



**XR01CX DIGITAL THERMOSTAT**  
**XR02CX DIGITAL CONTROLLER WITH "OFF CYCLE" DEFROST**  
**XR03CX DIGITAL CONTROLLER WITH AUXILIARY RELAY**  
**XR04CX DIGITAL CONTROLLER WITH DEFROST RELAY**  
**XR06CX DIGITAL CONTROLLER WITH DEFROST AND FANS MANAGEMENT**

1599020280 Rel.1.0

**OPERATING MANUAL**

**1. GENERAL WARNINGS**

- PLEASE READ BEFORE USING THIS MANUAL**
  - This manual is part of the product and should be kept near the instrument for easy and quick reference.
  - The instrument shall not be used for purposes different from those described hereunder. It cannot be used as a safety device.
  - Check the application limits before proceeding.
  - Emerson Srl reserves the right to change the composition of its products, even without notice, ensuring the same and unchanged functionality.

**1.2 SAFETY PRECAUTIONS**

- Check the supply voltage is correct before connecting the instrument.
- Do not expose to water or moisture: use the controller only within the operating limits avoiding sudden temperature changes with high atmospheric humidity to prevent formation of condensation.
- Warning: disconnect all electrical connections before any kind of maintenance.
- Fit the probe where it is not accessible by the End User. The instrument must not be opened.
- In case of failure or faulty operation send the instrument back to the distributor or to "Dixell S.r.l." (see address) with a detailed description of the fault.
- Consider the maximum current which can be applied to each relay (see Technical Data).
- Ensure that the wires for probes, loads and the power supply are separated and far enough from each other, without crossing or intertwining.
- In case of applications in industrial environments, the use of mains filters (our mod. FT1) in parallel with inductive loads could be useful.

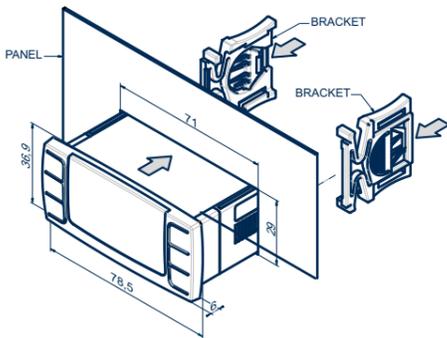
**1.3 DISPOSAL OF THE PRODUCT**

The appliance (or the product) must be disposed of separately in accordance with the local waste disposal legislation in force.

**2. FRONT PANEL**

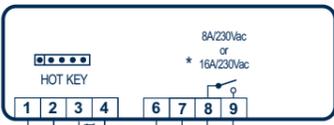


**3. DIMENSIONS AND CUT OUT**

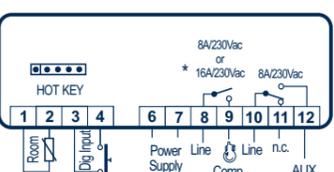


**4. CONNECTIONS**

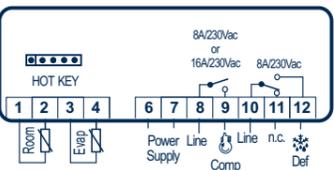
**XR01CX - XR02CX 8A or 16A COMP.**



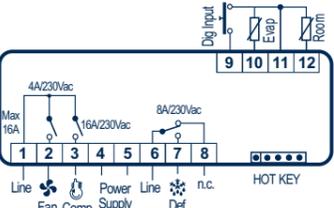
**XR03CX 8A or 16A COMP.**



**XR04CX 8A or 16A COMP.**



**XR06CX 16A COMP.**



**5. GENERAL DESCRIPTION**

Model **XR01CX**, in 32x74x50 mm short format, is a single stage temperature thermostat suitable for applications in the field of refrigeration or heating. It provides a relay output to drive the compressor. It is also provided with 1 NTC probe input and one digital input. The instrument is fully configurable through special parameters that can be easily programmed through the keyboard or by the HOTKEY.

Model **XR02CX**, in 32x74x50 mm short format, is a digital controller with off cycle defrost designed for refrigeration applications at normal temperature. It provides a relay output to drive the compressor. It is also provided with 1 NTC probe input and one digital input. The instrument is fully configurable through special parameters that can be easily programmed through the keyboard or by the HOTKEY.

The **XR03CX**, in 32x74x50 mm short format, is microprocessor based controller suitable for applications on normal temperature refrigerating units. It provides two relay output: one for compressor and the other one for alarm signalling or as auxiliary output. It provides an NTC probe input and a digital input for alarm signalling, for switching the auxiliary output or for start defrost. The instrument is fully configurable through special parameters that can be easily programmed through the keyboard or by the HOTKEY.

The **XR04CX**, in 32x74x50 mm short format, is microprocessor based controller suitable for applications on normal or low temperature refrigerating units. It provides two relay output: one for compressor and the other one for defrost. It provides two NTC probe inputs, one for room temperature and other one to control defrost termination. The instrument is fully configurable through special parameters that can be easily programmed through the keyboard or by the HOTKEY.

The **XR06CX**, format 32x74x60 mm, is microprocessor based controller, suitable for applications on medium or low temperature ventilated refrigerating units. It has three relay outputs to control compressor, fan, and defrost, which can be either electrical or reverse cycle (hot gas). It is also provided with 2 NTC probe inputs, the first one for temperature control, the second one, to be located onto the evaporator, to control the defrost termination temperature and to managed the fan and it's provided with a configurable digital input. With the HOTKEY it's possible to program the instrument in a quick and easy way.

**6. REGULATION**

**6.1 THE REGULATION OUTPUT (Only for XR01CX)**  
The regulation is performed according to the temperature measured by probe. The instrument is provided with the CH programmable parameter which enables the user to set the regulation both for heating or cooling applications:  
• CH=cL -> cooling applications;  
• CH=Ht -> heating applications.

**6.2 COOLING APPLICATIONS**  
The regulation is performed according to the temperature measured by the thermostat probe with a positive differential from the set point: if the temperature increases and reaches set point plus differential the compressor is started and then turned off when the temperature reaches the set point value again.

