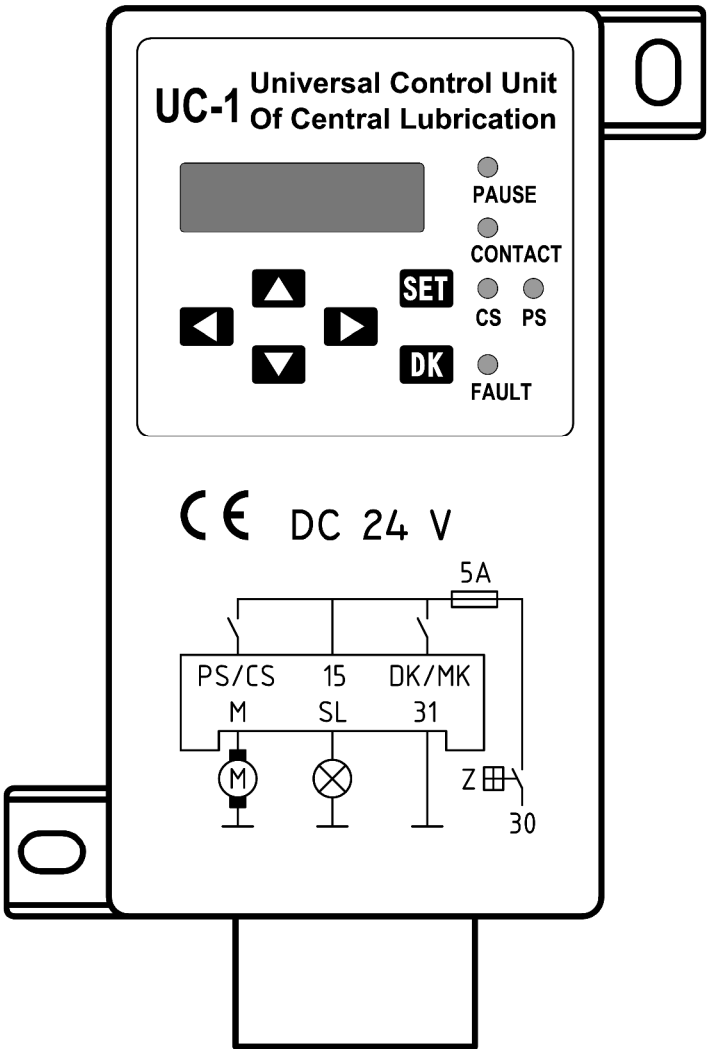
Universal Control Unit UC-1

User's Manual



Suzhou Leetern Industry Control Department

May. 2007

Universal Control Unit UC-1 is designed for controlling and monitoring of centralized lubrication systems of engineering machinery, chassis and lubrication stations. Universal Control Unit UC-1 is compatible with IG502-E and IG502-2-E Control Unit of VOGEL, and it can replace IG502-E and IG502-2-E.
UC-1 stores configuration data and parameters in EEPROM, which made UC-1 can store data safely for long period without backup power supply.
The control unit use LCD to display information. There are two language versions of Chinese and English for user to choose from.

Factory settings on UC-1 are as followings:

Pause mode:	timer
Pause time:	9 h
Contact mode:	timer
Contact time:	2min 36s (2.6min)
Initial password:	0000
System monitoring:	**P**ressure **S**witch

† Above settings are as same as those on IG502-E and IG502-2-E Control Unit (VOGEL).

Model's instruction

UC-1-12C	12V rated working voltage, Chinese interface
UC-1-12E	12V rated working voltage, English interface
UC-1-12M	12V rated working voltage, multi-language interface
UC-1-24C	24V rated working voltage, Chinese interface
UC-1-24E	24V rated working voltage, English interface
UC-1-24M	24V rated working voltage, multi-language interface
UC-1-1242C	11V~45V wide voltage, suitable for both 12V, 24V and 36 (42)V rated voltage, Chinese interface
UC-1-1242E	11V~45V wide voltage, suitable for both 12V, 24V and 36(42)V rated voltage, English interface
UC-1-1242M	11V~45V wide voltage, suitable for both 12V, 24V and 36(42)V rated voltage, multi-language interface

To prevent errors, please make sure you order and install the right model.

Manufacturer: Suzhou Leetern Industry Control Department
Address: Rm.102, Building 8, No. 22, Xiao Shi Jia Nong, Suzhou, China
Technical Support Fax: +86-512-68661838
Technical Support Email Box: support@leetern.com
Website: http://www.leetern.com

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Safety Warning!

Universal Control Unit UC-1 is designed and manufactured not only in conformity with the generally engineering standards, industrial safety and accident prevention regulations, but also in accordance with some relevant generally industrial technical acceptance standards.
Although this unit complies with relevant safety technical requirements, the use of the unit may still entail dangers leading to personal injury of the user or third parties or damage to property. Therefore, the unit must be used when it is in perfect technical condition. And the operation must strictly comply with operation manual. Errors that may affect safety must be rectified immediately.
The unit is designed for controlling and monitoring centralized lubrication systems. The user himself shall be liable for any damage caused by improper use.

Potential electrical dangers

This unit must be connected to the power supply only by trained qualified personnel in accordance with the local electric technical regulations. Improper connection may lead to serious personal injury.
This unit is designed to use in battery-powered on-board electric system of chassis, engineering equipment and lubrication station. When it is used for any other purposes, all safety regulations should be complied with.

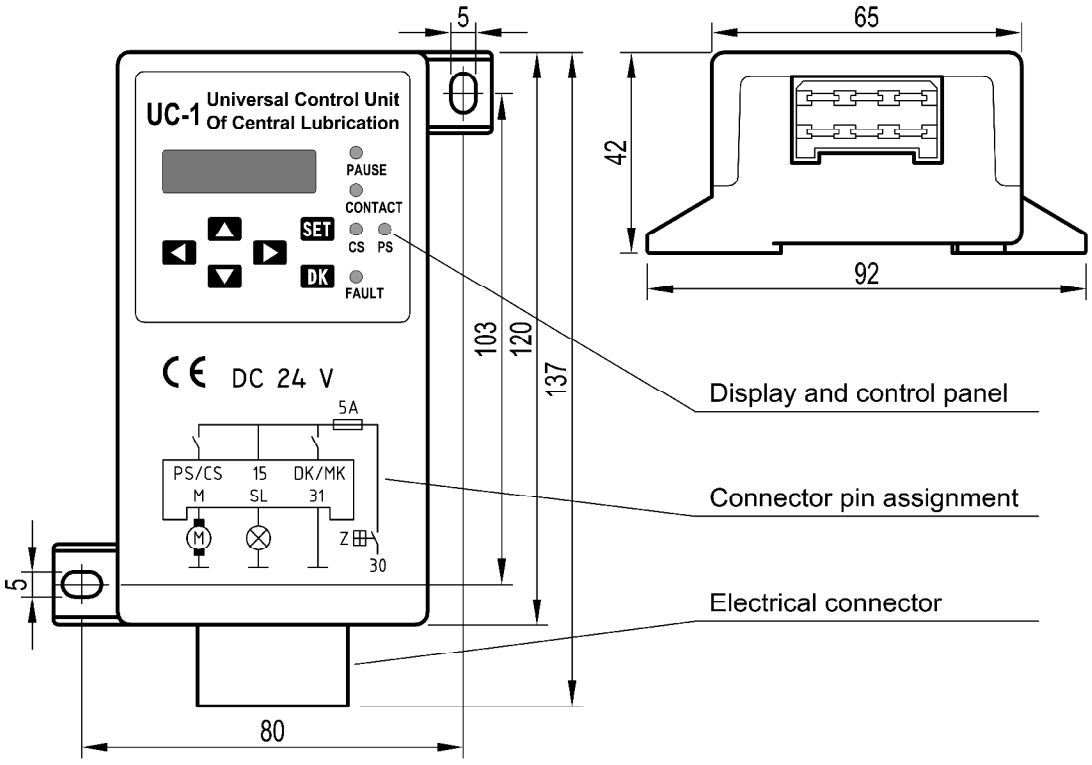
Qualified personnel

Qualified person means person trained, assigned and instructed by the operator of the equipment concerned. They are familiar with relevant safety rules or regulations and have certain knowledge and skills of safety.
They are entitled to carry out the activities required in a given case and will be able to recognize and avoid possibly existing dangers.

1. Installation

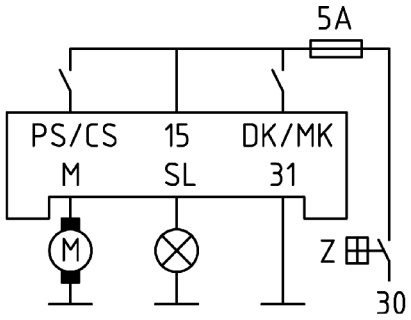
Universal Control Unit UC-1 is **not** designed to work in open-air; it has to be installed in an enclosed compartment to protect it from environmental influences.
If the control unit is installed at an inaccessible position, it is advisable to install additional signal lights and illuminated pushbutton in operation room. So that the operating situation of the control unit can be remote monitored.

1.1 Installation dimension

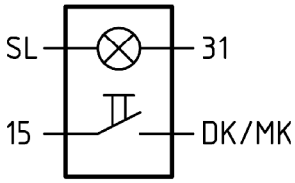


1.2 Electrical connection

PS / CS	External **P**ressure **S**witch or **C**ycle **S**witch
15	Positive pole of power supply of UC-1
+M	Pump motor
+SL	External **S**ignal **L**ight
DK / MK	External pushbutton (timer operation)
	Signal input (counter operation)
31	Ground
Z	Start-switch



Terminal connection diagram

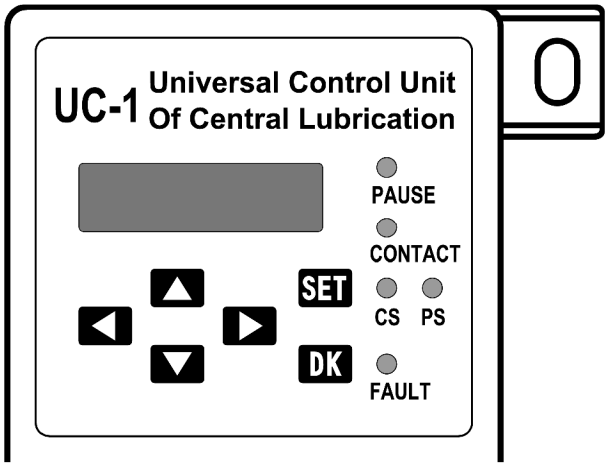


Electrical connection of external illuminated pushbutton diagram

Note: Universal Control Unit UC-1 has 12V, 24V rated working voltage models and wide voltage model for both 12V, 24V and 36(42)V available.

