

# User Manual

V1.2

## **RX35CX**

CONTROLLER FOR SINGLE OR TANDEM CONDENSING  
UNIT WITH ADVANCED FAN MANAGEMENT



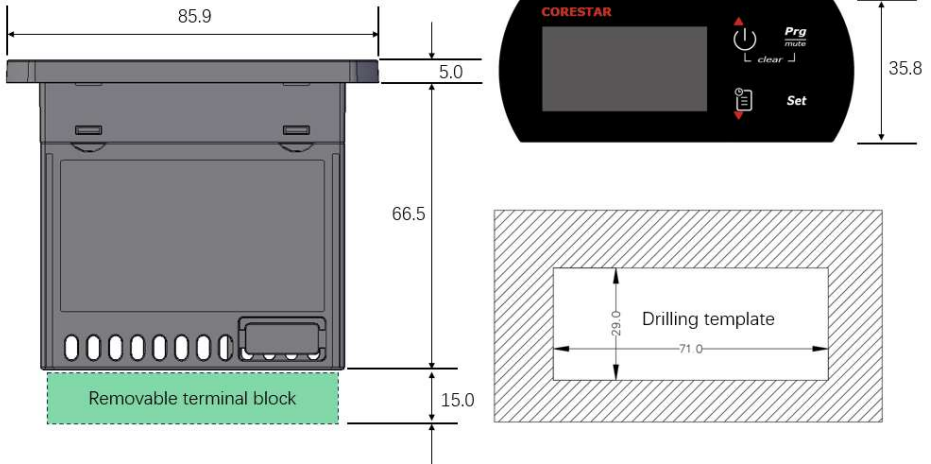
# Introduction

RX35CX is a controller suited to control small and medium condensing units. It is able to manage up to two compressors (standard ON/OFF, digital or inverter-controlled), and up to two ventilators (standard ON/OFF or modulated type). Moreover, the supported modulating ventilators can be both electronic ventilators (which use a 0÷10Vdc command signal) and ventilators controlled in phase-cut mode. The RX35CX is characterized by its versatility; in fact, it can be used both in “entry level” condensing units (one compressor and one ventilator) and medium condensing units (up to 2 compressors whereof one with variable capacity). Specific functions for the regulation optimization, for the control of malfunctioning status and for the energy saving, make this controller one of the most completed and reliable for the customer.

## Main features:

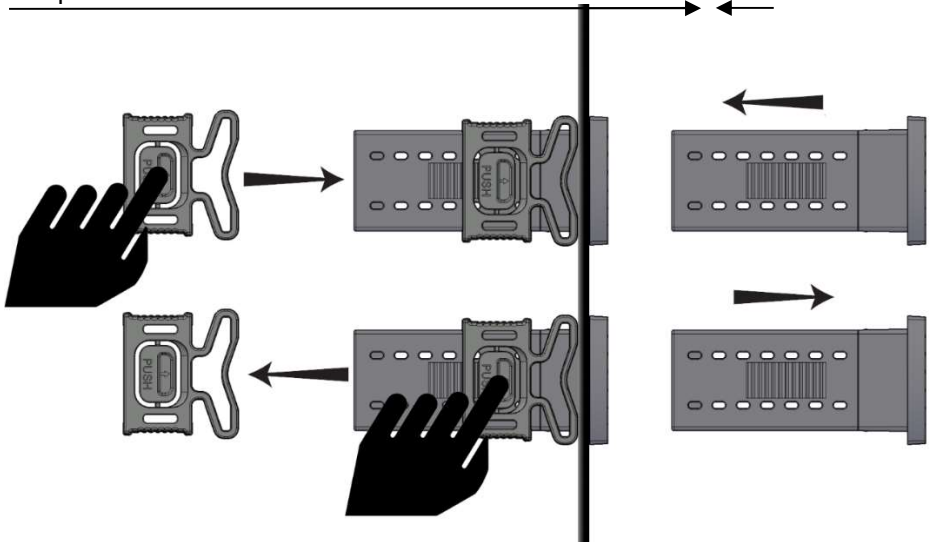
- Two relay outputs to drive ON-OFF compressors of ventilators, or for alarm signaling;
- 1 TRIAC output for ventilator speed modulation in phase-cut mode (MAX 300W)
- 1 analogue output (0-10Vdc or PWM type) for electronic ventilators control, inverter management or proportional repeater
- Up to 2 digital inputs free of voltage for external alarm management
- 2 analogue inputs to be used with ratiometric pressure transducer (0.5-4.5Vdc)
- Up to 3 temperature probe inputs NTC10k, NTC50k or PT1000 type
- RS485 serial network connection to remote supervisor and cloud systems (Modbus RTU);

