

(Etiquette signalétique)

CHGV 22 / 40



Groupe d'eau glacée avec équipement hydraulique air / eau - Fluide réfrigérant R 407 C


Air cooled water chiller with hydraulic equipment air / water - R 407 C refrigerant

Refrigeratore d'acqua in versione solo raffreddamento, con sezione idronica aria / acqua
Fluido refrigerante R 407 C

Grupo de enfriadora de agua con equipamiento hidráulico aire / agua
Fluido refrigerante R 407 C

Kaltwassersatz luftgekühlt mit Hydraulikausrüstung zur Außenaufstellung
Kältemittel R 407 C

MARKING

This product marked  conforms to the essential requirements of the Directives:

- Low voltage no. 2006/95/EC.
- Electromagnetic Compatibility no. 89/336 EEC, modified 92/31 and 93/68 EEC.



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APPLIANCES FILLED WITH R 407 C

R 407 C

- Fluid R 407 C, as opposed to R22, is not a pure fluid but a blend composed of:
 - 23% R 32 + 25% R 125 + 52% R 134 A.
- The compressors approved for operation with this fluid are filled beforehand with polyalcohol oil.
Contrary to mineral oil, it is very hygroscopic: it absorbs the humidity of the ambient air very quickly. This can modify its lubricant properties and lead in time to the destruction of the compressor.

MAINTENANCE INSTRUCTIONS

- 1 - Never add oil to the appliance; the compressor is filled with polyalcohol oil, a special oil which cannot tolerate the presence of other oils.
- 2 - The instruments used for:
 - filling,
 - pressure measurements,
 - emptying under vacuum,
 - recovering the fluid,must be compatible and only used for the R 407 C fluid.
- 3 - The weight of the refrigerant contained in the storage bottle must be checked constantly. Do not use it from the moment the remaining weight is less than 10% of the total weight.

4 - In the case of a new charge:

- do not use the charging cylinder,
- use a balance and a dip pipe type R 407 C cylinder,
- charge the weight of R 407 C as per the value indicated on the unit's identification plate,
- **IMPORTANT:** see instruction 3 above.

5 - The charge **must** be undertaken in liquid phase.

6 - In case of leakage, do not complete the charge: recover the remaining refrigerant for recycling and perform a total charge.

Recovery, recycling or the destruction of the fluid must be done in compliance with the laws in force in the country concerned.

7 - If the refrigerant circuit is opened, you must:

- avoid the entry of air into the circuit as much as possible,
- replace the filter drier,
- perform the "vacuum operation" at a minimum level of **0.3 mbar (static)**.

8 - Do not release R 407 C fluid into the atmosphere. This fluid is a fluorinated greenhouse gases, covered by the Kyoto Protocol with a Global Warming Potential (GWP) = 1653 - (CE Directive 842 / 2006).

1 - GENERALITIES

1.1 - GENERAL SUPPLY CONDITIONS

- Generally speaking, the material is transported at the consignee's risk.
- The consignee must immediately provide the carrier with written reserves if he finds any damage caused during transport.

1.2 - RECOMMENDATIONS

- Prior to all servicing or other actions on the equipment, installation, commissioning, operation, or maintenance, the personnel in charge of these operations shall become familiar with the instructions and recommendations provided in the installation manual of the unit as well as the elements of the project's technical file.
- The personnel responsible for receiving the unit must conduct a visual inspection in order to identify all damage to which the unit may have been subjected during transport: refrigerating circuit, electrical cabinet, cassis and cabinet.
- The unit must be installed, started, maintained, serviced by qualified and authorised personnel, in compliance with the requirements of all directives, laws and regulations and in accordance with standard trade practices.
- During installation, troubleshooting and maintenance operations, the use of pipes as a step: under the stress, the pipe may rupture and the refrigerant may cause serious burns.

1.3 - VOLTAGE

- Before carrying out any operation, check that the voltage indicated on the unit corresponds to the mains voltage.
- Before initiating maintenance or servicing on the installation, check that its power supply is disconnected and locked out.

1.4 - USE OF EQUIPMENT

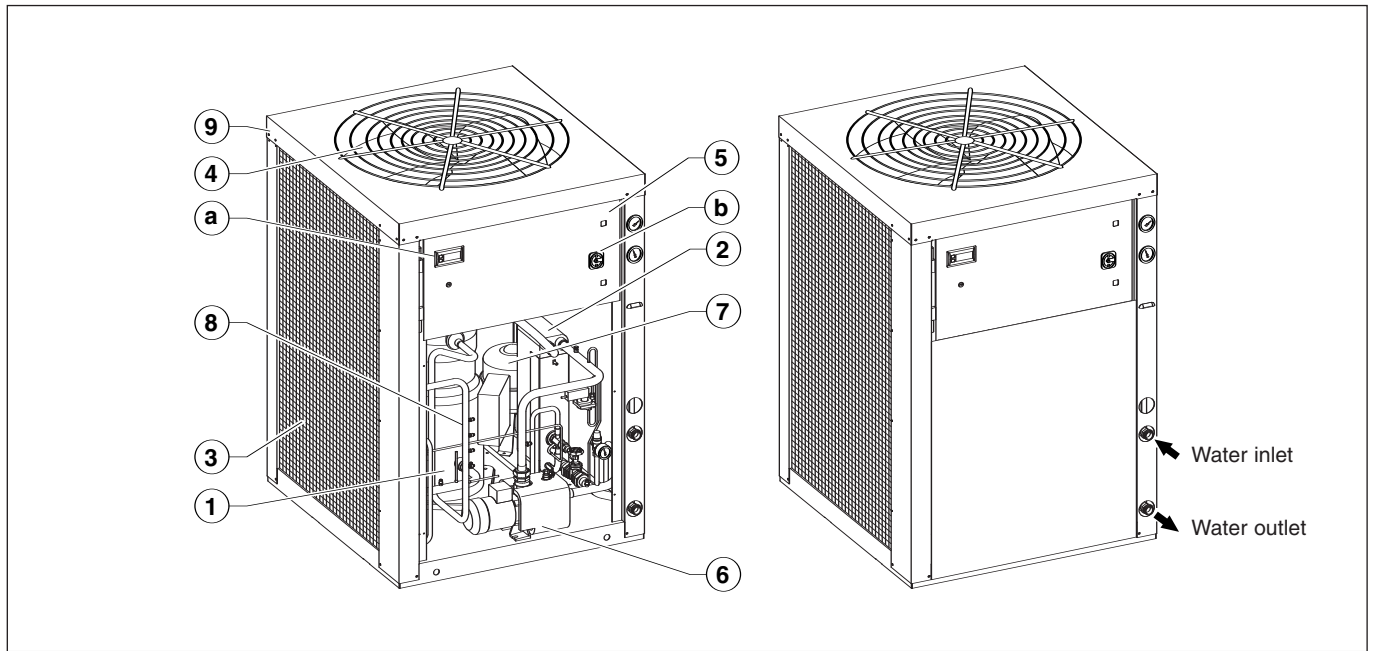
- This heat pump is intended for the air-conditioning of premises.

1.5 - OPERATING CONDITIONS

- Refer to the technical specifications, the nominal conditions and operating limitations in the technical manual.

2 - PRESENTATION

2.1 - DESCRIPTION



① SCROLL COMPRESSOR

- Mounted on vibration pads with sound insulation.

② WATER EXCHANGER

- Plate water exchanger with heat insulation.

③ AIR EXCHANGER

- Thin plate air exchanger with protective grille.

④ ELECTRIC FAN UNIT

- Electric fan unit with protective grille.

⑤ SWITCH BOX

- "ECH" electronic control **a**.
- Head pressure control.
- Main switch **b**.
- Phase-sequence tester.
- Power and control circuitry protected by magnetothermal circuit breakers.
- Complies with standard EN 60 204-1.
- Short circuit current 10 kA, as per IEC 947-2.

⑥ CIRCULATING PUMP

- Circulating pump with heat insulation.

⑦ EXPANSION TANK

⑧ REFRIGERATION CIRCUIT

- R407C load.
- Copper piping.
- Thermostatic regulator.
- Filter-dryer.
- HP and LP safety pressure switches.

⑨ CHASSIS - BODYWORK

- Galvanised sheet metal with light grey oven-baked polyester powder paint (RAL 7035).

