



User Manual

Eproms EVM - E48 – E1G

EVGL1 – EVGL2

Microface E

24VAC – 24VDC - 48VDC

Hiromatic G

Hiromatic E

English
HPAC - Code 272 189 Revision 15.02.2005

INDEX

1	Introduction	3
1.1	Foreword.....	3
2	Hardware	3
2.1	Microface Evolution 24V AC/DC – 48V DC.....	3
2.1.1	Microface Evolution 24V AC and Microface Evolution 24V DC.....	4
2.1.2	Networking between 24V AC/DC Units.....	5
2.1.3	Microface Evolution 48V DC.....	7
2.1.4	Networking between 48V DC Units	8
2.1.5	How to make mixed networks between Microface 24Vdc and Microface 48Vdc.....	9
2.1.6	Hironet Opto-isolator (only Microface 48VDC).....	10
2.2	LCD Display	11
2.3	Eprom	12
2.4	Humitemp and Humitemp Evolution	12
2.5	EEAP.....	13
2.6	Hirosensor 2T.....	13
2.7	PTC Temperature Sensor	13
2.8	PTC Airflow Sensor.....	13
2.9	I-Board / TAM Module	14
2.10	Hiromatic G / Hiromatic E.....	14
2.10.1	Hiromatic G / E direct Connection to Microface	14
2.10.2	Hiromatic G Backside View, Jumpers and Eprom Position.....	15
2.10.3	Hiromatic Evolution Backside View, Jumpers and Eprom Position.....	16
2.11	Power Supply Module for Hiromatic (24V only)	17
2.11.1	PSM Hardware	17
2.11.2	PSM Connection (24V only)	17
2.12	Hirobus Cables and other Connection Cables	17
2.12.1	Addressing	18
2.13	Hardware, Technical Specification	19
2.14	Spare Parts List.....	20
3	Software	21
3.1	The LCD Display	21
3.1.1	How to move through the Values/Parameters of the LCD Display	22
3.1.2	How to enter the Password (PIN).....	22
3.1.3	How to change Parameters	22
3.1.4	How to reset Alarms or Warnings	22
3.1.5	Tricks.....	22
3.2	The LCD Parameters	23
3.3	The Microface E LCD Display Warnings / Alarms.....	37
3.3.1	Hiromatic G / E.....	38
3.3.2	Hiromatic E Layout	38
3.3.3	How to Move in the Hiromatic Windows	40
3.3.4	The Menus	41
3.3.5	General Information.....	63
3.3.6	List of CCAC Eproms, used since 1996	63
3.3.7	Notes to Icon Versions (E1G, EVM) and non-Icons Versions (WXG, 1-2-3XM, A1M).....	63
3.4	Hiromatic Parameter List.....	64
3.5	Hiromatic Messages / Warnings / Alarms	72
4	Connection Guide.....	74
4.1	Inputs / Outputs for Chilled Water or Single Compressor Units.....	74
4.2	Inputs / Outputs for Twin Compressor Units.....	75
4.3	Electrical Connections	76

1 Introduction

1.1 Foreword

This User Manual describes the Microface E Control System. It contains information concerning the architectures of the control systems as well as the settings required to obtain the desired behaviour of the Unit.

The Microface Control System will effectively manage all the different functions of air conditioning units as well as of Chillers/Superchillers, depending on the Program inserted with the Eprom (Eprom explanation see: Chapter 2.3,Eprom).

In the following sections first the Hardware, and later the Software (Firmware) are explained in detail.

2 Hardware

2.1 Microface Evolution 24V AC/DC – 48V DC

The Microface Evolution is a microprocessor-based electronic card, which is able to manage the devices and the sensors installed in the unit (please note that Microface E differs from the so called "Microface Standard"; all explanations in the following sections refer ONLY to the Microface E and are not applicable on Microface Standard).

Microface E is installed in the electrical panel of indoor-units together with a User-interface module ("LCD Display"), which allows to read/set/reset values, parameters and alarms.

In outdoor- or ceiling mounted units the LCD Display is mounted in a box with extension cable, which allows placing it on a reachable position.

To get access to the Microface E connections and Jumpers the LCD Display (if present) has to be removed from its 4 mounting pins.



Take care not to pull out the connecting cable when removing the LCD Display!

Please note that there are 3 different Microfaces E available:

Supplied with 24 V AC; with 24V DC and with 48V DC. While both the 24V versions (AC and DC) have a very similar hardware and common properties, the 48V DC version is completely different: it needs a specific Eprom; also the networking follows different rules than the 24V AC or DC versions – see following chapters.

- For 24V AC supplied versions the Eprom EVM (Air Conditioner) or SCM (Chillers) has to be used
- For 24V DC supplied versions the Eprom EVM (Air Conditioner) has to be used
- For 48V DC supplied versions the Eprom E48 (Air Conditioner) has to be used.

24V AC/DC

2.1.1 Microface Evolution 24V AC and Microface Evolution 24V DC

Note: Microface E 24V AC and Microface E 24V DC have different hardware (different part numbers); but the components appear nearly identical on both Microfaces, so that the following description refers to both versions.

As the Microface E is the "Heart" of the System, which controls all Functions of the Unit, some Jumpers have to be set in order to set-up the control board according to the requested Functions. Most of these Jumpers are already correctly set in the factory, only the Jumpers for the unit's address ("A") has to be set in the field, during start-up of the Unit.



Never add / remove Jumpers when Microface is under power!

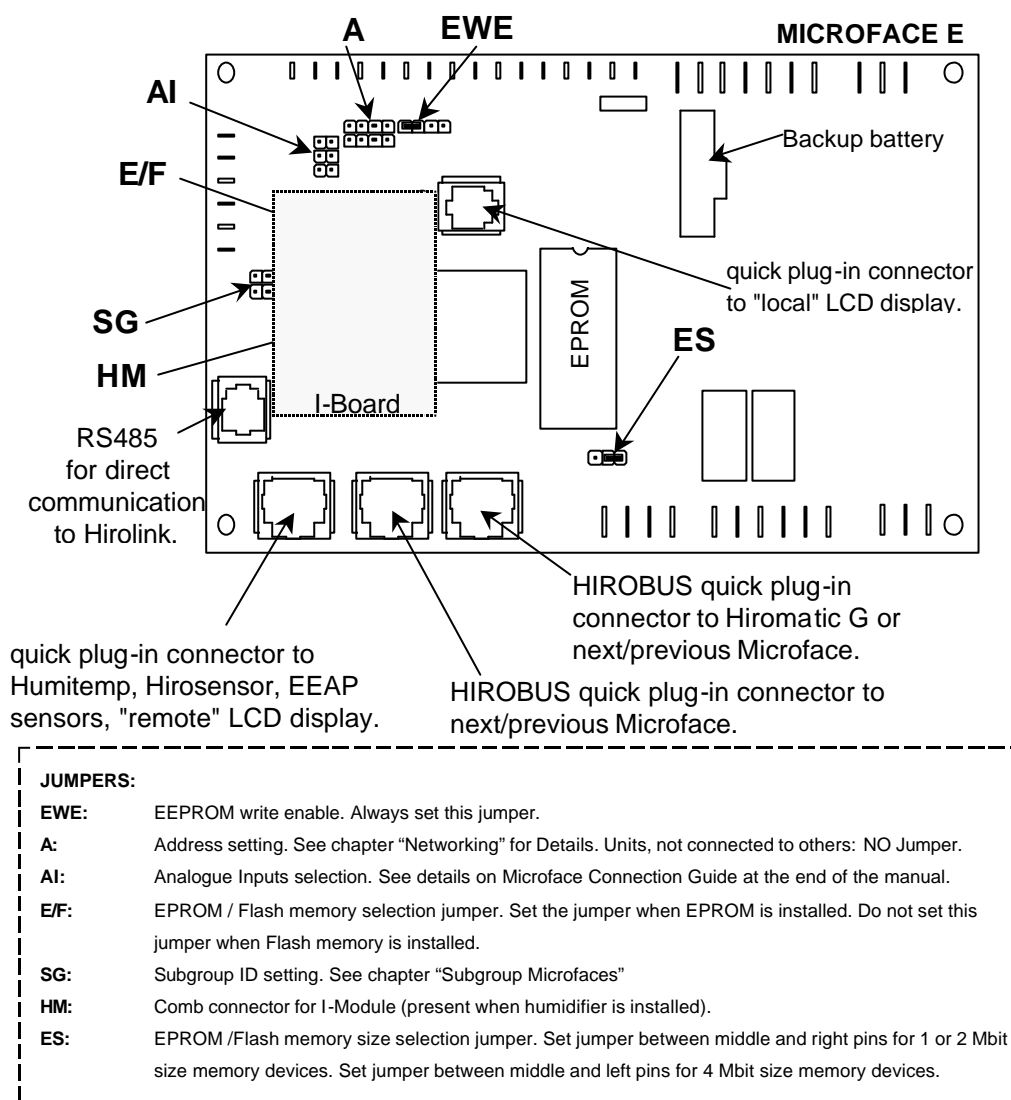


Figure 1 – Microface E 24V AC and 24V DC with connectors and jumpers.

24V AC/DC

2.1.2 Networking between 24V AC/DC Units

2.1.2.1 How to connect the Microfaces

Several units can be connected together via Hirobus. The units can exchange data, and so different features can be activated, like:

- Teamwork (The group of units behaves like 1 big unit)
- Standby + Rotation + Cascade
- One common Hiromatic
- ... and some more, described in the Software Part of this Manual.

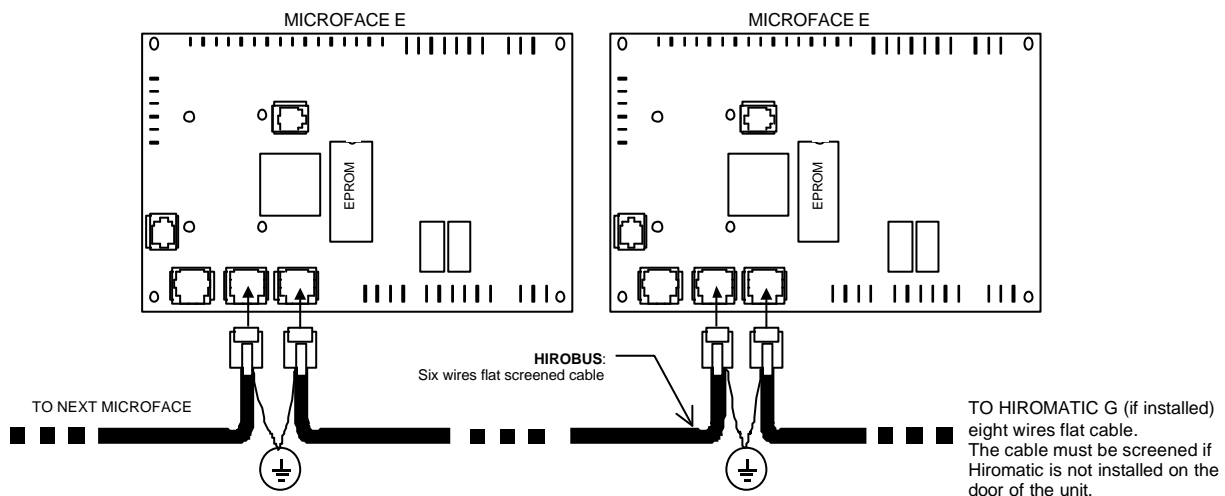


Note: The maximum number of units to be connected is **16**.

This Number reduces to **8**, only if a Hirolink is connected to the common Hiromatic. If a Hirolink Light or Hirolink SMM is connected directly to the Microfaces, **16** Units can be connected.



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 your sales reps.. Before connecting the cables to the Microface a check with Cable-Tester (see Spare Parts List, Chapter 2.14) has to be performed.



NOTE : CONNECT THE SCREEN OF THE FLAT CABLE TO THE CLOSEST "PE" (EARTH) OF THE ELECTRICAL PANEL ON BOTH SIDE OF THE CABLE. HIROBUS CABLES MUST BE INSTALLED INSIDE SUITABLE CONDUITS, SEPARATE FROM THOSE OF POWER TRANSMISSION CABLES.

Figure 2 connecting Microfaces. Cables to be used: see Figure 25 on page 18.



The bus-cable must be wired from 1st unit to the 2nd, from 2nd to the 3rd etc. "Star" or "Ring" connections are not allowed at all.

The Maximum length of the Hirobus-cable is 300 meters, counting all connection cables together. The single distances are not of interest, as long as the total length of all cables together doesn't exceed 300 meters.

AC and DC MICROFACES E CANNOT BE CONNECTED IN THE SAME NETWORK!

24V AC/DC

2.1.2.2 Subgroup-Microfaces

In some specific Units (CCAC: twin compressor units with freecooling or Matrix 4 circuit: 2nd Microface for control of circuit 3 and 4) a second Microface is installed, identified as "Microface Subgroup". The Microface Subgroup must have the same eprom and the same address as the "Master" Microface; the definition of Master and Subgroup Microface is done through a Jumper. There are 2 types of Subgroup: Type 1 is used for CCAC, Type 3 for Matrix 4 Circuit. The position of the subgroup jumper also defines the type of subgroup, see Figure 3:

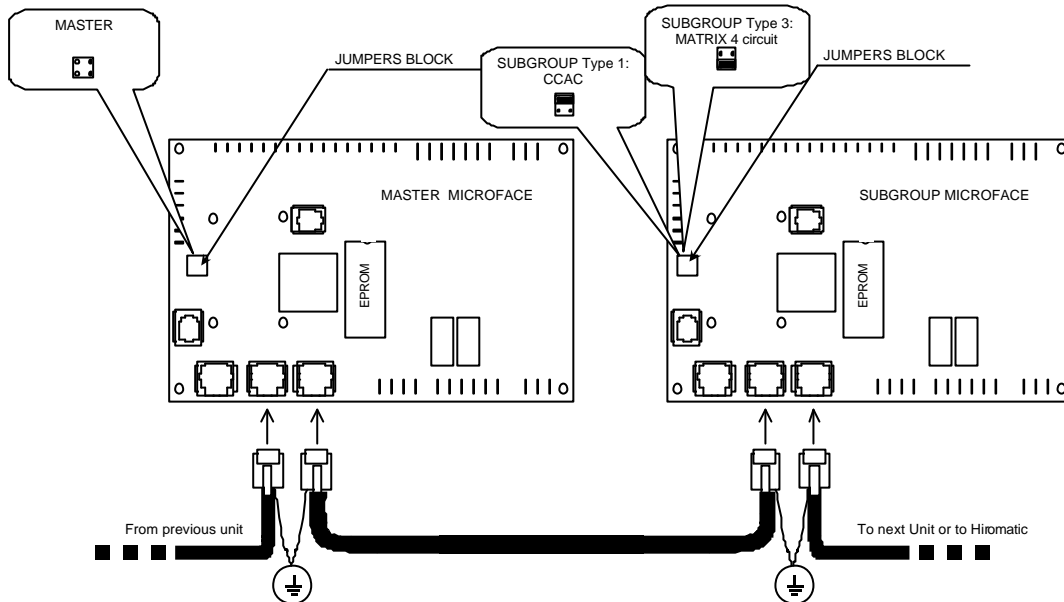


Figure 3 Master and Subgroup Microface

2.1.2.3 Slave-Microfaces

In some Chillers or Superchillers (Matrix) Screw Compressors are mounted. Screw Compressors have capacity control (50 – 100%), by using a slide, driven with solenoid valves. To control the solenoid valves, a so called „Slave Microface“ is installed. The Slave Microface uses a different Eprom (MIO), the Master Microface uses the Eprom SCM instead. For the Slave Microfaces no Subgroup must be set. The address is defined by the Slave Microface number: address 1 for Slave 1, 2 for Slave 2, regardless of the address of the Master Microface.

For connection see Figure 4: Master and Slave Microface

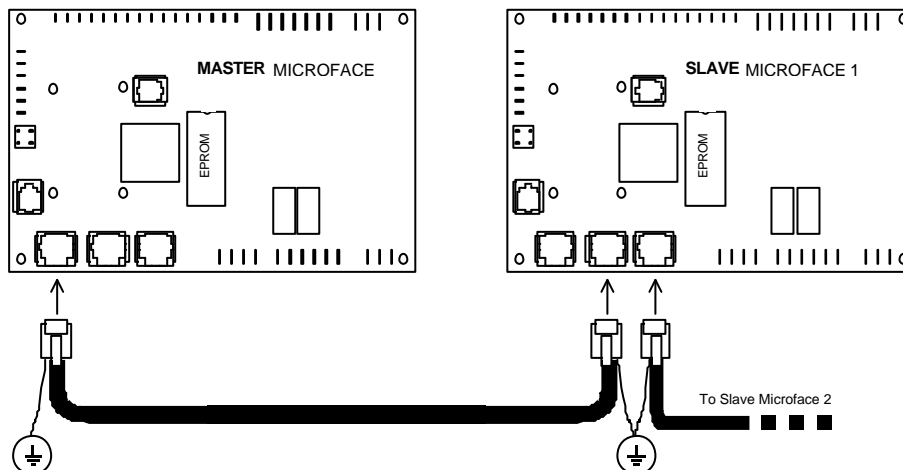


Figure 4: Master and Slave Microface

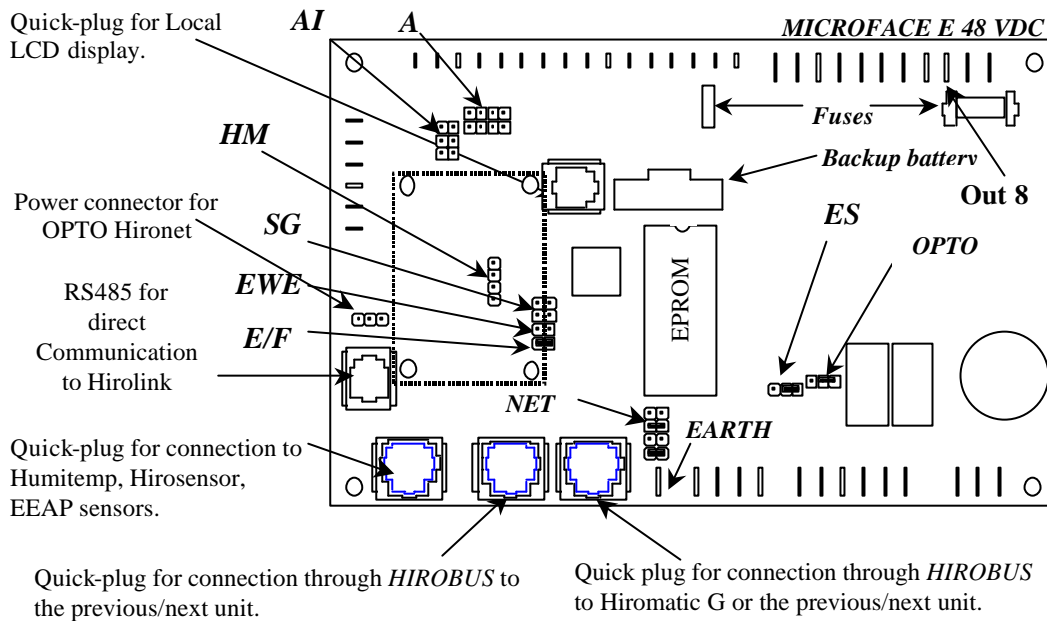
48V DC

2.1.3 Microface Evolution 48V DC

As the Microface E is the “Heart” of the System, which controls all Functions of the Unit, some Jumpers have to be set in order to set-up the control board according to the requested Functions. Most of these Jumpers are already correctly set in the factory, only the Jumpers for the unit’s address (“A”) has to be set in the field, during start-up of the Unit.



Never add / remove Jumpers when Microface is under power!



JUMPERS:

- EWE:** EEPROM write disable. Never set this jumper.
- A:** Address setting. See chapter “Networking” for Details. Units, not connected to others: NO Jumper set.
- 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 chapter “Units with 2 Microfaces”
- HM:** Comb connector for I-Module (present when humidifier is installed).
- 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.
- OPTO:** enable/disable of the analogue-optoislated output. Set the jumper in the right/left to have analogue-optoislated output. See more details in the User manual.
- EARTH:** this faston is connected to the HIROBUS RJ45 connectors screen. In case of screened Hirobus cable with metal connector, the Hirobus’s screen have to be connected to earth by faston.
- NET:** Opto-isolated Hirobus. See description in the chapter “Networking between Units”. Unit not connected to others and not connected to Hiromatic: NO Jumpers set.
- OPTO HIRONET:**
this 3 pins connector provides the power supply and direction signal to the OPTO Hironet interface (275799); attaching the OPTO Hironet interface the Hironet Network will be Opto-isolated.

Figure 5 – Microface E 48VDC with connectors and jumpers



Please note that the position of output 8 is different from Microface 24VDC to Microface 48VDC

48V DC

2.1.4 Networking between 48V DC Units

2.1.4.1 How to connect the Microfaces

Several units can be connected together via Hirobus. The units can exchange data, and so different features can be activated, like:

Teamwork (The group of units behaves like 1 big unit)

- Standby + Rotation + Cascade
- One common Hiromatic
- ... and some more, described in the Software Part of this Manual.



Note: The maximum number of 48V DC units to be connected is **6**.



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 your sales reps.. Before connecting the Cables to the Microface a check with Cable-Tester (see Spare Parts List, Chapter 2.14) has to be performed.

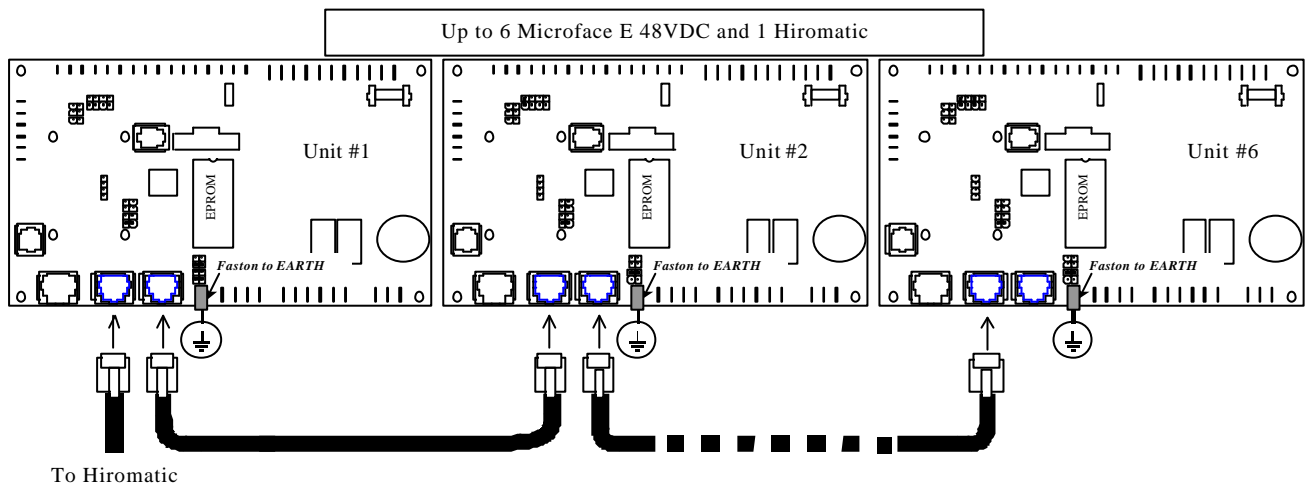


Figure 6 connecting Microfaces. Cables to be used: see Figure 24 on page 18.



The bus-cable must be wired from 1st unit to the 2nd, from 2nd to the 3^d etc. “Star” or “Ring” connections are not allowed at all.



The Maximum length of the Hirobus-cable is 60 meters, counting all connection cables together. The single distances are not of interest, as long as the total length of all cables together doesn't exceed 60 meters.



The Hirobus connectors of Microface 48VDC are fully optoisolated. It means that a power supply must be provided via Hirobus to the driver of each Hirobus connector because Microface does not supply those drivers. It is for this reason that a system with Microface 48VDC works in network only with 8 poles cables (2 poles are used to provide 10V to the drivers).

48V DC

2.1.4.2 Hirobus Opto-Isolation Jumper Setup

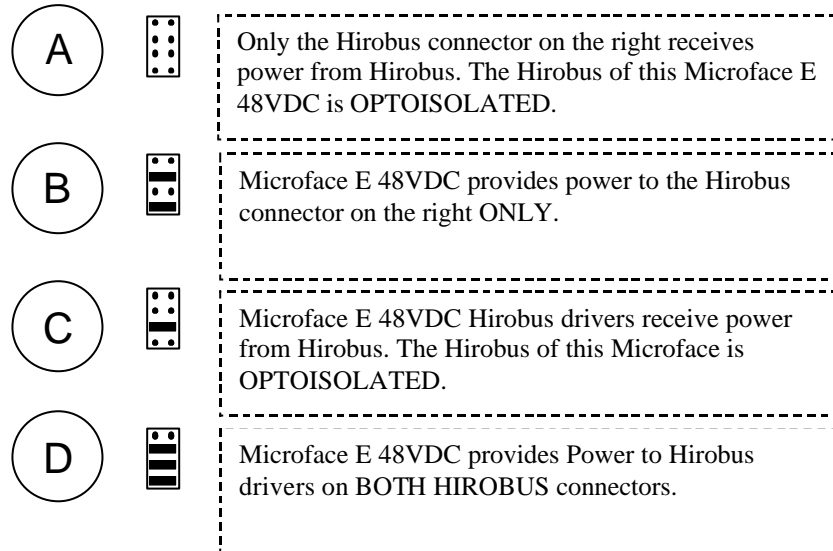


Figure 7, Jumpers for Hirobus

2.1.5 How to make mixed networks between Microface 24Vdc and Microface 48Vdc

There is the possibility to connect 1 **only** Microface 24VDC to 1 **only** Microface 48VDC with Hiromatic (optional). To do this see Figure 8

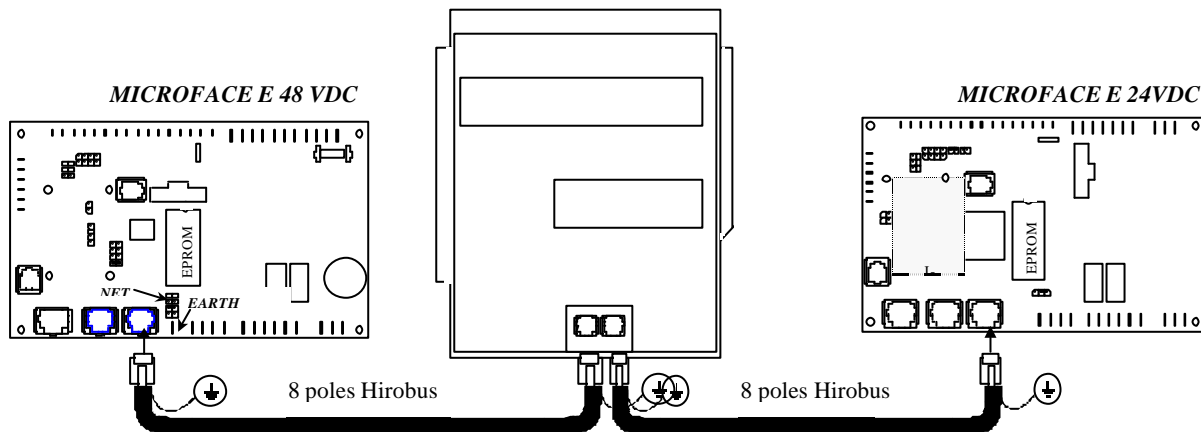


Figure 8 – mixed network with 1 Microface 48 VDC (with Hirobus Jumper Position **A** or **C**) and 1 Microface 24 VDC



In all the other possible variations of mixed connections, please contact Information & Controls Department (e-mail : info@connectivity.it)

48V DC

2.1.6 Hironet Opto-isolator (only Microface 48VDC)

For Microface 48VDC an opto-isolator for the Hironet is available. It must be used any time a connection from Microface E 48VDC to Hirolink has to be established.

There are two cable-connectors on it: the signal (Hironet) cable-connector (A) must be connected to the Hironet connector of Microface, the power supply cable-connector (B), which supplies the opto-isolator, shall be connected above (very close) the Hironet connector. The 2 sockets in the box (C,D) are to be used to perform the networking between the units.

