EVJH95

Controller for DHW heat pump heaters
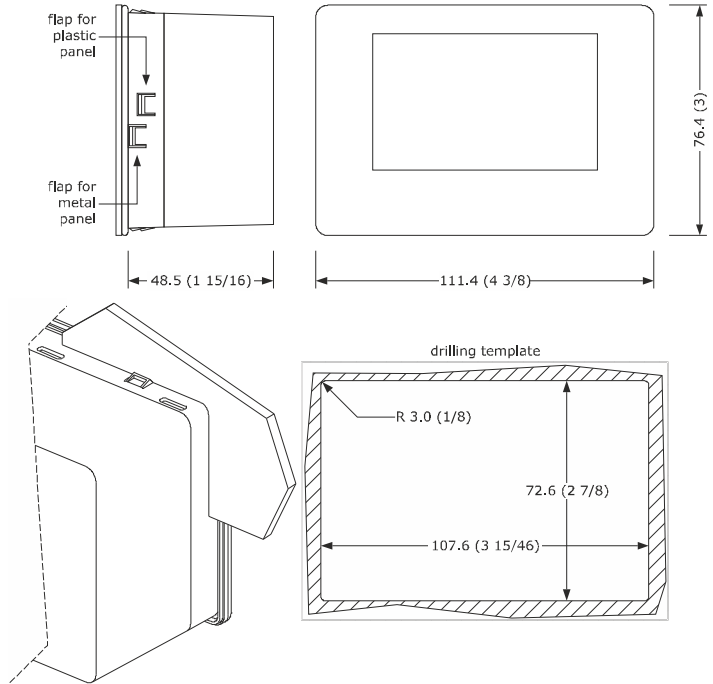
EVCO

EPoCA compatible

PLEASE READ CAREFULLY and save this document
CONSIDER THE ENVIRONMENT

EN   ENGLISH

- power supply 115... 230 VAC
- DHW tank upper and lower probe, evaporator probe (PTC/NTC/Pt 1000)
- photovoltaic, HP and multi-purpose digital input (see i0)
- compressor relay 16 A res. @ 250 VAC
- alarm buzzer
- TTL MODBUS slave port for EVconnect app, EPoCA remote monitoring system or for BMS.

1   MEASUREMENTS AND INSTALLATION

Measurements in mm (inches). Front installation on a plastic or metal panel (with elastic holding flaps).

N.B.
The thickness of a metal panel must be between 0.8 and 1.5 mm (1/32 and 1/16 in), while that for a plastic panel must be between 0.8 and 3.4 mm (1/32 and 1/8 in).
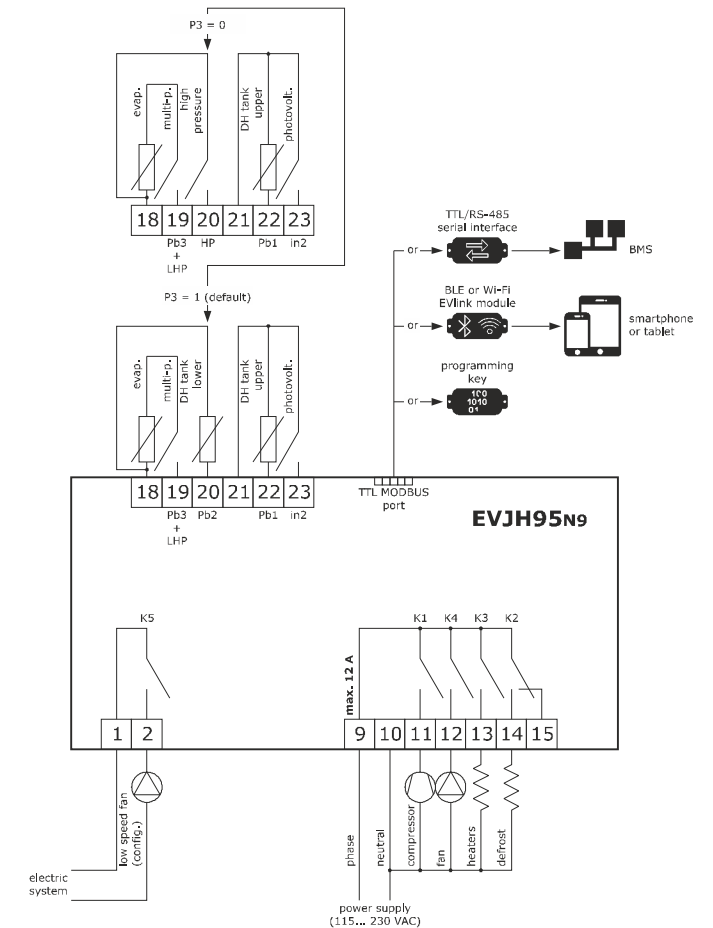

flap for plastic panel
flap for metal panel
48.5 (1 15/16)   111.4 (4 3/8)   76.4 (3)

drilling template
R 3.0 (1/8)
72.6 (2 7/8)
107.6 (3 15/46)

