Microface

(Microface, Microface E, Microface 24DC)

Hiromatic G

HPAC units

User Manual

English

cod. 271618/272038 - rev. 30.03.2001

INDEX

1. Foreword

This User Manual describes the Microface Control System. It contains information concerning the architecture of the control system as well as the settings reguired to obtain the desired behaviour. The Microface Control System can be used effectively to manage all the operating functions of air conditioning and chiller units. It can be used also to monitor and control also other special units, dependind on the EPROM (an integrated circuit that can be easily replaced) installed on Microface electronic card.

The following is the content of the manual:

Chapter 2. General description of Microface.
Chapter 3. General description of Hiromatic G.
Chapter 4. How to start the first time units equipped with Microface Control System.
Chapter 5. How to update the software of units equipped with Microface Control System.
Chapter 6. Spare parts list.
Chapter 7. Alarm list.
Chapter 8. Parameter table. Some parameters listed in the table are available only with Hiromatic G.
Chapter 9. Glossary. It is possible to find here the meaning of the parameters listed in the Parameters table. The items in the definitions that are defined in the Glossary are identified by an asterisk (*) and with the *italic style*.
Chapter 10. Microface inputs and outputs. This chapter includes information concerning inputs and outputs definition depending on the EPROM installed on Microface electronic card.
Chapter 11. Connection guide. This chapter contains, in a schematic way, information on electrical connections between the Microface Control System and the electrical panel in which Microface Control System is fitted. **For more details on electrical connections, please refere to the electrical diagrams of the unit**.

2. Microface

2.1 INTRODUCTION

Microface is the microprocessor-based electronic card able to manage the devices and the sensors installed on the unit.
Microface is installed in the electrical panel of the unit together with a input/output interface module, equipped with an LCD (*Liquid Crystal Display*), that displays the values read by the sensors, the parameters and alarms and with three push-buttons to change the setting of the control system.
Through the data transmission bus, called *HIROBUS*, the networking of up to sixteen[1] units controlled by Microface, is possible; the so-connected units can exchange data operating like a single big system. To avoid any problem, each Microface must be assigned an address (from 1 to 16) by properly setting the jumpers on the card (for further details see the following sections).
Moreover, by *HIROBUS* it is possible to connect Hiromatic G to the Microface network.
Hiromatic G is a microprocessor-based electronic device that permits to get information about the status of all the units of the network and to change the settings from a single graphic entry point.

2.2 MICROFACE CONTROL SYSTEM MODULES

The Microface Control System consists of two different interconnected modules:

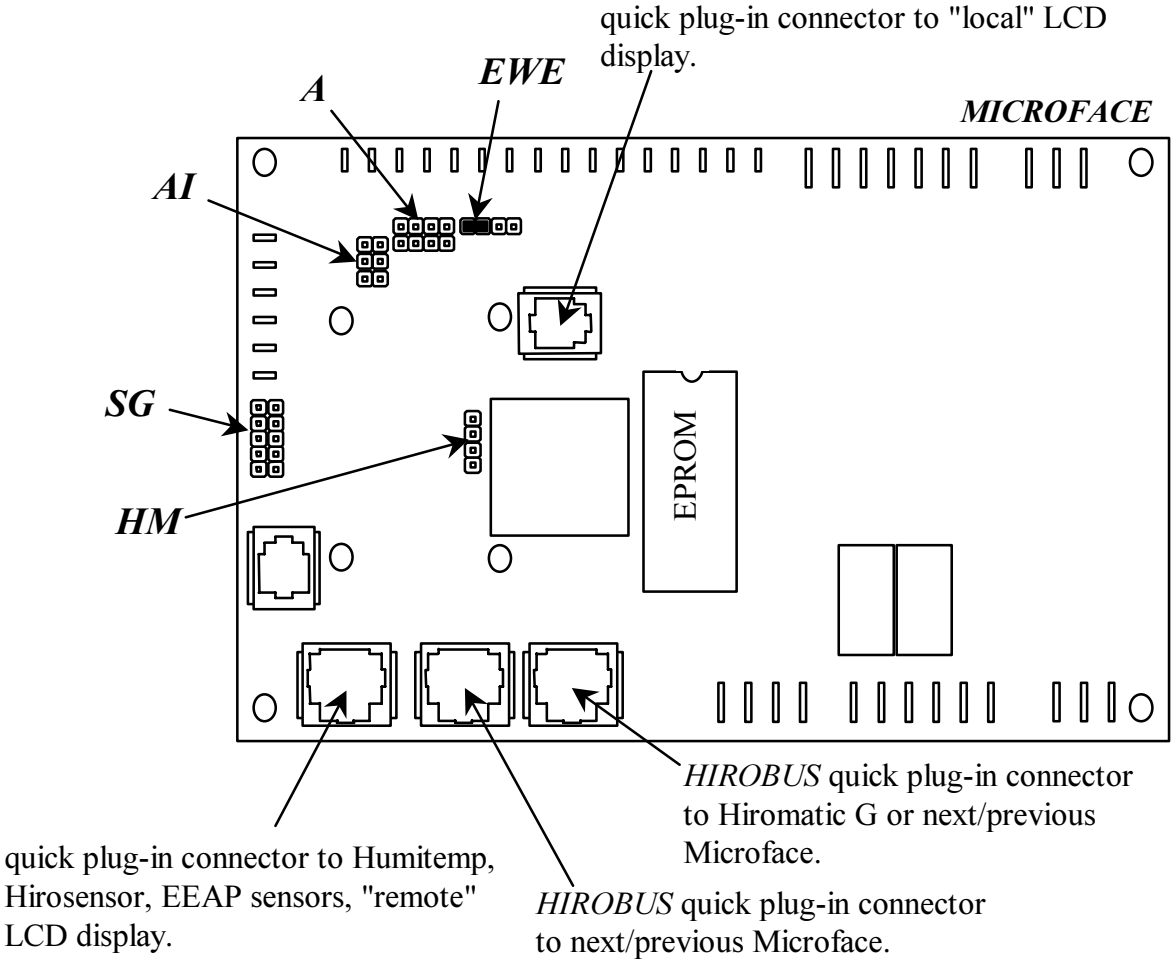
1. the Microface electronic card, that manages all the functions of the unit.
   three different models of Microface are available: Microface, Microface E (Evolution) and Microface E 24DC (for DC units);
2. the input/output interface module, interfacing Microface with the operator (display). Two different models of display are available: the "local" display and the "remote" display.

The connection between Microface electronic card and the "local" display is carried out by means of a four-pole flat cable, as indicated in Figure 2-3 (standard connection). When the "remote" display is used in place of the "local" display, the connection is carred out by means of a *HIROBUS* cable (eight wires flat screened cable) as indicated in Figure 2-4.

Most units are equipped with only one Microface electronic card which completely manage the unit. Some other units are fitted with two Microface electronic cards. In this case, the two Microface electronic cards mount the same EPROM but **they have different tasks**. For these units the two Microface must be connected togheter via *HIROBUS* cable with six wires and the jumpers on the *Printed Circuit Board* must be set as in Figure 2-3 (or Figure 2-4). Both Microface must have the same address (see Figure 2-9).

[1] When a Hirolink device is used to interface the Air Conditioning system to a supervision / telemaintenance system, the maximum number of units that can be connected in network via Hirobus is eight.

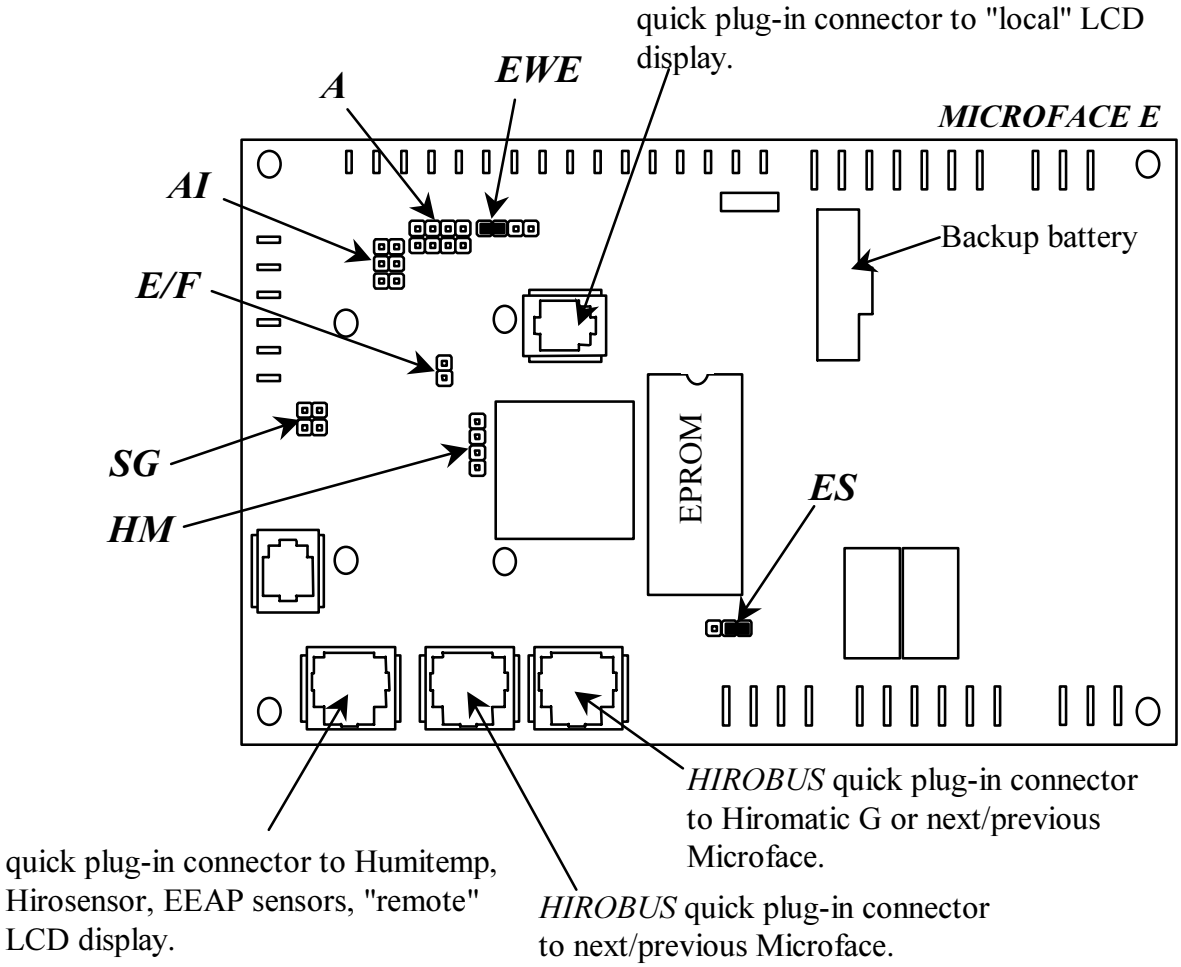
2.3 POSITION OF JUMPERS ON MICROFACE



JUMPERS:

EWE:	EEPROM write enable. Always set this jumper.
A:	Address setting. See Figure 2-9 for details.
AI:	Analogue Inputs selection. See details on Microface Connection Guide at the end of the manual.
SG:	Subgroup ID setting. See Figure 2-3 and 2-4 for details.
HM:	Comb connector for I-Module (present when humidifier is installed). When I-Module is not installed, set a jumper between the two pins in the middle.

Figure 2-1 Microface layout (including jumpers).



JUMPERS:

EWE:	EEPROM write enable. Always set this jumper.
A:	Address setting. See Figure 2-9 for details.
AI:	Analogue Inputs selection. See details on Microface Connection Guide at the end of the manual.
E/F:	EPROM / Flash memory selection jumper. Set the jumper when EPROM is installed. Do not set this jumper when Flash memory is installed.
SG:	Subgroup ID setting. See Figure 2-3 and 2-4 for details.
HM:	Comb connector for I-Module (present when humidifier is installed). When I-Module is not installed, set a jumper between the two pins in the middle.
ES:	EPROM /Flash memory size selection jumper. Set jumper between middle and right pins for 1 or 2 Mbit size memory devices. Set jumper between middle and left pins for 4 Mbit size memory devices.

Figure 2-2 Microface E layout (including jumpers).

2.4 CONNECTIONS BETWEEN MICROFACE CONTROL SYSTEM MODULES

The connections between Microface Control System components must be performed as described in the following figures:

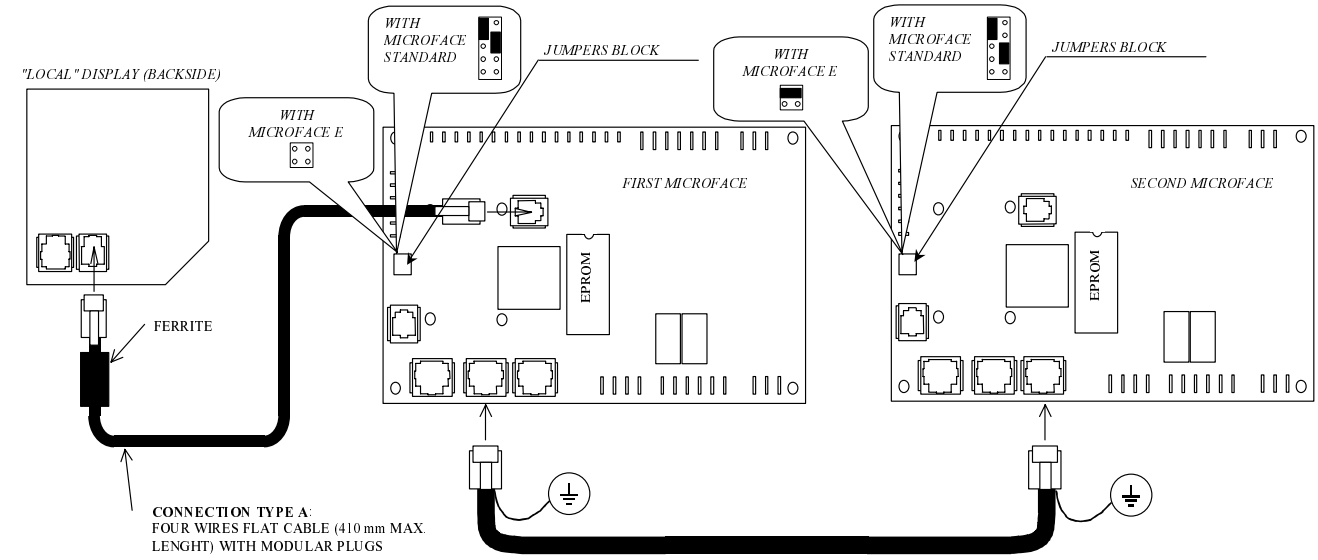


Figure 2-3 Connection between Microface and the "local" display. Not all the units have the second Microface installed in the electrical panel.When the unit needs the second Microface, the connection between the two Microface is performed in the factory.

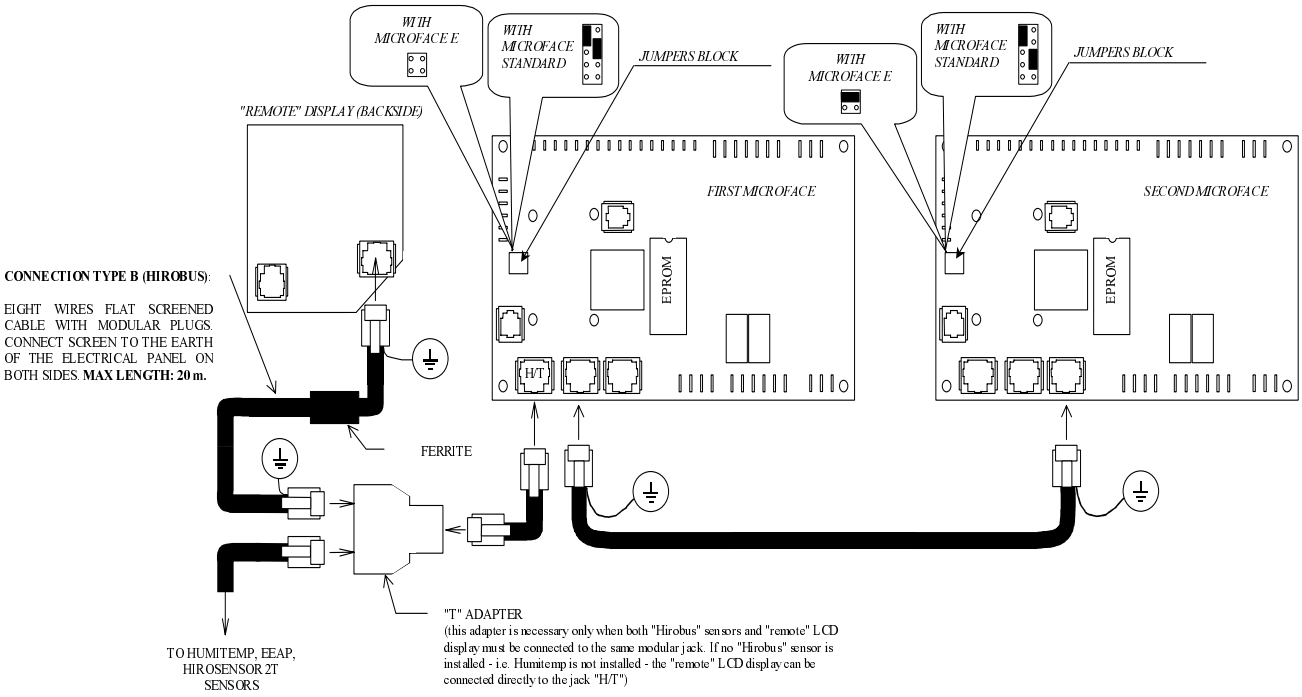


Figure 2-4 Connection between Microface and "remote" display by means of *HIROBUS*. Not all the units have the second Microface installed in the electrical panel.When the unit needs the second Microface, the connection between the two Microface is performed in the factory.

2.5 THE INPUT/OUTPUT INTERFACE MODULE (DISPLAY) AND MICROFACE NETWORK

The interface module consists of a backlighted LCD and of three push-buttons that permit an easy access to the unit parameters (see Figure 2-5). Writing access is protected by a password.

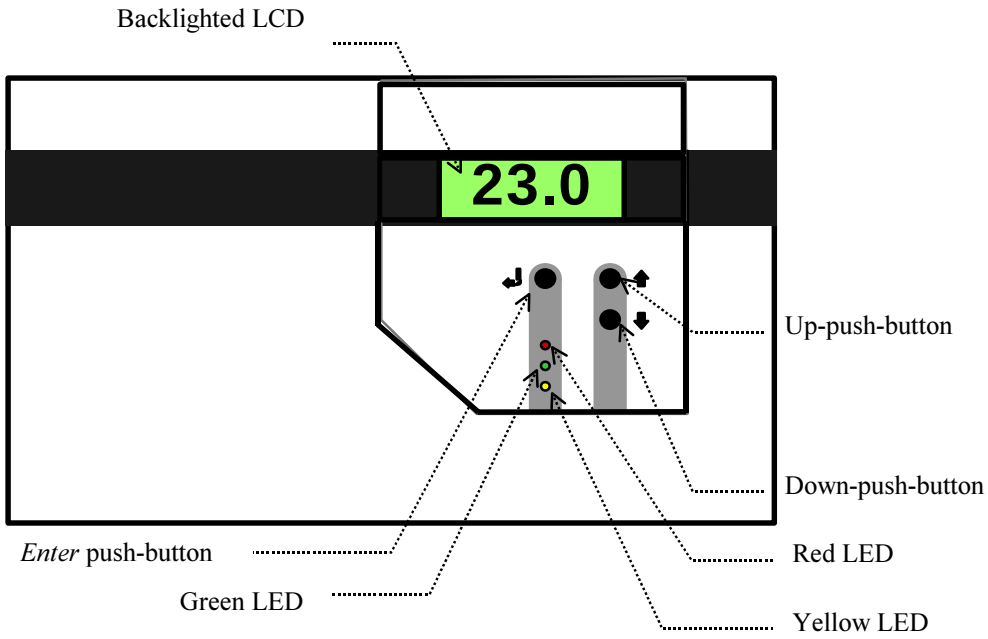


Figure 2-5 Interface module between Microface and operator (front view).

There are three LEDs: the yellow LED to indicate the unit is power supplied, the green one lights up when the unit is operating and the red one signalling either an alarm or a warning condition.

On the LCD the following symbols will be displayed (see Figure 2-6):

Figure 2-6 LCD of the interface module between Microface and the operator.


The snow symbol is active when the unit is in cooling operating mode.


The fan symbol is active when the unit is running, that means that the fans (in *HPAC* units) or the pumps (in chiller units) are running.


The sun symbol is active when the unit is in heating operating mode.


The alarm triangle is ON when either a warning or an alarm is active.

STANDBY The „STAND BY“ string will be displayed when the unit is in the stand-by mode (not running).

SET The „SET“ string will de displayed after the correct password is entered; the presence of this string on the display confirms the full access to the displayed parameters.

RH % The „RH“ and “%” strings appear when relative humidity is displayed on the LCD.

°C The „°C“ string appears when temperature is displayed on the LCD.

Two different models of *display for Microface* are available: the "local" LCD display and the "remote" LCD display. The "local" display, provided with one four-poles modular jack, must be used when it is mounted immediately on the Microface board (like a cover). The cable used to perform the connection between the "local" display and the Microface board is a four-wires flat cable with two terminal four-poles modular plugs and the maximum lenght of this cable is 410 millimeters (see Figure 2-3).
The "remote" display, provided with one eight-poles modular jack, must be used when it is mounted far from the Microface board. The cable used to perform the connection between the "remote" display and the Microface board is a eight-wires flat cable with two terminal eight-poles modular plugs and the maximum lenght of this cable is 20 meters. The lenght of this cable must be taken into account for the compute of the total *HIROBUS* lenght! (see Figure 2-4).
Both models are provided with one six-poles modular jack for the connection with the *ON/OFF Switch and LED*, when installed on the door of the unit (see Figure 2-7).
The external panel *Switch and LED* is made up by a switch to ON / OFF the unit and one LED; the LED is

- green ON when unit is in operation
- red ON when unit is in alarm (or warning)
- green flashing when unit is in *stand-by*
- orange ON when unit is electrically powered but not in operation.