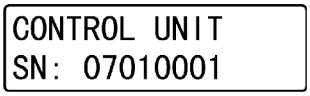
Please make sure that the system voltage matches the voltage claimed on the control unit. The fluctuation of supply voltage should be within power voltage limit range. Lower or higher than the voltage limit will permanently damage the control unit.
UC-1-24X, supply voltage limit range is **20V~36V.**
UC-1-12X, supply voltage limit range is **11V~18V.**
UC-1-1242X, wide voltage model, supply voltage limit range is **11V~45V.**
If the lowest required voltage is not guaranteed, please purchase Low Voltage Protector to protect the control unit against low voltage.

2. Display and control panel



Film panel protects UC-1 from humidity and dust.
Please use soft cloth with warm water or neutral detergent to clean the film panel. Organic solvent is prohibited because the film is made in organic material.
Do not use sharp tools/ object to touch the panel.

2.1 LCD display



LCD displays operating status and parameters.

It is deactivated normally. To activate it, press key ▲ or ▼ , LCD then start to display current status and programmed parameters. †

2.2 LED signal light

CONTACT: Lubricating signal light

LED “CONTACT” is on: Power is supplied to pump and control unit. System is in CONTACT status. (Pump motor is running)
LED “CONTACT” is flashing:

1. Control unit is in CONTACT programming mode. The value and control mode of CONTACT can be altered.
2. When CS (**C**ycle **S**witch) monitoring is activated, LED “CONTACT” and “CS” will be alternate flashing and control unit is in drive phase of a block operation.

PAUSE: Pause signal light.

LED “PAUSE” is on: Power is supplied to pump and control unit. System is in PAUSE status.

LED “PAUSE” is flashing:

1. Control unit is in PAUSE programming mode. The value and control mode of PAUSE can be altered.
2. When **C**ycle **S**witch monitoring is activated, LED “PAUSE” and “CS” are flashing alternately. Control unit is in PAUSE phase of a block operation.

CS : External **C**ycle **S**witch signal light

LED “CS” is on: A Cycle Switch is used for monitoring the system. Monitoring the progressive distributor during the pump running time.
LED “CS” is flashing:

1. Control unit is in monitoring programming status. At this status, the mode of monitoring can be altered; Cycle Switch monitoring can be activated or deactivated.
2. When CS (**C**ycle **S**witch) monitoring is activated, LED “CONTACT” (or “PAUSE”) and LED “CS” will be alternate flashing and control unit is in block operation.

PS : External **P**ressure **S**witch signal light

LED “PS” is on: A pressure switch is used for monitoring the system. Monitoring pressure during pump running time.
LED “PS” is flashing: Control unit is in monitoring programming status. At this status, the mode of monitoring can be altered; the Pressure Switch monitoring can be activated or deactivated.

FAULT : Fault signal light

LED “FAULT” flashes quickly: Control unit is in fault.
Press key ▲ or ▼ , then fault message will be displayed on LCD.

2.3 Keys

Scroll up or down key

Activate display in display mode.
Increase with key ▲ or decrease with key ▼ the displayed value at cursor position by 1 in programming mode. ††
Press key ▲ to roll up the menu in menu operation.

◀ ▶ Scroll left or right key

To move the cursor position when input parameters in programming

SET **SET** key

Activate programming mode. Confirm entered values or option.

DK **D**raining or cleared **K**ey

During PAUSE time, to initiate an intermediate lubrication cycle by pressing DK once.

In FAULT status, operate this key to clear fault message and get system back to normal lubrication cycle.

2.4 External Signal Light SL

If an external signal light SL has been installed, SL will flash for 3 seconds after the start-switch is started.

Note: Control unit needs a certain time to save the operating parameters at the point of power-down so that the lubrication task of the control unit could be continued after the break. **The interval of the power-down and the next power-on should not be shorter than 3 seconds. Otherwise, control unit may not start properly, and SL will not flash.**

Whenever the control unit is performing the lubrication task, light “SL” will be on, indicating the status of lubricating; If the detecting system detects any faults during operating process, light “SL” will be flashing to remind user that the lubrication system is in fault.

† Under display mode or programming mode, if no key operations for more than 2 minute, LCD turns off automatically and quit current operation.

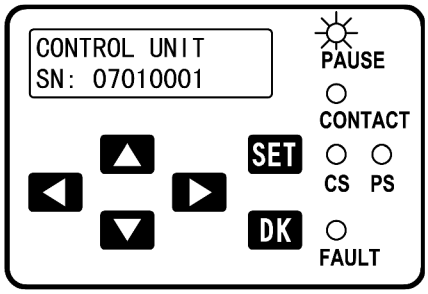
†† When using key ▲ or ▼ to alter parameters, control unit will refuse to perform the change if the new parameter is out of the programmable range of the control unit. In such cases, please check your operation.

3. Display mode

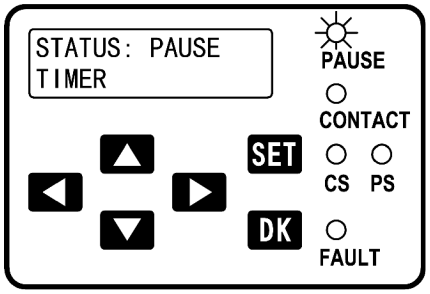
Briefly press key ▲ or ▼ to activate display. The current values and the preset parameters are displayed.
During normal operation, LED signal lights are used to show current status of the control unit.

3.1 Display operation

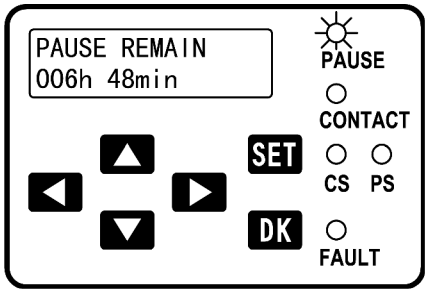
1. Briefly press key ▲ or ▼ to activate display mode and to show control unit's **S**erial **N**umber †
Example: 07010001



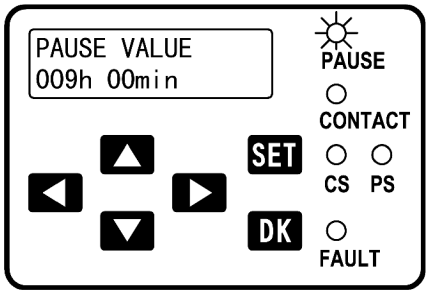
2. Press key ▲ , to show the current operating status of the control unit.
Example: PAUSE & TIMER MODE
(Pause time in timer mode)



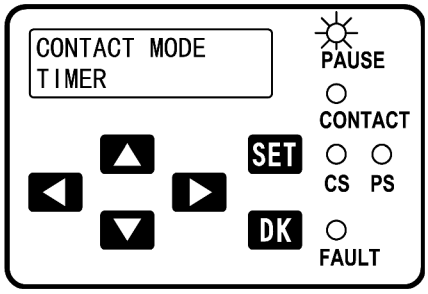
3. Press ▲ , displays the remaining pause time.
Example: 006h 48min
If PAUSE is set in counter mode, a number will be displayed.



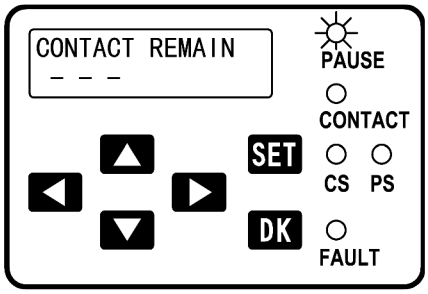
4. Press ▲ , displays preset parameter of pause time.
Example: 009h 00min
If PAUSE is set in counter mode, a number will be displayed.



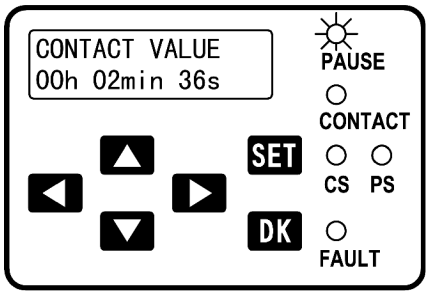
5. Press ▲ , displays the control mode of CONTACT.
Example: TIMER
(The control mode of Pump is Timer)



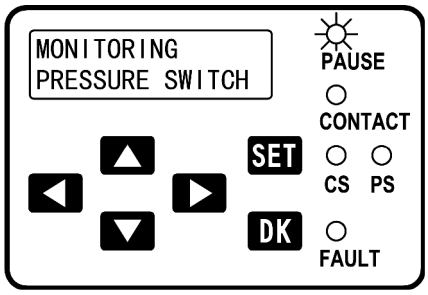
6. Press ▲ , " － － －" is displayed. Because system is now in PAUSE time, there is no remaining value of CONTACT.



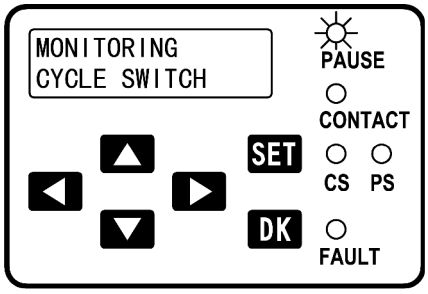
7. Press ▲ , displays preset parameter of CONTACT.
Example: 00h 02min 36s
If CONTACT is set in counter mode, a number will be displayed.



