µchiller

Controller for chillers / heat pumps

µCH2 SE replacement guide

LEGGI E CONSERVA QUESTE ISTRUZIONI

READ AND SAVE THESE INSTRUCTIONS

NO POWER & SIGNAL CABLES TOGETHER

READ CAREFULLY IN THE TEXT!

High Efficiency Solutions

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.
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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.
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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. 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 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.

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DISPOSAL

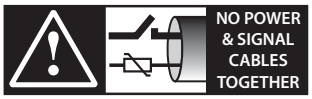
INFORMATION FOR USERS ON THE CORRECT HANDLING OF WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

In reference to European Union directive 2002/96/EC issued on 27 January 2003 and related national legislation, please note that:

1. WEEE cannot be disposed of as municipal waste and such waste must be collected and disposed of separately;
2. 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;
3. 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;
4. 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;
5. 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 INDUSTRIES Hq products are guaranteed by the ISO 9001 certified design and production system.



READ CAREFULLY IN THE TEXT!

IMPORTANT: 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.

Content

1. INTRODUCTION

This guide has been created with the aim of supporting uChiller users for replacement in the field of the microchiller2 SE (hereinafter mCH2 SE) with the new product (hereinafter Legacy model).

This document contains specific information on the Legacy models.
For other functions, see the µChiller manual +0300053 rel. 1.3 and higher.**

List of Legacy models and dedicated accessories used to replace mCH2 SE.

P/N	Assembly	Connectivity	Compressor management:	Remarks	Electronic valve management
UCHBP000X0190	panel	NFC	On/Off	standard version	bipolar: with EVD Evolution driver
UCHBP000X0200	panel	NFC, Bluetooth (BLE)	On/Off	standard version	bipolar: with EVD Evolution driver
UCHBD000X1230	DIN rail	-	On/Off	standard version	bipolar: with EVD Evolution driver

Tab. 1.a

Accessory P/N	Description
UCHCONPMC0	Adapter kit for MCH2

Tab. 1.b

Below is the list of MCH2 and MCH2-SE products and I/O expansions that can be replaced with the new uChiller

Part number	Description	Replacement product
MCH200000*	MICROCHILLER 2 B.IN VERS,1 CIRCUIT, 2 COMPRES.	UCHBP000X0190 / UCHBP000X0200
MCH200003*	MCH 2 SE MAX 1 CIRC. 2 COMPR.	UCHBP000X0190 / UCHBP000X0200
MCH200103*	MCH 2 SE MAX 1 CIRC. 2 COMPR. + RTC	UCHBP000X0190 / UCHBP000X0200
MCH201000*	MICROCHILLER 2 MAX 1 CIRC. 2 COMPR. WITH NEUTRAL PLASTIC	UCHBP000X0190 / UCHBP000X0200
MCH201003*	MCH 2 SE MAX 1 CIRC. 2 COMPR. WITHOUT LOGO	UCHBP000X0190 / UCHBP000X0200
MCH201103*	MCH 2 SE MAX 1 CIRC. 2 COMPR. + RTC WITHOUT LOGO	UCHBP000X0190 / UCHBP000X0200
MCH200001*	MICROCHILLER 2 DIN VERS, 1 CIRCUIT, 2 COMPRES.	UCHBD000X1230
MCH200002*	MICROCHILLER 2 EXPANS. MAX 2 CIRC. 4 COMPR.	UCHBE00001230

Tab. 1.c

1.1 Main functions

Ref.	Description
Main features	Up to two circuits and 2 + 2 compressors
	Tandem compressor configuration
	Air/water (A/W) and water/water chiller or heat pump
	Air/air unit (A/A)
	Condensing unit (MC)
	Up to 2 evaporators per unit
Hardware	Panel mounting model
	DIN rail model
User interface	7-segment, 2-row LED display, optional pGDx graphic display, communication via APPLICA app (compatible with NFC and BTLE) for mobile devices
Temperature control	PID at start-up
	PID in operation
	Set point compensation on outdoor temperature
Compressor rotation	FIFO or timed
Compressor management	Generic scroll compressors
Circuit destabilisation	Forced compressor rotation (extended operation at part load)
Electronic valve driver	External driver management via FieldBus port (all versions)
Programming with time bands	Unit ON-OFF or 2nd set point (1 time band per day)
	"Noise reduction" function for condenser fans (1 time band per day)
System pumps	1/2 pumps (2 pumps only with 2 circuits)
	Rotation by time or with pump overload alarm
	Cyclical activation during standby
Water-cooled condenser	1 common pump for both circuits
Air-cooled condenser	Independent fans on each circuit or common to both circuits
	Fan modulation based on condensing temperature (On/Off fan control via relay or CAREL CONVONOFF0 module)
	Optimised start-up to quickly bring the compressor(s) to steady operation
	Fan anti-block protection (harsh climate)
Defrost	Simultaneous
	Separate
	Independent
	Only when the fans are used
	Defrost interval managed based on outside temperature ("sliding defrost")
Prevent	Prevention of scroll compressor operating limits in relation to condensing and evaporation temperature
	Evaporator frost prevention
Alarms (see the chapter on Alarms)	Management of automatic and manual reset according to alarm severity
	Alarm log (up to 20 events): alarm and reset date and time recorded
Connectivity/supervision	RS485 serial port
	Modbus RTU
	Baud rate up to 115200 bit/s
	Frame configurable by Parity (None, Even, Odd) and StopBits (1 or 2); Databits fixed at 8 bits.

Tab. 1.d

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 to dust (formation of corrosive patina with possible oxidation and reduction of insulation).

2.2 Panel version

2.2.1 Dimensions in mm (inches)

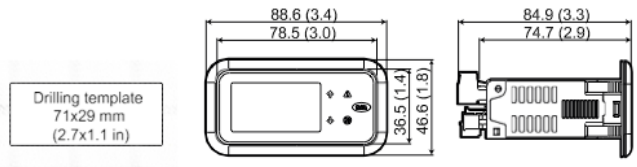


Fig. 2.a

2.2.2 Assembly

Caution: before carrying out any maintenance, disconnect the controller from the power supply by moving the main system switch to "off".

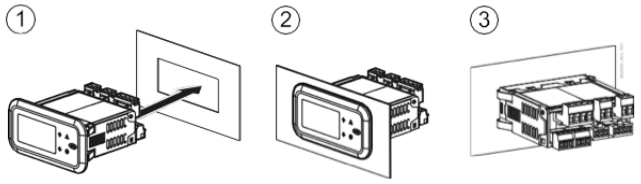


Fig. 2.b

1. Place the controller in the opening, pressing lightly on the side anchoring tabs.
2. Then press on the front until fully inserted (the side tabs will bend, and the catches will attach the controller to the panel).

Caution: IP65 front protection is guaranteed only if the following conditions are met:

- maximum deviation of the rectangular opening from flat surface: ≤ 0.5 mm;
- thickness of the electrical panel sheet metal: 0.8-2 mm;
- maximum roughness of the surface where the gasket is applied: ≤ 120 µm.

Notice: the thickness of the sheet metal (or material) used to make the electrical panel must be adequate to ensure safe and stable mounting of the product..

2.2.3 Assembly

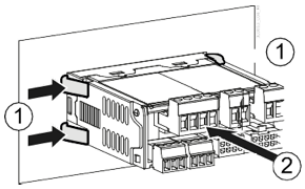


Fig. 2.a

Open the electrical panel from the rear and press the anchoring tabs and then the controller to remove it.

1. Gently press the side anchoring tabs on the controller;
2. Exert slight pressure on the controller until it is removed.

Caution: the operation does not require the use of a screwdriver or other tools.

2.3 DIN rail version

2.3.3 Dimensions - mm (in)

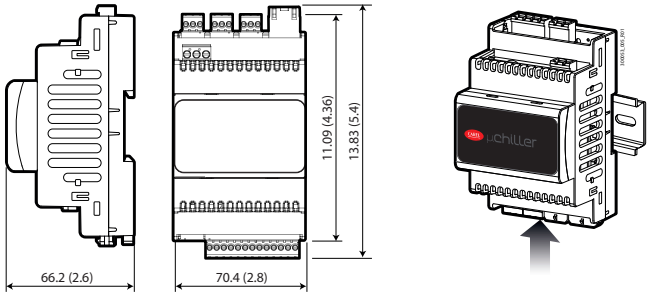


Fig. 2.c

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

2.3.4 Assembly

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.

2.4 Electrical installation

Caution: before carrying out any maintenance, disconnect the controller from the power supply by moving the main system switch to "off".

2.4.1 Adapter kit for MCH2

Using the UCHCONPMC0 adapter kit, installers can replace the mCH2 SE with the corresponding uCH legacy model in just a few minutes, utilising the existing wiring in the unit's electrical panel.

**NDR : l'immagine è presente nella news uChiller 2021_04_30

If the adapter kit is not available, see the following paragraphs.

2.4.2 Description of the terminals

Panel model

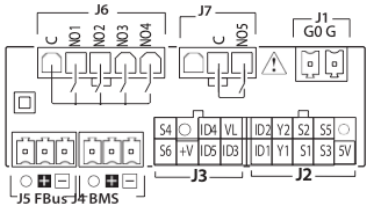


Fig. 2.d

DIN rail model

Basic

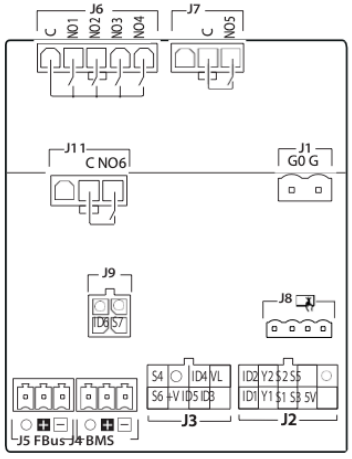


Fig. 2.e

Ref.		Description
J1	G	Power supply
	G0	Power supply: reference
J2	5V	Ratiometric probe power supply
	S3	Analogue input 3
	S1	Analogue input 1
	Y1	Analogue output 1
	ID1	Digital input 1
	O	GND: reference for probes, digital inputs and analogue outputs
	S5	Analogue input 5
	S2	Analogue input 2
	Y2	Analogue output 2
	ID2	Digital input 2
J3	ID3	Digital input 3
	ID5	Digital input 5
	+V	Power supply to 4-20 mA active probes
	S6	Analogue input 6
	VL	Not used
	ID4	Digital input 4
	O	GND: reference for analogue and digital inputs
	S4	Analogue input 4
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 5
	NO5	Digital output (relay) 5
J8	-	Unit terminal connector (AX5* or PGR04*)
J9	S7	Analogue input 7
	ID6	Digital input 6
	O	Input reference
	O	Input reference
J11	-	(not used)
	C	Common for relay 6
	NO6	Digital output (relay) 6

Tab. 2.a

2.5 Probe/digital input connection

NTC probes

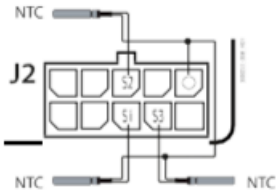


Fig. 2.f

4-20 mA probes/digital inputs

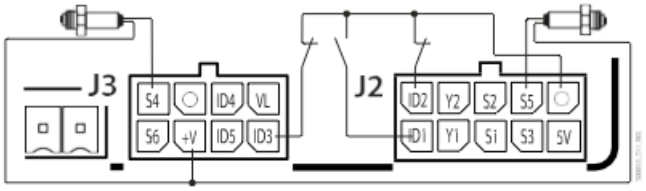


Fig. 2.g

0-10 Vdc probes

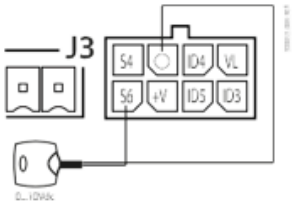


Fig. 2.h

0-5 V ratiometric pressure probes

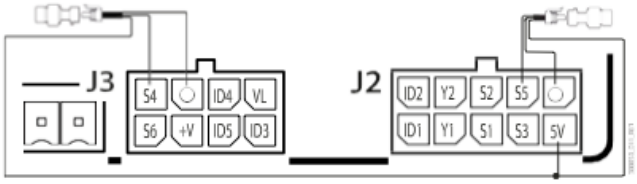


Fig. 2.i

Notice: O = GND

2.6 Connection to user terminals

2.6.1 Panel model

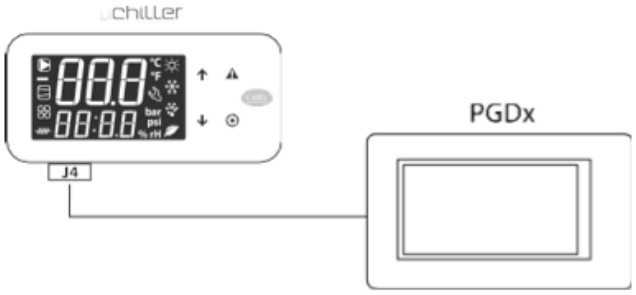


Fig. 2.j

2.6.2 DIN rail model

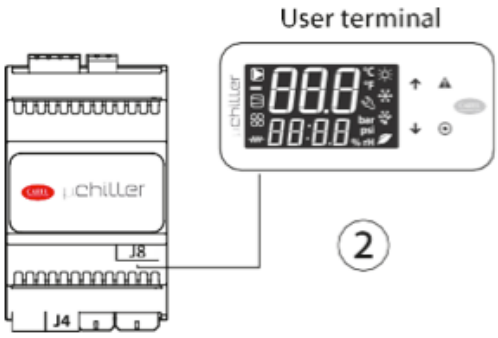


Fig. 2.k

Connection to connector J4

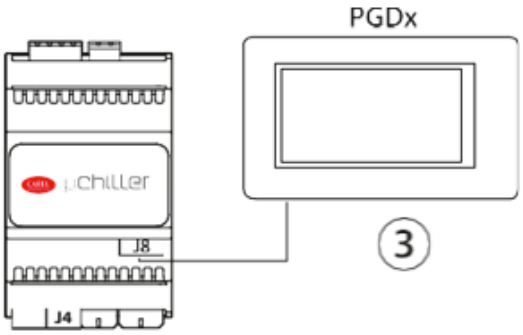


Fig. 2.l

Connection to connector J8

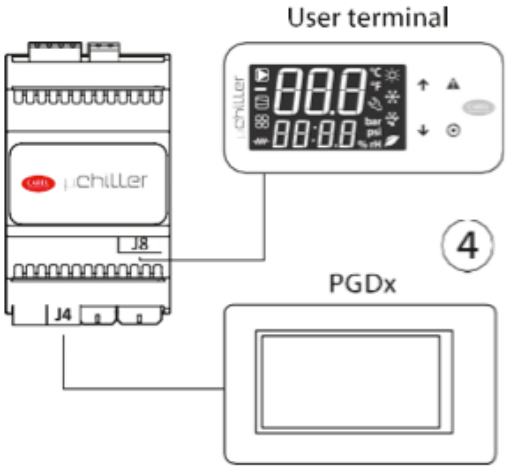


Fig. 2.m

Notice 2: in cases (1) and (4), set the BMS port communication parameters as shown in the table:

Communication parameters

User	Display	P/N	Description	Value	Min	Max	UOM
S	x	Hd00	BMS: serial address	1	1	247	-
S	x	Hd01	BMS: baud rate 3=9600; 4=19200; 5=38400; 6=57600; 7=115200	6	3	7	-
S		Hd02	BMS: settings 0=8-NONE-1; 1=8-NONE-2; 2=8-EVEN-1 3=8-EVEN-2; 4=8-ODD-1; 5=8-ODD-2	0	0	5	-

Tab. 2.b

2.7 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.

