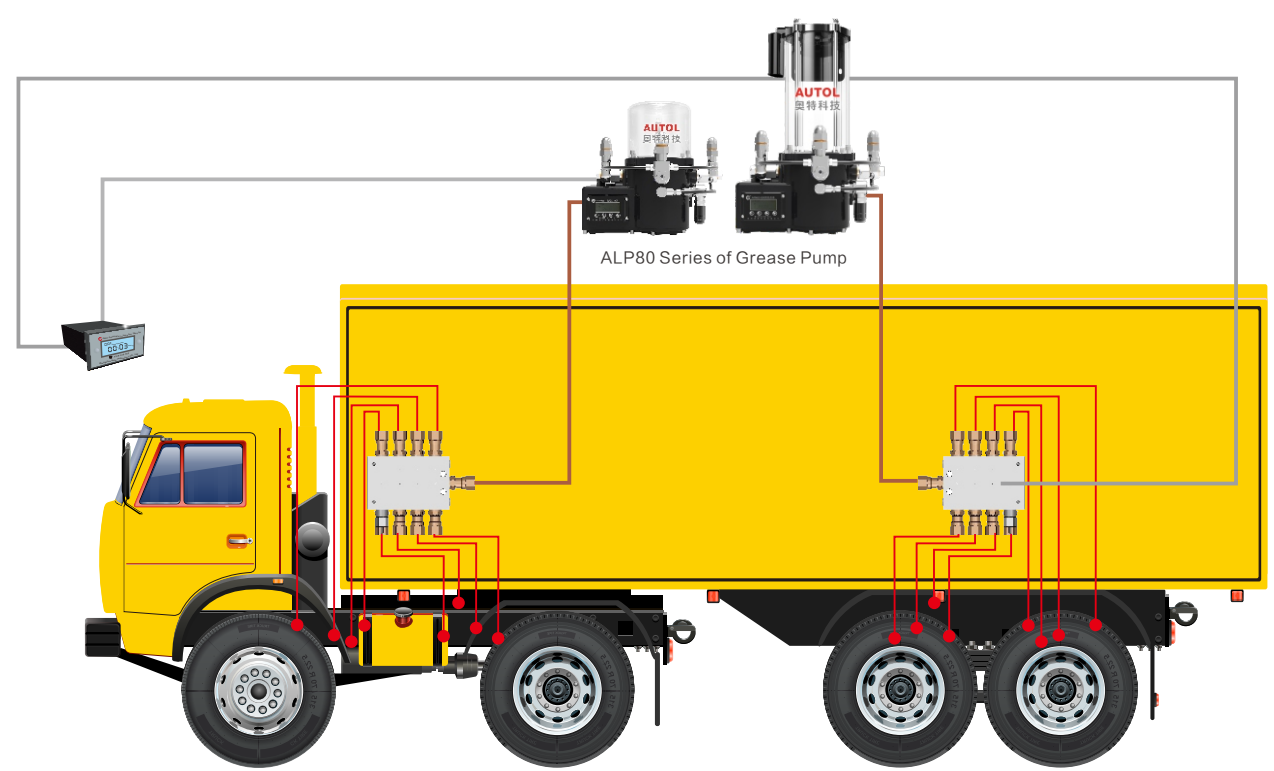
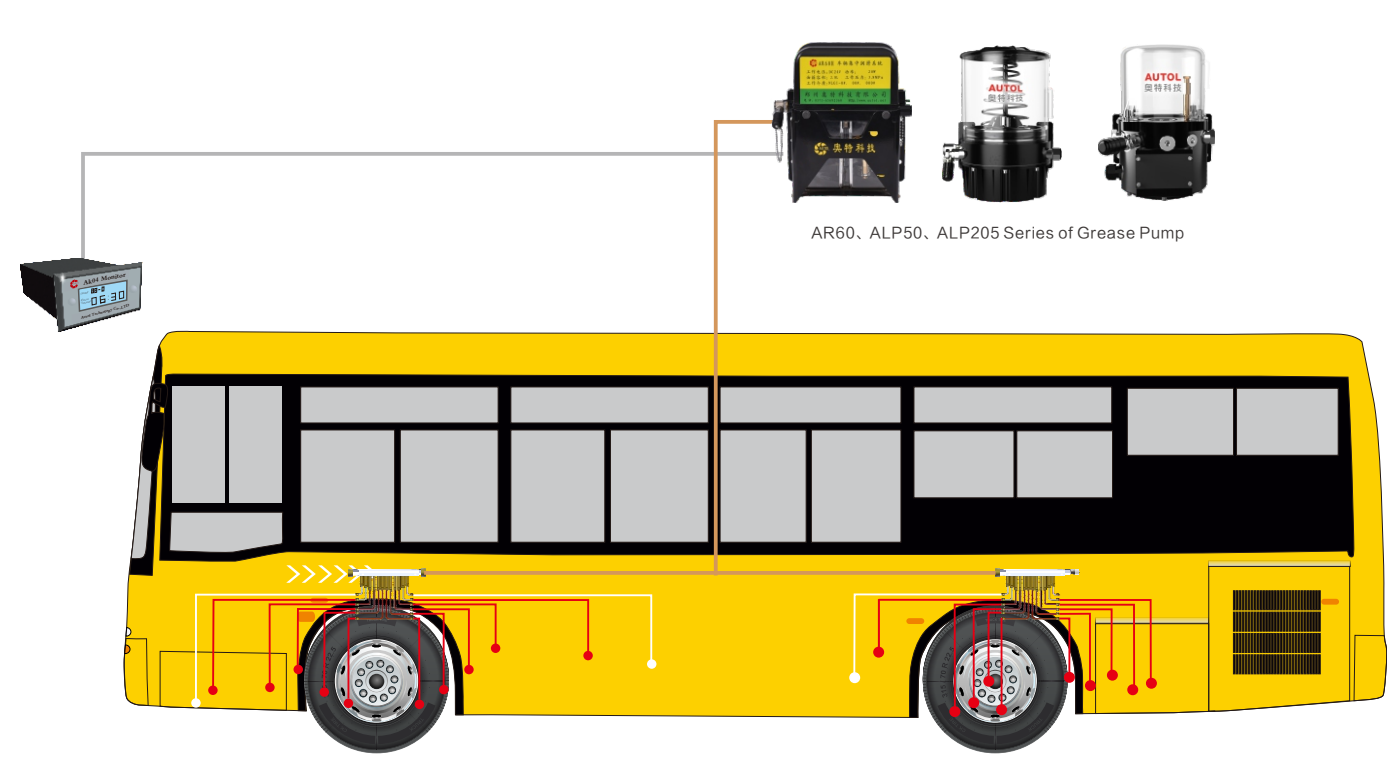


Energy saving and environmentally friendly: Grease reduced by over 70%.

Conventional manually operated lubrication causes large amount of grease waste. The centralized lubrication system can supply clean pressurized grease to the designated lube points with fixed amount at fixed time during operation for optimal lubrication, causing reduction in grease consumption over 70%.



# Commercial Vehicles Solution



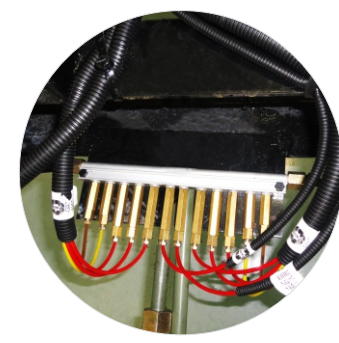
**Monitor -**  
It is the brain of the system. Its function is to monitor and dynamically display the real-time data from the system.



**Pump -**  
It's the heart of the system and delivers the grease from the reservoir to the grease distributors at high pressure.