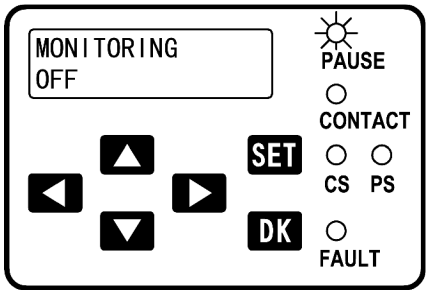
8. Press ▲ to display system monitoring.
Displayed content may be:
PRESSURE SWITCH
(Monitoring via pressure switch.)



or CYCLE SWITCH
(Monitoring via cycle switch.)



or OFF
(Monitoring disabled)



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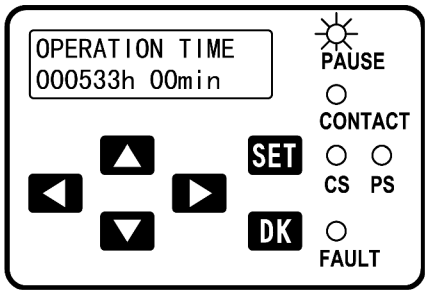
9. Press ▲ , displays total operation time.
Example: 000533h 48min
Maximum value: 999999h 59min



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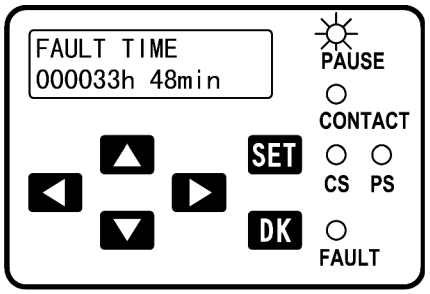
10. Press ▲ , displays total fault time.
Example: 000033h 48min
Maximum value: 999999h 59min



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11. Press ▲ , display goes out.
Total operation time and total fault time will not be erased. They are permanently stored in EEPROM.

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† This function is set according to EU's regulations. According to relevant EU directives, electronic product for EU market must owns an only serial number, which enables to trace and manage the product.

3.2 Change operating language

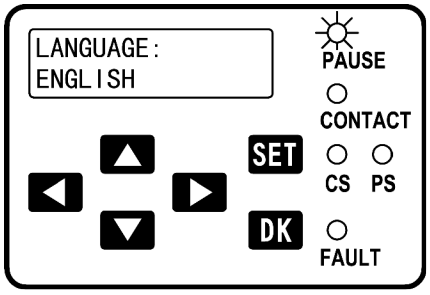
Multi-language model control unit can change operating language to meet user's requirement.

The steps to change operating language are as followings:

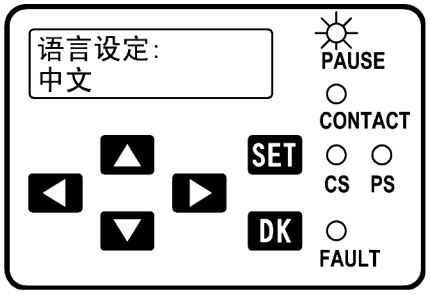
1. Cut off the power of the control unit.

2. Press keys SET and ▲ together, electrify control unit at the same time.

3. Control unit shows the current working language.
Example: current working language is English



4. Press key ▲ or ▼ to select language. After selection, control unit then displays working language in the language selected.
Example: working language is changed to Chinese



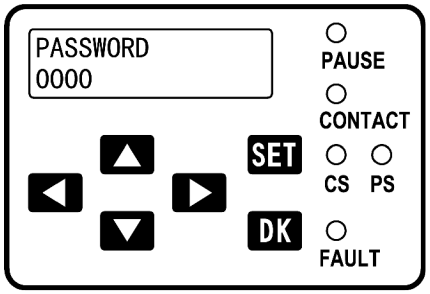
5. Press key SET to confirm the language selected. LCD goes off. The new set operating language will be stored permanently till the next change.

4. Programming

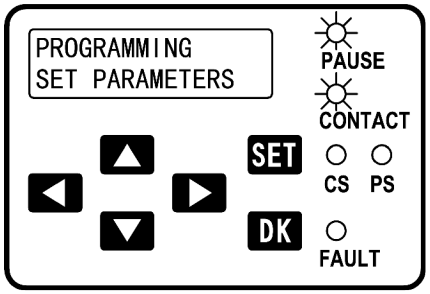
Press **SET** longer than 2 seconds to activate programming. All preset parameters and control modes can be altered.
Please note: Programming always starts with steps 1-2.

4.1 Starts programming

1. Press **SET** longer than 2 seconds, the control unit will then ask for password. Please enter the preset password.

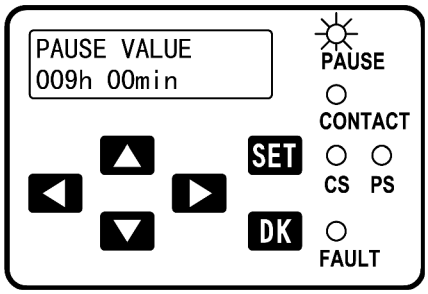


2. Press **SET** to confirm the password. LCD now displays PROGRAMMING. And the default operation is “SET PARAMETERS”.

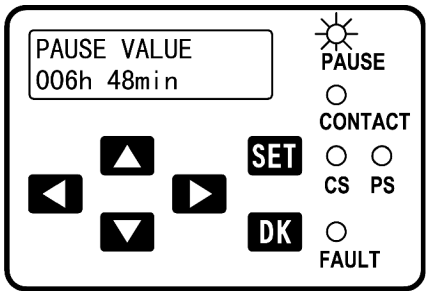


4.2 Alters pause and contact values (Carry out steps 1-2)

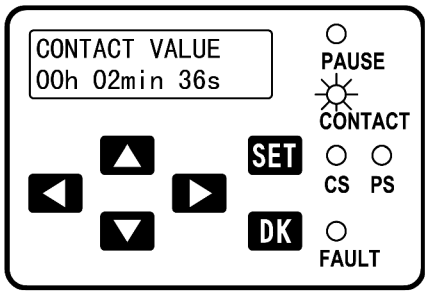
3. Briefly press **SET** to display the preset PAUSE value.
LED “PAUSE” flashes.
Example: 9 h (Factory setting)



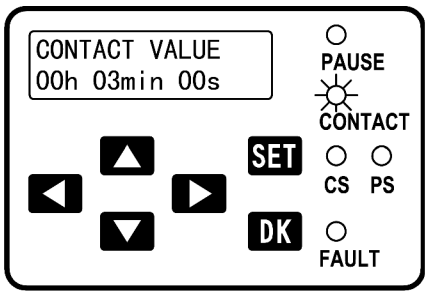
4. Use keys ▲ ▼ ◀ ▶ to set new pause value.
Example: new value is 6 hours and 48 minutes.



5. Press **SET** to confirm the new PAUSE value. LED “PAUSE” goes out and LED “CONTACT” Flashes. The preset contact value is displayed
Example: 2min 36s (Factory setting)



6. Use keys ▲ ▼ ◀ ▶ to set new contact value.
Example: new value is 3 minutes.

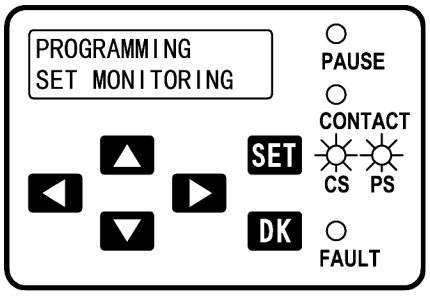


7. Press **SET** to confirm the new contact value.

8. LCD flashes to remind user all new values are confirmed. Then press **SET** without releasing, LCD stops flashing; 2 seconds later, the new values are saved permanently and display goes out.
Note: If press **SET** shorter than 2 seconds, the control unit will give up new values and go back to the initial state of PROGRAMMING.

4.3 **Change system monitoring settings** (Carry out steps 1-2)

3. Continually press ▲ till “SET MONITORING” is displayed on the second line of the LCD and LED “CS” and “PS” are flashing



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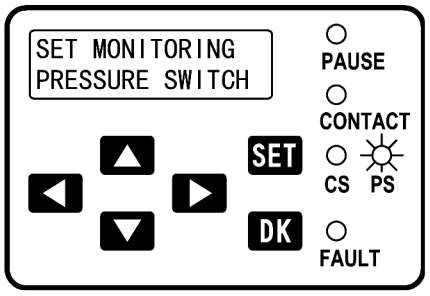
4. Briefly press SET to get into system monitoring setting status. The current monitoring mode is displayed.
Example: PRESSURE SWITCH
Monitoring via pressure switch. (Factory setting)



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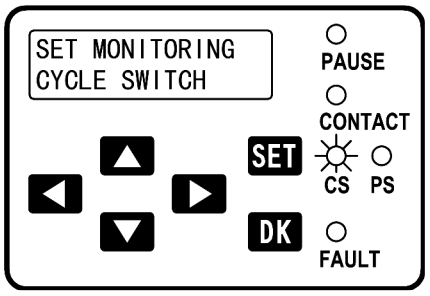
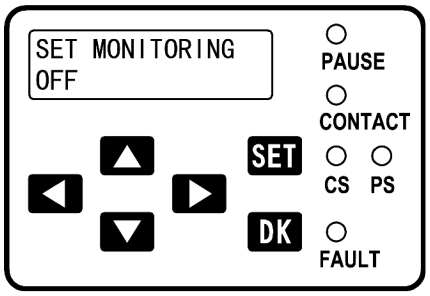
5. Press ▲ or ▼ to select monitoring mode.
Example: LED “CS” flashes, “CYCLE SWITCH” is selected. (Monitoring via cycle switch)



or select “OFF” to deactivate system monitoring. (LED “CS” and “PS” goes out)



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6. Press SET to confirm the new settings.

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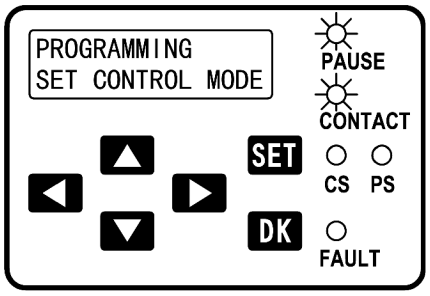
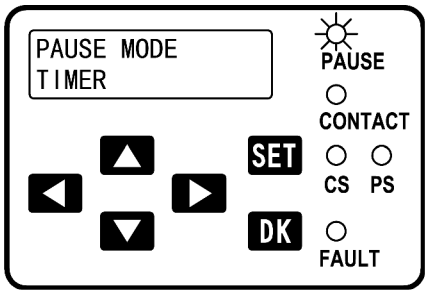
7. LCD begins flashing to remind user all new settings are confirmed. Then press SET without releasing, LCD stops flashing; 2 seconds later, the new values are saved permanently and display goes out.
Note: If press SET shorter than 2 seconds, the control unit will give up new settings and go back to the initial state of PROGRAMMING.