**6.3 HEATING APPLICATIONS (Only XR01CX)**  
The Ht value is automatically subtracted to the SET POINT. If the temperature decreases and reaches set point minus differential the output is started and then turned off when the temperature reaches set point value again.

**7. DEFROST**

**XR02CX - XR03CX:** Defrost is performed through a simple stop of the compressor. Parameter **Id** controls the interval between defrost cycles, while its length is controlled by parameter **Md**.  
**XR04CX - XR06CX:** Two defrost modes are available through the **td** parameter:  
• **td=EL** defrost through electrical heater (compressor OFF);  
• **td=in** hot gas defrost (compressor ON).  
Other parameters are used to control the interval between defrost cycles (**Id**), its maximum length (**Md**) and two defrost modes: timed or controlled by the evaporator's probe. At the end of defrost dripping time is started, its length is set in the **dt** parameter. With **dt=0** the dripping time is disabled.

**8. FANS (Only XR06CX)**

With **FC** parameter it can be selected the fans functioning:  
• **FC=cn** will switch ON and OFF with the compressor and **not run** during defrost  
• **FC=on** fans will run even if the compressor is off, and **not run** during defrost  
After defrost, there is a timed fan delay allowing for drip time, set by means of the **Fd** parameter.  
• **FC=cyc** fans will switch ON and OFF with the compressor and **run** during defrost  
• **FC=of** fans will run continuously also during defrost.  
An additional parameter **FS** provides the setting of temperature, detected by the evaporator probe, above which the fans are always OFF. This is used to make sure circulation of air only if his temperature is lower than set in **FS**.

**8.1 FANS AND DIGITAL INPUT**

When the digital input is configured as door switch **IF=do**, fans and compressor status depends on the **dC** parameter value:  
**dC=no** normal regulation;  
**dC=Fn** fans OFF;  
**dC=cP** compressor OFF;  
**dC=Fc** compressor and fans OFF.  
When **rd=y**, the regulation restart with door open alarm.

**9. VOLTAGE PROTECTION (Option)**

The HLVD function provides an alarm if the voltage of the power supply out of the normal range **vU** and **vL**.  
Parameters **vc** enable this function. **vU** and **vL** define the limitation threshold of the power, and if the voltage out of the range, the alarm will be triggered. Then the system will go to the dedicate action according to the parameter **vr**.  
• **vr=n** the regulation not stop  
• **vr=y** the regulation stop  
When the power back to the normal range, then alarm disappeared, the system will start to run the normal regulation.

**10. FRONT PANEL COMMANDS**

- SET** To display target set point, in programming mode it selects a parameter or confirm an operation
- To start a manual defrost
  - In programming mode it browses the parameter codes or increases the displayed value
  - In programming mode it browses the parameter codes or decreases the displayed value

**KEYS COMBINATION**

- To lock or unlock the keyboard
- SET** + To enter in programming mode
- SET** + To return to room temperature display
- + To reset parameters

LED	MODE	SIGNIFICATO
	On	Compressor enabled
	Flashing	- Compressor activation delay active (during -Compressor stop for micro-door)
	On	Defrost in progress
	Flashing	- Defrost delay active (during time dd) - Dripping in progress (during time dt)
	On	Fans output enabled
	Flashing	Fans delay after defrost
	On	Alarms happened
	Flashing	----

**10.1 HOW TO SEE THE SET POINT**

- Push and immediately release the **SET** key, the set point will be showed;
- Push and immediately release the **SET** key or wait about 5s to return to normal visualisation.

**10.2 HOW TO CHANGE THE SETPOINT**

- Push the **SET** key for more than 2 seconds to change the Set point value;
- The value of the set point will be displayed and starts blinking;
- To change the **SET** value push the **o** or **n** arrows within 10s;
- To memorise the new set point value push the **SET** key again or wait 15s.

**10.3 HOW TO START A MANUAL DEFROST**

Push the **DEF** key for more than 2 seconds and a manual defrost will start, the pre-condition is evaporator probe temp lower than **dE**.

**10.4 HOW TO CHANGE A PARAMETER VALUE**

- To change the parameter's value operate as follows:
- Enter the Programming mode by pressing the **SET** + keys for 3s;
  - Select the required parameter.
  - Press the **SET** key to display its value (set value starts to blink);
  - Use or to change its value;
  - Press **SET** to store the new value and move to the following parameter.
- To exit:** Press **SET** + or wait 15s without pressing a key.  
**NOTE:** the set value is stored even when the procedure is exited by waiting the time-out to expire. Please restart the controller after change the parameters

**10.5 HOW TO RESET TO THE FACTORY PARAMETER VALUE (Option)**

In the first 60s after controller power-on, it allows user to reset to the factory parameter through key combination with steps below:  
1. Start pressing **DEF** key and for 5s;  
2. Then release just but keep **DEF** key another 5s. Then parameter reset successfully by controller re-start automatically.  
**NOTE:**  
• The Parameters Factory Reset function shall be accessible in the first 60 seconds from the device power-on. The default configuration will initiate the loading, during this time all regulation will be interrupted, relays will be powered off, and the controllers is reset.  
• It allows user to reset to a customized parameter map through Hotkey, to download the parameters into the controller firstly, then execute the above 2 steps.

Here is the steps to update to customized parameter into the controller.

- Save your own parameter map into a Hotkey
- Plug-in the hotkey into the controller, power off the controller
- Then power on the controller, the parameter into Hotkey will be downloaded into the controller automatically with display showing "Er" label.

**NOTE:** After reset to user parameter, it will be impossible to reset to Emerson parameter anymore.

**10.6 HIDDEN MENU**

The hidden menu includes all the parameters of the instrument.