INSTALLATION PRECAUTIONS

- Ensure that the working conditions are within the limits stated in the *TECHNICAL SPECIFICATIONS* section.
- Do not install the device close to heat sources, equipment with a strong magnetic field, in places subject to direct sunlight, rain, damp, excessive dust, mechanical vibrations or shocks.
- In compliance with safety regulations, the device must be installed properly to ensure adequate protection from contact with electrical parts. All protective parts must be fixed in such a way as to need the aid of a tool to remove them.

2   ELECTRICAL CONNECTION

N.B.
- Use cables of an adequate section for the current running through them.
- To reduce any electromagnetic interference connect the power cables as far away as possible from the signal cables.

P3 = 0
evap. | multi-p.+ high pressure | DH tank upper | photovolt.
18 19 20 21 22 23
Pb3   HP   Pb1 in2
+
LHP

P3 = 1 (default)
evap. | multi-p.+ high pressure | DH tank lower | DH tank upper | photovolt.
18 19 20 21 22 23
Pb3 Pb2 Pb1 in2
+
LHP

TTL MODBUS port

EVJH95N9

TTL/RS-485 serial interface → BMS
BLE or Wi-Fi EVlink module → smartphone or tablet
programming key

K5 | K1 K4 K3 K2
max. 12 A
1 2 | 9 10 11 12 13 14 15
low speed fan (config.) | phase | neutral | compressor | fan | heaters | defrost
electric system
power supply (115... 230 VAC)

PRECAUTIONS FOR ELECTRICAL CONNECTION

- If using an electrical or pneumatic screwdriver, adjust the tightening torque.
- If the device has been moved from a cold to a warm place, the humidity may have caused condensation to form inside. Wait about an hour before switching on the power.
- Make sure that the supply voltage, electrical frequency and power are within the set limits. See the section *TECHNICAL SPECIFICATIONS*.
- Disconnect the power supply before doing any type of maintenance.
- Do not use the device as safety device.
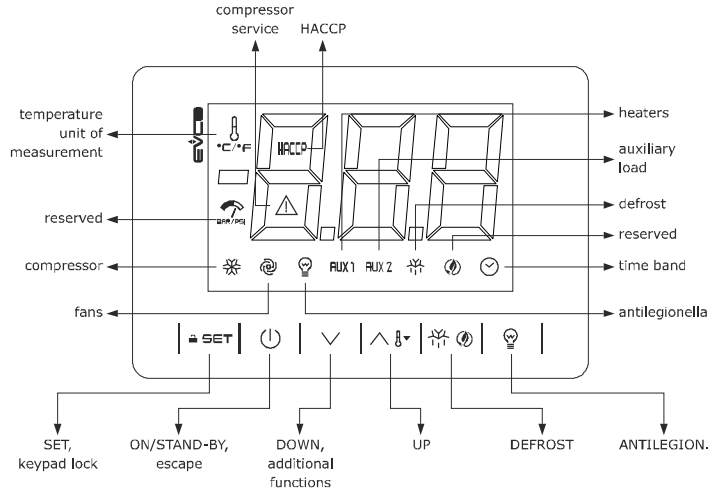- For repairs and for further information, contact the EVCO sales network.

3   FIRST-TIME USE

1. Carry out the installation following the instructions given in the section *MEASUREMENTS AND INSTALLATION*.
2. Power up the device as set out in the section *ELECTRICAL CONNECTION*: an internal test will start up.
   The test normally takes a few seconds: when it is finished the display will switch off.
3. Configure the device as shown in the section *Setting configuration parameters*.
   Recommended configuration parameters for first-time use:

PAR.	DEF.	PARAMETER	MIN... MAX.
SP1	55.0	setpoint in economy mode	r3... r4
SP2	65.0	setpoint in comfort mode	r1... r2
P0	1	type of probe	0 = PTC 1 = NTC 2 = Pt 1000
P2	0	temperature measurement unit	0 = °C 1 = °F
P3	1	enabled probes	0 = DHW tank upper probe + high pressure input 1 = DHW tank upper and lower probe
d1	2	type of defrost	0 = electric 1 = hot gas 2 = compressor stopped 3 = hot gas balancing the pressure

Then check that the remaining settings are appropriate; see the section *CONFIGURATION PARAMETERS*.

