

(Etiquette signalétique)

## CHGV 50 / 80



**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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## SUMMARY

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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

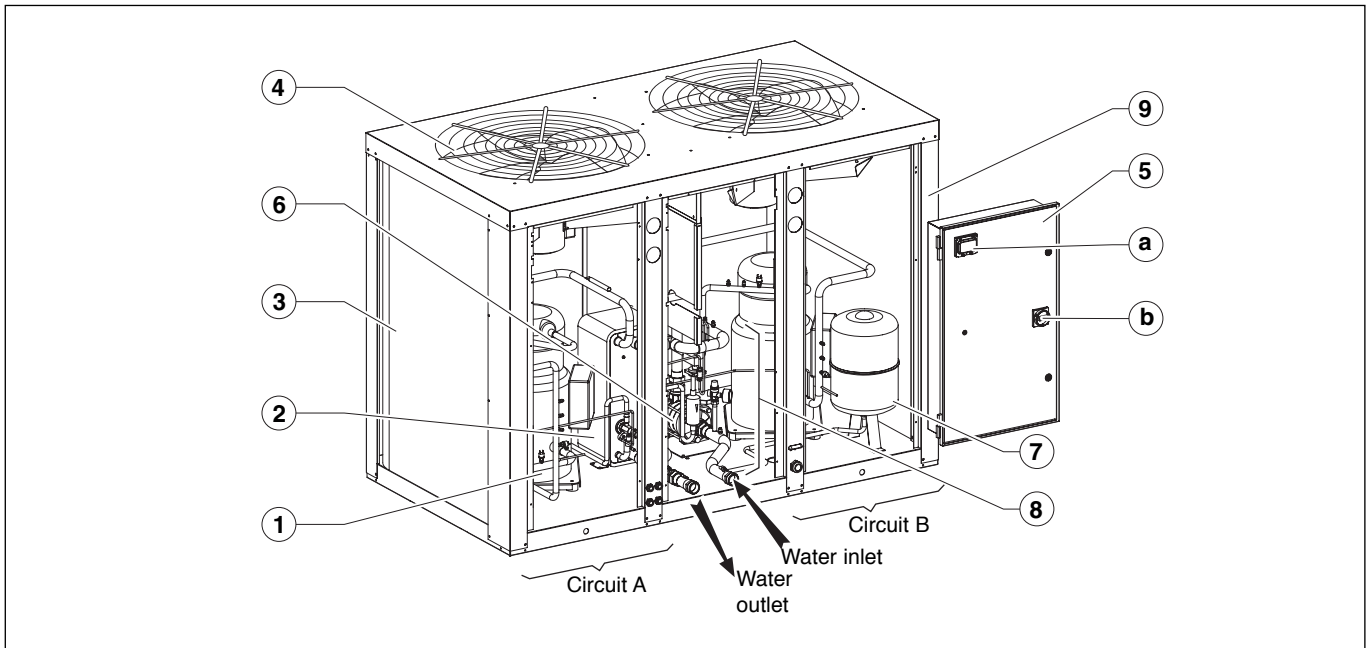
- This heat pump is intended for the air-conditioning of premises.

### 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.
- 1 per circuit.

#### ② WATER EXCHANGER

- Plate water exchanger with heat insulation.
- 1 per circuit.

#### ③ AIR EXCHANGER

- Thin plate air exchanger with protective grille.
- 1 per circuit.

#### ④ ELECTRIC FAN UNIT

- Electric fan unit with protective grille.
- 1 per circuit.

#### ⑤ SWITCH BOX

- "ECH" electronic control ①.
- Main switch ②.
- 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 CIRCUITS

- R407C loads.
- 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.

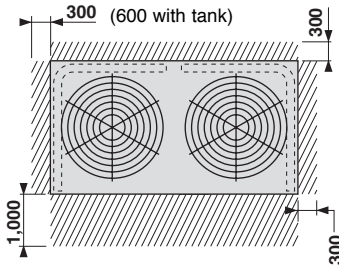
General tolerance  $\pm 10$  mm.

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

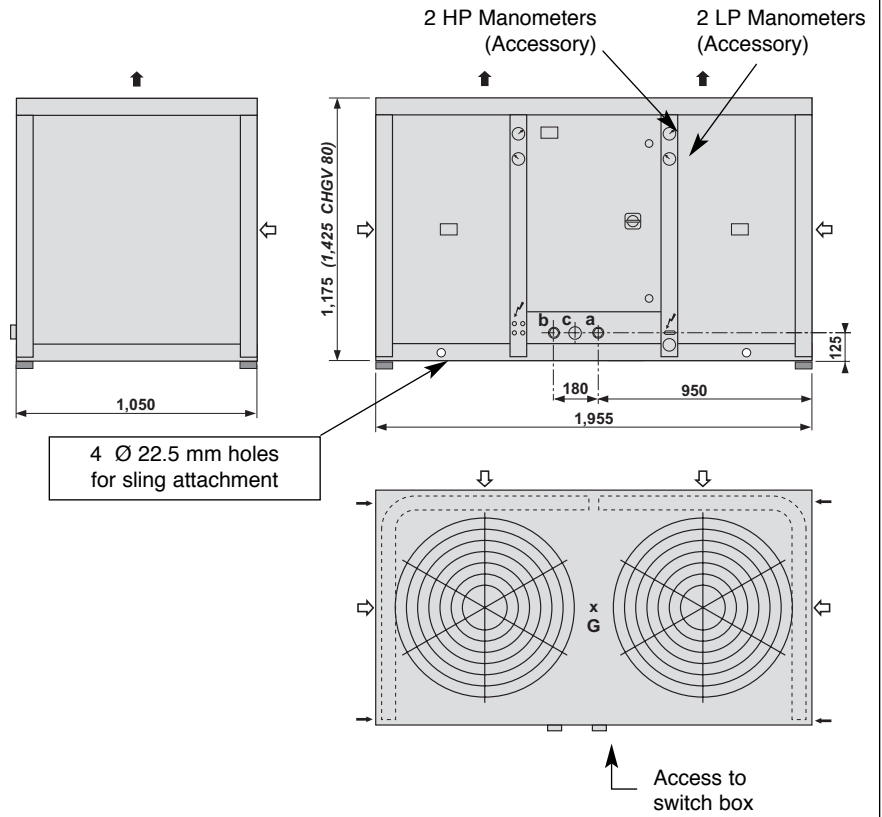
- ⚡ Electrical connections
- Location of the 4 anti-vibration pads (accessory) (100 x 100 x 25 mm) under girders
- G Centre of gravity (in the centre of the unit)

### 2.2.1 - CHGV

- Clearances to be respected for unit operation and maintenance.
- No obstacle less than 3 m above the unit.