**HOW TO ENTER THE HIDDEN MENU**

- Enter the Programming mode by pressing the **SET** + keys for 3s (Set value starts blinking);
  - Released the keys, then push again the **SET** + keys for more than 7s. The L2 label will be displayed immediately followed from the Hy parameter.
  - Select the required parameter;
  - Press the **SET** key to display its value;
  - Use or to change its value;
  - Press **SET** to store the new value and move to the following parameter.
- To exit:** Press **SET** + or wait 15s without pressing a key.  
**NOTE1:** if none parameter is present in L1, after 3s the **nP** message is displayed. Keep the keys pushed till the L2 message is displayed.  
**NOTE2:** the set value is stored even when the procedure is exited by waiting the time-out to expire.

**HOW TO MOVE A PARAMETER FROM THE HIDDEN MENU TO THE FIRST LEVEL AND VICEVERSA.**  
Each parameter present in the HIDDEN MENU can be removed or put into "THE FIRST LEVEL" (user level) by pressing **SET** + . In HIDDEN MENU when a parameter is present in First Level the decimal point is on.

**10.7 TO LOCK THE KEYBOARD**

Keep pressed for more than 3s the + keys.  
The **PF** message will be displayed and the keyboard will be locked. If a key is pressed more than 3s the **PF** message will be displayed.

**10.8 TO UNLOCK THE KEYBOARD**

Keep pressed together for more than 3s the + keys till the **Pn** message will be displayed.

**11. DIGITAL INPUTS**

The free voltage digital input is programmable in different configurations by the **IF** parameter.

**11.1 DOOR SWITCH (IF=do)**

It signals the door status and the corresponding relay output status through the **dC** parameter. **no** = normal (any change); **Fn** = Fan OFF; **CP** = Compressor OFF; **FC** = Compressor and fan OFF.

Since the door is opened, after the delay time set through parameter **di**, the door alarm is enabled, the display shows the message **dA** and the regulation restarts if **rd = y**. The alarm stops as soon as the external digital input is disabled again. With the door open, the high and low temperature alarms are disabled.

**11.2 EXTERNAL ALARM (IF=EA)**

As soon as the digital input is activated the unit will wait for **di** time delay before signalling the **EA** alarm message. The outputs status don't change. The alarm stops just after the digital input is de-activated.

**11.3 SERIOUS ALARM (IF=bA)**

When the digital input is activated, the unit will wait for **di** delay before signalling the **CA** alarm message. The relay outputs are switched OFF. The alarm will stop as soon as the digital input is de-activated.

**11.4 SWITCHING SECOND RELAY ON (IF=Au) (Only XR03CX)**

When **o1=Au** it switches on and off the second relay.

**11.5 START DEFROST (IF=dF)**

It starts a defrost if there are the right conditions. After the defrost is finished, the normal regulation will restart only if the digital input is disabled otherwise the instrument will wait until the **Md** safety time is expired.

**11.6 INVERSION OF THE KIND OF ACTION: HEATING - COOLING (IF=Hc)**

This function allows to invert the reaction of the controller: from cooling to heating and viceversa.

**12. INSTALLATION AND MOUNTING**

Instruments shall be mounted on vertical panel, in a 29x71 mm hole, and fixed using the special bracket supplied.

The temperature range allowed for correct operation is 0+60°C. Avoid places subject to strong vibrations, corrosive gases, excessive dirt or humidity. The same recommendations apply to probes. Let air circulate by the cooling holes.

**13. ELECTRICAL CONNECTIONS**

The instruments are provided with screw terminal block to connect cables with a cross section up to 2.5 mm<sup>2</sup>. Before connecting cables make sure the power supply complies with the instrument's requirements. Separate the probe cables from the power supply cables, from the outputs and the power connections. Do not exceed the maximum current allowed on each relay, in case of heavier loads use a suitable external relay.

**13.1 PROBES**

The probes shall be mounted with the bulb upwards to prevent damages due to casual liquid infiltration. It is recommended to place the thermostat probe away from air streams to correctly measure the average room temperature. Place the defrost termination probe among the evaporator fins in the coldest place, where most ice is formed, far from heaters or from the warmest place during defrost, to prevent premature defrost termination.

**14. HOW TO USE THE HOT KEY**

**14.1 HOW TO PROGRAM THE HOT KEY FROM THE INSTRUMENT (UPLOAD)**

- Program one controller with the front keypad;
- When the controller is ON, insert the Hot key and push key, the **uP** message appears followed by a flashing **En**;
- Push **SET** key and the **En** will stop flashing;
- Turn OFF the instrument remove the Hot Key, then turn it ON again.

**NOTE:** the **Er** message is displayed for failed programming. In this case push again key if you want to restart the upload again or remove the Hot key to abort the operation.

**14.2 HOW TO PROGRAM AN INSTRUMENT USING HOT KEY (DOWNLOAD)**

- Turn OFF the instrument;
  - Insert a **programmed Hot Key into the 5 PIN** receptacle and then turn the Controller ON;
  - Automatically the parameter list of the Hot Key is downloaded into the Controller memory, successfully followed by appear **En** label;
  - After 10 seconds the instrument will restart working with the new parameters;
  - Remove the Hot Key.
- NOTE:** the **Er** message is displayed for failed programming. Check the Hotkey connection, check the data into Hotkey and repeat the actions above..

**15. ALARM SIGNALLING**

显示字符	报警原因	输出状态
P1	Room probe failure	Compressor output according to "Cy" and "Cn"
P2	Evaporator probe failure	Defrost end is timed
HA	Maximum temperature	Outputs unchanged
LA	Minimum temperature	Outputs unchanged
EA	External alarm	Outputs unchanged
CA	Serious external alarm	All outputs OFF
dA	Door Open	Compressor and fans restarts
Hu	High voltage of power	All outputs off except alarm/light
Lu	Low voltage of power	All outputs off except alarm/light

**15.1 ALARM RECOVERY**

Probe alarms **P1** and **P2** start some seconds after the fault in the related probe; they automatically stop some seconds after the probe restarts normal operation. Check connections before replacing the probe. Temperature alarms **HA** and **LA** automatically stop as soon as the temperature returns to normal values.  
Alarms **EA** and **CA** (with **IF=bL**) recover as soon as the digital input is disabled.