4. Disconnect the device from the mains.
5. Make the electrical connection as shown in the section *ELECTRICAL CONNECTION* without powering up the device.
6. For the connection in an RS-485 network connect the interface EVIF22TSX or EVIF23TSX, to activate real time functions connect the module EVIF23TSX, to use the device with the EPoCA remote monitoring system, connect the EVIF25TWX module, to use the device with the app EVconnect connect the interface EVIF25TBX: see the relevant instruction sheets. **If EVIF22TSX or EVIF23TSX is used, set parameter bLE to 0.**
7. Power up the device.

4   USER INTERFACE AND MAIN FUNCTIONS

compressor service   HACCP
temperature unit of measurement
reserved
compressor
fans
heaters
auxiliary load
defrost
reserved
time band
antilegionella

SET, keypad lock
ON/STAND-BY, escape
DOWN, additional functions
UP
DEFROST
ANTILEGION.

4.1   Switching the device on/off

1. | Touch the ON/STAND-BY key for 4 s.

If the device is switched on, the display will show the P5 value ("DHW tank upper temperature" default): if the display shows an alarm code, see the section *ALARMS*.

LED	ON	OFF	FLASHING
❄	compressor switched on	compressor switched off	- compressor protection active - setpoint being set
⊚	fans switched on	fans switched off	fans switched on with low speed
💡	anti-legionella function active	-	-
AUX 1	heaters switched on	heaters switched off	-
AUX 2	auxiliary load on	auxiliary load off	-
☀	defrost active	-	-
∅	reserved	-	-
⊘	time band active	-	-
°C/°F	temperature display	-	-
HACCP	alarm active	-	-
⚠	compressor maintenance request	-	operation with EVconnect app active

When 30s have elapsed without the keys being pressed, the display will show the "**Loc**" label and the keypad will lock automatically.

4.2   Unlocking the keypad

Touch a key for 1 s: the display will show the label "**UnL**".

4.3   Setting the setpoint Economy

Check that the keypad is not locked.

1.	⊡SET	Touch the SET key: the display will show the label "**SP1**".
2.	⊡SET	Touch the SET key.
3.	⋁⋀	Touch the UP or DOWN keys within 15 s to set the value within the limits r3 and r4 (default "40... 55").
4.	⊡SET	Touch the SET key (or take no action for 15 s).
5.	⊕	Touch the ON/STAND-BY key.

4.4   Setting the Comfort setpoint

Check that the keypad is not locked.

1.	⊡SET	Touch the SET key: the display will show the label "**SP1**".
2.	⋁⋀	Touch the UP or DOWN key to select the label "**SP2**".
3.	⊡SET	Touch the SET key.
4.	⋁⋀	Touch the UP or DOWN keys within 15 s to set the value within the limits r1 and r2 (default "40... 70").

5.	⊡SET	Touch the SET key (or take no action for 15 s).
6.	⊕	Touch the ON/STAND-BY key.

4.5   Setting the overboost activation threshold

Check that the keypad is not locked.

1.	⊡SET	Touch the SET key: the display will show the label "**SP1**".
2.	⋁⋀	Touch the UP or DOWN key to select the label "**SP3**".
3.	⊡SET	Touch the SET key.
4.	⋁⋀	Touch the UP or DOWN keys within 15 s to set the value within the limits 10 and r2 (default "10... 70").
5.	⊡SET	Touch the SET key (or take no action for 15 s).
6.	⊕	Touch the ON/STAND-BY key.

4.6   Setting the fan speed (if u1 = 3)

Check that the keypad is not locked.

1.	⊡SET	Touch the SET key: the display will show the label "**SP1**".
2.	⋁⋀	Touch the UP or DOWN keys within 15 s to select the label "**FCn**" or "**FCF**".

LAB.	MEANING
FCn	fan speed if compressor on
FCF	fan speed if compressor off

3.	⊡SET	Touch the SET key.
4.	⋁⋀	Touch the UP or DOWN keys within 15 s to set the value.

LAB.	MEANING
0	off
1	low speed
2	high speed

5.	⊡SET	Touch the SET key (or take no action for 15 s).
6.	⊕	Touch the ON/STAND-BY key.

Between the deactivation of a relay and the activation of the other there is a delay of 5/10 s.

