

ZRDBG4024PCG Intelligent Lubrication Grease Pump Station

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1. ZRDBG4024PCG Appearance and schematic diagram of intelligent lubrication pump station (A3)



Intelligent Lubrication Pump Station Overview and System Description

Product Introduction

The ZRDBG series electric lubrication pump is the on-site intelligent pump station of the ZR1601-Web wireless intelligent lubrication system. It is responsible for delivering grease to all lubrication points. It can process various detailed parameters of its own operation and send them wirelessly to the server software platform for storage and analysis. It can maintain data linkage with the wireless intelligent distributor to realize information data supplement and verification of each lubrication point.

Basic parameters

Nominal pressure	40Mpa
Motor power	1.5KW
Rated flow	400mL/min
Operating voltage	380V
Oil tank capacity	100L
Weight	320KG
Communication	Wireless Communications
Electrical Control	Siemens PLC and Siemens touch screen
Operating temperature	-20-80°C
Fluid	grease with a cone penetration of not less than 220 (25°C, 150g) 1/10mm (NLG10#~2#) and lubricating oil with a viscosity grade of not less than N68.

Function

1. The lubrication pump works in a two-line mode, and adopts the working principle of the reversing valve alternately boosting two main lines. The oil supply of the two-line distributor to each lubrication point is realized through the alternating operation of oil pressure;
2. The control system can be switched arbitrarily between manual control, automatic control and partition control as needed;
3. It is equipped with a pump outlet pressure and AB line pressure transmitter, and the touch screen can display the pressure value in real time;
4. It is equipped with an ultrasonic level meter and an oil temperature sensor, and a temperature and humidity sensor in the cabinet. The touch screen can display the oil level, oil temperature and the temperature and humidity inside the electric control cabinet in real time;
5. The oil outlet is equipped with a two-position four-way reversing valve, and the oil inlet is equipped with a two-position two-way on-off valve to ensure the stability of the pump station operation and the stability of the grease replenishment;
6. The pump station has detailed alarm information. In addition to the conventional oil supply timeout and oil level alarm, it also has motor overload, abnormal reversing, air suction, leakage, overpressure and sensor abnormality.
7. The touch screen interface is more user-friendly, and the human-computer interaction is more easy to understand;
8. The system can control each lubrication system from the network cloud platform. It can realize the operation of start, stop, parameter setting, history query, alarm reset, etc.;
9. It has the function of fault push. When the pump station fails, the relevant person in charge can be sent a text message at the first time;
10. The supporting server software platform integrates the operation data of the pump station with the data of the intelligent distributor, analyzes the filling pressure of each oil outlet of the distributor and generates a trend chart, and can provide fault pre-alarm information under the setting of the warning value;

Instructions

1. The pump should be installed in a place with suitable ambient temperature, less dust, and convenient for adjustment, inspection, maintenance, disassembly, cleaning and grease filling;
2. It should be arranged in the center of the system as much as possible, shorten the piping length, maintain the minimum pressure drop, and enable the pump to generate enough pressure to overcome the resistance of the lubrication point;
3. Before use, 50# mechanical oil must be added to the reducer to the height specified by the oil mark;
4. The set pressure of the pressure regulating valve can be adjusted arbitrarily within the range of 0-40Mpa, and it is not allowed to exceed the nominal pressure of the pump 40Mpa during use;
5. The filter screen of the Y-type filter valve should be cleaned regularly to prevent blockage;
6. If the system pressure reaches about 50Mpa due to some fault, the fuse will break. Find out the cause and eliminate it before installing a new fuse;
7. It is recommended to use ZRJB or ZRGP type refueling pump to add grease to the oil reservoir from the grease filling port of the oil reservoir.