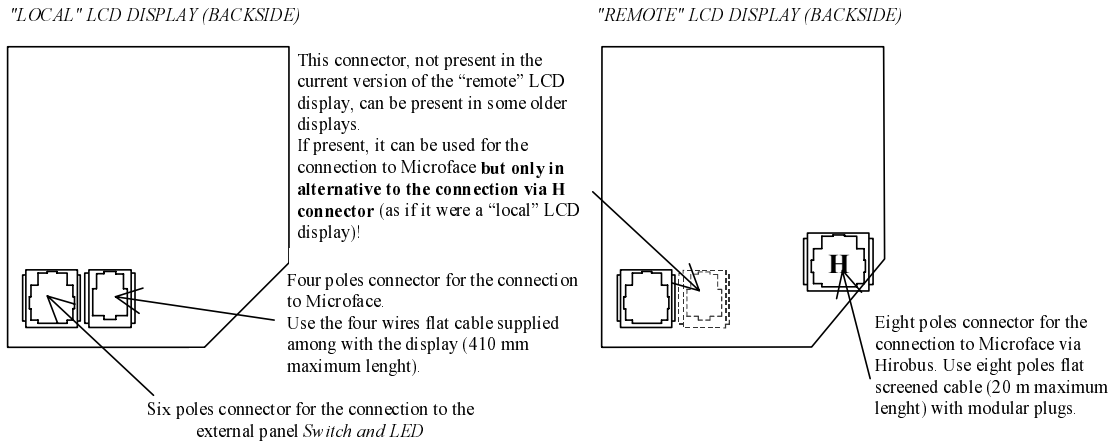


Figure 2-7 Backside of the input/output interface module.

Several Microface electronic cards belonging to different units can be connected to each other by means of the data transmission bus, called *HIROBUS*. The Figure 2-8 shows the connection between the different Microface electronic cards.

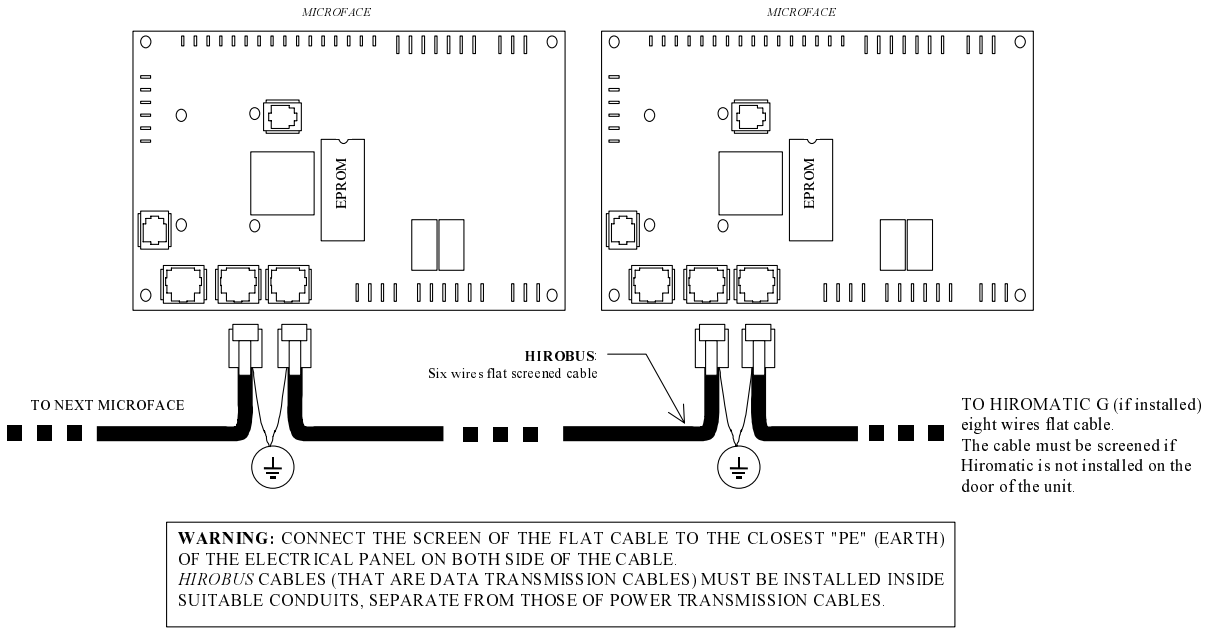


Figure 2-8 Sketch of the connections between the Microface electronics cards belonging to different units.

When more Microface electronic cards are connected to the same *HIROBUS*, it is necessary to assign a different address to each of them, by means of a group of jumpers on the electronic card. The jumper position on the electronic card is described in Figure 2-9.

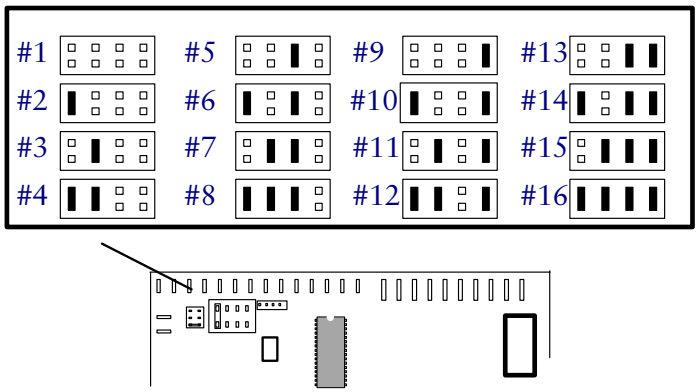
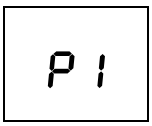
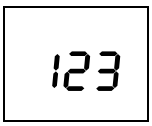


Figure 2-9 Setting the jumpers defining the Microface address.

2.6 MICROFACE PROGRAMMING

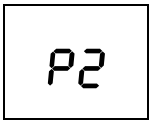
The parameters and variables of Microface Control System are accessible by means of input / output interface module display with the following procedure:

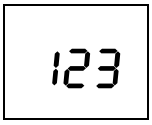




The name of the first parameter (P1 is not a real parameter, is only an example; see Chapter 8 to know real parameter names) will be displayed for one second, while the value itself will be displayed for two seconds (alternating).

"up" and "down" push-buttons





The name of the second parameter (P2is not a real parameter, is only an example; see Chapter 8 to know real parameter names) will be displayed for one second, while the value itself will be displayed for two seconds (alternating).

"up" and "down" push-buttons to reach the other parameters.

The Microface input / output interface module makes it possible to set all the necessary parameters, sensors and alarms, as specified.

When an alarm is triggered, the alarm red LED is lit on the panel of the interface module and the corresponding symbol is displayed.

To reach the parameter section, press the "down" push-button; the first of the parameters belonging to the *group 0* will be displayed. When pressing "Enter" (↵) the current value will be displayed. The parameters belonging to the *group 0* are read only. The *group 0* parameters are followed by the parameters of *groups 1* and *2*. A password (Pin) is necessary to access them.
Entering the *Level 1* password the access is enabled together with the possibility to change the parameters belonging to *group 1*, while entering the *Level 2* password, the access is enabled together with the possibility to change the parameters belonging to *group 2*. Without password or by entering the wrong password, first you can have access to the *group 1* parameters, then to the *group 2* parameters, without the possibility to change values.

To change the value of a parameter, scroll the list using the "up" and "down" push-buttons until the desired parameter is displayed and press "Enter" (↵). By pressing the "up" and "down" push-buttons, it is possible to change the corresponding value; after having obtained the required value, press enter (↵) again. The display will show again the name of the parameter aletrnating with the new value.
Press the "down" push-button to have access to the parameter that follows in the list, and so on until the last parameter is displayed.
The Alarm section can be reached pressing the "up" push-button when the first parameter is on the display; alarms are pointed out according to their code order.
After having entered the alarm section, the alarm code is displayed and every second the code is replaced by the coded description (see Chapter 2.3).
Pressing the key "Enter" (↵), when an alarm code is displayed on the LCD, all the active alarms will be reset. After the reset operation, all the still active alarms will be ri-signalled. If there are no more active alarms, the first parameter / value of the list will be displayed again.

To quickly reach the parameter at the bottom of the list, press "Enter" (↵) together with the "down" push-button. To quickly reach the parameter at the top of the list, press "Enter" (↵) together with the "up" push-button.

2.6.1 Entering a password

To enter a *password* in Microface, select the "Pin" parameter by pressing the "up" and "down" push-buttons. When pressing "Enter" (↵), a 0 will be displayed as first digit on the left and will be followed by two dashes (a password is made of 3 digits). Change the numeric value by pressing the "up" or "down" push-buttons. After having obtained the required numeric value, press "Enter" (↵) to go to the following digit. Pressing "Enter" (↵) after having selected the last *password* digit, the parameter ("Pin") name will be displayed again. If the correct *Password* is entered, the desired modifications can be made.

N.B.: the password is stored, until the first parameter / value of the list is displayed again.

2.6.2 Control parameters and sensor reading

In Chapter 8 you will find a list of the control parameters and the readings of the sensors available with the Microface Control System through the input/output interface module or Hiromatic G.

2.7 *HIROBUS* CONNECTIONS

The connections between different Microface electronic cards, Hiromatic, display and sensors are carried out with cables having a different number of wires and different connectors. Following you'll find how these cables have to be done. For the type of cable and connectors refer to the spare part list included in this manual.

WARNING: *please note that a wrong connection could cause serious problems to the electronic devices (Microface and Hiromatic); for this reason we strongly recommend you to use only first quality products or to buy the cables directly from our spare parts service.*

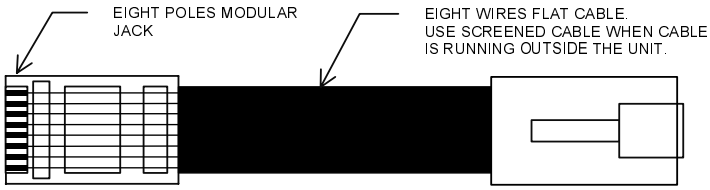


Figure 2-10 Eight-wires *HIROBUS* cable for Hiromatic or Humitemp connections, eight poles connectors; used also for the connection between Microface and the input / output module via *HIROBUS* (see connection type B of Figure 2-4).

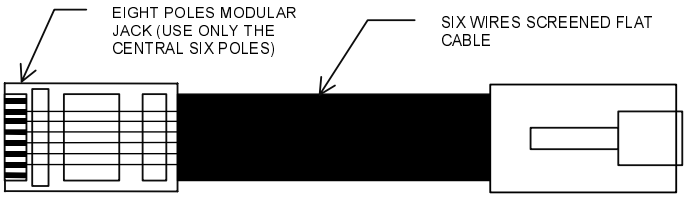


Figure 2-11 Six-wires *HIROBUS* cable, for Microface connections, eight poles connectors.

Following cable is the one which connect the Microface display to the Microface. For technical reason this cable must not exceed the length of 410 mm.

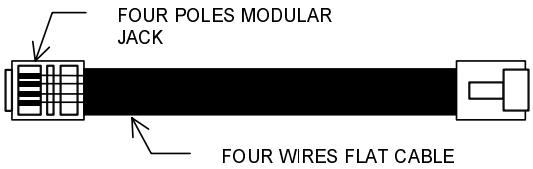


Figure 2-12 Four-wires flat cable for Microface input/output interface module, four poles connectors.

3. Hiromatic G

Hiromatic G is a microprocessor-based electronic device, which makes it possible to control the functions of one or more Microface devices (up to sixteen; while if you want to connect Hirolink to Hiromatic, this number goes down to eight).
Hiromatic G makes also a *Graphic Data Record* available for each unit together with the a *Status Report* for the system and for each single unit.

3.1 HIROMATIC G DESCRIPTION AND CONNECTIONS

Hiromatic can be fixed on the frontal panel of the unit, simply connecting the *HIROBUS* cable as shown in Figure 3-1.

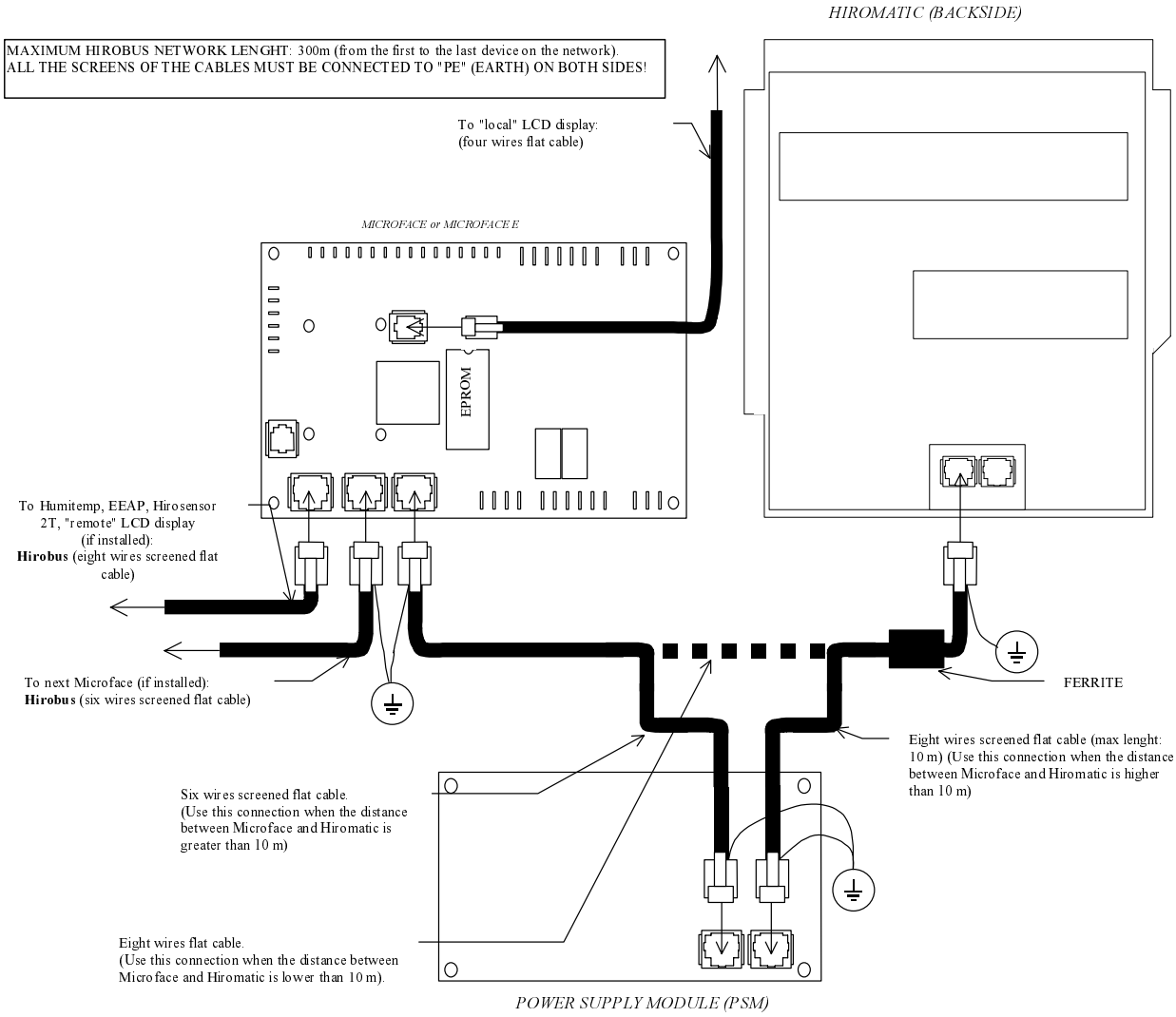


Figure 3-1 Connecting drawing for Hiromatic Graphic and Microface.

Hiromatic G can be supplied mounted in a independent electrical panel containing a power supply module as well (PSM Power Supply Module). The connection between Hiromatic G and the PSM is carried out in the factory by means of a eight wires *HIROBUS* cable. The PSM should be connected to Microface electronic card through a six wires screened *HIROBUS* cable; the screen needs to be grounded in both terminals.
When the system consists of more than one unit, Hiromatic can be connected to the unit where Microface is equipped with a free *HIROBUS* connector (usually either the first or the last one of the Microface chain) (see Figure 3-1).

3.2 HIROMATIC G FRONT PANEL

The front panel of Hiromatic G for HPAC units consists of a backlighted graphic LCD, of nine push-buttons that permit input function and of three LED (see Figure 3-2).

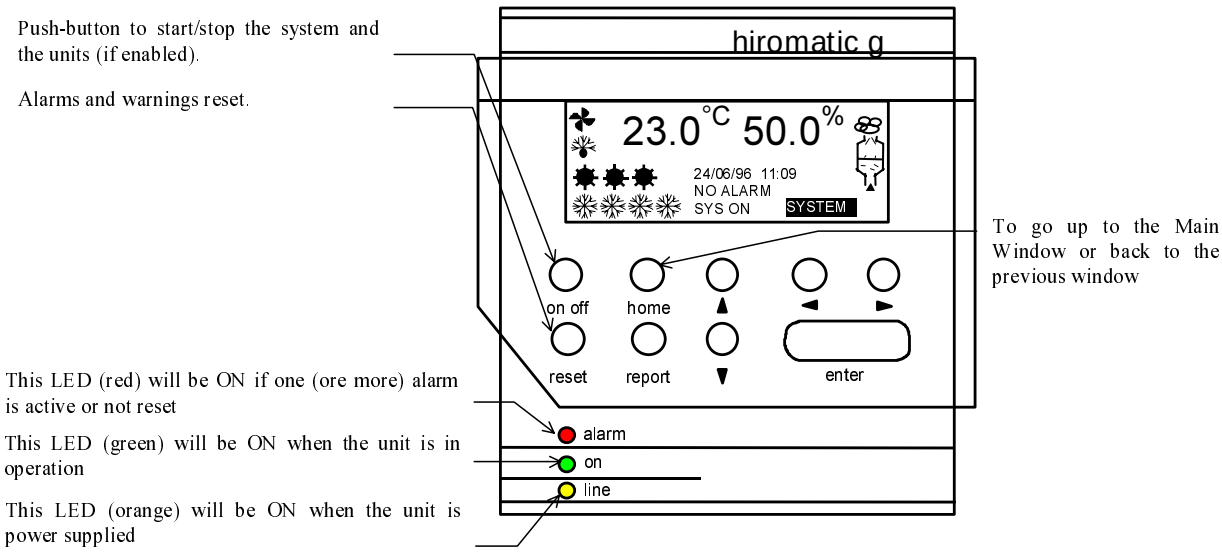


Figure 3-2 Front panel of Hiromatic G (for HPAC units).

Fan(s) is (are) in operation.

Dehumidification function is operating.

Heating function is operating: each sun symbol on the display represents one heating step (up to three heating steps).
Cooling function is operating:

- direct expansion units: each snow symbol represent one cooling step (up to two steps with two compressors units);
- chilled water or SS (Super Saving) units: the number of snow symbols that appear on the display represents how much the valve is open (up to four snow symbols);
- single compressor freecooling or dualfluid units: the first snow symbol on the left represents the status of the compressor (the symbol will be on the display when the compressor is in operation), the last three symbols on the right represent the status of the freecooling actuator.
- twin compressors freecooling or dualfluid units: the first two snow symbols on the left represent the status of the two compressors, the remaining two symbols represent the status of the freecooling.

Humidification is in operation; if the arrow on the bottom of the symbol is ▲ then the humidifier is in fill phase, if is ▼ the humidifier is in the drain phase.

23.0°C — Room temperature.

50.0% — Room relative humidity (if Humitemp is installed).

24/06/96 11:09
NO ALARM
SYS ON SYSTEM

During power on the Software-Version is displayed.
During normal operation: date ,time , the message „NO ALARM“, and the System status (or the unit status when in the unit window.) During warning or alarm events it shows “WARNING” or “ALARM” instead of “NO ALARM”.
If one of the connected units is in manual mode, it shows “MANUAL”.
If one of the connected units is in sleep mode, it shows “SLEEP ON”.
If “SYSTEM” is indicated, system values are monitored: the average of temperature and humidity of all units with system on, and all symbols of each individual unit (if one unit is in cooling mode and another in heating mode, the system window shows both the symbols : heating and cooling).
If “UNIT 1” (up to 16) is indicated, only all the values and symbols from this specific unit are monitored.

3.3 HOW TO MOVE THROUGH THE HIROMATIC G SCREENS

The user can switch between different screens / menu items / parameters of Hiromatic G using the arrow push-buttons as indicated in Figure 3-3.

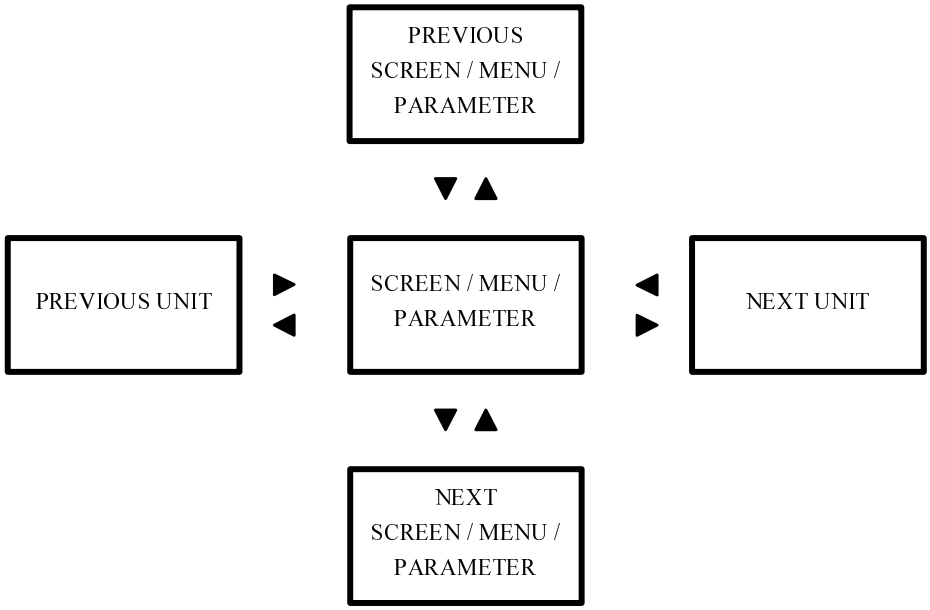


Figure 3-3 Use of the arrow push-buttons to reach and modify Microface Control System settings**.**

The up and down arrow push-buttons serve to move from one screen to another / move from one parameter to another / increase and decrease values.
The enter push-button serves to select menus / select parameters / change the value of parameters.
The left and right arrow push-buttons serve to shift from a menu of a unit to the same menu of an other one.
The ON/OFF push-button serve to switch on/off the unit or the system.
The list of the parameter and the menu is described in Chapter 8.

3.3.1 Setpoint screen

To reach the *setpoint screen* press “up arrow” push-button twice from *main system screen* (the screen available immediatly after the boot of Hiromatic G). To change the value of a setpoint it is mandatory to enter the correct *password*, select the setpoint that must be changed using the “up” and “down” arrows push-button and then press “enter” to change the value; select the desired value using the up and down arrow push-buttons and press “enter” again to confirm the selection (see Figure 3-4).

