

IWP 750-760 BT-TN

Electronic controller for ventilated refrigeration units.

IT

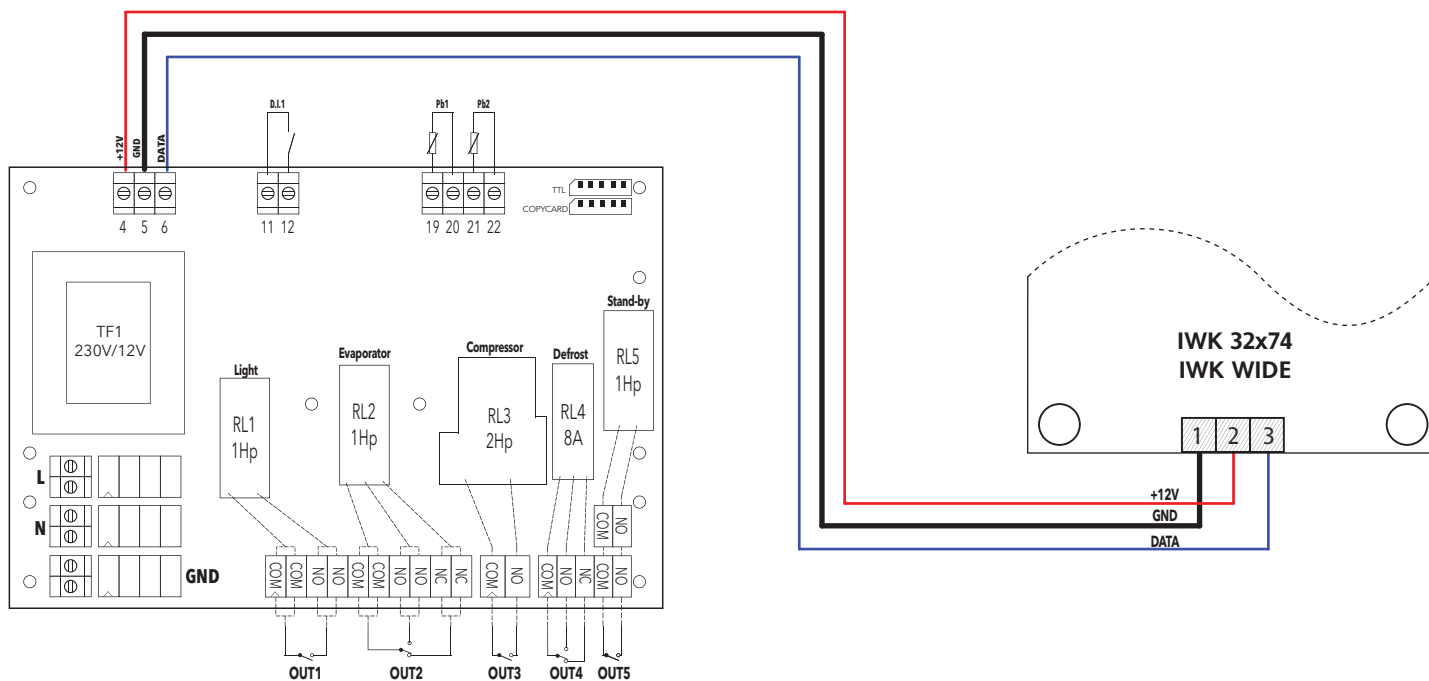
The **System** consists of 2 units:

- 1 IWP750 or IWP760 230V~ power module
- 1 IWK (32x74 or WIDE) keyboard used to manage the IWP750 or IWP760 board.

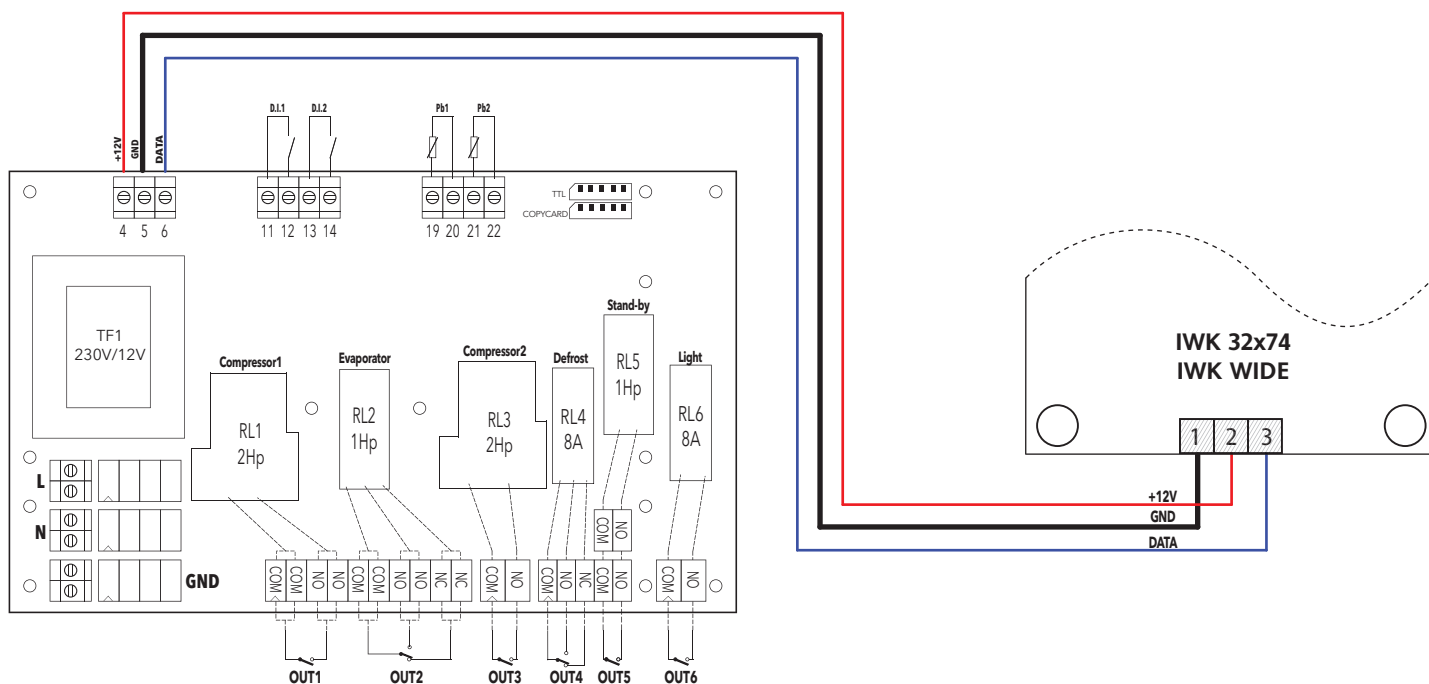
This controller was designed to manage plug-in application.

POWER MODULE - KEYBOARD CONNECTION DIAGRAMS

IWP750 connection: POWER MODULE-KEYBOARD



IWP760 connection: POWER MODULE-KEYBOARD



IWK KEYBOARDS (32x74 and WIDE)

TECHNICAL DATA

KEYBOARD:	32x74	WIDE
Front protection:	IP65	IP40
Dimensions:	70,0 x 28,3mm (Lxh) - depth 30 mm	149,2 x 30,3mm (Lxh) - depth 23 mm
Terminals:	screw type for 2.5mm ² section cables	phoenix connector MKDSN 3 ways
Temperature:	operating: -5...55 °C - storage: -30...85 °C.	
Ambient humidity:	operating / storage: 10...90% RH (non-condensing).	
Accuracy:	better than 0.5% of full-scale +1 digit	
Resolution:	1 or 0,1 °C	
Buzzer:	YES	
Power supply:	12V \pm 10% directly from the IWP750 or IWP760 power module	

The device is classified:

- In terms of construction, as an independently mounted automatic electronic control device.
- in terms of automatic operating characteristics, as a type 1B controller.
- in terms of software class and structure, as a Class A controller.
- As a device with class 2 pollution rating (standard).
- As a device with class D fire resistance.
- In terms of over-voltage category, as a grade II device.
- As a device made with class IIIa material.

