奥特科技 AUTOL 集中润滑专家

AR60/AL50/AL20 系列
AR60/AL50/AL20 Series

集中润滑系统使用说明书
Centralized Lubricating System Operation Manual

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Zhengzhou Autol Technology Co. Ltd.

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一、系统概述
I. System Overview

AR60、AL50、AL20 系列集中润滑系统是奥特科技有限公司经过长期市场调研和技术创新，研发的新一代集中润滑系统，拥有多项技术发明专利。目前，已广泛适用于商用车、工程机械设备等行业。

AR60, AL50 and AL20 series is a new generation of centralized lubricating system developed by Autol Technology Co. Ltd. after long-term market research and technological innovation. The system has a number of technical invention patents. Currently, the system is widely used in commercial vehicle, construction machinery equipment and other industries.

该系统是通过成套的供油系统按需对设备的各个必要润滑部位进行供油作业。可以起到减小摩擦阻力、减少接触磨损、降低摩擦表面温度的作用,同时还起到一定的防锈、减震和密封辅助作用。

The system supplies grease to all necessary lubricating parts of the equipment as required via a set of complete grease supply system. It can reduce friction resistance, contact wear and temperature of the friction surface. In addition, it helps to avoid corrosion, shock absorption and keep sealing performance.

二、系统结构与工作原理
II. System Structure and Operation Principle

2.1 系统组成
2.1 System composition

集中润滑系统由监控装置、泵油装置、分配器、管路附件组成。泵油装置和分配器通过管路附件把设备上分布的数十个油脂润滑点连成一完整的封闭系统。系统在监控装置控制下运行，自动地向各摩擦副定时、定量强制供油，以确保各摩擦副润滑良好。

Centralized lubricating system is composed of monitoring device, grease pump device, distributor, piping accessories etc. Grease pump device and distributor connect tens of grease lubricating points distributed around the equipment together to make them as a complete closed system through piping accessories. System operates under monitoring device to supply grease to each friction pair regularly and quantificationally, so as to ensure each friction pair are lubricated well.

监控装置由监控器和传感器（油压传感器、温度传感器）等组成。

Monitoring device is composed of monitor and sensor (grease pressure sensor, temperature sensor).

监控器——即微电脑程序监视控制装置，是系统运行的控制中枢，实时监控并动态显示油路油压、休止倒计时、运行计时、累计工作次数及故障代码等各运行参数，并具有过载保护和故障报警功能。AR60/AL50/AL20 系列集中润滑系统配置 AK 系列监控器；

Monitor —— namely microcomputer program monitoring control device, is the center to control system operation. It monitors and displays dynamically various operation parameters in real time such as grease pressure in grease pipeline, rest countdown, operation time, cumulative operation times and fault code etc. Moreover, it has overload protection and fault alarm function. AR60/AL50/AL20 series centralized lubricating system is equipped with AK series monitor;

油压传感器——监测系统主油管路最远端的的油脂压力，并将信号传输到监控器；

Grease pressure sensor——monitors grease pressure at the farthest end of system main grease pipeline, and sends signal to the monitor;

温控传感器——对于年最低气温低于-15℃的区域，系统设置温控传感器，监测环境温度，并将信号传输到 AK 系列监控器；

Temperature control sensor——for areas where annual minimum temperature is below -15℃, a temperature control sensor is set to monitor ambient temperature and transmit signal to AK series monitor;

泵油装置——是系统的运行核心，将油箱内的润滑脂以较高压力泵出。包括
Grease pump device——operation core of the system,which is used to pump out the grease from tank at high pressure. It includes

AR60/ALP50/ALP20 系列润滑泵。
AR60/ALP50/ALP20 series lubricant pump.

分配器——根据不同摩擦副的润滑脂需求量，存储定量的油脂并供给各润滑点；AR60/AL50/AL20 系列集中润滑系统使用定量加压式分配器；
Distributor——stores certain volume of grease according to grease requirement of various friction pair and supplies to each lubricating point; AR60/AL50/AL20 series centralized lubricating system adopts quantitative pressurized distributor;

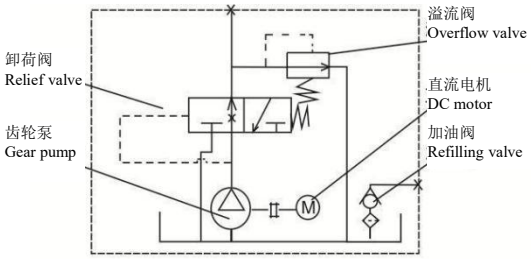
系统附件：主要包括电路、主油管路、分油管路、及管接头等，将系统各单元连成一完整的封闭系统。
System accessories: It mainly includes circuit, main grease pipeline, grease distribution pipeline, and pipe connector, etc., to connect all units of the system into a complete closed system.

系统结构原理图
System Structure Diagram

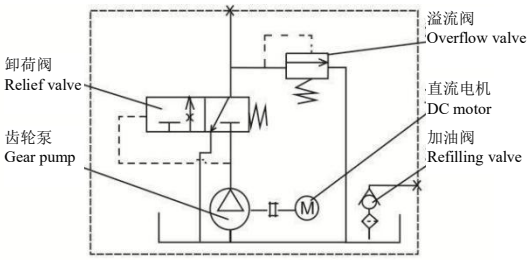
2. 2 工作原理
2.2 Operation principle

当休止倒计时结束，泵油装置受到监控器发来的启动指令，电机带动润滑泵运转，润滑泵吸入油脂，压送至卸荷阀，打开卸荷阀出油通道，开始对主油路加压供油，主油路压力升高到一定值时，将加压式分配器内储存的油脂压向各润滑点。当润滑泵站出口压力达到溢流阀开启压力时，余油经溢流阀小孔流回油箱。供脂泵站接受到监控器停机指令后电机停转，卸荷阀卸荷孔打开，主油路油脂倒流回油箱，主油路剩余压力约为 0.05MPa～0.2MPa。
When rest countdown ends, grease pump device receives start command from monitor and motor drives lubricant pump to operate. The lubricant pump sucks grease and drivers the grease to relief valve in a pressurized manner. Grease outlet channel of the valve is opened and system starts to apply pressure to main grease pipeline to supply grease. When pressure in main grease pipeline rises to a certain value, grease stored in pressurized distributor is supplied to each lubricating point. When pressure

at lubricating pump station outlet reaches overflow valve open pressure, redundant grease flows back to the tank through the small hole in the overflow valve. Motor stops running when lubricating pump station receives monitor stop command, relief hole of the relief valve opens, grease in main grease pipeline flows back into to tank, and residual pressure in the main grease pipeline is about 0.05MPa～0.2MPa.



泵站工作状态
Pump station operation condition



泵站休止状态
Pump station rest condition

泵站液压原理图

Pump Station Hydraulic Pressure Diagram

三、技术参数
III. Technical Parameters

参数：
Parameters:

使用温度 ：-40℃～70℃(低温环境下要求油脂能满足相应的低温性能)；类型：高泵送型润滑泵站；工作时间：油压传感器闭合后延续 40 秒；油箱容量：2.8L；
Operation temperature: -40℃～70℃ (The grease is required to meet the corresponding low temperature performance at low temperature); Type: High - pumping lubricating pump station; Operation time: 40s delay after grease pressure sensor is closed; Capacity of tank: 2.8L;

电机参数：DC24V/20W(或 DC12V/20W)；
Motor parameters: DC24V/20W (or DC12V/20W);

输出油量：120mL/分钟；输出压力：常温下 4.0MPa；
Grease output: 120mL/min; Output pressure: 4.0MPa (at normal temperature);

适用油脂：NLGI--0#、00#、000#；
Apply grease: NLGI--0#, 00#, 000#;

防护级别：IP65；
Protection level: IP65;

3.1.2 ALP50 系列润滑泵
3.1.2 ALP50 series lubricant pump

ALP50 系列润滑泵在油箱内设置有弹簧活塞辅助压油装置。该装置可以保证油箱内油脂处在受压状态，改善润滑泵吸油条件，适用于高寒、高海拔等严苛工况。AL50 系列润滑泵包括 ALP501(油箱容积 1L)、ALP502(油箱容积 2L)。

For ALP50 series lubricant pump, a spring piston auxiliary grease pressing device is equipped in the tank. The equipment can ensure grease in the tank is in pressurized status, to improve grease suck condition of the lubricant pump. It is suitable for severe conditions such as high cold, high altitude and others. AL50 series lubricating pump contains two models: ALP501 (tank capacity 1L), ALP502 (tank capacity 2L).

参数：
Parameters:

使用温度 ：-40℃～70℃(低温环境下要求油脂能满足相应的低温性能)；类型：高泵送型润滑泵站；工作时间：油压传感器闭合后延续 40 秒；油箱容量：2L；
Operation temperature: -40℃～70℃ (The grease is required to meet the corresponding low temperature performance at low temperature); Type: High - pumping lubricating pump station; Operation time: 40s delay after grease pressure sensor is closed; Capacity of tank: 2L;

电机参数：DC24V/20W(或 DC12V/20W)；
Motor parameters: DC24V/20W (or DC12V/20W);

输出油量：55mL/分钟；输出压力：常温下 4.5MPa；
Grease output: 55mL/min; Output pressure: 4.5MPa (at normal temperature);

适用油脂：NLGI--0#、00#、000#；
Applicable grease: NLGI--0#, 00#, 000#;

防护级别：IP65；
Protection level: IP65;

3.1.3 ALP20 系列润滑泵
3.1.3 ALP20 series lubricant pump

ALP20 系列润滑泵容积 1L，外形紧凑，适用于润滑点少、安装空间有限、润
Capacity of ALP20 series lubricant pump is 1L. It is compact and applicable to equipment with few lubricating points, limited installation space and short lubricating period.