4.7   Activating manual defrost

Check that the keypad isn't locked and that the anti-legionella and overboost functions aren't active.

1.	☀∅	Touch the DEFROST key for 4s.

If P4 = 1 or 2 (default), defrost is activated provided that the evaporator temperature is lower than the d2 threshold.

4.8   Silencing the alarm buzzer (if u9 = 1)

Touch a key.

5   FUNCTIONS AND LOAD OPERATIONS

5.1   Economy

- compressor on if DHW tank lower temperature < "SP1 setpoint - r0 differential" and off if DHW tank lower temperature > "SP1 setpoint"
- fans on if compressor on
- heaters switched off in normal operation (on if needed during defrost).

5.2   Comfort

- compressor on if DHW tank lower temperature < "SP5 setpoint - r0 differential" and off if DHW tank lower temperature > "SP5 setpoint"
- fans on if compressor on
- heaters on, with a single probe configured (P3 = 0), if DHW tank upper temperature < "SP2 - r6 threshold - r7 differential" and off if DHW tank upper temperature > "SP2 - r6 threshold"
- heaters on, with two probes configured (P3 = 1), if DHW tank upper temperature < "SP2 – r0 differential" and off if DHW tank upper temperature > "SP2"
- support heaters on, with a single probe configured (P3 = 0), if DHW tank upper temperature < "SP2 - r6 threshold - r8 differential" and off if DHW tank upper temperature > "SP2 - r6 threshold"
- heaters on, with two probes configured (P3 = 1), if DHW tank upper temperature < "SP2 – r8 differential" and off if DHW tank upper temperature > "SP2".

5.3   Anti-legionella

It activates at "H0 intervals" or at "Ant time", provided that DHW tank lower temperature > "SP1 setpoint" and > "SP2 setpoint"

- compressor switched off
- fans switched off
- heaters switched on until DHW tank upper temperature > "H1 threshold" and then for "H3 time".

5.4   Overboost

It activates in manual mode, provided that DHW tank upper and lower temperature < "SP3 threshold"

- compressor, fans and heaters on until DHW tank upper temperature > "SP1 setpoint".

5.5   Defrosting

It activates with evaporator temperature < "d17 threshold" for "d18 time" or in manual mode, provided that the anti-legionella and overboost functions are not active

- compressor switched on if d1 = 1
- defrost relay active if d1 = 1 or 2
- fans switched on if d1 = 2
- heaters switched on to prevent too high temperature drop in the storage tank.

5.6   Photovoltaic system

It activates with photovoltaic input active

- operation as in comfort mode, except for "SP2 setpoint" which becomes "SP6 setpoint".

5.7   Green

It activates with multi-purpose input active and DHW tank upper and lower temperature > "SP8 setpoint"

- compressor switched off
- fans switched off
- heaters switched off.

5.8   Antifreeze

This function is used to prevent the water freezing. It is activated when tank upper temperature < "SP7 setpoint" – "r0 differential" and this function is deactivated when tank upper temperature > "SP7 setpoint"

- heaters are switched on.

This function can be active only if the controller is in stand-by.

5.9   Pre opening hot gas defrost valve

This function is used to balance the pressure at the compressor start-up, and it is activated only if "d1" = 3.

This function switch on the defrost output "i11" seconds before the start-up of the compressor, this occurs every time the compressor started, even if there is no defrost request.

5.10   Fan operation

The fan operates depending on the active function, normally C12 second before the switch on of the compressor. There are some exceptions:

- defrost: in case of hot gas (d1=1) compressor is active but fan is off. In case of compressor stop (d1=2) compressor is off but fan is active
- alarms: in case of LHP compressor is off but fan is active.

6 ADDITIONAL FUNCTIONS

6.1 Activating/deactivating comfort operation in manual mode
Check that the keypad is not locked.

1.	∨	Touch the DOWN key: the display will show a code.
2.	∧ ⌂ ∨	Touch the UP or DOWN key within 15 s to select a label.

COD.	DESCRIPTION
Auto	activates comfort operation
ECO	deactivates comfort operation

3.	⌂SET	Touch the SET key.
4.	⏻	Touch the ON/STAND-BY key (or take no action for 60s) to exit the procedure.

6.2 Activating/deactivating antilegionella function in manual mode
Check that the keypad is not locked.

1.	💡	Touch the DOWN key: the display will show the label "Ant" flashing.
2.	⌂SET	Touch the SET key to activate the function.
3.	⏻	Touch the ON/STAND-BY key to deactivate the function.