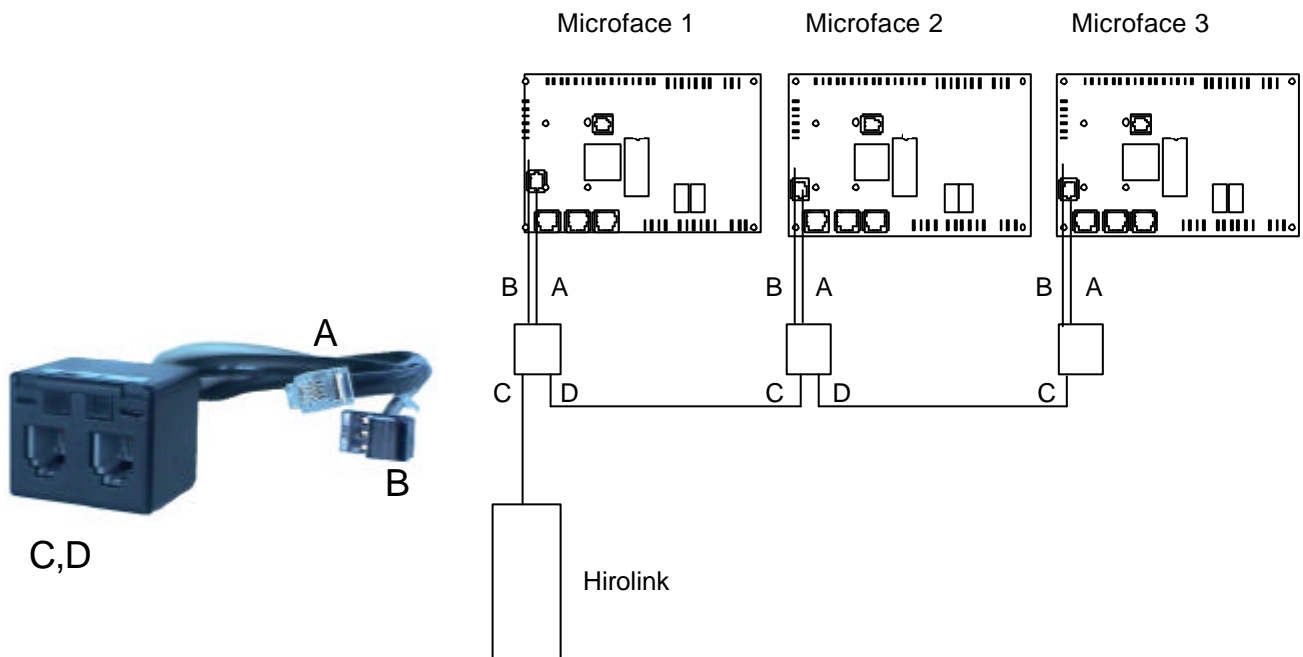


Figure 9 – Hironet opto-isolated connector with example of connection (for Eprom E48)

2.2 LCD Display

There are two different Displays available:
 "Local" Display
 "Remote" Display

Both Displays have the same Front-View:

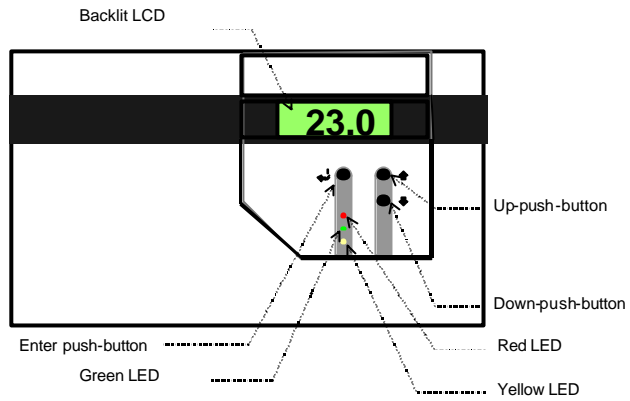


Figure 10 – LCD Display Front View (with plastic cover)

Just the backside connections are different, because of the different connection types to the Microface E: Local or Remote Display.

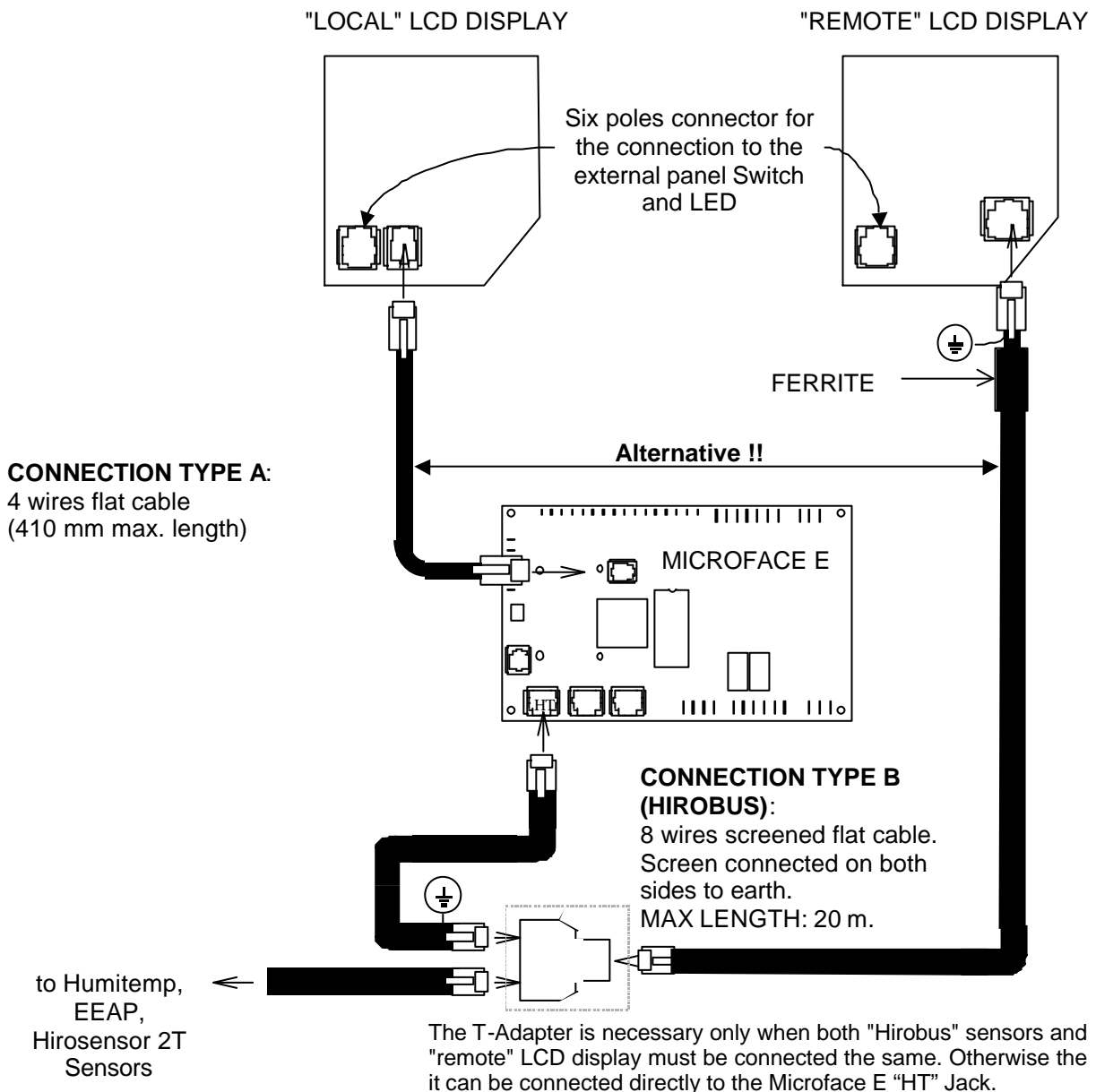


Figure 11 – Local and Remote Display Backside



Never use cables longer than 410 mm (Local Display) or longer than 20m (Remote Display)!

2.3 Eprom

The Eprom is the device, which stores the Program; the Microface has to work with. It doesn't store any user-settings; this is done by the Microface itself (in the RAM and the E²Prom). The Version Name and the Number are printed on the Label of the Eprom.

The following Eproms are today in use for Standard Units (the xxx is a placeholder for the actual Version):

EVM 1.60.xxx	2 MBit Air Conditioners, for Microface E 24V AC/DC.
E48 1.60.xxx	2 MBIT Air Conditioners, for Microface E 48V DC.
E1G 1.60.xxx	2 MBit Air Conditioners, for Hiromatic G.
EVG L1/L2 1.60.xxx	4 MBit Air Conditioners, for Hiromatic E.
SCM 1.01 / 1.02.xxx	2 MBit Chillers/Superchillers, for Microface E 24V AC.
MIO 1.01 / 1.02.xxx	2 MBit Chillers/Superchillers, Output extension for Microface E 24V AC.
SCG 1.01 / 1.02.xxx	2 MBit Chillers/Superchillers, for Hiromatic G.
SCE L1 1.01 / 1. 02.xxx	4 MBit Chillers/Superchillers, for Hiromatic E.

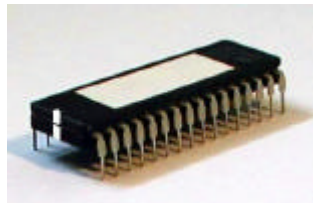


Figure 12 - Eprom



Un-power the Microface before mounting/dismounting the Eprom. Remove Eprom only with special tool; never use a screwdriver. For correct direction of mounting please refer to Figure 1 in Chapter Microface Evolution for Microface, and Figure 20 in Chapter 2.10.2 for Hiromatic. Compare the Mark in the Eprom with the direction in the Drawing.

2.4 Humitemp and Humitemp Evolution

The Humitemp is a combined Temperature / Humidity Sensor. If connected, the Microface will use the values of the Humitemp for control. It is connected to the Microface through Hirobus-Cable (max. length: 25 m). The Humitemp is used for Air-Conditioners only.

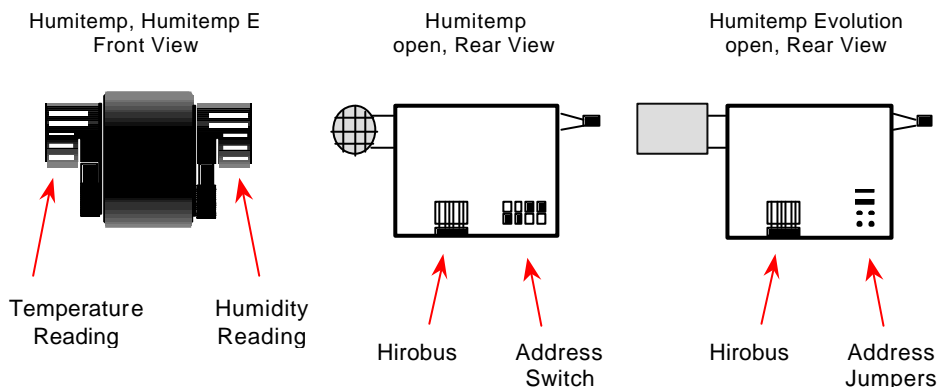


Figure 13 – Humitemp

The Address-Switches / Jumpers inside the Humitemp allows setting different Functions to the Sensor:

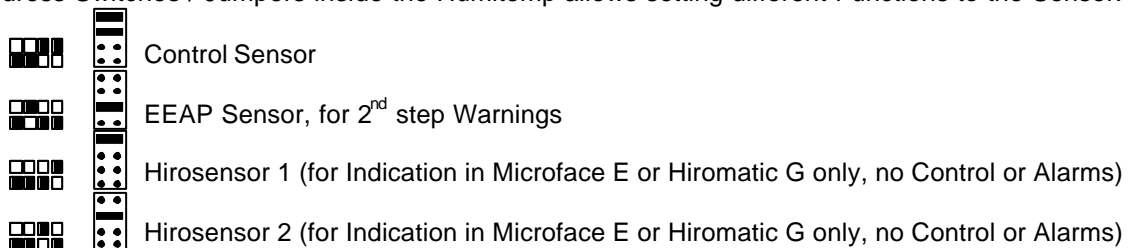


Figure 14 – Address switches / jumpers

These address switches / jumpers are also present in the EEAP and Hirosensor 2T sensors.

2.5 EEAP

The EEAP has the same Hardware as the Humitemp. The EEAP function can be activated by simply changing the Address-Switches to the EEAP function. The EEAP is used for Air-Conditioners only.

2.6 Hirosensor 2T

The Hirosensor 2T is a double temperature sensor; it allows (according to the Software installed in the Microface) to show 2 more temperatures (without any Warning Levels or Control Functions) in the Control. Both temperature sensors have a cable length of 2 meters.

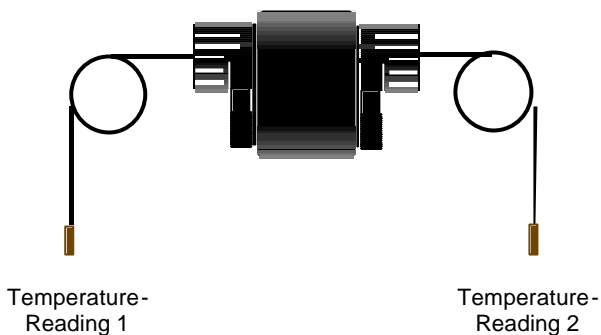


Figure 15 – Hirosensor 2T

2.7 PTC Temperature Sensor

The PTC Sensor is used in Air-Conditioners as well as in Chillers/Superchillers. There are different Types and lengths available: please refer to Chapter 2.14 Spare Parts List.

PTC Sensors are temperature-sensors, changing the resistance according to the temperature (positive temperature coefficient). The connection is 2 poles. The length of the cable for the sensor ranges from 2 to 10 meters.

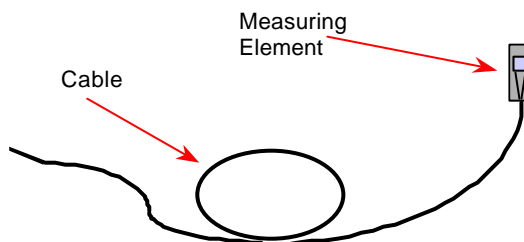


Figure 16 – PTC Sensor

2.8 PTC Airflow Sensor

The PTC Airflow Sensor measures the Airspeed (used only in Air-Conditioners). The System used is the one used also for Airflow-Anemometers. There is an automated Setup-Procedure in the EVM Software, which helps making the right settings. The PTC Airflow has to be supplied with 24V, and gives back a Signal of 0-10VDC, according the airspeed measured. It has to be connected to an analogue input. The connection is 3 poles. The length of the cable for the sensor is 2 meters.

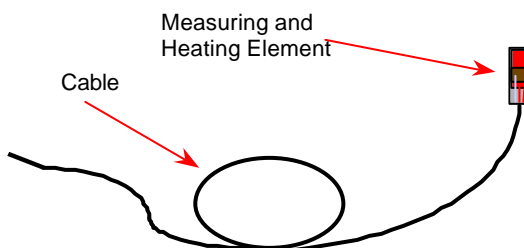


Figure 17 – PTC Airflow

2.9 I-Board / TAM Module

The I-Board for CCAC Units is the current transformer for the Humidifier (cylinder Type). For Chillers/Superchillers it can be used (optional) to have a volt free Warning contact. The I-Board consists of one Current Transformer-Coil (one phase of the power supply for the humidifier must be wired through the hole); and 1 output relay (to start humidifier for CCAC applications, and to have the warning relay for Chiller / Superchiller applications). The I-Board is simply plugged onto the Microface, see Chapter 2.1.1 on page 4 for the position.

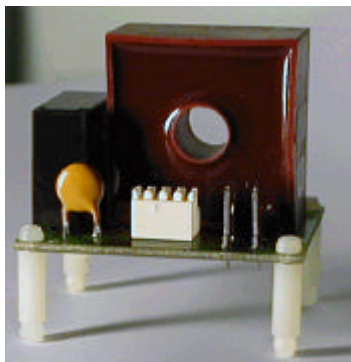


Figure 18 – I-Board

2.10 Hiromatic G / Hiromatic E

Hiromatic G / E is a microprocessor-based electronic device, which makes it possible to control the functions of one or more Microface devices. Hiromatic G offers numerous advantages of programming the units as well as to optimise their operation using various features, see chapter 3, Software.

2.10.1 Hiromatic G / E direct Connection to Microface

Hiromatic can be fixed on the front panel of the unit, simply connecting the HIROBUS cable as shown in Figure 19

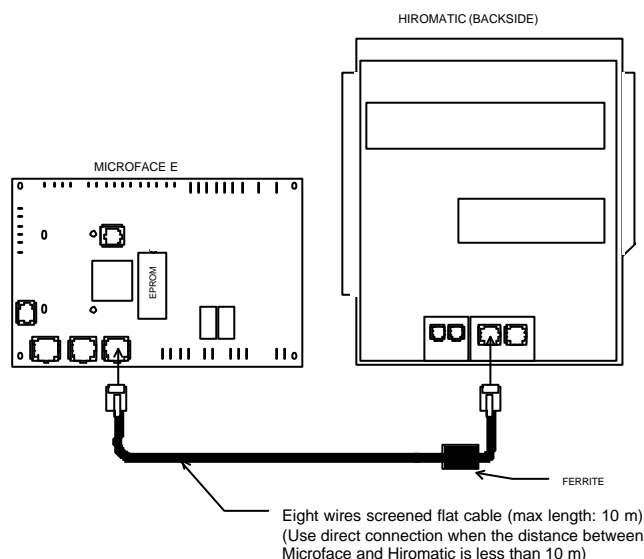


Figure 19 – direct Connection between Microface and Hiromatic

2.10.2 Hiromatic G Backside View, Jumpers and Eprom Position

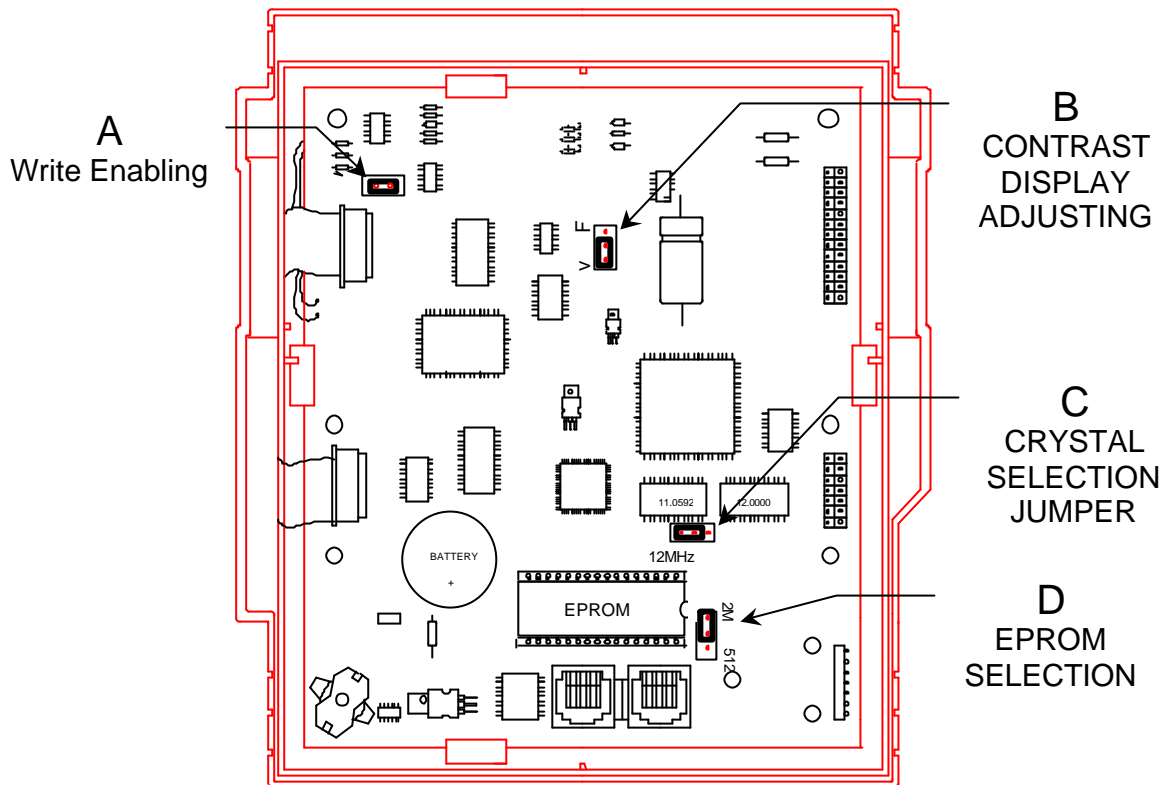


Figure 20 – Hiromatic G Backside

Description of the Jumpers:

- A: Write enabling for E²Prom. Always set this Jumper.
- B: With jumper on V position, the adjusting of the Display contrast is enabled; with jumper on F position, it is fixed.
- C: Please double-check with your Hirolink Manual, which Frequency has to be set. Normally 12MHz should be O.K. If no Hirolink is connected, the setting is not of interest.
- D: Eprom selection. Jumper must be in 2M Position.



Please take special care about the Jumpers when installing a new (Spare Part) Hiromatic!

2.10.3 Hiromatic Evolution Backside View, Jumpers and Eprom Position

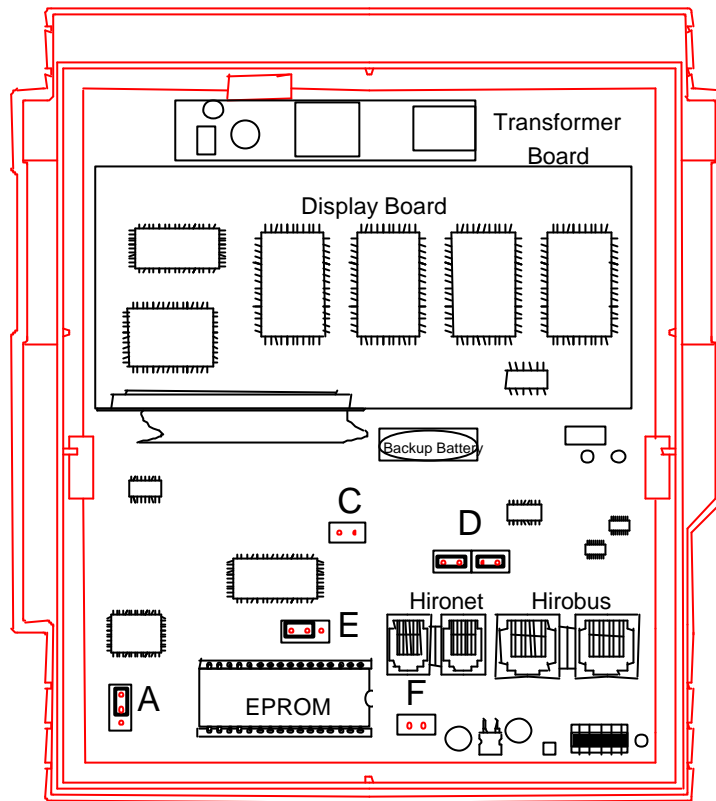


Figure 21– Hiromatic Evolution Backside

Description of the Jumpers:

- A: Eprom (2M) / Flash Size (4M): Middle + Upper Jumper: 2 or 4 MBit (std. setting)
Middle + Lower Jumper: not used.
- C: Write Disabling: do not set this Jumper
- D: Interface Selection: both Jumpers as indicated in Drawing: RS 485 (std. setting)
No Jumpers set: RS 422
- E: Contrast Selection: Middle + Left Jumper: Variable Contrast
Middle + Right Jumper: Fixed Contrast
- F: Flash download: not supported yet. Do not set this Jumper



Please take special care about the Jumpers when installing a new (Spare Part) Hiromatic!

2.11 Power Supply Module for Hiromatic (24V only)

2.11.1 PSM Hardware

Hiromatic G can be supplied mounted in an independent electrical panel containing a power supply module as well (PSM Power Supply Module), if the Distance to the next Microface is more than 10 meters. The PSM Module itself needs a power of 24V AC or 24V DC.

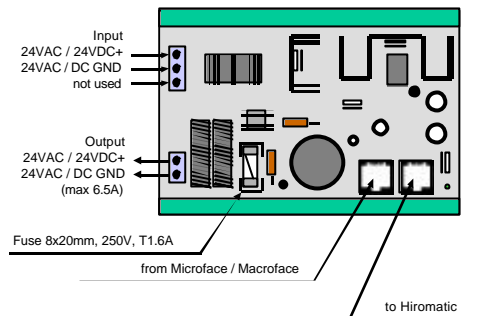


Figure 22 – PSM Module

2.11.2 PSM Connection (24V only)

The connection between Hiromatic G and the PSM is carried out in the factory by means of an eight wires HIROBUS cable. The PSM should be connected to

Microface 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 any unit where Microface has a free HIROBUS connector (usually either the first or the last one of the Microface chain).

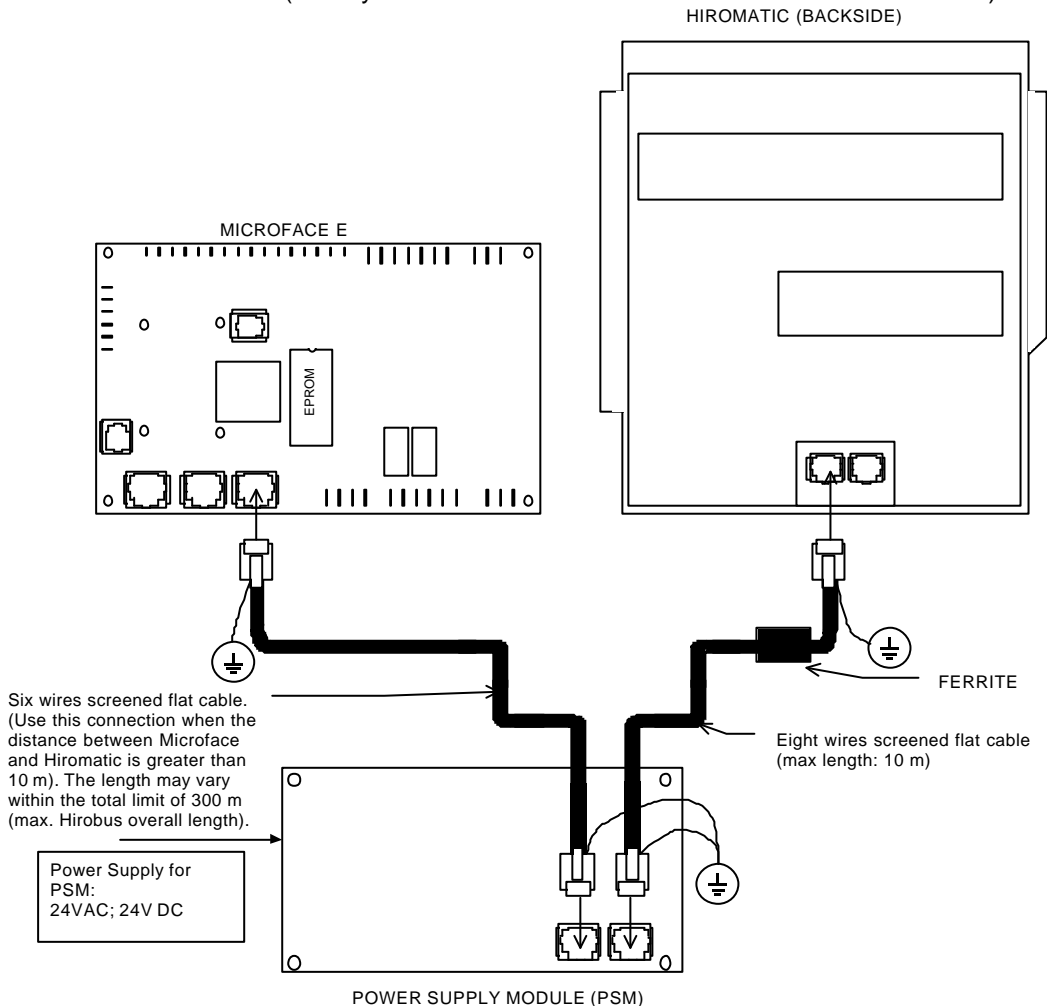


Figure 23 Connection of Microface LAN to Hiromatic Graphic with PSM.

2.12 Hirobus Cables and other Connection Cables

The connections between various Microfaces, Hiromatic, display and sensors are carried out with cables having a different number of wires and different connectors. Following you can 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.



Please note that a wrong connection could cause serious problems to the electronic devices (Microface and Hiromatic); for this reason we strongly recommend to use only first quality products or to buy the cables directly from your sales reps..

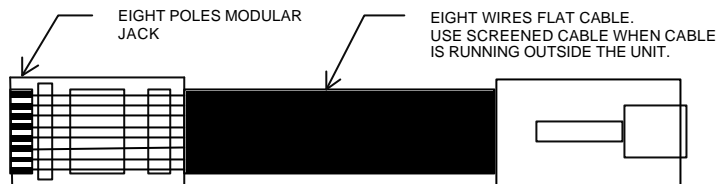


Figure 24 Eight-wires; eight poles connector HIROBUS cable, for Hiromatic or Humitemp connections; for connection between Microface and the remote LCD Display (see Figure 11); and for Microface 48V DC connections (screened cable necessary).