Attention

1. This lubrication system must be fixed and staffed, and must be operated by qualified operators. Non-technical personnel are not allowed to operate or disassemble it at will.
2. The grease used must meet the system's use requirements.
3. The lubricating pump must ensure the cleanliness of the lubricating oil when refueling.
4. The equipment should usually be placed in an automatic operation state and automatically operate according to the pre-adjusted parameters. The parameters must not be changed at will to avoid affecting the oil supply effect. If it is necessary to modify, it must be reported to the supervisor for approval before being operated by professionals, and the modification records must be kept. When the parameters are lost due to long-term shutdown or improper operation, professionals must re-enter them according to the previous parameters and keep records.
5. Manual operation is generally only used during equipment commissioning. If manual operation is required, pay close attention to the pressure gauge indication to prevent the system from over-pressure operation. At the end of manual operation, pay attention to turning off the oil pump.
6. It is not allowed to connect unrelated electrical appliances in the control cabinet. The sockets in the cabinet are used for debugging programs, and it is forbidden to plug in high-power electrical equipment.
7. The pressure of the lubrication pump has been adjusted at the factory. Generally, it is not allowed to adjust it at will. If it is necessary to adjust it, it must be done by professionals.
8. The lubrication pump is not allowed to run idle for a long time, and it is not allowed to reverse.
9. Equipment failure should be handled in time. Before handling the failure, be sure to turn off the power supply and hang a warning sign, and then operate after the pressure in the main oil pipe is released.
10. The motor reducer must be supplemented with an appropriate amount of 3# molybdenum disulfide grease from the exhaust plug hole for the first two months of use, and then supplemented every four months.

Note:

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**Intelligent lubrication pump station electric
control box touch screen**

Instruction manual

Introduction

Siemens SMART LINE touch screen is the human-machine interaction tool for the entire pump station, accurately providing the standard functions of the human-machine interface. The touch screen and S7-200 SMART PLC form a perfect automation control and human-machine interaction platform. Its functions are as follows:

1. Control the operation of the pump station and set operating parameters;
2. Display all status information of the pump station;
3. Fault alarm function;
4. Data and alarm record archiving;

Interface Introduction 1-Main Menu



The figure shows the main menu interface, which contains the operating status information and control buttons of the pump station:

- Status bar: Displays the current status of the pump station (green: running, white: not running)
- Pump station working: lubrication pump working or stopping;
- Motor working: lubrication pump motor starting or stopping;
- A/B line working: A line working or stopping;
- Grease filling working: grease filling pump (if any) starting or stopping, grease filling valve opening or closing
- Pump outlet/A line/B line pressure: the real-time grease pressure inside the pipeline collected by the pump outlet/A line/B line pressure transmitter;
- Cabinet temperature/humidity: the real-time temperature and humidity inside the electric control box;
- Remaining time to the next oil supply start: the remaining time to the next cycle lubrication pump start in automatic and partition mode;
- Dual-line interval time: the time when lines A and B are paused during work. For example: AB line is set to 5 minutes. When A line finishes working, the lubrication pump stops. After 5 minutes, the lubrication pump starts and B line starts working;
- Remaining number of cycles: In automatic and partition modes, the remaining number of AB line cycles in this cycle; manual and continuous modes do not have this content;
- Pump station monitoring remaining time: This time is displayed when the pump station is working, and is used to display the remaining monitoring time when the current A line/B line is working;
- Remaining time for oil supply completion: This time is displayed when the pump station is working. When the pump station reaches the switching pressure, the remaining time of the pressure holding delay is displayed;
- Remaining time for grease replenishment monitoring: This time is displayed after the grease replenishment work, and the remaining time for grease replenishment monitoring is displayed;
- Oil temperature: Displays the temperature value in the pump oil barrel;
- Oil level: Displays the real-time grease level;
- Oil volume: The remaining oil volume inside the pump station at this time;

Alarm bar:

Displays the current alarm information of the pump station (red: serious alarm, the pump station cannot continue to work; yellow: general alarm, the pump station can continue to work; white: no alarm)

- No pressure: The pressure of the pump station is always lower than the lower limit when it is working, and exceeds the set monitoring time;
- Pump overpressure: The pressure of the pump station exceeds the set upper pressure limit when it is working;
- A line/B line oil supply timeout: The working time of A/B line exceeds the set monitoring time;
- Abnormal pressure: The pressure value display does not conform to normal logic;
- Abnormal reversing: The reversing work does not conform to normal logic;
- Lubrication pump overload: The lubrication pump motor is overloaded;
- Oil level is too low: The liquid level in the oil storage barrel is lower than the minimum oil level warning value;
- Low oil level: The liquid level in the oil storage barrel is lower than the low oil level warning value. After the alarm occurs, the system will start the grease replenishment pump (when the grease replenishment pump mode is automatic), and the alarm will be automatically eliminated when the oil level is higher than the minimum warning value;
- Grease replenishment pump overload: The grease replenishment pump motor is overloaded;
- Oil level is too high: The liquid level in the oil storage barrel is too high to trigger the ultra-high liquid level sensor;
- Oil replenishment timeout: The working time of the grease replenishment pump exceeds the setting value of the grease replenishment monitoring time;
- Alarm elimination: When an alarm occurs or the buzzer alarm is heard, The alarm can be reset by clicking the Alarm Clear button. If the alarm cannot be triggered first, the alarm can be cleared only after troubleshooting according to the alarm information.