Front



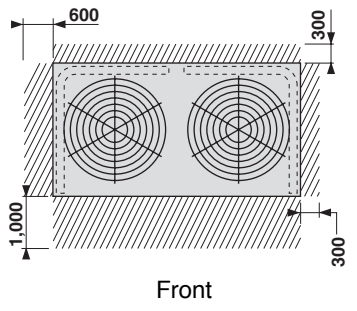
4 Ø 22.5 mm holes for sling attachment

Access to switch box

	Net weight
CHGV 50	500 kg
CHGV 64	534 kg
CHGV 72	556 kg
CHGV 80	606 kg

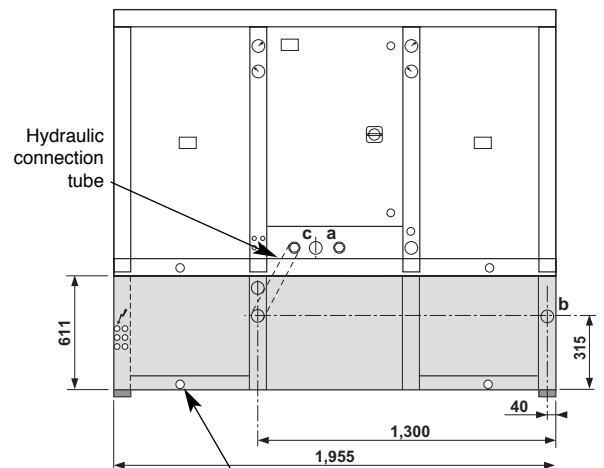
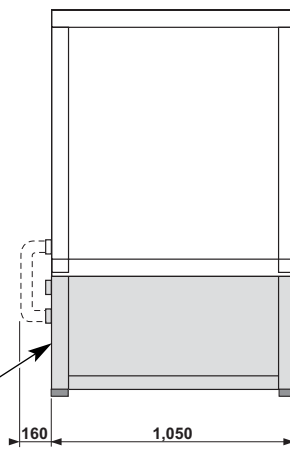
### 2.2.2 - 300-LITRES BUFFER TANK (ACCESSORY)

- Clearances to be respected for maintenance.



Front

Buffer tank

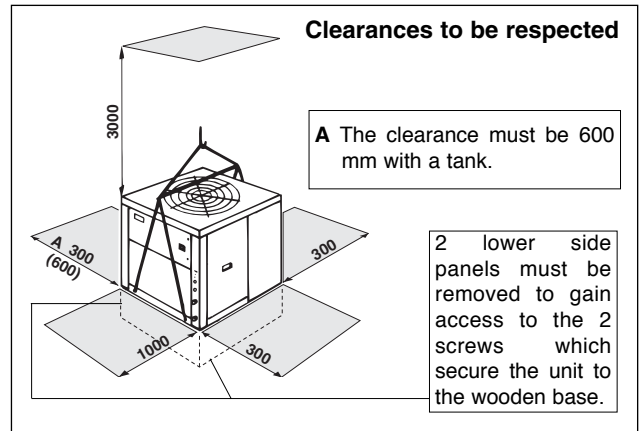


4 Ø 22.5 mm holes for sling attachment for handling the tank only

	Net weight
Tank without heating	185 kg

## 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" 1/2 (40 x 49)**.
- 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 1005812.

### 4.2.2 - POWER SUPPLY

- The power supply must be **three-phase 400 V / 50 Hz + Neutral**, in the electrical box, on the power terminal strip (see electrical diagrams).

#### 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:

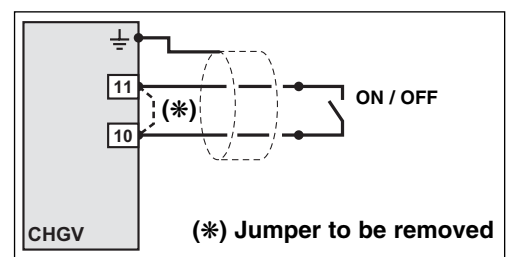
- Maximum current, see table below.
  - Multi-pole copper cable with PR insulation.
  - Installation in non-ventilated cable duct (installation method No. 41). No other power cable.
  - Ambient temperature 40°C.
- The lengths indicated below correspond to a voltage drop less than 5% in the cable.

CHGV		50	64	72	80
Starting current	<b>A</b>	170	185	225	225
Max. total current	<b>A</b>	42.8	56.3	60.4	64.8
Power supply cable section	<b>mm<sup>2</sup></b>	16	16	25	25
Max. connection length	<b>m</b>	100	100	150	150

- The complete electrical specifications are given in the table of the technical documentation.
- **Note:** Power to the frost resistor of the tank must be separate from the installation.

### 4.2.3 - CONTROL BY EXTERNAL CONTACT

- The unit can be controlled remotely by connecting a good-quality, potential-free external contact (contact closed = On, contact closed = Off),
- The On / Off signal is connected to terminals 10 and 11 of the terminal strip located in the electrical box (remove the existing jumper - 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 mm<sup>2</sup>.



### 4.2.4 - REMOTE CONTROL

- See § 6.3. (Accessories).

### 4.2.5 - MISCELLANEOUS

#### Alarm transfer:

Potential-free contact (2A resistive - 250 Vac maximum) available on terminals 15 and 16 of the terminal strip in the electrical box.

Contact open = Alarm or power supply loss.

## 5 - OPERATION OF "ECH" ELECTRONIC CONTROL

- 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

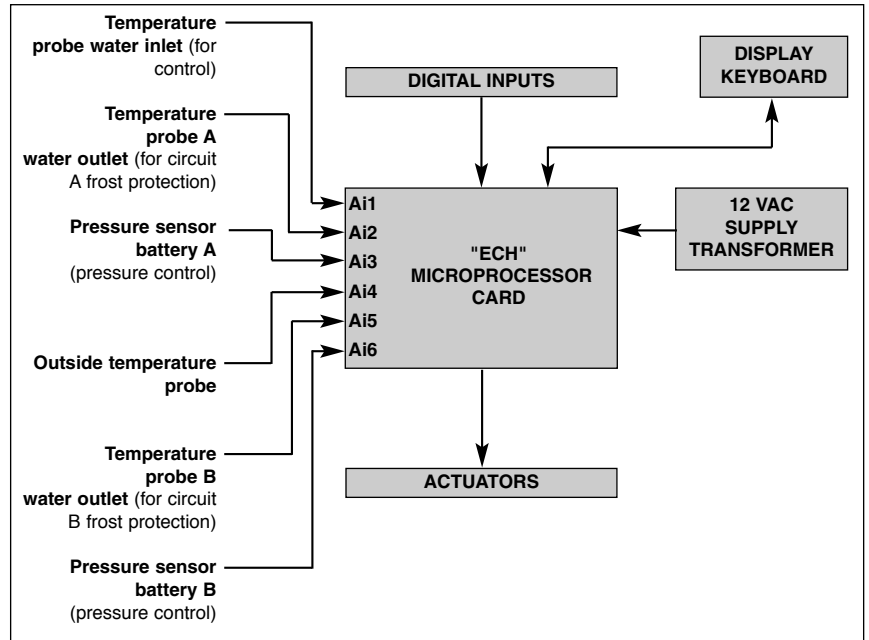
- The microprocessor controls the operation of the machine and of the associated alarms.

It continuously compares the water temperature measured by the probe (Ai1) and the setpoint temperature value entered via the keyboard.

Each operating request generated by the control system is signalled by indicator lights (6) or (8) - see below.

Each light flashes if a safety delay is in progress. The light shines steady when the corresponding circuit is in operation.

- The **control** probe is located on the **water inlet** in the factory.



### 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)).

(3) LED display.

(4) Cooling mode indicator.

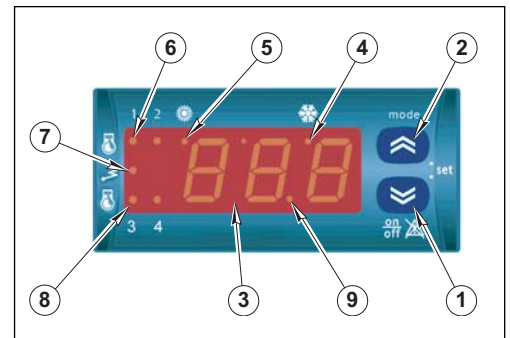
(5) Heating mode indicator (not used).