IWK keyboards features



KEYs

Key	Keyboards		Single Press	Press and hold
	32x74	WIDE		
SET			<ul style="list-style-type: none"> • Displays any alarms (if active) • Access to "Machine Status" menu 	<ul style="list-style-type: none"> • Access to the "Programming" menu parameters • Display/change/confirms commands
UP			<ul style="list-style-type: none"> • Scrolls through menu items • Increases values 	<ul style="list-style-type: none"> • Activates the setting function (see par. H31)
DOWN			<ul style="list-style-type: none"> • Scrolls through menu items • Decreases values 	<ul style="list-style-type: none"> • Activates the setting function (see par. H32)
ESC			<ul style="list-style-type: none"> • Returns to the previous menu level • Confirms parameter value 	<ul style="list-style-type: none"> • Activates the setting function (see par. H33)
LUCE	---		<ul style="list-style-type: none"> • Switches on/off the relay setting (LIGHT) 	---
ON/OFF	---		<ul style="list-style-type: none"> • Switches on/off the instrument 	---
UP + ESC			<ul style="list-style-type: none"> • Press and hold simultaneously for at least 2 seconds to lock the keyboard. To disable the keyboard lock, repeat the aforementioned procedure. 	
DOWN + ESC			<ul style="list-style-type: none"> • Press and hold simultaneously for at least 3 seconds to enter bt/tn programming and load parameters for one or other of the applications. 	
UP + DOWN			<ul style="list-style-type: none"> • Press and hold simultaneously for at least 1 second to reset the "Condenser filter"alarm. 	

LEDs

Led	Status: ON	Status: Blinking	Status: OFF
eco	access to level 2 parameters	Reduced set active	otherwise
	compressor Active	ritardo, protezione o attivazione bloccata	otherwise
	automatic defrost active	manually activated or from D.I.	otherwise
	fans active	otherwise	fans active
	Alarm present	alarm acknowledged	otherwise
AUX / Light	AUX output active	otherwise	AUX output not active

IMPORTANT! the LED status should always be modified as soon as the regulator requires it:

- after exiting programming mode following parameter modification
- after exiting setpoint display mode following setpoint modification
- immediately after enabling the reduced set function

IWP POWER MODULE (IWP750 and IWP760)

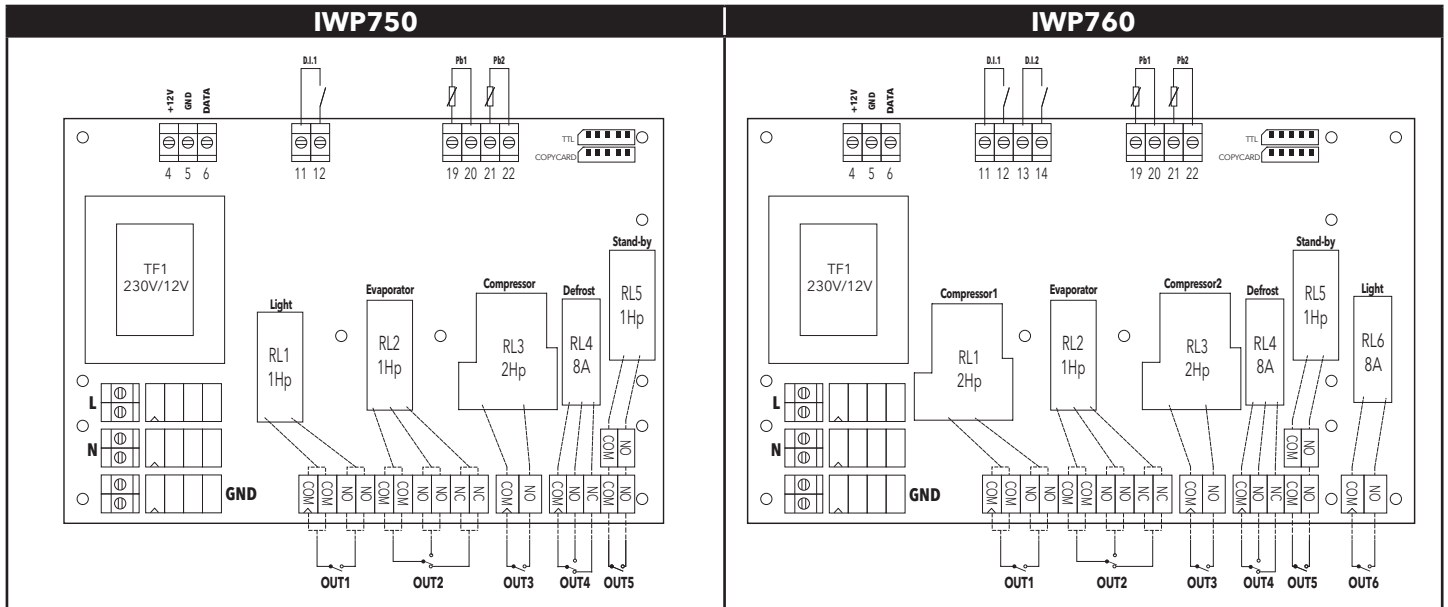
TECHNICAL DATA

POWER MODULE:	IWP750	IWP760
Container:	open board	open board
Dimensions:	160 x 107.5 mm (Lxh)	178.5 x 107.5 mm (Lxh)
Mounting:	can be adapted to container sizes that comply with DIN specifications (installed on DIN rail).	
Terminals:	screw type for 2.5mm ² section cables and faston.	
Temperature:	operating: -5...55 °C - storage: -30...85 °C.	
Ambient humidity:	operating / storage: 10...90% RH (non-condensing).	
Power supply:	230 V~ ±10% 50/60 Hz - Power consumption: 6,5W max	
Range:	-50,0 ... 110,0°C (NTC) and -55,0 ... 140,0°C (PTC)	
Accuracy:	better than 0.5% full scale + 1 digit	
Resolution:	1 or 0,1 °C	
Buzzer:	NO (manag the one present on keyboard)	
Analogue inputs:	2 NTC/PTC (can be selected using parameter H00 - Pb1 and Pb2) - NOTA: probe Pb2 is only present if H42 = y	
Digital inputs:	1 voltage-free digital input: • D.I.1 = configured as general pressure switch	2 voltage-free digital inputs: • D.I.1 = configured as general pressure switch • D.I.2 = configured as general pressure switch 2nd compressor
Serial Outputs:	a) TTL (5-way connector): for connection to Copy Card. b) "Voltage**" serial (terminals 4-5-6) for power module-keyboard connection.	
Digital outputs:	The device has 5 relay outputs: • OUT1 (RY1 - Light) = SPST - Relé 1Hp 250V~ • OUT2 (RY2 - Evaporator) = SPDT - Relé 1Hp 250V~ • OUT3 (RY3 - Compressor) = SPST - Relé 12(12)A (2Hp) 250V~ • OUT4 (RY4 - Defrost) = SPDT - Relé 8(4)A (1/2Hp) 250V~ • OUT5 (RY5 - Stand-by) = SPST - Relé 1Hp 250V~	The device has 6 relay outputs: • OUT1 (RY1 - Compressor1) = SPST - Relé 12(12)A (2Hp) 250V~ • OUT2 (RY2 - Evaporator) = SPDT - Relé 1Hp 250V~ • OUT3 (RY3 - Compressor2) = SPST - Relé 12(12)A (2Hp) 250V~ • OUT4 (RY4 - Defrost) = SPDT - Relé 8(4)A (1/2Hp) 250V~ • OUT5 (RY5 - Stand-by) = SPST - Relé 1Hp 250V~ • OUT6 (RY6 - Light) = SPST - Relé 8(4)A (1/2Hp) 250V~

The device is classified:

- In terms of construction, as an independently mounted automatic electronic control device.
- in terms of automatic operating characteristics, as a type 1B controller.
- in terms of software class and structure, as a Class A controller.
- As a device with class 2 pollution rating (standard).
- As a device with class D fire resistance.
- In terms of over-voltage category, as a grade II device.
- As a device made with class IIIa material.