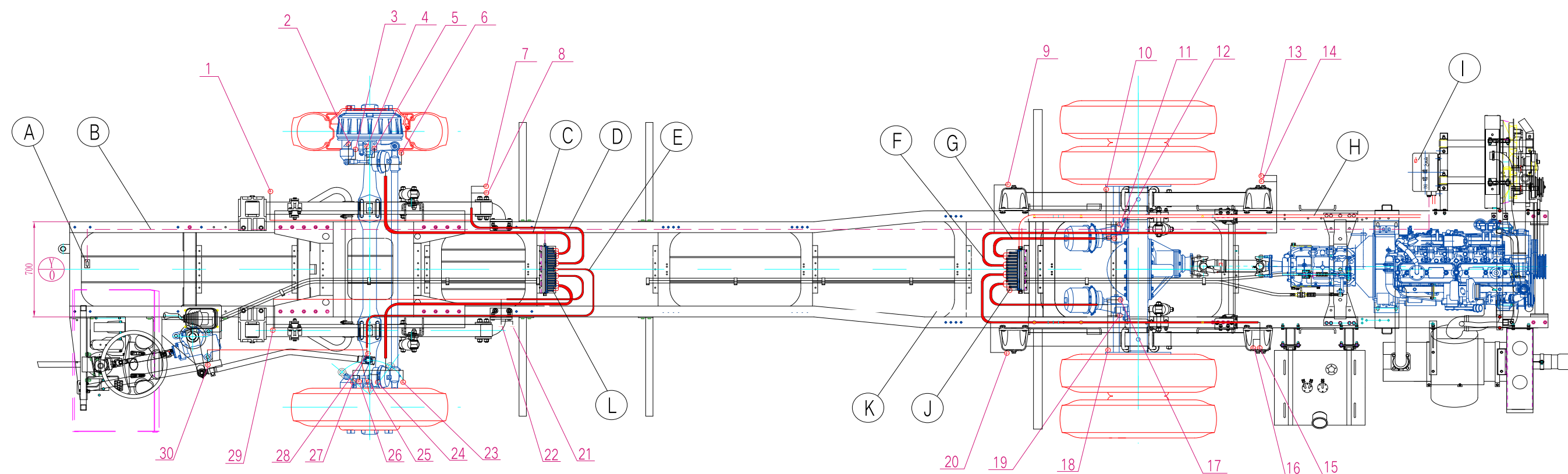
**Lube Points -**  
Each vehicle has different numbers of lube points, which need to be lubricated regularly.



**Distributor -**  
They deliver grease to the lube points in the quantities required.



# Commercial Vehicles Solution



## Lubrication Points

- |                                            |                                             |
|--------------------------------------------|---------------------------------------------|
| 1 Front pin of Plate Spring in Front Axle  | 16 Moving Pin in Rear Axle                  |
| 2 Camshaft stand                           | 17 Adjusting arm                            |
| 3 Adjusting Arm                            | 18 Camshaft                                 |
| 4 Up Point in Main pin                     | 19 Camshaft                                 |
| 5 Down point in Main Pin                   | 20 Front Pin of Plate Spring in Rear Axle   |
| 6 Tie Rod                                  | 21 Fixed Pin of Plate Spring in Front Axle  |
| 7 Fixed Pin of Plate Spring in Front Axle  | 22 Moving Pin of Plate Spring in Front Axle |
| 8 Moving Pin of Plate Spring in Front Axle | 23 Tie Rod                                  |
| 9 Front pin of Plate Spring in Rear Axle   | 24 Up Point in Main pin                     |
| 10 Camshaft                                | 25 Down point in Main Pin                   |
| 11 Camshaft                                | 26 Camshaft                                 |
| 12 Adjusting arm                           | 27 Adjusting arm                            |
| 13 Fixed Pin of Plate Spring               | 28 Rear Point in Drag Link                  |
| 14 Moving Pin in Rear Axle                 | 29 Front Pin of Plate Spring in Front Axle  |
| 15 Fixed Pin of Plate Spring               | 30 Front Point in Drag Link                 |

## Configuration of Lubrication System

- |   |          |                                            |
|---|----------|--------------------------------------------|
| A | Ak04     | Monitor                                    |
| B | AR-XS    | Assembly of Wires Bundle                   |
| C | AR-07    | Pipes Bundle of Steering in Front Axle     |
| D | AR-08    | Pipes Bundle of Plate Spring in Front Aode |
| E | AR-09    | Pipes Bundle of Drag Link                  |
| F | AR-11    | Pipes Bundle of Plate Spring in Rear Axle  |
| G | AR-10    | Pipes Bundle of Brake in Rear Axle         |
| H | AR-06    | Assembly of Main Pipes in Rear Axle        |
| I | AR60H    | Pump Station                               |
| J | AR-03/04 | Assembly of Distributors in Rear Axle      |
| K | AR-05    | Assembly of Main Pipes in Front Axle       |
| L | AR-01/02 | Assembly of Distributors in Front Axle     |



# Remote Control and Monitoring System Solution of Construction Machinery Lubrication

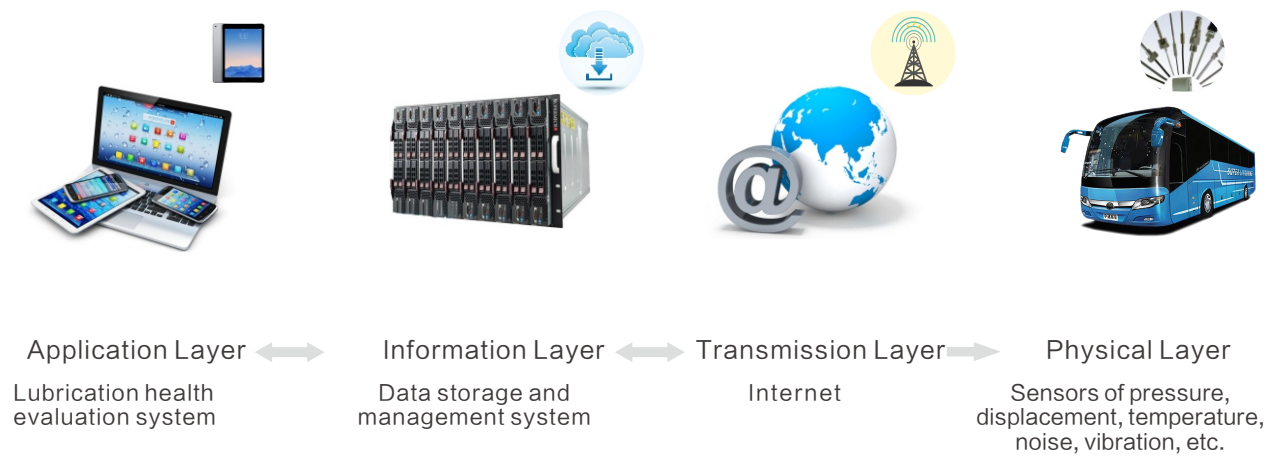
## System components and advantages

The system consists of centralized lubrication system server, wireless receiver-transmitter, Web client, centralized lubrication system, SMS service, and smart mobile phone client.

1. It supports mobile phone SMS inquiry function to know lubrication conditions at lube points whenever and wherever possible.
2. The Web client allows for checking operating conditions of the whole lubrication system, user management, lubrication parameters, and lubrication report.
3. Application of modern networking technology to network the distributed lube points. The personnel responsible for management and maintenance may know the lubrication operating conditions whenever possible.
4. The wireless remote monitoring system allows for checking lube points information on faults, without troubleshooting point by point, with less labor intensity of maintenance personnel.
5. The level information of every set of lubrication system and the operating condition of every distributor may be checked in a timely manner.
6. With the wireless remote monitoring system, the lubrication parameters of lube points can be set and checked.