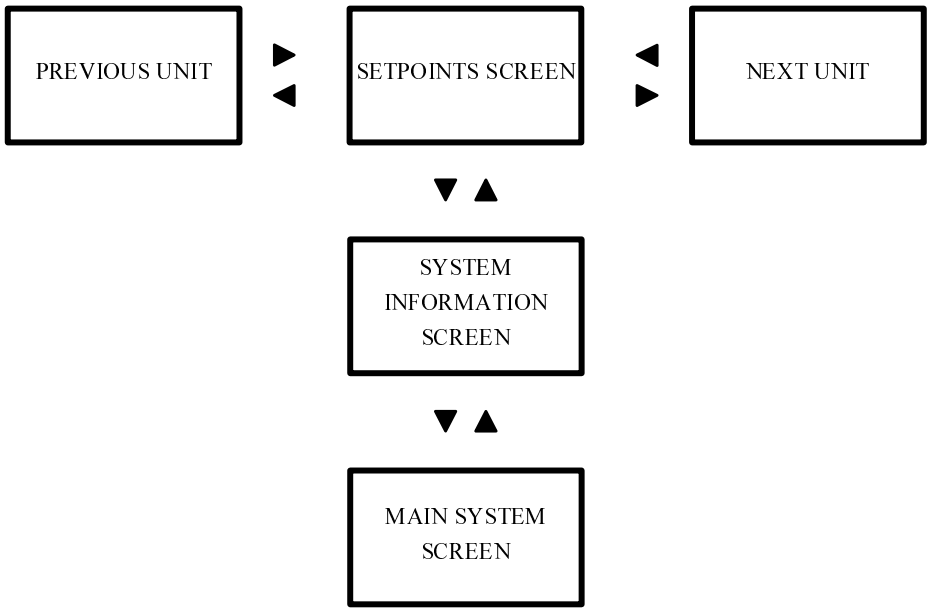


Figure 3-4 Use of the arrow push-buttons to reach the *System Information Screen* and the *Setpoints Screen.*

3.3.2 System information screen

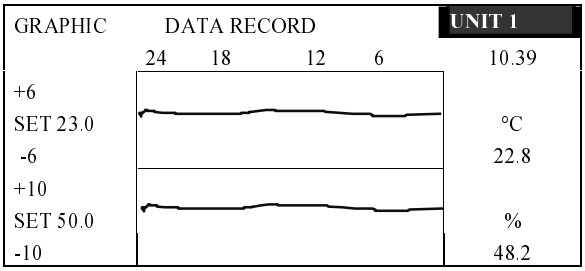
The *System information screen* monitors the status of all connected units. To reach this screen, press “up arrow” push-button once from the *Main system screen* (see Figure 3-4). The information indicated is the same of the status of the single unit main screen.

Unit 01	SYS ON	Unit 09	SYS ON
Unit 02	SYS OFF	Unit 10	SYS OFF
Unit 03	STD BY	Unit 11	SYS ON
Unit 04	Warning	Unit 12	Warning
Unit 05	SYS OFF	Unit 13	SYS OFF
Unit 06	SYS ON	Unit 14	SYS ON
Unit 07	SYS ON	Unit 15	SYS ON
Unit 08	SYS OFF	Unit 16	SYS OFF

3.3.3 Graphic Data Record

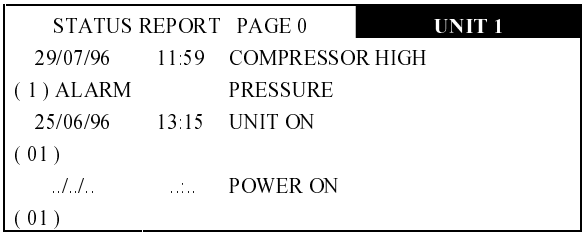
The *Graphic Data Record* monitors the temperature and relative humidity (for HPAC applications, if the Humitemp is installed), or the inlet and outlet temperature (for chiller applications), of the previous 24 hours.
On the right the actual values of temperature and humidity are shown.
On the top right the actual time is indicated, two horizontal lines are drawn, the indication on the top (6,12,...) marks the hours previous to the actual time.
On the left there is the scale: the middle value represents the actual setpoint , the value above and below can be set as follows: press “enter” to mark the upper scale end of the graphic data record on the top. With the up/down arrow push-button the value can be changed. Press the “right arrow” push-button (without to press “enter” before) to move the highlighted field to the upper scale end of the other graphic data record, which can be changed now in the same way. Press “enter” to automatically adjuste the lower scale end in order to have symmetric range.

The Unit *Graphic Data Record* starts to be stored from the last power on of the unit. The System *Graphic Data Record*, which represent the average of the data of the all unit connected in network, is stored even in case of missing power (Hiromatic G has a back up battery that supply power to volatile memory).



3.3.4 Status Report

The *Status Report* is a ‘container’ where the single Microface electronic cards put the occurred events. There are two kind of *Status Report*: ***System*** and ***Unit.*** System *Status Report* is stored into Hiromatic G and keep note of the last 200 events which occurs to the whole system (it is retained into memory also after a power failure, thanks to the back up battery). Unit *Status Report* keeps only the data which are related to the relevant unit and it is reset at each power failure. It is possible to get the *Status Report* by pressing “enter” from the *main screen* (System or Unit) or entering on the Status Report line in the „access to other menus“ screen. *Status Report* give the following information:



- Unit Number (top right)
- Page Number (top centre)
- Message (each message consists of two lines : the first line contains the text, date and time , the second line contains the unit number, and the information message (no text, Warning or Alarm).

3.4 JUMPERS ON HIROMATIC G PCB

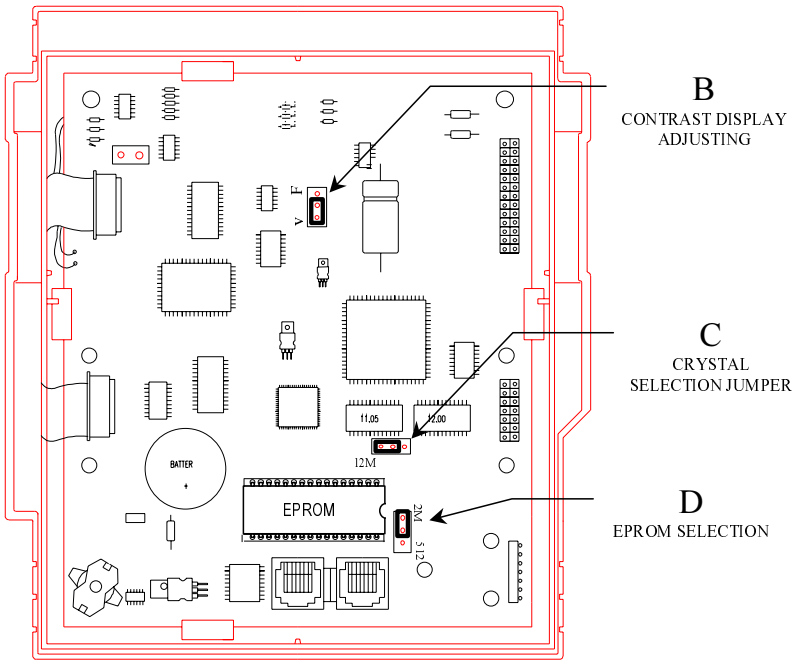


Figure 3-5 Back of Hiromatic G (PCB). Please, note jumper position and EPROM positioning

B: With jumper on V position, the adjusting of the Display contrast is enabled, with jumper on F position, it is fixed.

C: ***To connect Hiromatic to Hirolink, it is mandatory to make the bridge on 12M position.***

D: With jumper on 512 position, it is selected a 1Mbit EPROM, with jumper on 2M position, it is selected a 2 Mbit EPROM. ***Warning: when the EPROM is upgraded, it is necessary to set the jumper D according to the size of the EPROM otherwise the Hiromatic G will not work!! Hiromatic G, when supplied as spare part, has the bridge on position 512.***

4. How to start the first time new units equipped with Microface Control System

Microface is already factory pre-configured according to the unit configuration and it is ready to start. To switch on the unit is enough to press the On-Off switch and, in case that Hiromatic is connected, to press the ON-OFF push button on the front panel of Hiromatic.
Network configuration are needed in the case that more than one unit is interconnected via *HIROBUS*.

5. How to update the software of units equipped with Microface Control System

Microface electronic card software is suitable to manage different type of units with different functionality and devices. It is mandatory to set the correct cooling configuration / unit configuration otherwise the unit could be seriously damaged and false alarm are generated.
To avoid this problem it is necessary to respect the following points:

1. Switch off the unit with the unit ON-OFF switch.
2. Open the automatic switch of the general power supply of the unit.
3. Remove the old EPROM and install the new one (using the right tool).
4. Close the automatic switch of the general power supply of the unit and switch on the unit with the unit ON-OFF switch; after the display is lighted up press the down arrow until *Pin* parameter is reached.
5. Enter the *Pin* (Personal identification number) (see Glossary).
6. Set properly the *Cooling configuration* / *Unit configuration* of the unit.
7. Press the up arrow until parameter Std (Standard settings) is reached.
8. Select standard settings yes.

The above indicated points are enough to select the right cooling configuration and avoiding damage to the unit. Next steps are the configuration of the optional devices installed (Humidifier, Electrical heaters, Liquistat sensor) that it has to be done according the unit configuration.
After completing the set up follow the instruction of the previous paragraph.

6. Spare Parts List

DESCRIPTION	CODE
Switch + Led	255039
Microface and Hiromatic user manual	271618
Microface board	275097
Microface E (Evolution) board	275297
Microface E (Evolution) 24DC board (only for DC units)	275298
Local LCD display for Microface	275098
Remote LCD display for Microface	275662
Alarm Board 24VAC	275148
Heating Board for "Single FC / DF" unit	275366
Alarm Board 24VDC	275288
Probe temperature PTC	275183
Probe PTC 2 kohm L = 10 m	275155
Probe temp. + hum. Humitemp	275181
Probe airflow PTC	275184
EPROM Microface 1XM160***	275426
EPROM Microface 2XM160***	275397
EPROM Microface 3XM160***	275396
EPROM Microface A1M160***	275526
Master control Hiromatic Graphic	275051
EPROM Hiromatic WXG160***	275425
Kit EEAP	372201
Hirosensor 2T	275193
Kit liquistat - Hiromatic	482979
LWD (Leakage Water Detector)	275353
Flat cable 8 way M-M L = 1 m	275607
Flat cable 8 way M-M L = 10 m	275610
Flat cable 8 way screen (specify lenght)	275626
Flat cable 8 way not screen (specify lenght)	275611
Module PSM 24/24-10 for Hiromatic	275316
"T" adapter for *HIROBUS*	275652
Plastic holder for Microface only	270002
Plastic holder for Microface and LCD display	270003
Plastic spacers for Microface (orderfour pieces for each code)	271286
	271287
	271288

7. Alarm List

MICROFACE CODE	*MICROFACE MESSAGE*	*HIROMATIC MESSAGE*	*Type*
A1	"HP1"	"COMP. 1 HIGH PRESSURE"	Alarm
A2	"LP1"	"COMPRESSOR 1 LOW PRESSURE"	Alarm (Delay as set LPd)
A3	"HC"	"HIGH CHILLED WATER"	Warning (Delay = 15m after System on)
A4	"LC"	"LOW CHILLED WATER FLOW"	Warning (Delay = 10s)
A5	"EHO"	"ELECTRICAL HEATERS OVERHEATED"	Alarm (Delay = 30s only in heating operation)
A6	"AF"	"FAN FAILURE"	Warning (Delay = 10s, the heaters, humidifier and dehumidification are stopped)
A7	"AF"	"FAN FAILURE"	Alarm (Delay = 10s, the unit is stopped)
A8	"CF"	"CLOGGED FILTERS"	Warning (Delay = 10s)
A9	"LE"	"WATER LEAKAGE"	Warning (only indication)
A10	"LE"	"WATER LEAKAGE"	Alarm (unit is stopped)
A11	"UI1"	"USER INPUT 1 TRIGGERED"	Warning (only indication)
A12	"UI1"	"USER INPUT 1 TRIGGERED"	Alarm (unit is stopped)
A13	"HFA"	"HUMIDIFIER FAILURE"	Warning (Delay = 40m)
A14	"HHC"	"HUMIDIFIER HIGH CURRENT"	Warning
A15	"HF"	"HUMIDIFIER FAILURE"	Warning (Delay = 40m)
A16	"HN"	"HUMIDIFIER FAILURE"	Warning (Delay = 40m)
A17	"HUC"	"HUMIDIFIER CYLINDER WORN"	Warning
A18	"HrT"	"HIGH ROOM TEMPERATURE"	Warning (Delay = 15m after System on)
A19	"LrT"	"LOW ROOM TEMPERATURE"	Warning (Delay = 15m after System on)
A20	"HrH"	"HIGH ROOM HUMIDITY"	Warning (Delay = 15m after System on)
A21	"LrH"	"LOW ROOM HUMIDITY"	Warning (Delay = 15m after System on)
A22	"HTE"	"HIGH ROOM TEMPERATURE"	Alarm (Delay = 15m after System on)
A23	"LTE"	"LOW ROOM TEMPERATURE"	Alarm (Delay = 15m after System on)
A24	"HHE"	"HIGH ROOM HUMIDITY"	Alarm (Delay = 15m after System on)
A25	"LHE"	"LOW ROOM HUMIDITY"	Alarm (Delay = 15m after System on)
A26	"HE"	"CONDITIONER WORKING HOURS EXCEEDED"	Warning
A27	"HC1"	"COMPRESSOR 1 WORKING HOURS EXCEEDED"	Warning
A28	"HH"	"HUMIDIFIER WORKING HOURS EXCEEDED"	Warning
A29	"PtC"	"PTC SENSOR FAILURE"	Warning
A30	"rSF"	"ROOM SENSOR FAILURE"	Warning
A31	"rSF"	"ROOM SENSOR FAILURE	Alarm
A32	"ESF"	"EEAP SENSOR FAILURE"	Warning
A33	"SF"	"WATER PRESENCE SENSOR FAILURE"	Warning
A34	"NET"	"NETWORK FAILURE"	Warning
A35	"or"	"OUT OF MEMORY"	Warning
A36	-	"UNIT ON"	Message
A37	-	"UNIT OFF"	Message
A38	-	"SLEEP MODE"	Message
A39	-	"STANDBY MODE"	Message
A40	-	"POWER ON UNIT LOGIN"	Message

MICROFACE CODE	*MICROFACE MESSAGE*	*HIROMATIC MESSAGE*	*Type*
A41	-	"POWER OFF"	Message
A42	-	"Unit 1 disconnected"	Warning
A43	-	"Unit 2 disconnected"	Warning
A44	-	"Unit 3 disconnected"	Warning
A45	-	"Unit 4 disconnected"	Warning
A46	-	"Unit 5 disconnected"	Warning
A47	-	"Unit 6 disconnected"	Warning
A48	-	"Unit 7 disconnected"	Warning
A49	-	"Unit 8 disconnected"	Warning
A50	-	"Unit 9 disconnected"	Warning
A51	-	"Unit 10 disconnected"	Warning
A52	-	"Unit 11 disconnected"	Warning
A53	-	"Unit 12 disconnected"	Warning
A54	-	"Unit 13 disconnected"	Warning
A55	-	"Unit 14 disconnected"	Warning
A56	-	"Unit 15 disconnected"	Warning
A57	-	"Unit 16 disconnected"	Warning
A58	"HP2"	"COMP. 2 HIGH PRESSURE"	Alarm
A59	"LP2"	"COMPRESSOR 2 LOW PRESSURE"	Alarm
A60	"HC2"	"COMPRESSOR 2 WORKING HOURS EXCEEDED"	Warning
A61	"Out"	"OUTDOOR TEMP. SENSOR"	Warning
A62	"gLy"	"GLYCOL TEMP. SENSOR"	Warning
A63	-	"FREECOOLING STOPPED FOR 1 HOUR"	Message
A64	-	"ON-OFF BY HIROMATIC NOT ENABLED"	Message
A65	"Fir"	"SMOKE ALARM"	Alarm
A66	-	"NO POWER (USER INPUT)"	Message
A67	-	"POWER ON (USER INPUT)"	Message
A68	"UI2"	"USER INPUT 2 TRIGGERED"	Warning
A69	"UI2"	"USER INPUT 2 TRIGGERED"	Alarm
A70	"nEt"	"NO CONNECTION TO UNIT 1"	Warning
A71	"th1"	"COMPRESSOR 1 MOTOR PROTECTION"	Alarm
A72	"th2"	"COMPRESSOR 2 MOTOR PROTECTION"	Alarm
A73	"Fir"	"FIRE ALARM"	Alarm
A74	-	"OUT OF MEMORY"	Warning
A75	"FA1"	"CONDENSER 1 FAN FAILURE"	Warning
A76	"FA2"	"CONDENSER 2 FAN FAILURE"	Warning
A77	"Hb"	"NETWORK PING"	Warning
A78	"SId"	"SUBGROUP-ID NOT UNIQUE"	Warning
A79	"SU1"	"SUBGROUP-UNIT 1 NOT CONNECTED"	Warning
A80	"SU2"	"SUBGROUP-UNIT 2 NOT CONNECTED"	Warning
A81	"rSF"	"SHARE ROOM SENSOR FAILURE"	Warning
A82	"rSF"	"SHARE ROOM SENSOR FAILURE"	Alarm
A83	"Out"	"SHARE OUTDOOR TEMP. SENSOR"	Warning
A84	"gLy"	"SHARE GLYCOL TEMP. SENSOR"	Warning
A85	"SPO"	"UNIT SYNCHRONISATION (=Short Reset)"	Message
A86	“HHt”	Humidifier High Temperature	Alarm
A87	“HuO”	Humidifier Overflow	Alarm

8. Parameters table [2]

HIROMATIC WINDOW PARAMETER NAME	SHARE	MICROFACE ABBREVIATION	RANGE	STANDARD SETTING [3]	Direct FC SETTING	USER SETTING
MAIN WINDOW *(this window will be present each time that the unit is powered on and when keybord on Hiromatic is not used for at least 2 minutes)*						
RETURN AIR TEMPERATURE		t 1	read only			
RETURN AIR HUMIDITY		H 1	read only			
SETPOINTS MENU *(press ▲ 2 times from MAIN WINDOW)*						
PASSWORD		PAS				
ROOM TEMPERATURE SETPOINT	Yes	SPt	5.0, 5.1, ..., 40.0	23.0	27.0	
ROOM TEMP. SETPOINT 2	Yes	SP2	NO (no), 5, 6, ..., 40	no	27	
ROOM HUMIDITY SETPOINT	Yes	SPH	NO (no), 20, 21, ..., 80	50	no	
SUPPLY AIR LIMIT SETPOINT	Yes	SUP	NO (no), 5, 6, ..., 25	no	10	
FANSPEED (%)		FS	NO (no), 30, 31, ..., 100	no	no	
ADDITIONAL SENSORS *(press ▼ from "Unit" MAIN WINDOW)*						
PTC TEMPERATURE[4]		t2	read only			
OUTDOOR / GLYCOL TEMP.		t3 / t4	read only			
EEAP		EEt / EEH	read only			
HIROSENSOR 1		H1L / H1r	read only			
HIROSENSOR 2		H2L / H2r	read only			
ACTUAL SETPOINT T / H		Act / AcH	read only			
FREECOOLING STATUS[5]			OFF, START, ON (read only)			
2 WORKING HOURS *(Select item N. 2 in the ACCESS TO OTHER MENU window; to reach the ACCESS TO OTHER MENU window press ▼ 2 times from "System" MAIN WINDOW and enter the password; the current values are on the left, the warning level on the right; the range and standard settings indications are applicable only to warning levels)*						
CONDITIONER			0, 100, ..., 32000	32000		
COMPRESSOR 1			0, 100, ..., 32000	32000		
COMPRESSOR 2			0, 100, ..., 32000	32000		
HUMIDIFIER			0, 100, ..., 32000	32000		
HEATER						
FREECOOLING						
3.1 SET-UP (SYSTEM) *(Select item N. 3 in the ACCESS TO OTHER MENU window; to reach the ACCESS TO OTHER MENU window press ▼ 2 times from "System" MAIN WINDOW and enter the password)*						
LANGUAGE			Greek, Polish, Russian, Portogue, Svenska, Italiano, Espanol, Francais, Deutsch, English, Czech			
STANDARD SETTING (SYS)			YES ("pushbutton")			
INDICATION OF TEMPERATURE			°C	°C		
SHARED PARAMETERS		ShP	NO (no), YES (YES)	no		
NUMBER OF CONNECTED UNITS		nEt	1-16	1		
SET DATE/TIME						
3.2 SET-UP (UNIT) *(press ▼ from 3.1 SET-UP (SYSTEM) window to reach this menu; press ◄ ► to change Unit)*						
STANDARD SETTING (SINGLE)		Std	YES (YES), NO (no)	YES		
AUTORESTART	Yes	Aut	0,1, ..., 999 (sec)	5		
HIROMATIC ON/OFF BUTTON ENABLED	Yes	rE	YES (YES), NO (no)	YES		

[2] The table includes all the parameters available in the Microface and Hiromatic G control system. Depending on the EPROM installed on Microface (e.g. 1XM ,2XM or 3XM) some of them can be not available or the range can be a subset of the indicated range (e.g. "COOLING CONFIGURATION").
[3] Factory settings could be different, in special cases, from those indicated in the table.
[4] SUPPLY AIR TEMPERATURE appears instead of PTC TEMPERATURE when the SUPPLY AIR LIMIT is set.
[5] Only in Free Cooling or Dual Fluid units.