2.2 - DIMENSIONS AND WEIGHT

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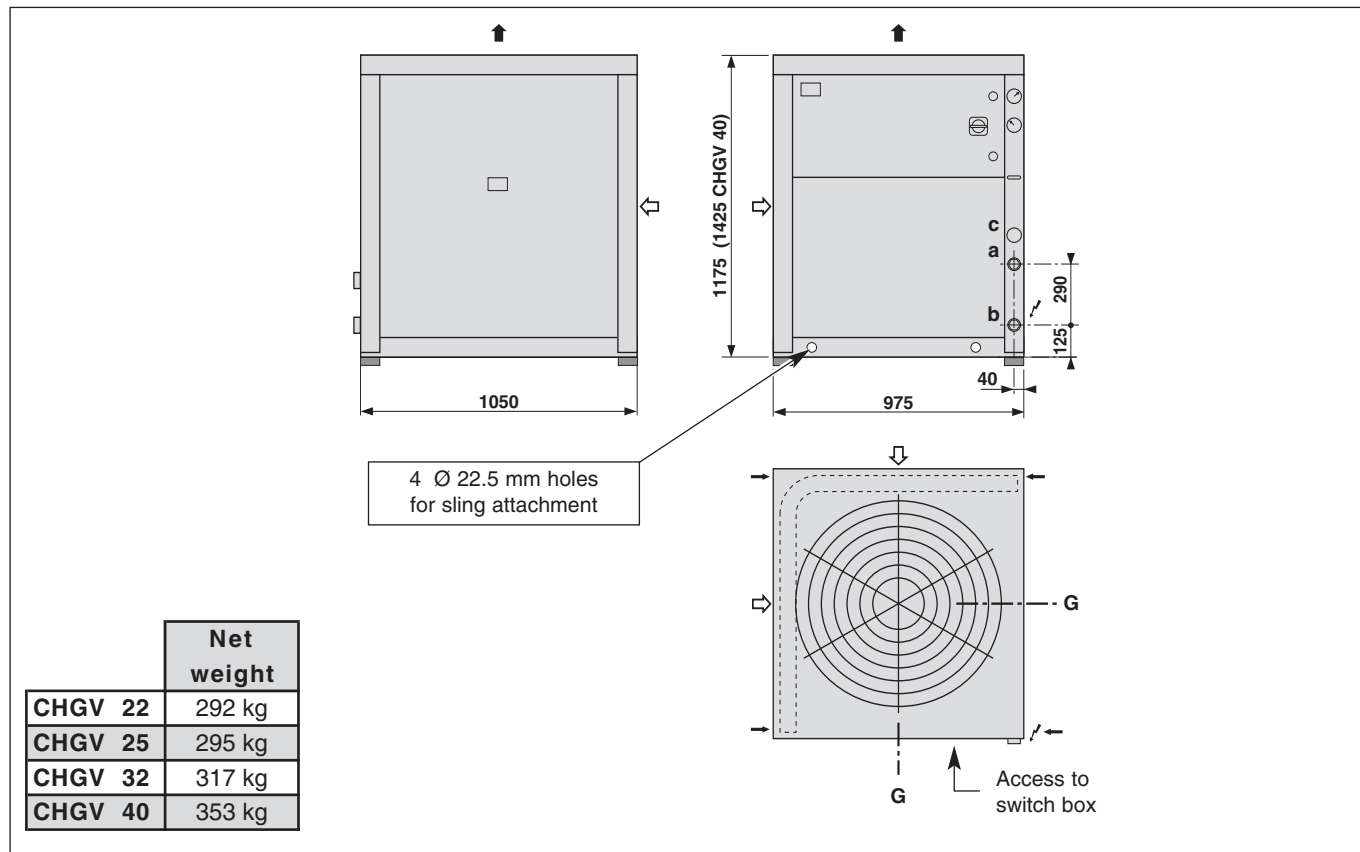
Dimensions (in mm) are given for standard units without options.

General tolerance ± 10 mm.

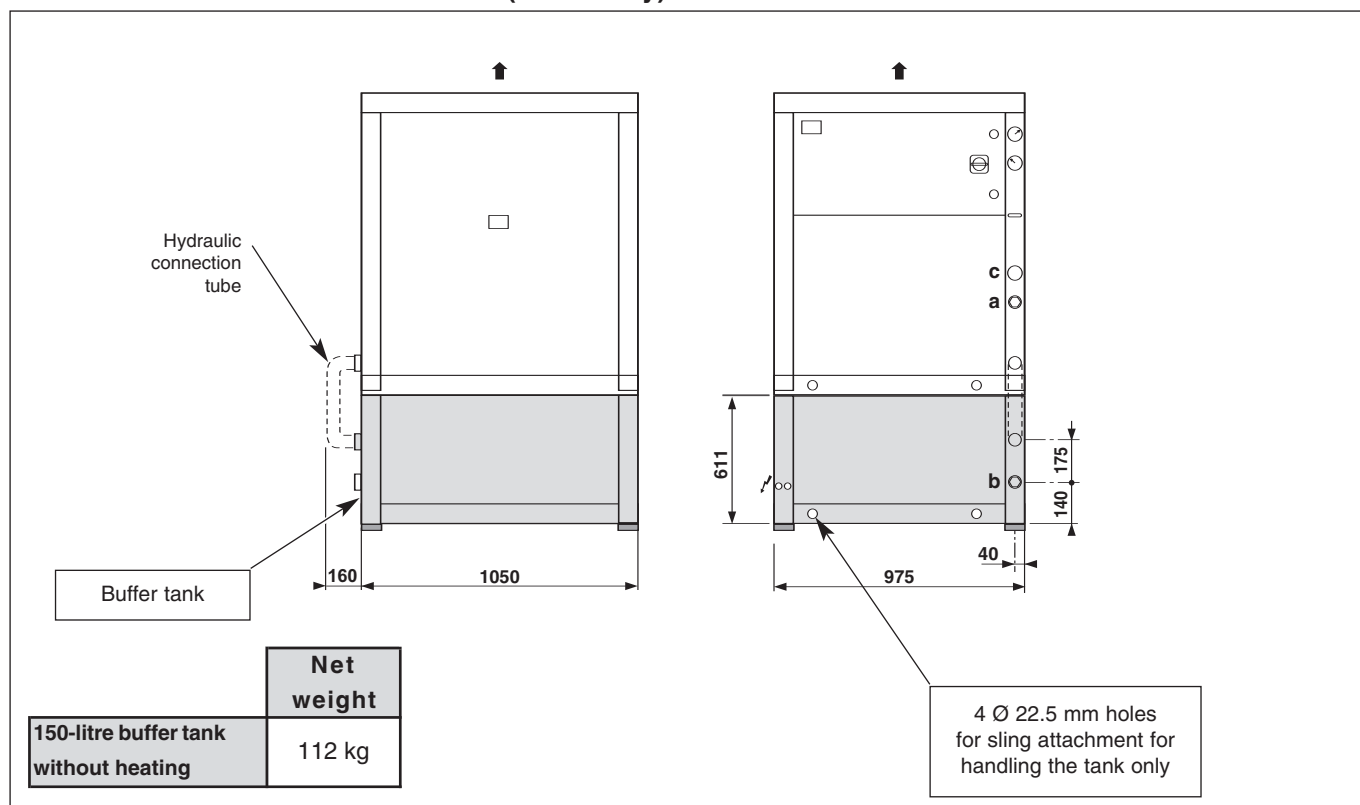
- ↑ Condenser air discharge
- ⇩ Condenser air suction
- a Water inlet connection
- b Water outlet connection
- c HP and LP hose entry

- ↗ Power supply
- Location of the 4 anti-vibration pads (accessory) (100 x 100 x 25 mm) under girders
- G Centre of gravity (in the centre of the unit)

2.2.1 - CHGV

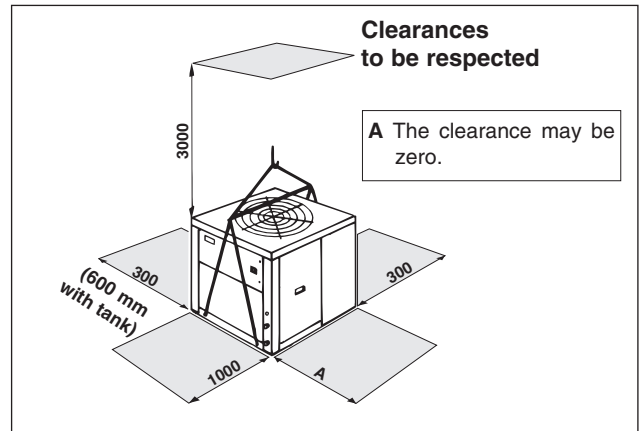


2.2.2 - 150-LITRES BUFFER TANK (Accessory)



3 - INSTALLATION

- Prior to all servicing or other actions on the equipment, installation, commissioning, operation, or maintenance, the personnel in charge of these operations shall become familiar with the instructions and recommendations provided in the installation manual of the unit as well as the elements of the project's technical file.
- The personnel responsible for receiving the unit must conduct a visual inspection in order to identify all damage to which the unit may have been subjected during transport: refrigerating circuit, electrical cabinet, cassis and cabinet.
- The unit must not be installed near the following:
 - sources of heat,
 - combustible materials,
 - return / air intake of an adjacent building.
- The unit must be installed, started, maintained and repaired by qualified servicing personnel in compliance with the requirements of all directives, laws and regulations and in accordance with standard trade practices.
- During installation, troubleshooting and maintenance operations, the use of pipes as a step: under the stress, the pipe may rupture and the refrigerant may cause serious burns.
- The unit is delivered on a wooden pallet and shrink-wrapped.
- A lift truck may be used to remove the unit from its pallet.
- Handle the unit with care.
- Crane installation: once the plastic film has been removed, the machine may be lifted by placing the hoisting hooks into the four \varnothing 22.5 holes.
- Spacers or protective pads should be placed between the slings and body to avoid damage.
- The unit's centre of gravity and weight are indicated on the space requirement diagrams and in the table of the technical documentation.
- Before installation, verify the following points:
 - the unit must be installed outside in an appropriate location and in compliance with environmental requirements (sound level, integration, etc...),
 - the unit's installation location must be perfectly level and strong enough to support the weight of the unit and must have adequate inundation protection,
 - sufficient space around the unit should be provided in order to facilitate servicing and maintenance operations (see drawing above),
 - air suction to the coil and fan discharge must not be obstructed,
 - install the unit above the region's average snowfall level,
 - vibrations and noise must not be transmitted to adjacent buildings,
 - install the machine on anti-vibration pads and fit hoses on piping elements, as required,
 - if necessary, consult an acoustics specialist concerning the unit's optimum location.
- **AVOID:**
 - excessive exposure to sea-air or corrosive gases,
 - the proximity of the extractor fan,
 - projections of mud (next to a roadway or path, for example),
 - areas where there is strong wind blowing against the unit's air exhaust.
- Protection index of the unit:
 - IP 24 : for the electrical equipment,
 - (IPXXB : for the mechanical hazards).



IMPORTANT:

If a tank is mounted underneath the unit, never handle the assembly. The unit and the tank must be handled separately (see § 6.5.1).