Control Bar


- Upper computer association mode Local/Controlled: PLC control mode selection. In local mode, the touch screen can control the normal operation of the pump station. In controlled mode, the upper computer pouring signal input is required, otherwise the touch screen cannot control the normal operation of the pump station;
- Lubrication pump start/stop switching: In manual mode, control the start/stop of the lubrication pump;
- Lubrication pump working mode selection:
 - Automatic mode: The lubrication pump station automatically runs periodically according to the set parameters;
 - Manual mode: Manually click to start and stop the pump station;
 - Continuous mode: The lubrication pump station runs continuously, and performs a reciprocating cycle of line A-line B;
 - Partition mode: Add a partition function based on the automatic mode to achieve different lubrication cycle requirements for different partitions;
- Grease replenishment pump working mode selection:
 - Automatic mode: Automatically start and stop grease replenishment according to the oil level; Stop/Start: Manually control to start or stop grease replenishment;

Working interface 2-Parameter setting

		主菜单	参数设定	分区控制	系统参数	报警日志
间隔时间设定	监控时间设定	AB线间隔时间设定	循环次数设定			
0 时 30 分	10 分 0 秒	5 分	1 次			
泵过压上限设定	A线换向压力设定	A线延时换向设定	A线保压下限加值	A线保压上限加值		
30.0 Mpa	15.0 Mpa	30 秒	1.0 Mpa	2.0 Mpa		
	B线换向压力设定	B线延时换向设定	B线保压下限加值	B线保压上限加值		
	15.0 Mpa	30 秒	1.0 Mpa	2.0 Mpa		
设定完成后请点击						

- This interface can set the working parameters of the lubrication pump to meet the needs of automated lubrication under different working conditions;
- Interval time setting: the interval time setting value of each cycle, effective in automatic mode;
- Monitoring time setting: the maximum limit time of A line or B line working in each cycle;
- Dual line interval time setting: the interval time setting of A line and B line working in each cycle, effective in automatic and partition modes;
- Cycle number setting: the number of cycles of A line and B line working in each cycle, effective in automatic and partition modes;
- Pump overpressure upper limit setting: the maximum allowable value of pump outlet pressure;
- A line/B line switching pressure setting: the pressure setting value at the start of A line/B line delay switching time timing when A line/B line is working;
- A line/B line delay switching time setting: the time value of starting timing switching when the A line/B line pressure reaches the A line/B line switching pressure setting value in each cycle;
- Setting completed: After entering the parameter setting, you must click this button to finally complete the parameter setting;

Working interface 3-partition control

		主菜单	参数设定	分区控制	系统参数	运行日志
分区工作状态	一 分 区	二 分 区	三 分 区	四 分 区		
间隔时基设定	2	3	4	5		
间隔时基显示	2	3	4	5		
分区阀手动控制	开 关	开 关	开 关	开 关		
分区时基设定	1 时	30 分				
当前时基剩余时间	1 时	30 分				
						确认