HIROMATIC WINDOW PARAMETER NAME	SHARE	MICROFACE ABBREVIATION	RANGE	STANDARD SETTING [3]	Direct FC SETTING	USER SETTING
3.3 COMMUNICATION SETUP (SYSTEM) *(press ▼ 2 times from 3.1 SET-UP (SYSTEM) window to reach this menu)*						
IDENTIFICATION NUMBER (HM)		-	1, 2, ..., 99	1		
ENABLE COMMUNICATION (HM)		-	YES, NO	YES		
BAUDRATE (change with Jumper)(HM)		-	20833 / 19200	20833		
IDENTIFICATION NUMBER (MIC)		Id	1, 2, ..., 99	1		
ENABLE COMMUNICATION (MIC)		CEn	YES, NO	YES		
3.4 VERSION INFORMATION (SYSTEM) *(press ▼ 3 times from 3.1 SET-UP (SYSTEM) window to reach this menu*						
EPROM VERSION			read only			
DATE			read only			
KERNEL			read only			
HV			read only			
4.1 CONTROL PARAMETERS *(Select item N. 4 in the ACCESS TO OTHER MENU window; to reach the ACCESS TO OTHER MENU window press ▼ 2 times from "System" MAIN WINDOW and enter the password; press ◄ ► to change Unit)*						
TEMP. PROPORTIONAL BAND	Yes	Pbt	1.0, 1.1, ..., 30.0	3.0	5.0	
TEMP. INTERGRATION FACTOR	Yes	IF	NO (no), 5, 6, ..., 15	no		
HUMIDITY PROPORTIONALBAND	Yes	PbH	2, 3, ..., 60	10		
HUMIDITY INTERGRATION FACTOR	Yes	IFH	NO (no), 5, 6, ..., 15	no		
HUMIDITY CONTROL		PH	ON/OFF (onO), PROP. (Pro)	onO		
HYSTERESIS DEHUMIDIFICATION	Yes	dHh	25, 26, ..., 75	30		
4.2 CONTROL-ALARM CONFIG. *(press ▼ from 4.1 CONTROL PARAMETERS window to reach this menu; press ◄ ► to change Unit)*						
DT ROOM-OUTD./ ROOM-GLYC.	Yes	dt1 / dt2	NO(no), CON (Con), EFC (EFC), 3, 4, ..., 25 /NO(no), CON (Con), 2, 3, 4, ..., 25	no / no	12 / no	
STOP FC AT ROOM SET +	Yes	dt3	NO(no), 1 ÷ 25	5		
HIGH/LOW TEMP. WARNING	Yes	Ht / Lt	NO(no),1 ÷ 99/NO(no),1 ÷ 99	27 / 18	32 / 15	
HIGH/LOW HUM. WARNING	Yes	HH / LH	NO(no),1 ÷ 99/NO(no),1 ÷ 99	70 / 35		
HIGH/LOW TEMP. ALARM EEAP	Yes	HtA / LtA	NO(no),1 ÷ 99/NO(no),1 ÷ 99	no / no		
HIGH/LOW HUM. ALARM EEAP	Yes	HHA / UHA	NO(no),1 ÷ 99/NO(no),1 ÷ 99	no / no		
4.3 ALARM CONFIGURATION *(press ▼ 2 times from 4.1 CONTROL PARAMETERS window to reach this menu; press ◄ ► to change Unit)*						
LOW AIRFLOW AT		FLo	0 ÷ 100, SWI	40	38 / 0	
FAN FAILURE		FF	WARNING (ALP) ALARM (AhP)	ALP		
USER INPUT # 1		US1	WARNING (ALP), ALARM (AhP), 2nd Setpoint (SEt), nHumi (nH), nComp (nC), No Power (noP), Not Used (nu)	noP		
USER INPUT # 2		US2	LSI (LSI), No Power (noP), Not Used (nu)	noP		
LOW PRESSURE DELAY TIME(min)		LPd	0 ÷ 5	3	5	
COMP. THERMAL PROT. ENABLED		tHC	NO (no), YES (YES)	no		

HIROMATIC WINDOW						
PARAMETER NAME	**SHARE**	**MICROFACE ABBREVIATION**	**RANGE**	**STANDARD SETTING [3]**	**Direct FC SETTING**	**USER SETTING**
5.1 OPTIONAL DEVICES (T) *(Select item N. 5 in the ACCESS TO OTHER MENU window; to reach the ACCESS TO OTHER MENU window press ▼ 2 times from "System" MAIN WINDOW and enter the password; press ◄ ► to change Unit)*						
COOLING CONFIGURATION		tYP	DIRECT FC (dFc), TWIN FC/DF (tFC), SING. FC/DF (SFd), TWIN DX (tdE), SINGLE DX (SdE), CHILLED W. (CU)		dFc	
MINIMUM ACTUATOR OPENING		AoP	0, 1, ..., 50	0	90 / 30 / 130	
ACTUATOR RUNNING TIME		rt	30 ÷ 500			
HEATING STEPS / DEAD BAND		EHS / HdE	0, 1, 2, 3, HtA, LtA, CHF, FCF, Lqt. / 0 ÷ 30	0 / 0		
ANALOG OUTPUT 0 / 1		An0 / An1	3P. ACTUATOR 1/2 (3P1 / 3P2), HEATING 33% (H33), SUPPLY CONTROL (SLc), RADCOOLER (rAd), HEATER BOARD (ELH), COOLING/1/2 (Co / Co1 / Co2), RETURN TEMP. (Htt), HT HUM. (HtH), SUPPLY TEMP. (Ptc), HUMIDIFIER (HU), FANSPEED (FS), ALARM BOARD (AL1) HEATERS (HER), SUPERSAVER (SS), METRIC ROOM (Cr)			
PUMP DOWN		Pdo	YES (YES) / NO (no)	No		
5.2 OPTIONAL DEVICES (H) *(press ▼ from 5.1 OPTIONAL DEVICES (T) window to reach this menu; press ◄ ► to change Unit)*						
DEHUMIDIFICATION ENABLE		dEH	NO (no), YES (YES), STOP FC (SFC)	no		
DE-HUMIDIFICATION RELAY AS		dEC	DEHUM (dEH), WARNING (A1), NO POWER (Poo)	dEH		
HUMIDIFIER SUPPLY VOLTAGE		HS	230V ,400V, 460V, 575V	230V		
HUMIDIFIER MODEL		HU	21L (21L), 53L/H (53L/H), 93L/H (93L/H), d3H (d3H), HT2/5/9 (Ht2/5/9), EXT (Et), IF3, IF6.	Et		
HUMIDIFIER STEAM OUTPUT / FLUSH RATE		Pro	no, 30-100 (%), 110 – 250%	no		
WATER LEAKAGE DETECTOR		LSt	NO (no), WARNING (A1), ALARM (A2)	no		
6.1 SLEEP MODE (SYSTEM) *(Only available with Hiromatic G; select item N. 6 in the ACCESS TO OTHER MENU window; to reach the ACCESS TO OTHER MENU window press ▼ 2 times from "System" MAIN WINDOW and enter the password; press ◄ ► to change Unit)*						
FIRST INTERVAL FROM / TO			00:00-23:59	00:00		
SECOND INTERVAL FROM / TO			00:00-23:59	00:00		
SLEEP ALL THE DAY			MO, TU, WE, TH, FR, SA, SU			
NEUTRAL ZONE OR SYS OFF			2-15, SYS OFF		4	
SLEEP MODE RESET			NO, YES, AUTO			

HIROMATIC WINDOW PARAMETER NAME	SHARE	MICROFACE ABBREVIATION	RANGE	STANDARD SETTING [3]	Direct FC SETTING	USER SETTING
6.2 STANDBY SETTINGS (SYSTEM) *(press ▼ from 6.1 SLEEP MODE window to reach this menu; press ◄ ► to change Unit)*						
NUMBER OF STANDBY UNITS		Stb	0-16	0		
ROTATION AT			00:00-23:59	00:00		
ROTATION FREQUENCY[6]		rot	NO (no), DAILY (YES), EVERY MO, TU, WE, TH, FR, SA, SU			
PERFORM ONE ROTATION			NO, YES			
CASCADE STANDBY UNITS		CAS	NO (no), YES (Yth), TEMP (Yt), COOL (Ytc)			
7.1 SERVICE (MANUAL CONTROLS) (UNIT) *(Select item N. 7 in the ACCESS TO OTHER MENU window; to reach the ACCESS TO OTHER MENU window press ▼ 2 times from "System" MAIN WINDOW and enter the password; press ◄ ► to change Unit)*						
MANUAL			OFF-ON			
FAN			OFF-ON			
COMPRESSOR 1			OFF-ON			
COMPRESSOR 2			OFF-ON			
HUMIDIFIER			OFF-ON			
HUM. DRAIN		dr	OFF-ON			
HEAT 1			OFF-ON			
HEAT 2			OFF-ON			
DEHUM			OFF-ON			
3P. ACTUAT. 1 / 2			0-100%			
AUTOTEST (MICROFACE ONLY)		tSt	YES, NO			
7.2 SERVICE (DIGITAL INPUTS) (UNIT) *(visualization of the status of the Digital Inputs only on Hiromatic G display; press ▼ from 7.1 SERVICE (MANUAL CONTROLS) window to reach this menu; press ◄ ► to change Unit)*						
US1 (US 2)			read only			
TSR			read only			
CF			read only			
LP1 (LP2) / LOLF[7]			read only			
HP1 (HP2) / HICW[7]			read only			
REM			read only			
TH1 (TH2)			read only			
DT1 (DT2)			read only			
7.3 SERVICES (ANALOG INPUTS and OUTPUTS) *(visualization of the status of the Analog Inputsand Outputs only on Hiromatic G display; press ▼ 2 times from 7.1 SERVICE (MANUAL CONTROLS) window to reach this menu; press ◄ ► to change Unit)*						
LIQUISTAT SENSOR		L9	read only			
AIRFLOW RATE SENSOR		FLo	read only			
HUMIDIFIER CURRENT		HUC	read only			
ANALOG OUTPUT 1		r1	read only			
ANALOG OUTPUT 2		r2	read only			
7.4 CALIBRATION						
HUMITEMP		CA1 / CA2	+/- 9.9			
PTC3		CA3	+/- 9.9			
EEAP		CA4 / CA5	+/- 9.9			
HIROSENSOR #1		CA6 / CA7	+/- 9.9			
HIROSENSOR #2		CA8 / CA9	+/- 9.9			
PTC10 / PTC11		C10 / C11	+/- 9.9			

[6] The options EVERY MO, TU, ..., SU are available only with Hiromatic G. With Microface only no and yes (daily) options are available.
[7] The indication switch to LOLF and HICW when CHILLED W. (CU) Cooling Configuration is selected.

9. Glossary[8]

3 P. ACTUAT. 1 / 2 (3 POINT ACTUATORS)

Read only value which indicates the position of modulated actuators (chilled water valve or Free Cooling damper or valve). "0%" means actuator completely close and "100%" completely open. For reference purposes, the position of the actuators are re-set at System ON (close command for a time of 110% of the **Actuator Running Time*).

ACTUAL SETPOINT T/H

The current values of the setpoint (reference values) of the **Return Air Temperature* and **Return Air Humidity*. The air conditioning unit will operate in order to achieve these targets. Used only for visualisation.

ACTUATOR RUNNING TIME

Actuators are motors, that drive either the Freecooling damper or which drive chilled water or Freecooling valves. This parameter holds the information about the time necessary from completely closed to completely open position.

AIRFLOW RATE SENSOR

Read only analogue value (in percentage) that informs about the airflow speed inside the unit. This value can be taken into account when setting the **Low Airflow At*.

ANALOGUE OUTPUT 0,1

Both the 0 – 10Vdc outputs may be used for several purposes:

Hiromatic	*LCD Display*	*Meaning*
3P. ACTUATOR 1	3P 1	Position of first 3 Point Actuator
3P. ACTUATOR 2	3P2	Position of second 3 Point Actuator
HEATING 33%	H33	Heating, 33% (1st Step of Heating)
SUPPLY CONTROL	SLc	For fan speed regulation in relation to supply air temperature
RADCOOLER	rAd	Radcooler fan speed regulation
HEATER BOARD	ELH	Drive signal for heater board
HT HUM.	HtH	Humitemp humidity (0%rH - 100%rH = 0V - 10V)
SUPPLY TEMP.	Ptc	PTC sensor reading (0°C - 50°C = 0V - 10V)
RETURN TEMP	Htt	Humitemp temperature (0°C - 50°C = 0V - 10V)
FANSPEED	FS	Fanspeed (30% - 100%), fixed by **Fanspeed*
HEATERS	HEA	Signal proportional to temperature PI deviation in heating half band
HUMIDIFIER	HU	Signal proportional to humidity PI deviation in humidification half band
COOLING	Co	Signal proportional to temperature PI deviation in cooling half band
COOLING 1	Co 1	Signal proportional to first cooling step hysteresis
COOLING 2	Co2	Signal proportional to second cooling step hysteresis
SUPERSAVER	SS	Supersaver output
ALARMBOARD	AL 1	Alarm Board
METRIC ROOM	Cr	Drive signal for hot gas re-heating in "Constant-like" units.

AUTORESTART

The time delay, in seconds, between the power on and the start of the unit. If a unit was stopped before a power supply lack, it remains stopped when power supply comes back.

[8] The entries in the Glossary correspond to the name used in the Hiromatic G. They are listed in alphabetical order. The expressions in * *italic style* are defined somewhere in the Glossary.

AUTOTEST (MICROFACE ONLY)

The Autotest Function allows to run Test-Procedure, which sets automatically one output after the other, in order to check if the unit reacts correctly.
NOTE: Autotest Function is available only in A1M Eproms, with **Cooling Configuration* Direct FC (Telecom Units).
The Autotest is started by simply change the tSt Parameter in the Microface to YES (possible only if the Unit is OFF), and can be interrupted at any time by selecting the Parameter to NO, or by starting the Unit in automatic mode.
Autotest Sequence:

1. fan starts for 1 minute.
2. after that the compressor starts for 4 minutes.
3. compressor stops and the electrical heater starts for 1 minute.
4. electrical heater stops and FC-3-point-valve opens to 50 %.
5. if 50 % of the FC-3-point-valve is reached, the FC-3-point-valve closes to 0 %.
6. if 0 % of the FC-3-point-valve is reached, the alarm-relay (7) will be activated for a time of 1 minute.
7. alarm-relay (7) is deactivated and warning relay (0) will be activated for a time of 1 minute.
8. warning-relay relay (0) and fan will be deactivated.

All safety devices (HP,LP, Heaters safety etc.) are active during the sequence.

BAUDRATE (HM)

The speed of the communication of Hiromatic with Hirolink. It is not selectable via software but by means of a jumper on Hiromatic Graphic board.

CASCADE STANDBY UNITS

Setting this parameter will let the standby unit(s) to start not only when an alarm appears on an active unit but also in case of increasing and/or decreasing of temperature and/or humidity to co-work with active unit(s).

Hiromatic	*LCD Display*	*Meaning*
NO	no	cascade function not active
YES	YEh	cascade functione active with both temperature (cooling/heating) and humidity (humidification/de-humification)
TEMP	YE	cascade functione active only for temperature (cooling/heating)
COOL	YEc	cascade functione active only for cooling

COMP. THERMAL PROT. ENABLED

To enable or not enable the alarm “compressor motor protection”.

COMPRESSOR 1 (WORKING HOURS)

A counter of the total number of hours the first air compressor is working. It is possible to set a warning level. When the number of working hours exceeds this level a warning is generated.

COMPRESSOR 2 (WORKING HOURS)

A counter of the total number of hours the second air compressor is working. It is possible to set a warning level. When the number of working hours exceeds this level a warning is generated.

CONDITIONER (WORKING HOURS)

A counter of the total number of hours the Air Conditioning unit is working. It is possible to set a warning level. When the number of working hours exceeds this level a warning is generated.

COOLING CONFIGURATION

This parameter defines the operating mode of the unit.

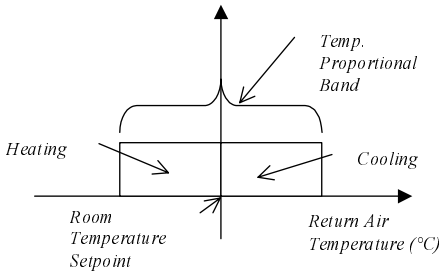
WARNING: wrong setting of this parameter may cause false alarms as well as serious damage of the unit. For correct setting please refer to the label on the Microface Cover. If the label is not present, please refer to the following table:

Hiromatic	*LCD Display*	*Meaning*
DIRECT FC	dFC	Direct Freecooling
TWIN FC/DF	tFC	Twin circuit Freecooler / Dual Fluid
SINGLE FC/DF	SFd	Freecooler / Dual Fluid
TWIN DX	tdE	Twin Compressor Unit
SINGLE DX	SdE	Single Compressor Unit
CHILLED W.	CU	Chilled Water Unit

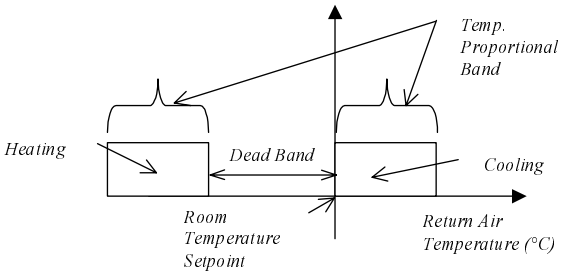
Notes: Hiwall Units ALWAYS have to be set as Direct FC, even if the Units do not have Freecooling.
To find out, which FC Configuration (Single or Direct) has to be set, the Electrical Diagram has to be checked: If the Supply Air Sensor is connected to PTC4, the Unit has to be configured as DIRECT FC (dFC).

DATE (VERSION INFORMATION)
The date of the EPROM version. This information appears (among others) also at the power on of Hiromatic G.

DEAD BAND (for heating)
The extension of the interval in the **Return Air Temperature* axis, at the left of the **Room Temperature Setpoint*, in which the unit is in ventilation mode only. Until the **Return air Temperature* remains inside this interval the unit never goes in heating mode. The heating half-part of the **Temp. Proportional Band* is shifted on the left of an amount equal to Dead Band (see figure).



WITHOUT DEADBAND
(DEADBAND = 0)



WITH DEADBAND
(DEADBAND ≠ 0)

DEHUMIDIFICATION ENABLE
To enable or not enable the dehumidification mode.

DE-HUMIDIFICATION RELAY AS
Allows using the digital output of dehumidification for other purposes, if the dehumidification mode is not required.

Hiromatic	*LCD Display*	*Meaning*
DEHUM	dEH	Dehumidification relay used for dehumidification
WARNING	A1	Relay used as General Warning Contact
NO POWER	P00	Relay changes its status when the unit switches to "NO POWER" mode.

DT ROOM-GLYC.
The value of the difference between the **Return Air Temperature* and the **Glycol Temp.* over which (with a hysteresis of +/-1,5 °C) the unit, if also the conditions on **DT Room-Outd.* and **Stop FC at RoomSp.* + are fulfilled, will switch over to Free Cooling mode (if there are not other conditions that disable the Free Cooling operation).

DT ROOM-OUTD.
The value of the difference between the **Return Air Temperature* and the **Outdoor Temp.* over which (with a hysteresis of +/-1,5 °C) the unit will enable Free Cooling mode (if there are not other conditions that disable the FreeCooling operation). The Free Cooling mode will be activated when also the condition on **DT Room-Glycol* is fulfilled.

EEAP
The temperature and relative humidity measured by the EEAP (Electronic Environment Alarm Package) sensor (if installed).

ENABLE COMMUNICATION (HM)
Set "YES" to enable the communication between Hiromatic Graphic and the Hirolink connected in a Hironet network.
"YES" = Send Information to the Hirolink and accept also Commands from the Hirolink (read & write).
"NO" = Send Information to the Hirolink and do not accept Commands from the Hirolink (read only).

ENABLE COMMUNICATION (MIC)
Set "YES" to enable the communication between Microface and the Hirolink connected in a Hironet network.
NOTE: Direct Communication between Microface and Hirolink is possible only with A1M, 2XM and 3XM Eproms, but not with 1XM Eproms. Direct Communication requires Microface "E" because of the Eprom Size.
"YES" = Send Information to the Hirolink and accept also Commands from the Hirolink (read & write).
"NO" = Send Information to the Hirolink and do not accept Commands from the Hirolink (read only).

EPROM VERSION
The version of the EPROM installed on Hiromatic G. This information appears (among others) also at the power on of Hiromatic G. Remember to record this information when you ask for help from Service.

FAN FAILURE
Depending on the value assigned to this parameter, Microface will stop humidity control and heating only ("warning") or will completely stop the unit ("alarm") when the voltage generated by airflow sensor is lower than the threshold set in **Low Airflow At*. If a differential pressure switch is used for Fan Control, "SWI" has to be set.

FANSPEED
The parameter used by Microface to regulate the speed of the fan when an Analogue Output of Microface is used to drive the fan. The corresponding Analogue Output must be assigned to Fanspeed (can be view as a potentiometer).

FIRST INTERVAL FROM / TO
Specification of the period of time in which the unit will be in Sleep Mode. Set to 00:00 both "FROM" and "TO" if Sleep Mode is not desired.

FREECOOLING (working hours)
A counter of the total number of hours the air conditioning unit is working in Free Cooling status. It is not possible to set a warning level for this counter.

FREECOOLING STATUS
Indicates the actual status of the Free Cooling mode of the unit. "START" means that the condition on the **Outdoor Temperature* is fulfilled but other conditions (on **Glycol Temperature* and/or **Return Air Temperature*) are not yet fulfilled. When all the conditions are fulfilled the Free Cooling mode becomes operating (Free Cooling Status = "ON")

GLYCOL TEMP. (Glycol Temperature)
The temperature of the refrigerant mixture (water or glycol and water) entering the unit. In Free Cooling or Dual Fluid units, depending on the value set in **DT Room-Glycol*, it is only displayed or used to decide the **Free Cooling Status* of the unit. In Free Cooling units it also drives the **Analogue Output* for the radcooler.

HEATER
A counter of the total number of hours the heater is working. It is not possible to set a warning level for this counter.

HEATING STEPS
Number of heating steps.

HIGH/LOW HUM. ALARM EEAP
The thresholds that define an interval of values, for the humidity of the air where the EEAP sensor is installed, outside which a warning is generated (the unit will continue its operations). The warning is delayed of 15 minutes after system on. If the user set at least one of these thresholds to a value different from "NO" an EEAP sensor must be installed otherwise an alarm will be generated.

HIGH/LOW HUM. WARNING
The thresholds that define an interval of values for **Return Air Humidity* outside which a warning is generated (the unit will continue its operations). The warning is delayed of 15 minutes after system on.

HIGH/LOW TEMP. ALARM EEAP
The thresholds that define an interval of values, for the temperature of the air where the EEAP sensor is installed, outside which a warning is generated (the unit will continue its operations). The warning is delayed of 15 minutes after system on. If the user set at least one of these thresholds to a value different from "no" an EEAP sensor must be installed otherwise an alarm will be generated.

HIGH/LOW TEMP. WARNING
The thresholds that define an interval of values for **Return Air Temperature* outside which a warning is generated (the unit will continue its operations). The warning is delayed of 15 minutes after system on.

HIROMATIC ON/OFF BUTTON ENABLE
To enable the ON/OFF button of Hiromatic Graphic to switch ON/OFF the air conditioning units on the *HIROBUS* network.

HIROSENSOR 1 (2)
The temperatures (two values) measured by Hirosensor sensor number 1 (2). These values are not used for regulation or alarm /warning generation.

HUM. DRAIN (humidifier drain)
An override command to drain the cylinder of the humidifier. When set to "ON" the drain command will be active for 20 seconds.

HUMIDIFIER (working hours)
A counter of the total number of hours the humidifier is working. It is possible to set a warning level. When the number of working hours exceeds this level a warning is generated.

HUMIDIFIER MODEL
To be set according the steam generating cylinder mounted in the air conditioning unit. If an external humidifier has to be controlled, this parameter must be set to "EXT".

HUMIDIFIER STEAM OUTPUT / FLUSH RATE

This Parameter belongs to both the different Humidifier types: to the Electrodes Cylinder pls. Refer to STEAM OUTPUT Value only, for Infrared Humidifiers refer to the FLUSH RATE value only.
STEAM OUTPUT:When set to "100%" the humidifier will produce the nominal amount of steam; if set to a lower value the humidifier will produce less steam according the setting. (e.g. a humidifier with a capacity of 9 kg/h will produce at most 4,5 kg/h when Humidifier Steam Output is set to "50%").
FLUSH RATE: Changing this Parameter allows to enlarge the refill time. The lowest refill time is 4 Minutes (IR3) or 7 Minutes (IR6) and can be enlarged increasing the percentage up to 250%.

