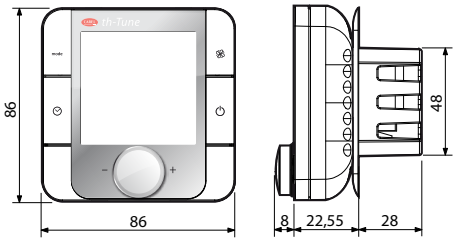
AT* - th Tune 空调电子控制器（嵌入式安装）/ *Electronic controller for air-conditioning (flush-mount model)*

CAREL

尺寸/ *Dimensions* (mm)



拆解/ *Dismantling*

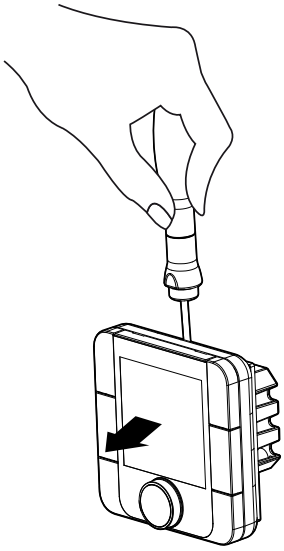


Fig. 1

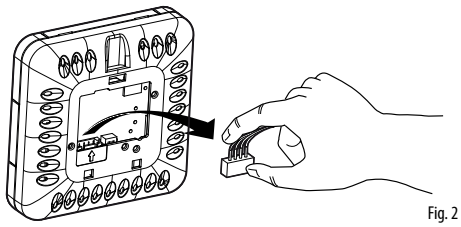


Fig. 2

连接 / *Wiring*

24 Vac/dc

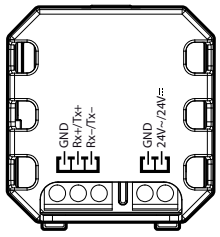


Fig. 3

230 Vac

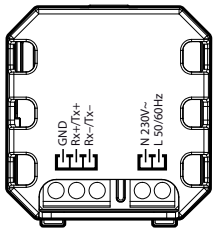


Fig. 4

RC

th-Tune是CAREL的室内手操器，与可编程控制器pCO*配合使用，控制居住环境的温湿度。部分型号配置一个温度传感器或一个温湿度传感器，设备电源是230Vac或24Vac/Vdc。th-Tune兼容目前市场上(意大利、美国、德国、中国)主要的嵌入式安装暗盒。温度和湿度可以通过前面板上的旋钮来设置，操作方式简单且人性化。th-Tune也允许用户做一些其他设置，如操作模式和时段的设置。控制和显示模式取决于th-Tune所连接的控制器。紧凑的尺寸和精美的外观使th-Tune适合安装于各种房间。

代码	型号
ATA*******	230 Vac供电电源
ATC*******	24 Vac/Vdc供电电源
AT******C*	嵌入式安装
AT*****A**	集成温度传感器
AT*****C**	集成温湿度传感器
AT*M******	防水键盘

表. 1

安装警告

- 此设备设计为嵌入式安装方式，完全兼容暗盒标准；
- 在对此设备进行任何操作前，请断开总电源的开关来切断电源连接。然后从尾部拆开前面板进行电气连接；
- 对24Vac供电的版本，需要使用一个最小容量为2VA的2级电源转化器；
- 如果此设备和其通过串行线所连接的控制器使用同一电源转换器，需要把此设备的GND端子和其所连接的控制器GND端子连接；
- 如果24Vac/24Vdc 版本的设备需要接地，请使用GND线，此方式对其他电力设备同样适用；
- 如果th-Tune使用直流电源供电，那么与其通过串行线连接的其他控制器也需要直流电源供电，若其他控制器不能使用直流电源供电，则th-Tune也不能使用直流电源；
- 串行通讯连接线需要使用三芯屏蔽电缆AWG20-22。通讯距离不能超过500米。对扩展通讯网络，需要在第一个和最后一个通讯节点的RX/ TX+线和 RX/TX-线之间各安装一个120欧姆的匹配电阻，来防止可能出现的通讯问题。

装配

对86盒安装方式，需要预留最小直径为65mm及最小深度为31mm的安装孔。

1. 用螺丝刀拆下设备前面部分（Fig.1）
2. 从前面部分拔下四芯连接线（Fig.2）
3. 电气连接
   - 对230Vac供电类型见Fig.4；
   - 对24Vac/24Vdc供电类型见Fig.3，需保证直流电源的极性正确(24 V, GND)；
4. 用包装自带的2颗螺钉固定设备的尾部；
   - 对AT******C*类型如Fig.6方式插入螺钉；
5. 插入四芯连接线；
6. 最后安装设备的前面部分，按标识指示由下往上合上前面部分。请确保连接线的位置以保证设备卡合到位。

