



Operation instructions

Controller for air handling units CU24V2





WARNING: Please read this manual carefully before connecting the panel



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The device is manufactured in accordance with the European standard EN1886, EN13053

This documentation must always be handed over to the customer!
In case of non-compliance with the conditions stated in this documentation, VentiAir s.r.o.
reserves the right to refuse the warranty.

Version 04/2021



WARNING!!

When connecting the panel to the controller, take care not to change the G0 earth voltage cable with G phase cable in one of the devices.

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Reversing these cables in one of the devices will lead to a short-circuit between G and G0 through the RS485 output and to the damage of this output.

24 V AC power supply should be connected as below:

- G0 earth voltage cable should be connected to terminal No. 1
- G phase cable should be connected to terminal No. 2



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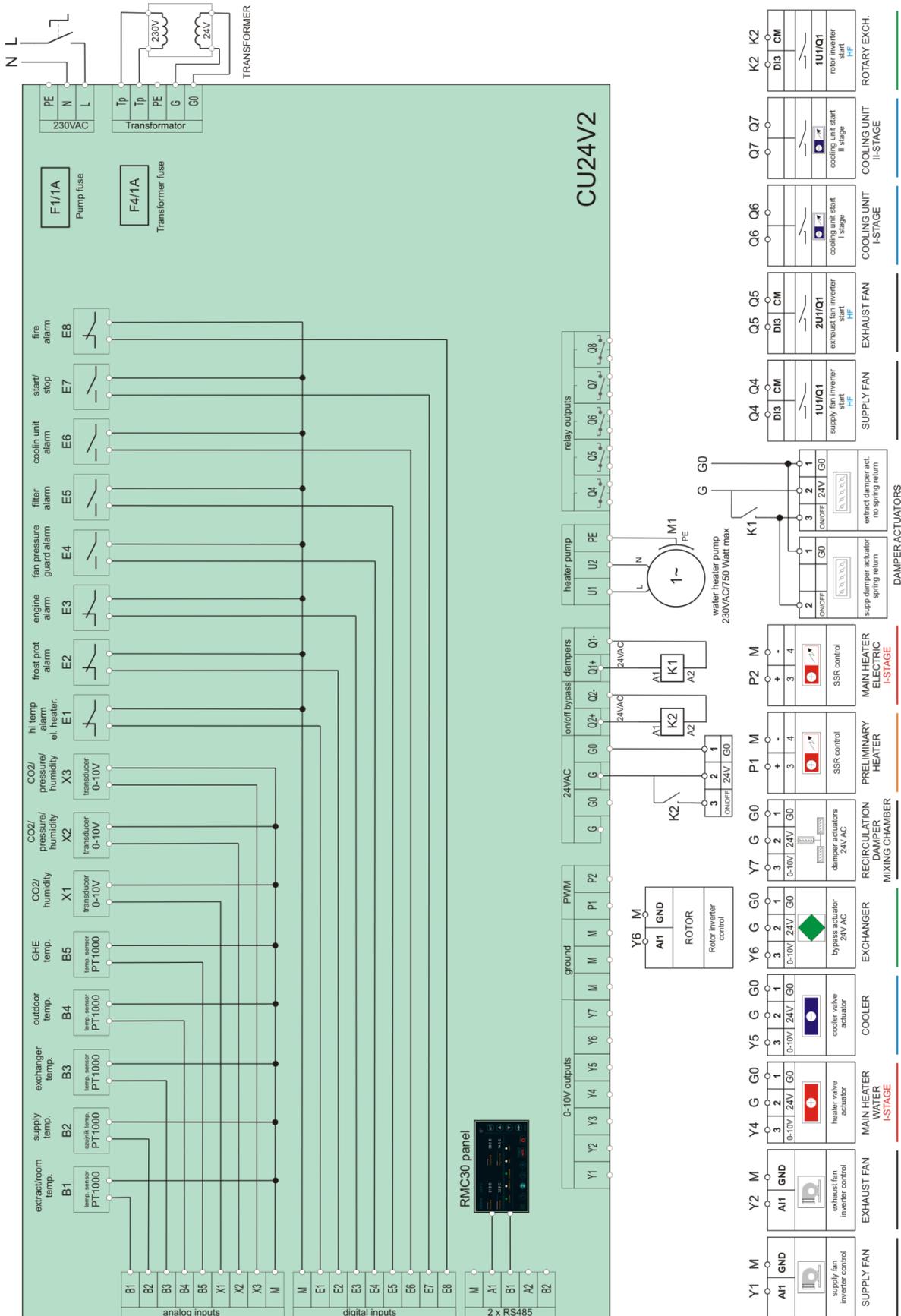


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2 WIRING DIAGRAM OF CU24V2



3 PANEL CONNECTION

No.	Type	Description
1	Power supply (-)	G0: Supply earth voltage
2	Power supply (+)	G: +24V AC
3	Unused	-
4	M	Ground
5	A	Serial interface RS485
6	B	

4 OPERATION

The CU24V2 controller is a configurable controller for HVAC AHUs. The rich configuration options of the controller allows to create applications for AHU in almost all configurations. The controller comes complete with a 4.3" wall-mounted color touch panel **RMC30**, which allows you to create applications, parameterize the controller and manage the unit. The panel has a built-in very innovative and intelligent interface that allows the user to easily and clearly program the controller and navigate in the menu system. It has a unique solution consisting of a built-in guide, which during navigation in the menu, prompts the user how to use the buttons and explains the parameter designations, so there is no need to consult the instructions. When creating an application, the user only selects which functions he wants to use, while the controller sets the input/output for the task depending on the selected other functions, then the selection is displayed on the panel in real time. The I/O list of the built application along with the description and visualization is made available and can be consulted when connecting devices to the controller.