4.4 Change PAUSE and CONTACT control mode (Carry out steps 1-2)

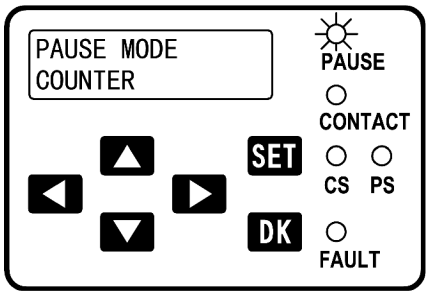
3. Continually press ▲ till “SET CONTROL MODE” is displayed on the second line of the LCD, and LED “PAUSE” and “CONTACT” flash.



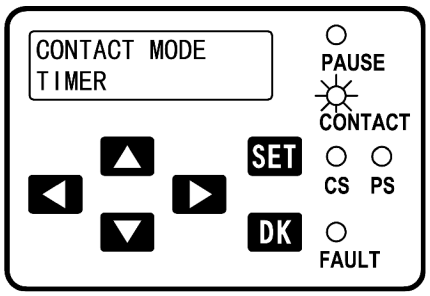
4. Briefly press SET to get into pause mode setting.
LED “PAUSE” flashes.
The current pause mode is displayed.
Example: TIMER (Factory setting)



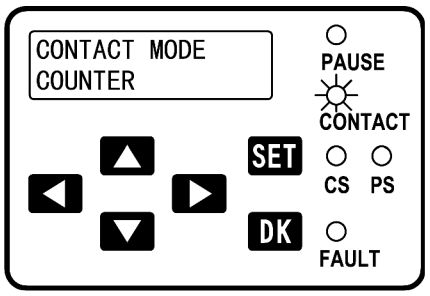
5. Press ▲ or ▼ to change pause mode.
Example: COUNTER



6. Press SET to confirm the new PAUSE mode.
LED “PAUSE” goes out and LED “CONTACT” flashes. The preset contact mode is displayed
Example: TIMER



7. Press ▲ or ▼ to change contact mode.
Example: COUNTER



8. Press SET to confirm the new contact mode.

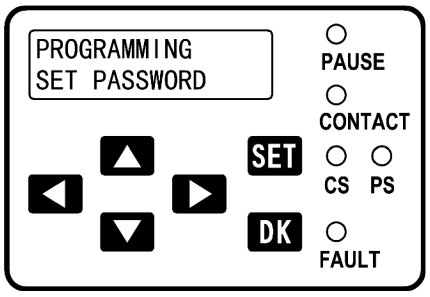
9. LCD flashes to remind user all new settings are confirmed. Then press SET without releasing, LCD stops flashing; 2 seconds later, the new values are saved permanently and display goes out.
Note: If press SET shorter than 2 seconds, the control unit will give up new settings and go back to the initial state of PROGRAMMING

Please note: after the control mode of PAUSE or CONTACT being changed, the new control parameter should be set according to the requirement of actual lubrication task**.**

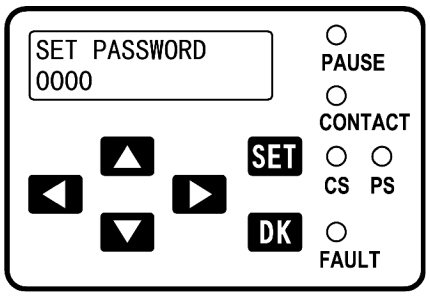
4.5 **Change password** (Carry out steps 1-2)

Once the password is changed, the password set by factory will be erased. The new password is saved till next change.

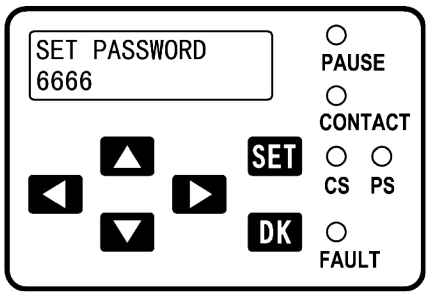
3. Continually press ▲ till “SET PASSWORD” is displayed on the second line of the LCD.



4. Briefly press SET to get into SET PASSWORD status, LCD displays current password.
Example: 0000 (Factory setting)



5. Edit 4 digits new password.
Example: 6666
The password range of UC-1 is 0000 to 9999. Control unit has no limitation within this area.



6. Press SET to confirm the new password.

7. LCD flashes to remind user the new password is confirmed. Then press SET without releasing, LCD stops flashing; 2 seconds later, the new values are saved permanently and display goes out.
Note: If press SET less than 2 seconds, the control unit will give up new password and go back to the initial state of PROGRAMMING.

Please note:
The password should be kept in a safe place. If the password gets lost, the programming of parameters for the control unit is impossible. In case of that, please contact manufacturer. Manufacturer’s contact information is printed on fly page of the User’s Manual.

5. Operating modes

5.1 Timer operation

Set “TIMER” for PAUSE and CONTACT.
The control of the lubrication cycle takes place based on the values preset for PAUSE and CONTACT times. It carries out the operation cycle of “PAUSE - CONTACT”.

Press DK , an intermediate lubrication cycle is activated OR the displayed fault message is cleared. External DK button can be connected to the terminal DK/MK.

5.2 Counter operation (Pause depends on impulses)

Set “Counter” for PAUSE and “Timer” for CONTACT.
Connect an external impulse transmitter to the terminal KD/MK.
PAUSE: Display and program values in impulses.
CONTACT: Display and program values in minutes.
This operating mode is only used in connection with pump units filling level monitoring W1.

5.3 Combination operation(Pump running is controlled by external impulse)

PAUSE: Display and program values in impulses or time.
CONTACT: Display and program values in impulses.
Users may combine “COUNTER MODE” of pause with “COUNTER MODE” of contact, or “TIMER MODE” of pause with “COUNTER MODE” of contact.

5.4 Operation without system monitoring

The lubrication cycle performs only according to the preset values of PAUSE and CONTACT. Fault monitoring is disabled in this mode.
In this mode, the monitoring function must be disabled. Monitoring mode should be “OFF”. Fault will not be automatically detected and displayed.

5.5 Operation with system monitoring

In this mode, system can be monitored by external switches.
The following functions can be monitored:
The filling level in the lubricant tank (only for pumps filling level monitoring W1).
The pressure build-up in the main line can be monitored via a pressure switch.

The function of the progressive feeder can be monitored via a cycle switch. Faults will be automatically detected and displayed when system monitoring is activated.

5.6 Power-off protection function

The control unit has power-off protection function. When power is cut off, the control unit auto stores operating status, remain values, total operation time and total fault time at the point of power-off. When next electrify starts, the control unit will continue carrying out operation from last point of power-off.
The control unit stores operating status and values in EEPROM. The data can reliable be stored for 10 years.

6. Faults

When the control unit detects system faults, LED “FAULT” on the panel will be flashing quickly. If an external Signal Light has been installed, light “SL” will be also flashing to remind user the lubrication system is in fault. Meanwhile, the control unit stops normal operation and wait for user to handle the faults. User may check the detailed cause of the fault through LCD.

6.1 Display faults

Briefly press ▲ or ▼ to start the display of fault messages. The meaning of the display are as followings:

PRESSURE SWITCH: No signal is received from pressure switch during pump running time.

CYCLE SWITCH: No signal is received from cycle switch during pump running time.

LOW LEVEL: The filling level in lubricant tank has dropped below the minimum level.

SYSTEM ERROR: the control unit itself has error inside. If such situation occurs, get the control unit power off, then get it power on 1 min later. If error still exists, please contact the manufacturer.

6.2 Clear fault messages

Press DK to acknowledge and clear fault messages, and to start a normal lubrication cycle.

Please note : DK must been used after determining and correcting the faults. The user himself is liable for any damages caused by operating the equipment without lubrication.

6.3 Block operation

If CS (**C**ycle **S**witch) is programmed, a block operation will be automatically activated when no signal from the cycle switch is received during the pump running time. To test Cycle Switch:

(1). When no signal from CS is received during the pump running period, the normal lubrication operation will be aborted, then a 15 min interval block operation begins.

(2). When the 1st 15 min block interval ends, it drives the pump. If signal from CS is received, the block operation will be aborted. System goes back to normal lubrication cycle. If there is still no signal from CS, then another block operation begins.

(3). If signal from CS is received during the 2nd 15 min interval, the block operation is aborted and the system will go back to normal operation. If there is no signal from CS, then the 3rd block operation begins.

(4). If the system receives signals from CS during the 3rd 15 min interval, then it will go back to normal lubrication cycle. If there is still no signal received, then the block operation is aborted and a fault message is displayed.

If the preset PAUSE time is shorter than 15 min, the block pause will correspond to the preset value.
During block operation, relevant LED on the control panel will be flashing to indicate that the control unit is now performing block operation. LED “CS” flashes alternative with LED “PAUSE” means the control unit is now in the Pause phase of the block operation. LED “CS” flashes alternative with LED “CONTACT” indicates the control unit is now in Drive phase of the block operation.

6.4 No signal from pressure switch

If PS (**P**ressure **S**witch) monitoring is programmed, normal operation will automatically stop when no signal from the pressure switch is received during the pump running. And a fault message is displayed.

6.5 Storage of fault messages

The time that has elapsed since the occurrence of the fault message up to its acknowledgement will be added up and saved automatically. And the saved fault time is not erasable.
The maximum savable fault time is 999 999 hrs and 59 min. And the minimum savable fault interval is 1 minute.