4 - CONNECTIONS

4.1 - HYDRAULIC CONNECTION

- Connect the water pipes to the corresponding connections: **male 1" 1/4 (33 x 42)**.
- Connect the hydraulic filter onto the water intake. Also provide 2 isolation valves for intake cleaning purposes.
- The pipes must be at a sufficient distance from the removable panels to enable servicing operations to be performed.
- Make the connection with flexible hoses preferably.
- **The diameter of the pipes must be calculated according to the installation (take care with high head losses.**

4.2 - ELECTRICAL CONNECTIONS

4.2.1 - GENERALITIES:

- In all cases, refer to the wiring diagrams supplied with the unit or supplied upon request.
- The acceptable voltage variation is: $\pm 10\%$ during operation.
- The electrical connection conduits must be fixed.
- Short circuit current: 10 kA as per CEI 947-2.
- Class 1 unit.
- Use the holes fitted with grommets for passing cables into the unit.
- Use the stuffing boxes for passing cables into in the electrical box.
- The electrical installation must comply with the standards and regulations applicable where the unit is being installed (in particular NFC 15-100 \approx CEI 364).
- The unit is designed to be connected to a main supply with a TT, IT or TN.S neutral point connection (as per NF C 15-100).
- Electrical diagram **1005803**.

4.2.2 - GENERATOR POWER SUPPLY

- The power supply must be **three-phase 400 V / 50 Hz + Neutral**, in the electrical box directly on power switch S1.

CAUTION:

Before starting the unit, ensure that the phase rotation order is correct. The phase-sequence controller restricts the unit from operating if the 3 supply phases are not in order or if a phase is absent.

- The power supply must come from an isolation and electric protection device (not supplied) in accordance with existing regulations.
- The sizing of the power supply cables is to be ensured by the installer in accordance with the installation conditions and as per current standards.

Cable sizes, indicated below, are given for information purposes.

They are calculated in accordance with NFC 15-100 (\approx CEI 364) with the following hypotheses:

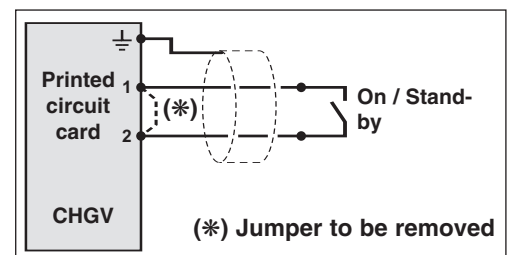
- Maximum current, see table below.
 - Multi-pole copper cable with PR insulation.
 - Installation in non-ventilated cable duct (installation method No. 41). No other power cable.
 - Ambient temperature 40°C.
- The lengths indicated below correspond to a voltage drop less than 5% in the cable.

CHGV		22	25	32	40
Starting current	A	145	145	150	190
Max. total current	A	20.5	24.3	31.6	35.8
Power supply cable section	mm²	6	6	6	10
Max. connection length	m	100	100	100	100

- The complete electrical specifications are given in the table of the technical documentation.

4.2.3 - CONTROL BY EXTERNAL CONTACT

- The unit can be controlled remotely by connecting a good-quality, potential-free external contact (not supplied) for the remove On / Stand-by signal (contact closed = operation authorized, contact open = in stand-by mode).
- The On / Stand-by signal is connected to terminals 1 and 2 of the PCB located in the switch box (remove the existing bridge - see diagram).
- The wiring of this contact must not be routed near power cables in order to avoid electromagnetic disturbances.
- Use shielded cable with twisted pair (shielding grounded on generator side).
- Max. connection cable length: 100 m.
- Minimum wire size: 0.5 mm².



4.2.4 - REMOTE CONTROL

- See paragraph 6.3 (Accessories).

4.2.5 - MISCELLANEOUS

• Alarm transfer:

Potential-free changeover contact (2A resistive - 250 VAC max.) available on the PCB terminal strip in the electrical box (terminals 5 (common), 6 and 7 of the printed circuit) for remote signaling. See schematic.

- In case of alarm:

- contact open between terminals 5 and 6,
- contact closed between terminals 5 and 7.

5 - OPERATION OF "ECH" ELECTRONIC CONTROL

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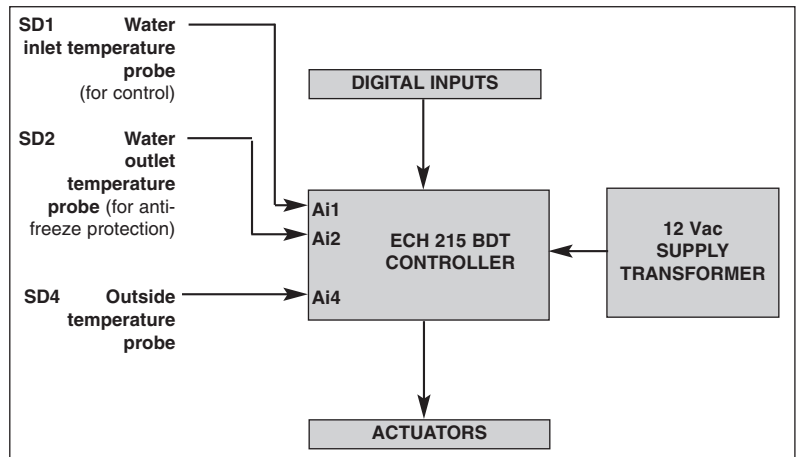
- See wiring diagrams supplied with the machine.

5.1 - DELIVERY STATE

- The control unit is supplied fitted in the machine and factory pre-set.
- All the connections are made except those concerning the available signals or the options.

5.2 - PRINCIPLE

- The microprocessor controls the operation of the machine and of the associated alarms. It continuously compares the water temperature measured by the probe **SD1** and the setpoint temperature value entered via the keyboard.



Each operating request produced by the control unit is indicated by the light **(6)** (see below).

This light flashes if a safety delay is in progress. It stays on when the compressor is operating.

- The **control** probe **SD1** is located on the **water inlet** in the factory.
- The controller is connected on a printed circuit board on which the inputs and outputs are connected.

On this board:

- 12 V supply transformer,
- the alarm report relay, with its terminal strip,
- the 230 V circuit fuse (4 A - 250 V - 5x20 - fast - breaking capacity: 1.5 kA).
- connecting terminal strip for the On / Stand-by contact.

5.3 - PRESENTATION

5.3.1 - DISPLAY KEYBOARD

(1) Key for:

- Local On / Off control,
- access to parameters (in combination with button (2)),
- alarm clearance,
- hour counter reset.

(2) Key for:

- access to parameters (in combination with button (1)).
- Local operating mode selection (stand-by / cooling).

(3) LED display.

(4) Cooling mode indicator.

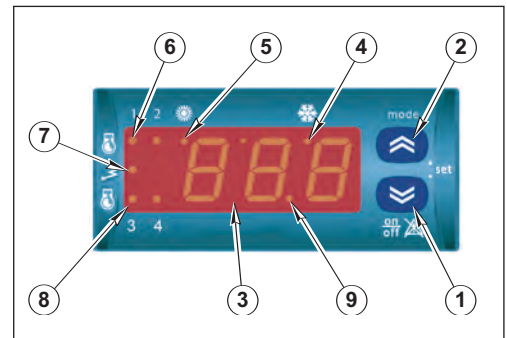
(5) Heating mode indicator (not used).

(6) Compressor on indicator.

(7) Defrosting indicator (not used).

(8) Indicator for possible supplementary heating control (not used).

(9) Decimal point: if illuminated when the operating time is displayed, the value must be multiplied by 100.

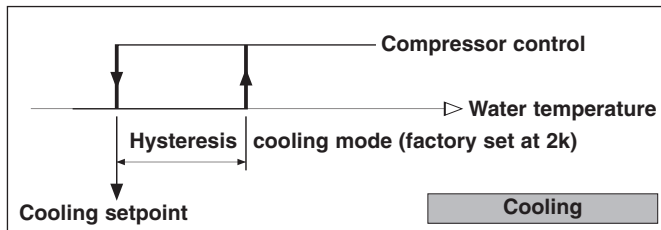


5.3.2 - CTN TYPE TEMPERATURE PROBE

- 10 k Ω at 25°C.

Temperature (°C)	Ohmic value (Ohm)
-20	67,740
-10	42,450
0	27,280
10	17,960
20	12,090
25	10,000
30	8,313
40	5,820
50	4,161
60	3,021
70	2,229

5.4 - OPERATING MODE



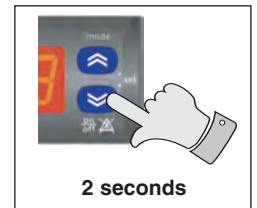
5.5 - STARTING

The unit is factory configured for remote control by contact (see other possibilities in paragraph 4.2.3).

- **Initial condition:**
 - the unit is connected both hydraulically and electrically, and is ready to operate,
 - the remote stand-by contact is open (= stand-by).
- **Turn the installation on:**
 - the display comes on and shows the water temperature (read by the control probe **SD1**). The mode indicator lamps (4) and (5) flash to signal remote stand-by,
 - the unit's circulating pump starts.
- **To start the unit:**
 - close the remote stand-by contact (not supplied) if connected (see paragraph 4.2.3),
 - the cooling indicator (4) comes on,
 - the compressor "ON" indicator light (6) comes on if necessary (see diagram paragraph 5.4). If the light flashes, it means that the compressor is starting required but that a safety delay is in progress. This light stays on when the compressor has started.
- **To stop the unit:**
 - open the remote stand-by contact,
 - the compressor operation indicator lamp (6) goes out and the operating mode indicator lamps (4) and (5) flash,
 - the unit's circulating pump remains in operation.
- **Complete stop:**
 - the unit can be completely stopped with the circulating pump shut-down by pressing and holding the **ON/OFF** button (1) for 2 seconds. The display unit goes blank, only the decimal indicator lamp (9) remains illuminated. This shut-down takes priority.