4.1 BASIC FUNCTIONS

- Temperature control
 - Cascade temperature control with min/max limitation. or airflow adjustment
 - Water and electric heater control
 - Water cooler and chiller control
 - Heat pump control
 - Pre-heating function
 - Active water heater frost protection
 - Protection of electric heaters against overheating
 - Preliminary heater
 - Cascade connection of two heaters: I and II section

- Fan control
 - Supply and exhaust fan control

- Frequency converter control
- Engine alarm
- Fan pressure switch
- Control of heat recovery system
 - Rotary, cross and glycol exchanger control
 - Mixing chamber control
 - Exchanger freezing protection
- CO₂ regulation
- Supply and exhaust pressure regulation
- Humidity control
- Real time clock with weekly work schedule
- Alarms
 - Signalling and alarm management
 - Alarm history overview
- BMS
 - Possibility to connect to the BMS system via the RS485 serial link
 - MODBUS communication protocol

4.2 SCANNING THE NETWORK

At power on RMC30 panel will scan the network to find device. The address of the device is displayed in the top right corner and is preceded by the character "@". After a device is detected data will be loaded from it before the panel can start operating. During data loading an animation appears on the top-right side of the display. **After power on wait until full data load full display of information before using the keys to navigate.**

4.3 KEYS DESCRIPTION:

-  Entering the **Menu** review or entering the parameter editing mode in the Menu.
-  Scrolling the menu backward or change parameter value during setting.
-  Scrolling the menu forward or changing the parameter value during setting.
-  Switching main screen views or moving to the next parameter during setting.
-  The AHU is working. Pressing switches off the AHU.
-  The AHU is off. Pressing turns on the AHU.
-  Selection of program AUTO, MAN, PRO1, PRO2. Each press switches to the next value on the list.
- 
- 
- 
-  Switching fan gears

4.4 HOME PAGE AND SETPOINT EDITING

The home page contains all the most important information of the HVAC unit and enables direct editing of setpoints such as temperature, fan speed, work program and switching on/off of the unit, without having to scroll the screens to search for information.

Home page view



- Increasing the temperature: click 
- Reducing the temperature: click 
- Setting fan speed: click on the appropriate number in the field 
- Change work program: click on  until the desired program appears
- Turning on or off the unit: click on  or 

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Note: The temperature changes every 0.5 C. For a more accurate temperature editing, this should be done within the time schedule.



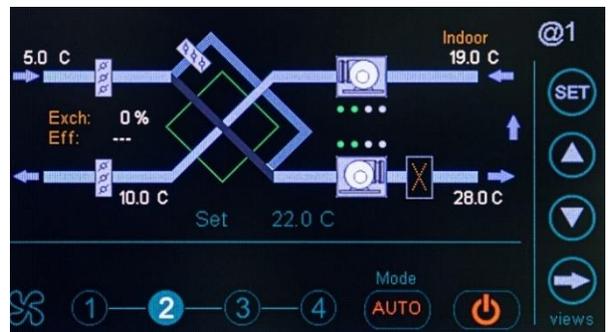
4.5 SWITCHING HOME SCREEN VIEWS

The RMC30 panel enables displaying all information from the HVAC unit. This information is grouped into several views that can be switched with the key in the order shown below.

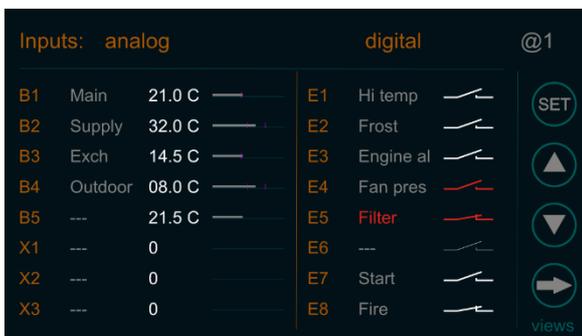
1. Home page



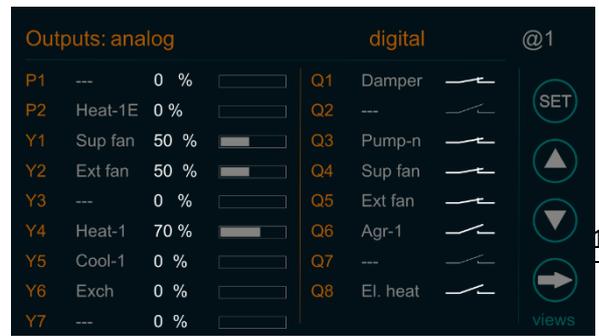
2. Scheme



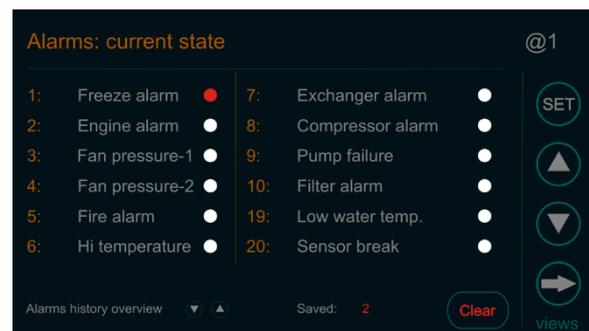
3. Analog and digital inputs display



4. Analog and digital outputs display



5. Alarms display



4.6 ABBREVIATION DESCRIPTION

Abbreviation description for input

Shortcut	Description
Main	Main sensor
Supply	Supply sensor
Outdoor	Outdoor sensor
Exch	Exchanger sensor
GHE	GHE temperature sensor
Pre-heat	Preliminary heating temperature sensor
CO2	CO ₂ transducer
Hum	Humidity transducer
Pres-1	Pressure transducer 1
Pres-2	Pressure transducer 2
Frost	Frost thermostat
Pres-S	Supply fan pressure guard
Pres-E	Extract fan pressure guard
Engine al	Engine alarm
Aprot	Cooling unit alarm
Fire	Fire alarm
Hi temp	Hi temperature alarm
Pump al	Pomp alarm
Filter	Filter alarm
Start	Start/stop input
Cust-1	Custom function 1 input
Cust-2	Custom function 2 input

