INSTALLATION INSTRUCTIONS



AIR COOLED WATER CHILLER HEAT PUMP WITH AXIAL FAN WITH BUILT-IN HYDRAULIC MODULE (OPTIONAL) 407 C refrigerant

C€ MARKING

This product marked $\mathsf{C}\mathsf{E}$ conforms to the essential requirements of the Directives:

- Low voltage no. 73/23 EEC, modified 93/68 EEC,
- Electromagnetic Compatibility no. 89/336 EEC, modified 92/31 and 93/68 EEC.



SUMMARY

- 4 Connections 4

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

- 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.

 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 (for "split systems", refer to the installation instructions as the charge must consider the length of the connecting lines),
 - IMPORTANT: see paragraph 3.
- 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)**.

1 - GENERAL

- The equipment must be installed, started-up and maintained by authorised and qualified personnel, in accordance with local rules and professional standards.
- The recommendations and instructions presented in the manual and on labels must be followed.

1.1 - GENERAL SUPPLY CONDITIONS

- The units must be securely anchored to the truck's trailer during transport.
- Generally speaking, the material is transported at the consignee's risk.
- In the event of damages during transport, the consignee must notify the carrier by registered letter within three days following delivery.

1.2 - VOLTAGE

- Before carrying out any operation, check that the voltage indicated on the unit corresponds to the mains voltage.
- Before servicing the unit, ensure that the electrical power supply has been shut off and warning signs installed.

1.3 - TECHNICAL AND PHYSICAL CHARACTERISTICS

See technical data.

2 - DIMENSIONS



3 - INSTALLATION

- 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 Ø 37 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.

CAUTION:

- Do not install the external unit near an inflammable gas source.
- Do not install the unit near to oil engines or in a place where it would be exposed to salty air or sulphur dioxide.
- Do not install the unit near to equipment which gives off a lot of heat (e.g. boiler).
- Do not install the unit near a road or a path, so as to protect the appliance from splashed mud.
- Protection index: electrical equipment IP44.
- The protective grilles (accessory) are mandatory if the unit is installed in areas where the access is not controlled.



4 - CONNECTIONS

4.1 - HYDRAULIC CONNECTION

- Connect the water pipes to the corresponding connections:
 - PMERV/PMHRV 2088 to 2144 : male 2" 1/2 (66 x 76).
- 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).
- Condensate drainage may be connected: 2 fittings, for Ø 12 mm tubing, are provided at the rear under the finned batteries.

4.2 - ELECTRICAL CONNECTION

4.2.1 - GENERAL

- 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.
- For passing cables into the switch box, use the cable glands designed for this purpose.
- The electrical installation must comply with the standards and regulations applicable where the unit is being installed (in particular NFC 15-100 \sim CEI 364).
- The machine is intented for connection to the mains according to existing regulations.

4.2.2 - MAINS SUPPLY

• The power supply is 400V, three-phase, 50 Hz, connected directly on the power terminal located in the unit's electrical box (see wiring diagrams).

Place cable glands (not supplied) for the passage in the bottom of the box. **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 (\simeq CEI 364) with the following hypotheses:

- Maximum current.
- 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.

PMERV / PMHRV		2088	2100	2128	2144
Starting current	Α	200	220	240	290
Max. total current	Α	93	113	135	143
Power supply cable section	mm²	35	50	50	50
Length	m	200	200	200	200

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

4.2.3 - REMOTE CONTROL

- The unit is factory-wired for heating mode operation.
 - However, we recommend that operating mode change-over (heating/cooling) be controlled by connecting 2 good-quality, potential-free external contacts (not supplied):
 - 1 for the remote On/Off signal
 - contact closed = operation authorized,
 - contact open = off,
 - 1 for change-over of the operating mode
 - contact closed = heating mode,
 - contact open = cooling mode.

- The wiring of these contacts must not be routed near power cables in order to avoid electromagnetic disturbances.
- Max. connection cable length: 100 m, 1.5 mm².

CAUTION:

Mode changes (heating/cooling) are to be performed with the unit shutdown.

• These contacts are supplied with 24V by the generators control circuit.



