ENG

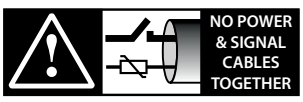
µAria

Controller for ventilation units
with heat recovery

USER MANUAL

LEGGI E CONSERVA QUESTE ISTRUZIONI

READ AND SAVE THESE INSTRUCTIONS



READ CAREFULLY IN THE TEXT!

µAria
+0300105EN - ENG
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GENERAL WARNINGS

CAREL bases the development of its products on decades of experience in HVAC, on continuous investments in technological innovations to products, procedures and strict quality processes with in-circuit and functional testing on 100% of its products, and on the most innovative production technology available on the market. CAREL and its subsidiaries/affiliates nonetheless cannot guarantee that all the aspects of the product and the software included with the product respond to the requirements of the final application, despite the product being developed according to start-of-the-art techniques. The customer (manufacturer, developer or installer of the final equipment) accepts all liability and risk relating to the configuration of the product in order to reach the expected results in relation to the specific final installation and/or equipment. CAREL may, based on specific agreements, act as a consultant for the successful commissioning of the final unit/application, however in no case does it accept liability for the correct operation of the final equipment/system. The CAREL product is a state-of-the-art product, whose operation is specified in the technical documentation supplied with the product or can be downloaded, even prior to purchase, from the website www.carel.com. Each CAREL product, in relation to its advanced level of technology, requires setup/configuration/programming/commissioning to be able to operate in the best possible way for the specific application. Failure to complete such operations, which are required/indicated in the user manual, may cause the final product to malfunction; CAREL accepts no liability in such cases. Only qualified personnel may install or carry out technical service on the product. The customer must only use the product in the manner described in the documentation relating to the product. In addition to observing any further warnings described in this manual, the following warnings must be heeded for all CAREL products:

- prevent the electronic circuits from getting wet. Rain, humidity and all types of liquids or condensate contain corrosive minerals that may damage the electronic circuits. any case, the product should be used or stored in environments that comply with the temperature and humidity limits specified in the manual;
- do not install the device in particularly hot environments. Too high temperatures may reduce the life of electronic devices, damage them and deform or melt the plastic parts. In any case, the product should be used or stored in environments that comply with the temperature and humidity limits specified in the manual;
- do not attempt to open the device in any way other than described in the manual;
- do not drop, hit or shake the device, as the internal circuits and mechanisms may be irreparably damaged;
- do not use corrosive chemicals, solvents or aggressive detergents to clean the device;
- do not use the product for applications other than those specified in the technical manual.

All of the above suggestions likewise apply to the controllers, serial cards, programming keys or any other accessory in the CAREL product portfolio. CAREL adopts a policy of continual development. Consequently, CAREL reserves the right to make changes and improvements to any product described in this document without prior warning. The technical specifications shown in the manual may be changed without prior warning. The liability of CAREL in relation to its products is specified in the CAREL general contract conditions, available on the website www.carel.com and/or by specific agreements with customers; specifically, to the extent where allowed by applicable legislation, in no case will CAREL, its employees or subsidiaries/affiliates be liable for any lost earnings or sales, losses of data and information, costs of replacement goods or services, damage to things or people, downtime or any direct, indirect, incidental, actual, punitive, exemplary, special or consequential damage of any kind whatsoever, whether contractual, extra-contractual or due to negligence, or any other liabilities deriving from the installation, use or impossibility to use the product, even if CAREL or its subsidiaries/affiliates are warned of the possibility of such damage.

DISPOSAL

Fig. 1

Fig. 2

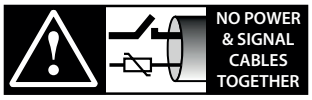
INFORMATION FOR USERS ON THE CORRECT HANDLING OF WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

The product is made up of metal parts and plastic parts. In reference to European Union directive 2002/96/EC issued on 27 January 2003 and related national legislation, please note that:

- WEEE cannot be disposed of as municipal waste and such waste must be collected and disposed of separately;
- the public or private waste collection systems defined by local legislation must be used. In addition, the equipment can be returned to the distributor at the end of its working life when buying new equipment;
- the equipment may contain hazardous substances: the improper use or incorrect disposal of such may have negative effects on human health and on the environment;
- the symbol (crossed-out wheeled bin) shown on the product or on the packaging and on the technical leaflet indicates that the equipment has been introduced onto the market after 13 August 2005 and that it must be disposed of separately;
- in the event of illegal disposal of electrical and electronic waste, the penalties are specified by local waste disposal legislation.

Warranty on materials: 2 years (from production date, excluding consumables).

Approval: the quality and safety of CAREL S.p.A. products are guaranteed by the ISO 9001 certified design and production system.



READ CAREFULLY IN THE TEXT!

Separate as much as possible the probe and digital input cables from cables to inductive loads and power cables, so as to avoid possible electromagnetic disturbance. Never run power cables (including the electrical panel cables) and signal cables in the same conduits.

Key to the symbols:

Caution: to bring critical issues to the attention of those using the product.

Notice: to focus attention on important topics; in particular the practical application of the various product functions.

Caution: this product is to be integrated and/or incorporated into the final apparatus or equipment. Verification of conformity to the laws and technical standards in force in the country where the final apparatus or equipment will be operated is the manufacturer's responsibility. Before delivering the product, Carel has already completed the checks and tests required by the relevant European directives and harmonised standards, using a typical test setup, which however cannot be considered as representing all possible conditions of the final installation.

Index

1. INTRODUCTION

uAria is the Carel product for managing residential ventilation units with heat recovery.
uAria stands out for:
- high-efficiency control to maintain indoor comfort
- flexible and easy-to-set scheduler via mobile app
- highly scalable solution to adapt to different unit configurations.
- pre-configurations available for quick unit setup
- ease of use via the mobile app for Android and IOS
- ease of connection via Bluetooth and NFC technologies.

It can manage units with up to two fans (supply + return), cross-flow or thermal wheel heat recovery units, hot/cold water coil and a fresh air heater for especially cold climates.

The user terminal features wireless connectivity to mobile devices. CAREL's "APPLICA" app, available on Google Play for the Android operating system and Apple store for iOS (Bluetooth only), makes it easier to configure parameters and commission the unit in the field.

1.1 Functions and main features

uAria provides several functions, main and auxiliary, which can be configured according to needs:
- Temperature control (with PID control and high-efficiency free-cooling/free-heating management)
- Air quality control (humidity, CO2, VOC)
- Constant pressure/flow-rate control
- Heat recovery unit defrost
- Frost and low outside temperature prevention functions
- Frost protection (antifreeze)

All of these functions are integrated to guarantee the most efficient control and unit safety at all times.

uAria includes management of various devices, in both on-off and modulating mode:
- Supply fan
- Return fan
- Cross-flow heat recovery unit (bypass damper)
- Thermal wheel
- Main coil
- Fresh air pre-heater
- Generic auxiliary device

Each device is managed based on its own configuration and the selected type of control, in addition to its own safety functions.

To facilitate integration of the application in residential environments, a Carel thTune room terminal can be connected.

1.2 Functional diagram

uAria allows dynamic unit configuration. In fact, users can choose which devices to enable, select the I/Os for each of these and set them as desired. To simplify initial unit set-up, 10 pre-configurations are provided. These pre-configurations can be modified to adapt the specific needs.

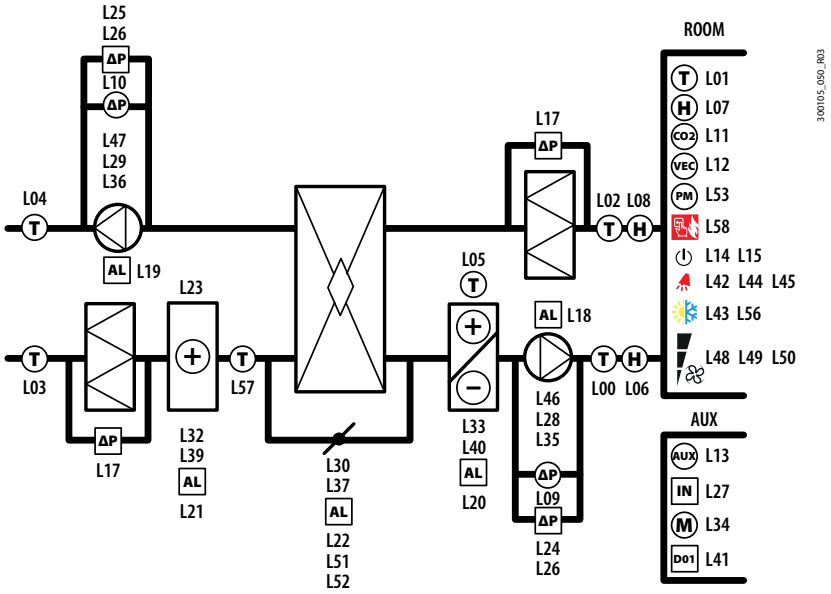


Fig. 1.a

AI	Analogue inputs
L00	Supply temperature
L01	Room temperature
L02	Return temperature
L03	External temperature
L04	Exhaust temperature
L05	Antifreeze temperature
L06	Supply humidity
L07	Room humidity
L08	Return humidity
L09	Supply air pressure
L10	Return air pressure
L11	Air quality CO2
L12	Air quality VOC
L13	Auxiliary probe
L53	Air quality PM
L57	Fresh air pre-heater temp.
L46	Tachometer supply fan
L47	Tachometer return fan

DI	Digital inputs
L14	Unit ON/OFF input
L15	Serious alarm input
L16	Summer/Winter input
L17	Filter alarm input
L18	Supply fan overload
L19	Return fan overload
L20	Main coil overload
L21	Fresh air pre heater overload
L22	Recovery overload
L23	Fans overload
L24	Supply air flow switch
L25	Return air flow switch
L26	Air flow switch
L27	Auxiliary input
L54	Condensation alarm
L58	Fire/smoke alarm input
L48	Fan speed 1
L49	Fan speed 2
L50	Fan speed 3

AO	Analogue outputs
L28	Supply fan analogue
L29	Return fan analogue
L30	Bypass damper analogue
L31	Thermal wheel analogue
L32	Fresh air pre heater analogue
L33	Main coil analogue
L34	Auxiliary output analogue

DO	Digital outputs
L35	Supply fan digital
L36	Return fan digital
L37	Bypass damper digital
L38	Thermal wheel digital
L39	Fresh air pre heater digital
L40	Main coil digital
L41	Auxiliary output digital
L42	Unit status output
L43	Summer/Winter output
L44	Global alarm output
L45	Filter alarm output
L51	Bypass damper open (3 points)
L52	Bypass damper close (3 points)
L55	Condensation alarm
L56	Cooling/heating status

Tab. 1.a

1.3 Models

Description	Part number	Connectivity	Assembly	AIN	DIN	AOUT	DOUT	Power input
UARIA, DIN MOUNTING	UARAD00001370	Modbus RTU (RS485)	DIN	6	5	2	4	115-230V
UARIA ENHANCED, DIN MOUNTING	UARADE0001320	Modbus RTU (RS485)	DIN	6	5	4	5	115-230V

Tab. 1.b

1.4 Accessories

Below is a list of accessories that are suitable for use with uAria. CAREL has passive and active temperature probes and differential pressure probes, for duct installation, designed specifically for heat recovery units and small air handling units.

Notice: see manuals +040010025/+040010026 for guidelines on installing the sensors on the unit.

1.4.1 User terminal

The user terminal includes the display and keypad, comprising four buttons that, when pressed alone or combined with other buttons, access the functions for making the basic settings or viewing the main information, with different possibilities available based on the user profile (for more information, see "Commissioning").
Connectivity, NFC + Bluetooth (BLE), for interaction with mobile devices and to simplify unit commissioning (after having installed the CAREL "Applica" app for the Android operating system, see "Commissioning" and "User interface").
For assembly, see the technical leaflet +0500143IE.

Fig. 1.b

P/N	Description
AX5500PS20A30	User terminal (NFC, Bluetooth BLE)
ACS00CB000020	User terminal cable - 1.5 m long
ACS00CB000010	User terminal cable - 3 m long

Tab. 1.c

1.4.2 Cable and connector kit

Controllers in multiple packs are supplied without connectors. Depending on the version of the controller, see the table below.

Part number	Description
UARCOND000	Connector kit for uAria Enhanced
ACS00CK002101	Conneector kit for uAria Basic
ACS00CB002530	Kit of 10 minifit cables with lugs, 1 m
ACS00CB000230	Kit of 10 coloured microfit cables with lugs, 1 m
ACS00CB000330	Kit of 8 coloured microfit cables with lugs, 1 m

Tab. 1.d

(*) 3/5/1: length = 1/ 2.2/ 3 m

1.4.3 NTC temperature sensor

Fig. 1.c

P/N	Type	Range
NTC*HP*	10 kΩ ±1% @25°C, IP67	-50 to 105/50 °C (air/fluid)
NTC*WF*	10 kΩ±1%@25°C (Fast), IP67	-50 to 105°C
NTC*WH*	10 kΩ ±1% @25°C, IP68	-50 to 105°C
NTC*HF*	10 kΩ±1%@25°C,strap-on, IP67	-50 to 105°C

Tab. 1.e

1.4.4 Duct temperature sensor

Fig. 1.d

P/N	Type	Range
DPDT011000	NTC	-20T70°C
DPDT010000	0-1 V, 4-20 mA	

Tab. 1.f

1.4.5 Air quality sensor

Fig. 1.e

CO_2 SENSORS

P/N	Range	Output
DPWQ402000	0-2000 ppm	0-10 V
DPDQ402000	0-2000 ppm	0-10 V

Tab. 1.g

1.4.6 Differential air pressure sensor

P/N	Range	Output
SPKD00U5N0	0-1000 Pa	4 to 20 mA
	0-2500 Pa	
	0-3000 Pa	
	0-5000 Pa	

Tab. 1.h

Fig. 1.f

1.4.7 Differential air pressure switches/flow switches

PRESSURE SWITCHES

P/N	Range	Output
DCPD000100	0.5 to 5 mbars	ON/OFF
DCPD001100	0.2 to 2 mbars	ON/OFF

Tab. 1.i

FLOW SWITCHES

P/N	Range	Output
DCFL000100	1 to 9 m/s	ON/OFF

Tab. 1.j

Fig. 1.g

1.4.8 th-Tune terminal

th-Tune part number AT* is the room terminal that, together with the uAria controller, allows the user to set the room temperature and humidity (when the corresponding probes are available). Depending on the model, the power supply can be 230 Vac or 24 Vac/Vdc. th-Tune is compatible with the main recessed wall boxes on the market. The temperature set point can be set simply and intuitively using the front knob. For assembly details, see the technical leaflet +0500016IE.

Fig. 1.h

1.4.9 USB/RS485 converter

Electronic device used to interface an RS485 network to a personal computer via the USB port. See technical leaflet +050000590

Fig. 1.i

1.4.10 All-in-one room and duct sensor (temperature, humidity, CO2 and VOC)

Room	
DPWQ60B010	24 Vac/15…36 Vdc
DPWQ70B010	
DPWQ80B010	
DPWQ90B010	
Room with display	
DPWQ61B010	
DPWQ71B010	
DPWQ81B010	
DPWQ91B010	
Duct	
DPDQ60B010	24 Vac/15…36 Vdc
DPDQ70B010	

Tab. 1.k

Fig. 1.j

2. INSTALLATION

2.1 Warnings

Caution: avoid installing the controller in environments with the following characteristics:

- temperature and humidity that do not comply with the ambient operating conditions (see "Technical specifications");
- strong vibrations or knocks;
- exposure to water sprays or condensate;
- exposure to aggressive and polluting atmospheres (e.g.: sulphur and ammonia gases, saline mist, smoke) which may cause corrosion and/or oxidation;
- strong magnetic and/or radio frequency interference (thus avoid installation
- near transmitting antennae);
- exposure to direct sunlight and the elements in general;
- wide and rapid fluctuations in ambient temperature;
- exposure of the controller to dust (formation of corrosive patina with possible oxidation and reduction of insulation);

2.2 DIN rail version

2.2.1 Dimensions mm (inches)

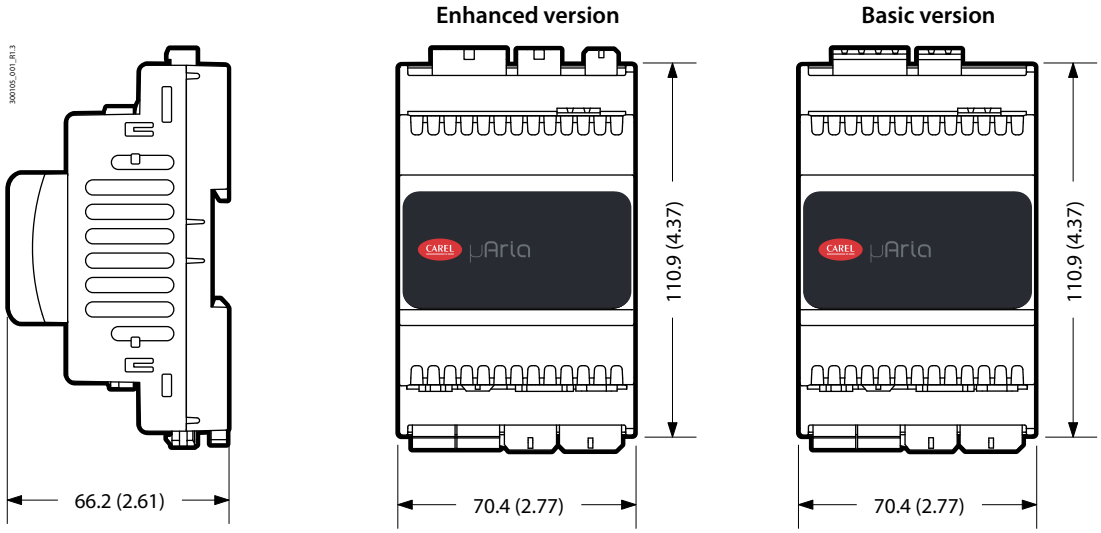


Fig. 2.a

2.2.2 Assembly

Apply slight pressure to the controller resting on the DIN rail until the rear tab clicks into place.

2.2.3 Removal

Use a screwdriver as a lever in the hole to lift and release the tab. The tab is held in the locked position by return springs.

2.3 Description of the terminals

Enhanced version

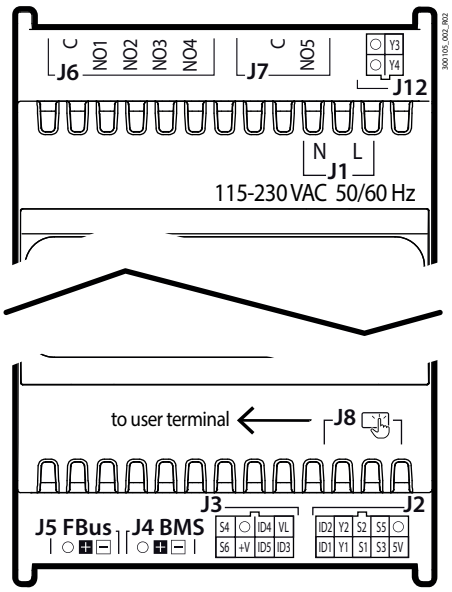


Fig. 2.b

Ref.		Description	Cable kit colour
J1	L	Power supply	-
	N		-
J2	5V	Ratiometric probe power supply	white
	S3	Analogue input 3	brown
	S1	Analogue input 1	green
	Y1	Analogue output 1	yellow
	ID1	Digital input 1	grey
	O	GND: reference for probes, digital inputs and analogue outputs	pink
	S5	Analogue input 5	blue
	S2	Analogue input 2	red
	Y2	Analogue output 2	black
	ID2	Digital input 2	purple
J3	ID3	Digital input 3	white
	ID5	Digital input 5	brown
	+V	Power supply to 4-20 mA active probes	green
	S6	Analogue input 6	yellow
	VL	Not used	grey
	ID4	Digital input 4	pink
	O	GND	blue
	S4	Analogue input 4	red
J4	-	BMS serial port (RS485): Rx-/Tx-	
	+	BMS serial port (RS485): Rx+/Tx+	
	O	BMS serial port (RS485): GND	
J5	-	Fieldbus serial port (RS485): Rx-/Tx-	
	+	Fieldbus serial port (RS485): Rx+/Tx+	
	O	Fieldbus serial port (RS485): GND	
J6	C	Common for relays 1, 2, 3.4	
	NO1	Digital output (relay) 1	
	NO2	Digital output (relay) 2	
	NO3	Digital output (relay) 3	
	NO4	Digital output (relay) 4	
J7	C	Common for relay 4	
	NO5	Digital output (relay) 4	
J8	-	Remote terminal connector (DIN version only)	
J12	O	GND: reference for analogue output Y3	
	Y3	Analogue output 3	
	O	GND: reference for analogue output Y4	
	Y4	Analogue output 4	

Tab. 2.a

Basic version

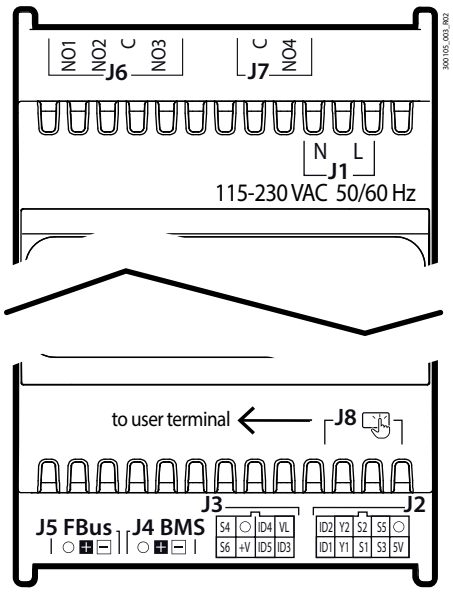


Fig. 2.c

Ref.		Description	Cable kit colour
J1	L	Power supply	-
	N		-
J2	5V	Ratiometric probe power supply	white
	S3	Analogue input 3	brown
	S1	Analogue input 1	green
	Y1	Analogue output 1	yellow
	ID1	Digital input 1	grey
	O	GND: reference for probes, digital inputs and analogue outputs	pink
	S5	Analogue input 5	blue
	S2	Analogue input 2	red
	Y2	Analogue output 2	black
	ID2	Digital input 2	purple
J3	ID3	Digital input 3	white
	ID5	Digital input 5	brown
	+V	Power supply to 4-20 mA active probes	green
	S6	Analogue input 6	yellow
	VL	Not used	grey
	ID4	Digital input 4	pink
	O	GND	blue
	S4	Analogue input 4	red
J4	-	BMS serial port (RS485): Rx-/Tx-	
	+	BMS serial port (RS485): Rx+/Tx+	
	O	BMS serial port (RS485): GND	
J5	-	Fieldbus serial port (RS485): Rx-/Tx-	
	+	Fieldbus serial port (RS485): Rx+/Tx+	
	O	Fieldbus serial port (RS485): GND	
J6	C	Common for relays 1, 2, 3	
	NO1	Digital output (relay) 1	
	NO2	Digital output (relay) 2	
	NO3	Digital output (relay) 3	
J7	C	Common for relay 4	
	NO4	Digital output (relay) 4	
J8	-	Remote terminal connector (DIN version only)	

Tab. 2.b

2.4 Probe connection

Notice:

- the probe connections relate to the default parameter configuration.
- probes S1, S2, S3 can be configured as NTC or PT1000
- probes S4, S5 can be configured as NTC / PT1000 / 4-20 mA
- probe S6 can be configured as NTC / PT1000 / 4-20 mA / 0-10 V

NTC probes

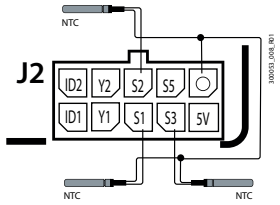


Fig. 2.d

4-20 mA probes/digital inputs

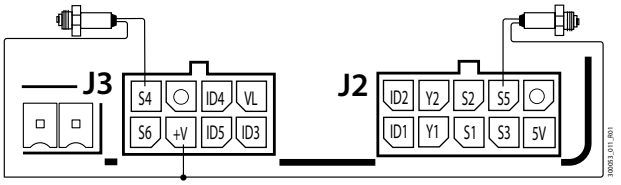


Fig. 2.e

Probes 0-10Vdc

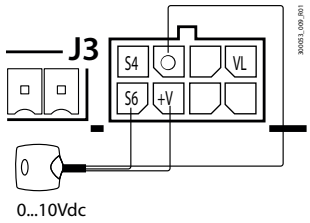


Fig. 2.f

Ratiometric pressure probes 0...5V

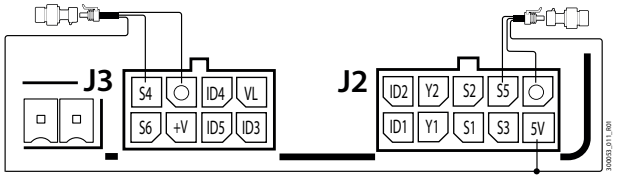


Fig. 2.g

2.5 Connection diagram

Versione Enhanced

Versione Basic

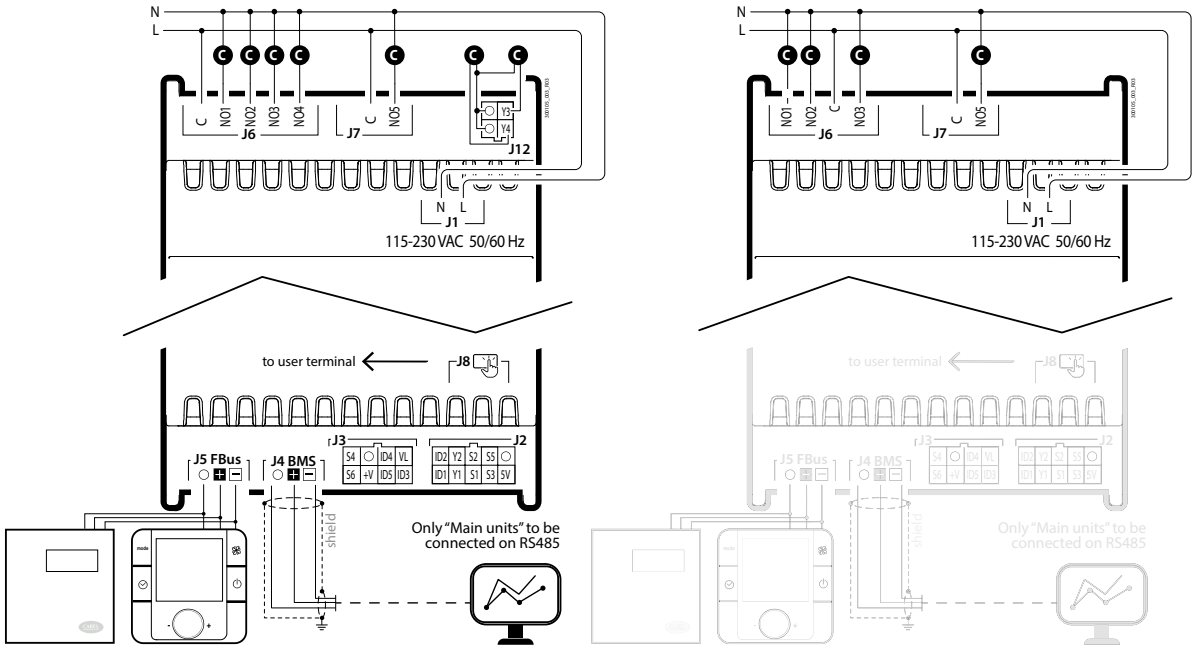


Fig. 2.h

2.6 Positioning inside the panel

The position of the controller in the electrical cabinet must be chosen so as to guarantee correct physical separation from the power components (solenoids, contactors, actuators, inverters, ...) and the connected cables. Proximity to such devices/cables may create random malfunctions that are not immediately evident. The structure of the panel must allow the correct flow of cooling air.

2.7 Electrical installation

Caution: when laying the wiring, "physically" separate the power part from the control part. The proximity of these two sets of wires will, in most cases, cause problems of induced disturbance or, over time, malfunctions or damage to the components. The ideal solution is to house these two circuits in two separate cabinets. Sometimes this is not possible, and therefore the power part and the control part must be installed in two separate areas inside the same panel. For the control signals, it is recommended to use shielded cables with twisted wires. If the control cables have to cross over the power cables, the intersections must be as near as possible to 90 degrees, always avoiding running the control cables parallel to the power cables.

Pay attention to the following warnings:

- use cable ends suitable for the corresponding terminals. Loosen each screw and insert the cable ends, then tighten the screws. When the operation is completed, slightly tug the cables to check they are sufficiently tight;
- separate as much as possible the probe signal, digital input and serial line cables from the cables carrying inductive loads and power cables to avoid possible electromagnetic disturbance. Never run power cables (including the electrical cables) and probe signal cables in the same conduits. Do not install the probe cables in the immediate vicinity of power devices (contactors, circuit breakers or similar);
- reduce the path of the probe cables as much as possible, and avoid spiral paths that enclose power devices;
- avoid touching or nearly touching the electronic components fitted on the boards to avoid electrostatic discharges (extremely damaging) from the operator to the components;
- do not secure the cables to the terminals by pressing the screwdriver with excessive force, to avoid damaging the controller: maximum tightening torque: 0.22-0.25 N•m.
- for applications subject to considerable vibrations (1.5 mm pk-pk 10/55 Hz), secure the cables connected to the controller around 3 cm from the connectors using cable ties;
- all the extra low voltage connections (analogue and digital inputs, analogue outputs, serial bus connections, power supplies) must have reinforced or double insulation from the mains network.

2.8 Serial port connections

For serial connections (FBus and BMS ports), the cables used must be suitable for the RS485 standard (shielded twisted pair, see the specifications in the following table). The earth connection of the shield must be made using the shortest connection possible on the metal plate at the bottom of the electrical panel.

Main device	Serial port	Lmax (m)	Wire/wire capacitance (pF/m)	resistance on first and last device	Max secondary devices on bus	Data rate (bit/s)
uAria	FBus	500	<90	120 Ω	9	19200
PC (supervision)	BMS	500	<90	120 Ω	-	19200

Tab. 2.c

The power supply connections must be in phase between the two controllers (G0 on the main controller and G0 on the secondary controller connected to the same power supply wire).

Notice: connect the shield to the earth in the electrical panel. Connect a 120 Ω terminating resistor between the Tx/Rx+ and Tx/Rx- terminals on the last controller on the RS485 line.

2.9 Installation

For installation proceed as follows, with reference to the wiring diagrams:

- before performing any operations on the control board, disconnect the main power supply by turning the main switch in the electrical panel OFF;
- avoid touching the control board, as electrostatic discharges may damage the electronic components;
- the index of protection required for the application must be ensured by the manufacturer of the cabinet or by suitable assembly of the controller;
- connect any digital inputs, Lmax = 10 m;
- connect the actuators: the actuators should only be connected after having programmed the controller. Carefully evaluate the maximum ratings of the relay outputs as indicated in "Controller electrical and physical specifications";
- program the controller: see "User interface";
- for the connection of the main/secondary network and user interfaces, use shielded cable and check the maximum distances and cable sizes specified in "Electrical specifications";
- for safety devices (e.g. circuit breakers), comply with the following requirements:
  - IEC 60364-4-41;
  - standards in force in the country;
  - connection technical requirements of the power company.