# Dimensions (unit: mm)



## Panel mounting installing/uninstalling

The panel thickness must be between 1.0 and 10.0mm



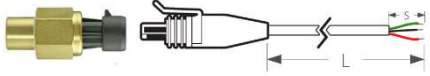
# Electrical Specifications

Power supply	100~240Vac, 3.5VA	
Inputs	P3	NTC or PT1000
	P4	NTC or PT1000
	P1	Suction line ratiometric transducer (0.5~4.5Vdc)
	P2	Condensing line ratiometric transducer (0.5~4.5Vdc) Or NTC-10K/NTC-50K/PT1000
	DI1	voltage-free contact, contact resistance < 10 $\Omega$ , closing current 6 mA
	DI2	voltage-free contact, contact resistance < 10 $\Omega$ , closing current 6 mA
Temperature probes type	NTC-10K	10k $\Omega$ at 25°C, range from - 50T105°C
	NTC-50K	50k $\Omega$ at 25°C, range -40T150°C
	PT1000	1000 $\Omega$ at 0°C, range from -85T150°C
outputs	oA1	250V~, 10(10) A, N.O, SPST
	oA2	250V~, 8(4) A, N.O, SPST
	oA3(Triac)	24~240V AC
	oAn	PWM/0-10V,Max 20mA
*Relay not suitable for fluorescent loads (neon lights, etc.) that use starters (ballasts) with phase shifting capacitors.		
RTC	error at 25°C $\pm$ 10 ppm ( $\pm$ 5 min/year), if RTC function available	
Operating temperature	-10T60°C	
Operating humidity	< 90% RH non-condensing	
Front panel IP level	assembly on smooth and indeformable panel with IP65 gasket	
protection against surge	category II	
Communications	Modbus RTU	

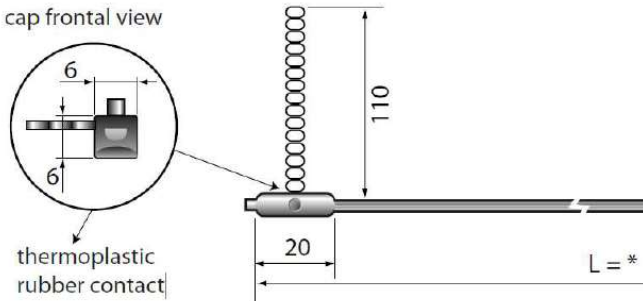
# OPERATIONAL TOOLS

Description	Code
Temperature probe	ESR11-F-02M
Suction Pressure Transducer	PKSV00200: 0T20 bar
Discharge Pressure Transducer	PKSV00345: 0T34.5 bar
External SSR for solenoid capacity	CSSRE-606DD,DIN rail
Single phase fan speed regulator	FCSV05,max 500W
Single phase fan speed regulator	FCSA, max 2KW

## RATIOMETRIC PRESSURE TRANSDUCERS (0.5-4.5VDC)

	L=2.0m, 0T20bar code: <b>PKSV00200</b>
	L=2.0m, 0T34.5 bar code: <b>PKSV00345</b>