滑周期短的设备。ALP20 系列润滑泵可以选装内置监控器组件和加压式分配器组件。ALP20 系列润滑泵包括 ALP205W(外置监控器)、ALP205N(内置监控器)、ALP205W-JP(外置监控器、集成加压式分配器组件)、ALP205N-JP(内置监控器、集成加压式分配器组件)。
For ALP20 series lubricating pump, optional internal monitor unit and pressurized distributor unit are available. ALP20 series lubricating pump contains ALP205W (external monitor), ALP205N (internal monitor), ALP205W-JP (external monitor, pressurized distributor unit), ALP205N-JP (internal monitor unit, pressurized distributor unit).

参数：
Parameters:

使用温度 ：-40℃～70℃(低温环境下要求油脂能满足相应的低温性能)；类型：高泵送型润滑泵站；工作时间：油压传感器闭合后延续 40 秒；油箱容量：1L；
Operation temperature: -40℃～70℃ (The grease is required to meet the corresponding low temperature performance at low temperature); Type: High -

pumping lubricating pump station; Operation time: 40s delay after grease pressure sensor is closed; Capacity of tank: 1L;

电机参数：DC24V/40W(或 DC12V/40W)；
Motor parameters: DC24V/40W (or DC12V/40W);

输出油量：90mL/分钟；输出压力：常温下 4.0MPa；
Grease output: 90mL/min; Output pressure: 4.0MPa (at normal temperature);

适用油脂：NLGI--0#、00#、000#；
Apply grease: NLGI--0#, 00#, 000#;

最多润滑点数：10 个（推荐）；
Max lubricating points: 10 (recommended);

防护级别：IP65 以上；
Protection level: Above IP65;

3.2 监控器
3.2 Monitor

3.2.1 外置监控器
3.2.1 External monitor

参数：
Parameters:

控制模式：ECU 微电脑程序控制，AK04/AK07 型监控器；
Control mode: ECU microcomputer program control， AK04/AK07 monitor;

休止间隔：AK04：6-20 小时（可调），
Rest interval: AK04： 6-20 hours (adjustable),

AK07：1-30 小时（可调）；显示模式：液晶动态显示：油压、计数、休止时间、工作时间、故障代码等；
AK07: 1-30 hours (adjustable); Display mode: Liquid crystal dynamic display: grease pressure, counting, rest time, operation time, fault code, etc;

温度传感器：自动检测环境温度，低温待机保护；信号输出：AK04 无 CAN 总线通信接口，

Temperature sensor: automatic detection of ambient temperature, low temperature standby protection; Signal output: no CAN bus communication interface for AK04,

AK07 预留 CAN 总线通信接口；建议安装开孔尺寸：71×35
reserved CAN bus communication interface for AK07; Recommended installation hole size: 71×35

3.2.2 内置监控器
3.2.2 Internal monitor

参数：
Parameters:

控制模式：ECU 微电脑程序控制，AK06 型监控器；
Control mode: ECU microcomputer program control, AK06 monitor;

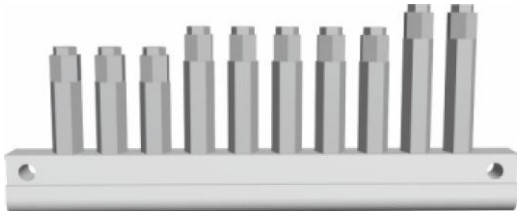
休止间隔：1-30 小时（30 级可调）；显示模式：液晶动态显示：油压、计数、休止时间、工作时间、故障代码等；
Rest interval: 1-30 hours (adjustable at 30 levels); Display mode: liquid crystal dynamic display: grease pressure, counting, rest time, operation time, fault code, etc;

温度传感器：自动检测环境温度，低温待机保护；信号输出：预留 CAN 总线通信接口；
Temperature sensor: automatic detection of ambient temperature, low temperature standby protection; Signal output: reserved CAN bus communication interface;

3.3 分配器
3.3 Distributor

AR60/AL50/AL20 系列集中润滑系统使用定量加压式分配器。
AR60/AL50/AL20 series centralized lubricating system adopts quantitative pressurized distributor.

定量加压式分配器采用全并联结构，结构紧凑，可靠性高，维修方便、维护成本低，能够满足设备在各种环境条件下的润滑要求。
The quantitative pressurized distributor adopts full parallel structure. Its structure is compact, reliability is high, maintenance is easy and maintenance cost is low. So that, it can satisfy the lubrication requirements of equipment under various conditions.



参数：
Parameters:

型式：加压式；排油压力：常温下 2.5MPa；
Type: pressurized; Grease discharge pressure: 2.5MPa at normal temperature;

循环输出量：0.13mL、0.2mL、0.4mL；
Cyclic output: 0.13mL, 0.2mL, 0.4mL;

定量加压式分配器由分配器壳体、伞形阀、定量柱塞、芯杆、回位弹簧、出油接头及联接体等组成。在供脂泵站通过主油管路加压供油时，分配器将上一循
Quantitative pressurized distributor is composed of distributor housing, umbrella valve, quantitative plunger, core rod, return spring, grease outlet connector, coupling body and so on. When lubricating pump station supply grease in pressurized manner through main grease pipeline,

环储存好的油脂经分油管路以较大压力向各润滑点供给，常温下排油压力最高可达到 2.5MPa，寒冷气温下排油压力自动随气温下降而提高，确保粘稠油脂顺利注入摩擦副。供脂泵站停止工作后，分配器储油腔计量储油。根据各摩擦副需油量共设置三种排油量，分别为 0.13mL/次、0.2mL/次、0.4mL/次。
the distributor supplies grease stored in the previous cycle to each lubricating point at larger pressure by grease distribution pipelines. The grease discharge pressure can reach up to 2.5MPa at normal temperature. In cold temperatures, the grease discharge pressure automatically increases as the temperature drops, to make sure viscous grease can be injected smoothly into the friction pair. After the lubricating pump station stops, distributor grease chamber measures volume of grease stored. It is necessary to set three grease discharge volume according to grease requirement of each friction pair: 0.13mL/time, 0.2mL/time and 0.4mL/time respectively.

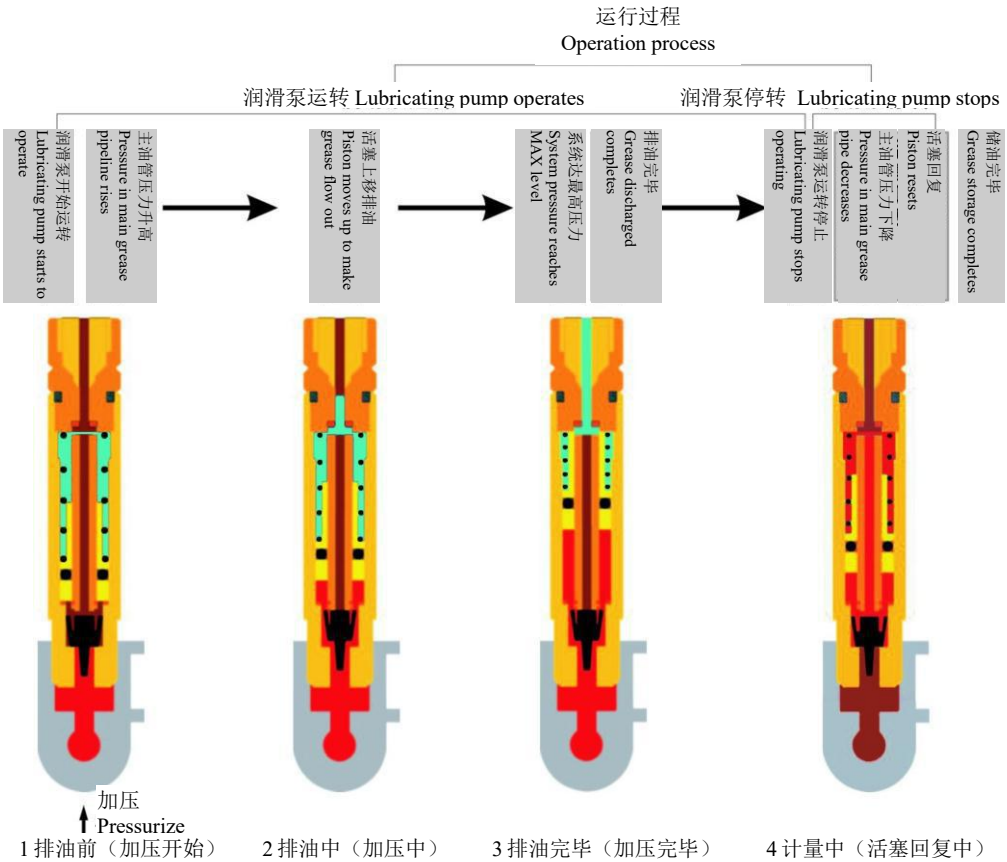
工作过程如下：
The operation process is as follows:

1）主油管路高压油脂在压力作用下推动分配器内的伞形阀向上移动。
1) The high pressure grease in the main grease pipeline pushes umbrella valve in the distributor to make it move upward under pressure.

2）伞形阀封住芯杆中心孔，主油管路高压油脂推动活塞克服弹簧力开始上升，将上腔上一循环储存的油脂排出。
2) The umbrella valve seals the center hole of core rod. The high pressure grease in the main grease pipeline pushes the piston against the spring force to move upwards. So that, grease stored in chamber in previous cycle is discharged.

3）当活塞移至上腔顶点时，排油完毕。
3) When the piston moves to the top of chamber, grease discharged completes.

