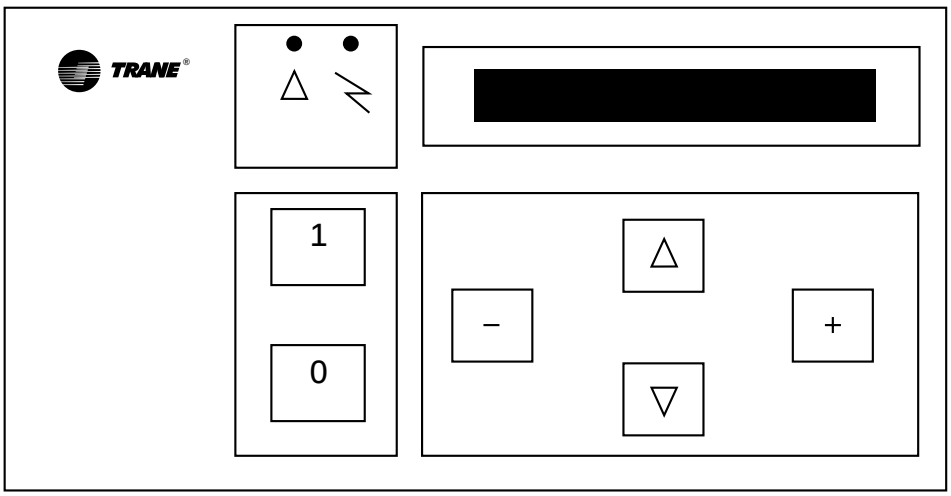
SMM
Configuration SMM Module for Scroll Units, H Generation

Installation
Operation
Maintenance



Quality Management System Approval

Foreword

These installation, operation and maintenance instructions are given as a guide to good practice in the installation, putting into service, operation, and maintenance by the user, of Trane SMM chillers.They do not contain full service procedures necessary for the continued successful operation of this equipment. The services of a qualified technician should be employed through the medium of a maintenance contract with a reputable service company.

Warranty

Warranty is based on the general terms and conditions of Société Trane or Trane UK Ltd. The warranty is void if the equipment is repaired or modified without the written approval of Trane, if the operating limits are exceeded or if the control system or the electrical wiring is modified.
Damage due to misuse, lack of maintenance or failure to comply with the manufacturer's instructions or recommendations is not covered by the warranty obligation.
If the user does not conform to the rules of chapter "Maintenance", it may entail cancellation of warranty and liabilities by Trane.

Reception

On arrival, inspect the unit before signing the delivery note. Specify any damage on the delivery note, and send a registered letter of protest to the last carrier of the goods within 72 hours of delivery. Notify the local Trane Sales Office at the same time.
The unit should be totally inspected within 7 days of delivery. If any concealed damage is discovered, send a registered letter of protest to the carrier within 7 days of delivery and notify the local Trane Office.
Units are shipped with the refrigerant operating or holding charge and should be examined with an electronic leak detector to determine the hermetic integrity of the unit. The refrigerant charge is not included in the standard Trane Warranty Cover.

General information

About this manual

Cautions appear at appropriate places in this instruction manual. Your personal safety and the proper operation of this machine require that you follow them carefully.
The constructor assumes no liability for installations or servicing performed by unqualified personnel.

About the unit

These SMM units are assembled, pressure tested, dehydrated, charged and run tested before shipment. The information contained in this manual applies to units designated SMM.