**16. TECHNICAL DATA**

Purpose of Control	Operating Control
Construction of Control	Incorporated control intended to be used within Class I and Class II equipment
Housing	Self extinguishing PC
Case	Frontal 32x74mm; depth 50 or 60mm
Mounting	Panel mounting in a 71x29mm panel cut-out
Protection	Rear: IP20 (EN60529) Frontal: IP65(EN60529), type 1 enclosure (UL 50e)
Connections	Screw terminal blocks 2.5mm <sup>2</sup> wiring
Power Supply	According to the model: 12Vdc; ±10%; 230Vac; 50%, 100/50Hz; 115Vac; 10%, 50/60Hz
Power Absorption	3.5 V Amax
Display	2 digits, red LED, 14,2 mm high
Digital Input	Free voltage contact

	Normal	Terminal	UL	IEC
Relay Outputs	0A1	SPST 8A, 230Vac	Resistive 16A, 230Vac, 100K Cycles (NO) Motor Load 120W (1.8PLA2S ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 83%, 230Vac, 8K Cycles (NO)	Resistive or inductive 16(A), 230Vac, 100K Cycles (NO)
	0A2	SPST 8A, 230Vac	Resistive 8A (NO only), 230Vac, 30K Cycles (NO) Motor Load 120W (1.8PLA2S ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 83%, 230Vac, 8K Cycles (NO)	Resistive or inductive 8(A), 230Vac, 100K Cycles (NO)
	0A3	SPST 4A, 230Vac	Resistive 4A, 230Vac, 30K Cycles (NO) Motor Load 120W (1.8PLA2S ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 83%, 230Vac, 8K Cycles (NO)	Resistive or inductive 3(A) or 4(A), 230Vac, 100K Cycles (NO)
	0A4	SPST 16A, 230Vac	General Purpose 16(A)Max load, 230Vac, 50K Cycles (NO) Motor Load 120W (1.8PLA2S ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 83%, 230Vac, 8K Cycles (NO)	Resistive 16A, 230Vac, 100K Cycles (NO)
Relay Outputs	0A1	SPST 16A, 230Vac	Resistive 16A, 230Vac, 100K Cycles (NO) Motor Load 120W (1.8PLA2S ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 83%, 230Vac, 8K Cycles (NO)	Resistive or inductive 16(A), 230Vac, 100K Cycles (NO)
	0A2	SPST 8A, 230Vac	Resistive 8A, 230Vac, 100K Cycles (NO) Motor Load 120W (1.8PLA2S ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 83%, 230Vac, 8K Cycles (NO)	Resistive or inductive 13(A) or 12(A), 230Vac, 100K Cycles (NO)
			Resistive 8A, 230Vac, 30K Cycles (CO)	Resistive 8A, 230Vac, 30K Cycles (CO)

NOTE: \*A1 not both are fitted  
\*Terminal 1 is a shared LINE common. Maximum current Rating is 16A. Two load conditions shall be considered, either 13A (A1) + 3A (A2) or 12A (A1) + 4A (A2).

Data Storing	on the non-volatile memory (EEPROM)
Type of Action	1.B
Pollution Degree	2
Software Class	A
Rate Impulsive Voltage	2500V for 115Vac and 230Vac Models 500V for 12V models
Over voltage Category	II
Operation Temperature	0+60 °C (IEC/EN 60730-1), -20+60 °C (UL 60730-1 - CAN/CSA E60730-1)
Storage Temperature	-20+60 °C (UL 60730-1)
Relative Humidity	20+85% (no condensing)
Measuring and Regulation Range	NTC -40+110°C (-40+230°F), resolution 0,1 °C or 1°C or 1 °F (selectable)
Accuracy	(Ambient temp. 25°C): ±0,7 °C ±1 digit

**DEFAULT SETTING VALUES**

LABEL	DESCRIPTION	RANGE	XR01CX	XR02CX	XR03CX	XR04CX	XR06CX
Set	Set Point	LS - US	5.0	3.0	3.0	-5.0	-5.0
Hy	Differential	0.1 + 25°C/1 + 45°F	2.0°C / 4 °F				
LS	Minimum Set Point	-55°C/-67°F-SET	-55 °C /-55°F				
US	Maximum Set Point	SET-99°C/SET-99°F	99 °C / 99°F				
od	Outputs activation delay at start up	0 + 99 min	0	0	0	0	0
AC	Anti-short cycle delay	0 + 50 min	1	1	1	1	1</



- XR01CX 电子温控器**
- XR02CX 带有停机融霜功能的电子温控器**
- XR03CX 带有自定义继电器的电子温控器**
- XR04CX 带有融霜继电器的电子温控器**
- XR06CX 带有融霜和蒸发器风扇控制的电子温控器**

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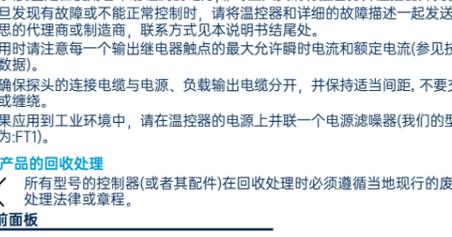
**使用手册**