Note:

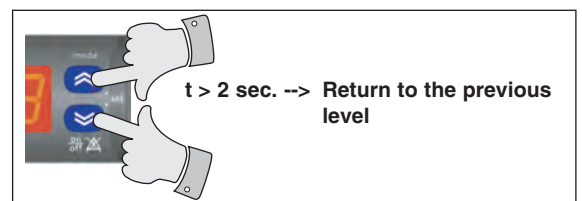
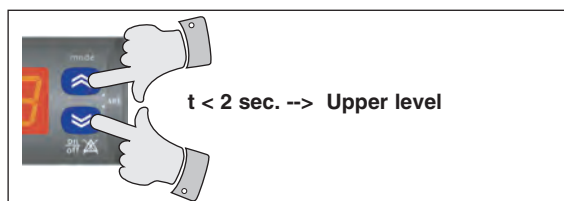
Shut-down of the circulating pump is delayed 1 minute after the compressor stops.



5.6 - PARAMETERS - DISPLAYING AND ADJUSTING

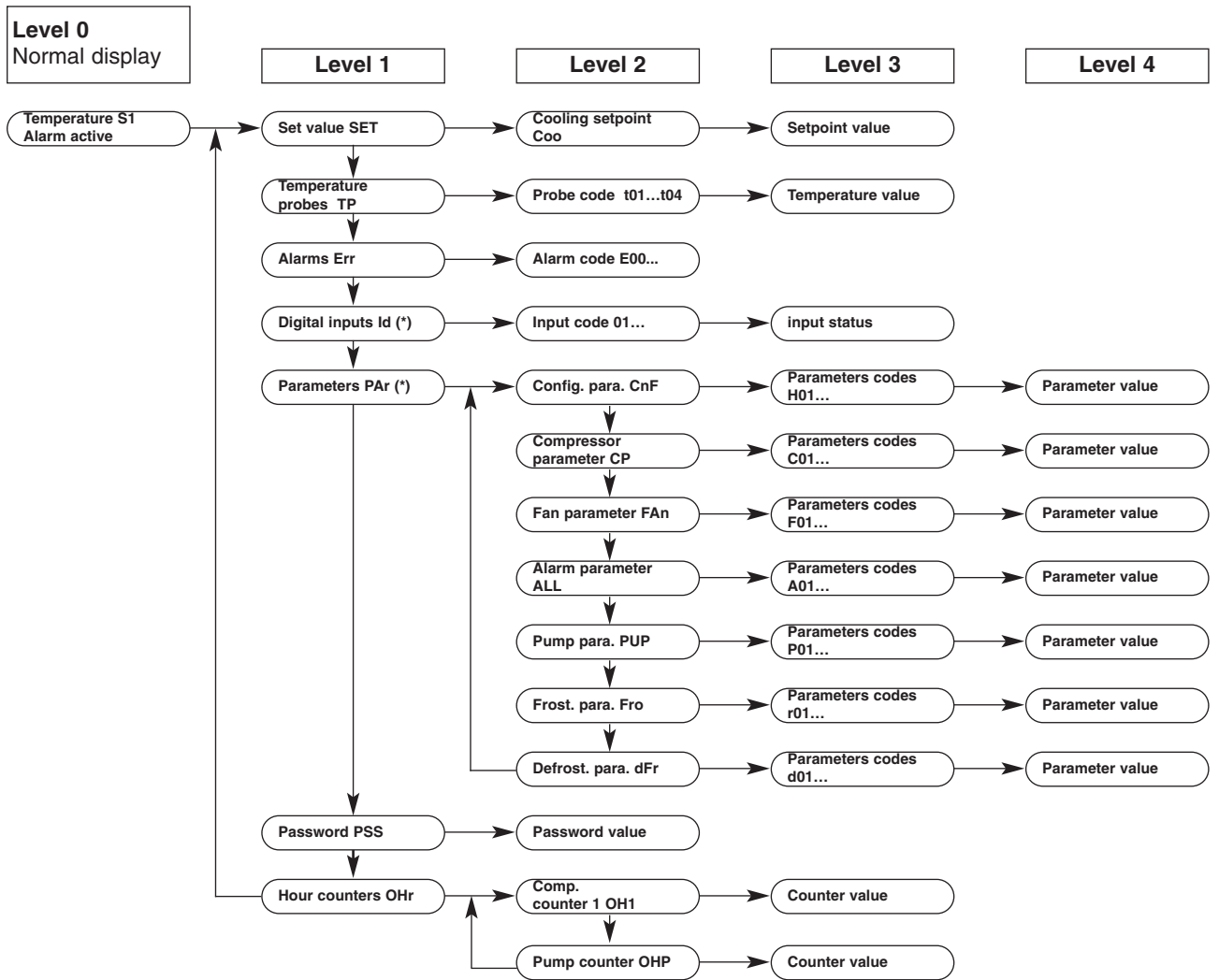
5.6.1 - GENERALITIES

- Parameter access is structured within a multi-level menu, see the diagram below. Simultaneously pressing the "ON/OFF" (1) and "Mode" (2) buttons for a brief moment (less than 2 seconds) gives access to the next level. Simultaneously pressing for a long moment (longer than 2 seconds) turns you to the previous level.



- Button (1) or button (2) is used to scroll through the entries ("**Label**") within the same level or to increase or decrease a parameter value.

5.6.2 - PARAMETER ACCESS DIAGRAM



(*) Accessible to qualified personnel only after entering the password (PSS).

Note 1: Indicator lamps (6), (7), (8) flash when levels 1 and above are accessed.

Note 2: The normal display (level 0) returns automatically after 5 minutes if no buttons are pressed.

5.6.3 - SET POINT ADJUSTMENT

- Simultaneously press buttons (1) and (2) for at least 2 seconds, "SET" is displayed.
- Press the 2 buttons again, "Coo" is displayed.
- Simultaneously press the 2 buttons again for 2 seconds. The setpoint value appears. If needed, modify the value with the buttons.
- Press the 2 buttons simultaneously to validate the setpoint.
- Return to the normal display by simultaneously pressing the 2 buttons for more than 2 seconds.

Code	Parameter	Factory setting (terminal units)	Adjustment range
Coo	Cooling set point	12 °C	9 to 25 °C

Reminder: control on the installation return temperature.

Note:

All units are factory configured and parameterized for optimum operation in the terminal unit application.

5.6.4 - DISPLAY OF TEMPERATURES, ALARMS, AND HOUR COUNTERS

Accessible directly via the menu, see diagram 5.6.2.

- Temperatures "TP":
Displays the values indicated by each temperature probe:
t01: water inlet temperature.
t02: water outlet temperature.
t04: outside air temperature.
- Alarms "Err":
Displays the list of all current alarms (scroll through the alarm messages with buttons (1) and/or (2)).
- Hour counters "OHr":
Displays the operating time of the compressor ("OH1") and the circulating pump ("OHP"). The counter can be reset by a long press (> 2 seconds) on button (1) when the counter value is displayed.

5.6.5 - ACCESS TO THE TECHNICAL PARAMETERS "PAR"

For qualified personnel after entering the password "PSS". Any incorrect adjustment may lead to serious malfunctions.

- Go to the "PSS" section in the menu. Briefly and simultaneously press buttons (1) and (2). The "---" message appears. Display the password ("199") using buttons (1) and (2) and validate it by simultaneously pressing buttons (1) and (2). It is now possible to enter the parameters section "PAR".

CAUTION:

After modifying one or more technical parameters, the controller must be turned off then back on again to reset it with its new parameters.

5.7 - ALARMS

- When an alarm occurs:
 - the alarm report is activated,
 - the corresponding code flashes on the display unit. See table,
 - the unit stops if necessary (see table below).

- Remedy the fault.

IMPORTANT NOTE:

All work must be carried out by qualified, experienced personnel.

- The alarms are normally reset automatically.
- **CAUTION:** the alarms:
 - HP,
 - LP (low pressure),
 - Anti-freeze,
 - Water flow rate

have an event counter that shifts to **manual** reset if the alarm occurs several times during the last hour.

- The "refrigerating circuit" alarm is reset manually.
- The alarms are reset by briefly pressing the "ON/OFF" button (1).
- When the alarm is cleared:
 - the alarm report is de-activated,
 - the display reverts to normal (not flashing),
 - the machine can re-start (if it was stopped).
- **Special features of the alarm relay:**
 - the potential-free change-over contact (2 A - 230 VAC max.), on the terminal strip of the PCB, comes from the relay located on this board,
 - the relay is actuated in the absence of an alarm (contacts: 5/6 closed and 5/7 open),
 - in the case of alarm or power supply loss, the relay is released (contacts: 5/6 open and 5/7 closed).

SUMMARY TABLE OF ALARMS

Alarm	Code	Inhibition delay	Compressor stop	Fan stop	Pump stop	Remarks
Fault on probe 1	E40		X	X		
Fault on probe 2	E06		X	X		
Fault on probe 4	E42		X	X		Force water pump operation
H.P.	E01		X			
L.P. or fan and compressor overheating or phase order	E02	120" at start-up	X	X		
Anti-freeze (water heat exchanger)	E05		X	X		From probe SD2 (water outlet). Threshold : 4° C
Water flow rate	E41	10" in operation 30" at start-up	X	X	X If passage reset manual	
Refrigeration circuit (*)	E44	120" at start-up + 120" in operation	X	X		Manual reset.
Max. water temperature	E46	30"	X			From probe SD1 (water inlet). Threshold : 60° C
Configuration error	E45		X	X	X	

(*) The refrigeration circuit alarm is activated if the temperature difference between the water inlet and outlet (after a few minutes of compressor operation) is insufficient (refrigerant charge, three-phase compressor turning "backwards", inversion valve blocked...).

5.8 - SPECIAL OPERATING FEATURES

• **Reduction of water volume:**

- the controller uses a self-adapting algorithm that analyses the compressor's operating time and can indicate deviations of the current set point (and the corresponding hysteresis) in case of too short operating times (in order to extend the operating times),
- for special applications, in which case the dimensioning of the unit and the circuit are carefully designed, this function can be deactivated. To do this, set the parameter **C08** to **0** in the "**CP**" section of the parameterization menu.