4.2.4 - MISCELLANEOUS

• Alarm transfer

Change-over contact, potential free (5A resistive - 250 VAC max.) on the unit terminal strip for remote signalling (common terminal 25, contact NO 26, contact NF 27).

• Water circulating pump control (with PMERV) Normally open contact, potential free (5A resistive - 250 VAC max.) on the PMERV terminal strip (terminals 28 and 29).

5 - OPTIONS

5.1 - SAFETY PUMP OPTION for PMHRV - Code K 60 L 101 M

• The switchover of the electrical supply onto the 2nd pump is performed manually by a switch box placed near the pumps.

5.2 - 800 W ANTIFREEZE OPTION for PMHRV - Code K 60 C 010 M

- The immersion heater's power supply and control 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.
- Prior 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 immersion heater cover.
 - Note 1 : The immersion heater is equipped with an adjustable thermostat set at approximately 7°C.
 - Note 2 : Power to the immersion heater 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.



5.3 - REMOTE µCHILLER DISPLAY KEYBOARD

5.3.1 - USE

· Enables remote operation of the display keyboard (refer to paragraph 7.3).

Note: The display keyboard installed on the unit remains operational.

MAIN CHARACTERISTICS

- · Wall-mounted housing.
- IP 20.
- Operating temperature : 0°C to 50°C
- Storing temperature : -10°C to +60°C
- Humidity (HR)
- : 90% without condensation. Ambient pollution : Normal.
- Max. distance : 150 m.

5.3.3 - CONTROL MODULE INSTALLATION

5.3.2 - KIT CONTENTS

- 1 remote control unit with mounting screws.
- 1 interface board to be installed inside the remote control module.
 - Note 1: The accessory also includes an interface board connected to the unit's I/O board. This interface board is factory-installed.
 - Note 2: µCHILLER controls are factory-set for operation with 2 display keyboards. If one of the display keyboards is disconnected, the "Cn" message flashes on the other module's display. The uCHILLER setting maintains control of the machine.

Remote control



- Make the hole for the cable link.
- Install the control module base (see location of mounting holes opposite).
- · Connect the cable to the interface board MCHRET0000 (included in the kit) according to the wiring diagram in paragraph 4 and install the assembly in the module.
- Slide micro-switch N°1 (remote control address) to the "ON" position.

This micro-switch is located inside the remote control module.

- **NOTE:** The settings of the micro-switches on the back of the unit's display keyboard are not to be changed (position indicated in the unit's technical manual).
- · Install the control module onto its base with the supplied screws and screw covers.
- Start the installation and check that both display keyboard units operate.

Centering pins Rear view Micro-switch N° 1 keypad 🚓 address + 0=1 tern 1=2 term Interface board terminal OND 0 ± × × ė

5.3.4 - ELECTRICAL CONNECTION



Interface board

MCHERT0000

A - PRINCIPLE

B - CONNECTION DETAIL

- Type of cable:
 - 3 twisted pairs, shielded,
 - resistance < 80 mOhm/meter.
- Do not route this cable near power cables.
- Use a cable gland and grommet for passing the cable into the unit.

5.3.5 - DISPLAY KEYBOARD FUNCTIONS

• See complete details in the module's technical manual.



(*) Important information concerning operation of start-up/shut-down keys:

• With the remote control module, settings are factory-set for start-up (and selection of the Cooling/Heating mode for heat pump units) with the display keyboard keys.

In this case, the remote On/Off and Cooling/Heating inversion digital inputs are deactivated.

For special factory-set parameters (specify when ordering), these digital inputs may be configured to remain active.

In this case, the display keyboard's 🕷 and 🗱 keys are inactive.

6 - STARTING

6.1 - CHECK:

- That all hydraulic connections are properly tightened and that the hydraulic system functions correctly:
 - purge the circuits (on the PMHRV units, if a purge exists on the pump body),
 - position of valves,
 - hydraulic pressure.
- 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.

IMPORTANT:

If antifreeze is added (monopropylene glycol), a minium rate of 15% to 20% is needed to avoid any risk of corrosion.

If an add-on furnace is used in the installation, ensure that the anti-freeze used will not damage the furnace.