Abbreviation description for output

Shortcut	Description
Heat-1	Main heater (first heating step)
Heat-sec	Secondary heating (second heating step)
Heat-1 E	Electric heater (first heating step)
El. heat	Electric heater supply
Cooling	Cooling control
Agr-1	Cooling unit – 1 step
Agr-2	Cooling unit – 2 step
Exch	Exchanger control
Damper	On/off damper
Recirc	Recirculation control (mixing chamber)
Bypass	Bypass control
GHE	GHE control
Pump-H	Water heater pump
Pump-C	Water cooling pump
Pump-ex	Exchanger pump
Heat P	Heating pump
CO2	CO ₂ control
Pres-1	Pressure control-1
Pres-2	Pressure control-2

Sup fan	Supply fan control
Ext fan	Extract fan control

4.7 APPLICATION SETTING

The CU24V2 controller has built-in some predefined applications that can be selected from a list by setting the parameter **APP**. To manually define your own application set the parameter **APP = USER**. When a predefined application is selected (APP is other than USER) the items in the menu for manual defining an application will be disabled.

Predefined application list:

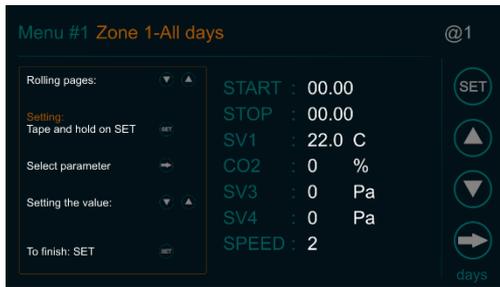
Nr	Heating	Cooling	Preheat	Sec heat	Exchanger (bypass)	Recirculation	Heat pump	CO ₂ control
Heat recovery units with on/off bypass control								
1-rec	P2	-	-	-	Q2	-	-	-
2-rec	P2	-	P1	-	Q2	-	-	-
AHU with water heater								
3-w	Y4	-	-	-	Y6, Q2	-	-	-
4-wx	Y4	Q6	-	-	Y6, Q2	-	-	-
5-wxr	Y4	Q6	-	-	Y6, Q2	Y7	-	-
AHU with electric heater								
6-e	P2	-	-	-	Y6, Q2	-	-	-
7-ex	P2	Q6	-	-	Y6, Q2	-	-	-
8-exr	P2	Q6	-	-	Y6, Q2	Y7	-	-
AHU with heat pump								
9-hp	Y4	Y4, Q7	-	-	Y6, Q2	-	Q6	-
10-hp	Y4	Y4, Q7	-	P2	Y6, Q2	-	Q6	-
AHU with CO ₂ control								
11-co	Y4	Q6	-	-	Y6, Q2	-	-	Y1, Y2

The setting below is common to all the **predefined applications**:

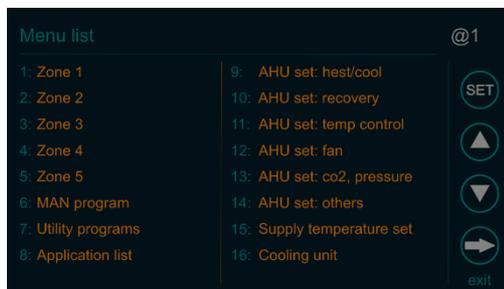
- Supply fan inverter control: Y1
- Supply fan inverter start: Q4
- Extract fan inverter control: Y2
- Extract fan inverter start: Q5
- On/Off dampers: Q1
- Water heater pump: U1-U2

4.8 MENU OVERVIEW AND PARAMETERS SETTING

1. Click  and hold until the first page **Menu #1** of the Menu appears (about 1 sec).



2. There are two ways to search parameters:
 - a. Scroll the pages with the buttons   until you find the parameter.
 - b. Faster method:
 - Click on **Menu #1** to open the page with the menu contents as below



- Scroll with the buttons   to search the relevant chapter
 - Click on a chapter to directly open its page with the parameter list
3. To enable editing parameters, click on  and hold until the color of the first parameter from the list changes. Editing mode is indicated by a red circle .
 4. Set the desired parameter value with the buttons  .
 5. To switch to the next parameter click .
 6. To finish editing click and hold  until the colour of the parameter value goes out. The red circle in the button will also turn off and go back to .
 7. To exit the Menu section and return to the home page, click .

Note: if you are in the schedule menu (Menu # 1 to Menu # 6) then you must first scroll the pages to an area outside this range before clicking  otherwise the days of the week will scroll.

4.8.1 Menu #1 Zone 1 – All days

Name	Default setting	Range	Description
START	00.00	00.00 ÷ 23.59 G:M	Time zone start time
STOP	00.00	00.00 ÷ 23.59 G:M	Time zone end time
SV1	22.0	-24.0 ÷ 69.0 °C	Set temperature
CO2/SV2	0	0 ÷ 100 %	Set value of CO ₂ or humidity
SV3	0	0 ÷ 1000 Pa,%	Set value of for pressure, CO ₂ or humidity
SV4	0	0 ÷ 1000 Pa,%	Set value of for pressure, CO ₂ or humidity
SPEED	2	1 ÷ 4	Fan speed

4.8.2 Menu #2 Zone 2 – All days

As above

4.8.3 Menu #3 Zone 3 – All days

4.8.4 Menu #4 Zone 4 – All days

4.8.5 Menu #5 Zone 5 – All days

4.8.6 Menu #6 MAN program – All days

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Name	Default setting	Range	Description
TIME	00.00	00.00 ÷ 23.59 G:M	Program running time
SV1	22.0	-24.0 ÷ 69.0 °C	Set temperature
CO2	0	0 ÷ 100 %	Set value of CO ₂ or humidity
SV3	0	0 ÷ 1000 Pa,%	Set value of for pressure, CO ₂ or humidity
SV4	0	0 ÷ 1000 Pa,%	Set value of for pressure, CO ₂ or humidity
SPEED	2	1 ÷ 4	Fan speed