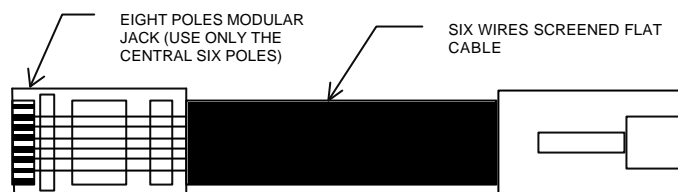


Figure 25 Six-wires (Pin 1 and 8 not connected) HIROBUS cable, for Microface 24V AC/DC connections, eight poles connectors. This cable must be screened.

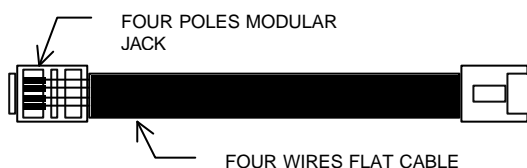


Figure 26 4 wires flat cable for local LCD Display, four poles connectors.

2.12.1 Addressing

When Microfaces are connected with HIROBUS, it is necessary to assign a different address to each of them, by means of a group of jumpers on the Microface. The jumper position is described in Figure 27.



The units must be addressed starting from #1, consecutively. If there are 2 Microfaces on Board (Subgroup, see chapter Subgroup-Microfaces), both Microfaces must have the same address. The bus-cable doesn't necessarily need to go in order of the addresses, it could also be wired 1-5-4-2-3, for example.

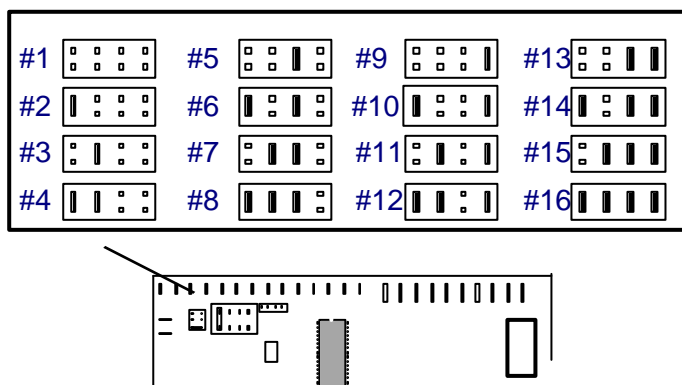


Figure 27 – Address Jumpers

2.13 Hardware, Technical Specification

Microface E 24V AC	
Power Supply	24VAC, $\pm 10\%$; 50 Hz
Digital Out (Triac)	7
Digital Out (Relay)	2 (max. 24V – 1A)
Analogue Out (0-10V)	2
Analogue In (resistive)	8
Analogue In (resistive / 0-10VDC)	3
Storage Temperature	-10 (not condensing) to +65°C
Operating Temperature Range	0 (not condensing) to +55°C
Microface E 24V DC	
Power Supply	24VDC, $\pm 10\%$
Digital Out (Triac)	7
Digital Out (Relay)	2
Analogue Out (0-10V)	2
Analogue In (resistive)	8
Analogue In (resistive / 0-10VDC)	3
Storage Temperature	-10 (not condensing) to +65°C
Operating Temperature Range	0 (not condensing) to +55°C
Microface E 48 VDC	
Power Supply	48VDC, $\pm 10\%$
Digital Out (Triac)	7
Digital Out (Relay)	2
Analogue Out (0-10V)	2 (1 opto isolated)
Analogue In (resistive)	8
Analogue In (resistive / 0-10VDC)	3
Storage Temperature	-10 (not condensing) to +65°C
Operating Temperature Range	0 (not condensing) to +55°C
Humitemp, EEAP	
Power Supply	10VDC (from Hirobus)
Temperature range	0 to 50°C
Humidity range	20 to 90%
Minimum airspeed required	0,5 m/s
Temperature precision	$\pm 0,5^\circ\text{C}$
Humidity precision (@25°C)	40 to 65%: $\pm 2\%$ r.H. 20 to 90%: $\pm 4\%$ r.H.
Hirosensor 2T	
Power Supply	10VDC (from Hirobus)
Temperature range	-28 to 100°C
Length of sensor elements	2 m (each)
PTC Temperature sensor	
Cable length	1,5 m and 10m
Temperature range	-28 to 100°C
Point of calibration	2000 Ω at 25.0°C
Hiromatic G / E	
Power Supply	10VDC (from Hirobus)
Graphic Display	Backlit, 200 x 64 pixels
Mounting hole	175 x 150mm
Power Supply Module (PSM)	
Power supply	24VAC, $\pm 10\%$; 24VDC, $\pm 20\%$
Output	10VDC (Hirobus, stabilised); 24VAC, $\pm 10\%$; 24VDC, $\pm 20\%$ (filtered)
I-Board (Current transformer)	
Current Range	0 – 30A
Digital Out (Relay)	1 (max. 24V – 1A)

2.14 Spare Parts List

DESCRIPTION	CODE		
Useful for		Air-Conditioners	Chillers/Superchillers
Switch + Led	255039	Yes	Yes
Microface E and Hiromatic G user manual CCAC GB	272189	Yes	No
Microface and Hiromatic user manual SC2000 / Matrix	271589	No	Yes
Microface E (Evolution) 24 AC board	275297	Yes	Yes
Microface E (Evolution) 24 DC board (only for DC units)	275298	Yes	No
Microface E (Evolution) 48 DC board (only for DC units)	275690	Yes	No
Opto-isolated Connector for 48V Hironet connection	275799	Yes	No
Local LCD display for Microface	275098	Yes	Yes
Remote LCD display for Microface	275662	Yes	No
I-Board / TAM Module	275099	Yes	Yes
Alarm Board 24VAC	275148	Yes	No
Heaters Board for 1 Comp + Glycol FC units 24VAC	275366	Yes	No
Alarm Board 24VDC	275288	Yes	No
Probe temperature PTC	275183	Yes	No
Probe PTC 2 kohm L = 10 m	275155	Yes	Yes
Probe Temp. + Hum. Humitemp	275181	Yes	No
Probe airflow PTC	275184	Yes	No
EPROM Microface EVM160***	275791	Yes	No
EPROM Hiromatic E48160***	275795	Yes	No
EPROM Hiromatic E1G160***	275789	Yes	No
EPROM Hiromatic EVG-L1 160***	275790	Yes	No
EPROM Hiromatic EVG-L2 160***	275875	Yes	No
EPROM Microface SCM101***	275427	No	Yes
EPROM Microface MIO101***	275766	No	Yes
EPROM Hiromatic SCG101***	275428	No	Yes
EPROM Hiromatic SCE L1 101***	275733	No	Yes
EPROM Microface SCM102***	276049	No	Yes
EPROM Microface MIO102***	276050	No	Yes
EPROM Hiromatic SCG102***	276052	No	Yes
EPROM Hiromatic SCE L1 102***	276051	No	Yes
Hiromatic Graphic	275051	Yes	Yes
Hiromatic Evolution	275691	Yes	No
Kit EEAP	372201	Yes	No
Hirosensor 2T	275193	Yes	Yes
Kit Liquistat - Hiromatic	482979	Yes	No
LWD (Leakage Water Detector)	275353	Yes	No
Flat cable 8 way M-M L = 1 m	275607	Yes	Yes
Flat cable 8 way M-M L = 10 m	275610	Yes	Yes
Flat cable 8 way screened (specify length)	275626	Yes	Yes
Module PSM 24/24-10 for Hiromatic	275316	Yes	Yes
"T" adapter for HIROBUS	275652	Yes	No
Plastic holder for Microface only	270002	Yes	Yes
Plastic holder for Microface and LCD display	270003	Yes	Yes
Hirobus / Hironet Cable Tester	480061	Yes	Yes
Hirobus / Hironet Interface Tester	480060	Yes	Yes

3 Software

3.1 The LCD Display

The interface module consists of a backlit LCD and of three push buttons that permit an easy access to the unit parameters (see Figure 28). Writing access is protected by a password.

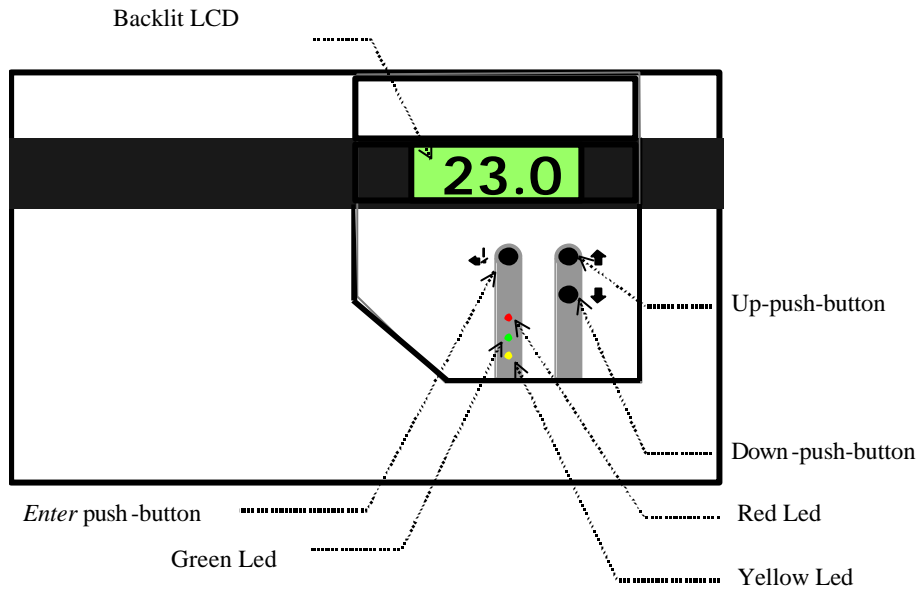


Figure 28 Interface module between Microface and operator (front view).

There are three LED's: the yellow Led to indicate the unit is power supplied, the green one lights up when the unit is in operation and the red one signals either an alarm or a warning condition.

On the LCD the following symbols will be displayed (see Figure 29):

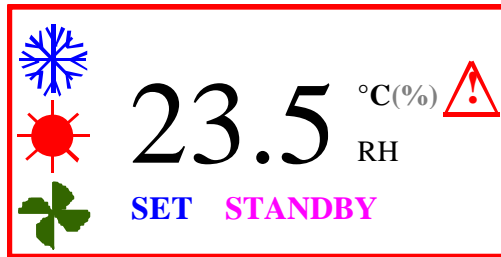




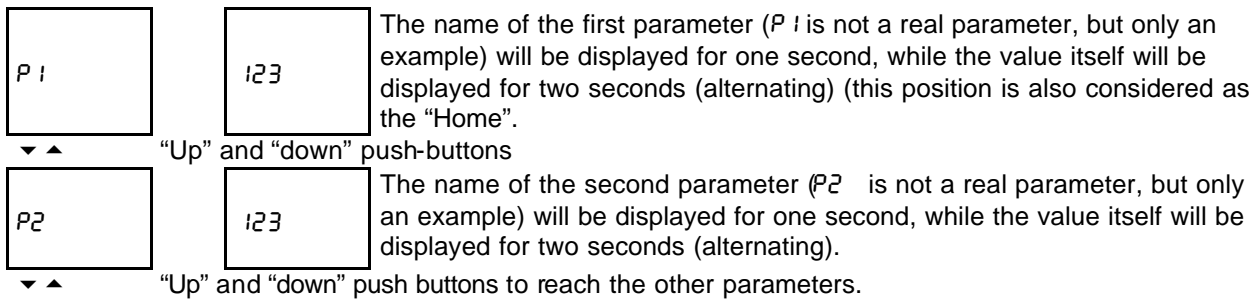


Figure 29; LCD Layout

-  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 fan(s) / (pump) is (are) operating.
-  The sun symbol is active when the unit is in heating mode (AC only)
-  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). Attention: There is a 3 minutes after-running time when changing from ON to STANDBY. Therefore the Unit displays STANDBY with fans still on for a time of 3 minutes.
- SET** The 'SET' string will be 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.

3.1.1 How to move through the Values/Parameters of the LCD Display

All Values and Parameters are listed up just one after the other. To jump the next parameter, simply the “down” button has to be pressed.



3.1.2 How to enter the Password (PIN)

Without password or by entering the wrong password, read only access is given, without the possibility to change values.

To enter a *password* in Microface, select the “Pin” parameter by pressing the “down” push-button as often as necessary. 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. Reaching the next changeable Parameter, the LCD Display will show a “SET” string, which is the confirmation, that the PIN was entered correctly.

Different Password-Levels give different “Rights”:

	Air Conditioners	Superchillers
Level 0	Read only	Read only
Level 1	Customer Level	Customer Level
Level 2	Service Low Level	Service Level
Level 3	Not used	Not used
Level 4	Sensor Calibration	Sensor Calibration
Level 5	Service High Level	Not used
Level 6	Service contacts	Not used



The password is stored, until the first parameter / value (“Home”) of the list is displayed again. Never leave the Unit without jumping back to “home” (pressing “Enter” and “UP” together).

3.1.3 How to change Parameters

To change the value of a parameter (possible only when the Password “PIN” has been correctly inserted), 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 alternating with the new value.

3.1.4 How to reset Alarms or Warnings

When an alarm is triggered, the red alarm LED is lit on the LCD Display Module and the corresponding symbol is shown in the Display.

The Alarm section can be reached by 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.

Pressing the “Enter” key (↵), 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 shown again. If there are no more active alarms, the first parameter / value of the list will be displayed again.

3.1.5 Tricks

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.

3.2 The LCD Parameters

See chapter 3.1.1 how to move through the Menu and how to enter the Password. The order of the following table is according the menu-layout of the LCD.

LCD	Parameter Name	Description	User Setting
E1	RETURN TEMP.	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.	
h1	RETURN HUMIDITY	The humidity of the air entering the air conditioning unit. The 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.	
E2	SUPPLY TEMP.	A read only value. It is the temperature of the air delivery of the unit. Available only when the corresponding sensor is installed. This Value could influence the Control, if SUPPLY LIMIT (Para 114) is set.	
E3	OUTDOOR TEMP.	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 here is this average.	
E4	GLYCOL TEMP.	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 Dry-Cooler. Each Unit uses ist own sensor for Control.	

Lcd	Parameter Name	Description	User Setting
Rct Rch	ACTUAL TEMP. SETP ACTUAL HUM. SETP.	This Value shows the actual Temp / Hum Setpoint for the specific Unit. The Humidity Setpoint can be automatically influenced from the Humidity Compensation' Parameter. see Para 113 in Control Parameters 1/2.	
EEt EEh	EEAP EEAP	The Temperature and relative Humidity measured by the optional EEAP Sensor (Electronic Environment Alarm Package) (if installed). This Sensor allows to set second step Temp. and Hum. Warnings.	
H1L H1r H2L H2r	HIROSENSOR 1 HIROSENSOR 1 HIROSENSOR 2 HIROSENSOR 2	The temperatures (two values) measured by Hirosensor sensor number 1 (2). These values are not used for regulation or Alarm / Warning generation.	
dr	DRAIN :	DRAIN' (Humidifier) can be set to ON without setting MANUAL to ON, and without to Enter a Password before. DRAIN stops automatically after 20 Seconds. NOTE: The Alarm Relay falls to 'ALARM' when setting the Unit in Manual Mode.	
P in	PASSWORD:	Microface has 3 Levels of Password. Please ask your local dealer to get it.	
nEt	NUMBER OF UNITS	The number of air conditioning units connected together in the Bus-Network. The user must set it properly depending on the actual Network configuration. All the units in the network must have different addresses (starting from 1).	
SHP	TEAMWORK MODE	Possible settings: NO, 1, 2. NO : The Units work in stand-alone, using ist own sensors for regulation. This setting must be used in Multi-Room Installations. Set to 1 if the units shall operate as one System. For Control the average T+H of all units in operation is used. All Units together are working like one big Unit. Not to be set in Multi-Zone Rooms.	

LId	Parameter Name	Description	User Setting
		<p>Possible settings: NO, 1, 2.</p> <p>Set to 2 if the units shall operate in stand-alone, but with restrictions from the Average T+H. The Averages decide, if Cooling or Heating, Hum or Dehum has to be performed, the units itself decide about according their own Sensors.</p> <p>Teamwork setting 2 is a stand-alone mode operation, but 'mastered' from the Average T+H, to avoid competition between the Units.</p> <p>To be set in Multi-Zone or un-balanced Rooms.</p>	
Id	IDENTIFICATION NUMBER	A number that uniquely identify a Microface connected on an Hironet network. Must be different for each Microface in the network.	
LEn	COMMUNICATION	<p>Set 'NO' if the Microface will transmit Data to the Hirolink, without accepting commands from Hirolink.</p> <p>Set 'YES' if also commands (Setpoint changes etc.) shall be accepted from Hirolink.</p>	
Aut	AUTORESTART	<p>The time delay, in seconds, between the power on and the start of the unit.</p> <p>NOTE: Each Unit multiplies the time with its Microface ID Number.</p>	
rE	HM ON/OFF ENABLED	To enable the ON/OFF button of Hiromatic Graphic to switch ON/OFF the air conditioning units on the HIROBUS network.	
SPt	TEMP. 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.	

LCD	Parameter Name	Description	User Setting
SPH	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 to HUM or to DEHUM.	
Hco	HUM COMPENSATION	If enabled, the Control respects the psychometric relation between Temperature and Humidity. Reading the actual Temperature the relative Humidity Setpoint will be recalculated. See SYS or Unit Overview, act. Setp.	
SUP	SUPPLY LIMIT	A low limit for the Supply Air Temp. 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 Temperature Setpoint and b) the deviation of Supply Temperature from Supply Air Setpoint. Note: Supply Limit is capable to reduce the opening of Dampers of Valves, but will never stop a compressor. (Exception: 2nd Compressor in a Twin Compressor Unit).	
SP2	TEMP. SETPOINT 2	A second setpoint value for the air temperature of the room. It is used when at least one User Input is set as 2ndSETP (Second Setpoint) and the switch on the corresponding input of Microface is open.	
F55	FANSPEED STANDARD	The parameter used by Microface to regulate the speed of the fan during normal operation when an Analog Output of Microface is used to drive the fan. (The corresponding Analogue Output must be assigned to Fanspeed).	

LCD	Parameter Name	Description	User Setting
F5d	FANSPEED DEHUM	The parameter used by Microface to regulate the speed of the fan during Dehum operation when an Analog Output of Microface is used to drive the fan. (The corresponding Analogue Output must be assigned to Fanspeed).	
F5P	FANSPEED NO POWER	The parameter used by Microface to regulate the speed of the fan during NoPower operation when an Analog Output of Microface is used to drive the fan. (The corresponding Analogue Output must be assigned to Fanspeed).	
5tb	NUMBER OF STDBY UNITS	STBY Units normally are halted and will start only in case of an alarm of another Unit in the Network. This parameter defines how many units will be in standby mode. For Rotation see Para 012 and 013.	
rot	ROTATION FREQUENCY	In Microface only units the possible settings are: NO or YES. NO means no Rotation by time, only in case of an Alarm the faulty Unit will be switched off and the Standby Unit will be started. If set to YES, rotation will be done every 24 hours.	
CR5	ENABLE CASCADE	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-operate with active unit(s). NOTE: Cascade settings force Teamw. 1! Possible Settings: no NO : cascade function not active Yth YES : active with both temperature (cooling/heating) and humidity (humidification/de-humification) Yt TEMP : active only for temperature (cooling/heating) Ytc COOL : active only for cooling	
rob	ROTATE BY	Allows to perform a group units rotation	

<i>LCd</i>	Parameter Name	Description	User Setting
<i>roo</i>	ROTATE ONCE	When set to 'YES' the system is forced to perform one rotation of the standby units. Working only when 'Rotation Frequency' (Para 012) is not set to 'NO'.	
<i>Ht</i> <i>Lt</i> <i>Hh</i> <i>Lh</i>	HIGH TEMPERATURE LOW TEMPERATURE HIGH HUMIDITY LOW HUMIDITY	These Warnings are generated from the Standard Return Sensor of each Unit, if the thresholds are over- / overridden. The Warnings are delayed for a time of 30 Minutes after Unit start.	
<i>HtR</i> <i>LtR</i> <i>HhR</i> <i>LhR</i>	EEAP WARNINGS HIGH TEMPERATURE LOW TEMPERATURE HIGH HUMIDITY LOW HUMIDITY	These Warnings are generated from the optional EEAP Sensor, if the thresholds are over- / overridden. The Warnings are delayed for a time of 30 Minutes after Unit start.	
<i>Eco</i>	EEAP CONNECTED	This Parameter changes automatically to YES, If EEAP is connected. This Parameter is read only.	
<i>US1</i> <i>US2</i>	USER INPUT 1 USER INPUT 2	According to the value set for this parameter (both inputs have the same selection possibilities) Microface will take some actions when the switch connected to the corresponding input of Microface is open : <i>nH</i> nHumi' :the humidification is disabled <i>nC</i> nComp' :the compressor(s) disabled <i>ALP</i> WARNING' :a Warning is generated (the unit continue its operations) <i>ALhP</i> ALARM' :an alarm is generated (the unit stops its operations) <i>SEt</i> 2nd Setpoint' :the reference value for Return Air Temperature regulation switches to Temp.Setpoint 2 <i>noP</i> No Power' :everything is stopped except Fans and Freecooling function <i>no</i> Not Used' : Microface will not take any action on User Input opening. <i>LSI</i> LSI' : self-setting on UI2 when a STD. Internal Humidifier is selected.	

LCD	Parameter Name	Description	User Setting
noC tFc	UNIT TYPE: COMPRESSORS UNIT TYPE: FC	<p>These parameters define the operating mode of the unit. WARNING: wrong setting of this Para may cause false alarms as well as serious damage of the unit. For correct setting please refer to the following table:</p> <p>No. (Number) of Compressors:</p> <p>0 0 = Chilled Water Unit 1 1 = Single Compressor 2 2 = Twin Compressor</p> <p>Type of Freecooling:</p> <p>n N (None) = No Freecooling R ir AIR = FC by opening AIR-DAMPER 6LY GLYC = FC by opening Water Valve(s)</p>	
Std	STD. SETTINGS	<p>If set to YES, all Parameters of the selected Unit will be changed automatically to pre-defined Values. To be used after Microface or Eprom update only. NOTE: 'YES' jumps back to 'NO' (it behaves as a 'push button').</p>	
Pbt iF	T-PROPORTIONAL BAND T-INTEGRATION FACTOR	<p>Normally best results will be reached if the 'AUTOSET' (Para 255) is enabled. Proportional Band is divided in two equal parts, one part for Cooling, one part for Heating (Hysteresis). Inside this Hysteresis there are the different Components (Compressors, Heaters), which share the width of the Hysteresis. If Teamwork Mode 1 is selected, the P-Band belongs to the whole System. NOTE: Too small P-Band will cause the bad Control Quality (Hunting). Integration Factor: If set to any value, the PI 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.</p> <p>To be used if P-Band must be wide because of bigger number of units connected, and working in Teamwork 1.</p>	

LCD	Parameter Name	Description	User Setting
<p><i>PbH</i> <i>IFH</i></p>	<p>H-PROPORTIONALBAND H-INTEGRATION FACTOR</p>	<p>Normally best results will be reached if the 'AUTOSET' (Para 255) is enabled. Proportional Band is divided in two equal parts, one part for Dehum. , one part for Hum. (Hysteresis). Inside this Hysteresis there are the different Components (Humidifier etc.), which share the width of the Hysteresis. If Teamwork Mode 1 is selected, the P-Band belongs to the whole System. NOTE: Too small P-Band will cause the bad Control Quality (Hunting). Integration Factor: If set to any value, the PI control is enabled. The integration factor doubles the actual, real deviation from the setpoint within the selected time. This will force Hum / Dehum to add more steps to reach the setpoint. To be used if P-Band must be wide because of bigger number of units connected, and working in Teamwork 1.</p>	
<p><i>RSE</i></p>	<p>AUTOSET ENABLE</p>	<p>Enables the permanent Calculation and Self-Setting of the best Control Parameters for the actual Situation. It is recommended to run the System always with AUTSET ON.</p>	
<p><i>EHS</i></p>	<p>HEATING STEPS</p>	<p>Number of Heating Steps. 0,1,2,or 3. If NO Heater is present, the 2 free Outputs might be used for ALARMS / WARNINGS Indication, see List on next page: LQT : Rel.1: Water Alarm (LWD) Rel.2: High/Low Temperature FCF : Rel.1: Compressor Fail (HP/LP/TH) Rel.2: Fan Failure CHF : Rel.1: Compressor Fail (HP/LP/TH) Rel.2: Humidifier Failure LTA : Rel.1: Low Temperature Rel.2: Low Temperature (EEAP) HTA : Rel.1: High Temperature Rel.2: High Temperature (EEAP)</p>	

LCd	Parameter Name	Description	User Setting
HdE	HEATING DEADBAND	The Value the Heaters shall start later'. Means the the Group of Heaters is shifted with the Deadband Value to lower Temperatures.	
rt	3P.ACT. RUNTIME	Actuators are motors, that drive either the Freecooling Damper or which drive Chilled Water or Freecooling valves. This Parameter is the information for the time necessary from completely closed to completely open position.	
RoP	3P.ACT. MIN.OPEN	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 3P-Actuator completely.	
HuE	HUMIDIFIER ENABLE	Enables / Disables the Humidifier Operation. NOTE: Setting this Parameter to YES makes the Control looking for a Humidity Sensor. If not present, a Warning will occur.	
HU H5	HUMIDIFIER MODEL SUPPLY VOLTAGE	To be set according the Steam Cylinder mounted in the air conditioning unit. If an external humidifier has to be controlled, this parameter must be set to 'EXT'.The Voltage sets automatically after setting the Cylinder Type.	
Pro	STEAM RATE	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. This is valid for both operating Modes: ON-Off and Proportional.	
PH	CONTROL	The ctrl. behaviour of the Humidifier: ono When set to 'ON/OFF' the Humidifier will start at the left-end of Humidity Proportional Band at its max. capacity (defined with STEAM RATE) and stop when the Room Humidity Setpoint is reached.	

LCd	Parameter Name	Description	User Setting
PH	CONTROL	Otherwise, the steam output will be proportional to the deviation of Return Air Humidity from Room Humidity Setpoint.	
HUC	ACT.L HUMIDIFIER CURRENT	Shows the actual measured current from the Steam Cylinder.	
Hud	DEADBAND	The Value the Humidifier shall start later'. Means the the Humidifier is shifted with the Deadband Value to lower Humidity.	
dEH	DEHUM.ENABLE	Enables / Disables the Dehumidification Operation. NOTE: Setting this Parameter to YES makes the Control looking for a Humidity Sensor. If not present, a Warning will occur. no NO : No Dehum performed YES YES : Dehum performed if required. SFc STOP FC: (For Direct FC Units): Instead to start the Compressor for Dehum, the FC Damper will be closed to avoid incoming Outdoor Humidity.	
ELr	EL.REHEAT ENABLE	During Dehum Operation it could be necessary to reheat. If it is no problem from the Power consumption, put Para to 'YES', If Compressor and Heaters may not operate at the same time, put it to 'NO'.	
dHh	DEHUM HYSTERESIS	Defines the Return Air Humidity value at which the dehumidification will be stopped. It is expressed as percentage of the full Humidity Proportional Band. (50% means that dehumidification will be stopped at Room Humidity Setpoint).	
ddb	DEADBAND	The Value the Dehumidification shall start 'later'. Means the the Dehum-Starting point is shifted with the Deadband Value to higher Humidity.	