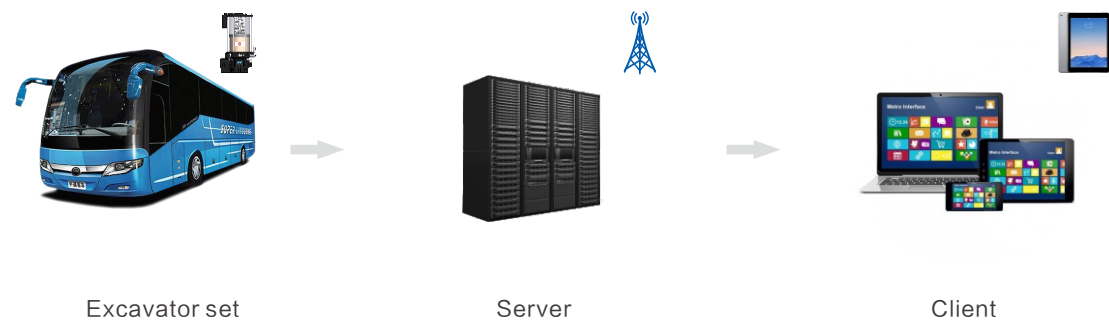


## Equipment Health Management System



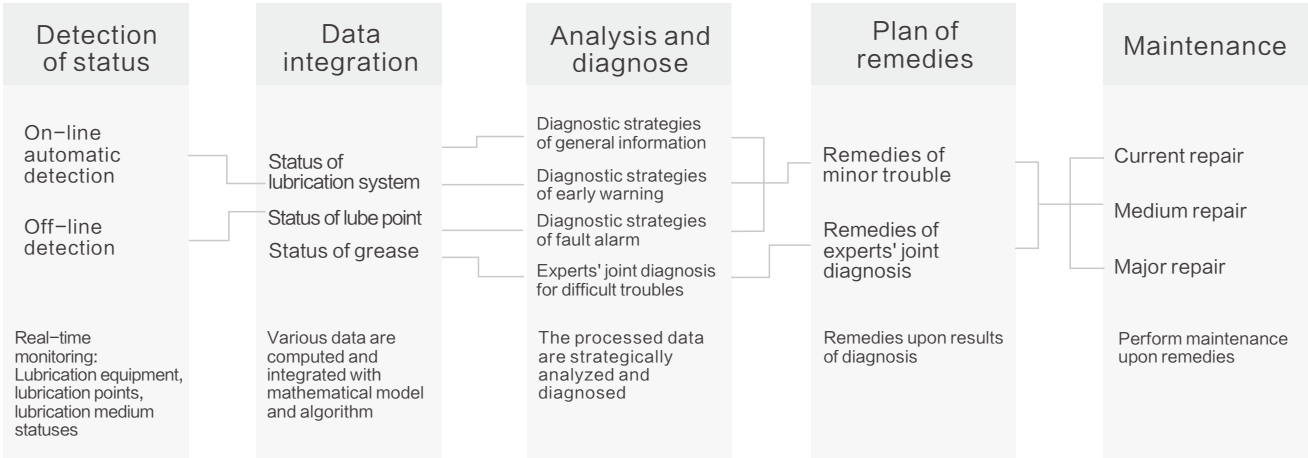
Note: It is active when the mobile phone signal ( 3G/4G ) is available under fibre-optical network conditions.

## Wireless Remote Monitoring System



Note: It is active when the mobile phone signal ( 3G/4G ) is available under fibre-optical network conditions.

## Health Management Business Mode



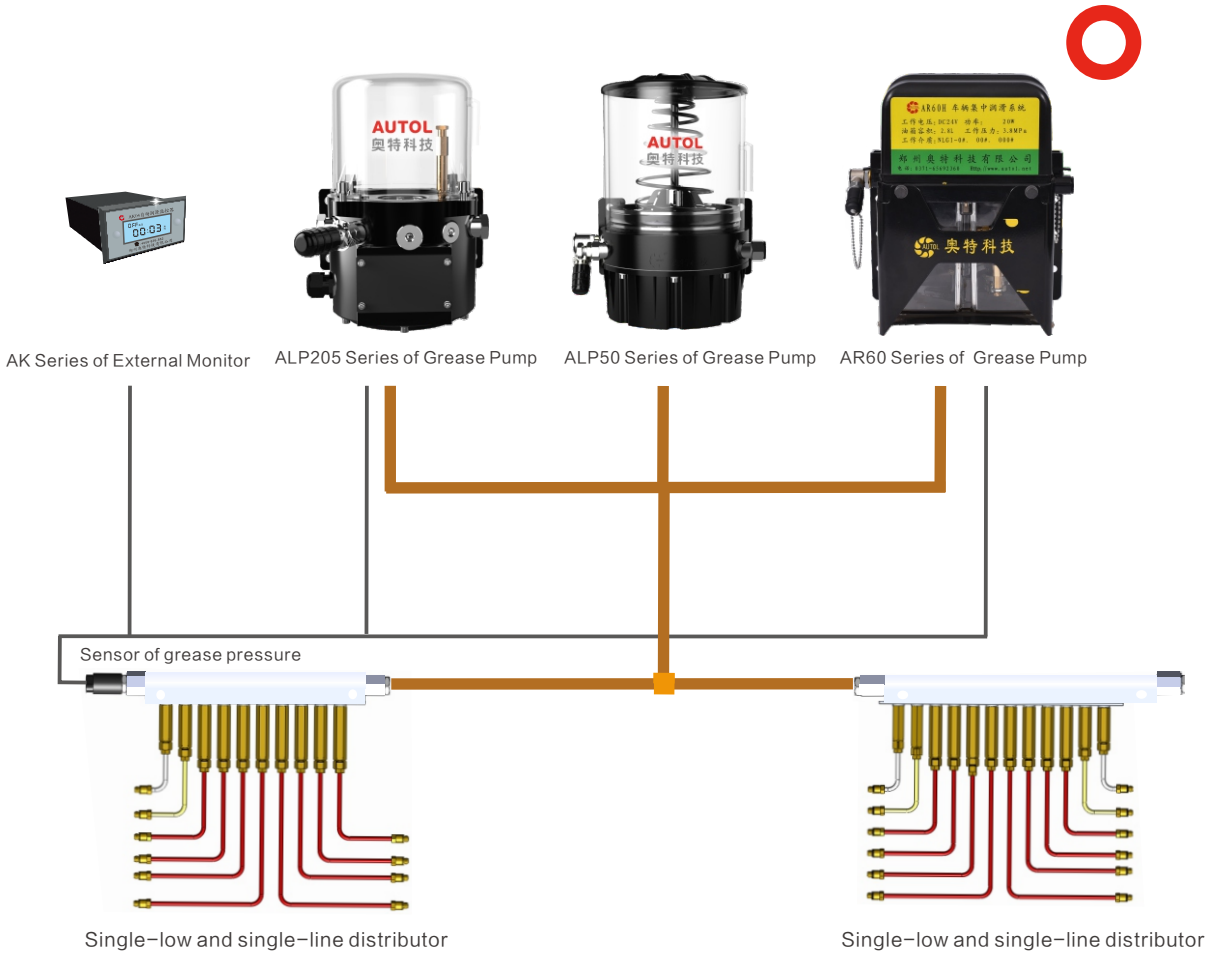
# Single-row Single-line CLS

The single-row and single-line centralized lubrication system is designed with LED control, monitoring and working cyclically.

