REAN

FROSTAGE

RCR305

PRODUCT MANUAL

REAN

ESSEM OTOMASYON MÜHENDİSLİK SAN. TİC. LTD. ŞTİ.
Çakmak Mah. Varan Cad. Bahariye Sk. No:2A 34774
ÜMRANİYE/İSTANBUL-TURKİYE
Tel : +90 216 364 75 45
url : www.rean.com.tr

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Table of Contents

Note: For repair or device-related questions, please contact the REAN sales team.

1.General Features

1.1. Descriptions

FROSTAGE is a high-performance and intelligent control device developed for industrial refrigeration systems. Thanks to its modern microcontroller-based architecture, it precisely manages critical processes such as temperature control, defrost management, and fan control. With advanced software algorithms, it enhances energy efficiency while prioritizing system safety. Its user-friendly interface and ease of parameter configuration provide a practical solution for both installation and operation.

1.2. Application Areas

FROSTAGE is specifically designed to achieve high performance in cold storage and industrial preservation systems. It provides reliable management in applications where temperature control is critical, such as meat and dairy products, fruits and vegetables, pharmaceuticals, or frozen food storage. The device automatically manages the entire cooling cycle through its compressor, defrost, fan, lighting, and auxiliary outputs, thus maintaining product freshness and system efficiency.

1.3. Technical Specifications

- 3 NTC sensor inputs (room temperature, evaporator, optional third sensor)
- 5 relay outputs: cooling, defrost, fan, lighting, and auxiliary control
- Large display with LED status indicators
- Lighting and auxiliary outputs can be activated via the device's keypad
- Adjustable compressor protection parameters
- Sensor calibration values can be set by the user
- 0.1°C temperature reading resolution
- Quick cooling function and energy-saving mode
- Flexible definition of upper and lower limits for set values
- Safe operation mode based on time in case of sensor failure
- 2 digital inputs with user-assignable functions
- Power supply: 230V AC 50/60 Hz
- Compressor output: 250V AC, 30A NO
- Defrost relay: 250V AC, 16A NO+NC
- Fan relay: 250V AC, 16A NO+NC
- Lighting relay: 250V AC, 8A NO+NC
- Auxiliary relay: 250V AC, 8A NO+NC
- Easy installation with wall-mounted and terminal-connected structure
- IP65 protection class
- CE certified safe design compliant with EN standards

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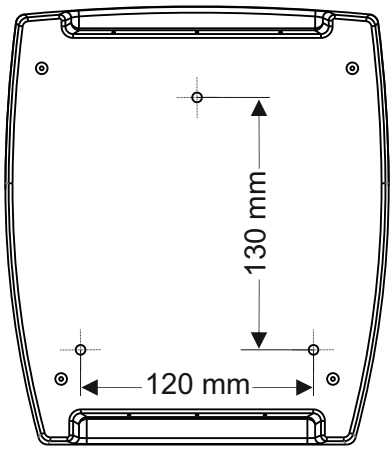
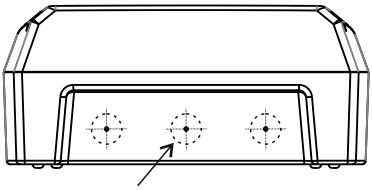
2.External Dimensions and Installation RCR305