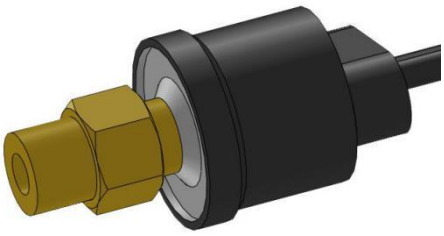
4）润滑泵停止工作时，卸压阀自行开启，主油管路高压油脂经卸压阀回流，系统压力迅速下降，分配器活塞在弹簧作用下开始回复，伞形阀复位，封住进油口，活塞则将下腔油脂通过芯杆中心孔压送到上腔，同时下次的供油亦储备完毕。
4) When the lubricating pump stops operating, relief valve opens automatically, and high pressure grease in the main grease pipeline flows back through the relief valve. Pressure in the system drops rapidly and distributor piston begins to reset under the action of spring. The umbrella valve moves to its original position to seal the grease outlet. Piston operates to deliver grease from lower chamber to upper chamber through center hole of the core rod. At the same time, the grease is stored well for next supply.



3.5 油压传感器
3.5 Oil pressure sensor

参数：
Parameters:

动作压力范围：闭合点 2.6MPa/断开点 2.0MPa；触点类型：常开；
Operation pressure range: 2.6MPa for close point / 2.0MPa for open point;
Contact type: Normal-open;



3.6 油管规格(选配件)
3.6 Grease pipe specification (option)

规格：
Specification:

主油管：Φ10*1.75 树脂管或Φ10*1 钢管；
Main grease pipe: Φ10*1.75 resin pipe or Φ10*1 steel pipe;

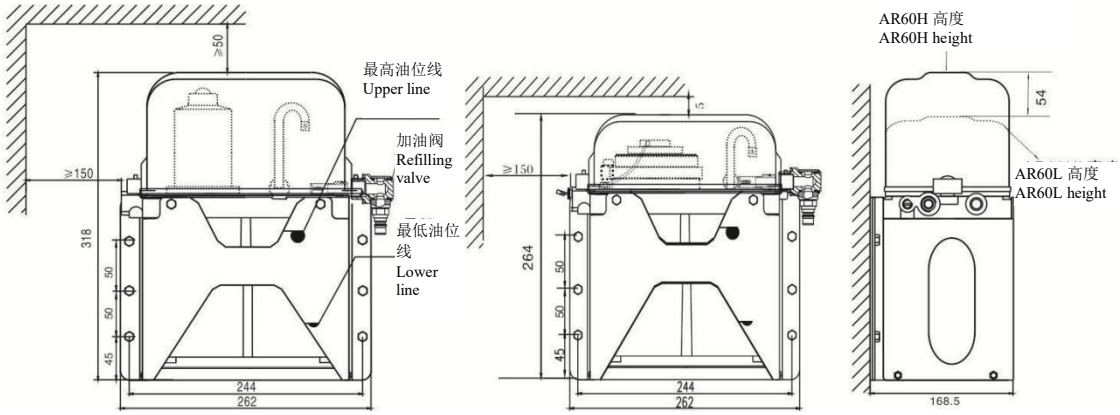
分油管：Φ4*0.75 尼龙管；
Grease distribution pipe: Φ4*0.75 nylon pipe;

四、外形尺寸
IV. Overall Dimensions

4.1 润滑泵
4.1 Lubricating pump

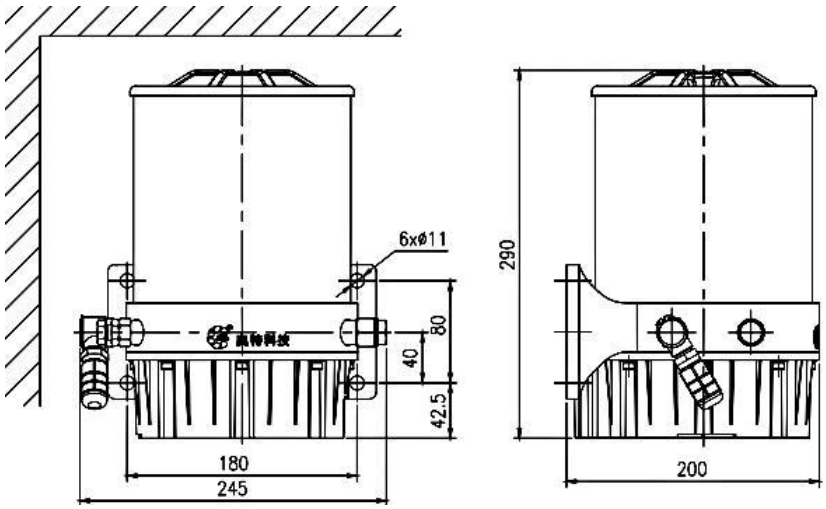
1.润滑泵以防碰撞建议固定在相对封闭的防护箱体内。
1. It is recommended to secure the **lubricating pump** in a relatively closed protective box to prevent collision.

AR60 系列：
AR60 series:

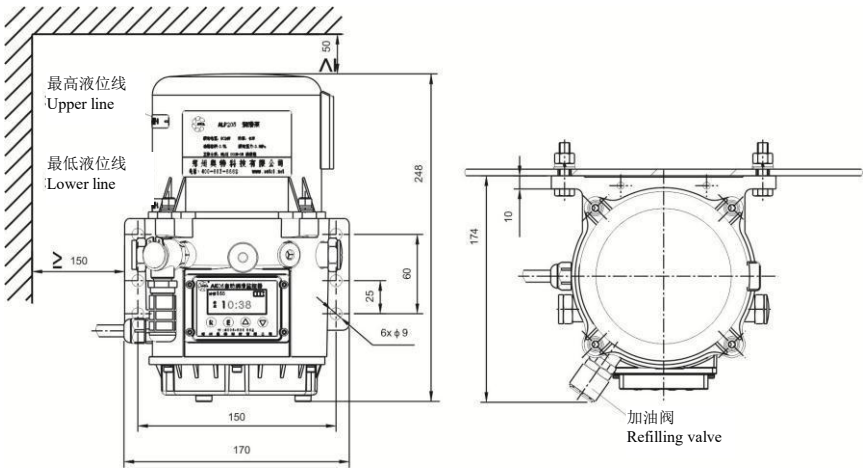


AR60H 装配图 AR60HL 装配图
AR60H Assembly Drawing AR60HL Assembly Drawing

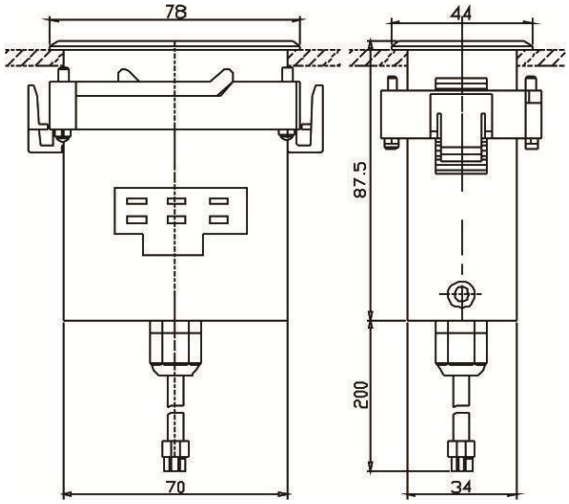
ALP502：
ALP502:



ALP205：
ALP205:

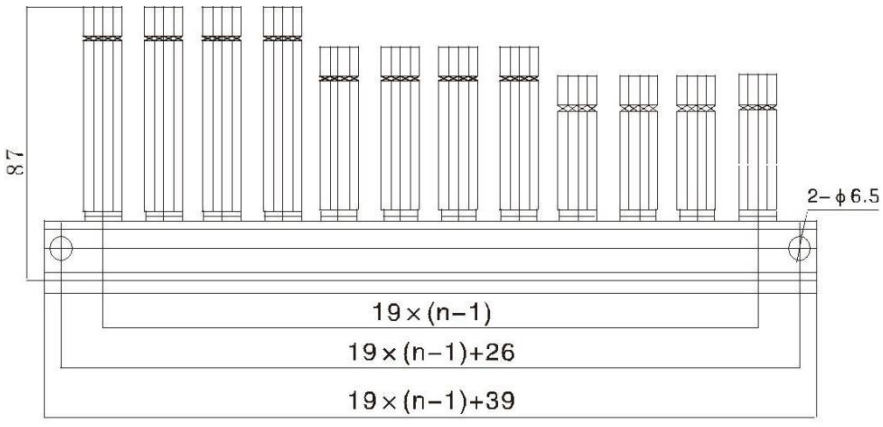


4.2 监控器
4.2 Monitor



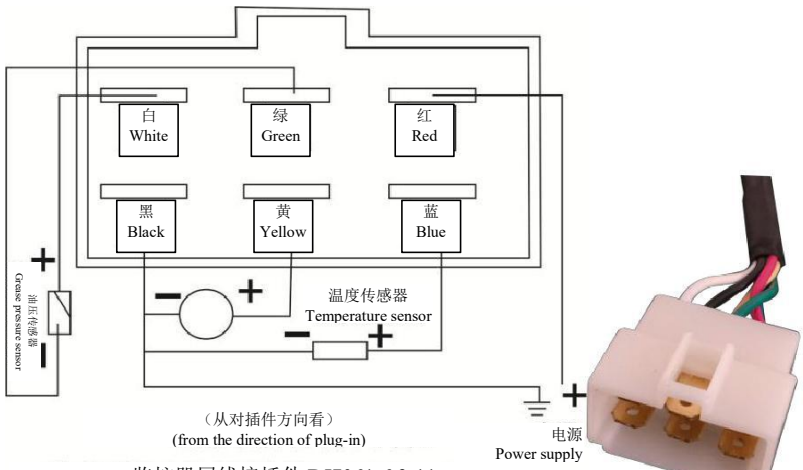
外置监控器安装图
External monitor Installation Drawing