## PIPE MOUNTING TEMPERATURE PROBE: ESR11-F-02M



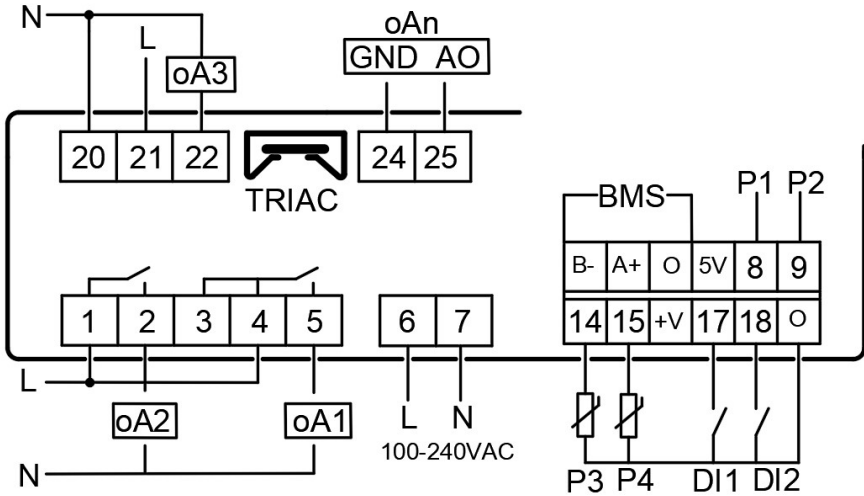
- Probe Type: NTC-50K
- Temperature range: -40T150°C
- Cable length: 2.0mt
- Code: ESR11-F-02M

# Wiring diagrams

## Important warning:

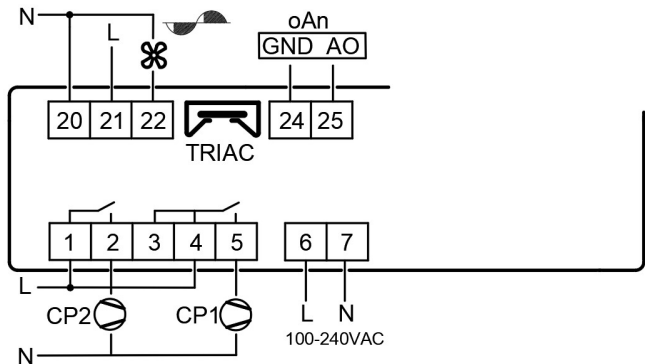
#22 is TRIAC output, can NOT connect to mains power input 'L' directly, or else may permanently damage the controller!!

Inputs and outputs definition

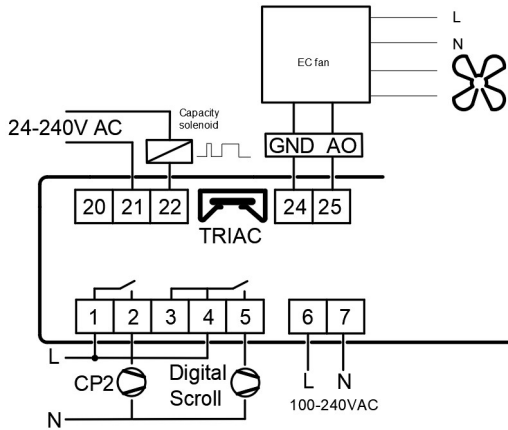


## Loads

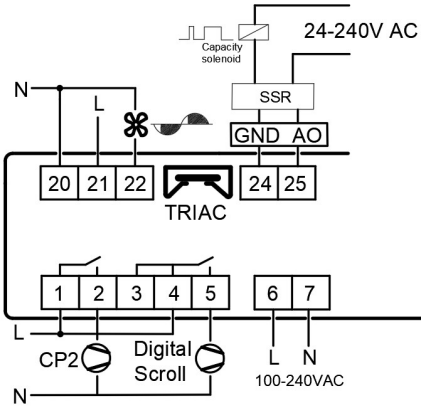
- 2 Compressors ON-OFF type
- 1 Ventilator controlled in phase-cut mode