IWP power module features



TERMINALS

4/5/6	"Voltage" Serial (Power module-keyboard connection)	OUT 1	Relay output RY1 (IWP750: Light ; IWP760: Compressor1)
11 - 12	Digital input D.I.1 (general pressure switch)	OUT 2	Relay output RY2 (IWP750: Evaporator ; IWP760: Evaporator)
13 - 14	Digital input D.I.2 (general pressure switch) - IWP760 only	OUT 3	Relay output RY3 (IWP750: Compressor ; IWP760: Compressor2)
19 - 20	Probe Pb1 input (cold room)	OUT 4	Relay output RY4 (IWP750: Defrost ; IWP760: Defrost)
21 - 22	Probe Pb2 input (evaporator)	OUT 5	Relay output RY5 (IWP750: Stand-by ; IWP760: Stand-by)
L - N	230V~ board power supply	OUT 6	Relay output RY6 (IWP750: ---; IWP760: Light)
TTL	TTL input	Copy Card	Copy Card input


KEYBOARD LOCK

The controller keyboard can be disabled in 2 ways:

- By pressing a sequence of keys: press **UP+ ESC** key for 5 seconds, repeat to unlock the keyboard.
- By programming parameter **LOC** appropriately (see folder with label **diS**).

NOTES: - **IWP760 only:** To show that the keyboard has been locked, the LED on the right of the **SET** key lights up.
- When the keyboard has been locked, the programming menu can always be accessed by pressing the **SET** key for at least 5 seconds. The setpoint can still be viewed.

MANUAL DEFROST CYCLE ACTIVATION

To manually activate the defrost cycle, hold down the **UP** key (IWK 32x74 keyboard) or the  key (IWK WIDE keyboard) for at least 2 seconds, or activate it from **Digital Input**. If conditions for defrosting are not present, i.e. if:

- evaporator probe Pb2 temperature is greater than the end defrost temperature (valid if **H42 = y**).
- parameter **OdO = 0**

The display will blink three (3) times to indicate that the operation will not be performed.

USING THE COPY CARD

The copy card is an accessory which, when connected to the TTL type serial port, allows quick programming of the instrument parameters (upload and download of a parameter map to or from one or more instruments of the same type). The operations are performed as follows:

Fr (Format)

This command is used to format the copy card, an operation which is **necessary** when the instrument is being used for the first time or with other models which are not mutually compatible.

IMPORTANT: when the key has been programmed, all data entered will be deleted when parameter Fr is used. This operation cannot be reversed.

UL (UPLOAD: data transfer instrumento --> Copy Card)

This function uploads the programming parameters from the instrument.

dL (DOWNLOAD: data transfer Copy Card --> instrument)

This function downloads programming parameters to the instrument.

The operations are carried out by accessing the folder identified by the label **FPr** and selecting the commands **UL**, **dL** or **Fr** as required.

Press the **SET** key to confirm this operation.

If the operation has been successfully completed, the "y" label will appear, otherwise the "n" label will appear.

Download "from reset"

Connect the Copy Card with the device OFF. On switching the controller on, the programming parameters will be loaded from the key; on completion of the lamp test, the display will show the following for 5 seconds:

- label **dLY** if the operation completed successfully;
- label **dLn** if the operation failed.

NOTE: After the parameters have been downloaded, the device uses the new map just downloaded.

ACCESSING AND USING THE MENUS

The instrument has two main menus which can be accessed as follows:

- "Machine Status Menu": press **SET** key once.
- "Programing Menu": press and hold the **SET** key.

Press the **SET** key once to view the contents of any folder highlighted by the corresponding label.

At this point it will be possible to scroll through the contents of the folder and make changes or use the functions contained therein.

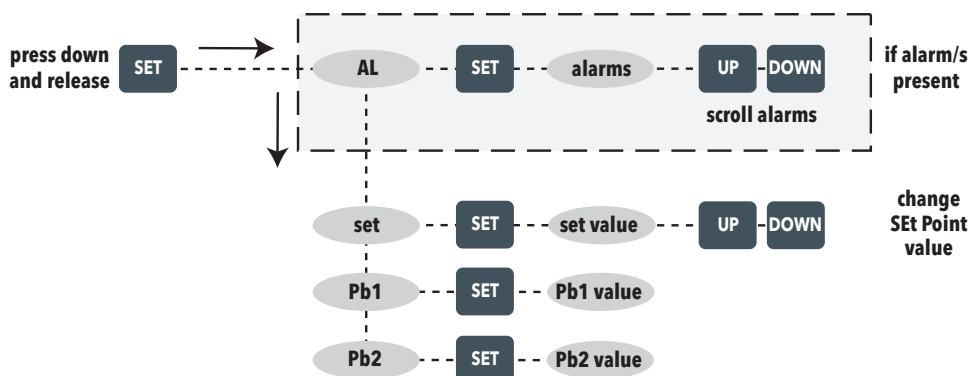
Either press no key for 15 seconds (time-out) or press the **ESC** key once to confirm the last value displayed and go back to the previous screen.

MACHINE STATUS MENU

Press and release the **SET** key to open the "Machine Status" menu. The following parameters will appear:

- **AL**: alarms folder (**if present; probe errors/faults excluded**);
- **SET**: Setpoint configuration folder;
- **Pb1**: probe 1 value folder;
- **Pb2**: probe 2 value folder.

You can use the "UP" and "DOWN" keys to scroll through all folders in the menu.



PROGRAMMING MENU

Passwords **PA1** and **PA2** give access to level 1 and level 2 parameters respectively. To enable them (value ≠ 0) and assign them the desired value, access the "Programming" menu in the folder with the label **dis**.

If the passwords are enabled you will be prompted for:

- **PA1** on entering the Programming menu for access to parameters in the **User** menu;
- **PA2** in the folder with label **Cnf** containing level 1 parameters for access to parameters in the **Installer** menu.

1) Display of level 1 parameters

To access the "Programming" menu press and hold the **SET** key for more than 5 seconds. If **PA1 ≠ 0**, the entry PASSWORD will be requested and (if the correct password is entered), the label of the first folder will appear. If the password is incorrect, the display will show the PA1 label again. To scroll the other folders use the **UP** and **DOWN** keys.

N.B.: at this level the folders will show all level 1 parameters, but no other level; level 2 parameters are NOT visible, even if NOT password-protected.

2) Display of level 2 parameters

After entering the Programming Menu, access the **Cnf**, folder and scroll through the parameters until the PA2 label is displayed. Pressing the **SET** key displays all level 2 parameters (but no other level), and the label of the first folder in the programming menu will appear.

Level 2 parameters can be protected by a second password (see parameter **PA2** in the **dis** folder).

If **PA2 ≠ 0**, the level 2 entry PASSWORD will be requested on opening folder **Cnf** and (if the correct password is entered), the label of the first folder in the programming menu will appear.

N.B.: At this level, the folders display all level 2 parameters, but no other level. Level 1 parameters will not be visible.

To enter a folder press **SET**. The label of the first visible parameter appears. Use the **UP** and **DOWN** keys to scroll the other parameters, press and release the **SET** key to modify a parameter then enter the required value using the **UP** and **DOWN** keys. Press the **SET** key to confirm and move on to the next parameter.

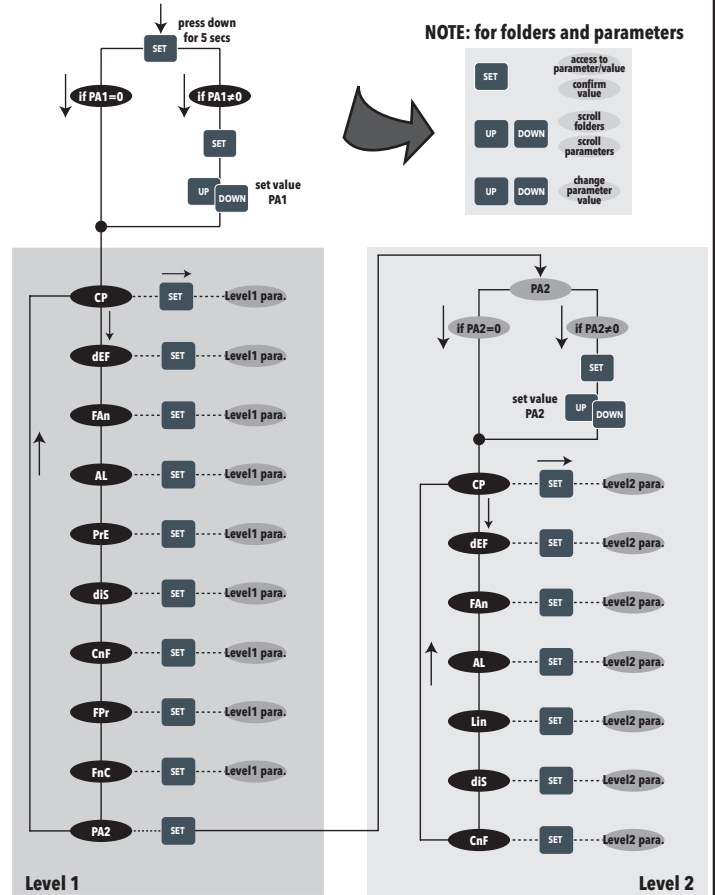
3) "bt/tn" programming of power module

At level 2 in folder CnF, parameter **H58** is visible (named "parameter map selector" or "vector number") which allows you to programme a sub-group of parameters depending on the type of installation required (**bt** or **tn**).