2.1. External Dimensions

2.2. Wall Mounting



Wall Mounting Hole Dimensions



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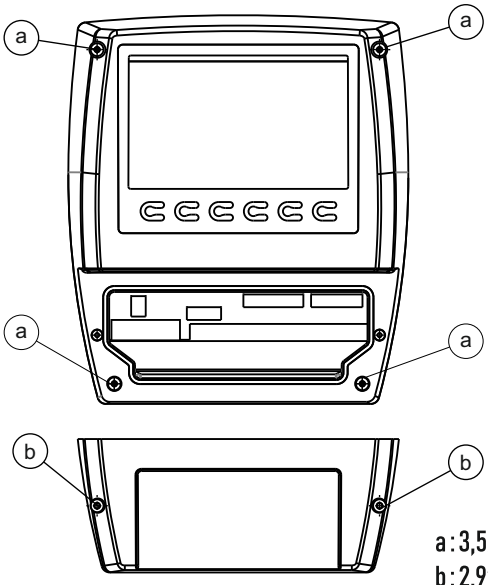
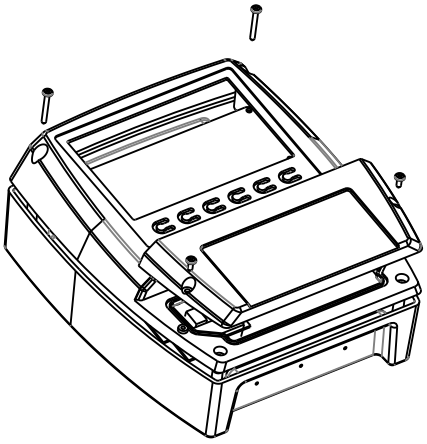
2.External Dimensions and Installation RCR305

2.3. Device Installation



Front Cover



a : 3,5x13mm Stainless Steel Screw
b : 2,9x9,5mm Stainless Steel Screw

Note: After securing the rear housing to the wall, mount the front frame onto the rear housing as shown above. Fasten it with 4 pieces of 3.5x13mm screws identified as "a" in the illustration above. Once you have completed the electrical connections, attach the connection cover to the front frame and secure it with 2 pieces of 2.9x9.5mm screws identified as "b" in the illustration above. The installation process will be complete at this stage.

2.4. Electrical Connections ⚠

During device installation or maintenance, the connection cables must not be energized. Power supply and signal cables entering the device should be kept as far apart as possible. The device should be protected from vibration, and its operating temperature should be carefully observed. Before starting the installation, always discharge static electricity from the body by touching a grounded surface. The cable lengths for the power supply, relay outputs, sensors, and digital inputs should each be a maximum of 10 meters.

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2.External Dimensions and Installation RCR305

2.5. Wiring Guide

WARNING! Loose wiring can cause electric shock and fire. Installation and electrical connections must be carried out in accordance with the instructions provided by technical personnel. Failure to follow these warnings may result in death or serious injuries.

mm / in. 6.5 / 0.26								
mm^2	0.2...2.5	0.2...2.5	0.2...2.5	0.2...2.5	0.2...2.5	0.2...2.5	0.2...2.5	0.2...2.5
AWG	0.2...2.5	0.2...2.5	0.2...2.5	0.2...2.5	0.2...2.5	0.2...2.5	0.2...2.5	0.2...2.5

Ø3.5 mm (0.14 in.)			
	N•m	0.5...0.6
	lb-in	4.42...5.31

Note: Pay attention to the tightening torque values for screws and the dimensions of the cables specified in the table above.

3.Keypad and Symbols

3.1. Keypad

SET	Holding the button for 5 seconds activates the device programming mode. Pressing the button once displays the set value on the screen and enters adjustment mode. In the menu, the button is used to confirm commands entered for parameters.
▼	Pressing this button decreases the values and allows navigation in the programming screen. Holding this button for 5 seconds activates the manual defrost mode. When pressed momentarily on the main screen, the lowest recorded temperature is displayed.
▲	Pressing this button increases the values and allows navigation in the programming screen. Holding this button for 5 seconds activates the Fast Cooling mode. When pressed this button on the main screen, the highest recorded temperature is displayed.
	Pressing this button once activates the lighting relay, and pressing it again deactivates the lighting relay.
AUX	Pressing this button once activates the Aux relay, and pressing it again deactivates the Aux relay.
	Holding this button for 5 seconds activates the device standby mode. All outputs are turned off (the lighting output status can be configured from the menu). Pressing the button again resumes operation and the device continues working.