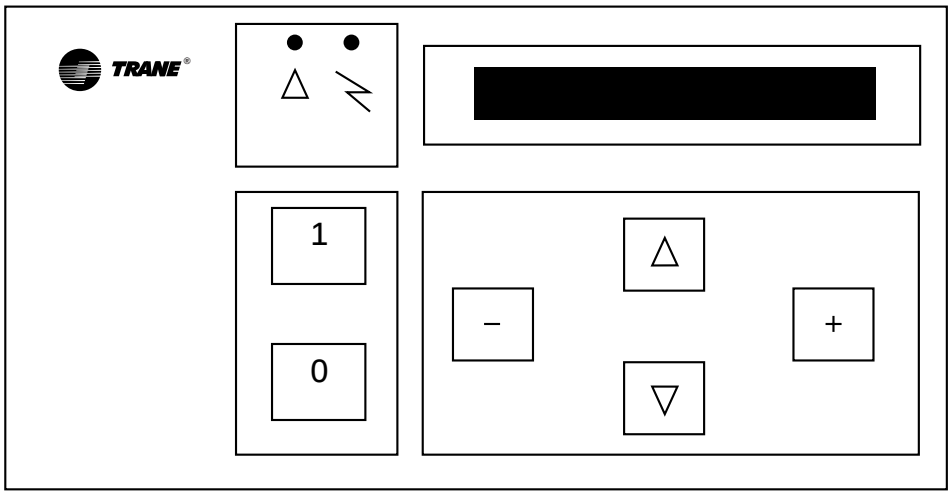
Refrigerant

The refrigerant provided by Société Trane or Trane UK Ltd meets all the requirements of our units. When using recycled or reprocessed refrigerant, it is advisable to ensure its quality is equivalent to that of a new refrigerant. For this, it is necessary to have a precise analysis made by a specialized laboratory. If this condition is not respected, the Société Trane or Trane UK Ltd warranty could be cancelled.

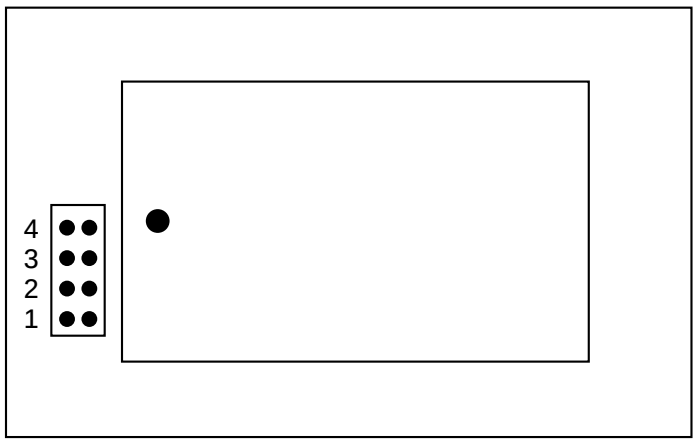
Content

Hardware

Base Module



Auxiliary Module



When the jumper is in position 1, the auxiliary module is used to control the circuit 2.
When the jumper is in position 2, the auxiliary module is used to control the fans.
When the jumper is in position 3, the auxiliairy module is used to control the leaving hot water temperature.
When the jumper is in position 4, the auxiliary module is used to allow to display the evaporator and condenser inlet water temperatures.

Operation of the module

Function of keys O and 1

The key 1 is used to allow the start of the compressor.

The key O is used to stop the chiller.
When the operator press on key O, the following message appears :

A operator stop

How to reset the SMM?

Press on the key “1”.
The hour and the leaving chilled water temperatures are displayed.

The orange LED is switched off.

Notes
If one of the following faults is displayed :
- M comp A1 fault
- M comp A2 fault
- M comp B1 fault
- M comp B2 fault

the corresponding overload relays must be reset before to reset the SMM.

If one of the following faults is displayed
- M CKT 1 fault
- M CKT 2 fault

the corresponding high pressure pressostats must be reset before to reset the SMM.

How to have access to the menu A?

Press 1 time on the key ▽
The following message appears

**** A ****

Press 1 time on the key +

Chilled water set point is displayed.

A 01	Value °C

To have access to the following information, press the key ▽

To exit the menu press the key △ during a few seconds.

Information contained in the menu A
- A01 Active water setpoint
- A02 Evaporator water outlet mix temperature
- A03 Circuit 1 evaporator water outlet temperature
- A04 Circuit 2 evaporator water outlet temperature
- A05 Air temperature
- A06 Number of compressor A1 operating hours
- A07 Number of compressor A1 starts
- A08 Number of compressor B1 operating hours
- A09 Number of compressor B1 starts
- A10 Number of compressor A2 operating hours
- A11 Number of compressor A2 starts
- A12 Number of compressor B2 operating hours
- A13 Number of compressor B2 starts.

How to have access to the menu B?

Press twice on the key ▽
The following message appears

**** B ****

Press 1 time on the key +
The leaving chilled water temperature set point value is displayed.
To change the value, press on the keys + or -
To have access to the following parameters, press on the key ▽
To change the value of these parameters, press on the keys + or -
To exit this menu, press the key △ during a few seconds.