(6) Compressor on indicator, circuit A.

(7) Supplementary heating authorisation, if any indicator (not used).

(8) Compressor on indicator, circuit B.

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



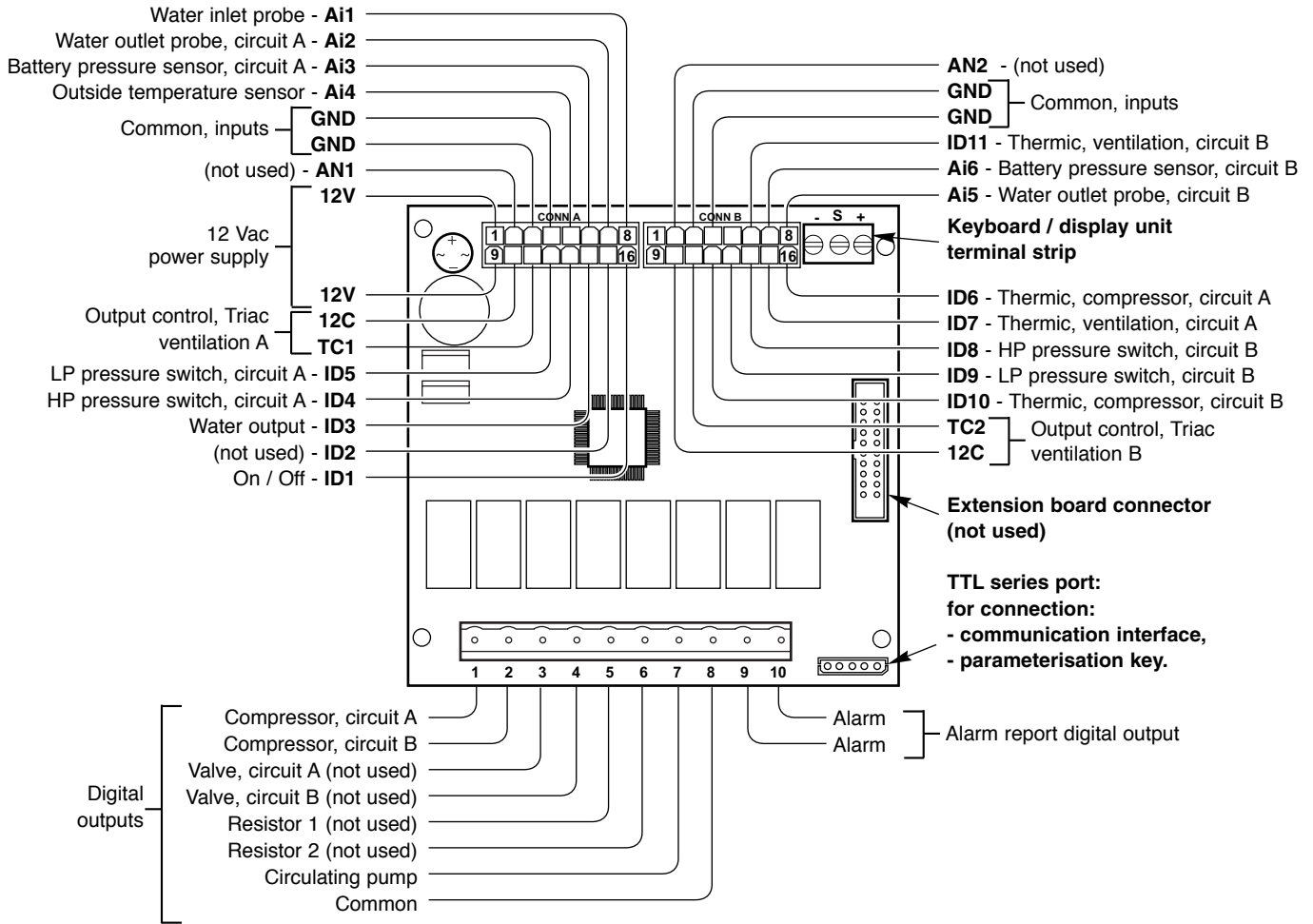
#### 5.3.2 - CTN TYPE TEMPERATURE PROBE

- 10 kΩ at 25°C.

Temperature (°C)	Ohmic value (Ohm)
-20	67 740
-10	42 250
0	27 280
10	17 960
20	12 090
25	10 000
30	8 310
40	5 820
50	4 160
60	3 020
70	2 220

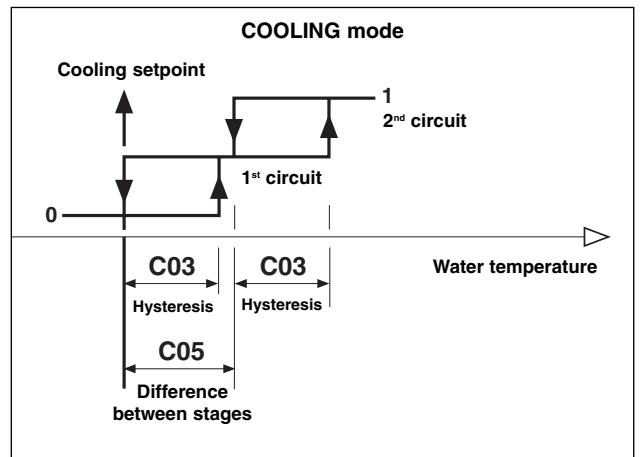
### 5.3.3 - INPUT / OUTPUT BOARD

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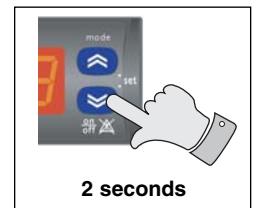
### 5.4 - OPERATING MODE

- Staged triggering of cooling circuits depending on the difference in relation to the water setpoint temperature.
- **Note:** An **automatic** refrigerating circuit switchover system allows their operating time to be shared.



### 5.5 - STARTING

- **Initial condition:**
  - Machine hydraulically and electrically connected ready to operate.
  - If connected, the remote On / Off contact is open (Off).
- **Turn the installation on.**
  - The display unit is off (except for the "decimal" point which remains illuminated); this means that the controller is off. Turn it off by pressing and holding the "ON / OFF" button for 2 seconds.
  - The cooling indicator  (4) comes on. The display unit then indicates the message "E00" which identifies shutdown by the remote On / Off contact (if used).
- **To start the unit:**
  - Close the remote On / Off contact. The water inlet temperature is displayed. The circulating pump starts.
  - The operating lights of the compressors (6) and (8) illuminate if required (see diagram, paragraph 5.3). 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.





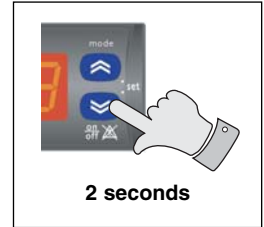
**To stop the unit:**

- Open the remote Off (stop) contact.
- The indicator lights of compressors (6) and (8) go off and the message "E00" is displayed.
- The water circulating pump stops after 3 minutes.

**Note:** the unit can be shut off locally by pressing and holding the "ON / OFF" button for 2 seconds.

Locally-controlled shut-off has priority over the remote control command.