7. Technical Data

Voltage of power supply:	12V, 24V, 12V~42V(wide voltage model)
Type of protection:	IP40
Max. Load output M:	10A, 16A(wide voltage model)
SL output:	5W
Data storage:	No limitation
Operation temperature:	-20℃~70℃
Storage temperature:	-40℃~80℃
Recommended fuse specification:	5A, 10A(wide voltage model)
Installation dimensions L×W×H:	137mm×92mm×42mm
Single Mass:	200g
Programmable contact time:	1 s to 17h 59min 59s
Programmable pause time:	1 min to 999h 59min
Programmable impulses:	1 to 59999
Operation time Memory:	0 to 999 999 h 59 min
Fault time Memory:	0 to 999 999 h 59 min

Notes

UC-1 通用润滑系统控制器是专门为集中润滑控制设计的控制器，适用于工程机械、底盘集中润滑和润滑站的控制。UC-1 通用润滑系统控制器与德国 VOGEL 公司的 IG502-E 和 IG502-2-E 多功能控制器兼容，可以替代 IG502-E 和 IG502-2-E 多功能控制器。

控制器的控制方式和控制参数保存在 EEPROM 内，不需要后备电源支持就可以长期可靠存储。

控制器采用液晶显示器，以文字方式显示信息，并且有多种语言版本，方便用户操作使用。

UC-1 通用润滑系统控制器出厂设置如下：

间歇控制方式：	定时器控制
间歇时间：	9 小时
润滑控制方式：	定时器控制
润滑时间：	2 分 36 秒(2.6 分钟)
初始保护密码：	0000
系统监控方式：	压力开关监控

† 以上设置与 IG502-E(IG502-2-E)多功能控制器的出厂设置一致。

型号说明

UC-1-12C　12V 标称工作电压，中文界面

UC-1-12E　12V 标称工作电压，英文界面

UC-1-12M　12V 标称工作电压，多语种界面

UC-1-24C　24V 标称工作电压，中文界面

UC-1-24E　24V 标称工作电压，英文界面

UC-1-24M　24V 标称工作电压，多语种界面

UC-1-1242C　11V~45V 宽电压，12V，24V 和 36(42)V 标称供电电压，中文语言界面

UC-1-1242E　11V~45V 宽电压，12V，24V 和 36(42)V 标称工作电压，英文语言界面

UC-1-1242M　11V~45V 宽电压，12V，24V 和 36(42)V 标称工作电压，多语言界面

订货和安装时务请认准详细规格型号，以免发生错误。

产品制造商：　苏州力天工业控制事业部

办公地址：　苏州市小施家弄 22 号 8 号楼 102 室

技术支援电话：0512-68661838

技术支援邮箱：support@leetern.com

互联网网站：　http://www.leetern.com

目　　录

安全警告！

UC-1 通用润滑控制器(以下简称本产品)按照通用工程技术标准设计和制造。在符合相应的工业安全和事故防范条例的同时，还符合相应的一般工业技术验收标准。

虽然本产品符合相应的安全技术条件，但使用中仍然可能会伤害到使用者或第三者或危及其他器材。因此只能安装使用技术状态完全正常的产品并严格遵守操作说明，任何影响安全的故障应立即纠正。

本产品只能用于集中润滑系统的控制与监控。如被用于任何不恰当之处而造成的损害，由当事人自己负责。

潜在的电气危险

本产品只能由经过培训的合格人员，按照国家电气技术规范规定接入电源。不正确的连接将导致人员的重大伤害。

本产品适用于底盘、工程机械及润滑站上，以蓄电池或类似直流电源供电的电气系统。当作其他用途时，必须遵守相应的安全规定。

合格人员

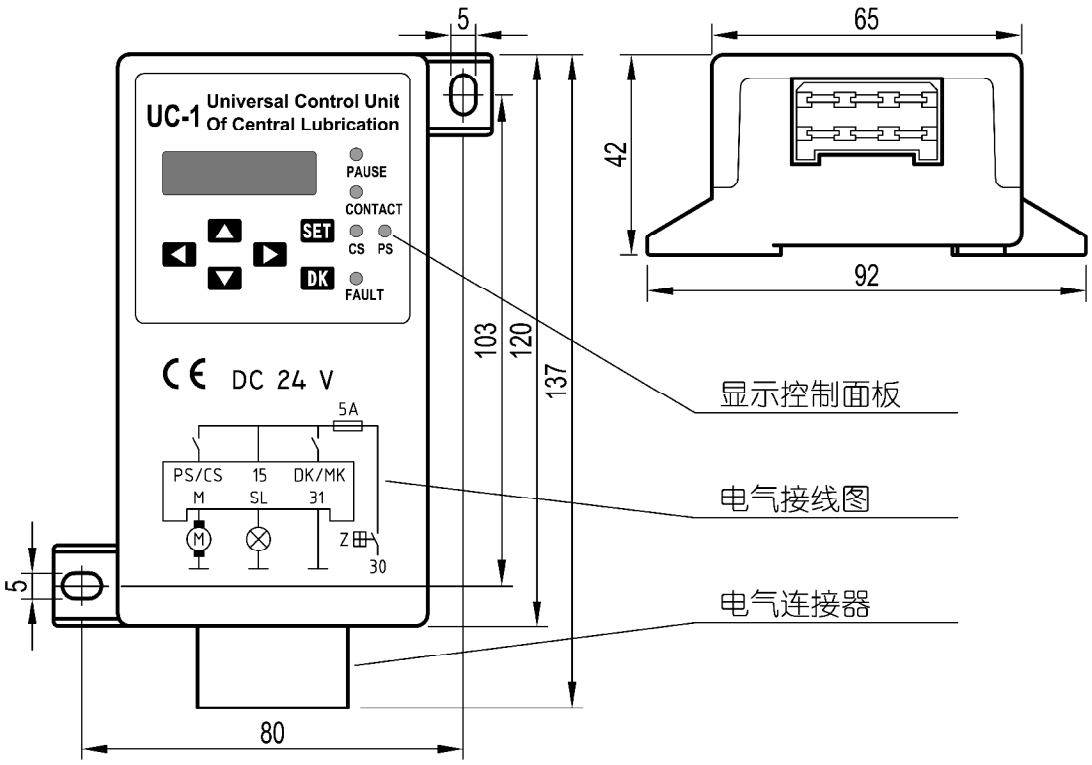
本手册所称合格人员，是指接受过本产品相关培训的人员。他们要熟悉相关的安全标准、规定，具备相应的安全知识和技能。他们能在已知情况下被授予完成需要做的工作，还要能够识别并阻止可能发生的危险。

1. 安装

UC-1 通用润滑系统控制器**不是**为露天使用设计的，控制器必须安装在封闭隔仓内，以保护控制器不受环境影响。

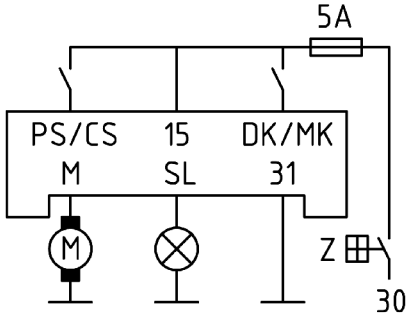
如果控制器被安装在难于接近的地方，可以在操作室安装指示灯和按钮开关，以便远程监控控制器的运转。

1.1 外形尺寸

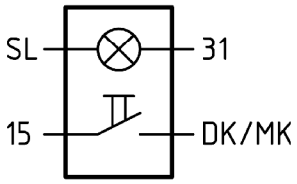


1.2 电气接线

PS / CS	外接压力开关或外接循环开关
15	控制器供电正极
+M	泵电机
+SL	外接指示灯
DK / MK	外接按钮开关(定时工作方式)
	计数信号输入(计数工作方式)
31	接地
Z	启动开关



电气连接器接线图



DK 开关和 SL 灯组件接线图

请注意：UC-1 通用润滑控制器有 12V 和 24V 两种标称电压规格，以及 12V、24V 和 36(42)V 均能适应的宽电压(10V~45V)规格。

安装和使用控制器时，必须保证电源电压与 UC-1 控制器面板上标称电压一致。电源电压波动必须在规定的供电电压范围内，低于或者高过这个电压范围都会给控制器造成永久性的损害。

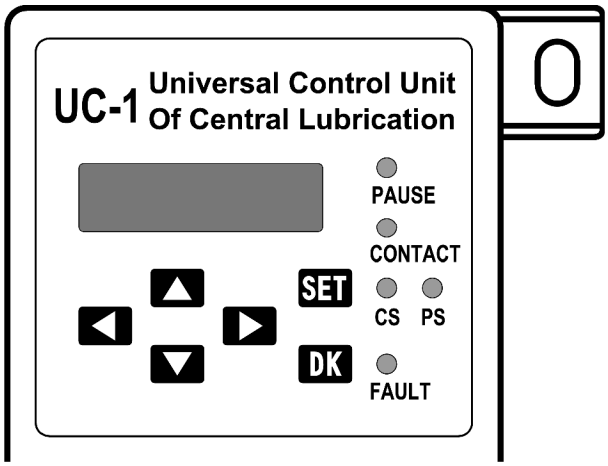
UC-1-12X 型号的控制器，供电电压必须在 **10V~18V** 范围内；