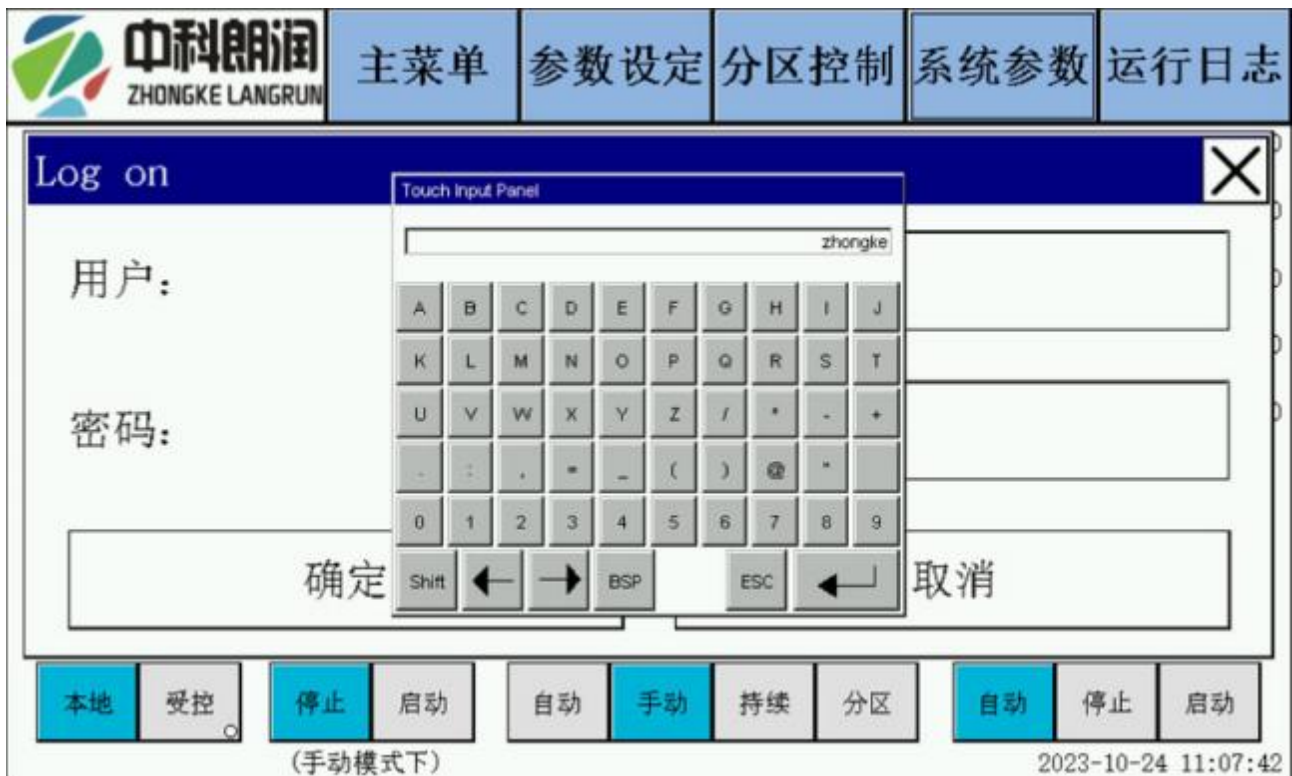
The following figure shows the partition control interface. This interface is used to set different lubrication cycles for different partitions in the partition mode to meet the automatic control in the complex partition mode.

- Time base setting: The time base is the time base, which refers to the basic unit of time display;
- Interval time setting: The lubrication interval time of each partition, that is, the interval of how many units of time base;
- Interval time display: The remaining time from the partition to the next lubrication, that is, the remaining number of units of time base;
- Confirmation: After entering the partition parameter setting, you must click Confirm to complete the parameter setting; As shown in the figure, the time base is set to 1 hour and 30 minutes, and the interval time of partitions 1-4 is 2,3, 4, and 5 respectively. Their oiling frequencies are: Zone 1 is oiled once every 3 hours, Zone 2 is oiled once every 4.5 hours, Zone 3 is oiled once every 6 hours; Zone 4 is oiled once every 7.5 hours;

Working interface 4-system parameters

System parameters are the parameters of the pump station system itself. Non-professionals are not allowed to change them easily. The parameter interface requires user and password input to enter;

The user and password input interface is as follows:



Work interface 5-Running log

The following is the operation log interface, which records and displays each operation information and alarm information of the pump station;