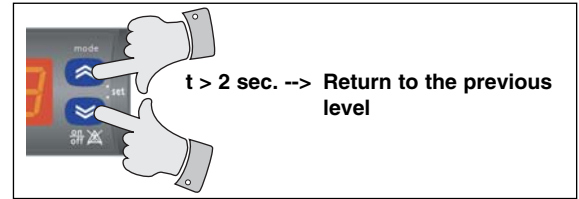
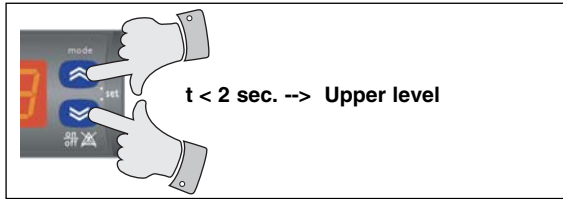
The display unit is off at this time (except for the "decimal" point which remains illuminated).



**5.6 - PARAMETERS - DISPLAYING AND ADJUSTING**

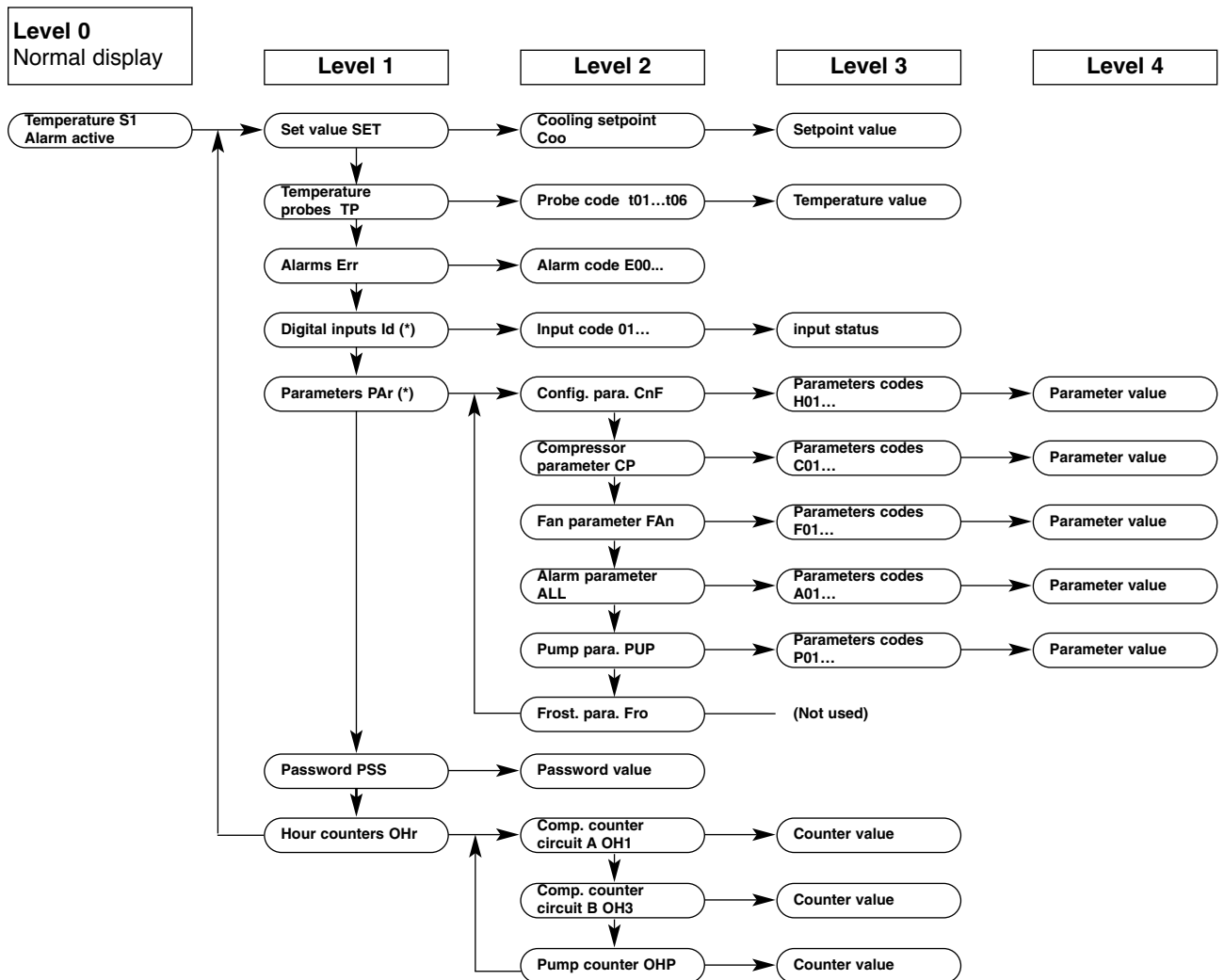
**5.6.1 - GENERALITIES**

- 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) and (8) flash when levels 1 and above are indicated.

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

### 5.6.3 - SETPOINT 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	10 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 (and pressures) "TP":  
Displays the values indicated by each temperature probe:  
**t01**: water inlet temperature.  
**t02**: exchanger water outlet temperature, circuit A.  
**t03**: battery pressure, circuit A.  
**t04**: outside air temperature.  
**t05**: exchanger water outlet temperature, circuit B.  
**t06**: battery pressure, circuit B.
- 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 on circuit **A** ("OH1"), and the compressor on circuit **B** ("OH3") 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.**

- **CAUTION:** the alarms:
  - HP,
  - LP (low pressure),
  - Anti-freeze,
  - Water flow rate

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

- 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 (no flashing),
  - the machine can re-start (if it was stopped).
- **Note: Alarms are active in off mode.**
- **Special features of the alarm report:**
  - Potential-free contact (2 A resistive - 250 Vac) available on the terminal strip of the electric box. Contact open in case of alarm or loss of power supply.
  - This report's operating logic can be changed by changing parameter **H45** from **1** to **0**.
  - The alarm report can be activated in case of shutdown by remote contact by changing parameter **H72** from **1** to **0**.

# SUMMARY TABLE OF ALARMS

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Alarm	Code	Inhibition delay	Compressor stop		Fan stop		Water pump shutdown	Reset	Remarks
			A	B	A	B			
Water inlet temperature probe fault, Ai1	E40		X	X	X	X		A	
Water outlet temperature sensor fault circuit A - Ai2	E06		X	X	X	X		A	
Pressure sensor fault battery A - Ai3	E07		X	X	X	X		A	
Outside temperature sensor fault, Ai4	E42		X	X	X	X		A	Force water pump operation
Water outlet temperature sensor fault circuit B - Ai5	E26		X	X	X	X		A	
Pressure sensor fault battery B - Ai6	E27		X	X	X	X		A	
H.P. circuit A	E01		X		X			A/M	
H.P. circuit B	E21			X		X		A/M	
L.P. circuit A	E02	120" at start-up	X		X			A/M	
L.P. circuit B	E22	120" at start-up		X		X		A/M	
Thermic, compressor, circuit A or phase order	E03		X		X			M	See also reset of the corresponding circuit breaker
Thermic, compressor, circuit B or phase order	E23			X		X		M	
Thermic, fan, circuit A	E04		X		X			M	
Thermic, fan, circuit B	E24			X		X		M	
Anti-freeze, circuit A (exchanger outlet)	E05		X	X	X	X		A/M	From probe Ai2 (water outlet) Threshold = 3° C
Anti-freeze, circuit B (exchanger outlet)	E25		X	X	X	X		A/M	From probe Ai5 (water outlet) Threshold = 3° C
Water flow rate	E41	10" in operation 30" at start-up	X	X	X	X	X If manual reset	A/M	
Configuration error	E45		X	X	X	X	X		Consult the After-Sales Service Department
Water inlet temperature too high	E46	2'						A	Threshold = 35 °C
Shutdown by remote contact	E00		X	X	X	X	X	A	No alarm report with H72 = 1