6.2 - STARTING-UP THE UNIT

- Power up the unit.
- Start the unit and the water circulation pump (for the PMHRV, the pump is controlled directly by the generator). See paragraph 7.5.



6.3 - CHECKS TO BE MADE

- Rotation direction of the fan(s) and the pump. If not, reverse 2 phases on the electrical power supply.
- Check HP and LP by passing the pressure tapping pipes through the hole provided (see pages 2 and 3). Also check the amperages as per the start-up data sheet.
- · Check water flow.

- Check control system operation.
- Water circuit pressure.
- **NOTE:** The hydraulic modules of the PMHRV models are fitted with a safety pressure switch which prohibits the water circulation pump, and thus the unit, from operating should circuit pressure be insufficient (cut-off 0.6 bar, engagement 1.4 bar).

7 - OPERATION OF μ CHILLER ELECTRONIC CONTROL

Temperature

· See wiring diagrams supplied with the machine.

7.1 - 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.

7.2 - PRINCIPLE

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

It continuously compares the water temperature measured by a probe (S1) and the setpoint temperature value entered via the keyboard.

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

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

• The **control** probe S1 is located on the **water inlet** in the factory.

7.3 - PRESENTATION

7.3.1 - DISPLAY KEYBOARD



Key for: Return to normal display/validation of parameters,

- Stopping audible alarm.
 - Incrementation of parameters.
- (3) Key for:
 - Decrementation of parameters.
- (4) Key for access to parameters.
- 5 LED display.
- (6a) Circuit A compressor on indicator light.
- (6b) Circuit B compressor on indicator light.
- (7) Cooling light ("Summer").
- 8 Heating light ("Winter")
- 9 Compressor operating hours x 100 light.

7.3.2 - POSITIONS OF THE MICRO-SWITCHES LOCATED AT THE BACK OF THE DISPLAY KEYBOARD



- (10) Connector for link with controller card.
- (1) Micro-switch for selection of number of display keyboards connected:

00 = 1 keyboard (standard setting), 01 = 2 keyboards.

- (12) Buzzer enable micro-switch ("ON" as standard).
- (13) Keyboard enable micro-switch ("ON" as standard).



7.3.3 - MAIN INPUT/OUTPUT BOARD



7.3.4 - ADDITIONAL INPUT / OUTPUT BOARD (for the 2nd refrigerating circuit)



7.3.5 - CTN TYPE TEMPERATURE PROBES

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

7.4 - OPERATING MODES





- The PMERV /PMHRV are wired in the factory to operate in heating mode.
- The operating mode (heating/cooling) can be switched remotely by connecting two external contacts (see paragraph 4.2.4 for details):
 - 1 contact for stopping by remote control (contact open = off contact closed = on),
 - 1 contact to change the mode (contact open = cooling contact closed = heating).
- Note: An automatic refrigerating circuit switchover system allows their operating time to be shared

7.5 - STARTING

• Initial condition:

- Machine hydraulically and electrically connected ready to operate.
- The remote operating mode selection (Heating/Cooling) is made.
- The remote On/Off selector is on "Off".
- Turn the installation on.
- The display comes on and shows the water temperature (read by the control probe S1).
- Place the remote On/Off selector on "On".
- The indicator lamp corresponding to the selected mode lights up:
 - indicator lamp (7) : Cooling,
 - indicator lamp (8) : Heating.
- The compressor "On" indicator lights (**6a**) and (**6b**) comes on if necessary (see diagram, paragraph 7.4). If the light flashes, it means that the compressor starting is required but that a safety delay is in progress. This light stays on when the compressor has started.
- To shut down the unit, place the remote On/Off selector on "Off". The operating mode indicator lights (7) and (8) and the compressor operation light (6) go off.

NOTE

The controller's anti-short-cycle system requires that the compressor operate for a minimum time period. In case of machine shutdown, the compressors may continue to operate for a certain period of time (150 seconds maximum).

CAUTION

Changing the operating mode (heating/cooling) must only be done when the machine is stopped.