Caution: the following warnings must be observed when connecting the controllers:

- incorrect connection to the power supply may seriously damage the controller;
- use cable ends suitable for the corresponding terminals. Loosen each screw and insert the cable ends, then tighten the screws and lightly tug the cables to check correct tightness;
- separate as much as possible the probe and digital input cables from cables to inductive loads and power cables, so as to avoid possible electromagnetic disturbance. Never run power cables (including the electrical panel cables) and probe signal cables in the same conduits;
- do not install the probe cables in the immediate vicinity of power devices (contactors, circuit breakers, etc.). Reduce the path of probe cables as much as possible, and avoid spiral paths that enclose power devices.

3. COMMISSIONING

3.1 APPLICA app

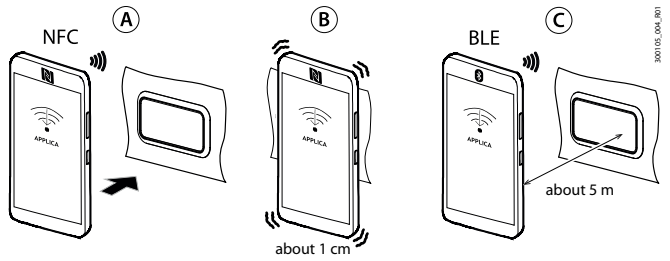


Fig. 3.a

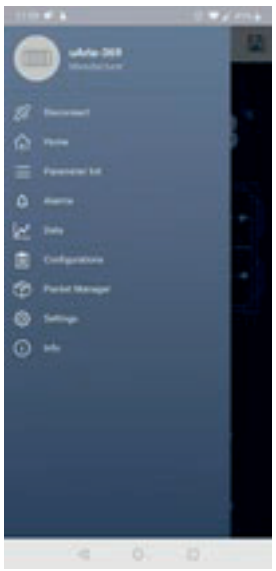
The "Applica" app can be used to configure the controller from a mobile device (smartphone, tablet), via NFC (Near Field Communication) and Bluetooth (BLE). Users can both configure the commissioning parameters and set groups of preset parameters according to specific needs (configurazioni).

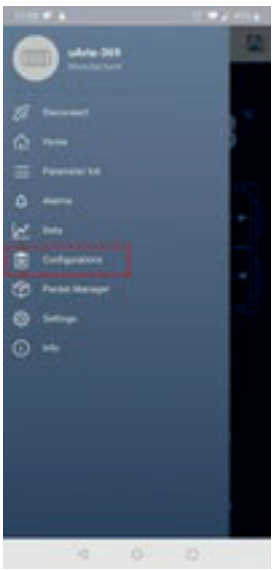
Once the Carel "Applica" app has been installed and opened (see the paragraph "Mobile device", proceed as follows:
1. For NFC devices (A), move the mobile device near to the µAria user terminal (the position of the NFC antenna on the mobile device must be identified in order to place it over the display): wait for the signal that the device has been read (B).
2. For Bluetooth devices (C), select the "SCAN BLUETOOTH" option, then choose the device from the list.

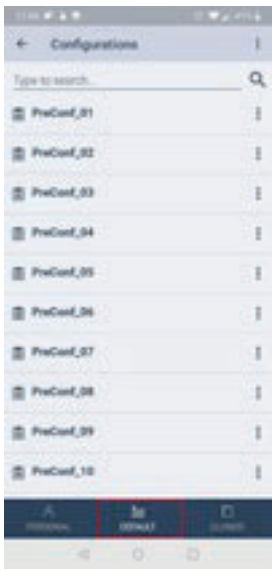
3.1.1 Configuration procedure

uAria provides default unit configurations to be used as the starting point, changing only the required differences from the default settings, where necessary.
To choose one of the default configurations, proceed as follows:

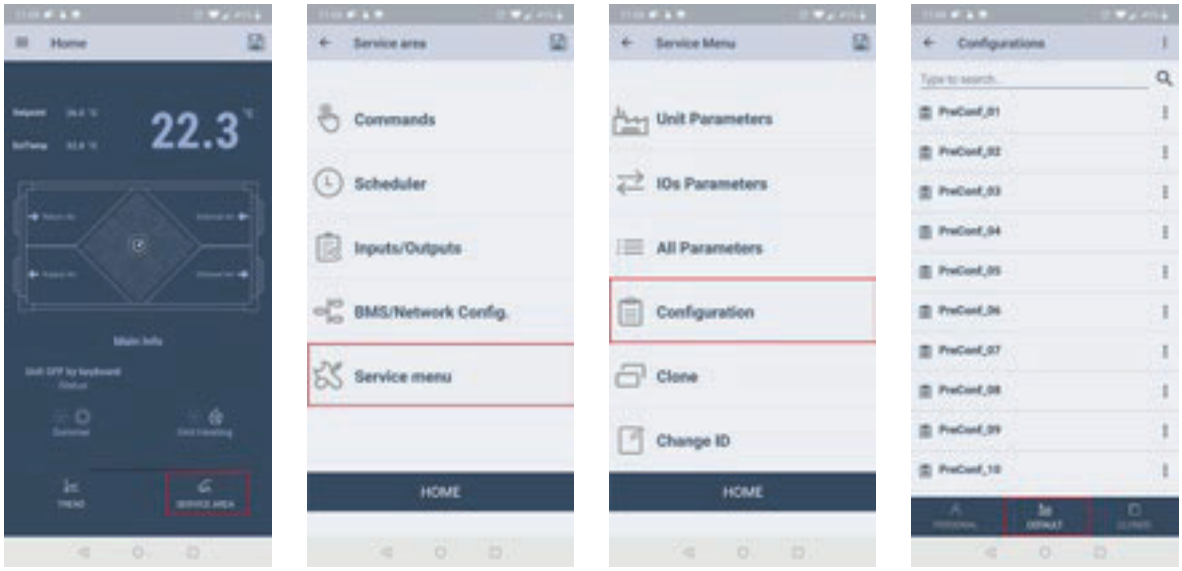
1. Open the pop-up menu
2. Configurations
3. Choose one of the available configurations







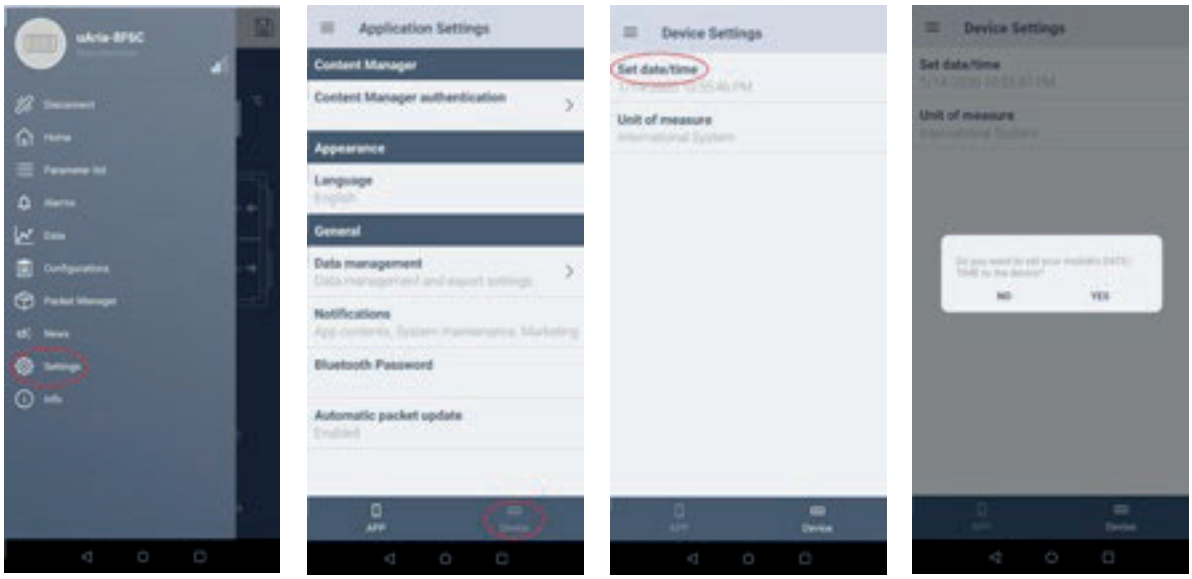
1. Menu.
2. Service Menu
3. Unit parameters
4. Configure the unit.



All of the parameters are listed and described in the paragraph "Unit configuration parameter list"

3.1.2 Date/time setting

Applica includes a feature for setting the date and time on µAria in just one simple step, copying the values from the mobile device.



Procedure:
1. open Applica on the mobile device;
2. access the controller via NFC or Bluetooth, entering your profile credentials;
3. access the menu on the command bar at the top left;
4. select "set date/time":
5. confirm;
6. with an NFC connection, move the device near to the user terminal to write the copied values.

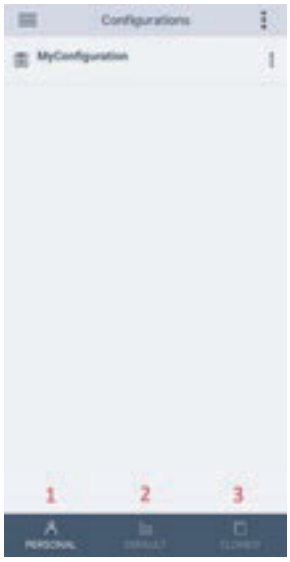
Notice: with a Bluetooth connection, the values are copied on confirmation.

3.1.3 Copy configuration

Applica includes a "Clone" feature to acquire the configuration from one unit and replicate it "one-for-one" to other units.

Procedure:
1. open Applica on the mobile device;
2. access the controller via NFC or Bluetooth, using the "Service" or "Manufacturer" profile credentials;
3. go to "Service area" -> "Service menu" -> "Clone";
4. enter a name to describe the configuration being saved;
5. with an NFC connection: move the device bear to the display terminal on the µAria that the configuration is being copied from; once the message shows the configuration has been acquired, this is saved to the smartphone's memory, available via icon 2 (see the following figure);
6. select the saved configuration; (with an NFC connection) move the device near to the display terminal on the µAria that the same configuration is being applied to;
7. confirm and wait for the confirmation message.

Notice: with a Bluetooth connection the configuration is saved/applied on confirmation.



With reference to the figure on the side, tapping icon:
1. accesses the configurations saved by the user;
2. accesses the configurations prepared by Carel;
3. accesses the saved clones.

3.2 Applica Desktop

Applica Desktop is a program intended for manufacturers and installers of units fitted with the uAria controller. It can be downloaded from ksa.carel.com. The Applica Desktop offers the possibility to:
- access the controller using the assigned profile;
- create configurations;
- apply configurations;
- clone a unit configuration, i.e. copy all of the unit's parameter values;
- complete the commissioning procedure;
- troubleshoot any problems on the unit.

Notice:
- Applica Desktop can be used as an alternative to the Applica app, and requires an internet connection;
- For the physical connection to the BMS port on uAria, use the USB/RS485 converter P/N CVSTDUMOR0

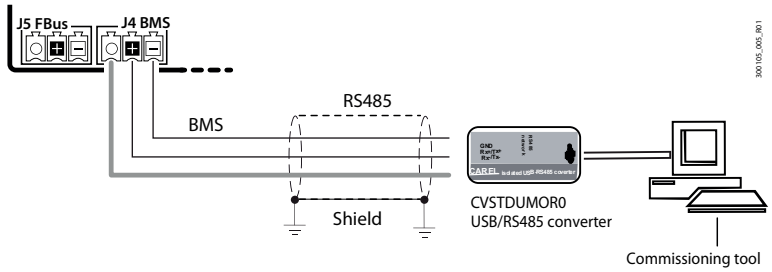
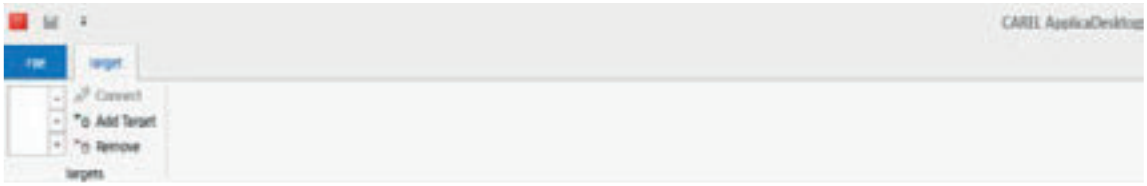


Fig. 3.b

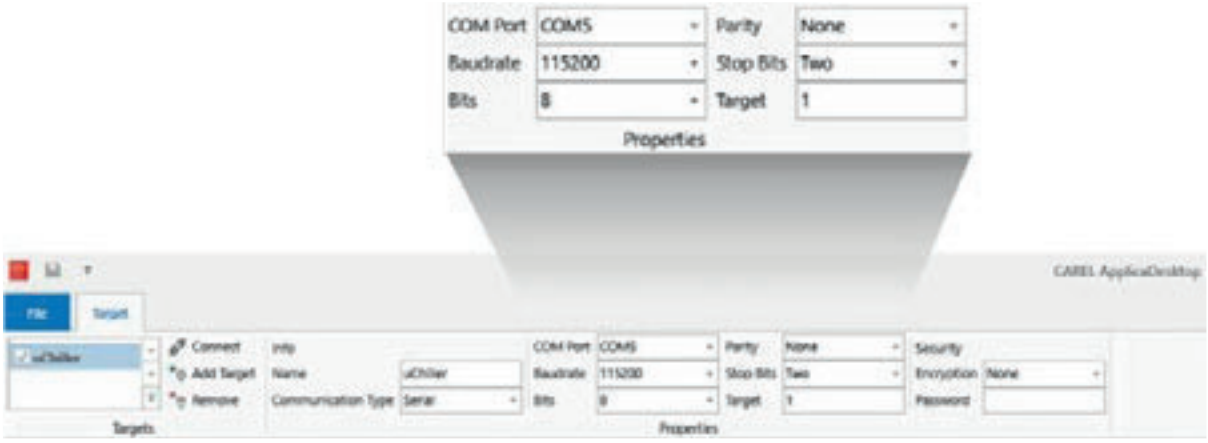
3.2.1 Configuration procedure

uAria provides default unit configurations to be used as the starting point, changing only the required differences from the default settings, where necessary. To choose one of the default configurations, proceed as follows:

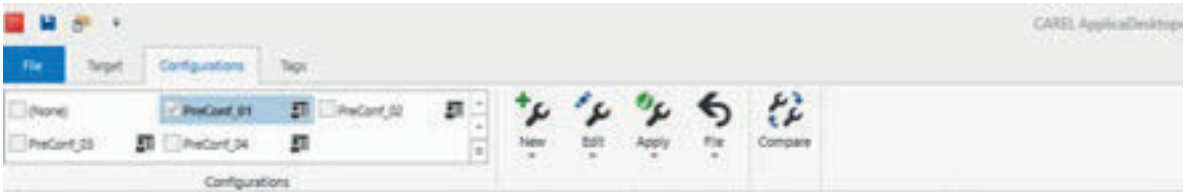
1. Connect to the BMS port on the uAria controller, as shown in the figure
2. Open Applica Desktop



3. Select "Add target" and assign it a meaningful name (e.g. "uAria")
4. In the "COM Port" field, enter the COM port used for the USB connection to the USB/RS485 converter
5. Configure the connection parameters (Baudrate=115200, Bits=8, Parity=None, Stop Bits=Two, Serial Node=1) as shown in the figure (the data are saved automatically);

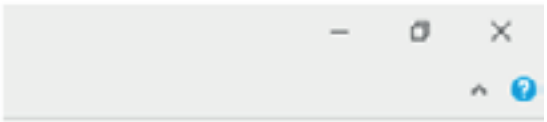


6. Use "Connect" to connect to the uAria (which must be powered on);
7. Once connected, select the "Configurations" label: the command bar will be displayed, as shown:



8. Select the desired configuration, and then "Apply Configuration";
9. Applica Desktop will display a message when the parameters have been set, and if necessary indicating any values that have been applied that do not belong to the current user profile (some parameters may not be visible to the user).

Notice: Applica Desktop features complete online help, available via the "?" icon at the top right of the window (figure):



3.2.2 Date and time setting

The time can be set from Applica Desktop; to do this, connect to the target as specified above; once connected, the following options will be shown:

Select "Set date/time" and then at the prompt, confirm that the current time on the PC will be set on the uAria controller.

3.3 Unit configuration parameter list

Certain parameters are used to configure the unit. These parameters available depending on which of the available I/Os are enabled or disabled. The parameters can be accessed in the mobile application from the "Service menu" -> "Unit parameters", or from the list of all parameters under the "Unit configuration" category.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
C00	Main coil - type	0	0	3		S	R/W		HR008 (16bit)
C01	Main coil - mode	2	0	4		S	R/W		HR009 (16bit)
E00	Scheduler - enable	FALSE				U	R/W		CS004
f00	Fans - configuration	0	0	2		S	R/W		HR081 (16bit)
f01	Fans - type	0	0	1		S	R/W		HR082 (16bit)
f02	Fans - control type	0	0	2		S	R/W		HR083 (16bit)
f03	Air flow check - type	0	0	3		S	R/W		HR084 (16bit)
f04	Air flow - switch type	0	0	2		S	R/W		HR085 (16bit)
G00	Auxiliary output - type	0	0	2		S	R/W		HR105 (16bit)
G01	Auxiliary output - AIN type	13	0	13		S	R/W		HR106 (16bit)
G02	Auxiliary output - enable control type	1	0	3		S	R/W		HR107 (16bit)
H00	Heat recovery - type	0	0	4		S	R/W		HR119 (16bit)
I00	Frost protection - control type	0	0	2		S	R/W		HR126 (16bit)
J00	Fresh air pre-heater - type	0	0	2		S	R/W		HR133 (16bit)
J01	Fresh air pre-heater - control type	1	0	2		S	R/W		HR134 (16bit)
t00	Temperature control type	0	0	5		S	R/W		HR396 (16bit)
t01	Summer/Winter - selection type	3	0	3		U	R/W		HR397 (16bit)

Tab. 3.a

3.4 Input/output configuration

All of the parameters can be fully configured for all of the enabled I/Os.
To do this, in the mobile application go to the "Service menu" -> "IO parameters", or from the list of all parameters under the "IO Config." category.

Notice: only the enabled I/Os will be displayed, depending on the unit configuration.
For example, if only the supply fan is configured, the return fan configuration will not be visible.

3.4.1 Analogue inputs

In addition to the configuration of all of the I/Os, a probe alarm delay can also be set, which applies to all probes.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
L99	Probe alarm delay	10	0	999	s	S	R/W		HR316 (16bit)

Tab. 3.b

For each analogue input, the following can be set:
- "-b": (board) board that the input is connected to (uAria, thTune)
- "-c": (channel) number of the channel it is connected to (1 to 6)
- "-t": (type) type of input (NTC, 4-20 mA, ...)
- "-h": (high limit) maximum probe value
- "-l": (low limit) minimum probe value
- "-f": (filter) filter (0 to 9)
- "-o": (offset) offset value to add to the reading.

Code	Description
L00	Supply temperature
L01	Room temperature
L02	Return temperature
L03	External temperature
L05	Antifreeze temperature
L06	Supply humidity

Code	Description
L07	Room humidity
L08	Return humidity
L10	Return air pressure
L11	Air quality CO2
L12	Air quality VOC
L13	Auxiliary probe

Code	Description
L46	Tachometer supply fan
L47	Tachometer return fan
L53	Air quality PM
L57	Fresh air pre-heater temperature

Tab. 3.c

3.4.2 Digital inputs

For each digital input, the following can be set:
- "-b": (board) board that the input is connected to (uAria)
- "-c": (channel) number of the channel it is connected to (1 to 5)
- "-L": (logic) input logic (normally open / normally closed)

Code	Description
L14	Unit on off input
L15	Serious alarm input
L16	Summer/Winter input
L17	Filter alarm input
L18	Supply fan overload
L19	Return fan overload
L20	Main coil overload

Code	Description
L21	Fresh air pre heater overload
L22	Recovery overload
L23	Fans overload
L24	Supply air flow switch
L25	Return air flow switch
L26	Air flow switch
L27	Auxiliary input

Code	Description
L48	Fan fixed speed 1
L49	Fan fixed speed 2
L50	Fan fixed speed 3
L54	Condensation alarm
L58	Fire/smoke alarm input

Tab. 3.d

3.4.3 Digital outputs

For each digital ouput, the following can be set:
- "-b": (board) board that the input is connected to (uAria)
- "-c": (channel) number of the channel it is connected to (1 to 5)
- "-L": (logic) input logic (normally open / normally closed)

Code	Description
L35	Supply fan digital
L36	Return fan digital
L37	Bypass damper digital
L38	Thermal wheel digital
L39	Fresh air pre heater digital

Code	Description
L40	Main coil digital
L41	Auxiliary output digital
L42	Unit status output
L43	Summer/Winter output
L44	Global alarm output

Code	Description
L45	Filter alarm output
L51	Bypass damper open (3 points)
L52	Bypass damper close (3 points)
L55	Condensation alarm
L56	Cooling/heating status

Tab. 3.e

3.4.4 Analogue outputs

For each analogue output, the following can be set:
- "-b": (board) board that the input is connected to (uAria)
- "-c": (channel) number of the channel it is connected to (1 to 4)
- "-h": (high limit) maximum output limit
- "-l": (low limit) minimum output limit

Code	Description
L28	Supply fan analogue
L29	Return fan analogue
L30	Bypass damper analogue

Code	Description
L31	Thermal wheel analogue
L32	Fresh air pre-heater analogue

Code	Description
L33	Main coil analogue
L34	Auxiliary output analogue

Tab. 3.f

3.5 Checks after commissioning

Once having completed the installation, configuration and programming operations, after commissioning the controller check that:
- the programming logic is suitable to control the unit;
- the time has been set on the controller;
- the time bands have been set correctly, if enabled;
- the appropriate unit of measure has been set;
- the passwords have been changed to avoid unwanted parameter settings;

Caution: at the end of the commissioning procedure, the alarm log can be reset via the APPLICA app. See "Alarms".

4. USER INTERFACE

4.1 Introduction

The front panel of the user terminal includes the display and the keypad, featuring four buttons that, pressed alone or in combination, are used to program the controller. The display is used to show the values of a selected system variable and any alarms. The user interface display features three digits with sign and decimal point, a buzzer for signalling alarms and nine icons. The terminal features wireless connectivity and an NFC (Near Field Communication) or Bluetooth interface for interaction with mobile devices (on which the CAREL "Applica" app has been installed, available on Google Play for the Android operating system and on Apple store for iOS devices, Bluetooth only).

Notice:

- there are 3 user levels (U = User, S = Service, M = Manufacturer), each with its own password, visible and modifiable from the APPLICA app (see the parameter table);
- the unit of measure of the displayed values can be changed by setting parameter UOM.

Caution: the set of parameters accessible from the user interface is a subset of all the parameters available via the APPLICA app.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
UOM	UoM - Unit of measure used on the display	FALSE				U	R/W		CS077
y11	USER profile password	100	0	999		U	R/W	x	HR480 (16bit)
y12	SERVICE profile password	200	0	999		U	R/W		HR481 (16bit)
y13	MANUFACTURER profile password	123	0	999		S	R/W		HR482 (16bit)

Tab. 4.a

Notice: the user, service and manufacturer passwords can be changed directly by accessing the parameter list in the APPLICA app, and can contain up to 3 numeric characters.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
y16	Enable buzzer	FALSE				U	R/W		CS083

Tab. 4.b

The information available on the user terminal and in the Applica app may vary according to the type of profile, the password entered and the configuration parameters set by the manufacturer (see the parameter table).

4.2 User terminal

The display shows measurements in the range between –50 and +150°C, according to the type of probe used. For 0 to 5 V ratiometric and active 0 to 10 V or 4 to 20 mA probes, the unit of measure is defined by the type of probe used.

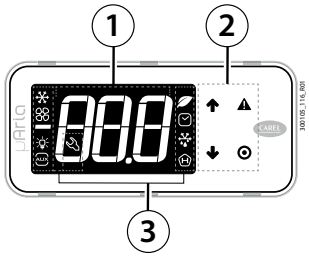


Fig. 4.a

Key:

1	Main field
2	Keypad
3	Operating mode

Notice:

- the user terminal can only be used to set the frequent parameters and display the value of the probes connected to uAria. The Service- and Manufacturer-level parameters are set using the "Applica" app or the configuration software, depending on the access profile. See the parameter table and the paragraph "Parameter categories visible on the user terminal";
- Parameter y24 is used to choose the variable to be shown on the display during normal operation:

0. Control probe	6. Frost protection temperature	12. Air quality (CO2)
1. Supply temperature	7. Supply humidity	13. Air quality (VOC)
2. Room temperature	8. Room humidity	14. Auxiliary probe
3. Return temperature	9. Return humidity	15. Pre-heater coil temperature
4. Outside temperature	10. Supply flow pressure	
5. Exhaust temperature	11. Return flow pressure	

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
y24	Main screen selection value	0	0	14		S	R/W		HR123 (16bit)

Tab. 4.c

4.2.1 Keypad

Button	Description	Function
/	UP	• Increase/decrease the value • Scroll direct access functions • LED on: scroll menu, parameters, direct access functions • LED flashing: set parameter values
	Alarm	• Pressed briefly: display alarms and mute buzzer • Pressed and held (3s): reset alarms • LED on/flashing: acknowledged/active alarm
	PRG	**Pressed briefly:** • Enter direct access function menu (from main screen) and activate/deactivate functions • Save value and return to the parameter code **Pressed and held (3 s):** • Enter programming mode or return to previous level without saving • LED on: main screen/programming mode

Tab. 4.d

Notice: when scrolling, a button is enabled only when illuminated.

4.2.2 Display

The icons provide information on device operation and/or the activation of certain functions, as shown in the table.

Icon	Function	On	Flashing
	-	-	-
	Fans	Fans active	Fans in start-up phase
	Economy status	Economy status active	-
AUX	Auxiliary output	Auxiliary output active	-
	Clock	Scheduler active	-
	Energy saving	Freecooling/freeheating active	-
	Defrost	Defrost active	-
	Service	Maintenance request	-

Tab. 4.e

4.2.3 Standard display

At start-up, the user terminal briefly shows "NFC", indicating that the NFC interface is available for communication with mobile devices, then the Firmware version, and then the standard display is shown. The standard display depends on the setting of parameter y24:

- control probe;
- value of one of the probes connected to the analogue inputs.

Notice: the message "bLE" flashes during the Bluetooth connection on the user terminal.

4.2.4 Programming mode

The user terminal only provides access to the basic configuration parameters, such as direct functions and active alarms without password protection, or, with password protection, advanced parameters and information (*).
Pressing PRG on the main screen for 3 s and entering the password accesses programming mode; see the menu descriptions for details of the available items.

Notice: (*) to optimise the configuration, use the APPLICA app.

Parameter categories visible on the user terminal

Without Password			
Cmd (Commands)		Syn (Synoptic)	
Code	Type	Code	Type
b00	R/W	SPt	R
b01	R/W (*)	rOt	R
b02	R/W	rOh	R
b03	R/W	rEt	R
b04	R/W	rEh	R
b05	R/W	Ett	R
b06	R/W	EHt	R
b07	R/W	CO2	R
b08	R/W	UOC	R
b09	R/W		
SCS	R		
E00	R/W		

With Password							
Stp (Set points)		Syn (Synoptic advanced)		Set (Settings)		Frc (Forcing devices)	
Code	Type	Code	Type	Code	Type	Code	Type
P00	R/W	SPt	R	UOM	R/W	n01	R/W
P01	R/W	rOt	R	y00	R/W	n02	R/W
P04	R/W	rOh	R	y01	R/W	n03	R/W
P05	R/W	rEt	R	y02	R/W	n04	R/W
P08	R/W	rEh	R	y14	R/W	n05	R/W
P09	R/W	Ett	R	y15	R/W	n06	R/W
P12	R/W	EHt	R	y16	R/W	n07	R/W
P13	R/W	CO2	R	y24	R/W	n08	R/W
P16	R/W	UOC	R			n09	R/W
P17	R/W	SPP	R			n10	R/W
P20	R/W	rEP	R			n11	R/W
P21	R/W	SPF	R			n12	R/W
P24	R/W	rEF	R				
P25	R/W	SFa	R				
P28	R/W	SFd	R				
P29	R/W	rFa	R				
P32	R/W	rFd	R				
P33	R/W	bPa	R				
P36	R/W	bPd	R				
P37	R/W	tHa	R				
		tHd	R				
		FHa	R				
		MCa	R				
		AUa	R				
		AUd	R				
		StS	R				

Tab. 4.f

(*) = Read/Write depends on the unit configuration.

Procedure

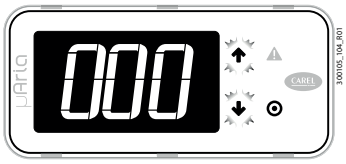
To navigate the menu tree, use the following buttons:

- UP and DOWN to navigate the menu and set the values;
- PRG to enter the menu items and save the changes made;
- Select the menu item or ESC to return to the previous branch.

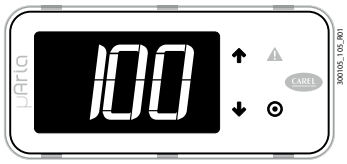
Example of setting parameter P00 (Temperature - summer comfort set point):

1. Wait for the standard display to be shown

2. Press PRG for 3 s: the password prompt is displayed

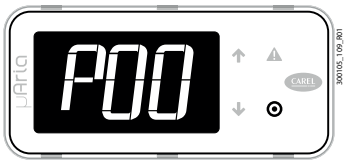


3. Press PRG: UP and DOWN flash (000)



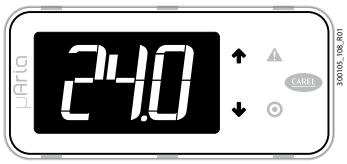
4. Press UP/DOWN and PRG to confirm each digit and enter the 3-digit password.

5. The first item in the StP menu is shown (= set points)

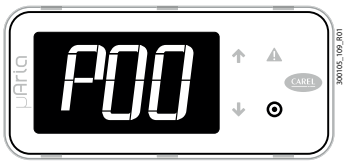


6. Press PRG: the first parameter is displayed

7. Press PRG to be able to set the value



8. Press UP/DOWN to modify the value



9. Press PRG to confirm the change: the display will show the available parameters (P00)

10. Press UP/DOWN to scroll to the other parameters, until coming to the "Esc" screen

11. Press PRG to return to the main menu

12. Repeat step 10 to return to the main screen

Notice:

- once back on the main screen, the password does not need to be immediately entered again to access the main menu. Logout occurs automatically after 3 minutes, or to log out manually select "Out" on the main screen;
- if no button is pressed, after 3 minutes the terminal will automatically return to the standard display.