A = Auto  
M = Manual

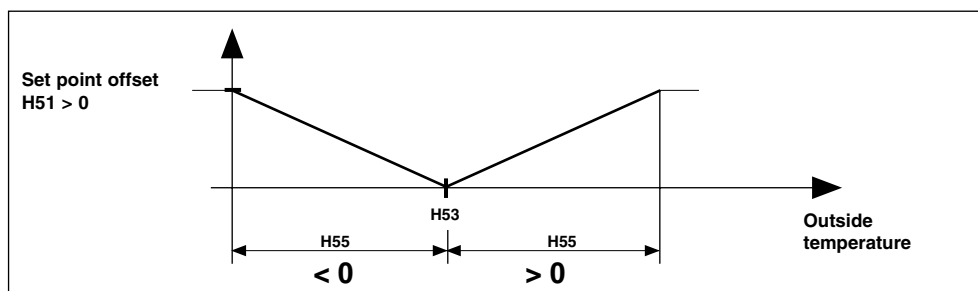
## 5.8 - SPECIAL OPERATING FEATURES

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- **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 **C18** to **0** in the "CP" section of the parameterization menu.
- **Water circulating pump control:**
  - the pump is actuated when the unit operating,
  - the pump is stopped when the unit is stopped. The shut-down of the pump is delayed 3 minutes after the compressor stops,
  - 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.  
In the event of a faulty outside temperature sensor, circulating pump operation is forced, for safety reasons.  
The "**Water output**" alarm (**E41**) stops the circulating pump when this alarm shifts to manual reset. In the event of a fault, the alarm report is actuated.
- **Pre-ventilation:**
  - in case of an operating request and in order to prepare the air exchanger, the fans are actuated approximately 20 seconds before the first compressor starts up.
- **Anti short-cycle time delays:**
  - the control of each cooling circuit features a time delay system in order to respect:
    - a maximum number of starts per hour (12),
    - a minimum stop time (150 seconds).
- **Starting the compressors:**
  - in order to reduce the starting currents, triggering of the 2<sup>nd</sup> refrigeration circuit is delayed (60 seconds, adjustable by parameter **C06**).
- **Control hysteresis:**
  - see the operating diagrams in § 5.4,
  - the hysteresis of each stage is factory-set at 1.5 k. Modification is possible. To do this, change parameter **C03** (cooling hysteresis) in the compressor section "CP",
  - the difference between the 2 stages is factory set at 1.5 k. Modification is possible. To do this, modify parameter **C05** in the compressor section "CP".
- **"Dynamic" set points:**
  - by changing the parameter **H50** from **0** to **1**, an automatic cooling set point compensation system based on the outside temperature is activated,
  - the following parameters allow the compensation slopes to be set

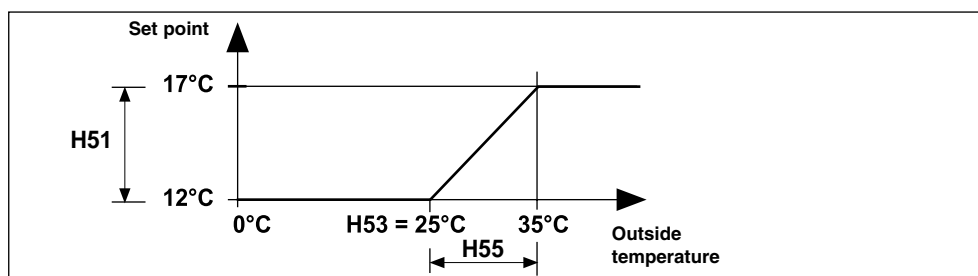
Parameter	Designation	Factory setting
<b>H51 =</b>	Set point "offset" in cooling mode	5 k
<b>H53 =</b>	Outside temperature setting ("foot of slope") in cooling mode	25°C
<b>H55 =</b>	Proportional strip in cooling mode	+ 10 k

### • Principle:



### • Example:

Factory setting in cooling mode



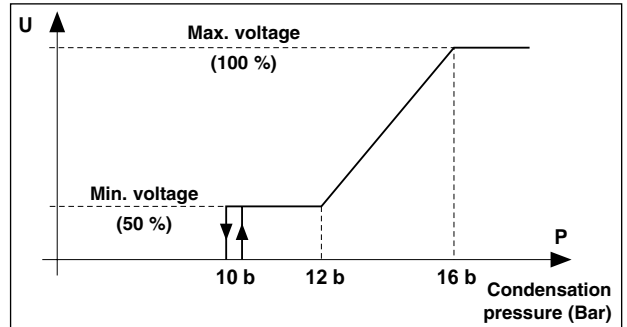
• **Adjustment of the value measured by the temperature probes ("Offset"):**

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

Parameter	Probe offset	Units	Factory setting
H57	Probe Ai1 offset	Degree	0
H58	Probe Ai2 offset	Degree	0
H59	Probe Ai3 offset	Degree/10	0
H60	Probe Ai4 offset	Degree	0
H61	Probe Ai5 offset	Degree	0
H62	Probe Ai6 offset	Degree/10	0

• **Condensation pressure control:**

- voltage selector (controlled by regulation "ECH") per refrigeration circuit for the power supply of the electric fan.
- based on the information gathered by the pressure sensors, the control varies the supply voltage of the electric fans in accordance with the diagram opposite.
- factory-set for optimal operation. For all other settings, consult us.
- the variable regulators are mounted inside the electric box.