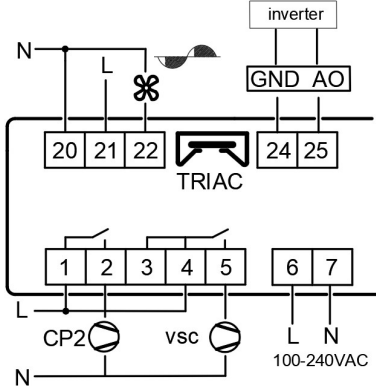
- 1 Digital scroll compressor
- 1 Compressor ON-OFF type
- 1 Electronic ventilator or external AC fan speed regulator



- 1 digital scroll compressor (use external SSR)
- 1 Compressor ON-OFF type
- 1 Ventilator controlled in phase-cut mode

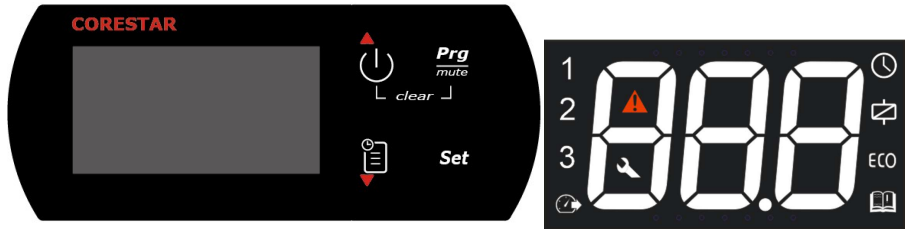


- 1 inverter-controlled compressor
- 1 Compressor ON-OFF type
- 1 Ventilator controlled in phase-cut mode





# User interface

## Interface



## Keys










keys	Press and release	Press for at least 5 seconds	Press at Start-up
<b>Prg mute</b>	if there is an active alarm: mutes the audible alarm (buzzer).	Show firmware version r *.* in 3 seconds accesses the type “F” parameters (frequent)	If pressed more than 3 seconds, activates the procedure for restore the default parameters
<b>Set</b>	If pressed for more than 3 s, displays and/or lets the user set the set point	Exit info / alarms/ service menu	Enter bootloader for firmware upgrade
	when setting the parameters, increases the value displayed or scrolls to the next parameter.	switches the controller ON/OFF	
	when setting the parameters, decreases the value displayed or scrolls to the previous parameter	Stored alarms it gives access to the stored alarms	
<b>Prg mute</b> +		reset any alarms with manual reset	
<b>Prg mute</b> + <b>Set</b>		access the type “C” parameters (Configuration), default password is 22	
+		To lock and unlock the keyboard	

 + <b>Set</b>		Goto info menu, it allows the visualization of some operating information
 + <b>Set</b>		Goto service menu, it allows to read working hours and activation numbers of important devices, important settings e.t.c


### ;Display

The user terminal display shows temperature in range -50 to +150°C. The temperature is displayed with resolution to the tenths between - 19.9 and + 19.9 °C. In the event of alarms, the value of the probe is displayed alternating with the codes of the active alarms.

#### Icons

Icon	Function	ON	OFF	Blink	Start-up
	Relay output oA1	ON	OFF	Awaiting	
	Relay output oA2	ON	OFF	Awaiting	
	Relay output oA3 (Triac)	ON	OFF	Awaiting	
	Analogue output oAn	active	OFF	-	
	alarm	Alarm active	-	Alarms in norm. operation or immediate or delayed alarm from external digital input	
	service			Malfunction (e.g. probe fault).	
	clock	RTC menu	-	Alarm clock	ON if RTC present
<b>ECO</b>	Energy saving mode	ON	OFF	-	
	Capacity solenoid vale	Energized	deenergized	-	
	Alarm in memory	At least an alarm present into memory	No alarm present in memory	A new alarm is occurred and need to be checked	

## Info MENU

This menu is directly accessible from  + **Set** buttons. The INFO menu allows the visualization of some operating information. Use the **UP** and **DOWN** buttons to browse between the variables of the INFO menu. The value of the displayed variable is accessed automatically after 3 sec switched to related variables.