5. FUNCTIONS

5.1 Fans

uAria can manage up to 2 fans and 3 combinations:
- Supply only
- Return only
- Supply + return

The following type of fans can be managed:
- On/Off
- Modulating

Both fans, when configured, must be the same type.

Optional flow control is available to ensure correct operation of the fans.

If the fans are configured as modulating, a main control, one or more auxiliary controls and one or more auxiliary functions can be selected.

The main control can be:
- Fixed speed
- Constant flow-rate
- Constant pressure

The auxiliary controls can be:
- Freecooling/freeheating
- Air quality
- Humidity
- Temperature

The auxiliary functions can be:
- Cleaning
- Night ventilation
- Post-ventilation

In any case, it is possible to set minimum and maximum values for each fan: these limits will always be observed during control, and the request will be scaled to ensure the maximum possible modulation within the set range.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
f00	Fans - configuration	0	0	2		S	R/W		HR081 (16bit)
f01	Fans - type	0	0	1		S	R/W		HR082 (16bit)
f02	Fans - control type	0	0	2		S	R/W		HR083 (16bit)
f14	Fans - post ventilation time	10	0	999	s	S	R/W		HR095 (16bit)
f15	Fans - enable temperature control	FALSE				S	R/W		CS022
f16	Fans - enable air quality control	FALSE				S	R/W		CS023
f17	Fans - enable humidity control	FALSE				S	R/W		CS024
f18	Fan night mode - enable	FALSE				S	R/W		CS025
f19	Fan cleaning - enable	FALSE				S	R/W		CS026
r06	Return fan - minimum speed	20	0	100	%	S	R/W		HR382 (16bit)
r07	Return fan - maximum speed	100	0	100	%	S	R/W		HR383 (16bit)
S06	Supply fan - minimum speed	20	0	100	%	S	R/W		HR392 (16bit)
S07	Supply fan - maximum speed	100	0	100	%	S	R/W		HR393 (16bit)

Tab. 5.a

5.1.1 Flow control

Flow control can be enabled so as guarantee correct operation of the fans at all times.
Flow can be measured by:
- a differential pressure switch
- an air pressure/flow probe
- both of the above

If using a differential pressure switch, the associated digital input is controlled directly.
If an air pressure/flow probe is used, the value read is compared against the threshold: if the value does not exceed the set threshold, flow is considered insufficient.
If using both, both conditions are verified: if at least one of the two is satisfied, flow is considered sufficient.

Flow control mode can also be selected:
- common for both fans
- return flow only
- supply flow only

If common control is selected: a common differential pressure switch will be controlled for both fans and/or the supply pressure probe only. If return flow only or supply flow only control is selected, only the differential pressure switch and/or corresponding probe will be controlled.

During unit start-up, it is normal for the time needed to reach the desired flow to be longer, while during normal operation, the desired flow must be reached at all times.
For this reason, there is a different procedure for identifying a no-flow condition at start-up and during steady operation.
In fact, when fully operational, a very short delay can be set: if sufficient flow is not measured, a flow alarm is generated after the set delay.

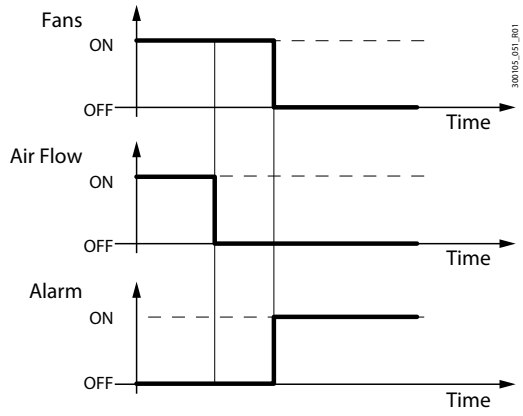


Fig. 5.a

During start-up, however, a longer delay can be set for verifying correct flow: if this is not measured, a warning is generated.
The warning will be reset after the same time. Once reset, another attempt is made: when the set number of attempts has expired, the flow alarm is generated.

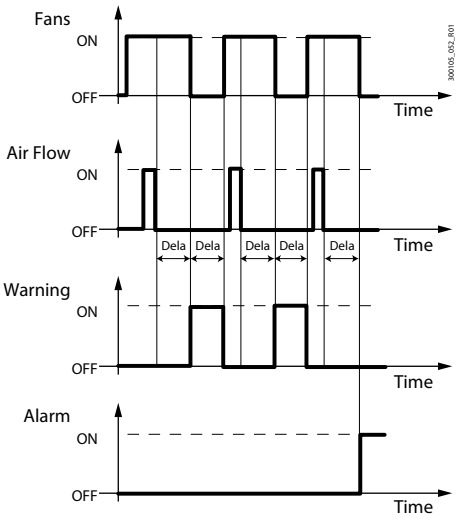


Fig. 5.b

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
f03	Air flow check - type	0	0	3		S	R/W		HR084 (16bit)
f04	Air flow - switch type	0	0	2		S	R/W		HR085 (16bit)
f05	Air flow check - pressure threshold	50	0	9999	Pa	S	R/W		HR086 (16bit)
f06	Air flow - K factor for flow calculations	100				S	R/W		HR087 (16bit)
f07	Air flow check - max number of attempts	3	1	255		S	R/W		HR088 (16bit)
f08	Air flow check - time in startup	15	0	999	s	S	R/W		HR089 (16bit)
f09	Air flow check - time in run	3	0	999		S	R/W		HR090 (16bit)

Tab. 5.b

5.1.2 Main control

Fixed speed

Fixed speed control involves setting the desired speed for both fans during normal operation. The only difference between the two fans is the speed-offset, that can be set for the return fan to always maintain an over or under pressure in the internal environment. This speed will only vary if the auxiliary controls and/or functions are enabled.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
f02	Fans - control type	0	0	2		S	R/W		HR083 (16bit)
f10	Fans - fixed speed	50	0	100	%	S	R/W		HR091 (16bit)

Tab. 5.c

Air flow/pressure control

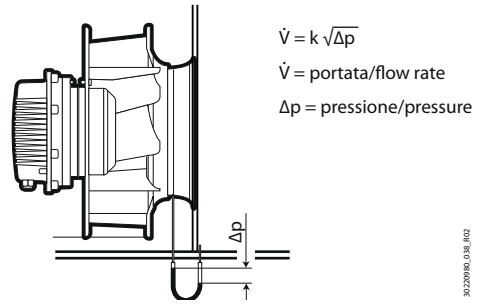


Fig. 5.c

To ensure constant flow in the room, air flow or pressure control can be selected.
The difference between the two depends on the unit of measure used. In fact, for flow control, the measured pressure is converted using the K coefficient (settable).
Each fan will be controlled completely independently: the control probe, set point and PID parameters will be different between the supply and return fans.

The example below shows PID control

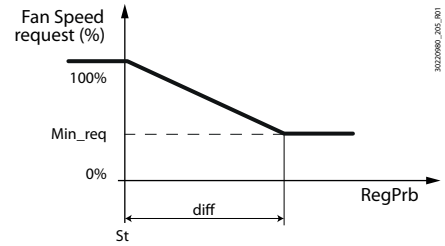


Fig. 5.d

A "dead zone" can also be set in which control stops, and the current fan speed is maintained.
In the event of an alarm from the control probe, the fan is forced to a settable speed.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
f02	Fans - control type	0	0	2		S	R/W		HR083 (16bit)
f06	Air flow - K factor for flow calculations	100				S	R/W		HR087 (16bit)
S02	Supply fan - airflow dead band	50	0	9999	m3/h	S	R/W		HR388 (16bit)
S03	Supply fan - PID proportional factor	8	0	99		S	R/W		HR389 (16bit)
S04	Supply fan - PID integral time	150	0	999	s	S	R/W		HR390 (16bit)
S05	Supply fan - PID derivative time	0	0	999	s	S	R/W		HR391 (16bit)
r02	Return fan - airflow dead band	50	0	9999	m3/h	S	R/W		HR378 (16bit)
r03	Return fan - PID proportional factor	8	0	99		S	R/W		HR379 (16bit)
r04	Return fan - PID integral time	150	0	999	s	S	R/W		HR380 (16bit)
r05	Return fan - PID derivative time	0	0	999	s	S	R/W		HR381 (16bit)

Tab. 5.d

5.1.3 Auxiliary controls

The auxiliary controls, which can only be enabled for modulating fans, are the following:

1. freecooling/freeheating (see Temperature control)
2. air quality (see Air quality control)
3. humidity (see Humidity control)
4. temperature

Each auxiliary control generates a request that is independent of the others, the effect the ventilation is however the same.
In each mode, the aim is to increase the amount of fresh outside air introduced into the room.
To achieve this, the action is slightly different depending on the type of main fan control.

If fixed speed is set, fan speed will be increased directly, always within the maximum selected.

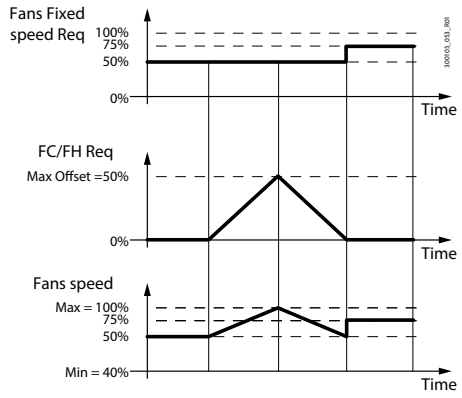


Fig. 5.e

If flow/pressure control is set, the control set point will be increased, always within the maximum selected.

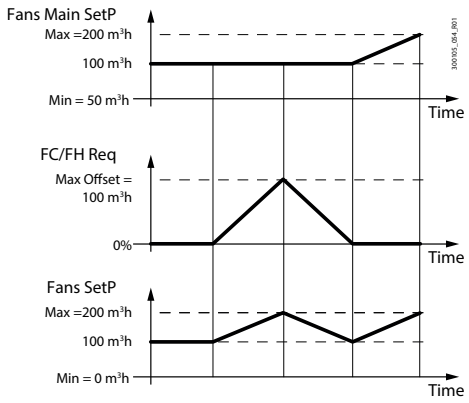


Fig. 5.f

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
f01	Fans - type	0	0	1		S	R/W		HR082 (16bit)
f15	Fans - enable temperature control	FALSE				S	R/W		CS022
f16	Fans - enable air quality control	FALSE				S	R/W		CS023
f17	Fans - enable humidity control	FALSE				S	R/W		CS024

Tab. 5.e

5.1.4 Auxiliary functions

Cleaning function

The cleaning function is used to force air change at certain times. This is mainly useful in units without an air quality probe, as in this case there is in fact no clear indication of the level of indoor air pollution. For this reason, the cleaning function forces the fans to operate at a set percentage for a certain time. If enabled, the function is activated every day. In the event of a blackout, the procedure is interrupted and will be activated the following day.

If necessary, the function can be started manually: after the set time, it will stop automatically.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
f19	Fan cleaning - enable	FALSE				S	R/W		CS026
f25	Fan cleaning - start time hours	12	0	23	h	S	R/W		HR101 (16bit)
f26	Fan cleaning - start time minutes	0	0	59	min	S	R/W		HR102 (16bit)
f27	Fan cleaning - duration time	30	0	999	min	S	R/W		HR103 (16bit)
f28	Fan cleaning - speed	80	0	100	%	S	R/W		HR104 (16bit)
f29	Fan cleaning - enable mode manually					S	R/W		CS027

Tab. 5.f

Night ventilation

In order to reduce the noise pollution caused by operation of the fans during night-time, maximum fan speed can be limited over a settable time band.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
f18	Fan night mode - enable	FALSE				S	R/W		CS025
f20	Fan night mode - start time hours	22	0	23	h	S	R/W		HR096 (16bit)
f21	Fan night mode - start time minutes	0	0	59	min	S	R/W		HR097 (16bit)
f22	Fan night mode - end time hours	7	0	23	h	S	R/W		HR098 (16bit)
f23	Fan night mode - end time minutes	0	0	59	min	S	R/W		HR099 (16bit)
f24	Fan night mode - max speed	60	0	100	%	S	R/W		HR100 (16bit)

Tab. 5.g

Post-ventilation

For units that use electric heaters, a post-ventilation time after the heaters switch off is needed to avoid overheating the units due to the absence of air flow. A post-ventilation time can thus be set to ensure fan operation for a set time after the heaters have been switched off. The function is activated automatically if at least one electric heater is configured.

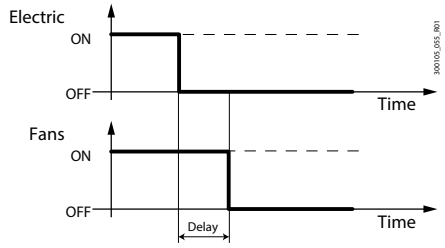
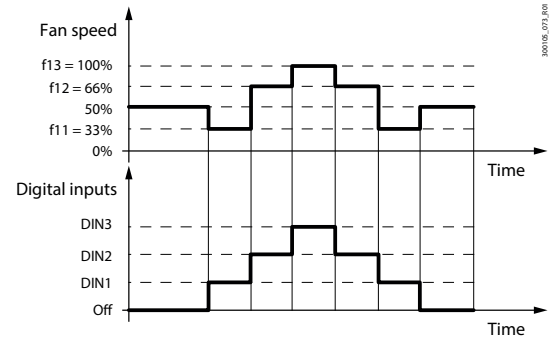


Fig. 5.g

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
f14	Fans - post ventilation time	10	0	999	s	S	R/W		HR095 (16bit)

Tab. 5.h

3 Speed Mode



If you want to force the fan speed to a different value from the regulation mode, up to 3 different speeds are available which overwrite the request, generated by other settings. This mode can be useful in applications for kitchen hoods or for manual overriding of a lower or higher speed than the current one. It is therefore possible to set up to 3 digital inputs which, if configured and activated, force the fan speed to the relative set speed.

Nota: If different digital inputs are activated at the same time, the highest speed is considered.

Fig. 5.h

Code	Description	Default	Min	Max	U.M.	User	R/W	Display	Modbus
f11	Fans - fixed speed 1	33	0	100	%	S	R/W	HR092 (16bit)	
f12	Fans - fixed speed 2	66	0	100	%	S	R/W	HR093 (16bit)	
f13	Fans - fixed speed 3	100	0	100	%	S	R/W	HR094 (16bit)	

Tab. 5.i

5.1.5 Smoke/fire alarm management

The unit can be managed in the event of a smoke/fire alarm. Management involves controlling the fans and dampers that have been configured. When the alarm is active, the unit will carry out one of the following actions:

- Stop the fans
- Force the supply fans to maximum speed
- Force the return fans to maximum speed
- Force both types of fans to maximum speed

Based on the chosen action, the dampers will work as described in the following table

Damper operation

Action	Bypass
Stop fans	Operation when the unit is off
Supply fans only	OPEN
Return fans only	OPEN
Both fans	OPEN

Tab. 5.j

Notice:

- if there is a fan flow warning, this is notified on the display, but the fans continue operating according to the set configuration.
- if there is a fan overload alarm, the fans will be switched off depending on the alarm settings (common or individual for each fan).

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
FSt	Fire/smoke alarm management (0=Stop fans - 1=Only supply fans - 2= Only return fans - 3=No stop)	0	0	3		S	R/W		HR562 (16bit)

Tab. 5.k

5.2 Heat recovery

uAria manages cross-flow and thermal wheel heat recovery units.
Six types of devices are managed:

- On/off bypass damper
- Modulating bypass damper
- On/off thermal wheel
- Modulating thermal wheel
- 3-position on/off bypass damper
- 3-position modulating bypass damper

Two thresholds can be selected to activate the heat recovery unit in particularly hot or cold climates. Beyond these thresholds, the heat recovery unit is activated at maximum capacity.

If temperature control is disabled, this it is the only condition that heat recovery control will be based on.
If temperature control is enabled, on the other hand, operation of the device is modulated based on the request generated (see the chapter on Temperature control).
On/off devices will be activated/deactivated when the request reaches the maximum/minimum.
The outside temperature thresholds set for activating heat recovery are always respected.

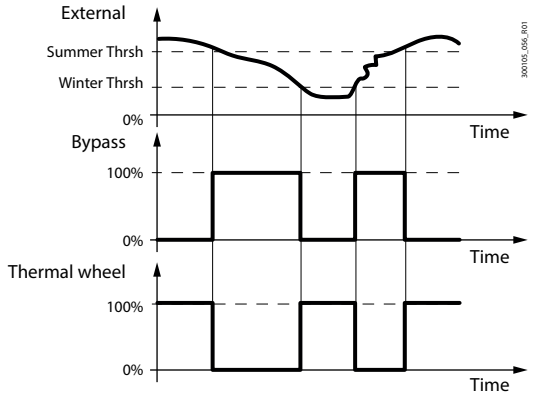


Fig. 5.i

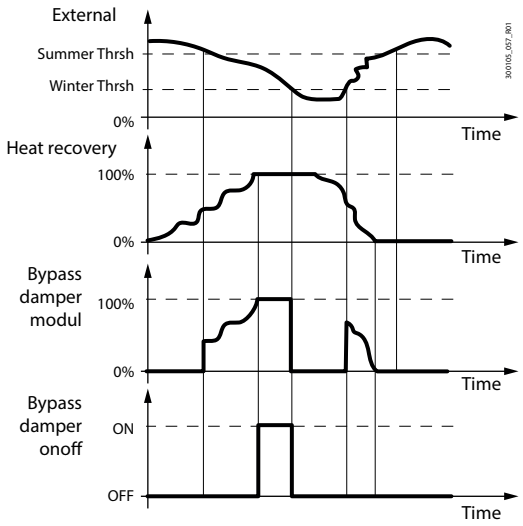


Fig. 5.j

If the "3-position" damper has been configured, either on/off or modulating, the two corresponding digital outputs for opening (Open) and closing (Close) the damper (L51 and L52) need to be configured. For both types, when the unit is started, the damper is forced to close for a time equal to the set opening time (H07), increased by 25%.

The operation of both types of dampers is shown in the graph in Fig.5.j

Setting the time H07 to "0" keeps the forced opening/closing value at all times.

Notice: the example shows the behaviour of the bypass damper. The same applies to the thermal wheel, with the difference that the output value is the inverse of that of the bypass damper.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
H00	Heat recovery - type	0	0	4		S	R/W		HR119 (16bit)
H01	Heat recovery - outside temperature summer limit	30	20	40	°C	S	R/W		HR120 (16bit)
H02	Heat recovery - outside temperature winter limit	10	-20	20	°C	S	R/W		HR121 (16bit)
H03	Heat recovery - PID proportional factor	8	0	99		S	R/W		HR122 (16bit)
H04	Heat recovery - PID integral time	150	0	999	s	S	R/W		HR123 (16bit)
H06	Heat recovery - PID derivative time	0	0	999	s	S	R/W		HR125 (16bit)
H07	Heat recovery – bypass damper opening time	0	0	999	s	S	R/W		HR464 (16bit)

Tab. 5.l

5.2.1 Defrost

During the winter, the outside air reaches low temperatures and this may cause ice to form on the heat recovery unit. The heat recovery unit is defrosted by modulating the opening of the bypass damper (for a plate heat recovery unit) or by reducing the speed of the thermal wheel.

Activation/deactivation

The defrost condition is identified by reading the outside temperature probe and the exhaust temperature probe, if configured.

The unit activates heat recovery defrost status when both of the following conditions are verified:
- the outside temperature probe reading falls below the maximum defrost request threshold
- the exhaust temperature probe reading falls below the defrost threshold, the unit activates heat recovery defrost.

This condition remains active as long as at least one of the following conditions is true:
- the exhaust temperature rises above the defrost threshold
- the outside temperature rises above the minimum defrost request threshold

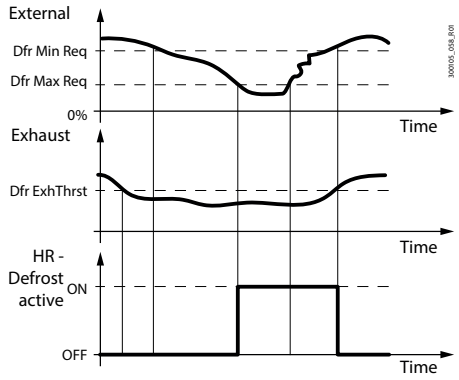


Fig. 5.k

Action

Defrosting is activated by fully opening the bypass damper or by reducing the speed of the thermal wheel to the minimum. For modulating devices, this is applied proportionally from the minimum request threshold to the maximum request threshold.

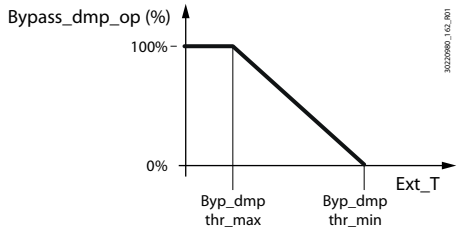


Fig. 5.l

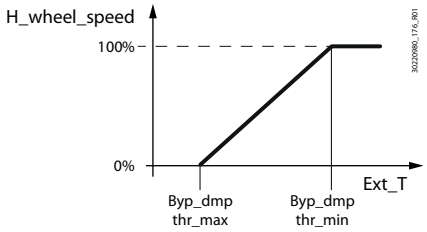


Fig. 5.m

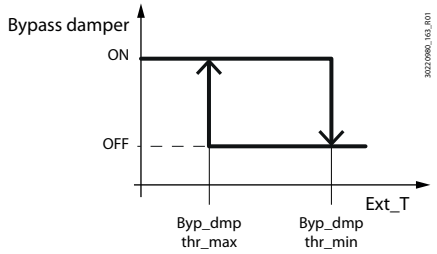


Fig. 5.n

There are also two time-outs: one to set a minimum delay between two consecutive defrosts, the other to set the maximum defrost duration.

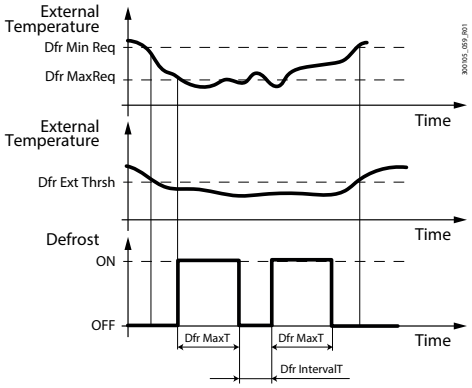


Fig. 5.o

Prevention

Modulating devices feature a prevention phase, during which the bypass damper is opened and the speed of the thermal wheel is reduced before activating defrost status.

The actions are applied proportionally, based on the minimum and maximum request thresholds.

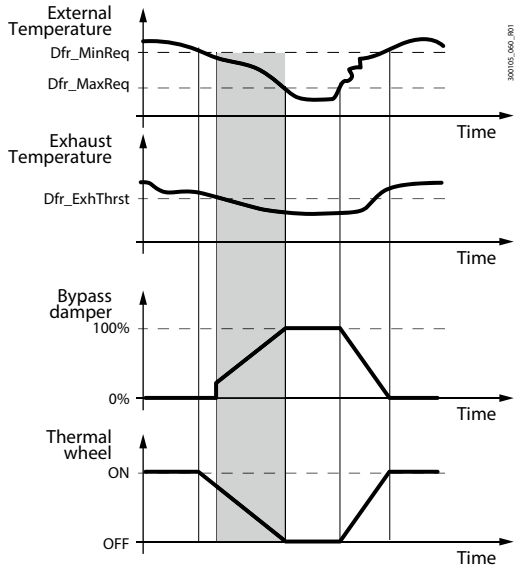


Fig. 5.p

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
d00	Defrost - temp. threshold for maximum heat recovery	-5	d01	20	°C	S	R/W		HR016 (16bit)
d01	Defrost - temp. threshold for minimum heat recovery	-10	-50	d00	°C	S	R/W		HR017 (16bit)
d02	Defrost - exhaust temperature threshold	8	-50	20	°C	S	R/W		HR018 (16bit)
d03	Defrost - maximum duration	1	0	999	min	S	R/W		HR019 (16bit)
d04	Defrost - minimum time between defrosts	1	0	999	min	S	R/W		HR020 (16bit)

Tab. 5.m

5.3 Main coil

uAria operates a main coil, the only coil that can be used for both heating and cooling.
The coil can be:

- On/off electric
- Modulating electric
- Modulating water

The main coil is only activated by temperature control (see Temperature control). If the modulating water coil is selected, how the coil manages heating and cooling requests can be set. The following can be selected:

- Cooling only
- Heating only
- Heating/cooling based on the main season
- Heating/cooling based on the season reserved for the coil set on the keypad
- Heating/cooling based on the season reserved for the coil set by BMS

Notice: for electric heaters, heating-only mode is always activated.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
C00	Main coil - type	0	0	3		S	R/W		HR008 (16bit)
C01	Main coil - mode	2	0	4		S	R/W		HR009 (16bit)
C02	Main coil - cool/heat mode from keypad	FALSE				S	R/W		CS002
C03	Main coil - cool/heat mode from BMS					S	R/W		CS003
C04	Main coil - cooling PID proportional factor	8	0	99		S	R/W		HR010 (16bit)
C05	Main coil - cooling PID integral time	150	0	999	s	S	R/W		HR011 (16bit)
C06	Main coil - cooling PID derivative time	0	0	999	s	S	R/W		HR012 (16bit)
C07	Main coil - heating PID proportional factor	8	0	99		S	R/W		HR013 (16bit)
C08	Main coil - heating PID integral time	150	0	999	s	S	R/W		HR014 (16bit)
C09	Main coil - heating PID derivative time	0	0	999	s	S	R/W		HR015 (16bit)

Tab. 5.n

5.4 Fresh air pre-heater

uAria manages an on/off or modulating fresh air electric pre-heater.
This heater is physically positioned upstream of the heat recovery unit, and its main purpose is to counteract the effect of particularly cold climates. In addition, it can also be used for normal temperature control.

Consequently, how the heater is controlled can be selected:
- Main temperature control
- Low outside temperature prevention
- Both of the above

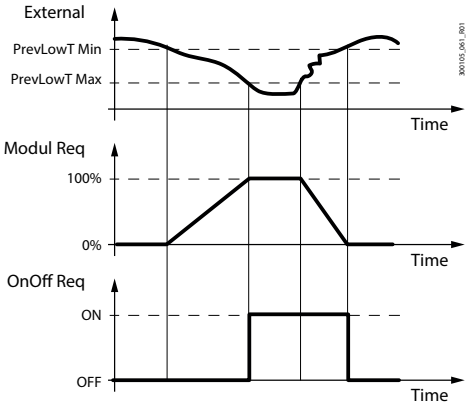


Fig. 5.a

If main temperature control is set, the request is generated by the temperature control (see Temperature control). If low outside temperature prevention is set, the temperature can be controlled based on either the outside probe or a dedicated coil probe.

In both cases, two thresholds can be set:
- Minimum request threshold
- Maximum request threshold

For modulating heaters, the request is calculated proportionally, increasing from the minimum threshold until reaching the maximum at the maximum threshold. On/off heaters are activated when the temperature falls below the maximum request threshold, and are deactivated when the temperature rises above the minimum request threshold.

If both types of control are set, the two requests will be calculated as described above, and the heater will be activated based on the higher of the two.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
J00	Fresh air pre-heater - type	0	0	2		S	R/W		HR133 (16bit)
J01	Fresh air pre-heater - control type	1	0	2		S	R/W		HR134 (16bit)
J02	Fresh air pre-heater - PID proportional factor	8	0	99		S	R/W		HR135 (16bit)
J03	Fresh air pre-heater - PID integral time	150	0	999	s	S	R/W		HR136 (16bit)
J04	Fresh air pre-heater - PID derivative time	0	0	999	s	S	R/W		HR137 (16bit)
J05	Prevent low temperature - minimum request	5	J06	50	°C	S	R/W		HR138 (16bit)
J06	Prevent low temperature - maximum request	-5	-50	J05	°C	S	R/W		HR139 (16bit)

Tab. 5.o

5.5 Auxiliary output

uAria manages a completely configurable auxiliary output. This can be used to manage an additional device, in addition to those already managed by the software. The type of output controlled can be selected as on/off or modulating. The input used for control can be selected from all of the probes available or a dedicated auxiliary probe:

0.	Supply temperature	5.	Frost protection temperature	10.	Return air pressure
1.	Room temperature	6.	Supply humidity	11.	Air quality CO2
2.	Return temperature	7.	Room humidity	12.	Air quality VOC
3.	Outside temperature	8.	Return humidity	13.	Auxiliary probe
4.	Exhaust temperature	9.	Supply air pressure		

Activation of control can depend on several conditions, including:
0. Always on
1. At unit power-on
2. When the fans are activated
3. When a dedicated auxiliary input is activated.

The control set point can be selected between:

0.	Temperature set point	3.	Return pressure set point	6.	Air quality set point
1.	Return flow set point	4.	Supply pressure set point	7.	Dedicated auxiliary set point
2.	Supply flow set point	5.	Humidity set point		

The mode can be selected between:
0. Cooling only
1. Heating only
2. Cooling/heating based on unit mode

Caution: "Cooling/heating based on unit mode" refers to the unit operating mode, cooling or heating, and not the current season.

Once all of the settings have been made, the request is calculated: via PID if configured as a modulating output, or using a simple hysteresis if configured as on/off.

Modulating:

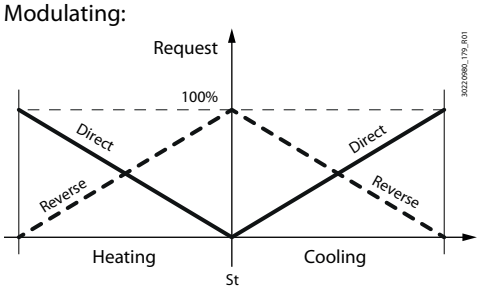


Fig. 5.q

On/Off:

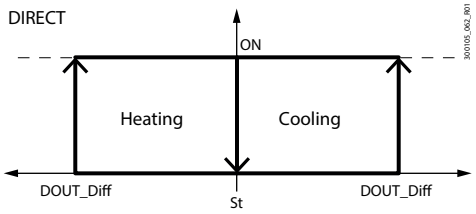


Fig. 5.r

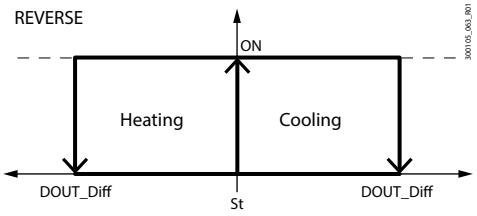


Fig. 5.s

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
G00	Auxiliary output - type	0	0	2		S	R/W		HR105 (16bit)
G01	Auxiliary output - AIN type	13	0	13		S	R/W		HR106 (16bit)
G02	Auxiliary output - enable control type	1	0	3		S	R/W		HR107 (16bit)
G03	Auxiliary output - set point type	8	0	8		S	R/W		HR108 (16bit)
G04	Auxiliary output - set point	20	-9999	9999		S	R/W		HR109 (16bit)
G05	Auxiliary output - PID cool/heat mode	2	0	2		S	R/W		HR110 (16bit)
G06	Auxiliary output - PID reverse mode	0	0	1		S	R/W		HR111 (16bit)
G07	Auxiliary output - PID dead band	0	-9999	9999		S	R/W		HR112 (16bit)
G08	Auxiliary output - PID proportional factor	8	0	99		S	R/W		HR113 (16bit)
G09	Auxiliary output - PID integral time	150	0	999	s	S	R/W		HR114 (16bit)
G10	Auxiliary output - PID derivative time	0	0	999	s	S	R/W		HR115 (16bit)
G11	Auxiliary output - PID low limit	0	0	100	%	S	R/W		HR116 (16bit)
G12	Auxiliary output - PID high limit	100	0	100	%	S	R/W		HR117 (16bit)
G13	Auxiliary output - DOUT differential	2	-9999	9999		S	R/W		HR118 (16bit)

Tab. 5.p

5.6 Switching on/off

During unit start-up, a device activation sequence is applied:

1. the return fan is activated, so as to begin to extract air from the room;
2. after a settable delay, the supply fan is activated;
3. if both fans are working correctly and the flow measured is sufficient (see Flow control), the other devices are then activated based on the control settings.