LCd	Parameter Name	Description	User Setting
dEC	DEHUM.RELAY AS	<p>Allows using the digital output of dehumidification for other purposes, if the dehumidification mode is not required:</p> <p>see next page:</p> <p>dEH DEHUM : Dehumidification relay used for Dehumidification (Standard)</p> <p>R1 WARNING : Relay used as General Warning Contact (splits WA and AL on two Rel.)</p> <p>P00 NO POWER : Relay changes its status if the unit switches to 'NO POWER' mode.</p>	
L5t	WATER LEAK DETECTOR	<p>R1 enabled can be set to Warning (Message only) or to Alarm (stops Unit in case of Water detection).</p> <p>R2 Value: actual Indication from LWD. Should be between 1.4 and 1.6 if OK.</p>	
L9			
dt1	DT ROOM-OUTDOOR	<p>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.</p> <p>If set to 'CON', the Control expects to get a command with a switch instead of a Temperature Sensor.</p> <p>If set to 'EFC' the unit will not go in Freecooling mode during normal Operation, but only in case of 'NO POWER' Operation or Compressor Failure, if the Delta is 3 deg C. (Emergency Freecooling only).</p>	
dt2	DT ROOM-GLYCOL	<p>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 will enable Free Cooling mode (if there are not other conditions that disable the FreeCooling</p>	

LCd	Parameter Name	Description	User Setting
	DT ROOM-GLYCOL	operation). The Free Cooling mode will be activated when also the condition on DT Room-Outdoor is fulfilled. If set to 'CON', the Control expects to get a command with a switch instead of a Temperature Sensor.	
dt3	STOP FC AT SET.+	The Free Cooling mode will be stopped when the Return Temp. will be greater than Room Temp. Setpoint plus Stop FC at Room Set +. If Free Cooling is stopped for this reason, it will be disable for at least one hour In case of FC+DX the vale is used to active the compressor 1. Compressor 2 (on Twin DF units) is activate 1.5°C over (see also <i>FPd</i>)	
<i>Rn 1, 2</i> <i>Rn 3, 4</i>	ANALOG OUTPUT 1, 2 ANALOG OUTPUT 3, 4	Both the 0 - 10Vdc outputs may be used for several purposes: <i>3P 1</i> 3P. ACTUATOR 1 : Position of first 3 Point Actuator (Feedback) <i>3P 2</i> 3P. ACTUATOR 2 : Position of second 3 Point Actuator (Feedback) <i>H33</i> HEATING 33% : Signal increases to 10V within the first step of Heaters. <i>SLC</i> SUPPLY CONTROL : Fan speed regulation in relation to supply air temperature <i>rRd</i> RADCOOLER : DryCooler Fanspeed Ctrl. (Glycol FC, incl. Su/WI changeover) <i>ELH</i> HEATER BOARD : For Units which have additional Heater Board for Heaters. <i>HtH</i> HT HUM. : Humidity Signal (0%rH - 100%rH = 0V - 10V) <i>Ptc</i> SUPPLY TEMP.: Supply Temp. Signal (0C - 50C = 0V - 10V) <i>HtT</i> RETURN TEMP : Return Temp. Signal (0C - 50C = 0V - 10V) <i>FS</i> FANSPEED : Fanspeed Control, Setpoints see Para 122,123 and 124. <i>HEA</i> HEATERS : Signal increases to 10V within the Heaters Part of P-Band. <i>HU</i> HUMIDIFIER : Signal incr. to 10V within the Humdifier Part of P-Band. <i>Co</i> COOLING : Signal increases to 10V within the Cooling Part of P-Band. <i>Co 1</i> COOLING 1 : Signal incr. to 10V within the Compressor 1 Hysteresis. <i>Co 2</i> COOLING 2 : Signal incr. to 10V within the Compressor 2 Hysteresis.	

LCd	Parameter Name	Description	User Setting
	55	SUPERSAVER : Output for Setpoint-shifting of Superchillers.	
	AL I	ALARMBOARD: Signal for Alarm Board	
	Cr	METRIC ROOM : Drive signal for Hot-Gas re-heating in 'Constant-like' units.	
		NOTE: Compressor will not stop on Set-Point, but 25% of P-Band lower, with a delay of 20 Minutes.	
FLo	LOW AIRFLOW AT	Use 'AUTOSET AIRFLOW' (Para 302) to set. Depending on the value assigned to this Para, Microface will give Warning or Alarm (depends on Para 304) when the voltage generated by airflow sensor is lower than the threshold set. If a differential pressure switch is used , 'SWI' has to be set.	
RSR	AUTOSET AIRFLOW	Stop Unit first.Set Parameter to 'YES'. Unit will start the Fan for 30 secs, and then wait 30 secs with Fan off. After that the Value will be set. If a Warning appears, there was no reaction from the Airflow device.	
FLo	AIRFLOW VALUE	Read only analogue value (percentage) that informs about the airflow speed inside the unit. This value can be taken into account when setting the Low Airflow At (Para 301).	
FF	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 Airflow Value is lower than the Treshold setting.	

Code	Parameter Name	Description	User Setting
LPd	LOW.PRES.AL.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.	
Comd	COMPRESSOR DELAY	The compressor is activated after the delay set , this function is used on those units equipped with Interceptor Water Valve	
thC	COMP.TH.ENABLE	To enable or disable the Alarm 'Compressor Motor Protection'.	
FPd	FC or DX FC+DX FC or DX	Cooling configuration Compressor and Free cooling are enabled to work together Compressor and Free cooling are not enabled to work together	
Sch	IST. STOP COMP.	Defines the working band of compressor 1 and compressor 2 when the free cooling is active.	
CA1 CA2 CA3 CA4 CA5 CA6 CA7 CA8 CA9 CI0 CI1	Calibration Humitemp Temp. Calibration Humitemp Humidity Calibration Supply Air Sensor Cal. EEAP Temperature Cal. EEAP Humidity Cal. Hirosensor 1 left Sensor Cal. Hirosensor 1 right Sensor Cal. Hirosensor 2 left Sensor Cal. Hirosensor 2 right Sensor Cal. Outdoor Temp. Sensor Cal. Glycol Temp. Sensor	Allows the User the adaptation of the Sensor-Values, using the Offset Values. The Actual Value contains already also the Offset.	
Autotest	Autotest	If set to YES, the Unit automatically runs following test Cycle: Fan ON After 1 Minute: Compressor 1 ON After 4 Minutes: Co 1 OFF, Co2 ON After 4 Minutes: Co 2 OFF, El. Heaters ON After 1 Minute: Heaters OFF, FC Act. to 50% After reaching 50%: Alarm relays ON After 1 Minute: Al. Rel. OFF, Warning Relay ON After 1 Minute: end of Test.	

3.3 The Microface E LCD Display Warnings / Alarms

R 1	HP 1	COMP. 1 HIGH PRESSURE	ALARM
R 2	LP 1	COMPRESSOR 1 LOW PRESSURE	ALARM
R 3	HC	HIGH CHILLED WATER	WARNING
R 4	LC	LOW CHILLED WATER FLOW	WARNING
R 5	EHO	ELECTRICAL HEATERS OVERHEATED	WARNING
R 6	RF	FAN FAILURE	WARNING
R 7	RF	FAN FAILURE	ALARM
R 8	CF	CLOGGED FILTERS	WARNING
R 9	LE	WATER LEAKAGE	WARNING
R 10	LE	WATER LEAKAGE	ALARM
R 11	UI 1	USER INPUT 1 TRIGGERED	WARNING
R 12	UI 1	USER INPUT 1 TRIGGERED	ALARM
R 13	HFR	HUMIDIFIER FAILURE	WARNING
R 14	HHC	HUMIDIFIER HIGH CURRENT	WARNING
R 15 R 16	HF Hn	HUMIDIFIER FAILURE	WARNING
R 17	HLC	HUMIDIFIER CYLINDER WORN	WARNING
R 18	H-t	HIGH ROOM TEMPERATURE	WARNING
R 19	L-t	LOW ROOM TEMPERATURE	WARNING
R 20	H-H	HIGH ROOM HUMIDITY	WARNING
R 21	L-H	LOW ROOM HUMIDITY	WARNING
R 22	H-tE	HIGH ROOM TEMPERATURE	WARNING
R 23	L-tE	LOW ROOM TEMPERATURE	WARNING
R 24	H-H	HIGH ROOM HUMIDITY	WARNING
R 25	L-H	LOW ROOM HUMIDITY	WARNING
R 26	HE	CONDITIONER WORKING HOURS EXCEEDED	WARNING
R 27	HC 1	COMPRESSOR 1 WORKING HOURS EXCEEDED	WARNING
R 28	HH	HUMIDIFIER WORKING HOURS EXCEEDED	WARNING
R 29	PtC	PTC SENSOR FAILURE	WARNING
R 30	r-SF	ROOM SENSOR FAILURE	WARNING
R 31	r-SF	ROOM SENSOR FAILURE	ALARM
R 32	EEF	EEAP SENSOR FAILURE	WARNING
R 33	SF	WATER PRESENCE SENSOR FAILURE	WARNING
R 34	r-Et	NETWORK FAILURE	WARNING
R 35	or	OUT OF MEMORY	WARNING
R 58	HP2	COMP. 2 HIGH PRESSURE	ALARM
R 59	LP2	COMPRESSOR 2 LOW PRESSURE	ALARM
R 60	HC2	COMPRESSOR 2 WORKING HOURS EXCEEDED	WARNING
R 61	Out	OUTDOOR TEMP. SENSOR	WARNING
R 62	GLY	GLYCOL TEMP. SENSOR	WARNING
R 65	F r	SMOKE ALARM	ALARM
R 68	UI2	USER INPUT 2 TRIGGERED	WARNING
R 69	UI2	USER INPUT 2 TRIGGERED	ALARM
R 70	r-Et	NO CONNECTION TO UNIT 1	WARNING
R 71	th 1	COMPRESSOR 1 MOTOR PROTECTION	ALARM
R 72	th 2	COMPRESSOR 2 MOTOR PROTECTION	ALARM
R 73	F r	FIRE ALARM	ALARM
R 75	FR 1	CONDENSER 1 FAN FAILURE	WARNING
R 76	FR 2	CONDENSER 2 FAN FAILURE	WARNING
R 77	Hb	NETWORK PING	WARNING
R 78	Sid	SUBGROUP-ID NOT UNIQUE	WARNING
R 79	SU 1	SUBGROUP-UNIT 1 NOT CONNECTED	WARNING
R 80	SU 2	SUBGROUP-UNIT 2 NOT CONNECTED	WARNING
R 81	r-SF	SHARE ROOM SENSOR FAILURE	WARNING
R 82	r-SF	SHARE ROOM SENSOR FAILURE	ALARM
R 83	Out	MAINTENANCE DONE	WARNING
R 84	GLY	MAINTENANCE SHOULD BE DONE	WARNING
R 90	RFd	AIRFLOW DEVICE NOT READY, PLS. CHECK	WARNING

3.3.1 Hiromatic G / E

Hiromatic G Layout

The front panel of Hiromatic G for HPAC units consists of a backlit graphic LCD, of nine push buttons that permit input function and of three LED (see Figure 30).

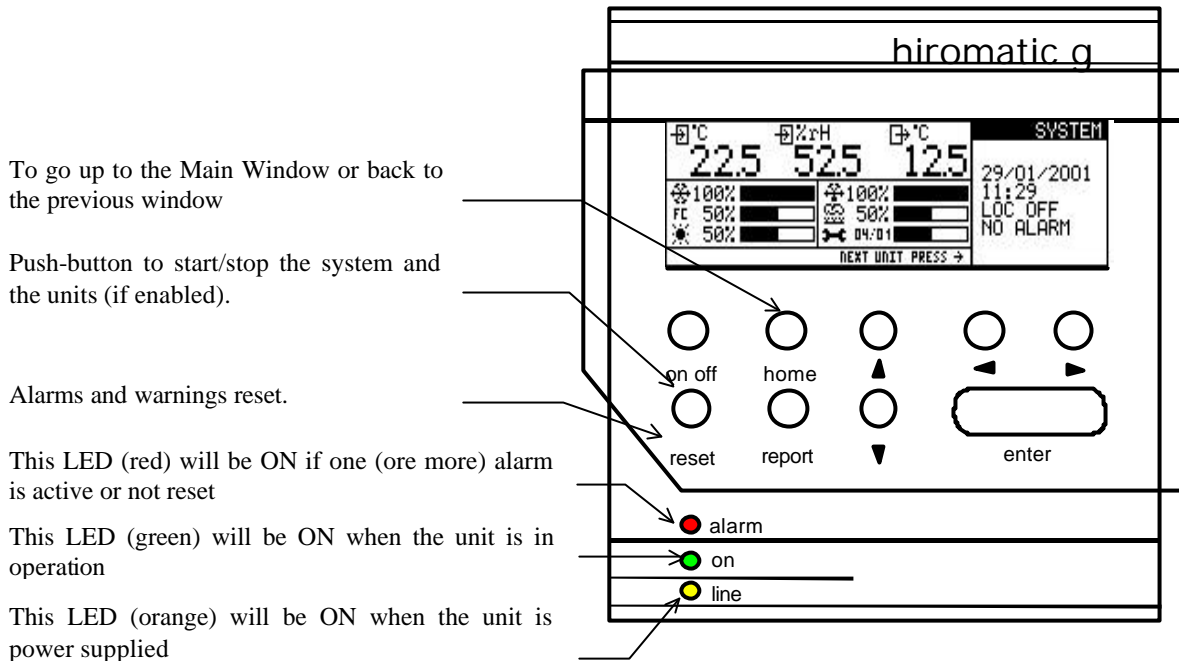


Figure 30 – Hiromatic G with E1G Eprom Front View

3.3.2 Hiromatic E Layout

The front panel of Hiromatic G for HPAC units consists of a backlit graphic LCD, of eight push buttons that permit input function and of two LED (see Figure 31).

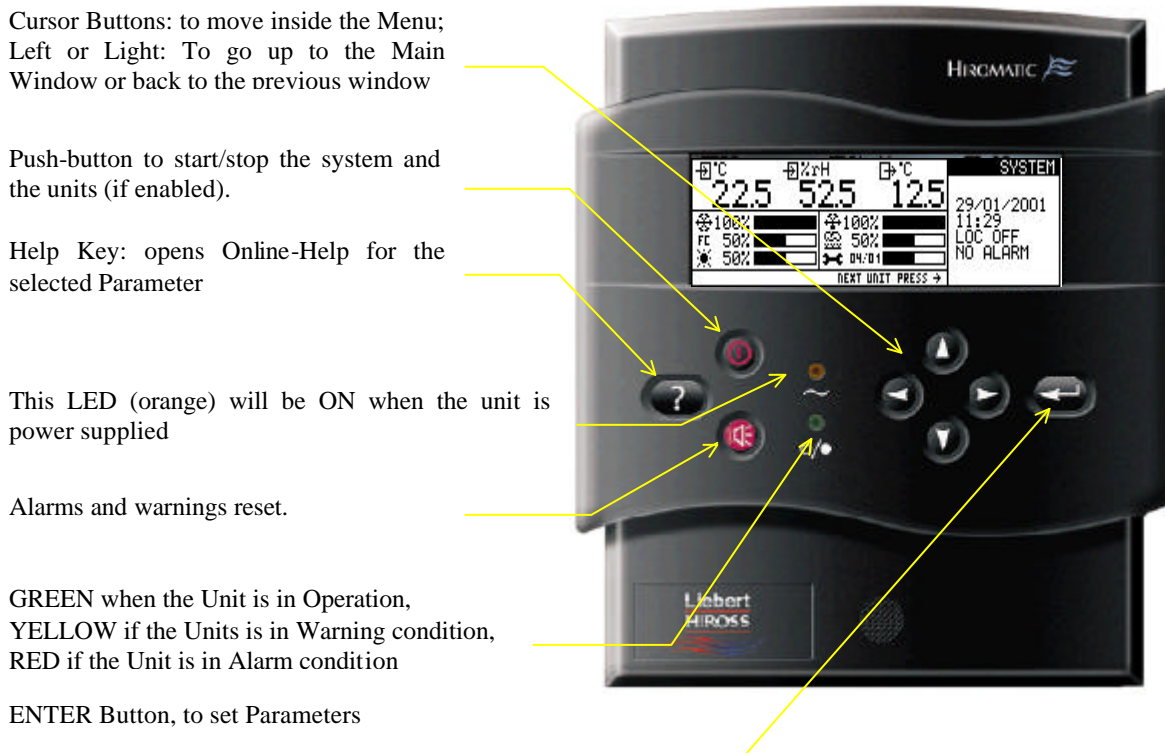















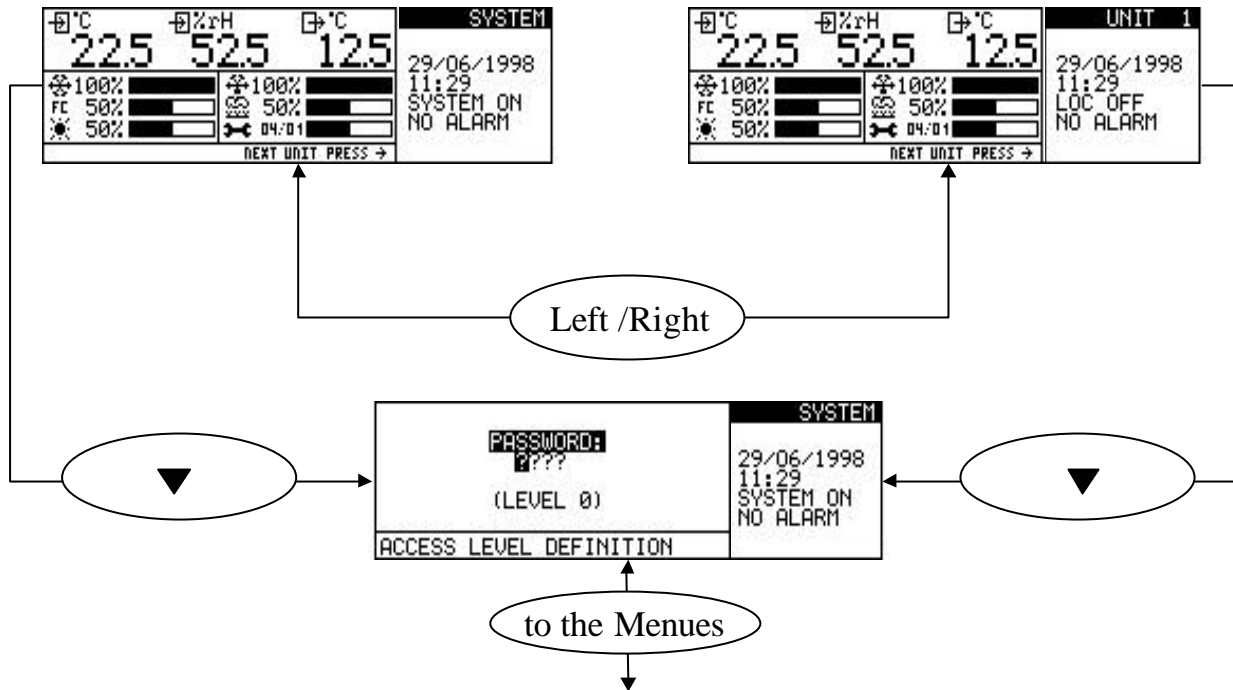


Figure 31 - Hiromatic E with EVG Eprom Front View

3.3.2.1 Meaning of the different Symbols in the Main Window

 °C 22.5	Return Air Temperature (if on the top-right SYSTEM is indicated, it is the average of all units with system on. If UNIT x is indicated, it is the return air temperature of the specific unit. This is valid for all indications in Hiromatic Display.
 %rH 52.5	Return Air Humidity of the System / the Unit.
 °C 12.5	Supply Air Temperature of the System / the Unit.
 100% 	This Bargraph gives Information about the actual used Cooling-recourses in Operation, either for the System or for a specific Unit. NOTE: Compressors stopped with failure are excluded from this Bargraph, so that the information is about the actual available compressors.
FC 50% 	This Bargraph gives Information about the actual used Freecooling-recourses in Operation, either for the System or for a specific Unit.
 0% 	This Bargraph gives Information about the actual used Heating-recourses in Operation, either for the System or for a specific Unit.
 0% 	This Bargraph gives Information about the actual used Dehumidification-recourses in Operation, either for the System or for a specific Unit.
 0% 	This Bargraph gives Information about the actual used Humidification-recourses in Operation, either for the System or for a specific Unit.
 09:01 	This Bargraph gives Information about the next Maintenance time (mm-yy. (See Next Maintenance Calculation on page 57 for explanation).
	This Field of the Window informs about time, date, the status of the System / Unit.

3.3.3 How to Move in the Hiromatic Windows

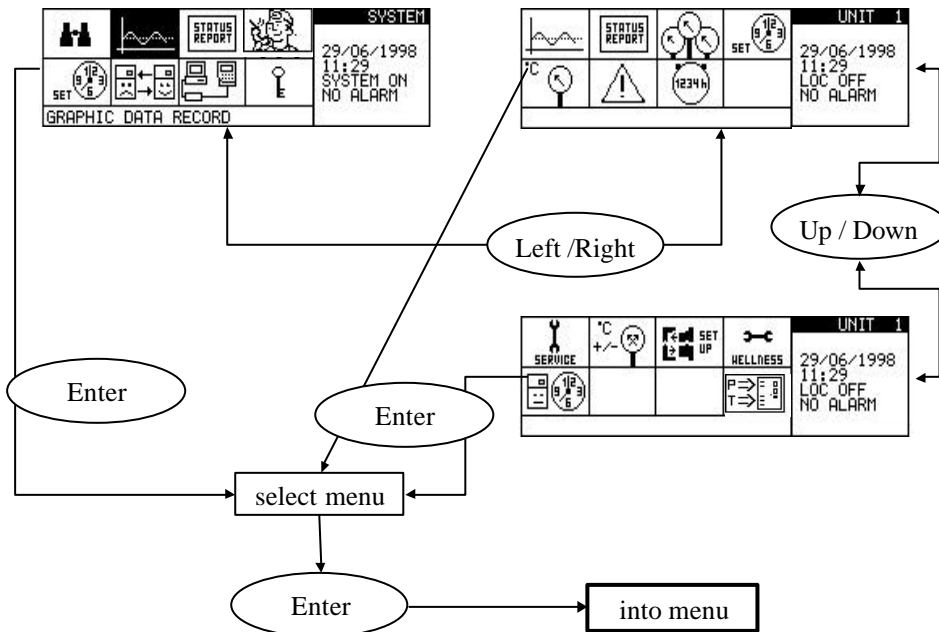


There are two ways to enter the menus: with or without Password. Entering without Password allows to read the values (except Password Menu and Calibration Menu); entering with Password allows also to change Parameters.

Without Password: Press ENTER or DOWN; press DOWN once more, and then ENTER.

With Password: Press ENTER or DOWN; ENTER to select first digit of Password; select with UP or DOWN, press RIGHT for the next Digit; UP or DOWN to select, etc. After having selected the correct Password, press ENTER.

Press DOWN to select the Enter-String, and press ENTER to jump into the Menu-Icons. Depending on the Password Level some of the Menu will be read/write, some of the read only.



Select the Window with LEFT-RIGHT-DOWN, Press ENTER to select the first Icon, Press LEFT-RIGHT-UP-DOWN to select the Icon (The Menu), and press ENTER to get in.

3.3.4 The Menus

The E1G Software gives some Icon – Menus:

- The **System Menu**, see Chapter 3.3.4.1 on page 41
- The **Unit Menu for User**, see Chapter 3.3.4.2 on page 45
- The **Unit Menu for Service and Setup** 3.3.4.3 on page 49.

3.3.4.1 System Menu



This Window contains the following Menus (from top left to bottom right):

	Readable w/o Password	Write Access Level
UNIT STATUS OVERVIEW	Yes	read only
GRAPHIC DATA RECORD	Yes	read only
STATUS REPORT	Yes	read only
SERVICE CONTACTS	Yes	Contact your distributor
SYSTEM SETTINGS	Yes	Level 0
STANDBY SETTINGS	Yes	Level 2 + 5
SYSTEM SETUP	Yes	Level 2 + 5
PASSWORD MENU	No	Level 3

Status Overview

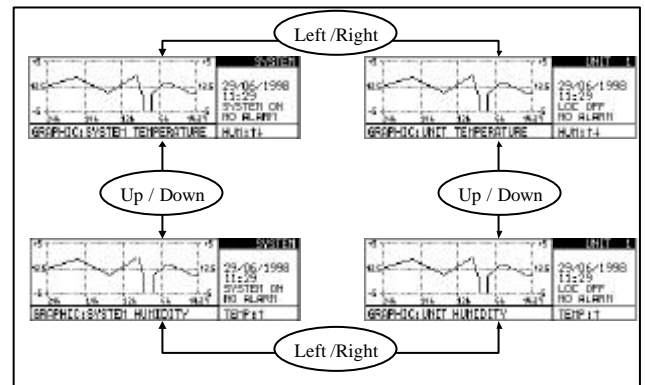
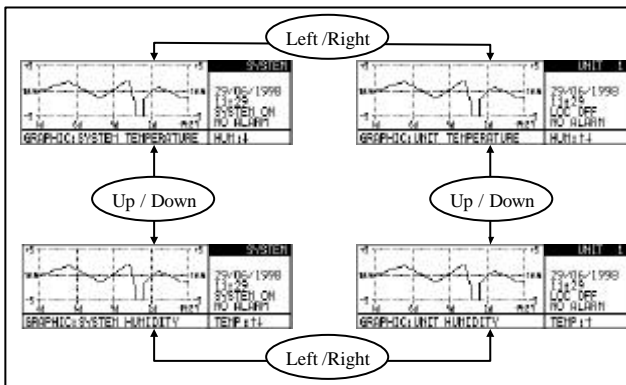
UNIT	1	SYS OFF	9
UNIT	2	SYS OFF	10
UNIT	3	SYS OFF	11
UNIT	4	SYS ON	12
UNIT	5	SYS ON	13
UNIT	6	SYS ON	14
UNIT	7	SYS ON	15
	8		16

This Window gives Information about the number of connected units and the status of each unit.

The String “UNIT” appears only for those Units, which are configured in the Parameter: “Number of Units”. If beside the “UNIT” String no Status appears, it means that the unit was disconnected from the Hirobus.

Graphic Data Records

For the System, as well as for each single unit an 8-days Graphic Data Record as well as a 24-hours Record for both Temperature and Humidity are available. The temperature/humidity scale can be adjusted (Enter-UP/DOWN). The Records are stored also after power off.





Status Report

The Status Report contains the last 200 events in order of appearance, which occurred to the System, as well as to each single unit. From the System-Status-Report (a collection of events of all units) it is possible to reach the Unit-Status-Report (a collection of events for the selected unit only) of the single units by pressing the RIGHT key.

STATUS REPORT	PAGE	66
(01) 21.02.2001 20:10	RESET	
GENERAL ALARM		
(01) 21.02.2001 20:10	ACKNOWLEDGE	
GENERAL ALARM		
(01) 20.02.2001 16:45	WARNING	
HIGH ROOM TEMPERATURE		



Service contacts

Please to contact your distributor to get more information.



System Settings

000	SYSTEM SETTINGS	
001	PIEZO FRQ.	OFF/0.5
002	LANGUAGE :	ENGLISH
003	TIME :	22:10
004	DATE :	TH 22/02/2001
005	CONTRAST :	74
006	TEMP. INDICATION	C

Help on: SYSTEM SETTINGS

This Window allows to select the Language of the Hiromatic, as well as to set the Time and the Date. Note: No Password is necessary to set Date & Time. Change to Fahrenheit not possible yet.



Standby Settings

010 STANDBY SETTINGS		
011	NUMBER OF STDBY UNITS	0
012	ROTATION FREQUENCY	DAILY
013	ROT. PERFORMED AT	10:00
014	ENABLE CASCADE	COOL.
015	ROTATE ONCE	NO
016	ROTATION BY / HT	1 / NO

Help on: NUMBER OF STDBY UNITS
 STBY Units normally are halted and will start only in case of an alarm of another Unit in the Network.
 This parameter defines how many units will be in standby mode.
 For Rotation see Para 012 and 013.

Help on: ROT. PERFORMED AT
 The time of the day at which the rotation of the standby units will be performed.
 Valid only when 'Rotation Frequency' (Para 012) is not set to 'NO'.

Help on: ROTATE ONCE
 When set to 'YES' the system is forced to perform one rotation of the standby units.
 Working only when 'Rotation Frequency' (Para 012) is not set to 'NO'.

Help On : ROTATE BY
 It allows to perform a group rotation

Help on: HT
 If set YES all standby units will be activated in case of High Temperature Warning

Help on: ROTATION FREQUENCY
 Defines the frequency at which the automatic rotation of standby units will be performed.
 Selectable: No, Daily, and all Days of the Week.
 For time of Rotation see Para 013.

Help on: ENABLE CASCADE 1/3
 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-operate with active unit(s).

Help on: ENABLE CASCADE 2/3
 NOTE: Cascade settings force Teamw. 1!
 Possible Settings:
 NO : cascade function not active
 YES : active with both temperature (cooling/heating) and humidity (humidification/de-humification)

Help on: ENABLE CASCADE 3/3
 TEMP : active only for temperature (cooling/heating)

COOL : active only for cooling



System Setup

020 SYSTEM SETUP		
021	NUMBER OF UNITS	4
022	TEAMWORK MODE	2
023	HM ID NUMBER	1
024	BAUDRATE	19200
025	COMMUNICATION	READ/WRITE
026	HM EPROM VERSION	EVGL1 1.60.037

Help on: NUMBER OF UNITS

The number of air conditioning units connected together in the Bus-Network. The user must set it properly depending on the actual Network configuration. All the units in the network must have different addresses (starting from 1).

Help on: HM ID NUMBER

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

Help on: BAUDRATE

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

Help on: COMMUNICATION

Set 'READ' if the Hiromatic will transmit Data to the Hirolink, without accepting commands from Hirolink. Set 'READ/WRITE' if also commands (Setpoint changes etc.) shall be accepted from Hirolink.

Help on: HM EPROM VERSION

The version of the EPROM installed in 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 PDE or any other Support Organisation.

Help on: TEAMWORK MODE 1/4

Possible settings: NO, 1, 2.

NO : The Units work in stand-alone, using ist own sensors for regulation.

This setting must be used in Multi-Room Installations.

Help on: TEAMWORK MODE 2/4

Set to 1 if the units shall operate as one System. For Control the average T+H of all units in operation is used.

All Units together are working like one big Unit.