After the amount is fixed by different plungers of the single-row and single-line distributor, the grease supplied by the grease pump is delivered to all the lube points.

NLGI-000, NLGI-00, NLGI-0 grease available.

It applies to mechanical equipment for construction machinery, commercial vehicles, metallurgy, port, wharf, ship, crane, woodworking, food, construction project, material handling etc.

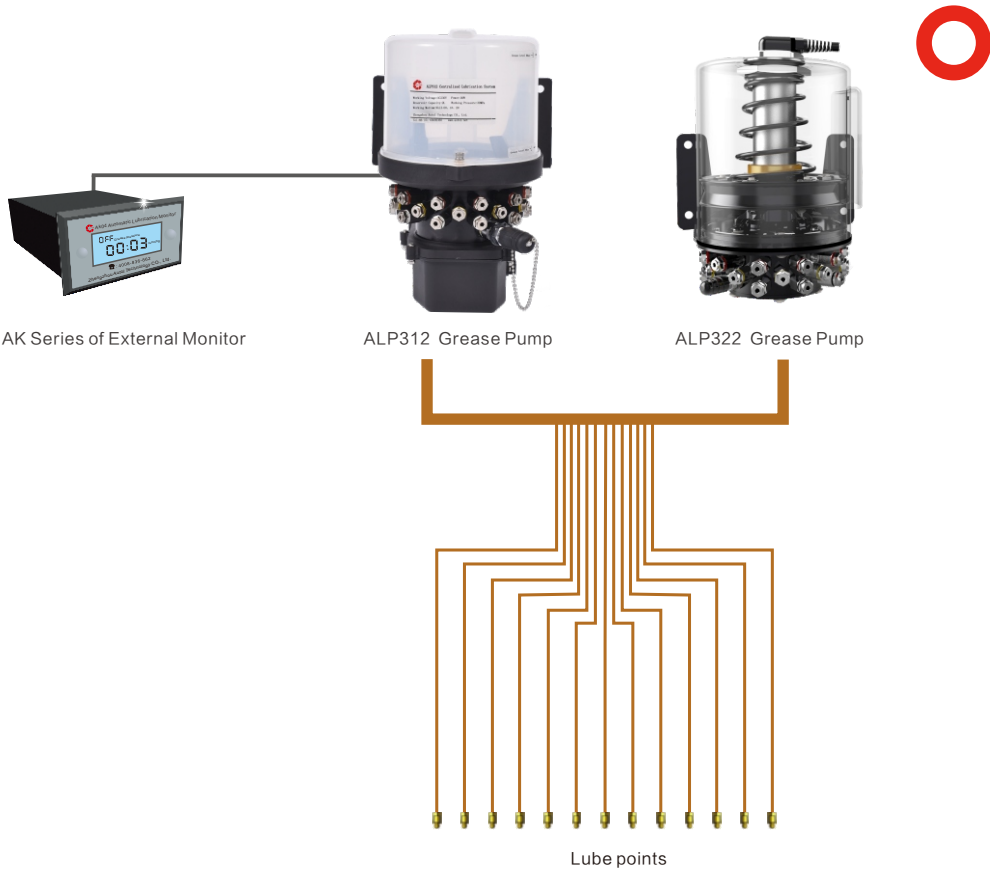


# Multi-point CLS

The centralized lubrication system with multi-point pump is a simple and efficient centralized lubrication system, featuring advantages as simple structure, easy installation, no grease distributor, and high operating reliability, etc.

The grease lines in the system are relatively independent each other. Failure to a single grease line will have no influence on the system.

It applies to mechanical equipment for construction machinery, commercial vehicles, metallurgy, harbor, wharf, ship, crane, woodworking, food, construction project, etc.

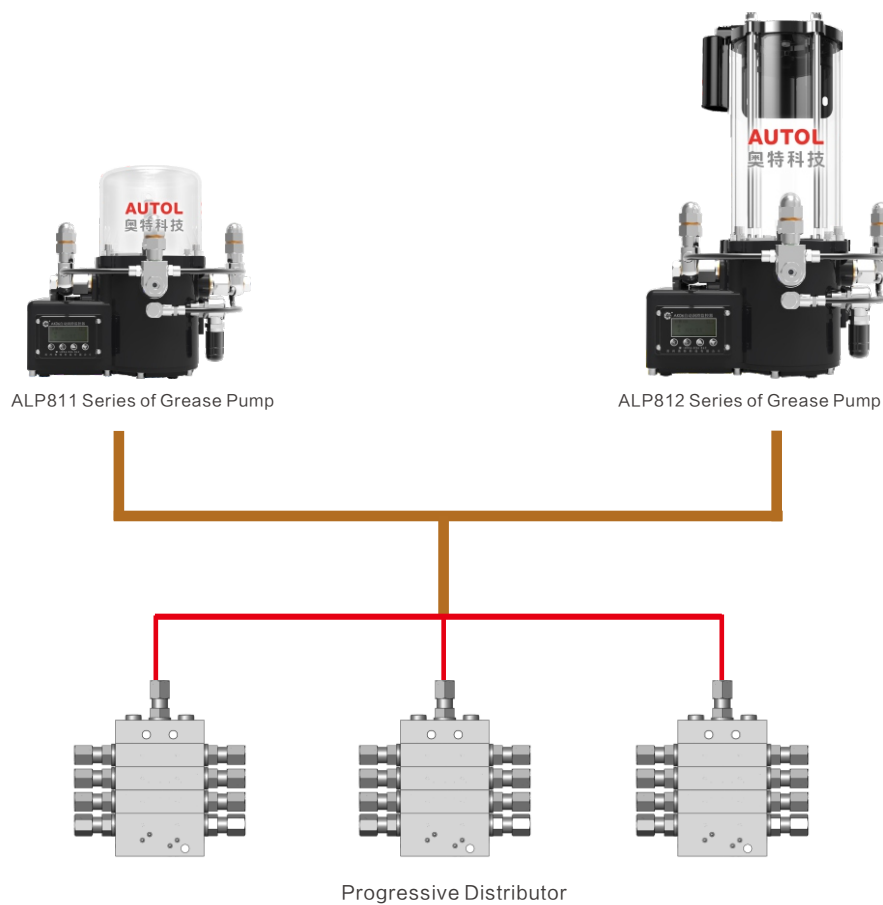


# Progressive CLS

The progressive centralized lubrication system is designed with LED control and monitoring and working cyclically. After the amount is fixed by the single-low and single-line distributor, the grease supplied by the grease pump is delivered to all the lube points.

NLGI-0, NLGI-1, NLGI-2 grease available.

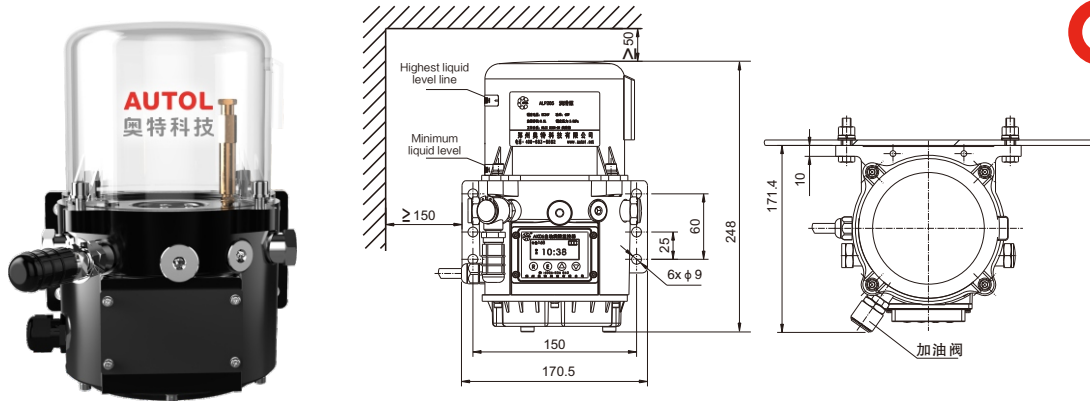
It applies to mechanical equipment for construction machinery, metallurgy, harbor, wharf, ship, crane, woodworking, food, construction project, etc.