4.8.7 Menu #7 Utility programs

Name	Default setting	Range	Description
PRO1	OFF	OFF, S4-E4,S1-E4, S0-E4,S1-E1, S4-E1, S4-E0	Work program for fans. The program is controlled by the defined digital input following the activation of the parameter PR1IN in Menu #14 . It performs according to the set value if PRO1 is selected as program and the digital input is activated. OFF: turning off the program S-supply; E-extract



			The number after the letter indicates the fan speed
PRO2	OFF	OFF, S4-E4,S1-E4, S0-E4,S1-E1, S4-E1, S4-E0	Work program for fans. The program is activated after selecting  OFF: turning off the program S-supply; E-extract The number after the letter indicates the fan speed

4.8.8 Menu #8 Application List

Name	Default setting	Range	Description
APP	4-WC	USER, 1÷11	Application select USER : Free application configuration 1÷11 : Selecting among ready applications

4.8.9 Menu #9 AHU set: heat/cool

Name	Default setting	Range	Description
HEAT1	water	none, water, elect	Main heater: First heating section
COOL	DX-1	none, water, DX-1, DX-2	Cooling coil: DX-1 : refrigeration unit one step DX-2 : refrigeration unit two step
PHEAT	none	none, water, elect	Preliminary heater: Mounted before the exchanger, it is used for pre-heating.
HEAT2	none	none, water, elect	Secondary heater: Works as a second heating section connected in cascade to the main heater HEAT1. During dehumidification, if heaters HEAT1 and HEAT2 are defined then HEAT1 will be switch off and only HEAT2 will work.
HPUMP	none	none, HP-1, HP-2	Heat pump : HP-1 : 0-10V for heating and cooling. HP-2 : 5-10V for heating 5-0V for cooling

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4.8.10 Menu #10 AHU set: recovery

Name	Default setting	Range	Description
ECON	bypass	none, bypass, inlet fan, 24VAC, contact	Exchanger control: bypass - 0-10V control for bypass or rotor supply - Exchanger without bypass with supply fan control for protection 24VAC - 24VAC on/off output for control contact - Potential free contact for on/off control

EPRO	B3		Exchanger protection: Protection by temperature sensor on the exchanger outlet.
DACO	none	No, Yes	Recirculation (Mixing chamber): 0V - 0% recirculation and 100% fresh air 10V - 100% recirculation and 0% fresh air
GWC	none	No, Yes	Ground heat exchanger

4.8.11 Menu #11 AHU set: temp control

Name	Default setting	Range	Description
TCON	cascade	cascade, supply	Temperature control: Cascade control with supply and room/exhaust sensor, or supply control.

4.8.12 Menu #12 AHU set: fan

Name	Default setting	Range	Description
FCON	freq	1 speed, 2 speed 3 speed, 4 speed freq	Fan control: 1 speed – 4 speed: AC fan freq: EC fan or inverter control

4.8.13 Menu #13 AHU set: CO₂, pressure

Name	Default setting	Range	Description
PID2	No	No, co2-fan, co2-damp, humidity, deshum, hum-desh	PID #2 control: CO ₂ or humidity control co2-fan CO ₂ control by fan co2-damp CO ₂ control by dampers humidity Humidification control deshum Deshumidification control hum-desh Humidification / deshumidification
PID3	No	No, pressure, CO ₂ , humidity, deshum, hum-desh	PID #3 control: Pressure, CO ₂ or humidity control pressure Pressure control by fan CO ₂ Additional CO ₂ control humidity Humidification control deshum Deshumidification control hum-desh Humidification / deshumidification
PID4	No	No, pressure, CO ₂ , humidity, deshum, hum-desh	PID #4 control: Pressure, CO ₂ or humidity control pressure Pressure control by fan CO ₂ Additional CO ₂ control humidity Humidification control deshum Deshumidification control

			hum-desh Humidification / deshumidification
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4.8.14 Menu #14 AHU set: others

Name	Default setting	Range	Description
ALOUT	No	No Yes	Alarm output: Digital output for alarm signalling
PR1IN	No	No Yes	Utility program-1: After enabling this function, the PRO1 program in Menu #7 will be controlled by the digital input indicated under this function.

4.8.15 Menu #15 Supply temperature set

Name	Default setting	Range	Description
MIN	15 °C	0 ÷ 66 °C	Minimum temperature
MAX	35 °C	0 ÷ 70 °C	Maximum temperature

4.8.16 Menu #16 Cooling unit

Name	Default setting	Range	Description
AOFF	05 °C	0 ÷ 20 °C	Cooling unit off: External temperature that disables the cooling unit
ONTM	5 min	0 ÷ 5 min	Cooling unit run time
OFFTM	5 min	0 ÷ 5 min	Cooling unit standby time

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4.8.17 Menu #17 Exchanger

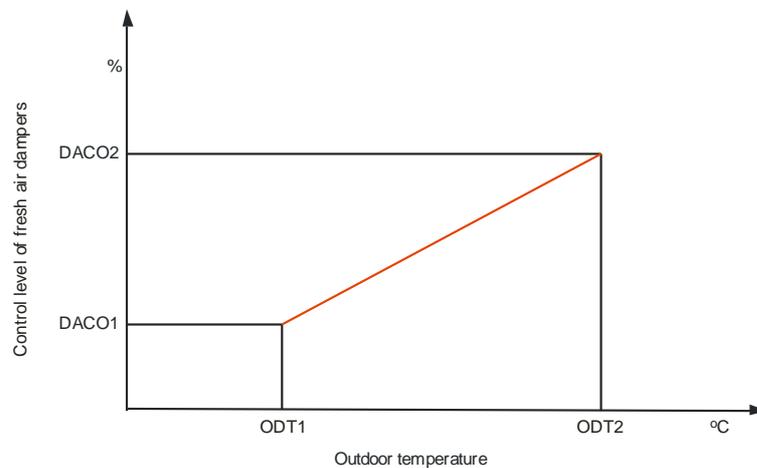
Name	Default setting	Range	Description
ELIM	5°C	-10 ÷ +10°C	Exchanger protection: The temperature below which alarm is set and the defrost starts.
PRT	8.0 °C	0 ÷ 15 °C	Preheating temperature: The set value for preheating.