For modulating fans, switch-on speed can be set and differs between the supply and return fans. When the main control is active, fans will start operating at the switch-on speed, avoiding sudden changes in speed.

During the shutdown phase, all of the devices are switched off.
The fans only remain on if necessary for post-ventilation (see Post-ventilation).

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
S00	Supply fan - start delay time	0	0	999	s	S	R/W		HR386 (16bit)
S01	Supply fan - switch-on speed	50	0	100	%	S	R/W		HR387 (16bit)
r01	Return fan - switch-on speed	50	0	100	%	S	R/W		HR377 (16bit)
f14	Fans - post ventilation time	10	0	999	s	S	R/W		HR095 (16bit)

Tab. 5.q

5.7 Scheduler

uAria offers the possibility to enable a scheduler. Three different profiles can be programmed:

- Economy - Comfort

The Economy and Comfort profiles have different control set points. The Off profile, on the other hand, switches the unit to "Off from scheduler" status.

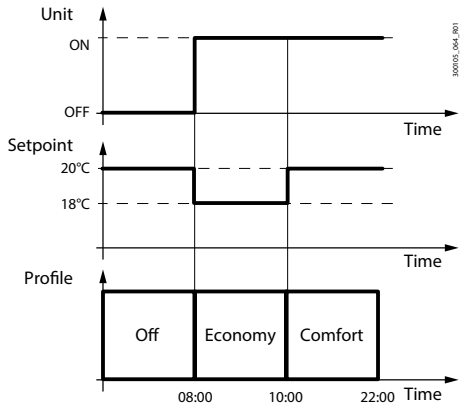


Fig. 5.t

Up to four programs can be set (P1, P2, P3 and P4), each with four daily time bands. Each time band can be enabled and the start time and profile can be selected. The set profile will then remain active until the start of the next time band.

The operating mode can be selected for each day of the week, and can be:

Off	PROGRAM1	PROGRAM3
Economy	PROGRAM2	PROGRAM4
Comfort		

If selecting Off, Economy or Comfort, that profile will remain active for the entire day, from 00:00 to 23:59.
If selecting P1 to P4, the set daily program will be active.

The default setting is:

- P1 used as the weekday program (Monday to Friday)
- P2 used as the weekend program (Saturday and Sunday)

P1 (weekday program) has two time bands:

1. At 08:00 the Comfort profile starts
2. At 22:00 the Economy profile starts

P2 (weekend program) also has two time bands:

1. At 08:00 the Comfort profile starts
2. At 22:00 the Off profile starts

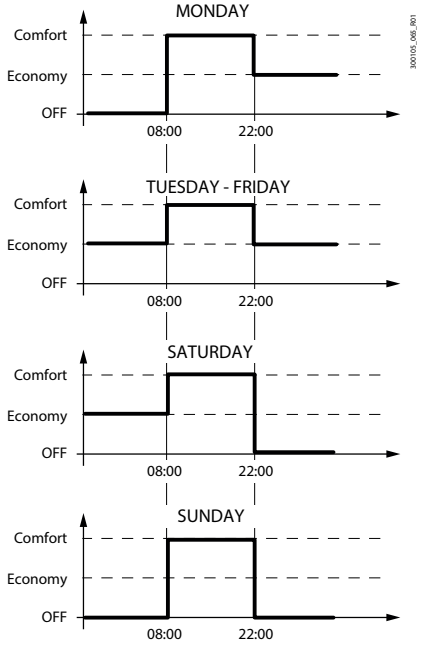


Fig. 5.u

A vacation period can be enabled, during which a different operating mode from ordinary programming is active. In this case, the vacation start and end day and month can be set; the selected mode will be activated in the set period.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
E00	Scheduler - enable	FALSE				U	R/W	x	CS004
E01	Scheduler - Prog1 - band 1 enable					U	R/W		CS005
E02	Scheduler - Prog1 - band 1 start hours	0	0	23	h	U	R/W		HR021 (16bit)
E02-E03	Scheduler - Prog1 - band 1 time					U	R/W		
E03	Scheduler - Prog1 - band 1 start minutes	0	0	59	min	U	R/W		HR022 (16bit)
E04	Scheduler - Prog1 - band 1 profile		0	2		U	R/W		HR023 (16bit)
E05	Scheduler - Prog1 - band 2 enable					U	R/W		CS006
E06	Scheduler - Prog1 - band 2 start hours	0	0	23	h	U	R/W		HR024 (16bit)
E06-E07	Scheduler - Prog1 - band 2 time					U	R/W		
E07	Scheduler - Prog1 - band 2 start minutes	0	0	59	min	U	R/W		HR025 (16bit)
E08	Scheduler - Prog1 - band 2 profile		0	2		U	R/W		HR026 (16bit)
E09	Scheduler - Prog1 - band 3 enable					U	R/W		CS007
E10	Scheduler - Prog1 - band 3 start hours	0	0	23	h	U	R/W		HR027 (16bit)
E10-E11	Scheduler - Prog1 - band 3 time					U	R/W		
E11	Scheduler - Prog1 - band 3 start minutes	0	0	59	min	U	R/W		HR028 (16bit)
E12	Scheduler - Prog1 - band 3 profile		0	2		U	R/W		HR029 (16bit)
E13	Scheduler - Prog1 - band 4 enable					U	R/W		CS008
E14	Scheduler - Prog1 - band 4 start hours	0	0	23	h	U	R/W		HR030 (16bit)
E14-E15	Scheduler - Prog1 - band 4 time					U	R/W		
E15	Scheduler - Prog1 - band 4 start minutes	0	0	59	min	U	R/W		HR031 (16bit)
E16	Scheduler - Prog1 - band 4 profile		0	2		U	R/W		HR032 (16bit)
E17	Scheduler - Prog2 - band 1 enable					U	R/W		CS009
E18	Scheduler - Prog2 - band 1 start hours	0	0	23	h	U	R/W		HR033 (16bit)
E18-E19	Scheduler - Prog2 - band 1 time					U	R/W		
E19	Scheduler - Prog2 - band 1 start minutes	0	0	59	min	U	R/W		HR034 (16bit)
E20	Scheduler - Prog2 - band 1 profile		0	2		U	R/W		HR035 (16bit)
E21	Scheduler - Prog2 - band 2 enable					U	R/W		CS010
E22	Scheduler - Prog2 - band 2 start hours	0	0	23	h	U	R/W		HR036 (16bit)
E22-E23	Scheduler - Prog2 - band 2 time					U	R/W		
E23	Scheduler - Prog2 - band 2 start minutes	0	0	59	min	U	R/W		HR037 (16bit)
E24	Scheduler - Prog2 - band 2 profile		0	2		U	R/W		HR038 (16bit)
E25	Scheduler - Prog2 - band 3 enable					U	R/W		CS011
E26	Scheduler - Prog2 - band 3 start hours	0	0	23	h	U	R/W		HR039 (16bit)
E26-E27	Scheduler - Prog2 - band 3 time					U	R/W		
E27	Scheduler - Prog2 - band 3 start minutes	0	0	59	min	U	R/W		HR040 (16bit)
E28	Scheduler - Prog2 - band 3 profile		0	2		U	R/W		HR041 (16bit)
E29	Scheduler - Prog2 - band 4 enable					U	R/W		CS012
E30	Scheduler - Prog2 - band 4 start hours	0	0	23	h	U	R/W		HR042 (16bit)
E30-E31	Scheduler - Prog2 - band 4 time					U	R/W		
E31	Scheduler - Prog2 - band 4 start minutes	0	0	59	min	U	R/W		HR043 (16bit)
E32	Scheduler - Prog2 - band 4 profile		0	2		U	R/W		HR044 (16bit)
E33	Scheduler - Prog3 - band 1 enable					U	R/W		CS013
E34	Scheduler - Prog3 - band 1 start hours	0	0	23	h	U	R/W		HR045 (16bit)
E34-E35	Scheduler - Prog3 - band 1 time					U	R/W		
E35	Scheduler - Prog3 - band 1 start minutes	0	0	59	min	U	R/W		HR046 (16bit)
E36	Scheduler - Prog3 - band 1 profile		0	2		U	R/W		HR047 (16bit)
E37	Scheduler - Prog3 - band 2 enable					U	R/W		CS014
E38	Scheduler - Prog3 - band 2 start hours	0	0	23	h	U	R/W		HR048 (16bit)
E38-E39	Scheduler - Prog3 - band 2 time					U	R/W		
E39	Scheduler - Prog3 - band 2 start minutes	0	0	59	min	U	R/W		HR049 (16bit)
E40	Scheduler - Prog3 - band 2 profile		0	2		U	R/W		HR050 (16bit)
E41	Scheduler - Prog3 - band 3 enable					U	R/W		CS015
E42	Scheduler - Prog3 - band 3 start hours	0	0	23	h	U	R/W		HR051 (16bit)
E42-E43	Scheduler - Prog3 - band 3 time					U	R/W		
E43	Scheduler - Prog3 - band 3 start minutes	0	0	59	min	U	R/W		HR052 (16bit)
E44	Scheduler - Prog3 - band 3 profile		0	2		U	R/W		HR053 (16bit)
E45	Scheduler - Prog3 - band 4 enable					U	R/W		CS016
E46	Scheduler - Prog3 - band 4 start hours	0	0	23	h	U	R/W		HR054 (16bit)
E46-E47	Scheduler - Prog3 - band 4 time					U	R/W		
E47	Scheduler - Prog3 - band 4 start minutes	0	0	59	min	U	R/W		HR055 (16bit)
E48	Scheduler - Prog3 - band 4 profile		0	2		U	R/W		HR056 (16bit)
E49	Scheduler - Prog4 - band 1 enable					U	R/W		CS017
E50	Scheduler - Prog4 - band 1 start hours	0	0	23	h	U	R/W		HR057 (16bit)
E50-E51	Scheduler - Prog4 - band 1 time					U	R/W		
E51	Scheduler - Prog4 - band 1 start minutes	0	0	59	min	U	R/W		HR058 (16bit)
E52	Scheduler - Prog4 - band 1 profile		0	2		U	R/W		HR059 (16bit)
E53	Scheduler - Prog4 - band 2 enable					U	R/W		CS018
E54	Scheduler - Prog4 - band 2 start hours	0	0	23	h	U	R/W		HR060 (16bit)
E54-E55	Scheduler - Prog4 - band 2 time					U	R/W		
E55	Scheduler - Prog4 - band 2 start minutes	0	0	59	min	U	R/W		HR061 (16bit)
E56	Scheduler - Prog4 - band 2 profile		0	2		U	R/W		HR062 (16bit)
E57	Scheduler - Prog4 - band 3 enable					U	R/W		CS019
E58	Scheduler - Prog4 - band 3 start hours	0	0	23	h	U	R/W		HR063 (16bit)
E58-E59	Scheduler - Prog4 - band 3 time					U	R/W		

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
E59	Scheduler - Prog4 - band 3 start minutes	0	0	59	min	U	R/W		HR064 (16bit)
E60	Scheduler - Prog4 - band 3 profile		0	2		U	R/W		HR065 (16bit)
E61	Scheduler - Prog4 - band 4 enable					U	R/W		CS020
E62	Scheduler - Prog4 - band 4 start hours	0	0	23	h	U	R/W		HR066 (16bit)
E62-E63	Scheduler - Prog4 - band 4 time					U	R/W		
E63	Scheduler - Prog4 - band 4 start minutes	0	0	59	min	U	R/W		HR067 (16bit)
E64	Scheduler - Prog4 - band 4 profile		0	2		U	R/W		HR068 (16bit)
E65	Scheduler - Monday mode		0	6		U	R/W		HR069 (16bit)
E66	Scheduler - Tuesday mode		0	6		U	R/W		HR070 (16bit)
E67	Scheduler - Wednesday mode		0	6		U	R/W		HR071 (16bit)
E68	Scheduler - Thursday mode		0	6		U	R/W		HR072 (16bit)
E69	Scheduler - Friday mode		0	6		U	R/W		HR073 (16bit)
E70	Scheduler - Saturday mode		0	6		U	R/W		HR074 (16bit)
E71	Scheduler - Sunday mode		0	6		U	R/W		HR075 (16bit)
E72	Scheduler - enable vacation period					U	R/W		CS021
E73	Scheduler - vacation period start day	1	1	31	d	U	R/W		HR076 (16bit)
E74	Scheduler - vacation period start month	1	1	12	mo	U	R/W		HR077 (16bit)
E75	Scheduler - vacation period end day	1	1	31	d	U	R/W		HR078 (16bit)
E76	Scheduler - vacation period end month	1	1	12	mo	U	R/W		HR079 (16bit)
E77	Scheduler - vacation period mode		0	6		U	R/W		HR080 (16bit)
SCo	Scheduler - on/off status (FALSE=Off,TRUE=On)					M	R		IS178
SCS	Scheduler - status		0	6		U	R	x	IR084 (16bit)

Tab. 5.r

5.8 Summer/winter and cooling/heating

The reference season can be set: this affects the selection of the set points used for temperature control (see Temperature control) and humidity control (see Humidity control).
The season can be changed by:

1. Keypad
2. Digital input
3. BMS
4. Automatic

If set to "automatic", changeover is based on the outside temperature. In this case, in fact, the outside temperature is measured and compared against two thresholds, one in winter and one in summer. When the temperature exceeds one of these thresholds, after a settable time, the reference season changes.

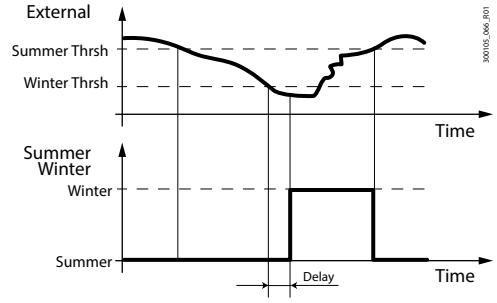


Fig. 5.v

The unit automatically selects whether to operate in cooling or heating mode based on the controlled temperature and how much this deviates from the reference set point. Both the offset and the waiting delay to change mode can be set. The mode will changeover only if there is no remaining temperature request: this is why an excessive temperature control request will cause an undesired changeover in mode.

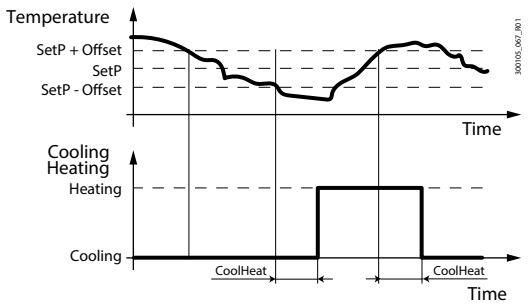


Fig. 5.w

5.9 Temperature control

uAria manages the operating of modulating devices so as to reach the temperature set point.
Several types of control are available:

1. Supply only
2. Return only
3. Room only
4. Return + supply
5. Room + supply

Supply, return or room temperature control

This type of control uses the selected temperature probe only: the probe reading and the corresponding set point are used to calculate the request.
Sequential PID control is applied (see Sequential control), which progressively activates all of the devices available on the unit, as set in the configuration menu.

For correct operation of this function, the following need to be set:
- The PID parameters relating to each individual actuator, considering the type of probe selected; the supply probe will have fast response times compared to return and room control
- Supply, return or room set point
- With return or room control, evaluate whether to enable supply limit control.

If auxiliary fan temperature control is enabled, another PID is activated in parallel with the main control function, and will follow the same logic as the other auxiliary control functions, as described in the chapter on Auxiliary control.
This additional control is only possible with return or room temperature control.

Return + supply or room + supply temperature control

This type of control uses two temperature probes at the same time.
It is optimised so as to reach the desired return or room temperature.
To do this, two control procedures are adopted:
- a first cascade control with the following stages:
  - first stage, if auxiliary fan temperature control is enabled, will calculate an additional request, following the logic described in the chapter on Auxiliary control;
  - second stage, controlling the room or return temperature, to calculate the supply set point;
- sequential control (see Sequential control), based on the supply probe reading. The function controls the return or room temperature by modulating the unit's heating or cooling capacity via supply control with a fixed set point.

For correct operation of this function, the following need to be set:
- The PID parameters relating to each individual actuator, used for the sequence managed by the sequential PID
- The PID parameters relating to cascade control, used to calculate the supply set point
- The minimum and maximum supply limits, used as the control range for calculating the supply set point
- Room or return set point

Sequential control

The uAria controller manages different devices, which can either operate alone or in a coordinated manner to ensure the best indoor comfort conditions. Each device is activated only after the previous device reaches full load. Considering then that each device will make a different contribution in terms of deliverable capacity and response time, each individual actuator can be calibrated with its own gain and integral time.

Below is a functional diagram of sequential PID control: with a single set point and a series of PID parameters for each device, the request is divided into a series of sub-requests, corresponding to the number of devices.

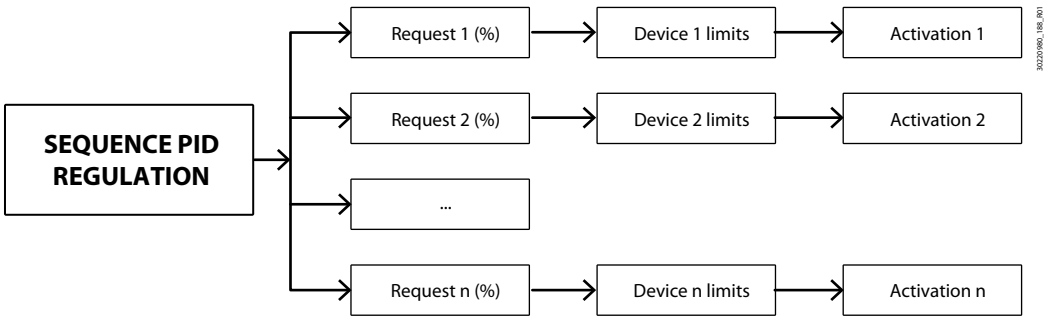


Fig. 5.x

The devices to be activated depend on the unit operating mode:

In cooling:

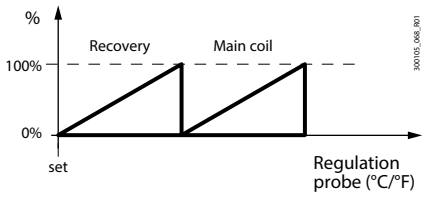


Fig. 5.y

In heating:

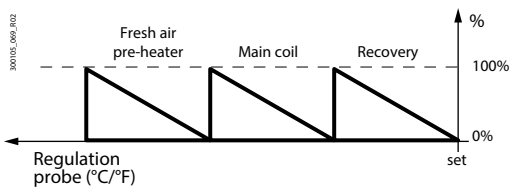


Fig. 5.z

If freecooling or freeheating status is active, the devices that are controlled change. In this case, in fact, heat recovery will be deactivated (bypass damper = 100%, thermal wheel = 0%).

In cooling with freecooling active:

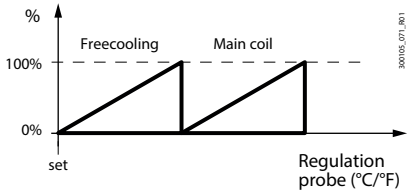


Fig. 5.aa

In cooling with freeheating active:

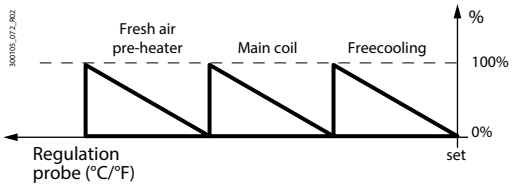


Fig. 5.ab

Notice: freecooling/freeheating and heat recovery are considered alternatives, as during freecooling/freeheating the by-pass damper is open and heat recovery is disabled.

Supply temperature limit

The algorithm corrects the actions implemented by the main control so as to remain within acceptable supply temperature values. This occurs, and is a required condition, when the main temperature control is not supply temperature control. The function uses a minimum and a maximum limit, with diversified actions according to the operating mode, heating or cooling.

	Low temperature limit	High temperature limit
Heating mode	In the event where the return set point has been reached but there is an active air quality control request. This leads to the introduction of cool outside air below the minimum limit. Limit control will thus increase the output of the heating devices.	Return temperature control may lead to the introduction of excessively hot air, due for example to overloading of the heating coils. Limit control will thus gradually reduce the output of the heating devices.
Cooling mode	Return temperature control may lead to the introduction of excessively cold air, due for example to low outside temperatures or overloading of the cooling coil. Limit control will thus gradually reduce the output of the cooling devices (coils and freecooling) and subsequently activate the heating devices, where available.	In the event where the return set point has been reached but there is an active air quality control request. This leads to the introduction of excessively hot outside air, above the minimum limit. Limit control will thus increase the output of the cooling devices.

Tab. 5.s

A gain and an integral time can be set to calibrate the limit control response, while different settings are possible for the limit request and the increase request. The same thresholds are also used as an alarm that, with a suitable delay, shuts the unit down (OFF) when reaching the minimum limit in cooling mode and the maximum limit in heating mode. In other cases, the alarm does not shut the unit down and is signal-only.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
t00	Temperature control type	0	0	5		S	R/W		HR396 (16bit)
t01	Summer/Winter - selection type	3	0	3		U	R/W		HR397 (16bit)
t02	Summer/Winter - change delay time	1	0	999	min	S	R/W		HR398 (16bit)
t03	Summer/Winter - Outside temperature summer threshold	28	t04	50	°C	S	R/W		HR399 (16bit)
t04	Summer/Winter - Outside temperature winter threshold	16	-20	t03	°C	S	R/W		HR400 (16bit)
t05	Cooling/Heating change - offset	2	0	20	°C	S	R/W		HR401 (16bit)
t06	Cooling/Heating change - delay time	1	0	999	min	S	R/W		HR402 (16bit)
t07	Freecooling - offset	3	0	20	°C	S	R/W		HR403 (16bit)
t08	Freeheating - offset	3	0	20	°C	S	R/W		HR404 (16bit)
t09	Freecooling - PID proportional factor	8	0	99		S	R/W		HR405 (16bit)
t10	Freecooling - PID integral time	150	0	999	s	S	R/W		HR406 (16bit)
t11	Freecooling - PID derivative time	0	0	999	s	S	R/W		HR407 (16bit)
t12	Freeheating - PID proportional factor	8	0	99		S	R/W		HR408 (16bit)
t13	Freeheating - PID integral time	150	0	999	s	S	R/W		HR409 (16bit)
t14	Freeheating - PID derivative time	0	0	999	s	S	R/W		HR410 (16bit)
t15	Temp. set point offset - PID proportional factor	8	0	99		S	R/W		HR411 (16bit)
t16	Temp. set point offset - PID derivative time	0	0	999	s	S	R/W		HR412 (16bit)
t17	Temp. set point offset - PID integral time	150	0	999	s	S	R/W		HR413 (16bit)
t18	Low supply temperature limit	16	0	t19	°C	S	R/W		HR414 (16bit)
t19	High supply temperature limit	32	t18	60	°C	S	R/W		HR415 (16bit)
t20	Low/High supply temp. - limit PID proportional factor	8	0	99		S	R/W		HR416 (16bit)
t21	Low/High supply temp. - limit PID integral time	150	0	999	s	S	R/W		HR417 (16bit)
t22	Low/High supply temp. - limit PID derivative time	0	0	999	s	S	R/W		HR418 (16bit)
t23	Low/High supply temp. - offset PID proportional factor	8	0	99		S	R/W		HR419 (16bit)
t24	Low/High supply temp. - offset PID integral time	150	0	999	s	S	R/W		HR420 (16bit)
t25	Low/High supply temp. - offset PID derivative time	0	0	999	s	S	R/W		HR421 (16bit)
t26	Low supply temperature alarm delay	10	0	999	min	S	R/W		HR422 (16bit)
t27	High supply temperature alarm delay	10	0	999	min	S	R/W		HR423 (16bit)
t28	Temperature regulation - PID Proportional factor	8	0	99		S	R/W		HR467 (16bit)
t29	Temperature regulation - PID Integral time	150	0	999	s	S	R/W		HR468 (16bit)
t30	Temperature regulation - PID Derivative time	0	0	99	s	S	R/W		HR469 (16bit)

Tab. 5.t

5.10 Air quality control

uAria can guarantee excellent levels of air quality by enabling auxiliary ventilation control (see Auxiliary controls). If enabled, a percentage request will be generated via the PID algorithm to keep the air quality as close as possible to the set point. Two air quality probes are managed: CO2 and VOC.

Control will be based on only one of the two probes, in this order:
- the CO2 probe, if available
- the VOC probe, if available

It is possible to set thresholds beyond which, after a settable delay, an alarm is generated to signal a probable fault, as well as a high air pollution alarm in the room.

It is also possible to connect the new IAQ probe via serial for reading the temperature/humidity/VOC/CO2/PM values: see paragraph 1.4.10 for the compatible part numbers.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
q01	Air quality - CO2 alarm threshold	900	0	1200	ppm	S	R/W		HR365 (16bit)
q02	Air quality - VOC alarm threshold	90	0	100	%	S	R/W		HR366 (16bit)
q06	Air quality - PID proportional factor	8	0	99		S	R/W		HR370 (16bit)
q07	Air quality - PID integral time	150	0	999	s	S	R/W		HR371 (16bit)
q08	Air quality - PID derivative time	0	0	999	s	S	R/W		HR372 (16bit)
q09	High CO2 alarm delay	30	0	999	min	S	R/W		HR373 (16bit)
q10	High VOC alarm delay	30	0	999	min	S	R/W		HR374 (16bit)
y36	IAQ - Device address	7	1	247		S	R/W		HR469 (16bit)
y37	IAQ - device timeout	1000				S	R/W		HR495 (16bit)
y38	IAQ - command delay time	0				S	R/W		HR470 (16bit)
y39	IAQ - Enable display backlight					S	R/W		CS108

Tab. 5.u

5.11 Humidity control

uAria can guarantee excellent levels of air quality by also controlling the humidity in the environment through auxiliary ventilation control (see Auxiliary controls). As no humidifier or specific dehumidification function is managed, this function works by intelligently managing the amount of fresh outside air introduced into the room. This is done by comparing the indoor and outside absolute humidity: if the conditions are favourable, humidity control can be activated, otherwise it is disabled. This function requires both the humidity probe and the corresponding temperature probe.

The available probe is selected automatically, in order of priority:
1. Room humidity probe, if configured
2. Return humidity probe, if configured

If control is enabled and the conditions are favourable, a percentage request will be generated through the PID algorithm to keep the air humidity as close as possible to the set point.

It is also possible to set a threshold beyond which, after a settable delay, an alarm is generated to signal a probable fault, as well as a high room humidity alarm.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
q00	Humidity - alarm threshold	85	0	100	%RH	S	R/W		HR364 (16bit)
q03	Humidity - PID proportional factor	8	0	99		S	R/W		HR367 (16bit)
q04	Humidity - PID integral time	150	0	999	s	S	R/W		HR368 (16bit)
q05	Humidity - PID derivative time	0	0	999	s	S	R/W		HR369 (16bit)
q11	High humidity alarm delay	30	0	999	min	S	R/W		HR375 (16bit)

Tab. 5.v

5.12 Frost protection

The frost protection function (also referred to as antifreeze) is used to protect the unit against particularly harsh temperature conditions. In particular, it is used to stop ice forming on the water coils and damaging them.
This function can be enabled both with the unit on and off.

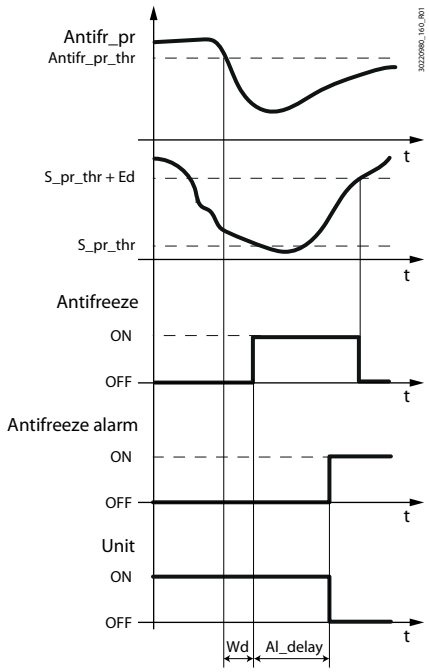
Activation

Frost protection can be activated by controlling:
- The outside temperature probe
- The frost protection temperature probe

If the temperature read by the frost protection control probe falls below the threshold for longer than the "warning delay", the unit goes into "Frost protection" status. If it remains in this status for longer than the "alarm delay" time, the unit switches off, going into "Off by alarm" status.

Deactivation

Frost protection is deactivated when the value read by the frost protection probe is greater than the frost protection threshold plus a settable differential.



Key:

Antifr_pr	Frost protection temperature
Antifr_pr_thr	Frost protection temperature threshold
Antifreeze alarm	Frost protection alarm
Wd	Warning delay
S_pr_th	Supply probe threshold

Fig. 5.ac

Control

If the condition for ending frost protection does not occur before the "Warning delay" time, the unit goes into frost protection status and the corresponding procedure is started.

5.12.1 Frost protection procedure

The frost protection procedure comprises two stages:

1. Prevention stage
2. Protection stage

Prevention

In the prevention stage, an attempt is made to limit the flow of outside air across the water coil.
Consequently, the fan request is limited, causing them to slow down proportionally to the controlled frost protection temperature. The limiting action begins when the temperature falls below the frost protection alarm reset threshold, until reaching the maximum when the temperature falls below the frost protection threshold.
The fans slow down until they reach a settable minimum frost protection speed threshold.