Parameters which can be modified in the menu B

B01 Evaporator outlet temperature setpoint
Setting -26.0°C to 30.0°C by 0,1 °C increment. Default value 6.0.
B02 Hot water outlet temperature setpoint
Setting 20.0°C to 60.0°C by 0,1 °C increment. Default value 45.0.
B03 Auxiliary water outlet temperature sepoint
Setting - 26.0°C to 60.0°C by 0,1 °C increment. Default value 6.0.
B04 Circuit 1 ON validation
Enabled circuit : Enable. Disabled circuit : Disable. Default value : Enable
B05 Circuit 2 ON validation
Enabled circuit : Enable. Disabled circuit : Disable. Default value : Enable
B06 Operating mode
Cooling mode : Cooling Heating mode : Heating
Serial link control : Extern Default value : Cooling
B07 Remote control validation
Remote control : Remote
Local control : Local
Default value : Local
B08 Auxiliary setpoint validation
Enabled circuit : Enable. Disabled circuit : Disable. Default value : Disable
B09 Current date display
B091 day - setting 1 to 31
B092 month - setting 1 to 12
B093 year - setting 00 to 99.
B10 Current hour display
B101 hour - setting 00 to 23
B102 Minutes - setting 00 to 59
B103 Seconds - setting 00 to 59.
B11 Set this parameter at 0,0 °C
B12 Set this parameter at 0,0 °C
B13 Set this parameter at 0,0 °C

How to have access to the menu C?

Press 3 times on the key ▽
The following message appears

**** C ****

Press 1 time on the key +

The last fault is displayed.
Press successively on the key + to display the last 20 faults
Press succesively on the key - to display the last fault.

To exit this menu, press during a few seconds on the key △.
This menu is used also to reset the SMM (see parapragh How to reset the SMM ?)

How to have access to the menu D?

Press 4 times on the key ▽
The following message appears

**** D ****

Press 1 time on the key +
The following message appears

D01 None

To change the value, press on the keys + or -
To have access to the following parameters, press on the key ▽
To change the values of these parameters, press on the keys + or -.
To exit this menu, press on the key △ during a few seconds.

Parameters which can be modified in the menu D

D01 Cooling setpoint reset type
None : None - On air : Air - On water : Ret. Wat. - Default value : None
D02 Cooling reset starting value
Setting 2°C to 55°C by 0,1°C increment. Default value 20.0.
D03 Cooling reset value range
Setting 2°C to 20°C by 0.1 °C increment. Default value 10.0.
D04 Cooling reset range
Setting -15°C to 15°C by 0.1 °C increment. Default value 5.0.
D05 Heating setpoint reset type
None : None - On air : Air - On water : Ret. Wat. - Default value : None
D06 Heating reset starting value
Setting 2°C to 55°C by 0,1°C increment. Default value 20.0.
D07 Heating reset value range
Setting 2°C to 20°C by 0.1 °C increment. Default value 10.0.
D08 Heating reset range
Setting -15°C to 15°C by 0.1 °C increment. Default value 5.0.

D09 Generic input type

0..10 Volts	0..10 V
2..10 Volts	2..10 V
0.20 mA	0..20 mA
4..20 mA	4..20 mA
Default value	0..10 V

10 V or 20 mA lead to a chilled water temperature set point reset of 20 °C.

D10 Evaporator pump stop timer
Setting 1 to 10 mn by 1 mn increment. Default value 1.

D11 Evaporator water pump automatical cleaning

None	None
6 hours	6 H
12 hours	12 H
24 hours	24 H
48 hours	48 H
Default value	None

D12 Compressor lead-lag

Increasing fix	1-2
Decreasing fix	2-1
Start and hour balancing	Auto
Automatic inversion at each start	TRANE
Default value	TRANE

The parameters D13 and D14 are used to determine the conditions under which the fault relays switch on.

D13 Default 1 report type		Displayed value
Unit or circuit 1 manual reset default	bit 0	1
Unit or circuit 2 manual reset default	bit 1	2
Unit or circuit 1 automatic reset default	bit 2	4
Unit or circuit 2 a utomatic reset default	bit 3	8
Circuit 1 not available or in limit	bit 4	16
Circuit 2 not available or in limit	bit 5	32
Informational default on unit	bit 6	64
Default value	1	