拆卸

如图1所示将螺丝刀插入设备顶部，向下按压以分离显示板

说明

请勿将此设备安装于以下环境中：

- 相对湿度超过设备正常工作限定湿度；
- 强烈震动或敲击；
- 暴露于水流喷洒环境；
- 暴露于刺激性及强腐蚀性气体（如硫磺、氨气、盐雾、烟雾等），以防止腐蚀及氧化；
- 强磁场及无线电干扰环境（如无线发射器）；
- 暴露于直接日照及类似强光下；
- 室内温度快速大幅波动；
- 室内存放易燃易爆物；
- 暴露于粉尘环境（腐蚀及氧化会降低绝缘效果）。

ENG

th-Tune is the Carel room terminal that, together with the pCO* programmable controller, allows the user the control the temperature and humidity in residential environments. Depending on the model, the terminal is fitted with a temperature probe or temperature and humidity probe, and power supply may be 230 Vac or 24 Vac/Vdc. th-Tune is compatible with the main flush mount distribution boxes available on the market (IT, US, DE, CN). Temperature and humidity set is simple and intuitive, using the knob on the front panel. th-Tune also allows the user to make some settings, such as the operating mode and time bands. The type of control and displays depend exclusively on the controller that th-Tune is connected to. The compact dimensions and elegant design make it suitable for all types of rooms.

Code	Model
ATA*******	230 Vac power supply
ATC*******	24 Vac/Vdc power supply
AT******C*	flush mount
AT*****A**	with temperature probe
AT*****C**	with temperature and humidity probe
AT*M******	membrane keypad

Tab. 1

Installation warnings

- These terminals have been designed for flush mount assembly, on distribution boxes compliant with the standards in force;
- before performing any operations on the terminal, disconnect the power supply from the device by switching the main switch on the electrical panel OFF. Then remove the front part of the terminal from the rear to make the electrical connections;
- for the 24 Vac version use a class 2 power transformer with minimum rating of 2 VA;
- if the transformer used for the terminal is the same for the controllers connected to the serial line, the power supply GND terminal on the th-Tune must be connected to the controller power supply GND line;
- if a power terminal on the 24 Vac/24 Vdc version needs to be earthed, use the GND terminal, both for the th-Tune that the other powered devices;
- when th-Tune has a DC power supply, the controllers connected to the serial line must also have a DC power supply. If the controllers do not allow DC power, then th-Tune cannot use the DC power supply;
- for the serial connection use three-wire shielded cable, AWG 20-22. The length of the network must not exceed 500 m. For extended networks fit a 120 Ohm resistor between RX/ TX+ and RX/TX- on the first and last device, to avoid possible communication problems.

Assembly

To fit the rear part of the terminal use a flush mount box with a min. diameter of 65 mm and a minimum depth of 31 mm.

1. detach the front from the rear of the terminal using a screwdriver (Fig. 1);
2. disconnect the 4-pin connector from the front part (Fig. 2);
3. make the electrical connections:
   - for 230 models Vac see Fig. 4;
   - for 24 Vac/24 Vdc models see Fig. 3; make sure the polarity (24 V⎓, GND) is right for direct current power supply;
4. fasten the rear to the flush mount box using the 2 screws supplied:
   - for models AT******C* insert the screws as shown in Fig. 6 and 7;
5. plug the 4-pin connector back in;
6. finally reposition the terminal, starting from the bottom tabs using a hinge movement. Make sure that the electrical wires are in position to ensure the terminal clicks into place.

Dismantling

Insert a screwdriver into the clot at the top (Fig. 1) and press downwards to detach the display.

General notes

Avoid installing the terminal in environments with the following characteristics:

- relative humidity greater than the value specified;
- strong vibrations or knocks;
- exposure to water sprays;
- exposure to aggressive and polluting atmospheres(e.g.: sulphur and ammonia fumes, saline mist, smoke) so as to avoid corrosion and/or oxidation;
- strong magnetic and/or radio frequency interference (for example, near transmitting antennae);
- exposure to direct sunlight or the elements in general;
- large and rapid fluctuations in the room temperature;
- environments where explosives or mixes of flammable gases are present;
- exposure to dust (formation of corrosive patina with possible oxidation and reduction of insulation).

