XH240K

TEMPERATURE AND HUMIDITY CONTROLLER

1. GENERAL WARNING

1.1 ⚠ PLEASE READ BEFORE USING THIS MANUAL

- This manual is part of the product and should be kept near the instrument for easy and quick reference.
- The instrument shall not be used for purposes different from those described hereunder. It cannot be used as a safety device.
- Check the application limits before proceeding.

1.2 ⚠ SAFETY PRECAUTIONS

- Check the supply voltage is correct before connecting the instrument.
- Do not expose to water or moisture: use the controller only within the operating limits avoiding sudden temperature changes with high atmospheric humidity to prevent formation of condensation
- Warning: disconnect all electrical connections before any kind of maintenance.
- Fit the probe where it is not accessible by the End User. The instrument must not be opened.
- In case of failure or faulty operation send the instrument back to the distributor or to "Dixell s.r.l." (see address) with a detailed description of the fault.
- Consider the maximum current which can be applied to each relay (see Technical Data).
- Ensure that the wires for probes, loads and the power supply are separated and far enough from each other, without crossing or intertwining.
- In case of applications in industrial environments, the use of mains filters (our mod. FT1) in parallel with inductive loads could be useful.

2. GENERAL DESCRIPTION

The **XH240K** is microprocessor controller suitable for applications on medium temperature refrigerating units. It must be connected by means of a two-wire cable ($\varnothing$ 1mm) at a distance of up to 30 meters to the keyboard **VH620, 100x64**mm format. It controls both humidity and temperature. It has 4 output relays to control compressor, heating elements , fan and humidifier. It has 2 analogue inputs: one for temperature control, the other for humidity. There is one digital input (free contact). An output allows the user to programme the parameter list with the **"Hot Key".**

3. TEMPERATURE REGULATION

The temperature regulation is performed through neutral zone using compressor and heater output relays.
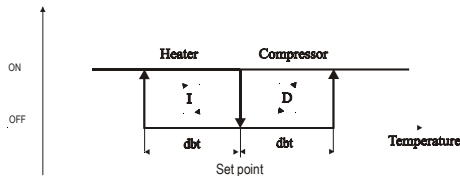
• **Heating** output: CUT IN is "SET_TEMP-dbt", CUT OUT is when the temperature reaches the set point.
• **Compressor** output CUT IN is " SET_TEMP +dbt", CUT OUT is when the temperature reaches the set point.

3.1 DEFROST

During the defrost temperature regulation is disabled.. Parameter "**IdF**" controls the interval between defrost cycles, while its length is controlled by parameter "**MdF**".
To disable defrost set the MdF parameter to zero.
Humidity regulation, during defrost, depends on the **Hud** parameter. With
Hud=no humidity regulation is disabled during defrosts.
Hud=yES humidity regulation is performed also during defrosts.

4. HUMIDITY REGULATION

The humidity regulation is performed through neutral zone, by humidifying dehumidifying.
Humidity control can be disabled setting the SET_RH to "nu" value. In this case only the temperature control is perform.

4.1 HUMIDIFYING ACTION

The humidifying action is done enabling the humidifier relay when the humidity is lower than the "SET_RH-dbH" value.
The relay is disable when humidity reaches the set values.

4.2 DEHUMIDIFYING ACTION

The dehumidifying action is performed enabling the heating and compressor output together when humidity is higher than SET_RH+dbH value.

Outputs are disabled when humidity comes back to the SET_RH value.

4.2.1 Relation between cooling, heating and dehumidifying

1. If is simultaneously present a request of cooling (temp>SET_TEMP+dbt) and dehumidifying (RH > SET_RH+dbH): the cooling action has the priority over the dehumidifying action: only the compressor relay is energised till the SET_TEMP is reached at this point also the heating relay is enabled.

2. If is simultaneously present a request of heating (temp< SET_TEMP-dbt) and dehumidifying (RH > SET_RH+dbH): the dehumidifying action has the priority over the heating action: both the compressor and the heating relays are energised till the humidity set is reached at this point only the heating relay is enabled.