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3.Keypad and Symbols RCR305

3.2. Key Combinations

SET	**ENTERING THE MENU**	Holding the Set button for 5 seconds will display the message PA on the screen, and the device will enter the parameter menu.
▼	**MANUAL DEFROST**	Holding the down button for 5 seconds activates the manual defrost mode.
▲	**FAST COOLING**	Holding the up button for 5 seconds activates the quick cooling mode.
⏻	**ON/OFF MODE**	Holding the On-Off button for 5 seconds deactivates all outputs, displays OFF on the screen, and puts the device into sleep mode.
▼ + ▲	**KEY LOCK MODE**	Holding the up and down arrow buttons for 5 seconds will display LOC on the screen, and the device will enter key lock mode. To exit this mode, hold the up and down arrow buttons again for 5 seconds, and "UNL" will appear on the screen, indicating that the device has exited key lock mode.

3.3. Symbols

	The led is on	Door input is active
	The led is on	Cooling relay is active
	The led is on	Fast cooling mode is active
	The led is on	Defrost relay is active
	The led is blinking	Dripping time is counting
	The led is on	Fan relay is active
AUX1	The led is on	Aux1 relay is active
	The led is on	Light relay is active
	The led is on	Energy saving mode is active
	The led is on	The device is in standby mode

3.4. Error Messages

Er1	Room Sensor (NTC1) Error	AL	Low Temperature Error
Er2	Evap. Sensor (NTC2) Error	AH	High Temperature Error
Er3	Aux Sensor (NTC3) Error	iA	Digital Input Error
CSh	Condanser Error	COh	Condanser Error

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4.Parameter List

RCR305

Parameter	Minimum	Maximum	Unit	Default	Describtion
SP	r1	r2	°C	-18	Set Value
Pr1	-50	150	°C	---	Instant room temperature value read by the NTC1 sensor
Pr2	-50	150	°C	---	Instant evaparator temperature value read by the NTC2 sensor
Pr3	-50	150	°C	---	Instant auxiliary temperature value read by the NTC3 sensor
o1	-50	50	°C	0	Offset value for temperature read by the room(NTC1) sensor
o2	-50	50	°C	0	Offset value for temperature read by the evaparator (NTC2) sensor
o3	-50	50	°C	0	Offset value for temperature read by the auxiliary (NTC3) sensor
P1	0	1	---	0	Decimal point (0:No, 1:Yes)
P3	0	3	---	1	Evaporator sensor function (0: Evaporator sensor disabled, 1: Evaporator sensor, defrost and fan are controlled according to this sensor, 2: Evaporator sensor, fan is controlled according to this sensor, defrost is controlled according to the ambient sensor, 3: Condenser sensor)
P5	0	3	---	0	Value to display on the screen (0: Room temperature, 1: Set value, 2: Evaporator or condenser temperature, 3: Room temperature - Evaporator temperature)
P6	0	1	---	0	Auxiliary sensor activation (0:No, 1:Yes)
P8	0	250	0,1sn	5	Refresh rate of the sensor value displayed on the screen
r0	0.1	20	°C	2	Hysteresis (differential) set value
r1	-50	r2	°C	-50	Low limit for Set Value
r2	r1	150	°C	150	High limit for Set Value
r3	0	1	---	0	Set value lock function; if this value is set to 1, the user cannot change the set value (0: No, 1: Yes)
r4	0	99	°C	0	Increase amount to be applied to the set value when energy-saving mode is active
r6	0	50	°C	0	Decrease amount to be applied to the set value when quick cooling mode is active
r7	0	240	dk	0	Duration for which the quick cooling mode will remain active
C0	0	15	dk	0	Delay time before the compressor activates upon initial power-on
C2	0	240	dk	3	Minimum downtime for the compressor
C3	0	240	dk	0	Minimum runtime for the compressor
C4	0	240	dk	10	Duration for which the compressor will not operate in case of ambient sensor error
C5	0	240	dk	10	Duration for which the compressor will operate in case of ambient sensor error
C6	0	150	°C	80	'COH' alarm is displayed on the screen if the condenser temperature exceeds this value
C7	0	150	°C	90	'Csh' alarm is displayed on the screen if the condenser temperature exceeds this value and the compressor relay disengages.