Protection

In the protection stage, ventilation stops completely and the coil valve is opened.
The function acts differently depending on the type of coil:

- For water coils, the valve is opened to a set frost protection percentage
- Electric coils are switched off (always based on the post-ventilation function)

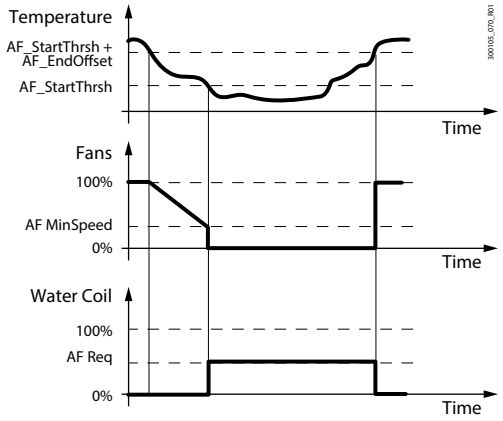


Fig. 5.ad

This action is maintained until the frost protection condition is reset, or until the alarm is activated after the set delay has elapsed. Moreover, the protection function can also be enabled when the unit is off, so that once the alarm is activated and the unit is switched off, the coil valve remains open at the set frost protection percentage.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
I00	Antifreeze - control type	0	0	2		S	R/W		HR126 (16bit)
I01	Antifreeze - start thresholds	-5	-20	20	°C	S	R/W		HR127 (16bit)
I02	Antifreeze - end delta	3	0	20	°C	S	R/W		HR128 (16bit)
I03	Antifreeze - action delay time	60	0	999	s	S	R/W		HR129 (16bit)
I04	Antifreeze - alarm delay time	20	0	999	min	S	R/W		HR130 (16bit)
I05	Antifreeze - enable with unit OFF	FALSE				S	R/W		CS028
I06	Coil antifreeze request	50	0	100	%	S	R/W		HR131 (16bit)
I07	Antifreeze - min fan speed	20	0	100	%	S	R/W		HR132 (16bit)

Tab. 5.w

5.13 Room terminal

uAria can manage a thTune room terminal. The room terminal can manage the basic unit functions and read the room temperature and humidity (depending on the part number).

From the room terminal, the following actions are possible:
- On/Off the unit with the "Power" button.
- Change the season with the "Mode" button. If the change of season is not set with "keyboard" option: the button will be blocked.
- Select the fan speed with the "Fan" button. In this case, the "3 Speed Mode" function described in paragraph "5.1.4 Auxiliary functions" is used. If "Auto" speed is selected: the fan follows the request calculated by the set regulation.
- Change the temperature setpoint. The modification will change the setpoint according to the season and the status of the current schedule.

View the value of different probes.
- The probes will be visible:
  - Room temperature
  - Room humidity
  - Delivery temperature
  - External temperature
- The values will only be visible if the probes are configured.

The room also uses LEDs and icons to show other important information:
- Alarm icon: flashing in the event of a serious alarm.
- Defrost icon: on if heat recovery unit defrost in progress.
- Ventilation icon: on if at least one fan is on; flashing for a fan alarm
- Heating icon:
  - on if fresh air pre-heater active or main coil active in heating mode
  - freeheating active
- Cooling icon:
  - on if main coil active in cooling mode
  - freecooling active
- Summer icon: on if summer season active
- Winter icon: on if winter season active
- Auto icon: on if season changeover set to automatic.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
y23	Enable thTune management	FALSE				S	R/W		CS088
y25	thTune - device address	1	1	247		S	R/W		HR487 (16bit)
y26	thTune - timeout	200	200	3000		S	R/W		HR488 (16bit)
y27	thTune - command delay	0	0	1000		S	R/W		HR489 (16bit)
f11	Fans - fixed speed 1		0	100	%	S	R/W		HR092 (16bit)
f12	Fans - fixed speed 2		0	100	%	S	R/W		HR093 (16bit)
f13	Fans - fixed speed 3		0	100	%	S	R/W		HR094 (16bit)

Tab. 5.x

5.14 Manual mode

It is possible set the different devices in manual mode to force their request respect to normal regulation. Each device has equipped with own enabling and manual request parameters; if enabled, the device will follow the request set for a time by a parameter. After this specific time, the device will return to automatic regulation mode. The manual mode works only if the uniti is on and in regulation, in case of alarm. If unit is off the device will switch off as normal.

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
n00	Manual mode reset time	60	0	999	min	S	R/W		HR317
n01	Enable supply fan manual mode	FALSE	FALSE	TRUE	-	S	R/W	X	CS54
n02	Supply fan manual mode value	0	0	n02-h	%	S	R/W	X	HR318
n03	Enable return fan manual mode	FALSE	FALSE	TRUE	-	S	R/W	X	CS55
n04	Return fan manual mode value	0	0	n04-h	%	S	R/W	X	HR319
n05	Enable heat recovery manual mode	FALSE	FALSE	TRUE	-	S	R/W	X	CS56
n06	Heat recovery manual mode value	0	0	n06-h	%	S	R/W	X	HR320
n07	Enable main coil manual mode	FALSE	FALSE	TRUE	-	S	R/W	X	CS57
n08	Main coil manual mode value	0	0	n08-h	%	S	R/W	X	HR321
n09	Enable freshair preheater coil manual mode	FALSE	FALSE	TRUE	-	S	R/W	X	CS58
n10	Freshair preheater coil manual mode value	0	0	n10-h	%	S	R/W	X	HR322
n11	Enable auxiliary device manual mode	FALSE	FALSE	TRUE	-	S	R/W	X	CS59
n12	Auxiliary device manual mode value	0	0	n12-h	%	S	R/W	X	HR323

Tab. 5.y

6. PARAMETER TABLE

uAria provides a database of supervisor variables via Modbus RTU protocol over RS485 (BMS port on the uAria controller). The BMS port has the following default settings:

- baud rate 115,200;
- 8 data bits;
- no parity;
- 1 stop bit

VSee the "Parameter table: Settings" to set different values. "Index" is the address specified in the Modbus® frame.

Notice:

- Levels: U=User; S=Service; M=Manufacturer;
- Display: the x indicates that the parameter can be accessed from the user terminal;
- R/W=read/write parameters; R=read-only parameters.

6.1 AirQuality/Humidity

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
q00	Humidity - alarm threshold	85	0	100	%rH		S	R/W		HR364 (16bit)
q01	Air quality - CO2 alarm threshold	900	0	1200	ppm		S	R/W		HR365 (16bit)
q02	Air quality - VOC alarm threshold	90	0	100	%		S	R/W		HR366 (16bit)
q03	Humidity - PID Proportional factor	8	0	99			S	R/W		HR367 (16bit)
q04	Humidity - PID Integral time	150	0	999	s		S	R/W		HR368 (16bit)
q05	Humidity - PID Derivative time	0	0	999	s		S	R/W		HR369 (16bit)
q06	Air quality - PID Proportional factor	8	0	99			S	R/W		HR370 (16bit)
q07	Air quality - PID Integral time	150	0	999	s		S	R/W		HR371 (16bit)
q08	Air quality - PID Derivative time	0	0	999	s		S	R/W		HR372 (16bit)
q09	High CO2 alarm delay	30	0	999	min		S	R/W		HR373 (16bit)
q10	High VOC alarm delay	30	0	999	min		S	R/W		HR374 (16bit)
q11	High humidity alarm delay	30	0	999	min		S	R/W		HR375 (16bit)
q12	IAQ - PM type	0	0	1		0: PM 2.5; 1: PM10	S	R/W		HR467 (16bit)
q13	IAQ - VOC sensibility	0	0	2		0: low; 1: medium; 2: high	S	R/W		HR468 (16bit)
EAh	External absolute humidity				gH2O/DAKg		M	R		IR015 (16bit)
rAh	Room/Return absolute humidity				gH2O/DAKg		M	R	x	IR076 (16bit)
Ah-En	Humidity - regulation enabled	FALSE					M	R		DI218
Aq-En	Air quality - enabled	FALSE					S	R		DI217

Tab. 6.a

6.2 Antifreeze

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
I00	Antifreeze - type control	0	0	2		0: disabled; 1: external temperat.; 2: antifreeze temperat.	S	R/W		HR126 (16bit)
I01	Antifreeze - start thresholds	-5	-20	20	°C		S	R/W		HR127 (16bit)
I02	Antifreeze - end delta	3	0	20	°C		S	R/W		HR128 (16bit)
I03	Antifreeze - actions delay time	60	0	999	s		S	R/W		HR129 (16bit)
I04	Antifreeze - alarm delay time	20	0	999	min		S	R/W		HR130 (16bit)
I05	Antifreeze - Enable in unit OFF	FALSE				0: disabled; 1: enabled	S	R/W		CS028
I06	Coil antifreeze request	50	0	100	%		S	R/W		HR131 (16bit)
I07	Antifreeze - fan min speed	20	0	100	%		S	R/W		HR132 (16bit)
AFA	Antifreeze - alarm active						M	R		IS045
AFO	Antifreeze - active						M	R		IS047
pFa	Prevent antifreeze active						M	R		IS168
pFr	Prevent antifreeze request				%		M	R		IR075 (16bit)
Af-En	Antifreeze – enabled						S	R		IS215

Tab. 6.b

6.3 Auxiliary output

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
G00	Auxiliary output - type	0	0	2		0: none; 1: on/off; 2: modulating	S	R/W		HR105 (16bit)
G01	Auxiliary output - AIN type	13	0	15		See **Table of auxiliary output types**	S	R/W		HR106 (16bit)

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
G02	Auxiliary output - enable regulation type	1	0	3		0: always on; 1: unit on; 2: fans on; 3: auxiliary din	S	R/W		HR107 (16bit)
G03	Auxiliary output - setpoint type	8	0	8		See **Table of auxiliary output set point types**	S	R/W		HR108 (16bit)
G04	Auxiliary output - setpoint	20	-9999	9999			S	R/W		HR109 (16bit)
G05	Auxiliary output - PID cool/heat mode	2	0	2		0: cool; 1: heat; 2: unit	S	R/W		HR110 (16bit)
G06	Auxiliary output - PID reverse mode	0	0	1		0: direct; 1: reverse	S	R/W		HR111 (16bit)
G07	Auxiliary output - PID Dead band	0	-9999	9999			S	R/W		HR112 (16bit)
G08	Auxiliary output - PID Proportional factor	8	0	99			S	R/W		HR113 (16bit)
G09	Auxiliary output - PID Integral time	150	0	999	s		S	R/W		HR114 (16bit)
G10	Auxiliary output - PID Derivative time	0	0	999	s		S	R/W		HR115 (16bit)
G11	Auxiliary output - PID low limit	0	0	100	%		S	R/W		HR116 (16bit)
G12	Auxiliary output - PID high limit	100	0	100	%		S	R/W		HR117 (16bit)
G13	Auxiliary output - DOUT differential	2	-9999	9999			S	R/W		HR118 (16bit)
Aux-Ain	Auxiliary output - AIN channel value						M	R		IR126 (16bit)
Aux-Ain-e	Auxiliary output - AIN channel enabled						M	R		IS193
Aux-CH	Auxiliary output - cool/heat mode		0	1			M	R		IR127 (16bit)
Aux-Din	Auxiliary output - DIN channel value						M	R		IS194
Aux-En	Auxiliary output - enabled						M	R		IS195
Aux-EnReg	Auxiliary output - enable PID regulation						M	R		IS196
Aux-On	Auxiliary output - on/off						M	R		IS197
Aux-Req	Auxiliary output - PID request						M	R		IR128 (16bit)
Aux-Set	Auxiliary output - setpoint						M	R		IR129 (16bit)

Tab. 6.c

Table of auxiliary output types

0: supply temperature	4: exhaust temp	8: return hum	12: air quality voc
1: room temp	5: antifreeze temp	9: supply air pressure	13: auxiliary probe
2: return temp	6: supply hum	10: return air pressure	14: air quality pm
3: external temp	7: room hum	11: air quality co2	15: fresh air preheater temperature

Tab. 6.d

Table of auxiliary output set point types

0: temperature setpoint	3: return air pressure setpoint	6: air quality co2 setpoint
1: return air flow setpoint	4: supply air pressure setpoint	7: air quality voc setp
2: supply air flow setpoint	5: humidity setpoint	8: auxiliary setpoint

Tab. 6.e

6.4 Commands

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
b00	Unit ON/OFF command by keyboard	FALSE					U	R/W		CS000
b01	Summer/Winter - mode by keyboard	FALSE				0: summer; 1: winter	U	R/W	x	CS001
b02	Temperature current setpoint		b02-l	b02-h	°C		U	R/W	x	HR000 (16bit)
b03	Humidity current setp		b03-l	b03-h	%rH		U	R/W	x	HR001 (16bit)
b04	Air quality CO2 - current setpoint		P18	P19	ppm		U	R/W	x	HR002 (16bit)
b05	Supply air pressure current setp		P22	P23	Pa		U	R/W	x	HR003 (16bit)
b06	Return air pressure current setp		P26	P27	Pa		U	R/W	x	HR004 (16bit)
b07	Supply air flow current setp		P30	P31	m3/h		U	R/W	x	HR005 (16bit)
b08	Return air flow current setp		P34	P35	m3/h		U	R/W	x	HR006 (16bit)
b09	Air quality VOC - current setpoint		P39	P38	%		U	R/W		HR007 (16bit)
b10	Fans - forcing speed type		0	3		0: Auto; 1: speed 1; 2: speed 2; 3: speed 3	U	R/W		HR124 (16bit)

Tab. 6.f

6.5 Defrost

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
d00	Defrost - temp. threshold for max. heat recovery	-5	d01	20	°C		S	R/W		HR016 (16bit)
d01	Defrost - temp. threshold for min. heat recovery	-10	-50	d00	°C		S	R/W		HR017 (16bit)
d02	Defrost - exhaust temperature threshold	8	-50	20	°C		S	R/W		HR018 (16bit)
d03	Defrost - maximum time duration	1	0	999	min		S	R/W		HR019 (16bit)
d04	Defrost - minimum time between defrosts	1	0	999	min		S	R/W	x	HR020 (16bit)
Dfa	Defrost active						M	R		IS055
Dfr	Defrost request				%		M	R		IR012 (16bit)
Dfp	Defrost prevention active						M	R		IS226
Dfr-En	Defrost – enabled						S	R		IS216

Tab. 6.g

6.6 Fans

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
f00	Fans - configuration	0	0	2		0: supply only; 1: return only; 2: supply + return	S	R/W		HR081 (16bit)
f01	Fans - type	0	0	1		0: on/off; 1: modulating	S	R/W		HR082 (16bit)
f02	Fans - regulation type	0	0	2		0: fixed; 1: air flow; 2: static pressure	S	R/W		HR083 (16bit)
f03	Air flow check - type	0	0	3		0: none; 1: switch; 2: probe; 3: both	S	R/W		HR084 (16bit)
f04	Air flow - switch type	0	0	2		0: common; 1: return only; 2: supply only	S	R/W		HR085 (16bit)
f05	Air flow check - pressure threshold	50	0	9999	Pa		S	R/W		HR086 (16bit)
f06	Air flow - K factor for flow calculations	100					S	R/W		HR087 (16bit)
f07	Air flow check - max number of attempts	3	1	255			S	R/W		HR088 (16bit)
f08	Air flow check - time in startup	15	0	999	s		S	R/W		HR089 (16bit)
f09	Air flow check - time in run	3	0	999			S	R/W		HR090 (16bit)
f10	Fans - fixed speed	50	0	100	%		S	R/W		HR091 (16bit)
f11	Fans - fixed speed 1	33	0	100	%		S	R/W		HR092 (16bit)
f12	Fans - fixed speed 2	66	0	100	%		S	R/W		HR093 (16bit)
f13	Fans - fixed speed 3	100	0	100	%		S	R/W		HR094 (16bit)
f14	Fans - post ventilation time	10	0	999	s		S	R/W		HR095 (16bit)
f15	Fans - enable free cooling/heating temperature regulation	FALSE				0: disabled; 1: enabled	S	R/W		CS022
f16	Fans - enable air quality regulation	FALSE				0: disabled; 1: enabled	S	R/W		CS023
f17	Fans - enable humidity regulation	FALSE				0: disabled; 1: enabled	S	R/W		CS024
f18	Fans night mode - enable	FALSE				0: disabled; 1: enabled	S	R/W		CS025
f19	Fans cleaning - enable	FALSE				0: disabled; 1: enabled	S	R/W		CS026
f20	Fans night mode - start time hour	22	0	23	h		S	R/W		HR096 (16bit)
f21	Fans night mode - start time minute	0	0	59	min		S	R/W		HR097 (16bit)
f22	Fans night mode - end time hour	7	0	23	h		S	R/W		HR098 (16bit)
f23	Fans night mode - end time minute	0	0	59	min		S	R/W		HR099 (16bit)
f24	Fans night mode - max speed	60	0	100	%		S	R/W		HR100 (16bit)
f25	Fans cleaning - start time hour	12	0	23	h		S	R/W		HR101 (16bit)
f26	Fans cleaning - start time minute	0	0	59	min		S	R/W		HR102 (16bit)
f27	Fans cleaning - duration time	30	0	999	min		S	R/W		HR103 (16bit)
f28	Fans cleaning - speed	80	0	100	%		S	R/W		HR104 (16bit)
f29	Fans cleaning - enable mode manually					0: disabled; 1: enabled	S	R/W		CS027
F30	Fans - enable temperature regulation					0: disabled; 1: enabled	S	R/W		CS107
Fhr	Fans - humidity request				%		M	R		IR019 (16bit)
fOn	Fans on						M	R		IS063
FPE	Fans post-ventilation enabled						M	R		IS064
Fqr	Fans - air quality request				%		M	R		IR020 (16bit)
FSO	Fans switched on successfully						M	R		IS065
fTr	Fans - free cooling/heating request				%		M	R		IR021 (16bit)
FSt	Fire/smoke alarm management	0	0	3		0: stop fans; 1: force only supply fan; 2: force only return fan; 3: force both fans	S	R/W		HR538 (16bit)

Tab. 6.h

6.7 Fresh air pre heater

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
J00	Fresh air pre heater - type	0	0	2		0: none; 1: electrical on/off; 2: electrical modulating; 3: water modulating	S	R/W		HR133 (16bit)
J01	Fresh air pre heater - control type	1	0	2		0: temp. control; 1: prevent low temp; 2: temp. + prevent control	S	R/W		HR134 (16bit)
J02	Fresh air pre heater - PID Proportional factor	8	0	99			S	R/W		HR135 (16bit)
J03	Fresh air pre heater - PID Integral time	150	0	999	s		S	R/W		HR136 (16bit)
J04	Fresh air pre heater - PID Derivative time	0	0	999	s		S	R/W		HR137 (16bit)
J05	Prevent low temperature - min request	5	J06	50	°C		S	R/W		HR138 (16bit)
J06	Prevent low temperature - max request	-5	-50	J05	°C		S	R/W		HR139 (16bit)
J07	Prevent low temperature type	0	0	1				R/W		HR535 (16bit)
FH-CH	Fresh air pre heater – cool/heat mode (FALSE= Cooling, TRUE = Heating)						M	R		IS198
FH-En	Fresh air pre heater – enabled						M	R		IS199
FH-On	Fresh air pre heater - on/off						U	R		IS200

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
FH-Req	Fresh air pre heater – request				%		M	R		IR130
FH-TE	Fresh air pre heater – type electric						M	R		IS211
FH-TReq	Fresh air pre heater – temp. control request				%		M	R		IR131

Tab. 6.i

6.8 Heat recovery

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
H00	Heat recovery - type	0	0	4		See **Table of heat recovery types**	S	R/W		HR119 (16bit)
H01	Heat recovery - ext. temp. summer limit	30	20	40	°C		S	R/W		HR120 (16bit)
H02	Heat recovery - ext. temp. winter limit	10	-20	20	°C		S	R/W		HR121 (16bit)
H03	Heat recovery - PID Proportional factor	8	0	99			S	R/W		HR122 (16bit)
H04	Heat recovery - PID Integral time	150	0	999	s		S	R/W		HR123 (16bit)
H06	Heat recovery - PID Derivative time	0	0	999	s		S	R/W		HR125 (16bit)
H07	Heat recovery – bypass damper opening time	0	0	999	s		S	R/W		HR462 (16bit)
HRec-En	Heat recovery – enabled						M	R		IS201
HRec-On	Heat recovery – on/off						M	R		IS202
HRec-Req	Heat recovery – request				%		M	R		IR132
HRec-TReq	Heat recovery – temperature control request				%		M	R		IR133
HRec-TW	Heat recovery – type thermal wheel						U	R		IS192
HRec-3PMod	Heat recovery - bypass three points modul						U	R		CS113
HRec-3POnOff	Heat recovery - bypass three points OnOff						U	R		CS113
HRec-Pos	Heat recovery - estimated position				%		U	R		HR463 (16bit)

Tab. 6.j

Table of heat recovery types

0: none	3: thermal wheel - onoff	6: bypass 3 points - modulating
1: bypass damper - onoff	4: thermal wheel - modulating	
2: bypass damper - modulating	5: bypass 3 points - onoff	

Tab. 6.k

6.9 Main coil

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
C00	Main coil - type	0	0	3		0: none; 1: electrical on/off; 2: electrical modulating; 3: water modulating	S	R/W		HR008 (16bit)
C01	Main coil - mode	2	0	4		0: cool only; 1: heat only; 2: season; 3: keyboard; 4: bms	S	R/W		HR009 (16bit)
C02	Main coil - cool/heat mode by keyboard	FALSE					S	R/W		CS002
C03	Main coil - cool/heat mode by BMS						S	R/W		CS003
C04	Main coil - cooling PID Proportional factor	8	0	99			S	R/W		HR010 (16bit)
C05	Main coil - cooling PID Integral time	150	0	999	s		S	R/W		HR011 (16bit)
C06	Main coil - cooling PID Derivative time	0	0	999	s		S	R/W	x	HR012 (16bit)
C07	Main coil - heating PID Proportional factor	8	0	99			S	R/W		HR013 (16bit)
C08	Main coil - heating PID Integral time	150	0	999	s		S	R/W		HR014 (16bit)
C09	Main coil - heating PID Derivative time	0	0	999	s		S	R/W		HR015 (16bit)
MC-CH	Main coil – cool/heat mode (FALSE=Cooling,TRUE=Heating)						M	R		IS203
MC-En	Main coil – enabled						M	R		IS204
MC-On	Main coil – on/off						U	R		IS205
MC-Req	Main coil – request				%		M	R		IR134
MC-TE	Main coil – Type electrc						M	R		IS210
MC-TReq	Main coil – temperature control request				%		M	R		IR135

Tab. 6.l

6.10 Manual mode

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
n00	Manual mode reset time	60	0	999	min		S	R/W	x	HR317 (16bit)
n01	Enable supply fan manual mode					0: disabled; 1: enabled	S	R/W	x	CS054
n02	Supply fan manual mode value			n02-h			S	R/W	x	HR318 (16bit)
n03	Enable return fan manual mode					0: disabled; 1: enabled	S	R/W	x	CS055
n04	Return fan manual mode value			n04-h			S	R/W	x	HR319 (16bit)

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
n05	Enable heat recovery manual mode					0: disabled; 1: enabled	S	R/W	x	CS056
n06	Heat recovery manual mode value			n06-h			S	R/W	x	HR320 (16bit)
n07	Enable main coil manual mode					0: disabled; 1: enabled	S	R/W	x	CS057
n08	Main coil manual mode value			n08-h			S	R/W	x	HR321 (16bit)
n09	Enable freshair preheater coil manual mode					0: disabled; 1: enabled	S	R/W	x	CS058
n10	Freshair preheater coil manual mode value			n10-h			S	R/W	x	HR322 (16bit)
n11	Enable auxiliary device manual mode					0: disabled; 1: enabled	S	R/W		CS059
n12	Auxiliary device manual mode value			n12-h			S	R/W	x	HR323 (16bit)

Tab. 6.m

6.11 Return fan

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
r00	Return fan - fixed speed offset	10	0	100	%		S	R/W		HR376 (16bit)
r01	Return fan - switch-on speed	50	0	100	%		S	R/W		HR377 (16bit)
r02	Return fan - airflow deadband	50	0	9999	m3/h		S	R/W		HR378 (16bit)
r03	Return fan - PID Proportional factor	0.5	0	99			S	R/W		HR379 (16bit)
r04	Return fan - PID Integral time	150	0	999	s		S	R/W		HR380 (16bit)
r05	Return fan - PID Derivative time	0	0	999	s		S	R/W		HR381 (16bit)
r06	Return fan - minimum speed	20	0	100	%		S	R/W		HR382 (16bit)
r07	Return fan - fan maximum speed	100	0	100	%		S	R/W		HR383 (16bit)
r08	Return fan - pressure deadband	50	0	500	Pa		S	R/W		HR384 (16bit)
r09	Return fan - alarm air pressure speed	50	0	100	%		S	R/W		HR385 (16bit)

Tab. 6.n

6.12 Scheduler

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
E00	Scheduler - enable	FALSE				0: disabled; 1: enabled	U	R/W		CS004
E01	Scheduler - Prog1 - band 1 enable					0: disabled; 1: enabled	U	R/W		CS005
E02	Scheduler - Prog1 - band 1 start hours	0	0	23	h		U	R/W		HR021 (16bit)
E02-E03	Scheduler - Prog1 - band 1 time						U	R/W		
E03	Scheduler - Prog1 - band 1 start minutes	0	0	59	min		U	R/W		HR022 (16bit)
E04	Scheduler - Prog1 - band 1 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR023 (16bit)
E05	Scheduler - Prog1 - band 2 enable					0: disabled; 1: enabled	U	R/W		CS006
E06	Scheduler - Prog1 - band 2 start hours	0	0	23	h		U	R/W		HR024 (16bit)
E06-E07	Scheduler - Prog1 - band 2 time						U	R/W		
E07	Scheduler - Prog1 - band 2 start minutes	0	0	59	min		U	R/W		HR025 (16bit)
E08	Scheduler - Prog1 - band 2 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR026 (16bit)
E09	Scheduler - Prog1 - band 3 enable					0: disabled; 1: enabled	U	R/W		CS007
E10	Scheduler - Prog1 - band 3 start hours	0	0	23	h		U	R/W		HR027 (16bit)
E10-E11	Scheduler - Prog1 - band 3 time						U	R/W		
E11	Scheduler - Prog1 - band 3 start minutes	0	0	59	min		U	R/W		HR028 (16bit)
E12	Scheduler - Prog1 - band 3 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR029 (16bit)
E13	Scheduler - Prog1 - band 4 band enable					0: disabled; 1: enabled	U	R/W		CS008
E14	Scheduler - Prog1 - band 4 start hours	0	0	23	h		U	R/W		HR030 (16bit)
E14-E15	Scheduler - Prog1 - band 4 time						U	R/W		
E15	Scheduler - Prog1 - band 4 start minutes	0	0	59	min		U	R/W		HR031 (16bit)
E16	Scheduler - Prog1 - band 4 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR032 (16bit)
E17	Scheduler - Prog2 - band 1 enable					0: disabled; 1: enabled	U	R/W		CS009
E18	Scheduler - Prog2 - band 1 start hours	0	0	23	h		U	R/W		HR033 (16bit)
E18-E19	Scheduler - Prog2 - band 1 time						U	R/W		
E19	Scheduler - Prog2 - band 1 start minutes	0	0	59	min		U	R/W		HR034 (16bit)
E20	Scheduler - Prog2 - band 1 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR035 (16bit)
E21	Scheduler - Prog2 - band 2 enable					0: disabled; 1: enabled	U	R/W		CS010
E22	Scheduler - Prog2 - band 2 start hours	0	0	23	h		U	R/W		HR036 (16bit)
E22-E23	Scheduler - Prog2 - band 2 time						U	R/W		
E23	Scheduler - Prog2 - band 2 start minutes	0	0	59	min		U	R/W		HR037 (16bit)
E24	Scheduler - Prog2 - band 2 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR038 (16bit)
E25	Scheduler - Prog2 - band 3 enable					0: disabled; 1: enabled	U	R/W		CS011
E26	Scheduler - Prog2 - band 3 start hours	0	0	23	h		U	R/W		HR039 (16bit)
E26-E27	Scheduler - Prog2 - band 3 time						U	R/W		
E27	Scheduler - Prog2 - band 3 start minutes	0	0	59	min		U	R/W		HR040 (16bit)
E28	Scheduler - Prog2 - band 3 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR041 (16bit)
E29	Scheduler - Prog2 - band 4 enable					0: disabled; 1: enabled	U	R/W		CS012