• **Circulating pump control:**

- the pump is actuated when the unit operating or in "**stand-by**" mode,
- the pump is stopped when the unit is completely "**OFF**". The shut-down of the pump is delayed 1 minute after the compressor stops. An antifreeze device forces pump operation if the outside temperature (probe **SD4**) drops below 0°C,
- an "anti-sticking" device forces pump operation (if stopped) for 3 seconds every 24 hours.

• **Operating mode selection:**

- the controller is factory configured to control the unit by 1 external:
 - On / Stand-by contact,
- in stand-by mode, the circulating pump continues to function.

Note:

- It is possible to shut the unit down completely (circulating pump stopped) by pressing the **ON/OFF** button (1).
- this configuration is adapted to system applications,

- for other applications, the following configurations are possible by modifying the parameterization:

a) **Complete shut-down ("OFF")** by remote contact (instead of "**stand-by**").

In the "**CnF**" configuration section, change the parameter **H20** from **7** (remote **stand-by**) to **4** (remote **OFF**). In the case of **remote "OFF"** complete shut-down, the display is off. Only the decimal indicator lamp **flashes**.

b) Selection of the stand-by / cooling mode using the display unit's keys.

In the "CnF" configuration section, change the parameter **H27** from **1** (selection by remote contact) to **0** (selection by keypad).

The operating mode is thus selected by successively pressing the "mode" button (2) according to the following sequence:

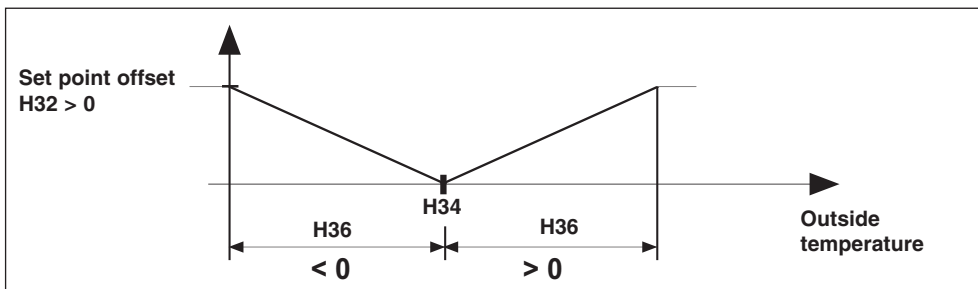
---> stand-by ---> cooling ---> stand-by ---

The stand-by mode is indicated by the extinction of the cooling mode indicator lamp.

- **Pre-ventilation:**
 - generally speaking, in order to condition the air heat exchanger, the fan always starts at full speed a few seconds before the compressor.
- **Anti short-cycle time delays:**
 - the compressor control features a time delay system in order to respect:
 - a maximum number of starts per hour (12),
 - a minimum stop time (150 seconds).
- **Control hysteresis:**
 - see the operating diagrams in paragraph 5.4,
 - the hysteresis in both cooling mode are factory set at 2k. It is possible to modify it. To do this, change parameter **C03** (cooling hysteresis) in the compressor section "CP".
- **"Dynamic" set point:**
 - by changing **H31** from **0** to **1**, an automatic setpoint compensation system is activated based on the outside temperature,
 - the following parameters allow the compensation slopes to be set:

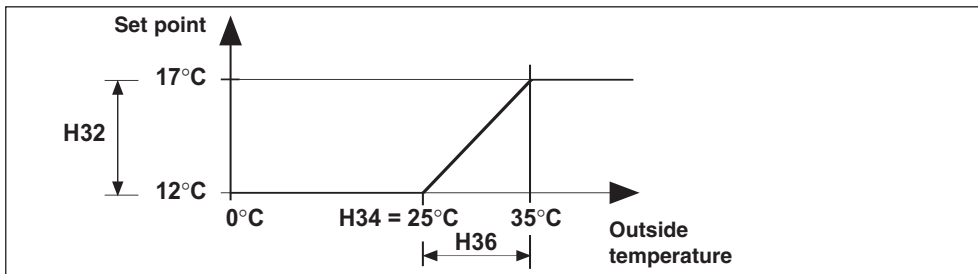
Parameter	Designation	Factory setting
H32 =	Set point "offset" in cooling mode	5 k
H34 =	Outside temperature setting ("foot of slope") in cooling mode	25°C
H36 =	Proportional strip in cooling mode	+ 10 k

• **Principle:**



• **Example:**

Factory setting in cooling mode



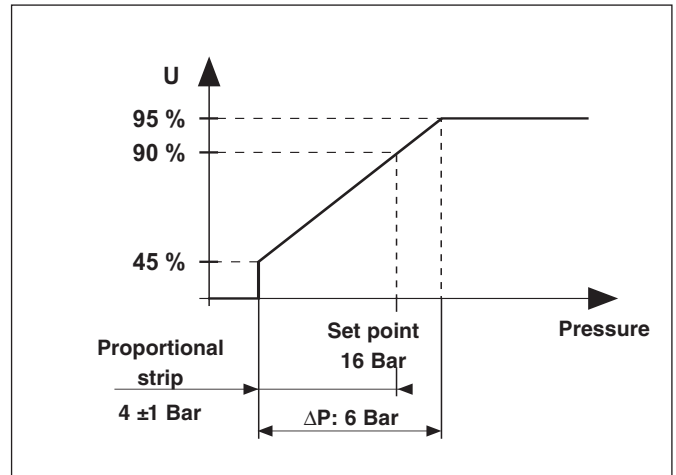
• **Adjustment of the value measured by the temperature probes ("Offset"):**

- allows the difference between the value displayed and the verified value to be compensated.

Parameter	Probe offset	Units	Factory setting
H39	Probe No. 1 offset	Degree	0
H40	Probe No. 2 offset	Degree	0
H42	Probe No. 4 offset	Degree/10	0

• **Condensation pressure control device:**

- The unit is equipped with a separate condensation pressure control device.
- Based on the pressure information provided by a specific sensor, the controller varies the supply voltage of the fan according to the diagram opposite.
- This controller is factory-set for optimal operation. Consult us for all other settings.
- The control unit is mounted on the back of the electrical box.



6 - ACCESSORIES

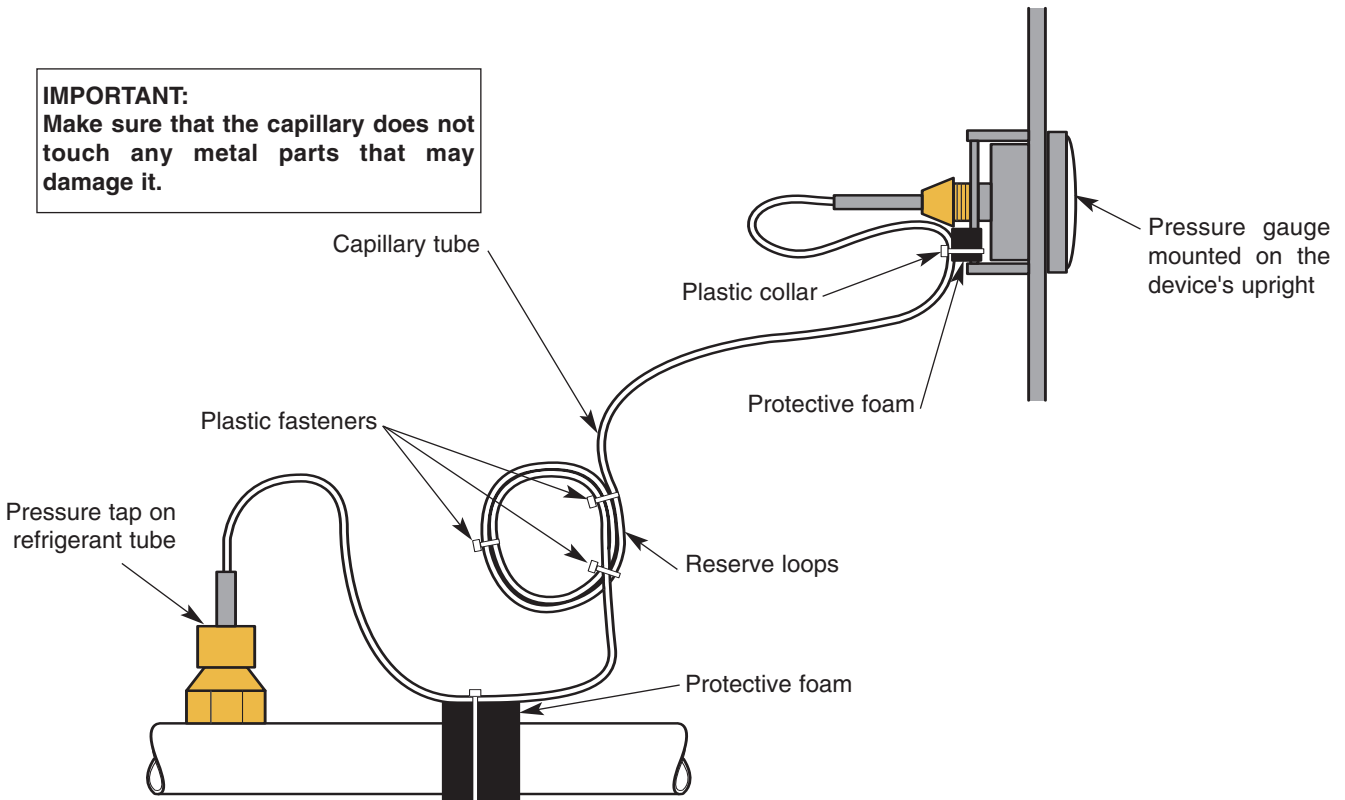
6.1 - VIBRATION KIT

- The kit includes:
 - a set of four vibration pads, 25 mm thick, code **70600035**,
 - a set of two hoses, length: 1 m, \varnothing 1" 1/4 **70600027**.