6.3 Activating the overboost function
Check that the keypad isn't locked.

1.	∨	Touch the DOWN key for 1 s: the display will show a code.
2.	∧ ⌂ ∨	Touch the UP or DOWN key within 15 s to select "ObS".
3.	⌂SET	Touch the SET key.
4.	⏻	Touch the ON/STAND-BY key (or take no action for 60s) to exit the procedure.

6.4 Displaying the operating mode
Check that the keypad is not locked.

1.	∨	Touch the DOWN key: the display will show a code.

COD.	DESCRIPTION
ECO	economy
ObS	overboost
Auto	comfort
Anti	anti-legionella: if flashing, DHW tank lower temperature > "SP1 setpoint" and > "SP2 setpoint"
dEFr	defrost
in2	photovoltaic function

2.	⏻	Touch the ON/STAND-BY key (or take no action for 60s) to exit the procedure.

6.5 Displaying/deleting compressor functioning hours
Check that the keypad is not locked.

1.	∨	Touch the DOWN key for 1 s: the display will show a code.
2.	∧ ⌂ ∨	Touch the UP or DOWN key within 15 s to select a label.

COD.	DESCRIPTION
CH	display compressor working hours in hundreds
rCH	delete compressor working hours

3.	⌂SET	Touch the SET key.
4.	∧ ⌂ ∨	Touch the UP or DOWN key to set "149" (to select rCH).
5.	⌂SET	Touch the SET key.
6.	⏻	Touch the ON/STAND-BY key (or take no action for 60s) to exit the procedure.

7 SETTINGS

7.1 Setting configuration parameters

1.	⌂SET	Touch the SET key for 4 s: the display will show the label "PA".
2.	⌂SET	Touch the SET key.
3.	∧ ⌂ ∨	Touch the UP or DOWN key within 15 s to set "-19".
4.	⌂SET	Touch the SET key (or take no action for 15 s): the display will show the label "SP".
5.	∧ ⌂ ∨	Touch the UP or DOWN key to select a parameter.
6.	⌂SET	Touch the SET key.
7.	∧ ⌂ ∨	Touch the UP or DOWN key within 15 s to set the value.
8.	⌂SET	Touch the SET key (or take no action for 15 s).
9.	⌂SET	Touch the SET key for 4s (or take no action for 60s) to exit the procedure.

7.2 Set the date, time and day of the week (if module EVIF23TSX, EVIF25TWX or interface EVIF25TBX is connected)

N.B.
- Do not disconnect the device from the mains within two minutes since the setting of the time and day of the week.
- if the device communicates with the EVconnect app, the date, time and day of the week will be automatically set by the smartphone or tablet.

Check that the keypad is not locked.

1.	∧ ⌂	Touch the UP key.
2.	∧ ⌂ ∨	Touch the UP or DOWN key within 15 s to select the label "rtc".
3.	⌂SET	Touch the SET key: the display will show the label "yy" followed by the last two figures of the year.
4.	∧ ⌂ ∨	Touch the UP or DOWN key within 15 s to set the year.
5.		Repeat actions 3. and 4. to set the next labels.

LAB.	DESCRIPTION OF THE NUMBERS FOLLOWING THE LABEL
n	month (01… 12)
d	day (01… 31)
h	time (00… 23)
n	minute (00… 59)

6.	⌂SET	Touch the SET key: the display will show the label for the day of the week.
7.	∧ ⌂ ∨	Touch the UP or DOWN key within 15 s to set the day of the week.

LAB.	DESCRIPTION
Mon	Monday
tuE	Tuesday
UEd	Wednesday
thu	Thursday
Fri	Friday
Sat	Saturday
Sun	Sunday

8.	⌂SET	Touch the SET key: the device will exit the procedure.
9.	⏻	Touch the ON/STAND-BY key to exit the procedure beforehand.

7.3 Restoring factory settings (default)

N.B.
- check that the factory settings are appropriate; see the section *CONFIGURATION PARAMETERS*.

1.	⌂SET	Touch the SET key for 4 s: the display will show the label "PA".
2.	⌂SET	Touch the SET key.
3.	∧ ⌂ ∨	Touch the UP or DOWN key within 15 s to set "149".
4.	⌂SET	Touch the SET key (or take no action for 15 s): the display will show the label "dEF".
5.	⌂SET	Touch the SET key.
6.	∧ ⌂ ∨	Touch the UP or DOWN key within 15 s to set "1".
7.	⌂SET	Touch the SET key (or take no action for 15 s): the display will show "- - -" flashing for 4 s, after which the device will exit the procedure.
8.		Disconnect the device from the power supply.
9.	⌂SET	Touch the SET key for 1s before action 6 to exit the procedure beforehand.