2.8 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 controller cables have to cross over the power cables, the intersections must be as near as possible to 90 degrees, always avoiding running the controller 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 clamps;
- 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.

2.9 Connecting serial ports with two circuits

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.

Master device	Serial port	Lmax (m)	Wire/ wire capac-itance (pF/m)	Resistance on first and last device	Max no. slave devic-es on bus	Data rate (bit/s)
µChiller	FBus	10	<90	120 Ω	16	19200
PC (super-vision)	BMS	500	<90	120 Ω	16	115200

Tab. 2.c

Notice: 120 Ω 1/4W terminating resistors on the first and last devices in the network must be used when the length exceeds 100 m.

For two-circuit units, the power supply connections must be in phase between the two controllers (G0 on the master controller and G0 on the slave controller connected to the same power supply wire); the serial connection between the two controllers (J5 FBus on the master and J4 BMS on the slave) must be made as shown in the figure (+ with + and - with -).

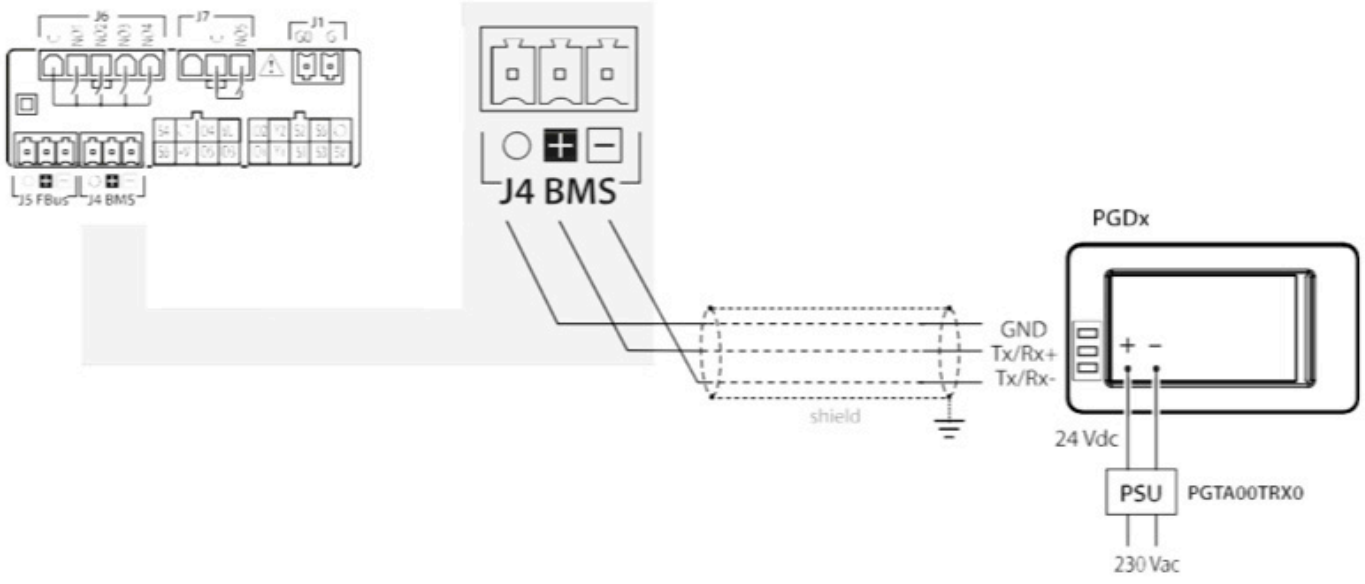


Fig. 2.n

2.10 Source fan speed controller

The typical connections on mCH2 / mCH2 SE to manage the source fans and how these change with the new mChiller are shown below.

Case 1: ON-OFF fan management

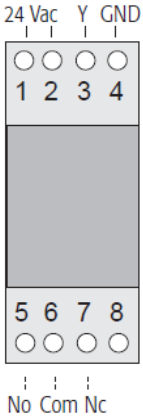


Fig. 2.o

ON/OFF management of condensing fans is possible by using the CONVONOFF0 module connected to mCH2 / mCH2 SE.
The control relay has a switchable power of 10 A at 250 Vac in AC1 (1/3 HP inductive).

Operation is similar with the new uCHiller. To manage the condensing fan in this mode, simply connect terminals 3 and 4 on the CONVONOFF0 module to terminals Y1 and GND (connector J2) on the UCHB*000X****.

Case 2: PWM fan speed management (MCHRTF*)

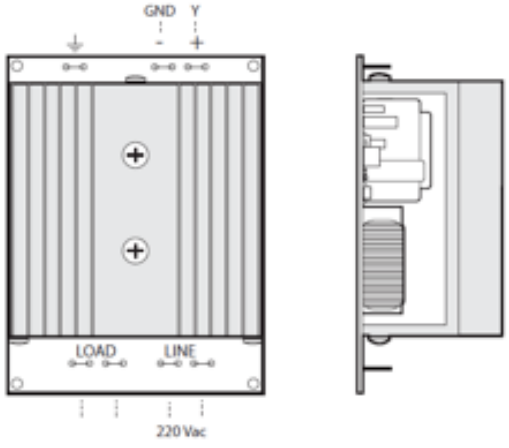


Fig. 2.p

The MCHRTF* single-phase voltage regulators use the phase cutting principle to regulate the effective output voltage to the load, based on the phase α of the control PWM signal.
The command from mCH2 / mCH2 SE is sent by connecting terminals Y and GND on MCHRTF* to the corresponding terminals on mCH2 / mCH2.

Specifically, when replacing mCH2 / mCH2 SE, the installer also needs to replace the MCHRTF* device, as the new uChiller manages 0-10 Vdc speed controllers to ensure higher precision and greater immunity to interference.

The following table shows the replacement models for MCHRTF*

Part number	Description	Replacement product
MCHRTF04C0	Fan speed controller-cut phase PWM 4A/230Vac Faston	FCSM042300
MCHRTF08C0	Fan speed controller-cut phase PWM 8A/230Vac Faston	FCSM082300
MCHRTF12C0	Fan speed controller-cut phase PWM 12A/230Vac Faston	FCSM122300

Tab. 2.a

Case 3: 0-10 Vdc fan speed management

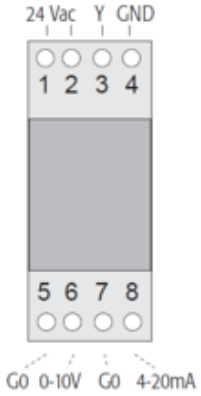


Fig. 2.q

The CONV0/10A0 module converts the PWM signal into a standard 0-10 Vdc (or 4-20 mA) signal.
This module is required if needing to use a non-Carel speed controller.

With the new uCHiller, to manage the condensing fan in this mode, simply remove the CONV0/10A0 module and connect the wires from terminals 5 and 6 on the CONV0/10A0 module to terminals Y1 and GND (connector J2) on UCHB*000X****.

Case 4: Fan speed management with FCS* module

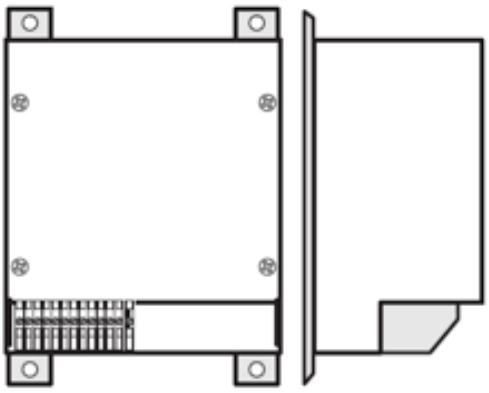


Fig. 2.r

mCH2 / mCH2SE can directly manage single-phase and three-phase FCS* speed controllers.
In this case, the "IN+" and "IN-" terminals on FCS* are connected to terminals "Y" and "GND" on mCH2 / mCH2 SE respectively

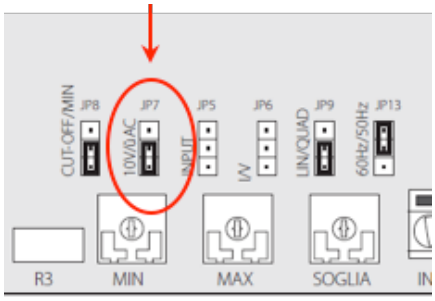


Fig. 2.s

With the new uCHiller, to manage the condensing fan in this mode, simply connect the wires from the "IN+" and "IN-" terminals on FCS* to terminals "Y" and "GND" (connector J2) on UCHB*000X****.
Pin-strip JP7 also needs to be set to 0-10 Vdc mode (as shown in the image on the side).

2.11 Electronic expansion valve driver

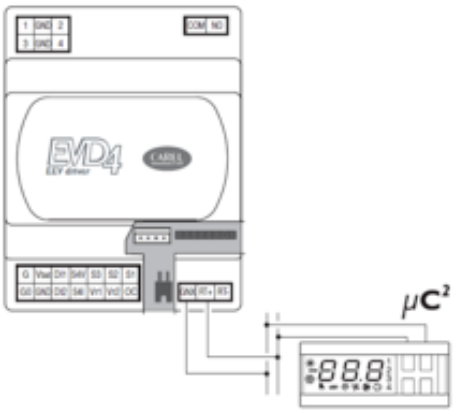


Fig. 2.t

mCH2 / mCH2 SE, when connected to the EVD4* driver can manage electronic expansion valves via the tLAN serial line.

When replacing mCH2 / mCH2 SE, the installer should also replace the EVD4* device, as EVD4* is now obsolete and no longer supported by Carel.

The EVD4* driver should be replaced with EVD EVO.

Notice: for information regarding the connections and the configuration of EVD EVO, see the corresponding product manual.

3. INPUT/OUTPUT CONFIGURATION

Information on how to configure the µChiller Legacy inputs and outputs to replace mCH2 and mCH2 SE is shown below.

Panel mounting model

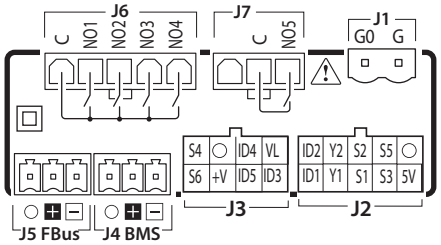


Fig. 3.a

DIN rail model (Basic)

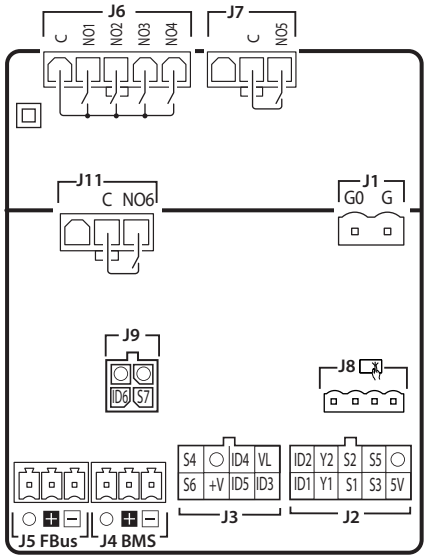


Fig. 3.b

3.1 Analogue inputs

The analogue inputs on µChiller Legacy are divided into four groups, according to the type of sensor connected. The groups and the list of parameters used to configure the different analogue inputs are shown below:

Group	Sensor	Master config. parameter	Slave config. parameter
GRP1	S1	HC31	HC41
	S2	HC32	HC42
	S3	HC00	HC43
GRP2	S4	HC34	HC44
	S5	HC35	HC45
GRP3	S6	HC03	HC05
GRP1*	S7*	HC04*	HC47

Tab. 3.a

(*) available only on DIN version

The meanings assigned to the analogue inputs according to the various groups for the Master controller (circuit 1) are as follows:

Value	GRP1	GRP2	GRP3
0	Not used	Not used	Not used
1	Source water delivery temp.	Source water delivery temp.	Source water delivery temp.
2	Outside temperature	Outside temperature	Outside temperature
3	Discharge temperature circuit 1	Discharge temperature circuit 1	Remote set point
4	Condensing temperature circ. 1	Condensing temperature circ. 1	Discharge temperature circuit 1
5	Suction temperature circ. 1	Suction temperature circ. 1	Condensing temperature circ. 1
6	Evaporation temperature circ. 1	Evaporation temperature circ. 1	Suction temperature circ. 1
7	System water return temperature	Condensing pressure circ. 1	Evaporation temperature circ. 1
8	System water delivery temp.	Evaporation pressure circ. 1	Condensing pressure circ. 1
9		System water return temperature	Evaporation pressure circ. 1
10		System water delivery temp.	System water return temperature
11			System water delivery temp.