6.2 - HP AND LP PRESSURE GAUGES

- Code **70970007**.
- The accessory includes 1 set of 2 pressure gauges (HP and LP).
 - Remove the caps on the riser of the front panel.
 - Install the pressure gauges.
 - Connect the capillary tubes to the pressure taps while observing the following precautions:

IMPORTANT:
 Make sure that the capillary does not touch any metal parts that may damage it.



6.3 - REMOTE CONTROL

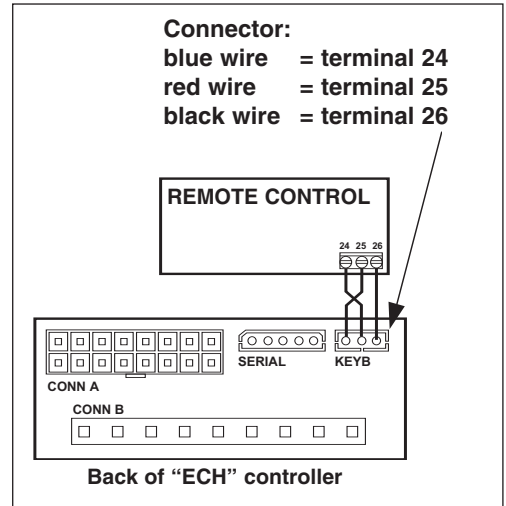
- Code **70250055**.
- The functions and display are exactly the same as those on controller.
- The only difference concerns the buttons  and  which are separated by the "ON/OFF" and "Mode" buttons.
- **The controller is designed to be installed inside sheltered rooms.**



- Connection:
 - the control is delivered with a connector so that the link can be connected to the "ECH" controller, mounted in the unit.
 - to extend the link, max. length.: 100 meters, use twisted pair shielded cable with a cross section of at least 0.5 mm² (shielding of the ground on unit side).

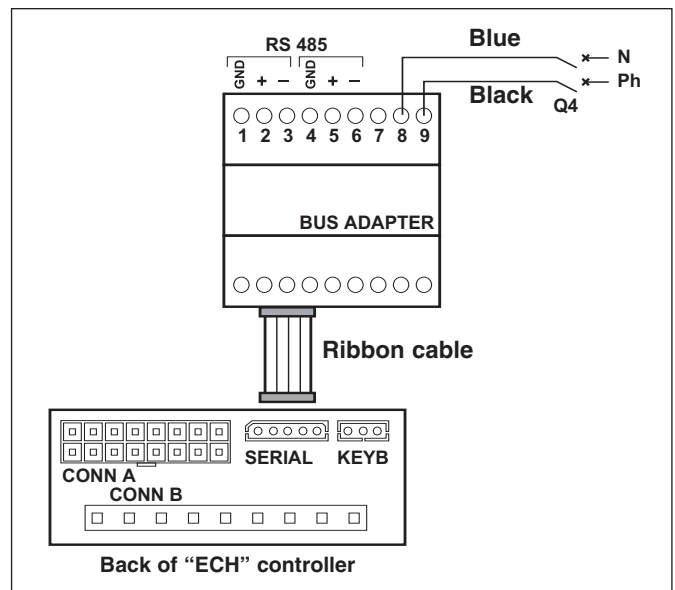
CAUTION:

**Do not route this cable near power cables.
The operation must take performed with the unit's power supply off and locked out.**



6.4 - RS 485 COMMUNICATION INTERFACE (MODBUS protocol)

- Code **70250056**.
- Mount the communication interface on the DIN rail next to the electrical box's terminal strip.
- Connect the ribbon cable (supplied) between the interface and the "ECH" controller.
- Connect the interface's 230 VAC power supply to the output of breaker Q4 using the Blue and Black wires supplied, as shown opposite.

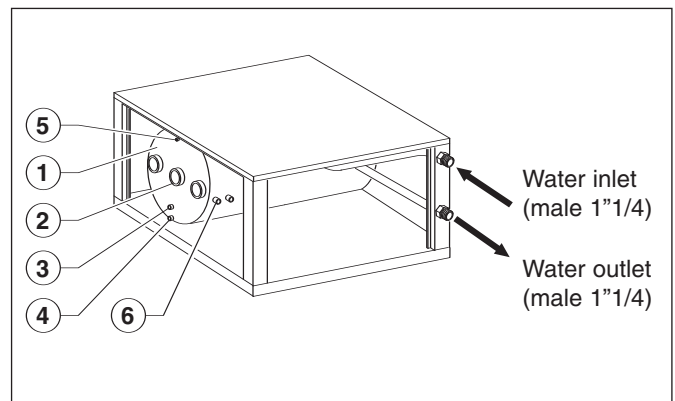


6.5 - 150-LITRE BUFFER TANK

- Code **70600110**: model without supplementary heating with 800 W frost protection resistor (single-phase 230 VAC).

Composition:

Mark	
1	Sheetmetal buffer tank - polyurethane insulation
2	Anti-freeze resistance 800 W
3	Fill valve
4	Drain valve
5	Purge
6	Safety valve (5 bar)



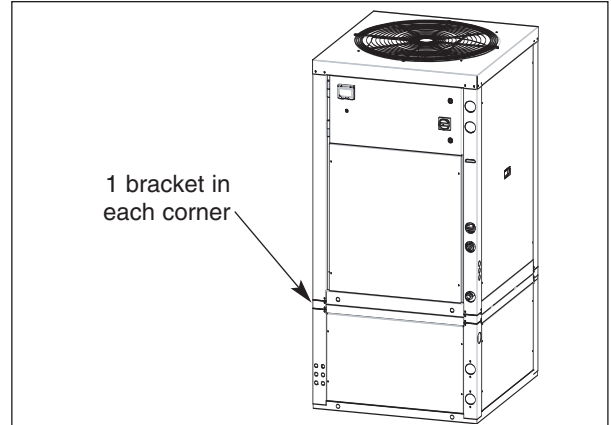
6.5.1 - INSTALLATION

- See dimensions and weight in § 2.2.
- Installation precautions in § 3.
- Designed to be installed either underneath the unit, or separately.

IMPORTANT:

If a tank is mounted underneath the unit, never handle the assembly. The unit and the tank must be handled separately.

- In the case where the tank is mounted underneath the unit, perform the following procedure:
 - Remove the side panels to gain access to the mounting screws on the transport pallet.
 - Position the tank with regard to the precautions stipulated in § 3; the position of the vibration pads (accessory) is indicated in § 2.2.
 - Place the unit on the tank chassis and secure the assembly with the 4 brackets and the 16 screws supplied with the tank.
 - If necessary, counter-drill the bracket mounting holes (\varnothing 5.5) in the unit's base.



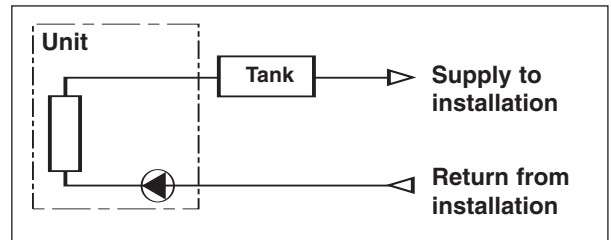
6.5.2 - HYDRAULIC CONNECTION

- Diagram: (see opposite).
- Connect the water pipes to the corresponding connections: **male 1" 1/4 (33 x 42)**.
- The tank is connected to the unit's outlet.

Note:

An insulated connection line connecting the unit's outlet to the tank's inlet is supplied with the tank (see § 2.2). This line is designed to be used in cases where the tank is placed underneath the unit.

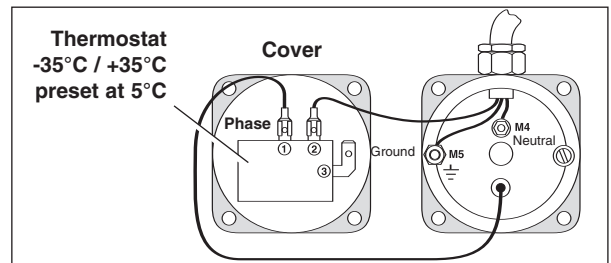
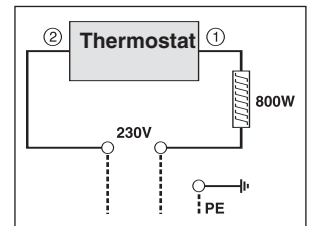
- The pipes must be at a sufficient distance from the removable panels to enable servicing operations to be performed.
- Make the connection with flexible hoses preferably.
- **The diameter of the pipes must be calculated according to the installation (take care with high head losses).**



6.5.3 - ELECTRICAL CONNECTIONS

See the general information about the electrical connections in § 4.2.1.

- The tank is equipped with an 800 W anti-freeze resistance.
- Power supply and control of this resistance shall be separate from all other installation circuits. It must be installed by qualified service personnel who are familiar with this type of equipment and in compliance with local regulations and recognized trade practices.
- **Before all operations on the unit, make sure that the power supply is disconnected and locked out.**
- The 230 Vac electrical power supply must be fitted with a separate overcurrent protection and disconnect switch in compliance with the rules and regulations in force.
- The power supply wiring must be secured. Use the cable gland located on the resistance cover.
- Route the cable through the grommet located on the front left-hand upright.
- **Note 1:** The resistance is equipped with an adjustable limiting thermostat set at approximately 5°C.
- **Note 2:** **Power to the resistance must be turned on only when the circuit is full of water.**
- **Note 3:** Make sure that wiring is securely clamped in the terminal block and the ground connection is correctly attached.



7 - STARTING

IMPORTANT

Before doing any work on the installation, make sure that it is switched off and that access to it is prevented. Any work must be carried out by personnel qualified and authorised to work on this type of machine.