4.8.18 Menu #18 Recirc. damper.

Name	Default setting	Range	Description
DMODE	OFF	OFF, 10%,20%,...100%, AUTO	Dampers control: OFF, 10..100%: dampers manually set AUTO: dampers controlled by the algorithm

ODT1	-5 °C	-25 ÷ 30°C	Outdoor temperature low range value.
DACO1	20 %	0 ÷ 100 %	Outdoor temperature high range value.
ODT2	15 °C	-25 ÷ 30°C	Damper control low range value
DACO2	100 %	0 ÷ 100 %	Damper control high range value

Mixing chamber dampers control description in AUTO mode



4.8.19 Menu #19 Bypass and GHE

Name	Default setting	Range	Description
Bypass	AUTO	OFF, ON, AUTO	Bypass setting: OFF – Switch off Bypass ON – Switch on Bypass AUTO – Bypass is controlled depending on the outdoor and the outlet/indoor temperatures.
GWC	AUTO	OFF, ON, AUTO	GHE setting: OFF – Switch off GHE ON – Switch on GHE AUTO – GHE is controlled depending on the temperature.

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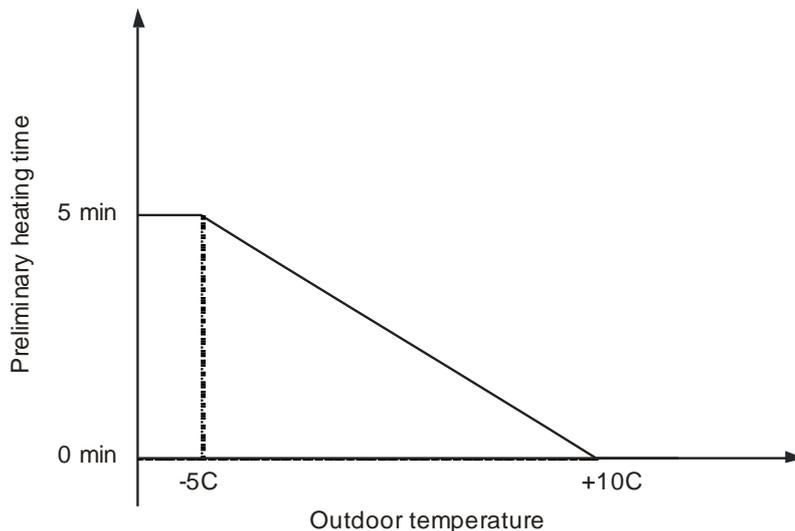
4.8.20 Menu #20 Heating set

Name	Default setting	Range	Description
PREH	ON	OFF, ON	Preliminary heating: Before the fans start the heater is warm up.
FOVER	MAN	MAN, AUTO	Frost alarm clearing: MAN – Manual start of the unit after clearing alarm manually. AUTO – Automatic alarm reset and unit start after the alarm signal disappears.



PUMP	0°C	-25 ÷ +15°C	Pump start temperature: Outdoor temperature below which the water heater pump will be activated.
------	-----	-------------	--

Preliminary heating curve:



4.8.21 Menu #21 Ventilating

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Name	Default setting	Range	Description
CYCLE	0 h	0 ÷ 6 h	Ventilating cycle: Ventilating function is activated only when the unit is standby. The AHU is started every CYCLE period and stopped after VTIME time.
VTIME	0 min	0 ÷ 60 min	Ventilating time

4.8.22 Menu #22 PID set: Heating

Name	Default setting	Range	Description
PBAND	30.0°C	0 ÷ 999.9°C	PBAND
INT	100 sec	0 ÷ 6000 sec	Integral time
HYS	1.5°C	0.5 ÷ 10.0°C	Heating hysteresis
HDIS	18°C	10 ÷ 22°C	Heating disabling: Outdoor temperature above witch heating is disabled (SUMMER).

4.8.23 Menu #23 PID set: Cooling

Name	Default setting	Range	Description
PBAND	30.0°C	0 ÷ 999.9°C	PBAND

INT	100 sec	0 ÷ 6000 sec	Integral time
HYS	1.5°C	0.5 ÷ 10.0°C	Heating hysteresis
CDIS	15°C	10 ÷ 22°C	Cooling disabling: Outdoor temperature bellow witch cooling is disabled (WINTER).

4.8.24 Menu #24 Heat–Cool hyst.

Name	Default setting	Range	Description
HYS1	2.0°C	0.5 ÷ 9.9°C	Dead zone between heating and cooling.