HUMIDIFIER SUPPLY VOLTAGE

Self-setting according the selected **Humidifier Model*.

HUMIDITY CONTROL

Defines the behaviour of the humidifier. When set to "ON/OFF" the humidifier will start at the left-end of **Humidity Proportional Band* at its maximum capacity (defined in **Humidifier Steam Output*) and stop when the **Room Humidity Setpoint* is reached. Otherwise, the steam output will be proportional to the deviation of **Return Air Humidity* from **Room Humidity Setpoint*.

HUMIDITY INTEGRATION FACTOR

If set to any value, the proportional plus integral control is enabled. The integration factor doubles the actual, real deviation from the setpoint within the selected time. This will force humidification/dehumidification to add more steps to reach the setpoint.

HUMIDITY PROPORTIONAL BAND

The interval of relative humidity values centred on **Room Humidity Setpoint* that defines the humidification and de-humidification behaviour of the unit. When the humidity reaches right (left)-end of the *Humidity Proportional Band* the de-humidification (humidification) resource is activated at 100%. The humidity at which the de-humidification is stopped depends also from **Hysteresis Dehumidification*.

HV (version information)

Information on the compatibility of the software running on Hiromatic G and Hirovisor 97 /Hirovisor 2000. Used only by Service to properly configure Hirovisor 97 / Hirovisor 2000.

HYSTERESIS DEHUMIDIFICATION

Defines the **Return Air Humidity* value at which the dehumidification will be stopped. It is expressed as percentage of the total **Humidity Proportional Band*. (50% means that dehumidification will be stopped at **Room Humidity Setpoint*).

IDENTIFICATION NUMBER (HM)

A number that uniquely identify an Hiromatic Graphic connected on an Hironet network. Must be different for each Hiromatic Graphic in the network.

IDENTIFICATION NUMBER (MIC)

A number that uniquely identify a Microface connected on an Hironet network. Must be different for each Microface in the network.
NOTE: Direct Communication between Microface and Hirolink is possible only with A1M, 2XM and 3XM Eproms, but not with 1XM Eproms. Direct Communication requires Microface "E" because of the Eprom Size.

INDICATION OF TEMPERATURE (not settable)

The unit used by Hiromatic Graphic to represent all temperatures (°C).

KERNEL (version information)

Information on kernel version of the software running on Hiromatic G. Used only by Service.

LANGUAGE

The language used by Hiromatic Graphic. Only available with Hiromatic G. Can be set by the user at LEVEL 2 access level.

LIQUISTAT SENSOR

A read only analogue value which represent the reading of the voltage on the corresponding analogue input. In normal conditions, when the sensor is dry (no water leakage), the indication should be approximately form 1.4 to 1.5. When a water leakage is present and the sensor is wet the indication should be lower than 0.9. When no Liquistat Sensor is connected the indication should be higher than 2.0 and the corresponding sensor failure is generated.

LOW AIRFLOW AT

A threshold value for the voltage generated by the airflow sensor connected to Microface. When the voltage is lower than this threshold a warning is generated. Depending on the value assigned to **Fan Failure* the unit will disable only humidification and heaters (warning) or will completely stop its operations (alarm). Select "SWI" if in the unit a differential pressure switch is installed in place of PTC airflow sensor.

LOW PRESSURE ALARM DELAY

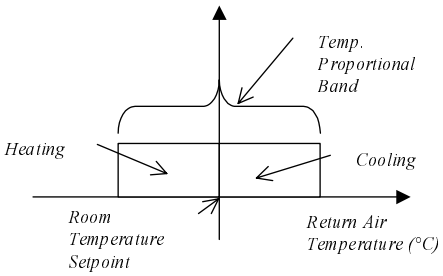
The time delay (in minutes) after a start of the compressor(s) in which the occurrence of a low pressure alarm is ignored. After this time the low pressure alarm is delayed of approximately 10 seconds.

MINIMUM ACTUATOR OPENING

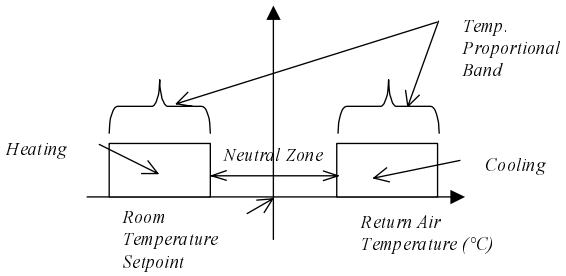
Actuators are motors, which drive either the Free Cooling damper or which drive chilled water or Free Cooling valves. For all this actuators this parameter guarantees a permanent opening of the selected percentage, as long as the unit is in operation, even if the control would like to close the actuator completely.

NEUTRAL ZONE OR SYS OFF

This parameter defines the behaviour of the air conditioning unit when in "sleep mode". If set to "SYS OFF" the unit will completely stop in the specified time intervals and normally operate outside them. If set to a value, between 2 and 15, a band of the specified width is added to the **Temperature Proportional Band*, centred on the **Room Temperature Setpoint*, in which the unit will completely stop its operations. The cooling and heating half-bands are shifted right and left respectively as indicated in the following figure. The humidity control is disabled during "sleep mode".



WITHOUT NEUTRAL ZONE



WITH NEUTRAL ZONE

NUMBER OF CONNECTED UNITS

The number of air conditioning units connected together in a *HIROBUS* network. The user must set it properly depending on actual *HIROBUS* network configuration. All the units in the network must have different addresses (see the manual for detail).

NUMBER OF STANDBY UNITS

The number of units in the network that operate in "Standby" mode.

OUTDOOR TEMP. (Outdoor Temperature)

The temperature of the environment outside the room. It is used, together with the **Return Air Temperature*, to decide the freecooling status of the unit. If more units are connected via *HIROBUS* each unit will work with the average of the values read by all sensors. The value displayed in Additional Sensor window is this average.

PASSWORD

Microface has three different access levels (LEVEL 1, LEVEL 2, LEVEL 4). Each level permits the access to a different set of parameters. To reach each level it is necessary to introduce the corresponding password. The passwords are as follows:

- LEVEL1 to configure the system for regulation 149
- LEVEL2 to completely configure the system ask to your local dealer for the password
- LEVEL4 to calibrate sensors and transducers ask to your local dealer for the password

Hiromatic Graphic has the same access levels with the same passwords.

PERFORM ONE ROTATION

When set to "YES" the system is forced to perform one rotation of the standby units.

PTC TEMPERATURE

Depending on the sensor configuration of the air conditioning unit, it is the temperature of the air flowing out of the unit or, when the Humitemp is not installed, that of the air flowing into the unit. The indication on Hiromatic G switches to SUPPLY AIR TEMPERATURE when **Supply Air Setpoint* is different than "no".

PUMP DOWN

If activated, at Compressor stop only the solenoid valve will close, and after LP Intervention (or after max. 25 seconds) the compressor itself will stop. Pump Down is not performed when Compressor stops because of Alarm, or if the Unit itself is stopped by Hiromatic or LCD Switch.
Note: Pump Down Function is implemented in 3XM Version only.

RETURN AIR HUMIDITY
The humidity of the air entering the air conditioning unit. Depending on how the unit is configured (devices and sensors installed), this humidity is measured by a Humitemp installed inside the unit in the return air flow path or, if Humitemp is not installed, is not measured.. For sensor installation please refer to the electrical diagrams of the unit. This humidity is used by Microface, together with **Room Humidity Setpoint*, **Humidity Proportional Band* and **Humidity Integration Factor* to decide the humidification/dehumidification status of the unit.

RETURN AIR TEMPERATURE
The temperature of the air entering the air conditioning unit. Depending on how the unit is configured (devices and sensors installed), this temperature is measured by a Humitemp or by a PTC sensor installed inside the unit in the return air flow path. For sensor installation please refer to the electrical diagrams of the unit. This temperature is used by Microface, together with **Room Temperature Setpoint*, **Temp. Proportional Band* and **Temp. Integration Factor* to decide the cooling status of the unit.

ROOM HUMIDITY SETPOINT
The humidity of the air desired in the room. It is the reference value used by Microface, together with **Return Air Humidity*, * *Humidity Proportional Band* and **Humidity Integration Factor* to decide the humidification or dehumidification status of the unit.

ROOM TEMP. SETPOINT 2 (Room Temperature Second Setpoint)
A second setpoint value for the air temperature of the room. It is used when at least one **User Input* is set as "SEt" (Second Setpoint) and the switch on the corresponding input of Microface is open.

ROOM TEMPERATURE SETPOINT
The temperature of the air desired in the room. It is the reference value used by Microface, together with **Return Air Temperature*, **Temp. Proportional Band* and **Temp. Integration Factor* to decide the cooling or heating status of the air conditioning unit.

ROTATION AT
The time of the day at which the rotation of the standby units will be performed. Valid only when **Rotation Frequency* is not set to "NO".

ROTATION FREQUENCY
Defines the frequency at which the automatic rotation of standby units will be performed. Without Hiromatic G, rotation is available only every 24 hours. If rotation is enabled and Hiromatic G is not connected, each time that Power ON is performed on the unit N. 1, the rotation is performed.

SECOND INTERVAL FROM / TO
Same as **First Interval From / To*.

SET DATE / TIME
To set the date and the time of the system (only on Hiromatic Graphic). The user can set them with LEVEL 1 access level (see **Password*). There are no problems related to year 2000. The Hiromatic G calendar incudes also leap years. The date indication on the 1st January, 2000 will be 01/01/00.

SET STANDARD SETTING (SINGLE)
If set to yes, all parameters of the selected unit, which have standard setting values, will be changed automatically to the values indicated in the standard settings table of the "parameters table", chapter 8.
NOTE: after setting to "YES" the indication jumps back automatically to "NO" (it behaves as a "push button").

SET STANDARD SETTING (SYS)
If set to yes, all parameters of all units inside the system, which have standard setting values, will be changed automatically to the values indicated in the standard settings table of the "parameters table", chapter 8.
NOTE: after setting to "YES" the indication jumps back automatically to "NO".

SHARED PARAMETERS
Set to yes if you want that all the units connected on a *HIROBUS* network will share a subset of parameters (to know which are the parameter shared see parameter table in the manual). The units in the network will co-work in order to reach the same target. In this way it is possible to avoid competition between units (e.g. one cooling and the other heating).

SLEEP ALL THE DAY
By means of this parameter it is possible to set the unit in order to force it to sleep the whole day in the selected days.

SLEEP MODE RESET
The Sleep Mode Reset allows to handle the behaviour of the unit during Sleep Mode if high / low temperature appears.

STOP FC AT ROOM SET +
The Free Cooling mode will be stopped when the **Return air Temperature* will be greater than **Room Temperature Setpoint* plus *Stop FC at Room Set +*. If Free Cooling mode is stopped for this reason, it will be disabled for at least one hour.

SUPPLY AIR LIMIT SETPOINT

A low limit for the **Supply Air Temperature*. The air conditioning unit will try to always keep the **Supply Air Temperature* greater than the value set in this parameter. If set to a value different from "NO" a PTC sensor must be installed inside the unit (or near it) in the supply air flow path. To decide its cooling status, Microface uses the lower between a) the deviation of **Return Air Temperature* from **Room Temperature Setpoint* and b) the deviation of **PTC Temperature* from **Supply Air Setpoint.*

SUPPLY AIR TEMPERATURE

A read only value. It is the temperature of the air delivery of the unit. Available only when the corresponding sensor is installed and the **Supply Air Limit Setpoint* parameter is set differently from "NO".

TEMP. INTEGRATION FACTOR (Temperature Integration Factor)

If set to any value, the proportional/integral control is enabled. The integration factor doubles the actual, real deviation from the setpoint within the selected time. This will force cooling/heating to add more steps to reach the setpoint.

TEMP. PROPORTIONAL BAND (TEMPERATURE PROPORTIONAL BAND)

The interval of room temperature values centred on **Room Temperature Setpoint* that defines the cooling and heating behaviour of the unit. When the room temperature reaches right (left) end of the *Temp. Proportional Band* the cooling (heating) resource is used at 100%. When the temperature goes back to the **Room Temperature Setpoint* the cooling (heating) resource are stopped.

USER INPUT #1 (#2)

According to the value set for this parameter Microface will take some actions when the switch connected to the corresponding input of Microface (for the identification of the User Input on Microface see electrical drawing of the unit) is open:

- UI1: "nHumi": the humidification is disabled;
- UI1: "nComp": the compressor(s) is(are) disabled;
- UI1: "WARNING": a warning is generated (the unit continue its operations);
- UI1: "ALARM": an alarm is generated (the unit stop its operations);
- UI1: "2nd Setpoint": the reference value for **Return Air Temperature* regulation switch to **Room Temp. Setpoint 2*;
- UI1,2: "No Power": everything is stopped except fans and free cooling function;
- UI1,2: "Not Used": Microface will not take any action on User Input opening.
- UI2: "LSI": self-setting when a standard humidifier is selected

WATER LEAKAGE DETECTOR (LWD)

Enables or disables the sensor. When enabled can be set to Warning (Message only) or to Alarm (stops Unit in case of Water detection).

A - 1. Microface Inputs and Outputs for 1XM, A1M and 2XM Units

Eprom / Input	1XM / A1M 160.xxx			
	Chilled Water	**Single DX**	**Single FC/DF**	**Direct FC**
P0	Remote On/Off **and** Fire Alarm	Remote On/Off **and** Fire Alarm	Remote On/Off **and** Fire Alarm	Remote On/Off **and** Fire Alarm
P1	User Input 1 **and** (Cond.1 Fan Failure **or** Smoke Warning)	User Input 1 **and** (Cond.1 Fan Failure **or** Smoke Warning)	User Input 1 **and** (Cond.1 Fan Failure **or** Smoke Warning)	User Input 1 **and** (Cond.1 Fan Failure **or** Smoke Warning)
P2	Clogged Filter	Clogged Filter	Clogged Filter	Clogged Filter
P3	High CW Temp.	HP **and** TH	HP **and** LP **and** TH	HP **and** LP **and** TH
P4	Low CW Flow	LP	Glycol Temp.	Supply Air Temp.
P5	Heaters Safety	Heaters Safety	Outdoor Temp.	Outdoor Temp.
P6	LSI **or** User Input 2	LSI **or** User Input 2	LSI **or** User Input 2	User Input 2
P7	Return Air Temp. **or** Supply Air Temp.	Return Air Temp. **or** Supply Air Temp.	Return Air Temp. **or** Supply Air Temp.	Return Air Temp.

Table 1-1 "Digital" inputs of "1XM / A1M - Microface" units.

Eprom / Input	1XM / A1M 160.xxx			
	Chilled Water	**Single DX**	**Single FC/DF**	**Direct FC**
An0	Airflow Device	Airflow Device	Airflow Device	Airflow Device
An1	Cond.2 Fan Failure	Cond.2 Fan Failure	Heaters Safety	Heaters Safety
An2	Leakage Water Detector (LWD)	Leakage Water Detector (LWD)	Leakage Water Detector (LWD)	Leakage Water Detector (LWD)

Table 1-2 "Analogue" inputs of "1XM / A1M - Microface" units.

Eprom / Output	1XM / A1M 160.xxx			
	Chilled Water	**Single DX**	**Single FC/DF**	**Direct FC**
OUT0	Dehumidification **or** Warning **or** No Power Operation	Dehumidification **or** Warning **or** No Power Operation	Dehumidification **or** Warning **or** No Power Operation	Dehumidification **or** Warning **or** No Power Operation
OUT1	Open Valve Actuator	Compressor	Compressor	Compressor
OUT2	Close Valve Actuator	Solenoid Valve	Freecooling On	Fan
OUT3	Heaters Step 1 **or** Alternative Function	Heaters Step 1 **or** Alternative Function	Open FC Actuator	Heaters Step 1 **or** Alternative Function
OUT4	Heaters Step 2 **or** Alternative Function	Heaters Step 2 **or** Alternative Function	Close FC Actuator	Heaters Step 2 **or** Alternative Function
OUT5	Humidifier Fill	Humidifier Fill	Humidifier Fill	Open FC Actuator
OUT6	Humidifier Drain	Humidifier Drain	Humidifier Drain	Close FC Actuator
OUT7	Alarm	Alarm	Alarm	Alarm
OUT8	Fan	Fan	Fan	Fan Failure (NC)
OUT9	Humidifier (internal or external)	Humidifier (internal or external)	Humidifier (internal or external)	Humidifier (external only)

Table 1-3 Digital outputs of "1XM / A1M - Microface" units.

Eprom / Output	1XM / A1M160.xxx			
	Chilled Water	**Single DX**	**Single FC/DF**	**Direct FC**
PWM 0	selectable	selectable	selectable	selectable
PWM 1	selectable	selectable	selectable	selectable

Table 1-4 Analogue outputs of "1XM / A1M - Microface" units.

Eprom	FIRST MICROFACE 2XM 160.xxx		SECOND MICROFACE 2XM 160.xxx
Input	**Twin DX**	**Twin FC/DF**	**Twin FC/DF**
P0	Remote On/Off **and** Fire Alarm	Remote On/Off **and** Fire Alarm	not used
P1	User Input 1 **and** (Cond.1 Fan Failure **or** Smoke Warning)	User Input 1 **and** (Cond.1 Fan Failure **or** Smoke Warning)	not used
P2	Clogged Filter	Clogged Filter	not used
P3	HP 1 **and** LP 1 **and** TH 1	HP 1 **and** LP 1 **and** TH 1	not used
P4	HP 2 **and** LP 2 **and** TH 2	HP 2 **and** LP 2 **and** TH 2	Outdoor Temp.
P5	Heaters Safety	Heaters Safety	Glycol Temp.
P6	LSI **or** User Input 2	LSI **or** User Input 2	not used
P7	Return Air Temp. **or** Supply Air Temp.	Return Air Temp. **or** Supply Air Temp.	not used

Table 1-5 "Digital" inputs of "2XM - Microface" units.

Eprom	FIRST MICROFACE 2XM 160.xxx		SECOND MICROFACE 2XM 160.xxx
Input	**Twin DX**	**Twin FC/DF**	**Twin FC/DF**
An0	Airflow Device	Airflow Device	not used
An1	Cond.2 Fan Failure	Cond.2 Fan Failure	not used
An2	Leakage Water Detector (LWD)	Leakage Water Detector (LWD)	not used

Table 1-6 "Analogue" inputs of "2XM - Microface" units.

Eprom	FIRST MICROFACE 2XM 160.xxx		SECOND MICROFACE 2XM 160.xxx
Output	**Twin DX**	**Twin FC/DF**	**Twin FC/DF**
OUT0	Dehumidification **or** Warning **or** No Power Operation	Dehumidification **or** Warning **or** No Power Operation	not used
OUT1	Compressor 1	Compressor 1	not used
OUT2	Compressor 2	Compressor 2	Freecooling
OUT3	Heaters Step 1 Or Alternative Function	Heaters Step 1 Or Alternative Function	Open FC Actuator 1
OUT4	Heaters Step 2 Or Alternative Function	Heaters Step 2 Or Alternative Function	Close FC Actuator 1
OUT5	Humidifier Fill	Humidifier Fill	Open FC Actuator 2
OUT6	Humidifier Drain	Humidifier Drain	Close FC Actuator 2
OUT7	Alarm	Alarm	not used
OUT8	Fan	Fan	not used
OUT9	Humidifier (internal or external)	Humidifier (internal or external)	not used

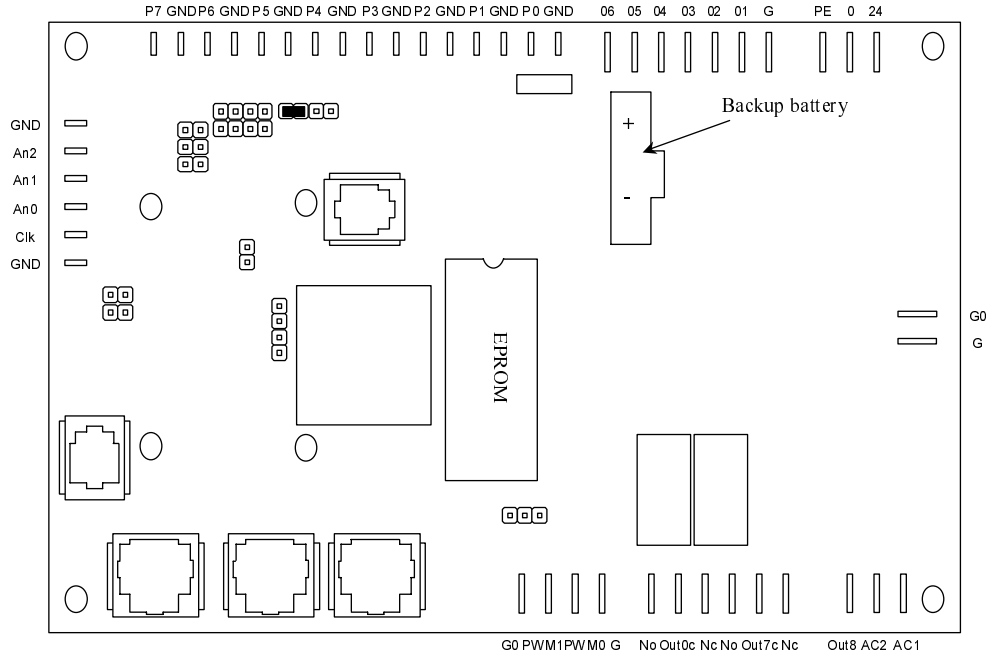
Table 1-7 Digital outputs of "2XM - Microface" units.

Eprom	FIRST MICROFACE 2XM 160.xxx		SECOND MICROFACE 2XM 160.xxx
Output	**Twin DX**	**Twin FC/DF**	**Twin FC/DF**
PWM0	selectable	selectable	not used
PWM1	selectable	selectable	not used

Table 1-8 Analogue outputs of "2XM - Microface" units.