UC-1-24X 型号的控制器，供电电压必须在 **20V~36V** 范围内；

UC-1-1242X 宽电压型号的控制器，供电电压必须在 **11V~45V** 范围内。

如果供电电压不能保证保证在上述范围，可以订购电压保护器以保护控制器不受过超范围电压损害。

2. 显示控制面板及其操作



UC-1 通用润滑系统控制器采用薄膜面板保护控制器不受潮气和污物侵入。

薄膜面板不能用有机溶剂来擦洗。如果想清洁面板，可以用软布蘸中性洗涤剂擦拭。不能用尖锐的物体刺薄膜面板，以免损坏薄膜面板。

2.1 LCD 液晶显示器

润滑系统控制器
SN：07010001

LCD 液晶显示器用来显示数据和工作状态

LCD 液晶显示器平时是关闭的。要启动显示，只要按下 ▲ ▼ 任意一个键，显示器即开始显示当前状态和设定的工作参数。†

2.2 LED 指示灯

PAUSE：间歇指示灯

PAUSE 灯亮表示：控制器和泵已经接通电源，系统处于间歇状态。

PAUSE 灯闪亮表示：

1、控制器处于间歇参数设定状态，此时可以修改间歇参数或控制方式；

2、如果控制器启用了 CS 循环开关监测、PAUSE 灯与 CS 灯交替闪亮，表示控制器处于子循环测试的间隔阶段。

CONTACT：润滑指示灯

CONTACT 灯亮表示：控制器和泵已经接通电源，系统处于润滑状态。（泵电机在运转）

CONTACT 灯闪亮表示：

1、控制器处于润滑参数设定状态，此时可以修改润滑参数或控制方式；

2、如果控制器启用了 CS 循环开关监测、CONTACT 灯与 CS 灯交替闪亮，表示控制器处于子循环测试的驱动阶段。

CS：外接循环开关指示灯

CS 灯亮表示：系统采用循环开关监控。泵运转期间监测递进式分配器。

CS 灯闪亮表示：

1、控制器处于监控方式设定状态，此时可以改变监控方式，设立或者撤销循环开关监控；

2、控制器启用了 CS 循环开关监测、CONTACT 灯或 PAUSE 灯与 CS 灯交替闪亮，表示控制器处于子循环测试过程。

PS：外接压力开关指示灯

PS 灯亮表示：系统采用压力开关监控。泵运转期间进行压力监测；

PS 灯闪亮表示：控制器处于监控方式设定状态，此时可以改变监控方式，设立或者撤销压力开关监控。

FAULT：故障指示灯

FAULT 灯急速闪亮表示：润滑系统发生了故障；

按动 ▲ 或者 ▼ 键后，故障信息就显示在液晶显示器上。

2.3 薄膜按键

上下滚动键

在显示模式下，启动控制器进入显示模式；

在编程模式下，▲ 令光标位数字加 1，▼ 令光标位数字减 1；

在菜单操作中，▲ 键滚动显示菜单项目。

◀ ▶ 左右滚动键

在编程模式下输入参数过程中，左右移动光标位置。

SET 设置键

启动进入编程设定模式， 确认选项或者参数。

DK 放油/清除键

在间歇状态下，按一次 DK，将启动一次中间润滑；

在故障状态下，按一次 DK，清除故障信号并使系统重新进入正常的润滑周期循环。

2.4 外接指示灯 SL

如果外接了 SL 指示灯，在启动电源开关后，SL 指示灯将闪亮 3 秒钟。

请注意：控制器断电时需要一定时间保存断电时刻工作参数，以便下次上电时从中断处继续执行润滑任务。因此用户在使用控制器时候，控制器断电与再次上电的时间间隔不能小于 3 秒钟。否则，控制器可能不能正常启动，SL 指示灯就不会闪亮。

当控制器正在执行润滑任务时候，SL 指示灯将被点亮，以指示控制器的润滑状态；如果在工作过程中控制器检测到了故障，SL 指示灯持续闪亮，以提醒用户：润滑系统发生了故障。

† 在显示模式或者编程模式下，如果超过 2 分钟没有按键操作，LCD 显示器将自动关闭，并退出当前操作。

†† 在使用 ▲ 和 ▼ 键改变设定参数时候，若改变后的参数超过控制器允许的范围，控制器将拒绝执行这个改变。遇到这种情况，请用户注意检查自己的操作。

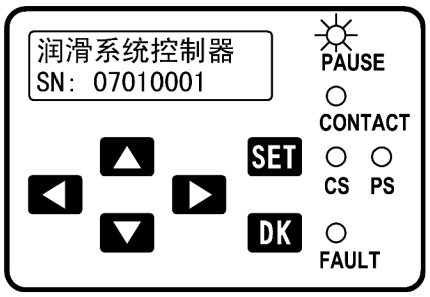
3. 显示模式

短暂按 ▲ 键或 ▼ 键，控制器就进入了显示模式，显示系统的各个设定参数和数据。而 LED 指示灯用来在平时显示控制器的状态。

3.1 显示操作

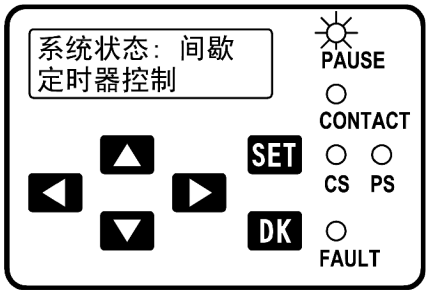
第 1 步：短暂按 ▲ 或 ▼ 键启动显示模式，显示控制器的出厂编号 †

例如：控制器编号为 07010001



第 2 步：按 ▲ 键，开始显示控制器的当前状态

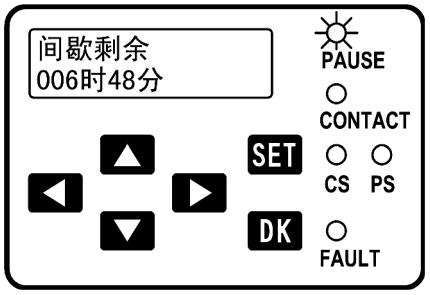
例如：定时器方式控制下的间歇状态



第 3 步：按 ▲ 键，显示当前剩余的数据

例如：正在进行的润滑工作中，剩余的间歇时间为 6 小时 48 分钟

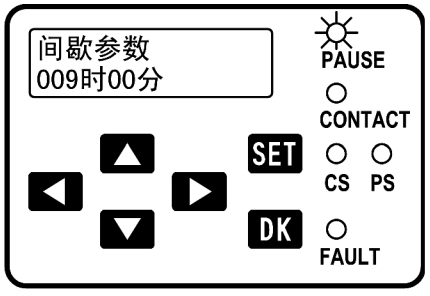
如果间歇采用计数控制，这里将显示数字



第 4 步：按 ▲ 键，显示预设的当前状态的控制参数

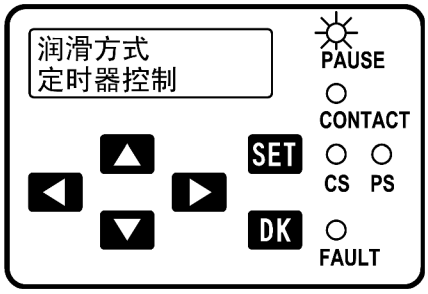
例如：预设的间歇参数为 9 小时

如果间歇采用计数控制，这里将显示数字

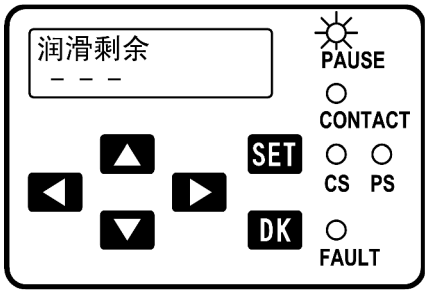


第 5 步：按 ▲ 键，显示控制器另一个状态的工作模式

例如：泵的运转为定时器控制



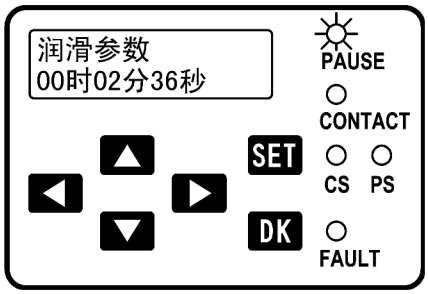
第 6 步：按 ▲ 键，由于控制器不在另一个状态，另一个状态的当前剩余数据没有意义，所以显示“ – – –”



第 7 步：按 ▲ 键，显示另一个状态预设的控制参数

例如：润滑 2 分钟 36 秒

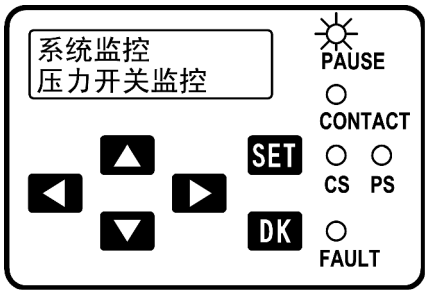
如果润滑采用计数控制，这里将显示数字



第 8 步：按 ▲ 键，进入显示监控方式状态

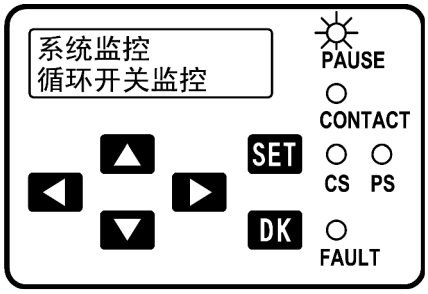
可能显示的内容是

压力开关监控

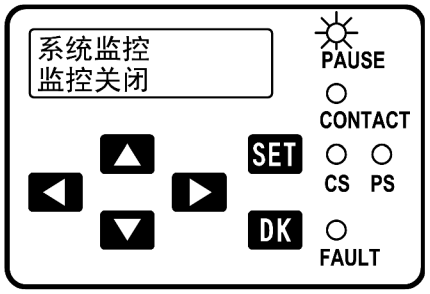


或者是

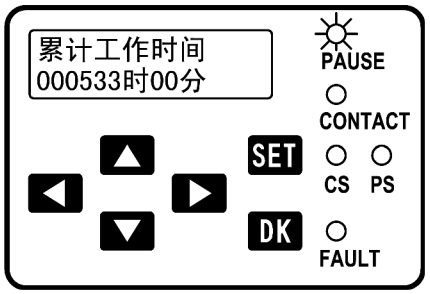
循环开关监控



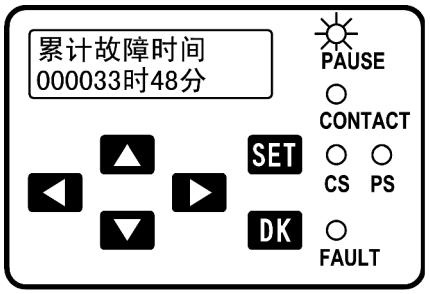
或者是
监控关闭



第 9 步：按 ▲ 键，进入累计工作时间显示状态



第 10 步：按 ▲ 键，进入累计故障时间显示状态



第 11 步：按 ▲ 键，关闭显示。

累计工作时间和累计故障时间不会被清除，被永久保存在控制器内

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† 该功能是根据欧盟的法规设置的。欧盟指令规定，在欧盟销售的电子产品必须有一个唯一的序列号，以实现对产品的追踪和管理