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4.Parameter List

Parameter	Minimum	Maximum	Unit	Default	Describtion
C8	0	100	dk	8	Alarm delay time when the condenser temperature reaches the value set in parameter C7
d0	0	99	saat	4	Defrost Duration
d1	0	2	---	0	Defrost type (0: Electrical defrost, 1: Hot gas defrost, 2: Defrost by stopping the compressor)
d2	-50	150	°C	12	Temperature at which the defrost process will terminate
d3	0	120	dk	20	When parameter P3 is set to 0, 2, or 3, it works as a defrost duration setting. If set to 1, it works as a maximum defrost duration control that terminates when the temperature reaches the value defined by "d2"
d4	0	1	---	0	Initial defrost option upon power-on (0: No, 1: Yes)
d5	0	30	dk	0	Delay time before the initial defrost process starts upon power-on (d4=1)
d6	0	1	---	2	Value displayed on the screen during defrost (0: Ambient temperature, 1: Set value, 2: Def)
d7	0	30	dk	3	Dripping duration after defrost
d8	0	2	---	0	The device enters defrost mode after remaining ON for the duration defined in d0. If the compressor remains ON for d0's defined duration or the ambient temperature drops below the threshold set in parameter d9, the device enters defrost mode
d9	-50	150	°C	0	When the evaporator temperature remains below the set value defined in this parameter for the duration defined in d0, defrost starts (d8=2 setting)
d10	0	240	dk	10	Delay for displaying the actual temperature after defrost
d11	0	3	---	2	For ending the first defrost cycle: (0: No sensor, only depends on d3 duration, 1: Looks at the first sensor, 2: Looks at the second sensor, 3: Looks at the third sensor)
d12	0	3	---	3	For ending the second defrost cycle: (0: No sensor, only depends on d3 duration, 1: Looks at the first sensor, 2: Looks at the second sensor, 3: Looks at the third sensor)
d13	-50	150	°C	12	Termination temperature setting for the second defrost cycle when i8=5 is active
d14	0	240	dk	20	Duration for the second defrost process when i8=5 is active
d15	0	180	dk	0	Minimum runtime required for the compressor before initiating defrost
A0	0	1	---	0	Type of alarm (0: Alarm linked to set value, 1: Independent alarm not linked to set value)
A1	-50	A4	°C	-50	Setpoint for Low temperature alarm
A4	A1	150	°C	150	Setpoint for High temperature alarm
A5	0	50	°C	2	Hysteresis for the alarm setpoint
A6	0	199	dk	12	Delay in warning when low (AL) or high (AH) temperature alarm conditions occur
A7	0	199	dk	17	Delay for initial low-temperature alarm condition (AL) upon power-on