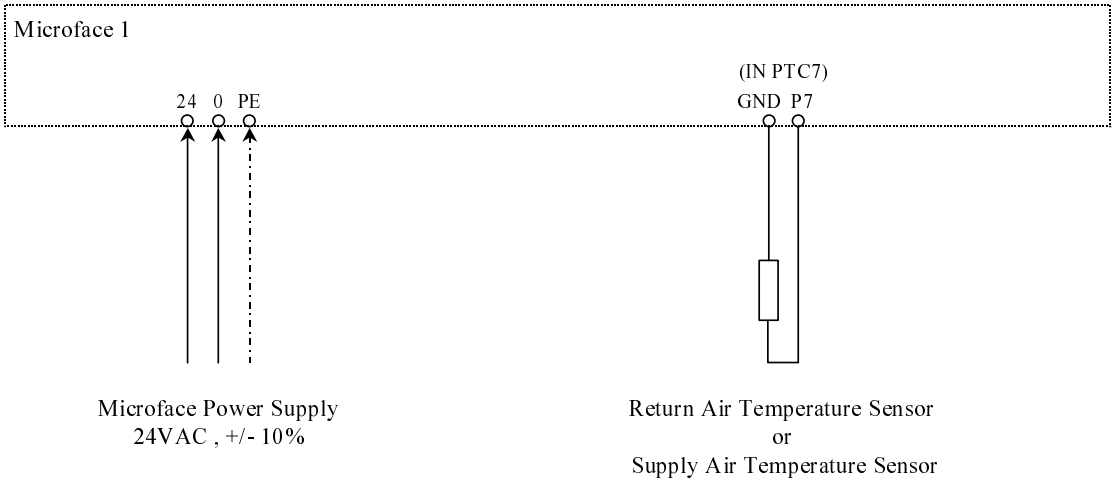
A - 2. Microface Connection Guide for 1XM, A1M and 2XM Units[1]

Microface - Layout



1

Power Supply, Inp. Sensors
Single DX, Chilled Water, Twin DX, Twin FC / DF

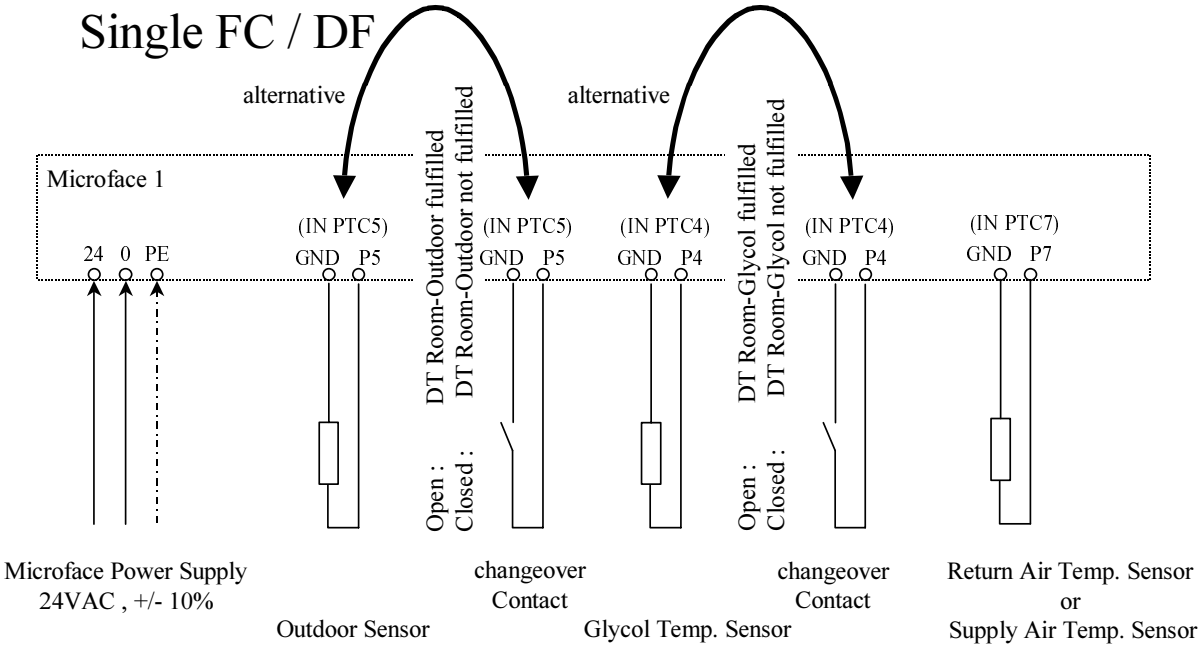


NOTES : If Humitemp is connected, this sensor changes automatically to Supply Sensor.
If no Humitemp is connected, it is the Return Air (Control) Sensor.

2

[1] For more details on electrical connections, please refere to the electrical diagrams of the unit.

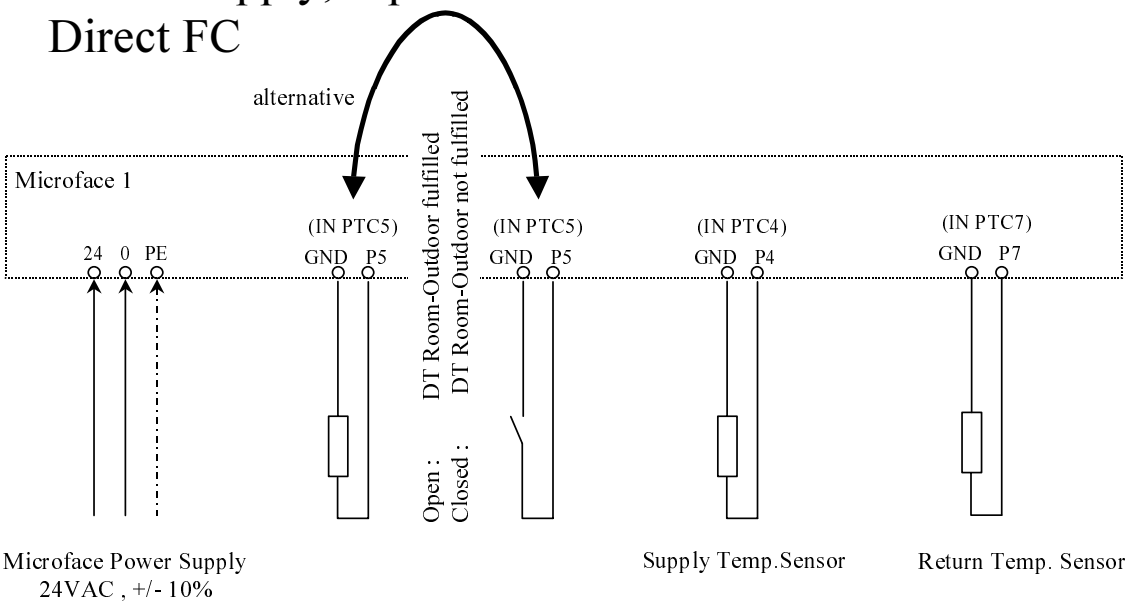
Power Supply, Inp. Sensors Single FC / DF



NOTES : If Humitemp is connected, the Return air sensor changes automatically to Supply Sensor. If no Humitemp is connected, it is the Return Air (Control) Sensor.
The Glycol sensor is Standard in FC units only, but can also be connected to DF Units.
Instead of the Sensors for Outdoor and Glycol also switching contacts may be used. The relevant Delta-T Parameter must be set to "CON" in that case.

3

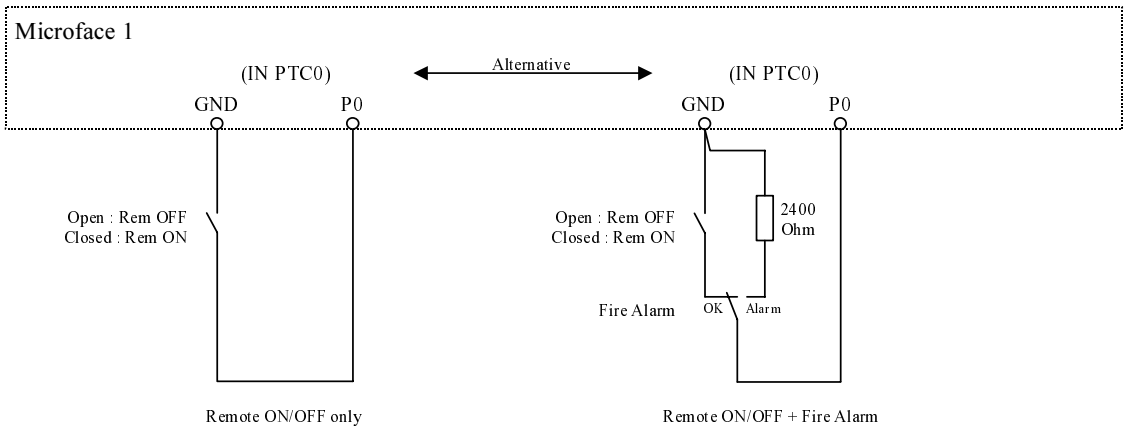
Power Supply, Inp. Sensors Direct FC



NOTES : If Humitemp is connected, the Inp. Return air sensor is for backup only(if connected).
Instead of the Outdoor Sensor also a switching contact may be used. The relevant Delta-T Parameter must be set to "CON" in that case.

4

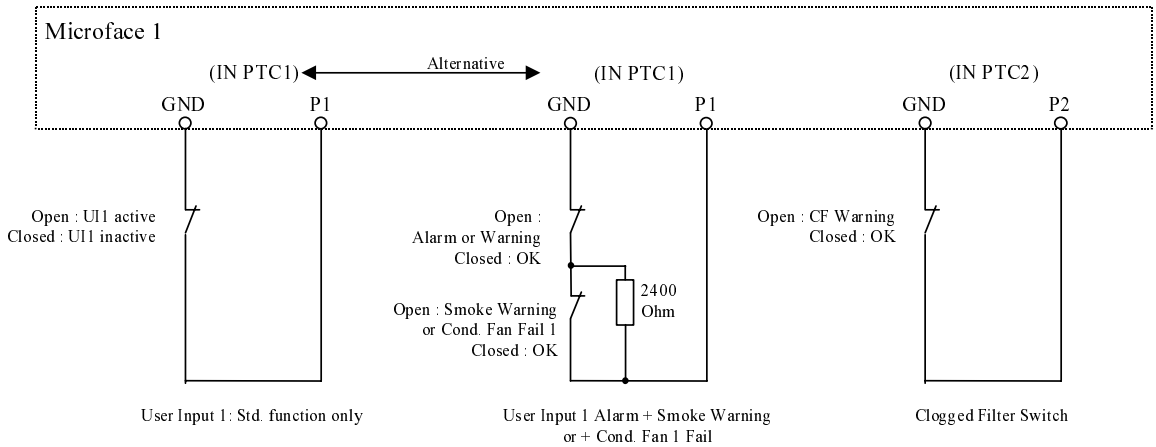
Remote On/Off + Fire Alarm
all Cooling Configurations



NOTES : The unit has to be restarted manually after fire alarm.

5

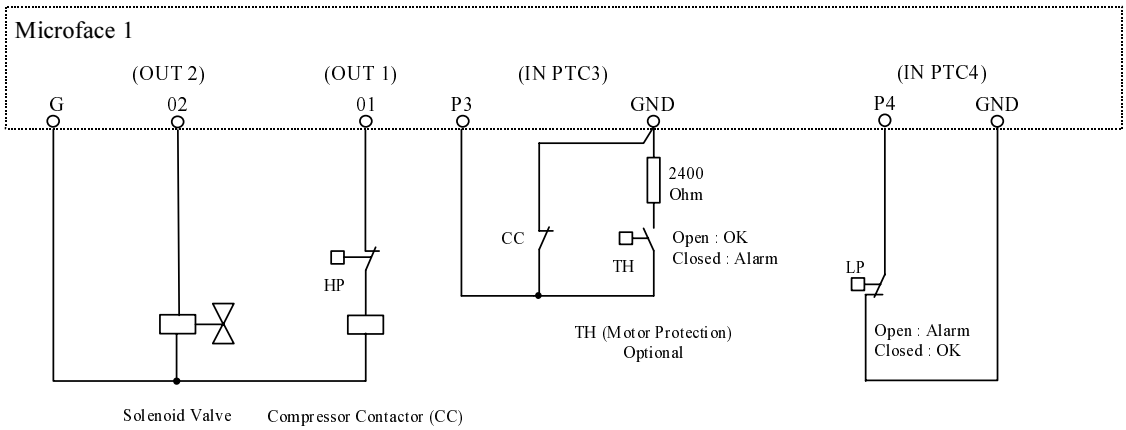
User Input 1 + Clogged Filter
all Cooling Configurations



NOTES : The Smoke Warning is available ONLY if the UI is set to Alarm.
The Smoke Warning DOESNOT STOP THE FAN. It only disables the Freecooling and closes the Freecooling actuator to 0.
If the UI is set to Warning, the second poss. is to get a Cond. Fan 1 Fail Warning.

6

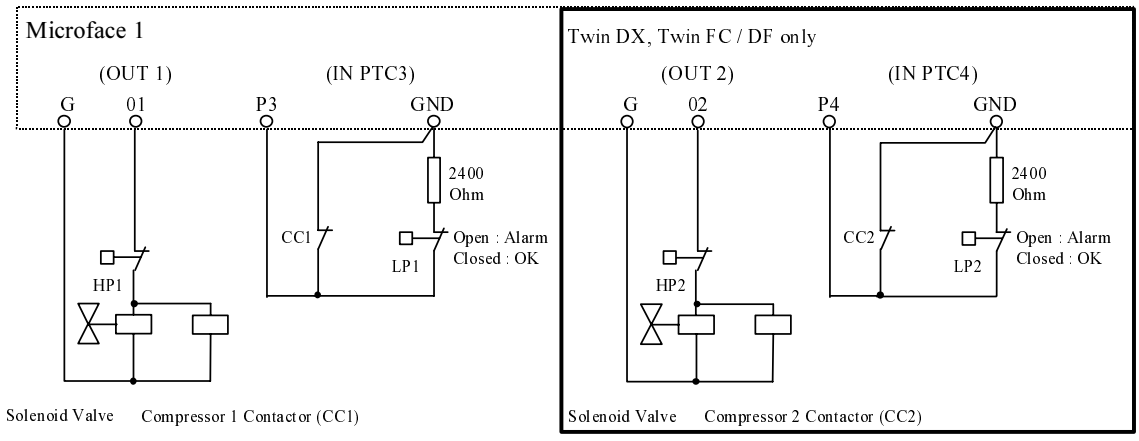
Compressor Control
Single DX



NOTES :

7

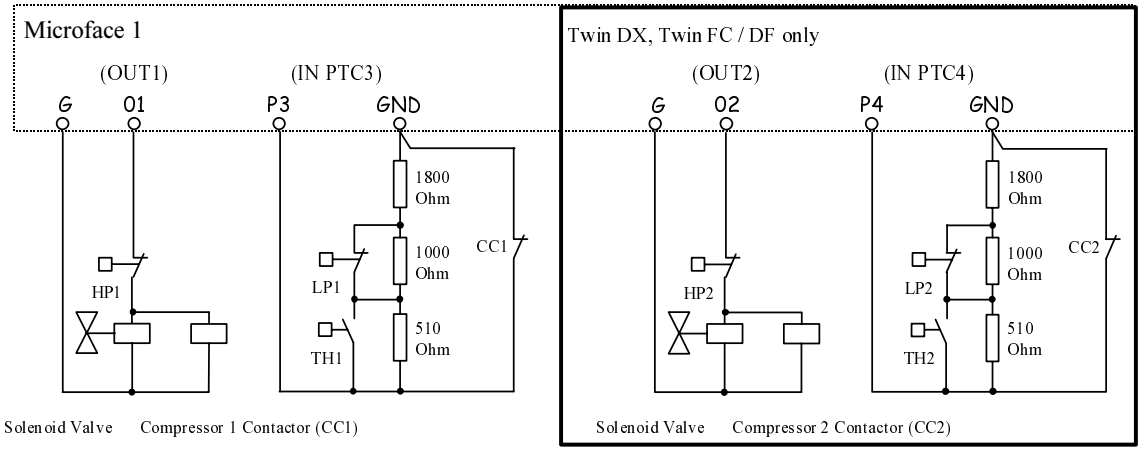
Compressor Control: Twin DX, Twin FC / DF,
Single FC / DF , Direct FC
without Thermal Protection



NOTES :

8

Compressor Control: Twin DX, Twin FC / DF, Single FC / DF , Direct FC with Thermal Protection

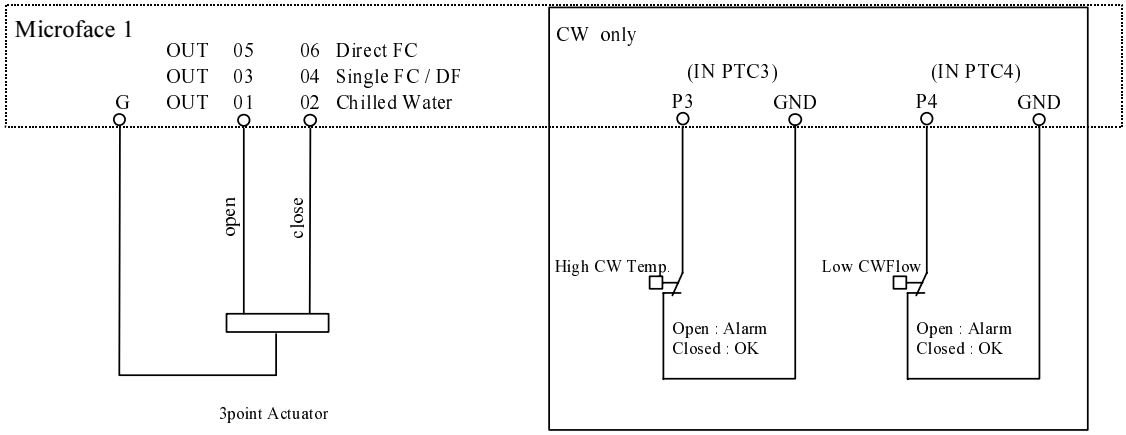


NOTES : LP1, LP2 : Open : Alarm
Closed : OK

TH1, TH2 : Open : OK
Closed :Alarm

9

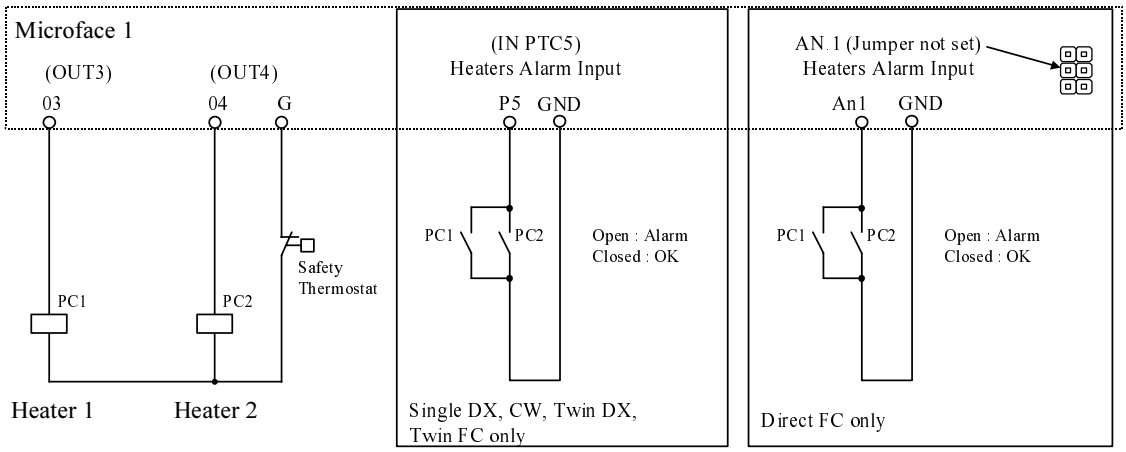
3 Point Actuator Control CW, Single FC / DF , Direct FC only



NOTES :

10

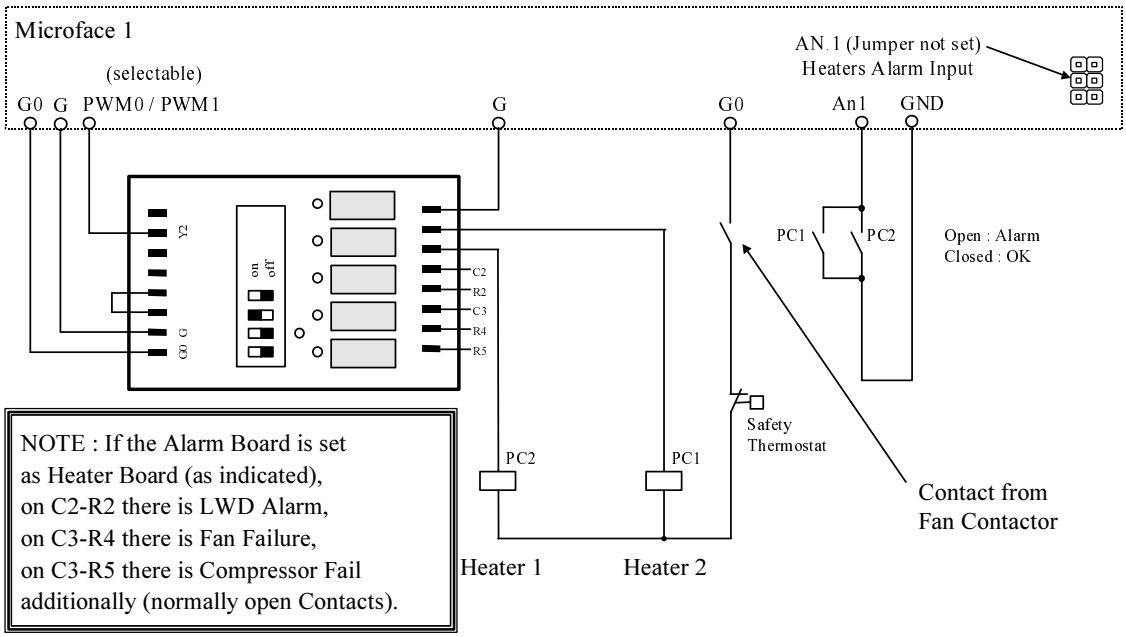
Electrical Heaters Control
Single DX, CW, Twin DX, Twin FC / DF, Direct FC



NOTE :

11

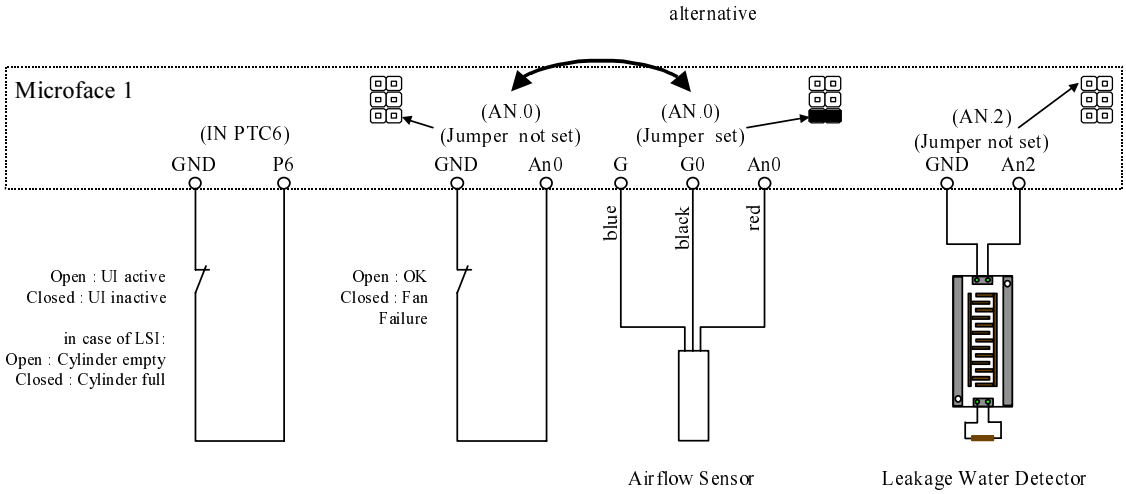
Electrical Heaters Control
Single FC / DF



NOTE : If the Alarm Board is set
as Heater Board (as indicated),
on C2-R2 there is LWD Alarm,
on C3-R4 there is Fan Failure,
on C3-R5 there is Compressor Fail
additionally (normally open Contacts).