8 CONFIGURATION PARAMETERS

No.	PAR.	DEF.	SETPOINT	MIN… MAX.
1	SP1	52.0	setpoint in economy mode	r3… r4
2	SP2	60.0	setpoint in comfort mode	r1… r2
3	SP3	40.0	overboost activation threshold	10 °C/°F… r2
4	SP5	52.0	heat pump switch-off threshold	r1… SP2
5	SP6	70.0	photovoltaic system setpoint	40… 100 °C/°F
6	SP7	5.0	setpoint in antifreeze mode	0… 40 °C/°F
7	SP8	40.0	setpoint in green mode	0… 100 °C/°F
8	SP9	-7.0	cold evaporator alarm threshold	-25… 25 °C/°F
9	SPA	-25	evaporator failure alarm threshold	-50… 25 °C/°F

No.	PAR.	DEF.	ANALOGUE INPUTS	MIN… MAX.
10	CA1	0.0	DHW tank upper probe offset	-25… 25 °C/°F
11	CA2	0.0	DHW tank lower probe offset	-25… 25 °C/°F
12	CA3	0.0	evaporator probe offset	-25… 25 °C/°F
13	P0	1	type of probe	0 = PTC 1 = NTC 2 = Pt 1000
14	P1	1	enable decimal point °C	0 = no 1 = yes
15	P2	0	temperature measurement unit	0 = °C 1 = °F
16	P3	1	enabled probes	0 = DHW tank upper probe + high pressure input 1 = DHW tank upper and lower probe
17	P4	2	evaporator probe function	0 = disabled (defrost every d18 minutes) 1 = defrost activation and defrost end 2 = defrost activation
18	P5	0	value displayed	0 = DHW tank upper temperature 1 = setpoint in comfort mode 2 = DHW tank lower temperature 3 = evaporator temperature
19	P8	5	display refresh time	0… 250 s: 10

No.	PAR.	DEF.	REGULATION	MIN… MAX.
20	r0	2.0	setpoint differential	1… 30 °C/°F
21	r1	20.0	minimum setpoint in comfort mode	10 °C/°F… r2
22	r2	60.0	maximum setpoint in comfort mode	r1… 100 °C/°F
23	r3	20.0	minimum setpoint in economy mode	10 °C/°F… r4
24	r4	52.0	maximum setpoint in economy mode	r3… 100 °C/°F
25	r5	0	enable setpoint blocking in economy and comfort modes	0 = no 1 = yes
26	r6	0.0	heater threshold in comfort mode	0… 50 °C/°F
27	r7	15.0	heater threshold differential in comfort mode	1… 30 °C/°F
28	r8	20.0	support heater threshold differential in comfort mode	r7… 30 °C/°F

No.	PAR.	DEF.	COMPRESSOR	MIN… MAX.
29	C0	3	compressor on delay from power-on	0… 240 min
30	C1	3	minimum time between two power-ons of compressor	0… 240 min
31	C2	3	minimum compressor-off time	0… 240 min
32	C3	0	minimum compressor-on time	0… 240 s
33	C10	0	compressor hours for maintenance	0… 999 h x 100 0 = disabled
34	C11	120	interval for cold evaporator control	0… 999 min
35	C12	60	compressor-on delay from fan on for cold evaporator control	0… 240 s
36	C13	20	compressor-on delay from green multi-purpose input reset	0… 240 min
37	C14	20	compressor-on consecutive time for evaporator failure control	-1… 240 min -1 = disabled

No.	PAR.	DEF.	DEFROST	MIN… MAX.
38	d1	3	type of defrost	0 = electric 1 = hot gas 2 = compressor stopped 3 = hot gas balancing the pressure
39	d2	3.0	defrost end threshold	-50… 50 °C/°F
40	d3	3	defrost duration	0… 99 min 0 = defrost disabled If P4 = 1, maximum duration
41	d17	-2.0	evaporation threshold for defrost interval count	-50… 50 °C/°F
42	d18	30	defrost interval	0… 240 min 0 = manual only