4.3 定量加压式分配器
4.3 Quantitative pressurized distributor



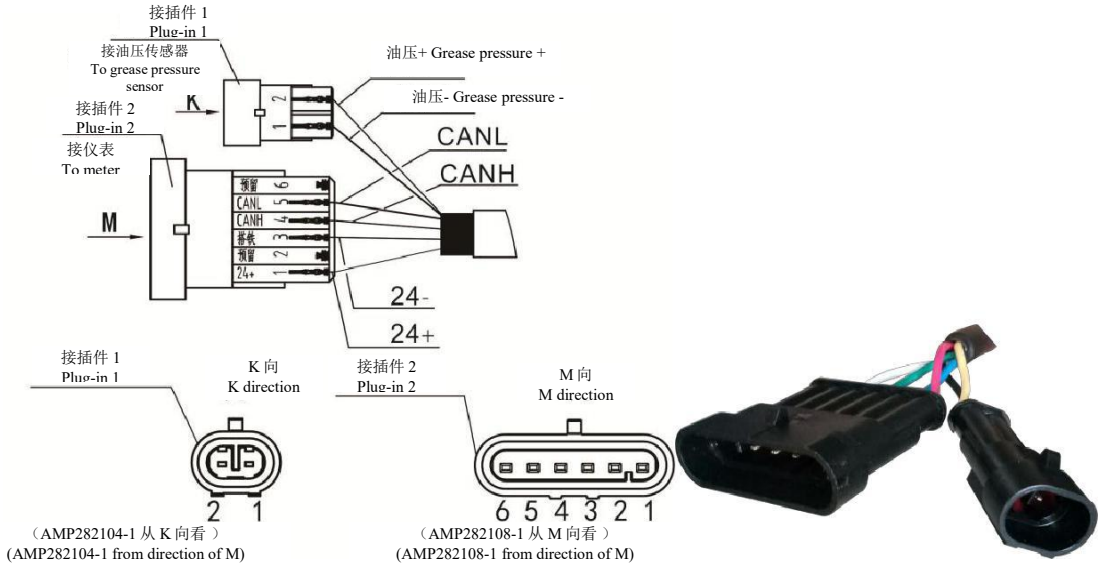
4.4 电气接口
4.4 Electrical interface

4.4.1 AK04 监控器接线方式
4.4.1 AK04 monitor wiring mode



监控器尾线接插件 DJ7061-6.3-11
Monitor wire plug-in DJ7061-6.3-11

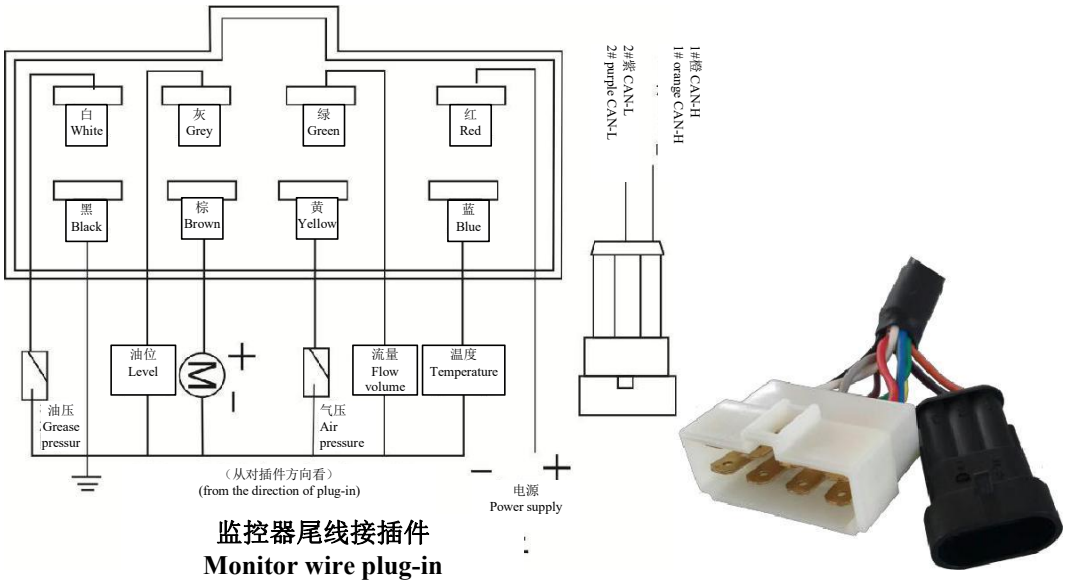
4.4.2 AK06 监控器接线方式
4.4.2 AK06 monitor wiring mode



（AMP282104-1 从 K 向看）
(AMP282104-1 from direction of M)

（AMP282108-1 从 M 向看）
(AMP282108-1 from direction of M)

4.4.3 AK07 监控器接线方式
4.4.3 AK07 monitor wiring mode



监控器尾线接插件
Monitor wire plug-in

备注：流量和气压目前未使用，属于预留功能
Note: The flow rate and pressure are not in use at present and they are reserved

五、安装设计及安装注意事项
V. Installation Design and Installation Notes

5.1 润滑泵站安装设计
5.1 Lubricating pump station installation and design

5.1.1 润滑点数的确定
5.1.1 Determination volume of lubricating points

润滑点是指设备上使用油嘴润滑的油脂摩擦副，其中作 360°旋转的摩擦副和个别高温摩擦副除外。
Lubricating point refers to grease friction pair on the equipment which are lubricated by oil nozzles. The friction pair with 360° rotation and individual high temperature friction pair are excluded.

5.1.2.各润滑点每次大致需油量的确定
5.1.2. Determining approximate volume of grease required for each lubricating point

一般供油间隔时间为 1 小时-30 小时，每个润滑点每次需油量在 0.13mL～0.4mL 间。
Generally, if interval of grease supply is 1 hour to 30 hours, volume of grease required for each lubricating point is between 0.13mL～ 0.4mL.

5.1.3.润滑系统供油量的确定
5.1.3.Determining volume of grease supplied to lubricating system

Q=q1+q2+q3=(1+20%)q1(mL)+c (mL/m)×L（m）

Q-系统供油量 q1-各润滑点需油量的总和 q2-安全附加值（20%q1）q3-主油管路损耗值
Q-Volume of grease supplied by system q1-Total volume of grease required by each lubricating point q2-Safe additional value (20%q1) q3-Loss value of main grease pipeline

c-主管路油压从 0.05Mpa 升至实际工作数值每米增加油量 L-主管路长度
C- Grease increment per meter when grease pressure of main grease pipeline is increased from 0.05Mpa to actual operation value L-Length of main grease pipeline

5.2 润滑泵站安装须知
5.2 Lubricating pump station installation notice

a)严禁带电安装。
a) Never install in live condition.

b)润滑泵站应垂直安装牢固，固定在环境污染少、加油维护方便、易于观察和操作的位置，如条件允许应在润滑泵站旁开一单独的作业门。c)安装时要求保证油箱上的液位线清晰、干净。d)安装面应平整，安装连接要可靠。e)距离热源 1 米以上。
b) Lubricating pump station shall be installed vertically and firmly, and fixed in a area with less environmental pollution, convenient refilling and maintenance, easy observation and operation. If possible, a separate service door shall be set beside the lubricating pump station. c) During installation, make sure level lines on the tank are clear and clean. d) The mounting surface shall be flat. And installation and connection shall be reliable. e) It shall be more than 1 meter away from the heat source.

f)润滑系统在使用过程、清洁过程或存储环境中，润滑泵站不得接触全氯乙醚、三氯乙醚或类似溶剂、极性有机溶剂（酒精、甲醇、丙酮和类似溶剂）、四氯化碳、碱性物质、芳香族、卤代碳水化合物。
f) In the process of usage, cleaning or storage environment of the lubricating system, the station shall not contact with perchlorether, trichloroethyl ether or similar solvent, polarity organic solvent (alcohol, methanol, acetone and similar solvents), carbon tetrachloride, alkaline substance, aromatic substances and halogenated carbohydrates.

5.3 分配器安装须知
5.3 Distributor installation notice

a)加压式分配器应牢固地固定在环境污染少、布管与维护方便并适宜观察的位置。b)安装时要分配器进出油口保持清洁、干净。
a) The pressurized distributor shall be firmly fixed in a position with less environmental pollution. Also, the area shall be easy to arrange pipes, maintain and observe. b)When installing, grease inlets and outlets shall be kept clean and tidy.

c)多个加压式分配器可经主油管联接连成一组。流量为 0.13mL/次、0.2mL/次、0.4mL/次的分油管分别对应白色、黄色和红色高压尼龙管，分油管末端应与润滑点接头连接。d)分配器应尽量靠近润滑点布置。
c) Several pressurized distributors can be connected to a group by main grease pipe. Grease distribution pipe with flow volume of 0.13mL/time, 0.2mL/time, and

0.4mL/time shall be corresponding to high pressure nylon pipe of white, yellow and red respectively. The end of the grease distribution pipe shall be connected with lubricating point connector. d) The distributor shall be arranged as close as possible to the lubricating point.