12

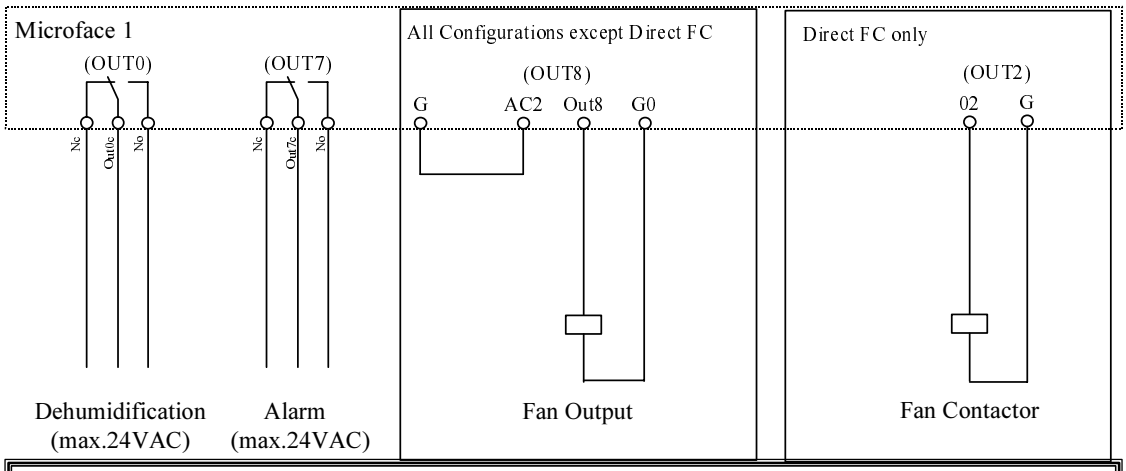
User Input 2, Airflow Device, LWD all Cooling Configurations



NOTES : Airflow Sensor or Differential Pressostat (Contact) for Fans supervision are alternative.

13

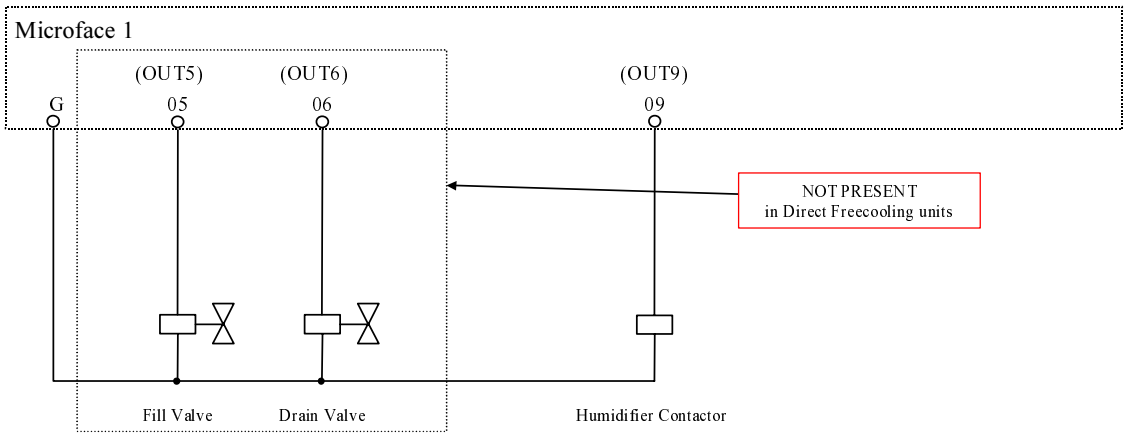
Warning, Alarm and Fan Output all Cooling Configurations



NOTE 1 : Dehum. Output can be programmed as :Dehumidification, Warning, No Power message or not used. (all Functions are alternative)
NOTE 2 : Direct Freecooling only : Output 8 is used to signalise Fan Failure.

14

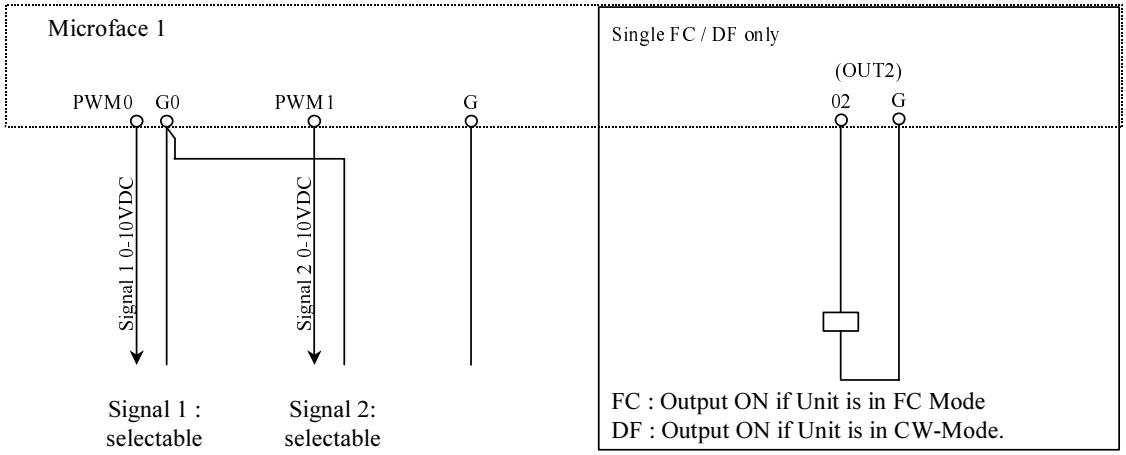
Humidifier Control
all Cooling Configurations



NOTES : Fill and Drain Valve are not present in Direct Freecooling Units.
In these Units only remote Humidifiers can be controlled (or internal Humidifier with additional Electronic Card).

15

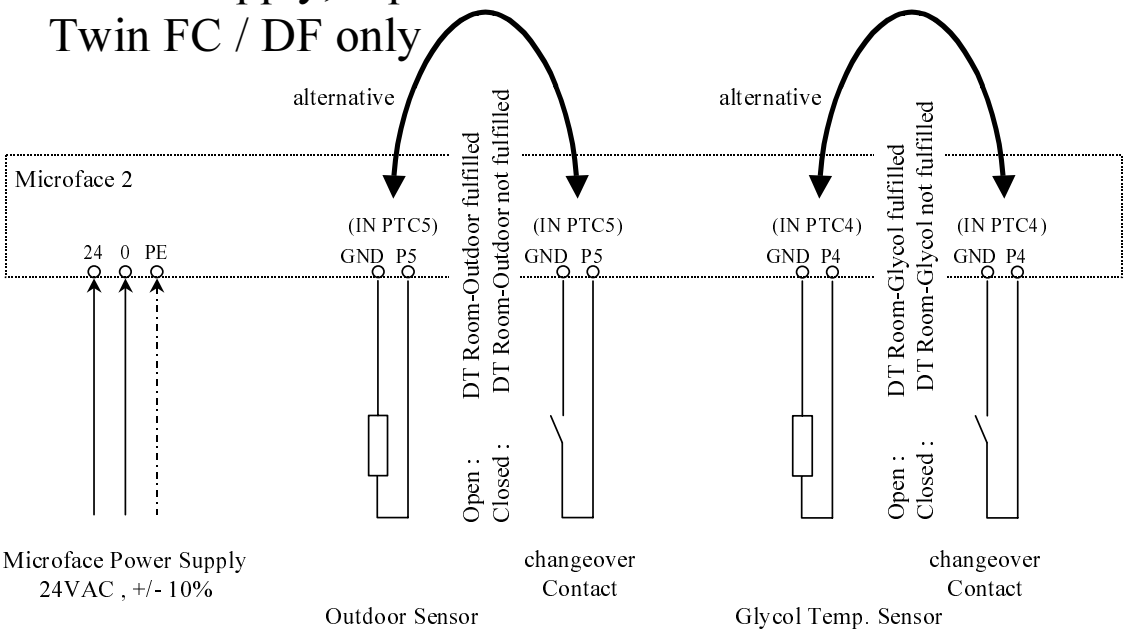
Analogue Outputs and
Status Messages Single FC / DF



NOTES : Single FC / DF: 1 Analogue Output is necessary to drive the Heater Board, if present.

16

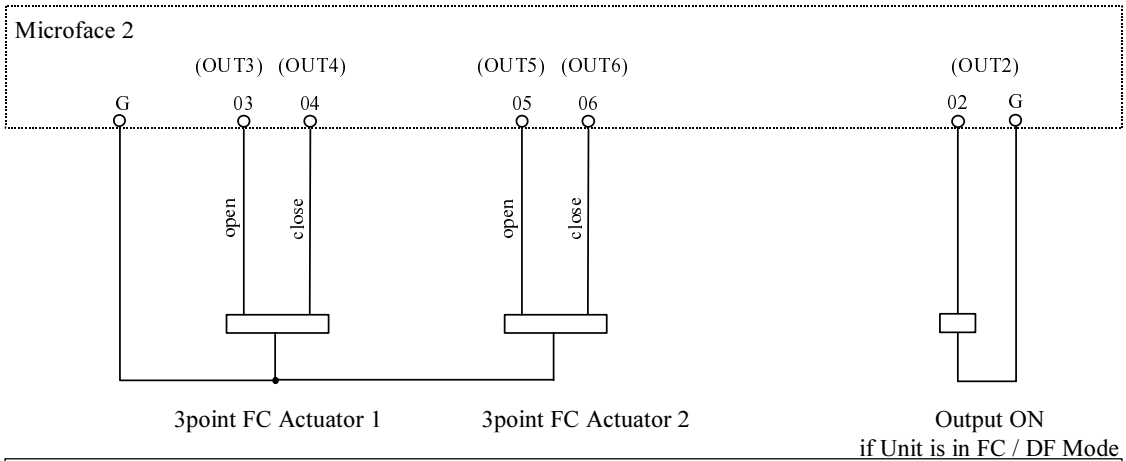
Power Supply, Inp. Sensors
Twin FC / DF only



NOTES : The Glycol sensor is Standard in FC units only, but can also be connected to DF Units.
Instead of the Sensors for Outdoor and Glycol also switching contacts may be used. The relevant Delta-T Parameter must be set to "CON" in that case.

17

Digital Outputs
Twin FC / DF only



NOTES :

18

A - 3. Microface Inputs and Outputs for 3XM Units

Eprom	FIRST MICROFACE 3XM 160.xxx			SECOND MICROFACE 3XM 160.xxx	
Input	**Chilled Water**	**Twin DX**	**Twin FC/DF**	**Twin DX**	**Twin FC/DF**
P0	Remote On/Off **and** Fire Alarm	Remote On/Off **and** Fire Alarm	Remote On/Off **and** Fire Alarm	LP 1	LP 1
P1	User Input 1	User Input 1 **and** Cond.1 Fan Failure	User Input 1 **and** Cond.1 Fan Failure	LP 2	LP 2
P2	Clogged Filter	Clogged Filter	Clogged Filter	High Hum. Temp.	High Hum. Temp.
P3	Low CW Flow	HP 1	HP 1	not used	not used
P4	High Hum. Temp.	HP 2	HP 2	not used	Outdoor Temp.
P5	Heaters Safety	Heaters Safety	Heaters Safety	not used	Glycol Temp.
P6	LSI **or** User Input 2	LSI **or** User Input 2	LSI **or** User Input 2	TH 1	TH 1
P7	Return Air Temp. **or** Supply Air Temp.	Return Air Temp. **or** Supply Air Temp.	Return Air Temp. **or** Supply Air Temp.	TH 2	TH 2

Table 3-1 "Digital" inputs of "3XM - Microface" units.

Eprom	FIRST MICROFACE 3XM 160.xxx			SECOND MICROFACE 3XM 160.xxx	
Input	**Chilled Water**	**Twin DX**	**Twin FC/DF**	**Twin DX**	**Twin FC/DF**
An0	Airflow Device	Airflow Device	Airflow Device	not used	not used
An1	IR Hum Overfill	IR Hum Overfill **or** Cond.Fan 2 Fail	IR Hum Overfill **or** Cond.Fan 2 Fail	not used	not used
An2	LWD	LWD	LWD	not used	not used

Table 3-2 "Analogue" inputs of "3XM - Microface" units.

Eprom	FIRST MICROFACE 3XM 160.xxx			SECOND MICROFACE 3XM 160.xxx	
Output	**Chilled Water**	**Twin DX**	**Twin FC/DF**	**Twin DX**	**Twin FC/DF**
OUT0	Dehumidification **or** Warning **or** No Power Operat.	Dehumidification **or** Warning **or** No Power Operat.	Dehumidification **or** Warning **or** No Power Operat.	Solenoid Valve Compressor 1	Solenoid Valve Compressor 1
OUT1	Open Actuator	Compressor 1	Compressor 1	Partialisation 1	Partialisation 1
OUT2	Close Actuator	Compressor 2	Compressor 2	not used	Freecooling
OUT3	Heaters Step 1 Or Alt.Function	Heaters Step 1 Or Alt.Function	Heaters Step 1 Or Alt.Function	Open Actuator 1	Open Actuator 1
OUT4	Heaters Step 2 Or Alt.Function	Heaters Step 2 Or Alt.Function	Heaters Step 2 Or Alt.Function	Close Actuator 1	Close Actuator 1
OUT5	Humidifier Fill	Humidifier Fill	Humidifier Fill	not used	not used
OUT6	Humidifier Drain	Humidifier Drain	Humidifier Drain	not used	not used
OUT7	Alarm	Alarm	Alarm	Solenoid Valve Compressor 2	Solenoid Valve Compressor 2
OUT8	Fan	Fan	Fan	Partialisation 2	Partialisation 2
OUT9	Humidifier	Humidifier	Humidifier	not used	not used

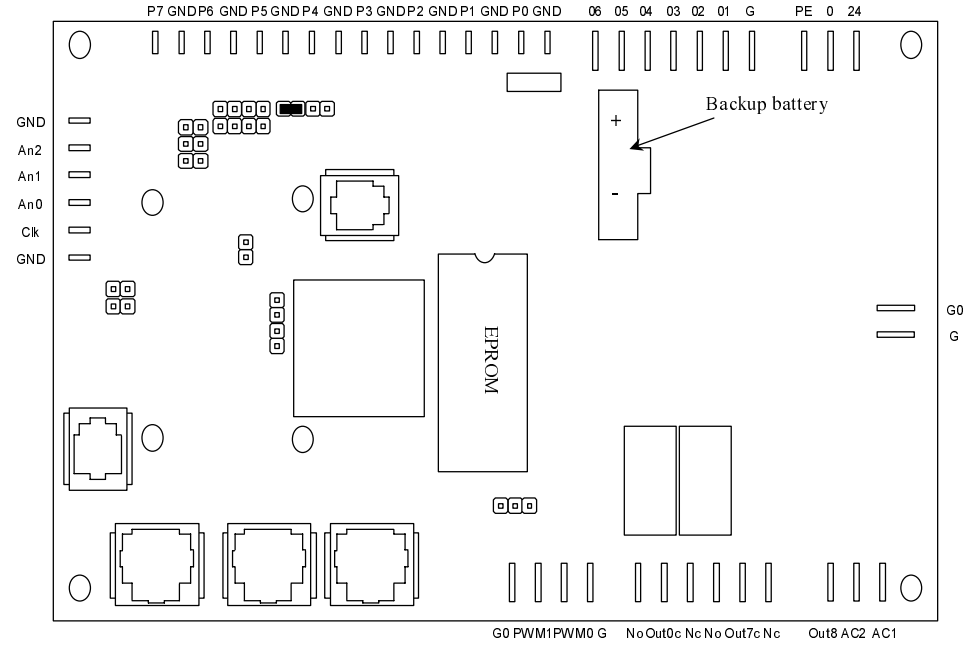
Table 3-3 Digital outputs of "3XM - Microface" units.

Eprom	FIRST MICROFACE 3XM 160.xxx			SECOND MICROFACE 3XM 160.xxx	
Output	**Chilled Water**	**Twin DX**	**Twin FC/DF**	**Twin DX**	**Twin FC/DF**
PWM0	selectable.	selectable	selectable	not used	not used
PWM1	selectable.	selectable	selectable	not used	not used

Table 3-4 Analogue outputs of "3XM - Microface" units.

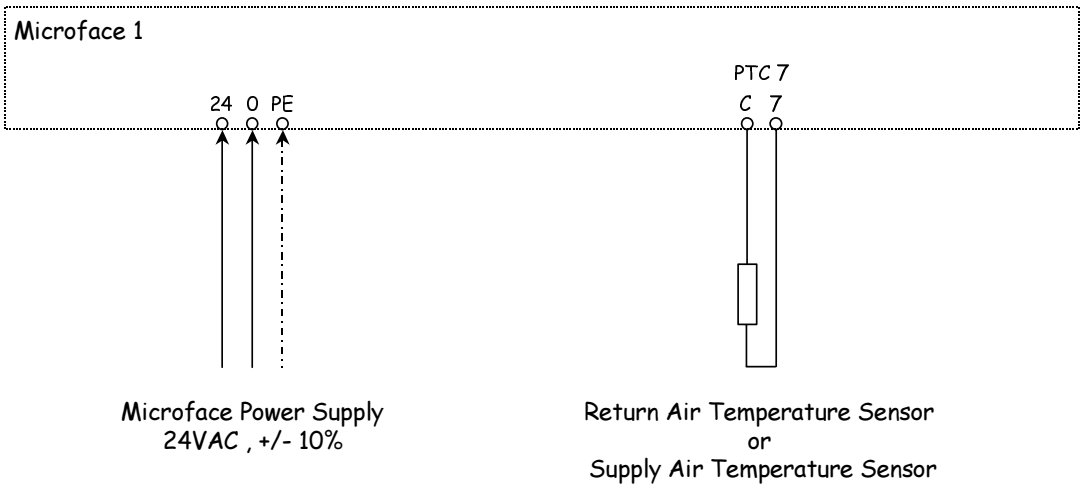
A - 4. Microface Connection Guide for 3XM Units[2]

Microface - Layout



1

Power Supply, PTC Sensors
all Configurations

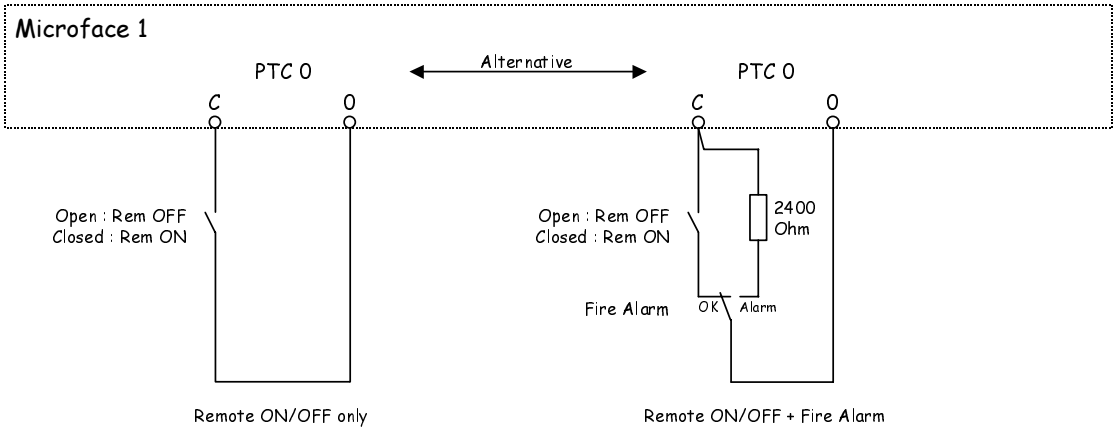


NOTES : If Humitemp is connected, this sensor changes automatically to Supply Sensor.
If no Humitemp is connected, it is the Return Air (Control) Sensor.

2

[2] For more details on electrical connections, please refere to the electrical diagrams of the unit.

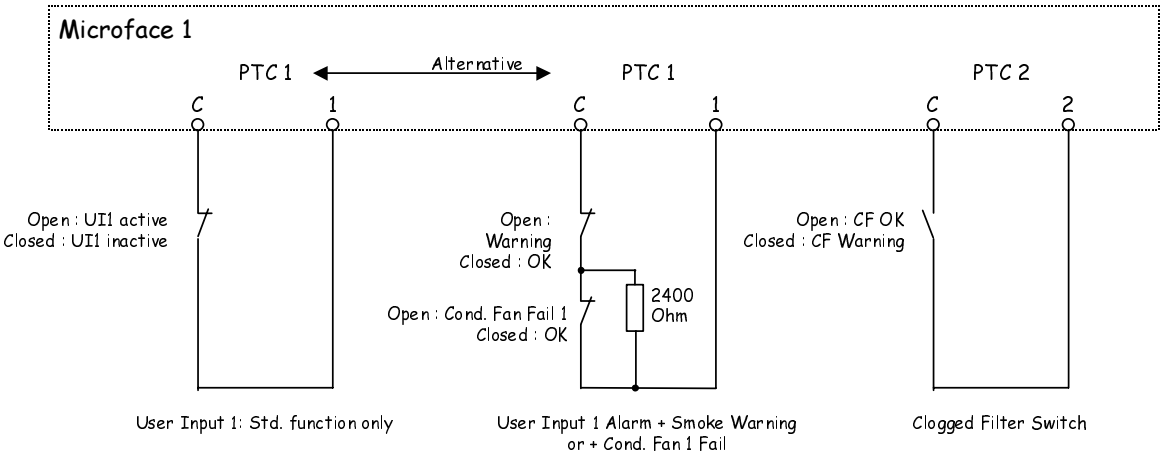
Remote On/Off + Fire Alarm
all Configurations



NOTES : The unit has to be restarted manually after fire alarm.