5. FANS

The fan control mode is selected by means of the "**FnC**" parameter:
    C-n = running when a load is on, OFF during the defrost;
    C-y = running when a load is on, ON during the defrost;
    O-n = continuous mode, OFF during the defrost;
   **O-y** = continuous mode, ON during the defrost;

6. THE DISPLAY

set temp.	To display and modify target temperature set point. (SET_TEMP)
set %RH	To display and modify target humidity set point (SET_RH); in programming mode it selects a parameter or confirm an operation.
▲	In programming mode it browses the parameter codes or increases the displayed value.
▼	In programming mode it browses the parameter codes or decreases the displayed value.
❄	By holding it pressed for 3s the defrost is started..
⏻	Switch ON and OFF the instrument.

KEY COMBINATIONS

▼ + ▲	To lock and unlock the keyboard
▼ + **set %RH**	To enter the programming mode.
▲ + **set %RH**	To exit the programming mode.

6.1 ICONS AND SYMBOLS

Each LED function is described in the following table.
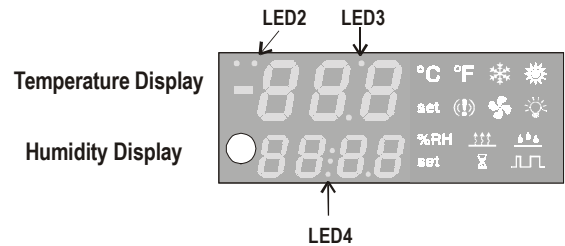
LED	MODE	FUNCTION
(((!)))	ON	- ALARM signal
Led 4	ON	- Instrument in stand by. - In "Pr2" indicates that the parameter is also present in "Pr1".
°C	ON	°C
❄	ON	The compressor is running
❄	FLASHING	- Anti-short cycle delay enabled
❄ LED 3	ON	The defrost is enabled
❄ LED 3	FLASHING	Drip time in progress
LED 2	FLASHING	Programming Phase (flashing with LED3)
☀	ON	Heating enabled
set (temp)	FLASHING	Temperature Set programming phase

LED	MODE	FUNCTION
❀	ON	Fan is running
%RH	ON	RH%
↑↑↑	ON	Dehumidifying enabled
▲▲▲	ON	Humidifying enabled
SET (umid)	FLASHING	Humidity Set programming phase

6.2 HOW TO SEE AND MODIFY THE SET POINT (TEMPERATURE AND HUMIDITY)

1. Push and immediately release the **SET** key: the display will show the Set point valueand the correspondant set icon starts flashing;
2. To change the Set value push the ▲ or ▼ arrows within 10s.
3. To memorise the new set point value push the **SET** key again or wait 10s.

6.3 TO START A MANUAL DEFROST

1. Push the **DEF** key for more than 2 seconds and a manual defrost will start.

6.4 TO ENTER IN PARAMETERS LIST "PR1"

To enter the parameter list "Pr1" (user accessible parameters) operate as follows:

1. Enter the Programming mode by pressing the **SET_RH+** ▼ for few seconds. (LED2&3 start flashing)
2. The instrument will show the first parameter present in "Pr1"

6.5 TO ENTER IN PARAMETERS LIST "PR2"

To access parameters in "**Pr2**":
1. Enter the "Pr1" level.
2. Select "Pr2" parameter and press the " **SET_RH** " key.
3. The "PAS" flashing message is displayed, shortly followed by "0 - -" with a flashing zero.
4. Use ▲ or ▼ to input the security code in the flashing digit; confirm the figure by pressing " **SET_RH** ".
   The security code is "321".
5. If the security code is correct the access to "Pr2" is enabled by pressing " **SET_RH** " on the last digit.

Another possibility is the following: after switching ON the instrument the user can push **SET_RH** + ▼ keys within 30 seconds.

NOTE: each parameter in "Pr2" can be removed or put into "Pr1" (user level) by pressing **SET_RH** + ▼. When a parameter is present in "Pr1" LED 4 is on.