**1. 注意事项**

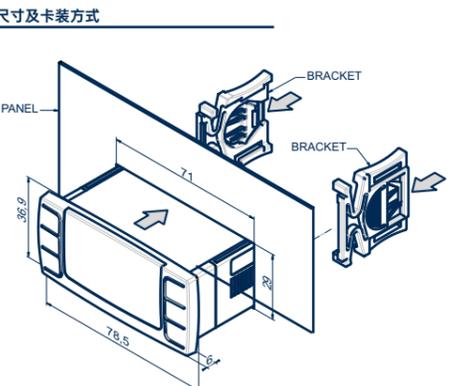
- 1.1 请在使用前详细阅读本手册
  - 请将说明书放在温控器附近，以便在需要时能够尽快查阅。
  - 请不要将温控器用于下述目的以外的情况，不能作为安全保护设备使用。
  - 请在使用前检查电源电压是否正确。
- 1.2 安全提示
  - 不要让温控器在有水或者潮湿的环境中使用；温控器只能在使用环境限定的条件下使用，应避免在高温环境下温度的剧烈变化而使得水蒸气凝结在内部的电路板上。
  - 注意：在检修前请断开温控器电源，最好断开所有连接线路，以防止意外发生。
  - 探头要固定在使用者不易碰到的地方，非专业人员请勿擅自打开温控器外壳。一旦发现故障或不能正常控制时，请将温控器和详细的故障描述一起发送到帝思的代理商或制造商，联系方式见本说明书结尾处。
  - 应用时请注意每一个输出继电器触点的最大允许瞬时电流和额定电流(参见技术数据)。
  - 请确保探头的连接电缆与电源、负载输出电缆分开，并保持适当间距，不要交叉或缠绕。
  - 如果应用到工业环境中，请在温控器的电源上并联一个电源滤波器(我们的型号为FT1)。

- 1.3 产品的回收处理
  - 所有型号的控制器(或者其配件)在回收处理时必须遵循当地现行的废物处理法律或章程。

**2. 前面板**

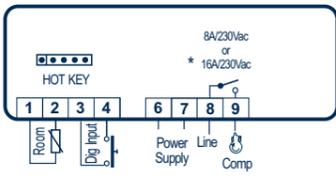


3. 尺寸及卡装方式
  - 探头要固定在使用者不易碰到的地方，非专业人员请勿擅自打开温控器外壳。
  - 应用时请注意每一个输出继电器触点的最大允许瞬时电流和额定电流(参见技术数据)。
  - 请确保探头的连接电缆与电源、负载输出电缆分开，并保持适当间距，不要交叉或缠绕。
  - 如果应用到工业环境中，请在温控器的电源上并联一个电源滤波器(我们的型号为FT1)。



**4. 接线图**

XR01CX - XR02CX 8A 或 16A 制冷输出继电器



XR03CX 8A 或 16A 制冷输出继电器



XR04CX 8A 或 16A 制冷输出继电器



XR06CX 16A 制冷输出继电器



**5. 概述**

- XR01CX:**外形尺寸32x74x50 mm为制冷/制热单输出微型温控器。适合应用于制冷或制热领域；有一路压缩机继电器输出，一路NTC探头输入和一路无源数字开关量输入；可通过面板上的键盘设定或编程(Hotkey)快速拷贝参数。
- XR02CX:**外形尺寸32x74x50 mm为适用于中温制冷系统机械化霜型温控器。有一路压缩机继电器输出，一路NTC探头输入和一路无源数字开关量或NTC蒸发器探头输入；可通过面板上的键盘设定或编程(Hotkey)快速拷贝参数。
- XR03CX:**外形尺寸32x74x50 mm为适用于中温制冷系统微型温控器，有二路输出：一路压缩机，一路可作为报警输出或辅助输出，有一路NTC探头输入，一路无源数字开关量报警输入，可根据设定控制辅助输出或者激活融霜；可通过面板上的键盘设定或编程(Hotkey)快速拷贝参数。
- XR04CX:**外形尺寸32x74x50 mm为适用于中/低温制冷系统微型温控器，有二路输出：一路压缩机，一路可作为融霜输出，有二路NTC探头输入：一路为库温，一路为蒸发器温度(融霜终止温度控制)；可通过面板上的键盘设定或编程(Hotkey)快速拷贝参数。

**XR06CX:**外形尺寸 32x74x60 mm为适用于中/低温强制风制冷系统微型温控器，有三路输出：一路压缩机、一路蒸发器风扇和一路融霜(电热或热气)，有二路NTC探头输入：一路为库温，一路为蒸发器温度(融霜终止温度+风扇停止温度控制)，一路无源数字开关量输入；可通过面板上的键盘设定或编程(Hotkey)快速拷贝参数。

**6. 负载控制**

- 6.1 控制调节类型(仅适用于型XR01CX)**
- 输出的状态是根据探头测得的温度来决定。参数表里提供一个CH参数，可以设定为制冷或制热两个不同控制方向的调节类型：
- CH=CL -> 制冷应用
  - CH=H -> 制热应用

**6.2 制冷应用**

压缩机输出的状态依据探头测得的温度，当温度大于等于设定值(SET) + 温差(Hy)时压缩机输出触点闭合，压缩机运转；当温度小于等于设定值(SET)时压缩机输出触点断开，压缩机停止运转。

**6.3 制热应用(仅适用于型XR01CX)**

与制冷时相反，当探头测得的温度小于等于设定值(SET)-温差(Hy)时输出触点闭合(在制冷时的压缩机输出此刻就成为制热输出了)；当探头测得的温度大于等于设定值(SET)时输出触点断开。

**7. 融霜**

XR02CX - XR03CX: 可以简单地通过停止压缩机运行来定时融霜，参数 id 给定融霜时间间隔，即多长时间融霜一次，而融霜持续时间是由参数Md来给定的。XR04CX - XR06CX: 通过td参数可以设定两种融霜类型：

- td=EL 电热融霜(融霜时压缩机输出继电器断开)
- td=in 热气融霜(融霜时压缩机输出继电器闭合)

其他参数还有：参数d给定融霜时间间隔，即多长时间融霜一次；而融霜持续时间最大时间是由参数Md来给定的；参数dE给定融霜终止温度；需要说明的是，无论Md和dE哪一个条件到了都会退出融霜，而一般情况下dE退出Md为 防止融霜过度保护为好。在融霜结束后可以设定一个滴水时间，由参数 dt来设定，当dt=0 时意味着无滴水过程。

**8. 风扇(仅适用于型号XR06CX)**

- 参数Fc有如下选择来确定风扇的运行模式：
- FC=cn 风扇与压缩机同开同停，融霜时停止
  - FC=on 风扇除了融霜期间停止外，其他时间一直运行
  - FC=cy 风扇与压缩机同开同停，融霜期间运转
  - FC=oy 风扇持续运转(包括融霜期间)
- 另一个参数FS可以设定一个温度，当检测蒸发器探头的温度超过这个温度时风扇总是停止的，只有温度低于这个温度时，风扇才能运转，气流才可以流动起来，确保在蒸发器温度较高时不把热量带给库内的空间。