Not to be set in Multi-Zone Rooms.

Help on: TEAMWORK MODE 3/4

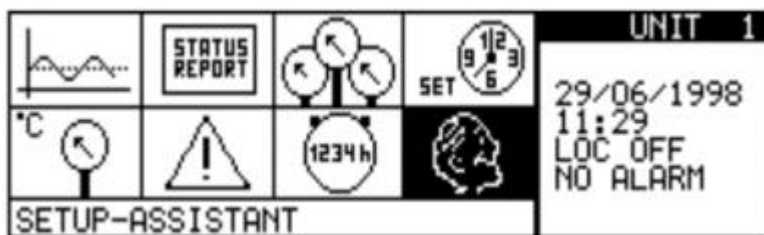
Set to 2 if the units shall operate in stand-alone, but with restrictions from the Average T+H. The Averages decide, if Cooling or Heating, Hum or Dehum has to be performed, the units itself decide about according their own Sensors.

Help on: TEAMWORK MODE 4/4

Teamwork setting 2 is a stand-alone mode operation, but 'mastered' from the Average T+H, to avoid competition between the Units.

To be set in Multi-Zone or un-balanced Rooms.

3.3.4.2 Unit Menus (User)



This Window contains the following Menus (from top left to bottom right):

	Readable w/o Password	Write Access Level
GRAPHIC DATA RECORD	Yes	read only
STATUS REPORT	Yes	read only
UNIT OVERVIEW	Yes	read only
UNIT SETTINGS	Yes	Level 2 + 5
CONTROL PARAMETERS	Yes	Level 1 + 2 + 5
WARNINGS / ALARMS	Yes	Level 2 + 5
WORKING HOURS	Yes	Level 2 + 5
SETUP ASSISTANT	No	Level 1



Graphic Data Record

See Graphic Data Records, on page 41



Status Report

See Status Report, on page 42



Unit Overview

UNIT OVERVIEW		
SUPPLY TEMP.	22.5 C	0
EEAP	12.6 C / 43.7 %rH	
HIROSENSOR 1	12.1 C / 22.2 C	0
HIROSENSOR 2	12.1 C / 22.2 C	0
OUTD/GLYCOL	22.9 C / 44.4 C	0
ACT.SETP.	24.0 C 45.0 %rH	

Help on: SUPPLY TEMP.

A read only value. It is the temperature of the air delivery of the unit.

Available only when the corresponding sensor is installed.

This Value could influence the Control, if SUPPLY LIMIT (Para 114) is set.

Help on: HIROSENSOR 1,2

The temperatures (two values) measured by Hiro sensor sensor number 1 (2). These values are not used for regulation or Alarm / Warning generation.

Help on: EEAP

The Temperature and relative Humidity measured by the optional EEAP Sensor (Electronic Environment Alarm Package) (if installed).

This Sensor allows to set second step Temp. and Hum. Warnings.

Help on: ACT.SETP.

This Value shows the actual Temp / Hum Setpoint for the specific Unit.

The Humidity Setpoint can be automatically influenced from the Humidity Compensation' Parameter. see Para 113 in Control Parameters 1/2.

Help on: OUTD/GLYCOL 1/4
 OUTD (OUTDOOR TEMP) :
 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

Help on: OUTD/GLYCOL 3/4
 GLYCOL (GLYCOL TEMP) :
 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

Help on: OUTD/GLYCOL 2/4
 HIROBUS each unit will work with the average of the values read by all sensors. The value displayed here is this average.

Help on: OUTD/GLYCOL 4/4
 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 Dry-Cooler. Each Unit uses ist own sensor for Control.



Unit Settings

100 UNIT SETTINGS	
101	
102	AUTORESTART 23 sec
103	HM ON/OFF ENABLED YES
104	
105	
106	

Help on: AUTORESTART
 The time delay, in seconds, between the power on and the start of the unit.

Help on: HM ON/OFF ENABLED
 To enable the ON/OFF button of Hiromatic Graphic to switch ON/OFF the air conditioning units on the HIROBUS network.

NOTE: Each Unit multiplies the time with its Microface ID Number.



Control Parameters

110 CONTROL PARAMETERS 1/2		
111	TEMP. SETPOINT	23.6 C
112	HUMIDITY SETPOINT	50.0 C
113	HUM COMPENSATION	YES
114	SUPPLY LIMIT	11.1 C
115	TEMP. SETPOINT 2	NO
116		

120 CONTROL PARAMETERS 2/2		
121		
122	FANSPEED STANDARD	90%
123	FANSPEED DEHUM	80%
124	FANSPEED NO POWER	60%
125		
126		

Help on: TEMP. 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.

Help on: 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 to HUM or to DEHUM.

Help on: HUM COMPENSATION

If enabled, the Control respects the psychometric relation between Temperature and Humidity. Reading the actual Temperature the relative Humidity Setpoint will be recalculated. See SYS or Unit Overview, act. Setp.

Help on: TEMP. SETPOINT 2

A second setpoint value for the air temperature of the room. It is used when at least one User Input is set as 2ndSETP (Second Setpoint) and the switch on the corresponding input of Microface is open.

Help on: SUPPLY LIMIT 1/3

A low limit for the Supply Air Temp. 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

Help on: SUPPLY LIMIT 2/3

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 Temperature Setpoint and b) the deviation of Supply

Help on: SUPPLY LIMIT 3/3

Temperature from Supply Air Setpoint. Note: Supply Limit is capable to reduce the opening of Dampers or Valves, but will never stop a compressor. (Exception: 2nd Compressor in a Twin Compressor Unit).

Help on: FANSPEED STANDARD

The parameter used by Microface to regulate the speed of the fan during normal operation when an Analog Output of Microface is used to drive the fan. (The corresponding Analogue Output must be assigned to Fanspeed).

Help on: FANSPEED DEHUM

The parameter used by Microface to regulate the speed of the fan during Dehum operation when an Analog Output of Microface is used to drive the fan. (The corresponding Analogue Output must be assigned to Fanspeed).

Help on: FANSPEED NO POWER

The parameter used by Microface to regulate the speed of the fan during NoPower operation when an Analog Output of Microface is used to drive the fan. (The corresponding Analogue Output must be assigned to Fanspeed).



Warnings / Alarms

130 STD. SENSOR WARNINGS		
131		
132	HIGH TEMPERATURE	28 C
133	LOW TEMPERATURE	17 C
134	HIGH HUMIDITY	65 %rH
135	LOW HUMIDITY	22 %rH
136		

Help on: STD. SENSOR WARNINGS

These Warnings are generated from the Standard Return Sensor of each Unit, if the thresholds are over- / underridden.

The Warnings are delayed for a time of 30 Minutes after Unit start.

Help on: USER INPUT 1,2 1/4

According to the value set for this parameter (both inputs have the same selection possibilities) Microface will take some actions when the switch connected to the corresponding input of Microface is open :

Help on: USER INPUT 1,2 2/4

nHumi' :the humidification is disabled

nComp' :the compressor(s) disabled

WARNING' :a Warning is generated

(the unit continue its operations)

ALARM' :an alarm is generated

(the unit stops its operations)

140 EEAP WARNINGS		
141	HIGH TEMPERATURE	32 °C
142	LOW TEMPERATURE	12 °C
143	HIGH HUMIDITY	85 %rh
144	LOW HUMIDITY	10 %rH
145	EEAP CONNECTED	NO
146	USER INPUT 2	Warning
147	USER INPUT 2	LSI

Help on: EEAP WARNINGS

These Warnings are generated from the optional EEAP Sensor, if the thresholds are over- / underridden.

The Warnings are delayed for a time of 30 Minutes after Unit start.

Para 146 shows if EEAP is connected.

Help on: USER INPUT 1,2 3/4

2nd Setpoint' :the reference value for

Return Air Temperature regulation

switches to Temp.Setpoint 2

No Power' :everything is stopped

except Fans and Freecooling function

Help on: USER INPUT 1,2 4/4

Not Used' : Microface will not take

any action on User Input opening.

LSI' : self-setting on UI2 when a

STD. Internal Humidifier is selected.



Working Hours

160 WORKING HOURS 1/2			
	HOURS	LIMIT	START
162	FAN 123	32000	1
163	CO1 456	32000	2
164	CO2 789	32000	3
165	FC 222	32000	4
166			

170 WORKING HOURS 2/2			
	HOUR	LIMIT	START
172	HE1 123	32000	1
173	HE2 456	32000	2
174	HUM 789	32000	3
175	DEH 222	32000	4
176			

Help on: WORKING HOURS

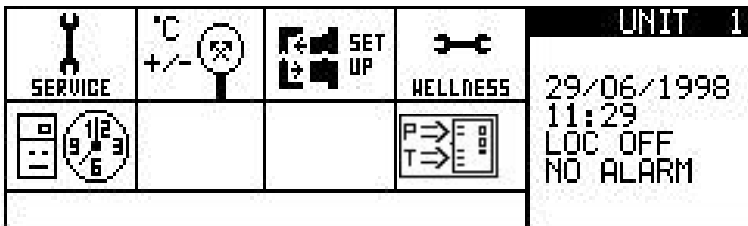
This Window shows the actual working hours of the components (HOURS), the hours threshold (LIMIT), the number of starts (START)



Setup Assistant

A self explaining Guide, which helps to set up the Setpoints, the Warning thresholds for first and second Level. Once started, it guides step by step through the procedure.

3.3.4.3 Unit Menu (Service & Setup)



This Window contains the following Menus (from top left to bottom right):

	Readable w/o Password	Write Access Level
SERVICE	Yes	Level 5
CALIBRATION	No	Level 4
UNIT CONFIGURATION	Yes	Level 5
NEXT MAINTENANCE CALC.	Yes	Level 5
SLEEP MODE SETTINGS	Yes	Level 2 + 5
REFRIGERANT	Yes	Level 5



Service

190 MANUAL OPERATION 1/6			
191	MANUAL:	OFF	HUM : OFF
192	FAN :	ON	DRAIN : OFF
193	COMP.1:	ON	DEHUM: OFF
194	COMP.2:	OFF	AL.REL: OFF
195	HEAT 1:	OFF	
196	HEAT 2:	OFF	

200 MANUAL OPERATION 2/6	
201	3P.ACTUATOR 1 : 0%
202	3P.ACTUATOR 2 : 0%
203	ANALOGUE OUT 1 : 0%
204	ANALOGUE OUT 2 : 0%
205	ANALOGUE OUT 3 : 0%
206	ANALOGUE OUT 4 : 0%

Help on: MANUAL OPERATION 1/2
 This Window allows to run all Components in Manual-Mode, with all Safety Devices on. At first the Para MANUAL' has to be set to 'ON', after that the FAN must be started, before to be able start any other component.

Help on: MANUAL OPERATION
 After setting the Unit in Manual Mode and starting the FAN, also both the ANALOGUE OUTPUT can be set individually (Ana Out are initialised on 60% when setting the Manual Mode. 3P Actuators are either CW / FC Valves or Dampers.

Help on: MANUAL OPERATION 2/2
 DRAIN' (Humidifier) can be set to ON without setting MANUAL to ON, and without to Enter a Password before. DRAIN stops automatically after 20 Seconds.
 NOTE: The Alarm Relay falls to 'ALARM' when setting the Unit in Manual Mode.

210 INPUTS INFORMATION 3/6			
211	REMOTE	0-0	ON 1232
212	FIRE ALARM	0-0	OK 1232
213	SMOKE WARN.	0-0	WA 1232
214	FILTER	0-0	WA 1232
215	USER INPUT1	0-0	ACT 1232
216	USER INPUT2	0-0	AL 1232

220 INPUTS INFORMATION 4/6			
221	HP1	0-0	OK 1232
222	LP1	0-0	OK 1232
223	TH1	0-0	OK 1232
224	HP2	0-0	OK 1232
225	LP2	0-0	OK 1232
226	TH2	0-0	OK 1232

230 INPUTS INFORMATION 5/6			
231	HIGH CW T.	0-0	OK 1232
232	LOW CW FLOW	0-0	OK 1232
233	COND.1 FAIL	0-0	OK 1232
234	COND.2 FAIL	0-0	OK 1232
235	DT1	0-0	OK 1232
236	DT2	0-0	OK 1232

240 INPUTS INFORMATION 6/6			
241	HEATERS OH.	0-0	OK 1232
242			
243			
244			
245			
246			

Help on: INPUTS INFORMATION
 This Window gives Info about the Digital Inputs.
 The CONTACT indicates open or closed, the Description informs about the Meaning of the Contact. The Number on the right is for internal use only.



Sensor Calibration

310 CALIBRATION 1/2			
		ACTUAL	OFFSET
311			
312	HT TEMP	20.0	0.0
313	HT HUMI	21.0	+1.1
314	PTC SU/RE	22.0	0.0
315	PTC AMB	2,3	-2.2
316	PTC GL/SU	34.7	0.0

320 CALIBRATION 2/2			
		ACTUAL	OFFSET
321			
322	HIROS. 1L	20.0	0.0
323	HIROS. 1R	21.0	+1.1
324	HIROS. 2L	22.0	0.0
325	HIROS. 2R	2,3	-2.2
326	EEAP T.	23.0	+0.0
327	EEAP H.	50.0	+0.0

Help on: CALIBRATION

Allows the User the adaptation of the Sensor-Values, using the Offset Values. The Actual Value contains already also the Offset.



250 UNIT CONFIGURATION 1/6		
251	UNIT TYPE: COMPRESSORS	1
252	UNIT TYPE: FC	AIR
253	STD. SETTINGS	NO
254	TEMP.PROP/INT	2.0K/ NO
255	HUM PROP/INT	6%/ NO
256	AUTOSET ENABLE	YES

Help on: AUTOSET ENABLE
 Enables the permanent Calculation and Self-Setting of the best Control Parameters for the actual Situation.

It is recommended to run the System always with AUTSET ON.

Help on: STD. SETTINGS
 If set to YES, all Parameters of the selected Unit will be changed automatically to pre-defined Values. To be used after Microface or Eprom update only. NOTE: 'YES' jumps back to 'NO' (it behaves as a 'push button').

Help on: TEMP.PROP/INT 1/4
 Normally best results will be reached if the 'AUTOSET' (Para 255) is enabled. Proportional Band is divided in two equal parts, one part for Cooling, one part for Heating (Hysteresis). Inside this Hysteresis there are the different

Help on: TEMP.PROP/INT 2/4
 Components (Compressors, Heaters), which share the width of the Hysteresis. If Teamwork Mode 1 is selected, the P-Band belongs to the whole System. NOTE: Too small P-Band will cause the bad Control Quality (Hunting).

Help on: TEMP.PROP/INT 3/4
 Integration Factor:
 If set to any value, the PI 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

Help on: TEMP.PROP/INT 4/4
 steps to reach the setpoint.

To be used if P-Band must be wide because of bigger number of units connected, and working in Teamwork 1.

Help on: UNIT TYPE: 1/3
 These parameters define the operating mode of the unit. WARNING: wrong setting of this Para may cause false alarms as well as serious damage of the unit. For correct setting please refer to the following table:

Help on: UNIT TYPE: 2/3
 No. (Number) of Compressors:
 0 = Chilled Water Unit
 1 = Single Compressor
 2 = Twin Compressor

Help on: UNIT TYPE: 3/3
 Type of Freecooling:
 N (None) = No Freecooling
 AIR = FC by opening AIR-DAMPER
 GLYC = FC by opening Water Valve(s)

Help on: HUM PROP/INT 1/4
 Normally best results will be reached if the 'AUTOSET' (Para 255) is enabled. Proportional Band is divided in two equal parts, one part for Dehum. , one part for Hum. (Hysteresis). Inside this Hysteresis there are the different

Help on: HUM PROP/INT 2/4
 Components (Humidifier etc.), which share the width of the Hysteresis. If Teamwork Mode 1 is selected, the P-Band belongs to the whole System. NOTE: Too small P-Band will cause the bad Control Quality (Hunting).

Help on: HUM PROP/INT 3/4
 Integration Factor:
 If set to any value, the PI control is enabled. The integration factor doubles the actual, real deviation from the setpoint within the selected time. This will force Hum / Dehum to add more

Help on: HUM PROP/INT 4/4
 steps to reach the setpoint.

To be used if P-Band must be wide because of bigger number of units connected, and working in Teamwork 1.

 Unit Setup – Window 2/6

260 UNIT CONFIGURATION 2/6		
261	HEATING STEPS	2
262	HEATING DEADBAND	0.0 K
263	3P.ACT. RUNTIME	170sec
264	3P.ACT. MIN.OPEN	0%
265	COMPRESSOR DELAY	0Sec
266		

Help on: HEATING STEPS 1/3
 Number of Heating Steps. 0,1,2,or 3.
 If NO Heater is present, the 2 free
 Outputs might be used for
 ALARMS / WARNINGS Indication,
 see List on next page:

Help on: HEATING STEPS 2/3
 LQT : Rel.1: Water Alarm (LWD)
 Rel.2: High/Low Temperature
 FCF : Rel.1: Compressor Fail (HP/LP/TH)
 Rel.2: Fan Failure
 CHF : Rel.1: Compressor Fail (HP/LP/TH)
 Rel.2: Humidifier Failure

Help on: HEATING STEPS 3/3
 LTA : Rel.1: Low Temperature
 Rel.2: Low Temperature (EEAP)
 HTA : Rel.1: High Temperature
 Rel.2: High Temperature (EEAP)

Help on: HEATING DEADBAND
 The Value the Heaters shall start
 later'. Means the the Group of Heaters
 is shifted with the Deadband Value to
 lower Temperatures.

Help on: 3P.ACT. RUNTIME
 Actuators are motors, that drive either
 the Freecooling Damper or which drive
 Chilled Water or Freecooling valves.
 This Parameter is the information for
 the time necessary from completely
 closed to completely open position.

Help on: 3P.ACT. MIN.OPEN
 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
 3P-Actuator completely.

Help on: COMPRESSOR DELAY
 This parameter defines the compressor delay activation
 in order to manage the Solenoid Interceptor
 Water Valve

 Unit Setup – Window 3/6

270 UNIT CONFIGURATION 3/6		
271	HUMIDIFIER ENABLE	NO
272	MODEL / SUP VOLT	93H/400V
273	STEAM RATE	100%
274	CONTROL	ON/OFF
275	AMPS NOM/ACT	10.3/ 5.2A
276	DEADBAND	0.0%

Help on: HUMIDIFIER ENABLE
 Enables / Disables the Humidifier
 Operation.
 NOTE: Setting this Parameter to YES
 makes the Control looking for a
 Humidity Sensor. If not present, a
 Warning will occur.

Help on: MODEL / SUP VOLT
 To be set according the Steam Cylinder
 mounted in the air conditioning unit.
 If an external humidifier has to be
 controlled, this parameter must be set
 to 'EXT'. The Voltage sets automatically
 after setting the Cylinder Type.

Help on: STEAM RATE

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. This is valid for both operating Modes: ON-Off and Proportional.

Help on: CONTROL 1/2

The ctrl. behaviour of the Humidifier: When set to 'ON/OFF' the Humidifier will start at the left-end of Humidity Proportional Band at its max. capacity (defined with STEAM RATE) and stop when the Room Humidity Setpoint is reached.

Help on: CONTROL 2/2

Otherwise, the steam output will be proportional to the deviation of Return Air Humidity from Room Humidity Setpoint.

Help on: AMPS NOM/ACT

Shows the Current, the Humidifier actually should run with (NOM), and the actual measured Current (ACT).

Help on: DEADBAND

The Value the Humidifier shall start later'. Means the the Humidifier is shifted with the Deadband Value to lower Humidity.

 **Unit Setup – Window 4/6**

280	UNIT CONFIGURATION 4/6	
281	DEHUM.ENABLE	STOP FC
282	EL.REHEAT ENABLE	YES
283	DEHUM HYSTERESIS	30%
284	DEADBAND	0.0%
285	DEHUM.RELAY AS	DEHUM
286	LWD / LWD INPUT	NO/0.0V

Help on: DEHUM.ENABLE 1/2

Enables / Disables the Dehumidification Operation.

NOTE: Setting this Parameter to YES makes the Control looking for a Humidity Sensor. If not present, a Warning will occur.

Help on: DEHUM.ENABLE 2/2

NO : No Dehum performed

YES : Dehum performed if required.

STOP FC: (For Direct FC Units):

Instead to start the Compressor for Dehum, the FC Damper will be closed to avoid incoming Outdoor Humidity.

Help on: DEHUM HYSTERESIS

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

Help on: DEADBAND

The Value the Dehumidification shall start 'later'. Means the the Dehum-Starting point is shifted with the Deadband Value to higher Humidity.

Help on: EL.REHEAT ENABLE
 During Dehum Operation it could be necessary to reheat. If it is no problem from the Power consumption, put Para to 'YES', If Compressor and Heaters may not operate at the same time, put it to 'NO'.

Help on: LWD / LWD INPUT
 Enables or disables the sensor. When enabled can be set to Warning (Message only) or to Alarm (stops Unit in case of Water detection).
 Value: actual Indication from LWD.
 Should be between 1.4 and 1.6 if OK.

Help on: DEHUM.RELAY AS 1/2
 Allows using the digital output of dehumidification for other purposes, if the dehumidification mode is not required:

see next page:

Help on: DEHUM.RELAY AS 2/2
 DEHUM : Dehumidification relay used for Dehumidification (Standard)
 WARNING : Relay used as General Warning Contact (splits WA and AL on two Rel.)
 NO POWER : Relay changes its status if the unit switches to 'NO POWER' mode.

 **Unit Setup – Window 5/6**

290 UNIT CONFIGURATION 5/6		
291	DT INT/EXT / INT/GLY	5 / 5K
292	STOP FC AT SET.+	5K
293	ANALOG OUTPUT 1	COOLING
294	ANALOG OUTPUT 2	HEATING
295	ANALOG OUTPUT 3	COOLING
296	ANALOG OUTPUT 4	HEATING

help on: DT INT/EXT 1/3
 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

help on: DT INT/EXT 2/3
 operation). The Free Cooling mode will be activated when also the condition on DT Room-Glycol is fulfilled.
 If set to 'CON', the Control expects to get a command with a switch instead of a Temperature Sensor.

help on: DT INT/EXT 3/3
 If set to 'EFC' the unit will not go in Freecooling mode during normal Operation, but only in case of 'NO POWER' Operation or Compressor Failure, if the Delta is 3 deg C. (Emergency Freecooling only).

Help on: DT INT/GLY 1/2
 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 will enable Free Cooling mode (if there are not other conditions that disable the FreeCooling

Help on: DT INT/GLY 1/2
 operation). The Free Cooling mode will be activated when also the condition on DT Room-Outdoor is fulfilled.
 If set to 'CON', the Control expects to get a command with a switch instead of a Temperature Sensor.

Help on: STOP FC AT SET.+
 The Free Cooling mode will be stopped when the Return Temp. will be greater than Room Temp. Setpoint plus Stop FC at Room Set +. If Free Cooling is stopped for this reason, it will be disabled for at least one hour.
 in case of FC+DX this parameter defines the start of compressor 1.
 Compressor 2 (on Twin DF) is activated 1.5 °K over

Help on: ANALOG OUTPUT 1,2,3,4 1/7
 Both the 0 - 10Vdc outputs may be used for several purposes:
 3P. ACTUATOR 1 : Position of first 3 Point Actuator (Feedback)
 3P. ACTUATOR 2 : Position of second 3 Point Actuator (Feedback)

Help on: ANALOG OUTPUT 1,2,3,4 2/7
 HEATING 33% : Signal increases to 10V within the first step of Heaters.
 SUPPLY CONTROL : Fan speed regulation in relation to supply air temperature
 RADCOOLER : DryCooler Fanspeed Ctrl. (Glycol FC, incl. Su/WI changeover)

Help on: ANALOG OUTPUT 1,2,3,4 3/7
 HEATER BOARD : For Units which have additional Heater Board for Heaters.
 HT HUM. : Humidity Signal (0%rH - 100%rH = 0V - 10V)
 SUPPLY TEMP.: Supply Temp. Signal (0C - 50C = 0V - 10V)

Help on: ANALOG OUTPUT 1,2,3,4 4/7
 RETURN TEMP : Return Temp. Signal (0C - 50C = 0V - 10V)
 FANSPEED : Fanspeed Control, Setpoints see Para 122,123 and 124.
 HEATERS : Signal increases to 10V within the Heaters Part of P-Band.

Help on: ANALOG OUTPUT 1,2,3,4 5/7
 HUMIDIFIER : Signal incr. to 10V within the Humdifier Part of P-Band.
 COOLING : Signal increases to 10V within the Cooling Part of P-Band.
 COOLING 1 : Signal incr. to 10V within the Compressor 1 Hysteresis.

Help on: ANALOG OUTPUT 1,2,3,4 6/7
 COOLING 2 : Signal incr. to 10V within the Compressor 2 Hysteresis.
 SUPERSAVER : Output for Setpoint-shifting of Superchillers.
 ALARMBOARD: Signal for Alarm Board

Help on: ANALOG OUTPUT 1,2,3,4 7/7
 METRIC ROOM : Drive signal for Hot-Gas re-heating in 'Constant-like' units.

NOTE: Compressor will not stop on Set-Point, but 25% of P-Band lower, with a delay of 20 Minutes.

 **Unit Setup – Window 6/6**

300 UNIT CONFIGURATION 6/6		
301	LOW AIRFLOW AT	50%
302	AUTOSET AIRFLOW	NO
303	AIRFLOW VALUE	44%
304	FAN FAILURE	WARNING
305	LOW.PRES.AL.DELAY	3min
306	COMP.TH.ENABLE	YES

Help on: LOW AIRFLOW AT 1/2
 Use 'AUTOSET AIRFLOW' (Para 302) to set. Depending on the value assigned to this Para, Microface will give Warning or Alarm (depends on Para 304) when the voltage generated by airflow sensor is lower than the threshold set.

Help on: LOW AIRFLOW AT 2/2
 If a differential pressure switch is used , 'SWI' has to be set.

Help on: AUTOSET AIRFLOW
 Stop Unit first.Set Parameter to 'YES'. Unit will start the Fan for 30 secs, and then wait 30 secs with Fan off. After that the Value will be set. If a Warning appears, there was no reaction from the Airflow device.

Help on: AIRFLOW VALUE
 Read only analogue value (percentage) that informs about the airflow speed inside the unit. This value can be taken into account when setting the Low Airflow At (Para 301).

Help on: 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 Airflow Value is lower than the Treshold setting.

Help on: COMP.TH.ENABLE

To enable or disable the Alarm 'Compressor Motor Protection'.

Help on: LOW.PRES.AL.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.

3.3.4.4 Next Maintenance Calculation

 **General Maintenance Settings**

HELLNRES

310 GENERAL MAINTENANCE SET. 1/7			
311	MAINT. FREQUENCY	3	PA
312	MAX. BONUS		3M
313	MAX. PENALTY		3M
314	LAST MAINTENANCE		02.01
315	BY: HUBER	RESET:	YES
316	CALC.NEXT MAINTENANCE		02.02

Help on: MAINT. FREQUENCY

Possible Settings are:

NO : No next Maintenance Calculation

- 1 : Maintenance 1 time a year
- 2 : Maintenance 2 times a year
- 3 : Maintenance 3 times a year
- 4 : Maintenance 4 times a year

Help on: LAST MAINTENANCE

This Date sets automatically if the Service Engineer sets the 'Reset' Parameter. (see next Line)

Help on: MAX. BONUS

If the Unit is working in good Conditions, next Maintenance can be shifted to later time, adding the Bonus (or parts of it) to the next planned Service time. The Bonus is given in Months.

Help on: LAST MAINTENANCE BY: / RESET:

The Service Engineer has to put his name in the name-field after Service. Pressing RESET sets the 'Last Maint. Date' to the actual Date, and resets all Maintenance Counters to 0.

Help on: MAX. PENALTY

If the Unit is working in bad Conditions, next Maintenance must be shifted to earlier time, reducing the Penalty (or parts of it) from the next planned Service time. Penalty is given in Months.

Help on: CALC.NEXT MAINTENANCE

Is the Result of the Settings done in this area. It shows the calculated next Service Time, respecting Bonus & Penalty as well as std. Maintenance Frequency.