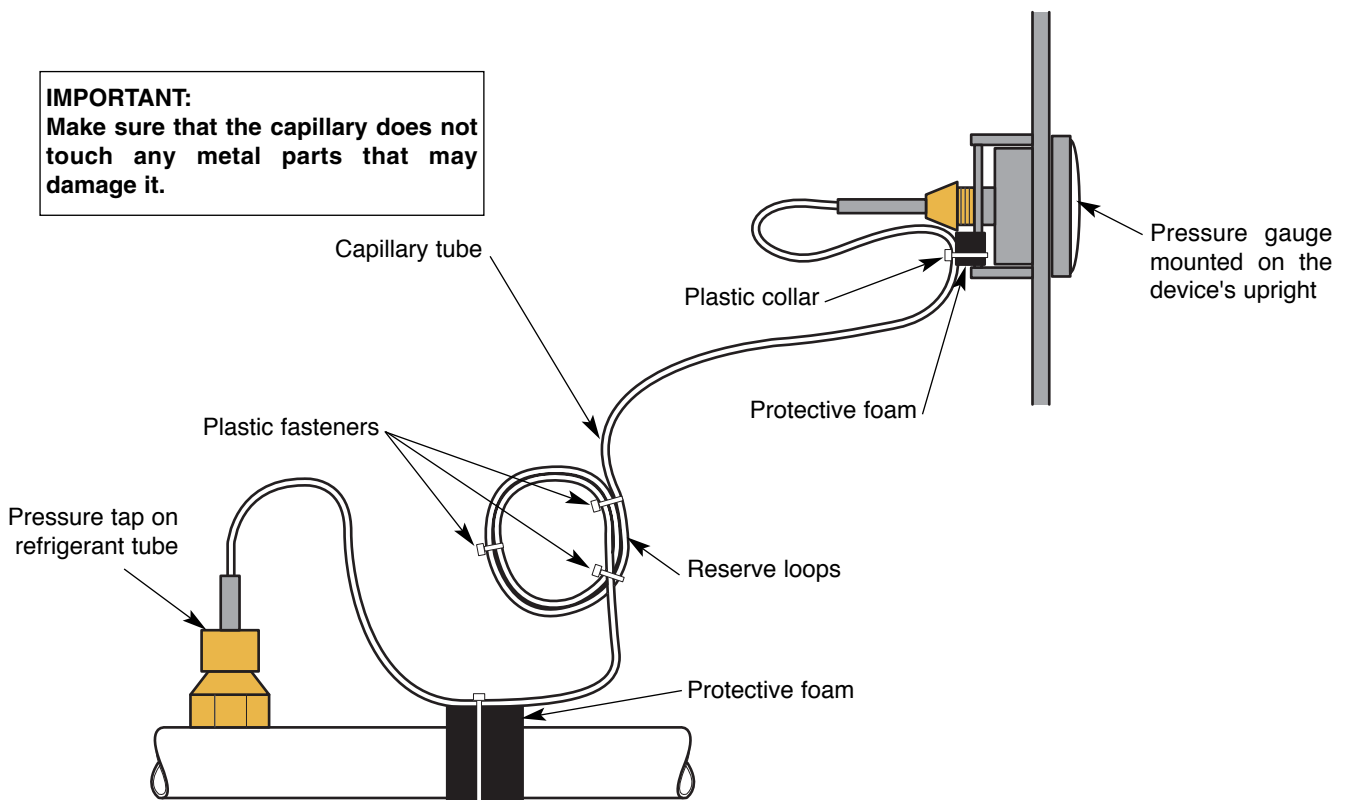
## 6 - ACCESSORIES

### 6.1 - VIBRATION KIT



- The kit includes:
  - a set of four vibration pads, 25 mm thick, code **70600035**,
  - a set of two hoses, length: 1.5 m,  $\varnothing$  1" 1/2 **70600034**.

### 6.2 - HP AND LP PRESSURE GAUGES

- Code **70970007**.
- The accessory includes 1 set of 2 pressure gauges (HP and LP). Two per apparatus must be ordered.
  - 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:



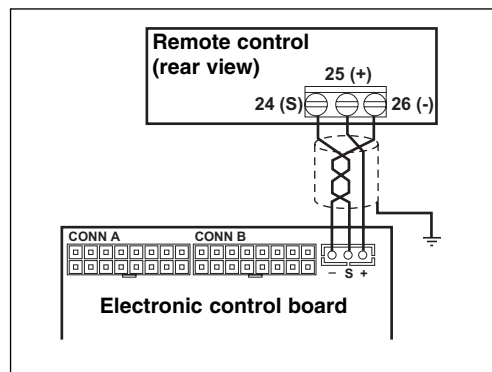
### 6.3 - REMOTE CONTROL

- Code **70250057**.
- 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:
  - on the electronic control board located in the electric box (in parallel with the box's display unit connection),
  - use twisted pair shielded cable with a cross section of at least 0.5 mm<sup>2</sup> (shielding of the ground on unit side), max. length: 100 meters.

**CAUTION:**

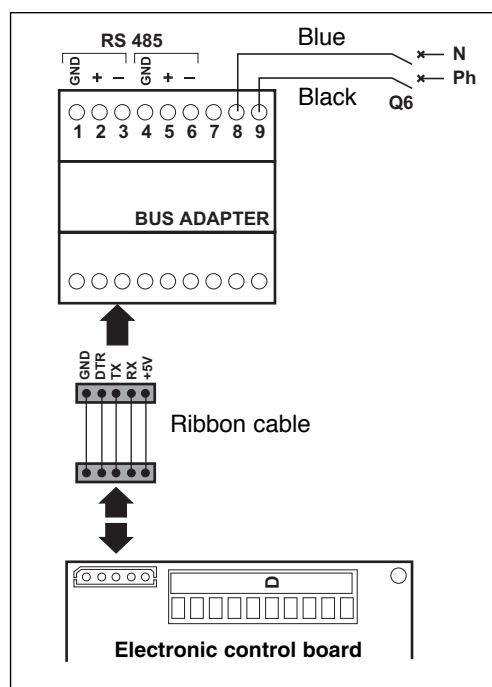
**Do not route this cable near power cables.**

**The operation must be performed only with the unit's power supply off and locked out.**



### 6.4 - RS 485 COMMUNICATION INTERFACE (MODBUS protocol)

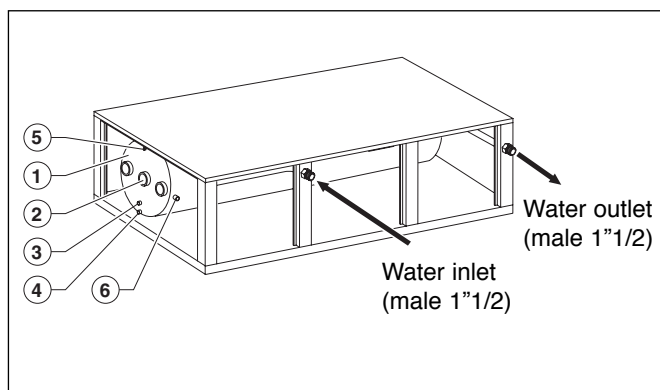
- Code **70250056**.
- Secure the communication interface on the DIN rail left to the electronic board located in the electric box.
- Connect the ribbon cable (supplied) between the interface and the electronic control board located in the electric box.
- Connect the interface's 230 Vac power supply to the output of breaker Q6 using the Blue and Black wires supplied, as shown opposite.



### 6.5 - 300-LITRES BUFFER TANK

- Code **70600120**: model without supplementary heating with 800 W anti-freeze resistance (single-phase 230 Vac).
- Designed to be installed either underneath the unit, or separately.

For installation underneath the unit, the tank is supplied with mounting brackets and an insulated tube for connection between the unit's water outlet and the tank's water inlet.





## 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

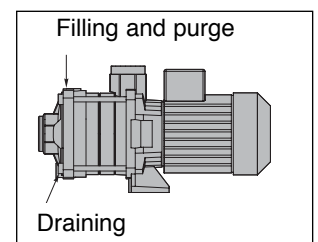
- Water flow-rate.

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 1<sup>st</sup> page of this manual.