Variable	Meaning
<b>P1</b>	Probe P1 value (suction line)
<b>P2</b>	Probe P2 value (condensing line)
<b>P3</b>	Probe P3 value
<b>P4</b>	Probe P4 value
<b>tdG</b>	Modulation interval for digital compressors
<b>PEr</b>	TRIAC output activation (in percentage)
<b>Aou</b>	Analogue output value (in percentage)

**EXIT:** Press **SET 5 sec** or wait for 60 sec without pressing any key.


### SETPOINTS VISUALIZATION

1. Press the **SET** button for 3 sec
2. SUCTION: the display will show the label **St1** [Compressor setpoint]
3. After 3 sec auto show the value of **St1**
4. press the **SET** button once again
5. The display shows the label **St2** [Ventilator setpoint]
6. After 3 sec auto show the value of **St2**
7. Press the **SET** button move to the homepage

### SETPOINTS MODIFICATION

1. Press the **SET** button for 3 sec
2. The display will show **St1**
3. After 3 sec auto show the value of **St1** (Compressor setpoint)
4. Change the value of **SET** by pressing the **UP** or **DOWN**
5. Press the **SET** button to save the set value in memory and move to the ventilator setpoint
6. The display will show **St2** (Ventilator setpoint)
7. After 3 sec auto show the value of **St2**
8. Change the value of **St2** by pressing the **UP** or **DOWN**
9. Press the **SET** button to save the set value in memory and move to the homepage

## SERVICE MENU

The SERVICE menu is accessible by using the  + **Set** button. This menu allows reading the values of any probe or digital input.

Variable	Meaning
<b>OA1</b>	OA1 function
<b>OA2</b>	OA2 function
<b>OA3</b>	OA3 function
<b>OAn</b>	OAn function
<b>n1H</b>	Activation number for output <b>oA1</b> (thousands of)
<b>n1L</b>	Activation number for output <b>oA1</b> (unit of)
<b>n2H</b>	Activation number for output <b>oA2</b> (thousands of)
<b>n2L</b>	Activation number for output <b>oA2</b> (unit of)



<b>o1H</b>	Number of working hours for output <b>oA1</b> (thousands of)
<b>o1L</b>	Number of working hours for output <b>oA1</b> (unit of)
<b>o2H</b>	Number of working hours for output <b>oA2</b> (thousands of)
<b>o2L</b>	Number of working hours for output <b>oA2</b> (unit of)
<b>bAu</b>	Baudrate (for communication serial) 1=9600,N,8,1, 2=19200,N,8,1, 3=38400,N,8,1 4=9600,E,8,1, 5=19200,E,8,1, 6=38400,E,8,1 7=9600,O,8,1, 8=19200,O,8,1, 9=38400,O,8,1


## ALARM MENU

The device is able to memorize:

- The total number of alarm events for any managed alarm (max 5)
- Type and duration of last 5 alarm events (**ALx, x=0...4**)

Moreover, after detecting a new alarm event:

- If a NEW ALARM has been detected, it will be signaled by showing the relative code on the display and by switching on the ALR icon and blinking the  icon
- When at least one alarm is present into memory, the icon  will be switched on.


**NOTE:** after entering the ALARM menu the icon  will stop blinking and will stay ON. This is used to indicate that all alarms in memory have been checked by an operator.

## TYPE OF ALARM EVENTS RECORDER

The following table shows the available information of the alarm menu:

Alarm	Meaning
<b>HA</b>	High pressure/temperature alarm on the suction line
<b>LA</b>	Low pressure/temperature alarm on the suction line
<b>H2</b>	High pressure/temperature alarm on the discharge line
<b>HLL</b>	High pressure lockout alarm
<b>L2</b>	Low pressure/temperature alarm on the discharge line
<b>dLt</b>	High temperature alarm on compressor head
<b>dLL</b>	Lockout due to DLT alarm
<b>ELP</b>	Electronic pressure switch (warning)
<b>ELL</b>	Electronic pressure switch (lockout)
<b>HP</b>	High pressure alarm from external sensor (warning)
<b>LP</b>	Low pressure alarm from external sensor (warning)
<b>LPL</b>	Low pressure alarm from external sensor (lockout)
<b>HPL</b>	High pressure alarm from external sensor (lockout)