4.8.25 Menu #25 PID set: CO₂

Name	Default setting	Range	Description
PBAND	30	1 ÷ 4000	PBAND
INT	100 sec	0 ÷ 6000 sec	Integral time

4.8.26 Menu #26 PID set: pressure

Name	Default setting	Range	Description
PBAND	500	1 ÷ 4000	PBAND
INT	10 sec	0 ÷ 6000 sec	Integral time

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4.8.27 Menu #27 PID set: humidifying

Name	Default setting	Range	Description
PBAND	30	1 ÷ 4000	PBAND
INT	100 sec	0 ÷ 6000 sec	Integral time

4.8.28 Menu #28 Measure ranges

Name	Default setting	Range	Description
X1R	100	0 ÷ 100	Input range for X1 (PID2): Setting the measuring range for input X1 (input for PID2 control). This is the measurement value corresponding to 10V signal from the transmitter.
X2R	1000	0 ÷ 1000	Input range for X2 (PID3): Setting the measuring range for input X2 (input for PID3 control). This is the



			measurement value corresponding to 10V signal from the transmitter.
X3R	1000	0 ÷ 1000	Input range for X3 (PID4): Setting the measuring range for input X3 (input for PID4 control). This is the measurement value corresponding to 10V signal from the transmitter.
OFS	0°C	0 ÷ 15.0°C	Temperature shift: The value for shifting down the temperature characteristic. The sensed value is decreased by the value OFS.

4.8.29 Menu #29 Units and flow

Name	Name	Default setting	Range
UNIT1	none	none, C, %RH, %, Pa, m3/h, ppm, m/sec, sec, min, h	Unit fo X1 input: The unit to display for the sensed value.
UNIT2	none	none, C, %RH, %, Pa, m3/h, ppm, m/sec, sec, min, h	Unit fo X2 input: The unit to display for the sensed value.
UNIT3	none	none, C, %RH, %, Pa, m3/h, ppm, m/sec, sec, min, h	Unit fo X3 input: The unit to display for the sensed value.
K2	0		K coefficient of the fan (X2 input) The flow is calculated according to the formula: Flow = K x square_root(Pressure)
K2	0		K coefficient of the fan (X3 input) The flow is calculated according to the formula: Flow = K x square_root (Pressure)

4.8.30 Menu #30 Fan setting

Name	Name	Default setting	Range
FCOEF	1.00	0.5 ÷ 2	Exhaust/supply ratio: Exhaust fan speed ratio to supply fan. Exhaust = FCOEF x Supply.
FMIN	10 %	10 ÷ 25	Fan minimum speed: The speed below which the fan cannot go down during speed modulation.



FMOD	7 °C	-25 ÷ 10 °C	Fan modulation start: Defines when the supply fan starts modulating to protect the exchanger. This is the number of degree C above the exchanger protection value ELIM.
START	0 sec	0 ÷ 100 sec	Start delay
STOP	0 sec or 30 sec	0 ÷ 100 sec	Stop delay
PREST	60 sec	10 ÷ 300 sec	Fan pressure guard time

4.8.31 Menu #31 Gear setting

Name	Name	Default setting	Range
SPD1	25%	10 ÷ 100 %	Fan speed for gear 1
SPD2	50%	10 ÷ 100 %	Fan speed for gear 2
SPD3	75%	10 ÷ 100 %	Fan speed for gear 3
SPD4	100%	10 ÷ 100 %	Fan speed for gear 4

4.8.32 Menu #32 Clock

Name	Default setting	Range	Description
H:M		00.00 ÷ 23.59	Hour: Minute
WDAY		SUN ÷ SAT	Day of the week
DAY		1 ÷ 31	Day of the month
MON		JAN ÷ DEC	Month
YEAR		20 ÷ 40	Year

4.8.33 Menu #33 Communication

Name	Default setting	Range	Description
ADR	001	1 ÷ 255	Slave address: Slave address for Modbus communication.
MODE	RTU	RTU, ASCII	MODBUS mode
RATE	9600	2400, 4800, 9600, 19200	Baud rate
PARIT	LACK	NONE, ODD. EVEN	Parity
BITNR	8	7, 8	Bit number
STBIT	1	1, 2	Stop bit number

4.8.34 Menu #34 Simulation

Name	Default setting	Range	Description
SIM	OFF	OFF, ON	Outputs control: Simulation mode allows to manually control the outputs. After power on the simulation is always in the off state. OFF – Normal operation of the unit ON – Manual control mode

4.8.35 Menu #35 Password setting

Name	Default setting	Range	Description
User	0	0 ÷ 999	User password: Login with limited access to parameters.
Admin1	0	0 ÷ 999	Admin password 1: Logging in without limiting access to parameters.

4.8.36 Menu #36 Language select

Name	Default setting	Range	Description
LANG	ENG	ENG, POL	Language

4.8.37 Menu #37 Information

4.8.38 Menu #38 Login

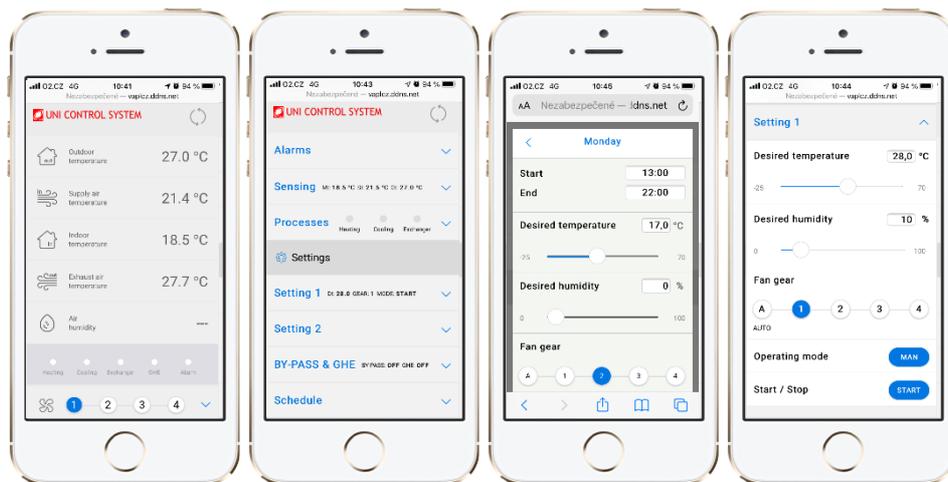
Name	Default setting	Range	Description
LOGIN		0 ÷ 999	Login: Enter password for parameter editing. Parameters are visible without login, but some need login for editing.