7.6 - ADJUSTING AND DISPLAYING THE PARAMETERS

- Parameters accessible by pressing the **SEL** (4) key for 5 seconds.
- The display displays the code of the 1st parameter on the list ("r1" see below).
- By pressing the (2) or (3) keys, scroll through the parameter codes until you reach the one you want.
- Press **SEL** (4) to find out the value of the corresponding parameter.
- The value of the parameter can if necessary be changed using the \blacktriangle (2) and \bigtriangledown (3) keys.
- Press **SEL** (4) to re-display the parameter codes.
- To store the parameters which have been changed and to exit the adjustment procedure, press the **PRG** (1) key.

FILE SEL SEL SEL SEL S5 SEC

If during the adjustment procedure no key is pressed for 60 seconds (this period is indicated by the display flashing), the system **automatically** reverts to normal operation and display **w**

indicated by the display flashing), the system **automatically** reverts to normal operation and display **without storing** the latest parameter changes.

Code	Parameters	Factory setting	Installation setting	Adjustment range	Remarks
r 1	Set point Cooling («Summer»)	12 °C	-	12 to 25°C	Probe located on water return
r 2	Differential Cooling	2 K	-	0.1 to 11 K	
r 3	Set point Heating («Winter»)	40°C	-	25 to 45°C	Probe located on water return
r 4	Differential Heating	5 K	-	0.1 to 11 K	
r 6	Water outlet temperature (Probe S2 for anti-freeze)	-	-	-	
r 7	Unused (Probe S4)	-	-	-	
r 8	Air exchanger temperature, circuit A (Probe S3 defrosting / condensating)	-	-	-	
r 9	Air exchanger temperature, circuit B (Probe S5 defrosting / condensating)	-	-	-	Display only
c 9	Compressor hour meter, circuit A	-	-	-	
сA	Compressor hour meter, circuit B	-	-	-	
сC	Pump hour meter	-	-	-	

 The hour meters are zeroed by pressing simultaneously on the ▲ (2) and ▼ (3) keys.

NOTE:

- The configuration and settings of each machine is factory-set for optimal operation.
- Parameters can be adapted to suit special installations on request.

Consult us.



7.7 - ALARMS

- When an alarm occurs:
 - the bell rings (for 1 minute),
 - the alarm report is activated (make-break dry contact 5 A resistive 250 VAC max.),
 - the display flashes and the alarm message appears cyclically (see table below),
 - the machine stops if necessary (see table below).
- Stop the bell by pressing the PRG key (1).
- Remedy the fault.

IMPORTANT NOTE:

Any work must be done by qualified, experienced person.

• The alarm is cancelled automatically as soon as the fault is cleared (with the exception of the water output alarm).

WATER OUTPUT ALARM CASE

Reset the "water output" alarm manually by simultaneously pressing the (2) and (3) keys if the circulation pump control is used.

- At that moment:
 - the alarm report is de-activated,
 - the display reverts to normal (no flashing),
 - the machine can re-start (if it was stopped).