7.1 - CHECK

- That all hydraulic connections are properly tightened and that the hydraulic system functions correctly:
 - purge the circuits,
 - position of valves,
 - hydraulic pressure (1.5 to 3 bar).
- That there are no leaks.
- That the machine is stable.
- That the power cables are well fixed to their connection terminals (loose terminals can cause heat build-up on the terminal board).
- That the electric cables are well insulated from any sections of sheet metal or metal parts which could damage them.
- That electrical wiring is a safe distance from refrigeration lines.
- That probe, control and power cables are properly separated.
- That the machine is earthed.
- That there are neither tools nor other foreign objects in the unit.

7.2 - STARTING-UP THE UNIT

- Power up the unit.
- Start the unit. See § 5.5.

CAUTION:

As the unit's power supply is three-phase, make sure that the phase rotation order is correct. If the phase order is not respected, the phase order controller KA1 prevents the unit from operating (OK indicator light off) and causes an alarm. To fix this, simply invert the 2 phases.

7.3 - CHECKS TO BE MADE

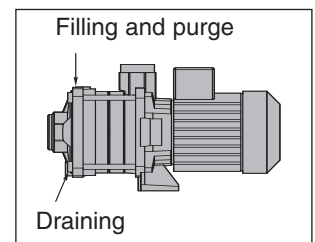
- Water flow-rate.

The generator is equipped with 1/4 SAE pressure taps upstream and downstream from the circulating pump to enable the pressure loss to be measured using a hydraulic pressure gauge. Use the circulating pump curves in paragraph 10 to determine the water flow rate.

Note:

The generator's water output must be ensured at all times (particular attention should be paid in the case of control of the terminal units on 2-way valve).

- Pump rotation direction. Should a problem occur, invert 2 phases on the pump's power supply.
- **Purge** the hydraulic system, with special attention given to the **pump**.
- Water circuit pressure.
- Filter cleanliness.
- Check the HP and LP pressures (route the pressure tap lines through the hole provided, see § 2.2) and check the intensities on the commissioning sheet.
- Check control system operation.



IMPORTANT:

- The unit's electronic control features a frost protection device that automatically starts the water circulating pump depending on the outside temperature (threshold: 0°C), even if the unit is turned off.
- When the unit is turned on, it is thus important to make sure that the hydraulic circuit is ready to operate (purge, water pressure, position of valves).
- **If antifreeze is added (monopropylene glycol), a minimum rate of 15% to 20% is needed to avoid any risk of corrosion.**
If the installation includes a supplementary boiler, make sure that the antifreeze used will not damage it.

8 - MAINTENANCE INSTRUCTIONS

IMPORTANT NOTE

- Before doing any work on the installation, make sure that it is switched off and locked out.
- Any work must be carried out by personnel qualified and authorised to work on this type of machine.
- Prior to all maintenance and servicing on the refrigerating circuit, one must first shut down the unit then wait a few minutes before installing temperature or pressure sensors. Certain equipment, such as the compressor and piping, may reach temperatures above 100°C and high pressures may lead to serious burns.

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8.1 - MAINTENANCE

All equipment must be properly maintained in order to provide optimum performance over time. Faulty maintenance can result in the cancellation of the product guaranty. Depending on the products, maintenance operations consist in the cleaning of filters (air, water), internal and external exchangers, casings, and the cleaning and protection of condensate tanks. Treating odours and the disinfection of room surfaces and volumes also contributes to the cleanliness of the air breathed by users.

- Carry out the following operations at least once a year (the frequency depends on the installation and operating conditions):
 - check for leaks on the refrigerating circuit,
 - check for traces of corrosion or oil stains around the refrigerating components,
 - inspect the composition and the condition of the coolant and check that it does not contain traces of refrigerating fluid,
 - cleaning the exchangers,
 - checking the wear parts,
 - checking the operating instructions and points,
 - check the safety devices: particularly check that the high and low-pressure controllers are properly connected on the refrigerating circuit and that they disengage the electrical circuit if triggered,
 - de-dusting the electrical equipment cabinet,
 - checking that the electrical connections are secure,
 - checking the earth connection,
 - check the hydraulic circuit (clean the filter, water quality, purge, flowrate, pressure, etc.),
 - verification of the unit's safety valve (and that of the tank, if any).

8.2 - GENERATOR SHUT-DOWN DURING WINTER

- 2 possibilities:
 - 1) Drain the unit and disconnect the power supply.
 - 2) Unit full of water and power on: as the unit is equipped with an antifreeze device which actuates the water circulating pump when the temperature drops below zero, it is imperative to ensure that the water can circulate within the unit.

9 - TROUBLESHOOTING

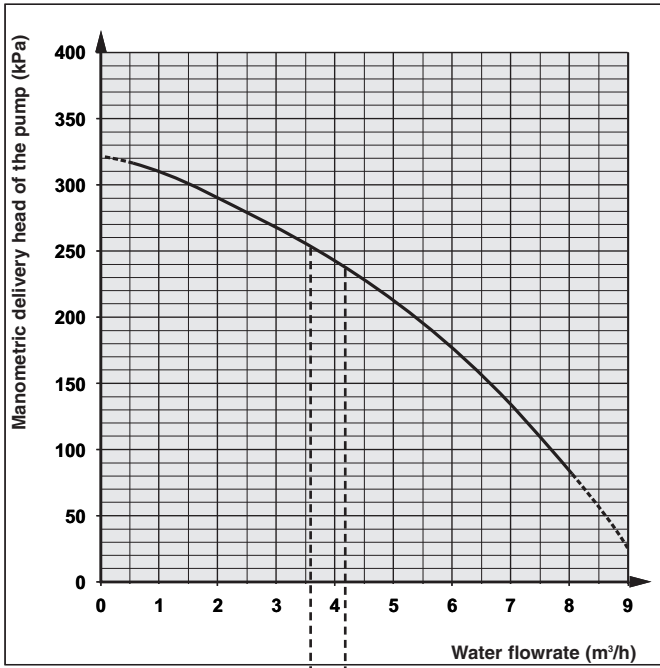
- All maintenance and servicing operations on the refrigerating circuit must be conducted in accordance with standard trade practices and safety rules: recovery of the refrigerant, inert shielded (nitrogen) brazing, etc...
- All brazing operations must be conducted by qualified welders.
- For equipment loaded with R 407 C, refer to the specific instructions at the beginning of the installation manual.
- This unit is equipped with pressurized equipment, for example piping.
Use only genuine parts listed in the spare parts list for replacing defective refrigeration components.
- Pipes may only be replaced by copper tubing in compliance with standard NF EN 12735-1.
- Leak detection, in the case of pressure testing:
 - Never use oxygen or dry air, as the risk of fire or explosion is present.
 - Use dehydrated nitrogen or a nitrogen and refrigerant mix indicated on the manufacturer's plate.
 - For units equipped with pressure gauges, the test pressure must not exceed the gauges' maximum allowable pressure rating.
- All part replacement with other than genuine parts, all modifications of the refrigerating circuit, all replacement of refrigerant by a fluid other than that indicated on the manufacturer's plate, all use of the unit outside the application limits defined in the documentation, shall result in the cancellation of PED CE marking compliance which shall fall under the liability of the individual who carried out these modifications.
- The technical information, relative to the safety requirements of the various applicable directives, is indicated on the manufacturer's plate of the unit and mentioned on the 1st page of this manual.

10 - CIRCULATING PUMP CURVES

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CHGV 22/25

PUMP TYPE MUH 503

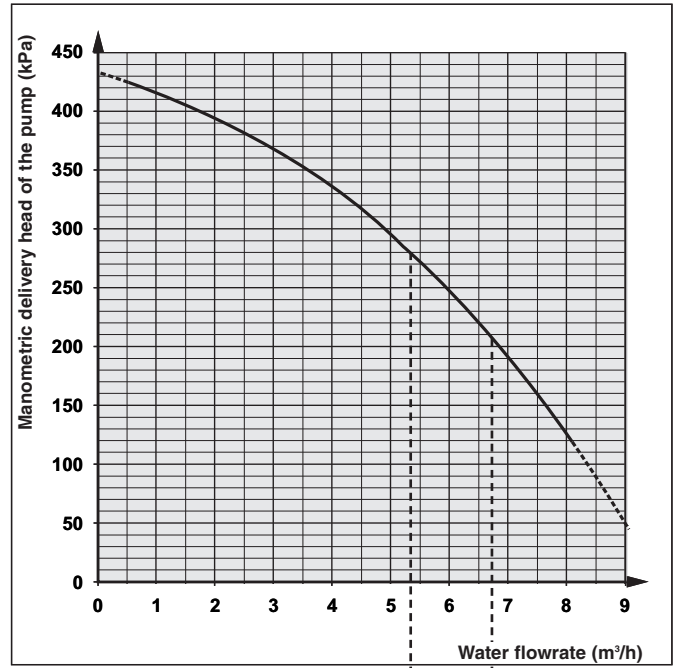


CHGV 22
3.56 m³/h

CHGV 25
4.18 m³/h

CHGV 32/40

PUMP TYPE MUH 504



CHGV 32
5.33 m³/h

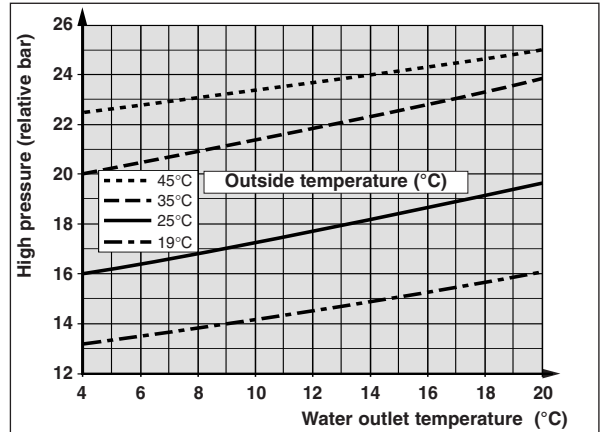
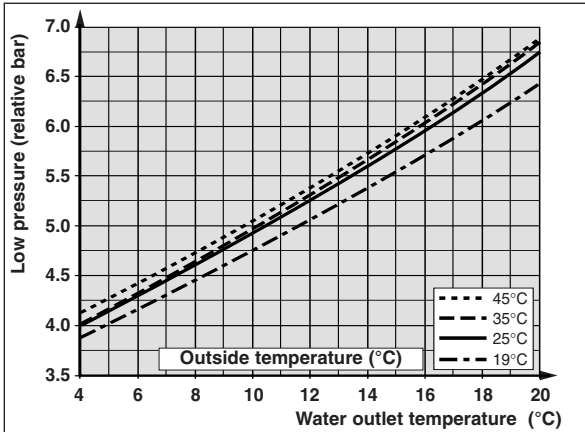
CHGV 40
6.73 m³/h