6.6 HOW TO CHANGE THE PARAMETER VALUE

1. Enter the Programming mode.
2. Select the required parameter with ▲ or ▼.
3. Press the " **SET_RH** " key to display its value (LED2&3 start blinking).
4. Use ▲ or ▼ to change its value.
5. Press " **SET_RH** " to store the new value and move to the following parameter.
To exit: Press **SET_RH + UP** or wait 15s without pressing a key.
NOTE: the new programming is stored even when the procedure is exited by waiting the time-out.

6.7 HOW TO LOCK THE KEYBOARD

1. Keep the ▲ and ▼ keys pressed together for more than 3 s the ▲ and ▼ keys.
2. The "**POF**" message will be displayed and the keyboard is locked. At this point it is only possible the viewing of the set point or the MAX o Min temperature stored and to switch ON and OFF the light, the auxiliary output and the instrument.

TO UNLOCK THE KEYBOARD
Keep the ▲ and ▼ keys pressed together for more than 3s.

6.8 ON/OFF FUNCTION

By pushing the **ON/OFF** key, the instrument shows "OFF" for 5 sec. and the ON/OFF LED is switched ON.
During the OFF status, all the relays are switched OFF and the regulations are stopped;
N.B. During the OFF status the LED4 button is lighted.

7. PARAMETER LIST
REGULATION

dbt half dead band width for temperature: (0,1÷25,5°C; 1÷45°F) this band is place below and above the temperature set point (SET_TEMP). The compressor is enabled when the temperature increases and reaches the SET_TEMP + dbt value. It is turned off when it comes back to the SET_TEMP. The heating output is enabled when temperature is less than SET_TEMP -dbt value and disabled when the SET_TEMP is reached.

dbH half dead band width for humidity: (0,5÷25,5RH) this band is place below and above the humidity set point (SET_RH). The dehumidifying action is enabled when the humidity increases and reaches the SET_RH + dbH value. It is stopped when it comes back to the SET_RH. The humidifying output is enabled when humidity is less than SET_RH -dbH value and disabled when the SET_RH is reached.

LS   Minimum temperature set point limit: (-50,0°C÷SET; -58°F÷SET) Sets the minimum acceptable value for the set point.

US   Maximum temperature set point limit: (SET÷110°C; SET÷230°F) Set the maximum acceptable value for set point.

OdS Outputs activation delay at start up: (0÷255 min) This function is enabled at the initial start up of the instrument and inhibits any output activation for the period of time set in the parameter. (Light can work)

AC   Anti-short cycle delay: (0÷30 min) interval between the compressor stop and the following restart.

LSH Minimum humidity set point limit: (Lci ÷ Set H) Sets the minimum acceptable value for the humidity set point.

USH Maximum humidity set point limit: (Set H ÷ uci) Set the maximum acceptable value for humidity set point.

DISPLAY

CF   Measurement unit: °C= Celsius; °F= Fahrenheit
rES Resolution (for °C): it allows decimal point display. **dE**=0,1°C; **in**=1°C
rEH Resolution for RH%: in = integer; Hd= half digit.

DEFROST

IdF Interval between defrosts: (1÷120h) Determines the time interval between the beginning of two defrost cycles.

MdF Duration of defrost: (0÷255 min) no evaporator probe, it sets the defrost duration.

dFd Display during defrost: **rt** = real temperature; **it** = temperature reading at the defrost start; **Set** = set point; **dEF** = "dEF" label; **dEG** = "dEG" label;

dAd Defrost display time out: (0÷255 min) Sets the maximum time between the end of defrost and the restarting of the real room temperature display.

Hud Humidity control during defrost: no: the humidity control is stopped during the defrost; **yES** the humidity control works also during the defrost.

FANS

FnC Fan operating mode: C-n = running when a load is on, OFF during the defrost;
C-y = running when a load is on, ON during the defrost;
O-n = continuous mode, OFF during the defrost;
O-y = continuous mode, ON during the defrost;

TEMPERATURE ALARMS

ALC Temperature alarm configuration
rE = High and Low alarms related to Set Point
Ab = High and low alarms related to the absolute temperature.