Maintenance Settings for Components

FAN SETTINGS/DIAGNOST. 2/7	
NUMBER OF STARTS	123
WORKING HOURS	1234
AV. WORKING TIME	123
STARTS/DAY OPT/WOR	12/200
NUMBER OF ALARMS	4
ACTUAL BONUS	2M

COMP.1 SETTINGS/DIAGNOST.3/7	
NUMBER OF STARTS	123
WORKING HOURS	1234
AV. WORKING TIME	123
STARTS/DAY OPT/WOR	12/200
NO.OF HP/LP/TH	1 / 1 / 0
ACTUAL BONUS	2M

COMP.2 SETTINGS/DIAGNOST.4/7	
NUMBER OF STARTS	123
WORKING HOURS	1234
AV. WORKING TIME	123
STARTS/DAY OPT/WOR	12/200
NO.OF HP/LP/TH	1 / 1 / 0
ACTUAL BONUS	2M

HEAT.1 SETTINGS/DIAGNOST.5/7	
NUMBER OF STARTS	123
WORKING HOURS	1234
AV. WORKING TIME	123
STARTS/DAY OPT/WOR	12/200
NUMBER OF ALARMS	1
ACTUAL BONUS	2M

HEAT.2 SETTINGS/DIAGNOST.6/7	
NUMBER OF STARTS	123
WORKING HOURS	1234
AV. WORKING TIME	123
STARTS/DAY OPT/WOR	12/200
NUMBER OF ALARMS	0
ACTUAL BONUS	2M

HUM. SETTINGS/DIAGNOST. 7/7	
NUMBER OF STARTS	123
WORKING HOURS	1234
AV. WORKING TIME	123
STARTS/DAY OPT/WOR	12/200
NUMBER OF ALARMS	2
ACTUAL BONUS	2M

Help on: NUMBER OF STARTS
 A Counter (read only) which indicates the Number of starts of the specific Component since the last Maintenance.

Counter will be reset when last Maintenance is set (Reset).

Help on: WORKING HOURS
 A Counter (read only) which indicates the Working Hours of the specific Component since the last Maintenance.

Counter will be reset when last Maintenance is set (Reset).

Help on: AV. WORKING TIME
 Calculated from Number of Starts and Working hours.
 This is the Basic Information for next Maintenance Calculation.

Help on: STARTS/DAY OPT/WOR
 Number of Starts per day for the specific Component, which can be considered as optimum (OPT), and can be considered as bad working condition (WOR).

Help on: NUMBER OF ALARMS
 A Counter (read only) which indicates the Number of Alarm occurred to the specific Component since last Maint. (split in HP/LP/TH for compressors)
 Counter will be reset when last Maintenance is set (Reset).

Help on: ACTUAL BONUS
 Actual Calculation of Wellness for the specific Component (+ or -, Months).
 The System will always take the value from the worst Component for next Maintenance Indication.



Sleep Mode (Timer Mode)

180 SLEEP MODE SETTINGS			
181	INTERVAL1	19:00	06:00
182	INTERVAL2	00:00	00:00
183	DAYS		MO
184	MODE		AUTO
185	RESET		YES
186			

Help on: INTERVAL1,2

Period of time in which the unit will be daily in Sleep Mode.

Setting doesnot depend on Day settings!

Set both Intervals to 00:00 if Sleep Mode is not desired.

Help on: DAYS

By means of this parameters it is possible to set the unit in order to force it to sleep the whole day in the selected days.

Selected days are visible, not selected days remain invisible.

Help on: MODE

If set to 'SYS OFF' the unit will completely stop in the specified time intervals.If set to a value,a deadband of the specified width is shifted in, where no cooling or heating is performed. Humidity ctrl is off in SM.

Help on: RESET 1/3

Setting NO:

If during Sleep Mode the Temperature or Humidity crosses the threshold, Sleep Mode will be interrupted (no Warning will appear for a time of 30 Minutes).

The Unit will 'fall asleep' again if

Help on: RESET 2/3

the next interval asks for Sleep Mode, or if the RESET-Parameter was set to YES' (changes back to 'NO' after set). Sleep Mode will be activated only if the Temperature is inside the theresholds.

Help on: RESET 3/3

Sleep Mode AUTO:

If the Temperature crosses the threshold (high or low) the Unit starts in standard mode and 'sleeps' again automatically if the temperature is close to the Setpoint.



Refrigerant

In the REFRIGERANT section some parameters are available which allow management of the logging of the refrigerant pressures and suction, discharge, condenser temperatures of the refrigerant circuit. The logging is possible only through the NAVIGATOR CARD (see connection guide and manual code 272599)

470 CIRC.1 REFRIGERANT DIAGN.					480 CIRC.2 REFRIGERANT DIAGN.				
471	PASSWORD (LEVEL 0)			????	481	PASSWORD (LEVEL 0)			????
472	COND. TEMP.	18,7	bar	50,2 °C	482	COND. TEMP.	18,7	bar	50,2 °C
473	EVAP. TEMP.	4,5	bar	5,2 °C	483	EVAP. TEMP.	4,5	bar	5,2 °C
474	DISCH. TEMP.			70,5 °C	484	DISCH. TEMP.			70,5 °C
475	SUCT. TEMP.			6,4 °C	485	SUCT. TEMP.			6,4 °C
476	LIQU. TEMP.			53,5 °C	486	LIQU. TEMP.			53,5 °C
477	SUPERH./SUBC.	1,2	K	3,3 K	487	SUPERH./SUBC.	1,2	K	3,3 K

CIRC. 1 / 2 REFRIGERANT DIAGNOSTIC

- COND. TEMP = condenser pressure value and temperature calculated
- EVAP. TEMP = evaporating pressure value and temperature calculated
- DISCH. TEMP = discharge thermometric temperature value
- SUCT. TEMP = suction thermometric temperature value
- LIQU. TEMP. = liquid thermometric temperature value
- SUPERH./SUBC. = superheating and sub cooling values calculated

490 REFRIGERANT C1/C2 SETUP				500 LOGGING SETUP		
491	REFRIGERANTE:		R407C	501	PASSWORD (LEVEL 0)	????
492	HP1: 0.0V =-6.0 bar	8.2V = 30.0 bar		502	LOGGING TIME	22h
493	LP1: 0.0V =-2.5 bar	8.0V = 10.0 bar		503	LOG. INTERVAL	1 sec.
494	H/L1: 10.0V = 16.0 bar	10.0V = 4.0 bar		504	LOGGING ACTIVE	YES
495	HP2: 0.0V =-6.0 bar	8.2V = 30.0 bar		505	COND./EVAP.	YES/YES
496	LP2: 0.0V =-2.5 bar	8.0V = 10.0 bar		506	DISCH./SUC T.	YES/YES
497	H/L2: 10.0V = 16.0 bar	10.0V = 4.0 bar		507	LIQUID TEMP.	YES

REFRIGERANT C1 / C2 SETUP

- HP1 / LP1 = offset for the pressure transducer of compressor 1
- HP2 / LP2 = offset for the pressure transducer of compressor 2

Note: the offset values showed on the picture have been defined according to the standard pressure transducers mounted on Liebert-Hiross units (Keller 4-20ma)

LOGGING SETUP

- LOGGING TIME = logging time of pressures and temperatures saved on the NAVIGATOR BOARD
- LOG. INTERVAL = defines the logging interval
- LOGGING ACTIVE = enables / disables the logging
- COND. EVAP. = enables / disables the logging of the items in subject
- DISCH./SUC T. = enables / disables the logging of the items in subject
- LIQUID TEMP. = enables / disables the logging of the items in subject

510 CRITICAL OPERATING AT			520 SENSOR OFFSET CALIBRATION		
511	PASSWORD (LEVEL 0)	????	521	PW (LIVELLO 0)	???? LETT. / OFFSET
512		SET IST.	522	C1 DISCH. TEMP.	70.0 /+0.0 °C
513	HP HIGHER	22.0 / 2.0 bar	523	C1 SUCT. TEMP.	5.0 /+0.0 °C
514	LP LOWER	2.5 / 2.0 bar	524	C1 LIQU. TEMP	50.0 /+0.0 °C
515	OUTD. HIGHER	30.0 / 2.0 °C	525	C2 DISCH. TEMP.	70.0 /+0.0 °C
516	DISCH. HIGHER	80.0 / 9.0 °C	526	C2 SUCT. TEMP.	5.0 /+0.0 °C
517	ROOM HIGHER	30.0 / 5.0 °C	527	C2 LIQU. TEMP	50.0 /+0.0 °C

CRITICAL OPERATING AT

- HP HIGHER = defines the condenser pressure limit, if the value exceeds the limit the logging is forced to 1 sample per second. The logging goes to normal as soon as the values comes below the limit minus the hysteresis defined. In case of high pressure alarm the logging is forced to 1 sample per second for 5 minutes, then the logging is stopped. It will be reactivated as soon as the alarm is restored.
- LP LOWER = defines the evaporator pressure limit, if the value exceeds the limit the logging is forced to 1 sample per second. The logging goes to normal as soon as the values comes over the limit plus the hysteresis defined. In case of low pressure alarm the logging is forced to 1 sample per second for 5 minutes, then the logging is stopped. It will be reactivated as soon as the alarm is restored.
- OUTD. HIGHER = defines the outdoor air temperature (detected by Microface) limit, if the value exceeds the limit the logging is forced to 1 sample per second. The logging goes to normal as soon as the value comes below the limit plus the hysteresis defined.
- ROOM HIGHER = defines the return air temperature (detected by Microface) limit, if the value exceeds the limit the logging is forced to 1 sample per second. The logging goes to normal as soon as the value comes below plus the hysteresis defined.

SENSOR OFFSET CALIBRATION

Offset PTC sensor calibration.

NOTE: the right offset must be performed when the compressor is working for a minimum of 5 minutes

3.3.4.5 Navigator card for FC+DX units

The Navigator Card must be used on units where the FC+DX cooling configuration is required. In this case the Hirobus address of Navigator must be 3 (see connection guide or Manual code 272599), and the inputs of the board will be used in a different way.

WARNING: the DX+FC function can be set only in case of Single DF or Twin DF units

530 FC+DX / BOARD 3 SETUP		
531	UNIT TYPE	FC or DX
532	LP1: 0.0 V=-2,5 bar	8.0 V = 10.0 bar
533	LP2: 0.0 V=-2,5 bar	8.0 V = 10.0 bar
534	L1/L2: 10.0 V = 4.2 bar	10.0 V = 4.2 bar
535	LP STOP FC A / HYST.	5.0 / 2.0 bar
536	LP ALARM AT / HYST.	2.5 / 2.0 bar
537	STOP COMP. HYST.	50.0 %

- UNIT TYPE = defines the cooling configuration:
FC or DX means that the compressor or free cooling will be used
FC + DX means that both, compressor and free cooling, can be activated
- LP1 = sensor pressure transducer offset
- LP2 = sensor pressure transducer offset

Note: the offset values showed on the picture have been defined according to the standard pressure transducers mounted on Liebert-Hiross units (Keller 4-20ma)

- LP STOP FC AT / HYST.= defines the low pressure limit to stop the free cooling when both, compressor and free cooling, are working. If the pressure exceeds the limit , the free cooling is stopped for 1 hour. The free cooling will be reactivated only if the pressure values comes over the limit plus the hysteresis defined
- LP ALARM AT / HYST. = define the low pressure limit to generate the low pressure alarm. The compressors will be enalbed to work as soon as the pressure comes over the limit plus the hysteresis defind and the alarm has been restored
- STOP COMP. HYST. = defines the working band of compressor 1 and 2 when the free cooling is active. The band value (in %) is calculated according to the temperature set point and DT3 parameters values. The DT3 paramter is used also to activate compressor 1.
Compressor 2 on twin DF units) is activated 1.5 °K over.

- Compatibility Notes

3.3.5 General Information

There are 2 compatibility levels: one for Hirobus (among the units) and one for Hironet (connection to Hirolink).

For **Hironet** there is nearly no restriction: “old” and “new” software versions can be put together and can be wired to one Hirolink. It is just a matter to check if the software used in the Hirolink is compatible also with the new unit; if not, the Hirolink needs to be upgraded (Eprom update).

For **Hirobus** compatibility some simple rules have to be respected:

All Eprom Versions are combined in so called “Families”. An Eprom label consists of 6 or 9 digits; digit 1-3 is the Eprom name; digit 4-6 shows the family (e.g.”1.60”); digit 7-9 is the release number, no influence to the compatibility. All Eproms within the same family are Hirobus-compatible; Eproms from different families are not compatible.

3.3.6 List of CCAC Eproms, used since 1996

Eprom Name	Description	Hiromatic G	Microface Standard	Microface Evolution
WXM 1.05 – 1.39	Microface Eprom for all CCAC	x	✓	x
WXG 1.05 – 1.39	Hiromatic Eprom; Std. menu layout	✓	x	x
WXM 1.41	Microface Eprom for all CCAC	x	✓	x
WXG 1.41	Hiromatic Eprom; Std. menu layout	✓	x	x
WXM 1.50	Microface Eprom for all CCAC	x	✓	x
WXG 1.50	Hiromatic Eprom; Std. menu layout	✓	x	x
WXM 1.51	Microface Eprom for all CCAC	x	✓	x
WXG 1.51	Hiromatic Eprom; Std. menu layout	✓	x	x
<hr/>				
1XM 1.60.xxx	Microface Eprom for Single Compressor and Chilled Water Units	x	✓	✓
2XM 1.60.xxx	Microface Eprom for Twin Compressor Units	x	x	✓
3XM 1.60.xxx	Microface Eprom for Twin Compressor Units, System 4	x	x	✓
A1M 1.60.xxx	Microface Eprom for Single Compressor and Chilled Water Units, with Direct Communication from Microface to Hirolink	x	x	✓
WXG 1.60.xxx	Hiromatic Eprom; Std. menu layout	✓	X	x
EVM 1.60.xxx	Microface Eprom for all CCAC Units (except System 4); with Direct Communication from Microface to Hirolink Light / SMM	x	x	✓
E1G 1.60.xxx	Hiromatic Eprom; Icon Menu	✓	x	x

The above listed Eproms need to be of the same family (1.51, or 1.60 etc.) in order to be Hirobus-compatible (to be connected together).

3.3.7 Notes to Icon Versions (E1G, EVM) and non-Icons Versions (WXG, 1-2-3XM, A1M)

3.3.7.1 EVM and 1-2-3XM / A1M to be connected together, without Hiromatic

Both the above software versions are fully compatible. No need to update the 1-2-3XM / A1M Versions to EVM.

3.3.7.2 EVM and 1-2-3XM / A1M to be connected together, with Hiromatic

The Microfaces can be connected together without problems. The Hiromatic to be used in that case is the WXG 1.60.xxx. The mixed System will behave like a typical 1-2-3XM / A1M WXG Installation. New functions like Teamwork 2, Auto-set of Control Parameters, Wellness & next Maintenance Calculation are not present.

If in a mixed Installation (EVM and 1-2-3XM / A1M) the Hiromatic G Software (E1G) will be connected, the new features will be available for the EVM-equipped Units only; the 1-2-3XM / A1M equipped Units will not support the new functions. The bar graphs in the System Window as well as in the Single unit windows will not fill up for units equipped with 1-2-3XM / A1M, but will consider only the EVM-equipped units.

3.4 Hiromatic Parameter List

The unit parameters are set depending on the unit type. The parameters on the “std. set” column are indicative. The parameters can be varied in order to have the unit’s correct operation in relation to the installation type. We advised to transcribe the unit configuration parameters into the “user setting” column and keep the manual inside the unit.

ENGLISH

Parameter Name	Nr.	Team	Read	Range	Res.	Std. Set	Std. Set	Std. Set	Std. Set	Std. Set	User
			Write			CW	DX 1 Co	DX 2 Co	FC Gly	FC Air	Setting
SYSTEM MAIN WINDOW											
RETURN TEMP.	-	-	R	-28.0 – 100.0	°C	0,1	-	-	-	-	
RETURN HUMIDITY	-	-	R	0 – 100.0	%rH	0,5	-	-	-	-	
SUPPLY TEMP.	-	-	R	-28.0 – 100.0	°C	0,1	-	-	-	-	
UNIT MAIN WINDOW											
RETURN TEMP.	-	-	R	-28.0 – 100.0	°C	0,1	-	-	-	-	
RETURN HUMIDITY	-	-	R	0 – 100.0	%rH	0,5	-	-	-	-	
SUPPLY TEMP.	-	-	R	-28.0 – 100.0	°C	0,1	-	-	-	-	
CONTACTS											
COUNTRY	-	-	W	None, Austria, Switz.D Switz.F, Benelux D, Benelux F, Germany, France, UK, Hungary, Italy, Poland, Spain	-	-	-	-	-	-	
LINE 1	-	-	W	Web contact	-	-	-	-	-	-	
LINE 2	-	-	W	Phone number	-	-	-	-	-	-	
LINE 3	-	-	W	Service contact	-	-	-	-	-	-	
LINE 4	-	-	W	Service email	-	-	-	-	-	-	
SYSTEM SETTINGS											
PIESZO FRO.	1	-		OFF , ON / 0.1 -- 2.0	-	-	-	-	-	-	
LANGUAGE :	2	-	W	L1 = English, Deutsch, Italiano, Espanol, Portugues, Swedish, Nederland, French L2 = English, Polski, Hungarian, Czech, Turkish, Russian, French, Greek	-	-	-	-	-	-	
TIME :	3	-	W	mm:hh	-	-	-	-	-	-	
DATE :	4	-	W	dd:mm:yy	-	-	-	-	-	-	
CONTRAST :	5	-	W	0-127	-	1	-	-	-	-	
TEMP. INDICATION	6	-	W	°C	-	-	°C	°C	°C	°C	
UNIT OVERVIEW											
ACTUAL TEMP. SETP	-	-	R	0 – 45.0	°C	0,1	-	-	-	-	
ACTUAL HUM. SETP.	-	-	R	0 – 100.0	%rH	1	-	-	-	-	
SUPPLY TEMP.	-	-	R	-28.0 – 100.0	°C	0,1	-	-	-	-	
EEAP	-	-	R	-28.0 – 100.0	°C	0,1	-	-	-	-	
EEAP	-	-	R	0 – 100.0	%rH	0,5	-	-	-	-	
HIROSENSOR 1	-	-	R	-28.0 – 100.0	°C	0,5	-	-	-	-	
HIROSENSOR 1	-	-	R	-28.0 – 100.0	%rH	0,5	-	-	-	-	
HIROSENSOR 2	-	-	R	-28.0 – 100.0	°C	0,5	-	-	-	-	
HIROSENSOR 2	-	-	R	-28.0 – 100.0	%rH	0,5	-	-	-	-	
OUTDOOR	-	-	R	-28.0 – 100.0	°C	0,5	-	-	-	-	
GLYCOL	-	-	R	-28.0 – 100.0	°C	0,5	-	-	-	-	
FAN	-	-	R	ON - OFF	-	-	-	-	-	-	
FAN	-	-	R	0-100	%	1	-	-	-	-	
COMPRESSOR 1	-	-	R	ON - OFF	-	-	-	-	-	-	
COMPRESSOR 1	-	-	R	0-100	%	1	-	-	-	-	
COMPRESSOR 2	-	-	R	ON - OFF	-	-	-	-	-	-	
COMPRESSOR 2	-	-	R	0-100	%	1	-	-	-	-	
CW VALVE	-	-	R	0-100	%	1	-	-	-	-	
HEATER 1	-	-	R	ON - OFF	-	-	-	-	-	-	
HEATER 1	-	-	R	0-100	%	1	-	-	-	-	
HEATER 2	-	-	R	ON - OFF	-	-	-	-	-	-	
HEATER 2	-	-	R	0-100	%	1	-	-	-	-	

Parameter Name	Nr.	Team	Read	Range		Res.	Std. Set	Std. Set	Std. Set	Std. Set	Std. Set	User
			Write				CW	DX 1 Co	DX 2 Co	FC Gly	FC Air	Setting
HUMIDIFIER	-	-	R	ON - OFF	-	-	-	-	-	-	-	
HUMIDIFIER	-	-	R	0-100	%	1	-	-	-	-	-	
DEHUMIDIFICATION	-	-	R	ON - OFF	-	-	-	-	-	-	-	
DEHUMIDIFICATION	-	-	R	0-100	%	1	-	-	-	-	-	
FC STATUS	-	-	R	ON, OFF, START	-	-	-	-	-	-	-	
FC ACTUATOR 1	-	-	R	0-100	%	1	-	-	-	-	-	
FC ACTUATOR 2	-	-	R	0-100	%	1	-	-	-	-	-	
SYSTEM SETUP												
NUMBER OF UNITS	21	YES	W	1 - 16	-	1	-	-	-	-	-	
TEAMWORK MODE	22	YES	W	No, 1, 2	-	-	-	-	-	-	-	
HM ID NUMBER	23	-	W	1-99	-	-	-	-	-	-	-	
BAUDRATE	24	-	R	19200, 20833	-	-	-	-	-	-	-	
COMMUNICATION	25	-	W	READ, READ/WRITE	-	-	-	-	-	-	-	
HM EPROM VERSION	26	-	R	read only	-	-	-	-	-	-	-	
UNIT SETTINGS												
AUTORESTART	102	-	W	0-999	S	1	5	5	5	5	5	
HM ON/OFF ENABLED	103	-	W	Yes-No	-	-	-	-	-	-	-	
CONTROL PARAMETERS												
TEMP. SETPOINT	111	YES	W	5.0-40.0	°C	0,1	23	23	23	23	27	
HUMIDITY SETPOINT	112	YES	W	No, 20-80	%rH	1	50	50	50	50	NO	
HUM COMPENSATION	113	YES	W	Yes, No	-	-	YES	YES	YES	YES	NO	
SUPPLY LIMIT	114	YES	W	No, 5-25	°C	1	NO	NO	NO	10	10	
TEMP. SETPOINT 2	115	YES	W	No, 5-40	°C	1	NO	NO	NO	NO	NO	
FANSPEED STANDARD	122	-	W	No, 30-100	%	1	NO	NO	NO	NO	100	
FANSPEED DEHUM	123	-	W	No, 30-100	%	1	NO	NO	NO	NO	80	
FANSPEED NO POWER	124	-	W	No, 1-100	%	1	NO	NO	NO	NO	65	
STANDBY SETTINGS												
NUMBER OF STDBY UNITS	11	YES	W	0-16	-	1	0	0	0	0	0	
ROTATION FREQUENCY	12	YES	W	DAILY, MON, TUE, WED, THU, FRI, SAT, SUN	-	-	NO	NO	NO	NO	NO	
ROT. PERFORMED AT	13	YES	W	hh:mm	-	-	00:00	00:00	00:00	00:00	00:00	
ENABLE CASCADE	14	YES	W	NO, YES, COOL., TEMP.	-	-	NO	NO	NO	NO	NO	
ROTATE ONCE	15	YES	W	Yes, No	-	-	NO	NO	NO	NO	NO	
ROTATE BY /HT	16	NO	W	1-8, / Yes, No								
STD. SENSOR WARNINGS												
HIGH TEMPERATURE	132	YES	W	No, 1-99	°C	1	NO	NO	NO	NO	NO	
LOW TEMPERATURE	133	YES	W	No, 1-99	°C	1	NO	NO	NO	NO	NO	
HIGH HUMIDITY	134	YES	W	No, 1-99	%rH	1	NO	NO	NO	NO	NO	
LOW HUMIDITY	135	YES	W	No, 1-99	%rH	1	NO	NO	NO	NO	NO	
EEAP WARNINGS												
HIGH TEMPERATURE	142	YES	W	No, 1-99	°C	1	NO	NO	NO	NO	NO	
LOW TEMPERATURE	143	YES	W	No, 1-99	°C	1	NO	NO	NO	NO	NO	
HIGH HUMIDITY	144	YES	W	No, 1-99	%rH	1	NO	NO	NO	NO	NO	
LOW HUMIDITY	145	YES	W	No, 1-99	%rH	1	NO	NO	NO	NO	NO	
EEAP CONNECTED	146	NO	R	Yes, No	-	-	-	-	-	-	-	
USER INPUT 1	152	NO	W	WARNING, ALARM, nHumi, nComp, 2ndSetp, NoPower, NotUsed, LSI	°C	1	nu	nu	nu	nu	noP	
USER INPUT 2	153	NO	W	See User 1	°C	1	nu	nu	nu	nu	nu	

ENGLISH

Parameter Name	Nr.	Team	Read	Range		Res.	Std. Set	Std. Set	Std. Set	Std. Set	Std. Set	User
			Write				CW	DX 1 Co	DX 2 Co	FC Gly	FC Air	Setting
WORKING HOURS												
FAN HOURS	162	NO	W	0 - 32000, actual	Hrs	1	NO	NO	NO	NO	NO	
FAN LIMIT	162	NO	W	No, 0-32000	Hrs	100	32000	32000	32000	32000	32000	
FAN START	162	NO	W	0 - 32000, actual	-	1	0	0	0	0	0	
CO1 HOURS	163	NO	W	0 - 32000, actual	Hrs	1	NO	NO	NO	NO	NO	
CO1 LIMIT	163	NO	W	No, 0-32000	Hrs	100	32000	32000	32000	32000	32000	
CO1 START	163	NO	W	0 - 32000, actual	-	1	0	0	0	0	0	
CO2 HOURS	164	NO	W	0 - 32000, actual	Hrs	1	NO	NO	NO	NO	NO	
CO2 LIMIT	164	NO	W	No, 0-32000	Hrs	100	32000	32000	32000	32000	32000	
CO2 START	164	NO	W	0 - 32000, actual	-	1	0	0	0	0	0	
FC HOURS	165	NO	W	0 - 32000, actual	Hrs	1	NO	NO	NO	NO	NO	
HE1 HOURS	172	NO	W	0 - 32000, actual	Hrs	1	NO	NO	NO	NO	NO	
HE1 START	172	NO	W	0 - 32000, actual	-	1	0	0	0	0	0	
HE2 HOURS	173	NO	W	0 - 32000, actual	Hrs	1	NO	NO	NO	NO	NO	
HE2 START	173	NO	W	0 - 32000, actual	-	1	0	0	0	0	0	
HUM HOURS	174	NO	W	0 - 32000, actual	Hrs	1	NO	NO	NO	NO	NO	
HUM LIMIT	174	NO	W	No, 0-32000	Hrs	100	32000	32000	32000	32000	32000	
HUM START	174	NO	W	0 - 32000, actual	-	1	0	0	0	0	0	
DEH HOURS	175	NO	W	0 - 32000, actual	Hrs	1	NO	NO	NO	NO	NO	
DEH START	175	NO	W	0 - 32000, actual	-	1	0	0	0	0	0	
SLEEP MODE SETTINGS												
INTERVAL1	181	YES	W	Time hh:mm	-	-	0.00	0.00	0.00	0.00	0.00	
INTERVAL1	181	YES	W	Time hh:mm	-	-	0.00	0.00	0.00	0.00	0.00	
INTERVAL2	182	YES	W	Time hh:mm	-	-	0.00	0.00	0.00	0.00	0.00	
INTERVAL2	182	YES	W	Time hh:mm	-	-	0.00	0.00	0.00	0.00	0.00	
DAYS	183	YES	W	MO, TU, WE, TH, FR, SA, SU	-	-	None	None	None	None	None	
MODE	184	YES	W	Sys Off, 2-15	°C	1	Sys Off	Sys Off	Sys Off	Sys Off	Sys Off	
RESET	185	YES	W	No, Yes, Auto	-	-	Auto	Auto	Auto	Auto	Auto	
MANUAL OPERATION												
MANUAL:	191	NO	W	ON, OFF	-	-	-	-	-	-	-	
FAN :	192	NO	W	ON, OFF	-	-	-	-	-	-	-	
COMP.1:	193	NO	W	ON, OFF	-	-	-	-	-	-	-	
COMP.2:	194	NO	W	ON, OFF	-	-	-	-	-	-	-	
HEAT 1:	195	NO	W	ON, OFF	-	-	-	-	-	-	-	
HEAT 2:	196	NO	W	ON, OFF	-	-	-	-	-	-	-	
HUM :	191	NO	W	ON, OFF	-	-	-	-	-	-	-	
DRAIN:	192	NO	W	ON, OFF	-	-	-	-	-	-	-	
DEHUM:	193	NO	W	ON, OFF	-	-	-	-	-	-	-	
AL.REL:	194	NO	W	ON, OFF	-	-	-	-	-	-	-	
3P.ACTUATOR 1 :	201	NO	W	0 - 100	%	1	-	-	-	-	-	
3P.ACTUATOR 2 :	202	NO	W	0 - 100	%	1	-	-	-	-	-	
ANALOGUE OUT 1 :	203	NO	W	0 - 100	%	1	-	-	-	-	-	
ANALOGUE OUT 2 :	204	NO	W	0 - 100	%	1	-	-	-	-	-	
ANALOGUE OUT 3 :	205	NO	W	0 - 100	%	1	-	-	-	-	-	
ANALOGUE OUT 4 :	206	NO	W	0 - 100	%	1	-	-	-	-	-	