This will produce a list of "general" parameters and a list of "characteristic" parameters for the installation.

Depending on the value of **H58**, a characteristic parameter "vector" is assigned, which can still be modified by the user, just like all other parameters.

The controller can always be reprogrammed with other "characteristic" parameters, modifying the **H58** value.



N.B.:

It is advisable to switch the instrument off then back on again each time parameters are modified to prevent malfunction of the configuration and/or timer operations underway.

MAX/MIN TEMPERATURE ALARMS

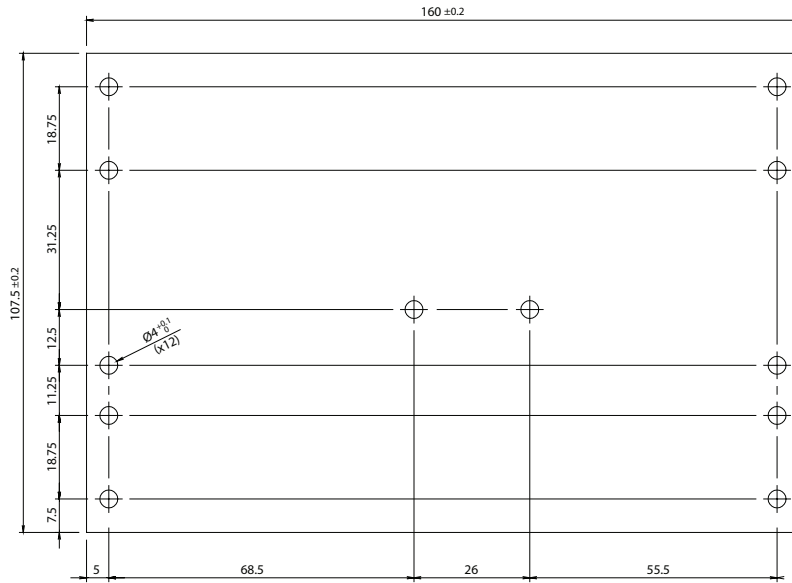
	Temperature value In relation to setpoint (Att=1)	Temperature value Absolute (Att=0)
Minimum temperature alarm	Temp. ≤ Set + LAL *	Temp. ≤ LAL (LAL with sign)
Maximum temperature alarm	Temp. ≥ Set + HAL **	Temp. ≥ HAL (HAL with sign)
Returning from minimum temperature alarm	Temp. ≥ Set + LAL + AFd Temp. ≥ Set - LAL + AFd	Temp. ≥ LAL + AFd
Returning from maximum temperature alarm	Temp. ≤ Set + HAL - AFd	Temp. ≤ HAL - AFd
	* if LAL is negative, Set + LAL < Set ** if HAL is negative, Set + HAL < Set	

MECHANICAL INSTALLATION

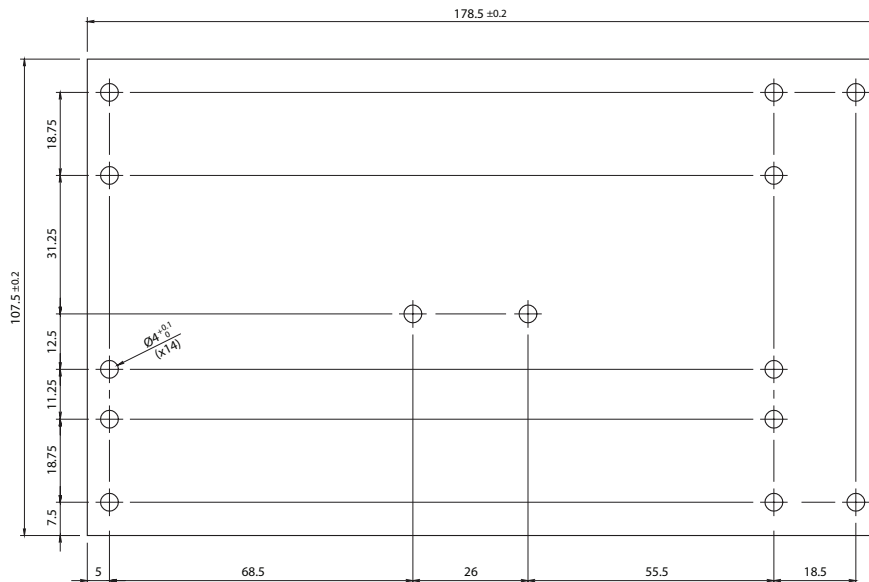
Do not install the device in places subject to high humidity and/or dirt; in fact, it is intended for use in sites with ordinary or normal levels of pollution. Keep the area around the instrument cooling slots adequately ventilated.

A diagram is provided below indicating where to drill the holes required to mount the 2 boards IWP750 and IWP760:

IWP750 POWER MODULE



IWP760 POWER MODULE

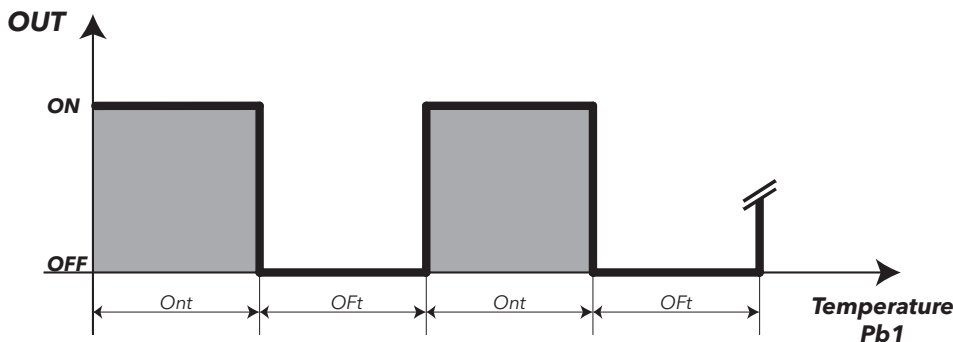


DUTY-CYCLE REGULATOR

A probe Pb1 (cold room) error causes the following actions:

- Code E1 is shown on the display
- The regulator is activated as indicated by parameters **Ont** and **Oft** if set for Duty Cycle.

The OdO parameter, for its entire duration, prevents activation of any output controlling a relay (compressor, defrosting, fans, etc.), with the exception of the buzzer and any alarm relay.



Ont and **Oft** parameters programmed for Duty Cycle

Ont	Oft	Compressor output
0	0	OFF
0	>0	OFF
>0	0	ON
>0	>0	DUTY CYCLE

STAND-BY REGULATOR (ON-OFF)

The Stand-by regulator can be enabled via the digital input (if configured correctly) or using one of the suitably programmed keys.

Operation:

- **Case1:** In off mode, only the display switches off and normal regulation continues (alarms are also signalled). In the event of an alarm, the display switches on to indicate the malfunction occurring; in this case the term display **OFF** applies.
- **Case2:** In off mode, the display remains on and all regulators are locked, including alarms; in this case the term **Stand-by** applies.
- **Case3:** In off mode, the display switches off and all regulators are locked, including alarms; in this case the term **Stand-by** applies.
- **Case4:** In off mode, "OFF" appears on the display and all regulators are locked, including alarms; in this case the term **Stand-by** applies.

When ON mode is restored via a key or an appropriately configured digital input, regular operation will commence, as is the case from power on. After switching on, the temperature alarm is excluded for a period of time "PAO" and the delay set by **OdO** (cases 2-3) is enabled. Every time the appliance is switched off, all cycles times are reset to zero (case 2-3).