ZHONGKE LANGRUN		主菜单	参数设定	分区控制	系统参数	运行日志
2023-10-24	10:44:09	人为消除报警				▲
2023-10-24	10:44:09	补脂泵工作				▲
2023-10-24	10:44:08	人为消除报警				
2023-10-24	10:44:08	泵过压报警				
2023-10-24	10:44:02	泵站电机工作				
2023-10-24	10:44:02	泵站工作				
2023-10-24	10:44:02	泵过压报警				
2023-10-24	10:43:57	泵站电机工作				
2023-10-24	10:43:57	泵站工作				→
2023-10-24	10:42:38	补脂泵工作				
2023-10-22	15:59:19	人为消除报警				
2023-10-22	15:59:18	泵过压报警				
2023-10-22	15:59:18	人为消除报警				
2023-10-22	15:59:13	泵站电机工作				
2023-10-22	15:59:13	泵站工作				▼
2023-10-22	15:59:13	泵过压报警				▼
2023-10-22	15:59:07	人为消除报警				

Notes

1. Do not disassemble at will, otherwise you will be responsible for the consequences;
2. Avoid operation by non-professionals;
3. Please replace original parts to ensure stable working conditions;

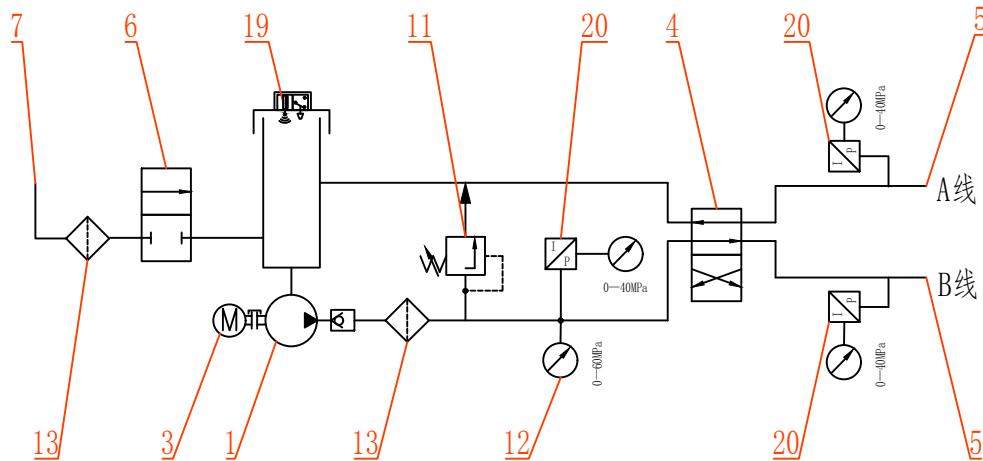
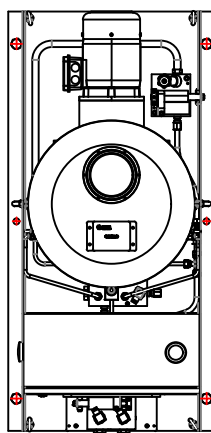
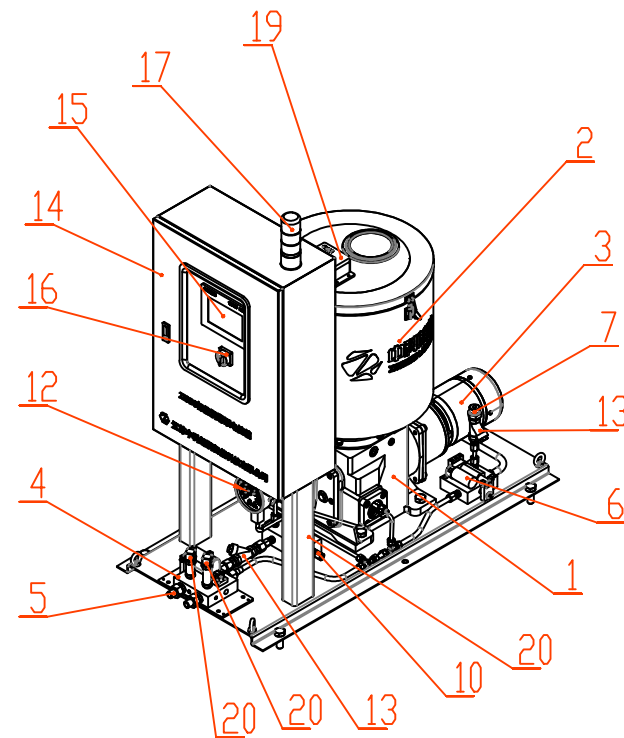
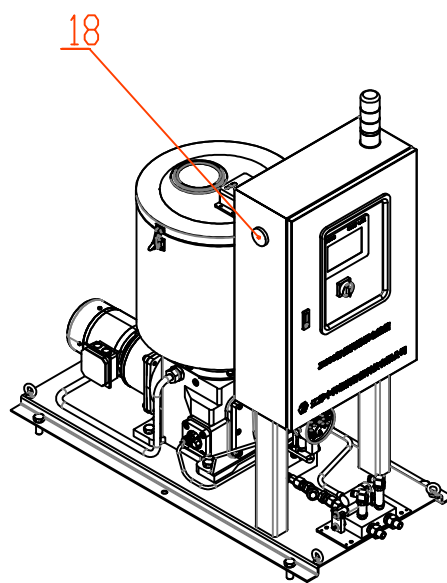
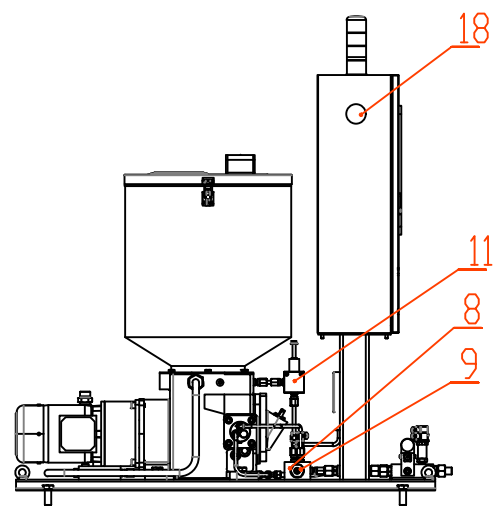
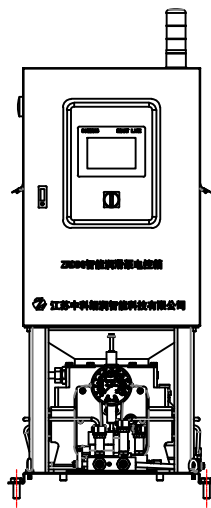