11 - PRESSURE CURVES

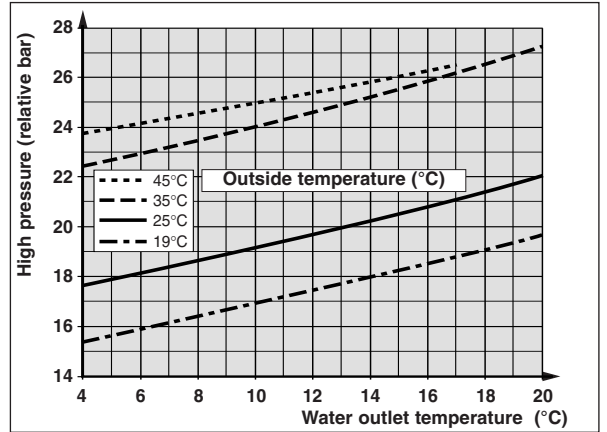
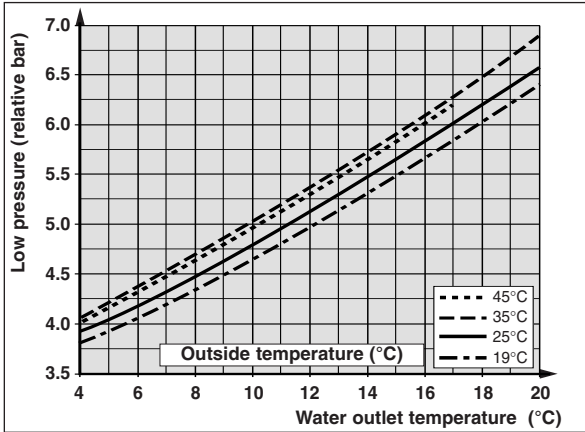
LOW PRESSURE

HIGH PRESSURE

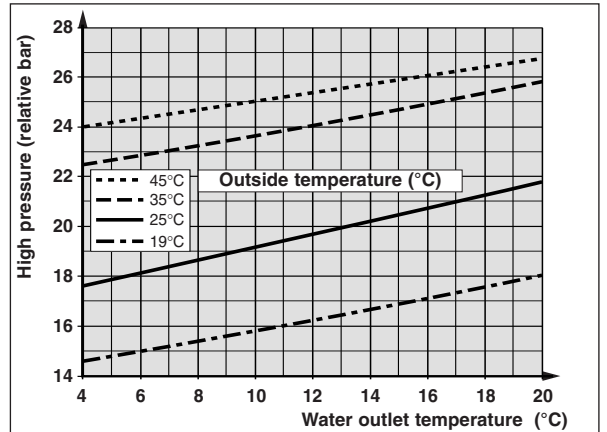
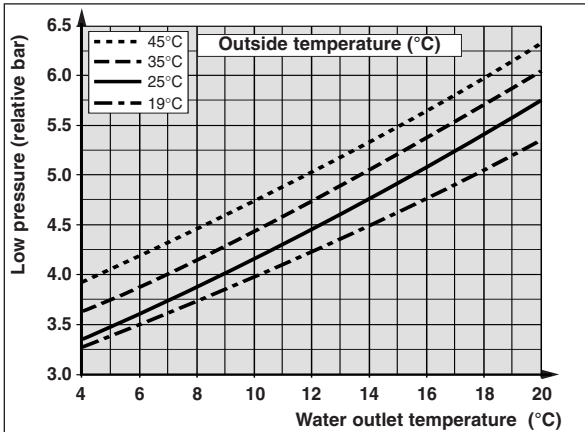
CHGV 22



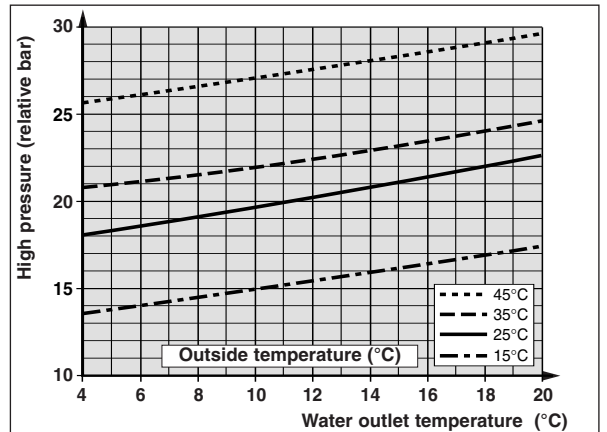
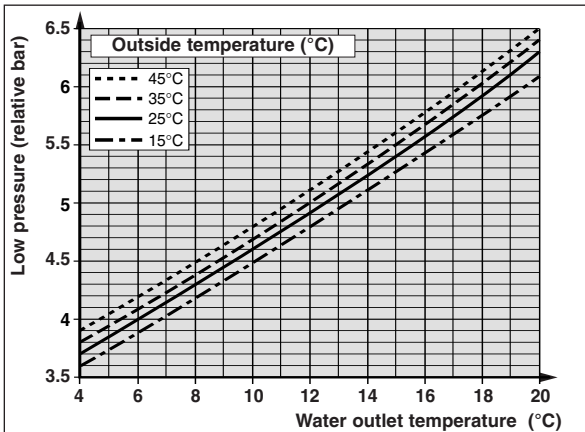
CHGV 25



CHGV 32



CHGV 40



12 - START-UP DATA SHEET

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CHGV				
Code:				
Serial Number:				
Started by:	Company:	Site:	Date:	
Voltage measured on unit				
V	L1-L2	L2-L3	L3-L1	
FANS				
Measured amperage				
Circuit breaker thermal setting		A		
COMPRESSORS				
Measured amperage		A/phase	L1	L2
Circuit breaker thermal setting		A		
PUMP				
Amperage		A/phase	L1	L3
Circuit breaker thermal setting		A		
HEAD PRESSURE CONTROL				
Setting				
SENSORS (see control sheet)				
Water temperature setpoint		Heating:		
Water temperature control sensor positioned in:		Inlet	Outlet	
TEMPERATURES (°C) / PRESSURES (bar)				
Outside temperature				
Water type		Pure	Glycol	% Glycol
Water inlet, generator				
Water outlet, generator				
Water circuit pressure				
Water flow rate				
Δ T:				
Suction, compressor				
Discharge, compressor				
Inlet, thermostatic expansion valve				
Outlet, thermostatic expansion valve				
Condensing pressure				
Evaporating pressure				
Superheating = (Compressor suction temperature - Evaporating temperature) = 7 to 8°C				
Sub-cooling = (Condensating temperature - Expansion valve inlet temperature) = 3 to 5°C				

CHGV	START-UP DATA SHEET Standard application		
Code:			
Serial Number:			
Started by:	Company:	Site:	Date:

Parameter	Min.	Max.	Unit	Factory value	Setting
G01 - Cooling set point	9	25	°C/°F	12	
H03 - Max. cooling set point limit	9	90	°C/°F	25	
H04 - Min. cooling set point limit	-40	25	°C/°F	9	
H20 - ID5 configuration (enter, On/Off)	0	7	num	7	
H26 - Communication protocol	0	1	num	0	
H27 - Operating mode selection configuration	0	2	num	1	
H31 - "Dynamic set point" validation	0	1	flag	0	
H32 - Cooling "dynamic set point" offset	-12.70	12.70	°C/°F	5	
H34 - Cooling "dynamic set point" setting	-127	127	°C/°F	25	
H36 - Cooling "dynamic set point proportional strip	-25.50	25.50	°C/°F	10	
H39 - Probe 1 offset	-12.70	12.70	°C/°F	0	
H40 - Probe 2 offset	-12.70	12.70	°C/°F	0	
H42 - Probe 4 offset	-127	127	°C/10	0	
H44 - Family series address (for communication)	0	14	num	0	
H45 - Device series address (for communication)	0	14	num	0	
H52 - Temperature measurement unit (°C/°F)	0	1	flag	0	
H54 - Parameter list No.	0	999	num	depending on the model	
H55 - Parameter list index	0	999	num	depending on the model	
H57 - Alarm relay activation OFF	0	1	flag	0	
A01 - LP alarm disabling time	0	255	sec	120	
A02 - Number of events/hour, LP alarm	0	255	num	3	
A06 - Number of events/hour, water output	0	255	num	3	
A11 - Anti-freeze alarm set point	-10	10	°C/°F	3	
A12 - Anti-freeze alarm hysteresis	0	25.50	°C/°F	2	
A13 - Number of events/hour, anti-freeze alarm	0	255	num	2	
A14 - Number of events/hour, HP alarm	0	255	num	3	
A15 - Cooling system alarm activation	0	1	flag	1	
A16 - Refrigeration circuit alarm time	0	255	min	2	
A18 - Refrigeration alarm disabling time	0	255	min	2	
A25 - Max. temperature alarm set point (AI)	0	255	°C/°F	60	
C03 - Control hysteresis in cooling mode	0	25.50	°C/°F	2	
C08 - Water volume reduction activation	0	1	flag	1	
P01 - Water pump configuration	0	3	num	0	

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