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
E30	Scheduler - Prog2 - band 4 start hours	0	0	23	h		U	R/W		HR042 (16bit)
E30-E31	Scheduler - Prog2 - band 4 time						U	R/W		
E31	Scheduler - Prog2 - band 4 start minutes	0	0	59	min		U	R/W		HR043 (16bit)
E32	Scheduler - Prog2 - band 4 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR044 (16bit)
E33	Scheduler - Prog3 - band 1 enable					0: disabled; 1: enabled	U	R/W		CS013
E34	Scheduler - Prog3 - band 1 start hours	0	0	23	h		U	R/W		HR045 (16bit)
E34-E35	Scheduler - Prog3 - band 1 time						U	R/W		
E35	Scheduler - Prog3 - band 1 start minutes	0	0	59	min		U	R/W		HR046 (16bit)
E36	Scheduler - Prog3 - band 1 profile		0	2			U	R/W		HR047 (16bit)
E37	Scheduler - Prog3 - band 2 enable						U	R/W		CS014
E38	Scheduler - Prog3 - band 2 start hours	0	0	23	h		U	R/W		HR048 (16bit)
E38-E39	Scheduler - Prog3 - band 2 time						U	R/W		
E39	Scheduler - Prog3 - band 2 start minutes	0	0	59	min		U	R/W		HR049 (16bit)
E40	Scheduler - Prog3 - band 2 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR050 (16bit)
E41	Scheduler - Prog3 - band 3 enable					0: disabled; 1: enabled	U	R/W		CS015
E42	Scheduler - Prog3 - band 3 start hours	0	0	23	h		U	R/W		HR051 (16bit)
E42-E43	Scheduler - Prog3 - band 3 time						U	R/W		
E43	Scheduler - Prog3 - band 3 start minutes	0	0	59	min		U	R/W		HR052 (16bit)
E44	Scheduler - Prog3 - band 3 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR053 (16bit)
E45	Scheduler - Prog3 - band 4 enable					0: disabled; 1: enabled	U	R/W		CS016
E46	Scheduler - Prog3 - band 4 start hours	0	0	23	h		U	R/W		HR054 (16bit)
E46-E47	Scheduler - Prog3 - band 4 time						U	R/W		
E47	Scheduler - Prog3 - band 4 start minutes	0	0	59	min		U	R/W		HR055 (16bit)
E48	Scheduler - Prog3 - band 4 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR056 (16bit)
E49	Scheduler - Prog4 - band 1 enable					0: disabled; 1: enabled	U	R/W		CS017
E50	Scheduler - Prog4 - band 1 start hours	0	0	23	h		U	R/W		HR057 (16bit)
E50-E51	Scheduler - Prog4 - band 1 time						U	R/W		
E51	Scheduler - Prog4 - band 1 start minutes	0	0	59	min		U	R/W		HR058 (16bit)
E52	Scheduler - Prog4 - band 1 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR059 (16bit)
E53	Scheduler - Prog4 - band 2 enable					0: disabled; 1: enabled	U	R/W		CS018
E54	Scheduler - Prog4 - band 2 start hours	0	0	23	h		U	R/W		HR060 (16bit)
E54-E55	Scheduler - Prog4 - band 2 time						U	R/W		
E55	Scheduler - Prog4 - band 2 start minutes	0	0	59	min		U	R/W		HR061 (16bit)
E56	Scheduler - Prog4 - band 2 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR062 (16bit)
E57	Scheduler - Prog4 - band 3 enable					0: disabled; 1: enabled	U	R/W		CS019
E58	Scheduler - Prog4 - band 3 start hours	0	0	23	h		U	R/W		HR063 (16bit)
E58-E59	Scheduler - Prog4 - band 3 time						U	R/W		
E59	Scheduler - Prog4 - band 3 start minutes	0	0	59	min		U	R/W		HR064 (16bit)
E60	Scheduler - Prog4 - band 3 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR065 (16bit)
E61	Scheduler - Prog4 - band 4 enable					0: disabled; 1: enabled	U	R/W		CS020
E62	Scheduler - Prog4 - band 4 start hours	0	0	23	h		U	R/W		HR066 (16bit)
E62-E63	Scheduler - Prog4 - band 4 time						U	R/W		
E63	Scheduler - Prog4 - band 4 start minutes	0	0	59	min		U	R/W		HR067 (16bit)
E64	Scheduler - Prog4 - band 4 profile		0	2		0: comfort; 1: economy; 2: off	U	R/W		HR068 (16bit)
E65	Scheduler - monday mode		0	6		See **Table of scheduler modes**	U	R/W		HR069 (16bit)
E66	Scheduler - tuesday mode		0	6		See **Table of scheduler modes**	U	R/W		HR070 (16bit)
E67	Scheduler - wednesday mode		0	6		See **Table of scheduler modes**	U	R/W		HR071 (16bit)
E68	Scheduler - thursday mode		0	6		See **Table of scheduler modes**	U	R/W		HR072 (16bit)
E69	Scheduler - friday mode		0	6		See **Table of scheduler modes**	U	R/W		HR073 (16bit)
E70	Scheduler - saturday mode		0	6		See **Table of scheduler modes**	U	R/W		HR074 (16bit)
E71	Scheduler - sunday mode		0	6		See **Table of scheduler modes**	U	R/W		HR075 (16bit)
E72	Scheduler - vacation period enable					0: disabled; 1: enabled	U	R/W		CS021
E73	Scheduler - vacation period start day	1	1	31	d		U	R/W		HR076 (16bit)
E74	Scheduler - vacation period start month	1	1	12	mo		U	R/W		HR077 (16bit)
E75	Scheduler - vacation period end day	1	1	31	d		U	R/W	x	HR078 (16bit)
E76	Scheduler - vacation period end month	1	1	12	mo		U	R/W	x	HR079 (16bit)
E77	Scheduler - vacation period mode		0	6		See **Table of scheduler modes**	U	R/W		HR080 (16bit)
SCo	Scheduler - on/off status (FALSE=Off,TRUE=On)						M	R	x	IS178
SCS	Scheduler - status		0	6			U	R		IR084 (16bit)

Tab. 6.o

Table of scheduler modes

0: comfort	3: program 1	6: program 4
1: economy	4: program 2	
2: off	5: program 3	

Tab. 6.p

6.13 Setpoint

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
P00	Temperature - summer comfort setpoint	26	P02	P03	°C		U	R/W		HR324 (16bit)
P01	Temperature - summer economy setpoint	28	P02	P03	°C		U	R/W		HR325 (16bit)
P02	Temperature - summer minimum value	16	0	P03	°C		U	R/W	x	HR326 (16bit)
P03	Temperature - summer maximum value	28	P02	50	°C		U	R/W	x	HR327 (16bit)
P04	Temperature - winter comfort setpoint	20	P06	P07	°C		U	R/W		HR328 (16bit)
P05	Temperature - winter economy setpoint	18	P06	P07	°C		U	R/W		HR329 (16bit)
P06	Temperature - winter minimum value	18	0	P07	°C		U	R/W	x	HR330 (16bit)
P07	Temperature - winter maximum value	28	P06	50	°C		U	R/W	x	HR331 (16bit)
P08	Humidity - summer comfort setpoint	50	P10	P11	%rH		U	R/W		HR332 (16bit)
P09	Humidity - summer economy setpoint	60	P10	P11	%rH		U	R/W		HR333 (16bit)
P10	Humidity - summer minimum value	35	0	P11	%rH		U	R/W	x	HR334 (16bit)
P11	Humidity - summer maximum value	65	P10	100	%rH		U	R/W	x	HR335 (16bit)
P12	Humidity - winter comfort setpoint	50	P14	P15	%rH		U	R/W		HR336 (16bit)
P13	Humidity - winter economy setpoint	40	P14	P15	%rH		U	R/W		HR337 (16bit)
P14	Humidity - winter minimum value	35	0	P15	%rH		U	R/W	x	HR338 (16bit)
P15	Humidity - winter maximum value	65	P14	100	%rH		U	R/W	x	HR339 (16bit)
P16	Air quality CO2 - comfort setpoint	800	P18	P19	ppm		U	R/W		HR340 (16bit)
P17	Air quality CO2 - economy setpoint	1000	P18	P19	ppm		U	R/W		HR341 (16bit)
P18	Air quality CO2 - minimum value	600	0	P19	ppm		U	R/W	x	HR342 (16bit)
P19	Air quality CO2 - maximum value	1000	P18	1200	ppm		U	R/W	x	HR343 (16bit)
P20	Supply air pressure - comfort setpoint	150	P22	P23	Pa		U	R/W		HR344 (16bit)
P21	Supply air pressure - economy setpoint	100	P22	P23	Pa		U	R/W		HR345 (16bit)
P22	Supply air pressure - minimum value	0	0	P23	Pa		U	R/W	x	HR346 (16bit)
P23	Supply air pressure - maximum value	300	P22	500	Pa		U	R/W	x	HR347 (16bit)
P24	Return air pressure - comfort setpoint	150	P26	P27	Pa		U	R/W		HR348 (16bit)
P25	Return air pressure - economy setpoint	100	P26	P27	Pa		U	R/W		HR349 (16bit)
P26	Return air pressure - minimum value	0	0	P27	Pa		U	R/W	x	HR350 (16bit)
P27	Return air pressure - maximum value	300	P26	500	Pa		U	R/W	x	HR351 (16bit)
P28	Supply air flow - comfort setpoint	300	P30	P31	m3/h		U	R/W		HR352 (16bit)
P29	Supply air flow - economy setpoint	250	P30	P31	m3/h		U	R/W		HR353 (16bit)
P30	Supply air flow - minimum value	0	0	P31	m3/h		U	R/W	x	HR354 (16bit)
P31	Supply air flow - maximum value	1000	P30	5000	m3/h		U	R/W	x	HR355 (16bit)
P32	Return air flow - comfort setpoint	300	P34	P35	m3/h		U	R/W		HR356 (16bit)
P33	Return air flow - economy setpoint	250	P34	P35	m3/h		U	R/W		HR357 (16bit)
P34	Return air flow - minimum value	0	0	P35	m3/h		U	R/W	x	HR358 (16bit)
P35	Return air flow - maximum value	1000	P34	5000	m3/h		U	R/W	x	HR359 (16bit)
P36	Air quality VOC - comfort setpoint	50	P39	P38	%		U	R/W		HR360 (16bit)
P37	Air quality VOC - economy setpoint	60	P39	P38	%		U	R/W		HR361 (16bit)
P38	Air quality VOC - maximum value	80	P39	100	%		U	R/W		HR362 (16bit)
P39	Air quality VOC - minimum value	20	0	P38	%		U	R/W		HR363 (16bit)

Tab. 6.q

6.14 Settings

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
UOM	UoM - Unit of measure used in display	FALSE				0: international (°C/m); 1: imperial (°F/ft)	U	R/W		CS077
y00	BMS port serial address	1	1	247			S	R/W		HR432 (16bit)
y01	BMS port network settings	1	0	5			S	R/W		HR433 (16bit)
y02	BMS port baud rate	7	0	8			S	R/W		HR434 (16bit)
y03	Applies the settings of serial line BMS at each variation: so it is not necessary to reset it.					0: disabled; 1: enabled	S	R/W		CS078
y04	Fieldbus port serial address	1	1	247			S	R/W		HR435 (16bit)
y05	FiledBus port baud rate	4	0	8			S	R/W		HR436 (16bit)
y06	FiledBus port network settings	1	0	5			S	R/W		HR437 (16bit)
y07	Applies the settings of serial line FB					0: disabled; 1: enabled	S	R/W		CS079
y08	New Date and Time to set inside the controller internal clock						U	R/W		HR438 (32bit)
y09	New Time Zone to set inside the controller internal clock						U	R/W	x	HR440 (640bit)
y10	Sets controller internal clock					0: disabled; 1: enabled	U	R/W	x	CS080
y11	Password of profile USER	100	0	999			U	R/W	x	HR480 (16bit)
y12	Password of profile SERVICE	200	0	999			U	R/W		HR481 (16bit)
y13	Password of profile MANUFACTURER	123	0	999			S	R/W		HR482 (16bit)
y14	Delete alarms log					0: disabled; 1: enabled	S	R/W		CS081
y15	Restore application to Carel settings					0: disabled; 1: enabled	S	R/W		CS082
y16	Enable buzzer	FALSE				0: disabled; 1: enabled	U	R/W		CS083
y17	Enable NFC	TRUE				0: disabled; 1: enabled	S	R/W		CS084
y18	NFC password (string of 4 chars)	'					S	R/W		HR483 (32bit)
y19	Enable unit ON/OFF command by BMS net	FALSE				0: disabled; 1: enabled	S	R/W	x	CS085
y20	Unit On/Off command by BMS (0=OFF, 1=ON)					0: OFF; 1: ON	S	R/W		CS086
y21	Summer/Winter - mode by BMS	FALSE				0: summer; 1: winter	S	R/W		CS087

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
y22	Behavior in case of BMS alarm	0	0	2		0: no alarm; 1: display only; 2: unit shutdown	S	R/W		HR485 (16bit)
y23	Enable thTune management	FALSE				0: disabled; 1: enabled	S	R/W		CS088
y24	Main mask selection value	0	0	14			S	R/W		HR486 (16bit)
y25	thTune - device address	1	1	247			S	R/W		HR487 (16bit)
y26	thTune - timeout	200	200	3000			S	R/W		HR488 (16bit)
y27	thTune - command delay	0	0	1000			S	R/W		HR489 (16bit)
y36	IAQ - Device address	7	1	247			S	R/W		HR469 (16bit)
y37	IAQ - device timeout	1000					S	R/W		HR495 (16bit)
y38	IAQ - command delay time	0					S	R/W		HR470 (16bit)
y39	IAQ - Enable display backlight						S	R/W		CS108

Tab. 6.r

6.15 Supply fan

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
S00	Supply fan - start delay time	0	0	999	s		S	R/W		HR386 (16bit)
S01	Supply fan - switch-on speed	50	0	100	%		S	R/W		HR387 (16bit)
S02	Supply fan - airflow deadband	50	0	9999	m3/h		S	R/W		HR388 (16bit)
S03	Supply fan - PID Proportional factor	8	0	99			S	R/W		HR389 (16bit)
S04	Supply fan - PID Integral time	150	0	999	s		S	R/W		HR390 (16bit)
S05	Supply fan - PID Derivative time	0	0	999	s		S	R/W		HR391 (16bit)
S06	Supply fan - minimum speed	20	0	100	%		S	R/W		HR392 (16bit)
S07	Supply fan - maximum speed	100	0	100	%		S	R/W		HR393 (16bit)
S08	Supply fan - pressure deadband	50	0	500	Pa		S	R/W		HR394 (16bit)
S09	Supply fan - alarm air pressure speed	50	0	100	%		S	R/W	x	HR395 (16bit)
SFan-DB	Supply fan – pressure PID DeadBand				Pa		M	R		IR140
SFan-En	Supply fan – enabled						M	R		IS208
SFan-On	Supply fan – on/off						U	R		IS209
SFan-PSet	Supply fan – pressure setpoint				Pa		M	R		IR141
SFan-Reg	Supply fan – regulation request				%		M	R		IR142
SFan-Reg	Supply fan - request				%		M	R		IR143

Tab. 6.s

6.16 Temperature regulation

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
t00	Temperature control type	0	0	5		0: none; 1: supply only; 2: return only; 3: room only; 4: return + supply; 5: room + supply	S	R/W		HR396 (16bit)
t01	Summer/Winter - selection type	3	0	3		0: by keyboard; 1: by din; 2: by bms; 3: auto	U	R/W		HR397 (16bit)
t02	Summer/Winter - change delay time	1	0	999	min		S	R/W		HR398 (16bit)
t03	Summer/Winter - External temperature summer threshold	28	t04	50	°C		S	R/W		HR399 (16bit)
t04	Summer/Winter - External temperature winter threshold	16	-20	t03	°C		S	R/W		HR400 (16bit)
t05	Cooling/Heating change - offset	2	0	20	°C		S	R/W		HR401 (16bit)
t06	Cooling/Heating change - delay time	1	0	999	min		S	R/W		HR402 (16bit)
t07	Free cooling - offset	3	0	20	°C		S	R/W		HR403 (16bit)
t08	Free heating - offset	3	0	20	°C		S	R/W		HR404 (16bit)
t09	Free cooling - PID Proportional factor	8	0	99			S	R/W		HR405 (16bit)
t10	Free cooling - PID Integral time	150	0	999	s		S	R/W		HR406 (16bit)
t11	Free cooling - PID Derivative time	0	0	999	s		S	R/W		HR407 (16bit)
t12	Free heating - PID Proportional factor	8	0	99			S	R/W		HR408 (16bit)
t13	Free heating - PID Integral time	150	0	999	s		S	R/W		HR409 (16bit)
t14	Free heating - PID Derivative time	0	0	999	s		S	R/W		HR410 (16bit)
t15	Temp. set point offset - PID Proportional factor	2	0	99			S	R/W		HR411 (16bit)
t16	Temp. set point offset - PID Derivative time	0	0	999	s		S	R/W		HR412 (16bit)
t17	Temp. set point offset - PID Integral time	150	0	999	s		S	R/W		HR413 (16bit)
t18	Low supply temperature limit	16	0	t19	°C		S	R/W		HR414 (16bit)
t19	High supply temperature limit	32	t18	60	°C		S	R/W		HR415 (16bit)
t20	Low/High supply temp. - limit PID Proportional factor	8	0	99			S	R/W		HR416 (16bit)
t21	Low/High supply temp. - limit PID Integral time	150	0	999	s		S	R/W		HR417 (16bit)
t22	Low/High supply temp. - limit PID Derivative time	0	0	999	s		S	R/W		HR418 (16bit)
t23	Low/High supply temp. - offset PID Proportional factor	8	0	99			S	R/W		HR419 (16bit)
t24	Low/High supply temp. - offset PID Integral time	150	0	999	s		S	R/W	x	HR420 (16bit)
t25	Low/High supply temp. - offset PID Derivative time	0	0	999	s		S	R/W	x	HR421 (16bit)
t26	Low supply temperature alarm delay	10	0	999	min		S	R/W		HR422 (16bit)
t27	High supply temperature alarm delay	10	0	999	min		S	R/W		HR423 (16bit)
t28	Temperature - PID Proportional factor	8	0	99			S	R/W		HR464 (16bit)

Code	Description	Default	Min	Max	UOM	Label	User	R/W	Display	Modbus
t29	Temperature - PID Integral time	150	0	999			S	R/W		HR466 (16bit)
t30	Temperature - PID Derivative time	0	0	999			S	R/W		HR465 (16bit)
dCH	Devices cooling/heating mode (FALSE=Cooling,TRUE=Heating)						M	R		IS054
FC	Free cooling mode						M	R		IS057
FCH	Free cooling/heating mode active						M	R		IS058
FH	Free heating mode						M	R		IS059
LHST-e	Low/High supply temp. - limit control enabled						M	R		IS161
LHST-h	Low/High supply temp. - high limit active						M	R		IS162
LHST-L	Low/High supply temp. - low limit active						M	R	x	IS163
LHST-lh	Low/High supply temp. - limit control (FALSE = LOW; TRUE = HIGH)						M	R		IS164
rCH	Return/Room cooling/heating mode (FALSE=Cooling,TRUE=Heating)						M	R	x	IS170
Sea	Summer/Winter - mode					0: summer; 1: winter	S	R		IS179
tSt	Temperature setpoint used compensated				°C		M	R		IR092 (16bit)
UCH	Unit cooling/heating mode (FALSE=Cooling,TRUE=Heating)					0: unit cooling; 1: unit heating	M	R		IS187

Tab. 6.t

6.17 Working hours

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
U00	Working hours - unit max number of operating hours	99	0	999	h		S	R/W		HR424 (16bit)
U01	Working hours - filter max number of operating hours	99	0	999	h		S	R/W		HR425 (16bit)
U02	Working hours - supply fan max number of operating hours	99	0	999	h		S	R/W		HR426 (16bit)
U03	Working hours - return fan max number of operating hours	99	0	999	h		S	R/W		HR427 (16bit)
U04	Working hours - heat recovery max number of operating hours	99	0	999	h		S	R/W		HR428 (16bit)
U05	Working hours - main coil max number of operating hours	99	0	999	h		S	R/W		HR429 (16bit)
U06	Working hours - fresh air pre heater max number of operating hours	99	0	999	h		S	R/W		HR430 (16bit)
U07	Working hours - auxiliary output max number of operating hours	99	0	999	h		S	R/W		HR431 (16bit)
U08	Working hours - unit reset partial counter and alarm					0: disabled; 1: enabled	S	R/W		CS061
U09	Working hours - filter reset partial counter and alarm					0: disabled; 1: enabled	S	R/W		CS062
U10	Working hours - supply fan reset partial counter and alarm					0: disabled; 1: enabled	S	R/W		CS063
U11	Working hours - return fan reset partial counter and alarm					0: disabled; 1: enabled	S	R/W		CS064
U12	Working hours - heat recovery reset partial counter and alarm					0: disabled; 1: enabled	S	R/W		CS065
U13	Working hours - main coil reset partial counter and alarm					0: disabled; 1: enabled	S	R/W		CS066
U14	Working hours - fresh air pre heater reset partial counter and alarm					0: disabled; 1: enabled	S	R/W		CS067
U15	Working hours - auxiliary output reset partial counter and alarm					0: disabled; 1: enabled	S	R/W		CS068
U16	Working hours - unit reset total counter					0: disabled; 1: enabled	S	R/W		CS069
U17	Working hours - filter reset total counter					0: disabled; 1: enabled	S	R/W		CS070
U18	Working hours - supply fan reset total counter					0: disabled; 1: enabled	S	R/W		CS071
U19	Working hours - return fan reset total counter					0: disabled; 1: enabled	S	R/W		CS072
U20	Working hours - heat recovery reset total counter					0: disabled; 1: enabled	S	R/W		CS073
U21	Working hours - main coil reset total counter					0: disabled; 1: enabled	S	R/W	x	CS074
U22	Working hours - fresh air pre heater reset total counter					0: disabled; 1: enabled	S	R/W		CS075
U23	Working hours - auxiliary output reset total counter					0: disabled; 1: enabled	S	R/W	x	CS076
wh00	Working hours - unit				h		S	R		IR094 (32bit)
wh00-t	Total operating hours - unit				h		M	R		IR096 (32bit)
wh01	Working hours - filter				h		S	R		IR098 (32bit)
wh01-t	Total operating hours - filter				h		M	R		IR100 (32bit)
wh02	Working hours - supply fan				h		S	R		IR102 (32bit)
wh02-t	Total operating hours - supply fan				h		M	R		IR104 (32bit)
wh03	Working hours - return fan				h		S	R		IR106 (32bit)
wh03-t	Total operating hours - return fan				h		M	R		IR108 (32bit)
wh04	Working hours - heat recovery				h		S	R		IR110 (32bit)
wh04-t	Total operating hours - heat recovery				h		M	R		IR112 (32bit)
wh05	Working hours - main coil				h		S	R		IR114 (32bit)
wh05-t	Total operating hours - main coil				h		M	R	x	IR116 (32bit)
wh06	Working hours - fresh air pre heater				h		S	R	x	IR118 (32bit)
wh06-t	Total operating hours - fresh air pre heater				h		M	R	x	IR120 (32bit)
wh07	Working hours - auxiliary output				h		S	R		IR122 (32bit)
wh07-t	Total operating hours - auxiliary output				h		M	R		IR124 (32bit)

Tab. 6.u

6.18 I/O configuration

Analog input

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
L00-b	Supply temperature - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR140 (16bit)
L00-c	Supply temperature - channel	-	0	L00-maxch	-	**See Table of analogue input channels (-c)**	S	RW		HR141 (16bit)
L00-f	Supply temperature - filter	5	0	10	-		S	RW		HR142 (16bit)
L00-h	Supply temperature - max value	105	L00-l	999.9	°C		S	RW		HR143 (16bit)
L00-l	Supply temperature - min value	-50	-99	L00-h	°C		S	RW		HR144 (16bit)
L00-o	Supply temperature - offset	-	-99.9	99.9	°C		S	RW		HR145 (16bit)
L00-t	Supply temperature - type	0	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR146 (16bit)
L01-b	Room temperature - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR147 (16bit)
L01-c	Room temperature - channel	-	0	L01-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR148 (16bit)
L01-f	Room temperature - filter	5	0	10	-		S	RW		HR149 (16bit)
L01-h	Room temperature - max value	105	L01-l	999.9	°C		S	RW		HR150 (16bit)
L01-l	Room temperature - min value	-50	-99	L01-h	°C		S	RW		HR151 (16bit)
L01-o	Room temperature - offset	-	-99.9	99.9	°C		S	RW		HR152 (16bit)
L01-t	Room temperature - type	0	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR153 (16bit)
L02-b	Return temperature - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR154 (16bit)
L02-c	Return temperature - channel	-	0	L02-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR155 (16bit)
L02-f	Return temperature - filter	5	0	10	-		S	RW		HR156 (16bit)
L02-h	Return temperature - max value	105	L02-l	999.9	°C		S	RW		HR157 (16bit)
L02-l	Return temperature - min value	-50	-99	L02-h	°C		S	RW		HR158 (16bit)
L02-o	Return temperature - offset	-	-99.9	99.9	°C		S	RW		HR159 (16bit)
L02-t	Return temperature - type	0	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR160 (16bit)
L03-b	External temperature - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR161 (16bit)
L03-c	External temperature - channel	-	0	L03-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR162 (16bit)
L03-f	External temperature - filter	5	0	10	-		S	RW		HR163 (16bit)
L03-h	External temperature - max value	105	L03-l	999.9	°C		S	RW		HR164 (16bit)
L03-l	External temperature - min value	-50	-99	L03-h	°C		S	RW		HR165 (16bit)
L03-o	External temperature - offset	-	-99.9	99.9	°C		S	RW		HR166 (16bit)
L03-t	External temperature - type	0	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR167 (16bit)
L04-b	Exhaust temperature - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR168 (16bit)
L04-c	Exhaust temperature - channel	-	0	L04-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR169 (16bit)
L04-f	Exhaust temperature - filter	5	0	10	-		S	RW		HR170 (16bit)
L04-h	Exhaust temperature - max value	105	L04-l	999.9	°C		S	RW		HR171 (16bit)
L04-l	Exhaust temperature - min value	-50	-99	L04-h	°C		S	RW		HR172 (16bit)
L04-o	Exhaust temperature - offset	-	-99.9	99.9	°C		S	RW		HR173 (16bit)
L04-t	Exhaust temperature - type	0	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR174 (16bit)
L05-b	Antifreeze temperature - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR175 (16bit)
L05-c	Antifreeze temperature - channel	-	0	L05-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR176 (16bit)
L05-f	Antifreeze temperature - filter	5	0	10	-		S	RW		HR177 (16bit)
L05-h	Antifreeze temperature - max value	105	L05-l	999.9	°C		S	RW		HR178 (16bit)
L05-l	Antifreeze temperature - min value	-50	-99	L05-h	°C		S	RW		HR179 (16bit)
L05-o	Antifreeze temperature - offset	-	-99.9	99.9	°C		S	RW		HR180 (16bit)
L05-t	Antifreeze temperature - type	0	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR181 (16bit)
L06-b	Supply humidity - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR182 (16bit)
L06-c	Supply humidity - channel	-	0	L06-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR183 (16bit)
L06-f	Supply humidity - filter	5	0	10	-		S	RW		HR184 (16bit)
L06-h	Supply humidity - max value	100	L06-l	999.9	%rH		S	RW		HR185 (16bit)
L06-l	Supply humidity - min value	0	0	L06-h	%rH		S	RW		HR186 (16bit)
L06-o	Supply humidity - offset	-	-99.9	99.9	%rH		S	RW		HR187 (16bit)
L06-t	Supply humidity - type	4	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR188 (16bit)
L07-b	Room humidity - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR189 (16bit)
L07-c	Room humidity - channel	-	0	L07-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR190 (16bit)
L07-f	Room humidity - filter	5	0	10	-		S	RW		HR191 (16bit)
L07-h	Room humidity - max value	100	L07-l	999.9	%rH		S	RW		HR192 (16bit)
L07-l	Room humidity - min value	0	0	L07-h	%rH		S	RW		HR193 (16bit)
L07-o	Room humidity - offset	-	-99.9	99.9	%rH		S	RW		HR194 (16bit)

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
L07-t	Room humidity - type	4	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR195 (16bit)
L08-b	Return humidity - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR196 (16bit)
L08-c	Return humidity - channel	-	0	L08-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR197 (16bit)
L08-f	Return humidity - filter	5	0	10	-		S	RW		HR198 (16bit)
L08-h	Return humidity - max value	100	L08-l	999.9	%rH		S	RW		HR199 (16bit)
L08-l	Return humidity - min value	0	0	L08-h	%rH		S	RW		HR200 (16bit)
L08-o	Return humidity - offset	-	-99.9	99.9	%rH		S	RW		HR201 (16bit)
L08-t	Return humidity - type	4	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR202 (16bit)
L09-b	Supply air pressure - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR203 (16bit)
L09-c	Supply air pressure - channel	-	0	L09-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR204 (16bit)
L09-f	Supply air pressure - filter	5	0	10	-		S	RW		HR205 (16bit)
L09-h	Supply air pressure - max value	2500	L09-l	9999.9	Pa		S	RW		HR206 (16bit)
L09-l	Supply air pressure - min value	0	0	L09-h	Pa		S	RW		HR207 (16bit)
L09-o	Supply air pressure - offset	-	-99.9	99.9	Pa		S	RW		HR208 (16bit)
L09-t	Supply air pressure - type	4	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR209 (16bit)
L10-b	Return air pressure - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR210 (16bit)
L10-c	Return air pressure - channel	-	0	L10-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR211 (16bit)
L10-f	Return air pressure - filter	5	0	10	-		S	RW		HR212 (16bit)
L10-h	Return air pressure - max value	2500	L10-l	9999.9	Pa		S	RW		HR213 (16bit)
L10-l	Return air pressure - min value	0	0	L10-h	Pa		S	RW		HR214 (16bit)
L10-o	Return air pressure - offset	-	-99.9	99.9	Pa		S	RW		HR215 (16bit)
L10-t	Return air pressure - type	4	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR216 (16bit)
L11-b	Air quality CO2 - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR217 (16bit)
L11-c	Air quality CO2 - channel	-	0	L11-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR218 (16bit)
L11-f	Air quality CO2 - filter	5	0	10	-		S	RW		HR219 (16bit)
L11-h	Air quality CO2 - max value	2000	L11-l	9999.9	ppm		S	RW		HR220 (16bit)
L11-l	Air quality CO2 - min value	0	0	L11-h	ppm		S	RW		HR221 (16bit)
L11-o	Air quality CO2 - offset	-	-99.9	99.9	ppm		S	RW		HR222 (16bit)
L11-t	Air quality CO2 - type	4	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR223 (16bit)
L12-b	Air quality VOC - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR224 (16bit)
L12-c	Air quality VOC - channel	-	0	L12-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR225 (16bit)
L12-f	Air quality VOC - filter	5	0	10	-		S	RW		HR226 (16bit)
L12-h	Air quality VOC - max value	100	L12-l	999.9	%		S	RW		HR227 (16bit)
L12-l	Air quality VOC - min value	0	0	L12-h	%		S	RW		HR228 (16bit)
L12-o	Air quality VOC - offset	-	-99.9	99.9	%		S	RW		HR229 (16bit)
L12-t	Air quality VOC - type	4	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR230 (16bit)
L13-b	Auxiliary probe - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR231 (16bit)
L13-c	Auxiliary probe - channel	-	0	L13-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR232 (16bit)
L13-f	Auxiliary probe - filter	5	0	10	-		S	RW		HR233 (16bit)
L13-h	Auxiliary probe - max value	100	L13-l	999.9	-		S	RW		HR234 (16bit)
L13-l	Auxiliary probe - min value	-50	-99	L13-h	-		S	RW		HR235 (16bit)
L13-o	Auxiliary AIN - offset	-	-99.9	99.9	-		S	RW		HR236 (16bit)
L13-t	Auxiliary probe - type	0	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR237 (16bit)
L46-b	Tachometer supply fan - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR510 (16bit)
L46-c	Tachometer supply fan - channel	-	0	11	-	See **Table of analogue input channels (-c)**	S	RW		HR511 (16bit)
L46-f	Tachometer supply fan - filter	0	0	10	-		S	RW		HR512 (16bit)
L46-h	Tachometer supply fan - max value	2000	L46-l	2000	Hz		S	RW		HR515 (16bit)
L46-l	Tachometer supply fan - min value	0	0	L46-h	Hz		S	RW		HR514 (16bit)
L46-o	Tachometer supply fan - offset	-	-99.9	99.9	Hz		S	RW		HR516 (16bit)
L46-t	Tachometer supply fan - type	24	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR513 (16bit)
L47-b	Tachometer return fan - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR517 (16bit)
L47-c	Tachometer return fan - channel	-	0	11	-	See **Table of analogue input channels (-c)**	S	RW		HR518 (16bit)
L47-f	Tachometer return fan - filter	0	0	10	-		S	RW		HR519 (16bit)
L47-h	Tachometer return fan - max value	2000	L47-l	2000	Hz		S	RW		HR522 (16bit)
L47-l	Tachometer return fan - min value	0	0	L47-h	Hz		S	RW		HR521 (16bit)
L47-o	Tachometer return fan - offset	-	-99.9	99.9	Hz		S	RW		HR523 (16bit)
L47-t	Tachometer return fan - type	24	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR520 (16bit)