**8.1 风扇与数字输入**

当数字输入功能设置为门开关时，即 IF=do 时，数字输入激活后控制器会按照 dC 参数的设定来相应地控制输出的状态；

dC=no 维持原来状态(输出状态不变)；

dC=Fn 仅风扇关闭；

dC=Cp 仅压缩机关闭；

dC=Fc 风扇和压缩机都关闭；

如果 rd=y 当数字开关量输入无效时，报警将立即停止，自动调节控制重新启动。

**9. 电压保护(可选功能)**

通过设置参数vc可启用高低电压检测功能，在电源超过正常范围vU和vL时进行报警。vU和vL决定了正常电压的上下限，如果检测到控制器的输入电压超过此范围，则触发报警，报警后控制系统将按照参数vr的配置进行：

- vr=n 负载无变化
- vr=n 负载无变化
- vr=n 负载无变化

当检测到输入电压恢复到正常范围后，报警自动解除，系统恢复正常。

**10. 面板的按键操作**

- SET** 在非编程状态下，按一次可显示目标设定值，在编程状态下可用来选择某一参数或确认一个操作。
- 在非编程状态下，可以启动一次手动融霜
  - 在编程状态下，可以向下浏览参数或增加参数值
  - 在编程状态下，可以向上浏览参数或减小参数值
- 组合键功能
- 锁定或解锁键盘
  - **SET+** 进入编程模式
  - **SET+** 退出编程模式，恢复到设备温度显示状态
  - + 恢复出厂设置参数

图标	状态	含义
	一直亮	正在制冷，压缩机输出触点闭合
	闪烁	-正处于防频繁启动延时等待时间 (按Ac参数)
	一直亮	正在融霜，融霜输出触点闭合
	闪烁	-融霜启动延迟中 (参数dd) -正在融霜后滴水 (参数dt)
	一直亮	风扇正在转动，风扇输出触点闭合
	闪烁	正处于融霜后启动延时等待时间
	一直亮	报警显示
	闪烁	-----

**10.1 如何查看设定值**

1. 按下并立即放开**SET**键，设定值被显示在屏幕上；
2. 按下并立即放开**SET**键，等待5秒钟后恢复到正常显示状态。

**10.2 如何修改设定值**

1. 持续按下 **SET**键2秒钟；
2. 设定值将被显示出来，并且开始闪烁；
3. 通过按 或 键来修改设定值；
4. 要存储新的设定值可再按一次**SET**键或者等待15秒钟。

**10.3 如何启动一次手动融霜**

持续按下 键超过2秒钟，就可以启动一次手动融霜(前提是蒸发器温度探头测得的值必须小于参数“dE”的设定值)。

**10.4 如何修改参数值(进入用户层，第一层)**

- 改参数值的操作如下：
1. 持续按下 **SET+** 键超过3秒钟进入编程状态，屏幕显示参数；
  2. 按 或 键选择需要的参数；
  3. 再按下 **SET** 键设定值开始闪烁；
  4. 用 或 键来修改参数值；
  5. 再按 **SET** 键来确认并存储新值，紧接着会显示下一个参数名称；
- 退出:**按下并立即放开**SET+** 键或不按任何键等待15秒。
- 注意:**不按任何键等待15秒退出时，新值也会被存储，参数修改后请重新启动控制器生效。

**10.5 如何恢复默认参数(可选功能)**

在控制器开机后的60秒内，可通过组合键恢复到控制器内保存的默认参数，操作步骤如下：

1. 按下 键和 键并持续5秒；
  2. 随后释放 键并持续按住 键超过5秒。
- 注意:**
- 恢复出厂参数功能只在设备开机的前60秒内有效，恢复参数期间所有调节功能及输出停止，恢复后控制器重启。
  - 如果要恢复到自定义参数，需通过编程(Hotkey)将自定义参数下载到控制器中，再执行上述2个步骤。

更新控制器默认参数表的操作如下：

1. 将需要更新的目标参数表保存至编程(Hotkey)；
2. 将Hotkey插入控制器，并将控制器断电；
3. 再次将控制器上电，Hotkey中的参数表会自动下载到温控器内的存储器中，面板显示“En”字符，即下载成功。

**注意:**恢复至用户自定义的参数后，无法再次恢复到艾默生出厂参数。

**10.6 隐藏参数(第二层)**

- 进入隐藏参数层可以浏览到温控器的所有参数。如何进入隐藏参数层
1. 首先持续按下 **SET+** 组合键超过3秒进入(第一层)编程状态(设定值闪烁)；
  2. 释放上述组合键，然后再持续按下 **SET+** 键超过7秒钟，L2字符会一闪而过，紧接着Hy参数会显示出来；
  3. 此时您已经进入隐藏参数层。
  4. 按 或 键选择需要的参数；
  5. 按 **SET** 键显示其参数值；
  6. 用 或 键来改变其值；
  7. 再按 **SET** 键存储新值，紧接着会显示下一个参数名称。
- 退出:**按下并立即放开**SET+** 键或不按任何键等待15秒。
- 注1:**如果在用户层(第一层)没有一个参数，在进入第一层3秒钟后会显示“nP”字符信息，持续按下上述组合键直到L2字符出现后进入第二层参数。
- 注2:**不按任何键等待15秒退出时，新值也会被存储。

**如何将参数从用户层(第一层)移到隐藏层(第二层)或者反过来。**

在进入隐藏参数层后，每一个位于隐藏层的参数都可以通过按 **SET+** 组合键移到用户层，再按一次又会移回来，当原来位于用户层的参数在隐藏层里显示时，该参数名称中会有一个小白点，所以可以通过小白点是否亮来判断该参数位于哪一层。