ENGLISH

Parameter Name	Nr.	Team	Read	Range		Res.	Std. Set	Std. Set	Std. Set	Std. Set	Std. Set	User
			Write				CW	DX 1 Co	DX 2 Co	FC Gly	FC Air	Setting
CALIBRATION												
HT TEMP	312	NO	W	+/- 9.9	°C	0,1	0.0	0.0	0.0	0.0	0.0	
HT HUMI	313	NO	W	+/- 9.9	%rH	0,1	0.0	0.0	0.0	0.0	0.0	
PTC SU/RE	314	NO	W	+/- 9.9	°C	0,1	0.0	0.0	0.0	0.0	0.0	
PTC AMB	315	NO	W	+/- 9.9	°C	0,1	0.0	0.0	0.0	0.0	0.0	
PTC GL/SU	316	NO	W	+/- 9.9	°C	0,1	0.0	0.0	0.0	0.0	0.0	
HIROS. 1L	322	NO	W	+/- 9.9	°C	0,1	0.0	0.0	0.0	0.0	0.0	
HIROS. 1R	323	NO	W	+/- 9.9	°C	0,1	0.0	0.0	0.0	0.0	0.0	
HIROS. 2L	324	NO	W	+/- 9.9	°C	0,1	0.0	0.0	0.0	0.0	0.0	
HIROS. 2R	325	NO	W	+/- 9.9	°C	0,1	0.0	0.0	0.0	0.0	0.0	
EEAPT.	332	NO	W	+/- 9.9	°C	0,1	0.0	0.0	0.0	0.0	0.0	
EEAPH.	333	NO	W	+/- 9.9	%rH	0,1	0.0	0.0	0.0	0.0	0.0	
UNIT CONFIGURATION												
UNIT TYPE: COMPRESSORS	251	NO	W	0, 1, 2	-	-	-	-	-	-	-	
UNIT TYPE: FC	252	NO	W	NONE, AIR, GLYC	-	-	-	-	-	-	-	
STD. SETTINGS	253	NO	W	Yes, No	-	-	-	-	-	-	-	
TEMP.PROP/INT	254	YES	W	1.0 – 30.0	K	3.0	Auto	Auto	Auto	Auto	Auto	
TEMP.PROP/INT	254	YES	W	No, 5-15	Min	NO	Auto	Auto	Auto	Auto	Auto	
HUM PROP/INT	255	YES	W	2 – 60	%rH	1	Auto	Auto	Auto	Auto	Auto	
HUM PROP/INT	255	YES	W	No, 5-15	Min	NO	Auto	Auto	Auto	Auto	Auto	
AUTOSET ENABLE	256	YES	W	Yes, No	-	-	YES	YES	YES	YES	YES	
HEATING STEPS	261	NO	W	0, 1, 2, 3, HtA, LtA, CHF, FCF, Lqt	-	-	-	-	-	-	-	
HEATING DEADBAND	262	YES	W	0.0 – 30.0	K	0.1	0	0	0	0	0	
BP.ACT. RUNTIME	263	NO	W	50 – 400	Sec	1	170	170	170	170	90	
BP.ACT. MIN.OPEN	264	NO	W	0 – 50	%	1	0	0	0	0	0	
COMPRESSOR DELAY	265	30	W	0-120	Sec	1	0	0	0	0	0	
HUMIDIFIER ENABLE	271	NO	W	Yes, No	-	-	-	-	-	-	-	
MODEL / SUP VOLT	272	NO	W	21L, 53L/H, 93L/H, d3H, HT2/5/9, EXT	-	-	-	-	-	-	-	
MODEL / SUP VOLT	272	NO		230, 400, 460, 575	V	-	-	-	-	-	-	
STEAM RATE	273	NO	W	No, 30-100	%	10	-	-	-	-	-	
CONTROL	274	NO	W	ON/OFF, PROP	-	-	-	-	-	-	-	
AMPS NOMACT	275	NO	R	0 – 40.00	A	0.01	-	-	-	-	-	
DEADBAND	276	YES	W	0 – 50.0	%	0.1	0	0	0	0	0	
DEHUM.ENABLE	281	NO	W	YES; STOP FC, NO	-	-	-	-	-	-	-	
EL.REHEAT ENABLE	282	NO	W	Yes, No	-	-	NO	NO	NO	NO	NO	
DEHUM HYSTERESIS	283	YES	W	25 – 50	%	1	50	50	50	50	50	
DEADBAND	284	YES	W	0 – 50	%	1	0	0	0	0	0	
DEHUM.RELAY AS	285	NO	W	DEHUM, NO POWER, WARNING	-	-	DEH	DEH	DEH	DEH	WA	
LWD / LWD INPUT	286	NO	W	NO, WARNING, ALARM	-	-	-	-	-	-	-	
LWD / LWD INPUT	286	NO	R	0 – 2.50	V	0.01	-	-	-	-	-	
DT ROOM-OUTDOOR	291	YES	W	NO, CON, EFC, 3-25K	K	1	NO	NO	NO	10	10	
DT ROOM-GLYCOL	291	5	W	NO, CON, 2-25K	K	1	NO	NO	NO	6	NO	
STOP FC AT SET.+	292	YES	W	NO, , 1-25K	K	1	NO	NO	NO	3	3	

ENGLISH

Parameter Name	Nr.	Team	Read	Range		Res.	Std. Set	Std. Set	Std. Set	Std. Set	Std. Set	User
			Write				CW	DX 1 Co	DX 2 Co	FC Gly	FC Air	Setting
ANALOG OUTPUT 1	293	NO	W	COOLING, HEATING, ALARMB., SUPERS., COOLING2, COOLING1, HUMID., FANSPEED, RET.TEMP, SUP.TEMP, HT HUMI., HEATERB., RADCOOL., SUP.CONT, HEAT 33%, 3P.ACT.1, 3P.ACT.2, METRIC	-	-	COOLIN G	COOLIN G	COOLIN G	COOLIN G	COOLIN G	
ANALOG OUTPUT 2	294	NO	W	See Analog 1	-	-	HEATIN	HEATIN	HEATIN	HEATIN	HEATIN	
ANALOG OUTPUT 3	295	NO	W	See Analog 1	-	-	COOLIN	COOLIN	COOLIN	COOLIN	COOLIN	
ANALOG OUTPUT 4	296	NO	W	See Analog 1	-	-	HEATIN	HEATIN	HEATIN	HEATIN	HEATIN	
LOW AIRFLOW AT	301	NO	W	0 – 100, Swi	%	1	40	40	40	40	40	
AUTOSET AIRFLOW	302	NO	W	No, Yes	-	-	-	-	-	-	-	
AIRFLOW VALUE	303	NO	R	0-100	%	1	-	-	-	-	-	
FAN FAILURE	304	NO	W	WARNING, ALARM	-	-	Alarm	Alarm	Alarm	Alarm	Alarm	
LOW.PRES.AL.DELAY	305	NO	W	0–5	Min	1	3	3	3	3	3	
COMP.TH.ENABLE	306	NO	W	Yes, No	-	-	-	-	-	-	-	
GENERAL MAINTENANCE SET. 1/7												
MAINT. FREQUENCY	-	YES	W	No, 1 – 4	M	1	-	-	-	-	-	
MAX. BONUS	-	YES	W	0 – 12	M	1	-	-	-	-	-	
MAX. PENALTY	-	YES	W	0 – 12	M	1	-	-	-	-	-	
LAST MAINTENANCE	-	YES	W	mm:yy	-	-	-	-	-	-	-	
BY: / RESET	-	NO	W	Editable text / Yes - No	-	-	-	-	-	-	-	
CALC.NEXT MAINTENANCE	-	-	R	mm:yy	-	-	-	-	-	-	-	
FAN SETTINGS/DIAGNOST. 2/7												
NUMBER OF STARTS	-	NO	R	0 - 32000	-	-	-	-	-	-	-	
WORKING HOURS	-	NO	R	0 - 32000	-	-	-	-	-	-	-	
AV. WORKING TIME	-	NO	R	0 - 32000	-	-	-	-	-	-	-	
STARTS/DAY OPT/WOR	-	YES	W	No, 1 – 240	-	-	1	1	1	1	1	
STARTS/DAY OPT/WOR	-	YES	W	No, 1 – 240	-	-	24	24	24	24	24	
NUMBER OF ALARMS	-	NO	R	0 - 32000	-	-	-	-	-	-	-	
ACTUAL BONUS	-	NO	R	-24	-	-	-	-	-	-	-	
COMP.1 SETTINGS/DIAGNOST.3/7												
NUMBER OF STARTS	-	NO	R	0 - 32000	-	-	-	-	-	-	-	
WORKING HOURS	-	NO	R	0 - 32000	-	-	-	-	-	-	-	
AV. WORKING TIME	-	NO	R	0 - 32000	-	-	-	-	-	-	-	
STARTS/DAY OPT/WOR	-	YES	W	No, 1 – 240	-	-	12	12	12	12	12	
STARTS/DAY OPT/WOR	-	YES	W	No, 1 – 240	-	-	240	240	240	240	240	
NO.OF HP/LP/TH	-	NO	R	0 - 32000	-	-	-	-	-	-	-	
ACTUAL BONUS	-	NO	R	-24	-	-	-	-	-	-	-	

ENGLISH

Parameter Name	Nr.	Team	Read	Range	Res.	Std. Set	Std. Set	Std. Set	Std. Set	Std. Set	User
			Write			CW	DX 1 Co	DX 2 Co	FC Gly	FC Air	Setting
COMP.2 SETTINGS/DIAGNOST.4/7											
NUMBER OF STARTS	-	NO	R	0 - 32000	-	-	-	-	-	-	
WORKING HOURS	-	NO	R	0 - 32000	-	-	-	-	-	-	
AV. WORKING TIME	-	NO	R	0 - 32000	-	-	-	-	-	-	
STARTS/DAY OPT/WOR	-	YES	W	No, 1 – 240	-	-	12	12	12	12	
STARTS/DAY OPT/WOR	-	YES	W	No, 1 – 240	-	-	240	240	240	240	
NO.OF HP/LP/TH	-	NO	R	0 - 32000	-	-	-	-	-	-	
ACTUAL BONUS	-	NO	R	-24	-	-	-	-	-	-	
HEAT.1 SETTINGS/DIAGNOST.5/7											
NUMBER OF STARTS	-	NO	R	0 - 32000	-	-	-	-	-	-	
WORKING HOURS	-	NO	R	0 - 32000	-	-	-	-	-	-	
AV. WORKING TIME	-	NO	R	0 - 32000	-	-	-	-	-	-	
STARTS/DAY OPT/WOR	-	YES	W	No, 1 – 240	-	-	24	24	24	24	
STARTS/DAY OPT/WOR	-	YES	W	No, 1 – 240	-	-	240	240	240	240	
NUMBER OF ALARMS	-	NO	R	0 - 32000	-	-	-	-	-	-	
ACTUAL BONUS	-	NO	R	-24	-	-	-	-	-	-	
HEAT.2 SETTINGS/DIAGNOST.6/7											
NUMBER OF STARTS	-	NO	R	0 - 32000	-	-	-	-	-	-	
WORKING HOURS	-	NO	R	0 - 32000	-	-	-	-	-	-	
AV. WORKING TIME	-	NO	R	0 - 32000	-	-	-	-	-	-	
STARTS/DAY OPT/WOR	-	YES	W	No, 1 – 240	-	-	24	24	24	24	
STARTS/DAY OPT/WOR	-	YES	W	No, 1 – 240	-	-	240	240	240	240	
NUMBER OF ALARMS	-	NO	R	0 - 32000	-	-	-	-	-	-	
ACTUAL BONUS	-	NO	R	-24	-	-	-	-	-	-	
HUM. SETTINGS/DIAGNOST. 7/7											
NUMBER OF STARTS	-	NO	R	0 - 32000	-	-	-	-	-	-	
WORKING HOURS	-	NO	R	0 - 32000	-	-	-	-	-	-	
AV. WORKING TIME	-	NO	R	0 - 32000	-	-	-	-	-	-	
STARTS/DAY OPT/WOR	-	YES	W	No, 1 – 240	-	-	24	24	24	24	
STARTS/DAY OPT/WOR	-	YES	W	No, 1 – 240	-	-	240	240	240	240	
NUMBER OF ALARMS	-	NO	R	0 - 32000	-	-	-	-	-	-	
ACTUAL BONUS	-	NO	R	-24	-	-	-	-	-	-	
C1 REFRIGERANT DIAGN.											
COND. TEMP.	472	NO	R	-25, 99 C / 0-40.0 bar	-	-	-	-	-	-	-
EVAP. TEMP.	473	NO	R	-25, 99 C / 0-40.0 bar	-	-	-	-	-	-	-
DISCH. TEMP.	474	NO	R	-25, 99 C / 0-40.0 bar	-	-	-	-	-	-	-
SUCT. TEMP.	475	NO	R	-25, 99 C / 0-40.0 bar	-	-	-	-	-	-	-
LIQU. TEMP.	476	NO	R	-25, 99 C / 0-40.0 bar	-	-	-	-	-	-	-
SUPERH. / SUBC.	477	NO	R	-25, 99 C / 0-40.0 bar	-	-	-	-	-	-	-
C2 REFRIGERANT DIAGN.											
COND. TEMP.	482	NO	R	-25, 99 C / 0-40.0 bar	-	-	-	-	-	-	-
EVAP. TEMP.	483	NO	R	-25, 99 C / 0-40.0 bar	-	-	-	-	-	-	-
DISCH. TEMP.	484	NO	R	-25, 99 C / 0-40.0 bar	-	-	-	-	-	-	-
SUCT. TEMP.	485	NO	R	-25, 99 C / 0-40.0 bar	-	-	-	-	-	-	-
LIQU. TEMP.	486	NO	R	-25, 99 C / 0-40.0 bar	-	-	-	-	-	-	-
SUPERH. / SUBC.	487	NO	R	-25, 99 C / 0-40.0 bar	-	-	-	-	-	-	-
REFRIGERANT C1 / 2 SETUP											
REFRIGERANT	491	NO	W	R22 - R407	-	-	R407	R407	R407	R407	R407
HP1	492	NO	W	-10 -- 50.0 bar	-	-	-	-	-	-	-
LP1	493	NO	W	-10 -- 50.0 bar	-	-	-	-	-	-	-
HP2	495	NO	W	-10 -- 50.0 bar	-	-	-	-	-	-	-
LP2	496	NO	W	-10 -- 50.0 bar	-	-	-	-	-	-	-

ENGLISH

Parameter Name	Nr.	Team	Read	Range	Res.	Std. Set	Std. Set	Std. Set	Std. Set	Std. Set	User
			Write			CW	DX 1 Co	DX 2 Co	FC Gly	FC Air	Setting
LOGGING SETUP											
LOGGING TIME	502	NO	R		-	-	-	-	-	-	
LOG. INTERVAL	503	NO	W	1, -- 765 sec	-	-	-	-	-	-	
LOGGING ACTIVE	504	NO	W	YES - NO	-	-	-	-	-	-	
COND. / EVAP.PR.	505	NO	W	YES - NO	-	-	-	-	-	-	
DISCH. / CUCT. T.	506	NO	W	YES - NO	-	-	-	-	-	-	
LIQUID TEMP.	507	NO	W	YES - NO	-	-	-	-	-	-	
CRITICAL OPERATING AT											
HP HIGHER	513	NO	W	10.0 - 40.0 / 0.0 - 20.0	-	-	-	-	-	-	
LP LOWER	514	NO	W	0.0 - 20.0 / 0.0 - 20.0	-	-	-	-	-	-	
OUTD. HIGHER	515	NO	W	10.0 - 40.0 / 0.0 - 20.0	-	-	-	-	-	-	
DISCH. HIGHER	516	NO	W	10.0 - 40.0 / 0.0 - 20.0	-	-	-	-	-	-	
ROOM HIGHER	517	NO	W	10.0 - 40.0 / 0.0 - 20.0	-	-	-	-	-	-	
SENSOR OFFSET CAL.											
C1 DISCH. TEMP	522	NO	W	+/- 9.9	-	-	-	-	-	-	
C1 SUCT. TEMP	523	NO	W	+/- 9.9	-	-	-	-	-	-	
C1 LIQU. TEMP	524	NO	W	+/- 9.9	-	-	-	-	-	-	
C2 DISCH. TEMP	525	NO	W	+/- 9.9	-	-	-	-	-	-	
C2 SUCT. TEMP	526	NO	W	+/- 9.9	-	-	-	-	-	-	
C2 LIQU. TEMP	527	NO	W	+/- 9.9	-	-	-	-	-	-	
FC+DX BOARD 3 SETUP											
UNIT TYPE	531	NO	W	FC+ DX , FC or DX	-	-	-	-	-	-	
LP1	532	NO	W	-10 -- 50.0 bar	-	-	-	-	-	-	
LP2	533	NO	W	-10 -- 50.0 bar	-	-	-	-	-	-	
LP STOP FC AT / HYST.	535	NO	W	0.0 - 20.0 / 0.0 - 20 bar	-	-	-	-	-	-	
LP ALARM AT / HYST.	536	NO	W	0.0 - 20.0 / 0.0 - 20 bar	-	-	-	-	-	-	
STOP COMP. HYST.	537	NO	W	10.0 -- 80.0 %	-	-	-	-	-	-	

3.5 Hiromatic Messages / Warnings / Alarms

0	GENERAL ALARM	RESET, ACKNOWLEDGE
1	COMP. 1 HIGH PRESSURE	ALARM
2	COMPRESSOR 1 LOW PRESSURE	ALARM
3	HIGH CHILLED WATER	WARNING
4	LOW CHILLED WATER FLOW	WARNING
5	ELECTRICAL HEATERS OVERHEATED	WARNING
6	FAN FAILURE	WARNING
7	FAN FAILURE	ALARM
8	CLOGGED FILTERS	WARNING
9	WATER LEAKAGE	WARNING
10	WATER LEAKAGE	ALARM
11	USER INPUT 1 TRIGGERED	WARNING
12	USER INPUT 1 TRIGGERED	ALARM
13	HUMIDIFIER FAILURE	WARNING
14	HUMIDIFIER HIGH CURRENT	WARNING
15	HUMIDIFIER FAILURE	WARNING
16	HUMIDIFIER FAILURE	WARNING
17	HUMIDIFIER CYLINDER WORN	WARNING
18	HIGH ROOM TEMPERATURE	WARNING
19	LOW ROOM TEMPERATURE	WARNING
20	HIGH ROOM HUMIDITY	WARNING
21	LOW ROOM HUMIDITY	WARNING
22	HIGH ROOM TEMPERATURE	WARNING
23	LOW ROOM TEMPERATURE	WARNING
24	HIGH ROOM HUMIDITY	WARNING
25	LOW ROOM HUMIDITY	WARNING
26	CONDITIONER WORKING HOURS EXCEEDED	WARNING
27	COMPRESSOR 1 WORKING HOURS EXCEEDED	WARNING
28	HUMIDIFIER WORKING HOURS EXCEEDED	WARNING
29	PTC SENSOR FAILURE	WARNING
30	ROOM SENSOR FAILURE	WARNING
31	ROOM SENSOR FAILURE	ALARM
32	EEAP SENSOR FAILURE	WARNING
33	WATER PRESENCE SENSOR FAILURE	WARNING
34	NETWORK FAILURE	WARNING
35	OUT OF MEMORY	WARNING
36	UNIT ON	MESSAGE
37	UNIT OFF	MESSAGE
38	SLEEP MODE	MESSAGE
39	STANDBY MODE	MESSAGE
40	POWER ON UNIT LOGIN	MESSAGE
41	POWER OFF	MESSAGE
42	Unit 1 disconnected	WARNING
43	Unit 2 disconnected	WARNING
44	Unit 3 disconnected	WARNING
45	Unit 4 disconnected	WARNING

ENGLISH

46	Unit 5 disconnected	WARNING
47	Unit 6 disconnected	WARNING
48	Unit 7 disconnected	WARNING
49	Unit 8 disconnected	WARNING
50	Unit 9 disconnected	WARNING
51	Unit 10 disconnected	WARNING
52	Unit 11 disconnected	WARNING
53	Unit 12 disconnected	WARNING
54	Unit 13 disconnected	WARNING
55	Unit 14 disconnected	WARNING
56	Unit 15 disconnected	WARNING
57	Unit 16 disconnected	WARNING
58	COMP. 2 HIGH PRESSURE	ALARM
59	COMPRESSOR 2 LOW PRESSURE	ALARM
60	COMPRESSOR 2 WORKING HOURS EXCEEDED	WARNING
61	OUTDOOR TEMP. SENSOR	WARNING
62	GLYCOL TEMP. SENSOR	WARNING
63	FREECOOLING STOPPED FOR 1 HOUR	MESSAGE
64	ON-OFF BY HIOMATIC NOT ENABLED	MESSAGE
65	SMOKE ALARM	ALARM
66	NO POWER (USER INPUT)	MESSAGE
67	POWER ON (USER INPUT)	MESSAGE
68	USER INPUT 2 TRIGGERED	WARNING
69	USER INPUT 2 TRIGGERED	ALARM
70	NO CONNECTION TO UNIT 1	WARNING
71	COMPRESSOR 1 MOTOR PROTECTION	ALARM
72	COMPRESSOR 2 MOTOR PROTECTION	ALARM
73	FIRE ALARM	ALARM
74	OUT OF MEMORY	WARNING
75	CONDENSER 1 FAN FAILURE	WARNING
76	CONDENSER 2 FAN FAILURE	WARNING
77	NETWORK PING	WARNING
78	SUBGROUP-ID NOT UNIQUE	WARNING
79	SUBGROUP-UNIT 1 NOT CONNECTED	WARNING
80	SUBGROUP-UNIT 2 NOT CONNECTED	WARNING
81	SHARE ROOM SENSOR FAILURE	WARNING
82	SHARE ROOM SENSOR FAILURE	ALARM
83	SHARE OUTDOOR TEMP. SENSOR	WARNING
84	SHARE GLYCOL TEMP. SENSOR	WARNING
85	UNIT SYNCHRONISATION	MESSAGE
86	MAINTENANCE SHOULD BE DONE	MESSAGE
87	MAINTENANCE DONE	MESSAGE
88	HEATER 1/2 WORKING HOURS EXCEEDED	WARNING
89	FREECOOLING WORKING HOURS EXCEEDED	WARNING
90	AIRFLOW DEVICE NOT READY, PLS. CHECK	WARNING

4 Connection Guide

The following gives Information about the Inputs and Outputs of the Microface. It is not an electrical drawing, but general information about how the Inputs and Outputs have to be used. For detailed information please refer to the electric diagram of the unit.

4.1 Inputs / Outputs for Chilled Water or Single Compressor Units

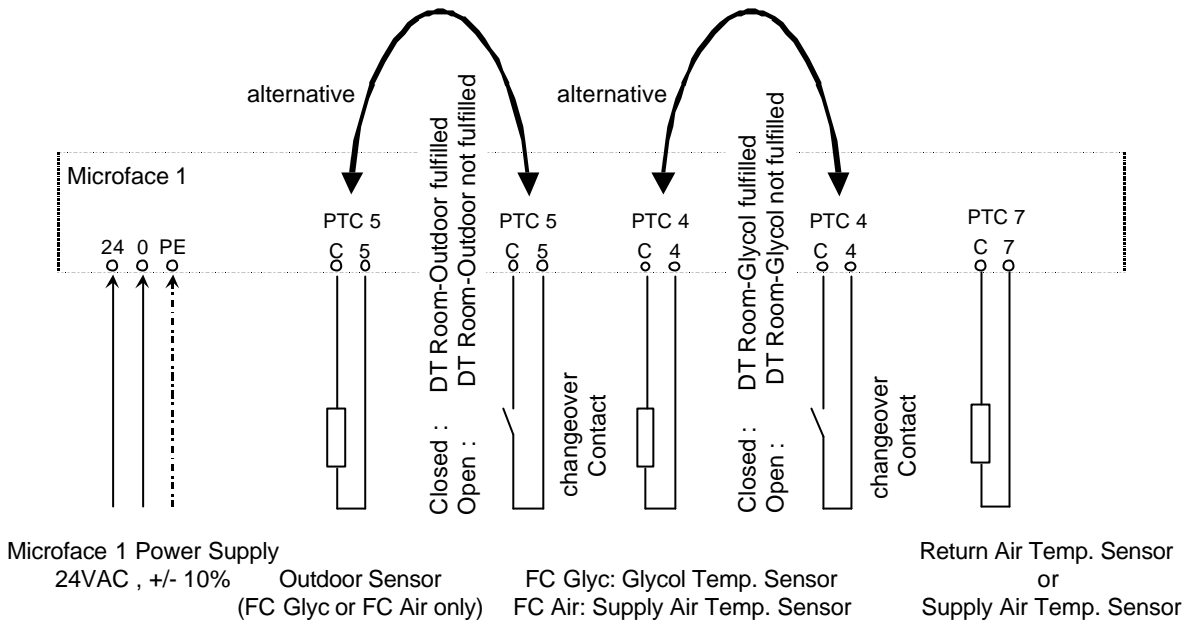
	Microface 1		Microface 2
Input	Co = 2; FC = 0	Co = 2; FC = Glyc	Co = 2; FC = Glyc
P0	Remote On/Off and Fire Alarm	Remote On/Off and Fire Alarm	Not used
P1	User Input 1 and (Cond.1 Fan Failure or Smoke Warning)	User Input 1 and (Cond.1 Fan Failure or Smoke Warning)	Not used
P2	Clogged Filter	Clogged Filter	Not used
P3	HP1 and LP1 and TH1	HP1 and LP1 and TH1	Not used
P4	HP2 and LP2 and TH2	HP2 and LP2 and TH2	Glycol Temp.
P5	Heaters Safety	Heaters Safety	Outdoor 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
Input	Co = 2; FC = 0	Co = 2; FC = Glyc	Co = 2; FC = Glyc
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
Output	Co = 2; FC = 0	Co = 2; FC = Glyc	Co = 2; FC = Glyc
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 On
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	Solenoid Water Valve Comp. 1
OUT6	Humidifier Drain	Humidifier Drain	Solenoid Water Valve Comp. 2
OUT7	Alarm	Alarm	Not used
OUT8	Fan	Fan	Not used
OUT9	Humidifier (internal or external)	Humidifier (internal or external)	Not used
Output	Co = 2; FC = 0	Co = 2; FC = Glyc	Co = 2; FC = Glyc
PWM 0	selectable	selectable	selectable
PWM 1	selectable	selectable	selectable

4.2 Inputs / Outputs for Twin Compressor Units

	Microface 1		Microface 2
Input	Co = 2; FC = 0	Co = 2; FC = Glyc	Co = 2; FC = Glyc
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	HP1 and LP1 and TH1	HP1 and LP1 and TH1	Not used
P4	HP2 and LP2 and TH2	HP2 and LP2 and TH2	Glycol Temp.
P5	Heaters Safety	Heaters Safety	Outdoor 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
Input	Co = 2; FC = 0	Co = 2; FC = Glyc	Co = 2; FC = Glyc
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
Output	Co = 2; FC = 0	Co = 2; FC = Glyc	Co = 2; FC = Glyc
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 On
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	Solenoid Water Valve Comp. 1
OUT6	Humidifier Drain	Humidifier Drain	Solenoid Water Valve Comp. 2
OUT7	Alarm	Alarm	Not used
OUT8	Fan	Fan	Not used
OUT9	Humidifier (internal or external)	Humidifier (internal or external)	Not used
Output	Co = 2; FC = 0	Co = 2; FC = Glyc	Co = 2; FC = Glyc
PWM 0	selectable	selectable	selectable
PWM 1	selectable	selectable	selectable

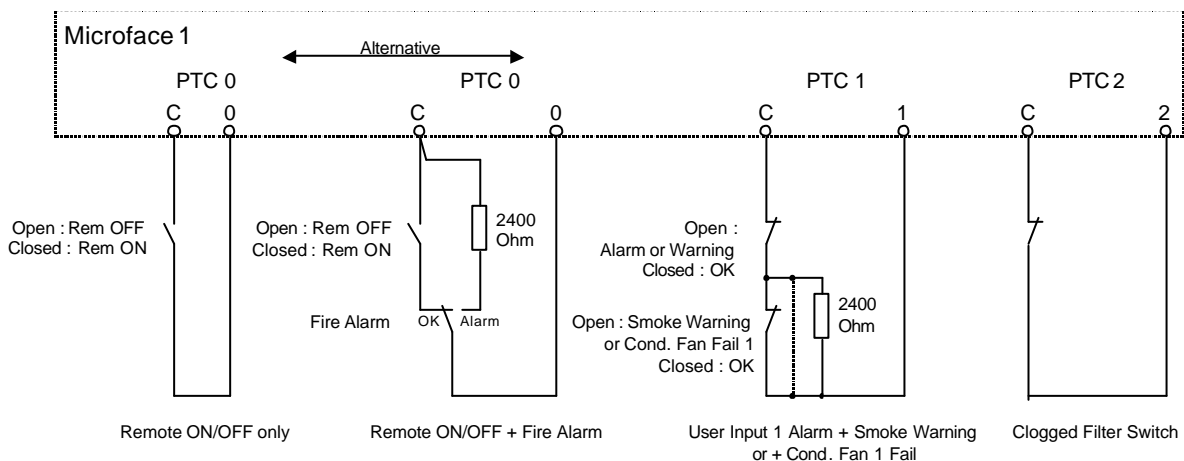
4.3 Electrical Connections

Power Supply, PTC Temperature Sensors



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.
 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.