5.4 润滑系统管道安装须知
5.4 Lubricating system pipeline installation notice

a) 主油管路一般采用耐压高于 10MPa 的φ10×1.75 树脂管且孔口必须有刚性衬套，也可采用φ10×1 钢管。b）安装前，分油管必须充满油脂；温度在 5℃以下安装时主油管也必须先充满油脂。c）主油管和分油管采用软管时均须套上波纹管。
a) The main grease pipe generally adopts Φ 10×1.75 resin pipe with pressure resistance higher than 10MPa. There must be rigid bushing at the hole. Φ 10×1 steel pipe can also be used. b) Before installation, the grease distribution pipe must be filled with grease; When installed at temperature below 5℃, the main grease pipe must be filled with grease first too. c) When hoses are used as main and grease distribution pipes, corrugated pipes must be covered.

d）从分配器出口至润滑点的分油管最大长度不得超过 4.5 米，在布管设计时应使其尽可能短，特别是通向密封严密的润滑点的分油管不应超过 3 米。分油管为尼龙管，安装时两端必须使用刚性衬套。e）油管应轴向垂直切断，不可使管口崩裂、划伤，更不可将油管压扁。f）安装时管道必须保持干净、清洁，无污染物。g）管路配管须短捷，避免设置过多弯头，以减少系统压力损失，确保管路畅通。h）油管弯曲时，φ10×1.75 树脂管和φ4×0.75 尼龙管的最小弯曲半径分别为
d) Maximum length of grease distribution pipe from distributor outlet to lubricating point shall not be over 4.5m. When designing pipe layout, make it as short as possible. Especially the grease distribution pipe to the tightly sealed lubricating point shall not exceed 3 meters. If the grease distribution pipe is nylon pipe, rigid bushings must be used at both ends when installing. e) The grease pipe shall be cut off vertically in axial direction. Do not crack or scratch the pipe opening, and never flatten the pipe. f) When installing, always keep pipe clean, tidy and free from dirt. g) Pipeline must be arranged compactly and avoid too much bends to reduce the system pressure loss and ensure pipeline clear. h) When bending grease pipe, minimum bend radius for Φ 10×1.75 resin pipe and Φ4×0.75 nylon pipe is

R90 和 R40。
R90 and R40 respectively.

i）管路在直线安装时应让软管实际长度比直线长度长 1%，如移动部位需弯曲时不要过于扭曲软管。j）主油管和分油管走向、弯道应避开热源和弯曲缝隙。
i) When installing pipeline in straight line, actual length of the hose should be 1% longer than the straight line length. If necessary to bend moving part, do not twist the hose too much. j) When arranging and bending main grease pipe and grease distribution pipe, avoid heat source and bend clearance.

k）对穿过横梁小孔和移动的油管必须使用管套保护。l）系统所有管道必须采用扎带、线卡或喉箍等固定在底盘上。m）各管道连接处必须安装牢固，管道连接处不可有漏油或渗油现象。
k) For grease pipe passing small hole in beam or movable one, must protect with pipe sleeve. l) All pipes of the system must be fixed to chassis with straps, wire clips or clamps. m) All pipe connections must be firmly installed, no grease can be leaked from connection areas.

5.5 监控系统安装
5.5 Monitoring system installation

a）外置监控器安装在便于日常操作维护监控的位置，该区域应干燥，不易淋雨。b）安装外置监控器时，建议开孔尺寸为 71×35。c）线束应套上波纹管，走向应避开燃油管道和热源。d）调试前，切勿接上电机线束接插件。
a) External monitor shall be installed in a position convenient for daily operation, maintenance and monitoring. The area shall be dry and not easy to get wet in a rain. b) When installing external monitor, recommended opening size is 71×35. c) Corrugated pipe shall be fitted to the wiring harness. Its arrangement shall avoid fuel pipe and heat source. d) Do not connect the motor harness connector before debugging.

直拉杆球头销 Drag link ball pin	横拉杆球头销 Tie rod ball pin	转向节主销轴 Steering knuckle king pin shaft	弹簧钢板销 Leaf spring pin	调整臂 Adjusting arm	凸轮轴尾座 Camshaft tail seat	凸轮轴颈座 Camshaft journal seat	变速纵拉杆万向节 Variable speed longitudinal rod universal joint	转动轴支架轴承 Rotating shaft bracket bearing	避震器 Shock absorber	门轴 Door spindle	刹车踏板轴 Brake pedal shaft
0.2	0.2	0.4	0.4	0.4	0.2	0.1	0.2	0.4	0.1	0.2	0.1
黄 Yellow	黄 Yellow	红 Red	红 Red	红 Red	黄 Yellow	白 White	黄 Yellow	红 Red	白 White	黄 Yellow	白 White

设备各润滑点需油量及分油管颜色对应关系
Volume of Grease Required for Each Lubricating Point on the Equipment, Color of Grease Distribution Pipe and Congruent Relationship

六、润滑脂加注
VI. Grease Filling

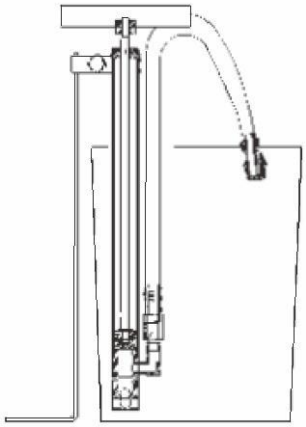
6.1 润滑脂加注须知
6.1. Grease filling notice

a）液位上限标签位置是根据产品容积进行设定的；b）润滑泵（具有活塞辅助压油装置）首次加油时必须先进行排气作业，排气孔位置的设定是为首次加油时需要超过液位上限至排气孔位置进行排气，待空气完全排出后，活塞会自动封闭排气孔；c）正常加油时，加至液位上限即可，以防止润滑脂溢出及异物进入油箱，造成环境污染和不必要的浪费，此外 AR60 润滑脂加注过量会造成润滑脂从油箱内溢出，在泵罩内滞留甚至引起润滑泵故障；d）首次加油排气时，为使油箱（具有活塞辅助压油装置）内空气排净，会有少量润滑脂从排气孔中溢出，此属正常允许范围内，擦去清除即可；e）后续再次加油时油箱（具有活塞辅助压油装置）若有空气，则与首次加油排气方式一样，将油加至排气孔位置，待空气排出后活塞自动封闭排气孔。f）向油箱注油时，若加油困难，一般系滤网堵塞所致，拆掉加油阀取出滤网清洗即可。g）由于本公司产品特点，自配有注油器，勿使用其它公司提供的注油器。

a) Upper level label position is set according to volume of the product; b) When the lubricating pump (with piston auxiliary grease pressing device) is refilled for the first time, air must be discharged. Position of exhaust hole is set to discharge air by adding grease until its level exceeds upper line. This operation shall be carried out when refilling for the first time. When air is completely discharged, the piston will automatically seal the exhaust hole; c) When filling grease normally, add until it reaches the upper level to prevent grease from flowing over and foreign matter from entering tank. Otherwise, it will cause environmental pollution and unnecessary waste. In addition, if excessive AR60 grease is filled into the tank, the grease will flow over from the tank. If stranding in the pump shell, lubricating pump failure could be caused; d) When refilling and discharging air for the first time, to discharge air from the tank (with piston auxiliary grease pressing device) completely, a small amount of grease will escape from the hole. This is normal. Just wipe it off; e) When refilling further, if there is any air in the tank (with piston auxiliary grease pressing device), operate in method for the first time and fill grease until it reaches exhaust hole position. The will piston automatically seal the hole after air is discharged completely. f) When filling grease to the tank, if it is difficult to fill, it is usually caused by blocked strainer. Remove refilling valve and strainer for cleaning. G) Due to characteristics of our products, grease refilling device is provided. Do not use grease refilling device of other companies.

6.2 润滑脂加注操作说明
6.2. Grease filling operation instructions

6.2.1 手动注油器结构如图
6.2.1 Structure of manual grease refilling device is shown in figure



6.2.2 手动注油器加注操作过程
6.2.2 Operation process of manual grease refilling device

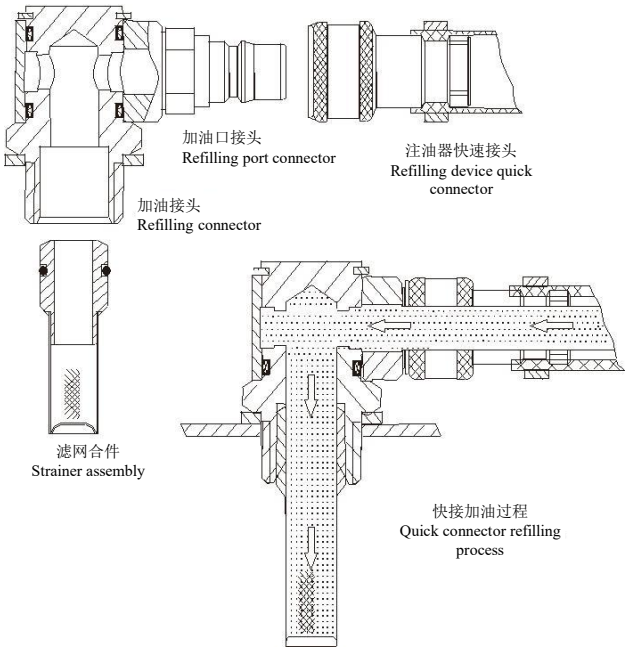
1.每两个月或二保时，请及时向油箱注入说明书推荐的润滑脂。
1. Fill the tank with grease recommended in the manual every 2 months or at the second maintenance.

2.使用前在靠近油桶上盖边缘处开两个圆孔，将注油器底部及其加油接头分别插入（见上页图）。
2. Before using, punch two round holes on the cover of grease container near the edge. Insert bottom of the grease refilling device and its refilling connector into the container respectively (see figure on previous page).

3.首次使用手动注油器前,需将油管内空气排净。操作：可用螺丝刀顶开快速接头内部的单向阀，上下拉压油杆,直至润滑油从快插接头流出为止。（注意：
3. Before using manual grease refilling device for the first time, it is necessary to discharge air from grease pipe. Operation: With a screwdriver, push check valve in the quick connector to make it open, pull and push the pressure rod, until grease flows out from the quick connector. **(Note:**

首次使用之后,严禁在非注油状态下拉压加油杆。)
After using for the first time, never pull and push the rod under non-refilling condition.)

4.清理干净加油口接头油脂，注油时，调整润滑泵加油口接头方向，取下加油口防尘套，将注油器接头插入润滑泵加油口接头，确认两接头卡到位后，防止憋压。（注意：防止污染；按顺序操作。）
4. Remove grease from refilling port connector. When refilling, adjust lubrication pump refilling port connector direction, remove dust cover from the refilling port and insert refilling device connector into connector of lubricating pump refilling port. Make sure the two connectors are clamped in place to avoid pressure accumulation. **(Attention: Operate in order to prevent pollution.)**



5.上下拉压油杆，进行加注。完成后松开快速接头，收起注油器，并装上加油口防尘帽。加注完毕后应装上防尘套，以免外界尘沙进入。
5. Push and pull the pressure rod to refill. After filling completely, release quick connector, store grease refilling device and install dust cover back to the refilling port. After refilling, dust cover shall be installed back to prevent sand from entering.