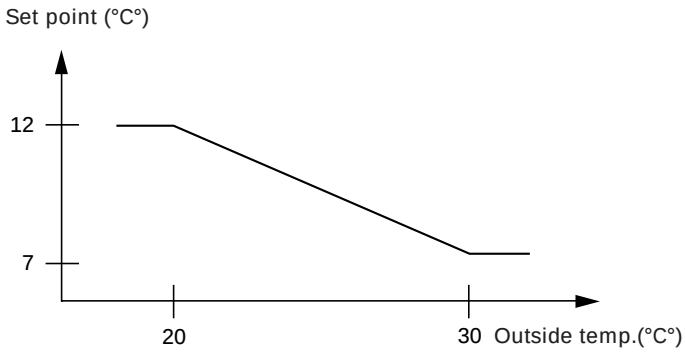
D14 Default 2 report type		
Unit or circuit 1 manual reset default	bit 0	1
Unit or circuit 2 manual reset default	bit 1	2
Unit or circuit 1 automatic reset default	bit 2	4
Unit or circuit 2 automatic reset default	bit 3	8
Circuit 1 not available or in limit	bit 4	16
Circuit 2 not available or in limit	bit 5	32
Informational default on unit	bit 6	64
Default value	2	

Example : on a 2 circuit unit, we wish that the fault relay 1 (D13) switches on if a manual or an automatic reset fault occur. i.e.in the cases corresponding to the bits 0, 1, 2, and 3. In this case, we have to display the value 15 (1+2+4+8)

D15 Serial link address
Setting 0 to 62. Default value 0.

Example of programmation of the chilled water temperature set point in function of the air temperature

Expected operation



Values to be programmed

Parameter	Value
B01	12,0
D01	Air
D02	20,0
D03	10,0
D04	-5,0

Use

For comfort type application, increasing the reset point when the air temperature decreases allows to obtain better C.O.P. at part load, so to decrease the energy consumption.

How to have access to the menu E?

Press 5 times on the key ▽
The following message appears

**** E ****

Press 1 time on the key +

The saturated refrigerant temperature inside circuit 1 evaporator is displayed.

E 01 value °C

To have access to the following information, press on the key ▽

To exit this menu, press on the key △ during a few seconds.

Information contained in the menu E

E01 Circuit 1 evaporator saturated temperature
E02 Circuit 1 evaporator saturated pressure
E03 Circuit 1 condenser saturated temperature
E04 Circuit 1 condenser saturated pressure
E05 Circuit 2 evaporator saturated temperature
E06 Circuit 2 evaporator saturated pressure
E07 Circuit 2 condenser saturated temperature
E08 Circuit 2 condenser saturated pressure
E09 Evaporator water inlet temperature
E10 Condenser water outlet temperature
E11 Condenser water inlet temperature

Explanation of the fault codes

Displayed messages	Description	Action
I Service demand	Service request on the unit : one of the compressor configurated as presently has reached the value 1	Contact Trane Service Agency
I E2P par. chg	When powering-up the module, one or more of the operating parameters in E2PROM was incorrect and has been corrected (default value). Check the configuration.	Check the configuration
I XRAM par. chg	When powering-up the module, one or more of the operating parameters in XRAM was incorrect and has been corrected (default value). Check the configuration.	Check the configuration
I E2P par. prog.	When powering-up the module, all the operating parameters in EPROM were incorrect and have been replaced by their default value. Make the configuration.	Check the configuration
A User ckt1 stop	Circuit 1 is forced to stop due to the operator's configuration (menu B04)	For info only. No necessary action
A User ckt2 stop	Circuit 2 is forced to stop due to the operator's configuration (menu B05)	For info only. No necessary action
A Ext. ckt1 stop	Circuit 1 is forced to stop due to an external cause, by the O/I input Auto/Stop 1.	For info only. No necessary action
A Ext ckt2 stop	Circuit 2 is forced to stop due to an external cause, by the O/I input Auto/Stop 2.	For info only. No necessary action
A Rem. ckt1 stop	Circuit 1 is forced to stop by the serial link.	For info only. No necessary action
A Rem. ckt2 stop	Circuit 2 is forced to stop by the serial link.	For info only. No necessary action
A User unit stop	Unit is forced to stop due to the operator's configuration. On single circuit units, this message is displayed if circuit 1 is devalidated (menu B04). On dual circuit this message is displayed if both circuits 1 and 2 are devalidated (menu B04 and menu B05)	For info only. No necessary action
A Ext. unit stop	Unit is forced to stop due to an external causes. On single circuit units, this message is displayed if circuit 1 is devalidated (O/I input Auto-Stop 1). On dual circuit units, this message is displayed if both circuits 1 and 2 are devalidated (O/I input Auto/Stop 1 and Auto/Stop 2).	For info only. No necessary action
A Rem. unit stop	Unit is forced to stop by the serial link. On single circuit units, this message is displayed if circuit 1 is devalidated by the serial link. On dual circuit units, this message is displayed if both circuits 1 and 2 are devalidated by the serial link.	For info only. No necessary action
A Operator stop	The unit is stopped by the operator who has pushed key O.	For info only. No necessary action
I E2prom fault	A default occured when writing information in E2PROM. The value in memory may not be right and thus corrected at next powering-up.	Switch off the SMM during 5 seconds
A Ckt1 limiting	One of the compressors of circuit 1 is prevented to start because one of the limitation is active (evaporator 1 outlet water temperature below the evaporator outlet water temperature low setpoint, evaporator 1 refrigerant temperature below the refrigerant temperature low setpoint, evaporator outlet temperature too high).	For info only. No necessary action
A Ckt2 limiting	One of the compressors of circuit 2 is prevented to start because one of the limitation is active (evaporator 2 outlet water temperature below the evaporator outlet water temperature low setpoint, evaporator 2 refrigerant temperature below the refrigerant temperature low setpoint, evaporator outlet water temperature too high). NB : this message can be displayed on 3 compressor units but without any influence on the operation of circuit 2.	For info only. No necessary action