ALL Low temperature alarm setting:
ALC = rE , 0 ÷ 50 °C or 90°F
ALC = Ab , - 50°C or -58°F ÷ ALU
when this temperature is reached and after the ALd delay time, the LA alarm is enabled,.

ALU High temperature alarm setting:
ALC= rE, 0 ÷ 50°C or 90°F
ALC= Ab, ALL ÷ 110°C or 230°F
when this temperature is reached and after the ALd delay time the HA alarm is enabled.

ALH Temperature alarm recovery differential: (0,1÷25,5°C; 1÷45°F) Intervention differential for recovery of temperature alarm.

ALd Temperature alarm delay: (0÷255 min) time interval between the detection of an alarm condition and the corresponding alarm signalling.

dAO Delay of temperature alarm at start-up: (0min÷23h 50min) time interval between the detection of the temperature alarm condition after the instrument power on and the alarm signalling.

EdA Alarm delay at the end of defrost: (0÷255 min) Time interval between the detection of the temperature alarm condition at the end of defrost and the alarm signalling.

dot Delay of temperature alarm after closing the door : (0÷255 min) Time delay to signal the temperature alarm condition after closing the door.

HUMIDITY ALARMS

AHC Humidity alarm configuration: rE = High and Low alarms related to humidity Set Point
Ab = High and low alarms related to the "absolute" humidity.

AHL Low humidity alarm setting: (with AHC = rE: 0 ÷ 50. With AHC = Ab: Lci ÷ AHu) when this humidity is reached and after the AHd delay time, the HLA alarm is enabled,.

AHU High humidity alarm setting: (with AHC = rE: 0÷50°C. with AHC = Ab: AHL ÷ uci) when this humidity is reached and after the AHd delay time the HHA alarm is enabled.

AHH Humidity alarm recovery differential: (0.5÷20.0) Intervention differential for recovery of humidity alarm.

AHd Humidity alarm delay: (0÷255 min) time interval between the detection of an alarm condition and the corresponding alarm signalling.

dHo Delay of humidity alarm at start-up: (0min÷23h 50min) time interval between the detection of the humidity alarm condition after the instrument power on and the alarm signalling.

doH Alarm delay at the end of defrost: (0÷255 min) Time interval between the detection of the humidity alarm condition at the end of defrost and the alarm signalling.

doA Open door alarm delay: (0÷255 min) delay between the detection of the open door condition and its alarm signalling: the flashing message "**dA**" is displayed.

nPS Pressure switch number: (0 ÷15) Number of activation of the pressure switch, during the "did" interval, before signalling the alarm event (I2F= PAL).
If the nPS activation in the "did" time is reached, switch off and on the instrument to restart normal regulation.

PROBE INPUTS

Ot **Thermostat probe calibration:** (-12.0÷12.0°C/ -21÷21°F) allows to adjust possible offset of the thermostat probe.

O3 **Humidity probe calibration:** (-10÷10 RH) allows to adjust possible offsets of the humidity probe.

P3P **Humidity probe presence: yES=** probe present; **no=** probe absent, only the temperature control is perfomed.

LCI **Readout with 4 mA** : (-999 ÷ 999). Adjustment of read out corresponding to 4mA signal.

UCI **Readout with 20 mA**: (-999÷999). Adjustment of read out corresponding to 20mA signal.

DIGITAL INPUTS

i1P **Digital input polarity: CL** : the digital input is activated by opening the contact;   **OP**   : the digital input is activated by closing the contact

i1F **Digital input operating mode:** it configures the digital input: **EAL** = generic alarm; **bAL** = serious alarm mode; **PAL** = Pressure switch; **Ht** = heating relay safety; **dor** = door switch

odc **Outputs status when open door:**
   on = normal; **Fan** = Fan OFF; **oFF** = all the loads are switched off

rrd **Outputs restarting after doA alarm: no =** outputs not affected by the doA alarm; **yES =** outputs restart with the doA alarm;

did **Time interval/delay for digital input alarm:**(0÷255 min.) Time interval to calculate the number of the pressure switch activation when I1F=PAL. If I1F=EAL or bAL (external alarms), "did" parameter defines the time delay between the detection and the successive signalling of alarms.