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4.Parameter List

RCR305

Parameter	Minimum	Maximum	Unit	Default	Describtion
F0	0	4	---	3	Fan relay status during normal operation (0: Does not work, 1: Runs continuously, 2: Operates based on compressor, 3: Operates based on F1 parameter, 4: Operates based on F1 parameter when compressor is off)
F1	-50	150	°C	2	Fan relay stops when evaporator temperature is high
F2	0	2	---	0	Fan relay status during defrost and drip modes (0: Does not work, 1: Runs continuously, 2: Operates based on F0 parameter)
F3	0	30	dk	2	Delay time after dripping for the fan relay
F4	0	3	---	2	Sensor selection to stop the fan relay based on evaporator temperature (0: No sensor, only F0 condition, 1: NTC1, 2: NTC2, 3: NTC3)
i0	0	4	---	0	Digital input type (0: Passive digital input, 1: Door switch input that stops compressor and fan relay, 2: Door switch input that stops fan relay, 3: Door switch input that triggers lighting relay, 4: Door switch input that stops compressor, fan relay than triggers lighting relay, 5: Door switch input that only stops lighting relay)
i1	0	1	---	0	Digital input polarity (0: Normally open, 1: Normally closed)
i2	-1	120	dk	-1	Delay time for door digital input alarm (-1: Alarm disabled)
i3	-1	120	dk	15	Maximum duration to terminate alarm conditions triggered by digital input (-1: Alarm remains active indefinitely)
i5	0	4	---	0	Digital 2 input type options: (0: Passive digital input, 1: Displays 'IA' while active, 2: Cancels thermostat OFF mode, 3: Triggers aux relay during activation, 4: Restarts operation after activation)
i6	0	1	---	0	Digital 2 input polarity (0: Normally open, 1: Normally closed)
i7	-1	120	dk	-1	Alarm delay time for digital 2 input (-1: Alarm disabled)
i8	0	6	---	0	Aux relay options: (0: Disabled, 1: Triggered by alarms, 2: Operates in parallel to fan relay, 3: Operates in parallel to defrost relay, 4: AUX output matches parameters, 5: Matches second defrost relay signal states, 6: Triggered based on digital 2 input)
i9	0	1	---	0	Auxiliary relay operation mode (i8=4 enables cooling or heating)
i10	-50	150	°C	10	Auxiliary relay set value (i8=4 is active)
i11	1	3	---	1	Sensor controlled by Aux relay (i8=4 enables sensing through 1: NTC1, 2: NTC2, 3: NTC3)
i13	0	240	---	0	If a digital signal equal to the set value is received by the door input, manual defrost is activated. If this value is '0,' this feature is disabled
i14	0	240	dk	0	Duration triggered by digital 2 input for defrost start ('0' disables this feature)
i15	0	1	---	0	Aux input polarity (0: Relay normally open, 1: Relay normally closed)
u2	0	1	---	0	Option to activate lamp relay when button is pressed during standby mode(0: No, 1: Yes)
u3	0	1	---	0	Automatic key lock function activates after 2 minutes of inactivity (0: No, 1: Yes)
dPr	-99	99	---	0	Parameter to reset device to factory settings (-19 triggers factory reset)

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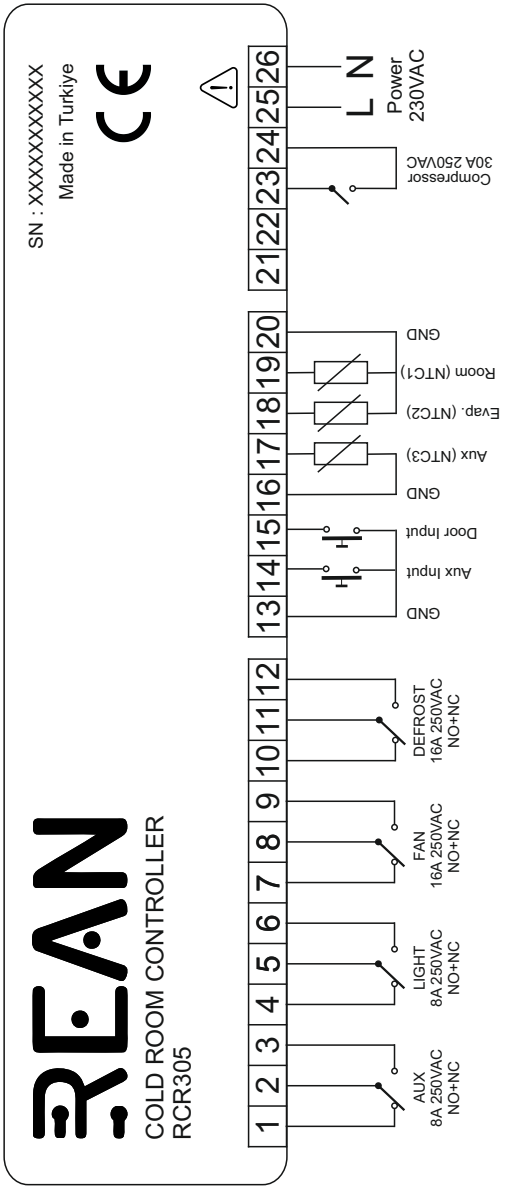
5.Connection Diagram

RCR305



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SALES TECHNICAL SUPPORT HOTLINE

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+90 216 364 75 45

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Address : Çakmak Mah. Varan Cad. Bahariye Sk. No:2A 34774 Ümraniye/İstanbul Türkiye
Tel : 0216 364 75 45 e-mail : rean@rean.com.tr
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