SUMMARY TABLE OF ALARMS

Alarm	Message	Inhibition delay (*)	Threshold (*)	Cancellation	Circuit A stop	Circuit B stop	Pump stop	Report	Remarks	
Fault on probe 1	E1	-	-	Auto	Х	Х	-	Х		
Fault on probe 2	E2	-	-	Auto	х	Х	-	Х	Actuates anti-freeze resistors	
Fault on probe 3 (circuit A)	E3	-	-	Auto	x	-	-	х		
Fault on probe 4	E4	-	-	-	-	-	-	-	Unused	
Fault on probe 5 (circuit B)	E5	-	-	Auto	-	х	-	Х		
Water flow rate	FL	30" on start-up 10" in operation	-	Auto	x	х	х	х	Alarm enabled if pump running	
Water heat exchanger frozen	A1	-	6°C	Auto	Х	Х	-	Х		
Circuit A H.P.	H1	-	Pressostat	Auto	х	-	-	х	Fan time delay stopped 1'	
Circuit A L.P.	L1	150" on start-up	Pressostat	Auto	Х	-	-	Х		
Compressor A maintenance	n1	-	10 000 h	Manual	-	-	-			
Circuit A thermal compressor	C1	-	Circuit breaker	Manual (**)	x	-	-	х	Alarm together with phase-sequence fault	
Circuit A thermal fan	F1	-	Circuit breaker	Manual (**)	х	-	-	х		
Defrosting too long circuit A	r1	-	10 mn	Auto	-	-	-	-	Self-cancellation with correct defrosting cycle	
Circuit B H.P.	H2	-	Pressostat	Auto	-	Х	-	Х	Fan time delay stopped 1'	
Circuit B L.P.	L2	150" on start-up	Pressostat	Auto	-	Х	-	Х		
Compressor B maintenance	n2	-	10 000 h	Manual	-	-	-	-		
Circuit B thermal compressor	C2	-	Circuit breaker	Manual (**)	-	х	-	х	Alarm together with phase-sequence fault	
Circuit B thermal fan	F2	-	Circuit breaker	Manual (**)	-	х	-	х		
Defrosting too long circuit B	r2	-	10 mn	Auto	-	-	-	-	Self-cancellation with correct defrosting cycle	
Memory error	EE	-	-	According to seriousness of fault	According to seriousness of fault	According to seriousness of fault	According to seriousness of fault	-	After-sales department operation to renew parameters or change the electronics	
Display link fault	Cn	-	-	According to seriousness of fault	According to seriousness of fault	According to seriousness of fault	According to seriousness of fault	-	After-sales department operation	
Supply voltage too low	EA	-	-	According to seriousness of fault	According to seriousness of fault	According to seriousness of fault	According to seriousness of fault	-	After-sales department operation	

NOTE: - (*) Factory settings.

- (**) Cancellation of the fault on the motor circuit breaker.

- The alarms are not activated when the machine is off (except for probe and memory faults).

7.8 - SPECIAL OPERATING FEATURES

7.8.1 - ANTI-FREEZE PROTECTION OF WATER HEAT EXCHANGER

- 2 functions performed:
 - control of a antifreeze heater,
 - anti-freeze alarm stopping the machine.
- Operating diagram (see opposite).

The setting of these thresholds can be changed in the factory on request to suit the machine's operating conditions.

Freeze alarm Resistor control $4^{\circ}C$ 5°C 6°C 7°C 8°C

7.8.2 - CIRCULATION PUMP CONTROL

- A normally-open contact (5A resistance -250VAC max.) is available on the terminal strip of PMERV units (see schematic) for water circulation pump control.
- The pump is controlled as soon as the machine is started up.

- The pump stops when the machine is stopped (by remote control stop contact) after a time delay of 5 minutes (the time delay is active if the compressor has been running).
- NOTE: This signal is used directly on the PMHRV to control pump of the hydraulic module.

7.8.3 - POWER CUT

• If the power is cut to the control circuits, the electronic control unit returns to the operating mode it was in before the power was cut and the parameters are still stored in memory when the power is restored.

7.8.4 - PROPORTIONAL HEAD PRESSURE CONTROL

- The devices are equipped in the factory with 2 fan voltage variators (1 per refrigerant circuit) controlled by the μ CHILLER electronic control.
- Using the information on condensating temperature (acquired by sensors S3 and S5 mounted on the condenser), the control varies the supply voltage of the motor fans as shown in the diagram opposite.

7.8.5 - REMOTE "µCHILLER" DISPLAY KEYBOARD (OPTIONAL)

- Enables transfer of display keyboard functions up to 150 m.
- See details in paragraph 5.3.

IMPORTANT NOTES:

- With this accessory, the μ CHILLER control is factory-configured for startup using the specific cooling \mathbb{H} or \mathbb{H} heating keys on the display keypad. In this case, the digital **On/Off** and **Remote Heating/Cooling Inversion** inputs are **Inactive**.
- By special factory-set parameters (specify when ordering), these digital inputs may remain active. In this case, the cooling 🛞 and heating 🛞 keys on the display keypad are inactive.