OTHER

Adt **RS485 serial address for temperature** (0÷247) identifies the instrument within a control or supervising system.

AdH RS485 serial address for humidity(0÷247) identifies the instrument within a control or supervising system.

Ptb **Parameter table:** (read only) it shows the original code of the **dIXEL** parameter map.

rEL **Software release:** (read only) Software version of the microprocessor.

Pr2 **Access to the protected parameter list** (read only).

8. DIGITAL INPUT

One digital input is present configurable by user by means of the i1F parameter according to the following descriptions.

8.1 DOOR SWITCH (12F = dor)

It signals the door status and the corresponding relay output status through the "**odc**" parameter:
no = normal (any change); **Fan** = Fan OFF; **oFF** = all the loads are switched off.

Since the door is opened, after the delay time set through parameter "**dOA**", the alarm output is enabled and the display shows the message "**dA**".
The status of loads depends on the "**rrd**" parameter:
   with **rrd=no** outputs are not affected by the doA alarm;
   with **rrd=yES =** outputs restart with the doA alarm;
The alarm stops as soon as the external digital input is disabled again. During this time and then for the delay "**dot**" and **"doH"** after closing the door, the temperature and humidity alarms are disabled.

8.2 GENERIC ALARM (I1F = EAL)

As soon as the digital input is activated the unit will wait for "**did**" time delay before signalling the "**EAL**" alarm message. The outputs status don't change. The alarm stops just after the digital input is de-activated.

8.3 SERIOUS ALARM MODE (I1F = BAL)

When the digital input is activated, the unit will wait for "**did**" delay before signalling the "**bAL**" alarm message. The relay outputs are switched OFF. The alarm will stop as soon as the digital input is de-activated.

8.4 PRESSURE SWITCH (I1F = PAL)

If during the interval time set by "**did**" parameter, the pressure switch has reached the number of activation of the "**nPS**" parameter, the "**PAL**" pressure alarm message will be displayed. The compressor and the regulation are stopped. When the digital input is ON the compressor is always OFF.
If the nPS activation in the did time is reached, switch off and on the instrument to restart normal regulation.

8.5 HEATING RELAY SAFETY (i1F=Ht)

With **i1F=Ht** as soon as the digital input is activated for "**did**" time heating relay is disactivated. The alarm will stop as soon as the digital input is de-activated.
1 Digital input is present with the door switch facility. It's action is determinate by the odc parameter according to this value:
odc= **on** normal regulation; **Fan** = Fan OFF; **oFF** = all the loads are switched off

8.6 DIGITAL INPUTS POLARITY

The digital input polarity depends on the "**i1P**" parameters.
   CL : the digital input is activated by opening the contact.
   OP : the digital input is activated by closing the contact

9. INSTALLATION AND MOUNTING

The **XH240K** shall be mounted in a panel with two or more screws and it must be connected to the keyboard by means of a two-wire cable (∅ 1mm). The keyboard **VH620** shall be mounted on vertical panel, in a 72x56 mm hole, and fixed using screws ∅ 3 x 2mm. To obtain an IP65 protection grade use the front panel rubber gasket (mod. RGW-V).

The temperature range allowed for correct operation is 0 - 60 °C. Avoid places subject to strong vibrations, corrosive gases, excessive dirt or humidity. The same recommendations apply to probes. Let the air circulate by the cooling holes.