No.	PAR.	DEF.	ALARMS	MIN… MAX.
43	A0	0	select value for low temperature alarm	0 = DHW tank upper temperature 1 = DHW tank lower temperature 2 = evaporator temperature
44	A1	10.0	low temperature alarm threshold	0… 50 °C/°F
45	A2	0	low temperature alarm type	0 = disabled 1 = absolute
46	A3	0	select value for high temperature alarm	0 = DHW tank upper temperature 1 = DHW tank lower temperature 2 = evaporator temperature
47	A4	75.0	high temperature alarm threshold	0… 199 °C/°F
48	A5	1	high temperature alarm type	0 = disabled 1 = absolute
49	A6	1	high temperature alarm delay from power-on	0… 240 min
50	A7	15	high/low temperature alarm delay	0… 240 min
51	A10	0	power failure duration for alarm recording	0… 240 min
52	A11	10.0	high/low temperature alarm reset differential	1… 30 °C/°F

No.	PAR.	DEF.	FAN	MIN… MAX.
53	F0	1	enable fan	0 = no 1 = yes
54	FCn	2	fan speed if compressor on	1 = low speed 2 = high speed
55	FCF	1	fan speed if compressor off	0 = off 1 = low speed 2 = high speed
56	FdF	1	fan speed in defrost	1 = low speed 2 = high speed

No.	PAR.	DEF.	ANTI-LEGIONELLA	MIN… MAX.
57	H0	30	anti-legionella interval	0… 99 d (days) 0 = none
58	H1	65.0	anti-legionella thermal threshold	10… 199 °C/°F
59	H3	2	anti-legionella thermal threshold maintenance duration	0… 240 min 0 = function disabled

No.	PAR.	DEF.	DIGITAL INPUTS	MIN… MAX.
60	i0	1	multi-purpose input function	0 = disabled 1 = pressure switch 2 = green
61	i2	5	compressor-on delay from pressure switch alarm reset	0… 120 min
62	i3	1	enable photovoltaic system	0 = no 1 = yes
63	i4	0	photovoltaic system input activation	0 = with contact closed 1 = with contact open
64	i5	0	high pressure input activation	0 = with contact closed 1 = with contact open
65	i8	3	number of pressure switch alarms for unit blocked alarm	0… 15 0 = disabled
66	i9	240	counter reset time for pressure switch alarms	1… 999 min
67	i10	24	pressure switch alarm delay from compressor-on	0… 240 sx1
68	i11	60	time pre opening hot gas defrost valve	0… 240 s
69	i12	0	fan off during pressure switch/unit blocked alarm	0 = no 1 = yes

No.	PAR.	DEF.	DIGITAL OUTPUTS	MIN… MAX.
70	u1	3	relay K5 configuration	0 = disabled 1 = circulation pump 2 = support heaters 3 = low speed fan
71	u2	60	compressor on delay from circulation pump on and circulation pump off delay from compressor off	0… 240 s 0 = on if device on
72	u9	1	enable alarm buzzer	0 = no 1 = yes

N.	PAR.	DEF.	CLOCK	MIN… MAX.
73	Hr0	0	enable clock	0 = no 1 = yes
74	Hd1	1	time for switch on on Monday	1 = with On1 e OF1 2 = with On2 e OF2
75	Hd2	1	time for switch on on Tuesday	1 = with On1 e OF1 2 = with On2 e OF2
76	Hd3	1	time for switch on on Wednesday	1 = with On1 e OF1 2 = with On2 e OF2
77	Hd4	1	time for switch on on Thursday	1 = with On1 e OF1 2 = with On2 e OF2
78	Hd5	1	time for switch on on Friday	1 = with On1 e OF1 2 = with On2 e OF2
79	Hd6	2	time for switch on on Saturday	1 = with On1 e OF1 2 = with On2 e OF2
80	Hd7	2	time for switch on on Sunday	1 = with On1 e OF1 2 = with On2 e OF2
81	HOn1	- - -	time for time band 1 on	00:00… 23:59 h: min 00:00 = disabled
82	HOF1	- - -	time for time band 1 off	00:00… 23:59 h: min 00:00 = disabled
83	HOn2	- - -	time for time band 2 on	00:00… 23:59 h: min 00:00 = disabled
84	HOF2	- - -	time for time band 2 off	00:00… 23:59 h: min 00:00 = disabled
85	Ant	- - -	time anti-legionella on	00:00… 23:59 h: min 00:00 = disabled

N.	PAR.	DEF.	SAFETIES	MIN… MAX.
86	PA1	426	level 1 password	-99… 999
87	PA2	824	level 2 password	-99… 999

N.	PAR.	DEF.	DATA-LOGGING EVLINK	MIN… MAX.
88	bLE	1	enable Bluetooth	0 = no 1 = si >1 reserved
89	rE0	15	data-logger sampling interval	0… 240 min
90	rE1	1	recorded temperature	0 = nessuna 1 = DHW tank upper 2 = DHW tank lower 3 = evaporator 4 = DHW tank upper and lower 5 = tutte