# 10 - CIRCULATING PUMP CURVES

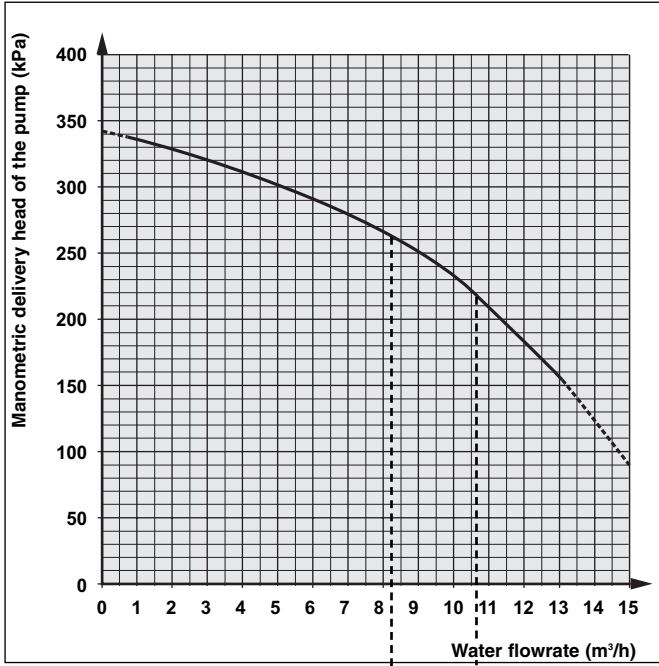
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CHGV 50/64

PUMP TYPE MUH 903

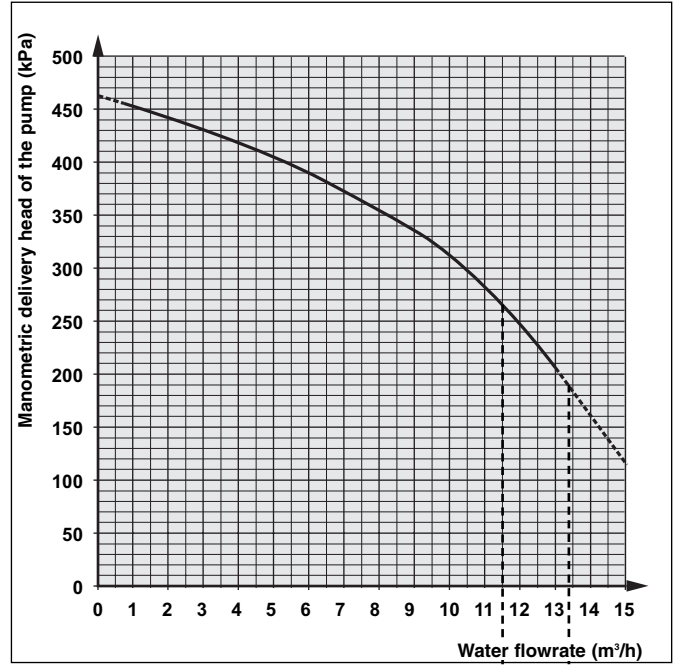
CHGV 72/80

PUMP TYPE MUH 904



CHGV 50  
8.21 m³/h

CHGV 64  
10.66 m³/h



CHGV 72  
11.52 m³/h

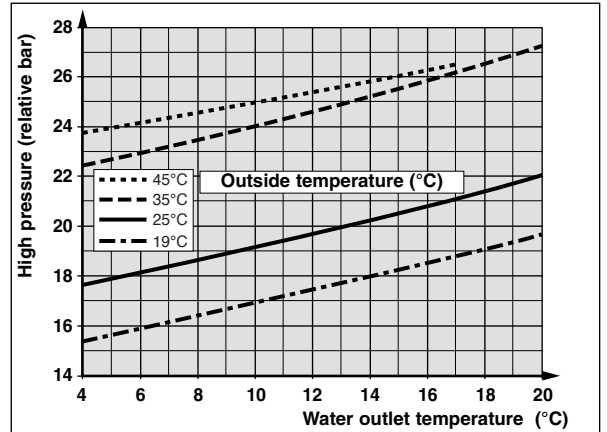
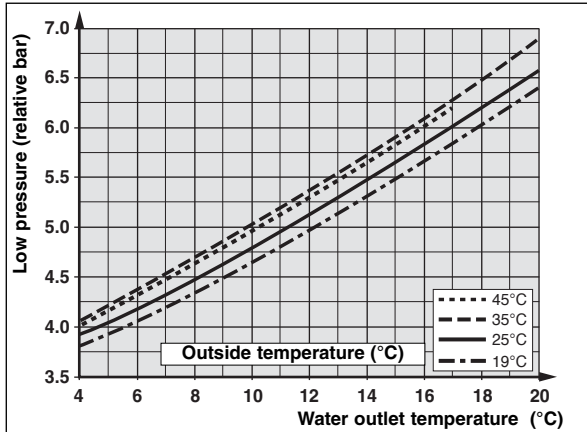
CHGV 80  
13.43 m³/h

# 11 - PRESSURE CURVES

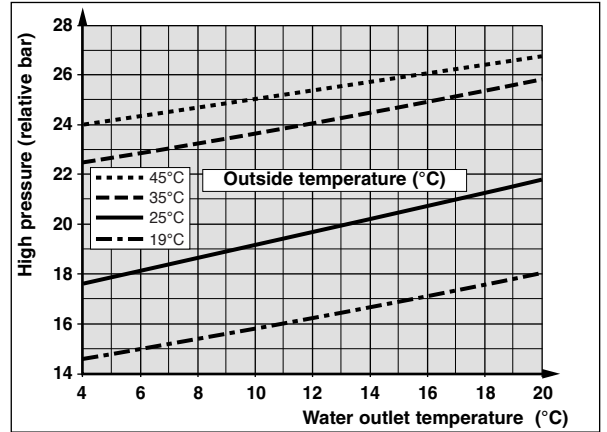
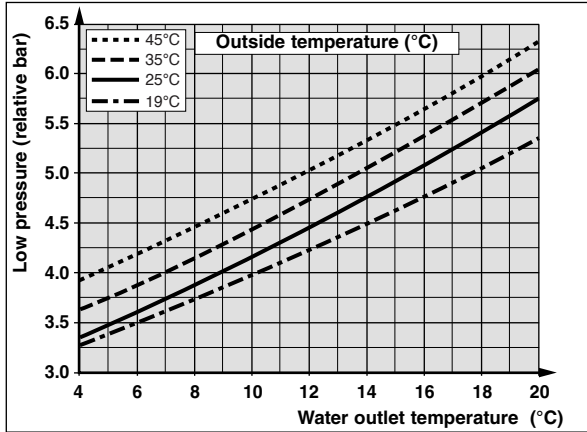
## LOW PRESSURE

## HIGH PRESSURE

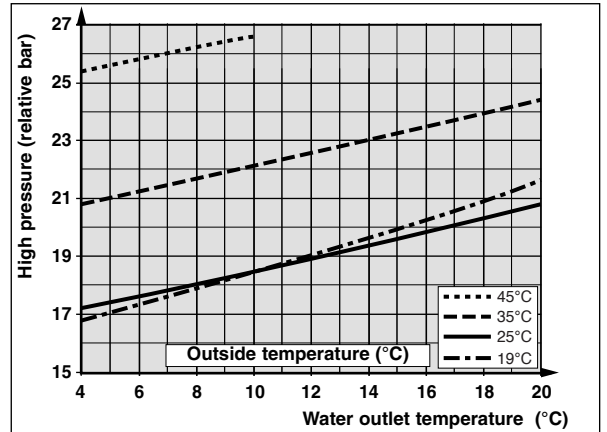
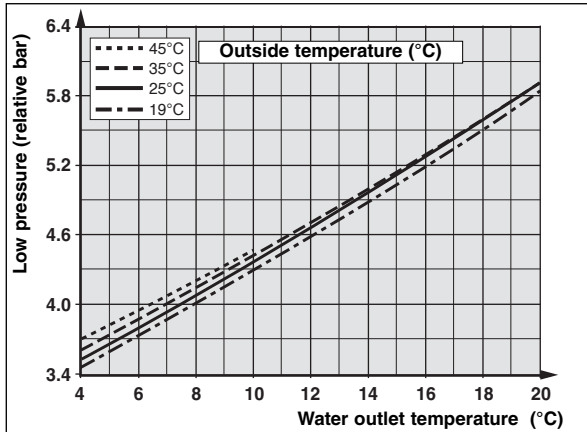
CHGV 50