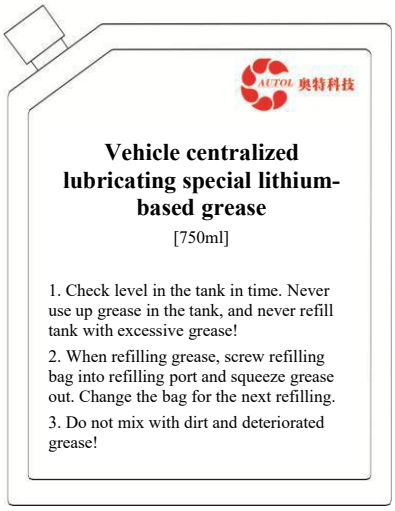
（原则上同一加油枪只加同一种油脂；如需更换油脂，使用时须清理加油枪杆上油脂，对设备加油前须排净加油管内旧油脂，操作步骤参考第 3 步， 防止两种油脂混合使用。）备注：该项加油设备适用于 15kg 标准油桶。
(In principle, one refilling gun can only be used to fill grease with same specification; If it is necessary to change grease, always remove grease from the gun. When add grease to equipment, must discharge the grease remained inside completely. Refer to step 3 mentioned above to prevent a kind of grease from mixing.) Note: The refilling equipment is suitable for standard grease container of 15kg.

6.切勿将不洁净或变质油脂注入油箱，定期清除加油阀滤网上的过滤杂质。
6. Never place dirty or deteriorated grease into the tank. Regularly remove impurities from strainer of refilling valve.

6.2.3 采用电动或气动注油机加注润滑脂过程与手动操作类似，注意观察液位防止加注过量。
6.2.3 Refill with electric or pneumatic refilling device. Operation process is the same as that of manual operation. Observe the level to prevent overfilling.

6.3 一次性加油袋：
6.3 Disposable refilling bag:

针对某些地区购买油脂比较困难，也为了使客户在外地加油时方便快捷，我们特意设计了一次性加油袋，以方便客户随车携带。1.请及时查看油箱油位，切勿使 油箱缺油或过满！2.加油时油脂袋拧入加油口挤出 油脂，待下次加油时更换油脂袋。3.切勿混入污物和变质油脂！
In some areas, it is difficult to buy grease. In order to make it convenient and quick for customers to refill, we have specially designed disposable refilling bag to facilitate customers to carry on vehicle. 1. Check level in the tank in time. Do not make the level too low or too high! 2. When refilling, screw the bag to refilling port and squeeze grease out. Change the bag for the next refilling. 3. Do not mix with dirt and deteriorated grease!



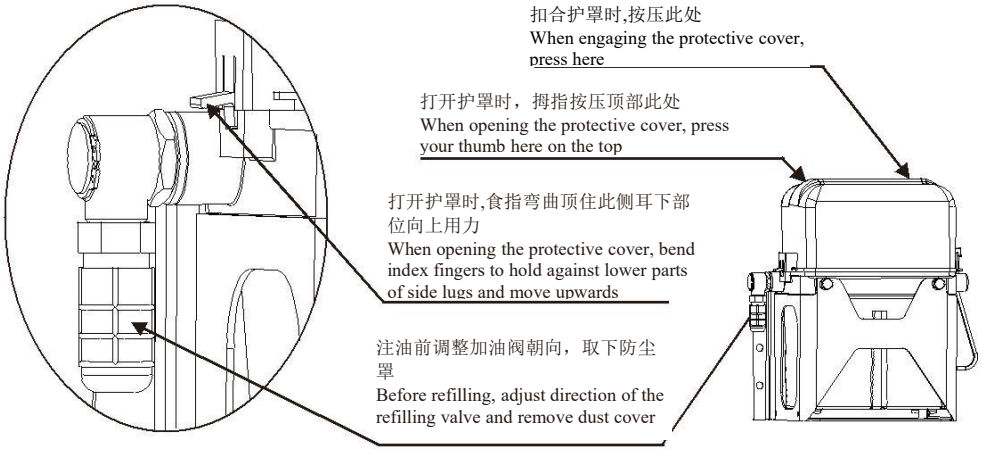
6.4 AR60 系列油箱护罩开合方法
6.4 Open and engagement method of AR60 series tank protective cover

1.开启方法：两手拇指分别按压油箱座盖两侧半圆凸起，食指弯曲顶住油箱护罩两侧耳稍下部位向上用力挤压再向上抬起，即可轻松取下油箱护罩。不便时可单手操作。
1. Open method: Press the semicircle convexes on both sides of the oil tank protective

cover with both thumbs respectively, and bend index fingers to hold against lower parts of two side lugs of the tank protective cover. Then, squeeze upwards with force and lift up to remove the tank protective cover easily. Operate with a hand if inconvenient.

2.扣合方法：拿起油箱护罩使其两侧耳孔均对准油箱座盖两侧半圆凸起（起导向作用）后，向下按压油箱护罩顶部即可使油箱护罩与油箱座盖严密扣合。

2. Engagement method: Hold the tank protective cover to make its tow side lugs align with semicircle convexes on both sides (play a guiding role). Then, press top of the tank protective cover to make the tank protective cover and tank seat cap tightly buckle.



七、系统调试
VII. System Debugging

7.1 清理
7.1 Clean

系统调试前，清理整个系统各部污垢和润滑点外油污。
Before debugging system, remove dirt from various parts of the whole system and remove oily dirt from lubricating points.

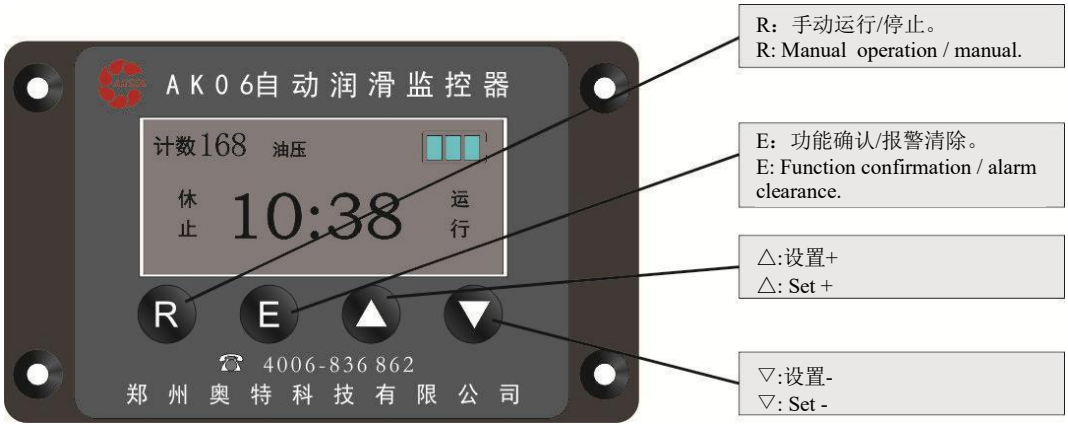
7.2 强制供脂
7.2 Supply grease forcibly

1.系统调试时，必须逐一将主油管路的每一个单独终端开路（即不拧上堵头或压力传感器），按手动运行键“R”(外置监控器按“左键”)，令润滑泵工作不小于20 秒，然后再重复操作，直至每一个单独终端都排出油脂为止。排净空气后及时将冒油的终端用堵头堵上或接上压力传感器。
1. When debugging system, open each individual terminal of the main grease pipeline one by one (that is not install plug or pressure sensor). Press manual button “R” (press “left button” on the external monitor) to make lubricating pump operate not less than 20 seconds. Repeat this operation until grease is discharged from each individual terminal. After air is discharged completely, install plug to terminal which grease comes from in time or connect pressure sensor.

2. 然后再重复进行多次强制供脂操作，抽检最远端润滑点及最近端的 3-5 个润滑点，如有 1 个不出油其他必须全检。
2. Repeat this operation several times to supply grease forcibly. Spot check the 3-5 lubricating points at the farthest and the nearest terminals. If grease cannot comes our from any one point, must inspect all of them.

3.如发现不能冒油的润滑点，须用手动加油枪装入与系统对应的油脂将堵塞处打通，再观察其在工作循环时能否达到要求。
3. If you find there is a lubricating point where grease cannot comes out, must clear the blocked point with manual gun filled with grease whose specification is corresponding to that of the existing one. Then, check whether it meet requirements in operation cycle.

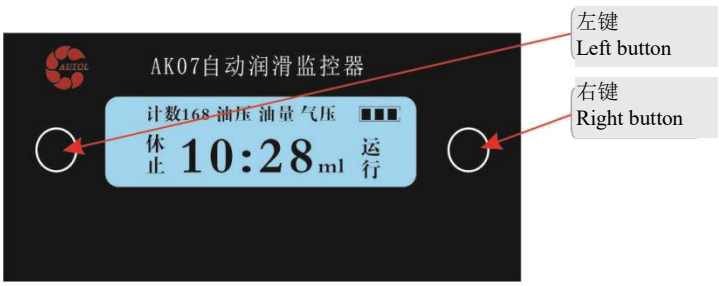
7.3 内置监控器操作说明
7.3 Internal monitor operation instructions



操作说明：
Operation instructions:

“▲”和“▼”一起按住超过 4 秒，点按“E”进入设定界面：依次点按“E”选择设定项“1P、2P、3P、4P”，确认。1P:点按“▲”或“▼”设置休止时间（1～30 小时,可以定制）；2P:设置检测脉冲数(0～99,可以定制)；3P:点按“▲”或“▼”设置运行时间（1～60 分钟,可以定制）；4P:点按“▲”或“▼”低温保护门槛值 0～50 (对应 0℃～-50℃)；点按“E”确认进入休止状态。
Press “▲” and “▼” at the same time over 4 seconds, and short press “E” to enter setting screen: Short press “E” to select item to be set “1P, 2P, 3P, 4P” and confirm. 1P: Short press “▲” or “▼” to set rest time (1～30 hours, it can be customized); 2P: Set detection pulse number (0～99, it can be customized); 3P: Short press “▲” or “▼” to set operation time (1～60 minutes, it can be customized); 4P: Short press “▲” or “▼” to set low temperature protection threshold to 0～50 (corresponding to 0℃～-50℃); Short press “E” to confirm to enter rest status.