3.2 切换工作语言

多语种型号的控制器可以在各种工作语言之间切换，以适应各个不同国家用户的需要。

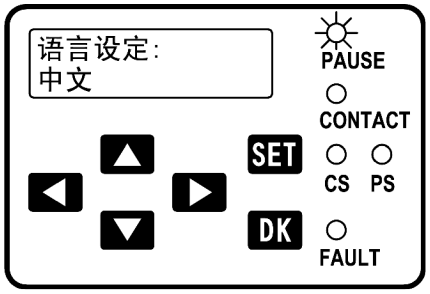
切换工作语言的方法如下：

第 1 步：断开控制器的电源

第 2 步：同时按下显示控制面板上的 SET 键和 ▲ 键不放，然后开启控制器电源

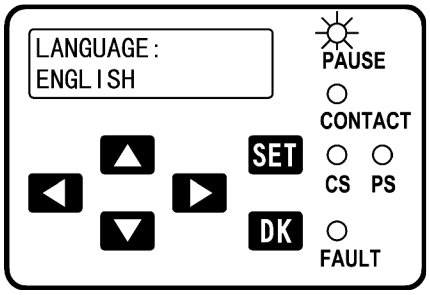
第 3 步：控制器以当前适用的工作语种显示当前的工作语言。

例如：当前工作语言为中文



第 4 步：按 ▲ 键或 ▼ 键，选择自己需要的语言。根据选择的不同，被选中的语言会以本语种显示当前备选语言。

例如：当前工作语言改为英文



第 5 步：按 SET 键，确认对语言的选择。液晶显示器显示关闭，新的工作语言设定被永久保存，直到下一次切换工作语言

4. 编程模式

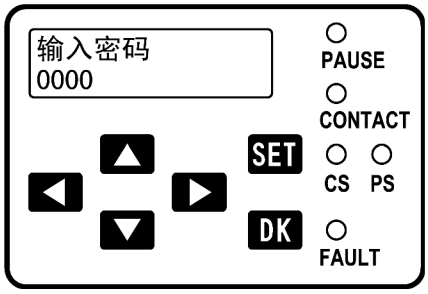
持续按下 **SET** 键超过 2 秒，控制器就进入编程模式，可以更改各个设置参数或者控制方式。

请注意：所有的编程操作都要从第 1-2 步(输入保护密码)开始。

4.1 启动编程模式

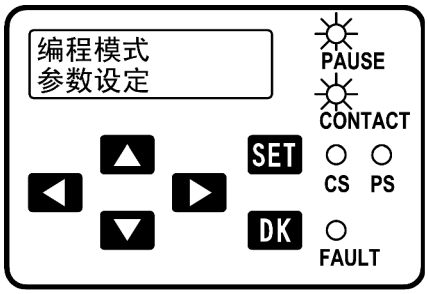
第 1 步：按下 **SET** 键超过 2 秒，显示器开始显示输入保护密码提示

请输入预先设定的密码



第 2 步：按 **SET** 键确认输入的保护密码 † 显示切换成操作项目显示，下面就可以进行具体编程操作了

默认的编程项目是“参数设定”

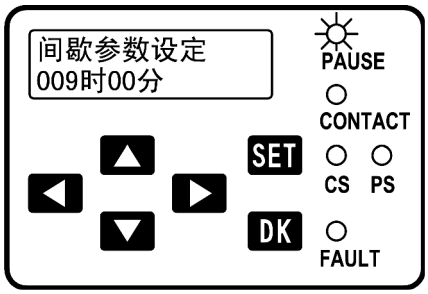


† 密码如果连续三次输入错误，控制器会自动退出密码输入状态并关闭显示。这个功能用来保护控制器不被恶意猜测密码猜中

4.2 更改间歇和润滑参数(先完成 1-2 步！)

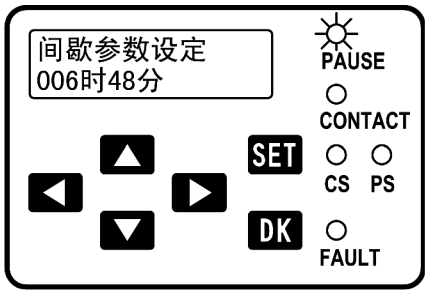
第 3 步：短暂按一下 SET 键，始显示预设的间歇控制参数，PAUSE 指示灯闪亮

例如：9 小时(出厂设定)



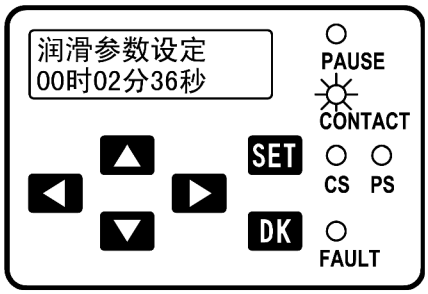
第 4 步：可以用 ▲ ▼ ◀ ▶ 键修改间歇参数

例如：修改成 6 小时 48 分钟



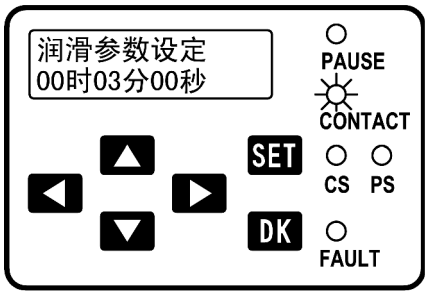
第 5 步：按 SET 键确认新的间歇参数。PAUSE 指示灯熄灭、CONTACT 指示灯闪亮，开始显示预设的润滑控制参数

例如：2 分钟 36 秒(出厂设定)



第 6 步：可以用 ▲ ▼ ◀ ▶ 键修改润滑控制参数

例如：修改成 3 分钟



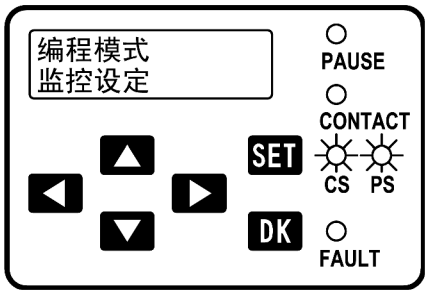
第 7 步：按 SET 键确认新的润滑控制参数

第 8 步：液晶显示器画面开始闪动，提示用户：所有的新参数已经被确认。按下 SET 键不放，液晶显示器画面停止闪动；2 秒以后，新参数被永久存储记忆、显示被关闭。

请注意：如果按 SET 键达不到 2 秒，控制器自动放弃新参数、重新回到“编程模式”的初始状态

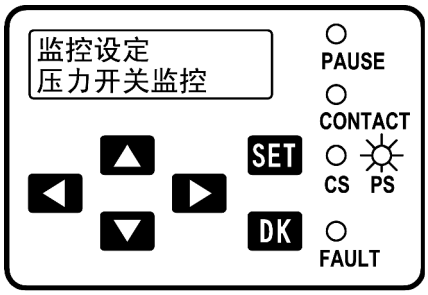
4.3 更改系统监控设置(先完成 1-2 步！)

第 3 步：多次按 ▲ 键，一直按到第二行出现“监控设定”字样，同时 CS、PS 灯交替闪亮



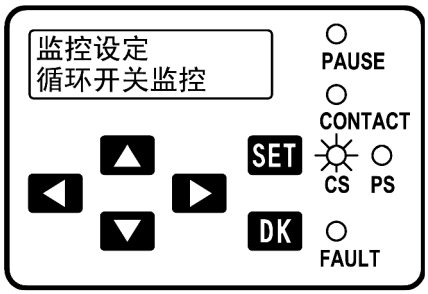
第 4 步：短暂按一下 SET 键，进入系统监控设置状态，开始显示当前的监控方式

例如：用压力开关监控(出厂设定)

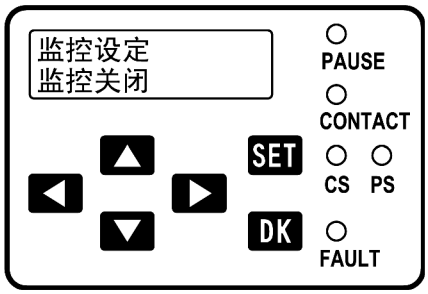


第 5 步：按 ▲ ▼ 键，选择所需要的监控方式

例如：用循环开关监控，CS 灯闪亮



或者选择“监控关闭”， CS 灯和 PS 灯熄灭，系统监控将被关闭



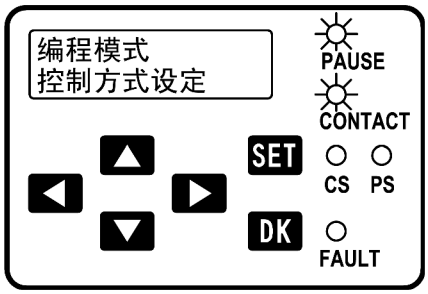
第 6 步：按 SET 键，确认新的监控方式

第 7 步：液晶显示器画面开始闪动，提示用户：所有的新设定已经被确认。按下 SET 键不放，液晶显示器画面停止闪动；2 秒以后，新设定被永久存储记忆、显示被关闭

请注意：如果按 SET 键达不到 2 秒，控制器自动放弃新设定、重新回到“编程模式”的初始状态

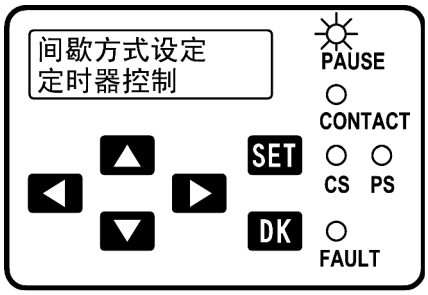
4.4 更改间歇和润滑控制方式(先完成 1-2 步！)

第 3 步：多次按 ▲ 键，一直按到第二行出现“控制方式设定”字样，同时 PAUSE 和 CONTACT 灯闪亮



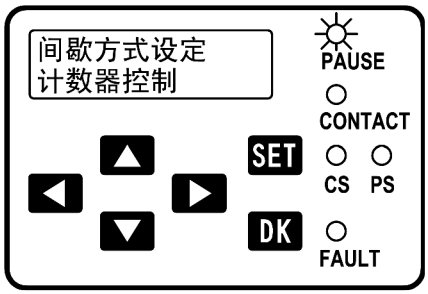
第 4 步：短暂按一下 SET 键，进入间歇方式设置状态。PAUSE 指示灯闪亮，开始显示预设的间歇控制方式