The on/off status is saved in non-volatile memory hence when power is restored after a blackout or after switching off, the device will restart in the status that was active prior to the power supply interruption.

NOTES: 1) when the device is OFF, all relays are disabled in accordance with parameter H08.

2) when the device is in Stand-by, all relays are de-energised (case 2-3-4) with the exception of AUX or ON-OFF (see H06).

CONDENSER FILTER CLEANING SIGNAL

Preventive maintenance/cleaning of the filter on the condensers is scheduled using parameters **CCi** and **CCb**.

The **CCi** parameter sets the number of days after which the alarm is activated (0 = disabled), while **CCb** is used to establish whether or not the buzzer will sound when the filter cleaning alarm is activated.

When the alarm is activated, simply press any key to silence the buzzer.

Resetting takes place manually, by pressing the UP + DOWN keys simultaneously or by accessing the **FnC** functions folder and selecting the **rCF** function. The counter will then start again from 0.

DIAGNOSTIC

Alarms are always indicated by the buzzer (if present) and the alarm led.

To switch off the buzzer, press and release any key; the corresponding led will continue to flash.

N.B.: If alarm exclusion times have been set (see "AL" folder in the parameters table) the alarm will not be signalled.

In the event of an alarm caused by a malfunctioning ambient probe (Pb1), the indication "E1" will appear on the display.

For a malfunctioning evaporator probe (Pb2), the indication "E2" will appear.

ALARMS

Label	Fault	Cause	Effects	Remedy
E1	Probe 1 faulty (cold room)	<ul style="list-style-type: none"> • Measured values are outside operating range • Probe faulty/short-circuited/open 	<ul style="list-style-type: none"> • Label E1 displayed • Alarm led permanently on • max/min alarm controller disabled • FCompressor operation based on parameters "Ont" and "OFt". 	<ul style="list-style-type: none"> • check probe type (par. H00) • check probe wiring • replace probe
E2	Probe 2 faulty (defrost)	<ul style="list-style-type: none"> • Measured values are outside operating range • Probe faulty/short-circuited/open 	<ul style="list-style-type: none"> • Label E2 displayed • Alarm led permanently on • The defrost cycle will end due to Time out (par. dEt) 	<ul style="list-style-type: none"> • check probe type (par. H00) • check probe wiring • replace probe
AH1	HIGH temperature alarm Pb1	value read by Pb1 > HAL after time of "tAO". (see "MAX/MIN TEMPERATURE ALARMS")	<ul style="list-style-type: none"> • Label AH1 recorded in folder AL • No effect on regulation 	Wait until value read by Pb1 returns below HAL .
AL1	LOW temperature alarm Pb1	value read by Pb1 < LAL after time of "tAO". (see "MAX/MIN TEMPERATURE ALARMS")	<ul style="list-style-type: none"> • Label AL1 recorded in folder AL • No effect on regulation 	Wait until value read by Pb1 returns above LAL .
nPA	pressure switch alarm	Activation of pressure alarm by general pressure switch.	<p>If the number N of pressure switch activations is N < PEn:</p> <ul style="list-style-type: none"> • Folder nPA recorded in folder AL, with the number of pressure switch activations • Regulation blocked (Compressor and Fans) 	<ul style="list-style-type: none"> • check and remove the cause which triggered the alarm on the D.I. (Automatic Reset)
EP1	pressure switch 1 alarm (Compressor1)	Pressure switch alarm activation by pressure switch on compressor1.	<p>If the number N of pressure switch 1 activations is N = PEn:</p> <ul style="list-style-type: none"> • Label EP1 displayed • Label PA recorded in folder AL • Alarm led permanently on • Regulation blocked (Compressor and Fans) 	<ul style="list-style-type: none"> • Switch the device off and back on again • Reset alarms by entering the functions folder and selecting the rAP function (Manual Reset).
EP2	pressure switch 2 alarm (Compressor2) (IWP760 only)	Pressure switch alarm activation by pressure switch on compressor2.	<p>If the number N of pressure switch 2 activations is N = PEn:</p> <ul style="list-style-type: none"> • Label EP2 displayed • Label PA recorded in folder AL • Alarm led permanently on • Regulation blocked (Compressor and Fans) 	<ul style="list-style-type: none"> • Switch the device off and back on again • Reset alarms by entering the functions folder and selecting the rAP function (Manual Reset).
ECC	Condenser filter cleaning signal	The set time interval for condenser filter cleaning. (par. CCi)	<ul style="list-style-type: none"> • Label ECC displayed • Buzzer activation if CCb = y 	<ul style="list-style-type: none"> • Press any key to silence the alarm • Reset the alarm by pressing the UP + DOWN keys simultaneously, or by using the rCF function in the FnC function folder.
E7	No link between power module and keyboard	Communication fault between Power module and Keyboard	<ul style="list-style-type: none"> • Label E7 recorded in folder AL • No effect on regulation 	<ul style="list-style-type: none"> • Wait for any disturbances to disappear • During configuration, switch off all devices then switch them back on again.