Tab. 3.b

The meanings assigned to the analogue inputs according to the various groups for the Slave controller (circuit 2) are as follows:

Value	GRP1	GRP2	GRP3
0	Not used	Not used	Not used
1	Source water delivery temp.	Source water delivery temp.	Source water delivery temp.
2	Outside temperature	Outside temperature	Outside temperature
3	Discharge temperature circuit 2	Discharge temperature circuit 2	Remote set point
4	Condensing temperature circ. 2	Condensing temperature circ. 2	Discharge temperature circuit 1
5	Suction temperature circ. 2	Suction temperature circ. 2	Condensing temperature circ. 1
6	Evaporation temperature circ. 2	Evaporation temperature circ. 2	Suction temperature circ. 1
7	Common water delivery temperature	Condensing pressure circ. 2	Evaporation temperature circ. 1
8	Evap. water delivery temp. 2	Evaporation pressure circ. 2	Condensing pressure circ. 2
9		Common water delivery temperature	Evaporation pressure circ. 2
10		Evap. water delivery temp. 2	Common water delivery temperature
11			Evaporation pressure circ. 2

Tab. 3.c

3.2 Digital inputs

Below is the list of parameters used to configure the digital inputs:

Digital input	Master configuration parameter	Slave configuration parameter
ID1	HC14	HC16
ID2	HC15	HC17
ID3	High pressure switch circ. 1	High pressure switch circ. 2
ID4	HC06	HC09
ID5	HC07	HC10
ID6*	HC08*	HC11

Tab. 3.d

(*) available only on DIN version

The digital input configuration parameters can have the following meaning:

Value	Master description (circuit 1)	Slave description (circuit 2)
0	Not used	Not used
1	System pump flow switch	System pump flow switch
2	Comp. 1 thermal protector circ. 1	Comp. 1 thermal prot circ. 2
3	Comp. 2 thermal protector circ. 1	Comp. 2 thermal prot. circ. 2
4	Remote on/off	Remote on/off
5	Cooling/heating	Cooling/heating
6	2nd set point	2nd set point
7	Remote alarm	Remote alarm
8	System pump 1 thermal protector	System pump 1 thermal protector
9	Low pressure switch circ. 1	Low pressure switch circ. 2
10	System pump 2 thermal protector	System pump 2 thermal protector
11**	Comp. 1 request circ. 1	Comp. 1 request circ. 2
12**	Comp. 2 request circ. 1	Comp. 2 request circ. 2

Tab. 3.e

(**) available only for condensing units

3.3 Analogue outputs

Below is the list of parameters used to configure the analogue outputs:

Analogue output	Master configuration parameter	Slave configuration parameter
Y1	HC71	HC81
Y2	HC72	HC82

Tab. 3.f

The analogue input configuration parameters can have the following meaning:

Value	Master description (circuit 1)	Slave description (circuit 2)
0	Not used	Not used
1	On-off source fan/pump circ. 1	On-off source fan/pump circ. 2
2	Modulating source fan circ. 1	Modulating source fan circ. 2
3	Free cooling	Free cooling

Tab. 3.g

3.4 Digital outputs

Below is the list of parameters used to configure the digital outputs:

Digital input	Master configuration parameter	Slave configuration parameter
NO1	HC51	HC61
NO2	HC52	HC62
NO3	HC53	HC63
NO4	HC54	HC64
NO5	HC55	HC65
NO6*	HC56	HC66

Tab. 3.h

(*) available only on DIN version

The digital output configuration parameters can have the following meaning:

Value	Master description (circuit 1)	Slave description (circuit 2)
0	Not used	Not used
1	Compressor1 circuit 1	Compressor1 circuit 2
2	Compressor 2 circuit 1	Compressor 2 circuit 2
3	System heater 1	System heater 2
4	System pump 1 / system fan	System pump 2
5	Source pump / fan	Source pump / fan
6	Frost protection heater evaporator 1	Frost protection heater evaporator 2
7	4-way valve circuit 1	4-way valve circuit 2
8	Oil equalisation valve circuit 1	Oil equalisation valve circuit 2
9	Freecooling valve	
10	General alarm	
11	System pump 2	
12	System heater 2	

Tab. 3.i

4. APPLICATION COMPATIBILITY

Below is a summary table for the correct configuration of the unit type on uChiller, starting from parameter Hd01 on uCh2 and uCH2SE.

uChiller Legacy parameter key
U077 : Type of unit
S068 : Source type (FALSE = Air, TRUE = Water)
ModE : Cooling/heating mode from keypad
(FALSE = Cooling TRUE = Heating)

uCH2se	uChiller (legacy)		
H01	U077	S068	ModE
0 = air-air unit	5	----	----
1 = air-air heat pump	6	----	FALSE = CH TRUE = HP
2 = air-water chiller	0	FALSE	----
3 = air-water heat pump	2	FALSE	FALSE = CH TRUE = HP
4 = water-water chiller	0	TRUE	----
5 = water-water heat pump with reverse-cycle on gas circuit	2	TRUE	FALSE = CH TRUE = HP
6 = water-water heat pump with reverse-cycle on water circuit	7	TRUE	FALSE = CH TRUE = HP
7 = condensing unit	3	FALSE	----
8 = condensing unit with reverse-cycle	4	FALSE	FALSE = CH TRUE = HP
9 = water-cooled condensing unit	3	TRUE	----
10 = water-cooled condensing unit with reverse-cycle	4	TRUE	FALSE = CH TRUE = HP
11 = air-air cooling only unit with electric heating	----	----	----

Tab. 4.a

4.1 Air/air

4.1.1 Single circuit

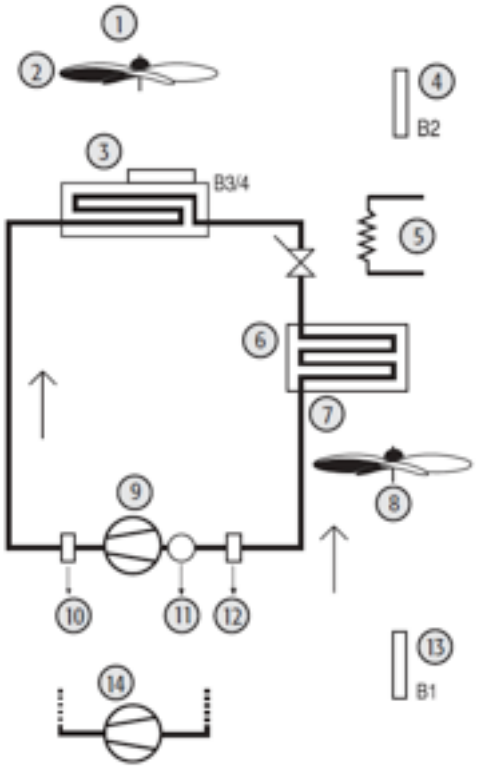


Fig. 4.a

Key:

1	condenser fan thermal protector
2	condenser fan
3	condenser probe
4	supply probe
5	heater
6	evaporator
7	supply fan thermal protector
8	supply fan
9	compressor 1
10	high pressure
11	compressor thermal protector
12	low pressure
13	room probe
14	compressor 2

4.1.2 Two circuits

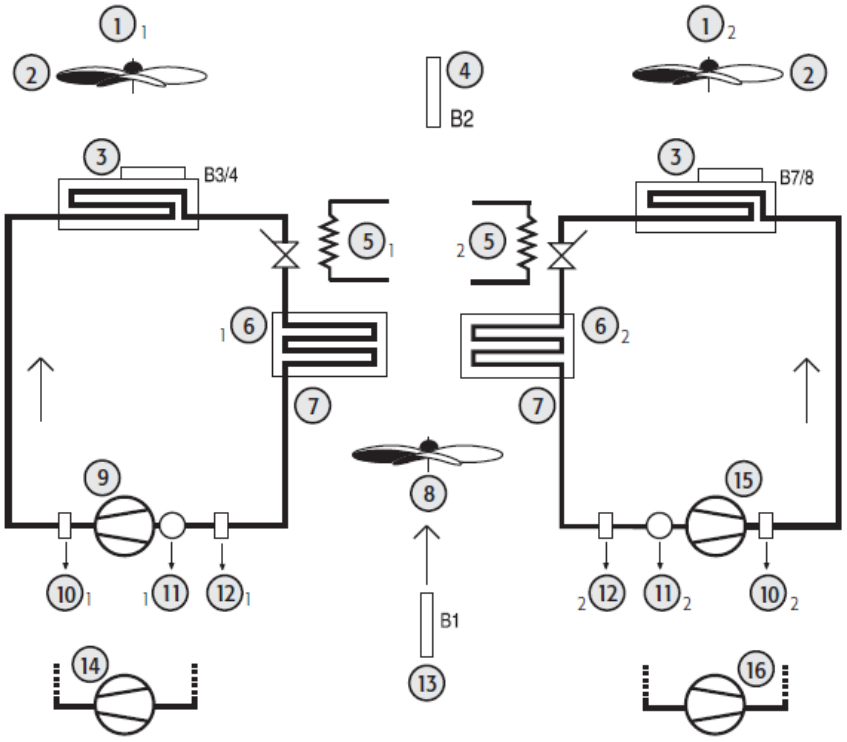


Fig. 4.b

Key:

1	condenser fan 1 & 2 thermal protector
2	fan
3	condenser probe
4	supply probe
5	heater 1 & 2
6	evaporator 1 & 2
7	supply fan thermal protector
8	supply fan
9	compressor 1 circuit 1
10	high pressure 1 & 2
11	compressor 1 & 2 thermal protector
12	low pressure 1 & 2
13	room probe
14	compressor 2 circuit 1
15	compressor 1 circuit 2
16	compressor 2 circuit 2

4.1.3 Two circuits, 1 condensing ventilation circuit

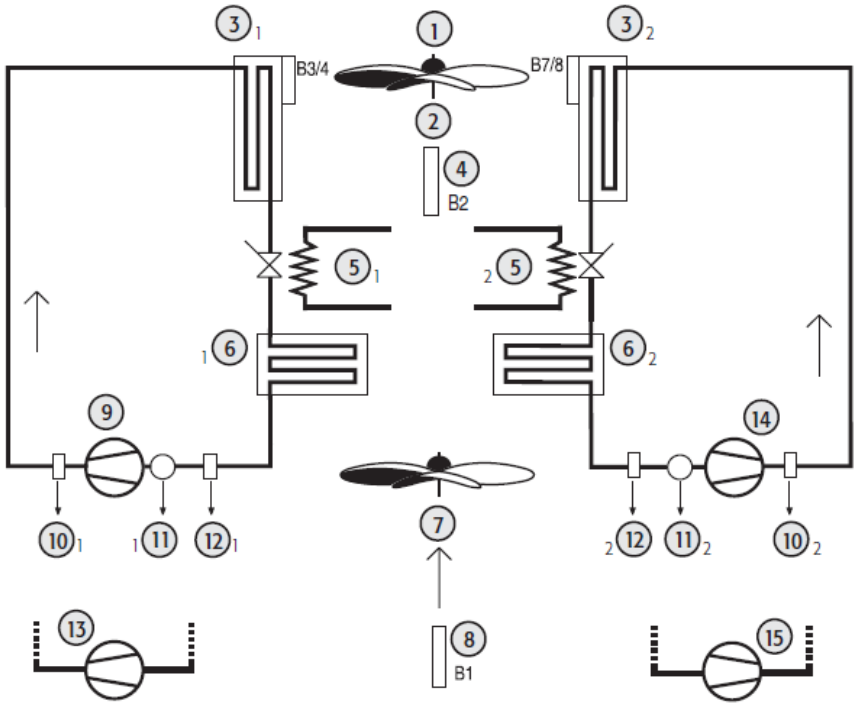


Fig. 4.c

Key:

1	condenser fan thermal protector
2	fan
3	condenser probe 1 & 2
4	supply probe
5	heater 1 & 2
6	evaporator 1 & 2
7	supply fan
8	room probe
9	compressor 1 circuit 1
10	high pressure 1 & 2
11	compressor 1 & 2 thermal protector
12	low pressure 1 & 2
13	compressor 1 circuit 1
14	compressor 1 circuit 2
15	compressor 2 circuit 2

4.2 Reverse-cycle air/air units

4.2.1 Single circuit

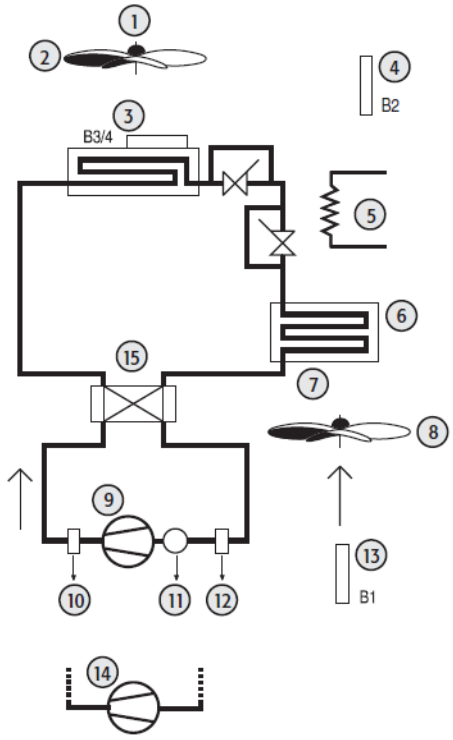


Fig. 4.d

Key:

1	condenser fan thermal protector
2	fan
3	condenser probe
4	supply probe
5	heater
6	evaporator
7	supply fan thermal protector
8	supply fan
9	compressor 1
10	high pressure
11	compressor thermal protector
12	low pressure
13	room probe
14	compressor 2
15	reversing valve

4.2.2 Two circuits

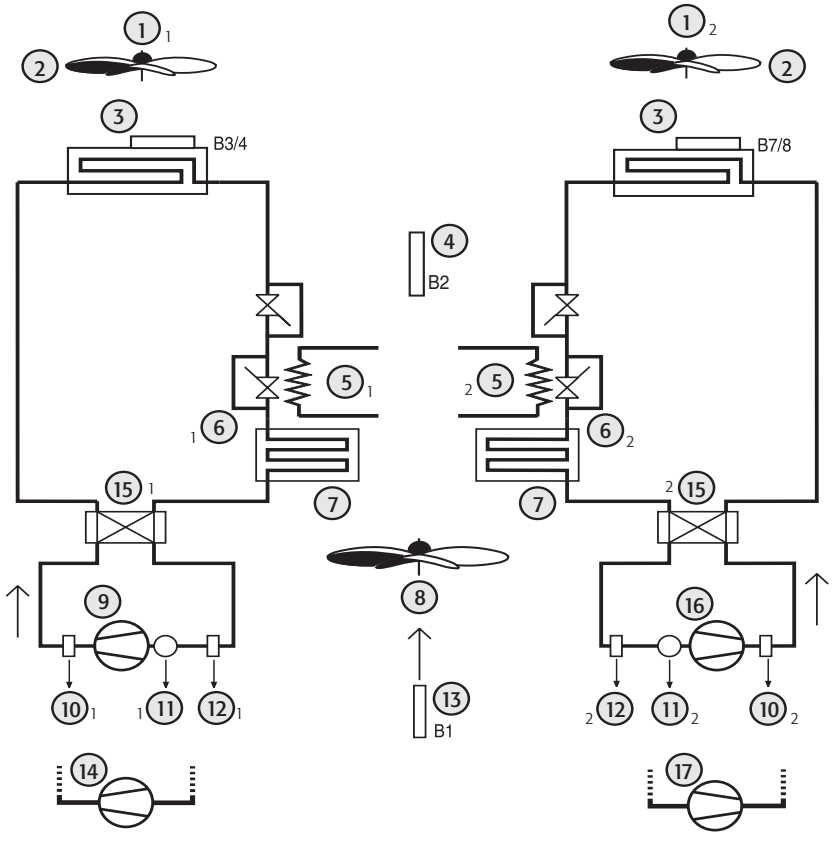


Fig. 4.e

Key:

1	condenser fan 1 & 2 thermal protector
2	fan
3	condenser probe
4	supply probe
5	heater 1 & 2
6	evaporator 1 & 2
7	supply fan thermal protector
8	supply fan
9	compressor 1 circuit 1
10	high pressure 1 & 2
11	compressor 1 & 2 thermal protector
12	low pressure 1 & 2
13	room probe
14	compressor 2 circuit 1
15	reversing valve
16	compressor 1 circuit 2
17	compressor 2 circuit 2