7.8.6 - DEFROSTING (In heating mode only)

- The control is regulated to operate as follows:
 - If the temperature detected by probe S3 or S5 is less than -5°C (for at least 10 seconds), the machine starts de-icing (switching of cooling cycle and stopping of fan) until the temperature read by S3 or S5 rises to 20°C.
 However, the duration of a de-icing phase is limited to 10 minutes. If de-icing is stopped by this time delay, alarm "r1" or "r2" appears on the display.
 - A period of 40 minutes must pass before a new de-icing phase can start.
 - For special operating conditions, it may be necessary to change these settings. In this case, contact the after sales service.
- NOTE: Message "d1" appears on the display during the defrosting phase.
 - Defrosting is performance separately on each of the refrigerating circuits. An inhibition delay (10 min.) enables defrosting of the 2nd circuit to be delayed.

7.8.7 - CYCLE INVERSION VALVE

• The valve is actuated in cooling mode.

7.8.8 - STARTING THE COMPRESSORS

• In order to reduce start-up currents:

- the triggering of the 2nd cooling circuit is delayed (control parameter C4 set at 10 seconds),
- the triggering of the 2nd compressor of a cooling circuit is delayed (time delay unit on the compressor switch set at approximately 5 seconds).

8 - MAINTENANCE INSTRUCTIONS

· Carry out the following operations at least once a year

(the frequency depends on the installation and operating conditions):

- Cleaning the air exchanger.
- Checking the wear parts.
- Checking the operating set points and temperatures.
- Check the refrigerant circuit in accordance with the regulations in force.
- Checking the safety devices.
- De-dusting the electrical equipment cabinet.
- Checking that the electrical connections are secure.
- Checking the earth connection.
- Check for leaks.
- Check the operation and parameters as per the start-up data sheet.
- Clean the filter on the hydraulic system.
- For the PMHRV : check the pump, water pressure, filter cleanliness,...
- Check the hydraulic system in accordance with established trade practices.
- A new filter dryer must be installed after all servicing operations performed on the refrigerant circuit.

IMPORTANT NOTE: Before carrying out any work on the machine, 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.



START-UP DATA SHEET

PMERV / PMHRV		Range PMERV/PMHRV 2088 to 2144				
Code:		_				
Serial Number:						
Started by:		Company:	Site:	Date:		
Voltage measured on unit	V	L1-L2	L2-L3	L3-L1		
FANS						
Measured amperage, circuit A A/	/phase	L1	L2	L3		
Circuit breaker thermal setting	Α					
Measured amperage, circuit B A/	phase	L1	L2	L3		
Circuit breaker thermal setting	Α					
COMPRESSORS		_				
Measured amperage, circuit A A/	phase	L1	L2	L3		
Circuit breaker thermal setting	Α					
Measured amperage, circuit B A/	/phase	L1	L2	L3		
Circuit breaker thermal setting	Α					
HEAD PRESSURE CONTROL						
Setting						
SENSORS						
Ambient temperature						
Ambient thermostat set point						
Water thermostat setting						
Differential setting						
Temperature sensor located at:			Inlet	Outlet		
Antifreeze setting						
Differential setting						
TEMPERATURES (°C) / PRESSURES (b	oar)					
Outside temperature						
Water type		Pure	Glycol	% Glycol		
Water inlet, generator						
Water outlet, generator						
Water circuit pressure						
Water flow rate						
ΔΤ:						
		Circuit A		Circuit B		
Suction, compressor						
Discharge, compressor						
Inlet, thermostatic expansion valve						
Outlet, thermostatic expansion valve						
Condensing pressure						
Evaporating pressure						
Superheating = (Compressor suction t	empera	ture - Evaporating temper	ature) = 7 to 8°C			
Sub-cooling = (Condensating tempera	ture - E	xpansion valve inlet temp	erature) = 3 to 5°C			

START-UP DATA SHEET

PMERV / PMHRV Code:		μCHILLER PARAMETER SETTINGS Standard application						
Serial N	umber:		e contra de esperior					
Started I	oy:	Company:	Site:	Date:				
	1							
Code	Description				Factory	Setting		
					value			
1	SENSOR							
6	Sensor S1 calibration			°C	0			
7	Sensor S2 calibration			°C	0			
8	Sensor S3 calibration			°C	0			
9	Sensor S4 calibration			°C	0	not applicable n/a		
а	Sensor S5 calibration			°C	0			
b	Digital filter				2			
С	Water inlet limit				12			
d	Unit of measure (0=°C / 1=°F)				0			