IWP POWER MODULE PARAMETERS Table

PAR.	DESCRIPTION	RANGE	M.U.	IWP750	Level	IWP760	Level
SEt	Setpoint. Control value whose range is between the minimum Setpoint LSE and the maximum Setpoint HSE. The SEtpoint is visible from the machine status menu and not from the programming menu.	LSE ... HSE	°C/°F	-23,0	---	-23,0	---
COMPRESSOR (folder CP)							
diF	Compressor relay activation differential; the compressor stops on reaching the Setpoint value (as indicated by the regulation probe) and restarts at a temperature value equal to the Setpoint plus the value of the differential. N.B.: diF cannot be equal to 0.	0,1 ... +30,0	°C/°F	2,0	User	2,0	User
HSE	Maximum value that can be assigned to the Setpoint. N.B.: The two Setpoints are interdependent: HSE cannot be less than LSE and vice-versa.	LSE ... +302	°C/°F	-18,0	User	-18,0	User
LSE	Minimum value that can be assigned to the Setpoint. N.B.: The two Setpoints are interdependent: LSE cannot be higher than HSE and vice-versa.	-58,0 ... HSE	°C/°F	-26,0	User	-26,0	User
OSP	Offset SetPoint. Temperature value to be added algebraically to the setpoint if reduced set enabled (Economy function). Enabling can be key-controlled, with specially configured key. N.B.: OSP cannot be equal to 0.	-30,0 ... 30,0	°C/°F	0,0	Inst	0,0	Inst
Cit	Compressor minimum running time before switching off. If Cit = 0 it is not active.	0 ... 250	min	2	Inst	2	Inst
CAt	Compressor maximum running time before switching off. If CAt = 0 it is not active.	0 ... 250	min	0	Inst	0	Inst
Ont	Compressor start time in the event of faulty probe. - if Ont = 1 and Oft = 0 , the compressor will always stay on (ON), - if Ont > 0 and Oft > 0 , it will run in duty cycle (see Duty Cycle diagram)	0 ... 250	min	10	User	10	User
Oft	Compressor switch-off time in the event of a probe fault. - if Oft = 1 and Ont = 0 , the compressor will always stay off (OFF), - if Oft > 0 and Ont > 0 , it will run in duty cycle (see Duty Cycle diagram)	0 ... 250	min	2	User	2	User
dOn	Delay time between switch-ons; the indicated delay time must elapse between two consecutive compressor switch-ons.	0 ... 250	secs	0	User	0	User
dOf	Delay time after switch off: the delay time indicated must elapse between deactivation of the compressor relay and the next switch-on.	0 ... 250	min	2	User	2	User
dbi	Delay time between switch-ons; the delay time indicated must elapse between two consecutive compressor switch-ons.	0 ... 250	min	2	User	2	User
OdO (!)	Delay in activating outputs after the instrument is switched on or after a power failure. If OdO = 0 it is not active.	0 ... 250	min	0	User	0	User
dSC	Delay in 2nd compressor activation. The dSC time must elapse between the activation of the compressor and the 2nd compressor. If the compressor switches off during the dSC period, the 2nd compressor will also remain off.	0 ... 250	secs	0	User	0	User
CCi	Time between one condenser cleaning procedure and the next. The alarm indicating the need to clean the condenser filter will be activated after CCi days.	0 ... 255	days	90	Inst	90	Inst
CCb	Enables/Disables the buzzer when the "condenser filter cleaning" alarm occurs.	n/y	flag	y	Inst	y	Inst
DEFROST (folder dEF)							
dty	defrost type. Type of defrost. 0 = electric defrost - compressor OFF during defrost cycle 1 = cycle inversion defrost (hot gas) - compressor ON during defrost cycle 2 = "Free": defrosting independently of compressor	0/1/2	num	0	User	0	User
dit	defrost interval time. Interval between the start of two consecutive defrost cycles. 0 = function disabled (defrosting NEVER performed)	0 ... 250	hours	8	User	8	User
dt1	defrost time 1. Unit of measure for defrost interval (parameter dit). 0 = parameter dit in hours. 1 = parameter dit in minutes. 2 = parameter dit in seconds.	0/1/2	num	0	Inst	0	Inst
dt2	defrost time 2. Unit of measure for duration of defrost (parameter dEt). 0 = parameter dEt in hours. 1 = parameter dEt in minutes. 2 = parameter dEt in seconds.	0/1/2	num	1	Inst	1	Inst
dCt	defrost Counting type. Selects the count mode for the defrost interval. 0 = compressor running time (DIGIFROST® method); Defrost active ONLY when the compressor is ON. N.B.: compressor running hours are counted separately from the evaporator probe (count active also when evaporator probe missing or faulty). 1 = appliance running time; the defrost count is always active when the machine is on and starts at each power-on; 2 = compressor stop. Every time the compressor stops, a defrost cycle is performed according to parameter dtY; 3 = not USED	0 ... 3	num	1	User	1	User
dCt	defrost relay	dty	compressor relay (in defrost)				
0 = compressor running hours	ON when dit is reached OFF when Pb2=dSt or due to time (dEt)	0 = electrical defrosting; 1 = reverse cycle defrost 2 = Free mode defrost	OFF ON ON if required by setpoint				
1 = Real time	ON when dit is reached OFF when Pb2=dSt or due to time (dEt)	0 = electrical defrosting; 1 = reverse cycle defrost 2 = Free mode defrost	OFF ON ON if required by setpoint				
2 = compressor stop	ON when compressor OFF OFF when Pb2=dSt or due to time (dEt)	0 = electrical defrosting; 1 = reverse cycle defrost 2 = Free mode defrost	OFF NOT RECOMMENDED!!! ON if required by setpoint				
3 = not used							
dOH	Defrost start delay time after request.	0 ... 59	min	0	User	0	User
dEt	Defrost time-out; determines the maximum defrost duration.	1 ... 250	min	30	User	30	User
dSt	Defrost end temperature (determined by the evaporator probe).	-50,0 ... 150	°C/°F	2,0	User	2,0	User
dPO	Determines whether the instrument must enter defrost mode (if the temperature measured by the evaporator allows this operation). n = no , does not start defrosting at start-up; y = yes , starts defrost at start-up.	n/y	num	n	User	n	User
tcd	Minimum compressor ON or OFF time before defrost. - if tcd > 0 (positive value) the compressor stays ON for " tcd " minutes; - if tcd < 0 (negative value) the compressor stays OFF for " tcd " minutes; - if tcd = 0 the parameter is ignored.	-31 ... +31	min	0	Inst	0	Inst
Cod	Compressor OFF time near a defrost cycle. If a defrost is programmed during the period of time set in this parameter, the compressor is not turned on. If Cod = 0 the function is excluded.	0 ... 60	min	0	Inst	0	Inst

PAR.	DESCRIPTION	RANGE	M.U.	IWP750	Level	IWP760	Level
FANS REGULATOR (folder FAn) (N.B.: for these parameters, Evaporator means Evaporator 1)							
FpT	Characterises parameter "FSt" which can be expressed either as an absolute temperature value or as a value relative to the Setpoint. 0 = absolute; 1 = relative.	0/1	num	0	Inst	0	Inst
FSt	Fan block temperature; if the evaporator probe reads a higher value than the set value, the fans are stopped. The value is either positive or negative and, depending on parameter FpT , can be either the absolute temperature or the temperature relative to the set point.	-50,0 ... +150	°C/°F	50,0	User	50,0	User
Fot	Fans start-up temperature; if the evaporator temperature is less than the set value in this parameter, the fans remain stopped. The value is positive or negative and is based on the FpT parameter, and represents the temperature in an absolute or relative manner related to the setpoint.	-50,0 ... +150	°C/°F	-50,0	Inst	-50,0	Inst
FAd	Fan activation intervention differential (see parameters " FSt " and " Fot "). Represents the difference in fan activation and deactivation temperatures.	1,0 ... 50,0	°C/°F	2,0	User	2,0	User
Fdt	Fan activation delay after a defrost cycle.	0 ... 250	min	8	User	8	User
dt	Dripping time. After a defrost cycle, the fans and compressor remain off for the dt time.	0 ... 250	min	1	User	1	User
dFd	Allows exclusion of the evaporator fans to be selected or not selected during defrosting. y = yes; n = no.	n/y	flag	y	User	y	User
FCO	Fan Compressor OFF. Selects or deselects fan deactivation at compressor OFF. n = fans off; y = fans on (with thermostat; depending on the value read by the defrosting probe, see parameter "FSt"); dc = duty cycle (via parameters "Fon" and "FoF").	n/y/dc	num	y	User	y	User
FdC	Fans switch-off delay after compressor stop; in minutes. If Fdc = 0 the function is excluded.	0 ... 99	min	0	Inst	0	Inst
Fon	Fan ON time in duty cycle. Fans used in duty cycle mode; valid when FCO = dc and H42=y (evaporator probe present)	0 ... 99	min	0	Inst	0	Inst
FoF	Fan OFF time in duty cycle. Fans used in duty cycle mode; valid when FCO = dc and H42=y (evaporator probe present)	0 ... 99	min	0	Inst	0	Inst
ALARMS (folder AL)							
Att	Alarm type. Parameters " HAL " and " LAL " intended as the absolute temperature value or differential in relation to the setpoint. 0 = absolute value; 1 = relative value. N.B.: In case of relative values (para. Att=1) parameter HAL should be set to positive values, whilst parameter LAL should have only negativ values (-LAL).	0/1	flag	0	Inst	0	Inst
AfD	Alarm differential. Temperature difference between activation and deactivation of a max/min alarm.	1,0 ... 50,0	°C/°F	2,0	User	2,0	User
HAL (!)	Maximum temperature alarm. Temperature value (intended either as distance from Setpoint or as an absolute value based on Att) which, if exceeded in an upward direction, triggers the activation of the alarm signal. See Max/Min Alarms Table.	LAL to 150	°C/°F	50,0	User	50,0	User
LAL (!)	Minimum temperature alarm. Temperature value (intended as distance from the set point or as an absolute value based on Att) which, when exceeded downwards, triggers the activation of the alarm signal. See Max/Min Alarms Table.	-50,0 to HAL	°C/°F	-50,0	User	-50,0	User
PAO (!)	Alarm override time after device is switched on following a power failure. This parameter refers to high/low temperature alarms only.	0 ... 10	hours	3	User	3	User
dAO	Temperature alarm exclusion time after defrost. This parameter refers to high/low temperature alarms only.	0 ... 999	min	90	User	90	User
tAO	Time delay for temperature alarm indication. This parameter refers to high/low temperature alarms only.	0 ... 250	min	90	User	90	User
PRESSURE SWITCH (folder PrE)							
PEn	Number of errors allowed for pressure switch input. 0 = disabled.	0...15	min	0	User	0	User
PEI	Pressure switch error count interval.	1...99	num	1	User	1	User
LINK (folder Lin)							
L00	Master, Slave, Keyboard Selection. Permits selecting an instrument as Master (0), Slave (da 1 a 7), Echo (0; in this case the Echo functions as a Master repeater, even if connected to a Slave).	0...4	num	0	Inst	0	Inst
L01	Number of Slaves in the Network. Refers only to Master. Number of Slaves in network (from 0 to 7). For Slaves/Echos leave value L01 = 0 .	0...4	num	0	Inst	0	Inst
L03	Sequential /Simultaneous Defrost. Refers to both Master and Slave. Simultaneous / sequential defrost. Master: n = sequential; y = simultaneous. Slave: n = ignore; y = accept.	n/y	num	n	Inst	n	Inst
L05	Network Command Enabled. Refers to both Master and Slave. Master: n = does not require that the Slaves have remote function activated; y = requires the Slaves to have remote function activated. Slave: n = ignores activation of remote functions coming from Master; y = accepts activation of remote functions coming from Master.	n/y	num	n	Inst	n	Inst
L08	Network Command Enabled from Slave. Enabling of basic slave network functions. n = disable; y = enable	n/y	num	n	Inst	n	Inst
DISPLAY (folder diS)							
LOC	LOCK. Block Setpoint modification. See corresponding paragraph. You can still access the parameter programming menu and edit the parameters, including this parameter, in order to allow keyboard unlocking. n = no; y = yes.	n/y	flag	n	User	n	User
PA1	PAssword 1. When enabled (PA1 ≠ 0), this is the access key to the level1 parameters (User).	0...250	num	0	User	0	User
PA2	PAssword 2. When enabled (PA2 ≠ 0), this is the access key to the level2 parameters (Installer).	0...250	num	0	Inst	0	Inst
ndt	Display with or without decimal point. n = no (integers only); y = si (displayed with decimal point).	n/y	flag	n	User	n	User
CA1	Calibration 1. Positive or negative temperature value added to the value read by Pb1 , according to the setting of parameter " CAI ", before being displayed and used for regulation.	-12,0...12,0	°C/°F	4,0	User	4,0	User
CA2	Calibration 2. Positive or negative temperature value added to the value read by Pb2 , according to the setting of parameter " CAI ", before being displayed and used for regulation.	-12,0...12,0	°C/°F	2,0	User	2,0	User
CA	Activation of offset for display, temperature control or both. 0 = sum with only the temperature displayed; 1 = sum with only the temperature used by the regulators, not for the display, which remains unchanged; 2 = sum with the displayed temperature, which is also used by the regulators.	0/1/2	num	2	Inst	2	Inst
LdL	Minimum value that can be displayed by the device.	-55,0 ... HdL	°C/°F	-50,0	Inst	-50,0	Inst
HdL	Maximum value that can be displayed by the device.	LdL ... 302	°C/°F	302	Inst	302	Inst