3

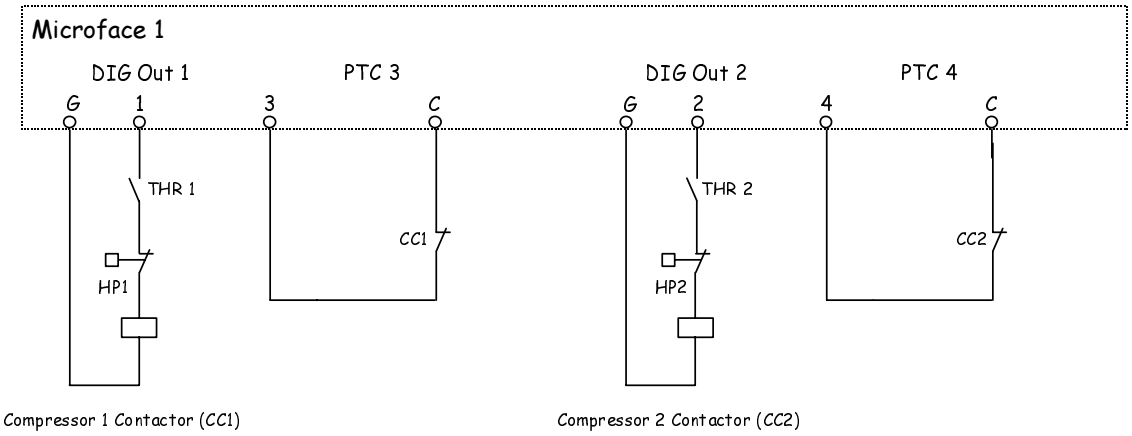
User Input 1 + Clogged Filter
all Configurations



NOTES : If the UI is set to Warning, the second poss. is to get a Cond. Fan 1 Fail Warning.

4

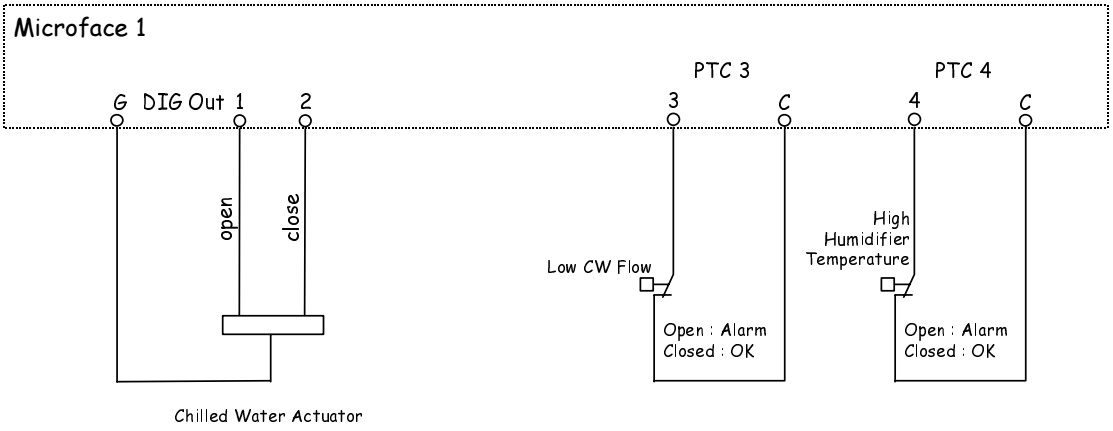
Compressor Control:
Twin DX + Twin FC/DF only



NOTES : Compressor Motor Protection must stop the Compressor directly, via Relay

5

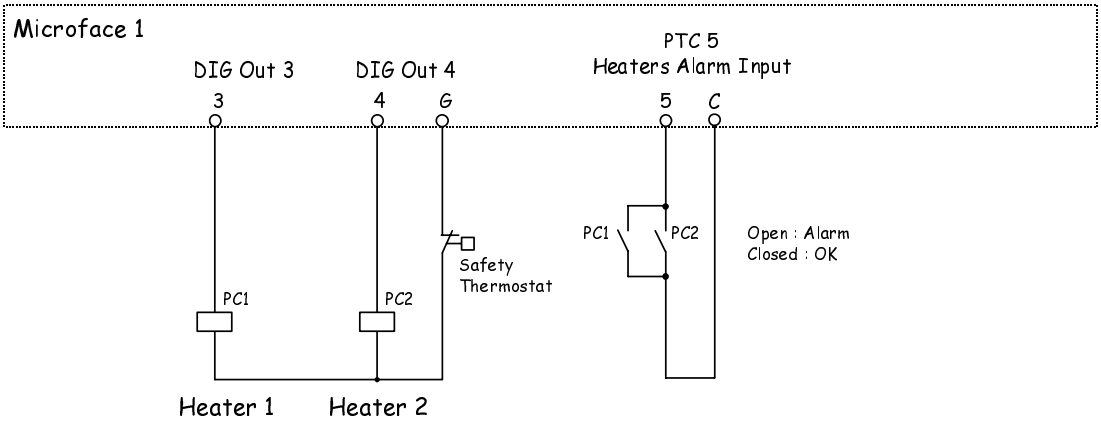
Chilled Water Actuator Control + Various
CW only



NOTES : High Humidifier Temperature Input only used if there is a Infrared-Humidifier.

6

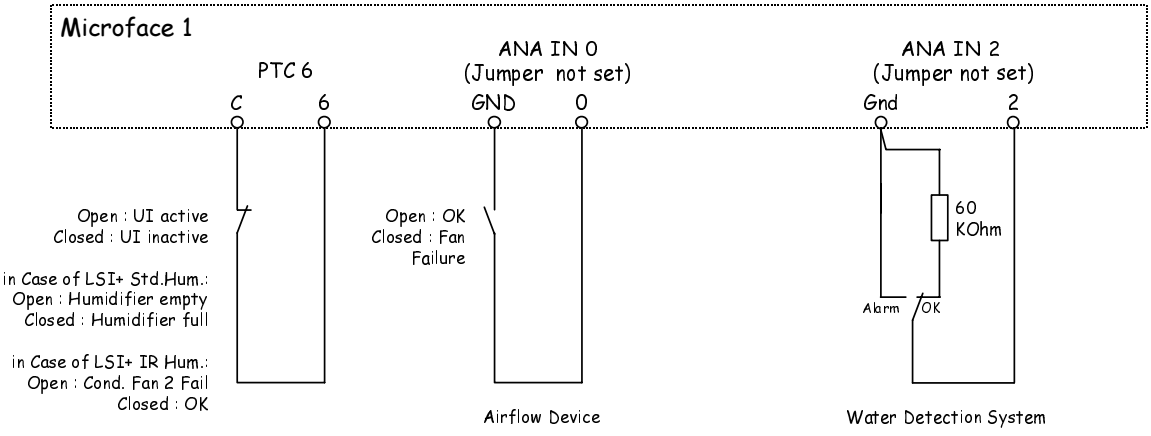
Electrical Heaters Control
all Configurations



NOTE : Instead of the Heaters some Alarm Outputs may be programmed.
Pls. Refer to the Controls Manual.

7

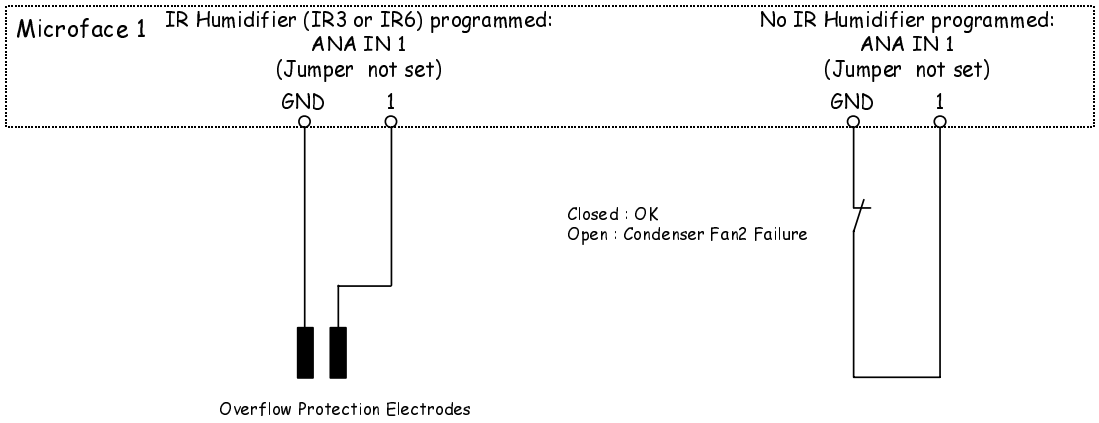
User Input 2, Airflow Device, Water Detection System
all Configurations



NOTES :

8

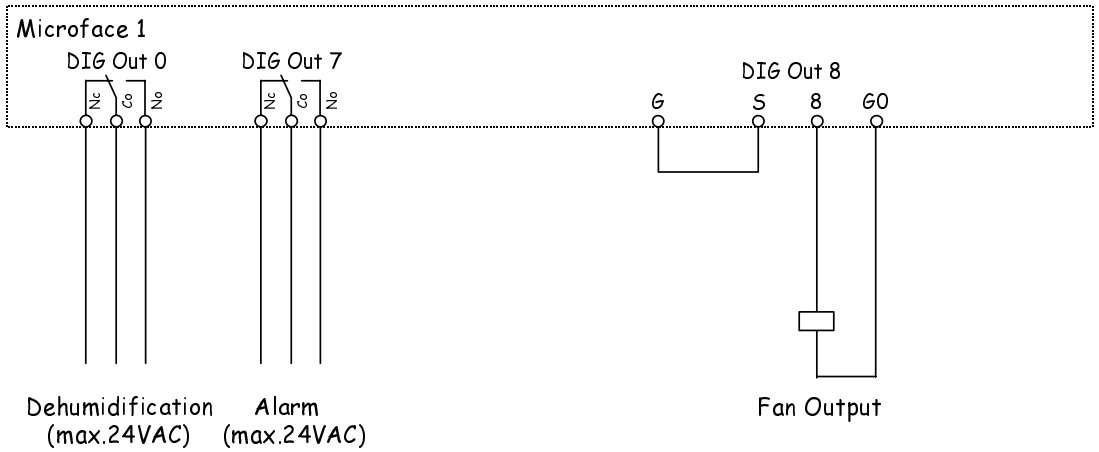
IR Humidifier Overflow Protection / Condenser 2 Failure
all Configurations



NOTES :

9

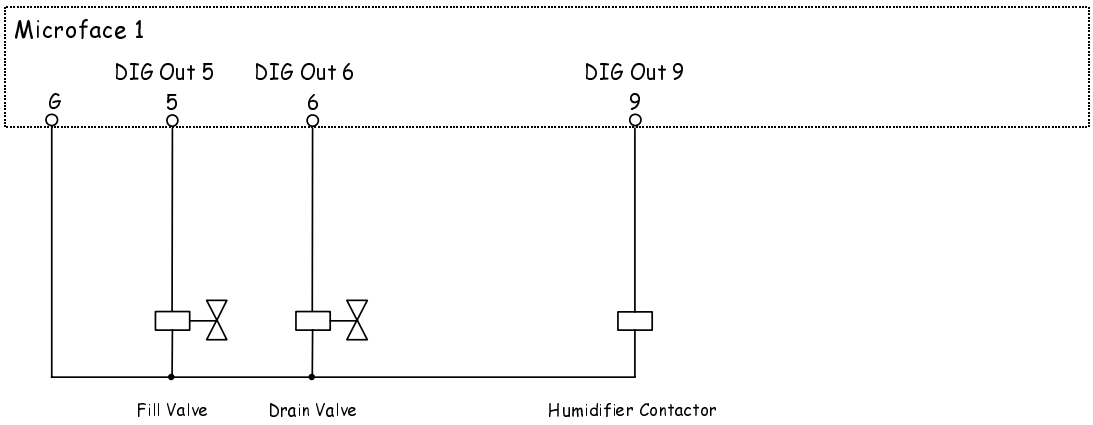
Warning, Alarm and Fan Output
all Configurations



NOTE 1 : Dehum. Output can be programmed as :Dehumidification, Warning, No Power message or not used. (all Functions are alternative)

10

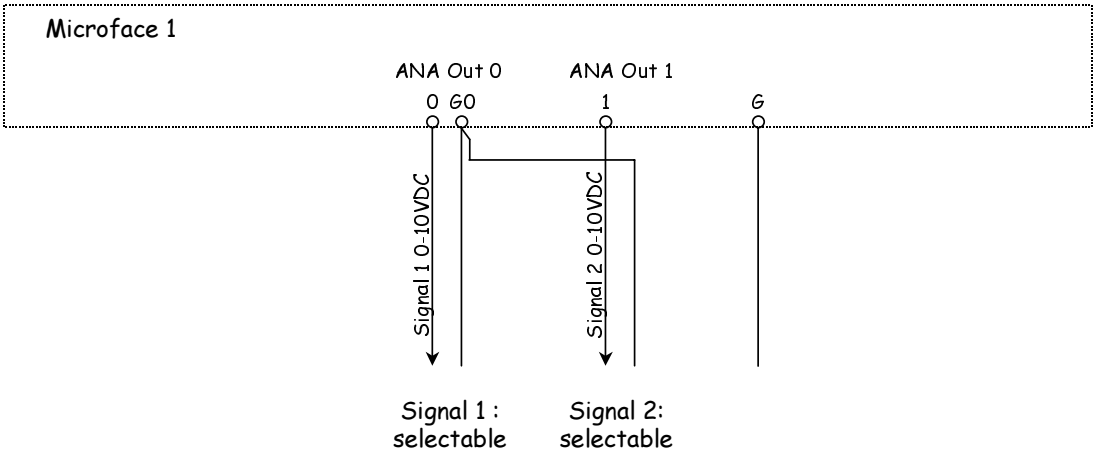
Humidifier Control
all Configurations



NOTES : Drain Valve not used for Infrared-Humidifier.

11

Analogue Outputs
all Configurations

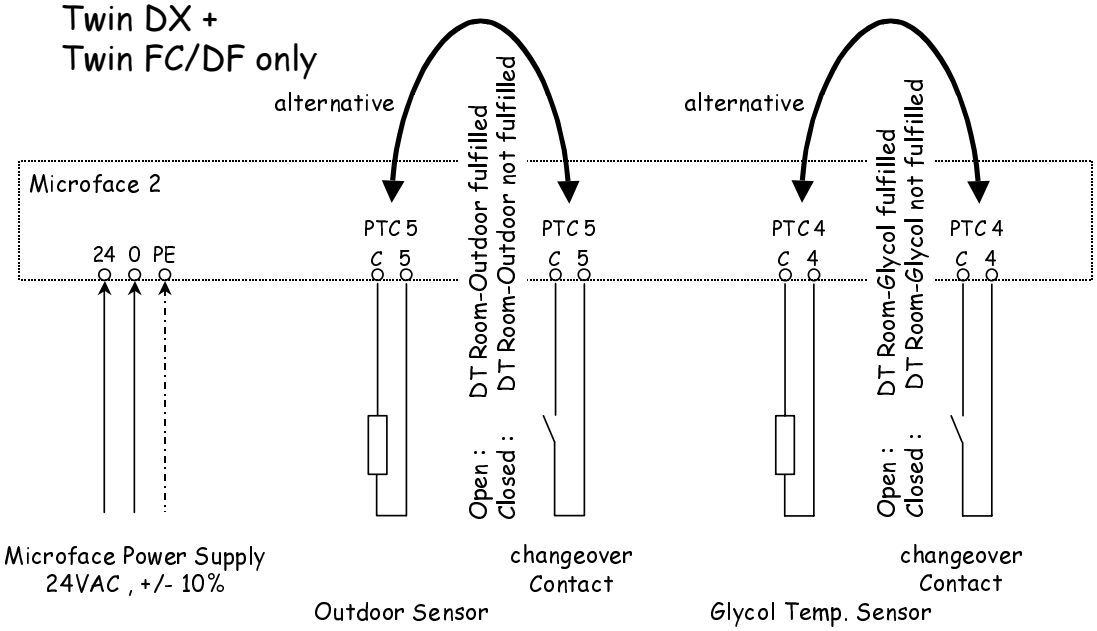


NOTES :

12

Power Supply, PTC Sensors

Twin DX +
Twin FC/DF only

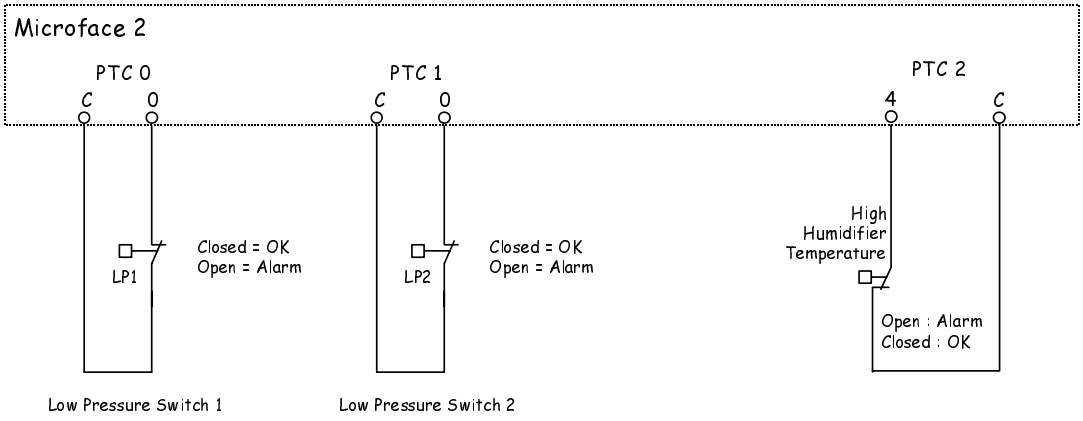


NOTES : The Glycol sensor is Standard in FC units only, but can also be connected to DF Units. Instead of the Sensors for Outdoor and Glycol also switching contacts may be used. The relevant Delta-T Parameter must be set to "CON" in that case.

13

LP, High Hum. Temp.

Twin DX + Twin FC/DF only

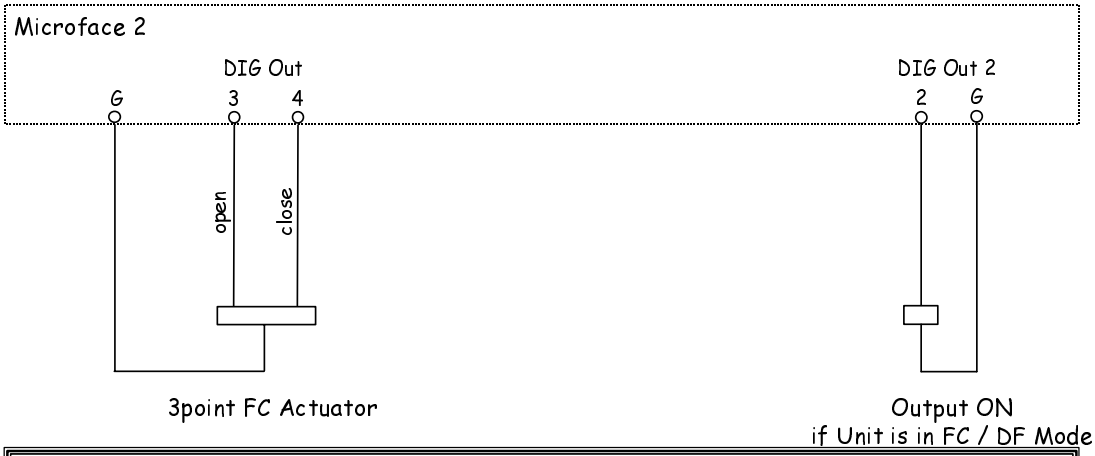


NOTES : High Humidifier Temperature Input only used if there is a Infrared-Humidifier.

14

FC Valve, FC Consensus

Twin DX + Twin FC/DF only

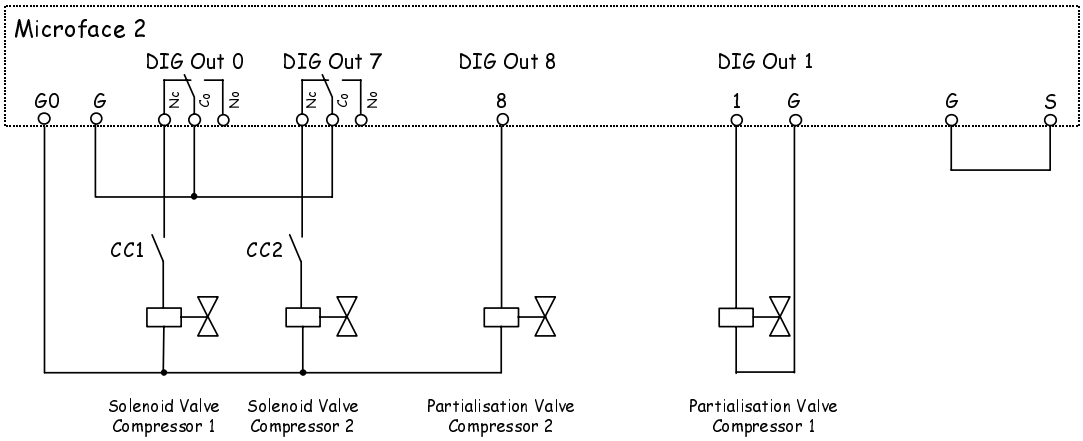


NOTES :

15

Compressor Control Valves

Twin DX + Twin FC/DF only



NOTES : The Solenoid **MUST BE** interrupted by the Compressor contactors (CC1, CC2)

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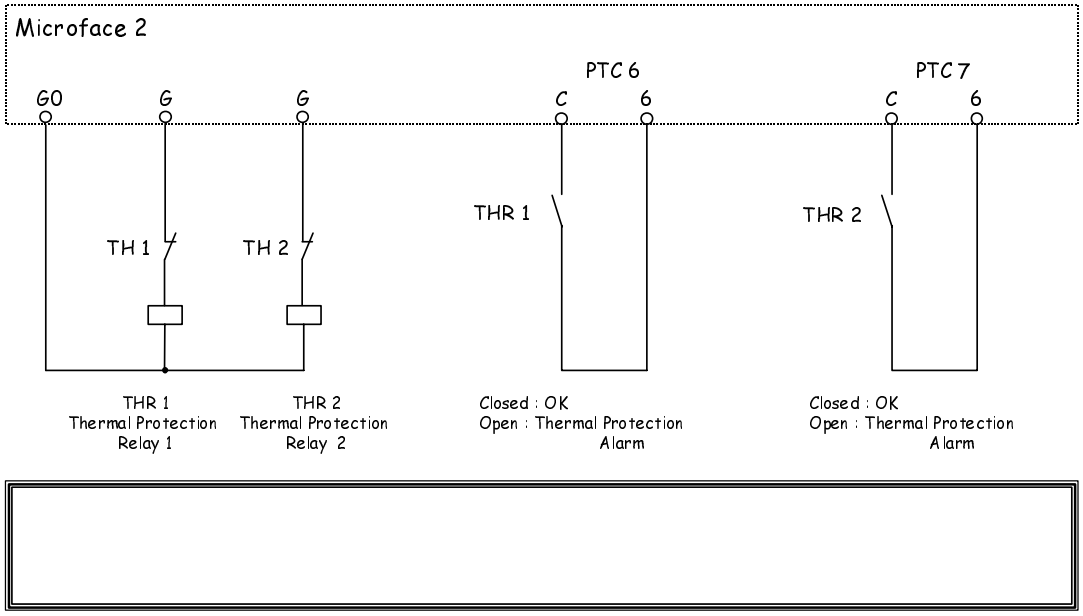
Compressor Thermal Protection

Twin DX + Twin FC/DF only



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