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
L53-b	Air quality PM - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR471 (16bit)
L53-c	Air quality PM - channel	-	0	L53-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR472 (16bit)
L53-f	Air quality PM - filter	5	0	10	-		S	RW		HR473 (16bit)
L53-h	Air quality PM - max value	1000	L53-l	9999.9	-		S	RW		HR524 (32bit)
L53-l	Air quality PM - min value	0	0	L53-h	-		S	RW		HR525 (32bit)
L53-o	Air quality PM - offset	-	-99.9	99.9	-		S	RW		HR526 (32bit)
L53-t	Air quality PM - type	4	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR474 (16bit)
L57-b	Fresh air preheater temperature - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR528 (16bit)
L57-c	Fresh air preheater temperature - channel	-	0	L57-maxch	-	See **Table of analogue input channels (-c)**	S	RW		HR529 (16bit)
L57-f	Fresh air preheater temperature - filter	5	0	10	-		S	RW		HR530 (16bit)
L57-h	Fresh air preheater temperature - max value	105	L57-l	999.9	°C		S	RW		HR532 (16bit)
L57-l	Fresh air preheater temperature - min value	-50	0	L57-h	°C		S	RW		HR533 (16bit)
L57-o	Fresh air preheater temperature - offset	-	-99.9	99.9	°C		S	RW		HR534 (16bit)
L57-t	Fresh air preheater temperature - type	0	0	27	-	See **Table of analogue input types (-t)**	S	RW		HR531 (16bit)
L99	Probe alarm delay	10	0	999	s		S	RW		HR316 (16bit)

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Analog output

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
L28-b	Supply fan analogue - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR266 (16bit)
L28-c	Supply fan analogue - channel	-	0	L28-maxch	-	See **Table of analogue output channels (-c)**	S	RW		HR267 (16bit)
L28-h	Supply fan - maximum value	100	0	100	%		S	RW		HR268 (16bit)
L28-l	Supply fan - minimum value	-	0	100	%		S	RW		HR269 (16bit)
L28-t	Supply fan analogue - type	-	0	5	-	See **Table of analogue output types (-t)**	S	RW		HR448 (16bit)
L29-b	Return fan analogue - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR270 (16bit)
L29-c	Return fan analogue - channel	-	0	L29-maxch	-	See **Table of analogue output channels (-c)**	S	RW		HR271 (16bit)
L29-h	Return fan - maximum value	100	0	100	%		S	RW		HR272 (16bit)
L29-l	Return fan - minimum value	-	0	100	%		S	RW		HR273 (16bit)
L29-t	Return fan analogue - type	-	0	5	-	See **Table of analogue output types (-t)**	S	RW		HR447 (16bit)
L30-b	Bypass damper analogue - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR274 (16bit)
L30-c	Bypass damper analogue - channel	-	0	L30-maxch	-	See **Table of analogue output channels (-c)**	S	RW		HR275 (16bit)
L30-h	Bypass damper - maximum value	100	0	100	%		S	RW		HR276 (16bit)
L30-l	Bypass damper - minimum value	-	0	100	%		S	RW		HR277 (16bit)
L30-t	Bypass damper analogue - type	-	0	5	-	See **Table of analogue output types (-t)**	S	RW		HR444 (16bit)
L31-b	Thermal wheel analogue - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR278 (16bit)
L31-c	Thermal wheel analogue - channel	-	0	L31-maxch	-	See **Table of analogue output channels (-c)**	S	RW		HR279 (16bit)
L31-h	Thermal wheel - maximum value	100	0	100	%		S	RW		HR280 (16bit)
L31-l	Thermal wheel - minimum value	-	0	100	%		S	RW		HR281 (16bit)
L31-t	Thermal wheel analogue - type	-	0	5	-	See **Table of analogue output types (-t)**	S	RW		HR449 (16bit)
L32-b	Fresh air pre heater analogue - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR282 (16bit)
L32-c	Fresh air pre heater analogue - channel	-	0	L32-maxch	-	See **Table of analogue output channels (-c)**	S	RW		HR283 (16bit)
L32-h	Fresh air pre heater coil - maximum value	100	0	100	%		S	RW		HR284 (16bit)
L32-l	Fresh air pre heater coil - minimum value	-	0	100	%		S	RW		HR285 (16bit)
L32-t	Fresh air pre heater analogue - type	-	0	5	-	See **Table of analogue output types (-t)**	S	RW		HR445 (16bit)
L33-b	Main coil analogue - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR286 (16bit)
L33-c	Main coil analogue - channel	-	0	L33-maxch	-	See **Table of analogue output channels (-c)**	S	RW		HR287 (16bit)
L33-h	Main coil - maximum value	100	0	100	%		S	RW		HR288 (16bit)
L33-l	Main coil - minimum value	-	0	100	%		S	RW		HR289 (16bit)
L33-t	Main coil analogue - type	-	0	5	-	See **Table of analogue output types (-t)**	S	RW		HR446 (16bit)
L34-b	Auxiliary output analogue - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR290 (16bit)
L34-c	Auxiliary output analogue - channel	-	0	L34-maxch	-	See **Table of analogue output channels (-c)**	S	RW		HR291 (16bit)

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
L34-h	Auxiliary AOUT - maximum value	100	0	100	%		S	RW		HR292 (16bit)
L34-l	Auxiliary AOUT - minimum value	-	0	100	%		S	RW		HR293 (16bit)
L34-t	Auxiliary output analogue - type	-	0	5	-	See **Table of analogue output types (-t)**	S	RW		HR443 (16bit)

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Digital input

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
L14-L	Unit on off input - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS29
L14-b	Unit on off input - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR238 (16bit)
L14-c	Unit on off input - channel	-	0	L14-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR239 (16bit)
L15-L	Serious alarm input - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS30
L15-b	Serious alarm input - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR240 (16bit)
L15-c	Serious alarm input - channel	-	0	L15-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR241 (16bit)
L16-L	Summer/Winter input - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS31
L16-b	Summer/Winter input - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR242 (16bit)
L16-c	Summer/Winter input - channel	-	0	L16-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR243 (16bit)
L17-L	Filter alarm input - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS32
L17-b	Filter alarm input - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR244 (16bit)
L17-c	Filter alarm input - channel	-	0	L17-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR245 (16bit)
L18-L	Supply fan overload - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS33
L18-b	Supply fan overload - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR246 (16bit)
L18-c	Supply fan overload - channel	-	0	L18-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR247 (16bit)
L19-L	Return fan overload - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS34
L19-b	Return fan overload - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR248 (16bit)
L19-c	Return fan overload - channel	-	0	L19-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR249 (16bit)
L20-L	Main coil overload - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS35
L20-b	Main coil overload - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR250 (16bit)
L20-c	Main coil overload - channel	-	0	L20-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR251 (16bit)
L21-L	Fresh air pre heater overload - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS36
L21-b	Fresh air pre heater overload - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR252 (16bit)
L21-c	Fresh air pre heater overload - channel	-	0	L21-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR253 (16bit)
L22-L	Recovery overload - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS37
L22-b	Recovery overload - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR254 (16bit)
L22-c	Recovery overload - channel	-	0	L22-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR255 (16bit)
L23-L	Fans overload - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS38
L23-b	Fans overload - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR256 (16bit)
L23-c	Fans overload - channel	-	0	L23-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR257 (16bit)
L24-L	Supply air flow switch - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS39
L24-b	Supply air flow switch - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR258 (16bit)
L24-c	Supply air flow switch - channel	-	0	L24-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR259 (16bit)
L25-L	Return air flow switch - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS40
L25-b	Return air flow switch - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR260 (16bit)
L25-c	Return air flow switch - channel	-	0	L25-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR261 (16bit)
L26-L	Air flow switch - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS41
L26-b	Air flow switch - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR262 (16bit)
L26-c	Air flow switch - channel	-	0	L26-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR263 (16bit)
L27-L	Auxiliary input - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS42
L27-b	Auxiliary input - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR264 (16bit)
L27-c	Auxiliary input - channel	-	0	L27-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR265 (16bit)
L48-L	Fan fixed speed 1 - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS102

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
L48-b	Fan fixed speed 1 - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR450 (16bit)
L48-c	Fan fixed speed 1 - channel	-	0	L48-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR451 (16bit)
L49-L	Fan fixed speed 2 - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS103
L49-b	Fan fixed speed 2 - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR452 (16bit)
L49-c	Fan fixed speed 2 - channel	-	0	L49-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR453 (16bit)
L50-L	Fan fixed speed 3 - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS104
L50-b	Fan fixed speed 3 - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR454 (16bit)
L50-c	Fan fixed speed 3 - channel	-	0	L50-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR455 (16bit)
L54-L	Condensation alarm input - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS109
L54-b	Condensation alarm input - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR497 (16bit)
L54-c	Condensation alarm input - channel	-	0	L54-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR499 (16bit)
L58-L	Fire/smoke alarm - logic	-	-	-	-	0: NC; 1: NO	S	RW		CS112
L58-b	Fire/smoke alarm - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR536 (16bit)
L58-c	Fire/smoke alarm - channel	-	0	L58-maxch	-	See **Table of digital input channels (-c)**	S	RW		HR537 (16bit)

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Digital output

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
L35-L	Supply fan digital - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS43
L35-b	Supply fan digital - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR294 (16bit)
L35-c	Supply fan digital - channel	-	0	L35-maxch	-	See **Table of digital output channels (-c)**	S	RW		HR295 (16bit)
L36-L	Return fan digital - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS44
L36-b	Return fan digital - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR296 (16bit)
L36-c	Return fan digital - channel	-	0	L36-maxch	-	See **Table of digital output channels (-c)**	S	RW		HR297 (16bit)
L37-L	Bypass damper digital - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS45
L37-b	Bypass damper digital - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR298 (16bit)
L37-c	Bypass damper digital - channel	-	0	L37-maxch	-	See **Table of digital output channels (-c)**	S	RW		HR299 (16bit)
L38-L	Thermal wheel digital - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS46
L38-b	Thermal wheel digital - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR300 (16bit)
L38-c	Thermal wheel digital - channel	-	0	L38-maxch	-	See **Table of digital output channels (-c)**	S	RW		HR301 (16bit)
L39-L	Fresh air pre heater digital - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS47
L39-b	Fresh air pre heater digital - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR302 (16bit)
L39-c	Fresh air pre heater digital - channel	-	0	L39-maxch	-	See **Table of digital output channels (-c)**	S	RW		HR303 (16bit)
L40-L	Main coil digital - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS48
L40-b	Main coil digital - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR304 (16bit)
L40-c	Main coil digital - channel	-	0	L40-maxch	-	See **Table of digital output channels (-c)**	S	RW		HR305 (16bit)
L41-L	Auxiliary output digital - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS49
L41-b	Auxiliary output digital - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR306 (16bit)
L41-c	Auxiliary output digital - channel	-	0	L41-maxch	-	See **Table of digital output channels (-c)**	S	RW		HR307 (16bit)
L42-L	Unit status output - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS50
L42-b	Unit status output - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR308 (16bit)
L42-c	Unit status output - channel	-	0	L42-maxch	-	See **Table of digital output channels (-c)**	S	RW		HR309 (16bit)
L43-L	Summer/Winter output - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS51
L43-b	Summer/Winter output - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR310 (16bit)
L43-c	Summer/Winter output - channel	-	0	L43-maxch	-	See **Table of digital output channels (-c)**	S	RW		HR311 (16bit)
L44-L	Global alarm output - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS52
L44-b	Global alarm output - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR312 (16bit)
L44-c	Global alarm output - channel	-	0	L44-maxch	-	See **Table of digital output channels (-c)**	S	RW		HR313 (16bit)
L45-L	Filter alarm output - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS53

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
L45-b	Filter alarm output - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR314 (16bit)
L45-c	Filter alarm output - channel	-	0	L45-maxch	-	See **Table of digital output channels (-c)**	S	RW		HR315 (16bit)
L51-L	Bypass damper close - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS105
L51-b	Bypass damper close - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR456 (16bit)
L51-c	Bypass damper close - channel	-	0	L51-maxch	-	See **Table of digital output channels (-c)**	S	RW		HR457 (16bit)
L52-L	Bypass damper open - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS106
L52-b	Bypass damper open - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR458 (16bit)
L52-c	Bypass damper open - channel	-	0	L52-maxch	-	See **Table of digital output channels (-c)**	S	RW		HR459 (16bit)
L55-L	Condensation alarm output - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS110
L55-b	Condensation alarm output - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR506 (16bit)
L55-c	Condensation alarm output - channel	-	0	L55-maxch	-	See **Table of digital output channels (-c)**	S	RW		HR504 (16bit)
L56-L	Cooling/Heating output - logic	-	-	-	-	0: NO; 1: NC	S	RW		CS111
L56-b	Cooling/Heating output - board	-	0	IOCfgMax-b	-	See **Table of board types (-b)**	S	RW		HR508 (16bit)

Tab. 6.y

Table of analogue input types (-t)

0: NTC	4: 4-20mA	8: Reserved 8	12: Reserved 12	16: Reserved 16	20: Reserved 20	24: DIN FREQ.
1: PT1000	5: Reserved 5	9: Reserved 9	13: Reserved 13	17: Reserved 17	21: Reserved 21	25: Reserved 25
2: RESERVED 2	6: 0...5V	10: Reserved 10	14: Reserved 14	18: Reserved 18	22: Reserved 22	26: Reserved 26
3: 0...10V	7: Reserved 7	11: Reserved 11	15: Reserved 15	19: Reserved 19	23: Reserved 23	27: No connection

Tab. 6.z

Table of analogue output types (-t)

0: 0-10V	2: RESERVED 2	4: RESERVED 3
1: RESERVED 1	3: PWM 100Hz	5: RESERVED 4

Tab. 6.aa

Table of board types (-b)

0: uAria	2: IAQ	4: Jotto
1: Room terminal	3: Expansion	

Tab. 6.ab

Table of analogue input channels (-c)

0: None	2: S2	4: S4	6: S6	8: S8	10: ID1
1: S1	3: S3	5: S5	7: S7	9: Reserved	11: ID3

Tab. 6.ac

Table of analogue output channels (-c)

0: None	2: Y2	4: Y4
1: Y1	3: Y3	

Tab. 6.ad

Table of digital input channels (-c)

0: None	2: ID2	4: ID4
1: ID1	3: ID3	5: ID5

Tab. 6.ae

Table of digital output channels (-c)

0: None	2: NO2	4: NO4
1: NO1	3: NO3	5: NO5

Tab. 6.af

6.19 I/O value

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
AFi	Air flow - switch	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS46
AFt	Antifreeze temperature	-	-	-	Â°C		M; S; U	R		IR0 (16bit)
APM	Air quality PM	-	-	-	-		M; S; U	R		IR210 (16bit)
ATd	Global alarm output	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS50
AUP	Auxiliary AIN	-	-	-	-		M; S; U	R		IR4 (16bit)
AUa	Auxiliary AOUT	-	0	100	%		M; S; U	R		IR3 (16bit)
AUd	Auxiliary DOUT	-	-	-	-	0: OFF; 1: ON	M; S; U	R		IS51
AUi	Auxiliary DIN	-	-	-	-	0: OFF; 1: ON	M; S; U	R		IS52
CAi	Condensation alarm input	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS245
CAo	Condensation alarm output	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS248
CHo	Cooling/Heating status	-	-	-	-		M; S; U	R		-
CO2	Air quality CO2	-	-	-	ppm		M; S; U	R		IR10 (16bit)
EHt	Exhaust temperature	-	-	-	Â°C		M; S; U	R		IR16 (16bit)
Ett	External temperature	-	-	-	Â°C		M; S; U	R		IR17 (16bit)
FAi	Filter alarm input	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS56
FHO	Fresh air preheater coil overload	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS61
FHa	Fresh air pre heater coil analogue	-	0	100	%		M; S; U	R		IR18 (16bit)
FHd	Fresh air pre heater coil digital	-	-	-	-	0: OFF; 1: ON	M; S; U	R		IS60
FOL	Fans overload	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS62
FPt	Fresh air pre-heater temperature	-	-	-	Â°C		M; S; U	R		IR215 (16bit)
FS1	Fan fixed speed 1	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS233
FS2	Fan fixed speed 2	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS234
FS3	Fan fixed speed 3	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS235
FSA	Fire/smoke alarm input	-	-	-	-		M; S; U	R		IS256
HrO	Recovery overload	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS68

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
MCO	Main coil overload	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS166
MCa	Main coil analogue	-	0	100	%		M; S; U	R		IR68 (16bit)
MCd	Main coil digital	-	-	-	-	0: OFF; 1: ON	M; S; U	R		IS165
RTa	Tachometer return fan frequency	-	-	-	Hz		M; S; U	R		IR198 (16bit)
SAF	Supply air flow switch	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS176
SAi	Serious alarm input	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS177
SFO	Supply fan overload	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS181
SFa	Supply fan analogue	-	0	100	%		M; S; U	R		IR85 (16bit)
SFd	Supply fan digital	-	-	-	-	0: OFF; 1: ON	M; S; U	R		IS180
SNd	Summer/Winter output	-	-	-	-	0: Summer; 1: Winter	M; S; U	R		IS182
SNi	Summer/Winter input	-	-	-	-	0: Summer; 1: Winter	M; S; U	R		IS183
SPP	Supply air pressure	-	-	-	Pa		M; S; U	R		IR88 (16bit)
SPf	Supply air flow	-	-	-	m3/h		M; S; U	R		IR86 (16bit)
SPh	Supply humidity	-	-	-	%rH		M; S; U	R		IR87 (16bit)
SPt	Supply temperature	-	-	-	Â°C		M; S; U	R		IR89 (16bit)
STa	Tachometer supply fan frequency	-	-	-	Hz		M; S; U	R		IR195 (16bit)
UOC	Air quality VOC	-	-	-	%		M; S; U	R		IR93 (16bit)
UOi	Unit on/off input	-	-	-	-	0: OFF; 1: ON	M; S; U	R		IS189
USd	Unit status	-	-	-	-	0: OFF; 1: ON	M; S; U	R		IS191
bPa	Bypass damper analogue	-	0	100	%		M; S; U	R		IR9 (16bit)
bPc	Bypass damper closing	-	-	-	-	0: OPEN; 1: CLOSED	M; S; U	R		IS264
bPd	Bypass damper digital	-	-	-	-	0: OFF; 1: ON	M; S; U	R		IS53
bPo	Bypass damper opening	-	-	-	-	0: CLOSED; 1: OPEN	M; S; U	R		IS263
fTd	Filter alarm output	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS66
rAF	Return air flow switch	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS169
rEP	Return air pressure	-	-	-	Pa		M; S; U	R		IR79 (16bit)
rEf	Return air flow	-	-	-	m3/h		M; S; U	R		IR77 (16bit)
rEh	Return humidity	-	-	-	%rH		M; S; U	R		IR78 (16bit)
rEt	Return temperature	-	-	-	Â°C		M; S; U	R		IR80 (16bit)
rFO	Return fan overload	-	-	-	-	0: NOT ACTIVE; 1: ACTIVE	M; S; U	R		IS175
rFa	Return fan analogue	-	0	100	%		M; S; U	R		IR81 (16bit)
rFd	Return fan digital	-	-	-	-	0: OFF; 1: ON	M; S; U	R		IS174
rOh	Room humidity	-	-	-	%rH		M; S; U	R		IR82 (16bit)
rOt	Room temperature	-	-	-	Â°C		M; S; U	R		IR83 (16bit)
tHa	Thermal wheel analogue	-	0	100	%		M; S; U	R		IR91 (16bit)
tHd	Thermal wheel digital	-	-	-	-	0: OFF; 1: ON	M; S; U	R		IS186

Tab. 6.ag

6.20 I/O Info

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
IOCfgErr-b	I/O configuration error - board	-	0	4	-		M; S	R		IR203 (16bit)
IOCfgErr-c	I/O configuration error - channel	-	-	-	-		M; S	R		IR202 (16bit)
IOCfgErr-typ	I/O configuration error - I/O type	-	0	4	-	0: NONE; 1: ANALOG INPUT; 2: DIGITAL INPUT; 3: ANALOG OUPUT; 4: DIGITAL OUTPUT	M; S	R		IR201 (16bit)
IOCfgMax-b	Maximum number of boards allowed	5	-	-	-			R		-
L00-cfg	Supply temperature - properly configured	-	-	-	-		M; S; U	R		IS69
L00-e	Supply temperature - enabled	-	-	-	-		M	R		IS70
L00-err	Supply temperature - error code	-	0	22	-		M	R		IR22 (16bit)
L00-maxch	Maximum channel number of I/O	-	-	-	-			R		IR162 (16bit)
L01-cfg	Room temperature - properly configured	-	-	-	-		M; S; U	R		IS71
L01-e	Room temperature - enabled	-	-	-	-		M	R		IS72
L01-err	Room temperature - error code	-	0	22	-		M	R		IR23
L01-maxch	Maximum channel number of I/O	-	-	-	-			R		IR159 (16bit)
L02-cfg	Return temperature - properly configured	-	-	-	-		M; S; U	R		IS73
L02-e	Return temperature - enabled	-	-	-	-		M	R		IS74
L02-err	Return temperature - error code	-	0	22	-		M	R		IR24 (16bit)
L02-maxch	Maximum channel number of I/O	-	-	-	-			R		IR157 (16bit)
L03-cfg	External temperature - properly configured	-	-	-	-		M; S; U	R		IS75
L03-e	External temperature - enabled	-	-	-	-		M	R		IS76
L03-err	External temperature - error code	-	0	22	-		M	R		IR25 (16bit)
L03-maxch	Maximum channel number of I/O	-	-	-	-			R		IR154 (16bit)
L04-cfg	Exhaust temperature - properly configured	-	-	-	-		M; S; U	R		IS77
L04-e	Exhaust temperature - enabled	-	-	-	-		M	R		IS78
L04-err	Exhaust temperature - error code	-	0	22	-		M	R		IR26 (16bit)
L04-maxch	Maximum channel number of I/O	-	-	-	-			R		IR153 (16bit)
L05-cfg	Antifreeze temper. - properly configured	-	-	-	-		M; S; U	R		IS79
L05-e	Antifreeze temperature - enabled	-	-	-	-		M	R		IS80
L05-err	Antifreeze temperature - error code	-	0	22	-		M	R		IR27 (16bit)
L05-maxch	Maximum channel number of I/O	-	-	-	-			R		IR148 (16bit)
L06-cfg	Supply humidity - properly configured	-	-	-	-		M; S; U	R		IS81
L06-e	Supply humidity - enabled	-	-	-	-		M	R		IS82

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
L06-err	Supply humidity - error code	-	0	22	-		M	R		IR28 (16bit)
L06-maxch	Maximum channel number of I/O	-	-	-	-			R		IR161 (16bit)
L07-cfg	Room humidity - properly configured	-	-	-	-		M; S; U	R		IS83
L07-e	Room humidity - enabled	-	-	-	-		M	R		IS84
L07-err	Room humidity - error code	-	0	22	-		M	R		IR29 (16bit)
L07-maxch	Maximum channel number of I/O	-	-	-	-			R		IR158 (16bit)
L08-cfg	Return humidity - properly configured	-	-	-	-		M; S; U	R		IS85
L08-e	Return humidity - enabled	-	-	-	-		M	R		IS86
L08-err	Return humidity - error code	-	0	22	-		M	R		IR30 (16bit)
L08-maxch	Maximum channel number of I/O	-	-	-	-			R		IR156 (16bit)
L09-cfg	Supply air pressure - properly configured	-	-	-	-		M; S; U	R		IS87
L09-e	Supply air pressure - enabled	-	-	-	-		M	R		IS88
L09-err	Supply air pressure - error code	-	0	22	-		M	R		IR31 (16bit)
L09-maxch	Maximum channel number of I/O	-	-	-	-			R		IR160 (16bit)
L10-cfg	Return air pressure - properly configured	-	-	-	-		M; S; U	R		IS89
L10-e	Return air pressure - enabled	-	-	-	-		M	R		IS90
L10-err	Return air pressure - error code	-	0	22	-		M	R		IR32 (16bit)
L10-maxch	Maximum channel number of I/O	-	-	-	-			R		IR155 (16bit)
L11-cfg	Air quality CO2 - properly configured	-	-	-	-		M; S; U	R		IS91
L11-e	Air quality CO2 - enabled	-	-	-	-		M	R		IS92
L11-err	Air quality CO2 - error code	-	0	22	-		M	R		IR33 (16bit)
L11-maxch	Maximum channel number of I/O	-	-	-	-			R		IR150 (16bit)
L12-cfg	Air quality VOC - properly configured	-	-	-	-		M; S; U	R		IS93
L12-e	Air quality VOC - enabled	-	-	-	-		M	R		IS94
L12-err	Air quality VOC - error code	-	0	22	-		M	R		IR34 (16bit)
L12-maxch	Maximum channel number of I/O	-	-	-	-			R		IR151 (16bit)
L13-cfg	Auxiliary probe - properly configured	-	-	-	-		M; S; U	R		IS95
L13-e	Auxiliary probe - enabled	-	-	-	-		M	R		IS96
L13-err	Auxiliary probe - error code	-	0	22	-		M	R		IR35 (16bit)
L13-maxch	Maximum channel number of I/O	-	-	-	-			R		IR152 (16bit)
L14-cfg	Unit on off input - properly configured	-	-	-	-		M; S; U	R		IS97
L14-e	Unit on off input - enabled	-	-	-	-		M	R		IS98
L14-err	Unit on off input - error code	-	0	22	-		M	R		IR36 (16bit)
L14-maxch	Maximum channel number of I/O	-	-	-	-			R		IR176 (16bit)
L15-cfg	Serious alarm input - properly configured	-	-	-	-		M; S; U	R		IS99
L15-e	Serious alarm input - enabled	-	-	-	-		M	R		IS100
L15-err	Serious alarm input - error code	-	0	22	-		M	R		IR37 (16bit)
L15-maxch	Maximum channel number of I/O	-	-	-	-			R		IR172 (16bit)
L16-cfg	Summer/Winter input - properly config.	-	-	-	-		M; S; U	R		IS101
L16-e	Summer/Winter input - enabled	-	-	-	-		M	R		IS102
L16-err	Summer/Winter input - error code	-	0	22	-		M	R		IR38 (16bit)
L16-maxch	Maximum channel number of I/O	-	-	-	-			R		IR173 (16bit)
L17-cfg	Filter alarm input - properly configured	-	-	-	-		M; S; U	R		IS103
L17-e	Filter alarm input - enabled	-	-	-	-		M	R		IS104
L17-err	Filter alarm input - error code	-	0	22	-		M	R		IR39 (16bit)
L17-maxch	Maximum channel number of I/O	-	-	-	-			R		IR166 (16bit)
L18-cfg	Supply fan overload - properly configured	-	-	-	-		M; S; U	R		IS105
L18-e	Supply fan overload - enabled	-	-	-	-		M	R		IS106
L18-err	Supply fan overload - error code	-	0	22	-		M	R		IR40 (16bit)
L18-maxch	Maximum channel number of I/O	-	-	-	-			R		IR175 (16bit)
L19-cfg	Return fan overload - properly configured	-	-	-	-		M; S; U	R		IS107
L19-e	Return fan overload - enabled	-	-	-	-		M	R		IS108
L19-err	Return fan overload - error code	-	0	22	-		M	R		IR41 (16bit)
L19-maxch	Maximum channel number of I/O	-	-	-	-			R		IR171 (16bit)
L20-cfg	Main coil overload - properly configured	-	-	-	-		M; S; U	R		IS109
L20-e	Main coil overload - enabled	-	-	-	-		M	R		IS110
L20-err	Main coil overload - error code	-	0	22	-		M	R		IR42 (16bit)
L20-maxch	Maximum channel number of I/O	-	-	-	-			R		IR168 (16bit)
L21-cfg	Fresh air pre heater overload - properly configured	-	-	-	-		M; S; U	R		IS111
L21-e	Fresh air pre heater overload - enabled	-	-	-	-		M	R		IS112
L21-err	Fresh air pre heater overload - error code	-	0	22	-		M	R		IR43 (16bit)
L21-maxch	Maximum channel number of I/O	-	-	-	-			R		IR167 (16bit)
L22-cfg	Recovery overload - properly configured	-	-	-	-		M; S; U	R		IS113
L22-e	Recovery overload - enabled	-	-	-	-		M	R		IS114
L22-err	Recovery overload - error code	-	0	22	-		M	R		IR44 (16bit)
L22-maxch	Maximum channel number of I/O	-	-	-	-			R		IR169 (16bit)
L23-cfg	Fans overload - properly configured	-	-	-	-		M; S; U	R		IS115
L23-e	Fans overload - enabled	-	-	-	-		M	R		IS116
L23-err	Fans overload - error code	-	0	22	-		M	R		IR45 (16bit)
L23-maxch	Maximum channel number of I/O	-	-	-	-			R		IR165 (16bit)
L24-cfg	Supply air flow switch - properly config.	-	-	-	-		M; S; U	R		IS117
L24-e	Supply air flow switch - enabled	-	-	-	-		M	R		IS118
L24-err	Supply air flow switch - error code	-	0	22	-		M	R		IR46 (16bit)
L24-maxch	Maximum channel number of I/O	-	-	-	-			R		IR174 (16bit)
L25-cfg	Return air flow switch - properly config.	-	-	-	-		M; S; U	R		IS119