N.	PAR.	DEF.	MODBUS	MIN… MAX.
91	LA	247	MODBUS address	1… 247
92	Lb	2	MODBUS baud rate	0 = 2.400 baud 1 = 4.800 baud 2 = 9.600 baud 3 = 19.200 baud
93	LP	2	parity	0 = none 1 = odd 2 = even

9 ALARMS

CODE	DESCRIPTION	RESET	TO CORRECT
Pr1	DHW tank upper probe alarm	automatic	- check P0 - check probe integrity - check electrical connection
Pr2	DHW tank lower probe alarm	automatic	
Pr3	evaporator probe alarm	automatic	
rtc	clock alarm	manual	set date, time and day of the week
AL	low temperature alarm	automatic	check A0, A1 and A2
AH	high temperature alarm	automatic	check A3, A4 and A5
PF	power failure alarm	manual	- touch a key - check electrical connection
LHP	pressure switch/unit blocked alarm	automatic/ manual	- switch the device off and on - check i0, i8 and i9
HP	high pressure alarm	manual	- switch the device off and on - check P3
FiL	compressor maintenance alarm	automatic	check C10 by silencing the buzzer you delete the compressor functioning hours
UtL	evaporator failure alarm	manual	- switch the device off and on - check SPA and C14

10 TECHNICAL SPECIFICATIONS

Purpose of the control device	Function controller
Construction of the control device	Built-in electronic device
Container	black, self-extinguishing.
Category of heat and fire resistance	D

Mounting methods for the control device	front installation on a plastic or metal panel (with elastic holding flaps)
Degree of protection provided by the covering	IP65 (front)
Connection method	
Fixed screw terminal blocks for wires up to 2.5 mm² (removable screw terminal blocks for wires up to 2,5 mm² by request)	Pico-Blade connector
Maximum permitted length for connection cables	
Power supply: 10 m (32.8 ft)	Analogue inputs: 10 m (32.8 ft)
Digital inputs: 10 m (32.8 ft)	Digital outputs: 10 m (32.8 ft)
Operating temperature	From -5 to 55 °C (from 23 to 131 °F)
Storage temperature	From -25 to 70 °C (from -13 to 158 °F)
Operating humidity	Relative humidity without condensate from 10 to 90%
Pollution status of the control device	2

Conformity		
RoHS 2011/65/CE	WEEE 2012/19/EU	REACH (EC) Regulation 1907/2006
EMC 2014/30/UE	LVD 2014/35/UE	

Power supply	115… 230 VAC (+10% -15%), 50/60 Hz (±3 Hz), max. 6 VA insulated
Earthing methods for the control device	None
Rated impulse-withstand voltage	2.5 KV
Over-voltage category	II
Software class and structure	A
Analogue inputs	2 for PTC, NTC or Pt 1000 probes (DHW tank upper probe and evaporator probe)

PTC probes	Sensor type	KTY 81-121 (990 Ω @ 25 °C, 77 °F)
	Measurement field	From -50 to 150 °C (from -58 to 302 °F)
	Resolution	0.1 °C (1 °F)
NTC probes	Sensor type	ß3435 (10 KΩ @ 25 °C, 77 °F)
	Measurement field	From -40 to 105 °C (from -40 to 221 °F)
	Resolution	0.1 °C (1 °F)
Pt 1000 probes	Measurement field:	from -100 to 650 °C (from -148 to 999 °F)
	Resolution:	0.1 °C (1 °F).

Digital inputs	2 dry contact (photovoltaic and multi-purpose input)

Dry contact	Contact type	5 VDC, 2 mA
	Power supply	None
	Protection	None

Other inputs	can be configured for analogue input (DHW tank lower probe) or for digital input (high pressure input)
Digital outputs	5 with electro-mechanical relay
Relay K1	SPST, 16 A res. @ 250 VAC
Relay K2	SPDT, 8 A res. @ 250 VAC
Relay K3	SPST, 8 A res. @ 250 VAC
Relay K4	SPST, 3 A res. @ 250 VAC
Relay K5	SPST, 3 A res. @ 250 VAC

The device guarantees double insulation between each digital output connector and the rest of the components of the device

Type 1 or Type 2 Actions	Type 1
Additional features of Type 1 or Type 2 actions	C
Displays	Custom display, 3 digit, with function icons
Alarm buzzer	Incorporated
Communications ports	1 TTL MODBUS slave port for EVconnect app, EPoCA remote monitoring system or for BMS