5 ETHERNET

uManager 10 is a converter with built-in http server, which enables remote management of air handling units controlled by Uni Control System controllers by mean of a smartphone, tablet or computer. Communication with the is done via a website with a graphic interface, so you can manage the unit from anywhere in the world if the network is available. You can connect from iOS and Android or Windows devices. The smart interface recognizes the type of terminal and adapts automatically to it. The site works under various Internet browsers like Firefox, Chrome, Safari etc

5.1 SAMPLE INTERFACE PAGES:



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5.2 CONNECTION

Connect the converter from one side to the controller through the RS485 serial port (terminals A, B) and on the other hand to the Internet socket.

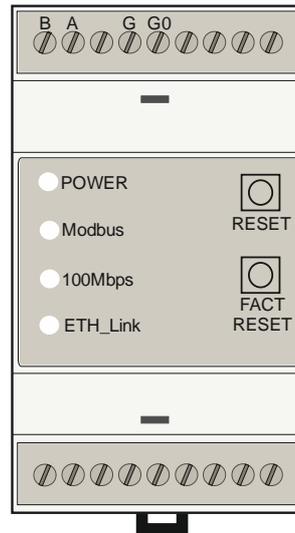
A 24VAC supply must be connected to the G0, G terminals

Descriptions of symbols:

- **G0, G:** 24 VAC power supply
- **A,B:** RS485 serial port

5.3 LED DESCRIPTION

- **POWER:** Power supply signalling
- **Modbus:** Modbus communication signalling Lights up when the transmission starts on Modbus. Goes off at the end of broadcasting
- **100Mbps:** LED lights up when the physical layer negotiates 100 MBps transfer rate. Goes off when the cable is disconnected
- **ETH_Link:** The LED lights up when the application has received the packet and is lit for 200 ms
- **RESET:** Device reset
- **FACT RESET:** Restore factory settings



5.4 CONVERTER CONNECTION

Enter the IP address of the device, the default values are:

- IP: **192.168.0.50**
- Address mask IP: 255.255.255.0
- TCP Port: 80
- Modbus: ASCII, 9600 baud, 8 bit data, 1 bit stop, No parity, address 1, delay 30

5.5 CONVERTER SETTINGS

After entering the converter's IP address, the login screen should appear in the browser. Enter your login and password there and click "Login". The default account is:

- Login: **admin**
- Password: **admin**

After logging in, select the option **Detail** at the bottom right of the screen.

In the subpage **Ethernet** ► **Configuration**, you must replace the factory IP with your own and set the network settings.

In the subpage **Modbus** ► **Configuration**, the communication parameters of the converter with the UCS controller must be set. The communication parameters must be identical to those set on the UCS controller.

For the ERC20 and CU24V1 controllers, you can find the communication parameters in the RMC20 panel menu.

For UCS controllers, the parameters can be found in the controller menu.

After entering new data, the converter is reset automatically and you must enter the new IP into the browser to connect to the converter.



6 CU24V2 CONTROLLER – MODBUS REGISTER LIST

6.1 REGISTER LIST WITH ADDRESS (FUNCTION 03, 06)

Protocol: **MODBUS RTU, MODBUS ASCII**

Warning:

MODBUS address is the address that is specified directly in the MODBUS protocol frame, Registers in the controller have double Modbus address. The second address is for use in the range from 0 to 9999 because not all software are able to use address above 9999. To have access to the second address just subtract the value **55536** from the address listed in the tables.

Items in red colour are not available.

Register Name	Register	MODBUS Address
PWM outputs P NOTE: 1. Control values are in % with 1/10 precision. After reading the register value the dot should be placed artificially Ex.: Reading the value 257 should be treated as 25.7% 2. The value 0x8000 means, the parameter is not available.	0 – P1 1 - P2 ... n - Pn	65472 65473 ... 65472+n
0-10V analog outputs NOTE: 1. Control values are in % with 1/10 precision. After reading the register value the dot should be placed artificially Ex.: Reading the value 257 should be treated as 25.7% 2. The value 0x8000 means, the parameter is not available.	0 – Y1 1 – Y2 ... n – Yn	65408 65409
Alarms register bit alignment Read and write Alarms register are 32-bit wide (see the description of registers)	0 – 1 – R1H: current alarm - High register 2 – R1L: current alarm – Low register	65280 65281 65282



<p>Desired values: read/write</p>	<p>0 – Desired temperature for the main heating/cooling . 65216 2 – Desired value for CO₂ control..... 65218 3 – Fan gear 65219 Writing- 5 values: 0 – Gear according to the controller setting 1 – gear 1 2 – gear 2 3 – gear 3 4 – gear 4 Reading- 4 values: 0 – gear 1 1 – gear 2 2 – gear 3 3 – gear 4 4 – Running mode 65220 Writing - 3 values: 0 – Running mode according to the controller setting 1 – AUTOMATIC 2 – MANUAL Reading - 2 values: 0 – AUTOMATIC 1 – MANUAL 5 – Desired value for pressure 1 (Inlet duct) 65221 6 – Desired value for pressure 2 (Outlet duct) 65222 7 – Fan running speed 65223 9 – Desired temperature for preliminary heater 65225</p>	
<p>Device operating state</p>	<p>0 – Register 1 65152 1 – Register 2 65153</p>	
<p>Sensed values 1. The sensed values have 1/10 precision. After reading the sensed value it should be divided by 10. Ex: Reading the number 257 should be treated as 25.7 2. Reading the value 0xFFFF means that , the parameter does not exist</p>	<p>0 – Indoor/exhaust temperature..... 64896 1 – CO₂ sensed value..... 64897 3 – Supply temperature..... 64899 6 – Outdoor temperature..... 64902 8 – Exchanger exhaust air temperature..... 64904 10 – Pressure value (inlet duct) 64906 12 – Pressure value (outlet duct) 64908 25 – Ground Heating Exchanger temperature..... 64921</p>	
<p>Reading control values Comments: 1. The control values are in % with 1/10 precision. After reading the sensed value it should be divided by 10. Np.: Reading the number 257 should be treated as 25.7%</p>	<p>0 – Main heater control: 0-100% 64832 1 – Secondary heater control: 0-100% 64833 2 – Cooling control: 0-100% 64834 3 – PID 2 control – humidifying: 0-100% 64835 4 – PID 2 control – CO₂/ deshumidifying: 0-100% 64836 5 – PID 3 control – pressure/humidifying: 0-100% 64837 6 – PID 3 control – CO₂/ deshumidifying: 0-100% 64838 7 – PID 4 control - pressure/humidifying: 0-100% 64839</p>	
<p>2. The value 0x8000 means that the given the parameter is not configured (does not exist)</p>	<p>8 – PID 4 control - CO₂/ deshumidifying: 0-100% 64840 9 – Exchanger control: 0-100% 64841 12 – Supply fan control 64844 13 – Extract fan control 64845</p>	