## ALARM MENU VISUALIZATION

1. Press the alarm  button for 5s
2. Scroll with **UP** or **DOWN** button up to label **ALO** (first alarm event memorized)
3. Press **SET** button to enter the event submenu
4. The encoding label relative to the logged event will be displayed
5. Press **SET** button again to display the time stamp of the alarm event recorded
6. Press the **SET** button to move to the next alarm event

## ALARM RESET

1. Enter the ALARM menu
2. To reset the alarm list, keep the PRG+UP button pressed for 3 sec until the message "rES" shows on the display

Note:

If not in ALARM menu, keep the PRG+UP button pressed for 3 sec until the message "rES" shows on the display, will reset any alarms with manual reset

**NOTE:** the current alarms will not reset

## PARAMETER VALUE MODIFICATION

The following procedure is to access password (default: 22) protected parameters:

1. Press **PRG+SET** buttons at the same time until display show '0'
2. Enter password (default: 22) by using **UP** or **DOWN** buttons
3. Press **SET** to access the programming menu
4. Select the parameter to modify by using **UP** or **DOWN** buttons
5. Press the **SET** button to display the actual parameter value
6. Change the value by using **UP** or **DOWN** buttons
7. Press the **SET** button to store the new value and move to the next parameter








**EXIT:** press **PRG** for 5s or wait for 30 sec without pressing anykey.

**NOTE:** the new value will NOT be stored in case the exit from the programming menu is by timeout.

## KEYBOARD LOCK

To prevent any random modification of the operating parameters it is possible to lock the keypad:

- **KEY LOCK:** keep both **UP** and **DOWN** buttons pressed for 3 sec: the message "PoF" indicates that the keyboard is locked.
- **UNLOCK THE KEYBOARD:** keep both **UP** and **DOWN** buttons pressed for 3sec: the message "Pon" will indicate that the keyboard is unlocked.

Code	why	Flashing icons	Reset	Action
P 1	Probe P1 fault		automatic	Change probe or modify configuration
P 2	Probe P2 fault		automatic	Change probe or modify configuration
P 3	Probe P3 fault		automatic	Change probe or modify configuration
P 4	Probe P4 fault		automatic	Change probe or modify configuration
H R	High pressure/temperature alarm on suction line		automatic	Check cooling circuit
L R	Low pressure/temperature alarm on suction line		automatic	Check cooling circuit
H 2	High pressure/temperature alarm on discharge line		automatic	Check cooling circuit
L 2	High pressure/temperature alarm on the discharge line		automatic	Check cooling circuit
H L L	High pressure lockout alarm		manual	Check cooling circuit
d L L	High temperature alarm on compressor head		automatic	Check cooling circuit
d L L	Lockout due to dLt alarm		Manual after temperature goes below the differential and at the end of the cooling time	Check cooling circuit
E L P	Electronic pressure switch (warning)		automatic	Check cooling circuit
E L L	Electronic pressure switch (lockout)		Manual by power on and off the device	Check cooling circuit
H P	External high pressure switch warning		automatic	Check cooling circuit
L P	External low pressure switch warning		automatic	Check cooling circuit
H P L	External high pressure switch lockout		Manual by power on and off the device	Check cooling circuit
L P L	External low pressure switch lockout		Manual by power on and off the device	Check cooling circuit
C U P	Compressor maintenance warning		Manual by power on and off the device	Perform maintenance
F U P	Ventilator maintenance warning		Manual by power on and off the device	Perform maintenance
E t c	Real time clock fault		automatic/manual	Set RTC parameters
E E	Unit parameter EEPROM error		automatic	Contact CORESTAR service