# ALP205 Series Piston Pump

ALP205 centralized lubrication pump was organized by 24V DC motor, gear pump, overflow valve, unloading valve and transparent fuel reservoir ,it also set up with quick refueling valve which can be refueled easily and convenient.

The pump has high pumpability performance , pressure of the distributor can automatically increase with the temperature drop in cold air conditions , the temperature control sensor provide the system in fuctional even temperature below -15℃ country or area.



Technical Data of ALP205 Series of Lubrication Pump

Model	Control mode	Nominal flow	Maximum operating pressure	Capacity	Height	Parameters of motor	Grease available	Suitable temperature
ALP205	External/ built-in monitor	90mL/min	Room temperature 3.8MPa	1L	248mm	40W DC24V/2.5A	NLGI-0#, 00#, 000#	-40℃~70℃

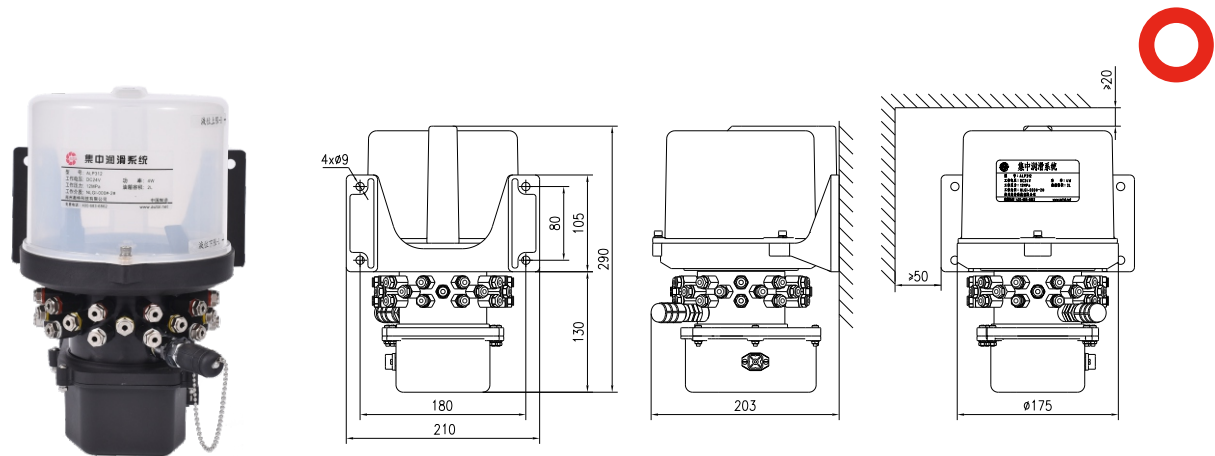


# ALP30 Series Piston Pump

The AL30 system is a simple and efficient centralized lubrication system, featuring advantages as simple structure, easy installation, no grease distributor, and high operating reliability, etc. The grease lines in the system are relatively independent. Failure to a single grease line will have no influence on the system.

It applies to welding robot, commercial vehicle, etc.

The reducer motor drives the eccentric wheel to rotate in the pump and in turn to reciprocate plungers which deliver grease to the pairs of friction components through individual supply lines.



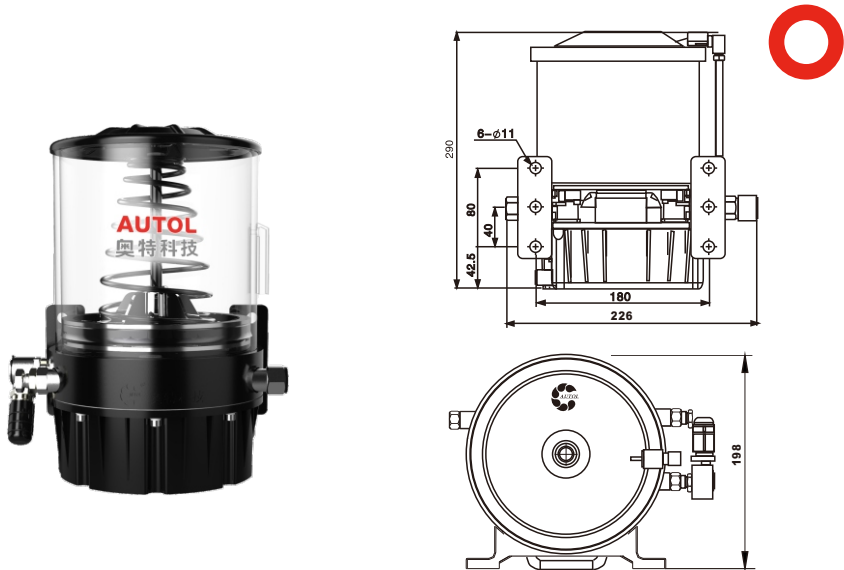
Technical Data of ALP312/ALP322 Series of Lubrication Pump

Model	Control mode	Number of plungers	Pressure output	Capacity	Height	Parameters of motor	Grease available	Suitable temperature	Revolution	Displacement of plunger
ALP312	External monitor	30	12MPa	2L	290mm	24V/4W	NLGI-000 <sup>0</sup> -2 <sup>0</sup>	-40℃~70℃	2r/min	0.015ml/cy(white) 0.02ml/cy(yellow) 0.04ml/cy(red)
ALP322	External monitor	29	12MPa	1.1L	265mm	24V/4W	NLGI-000 <sup>0</sup> -2 <sup>0</sup>	-40℃~70℃	1r/min	

# ALP50 Series of Grease Pump

AL50 series of centralized lubrication system is a parallel single-line centralized lubrication system, consisting of gear pump, single-low and single-line distributor, and monitoring unit. The system is provided with spring pressurized grease tank to effectively solve the problem of grease trapped in the tank. It applies to mechanical equipment for construction machinery, commercial vehicles, metallurgy, harbor, wharf, ship, crane, woodworking, food, construction project, etc.

In the system, the ECU LCD-based monitor controls the grease pump to operate cyclically. When it is running, the motor drives the gear pump to suck and discharge the grease. After the high pressure grease enters into the supply line, it is delivered to the lube points via the single-line distributor. Upon completion of operation, the system is unloaded.