PAR.	DESCRIPTION	RANGE	M.U.	IWP750	Level	IWP760	Level																
ddl	defrost display Lock. Display mode during defrost. 0 = displays the temperature read by probe Pb1 ; 1 = locks the reading at the temperature value read by thermostat probe when defrosting starts and until the next time the Setpoint value is reached; 2 = displays the label " deF " during defrosting and until the next time the Setpoint value is reached. (or until Ldd has elapsed).	0/1/2	num	1	User	1	User																
ldd	Timeout value to unlock the display (label deF) if the time to reach setpoint is too long during defrost, or if LAN communication between master and slave is interrupted (E7 error).	0 ... 255	min	120	User	120	User																
dro	Selection of °C or °F to display the temperature read by probes. 0 = °C, 1 = °F. N.B.: switching between °C and °F or vice versa DOES NOT modify the setpoint, differential, etc (e.g. set=10°C becomes 10°F).	0/1	flag	0	User	0	User																
ddd	Selects type of value to display. 0 = Setpoint; 1 = cold room probe Pb1 ; 2 = evaporator probe Pb2 ; 3 = NOT USED.	0/1/2/3	num	1	Inst	1	Inst																
CONFIGURATION (folder CnF) - NOTA: the instrument must be switched off and then on again each time folder CnF parameter configuration is modified to prevent any malfunction of the configuration and/or current timer operations.																							
H02	Key activation time, when configured with second function. When the ESC , UP and DOWN keys have been configured with a second function (defrost, aux, ecc) set, a time is set for quick activation of the second function, with the exception of the AUX and LIGHT functions which have a fixed delay of 0.5 seconds.	0...15	secs	2	Inst	2	Inst																
H06	Determines if the AUX/light door switch key/input are active when the device is OFF (but power on). n = key and DI not active when OFF; y = key and DI active when OFF.	n/y	flag	n	Inst	n	Inst																
H08	Function when in stand-by mode. 0 = only display OFF; 1 = display ON and regulators blocked; 2 = display off and regulators blocked; 3 = display shows 'OFF' label and regulators are blocked;	0...3	num	3	Inst	3	Inst																
H11	Configuration of digital input 1/polarity (D.I.1). 0 = disabled; ±1 = defrost; ±2 = reduced set; ±3 = AUX; ±4 = door switch; ±5 = external alarm; ±6 = NOT USED; ±7 = stand-by (ON-OFF); ±8 = NOT USED; ±9 = NOT USED; ±10 = NOT USED; ±11 = general pressure switch; ±12 = pre-heating; ±13 = forces evaporator fans; ±14 = activates light relay; ±15 = activates Frame Heater relay; ±16 = NOT USED; ±17 = general pressure switch compressor 2. N.B.: - The "+" sign indicates that the input is active when the contact is closed. - The "-" sign indicates that the input is active when the contact is open.	-17...+17	num	11	Inst	11	Inst																
H12	Model IWP760 only: Configuration of digital input 2/polarity (D.I.2). Same as H11.	-17...+17	num		Inst	17	Inst																
H21	Configuration of digital output 1 (OUT1 - RL1). 0 = disabled; 1 = compressor; 2 = defrost; 3 = fans; 4 = alarm; 5 = AUX; 6 = Stand-by; 7 = light; 8 = buzzer; 9 = defrosts evaporator 2; 10 = compressor 2; 11 = Frame Heater.	0...11	num	7	Inst	1	Inst																
H22	Configuration of digital output 2 (OUT2 - RL2). Same as H21.	0...11	num	3	Inst	3	Inst																
H23	Configuration of digital output 3 (OUT3 - RL3). Same as H21.	0...11	num	1	Inst	10	Inst																
H24	Configuration of digital output 4 (OUT4 - RL4). Same as H21.	0...11	num	2	Inst	2	Inst																
H25	Configuration of digital output 5 (OUT5 - RL5). Same as H21.	0...11	num	6	Inst	6	Inst																
H26	Model IWP760 only: Configuration of digital output 6 (OUT6 - RL6). Same as H21.	0...11	num		Inst	7	Inst																
H31	UP key configurability. 0 = disabled; 1 = defrost; 2 = AUX; 3 = reduced set; 4,5 = NOT USED; 6 = Light; 7 = Stand-by; 8 = NOT USED; 9 = activates evaporator fans; 10 = activates/disables Frame Heater relay; 11 = NOT USED; 12 = display/change Setpoint	0...12	num	0	Inst	0	Inst																
H32	DOWN key configurability. Same as H31.	0...12	num	0	Inst	0	Inst																
H33	ESC key configurability. Same as H31.	0...12	num	1	Inst	1	Inst																
H34	Function1 key configurability (AUX). Same as H31.	0...12	num	6	Inst	6	Inst																
H35	Function2 key configurability (ON/OFF). Same as H31.	0...12	num	7	Inst	7	Inst																
H41	Regulation probe presence (Pb1). n = not present; y = present.	n/y	flag	y	Inst	y	Inst																
H42	Evaporator probe presence (Pb2). n = not present; y = present.	n/y	flag	y	Inst	y	Inst																
H58	Select parameter vector.	tn/bt	flag	bt	Inst	bt	Inst																
reL	reLease firmware. Device software release: read-only parameter	/	/	/	/	/	User/Inst																
tAb	tAble of parameters. Reserved: read-only parameter	/	/	/	/	/	User/Inst																
COPY CARD (folder FPr)																							
UL	Upload. Programming parameter transfer from instrument to Copy Card.	/	/	/	/	/	User																
dL	Download. Programming parameter transfer from Copy Card to instrument.	/	/	/	/	/	User																
Fr	Formatting. Cancels all data in the Copy Card. PLEASE NOTE: using the "Fr" parameter (key formatting) results in permanent loss of data inserted in key. The operation cannot be cancelled.	/	/	/	/	/	User																
FUNCTIONS (folder FnC)																							
The following functions are available in the 'FnC' folder (last folder visible from the Programming Menu, level 1):																							
<table border="1"> <thead> <tr> <th>Function</th> <th>Function label ACTIVE</th> <th>Function label INACTIVE</th> <th>Alarm Signalling</th> </tr> </thead> <tbody> <tr> <td>Reduced SET</td> <td>OSP</td> <td>SP</td> <td>Led ON</td> </tr> <tr> <td>Pressure switch alarm reset</td> <td>rAP</td> <td>rAP</td> <td>Led ON</td> </tr> <tr> <td>Condenser cleaning alarm reset</td> <td>rCF</td> <td>rcF</td> <td>Led ON</td> </tr> </tbody> </table>								Function	Function label ACTIVE	Function label INACTIVE	Alarm Signalling	Reduced SET	OSP	SP	Led ON	Pressure switch alarm reset	rAP	rAP	Led ON	Condenser cleaning alarm reset	rCF	rcF	Led ON
Function	Function label ACTIVE	Function label INACTIVE	Alarm Signalling																				
Reduced SET	OSP	SP	Led ON																				
Pressure switch alarm reset	rAP	rAP	Led ON																				
Condenser cleaning alarm reset	rCF	rcF	Led ON																				
NOTES: • to modify the status of a specified function press the 'set' button • If the unit is switched off, the function labels go back to their default status.																							