9.1 XH240K DIMENSIONS
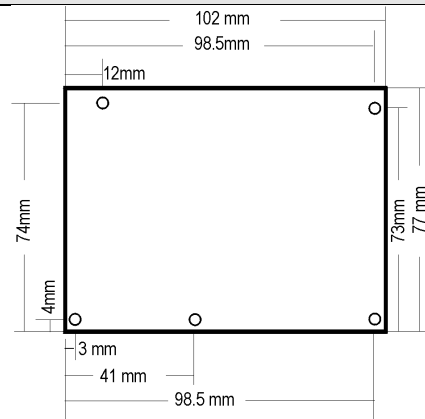
9.2 VH620 CUT OUT
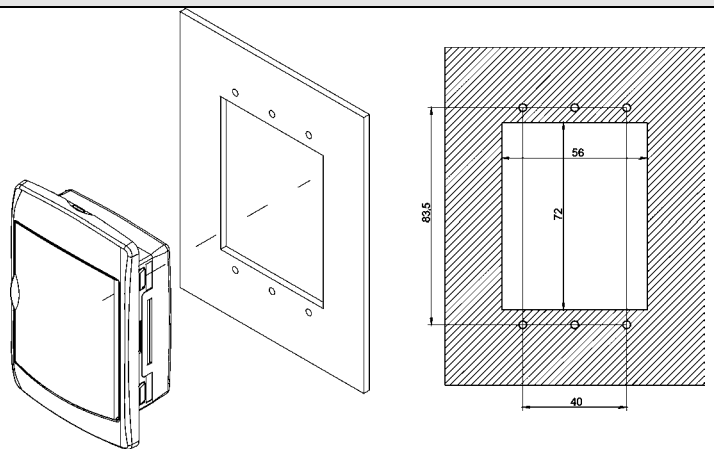
10. ELECTRICAL CONNECTIONS

The instruments are provided with screw terminal block to connect cables with a cross section up to 2,5 mm² for the digital and analogue inputs. Relays and power supply have a Faston connection (6,3mm). Heat-resistant cables have to be used. Before connecting cables make sure the power supply complies with the instrument's requirements. Separate the probe cables from the power supply cables, from the outputs and the power connections. Do not exceed the maximum current allowed on each relay, in case of heavier loads use a suitable external relay.
N.B. Maximum current allowed for all the loads is 20A.

10.1 PROBE CONNECTIONS

The probes shall be mounted with the bulb upwards to prevent damages due to casual liquid infiltration. It is recommended to place the thermostat probe away from air streams to correctly measure the average room temperature.

11. HOW TO USE THE HOT KEY

11.1 HOW TO PROGRAM A HOT KEY FROM THE INSTRUMENT (UPLOAD)

1. Program one controller with the front keypad.
2. When the controller is ON, insert the "**Hot key**" and push ▲ key; the **"uPL"** message appears followed a by flashing **"End"**
3. Push "**SET"** key and the **End** will stop flashing.
4. Turn OFF the instrument remove the **"Hot Key",** then turn it ON again.

NOTE: the "**Err**" message is displayed for failed programming. In this case push again ▲ key if you want to restart the upload again or remove the "**Hot key**" to abort the operation.

11.2 HOW TO PROGRAM AN INSTRUMENT USING A HOT KEY (DOWNLOAD)

1. Turn OFF the instrument.
2. Insert a **programmed "Hot Key" into the 5 PIN receptacle** and then turn the Controller ON.
3. Automatically the parameter list of the **"Hot Key"** is downloaded into the Controller memory, the "**doL**" message is blinking followed a by flashing **"End".**
4. After 10 seconds the instrument will restart working with the new parameters.
5. Remove the **"Hot Key".**.

NOTE the message "**Err**" is displayed for failed programming. In this case turn the unit off and then on if you want to restart the download again or remove the "**Hot key**" to abort the operation.

12. ALARM SIGNALLING

Message	Cause	Outputs
"P1"	Thermostat probe failure	Compressor and heating outputs off
"P3"	Humidity probe failure	Humidity regulation off
"HA"	High temperature alarm	Outputs unchanged
"LA"	Low temperature alarm	Outputs unchanged
"HHA"	High humidity alarm	Outputs unchanged
"HLA"	Low humidity alarm	Outputs unchanged
"dA"	Door switch alarm	Outputs depending on the odC parameter

The alarm message is displayed until the alarm condition recoveries.
All the alarm messages are showed alternating with the room temperature except for the "P1" which is flashing. To reset the "EE" alarm and restart the normal functioning press any key, the "**rSt**" message is displayed for about 3s.