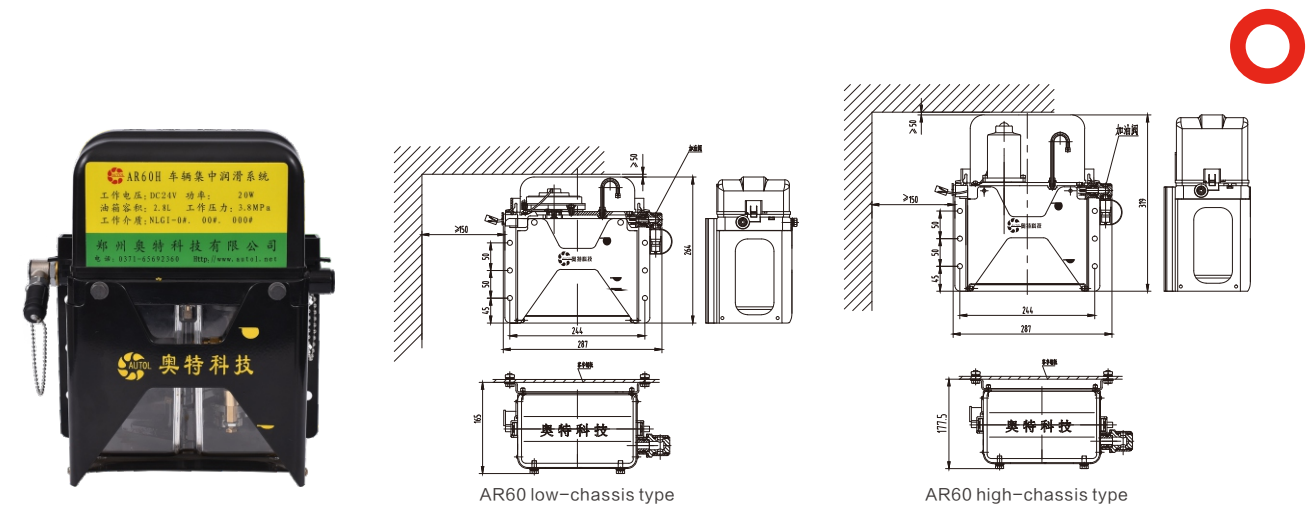
Technical Data of ALP502 Series of Lubrication Pump

Model	Control mode	Nominal flow	Maximum operating pressure	Capacity	Height	Parameters of motor	Grease available	Suitable temperature
ALP502	External monitor	55ml/min	4.5MPa	2L	290mm	DC24V/20W	NLGI-0#, 00#, 000#	-40℃~70℃

# AR60 Series of Grease Pump

AR60 series of centralized lubrication system is a parallel single-line centralized lubrication system, consisting of gear pump, single-row and single-line distributor, and monitoring unit. The system may increase the grease suction performance of the grease pump and grease filling performance of the distributor and could solve the difficult problem that grease is accumulated on the tank bottom. It applies to mechanical equipment for construction machinery, commercial vehicles, metallurgy, harbor, wharf, ship, crane, woodworking, food, construction project, etc.

In the system, the ECU LCD-based monitor controlled the grease pump operates cyclically. When it is running, the motor drives the gear pump to suck and discharge the grease. After the high pressure grease enters into the supply line, it is delivered to the lube points via the single-line distributor. Upon completion of operation, the system is unloaded.



Technical Data of AR60 Series of Lubrication Pump

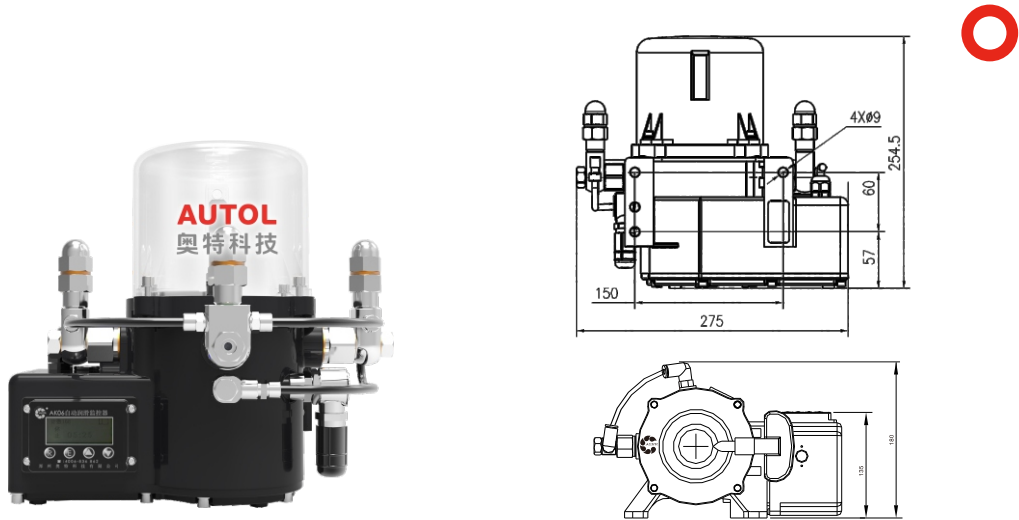
Model	Control mode	Nominal flow	Maximum operating pressure	Capacity	Height	Parameters of motor	Grease available	Suitable temperature
AR60	External monitor	90mL/min	3.8MPa	2.8L	320mm	20W 12V/24V	NLGI-00#, 000#	-40℃~70℃
AR60H		120mL/min			265mm		NLGI-0#, 000#, 00#	
AR60HL								

# ALP80 Series Piston Pump

AL80 series of centralized lubrication system primarily consists of high-pressure lubrication pump, distributor and monitor.

The AL80 series applies to mechanical equipment of construction machinery, wind power, port, electric power, mining, crane, engineering, wood working, beverage machinery, etc.

In the system, the ECU LCD-based monitor controlled the high-pressure grease pump operates cyclically. During operation, the reducer motor drives the eccentric wheel to reciprocate the plunger pair for grease pumping. After the pressurized grease enters into the supply line, the grease is supplied to lube points via the distributor metering chamber.



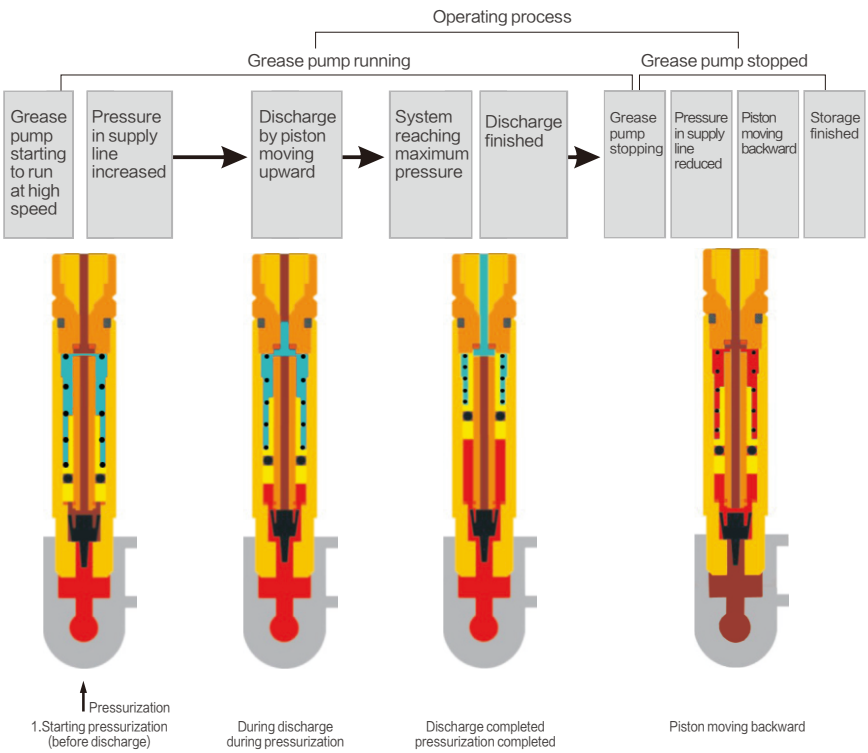
Technical Data of ALP80 Series of Lubrication Pump

Model	Control mode	work time	Nominal flow	Maximum operating pressure	Capacity	Height	Parameters of motor	Grease available	Suitable temperature
ALP80	External/built-in monitor	1~99min	2~5ml/min	35MPa	1L	328mm	24VDC 30W	NLGI-0#, 1#, 2#	-40℃~70℃
					2L	378mm			

# Single-row Single-line CLS

The discharge pressure of the single-row single-line distributor comes from pressure in the supply line. At normal temperature, the maximum discharge pressure may be up to 3.0 Mpa. Under low-temperature environment, the discharge pressure will be automatically increased with reduced air temperature. After the grease pump is stopped, the distributor storage chamber meters the grease stored.