4.2.3 Two circuits, 1 condensing ventilation circuit

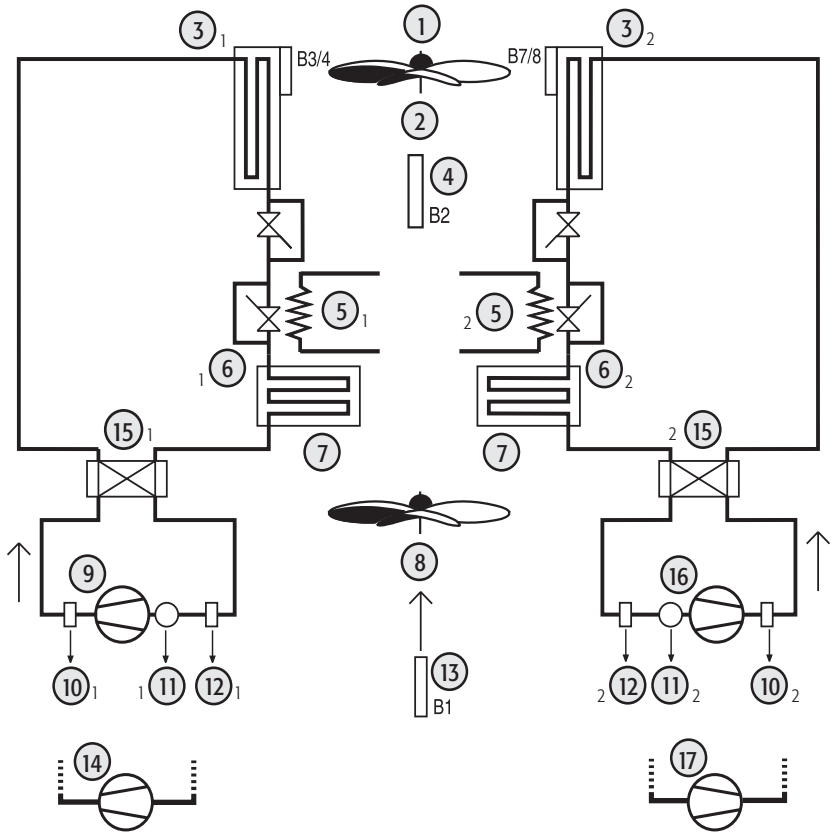


Fig. 4.f

Key:

1	condenser fan thermal protector
2	fan
3	condenser probe 1 & 2
4	supply probe
5	heater 1 & 2
6	evaporator 1 & 2
7	supply fan thermal protector
8	supply fan
9	compressor 1 circuit 1
10	high pressure 1 & 2
11	compressor 1 & 2 thermal protector
12	low pressure 1 & 2
13	room probe
14	compressor 2 circuit 1
15	reversing valve
16	compressor 1 circuit 2
17	compressor 2 circuit 2

4.3 Air/water chillers

4.3.1 Single circuit

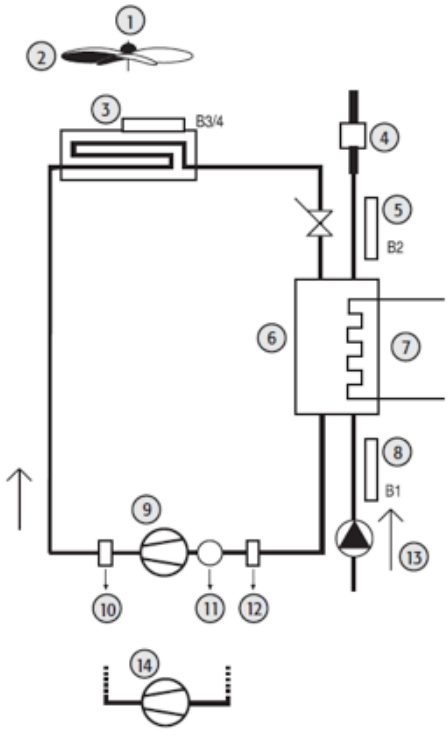


Fig. 4.g

Key:

1	condenser fan thermal protector
2	fan
3	condenser probe
4	flow switch
5	evaporator outlet probe
6	evaporator
7	frost protection heater
8	evaporator inlet probe
9	compressor 1
10	high pressure
11	compressor thermal protector
12	low pressure
13	water pump
14	compressor 2

4.3.2 Two circuits, 2 condensing ventilation circuits and 2 evaporators

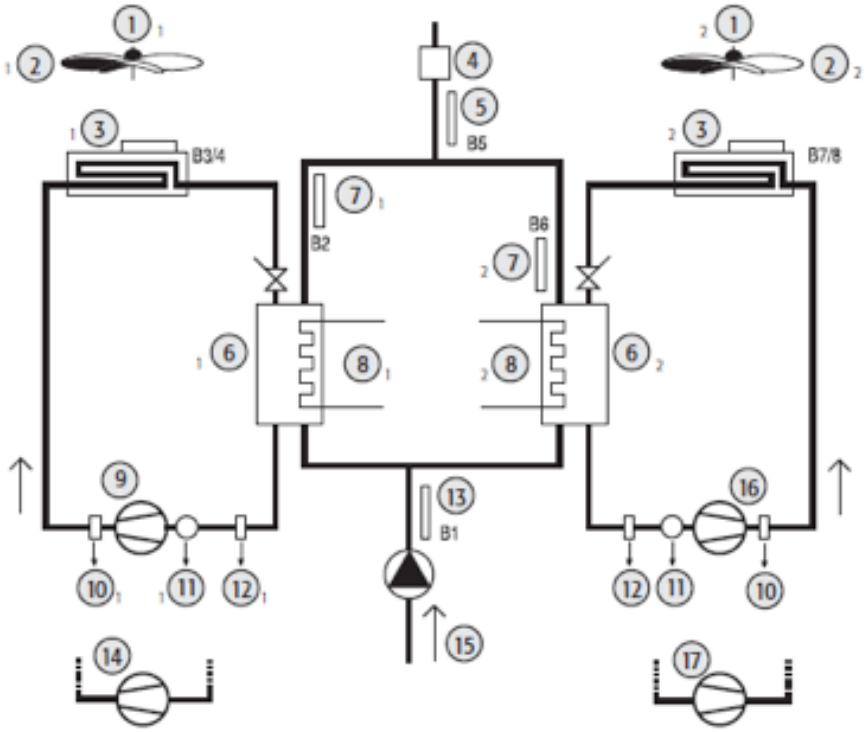


Fig. 4.h

Key:

1	condenser fan 1 & 2 thermal protector
2	fan
3	condenser probe
4	flow switch
5	common evaporator outlet probe
6	evaporator 1 & 2
7	evaporator outlet probe 1 & 2
8	frost protection heater 1 & 2
9	compressor 1 circuit 1
10	high pressure 1 & 2
11	compressor 1 & 2 thermal protector
12	low pressure 1 & 2
13	room probe
14	compressor 2 circuit 1
15	water pump
16	compressor 1 circuit 2
17	compressor 2 circuit 2

4.3.3 Two circuits, 1 condensing ventilation circuit

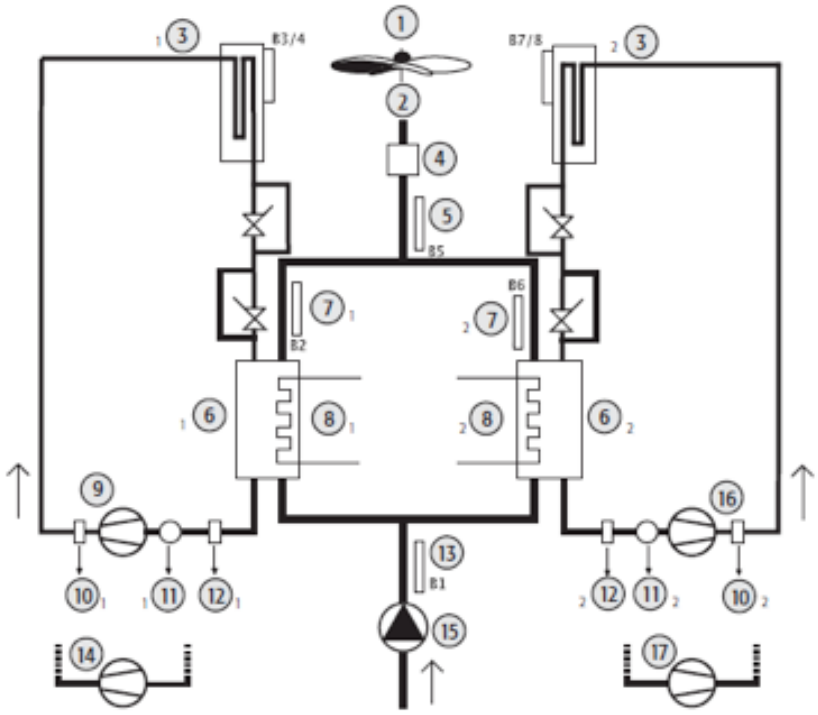


Fig. 4.i

Key:

1	condenser fan thermal protector
2	fan
3	condenser probe 1 & 2
4	flow switch
5	supply temperature probe
6	evaporator 1 & 2
7	evaporator outlet probe 1 & 2
8	frost protection heater 1 & 2
9	compressor 1 circuit 1
10	high pressure 1 & 2
11	compressor 1 & 2 thermal protector
12	low pressure 1 & 2
13	evaporator inlet probe
14	compressor 2 circuit 1
15	water pump
16	compressor 1 circuit 2
17	compressor 2 circuit 2

4.4 Reverse-cycle air/water units

4.4.1 Single circuit

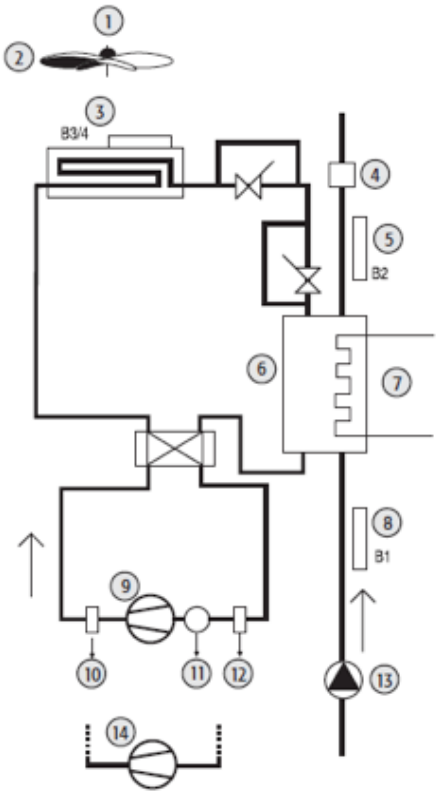


Fig. 4.j

Key:

1	condenser fan thermal protector
2	fan
3	condenser probe
4	flow switch
5	evaporator outlet probe
6	evaporator
7	frost protection heater
8	evaporator inlet probe
9	compressor 1
10	high pressure
11	compressor thermal protector
12	low pressure
13	room probe
14	compressor 2

4.4.2 Two circuits, 2 condensing ventilation circuits

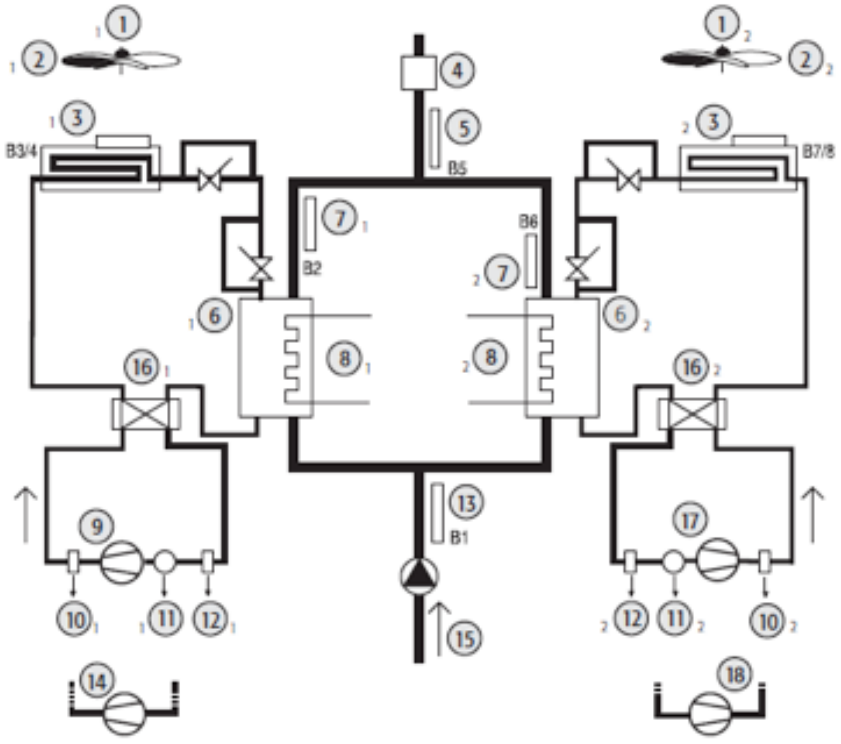


Fig. 4.k

Key:

1	condenser fan 1 & 2 thermal protector
2	fan
3	condenser probe
4	flow switch
5	common evaporator probe
6	evaporator 1 & 2
7	evaporator outlet probe 1 & 2
8	supply fan
9	compressor 1 circuit 1
10	high pressure 1 & 2
11	compressor 1 & 2 thermal protector
12	low pressure 1 & 2
13	evaporator inlet probe 1 & 2
14	compressor 2 circuit 1
15	water pump
16	reversing valve
17	compressor 1 circuit 2
18	compressor 2 circuit 2

4.4.3 Two circuits, 1 condensing ventilation circuit

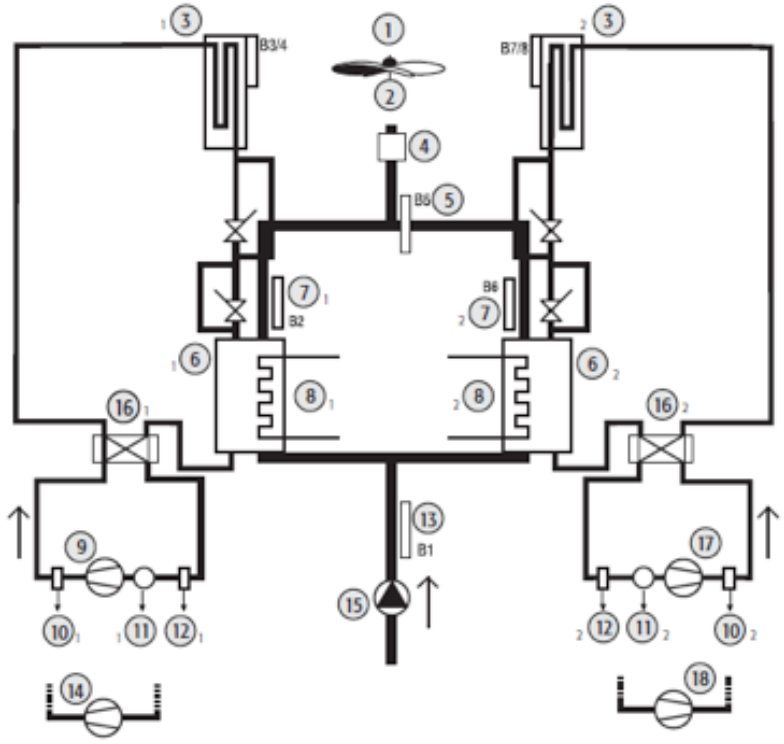


Fig. 4.l

Key:

1	condenser fan 1 & 2 thermal protector
2	fan
3	condenser probe
4	flow switch
5	common evaporator probe
6	evaporator 1 & 2
7	evaporator outlet probe 1 & 2
8	supply fan
9	compressor 1 circuit 1
10	high pressure 1 & 2
11	compressor 1 & 2 thermal protector
12	low pressure 1 & 2
13	evaporator inlet probe 1 & 2
14	compressor 2 circuit 1
15	water pump
16	reversing valve
17	compressor 1 circuit 2
18	compressor 2 circuit 2

4.5 Air/water chillers

4.5.1 Single circuit

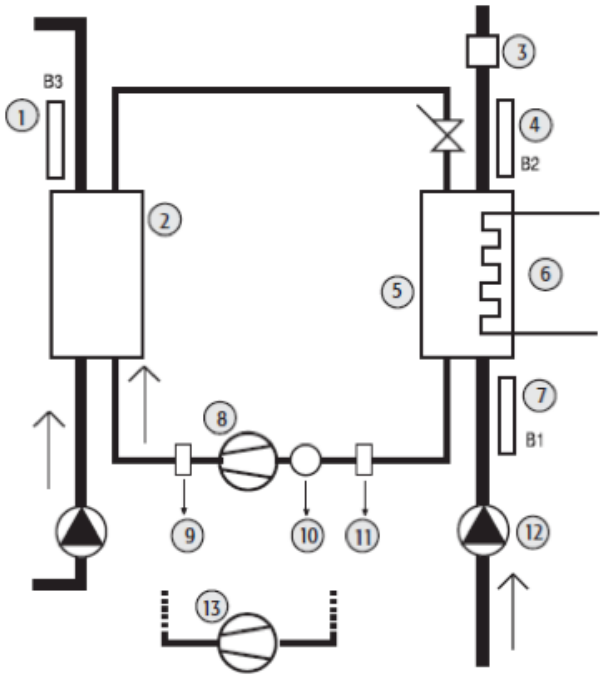


Fig. 4.m

Key:

1	cond. water temperature probe
2	condenser
3	flow switch
4	evaporator outlet probe
5	evaporator
6	frost protection heater
7	evaporator inlet probe
8	compressor 1
9	high pressure
10	compressor thermal protector
11	low pressure
12	water pump
13	compressor 2
14	compressor 2

4.5.2 Two circuits, 1 evaporator

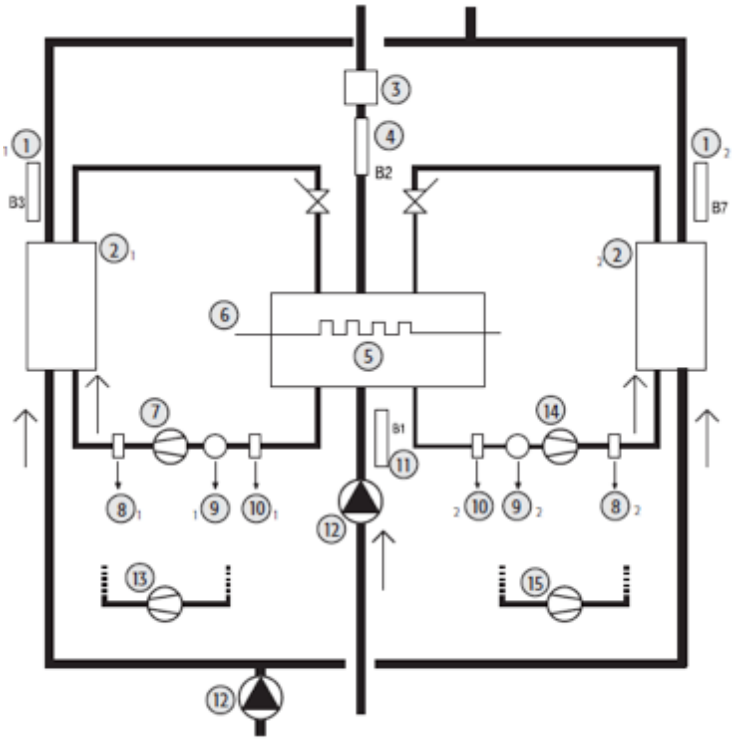


Fig. 4.n

Key:

1	Cond. water temperature probe 1 & 2
2	Condenser 1 & 2
3	flow switch
4	evaporator outlet probe
5	evaporator
6	frost protection heater
7	Compressor 1 circuit 1
8	High pressure 1 & 2
9	Compressor 1 & 2 thermal protector
10	Low pressure 1 & 2
11	Evaporator inlet probe
12	Water pump
13	Compressor 2 circuit 1
14	Compressor 1 circuit 2
15	Compressor 2 circuit 2

4.5.3 Two circuits, 2 evaporators

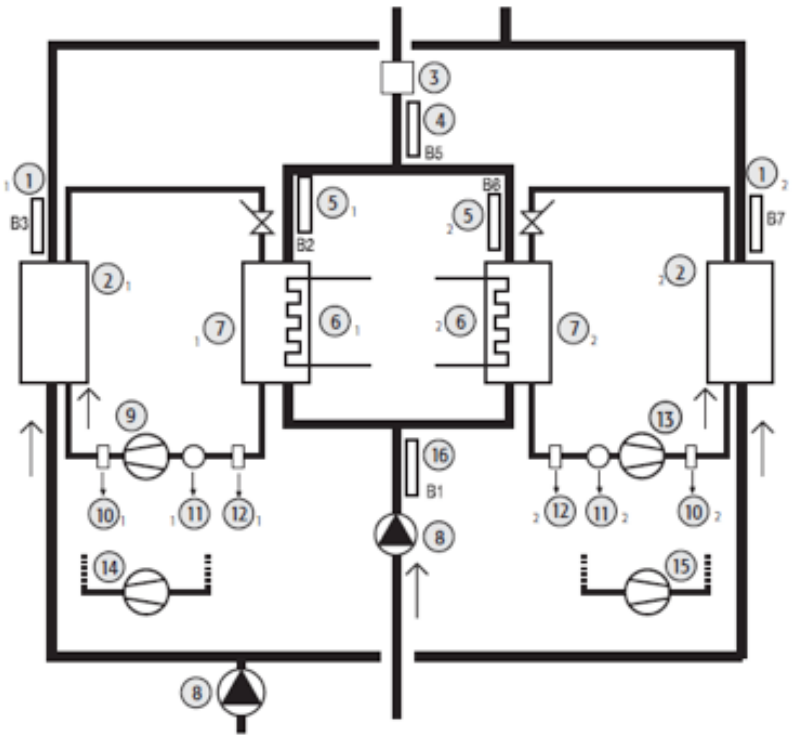


Fig. 4.o

Key:

1	Cond. water temperature probe 1 & 2
2	Condenser 1 & 2
3	flow switch
4	common evaporator outlet probe
5	evaporator outlet probe 1 & 2
6	frost protection heater 1 & 2
7	Evaporator 1 & 2
8	Water pump
9	Compressor 1 circuit 1
10	High pressure 1 & 2
11	Compressor 1 & 2 thermal protector
12	Low pressure 1 & 2
13	Compressor 1 circuit 2
14	Compressor 2 circuit 1
15	Compressor 2 circuit 2

4.6 Reverse-cycle water/water units

4.6.1 Single circuit

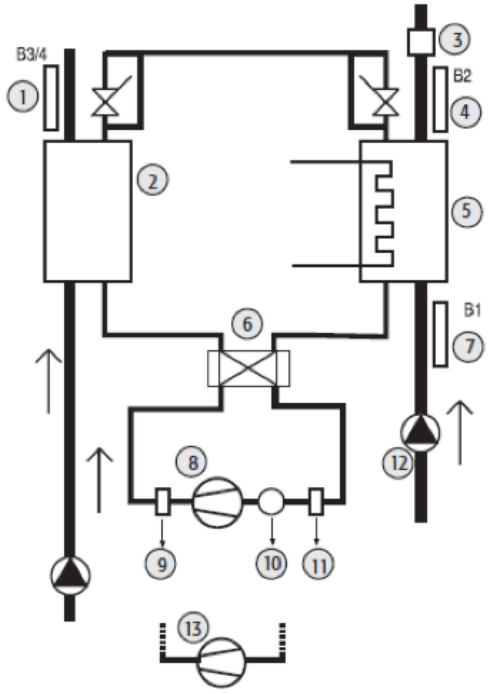


Fig. 4.p

Key:

1	Cond. water temperature probe
2	condenser
3	flow switch
4	Evaporator outlet probe
5	evaporator
6	Reversing valve
7	Evaporator inlet probe
8	compressor
9	High pressure
10	compressor thermal protector
11	Low pressure
12	Water pump
13	Compressor 2

4.6.2 Two circuits

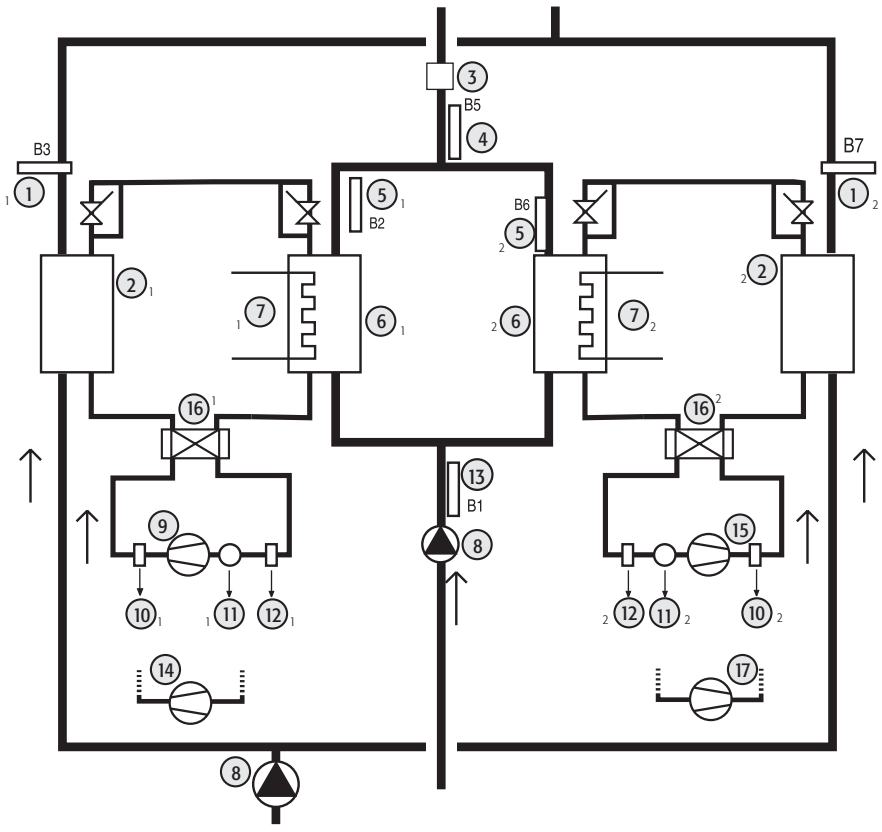


Fig. 4.q

Key:

1	cond. water temperature probe 1 & 2
2	condenser 1 & 2
3	flow switch
4	evaporator outlet probe
5	evaporator outlet probe 1 & 2
6	evaporator 1 & 2
7	frost protection heater 1 & 2
8	water pump
9	compressor 1 circuit 1
10	high pressure 1 & 2
11	compressor 1 & 2 thermal protector
12	low pressure 1 & 2
13	evaporator inlet probe
14	compressor 2 circuit 1
15	compressor 1 circuit 2
16	reversing valve 1 & 2
17	compressor 2 circuit 2

4.6.3 Two circuits, 1 evaporator

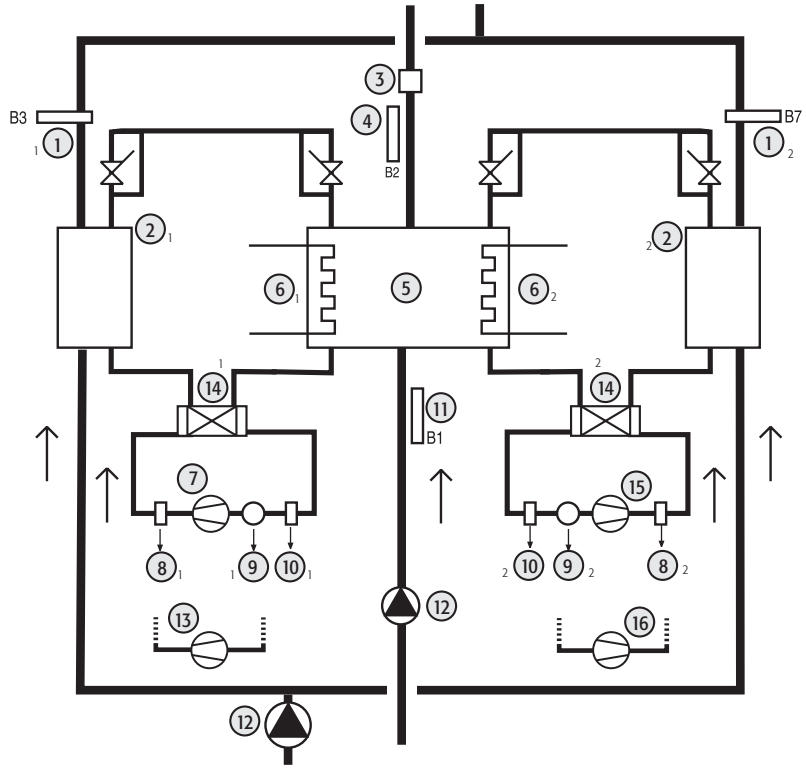


Fig. 4.r

Key:

1	condenser probe 1 & 2
2	condenser 1 & 2
3	flow switch
4	evaporator outlet probe
5	evaporator
6	frost protection heater 1 & 2
7	compressor 1 circuit 1
8	high pressure 1 & 2
9	compressor 1 & 2 thermal protector
10	low pressure 1 & 2
11	evaporator inlet probe
12	water pump
13	compressor 2 circuit 1
14	reversing valve 1 & 2
15	compressor 1 circuit 2
16	compressor 2 circuit 2

4.7 Air-cooled condensing unit

4.7.1 Single circuit

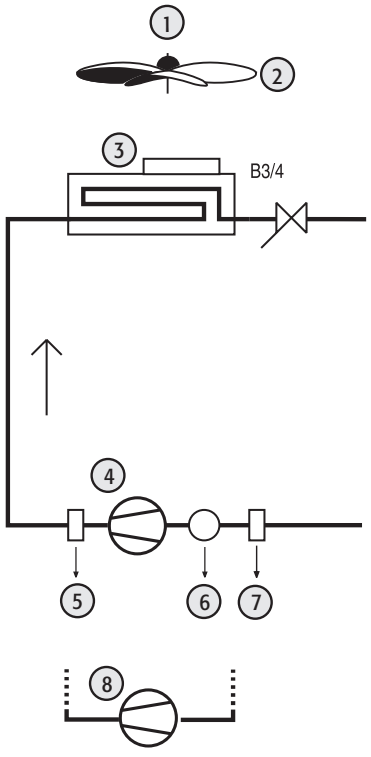


Fig. 4.s

Key:

1	condenser fan thermal protector
2	fan
3	condenser probe
4	compressor 1
5	high pressure
6	compressor thermal protector
7	low pressure
8	compressor 2

4.7.2 Two circuits

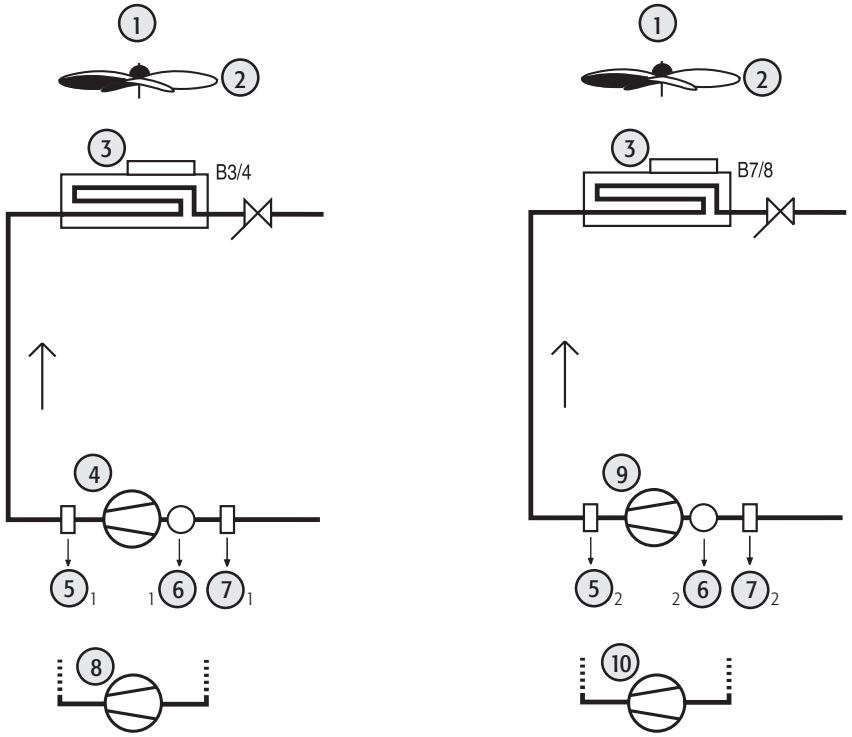


Fig. 4.t

Key:

1	condenser fan thermal protector
2	fan
3	condenser probe
4	compressor 1 circuit 1
5	high pressure 1 & 2
6	compressor 1 & 2 thermal protector
7	low pressure 1 & 2
8	compressor 2 circuit 1
9	compressor 1 circuit 2
10	compressor 2 circuit 2

4.8 Reverse-cycle air-cooled condensing unit

4.8.1 Single circuit

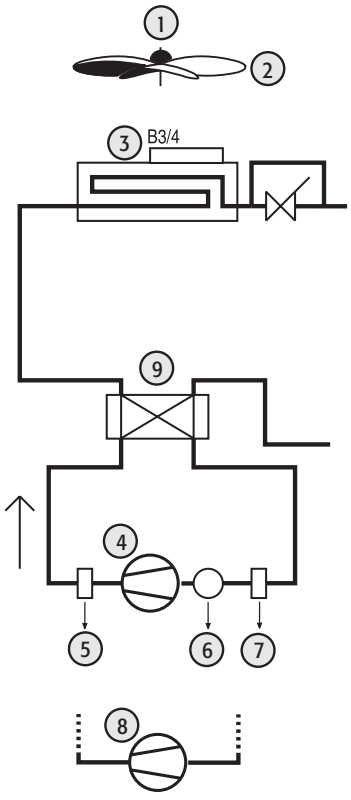


Fig. 4.u

Key:

1	condenser fan thermal protector
2	fan
3	condenser probe
4	compressor 1
5	high pressure
6	compressor thermal protector
7	low pressure
8	compressor 2
9	reversing valve

4.8.2 Two circuits, 1 condensing ventilation circuit

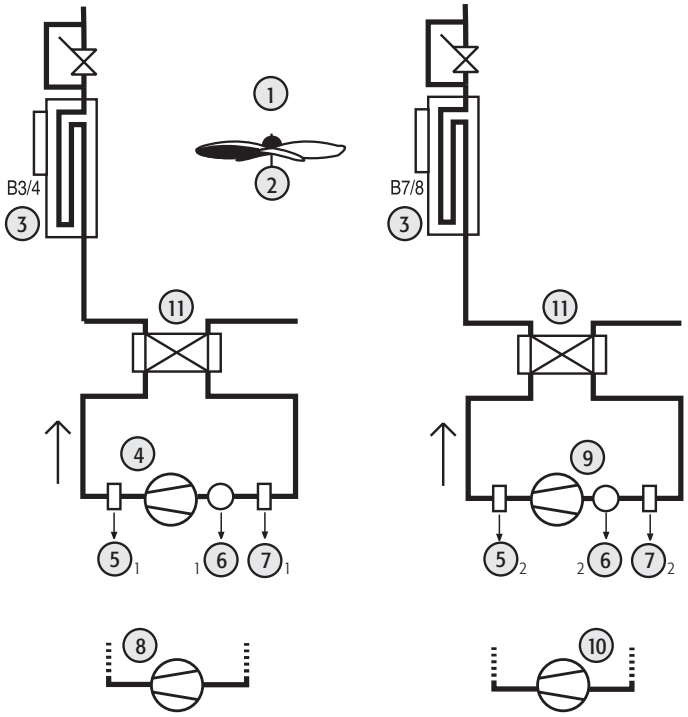


Fig. 4.v

Key:

1	condenser fan thermal protector
2	fan
3	condenser probe
4	compressor 1 circuit 1
5	high pressure 1 & 2
6	compressor 1 & 2 thermal protector
7	low pressure 1 & 2
8	compressor 2 circuit 1
9	compressor 1 circuit 2
10	compressor 2 circuit 2
11	reversing valve

4.9 Water-cooled condensing unit

4.9.1 Single circuit

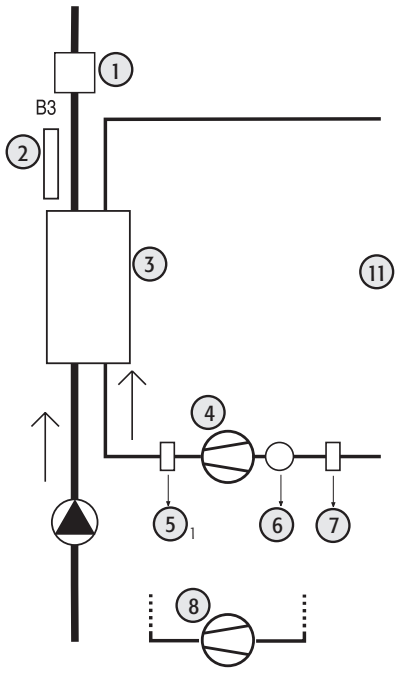


Fig. 4.w

Key:

1	flow switch
2	cond. water temperature probe
3	condenser
4	compressor 1
5	high pressure
6	compressor thermal protector
7	low pressure
8	compressor 2

4.9.2 Two circuits

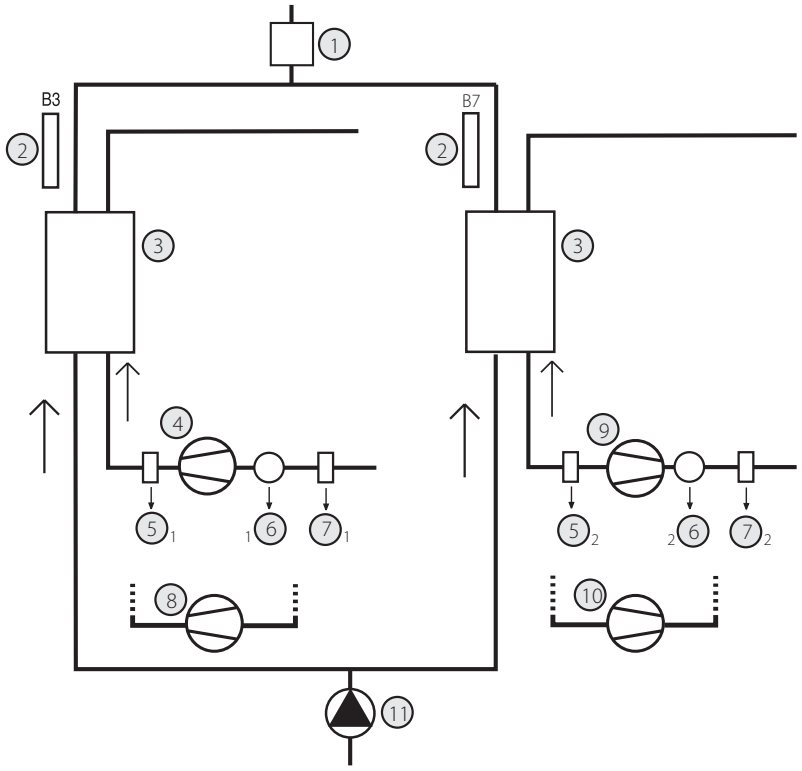


Fig. 4.x

Key:

1	flow switch
2	cond. water temperature probe
3	condenser
4	compressor 1 circuit 1
5	high pressure
6	compressor thermal protector
7	low pressure
8	compressor 2 circuit 1
9	compressor 1 circuit 2
10	compressor 2 circuit 2
11	water pump

4.10 Reverse-cycle water-cooled condensing unit

4.10.1 Single circuit

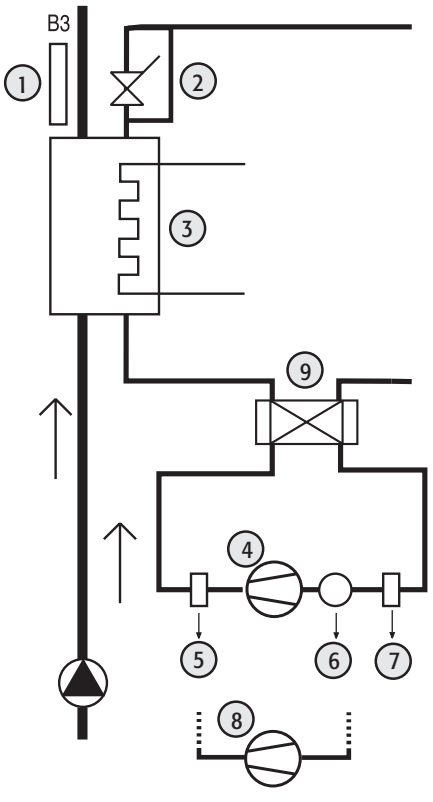


Fig. 4.y

Key:

1	condenser probe
2	condenser
3	frost protection heater
4	compressor 1
5	high pressure
6	compressor thermal protector
7	low pressure
8	compressor 2
9	reversing valve

4.10.2 Two circuits

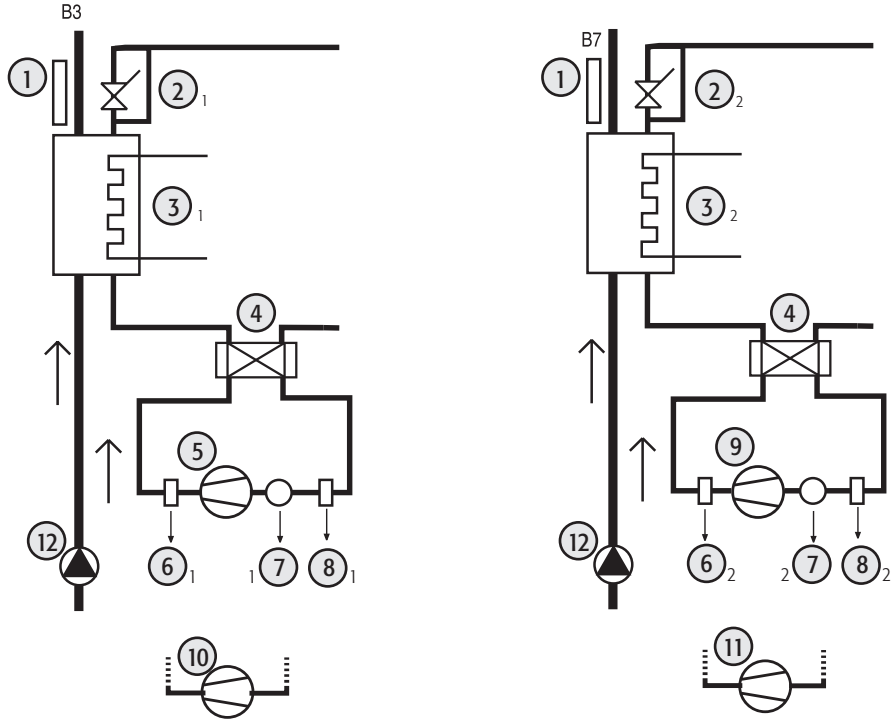


Fig. 4.z

Key:

1	condenser probe
2	condenser 1 & 2
3	frost protection heater 1 & 2
4	reversing valve
5	compressor 1 circuit 1
6	high pressure 1 & 2
7	compressor 1 & 2 thermal protector
8	low pressure 1 & 2
9	compressor 1 circuit 2
10	compressor 2 circuit 1
11	compressor 2 circuit 2
12	water pump

5. COMMISSIONING

5.1 APPLICA app

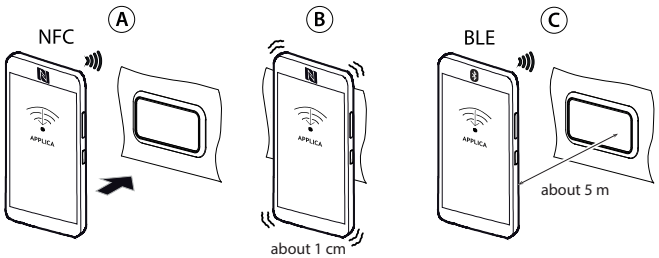


Fig. 5.a

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 (recipes).

Once the Carel "Applica" app has been installed and opened (see the paragraph "Mobile device", proceed as follows:

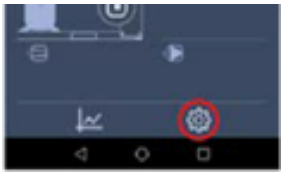
1. For NFC devices, move (A) the mobile device near to the µChiller user terminal (the position of the NFC antenna on the mobile device must be identified in order to place it over the display): wait for the signal that the device has been read (B).
2. 2. For Bluetooth devices (C), select the "SCAN BLUETOOTH" option, then choose the device from the list.

5.2 Config. procedure - Legacy model

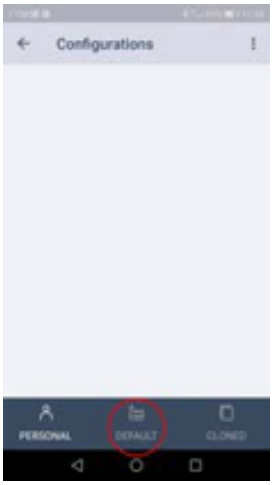
5.2.1 Step 1 - Set the refrigerant

Notice: refer to the table of models in the "Introduction".