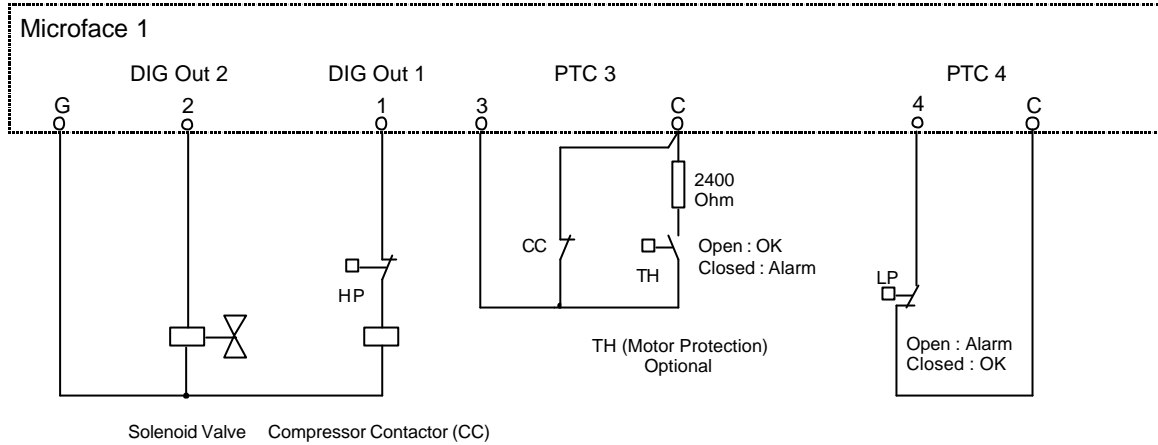
Remote On/Off, Fire Alarm, User Input 1, Clogged Filter



NOTES : **ALWAYS USE RELAYS TO CONNECT EXTERNAL CONTACTS TO THE Microface!**
NEVER CONNECT EXTERNAL COMMANDS DIRECTLY TO THE Microface!

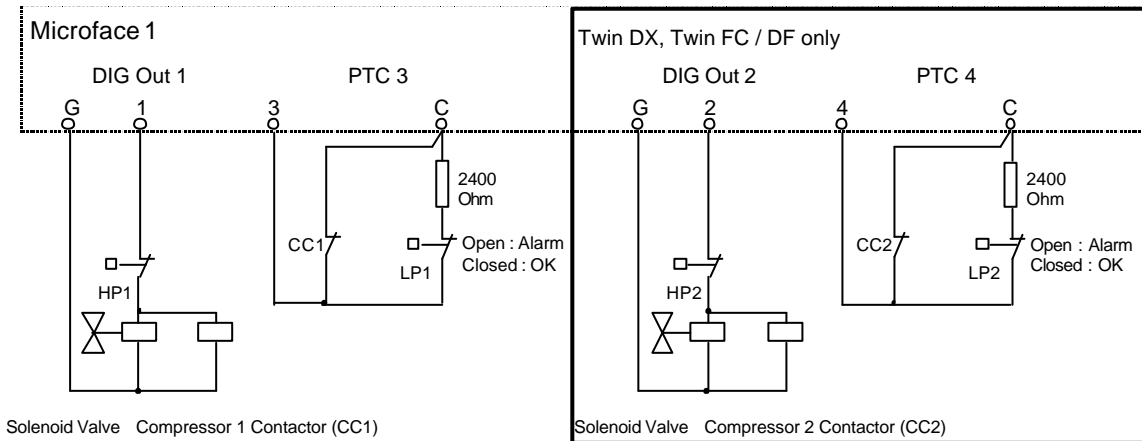
The Smoke Warning is available ONLY if the UI is set to Alarm.
 The Smoke Warning DOESNOT STOP THE FAN. It only disables the Freecooling and closes the Freecooling actuator to 0.
 If the UI is set to Warning, the second possibility. is to get a Condenser Fan 1 Fail Warning.

Compressor Control Compressor = 1, Freecooling = None



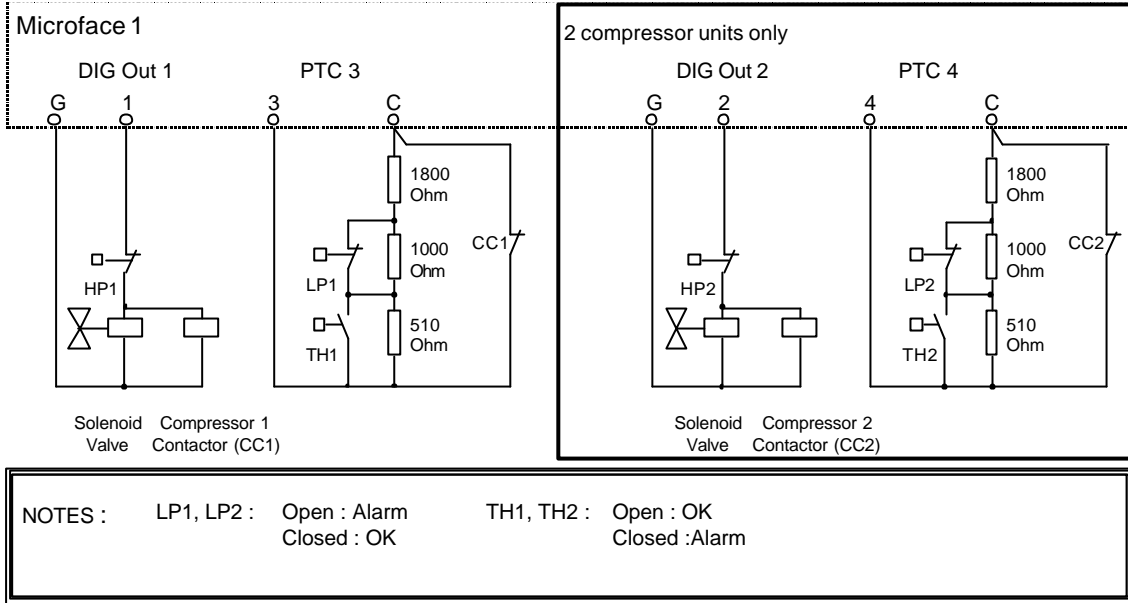
NOTES : with the 160032 Eprom version the output 2 is used for the solenoid interceptor water valve
In place of the solenoid interceptor refrigerant valve

Compressor Control: 1 or 2 Compressors + Freecooling Glyc or Air w/o Thermal Protection

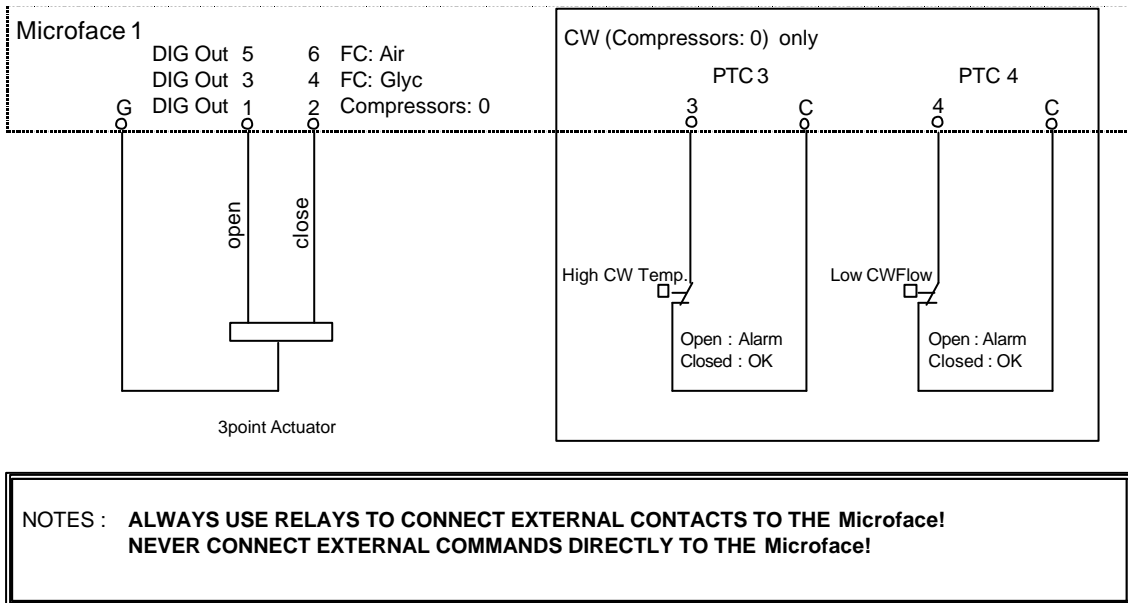


NOTES :

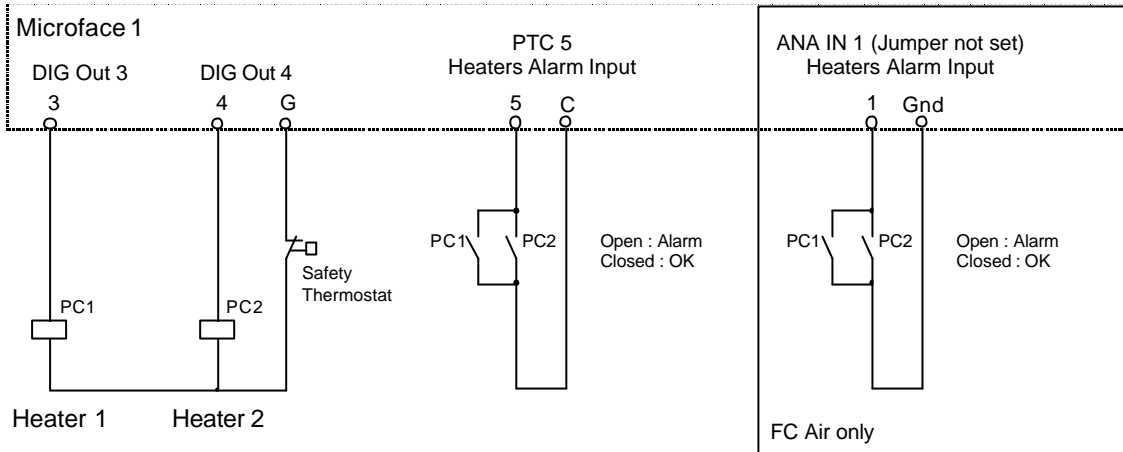
Compressor Control: 1 or 2 Compressors + Freecooling Glyc or Air with Thermal Protection



3 Point Actuator Control

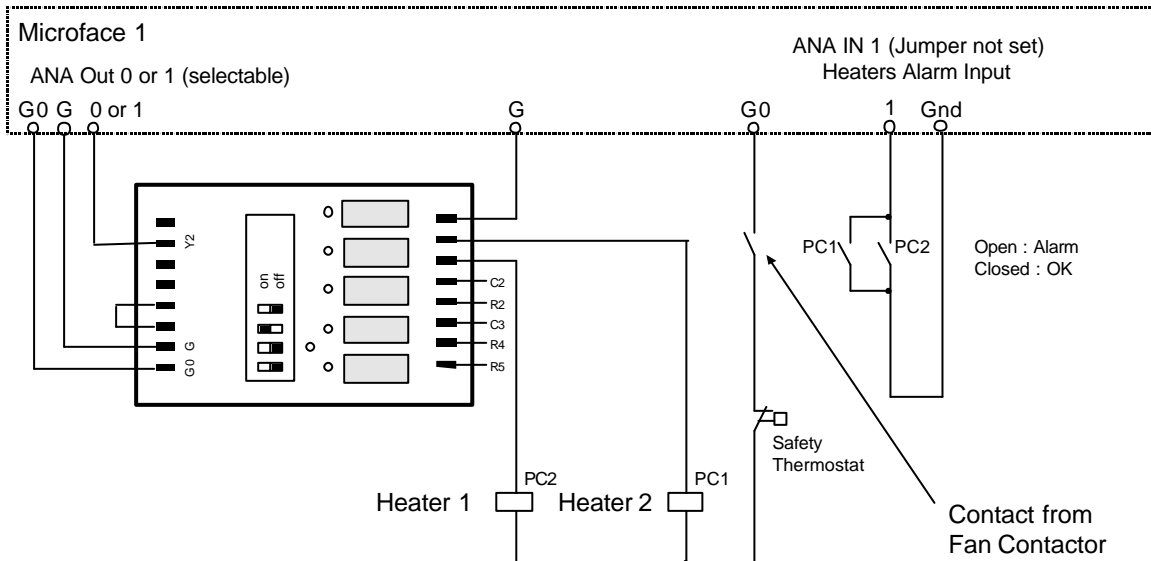


Electrical Heaters Control: all units except 1 Compressor + FC Glyc



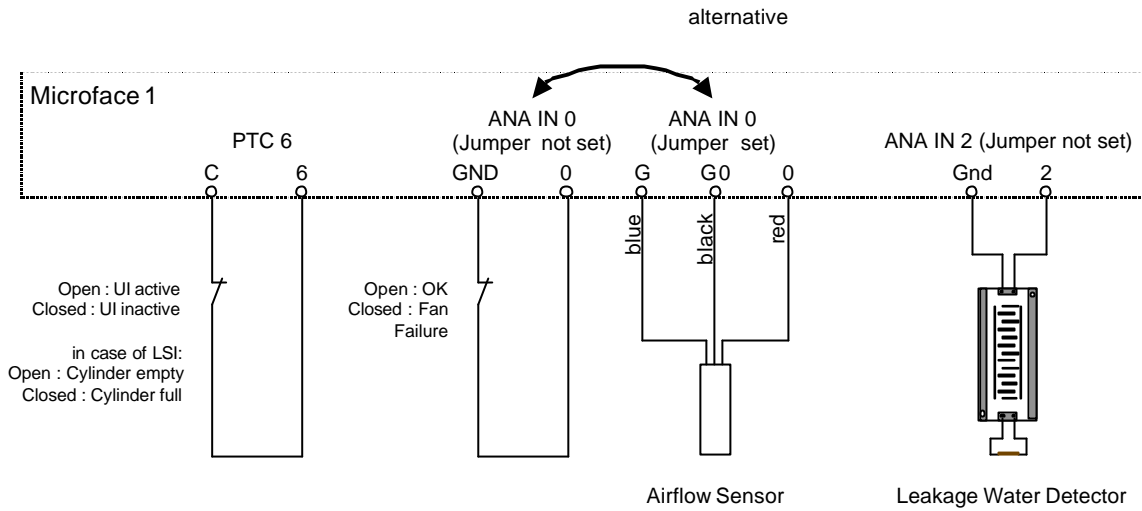
NOTE :

Electrical Heaters Control: Units with 1 Compressor + FC Glyc



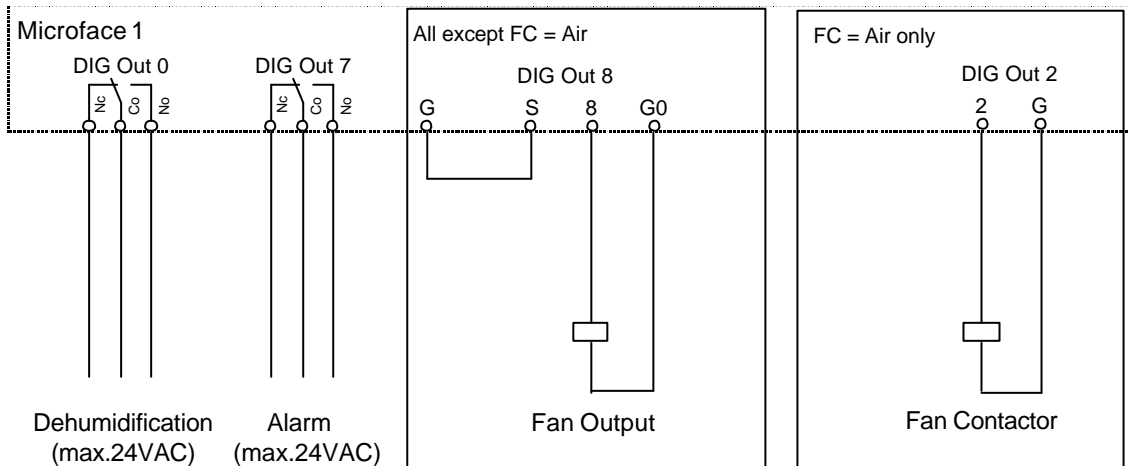
NOTE : on C2-R3 there is Solenoid Interceptor Water valve compressor 1
 on C3-R4 there is Solenoid Interceptor Water valve compressor 2
 C3-R5 is not used

User Input 2, Airflow Device, LWD



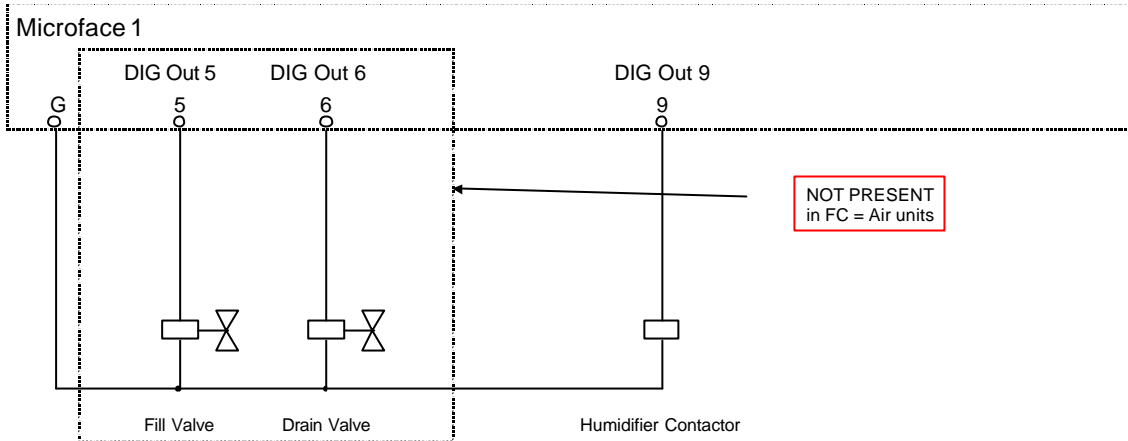
NOTES : ALWAYS USE RELAYS TO CONNECT EXTERNAL CONTACTS TO THE Microface!
NEVER CONNECT EXTERNAL COMMANDS DIRECTLY TO THE Microface!
Airflow Sensor or Differential Pressostat (Contact) for Fans supervision are alternative.

Warning, Alarm and Fan Output



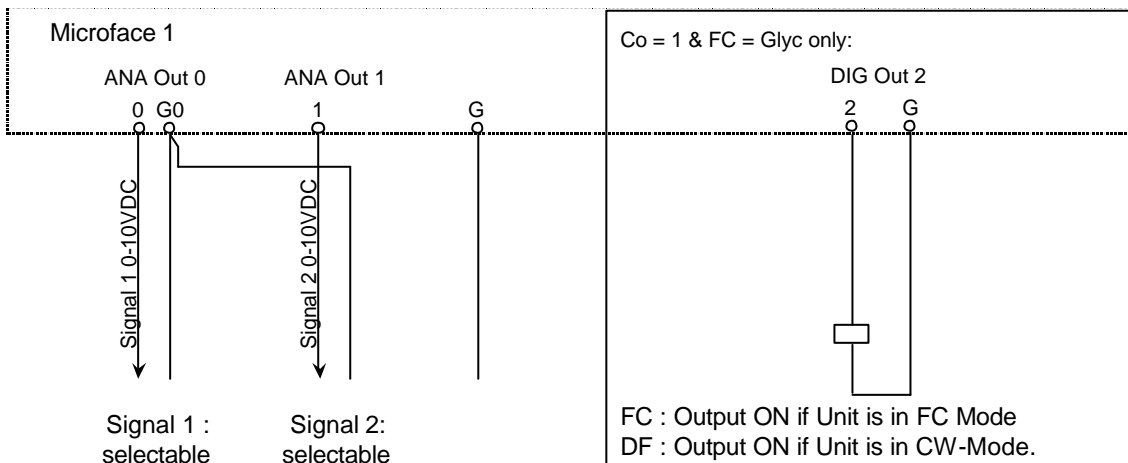
NOTE 1 : Dehum. Output can be programmed as :Dehumidification, Warning, No Power message or not used. (all Functions are alternative)

Humidifier Control



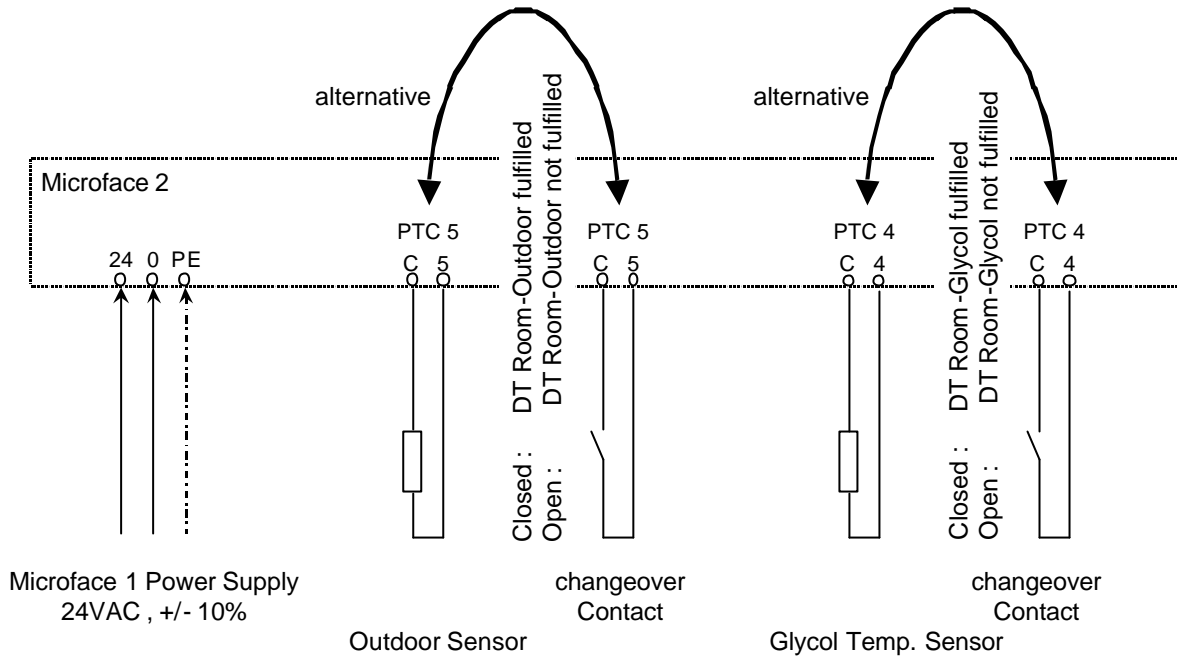
NOTES : Fill and Drain Valve are not present in Units with FC = Air.
 In these Units only remote Humidifiers can be controlled (or internal Humidifier with additional Electronic Card).

Analogue Outputs and Status Messages



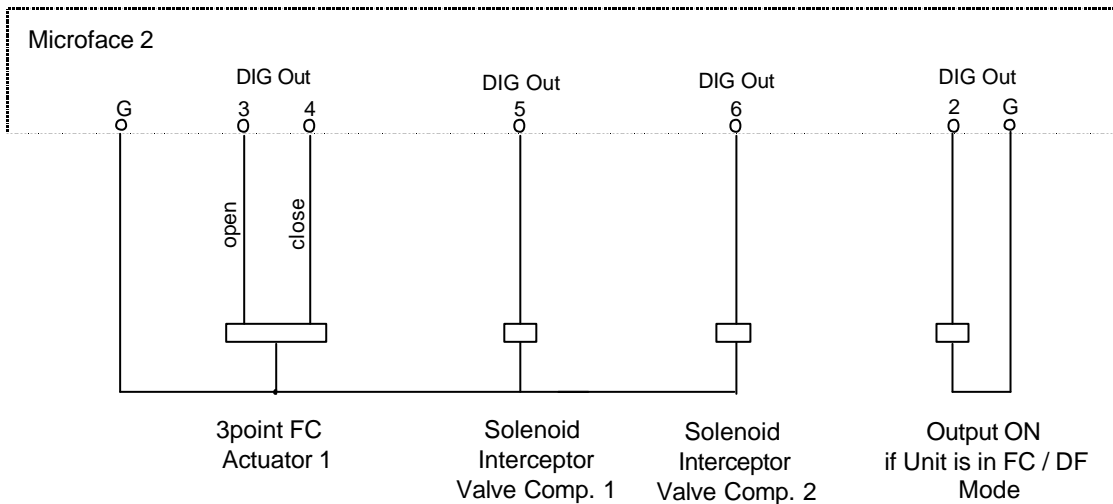
NOTES : Compressor = 1 & FC = Glyc: 1 Analogue Output is necessary to drive the Heater Board, if Heaters are present.

Power Supply, PTC Sensors for units with 2 Compressors & FC = Glyc

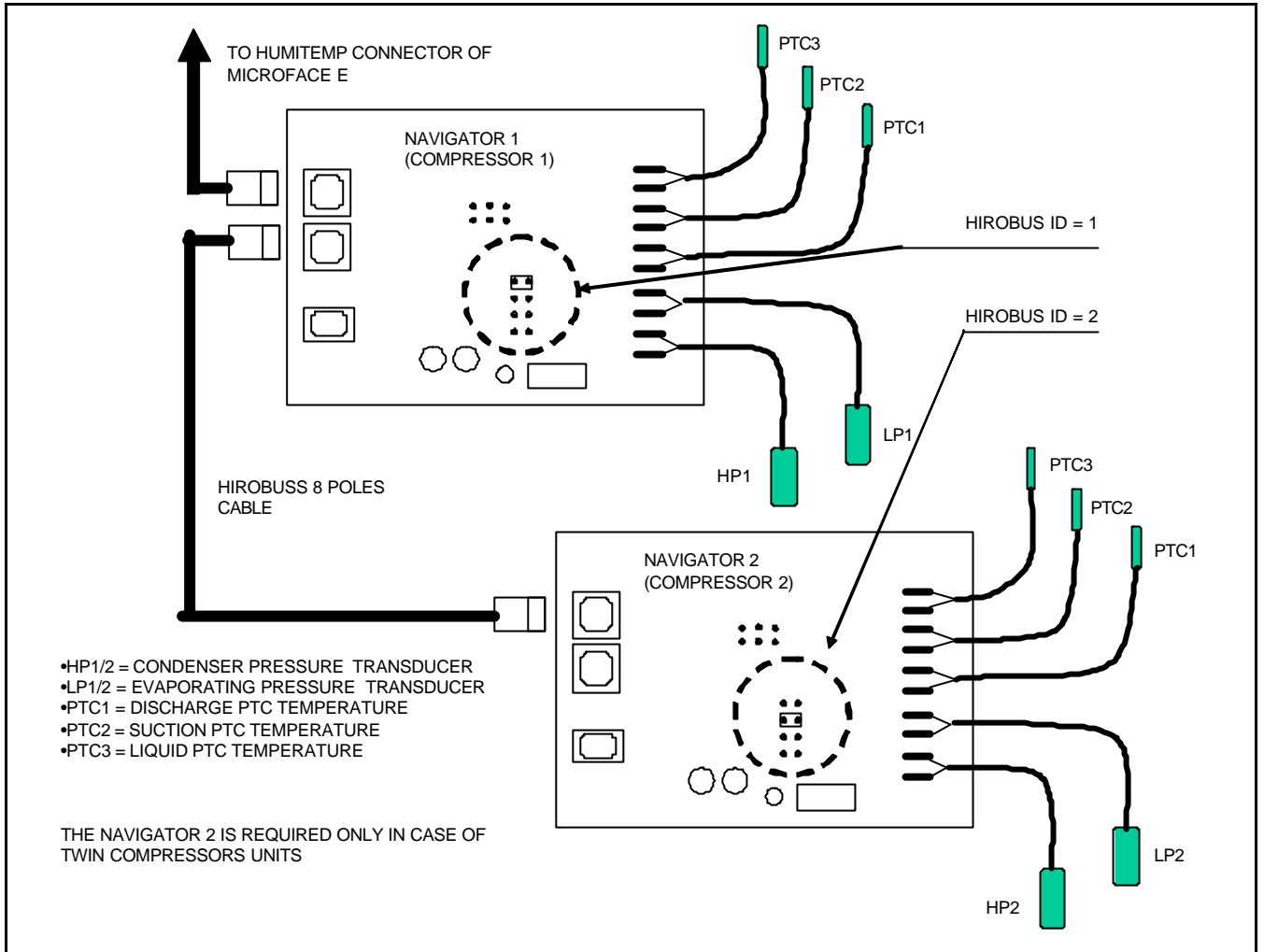


NOTES : The Glycol sensor is Standard in FC units only, but can also be connected to DF Units. Instead of the Sensors for Outdoor and Glycol also switching contacts may be used. The relevant Delta-T Parameter must be set to "CON" in that case.

Digital Outputs for units with 2 Compressors & FC = Glyc



NOTES :



Navigator card for FC + DX cooling configuration