- NOTES:** 1) If one or more parameters marked with (!) are modified, the controller **MUST** be switched off and then switched on again to ensure correct operation
2) Parameters with grey are part of bt and tn vectors.

BT/TN PROGRAMMING

The tab contains two parameter SET values, **bt** and **tn**, which can be selected in one of the following ways:

- Through suitable configuration of parameter **H58**
- Using the Copy Card
- Using the keyboard, pressing and holding the DOWN and ESC keys for at least 3 seconds: the type of operation active at that moment (**tn** for Vector 0, **bt** for Vector 1) will appear. The UP and DOWN keys can be used to change this value; pressing SET, ESC or allowing a timeout will make it possible to restart the machine with the new program selected.

Once the vector selected previously has loaded, the user will be able to modify the values of the aforementioned parameters: these values will be saved in E2. Selecting another vector will result in the values set previously being lost.

The parameters contained within the vectors cannot be modified by the user, but can be through serial programming (Param Manager or similar tools). It is recommended that the machine is switched off (reset) when programming is complete, to reset any counters which are already active.

Operation:

- once a **bt** or **tn** vector has been loaded, it is stored in the memory of parameter H58.
- loaded parameters can be modified and saved.
- vector parameters CANNOT be modified and saved.
- once the vector has been loaded, the instrument restarts with the updated values.

DEFAULT value for BT/TN vector (Parameter H58)

PAR.	DESCRIPTION	RANGE	M.U.	IWP750		IWP760	
				TN	BT	TN	BT
SEt	Setpoint. Control value whose range is between the minimum Setpoint LSE and the maximum Setpoint HSE.	LSE ... HSE	°C/°F	2,0	-23,0	2,0	-23,0
diF	Compressor relay activation differential. N.B.: diF cannot be equal to 0.	0,1 ... +30,0	°C/°F	2,0	2,0	2,0	2,0
HSE	Maximum value that can be assigned to the Setpoint.	LSE ... +302	°C/°F	8,0	-15,0	8,0	-15,0
LSE	Minimum value that can be assigned to the Setpoint.	-58,0 ... HSE	°C/°F	0,0	-25,0	0,0	-25,0
dty	defrost type. Type of defrost.						
	0 = electric defrost - compressor OFF during defrost cycle 1 = cycle inversion defrost (hot gas) - compressor ON during defrost cycle 2 = 'Free': defrost independent of compressor	0/1/2	num	0	0	0	0
dit	defrost interval time. Interval between the start of two consecutive defrost cycles. 0 = function disabled.	0 ... 250	hours	8	8	8	8
dCt	defrost Counting type. Selects the count mode for the defrost interval. 0 = compressor running hours (DIGIFROST® method); 1 = appliance running hours; 2 = compressor stop. 3 = not USED	0 ... 3	num	1	1	1	1
dOH	Defroststart delay time after request.	0 ... 59	min	0	0	0	0
dEt	Defrost time-out; determines the maximum defrost duration.	1 ... 250	min	30	30	30	30
dSt	Defrost end temperature (determined by Pb2 probe).	-50,0 ... 150	°C/°F	10,0	10,0	10,0	10,0
dPO	Determines whether the instrument must enter defrost mode. n = no; y = yes.	n/y	num	n	n	n	n
FSt	Fan block temperature. The value is either positive or negative and, depending on parameter Fpt , can be either the absolute temperature or the temperature relative to the Setpoint.	-50,0 ... +150	°C/°F	50,0	10,0	50,0	10,0
Fdt	Fan activation delay after a defrost cycle.	0 ... 250	min	0	10	0	10
dt	Dripping time. After a defrost cycle, the fans and compressor remain off for the dt time.	0 ... 250	min	1	3	1	3
dFd	Allows exclusion of the evaporator fans to be selected or not selected during defrosting. y = yes; n = no.	n/y	flag	n	n	n	n
ddl	defrost display Lock. Display mode during defrost.						
	0 = displays the temperature read by probe Pb1 ; 1 = locks the reading at the temperature value read by thermostat probe when defrosting starts and until the next time the set point value is reached; 2 = displays the label ' deF ' during defrosting and until the next time the Setpoint value is reached (or until Ldd has elapsed).	0/1/2	num	1	1	1	1

ELECTRICAL CONNECTIONS

Important! Make sure the machine is switched off before working on the electrical connections.

The device is equipped with:

- **IWP power module:** FASTON screw terminals to connect electrical cables, the cross-section of which must not exceed 2.5mm² (one wire per terminal for power connections): see the rating plate on the device for terminal ratings.
- **IWK keyboard:** Screw terminals to connect electrical cables, the cross-section of which must not exceed 1.5 mm² (one wire per terminal for power connections): see the rating plate on the device for terminal ratings.

The relay outputs are voltage free. Do not exceed the maximum permitted current; for higher loads, use a contactor with sufficient power capacity. Make sure that power supply is of the correct voltage for the instrument. Probes have no connection polarity and can be extended using a normal bipolar cable (note that the extension of the probes influences the instrument's electromagnetic compatibility -EMC: take great care with the wiring).

Probe cables, power supply cables and the TTL serial cables should be routed separately from power cables

It is recommended, for security reasons, that the instrument is installed on insulating supports/columns.

RESPONSIBILITY AND RESIDUAL RISKS

Eliwell Controls srl declines any liability for damage due to:

- Installation/uses other than those expressly specified and, in particular, failure to comply with the safety requirements of established standards and/or instructions specified in this document.
- Use on panels that do not provide adequate protection against electric shocks, water or dust when assembled.
- Use on panels allowing access to dangerous parts without having to use tools.
- Tampering with and/or modification of the product.
- Installation/use on panels which are not compliant with current standards and regulations.

DISCLAIMER

This document is the exclusive property of Eliwell Controls and may not be reproduced or circulated unless expressly authorised by Eliwell Controls itself. Every care has been taken in preparing this document; however, Eliwell Controls srl cannot accept liability for any damage resulting from its use.

The same applies to any person or company involved in preparing and editing this document. Eliwell Controls srl reserves the right to make changes or improvements at any time without notice.

CONDITIONS OF USE

Permitted use

For safety reasons, the device must be installed and used according to the instructions provided. In particular, parts carrying dangerous voltages must not be accessible in normal conditions. The device must be adequately protected from water and dust with regard to the application, and must only be accessible using tools (with the exception of the front panel). The device is suitable for use in household refrigeration appliances and/or similar equipment and has been tested for safety aspects in accordance with the harmonized European reference standards.

Improper use

Any use other than that expressly permitted is prohibited. The relays provided are of a functional type and can be subject to failure: any protection devices required by product standards, or suggested by common sense for obvious safety requirements, must be installed externally to the controller.

eliwell

Eliwell Controls s.r.l.

Via dell'Industria, 15 • Z.I. Paludi
32010 Pieve d'Alpago (BL) - ITALY
Telephone +39 0437 986 111
Facsimile +39 0437 989 066
www.eliwell.it

Technical Customer Support:

Technical helpline +39 0437 986 300
E-mail: techsuppeliwell@invensys.com

Sales:

Telephone +39 0437 986 100 (Italy)
+39 0437 986 200 (other countries)
E-mail: saleseliwell@invensys.com