1. With Bluetooth devices, access the Service menu by clicking the icon at the bottom right (figure). With NFC devices, the Service menu is already displayed by default (figure below point 2);



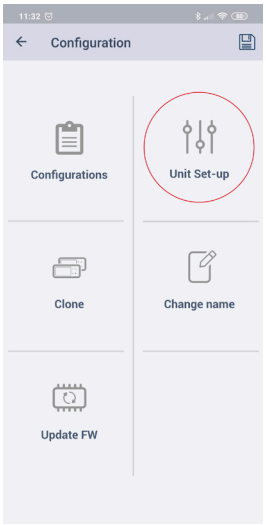
2. click "Set-up"--> "Configurations" -->"Defaults" (figure);

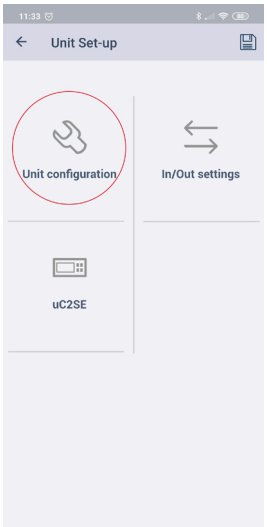


3. select the refrigerant used in the unit;
4. apply the selected configuration via NFC or Bluetooth. **The refrigerant has now been correctly configured;**

5.2.2 Step 2 - Configure the unit

1. continue configuring the unit by clicking the "Set-up"--> "Unit setup" --> "Unit configuration". Complete the unit configuration by pressing the PREV / NEXT buttons to scroll through all of the configuration parameter pages;

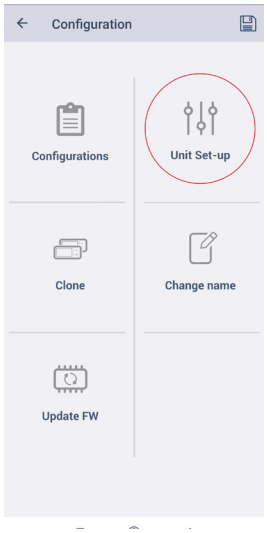


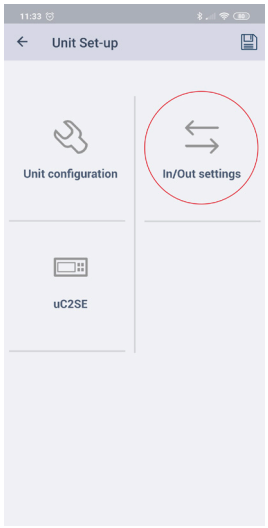


2. apply the parameters configured via NFC / Bluetooth to the controller.

5.2.3 Step 3 - Configure the inputs/outputs

1. click "Set-up"--> "Unit setup" --> "IO configuration". Complete the unit configuration by pressing the PREV / NEXT buttons to scroll through all of the configuration parameter pages;.

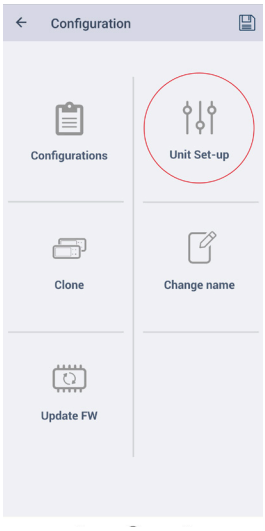


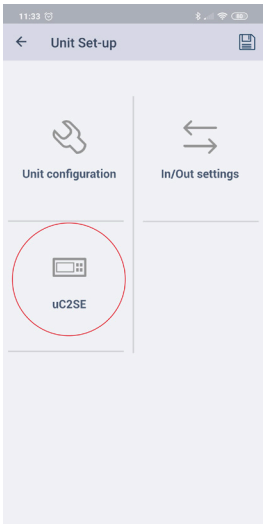


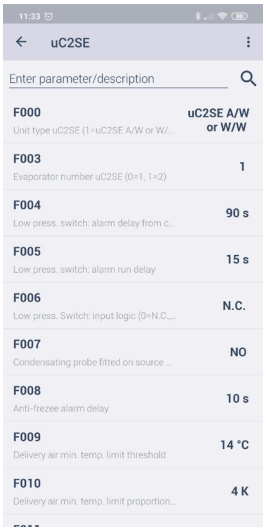
2. apply the parameters configured via NFC / Bluetooth to the controller.

5.2.4 Step 4 - Configure parameter compatibility with mCH2

1. click "Set-up"--> "Unit setup" --> "mCH2 parameters" and complete the configuration of the unit



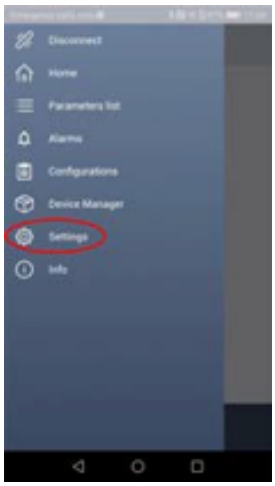


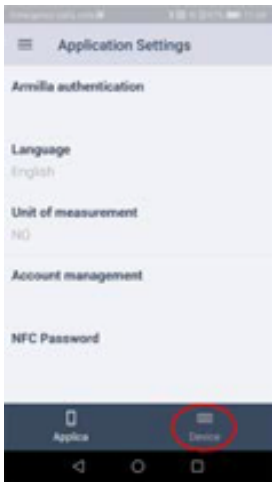


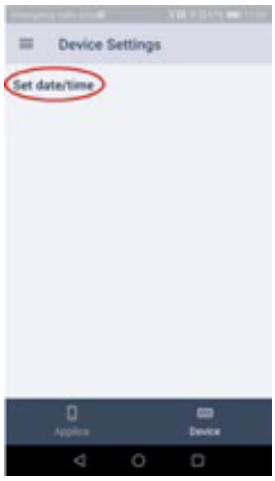
2. apply the parameters configured via NFC / Bluetooth to the controller.

5.2.5 Applica: date and time setting

Applica includes a feature for setting the date and time on µChiller 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.

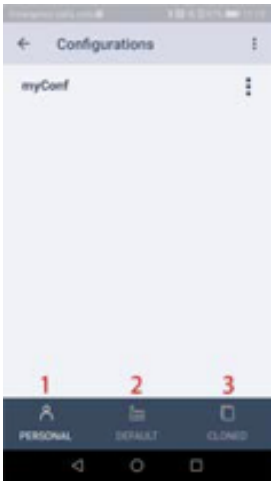
Notice: with a Bluetooth connection, the values are copied on confirmation.

5.2.6 Applica: 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. follow the path "Configurations/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 µChiller 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 µChiller 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 previous figure, tapping the icon:
1. accesses the configurations saved by the user;
2. accesses the configurations prepared by Carel;
3. accesses the saved clones.

5.3 Unit set-up parameter list

5.3.1 Unit parameters

Notice: follow the order shown in the table to configure the Unit set-up parameters.

Par.	Description	Def.	Min.	Max.	UOM
U077	Type of unit 0=CH; 1=HP; 2=CH/HP: 3=Cooling-only condensing unit; 4=Reverse-cycle condensing unit; 5=Cooling-only air/air; 6=Reverse-cycle air/air/air;	0	0	6	-
S068	Source type (0=Air, 1=Water)	0	0	1	-
U076	Number of system pumps	1	1	2	-
C046	No. of unit circuits	1	1	2	-
C047	Type of compressors used (0=1 On/Off; 1=2 On/Off; 2=1 BLDC; 3=1 BLDC+On/Off)	0	0	1/3	-
S065	Type of source fan (0/1=Modulating/ON-OFF)	0	0	1	-
S064	Type of source air circuit (0=Independent; 1=Common)	0	0	1	-
S072	Source pump activation 0=always on 1=On with compressors on 2=control on condensing temperature	0	0	1	-
E047	ExV driver (0=Disabled; 1=Built-in; 2=EVD Evolution)	0	0	2	-
E046	EVD Evolution: valve (1=CAREL ExV, ...) (*) (*) see EVD Evolution manual for the complete list of selectable valves	1	1	24	-
E020	MOP in cooling: threshold	30.0	-60.0	200.0	°C
E022	MOP in heating: threshold	20.0	-60.0	200.0	°C
C017	Max high pressure threshold (HP)	65.0	0.0	999.9	°C
C018	Min low pressure threshold (LP)	0.2	-99.9	99.9	bar
U068	Free cooling: enable (0/1=no/yes)	0	0	1	-
U074	Free cooling type (0=Air; 1=Remote coil; 2=Water)	0	0	2	-
U071	Design free cooling delta T	8.0	0.0	99.9	K
U061	System pump overload: input logic (0/1=NC/NO)	0	0	1	-
U065	Freecooling valve: output logic (0/1=NO/NC)	0	0	1	-
S063	Reversing valve: output logic (0/1=NO/NC)	0	0	1	-
S054	4-way valve: pressure differential for reversing	3.0	0.0	999.9	bar
C049	Low pressure switch alarm delay on compressor activation	90	0	999	-
C050	Low pressure switch alarm delay with compressor on	15	0	999	-
C051	Low pressure switch input logic (0=NC; 1=NA)	0	0	1	-
S053	Defrost synchronisation (0=Independent, 1=Separate, 2=Simultaneous)	0	0	2	-
U006	Cooling set point: minimum limit	5.0	-99.9	999.9	°C
U007	Cooling set point: maximum limit	20.0	-99.9	999.9	°C
U008	Heating set point: minimum limit	30.0	0.0	999.9	°C
U009	Heating set point: maximum limit	45.0	0.0	999.9	°C
Hc13	Buzzer (0/1=No/Yes)	1	0	1	-
U081	High/low pressure and frost alarm reset configuration 0= HP1-2/LP1-2/A1-2/Manual frost protection 1= HP1-2/LP1-2/A1-2/Automatic frost protection 2= HP1-2/A1-2 Manual frost protection LP1-2 automatic 3= HP1-2 manual LP1-2/A1-2 Automatic frost protection 4= HP1-2/LP1-2 manual A1-2/Automatic frost protection 5= HP1-2/LP1-2 (3 times in an hour) manual; A1-2/Automatic frost protection 6= HP1-2/LP1-2 (3 times in an hour) manual; A1-2/Manual frost protection 7=HP1-2 manual/LP1-2 (3 times in an hour)/Manual frost protection	7	0	7	-

Tab. 5.a

(*) see EVD Evolution manual for the complete list of selectable valves

5.3.2 I/O configuration

For the description of the following parameters, see chapter 3 of this document

Par.	Description	Def.	Min.	Max.	UOM
HC31	Analogue input 1 configuration Master	7	0	8	-
HC32	Analogue input 2 configuration Master	8	0	8	-
HC00	Analogue input 3 configuration Master	0	0	8	-
HC34	Analogue input 4 configuration Master	7	0	10	-
HC35	Analogue input 5 configuration Master	8	0	10	-
HC03	Analogue input 6 configuration Master	0	0	11	-
HC04	Analogue input 7 configuration Master	6	0	8	-
HC41	Analogue input 1 configuration Slave	0	0	8	-
HC42	Analogue input 2 configuration Slave	0	0	8	-
HC43	Analogue input 3 configuration Slave	0	0	8	-
HC44	Analogue input 4 configuration Slave	7	0	10	-
HC45	Analogue input 5 configuration Slave	8	0	10	-
HC05	Analogue input 6 configuration Slave	0	0	11	-
HC47	Analogue input 7 configuration Slave	6	0	8	-
HC14	Digital input 1 configuration Master	1	0	12	-
HC15	Digital input 2 configuration Master	2	0	12	-
HC06	Digital input 4 configuration Master	0	0	12	-
HC07	Digital input 5 configuration Master	7	0	12	-
HC08	Digital input 6 configuration Master	6	0	12	-
HC16	Digital input 1 configuration Slave	10	0	12	-
HC17	Digital input 2 configuration Slave	2	0	12	-
HC09	Digital input 4 configuration Slave	0	0	12	-
HC10	Digital input 5 configuration Slave	7	0	12	-
HC11	Digital input 6 configuration Slave	0	0	12	-
HC71	Analogue output 1 configuration Master	1	0	3	-
HC72	Analogue output 2 configuration Master	3	0	3	-
HC81	Analogue output 1 configuration Slave	1	0	3	-
HC82	Analogue output 2 configuration Slave	0	0	3	-
HC51	Digital output 1 configuration Master	1	0	12	-
HC52	Digital output 2 configuration Master	2	0	12	-
HC53	Digital output 3 configuration Master	4	0	12	-
HC54	Digital output 4 configuration Master	7	0	12	-
HC55	Digital output 5 configuration Master	10	0	12	-
HC56	Digital output 6 configuration Master	0	0	12	-
HC61	Digital output 1 configuration Slave	1	0	8	-
HC62	Digital output 2 configuration Slave	2	0	8	-
HC63	Digital output 3 configuration Slave	4	0	8	-
HC64	Digital output 4 configuration Slave	7	0	8	-
HC65	Digital output 5 configuration Slave	0	0	8	-
HC66	Digital output 6 configuration Slave	0	0	8	-
C037	Evaporation pressure: probe type (0=0-5V; 1=4-20mA)	0	0	1	-
C038	Evaporation pressure probe: min value	0.0	-1.0	99.9	bar
C039	Evaporation pressure probe: max value	17.3	0.0	99.9	bar
C040	Condensing pressure: probe type (0=0-5V; 1=4-20mA)	0	0	1	-
C041	Condensing pressure probe: min value	0.0	-1.0	99.9	bar
C042	Condensing pressure probe: max value	45.0	0.0	99.9	bar

Tab. 5.b

5.3.3 mCH2 parameters

Par.	Description	Def.	Min.	Max.	UOM
F027	Compressors at part load (0=NO, 1=YES)	0	0	1	-
F003	Number of evaporators (0=1; 1=2)	0	0	1	-
F007	Sensor S4 installed on the source heat exchanger (0=No, 1=Yes: in CH mode reads condensing temp., in HP mode reads evap. temp.)	0	0	1	-
F008	Frost protection alarm delay	10	0	999	-
F009	Supply air temperature limit threshold	14.0	0.0	99.9	°C
F010	Supply air temperature limit diff.	4.0	0.0	20.0	°K
F011	Heater dig. output logic (0=NO; 1=NC)	0	0	1	-
F012	Offset on set point in cooling operation for the heaters	1.0	0.0	99.9	°K
F013	Differential on set point in cooling mode for the heaters	0.5	0.2	99.9	°K
F014	Offset on set point in heating mode for the heaters	3.0	0.0	99.9	°K
F015	Differential on set point in heating mode for the heaters	1.0	0.2	99.9	°K
F016	Heaters active during defrost (0=No, 1=Yes)	0	0	1	-
F017	Supply fan operating mode (0=Always ON; 1=ON by temp. control)	0	0	1	-
F018	Hot-start set point	40.0	0.0	99.9	°C
F019	Hot-keep differential	5.0	0.0	99.9	°K
F020	Compressor request logic from digital input (0=NC; 1=NO)	1	0	1	-
F021	Mixed water outlet temperature probe calibration (S1 expansion)	0.0	-99.9	99.9	°K
F022	Evaporator 2 water outlet temperature probe calibration (S2 expansion)	0.0	-99.9	99.9	°K
F023	Direct relationship between digital inputs and digital outputs for condensing unit (0=No, 1=Yes)	0	0	1	-
F024	Manual heater 1 management (0=AUTO; 1= OFF; 2=ON)	0	0	2	-
F025	Manual heater 2 management (0=AUTO; 1= OFF; 2=ON)	0	0	2	-
F026	Compressors off at low outside temperature (air/air)	-40.0	-40.0	99.9	°C

Tab. 5.c

5.4 Applica Desktop

Applica Desktop is a program intended for manufacturers and installers of units fitted with the µChiller 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.