Displayed messages	Description	Action
A Ckt1 HP limit.	The condenser side refrigerant pressure on circuit 1 is too high, and the system reduces the number of compressors in operation until its complete stop if necessary.	Check condenser cleaning and fan state.
A Ckt2 HP limit.	The condenser side refrigerant pressure on circuit 2 is too high, and the system reduces the number of compressors in operation until its complete stop if necessary.	Check condenser cleanliness and fan state.
A Low ambience	The outdoor air temperature is lower than the low ambient setpoint.	For info only. No necessary action
A Ckt1 defrost	Circuit 1 is de-icing and thus preventing the operation of circuit 2 (if present)	For info only. No necessary action
A Ckt2 defrost	Circuit 2 is de-icing and thus preventing the operation of circuit 1.	For info only. No necessary action
A EVP water flow	Loss of evaporator water flow during more than 2 sec. If one of the compressor was operating, then the default LED is lit, if not, it is not lit.	Check chilled water pump state.
A Sensor 4 main	The customer analogical input is configurated as 2..10V or 4..20 mA and the signal is lower than 1V or 2mA.	Check configuration of parameter D09 and analogic inlet.
A Sensor 1 I/O 2	Sensor 1 (air temperature) of module I/O 2 is out of range (short circuit < -40°C, or circuit open > 80°C).	Change the sensor.
A Sensor 1 I/O 3	Sensor 1 (condenser water outlet temperature) of module I/O 3 is out of range (short circuit < -40°C, or circuit open > 80°C).	Change the sensor.
A Sensor 1 I/O 4	Sensor 1 (evaporator water inlet temperature) of module I/O 4 is out of range (short circuit < -40°C, or circuit open > 80°C).	Change the sensor.
A Sensor 1 main	Sensor 1 (evaporator 1 water outlet temperature) of the main module is out of range (short circuit < -40°C, or circuit open > 80°C).	Change the sensor.
A Sensor 2 main	Sensor 2 (evaporator 1 refrigerant saturated temperature) of the main module is out of range (short circuit < -40°C, or circuit open > 80°C).	Change the sensor.
A Sensor 3 main	Sensor 3 (evaporator 1 refrigerant saturated temperature) of the main module is out of range (short circuit < -40°C, or circuit open > 80°C).	Change the sensor.
A Sensor 1 I/O 1	Sensor 1 (evaporator 2 water outlet temperature) of module I/O 1 is out of range (short circuit < -40°C, or circuit open > 80°C).	Change the sensor.
A Sensor 2 I/O 1	Sensor 2 (evaporator 2 refrigerant saturated temperature) of module I/O 1 is out of range (short circuit < -40°C, or circuit open > 80°C).	Change the sensor.
A Sensor 3 I/O 1	Sensor 3 (condenser 2 refrigerant saturated temperature) of module I/O 1 is out of range (short circuit < -40°C, or circuit open > 80°C).	Change the sensor.
A Com I/O 1	The main module does not communicate anymore with module I/O 1. Check the link wiring with this module as well as its address (circuit 2 board)	Check the link wiring
A Com I/O 2	The main module does not communicate anymore with module I/O 2. Check the link wiring with this module as well as its address (air-cooled unit board)	Check the link wiring
A Com I/O 3	The main module does not communicate anymore with module I/O 3. Check the link wiring with this module as well as its address (reversible unit board)	Check the link wiring
A Com I/O 4	The main module does not communicate anymore with module I/O 4. Check the link wiring with this module as well as its address (option board)	Check the link wiring