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
L25-e	Return air flow switch - enabled	-	-	-	-		M	R		IS120
L25-err	Return air flow switch - error code	-	0	22	-		M	R		IR47 (16bit)
L25-maxch	Maximum channel number of I/O	-	-	-	-			R		IR170 (16bit)
L26-cfg	Air flow switch - properly configured	-	-	-	-		M; S; U	R		IS121
L26-e	Air flow switch - enabled	-	-	-	-		M	R		IS122
L26-err	Air flow switch - error code	-	0	22	-		M	R		IR48 (16bit)
L26-maxch	Maximum channel number of I/O	-	-	-	-			R		IR163 (16bit)
L27-cfg	Auxiliary input - properly configured	-	-	-	-		M; S; U	R		IS123
L27-e	Auxiliary input - enabled	-	-	-	-		M	R		IS124
L27-err	Auxiliary input - error code	-	0	22	-		M	R		IR49 (16bit)
L27-maxch	Maximum channel number of I/O	-	-	-	-			R		IR164 (16bit)
L28-cfg	Supply fan analogue - properly configured	-	-	-	-		M; S; U	R		IS125
L28-e	Supply fan analogue - enabled	-	-	-	-		M	R		IS126
L28-err	Supply fan analogue - error code	-	0	22	-		M	R		IR50 (16bit)
L28-maxch	Maximum channel number of I/O	-	-	-	-			R		IR182 (16bit)
L29-cfg	Return fan analogue - properly configured	-	-	-	-		M; S; U	R		IS127
L29-e	Return fan analogue - enabled	-	-	-	-		M	R		IS128
L29-err	Return fan analogue - error code	-	0	22	-		M	R		IR51 (16bit)
L29-maxch	Maximum channel number of I/O	-	-	-	-			R		IR181 (16bit)
L30-cfg	Bypass damper analogue - properly config.	-	-	-	-		M; S; U	R		IS129
L30-e	Bypass damper analogue - enabled	-	-	-	-		M	R		IS130
L30-err	Bypass damper analogue - error code	-	0	22	-		M	R		IR52 (16bit)
L30-maxch	Maximum channel number of I/O	-	-	-	-			R		IR178 (16bit)
L31-cfg	Thermal wheel analogue - properly config.	-	-	-	-		M; S; U	R		IS131
L31-e	Thermal wheel analogue - enabled	-	-	-	-		M	R		IS132
L31-err	Thermal wheel analogue - error code	-	0	22	-		M	R		IR53 (16bit)
L31-maxch	Maximum channel number of I/O	-	-	-	-			R		IR183 (16bit)
L32-cfg	Fresh air pre heater analogue - properly configured	-	-	-	-		M; S; U	R		IS133
L32-e	Fresh air pre heater analogue - enabled	-	-	-	-		M	R		IS134
L32-err	Fresh air pre heater analogue - error code	-	0	22	-		M	R		IR54 (16bit)
L32-maxch	Maximum channel number of I/O	-	-	-	-			R		IR179 (16bit)
L33-cfg	Main coil analogue - properly configured	-	-	-	-		M; S; U	R		IS135
L33-e	Main coil analogue - enabled	-	-	-	-		M	R		IS136
L33-err	Main coil analogue - error code	-	0	22	-		M	R		IR55 (16bit)
L33-maxch	Maximum channel number of I/O	-	-	-	-			R		IR180 (16bit)
L34-cfg	Auxiliary output analogue - properly configured	-	-	-	-		M; S; U	R		IS137
L34-e	Auxiliary output analogue - enabled	-	-	-	-		M	R		IS138
L34-err	Auxiliary output analogue - error code	-	0	22	-		M	R		IR56 (16bit)
L34-maxch	Maximum channel number of I/O	-	-	-	-			R		IR177 (16bit)
L35-cfg	Supply fan digital - properly configured	-	-	-	-		M; S; U	R		IS139
L35-e	Supply fan digital - enabled	-	-	-	-		M	R		IS140
L35-err	Supply fan digital - error code	-	0	22	-		M	R		IR57 (16bit)
L35-maxch	Maximum channel number of I/O	-	-	-	-			R		IR192 (16bit)
L36-cfg	Return fan digital - properly configured	-	-	-	-		M; S; U	R		IS141
L36-e	Return fan digital - enabled	-	-	-	-		M	R		IS142
L36-err	Return fan digital - error code	-	0	22	-		M	R		IR58 (16bit)
L36-maxch	Maximum channel number of I/O	-	-	-	-			R		IR190 (16bit)
L37-cfg	Bypass damper digital - properly config.	-	-	-	-		M; S; U	R		IS143
L37-e	Bypass damper digital - enabled	-	-	-	-		M	R		IS144
L37-err	Bypass damper digital - error code	-	0	22	-		M	R		IR59 (16bit)
L37-maxch	Maximum channel number of I/O	-	-	-	-			R		IR185 (16bit)
L38-cfg	Thermal wheel digital - properly config.	-	-	-	-		M; S; U	R		IS145
L38-e	Thermal wheel digital - enabled	-	-	-	-		M	R		IS146
L38-err	Thermal wheel digital - error code	-	0	22	-		M	R		IR60 (16bit)
L38-maxch	Maximum channel number of I/O	-	-	-	-			R		IR193 (16bit)
L39-cfg	Fresh air pre heater digital - properly configured	-	-	-	-		M; S; U	R		IS147
L39-e	Fresh air pre heater digital - enabled	-	-	-	-		M	R		IS148
L39-err	Fresh air pre heater digital - error code	-	0	22	-		M	R		IR61 (16bit)
L39-maxch	Maximum channel number of I/O	-	-	-	-			R		IR187 (16bit)
L40-cfg	Main coil digital - properly configured	-	-	-	-		M; S; U	R		IS149
L40-e	Main coil digital - enabled	-	-	-	-		M	R		IS150
L40-err	Main coil digital - error code	-	0	22	-		M	R		IR62 (16bit)
L40-maxch	Maximum channel number of I/O	-	-	-	-			R		IR189 (16bit)
L41-cfg	Auxiliary output digital - properly config.	-	-	-	-		M; S; U	R		IS151
L41-e	Auxiliary output digital - enabled	-	-	-	-		M	R		IS152
L41-err	Auxiliary output digital - error code	-	0	22	-		M	R		IR63 (16bit)
L41-maxch	Maximum channel number of I/O	-	-	-	-			R		IR184 (16bit)
L42-cfg	Unit status output - properly configured	-	-	-	-		M; S; U	R		IS153
L42-e	Unit status output - enabled	-	-	-	-		M	R		IS154
L42-err	Unit status output - error code	-	0	22	-		M	R		IR64 (16bit)
L42-maxch	Maximum channel number of I/O	-	-	-	-			R		IR194 (16bit)
L43-cfg	Summer/Winter output - properly config.	-	-	-	-		M; S; U	R		IS155
L43-e	Summer/Winter output - enabled	-	-	-	-		M	R		IS156
L43-err	Summer/Winter output - error code	-	0	22	-		M	R		IR65 (16bit)

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
L43-maxch	Maximum channel number of I/O	-	-	-	-			R		IR191 (16bit)
L44-cfg	Global alarm output - properly configured	-	-	-	-		M; S; U	R		IS157
L44-e	Global alarm output - enabled	-	-	-	-		M	R		IS158
L44-err	Global alarm output - error code	-	0	22	-		M	R		IR66 (16bit)
L44-maxch	Maximum channel number of I/O	-	-	-	-			R		IR188 (16bit)
L45-cfg	Filter alarm output - properly configured	-	-	-	-		M; S; U	R		IS159
L45-e	Filter alarm output - enabled	-	-	-	-		M	R		IS160
L45-err	Filter alarm output - error code	-	0	22	-		M	R		IR67 (16bit)
L45-maxch	Maximum channel number of I/O	-	-	-	-			R		IR186 (16bit)
L46-cfg	Tachometer supply fan - properly config.	-	-	-	-		M; S; U	R		IS222
L46-e	Tachometer supply fan - enabled	-	-	-	-		M	R		IS225
L46-err	Tachometer supply fan - error code	-	0	22	-		M	R		IR196 (16bit)
L46-maxch	Tachometer supply fan - max.channel	-	-	-	-			R		IR197 (16bit)
L47-cfg	Tachometer return fan - properly config.	-	-	-	-		M; S; U	R		IS224
L47-e	Tachometer return fan - enabled	-	-	-	-		M	R		IS223
L47-err	Tachometer return fan - error code	-	0	22	-		M	R		IR199 (16bit)
L47-maxch	Tachometer return fan - maximum channel	-	-	-	-			R		IR200 (16bit)
L48-cfg	Fan fixed speed 1 - properly configured	-	-	-	-		M; S; U	R		IS227
L48-e	Fan fixed speed 1 - enabled	-	-	-	-		M	R		IS228
L48-err	Fan fixed speed 1 - error code	-	0	22	-		M	R		IR204 (16bit)
L48-maxch	Maximum channel number of I/O	-	-	-	-			R		IR205 (16bit)
L49-cfg	Fan fixed speed 2 - properly configured	-	-	-	-		M; S; U	R		IS229
L49-e	Fan fixed speed 2 - enabled	-	-	-	-		M	R		IS230
L49-err	Fan fixed speed 2 - error code	-	0	22	-		M	R		IR206 (16bit)
L49-maxch	Maximum channel number of I/O	-	-	-	-			R		IR207 (16bit)
L50-cfg	Fan fixed speed 3 - properly configured	-	-	-	-		M; S; U	R		IS231
L50-e	Fan fixed speed 3 - enabled	-	-	-	-		M	R		IS232
L50-err	Fan fixed speed 3 - error code	-	0	22	-		M	R		IR208 (16bit)
L50-maxch	Maximum channel number of I/O	-	-	-	-			R		IR209 (16bit)
L51-cfg	Bypass damper close - properly configured	-	-	-	-		M; S; U	R		IS111
L51-e	Bypass damper close - enabled	-	-	-	-		M	R		IS236
L51-err	Bypass damper close - error code	-	0	22	-		M	R		IR221 (16bit)
L51-maxch	Maximum channel number of I/O	-	-	-	-			R		IR185 (16bit)
L52-cfg	Bypass damper open - properly configured	-	-	-	-		M; S; U	R		IS112
L52-e	Bypass damper open - enabled	-	-	-	-		M	R		IS237
L52-err	Bypass damper open - error code	-	0	22	-		M	R		IR222 (16bit)
L52-maxch	Maximum channel number of I/O	-	-	-	-			R		
L53-cfg	Air quality PM - properly configured	-	-	-	-		M; S; U	R		IS244
L53-e	Air quality PM - enabled	-	-	-	-		M	R		IS243
L53-err	Air quality PM - error code	-	0	22	-		M	R		IR219 (16bit)
L53-maxch	Maximum channel number of I/O	-	-	-	-			R		HR475 (16bit)
L54-cfg	Condensation alarm input - properly configured	-	-	-	-		M; S; U	R		IS246
L54-e	Condensation alarm input - enabled	-	-	-	-		M	R		IS242
L54-err	Condensation alarm input - error code	-	0	22	-		M	R		IR223 (16bit)
L54-maxch	Maximum channel number of I/O	-	-	-	-			R		HR501 (16bit)
L55-cfg	Condensation alarm output - properly configured	-	-	-	-		M; S; U	R		IS249
L55-e	Condensation alarm output - enabled	-	-	-	-		M	R		IS247
L55-err	Condensation alarm output - error code	-	0	22	-		M	R		IR212 (16bit)
L55-maxch	Maximum channel number of I/O	-	-	-	-			R		IR211 (16bit)
L56-cfg	Cooling/Heating output - properly configured	-	-	-	-		M; S; U	R		IS252
L56-e	Cooling/Heating output - enabled	-	-	-	-		M	R		IS251
L56-err	Cooling/Heating output - error code	-	0	22	-		M	R		IR213 (16bit)
L56-maxch	Maximum channel number of I/O	-	-	-	-			R		IR214 (16bit)
L57-cfg	Fresh air preheater temperature - properly configured	-	-	-	-		M; S; U	R		IS254
L57-e	Fresh air preheater temperature - enable	-	-	-	-		M	R		IS253
L57-err	Fresh air preheater temp. - error code	-	0	22	-		M	R		IR220 (16bit)
L57-maxch	Maximum channel number of I/O	-	-	-	-			R		IR216 (16bit)
L58-cfg	Fire/smoke alarm - properly configured	-	-	-	-		M; S; U	R		IS257
L58-e	Fire/smoke alarm - enabled	-	-	-	-		M	R		IS255
L58-err	Fire/smoke alarm - error code	-	0	22	-		M	R		IR217 (16bit)
L58-maxch	Maximum channel number of I/O	-	-	-	-			R		IR218 (16bit)

Tab. 6.ah

6.21 Alarms

Code	Description	Def.	Min	Max	UOM	Label	User	R/W	Display	Modbus
A01	Supply temperature probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS0
A02	Supply humidity probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS1
A03	Return temperature probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS2
A04	Return humidity probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS3
A05	Room temperature probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS4
A06	Room humidity probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS5
A07	External temperature probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS6
A08	Exhaust temperature probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS7
A09	Antifreeze temperature probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS8
A10	Supply air pressure probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS9
A11	Return air pressure probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS10
A12	Air quality CO2 probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS11
A13	Air quality VOC probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS12
A14	Auxiliary probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS13
A15	Air quality PM probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS14
A16	Fans overload alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS15
A17	Supply fan overload alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS16
A18	Return fan overload alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS17
A19	Main coil overload alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS18
A20	Fresh air pre heat coil overload alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS19
A21	Heat recovery overload alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS20
A22	Air flow alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS21
A23	Supply air flow alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS22
A24	Return air flow alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS23
A25	Low supply temperature alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS24
A26	High supply temperature alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS25
A27	High humidity alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS26
A28	High CO2 alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS27
A29	High VOC alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS28
A30	High PM alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS29
A31	Unit maintenance required	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS30
A32	Filters maintenance required	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS31
A33	Supply fan maintenance required	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS32
A34	Return fan maintenance required	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS33
A35	Thermal wheel maintenance required	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS34
A36	Main coil maintenance required	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS35
A37	Fresh air pre heat coil maintenance required	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS36
A38	Auxiliary output maintenance required	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS37
A39	Unit - Remote alarm by digital input	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS38
A40	Antifreeze alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS39
A41	Filter alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS40
A42	Unit - Error in retain memory writings	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS41
A43	Room terminal offline	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS42
A44	Room terminal clock alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS43
A45	BMS offline alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS44
A46	Unit RTC alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS212
A47	Expansion offline alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS213
A48	Expansion configuration error alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS214
A49	Unit - error in NFC memory writings	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS219
A50	Unit - the last configuration may not have been applied correctly	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS220
A51	I/O - configuration error	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS221
A52	Condensation alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS250
A53	Fresh air preheater temperature probe alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS258
A54	Fire/smoke alarm	-	-	-	-	0: No alarm; 1: Alarm Active	U	R		IS259
rES	Reset active alarms by BMS net	-	-	-	-	0: DISABLED; 1: ENABLED	S	RW		CS60

Tab. 6.ai

7. ALARMS AND SIGNALS

7.1 Types of alarms

uAria can manage two types of alarms:
- A - automatic: the alarm is reset when the alarm condition is no longer present;
- M - manual: an operator needs to manually reset the alarm.

Alarms that require technical service are shown on the display with the flashing spanner icon.
If the spanner icon is on, it means that a device has reached the programmed operating hour threshold, and maintenance is required (the alarm code indicates which device is affected).

7.1.1 Active alarms

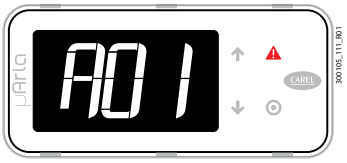
Notice: only active alarms are accessed via the user terminal

Active alarms are signalled by the buzzer and the flashing red alarm button. Pressing Alarm will mute the buzzer and display the alarm code.
Alarm activation is recorded in the alarm log, which can be viewed and exported in Applica.
If the alarm is reset automatically, the red alarm button goes off, the alarm code is cleared from the list and the alarm reset event is recorded in the alarm log.

Procedure (alarm acknowledgement):
1. press Alarm: the buzzer is muted, the alarm code is shown on the display;
2. press UP/DOWN to scroll through the list of alarms;
3. when finished, press Esc and then PRG to exit.

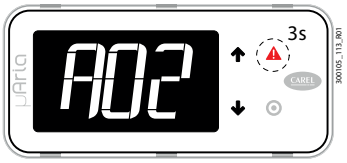
Procedure

When at least one alarm is active, the Alarm button flashes

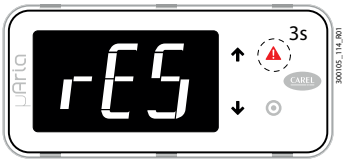


Pressing "Alarm" displays the code of the first active alarm

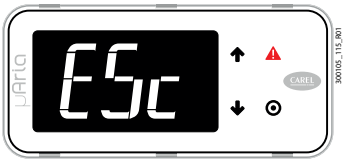
Pressing UP/DOWN displays the code of the other active alarms



Press and hold the "Alarm" button for 3s to reset the individual alarm



Press UP/DOWN until reaching the "Res" screen, and then press and hold "Alarm" for 3s to reset all active alarms and return to the main screen.



Press UP/DOWN until reaching the "Esc" screen, and then press "PRG" to return to the main screen.

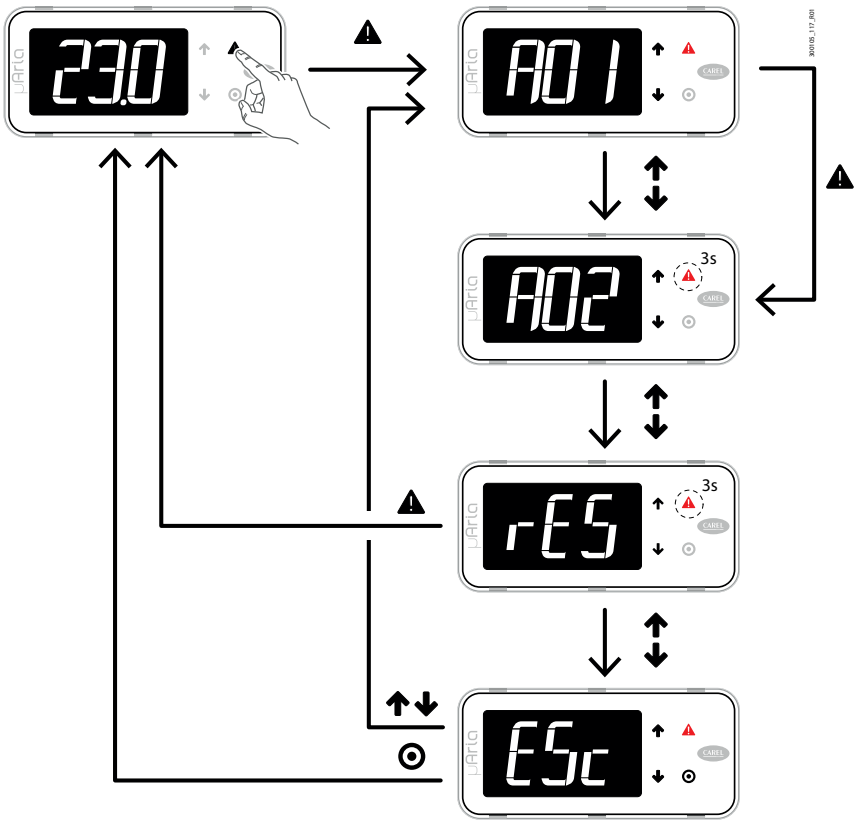


Fig. 7.a

The alarm log can be deleted using parameter y14, accessible via password on the terminal or APPLICA via smartphone, with BLE connection, using the specific function on the alarm page ("Service" level access is required). The same operations can be done in APPLICA via
smartphone, using the specific functions on the alarms page.

7.2 Alarm list

Code	Description	Reset	Action
A01	Supply temperature probe alarm	A	Unit shutdown if t00 = supply only or return + supply or room + supply
			Otherwise
			Display only
A02	Supply humidity probe alarm	A	Display only
A03	Return temperature probe alarm	A	Unit shutdown if t00 = return only or return + supply
			Otherwise
			Display only
A04	Return humidity probe alarm	A	Display only
A05	Room temperature probe alarm	A	Unit shutdown if t00 = room only or room + supply
			Otherwise
			Display only
A06	Room humidity probe alarm	A	Display only
A07	Outside temperature probe alarm	A	Display only
A08	Exhaust temperature probe alarm	A	Display only
A09	Antifreeze temperature probe alarm	A	Display only
A10	Supply pressure probe alarm	A	Display only
			Fan forced to speed S09
A11	Return pressure probe alarm	A	Display only
			Fan forced to speed r09
A12	Probe CO2 alarm	A	Display only
A13	VOC probe alarm	A	Display only
A14	Auxiliary probe alarm	A	Display only
A16	Fan overload alarm	M	Immediate unit shutdown
A17	Supply fan overload alarm	M	Immediate unit shutdown
A18	Return fan overload alarm	M	Immediate unit shutdown
A19	Main coil overload alarm	M	Immediate main coil shutdown
A20	Fresh air pre-heater coil overload alarm	M	Immediate pre-heater shutdown
A21	Heat recovery overload alarm	M	Immediate heat recovery shutdown
A22	Fan flow alarm	M	Immediate unit shutdown
A23	Supply fan flow alarm	M	Immediate unit shutdown
A24	Return fan flow alarm	M	Immediate unit shutdown

Code	Description	Reset	Action
A25	Low supply temperature alarm	A	In cooling mode: immediate unit shutdown In heating mode: display only
A26	High supply temperature alarm	A	In cooling mode: display only In heating mode: immediate unit shutdown
A27	High humidity alarm	A	Display only
A28	High CO2 level alarm	A	Display only
A29	High VOC level alarm	A	Display only
A31	Warning - Unit maintenance required	A	Display only
A32	Warning - Filter maintenance required	A	Display only
A33	Warning - Supply fan maintenance required	A	Display only
A34	Warning - Return fan maintenance required	A	Display only
A35	Warning - Thermal wheel maintenance required	A	Display only
A36	Warning - Main coil maintenance required	A	Display only
A37	Warning - Fresh air pre-heater maintenance required	A	Display only
A38	Warning - Auxiliary device maintenance required	A	Display only
A39	Serious alarm from digital input	A	Immediate unit shutdown
A40	Frost protection alarm	A	Unit shutdown
A41	Filter alarm from digital input	A	Display only
A42	Retain memory writes alarm	M	Unit shutdown
A43	Room terminal offline alarm	A	Display only
A44	Room terminal clock alarm	A	Display only
A45	BMS offline	A	Depends on parameter y22: 0. No alarm 1. Display only 2. Unit shutdown
A46	Invalid RTC date/time alarm	A	Display only
A49	NFC memory writes alarm	A	Display only
A50	Configuration application alarm	A	Display only
A51	Inputs/Outputs configuration alarm	A	Display only
A52	Condensation alarm	A	Dedicated digital output activation
A53	Outside temperature pre-heater probe alarm	A	Display only
A54	Smoke/fire alarm	A	Display only

Tab. 7.a

7.3 Alarm parameters

Some alarms depend on the settings of certain parameters

Probe alarms A01 to A14

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
L99	Probe alarm delay	10	0	999	s	S	R/W		HR316 (16bit)

Tab. 7.b

Flow alarms A22 to A24

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
f05	Air flow check - pressure threshold	50	0	9999	Pa	S	R/W		HR086 (16bit)
f07	Air flow check - max number of attempts	3	1	255		S	R/W		HR088 (16bit)
f08	Air flow check - time in startup	15	0	999	s	S	R/W		HR089 (16bit)
f09	Air flow check - time in run	3	0	999		S	R/W		HR090 (16bit)

Tab. 7.c

High/low temperature alarms A25-A26

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
t18	Low supply temperature limit	16	0	t19	°C	S	R/W		HR414 (16bit)
t19	High supply temperature limit	32	t18	60	°C	S	R/W		HR415 (16bit)
t26	Low supply temperature alarm delay	10	0	999	min	S	R/W		HR422 (16bit)
t27	High supply temperature alarm delay	10	0	999	min	S	R/W		HR423 (16bit)

Tab. 7.d

High/low air quality alarms A27 to A29

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
q00	Humidity - alarm threshold	85	0	100	%rH	S	R/W		HR364 (16bit)
q01	Air quality - CO2 alarm threshold	900	0	1200	ppm	S	R/W		HR365 (16bit)
q02	Air quality - VOC alarm threshold	90	0	100	%	S	R/W		HR366 (16bit)
q09	High CO2 alarm delay	30	0	999	min	S	R/W		HR373 (16bit)
q10	High VOC alarm delay	30	0	999	min	S	R/W		HR374 (16bit)
q11	High humidity alarm delay	30	0	999	min	S	R/W		HR375 (16bit)

Tab. 7.e

Maintenance required alarms A31 to A38

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
U00	Operating hours - unit max number of operating hours	99	0	999	h	S	R/W		HR424 (16bit)
U01	Operating hours - filter max number of operating hours	99	0	999	h	S	R/W		HR425 (16bit)
U02	Operating hours - supply fan max number of operating hours	99	0	999	h	S	R/W		HR426 (16bit)
U03	Operating hours - return fan max number of operating hours	99	0	999	h	S	R/W		HR427 (16bit)
U04	Operating hours - heat recovery max number of operating hours	99	0	999	h	S	R/W		HR428 (16bit)
U05	Operating hours - main coil max number of operating hours	99	0	999	h	S	R/W		HR429 (16bit)
U06	Operating hours - fresh air pre-heater max number of operating hours	99	0	999	h	S	R/W		HR430 (16bit)
U07	Operating hours - auxiliary output max number of operating hours	99	0	999	h	S	R/W		HR431 (16bit)

Tab. 7.f

BMS alarm A45

Code	Description	Default	Min	Max	UOM	User	R/W	Display	Modbus
y22	Behaviour for BMS alarm	0	0	2		S	R/W		HR485 (16bit)

Tab. 7.g

8. TECHNICAL SPECIFICATIONS

		UARAD* (DIN rail models)
Physical specifications	Dimensions	See figures
	Case	Polycarbonate
	Assembly	DIN rail
	Ball pressure test temperature	125°C
	Ingress protection	IP00
Environmental conditions	Operating temperature	-20T60 °C, <90% RH non-condensing
	Storage temperature	-40T85 °C, <90% RH non-condensing
Electrical specifications	Rated power supply	115-230 Vac
	Operating power supply voltage	115…230Vac, +10%-15% 115-230 Vac, +10% -15%
	Input frequency	50/60Hz
	Maximum current draw	150mArms
	Min power consumption	400mW
	Clock	precision +-50ppm; date/time retention after shutdown 6 months.
	Software class and structure	A
	Environmental pollution class	3
	Class of protection against electric shock	To be incorporated in class I or II appliances
	Type of action and disconnection	1.C
	Rated impulse voltage	115-230V input and relay outputs: 4 kV 24 V input: 0.5 kV
	Surge immunity category	115-230V input and relay outputs: III 24 V input: II
	Control device construction	Device to be incorporated
	Terminal block	Plug-in male-female. Wire sizes: see the "Connector/cable table"
User interface	Buzzer	not included on the controller, built-in on the user terminal
	Display	
Connectivity	NFC	not included on the controller, built-in on the user terminal
	Bluetooth Low Energy	
	BMS serial interface	Modbus RS485, not opto-isolated
	FieldBUS serial interface	Modbus RS485, not opto-isolated
	HMI interface	Modbus RS485, not opto-isolated

Tab. 8.a

		DIN
Analogue inputs (Lmax=10m)	S1, S2, S3: NTC / PT1000 S4, S5: 0-5 Vrat / 4-20 mA / NTC S6: NTC / PT1000 / 0-5 Vrat / 0-10 V / 4-20 mA	NTC: resolution 0.1 °C; 10kΩ@25°C; error: ±1°C in the range -50T50°C, ±3°C in the range 50T90°C PT1000: Resolution 0.1 °C; 1kΩ @ 0°C, error: ± 1° C in the range -60+120°C 0-5 Vrat: error 2% fs, typical 1% 4-20mA: error 5% fs, typical 1% 0-10 V: error 2% fs, typical 1%
Digital inputs	ID1, ID2, ID3, ID4, ID5	Voltage-free contact, not optically-isolated, typical closing current 6 mA, voltage with contact open 13 V, max contact resistance 50Ω
Analogue outputs	Y1, Y2, Y3, Y4	0-10V: 10 mA max PWM 100 Hz: max amplitude 10 V: 10 mA max
Digital outputs	Basic Version NO1 (16A), NO2 (8A), NO3 (5A), NO4 (5A), NO5 (5A) **Note:** Basic version on J6 connector, DIN: NO1+NO2+NO3 cannot exceed 15A max. Enhanced Version NO1 (5A), NO2 (5A), NO3 (5A), NO4 (5A), NO5 (5A) **Nota:** Enhanced version on J6 connector, DIN: NO1+NO2+NO3+NO4 cannot exceed 10A max	8 A: EN60730: 10A resistive, 250 V, 100k cycles; UL60730: 10A resistive, 240Vac, 100k cycles; 10FLA, 60LRA, 250Vac; Pilot duty B300, 6k cycles 16A: EN60730: 5 A resistive, 250 Vac, 100k cycles; 5(4), 250Vac, 100k cycles; 4(2), 250Vac, 100k cycles UL60730: 10 A resistive, 250 Vac, 100k cycles; 2 FLA, 12 LRA, 250 Vac, 30k cycles 5A: EN60730: 5 A resistive, 250 Vac, 50k cycles; 4(1), 230 Vac, 100k cycles; 3 (1), 230 Vac, 100k cycles UL60730: 5 A resistive, 250 Vac, 30k cycles; 1 FLA, 6 LRA, 250 Vac, 30k cycles; Pilot Duty C300, 30k cycles
Probe and terminal power supply	5 V	5 Vdc ± 2% to power the 0 to 5 V ratiometric probes. Maximum current delivered: 35 mA protected against short-circuits
	+V	8-11 V to power the 4-20 mA current probes. Max. current delivered: 80 mA protected against short-circuits
	VL	13 Vdc ± 10% to power the remote display
	HMI power supply	13 Vdc ± 10% to power the user terminal

		DIN
Cable lengths	Analogue inputs/outputs, digital inputs/outputs, probe power	<10m
		with 115 Vac power supply, if using +V in domestic environments, the maximum cable length is 2 m.
	BMS and Fieldbus serial cables	<500m with shielded cable
Conformity	Electrical safety	EN/UL 60730-1; EN/UL 60335-1
	Electromagnetic compatibility	EN 61000-6-1; EN 61000-6-2; EN 61000-6-3; EN 61000-6-4; EAC
	Applications with flammable refrigerant gases	EN/UL 60079-15; EN/UL 60335-2-34; EN/UL 60335-2-40; EN/UL 60335-2-89
	Wireless compliance	RED FCC; IC

Tab. 8.b

Note: for further information, see technical leaflet cod. Carel.: +0500143IE.

8.1 Connector/cable table

Ref.	Description	Wiring terminals	Wire size (mm2)	Lmax (m)
J1	Controller power supply	Plug-in screw terminal, 2-pin, pitch 5.08	1.5	10
J2	Inputs S1, S2, S3, S5, ID1, ID2; outputs Y1, Y2	10-pin Microfit crimp connector	0.05 - 0.52 (20 - 24 AWG)	10
J3	Inputs S4, S6, ID3, ID4. ID5	8-pin Microfit crimp connector	0.05 - 0.52 (20 - 24 AWG)	10
J4	BMS	Plug-in screw terminal, 3-pin, pitch 3.81	0.081 - 1.31	500
J5	Fbus	Plug-in screw terminal, 3-pin, pitch 3.81	0.081 - 1.31	10
J6	Outputs NO1, NO2, NO3, NO4 (Enhanced model)	5-pin Microfit crimp connector (5 A)		10
	Outputs NO1, NO2, NO3 (basic model)	Plug-in screw terminal, 4-pin, pitch 5.08 (16 A, 8 A, 5 A)		
J7	Output NO5 (Enhanced model)	3-pin Microfit crimp connector (5 A)		10
	Output NO4 (basic model)	Plug-in screw terminal, 2-pin, pitch 5.08 (5 A)		
J8	HMI remote terminal	Coded connection cable (see "Introduction")		
J12	Outputs Y3,Y4	4-pin Microfit crimp connector	0.05...0.52 (20-24AWG)	10

Tab. 8.a

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µAria +0300105EN rel. 1.2 - 02.05.2023