12.1 SILENCING BUZZER

Once the alarm signal is detected the buzzer, if present, can be silenced by pressing any key.

12.2 ALARM RECOVERY

Probe alarms : "**P1**" (probe1 faulty), "**P3**" ; they automatically stop 10s after the probe restarts normal operation. Check connections before replacing the probe.
Temperature alarms "**HA**" and "**LA**" automatically stop as soon as the thermostat temperature returns to normal values or when the defrost starts.
Humidity alarms "**HHA**" and "**LHA**" automatically stop as soon as the humidity returns to normal values.
Door switch alarm "**dA**" stop as soon as the door is closed.

13. TECHNICAL DATA

VH620 keyboard
Housing: self extinguishing ABS; **Case:** facia 100x64 mm; depth 23mm
Mounting: panel mounting in a 56x72 mm panel cut-out with two screws. ⌀ 3 x 2mm.
        Distance between the holes 40mm
Protection: IP20.
Frontal protection: IP65 with frontal gasket mod RG-V. (optional)
Connections: Screw terminal block ≤ 2,5 mm^2 heat-resistant wiring
Power supply: from **XH240K**; **Display:** double display + icons.
Optional output: buzzer

XH240K board
Housing: open board; **Case:** 77x102mm
Mounting: panel with two screws. ⌀ 3x2mm.
Connections: Screw terminal block ≤ 2,5 mm^2 heat-resistant wiring and 6,3mm Faston
Power supply: 230Vac ± 10%; **Power absorption:** 7VA max.
Inputs: 1 NTC probe + 4÷20mA probe
Digital input: 1 free voltage
Relay outputs:
     compressor: relay SPST 20(8) A, 250Vac
     heather: relay SPST 16(6) A, 250Vac
     fans: relay SPST 8(3) A, 250Vac
     humidifier: relay SPST 8(3) A, 250Vac
Data storing: on the non-volatile memory (EEPROM).
Kind of action: 1B.; **Pollution grade:** normal; **Software class:** A.
Operating temperature: 0÷60 °C.; **Storage temperature:** -25÷60 °C.
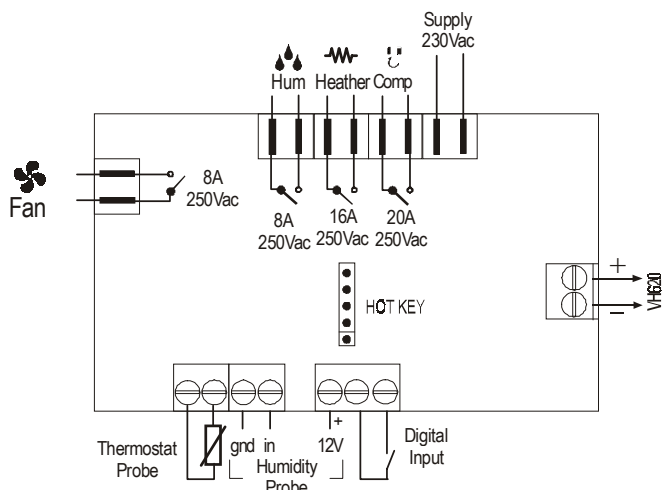**Relative humidity:** 20÷85% (no condensing)
Measuring and regulation range:
     NTC probe: -40÷110°C (-58÷230°F)
Resolution: 0,1 °C or 1°C or 1 °F (selectable).
Accuracy (ambient temp. 25°C): ±0,5 °C ±1 digit