Displayed messages	Description	Action
M Fan inverter 1	Speed variator number 1 shows a problem during a period longer than authorized. No circuit stop.	Not used
M Fan inverter 2	Speed variator number 2 shows a problem during a period longer than authorized. No circuit stop.	Not used
A Fan protection	One of the fan circuit breaker has tripped-out.	Check fan state
M Low ref. ckt1	Evaporator 1 refrigerant saturated temperature has overtaken the refrigerant low temperature setpoint.	Check expansion valve state and refrigerant load
M Low ref. ckt2	Evaporator 2 refrigerant saturated temperature has overtaken the refrigerant low temperature setpoint.	Check expansion valve state and refrigerant load
M Low water ckt1	Evaporator 1 water outlet temperature has overtaken the evaporator water low temperature setpoint.	Check chilled water flow
M Low water ckt2	Evaporator 2 water outlet temperature has overtaken the evaporator water low temperature setpoint.	Check chilled water flow
M Pressure ckt1	Circuit 1 has been put in consecutive stand-by too near : thus it is stopped.	Check condenser cleanliness
M Pressure ckt2	Circuit 2 has been put in consecutive stand-by too near : thus it is stopped.	Check condenser cleanliness
M Discharge ckt1	One of the circuit 1 compressors has operated during a too long period with a high discharge temperature : thus it is stopped.	Check refrigerant load
M Discharge ckt2	One of the circuit 2 compressors has operated during a too long period with a high discharge temperature : thus it is stopped.	Check refrigerant load
M Bypass ckt1	The hot gas by pass valve, used as an anti-freeze protection has been requested during too long a period : the circuit 1 is stopped.	Not used
M Bypass ckt2	The hot gas by pass valve, used as an anti-freeze protection has been requested during too long a period : the circuit 2 is stopped.	Not used
M Comp. A1 fault	The compressor A1 default I/O input shows a default.	Reset the overload relay of compressor A1
M Comp .B1 fault	The compressor B1 default I/O input shows a default.	Reset the overload relay of compressor B1
M Comp. A2 fault	The compressor A2 default I/O input shows a default.	Reset the overload relay of compressor A2
M Comp. B2 fault	The compressor B2 default I/O input shows a default.	Reset the overload relay of compressor B2
M ckt1 fault	HP or LP fault on circuit 1	Reset pressostat HP, circuit 1
M ckt2 fault	HP or LP fault on circuit 2	Reset pressostat HP, circuit 2
M Unit fault	All the present compressor default I/O inputs simultaneously show a default.	Reset pressostats and thermal relays

Note
The first letter of the displayed message indicates the type of default
I = for information
A = automatic reset default
M = manual reset default.

Notes

Safety recommendations

To avoid accidents and damage, the following recommendations should be observed during maintenance and service visits :

1. The maximum allowable pressures for system leak testing on low and high pressure side are given in the chapter "Installation". Always provide a pressure regulator.
2. Disconnect the main supply before any servicing on the unit.
3. Service work on the refrigeration system and the electrical system should be carried out only by qualified and experienced personnel.

Maintenance contract

It is strongly recommended that you sign a maintenance contract with your local Service Agency. This contract provides regular maintenance of your intallation by a specialist in our equipment. Regular maintenance ensures that any malfunction is detected and corrected in good time and minimizes the possibility that serious damage will occur. Finally, regular maintenance ensures the maximum operating life of your equipment. We would remind you that failure to respect these installation and maintenance instructions may result in immediate cancellation of the warranty.

Training

The equipment described in this manual is the result of many years of research and continuous development. To assist you in obtaining the best use of it, and maintaining it in perfect operating condition over a long period of time, the constructor have at your disposal a refrigeration and air conditioning service school. The principal aim of this is to give operators and maintenance technicians a better knowledge of the equipment they are using, or that is under their charge. Emphasis is particularly given to the importance of periodic checks on the unit operating parameters as well as on preventive maintenance, which reduces the cost of owing the unit by avoiding serious and costly breakdown.

For additional information, contact :

Distributor / Installer stamp

L80 IM 022 GB - 0697 •
Supersedes L80 IM 022 E - 1196

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