例如：定时器控制



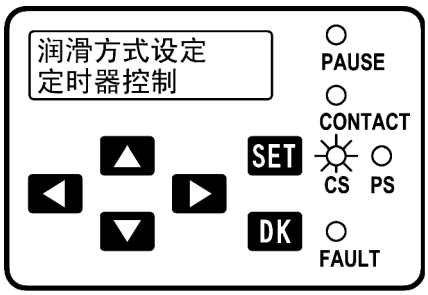
第 5 步：可以用 ▲ ▼ 键改变间歇控制方式

例如：改成计数控制



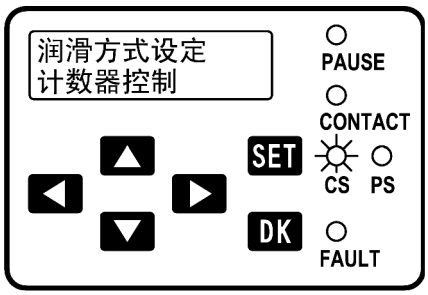
第 6 步：按 SET 键确认新的间歇控制方式。PAUSE 指示灯熄灭、CONTACT 指示灯闪亮，开始显示预设的润滑控制方式

显示切换成预设的润滑控制方式



第 7 步：可以用 ▲ ▼ 键改变润滑控制方式

例如：改成计数控制



第 8 步：按 SET 键，确认新的润滑控制方式

第 9 步：液晶显示器画面开始闪动，提示用户：所有的新设定已经被确认。按下 SET 键不放，液晶显示器画面停止闪动；2 秒以后，新设定被永久存储记忆、显示被关闭

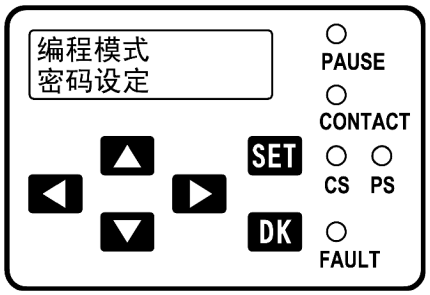
请注意：如果按 SET 键达不到 2 秒，控制器自动放弃新设定、重新回到“编程模式”的初始状态

请注意：改变间歇或润滑控制方式以后，务必要根据实际润滑任务的需要，重新设定新的间歇／润滑的控制参数

4.5 更改保护密码(先完成 1-2 步！)

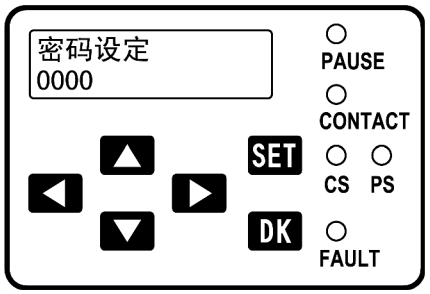
用户更改保护密码后，出厂预先设置的保护密码被清除，代之以用户输入的新保护密码。新保护密码将被永久存储，直到下一次更改保护密码。

第 3 步：多次按 ▲ 键，一直按到第二行出现“密码设定”字样



第 4 步：短暂按一下 SET 键，进入保护密码修改状态，同时 LCD 显示当前密码

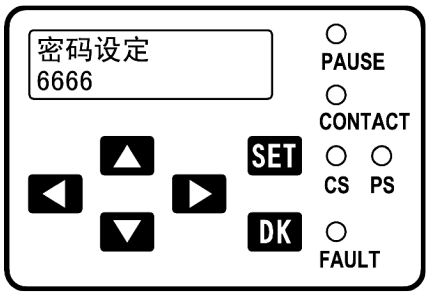
例如：0000(出厂设定)



第 5 步：输入 4 位数的新保护密码

例如：6666

新保护密码可在 0000~9999 间任意取值，控制器对此没有限制



第 6 步：按 SET 键确认新的保护密码

第 7 步:液晶显示器画面开始闪动,提示用户:新密码已经被确认。按下 SET 键不放，液晶显示器画面停止闪动；2 秒以后，新密码被永久存储记忆、显示被关闭

请注意：如果按 SET 键达不到 2 秒，控制器自动放弃新密码、重新回到“编程模式”的初始状态

请妥善保管新保护密码。如果忘记了保护密码，就不能再对控制器编程了。遇到这种情况，请联系制造商。制造商的联系方式印刷在手册扉页上

5. 工作模式

5.1 定时工作方式

设定“间歇定时方式”和“润滑定时方式”

润滑以时间为控制基础，按照预先设定的间歇时间和润滑时间，循环实现“间歇”-“润滑”控制

按下 DK 键或者 DK 按钮，可以启动一个中间润滑循环或者消除故障显示。外接 DK 按钮可以接到 DK/MK 输入端

5.2 计数工作方式(间歇以外接脉冲计数控制)

设定“间歇计数方式”和“润滑定时方式”

外接脉冲传感器信号接到 DK/MK 输入端

间歇：显示和设置的参数为计数脉冲数

润滑：显示和设置的参数为时间

这个方式仅用于连接泵站的油位装置监控 W1。

5.3 组合工作方式(泵的运转以外接脉冲计数控制)

间歇：显示和设置的参数为计数脉冲数或者时间

润滑：显示和设置的参数为计数脉冲数

可以组合成“间歇计数方式”和“润滑计数方式”，或者“间歇定时方式”和“润滑计数方式”

5.4 无系统监控工作

在这种方式下，润滑循环只能按照设定的间歇和润滑参数控制，而不去执行故障监控。

在无系统监控工作方式下，必须禁止系统监控功能，将监控方式设定为“监控关闭”。这时候，故障不能被自动检测和显示出来。

5.5 有系统监控工作

在这种方式下，系统是可以由外接开关监控的。

可以有下列监控功能：

油箱油位监控(仅用于连接泵站的油位装置监控 W1)；

采用压力开关监测主油管内压力的建立；

采用循环开关监测递进式分配器的功能。

启动系统监控后，故障能够被自动检测和显示出来。

5.6 断电保护功能

控制器具备断电保护功能。控制器断电时候，能够自动记忆断电时刻工作状态和剩余参数以及累计工作时间和累计故障时间。当控制器再次上电时候，能够从断电点继续执行原来的润滑任务。

控制器采用 EEPROM 记忆工作状态和参数。记忆的时间是长期的，能可靠存储 10 年以上。

6. 故障监测和处理

当控制器检测到系统故障时候，操作控制面板的 FAULT 指示灯会急速闪烁；如果外接了 SL 指示灯，SL 指示灯也跟随持续闪亮，以提示用户：润滑系统发生了故障。同时，控制器停止工作，等待用户处理故障。用户可以通过显示控制面板察看具体的故障原因。

6.1 故障显示

短暂按一下 ▲ 或 ▼ 键，具体故障信息就会显示出来，具体信息含义

压力开关错误：泵在运转期间没有接收到来自压力开关的信号

循环开关错误：泵在运转期间没有接收到来自循环开关的信号

油位开关错误：油箱中油位低于最低油位，无法正常润滑

系统错误：控制器内部发生了错误。遇到这种情况，请切断控制器电源，1 分钟后再接通控制器电源。如果故障仍然不能排除，请联系制造商

6.2 清除故障信号

按下 DK 键或者 DK 按钮，就可以清除故障信号，重新进入正常润滑周期。**请注意**：必须确认并排除故障后才能使用 DK 键或 DK 按钮，否则设备将因缺乏润滑而发生损坏！因为缺乏润滑造成用户设备损坏，由用户自行负责。

6.3 子循环测试

如果设定了 CS 监控，那么泵在运转期间没有收到循环开关的信号，将自动进入一个子循环测试过程，测试循环开关：

⑴、 在润滑泵运转期间，控制器没有收到循环开关发出的信号，正常的润滑工作被中止，开始 15 分钟间隔的子循环测试；

⑵、 第一个 15 分钟间隔时间到，驱动润滑泵。如果收到循环开关发出的信号，退出子循环测试，重新进入正常的润滑循环过程；如果没有收到循环开关发出的信号，重新设定间隔时间；

⑶、 第二个 15 分钟间隔时间到，驱动润滑泵。如果收到循环开关发出的信号，退出子循环测试，重新进入正常的润滑循环过程；如果没有收到循环开关发出的信号，再重新设定间隔时间；

⑷、 第三个 15 分钟间隔时间到，驱动润滑泵。如果收到循环开关发出的信号，退出子循环测试，重新进入正常的润滑循环过程；如果还没有收到循环开关发出的信号，退出子循环测试，进入故障停机状态并发出故障信号。

如果用户设定的间歇时间小于 15 分钟，则子循环时间间隔按照用户设定的间歇时间工作。

子循环过程中，显示控制面板相应的指示灯闪亮，指示控制器正在执行子循环测试：CS 灯与 PAUSE 灯交替闪亮，表示处于子循环测试的间隔阶段；CS 灯与 CONTACT 灯交替闪亮，表示处于子循环测试的驱动阶段。

6.4 压力开关检测

如果设定了 PS 监控，那么泵在运转期间没有收到压力开关的信号，将自动停止运行，发出故障报警信号。

6.5 故障信息储存

每次发生故障停机后，故障停机时间都会被自动累计、储存。被储存的累计故障时间是不能清除的。

控制器可以储存的最大累计故障时间为 999 999 小时 59 分钟，可以储存的最小故障时间为 1 分钟。

7. 技术参数

供电电压:	12V，24V，12V~42V(宽电压型号)
防护等级:	IP40
M 最大输出:	10A，16A(宽电压型号)
SL 输出:	5W
数据存储:	无限制
工作温度:	-20℃~70℃
储存温度:	-40℃~80℃
推荐保险丝规格:	5A，10A(宽电压型号)
外形尺寸:	137mm(长)×92mm(宽)×42mm(高)
单件质量:	200g
润滑时间设置范围:	1 秒~17 小时 59 分钟 59 秒
间歇时间设置范围:	1 分钟~999 小时 59 分钟
计数脉冲设置范围:	1~59999
累计工作时间记忆范围:	0~999 999 小时 59 分钟
累计故障时间记忆范围:	0~999 999 小时 59 分钟

记事栏