尾部尺寸 (mm) / *Dimensions of rear part (mm)*

型号 / *Models* AT*******C*

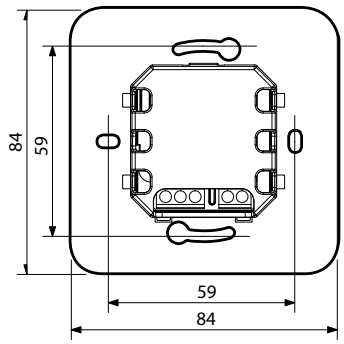


Fig. 5

分解图 / *Exploded dwg* AT******C*

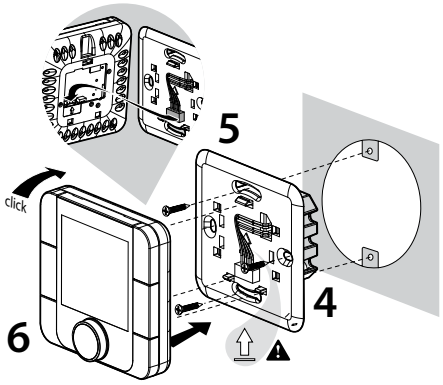


Fig. 6

分解图 / *Exploded dwg* AT******C*

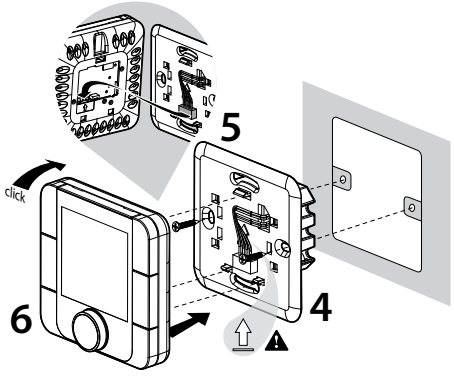


Fig. 7

显示

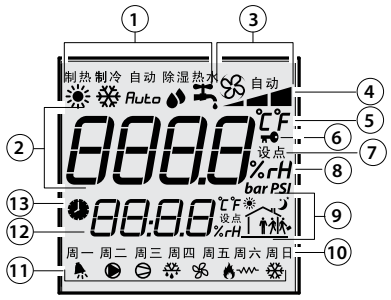


Fig. 8

按键

按键和显示符号的含义可能会根据th-Tune连接的不同控制器而有变化。下面是对一般设置的描述。
如果显示屏上显示"CN"，说明在电子控制器和手操器之间没有连接。手操器在上电时，一般会显示"CN"并持续30s，直到两者之间建立连接。如果在底部显示"Init"，则表示手操器正在被主控制器初始化。如果这个过程持续时间超过10分钟，则表明存在通讯问题。

按钮	描述	功能
模式	模式	选择运行模式：连续按下该键选择需要的模式
	风机	选择风机速度：连续按下该键选择需要的风速（低，中，高，自动）
	时钟	按一下：使能/禁用时段。 当使能时，图标 点亮。 按下并保持3s：进入菜单设置时段。使用旋钮选择下列选项： CLOCK：设置当前日期/时间：时间显示区域会闪烁。旋转旋钮进行调整，按下旋钮确认。 TIMEBAND：对于每一个时段（最多6个）按下旋钮设置该时段的开始时间以及相应的温度设定点。相关的图标（白天/晚上，房屋是否有人）会在侧面显示。选择ESC退出并返回主界面。 ESC：退出。 10s之后th-Tune会自动返回到主界面。
	电源	th-Tune设备ON/OFF；在某些菜单中，短时按下这个按钮与选择ESC是一样的。
PUSH	旋钮	旋转旋钮调整数值，按下旋钮确认

进入特殊菜单："模式"+"时钟"同时按下3s可以进入报警列表，只有在显示 图标时该菜单有效。 显示的报警信息取决于th-Tune连接的电子控制器。
同时按下"风机"和"电源"键3s可以进入参数设置菜单。各个等级的密码可以进入不同的菜单。密码22可以进入th-Tune的参数菜单，可以对地址参数"ADDR"进行设置：
- "波特"用于设定波特率("0"= 4800 bps, "1"= 9600 bps, "2"= 19200 bps)；
- "Pcal"用于校准传感器。