14. WIRING CONNECTIONS

15. DEFAULT SETTING VALUES

Label	Value	Menu	Description	Range
Set T	5.0	- - -	Temperature Set Point	LS ÷ uS (nu = temperature regulation disabled)
Set H	50.0	- - -	Humidity Set Point	LSH ÷ uSH (nu = humidity regulation disabled)
dbt	2.0	Pr1	Half dead band width for temperature	0.1°C o 1°F ÷ 25°C o 77°F
dbH	5.0	Pr1	Half dead band width for humidity	0.5 ÷ 50
LS	-40.0	Pr2	Minimum temperature set point limit	-50.0°C o –58°F ÷ Set T
uS	110	Pr2	Maximum temperature set point limit	Set T ÷ 110°C ÷ 230°F
odS	1	Pr2	Outputs activation delay at start up	0 ÷ 250 min
Ac	1	Pr1	Anti-short cycle delay	0 ÷ 30 min
LSH	0.0	Pr2	Minimum humidity set point limit	Lci ÷ Set H
uSH	100	Pr2	Maximum humidity set point limit	Set H ÷ uci
cF	°C	Pr2	Measurement unit	°C ÷°F
rES	dE	Pr2	Resolution (for °C):	in = integer / dE = decimal
rEH	Hd	Pr2	Resolution for RH%:	in = integer / Hd = half digit
idF	8	Pr1	Interval between defrosts	1 ÷ 120 h
MdF	20	Pr1	Duration of defrost	0 ÷ 250 min
dFd	it	Pr2	Display during defrost	rt / it / SEt / dEF / dEG
dAd	30	Pr2	Defrost display time out	0 ÷ 250 min
Hud	no	Pr2	Humidity control during defrost	no; yES
Fnc	c-n	Pr2	Fan operating mode	c-n / c-Y / o-n / o-Y
ALc	Ab	Pr2	Temperature alarm configuration	rE = relative / Ab = absolute
ALL	-40.0	Pr1	Low temperature alarm setting	0°C ÷ 50.0°C / -50.0°C ÷ ALu
ALu	110	Pr1	High temperature alarm setting	0°C ÷ 50.0°C / ALL ÷ 110°C
ALH	1.0	Pr2	Temperature alarm recovery differential	0.1°C o 1°F ÷ 25°C o 77°F
ALd	15	Pr2	Temperature alarm delay	0 ÷ 250 min
dAo	1.3	Pr2	Delay of temperature alarm at start-up	0.0 ÷ 23.5 h
EdA	20	Pr2	Alarm delay at the end of defrost	0 ÷ 250 min
dot	20	Pr2	Delay of temp. alarm after closing the door	0 ÷ 250 min
AHc	Ab	Pr2	Humidity alarm configuration	rE = relative / Ab = absolute
AHL	0.0	Pr1	Low humidity alarm setting	0 ÷ 50 / Lci ÷ AHu
AHu	100	Pr1	High humidity alarm setting	0 ÷ 50 / AHL ÷ uci
AHH	2.0	Pr2	Humidity alarm recovery differential	0.5 ÷ 25
AHd	15	Pr2	Humidity alarm delay	0 ÷ 250 min
dHo	1.3	Pr2	Delay of humidity alarm at start-up	0.0 ÷ 23.5 h
doH	20	Pr2	Alarm delay at the end of defrost	0 ÷ 250 min
doA	20	Pr2	Open door alarm delay	0 ÷ 250 min (250 = nu)
nPS	0	Pr2	Pressure switch number	0÷15
ot	0.0	Pr1	Thermostat probe calibration	-12.0 ÷ 12.0
o3	0.0	Pr1	Humidity probe calibration	-10 ÷ 10
P3P	yES	Pr2	Humidity probe presence	yES; no
Lci	0	Pr2	Readout with 4 mA	-999 ÷ 999
uci	100	Pr2	Readout with 20 mA	-999 ÷ 999
i1P	oP	Pr2	Digital input polarity	cL =open / oP = close
i1F	dor	Pr2	Digital input configuration	dor / PAL / EAL / bAL / Ht
odc	oFF	Pr2	Outputs status when open door	on / Fan / oFF
rrd	YES	Pr2	Outputs restarting after doA alarm	no = no / YES = yes
did	0	Pr2	Digital input alarm delay	0÷255 min.
Adt	1	Pr2	Serial address for temperature	0÷247
AdH	1	Pr2	Serial address for humidity	0÷247
Ptb	1	Pr2	Parameter table	- - -
rEL	1.0	Pr2	Software release	- - -
Pr2	321	Pr1	Access to the protected parameter list	- - -