**10.7 键盘锁定**

1. 持续按下 + 组合键超过3秒钟。
  2. “P”字符会显示出来，则键盘已经锁定。如果再按任何键超过3秒钟“P”字符会消失。
- 10.8 键盘解锁**
- 持续按下 + 组合键超过3秒钟直到“Pn”字符闪烁，则键盘解锁。

**11. 数字开关量输入**

- 无源数字开关量输入可以通过“IF”参数设定不同的功能，详见下述内容。
- 11.1 门开关(IF=do)**
- 设置为此功能时可以检测门的开关状态并按照 dC 参数的设定来相应地控制输出的状态：
- Fn = 仅风扇关闭；
  - Cp = 仅压缩机关闭；
  - Fc = 风扇压缩机都关闭。
- 一旦门打开，延时“di”参数所设定的时间后门开报警激活，屏幕上会显示“dA”字符，如果rd=y自动调节控制重新启动。当数字开关量输入无效时，报警将立即停止。当门开报警时，高低温报警失效。

**11.2 一般报警(IF=EA)**

一旦数字输入激活，装置将等待di参数设置的延迟时间，然后发送EA报警信息。输出状态不变，数字输入停用后，报警立即停止。

**11.3 严重报警(IF=bA)**

一旦数字输入激活，装置将等待di参数设置的延迟时间，然后发送CA报警信息。继电器输出关闭，数字输入停用后，报警立即停止。

**11.4 辅助功能继电器(IF=Au) (Only XR03CX)**

设置为此功能时可以启用辅助功能继电器。

**11.5 激活融霜(IF=dF)**

当融霜条件允许时，数字输入一旦有效就会激活一次融霜，融霜结束后，如果数字输入无效，那么就会退出融霜而恢复正常温度控制状态，否则温控器将会一直等待“Md”所设定的时间。

**11.6 开启电热丝(IF=Hc)**

设置为此功能时可以开启电热丝。

**12. 安装和固定**

温控器应该固定在垂直的面板上，面板上开孔尺寸29x71mm，并用专用的塑料卡子将其固定。工作环境需在0-60°C范围内才能保证其正常运行，应避免放置在有较强震动、有腐蚀性气体、脏乱不堪及潮湿的地方。探头的安装也有同样的要求。让空气能够从温控器的散热孔流通起来，以便带走热量。

**13. 电气连接**

温控器的螺栓连接端子允许使用不超过2.5mm的线缆，在连接线缆前请确认电源满足温控器的要求。请将探头线与电源线、继电器输出端子接线及温控器电源端子接线分开，不要交叉或缠绕，负载的额定电流和最大电流不要超过每个继电器允许的额定电流和最大工作电流，如果超过了请使用外接继电器或交流接触器。

**13.1 探头连接**

库温探头和蒸发器探头的头部应朝上固定，以避免水渗透进入到头部的球头内部而造成探头损坏。建议库温探头远离气流，应放置在气流平缓的地方，以便正确测量库内温度平均值。蒸发器探头(融霜终止探头)应该放置在蒸发器的翅片间温度最低、结霜最多且远离加热管(或融霜时最热)的位置，以避免过早地融霜退出，而霜还未融净。

**14. 如何使用编程钥匙**

**14.1 上载(将温控器内的参数复制到编程钥匙中)**

1. 在温控器通电的情况下，插入编程钥匙后，按 键，面板上会有“uP”字符显示出来，接着会显示“En”字符；
  2. 按下 **SET** 键“En”字符会停止闪烁；
  3. 关闭温控器，拔出编程钥匙，然后再将温控器通电；
- 注意:**若有“Er”显示则表明编程失败。此时可以再次按下 键重新上载，或者拔掉编程钥匙取消操作。

**14.2 下载(将编程钥匙内的参数复制到温控器中)**

1. 关闭温控器；
  2. 插入已经编过过程的编程钥匙到5针插座上，然后给温控器通电；
  3. 编程钥匙中的参数表会自动下载到温控器内的存储器中，面板显示“En”字符后下载结束；
  4. 大约10秒钟温控器会重新启动，按照新参数工作；
  5. 拔出编程钥匙。
- 注:**若有“Er”显示则表明编程失败。此时需要检查编程钥匙的插接是否可靠或者重新拷贝参数表到编程钥匙中，然后重复上述操作或者取消操作。

**15. 报警信号**

显示字符	报警原因	输出状态
P1	库温探头错误	压缩机输出按照“Cy”和“Cn”参数设定来工作
P2	蒸发器探头错误	融霜输出按照“id”和“Md”参数设定来工作
HA	高温报警	输出不变
LA	低温报警	输出不变
EA	一般报警	输出不变
CA	严重报警	输出全部停止
dA	门开关报警	压缩机和风扇重启
Hu	高压报警	除报警信号和灯外,所有输出关闭
Lu	低压报警	除报警信号和灯外,所有输出关闭

**15.1 报警复位**

当探头发生错误几秒钟后，对应的探头“P1”或“P2”报警会显示，当探头恢复正常几秒后，报警会自动复位。在更换探头时请检查探头的连接。温度报警“HA”，“LA”会在温度恢复正常值后立即停止。

一般报警“EA”和严重报警“CA”会在数字输入无效时立即停止。高低压报警“Hu”和“Lu”只有在电压恢复到正常范围后才会停止。对于内置有报警蜂鸣器的控制器，在报警发生蜂鸣器响起时，按下任意键即可使报警静音。