7.4 外置监控器操作说明
7.4 External monitor operation instructions



参数说明：
Parameter introductions

1P:休止时间(1～30 小时)；
1P: Rest time (1～30 hours);

2P:运行模式(0-99)，0：时间运行模式　　非 0：加油量(1-99 ml)；
2P: Operation mode (0-99), 0: Time operation mode　　Non-zero: Refilling volume (1-99 ml);

3P:加油时长(1～30 分钟)；
3P: Refilling time (1～30 minutes);

4P:低温保护门槛值 0～50(对应 0℃～-50℃)；
4P: Low temperature protection threshold 0～50 (corresponding to 0℃～-50℃);

5P:定量精度（1～10　单位为 0.1ml）。
5P: Quantitative accuracy (1～10　unit is 0.1ml).

操作说明：
Operation instructions:

先按下“右键”不放，再按下“左键”，先松开“右键”，再松开“左键”，进入设置 1P 参数界面，可通过点击“左键”进行设定。设定完成后，按“右键”切换到设置 2P 参数界面。依次可切换到 2P、3P、4P、5P 参数界面，参数设置完之后按“右键”保存参数，并退回休止状态。
First press “right button” and hold, then press “left button” and hold. After that, first release “right button” and then release “left button” to enter 1P parameter screen. Press “left button” to set. After setting completely, press “right button” to switch to 2P parameter screen. Switch to 2P, 3P, 4P and 5P parameter screen in sequence. After parameter screen is set, press “right button” to save parameter and return rest status.

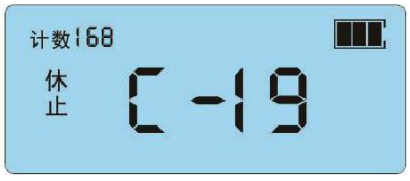
7.5 设置界面
7.5 Setting screen

7.5.1 休止状态
7.5.1 Rest status

7.5.2 运行时,未检测到油压
7.5.2 No grease pressure is detected while operating

7.5.3 运行时,检测到油压
7.5.3 Grease pressure is detected while operating

7.5.4 低温待机
7.5.4 Standby at low temperature



7.5.5 注油量不足报警（不影响系统运行，在下一次运行正常时自动清除故障）
7.5.5 insufficient grease alarm (It does not affect system operation. Clear the fault automatically at the next normal operation)

八、故障分析与排除
VIII. Fault Analysis and Troubleshooting

故障现象 **Fault Phenomenon**	故障原因 **Fault Cause**	排除方法 **Troubleshooting**
开始润滑时，电机不转， At the beginning of lubrication, the motor does not operate, 显示屏显示油压 “ OFF”， grease press on the display is displayed as “OFF”, 润滑设置时间到时，监控 lubrication set time is up, monitor 器显示“ EE-2”及“ 油压 ” displays “EE-2” and “grease pressure” 闪烁 blinks	1.监控器接线错误 1. Monitor is connected by mistake	按监控器接线图正 Connect monitor correctly according to 确接线 wiring drawing
	2 监控器损坏 Monitor damages	更换 Replace
	3.润滑泵站电机线断 3. Circuit of lubricating pump station motor is open	接好电线 Connect the wire well
	4 电机损坏 Motor damages	更换 Replace
	5 润滑泵卡死 Lubricating pump sticks	清洗润滑泵 Clean lubricating pump
	1 润滑泵吸油口有空 There is air at grease suction port of the lubricating pump	震动油箱，驱除空气 Vibrate the tank to expel air
	2.主油管破裂或主油 2. Main grease pipe breaks or main grease pipe 路连接处松动 connection becomes loose	检修、更换 Inspect, repair and replace
	3.加入油脂稠度过大	按说明书推荐更换

开始润滑时，电机转，显 At the beginning of lubrication, the motor operates, “grease pressure” in the display is displayed as “OFF”, lubrication set time is up, monitor displays “EE-2” and “grease pressure” blinks	3. Viscosity of grease added is too large		Replace as required in manual
	4.润滑泵站溢流阀损 4. Lubricating pump station overflow valve damages		更换 Replace
	5. 油压传感器损坏 5. Grease pressure sensor damages or wire hareness is open		更换或修复 Replace or repair
	6.油箱内 6. There is fine sundry matter in the tank	卸荷阀芯 Small hole of relief valve core is blocked	拆除，用柴油清洗， Remove, wash it clean with diesel. If the grease is not clean, wash the tank clean and replace the grease
		润滑泵吸 Lubrication pump grease suction port is blocked	
	7. 个别分配器密封 7. Individual distributor seal bowl breaks		更换相应分配器 Replace the corresponding distributor
	8. 监控器损坏 8. Monitor damages		更换 Replace

	9. 呼吸孔堵塞 9. Breathing hole blocks	压缩空气从油箱顺 Clean with compressed air from inside of the tank to outside through breathing hole position
	10.油箱缺油 10. Lubricating oil lack in the tank	请加油至规定刻度 Fill up to mark line as required
监控器常压，休止状态不 Monitor keeps displaying pressure signal, rest status displays “ON” instead of count number	1.监控器损坏 1. Monitor damages	更换监控器 Replace monitor
	2.卸荷阀卡死不回 2. Relief valve sticks and cannot return so that load cannot be released	拆除，柴油清洗或更 Remove, wash clean with diesel or replace
	3.油压传感器蓝绿两 3 There is short circuit in green and blue wires of grease pressure sensor	检查线束，找到短接 Inspect wire harness, find the short area and separate them, wrap them separately with insulating tape
个别摩擦副（黄油嘴）打 It is not possible to lubricate individual friction pair (grease nozzle)	1.与之相连分配器损 1. Distributor connected to it damages	清洗或更换 Wash or replace
	2.与之相连分油管断 2. Grease distribution pipeline connected to it breaks or is blocked (main)	用快换接头快速连 Quickly connect with a quick-change connector or replace grease distribution pipe

	3.装车前摩擦副内黄 3. Before installing to vehicle, grease in friction pair becomes hard lump and block the pair	用黄油枪加入与系 With a gun, add grease which is the same as the original one in the system to clear the channel
监控器不显示或显示异常 The monitor does not display or displays abnormally	1.电磁或静电干扰 1. Electromagnetic or electrostatic interference	断开电源再接通 Cut off the power and turn on
	2.接线错误或松动 2. Wire is connected by mistake or becomes loose	检查并正确接牢 Check and connect firmly and correctly
	3.监控器损坏 3. Monitor damages	更换 Replace

注意:故障无法排除时,请及时与我司联系。

Note: If a fault cannot be solved, please contact us in time.

九、维护与保养
IX. Care and Maintenance

整车一保：
First maintenance of whole vehicle:

1.打开电源，点按监控器按键，检查液晶显示是否正常；手动启动润滑泵，观察运行是否正常；2.检查主油管路、分油管路有无渗漏、折弯，各润滑点是否均能注入油脂，若发动机上有润滑点，请重点检查发动机上各分油管有无断裂、各润滑点润滑是否正常；3.检查管束固定及线束接插是否牢固，检查留有摆动余量的分油管束扎带固定位置是否松动；4．润滑系统在保养维护时，所拆卸部位由组合垫、紫铜垫等密封方式密封的，在重新安装时必须更换新的组合垫、紫铜垫；4.清除整个系统各部污垢和润滑点外渗油污；5.检查油箱中剩余油量，及时补充。
1. Turn power on, press button on the monitor and check if LCD display is normal; Start lubricating pump manually and observe whether it is running normally; 2. Check if main grease pipeline and grease distribution pipeline leak or bend. Check if grease can be added to all lubricating points. If there are lubricating points on engine, mainly check if each grease distribution pipe of the engine breaks, and if each lubricating point can be lubricated normally; 3. Check if pipe is fixed firmly, check if wire harness is secured firmly, and check if any tie of grease distribution pipe with swinging allowance becomes loose; 4. In case of maintaining lubricating system, if the removed part is sealed by combination washer, copper washer and other sealing methods, when install back, must replace with new combination washer and copper washer; 4. Remove oily dirt from various parts of the system and oily dirt leaked from lubricating points; 5. Check remaining grease in the tank and add in time.

注：在以往的工作中，有客户反应加油时异常困难，此现象属于加油阀滤网堵塞导致，清洗或更换加油阀滤网即可。此外，应注意加油和油脂（油桶）存放时的卫生。
Note: In the past, some customers said it was extreme difficulty in refilling. This is caused by blockage of refilling valve strainer. Wash or replace the refilling valve strainer. In addition, pay attention to clean condition when refilling or storing grease (container).

6．润滑泵的油箱内油脂的维护与保养：
6. Care and maintenance of grease in tank of lubricating pump:

油箱内润滑脂贮存时间或者停止运行时间达到 6 个月以上，润滑脂可能存在氧化、基础油分层析出等问题，导致润滑泵无法正常供脂。需要使用相同牌号油脂将内部旧油脂更换。
Grease in the tank or vehicle does not operate over 6 months. In this case, the grease

may be oxidized also, and base oil could layer and dissolve out, causing lubricating pump unable to supply grease normally. It is necessary to replace old grease inside with new one of the same specifications.