Start/Stop command and system operating state	Start/Stop command Write: Start= 0x00AA , Stop= 0x0055 Read: System operating state 0 – system stopped by the operator 1 – system stopped by the ECO mode function 2 – system stopped by schedule 3 – 4 – 5 – System running	64640
Parameters – group 1	1 – MIN: Supply minimum temperature..... 2 – MAX: Supply maximum temperature 56 – HDIS: Heating disable outdoor temp. (Summer).. 57 – CDIS: Cooling disable outdoor temp. (Winter).... 59 – FCOEF: Exhaust/Supply fan speed ratio	63233 63234 63288 63289 63291
Parameters – group 2	19- Temperature control type 0 – Cascade control 1 – Supply control	63187

6.2 OPERATING STATE REGISTER DESCRIPTION

Register 1

Bit nr	Process	Availability
0		No
1		No
2		No
3		No
4		No
5		No
6	Delay at start of the unit	
7	Delay at stop of the unit	
8 - 10	Device state: 0 - system stopped by the operator 1 - system stopped by the ECO mode function 2 - system stopped by schedule 3 - 4 - 5 - System running	
11	<i>Valve setting before starting control</i>	No
12	<i>Pump testing</i>	No
13	Temperature control of the preliminary heater – heating process	
14	<i>Temperature control of the preliminary heater – cooling process</i>	No
15	Exchanger defrosting process	

Register 2

Bit nr	Process	Availability
0	Primary heating (main heating) – Indoor temperature control	
1	<i>Secondary heating</i>	<i>No</i>
2	Cooling – Indoor temperature control	
3	Exchanger exhaust air temperature control - heating	
4		<i>No</i>
5	<i>Humidification process</i>	<i>No</i>
6	<i>Dehumidification process</i>	<i>No</i>
7	Exchanger	
8	<i>By-pass</i>	<i>No</i>
9	<i>GHE (Ground Heating Exchanger)</i>	<i>No</i>
10	Inlet fan	
11	Extract fan	
12	<i>FREE COOLING</i>	<i>No</i>
13	Preliminary heating	
14	<i>Fast heatibg</i>	<i>No</i>
15	<i>Fast cooling</i>	<i>No</i>

0 - disabled

1 – enabled

6.3 ALARM REGISTER DESCRIPTION R1H, R1L

RH - Register 1 (Most significant/high register)

Bit nr.	Alarm	Symbol	Availability
0		<i>RH+</i>	<i>No</i>
1		<i>RH-</i>	<i>No</i>
2		<i>A19</i>	<i>No</i>
3	Sensor break alarm	A20	
4	-		
5	Compressor low pressure	A22	
6	Compressor high pressure	A23	
7..15			



RL - Register 2 (Least significant/low register)

Bit nr.	Alarm	Symbol	Availability
0	Water heating coil frost alarm	A1	
1	<i>Engine alarm (thermic)</i>	<i>A2</i>	<i>No</i>
2	Inlet fan pressure guard alarm	A3	
3	<i>Extract fan pressure guard alarm</i>	<i>A4</i>	<i>No</i>
4	<i>Fire alarm</i>	<i>A5</i>	<i>No</i>
5	High temperature alarm	A6	
6	Exchanger freezing alarm	A7	
7	<i>Anti-freeze alarm</i>	<i>A8</i>	<i>No</i>
8	<i>Pump failure</i>	<i>A9</i>	<i>No</i>
9	Filter pressure guard alarm	A10	
10	<i>R1+</i>	<i>No</i>	
11	<i>R1-</i>	<i>No</i>	
12	<i>R2+</i>	<i>No</i>	
13	<i>R2-</i>	<i>No</i>	
14	<i>R3+</i>	<i>No</i>	
15	<i>R3-</i>	<i>No</i>	

6.4 INPUT REGISTERS: FUNCTION 04

Inputs	Address MODBUS
B1 - Exhaust sensor	0
B2 - Supply sensor	1
B3 - Exchanger sensor	2
B4 - Outdoor sensor	3
X1 - CO2 transmitter	256

6.5 COILS (DIGITAL OUTPUTS): FUNCTION 01

Outputs	U1-U2	DA	Q1	Q2	Q3	Q4		
Function	Heating coil pump	Dampers	Supply fan inverter start	Exhaust fan inverter start	Compressor 1-level	Compressor 2-level		
Address	0	1	2	3	4	5		

6.6 DISCRET INPUTS (DIGITAL INPUTS): FUNCTION 02

Inputs	E1	E2	E3	E4	E5			
Function	Frost thermostat or right temperature thermostat	Filter guard	Fan alarm	Compressor alarm	System start			
Address	0	1	2	3	4			