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技术说明

1. 泵站参数
公称压力：40MPa，公称流量：400mL/min，电机功率：1.5KW，油桶容积：100L；
2. 采用全传感型双线智能润滑泵站，具备自动定量打油、延时换向、贮油桶液位实时监测、自动补脂、泵出口压力及AB线压力实时监测、泵站环境温度湿度实时监测、故障报警及报警消除等功能；
3. 可通过逻辑判断区分润滑泵过载、补脂泵过载、泵吸空、管路泄露、升压受阻、管路渗漏、换向阀故障、传感器故障、油位异常；
4. 具备分区控制功能，通过增加分区阀可实现不同分区不同加注需求；
5. 具备智能远程控制功能，可通过远程智能终端控制泵站运行，修改参数，查看泵站工作状态、历史数据、报警信息，以及报警消除功能，实现在线监控，数据上传服务器，与无线智能分配器数据联动；

20	压力变送器	4-20mA, 0-40MPa	3	成品	
19	液位计	ZRYW03-50	1	组件	
18	远程监控模组	ZRYCM-V2.0	1	组件	远程实时通讯，与分配器数据联动
17	三色报警灯	施耐德	1	成品	
16	总开关		1	成品	
15	触摸屏	SIEMENS 700 V4	1	成品	
14	电气控制箱		1	组件	
13	过滤器		2	304组件	
12	机械式压力表	0~60MPa	1	成品	
11	可调溢流阀		1	304组件	
10	爆破片	50MPa	1	组件	
9	排气阀		1	组件	
8	集油阀		1	组件	
7	补脂口接头	M30*2	1	组件	
6	补脂阀		1	组件	
5	泵出口接头	R1/2焊接φ22	2	304	
4	二位四通换向阀		1	组件	
3	驱动电机	1.5kW三相交流电机	1	成品	
2	贮油桶		1		
1	泵体	双泵芯	1	组件	
序号	名称	品牌型号	数量	材料	备注

		电动干油润滑泵站	
设计：蓝文斐 标准化：图样标记：重量比例：		ZRDBG4024PCG	
审核：日期：2024-03-01 共1页 第1页		V9.0	

修改附件登记
 插图
 校核
 审核
 日期