我司建议以上保养要求请客户纳入整机保养规范中。
Our company suggest that, the customer shall integrate maintenance requirements above into machine maintenance specifications of the whole vehicle.

注意：
Note:

所有不按照要求操作，人为损坏的产品，不在保修范围内。如在操作过程中有任何疑问欢迎来电咨询。
All product damages due to non-compliant operation or man-made, are not covered in scope of warranty. If there are any questions while operating, welcome call to consult.

整车二保：
Second maintenance of whole vehicle:

1.作一保中的全部检查项目；
1. All items covered in the first maintenance shall be carried out;

2.检查油箱中剩余油量，每次二保时须加油至最高油位线。
2. Check volume of grease left in the tank. Add grease until its level reaches the upper line when performing the second maintenance.

整车大修：
Vehicle overhaul:

1.作一保、二保全部内容；
1. All items covered in the first and second maintenance shall be carried out;

2.检查油管、电线、油压传感器信号线、温控传感器信号线和护套线有无老化。
2. Inspect if grease pipes, wires, grease pressure sensor, temperature control sensor signal wire and sheathed wire are aging.

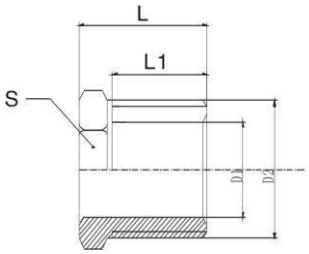
特别注意:
Special attention:

●监控器自动控制设备集中润滑系统的工作，司机只需监视监控器界面是否正常，勿需操作。如需调整出油频率，必须由维护管理部门集中遥控调节。●应加注适合环境的油脂,推荐牌号的 0#或 00#极压锂基脂（国产中石化长城牌为宜），油脂应清洁保管，清洁加注，加注时不可超越上刻线，也不可待没油时再加，确保二保加油。●机械设备维修保养若需临时挪动或部分拆除本系统管路时，务必记准管路原始安装状态，维修保养完后必须恢复原安装状态，否则管路将被拉断。●机械设备安装和维修时严禁电焊火花灼伤油管、护套、电线、如有损伤必须更换。

● The monitor automatically controls operation of the equipment centralized lubricating system. The driver only needs to monitor whether the monitor screen is normal. It is not necessary for the driver to operate. If grease output frequency needs to be adjusted, it must be centrally controlled by the maintenance management department. ● Grease suitable for environmental requirements should be refilled. 0# or 00# extreme pressure lithium-based grease is recommended (Domestic Great Wall brand of Sinopec will be ok). Keep grease clean in the process of refilling. Do not exceed upper line. In addition, do not add grease when there is no grease in the tank. Do not forget to add grease when earring out the second maintenance.● When maintaining and repairing mechanical equipment, if it is necessary to temporarily move or partially remove the system pipeline, always mark original installation state of the pipelines. After the maintenance, the original installation state must be restored, otherwise the pipeline will be broken. ● When installing and repairing mechanical equipment, any damage of grease pipe, sheath and wire due to electric welding spark is strictly prohibited. If so, must replace the damaged one.

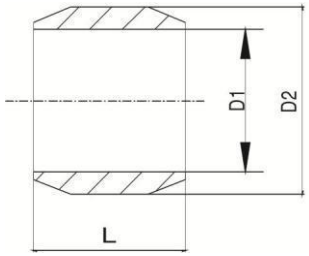
十、常用维修附件
X. Common Service Accessories

空心螺钉
Hollow screw



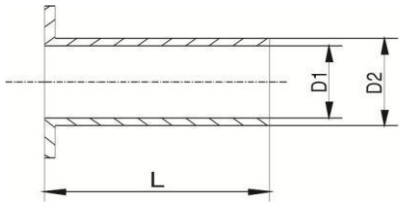
零件号 P/N	D1	D2	L	L1	S
KL4	4.2	M8*1	12	7.5	8
KL10	10.2	M16*1.5	16	11	16

双锥卡套
Double taper ferrule



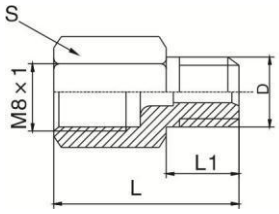
零件号 P/N	D1	D2	L
SK4	4.1	6.2	5
SK10	10.1	12.4	8

衬套
Bushing



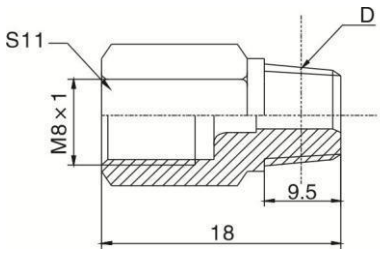
零件号 P/N	D2	D1	L
CT4	2.5	1.8	10
CT10	6.9	5	18

端直通接头
End straight connector



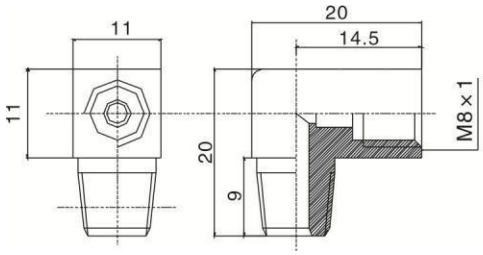
零件号 P/N	D	L	L1	S
Z6	M6	15	4.5	10
Z8	M8*1	15	4.5	10

端直通锥螺纹接头
End straight cone thread connector



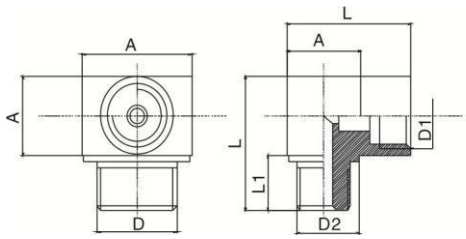
零件号 P/N	D
Z1/8	NPT1/8
R1/8	R1/8

端直角锥螺纹接头
End right-angle cone thread connector



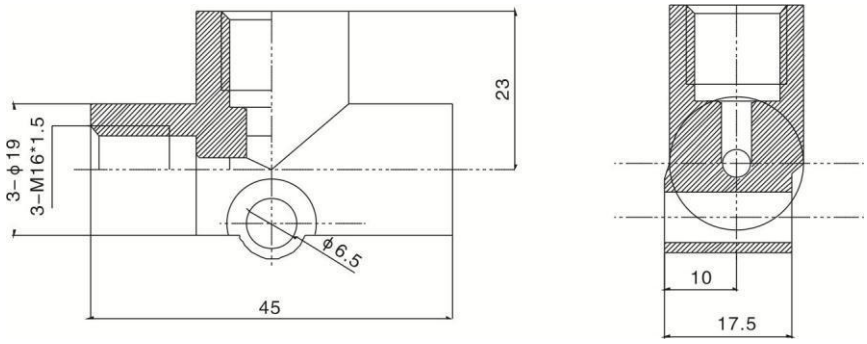
零件号 P/N	D
JZ1/8	NPT1/8
JR1/8	R1/8

端直角接头
End right-angle connector

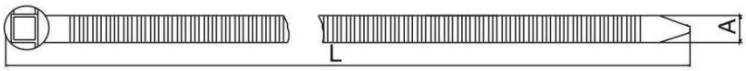


零件号 P/N	D	D1	L	L1	A
J6	M6	M8*1	20	6.5	11
J8	M8*1	M8*1	20	6.5	11

三通接头 ST10
Tee-junction ST10



尼龙扎带
Nylon cable ties

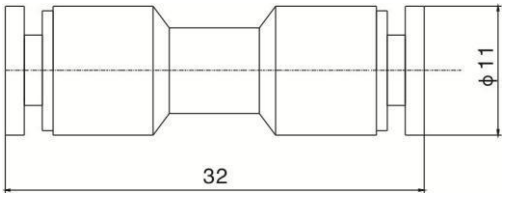


零件号 P/N	L	A
ZD8x240	240	8
ZD4.8x186	186	4.8

尼龙管
Nylon pipe

零件号 P/N	dXA	颜色 Color
NL4W	4x0.75	白色 White
NL4Y	4x0.75	黄色 Yellow
NL4R	4x0.75	红色 Red
NL10	10x1.75	黑色 Black

快换对接头
Quick-change connector



十一、运输与储存
XI.Transport and Storage

10.1 运输
10.1 Transport

10.1.1 装卸时，应小心轻放、不得倒置；
When loading or unloading, handle with care and do not place upside down.

10.1.2 装卸和运输中，应避免和其它物品发生碰撞；
When loading, unloading and transporting, collision with others shall be avoided;

10.2 储存
10.2 Storage

10.2.1 产品应储存在通风、干燥、不受阳光直射及空气中不含腐蚀性气体的库
The product shall be stored in a warehouse that is ventilated, dry, free from direct sunlight and corrosive gases in the air.

10.2.2 封闭所有开放的管路，防止灰尘、杂质侵入；
Seal all open pipelines to prevent dust and impurities from entering;

10.2.3 产品在库房内要码放整齐、注意通风，并注意包装箱上的标志、不得倒置。包装箱和地面、墙壁要保持至少 100mm 以上的距离。
Products in the warehouse shall be place in order. Pay attention to ventilation and signs on the packing cases. Do not place upside down. A distance of at least 100mm shall be kept among the packing case, floor and walls.

十二、售后服务
XII. After-Sales Service

郑州奥特科技有限公司销售服务网点，遍布全国各地，全国各地售后服务人员80余人。
Sales and service outlets of Zhengzhou Autol Technology Co. Ltd. Cover all over the country, with over 80 after-sales service personnel throughout the country.

全国售后服务热线：
National after-sales service hotline:

400-683-6862