**16. 技术参数**

控制类型	操作控制																																							
控制结构	适用于A类和B类设备的组合控制																																							
外壳	阻燃塑料 PC																																							
外形尺寸	正面 32x74 mm; 深 50 或 60mm																																							
安装尺寸	固定在开孔为71x 29 mm的面板上																																							
防护等级	背部: IP20 (EN60529) 前面部: IP65 (EN60529), 类型I外壳 (UL 50e)																																							
接线端子	螺栓连接, 接线线径 2.5 mm <sup>2</sup> , 扭矩 < 0.4 Nm																																							
供电电源	根据型号有: 12Vdc/±10%; 230Vac 10%, 50/60Hz; 115Vac 10%, 50/60Hz																																							
耗电	最大 3.5 VA																																							
显示	2位红色数码管, 14.2 mm高																																							
数字输入	无源开关量																																							
输出继电器	<table border="1"> <thead> <tr> <th>型号</th> <th>触点</th> <th>容量</th> <th>UL</th> <th>IEC</th> </tr> </thead> <tbody> <tr> <td rowspan="4">XR01CX</td> <td>aA1</td> <td>SPST 16A/230Vac</td> <td>Resistive 16A, 230Vac, 100K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)</td> <td>Resistive or Inductive 16B1A, 230Vac, 100K Cycles (NO)</td> </tr> <tr> <td>aA2</td> <td>SPST 8A/230Vac</td> <td>Resistive 8A (NO only), 230Vac, 30K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)</td> <td>Resistive or Inductive 831A, 230Vac, 100K Cycles (NO)</td> </tr> <tr> <td>aA3</td> <td>SPST 4A/230Vac</td> <td>Resistive 4A, 230Vac, 30K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)</td> <td>Resistive or Inductive 831A, 230Vac, 100K Cycles (NO)</td> </tr> <tr> <td>aA4</td> <td>SPST 2A/230Vac</td> <td>Resistive 2A, 230Vac, 30K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)</td> <td>Resistive or Inductive 831A, 230Vac, 100K Cycles (NO)</td> </tr> <tr> <td rowspan="4">XR02CX</td> <td>aA1</td> <td>SPST 16A/230Vac</td> <td>General Purpose 16A(Max load), 230Vac, 30K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)</td> <td>Resistive 16A, 230Vac, 100K Cycles (NO)</td> </tr> <tr> <td>aA2</td> <td>SPST 8A/230Vac</td> <td>Resistive 8A, 230Vac, 30K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)</td> <td>Resistive or Inductive 162A, 230Vac, 50K Cycles (NO)</td> </tr> <tr> <td>aA3</td> <td>SPST 4A/230Vac</td> <td>Resistive 4A, 230Vac, 30K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)</td> <td>Resistive or Inductive 13A or 12B1A, 230Vac, 100K Cycles (NO)</td> </tr> <tr> <td>aA4</td> <td>SPST 2A/230Vac</td> <td>Resistive 2A, 230Vac, 30K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)</td> <td>Resistive 8A, 230Vac, 30K Cycles (CO)</td> </tr> </tbody> </table>	型号	触点	容量	UL	IEC	XR01CX	aA1	SPST 16A/230Vac	Resistive 16A, 230Vac, 100K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)	Resistive or Inductive 16B1A, 230Vac, 100K Cycles (NO)	aA2	SPST 8A/230Vac	Resistive 8A (NO only), 230Vac, 30K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)	Resistive or Inductive 831A, 230Vac, 100K Cycles (NO)	aA3	SPST 4A/230Vac	Resistive 4A, 230Vac, 30K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)	Resistive or Inductive 831A, 230Vac, 100K Cycles (NO)	aA4	SPST 2A/230Vac	Resistive 2A, 230Vac, 30K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)	Resistive or Inductive 831A, 230Vac, 100K Cycles (NO)	XR02CX	aA1	SPST 16A/230Vac	General Purpose 16A(Max load), 230Vac, 30K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)	Resistive 16A, 230Vac, 100K Cycles (NO)	aA2	SPST 8A/230Vac	Resistive 8A, 230Vac, 30K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)	Resistive or Inductive 162A, 230Vac, 50K Cycles (NO)	aA3	SPST 4A/230Vac	Resistive 4A, 230Vac, 30K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)	Resistive or Inductive 13A or 12B1A, 230Vac, 100K Cycles (NO)	aA4	SPST 2A/230Vac	Resistive 2A, 230Vac, 30K Cycles (NO) Motor Load 120P (1FLA/12ALRA), 230Vac, 30K Cycles (NO) Pilot Duty 830K, 230Vac, 8K Cycles (NO)	Resistive 8A, 230Vac, 30K Cycles (CO)
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数据存储	电可擦电可写存储器 (EEPROM)																																							
控制级别	1.B																																							
环保等级	2																																							
软件等级	A																																							
最高绝缘电压	2500V - 115Vac 或 230Vac 500V - 12V																																							
过电压类别	II																																							
工作温度	0~60 °C (IEC EN 60730-1) -20~60 °C (UL 60730-1)																																							
贮藏温度	-20~60 °C (UL 60730-1)																																							
相对湿度	20~85% (无凝露)																																							
测量和控制温度范围	NTC -40~110°C (-40~230°F), 分辨率 0.1 °C 或 1 °F (可选)																																							
精度	(在环境温度 25°C时): ±0.7 °C ±1位																																							

**参数设定**

参数代码	描述	设定范围	XR01CX	XR02CX	XR03CX	XR04CX	XR06CX
Set	设定点	LS - US	5.0	3.0	3.0	-5.0	-5.0
Hy	温差	0.1+25°C/+45°F	2.0°C/4°F	2.0°C/4°F	2.0°C/4°F	2.0°C/4°F	2.0°C/4°F
LS	设定点最小允许设定温度	-55°C/-67°F-SET	-55°C/-55°F	-55°C/-55°F	-55°C/-55°F	-55°C/-55°F	-55°C/-55°F
US	设定点最大允许设定温度	SET+99°C/SET+99°F	99°C/99°F	99°C/99°F	99°C/99°F	99°C/99°F	99°C/99°F
od	上电输出延时	0 + 99分钟	0	0	0	0	0
AC	防频繁启动延时	0 + 50分钟	1	1	1	1	1
Cy	探头错误压缩机运转时间, Cy=0 压缩机总是关机	0 + 99分钟	15	15	15	15	15
Cn	探头错误压缩机停止时间, Cn=0 压缩机总是开机	0 + 99分钟	30	30	30	30	30
CH	控制类型	dL + Ht	dL	dL	dL	-	-
CF	测量单位: °C = 摄氏度; °F = 华氏度</						