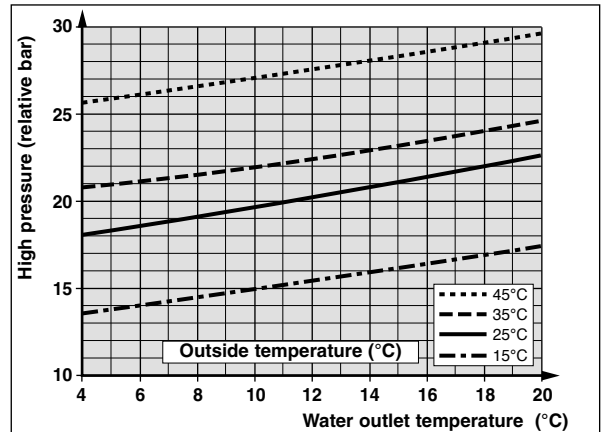
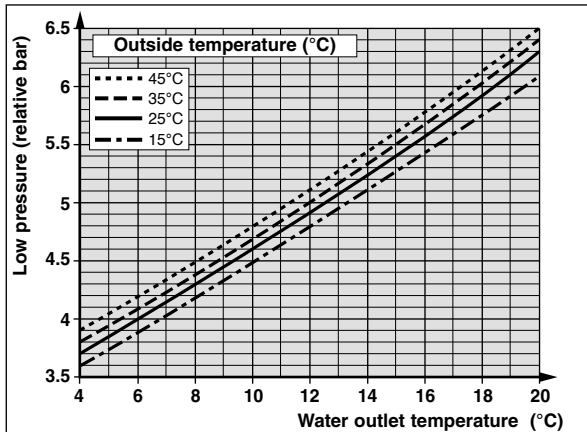
CHGV 64



CHGV 72



CHGV 80



## 12 - START-UP DATA SHEET

**GB**

<b>CHGV</b>				
<b>Code:</b>				
<b>Serial Number:</b>				
<b>Started by:</b>	Company:	Site:	Date:	
<b>Voltage measured on unit</b>				
V	<b>L1-L2</b>	<b>L2-L3</b>	<b>L3-L1</b>	
<b>FANS</b>				
Measured amperage, circuit A	<b>A/phase</b>	<b>L1</b>	<b>L2</b>	<b>L3</b>
Circuit breaker thermal setting	<b>A</b>			
Measured amperage, circuit B	<b>A/phase</b>	<b>L1</b>	<b>L2</b>	<b>L3</b>
Circuit breaker thermal setting	<b>A</b>			
<b>COMPRESSORS</b>				
Measured amperage, circuit A	<b>A/phase</b>	<b>L1</b>	<b>L2</b>	<b>L3</b>
Circuit breaker thermal setting	<b>A</b>			
Measured amperage, circuit B	<b>A/phase</b>	<b>L1</b>	<b>L2</b>	<b>L3</b>
Circuit breaker thermal setting	<b>A</b>			
<b>PUMP</b>				
Amperage	<b>A/phase</b>	<b>L1</b>	<b>L2</b>	<b>L3</b>
Circuit breaker thermal setting	<b>A</b>			
<b>HEAD PRESSURE CONTROL</b>				
Setting				
<b>SENSORS (see control sheet)</b>				
Water temperature setpoint				
Water temperature control sensor positioned in:	Inlet		Outlet	
<b>TEMPERATURES (°C) / PRESSURES (bar)</b>				
Outside temperature				
Water type	Pure	Glycol	% Glycol	
Water inlet, generator				
Water outlet, generator				
Water circuit pressure				
Water flow rate				
Δ T:				
	<b>Circuit A</b>		<b>Circuit B</b>	
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				

<b>CHGV</b>	<b>"ECH" PARAMETER SETTINGS</b> Standard application		
<b>Code:</b>			
<b>Serial Number:</b>			
<b>Started by:</b>	Company:	Site:	Date:

Parameter	Min.	Max.	Unit	Factory value	Setting
G01 - Cooling set point	10	25	°C/°F	12	
H03 - Max. cooling set point limit	12	99	°C/°F	25	
H04 - Min. cooling set point limit	-40	12	°C/°F	10	
H45 - Alarm report polarity	0	1	flag	1	
H50 - "Dynamic set point" validation	0	1	flag	0	
H51 - Cooling "dynamic set point" offset	-50	80	°C/°F	5	
H53 - Cooling "dynamic set point" setting	-127	127	°C/°F	25	
H55 - Cooling "dynamic set point proportional strip	-50	80	°C/°F	10	
H57 - Probe Ai1 offset	-12.70	12.70	°C/°F	0	
H58 - Probe Ai2 offset	-12.70	12.70	°C/°F	0	
H59 - Probe Ai3 offset	-127	127	°C/10	0	
H60 - Probe Ai4 offset	-12.70	12.70	°C/°F	0	
H61 - Probe Ai5 offset	-12.70	12.70	°C/°F	0	
H62 - Probe Ai6 offset	-127	127	°C/10	0	
H64 - Temperature measurement unit (°C/°F)	0	1	flag	0	
H65 - Family series address (for communication)	0	14	num	0	
H66 - Device series address (for communication)	0	14	num	1	
H72 - Remote alarm report deactivation - to OFF	0	1	flag	1	
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	2	
A11 - Anti-freeze alarm set point	-127	127	°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	
A15 - Max. alarm setpoint Water inlet temperature	-127	127	°C/°F	35	
A18 - Number of events/hour, HP alarm	0	255	num	3	
C03 - Control hysteresis in cooling mode	0	25.50	°C/°F	1.5	
C05 - Difference between stages	0	25.50	°C/°F	1.5	
C06 - Time delay setting of the 2 <sup>nd</sup> refrigerating circuit	0	255	sec	30	
C16 - Parameters list No.			-		
C17 - Parameter list index.			-		
C18 - Water volume reduction activation	0	1	flag	1	
F08 - P min speed setpoint, in cooling mode	-500	800	Kpa x 10	120	
F09 - Proportional strip P, in cooling mode	0	255	Kpa x 10	40	
F10 - Ventilation cutoff P differential, in cooling mode	0	255	Kpa x 10	20	
F14 - P max. speed setpoint, in cooling mode	-500	800	Kpa x 10	160	
P01 - Water pump configuration (0 = permanent operation)	0	1	num	0	

**F**

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Par souci d'amélioration constante, nos produits peuvent être modifiés sans préavis.  
Due to our policy of continuous development, our products are liable to modification without notice.  
Per garantire un costante miglioramento dei nostri prodotti, ci riserviamo di modificarli senza preavviso.  
En el interés de mejoras constantes, nuestros productos pueden modificarse sin aviso previo.  
Unsere Produkte werden laufend verbessert und können ohne Vorankündigung abgeändert werden.

**Technibel**

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