Maximum operating pressure: 6.3 Mpa  
Grease available: NLGI-000#、00#、0#  
Displacement: 0.1、0.13、0.2、0.4ml/cy

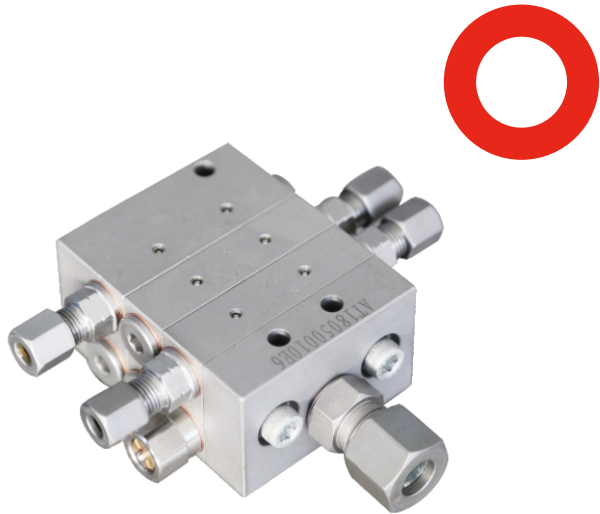


- 1.The umbrella valve inside the distributor moves upward under the pushing force of the pressure grease in the supply line.
- 2.The umbrella valve seals up the center hole in core rod. And, the high-pressure grease in the supply line pushes the piston to move upward against the spring resistance to discharge the grease remained in the upper chamber of the previous cycle.
- 3.The grease discharge is finished when the piston moves to the top of the upper chamber.
- 4.The unloading valve will automatically be opened when the grease pump is stopped. Now, the high-pressure grease inside the supply line flows back via the unloading valve, allowing that the system pressure drops rapidly. Then, the piston of the distributor returns under the action of the spring. And, the umbrella valve is reset to seal up the grease inlet. Next, the piston delivers grease from the lower chamber to the upper chamber through the center hole in core rod. Thus, the grease supply is also ready for the next cycle.

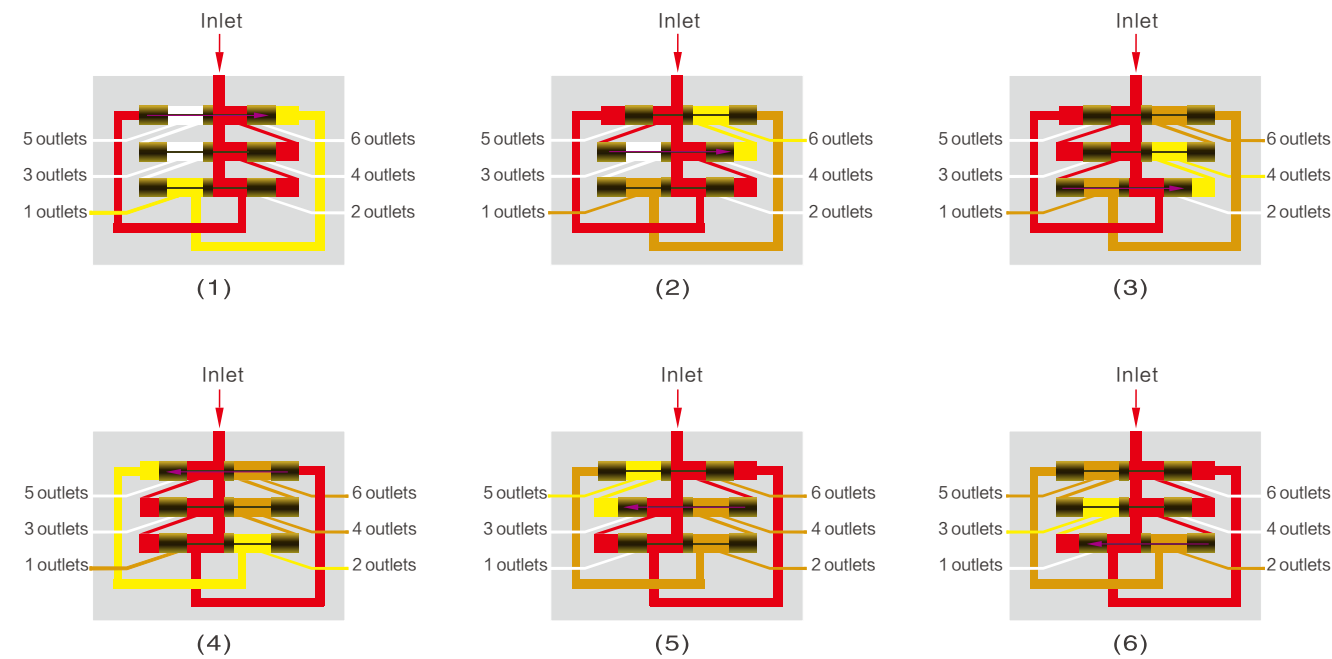
# SSV Progressive Distributor

Through sequential actions of plungers, the progressive distributor progressively supplies lube points. It may be constructed with blocks or pieces. A block-type distributor is structured with one block, with outlet being connected with 6/8/10/12/14 ways, with high operating pressure, suitable for heavy-duty machinery. A piece-type distributor consists of one front piece, one rear piece and intermediate pieces. Each intermediate piece is designed with 2 outlets. Each group of intermediate piece include 3 to 8 pieces. Each delivery may be independently design, depending on plunger area and stroke.

Maximum operating pressure: 30MPa  
Grease available: NLGI-0#、1#、2#  
Displacement: 0.2mL/cy



## Operating Principle



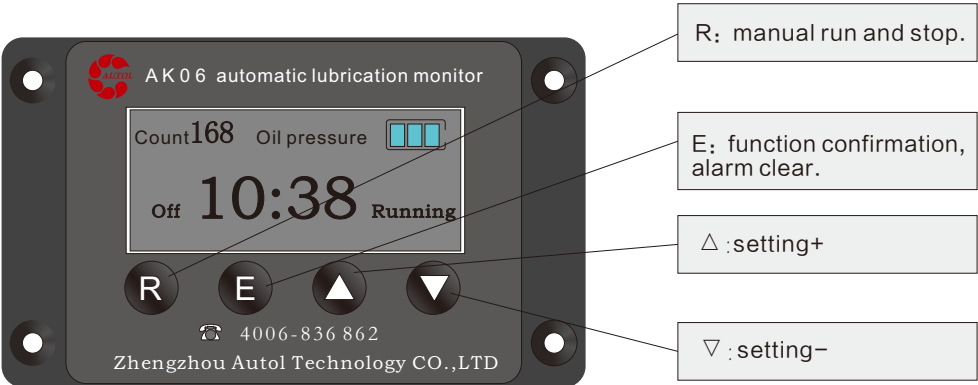
For a progressive distributor, plungers act in sequence. The pressure grease enters from the inlet of the distributor. The internal plungers act in sequence. As a result, the grease is delivered to lube points in turn. After the plungers stop moving for a long time, the high-pressure grease is supplied into the distributor again. And, the plungers will

immediately move from the stopping point of last movement. After the previous plunger has finished filling, the next plunger can only be activated by the pushing force of the pressure grease (As an example, the following figure shows a block-type structure with 6 outlets).