r	REGULATOR			
1	Summer set point (cooling)	۵°	12	
2	Summer differential (cooling)	°C	2	
3	Winter set point (heating)	°C	40	
4	Winter differential (heating)	°C	5	
5	Compressor change-over		0	
A	Min. summer set point (cooling)	°C	12	
b	Max. summer set point (cooling)	°C	25	
C	Min. winter set point (heating)	°C	25	_
d	Max. winter set point (heating)	°C	45	
C	COMPRESSOR	1	450	
1	Min. run time	S 10 c	150	
2	Min down time	10 s	5	
3	Time between two start-ups	10 \$	30	-
4	2 nd refrigerant circuit start-uptime delay	S	10	
6	Start-up time delay at power up	5	0	-
7	Compressor start-up delay after pump start-up	5	30	-
8	Pump shut-down time delay after machine shut-down	mn	5	-
b	Maintenance alarm threshold	b x 100	100	
F	FAN		100	
2	Operating mode (0=always ON/1=con cp/2=set_TOR/3=prop_set)		3	
5	Temperature summer min speed (cooling)	0	25	
	Pressure summer min speed (cooling)		20	not applicable
6	Temperature, summer max speed (cooling)	°C	50	
	Pressure, summer max speed (cooling)			not applicable
7	Temperature, winter min. speed (heating)	°C	50	not applicable
	Pressure, winter min. speed (heating)			not applicable
8	Temperature, winter max speed (heating)	°C	50	not applicable
	Pressure, winter max. speed (heating)			not applicable
9	Temperature, summer, stop fan (cooling)	°C	22	
	Pressure, summer stop fan (cooling)			not applicable
A	Temperature, winter, stop fan (heating)	°C	50	not applicable
	Pressure, winter, stop fan (heating)			not applicable
b	Delay, start-up fan full speed	4 s	5	
d	DEFROSTING			
1	Activation (0 = no $/ 1 = yes$)		1	
2	Mode (0 = time / 1 = temperature)		1	
3	Defrost start temperature	°C	-5	
	Defrost start pressure	bar		not applicable
4	Defrost end temperature	°C	20	
	Defrost end pressure	bar		not applicable
5	Min. time for triggering defrost	S	10	
6	Min. defrost duration time	S	0	
/	Max. defrost duration time	mn	10	
8	Delay between 2 defrost operations	mn	40	
9	Delay defrost context activation	mn	10	not oppliaable
A b	End demost contact activation Heating activation during defrecting		0	not applicable
0	Complete stop time defrest start	mn	0	
 	Complete stop time defrost and	mn	0	-
 	End defrost with 2 refrige circuits and 1 fan		0	not applicable
Δ	ANTIFREEZE		0	
1	Antifreeze alarm threshold	℃	6	
2	Antifreeze alarm differential		2	
3	Antifreeze alarm restraint time delay at start-up	s	0	
4	Antifreeze resistance triggering threshold	- °Č	6	
5	Antifreeze resistance differential	- Č	2	
P	ALARM			
1	Water output alarm restraint time delay at pump start-up	S	30	
2	Water output alarm restraint time delay while in operation	S	10	
3	LP alarm restraint time delay at compressor start-up	S	150	
4	Siren duration	mn	1	
Н	GENERAL			
1	Machine model PMERV - PMHRV		3	
2	Number of fans		1	
3	Number of evaporators (0= one single exchanger)		1	
4	Multi-pressure compressor (0=no)		0	
5	Pump operating mode		1	
6	Remote summer/winter changeover (0=no / 1=yes)		0/1	
7	Remote on/off control (0=no / 1=yes)		0/1	
8	Number of user keyboards (0= 1 keyboard / 1= 2 keyboards)		0	
9	Keyboard authorization		1	
A	Series address		1	
b	Remote control password		0	

9 - REFRIGERANT PRESSURE CURVES



10 - HEATING PRESSURE CURVES





Due to our policy of continuous development, our products are liable to modification without notice.



R.D. 28 Reyrieux BP 131 01601 Trévoux CEDEX France Tel. 33 4 74 00 92 92 - Fax 33 4 74 00 42 00 R.C.S. Bourg-en-Bresse B 759 200 728