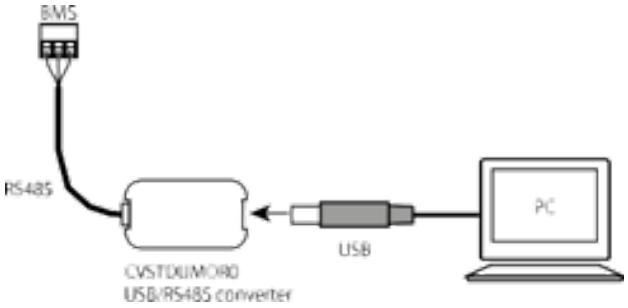


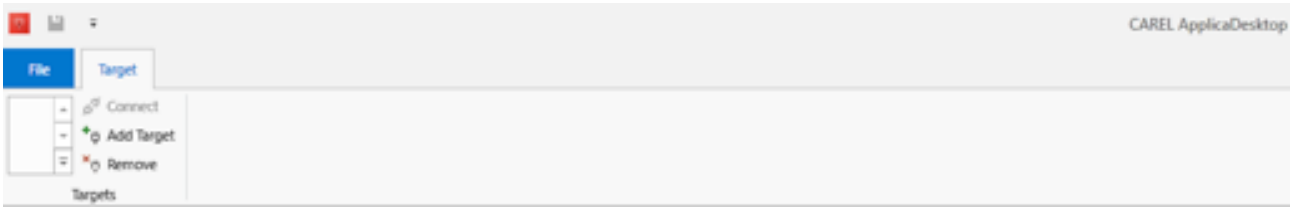
Fig. 5.b

Note:

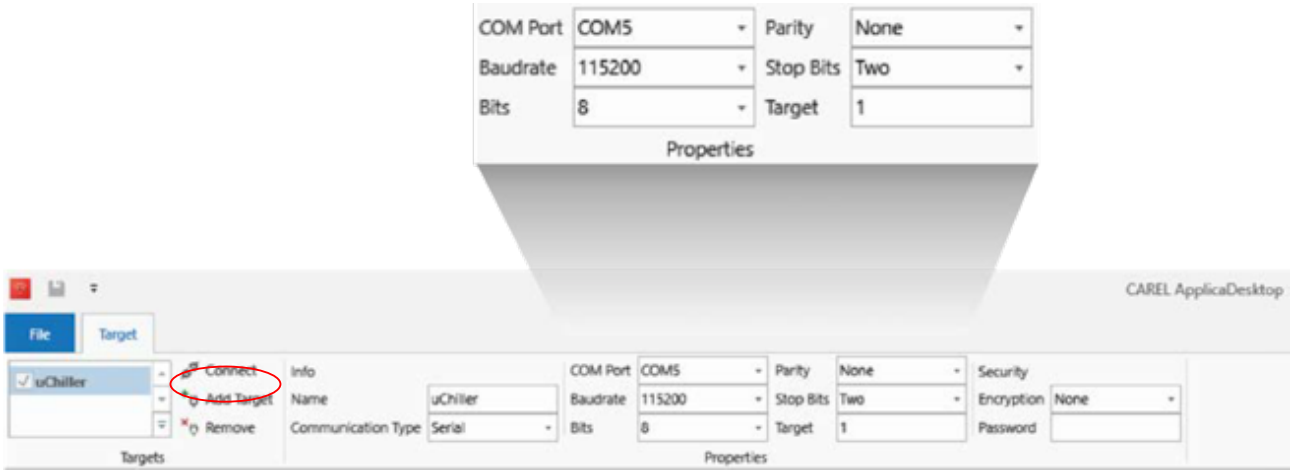
- Applica Desktop can be used as an alternative to the Applica app, and requires an internet connection;
- For the physical connection to the BMS port on µChiller, use the USB/RS485 converter P/N CVSTDUMOR0

5.4.1 Preparing for operation

1. Access KSA, "Software & Support","µChiller" section.
2. Select the "Configurations" folder.
3. For µChiller Standard, Enhanced and Legacy models (with On/Off compressor), select the "Refrigerants" section and then the refrigerant charged on the unit.
4. Connect to the BMS port on the µChiller controller, as shown in Figure 5.b;
5. Open Applica Desktop; a window will be opened with the right part of the top bar as shown below:



6. Select "Add target" and assign it a meaningful name (e.g.
7. In the "COM Port" field, enter the COM port used for the USB connection to the USB/RS485 converter;
8. 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);
9. Use "Connect" to connect to the µChiller (which must be powered on).

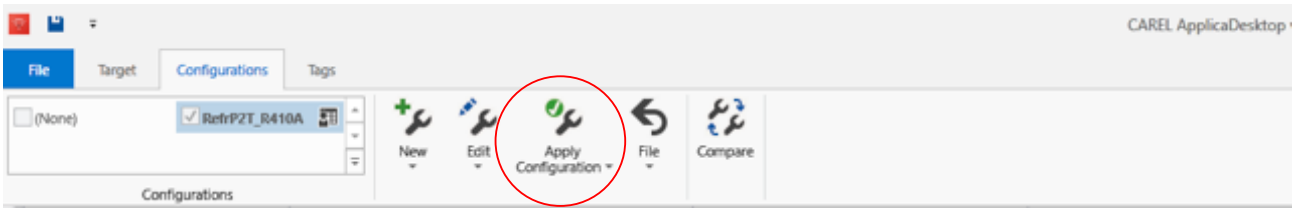


5.5 Configuration procedure with Applica Desktop - Legacy Model

5.5.1 Step 1 - Set the refrigerant

Once connected, select the "Configurations" label: the command bar will be displayed, as shown:

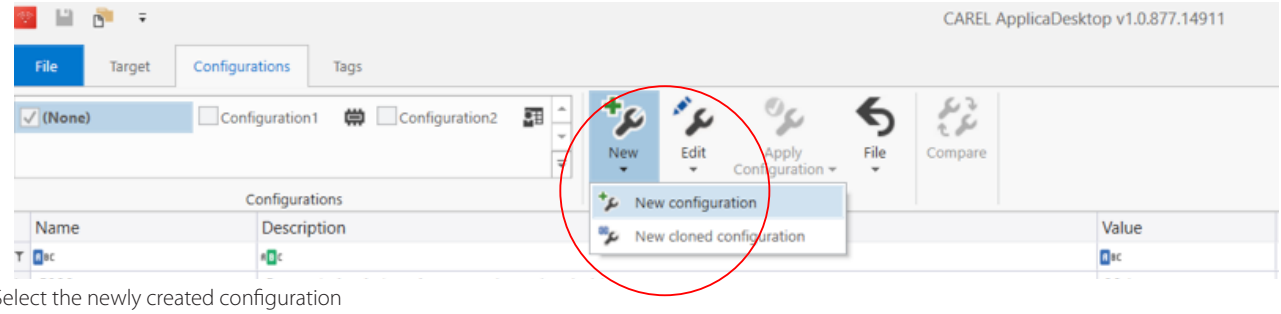
1. Select "File -> Import" to load the refrigerant configurations downloaded from KSA;
2. Select the configuration to be applied to the µChiller, and then "Apply Configuration";



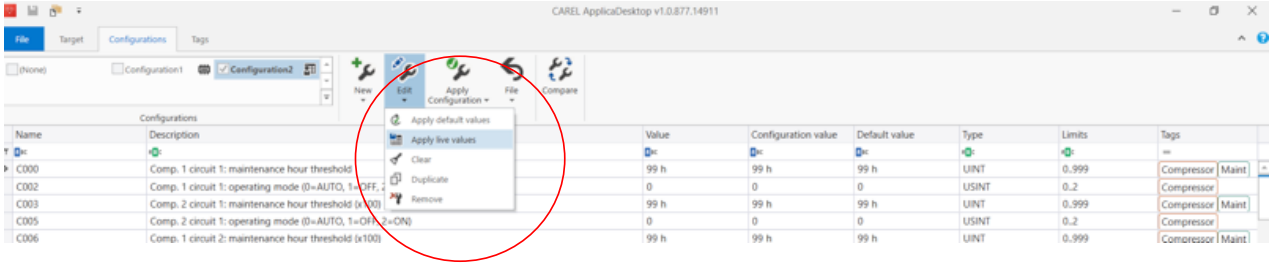
3. Applica Desktop will display a message when the parameters have been set, and if necessary indicating any values that have been applied that do not belong to the current user profile (some parameters may not be visible to the user).

5.5.2 Step 2 - Configure µChiller

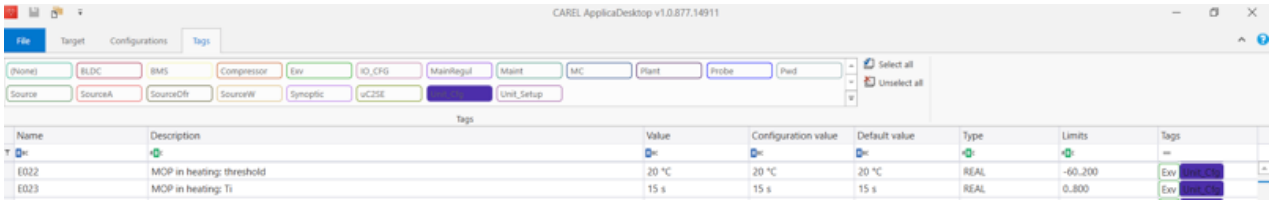
1. Select the "Configurations" label, select "New -> New configuration" and assign a name to the new configuration being created.



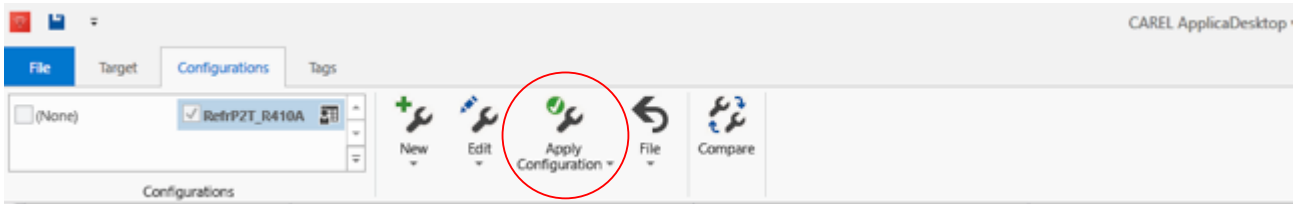
2. Select the newly created configuration
3. Select "Edit -> Apply Live Values". This operation copies the values of the parameters currently saved on the connected µChiller to the newly created configuration.



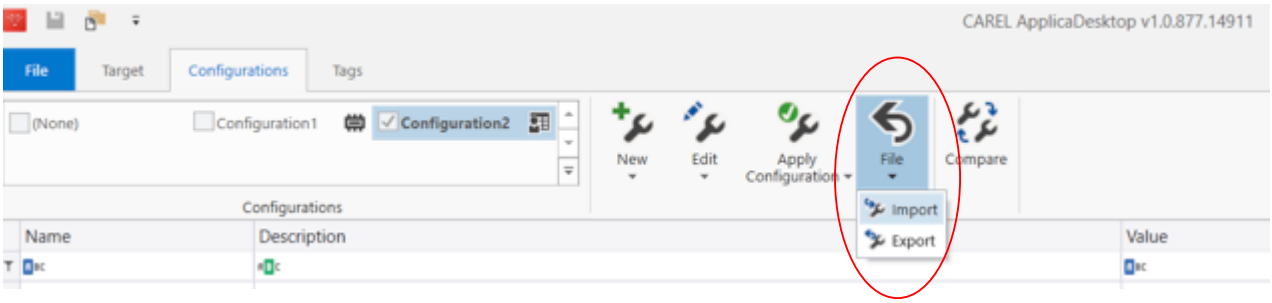
4. Select the "Tags" label and then the "Unit_Cfg" command
5. Change the parameters listed in the "Configuration value" column to configure the unit



6. Repeat the same steps for the "IO_CFG" and "uCH2SE" tags.
7. The unit has now been configured. If desired, the control parameters can be modified using the other tags available as search filters.
8. Once all of the desired parameters have been changed, to apply the changes select the "Configuration" label and select "Apply Configuration"

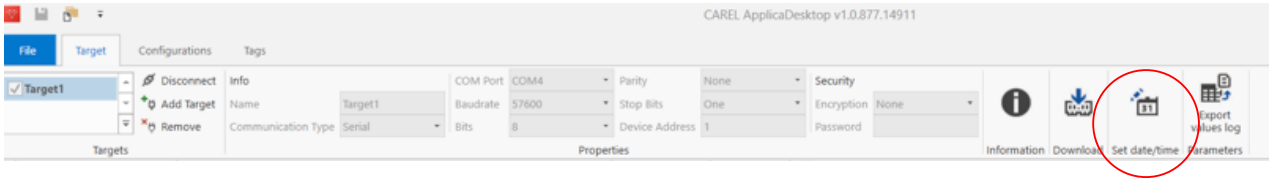


Finally, to save the newly-created configuration for future use, from the "Configurations" label select "File -> Export" and assign a name to the configuration being saved.



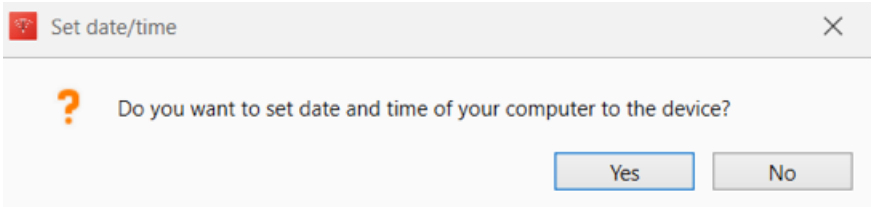
5.5.3 Applica Desktop: date and time setting

Applica Desktop can set the date and time on µChiller in just one simple step, copying the values from the PC to the controller.



Procedure:

1. Once connected, select "Set date&time";
2. In the pop-up window, confirm synchronisation of the time and date on µChiller with the PC



Notes

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µchiller +040000103 rel. 1.1 - 18.07.2022