# Monitor

## Built-in Monitor



### Important information:

Press and hold both "▲" and "▼" for 4s and above and press the "E" to enter into the mode of setting. It is automatically locked after exiting the mode of setting. Press briefly the "E" to enter into the setting interface and press briefly in turn the "E" to select the setting items "1P, 2P, 3P and 4P". Confirmed.

1P: Press briefly the "▲" or "▼" to set the off time ( 1 to 30 h, customizable ) ;

2P: Set the number of pulses to be detected (0 to 99 min, customizable);

3P: Press briefly the "▲" or "▼" to set the operation time ( 1 to 60 min, customizable ) ;

4P: Press briefly the "▲" or "▼" to set the low-temperature standby temperature ( -50℃ to 0℃); Briefly press the "E" to confirm entering into the "OFF" state.

Special Attention!  
This monitor is designed with function against misoperation:



## Setting Interface

1 Off status

2 Oil quantity pulse not detected during operation

3 Oil quantity pulse detected during operation

4 Low-temperature standby

5 Low level early warning status

6 Low level early warning status

7 Alarm due to lack of grease  
(Alarm sends and the machine will be shut down after 6 consecutive operations, the alarm will be automatically acknowledged after the tank is fully filled)

8 Alarm due to insufficient filling  
(It has no influence on system operation. Fault will be automatically cleared at the time of next normal operation)

# Monitor

## Remote Monitor

As a control center of the lubrication system, the monitor is used to dynamically display the grease pressure signal in the grease line, time countdown to the OFF state, operating hours, total number of operations and fault code, etc. It features protection for standby at low temperature and fault alarm. The monitor may be built-in or externally mounted. A built-in monitor is integrated with grease pump. An externally mounted monitor is installed for easy operation. The monitor is provided with a remote control, allowing for adjusting the system off time (1 to 30 h, non-standard, customizable) according to equipment operating conditions.



# Accessory



Electric Greaser



DC-801 Greaser

This greaser is supplied by 220 VAC and features such advantages as stable performance, high greasing efficiency, and wide scope of application, etc. It may be just inserted into 15 kg grease drum, quick and easy to fill with 0#-2# grease. Using distributor disc may cause higher filling efficiency.

The DC-801 greaser consists of a planetary reduction mechanism, an eccentric transmission structure, a plunger and a check valve sealing structure. The structure principle is simple, the performance is reliable, and the maintenance is convenient.

Voltage: AC220V/50Hz  
Displacement: 1L/min  
Maximum working pressure: 15MPa  
Weight: 16Kg  
Grease available: NLGI-00#, 0#, 1#, 2#, 3#

Voltage: DC24V  
Power: 300W  
Displacement: 350g/min  
Maximum working pressure: 40MPa  
Weight: 8.5kg  
Grease available: NLGI-0#, 1#, 2#



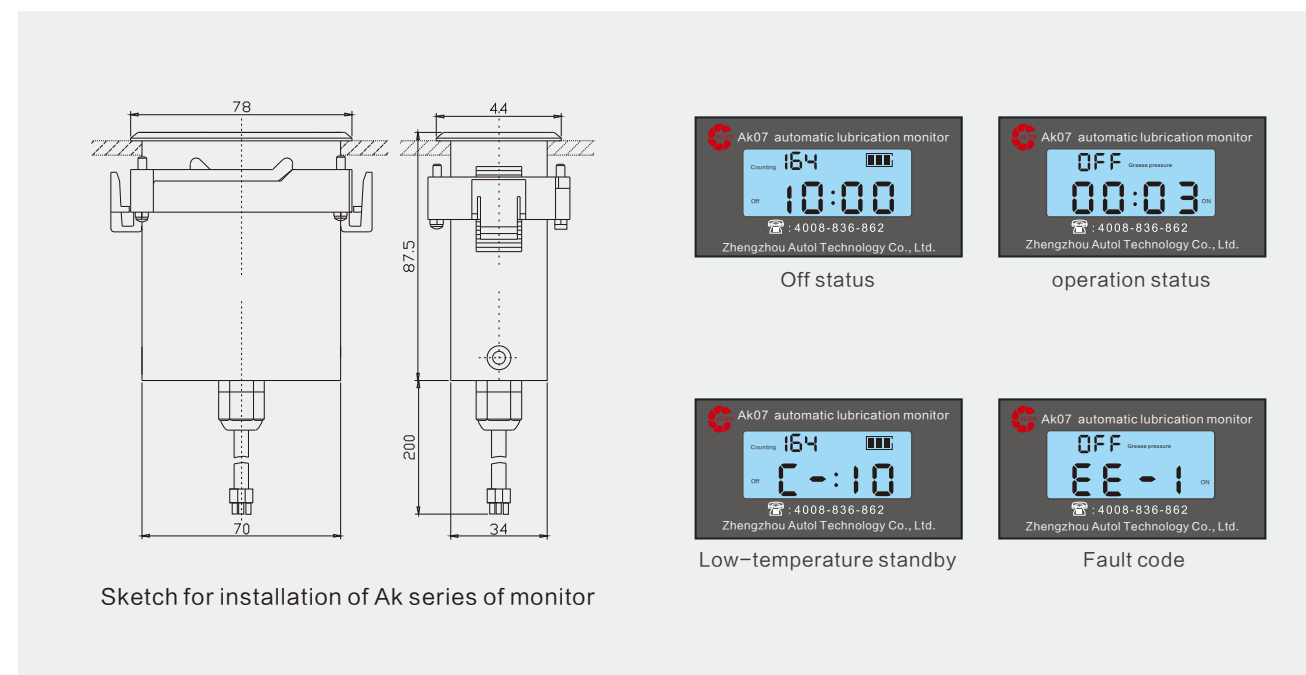
Manually Operated Grease Gun

Technical parameters:  
Displacement: 42ml/cy  
Grease: NLGI-0#, 1#, 2#



Greaser

This unit is a kind of tool used to suck grease manually from the drum and delivered into the grease tank of the various electric grease pumps. It is able to easily and efficiently fill electric grease pumps to avoid contamination of grease.



## Points of innovation:

It is designed with initiative intelligent temperature control technology to challenge the high altitude and extremely cold climate. The operating parameters may be dynamically displayed by an automatic ECU LCD-based system and microcomputer based automatic control. A CAN interface is reserved for remote wireless management via CAN platform.

# After-sales Services Freeing You From Worries

We keep forging ahead unswervingly to provide excellent products and best of the services to customers. We provide technical services to users with as quick response as possible and arrange regular visits to system inspection.

- 1. Before use of equipment, we will provide professional training services free of charge;
- 2. We will give instructions to installation and commissioning until normal operation.
- 3. After the equipment is put into service, we will go the customers' site for after-sales services such as follow-up inspection, etc. on a regular basis.
- 4. We provide training services to the users with respect to basic operation and routine maintenance of systems.
- 5. During warranty period, Autol will unconditionally replace or repair the defective products (if any) due to their quality.
- 6. For the products from the other manufactures, which were used by the customers in the past, we will provide service for the same.



# Marketing Network

## In China



Except Hong Kong special administrative region, the Autol's marketing network covers 23 provinces, 5 autonomous regions, 4 municipalities directly under the central government and 1 special administrative region.

## In the world



In 2015, Autol established Lubmann GmbH Research Institute for Lubrication in Germany, one of eight major industrial countries in the world. At present, the Autol's marketing network covers more than 40 countries and regions such as USA, Germany, Russia, France, Japan, India, South Africa, etc.

Cooperative Partner