技术规格

电源：ATA*******: 230 Vac (+10/-15%) 50/60 Hz
ATC*******: 24 Vac (+10/15%), 22 ~ 35 Vdc
最大功率：2VA
工作条件：-10~60 °C, 10~90% rH 无冷凝.
储存条件：-20~70 °C, 10~90% rH 无冷凝
环境污染：2
绝缘材料PTI：PCB 175~249；绝缘材料：PTI275
软件等级和结构：A
防护等级：IP20
防热防火等级：D
防触电等级：可用于1类或2类设备中
绝缘件耐压周期：长
抗浪涌等级：II
温度测量精度：0~40 °C: ±1 °C; 其他: ±1.5 °C
湿度测量精度：0~60 °C, 20 ~ 80% rH: ±5% rH

连接

485连接：AWG20~22，屏蔽电缆，最大长度500m
电源：线缆横截面积：0.5mm^2~1.5mm^2

显示说明：

1	工作模式
2	主区域
3	手动模式风机速度/自动模式
4	风机指示器
5	温度单位
6	功能锁定
7	设定点
8	相对湿度
9	当前时段
10	周历
11	执行器动作
12	副区域
13	时段激活

Keypad

The meaning of the buttons and the displays may vary according to the controller that th-Tune is connected to. Below is a description of the common settings. If "CN" is shown on the display, it means there is no communication with the electronic controller the terminal is connected to. On power-up, the terminal normally shows "CN" for around 30s, until communication is established. If "Init" is shown at the bottom, the terminal is being initialised by the master controller. If this process lasts more than 10 minutes it means there are communication problems.

Button	Desc.	Function
mode	MODE	Select operating mode: press until the desired operating mode is displayed
	FAN	Select fan speed: press to select the desired speed (min, med, max) or automatic (Auto)
	CLOCK	Press briefly: enable/disable the time bands. When enabled the icon comes on. Press and hold (3 s): access to the menu for setting the clock/time bands. Use the knob to select the following options: CLOCK: set current date/time: the time will start flashing. Turn the knob to select and press to confirm; TIMEBAND: time band setting. For each time band (max. 6) press to set the starting time and the corresponding temperature set point. The related icon will be shown on the side, depending on the status (day/night) and whether or not the home is occupied. Select ESC to exit the procedure and return to the standard display. ESC: to exit After a 10 s timeout th-Tune automatically returns to the main menu.
	POWER	th-Tune device On/Off; in some menus pressing the button briefl y is the same as choosing ESC.
PUSH	Knob	Turn the knob to set the value and press to confirm

Accessing the special menu: MODE + CLOCK for 3s to access the alarms menu, active only if the icon is on. The alarms displayed depend on the electronic controller that th-Tune is connected to. To access the parameters menu, press FAN and POWER together for 3s. Different passwords can be entered to access different menus. Psw 22 accesses the th-Tune parameters menu, which includes "ADDR" for setting the serial address:
- "Baud" for setting the baud rate ("0"= 4800 bps, "1"= 9600 bps, "2"= 19200 bps);
- "Pcal" for calibrating the probe.

Technical specifications

Power supply: Models ATA*******: 230 Vac (+10/-15%) 50/60 Hz
Models ATC*******: 24 Vac (+10 to -15%), 22 to 35 Vdc
Maximum current: 2 VA
Operating conditions: -10T60 °C, 10 to 90% rH non-cond.
Storage conditions: -20T70 °C, 10 to 90% rH non-cond.
Environmental pollution: 2
PTI of insulating materials: PCB: from 175 to 249; insulation material: PTI 275
Software class and structure: A
Index of protection of the case: IP20
Category of resistance to heat and fire: D
Classification according to protection against electric shock: to be integrated into class 1 or 2 appliances
Period of electrical stress across the insulating parts: long
Immunity against voltage surges: category II
Precision of temperature measurement: range 0T40 °C: ±1 °C; over: ±1.5 °C
Precision of humidity measurement: range 0T60 °C, 20 to 80% rH: ±5% rH

Connections
485 serial: AWG 20 to 22, shielded cable, Lmax=500 m
Power supply: Cross-section of the wires: 0.5 mm^2 to 1.5 mm^2

Key to the display:

1	Operating mode
2	Main field
3	Fan speed in manual mode/automatic
4	Fan speed indicator
5	Temperature unit of measure
6	Function locked
7	Set point
8	Relative humidity
9	Current time band
10	Day of the week
11	Actuator on
12	Secondary field
13	Time bands active

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