

## Z31- Z31S

DIGITAL ELECTRONIC  
THERMO-CONTROLLER

### OPERATING INSTRUCTIONS



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User Manual Highlighted for:  
**Z31-A GS Single Set-Point Digital  
Temperature Controller**

This is the standard single set-point controller shipped by Advanced Thermoelectric with some of our thermoelectric assemblies. It replaces the TLZ10 and TDH-01 Series. The "G" type operates in both 12 and 24V applications and has one "S" 16 Amp SPDT relay output. See the notes on pages 6&7 for modifications we make to the default parameter settings, including moving the set-point to 4 °C. Additional information for use with ElectraCOOL™ assemblies on last page.

*The Z31-A DOES NOT have defrost or buzzer functions. Parameters related to those functions are not present.*

#### FOREWORD



This manual contains the information necessary for the product to be installed correctly and also instructions for its maintenance and use; we therefore recommend that the utmost attention is paid to the following

instructions and to save it.

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#### 1 - INSTRUMENT DESCRIPTION

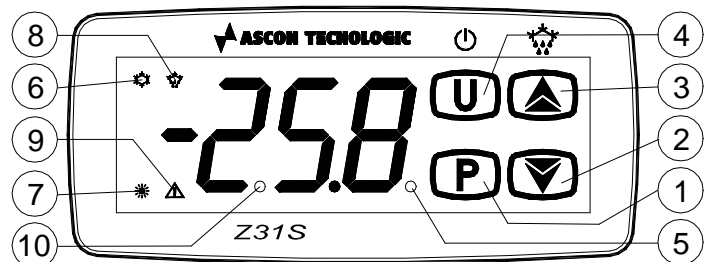
##### 1.1 - GENERAL DESCRIPTION

The model **Z31** is a digital electronic thermocontroller that is typically used in cooling applications that have temperature control with ON/OFF mode and defrosting control with intervals time by stopping compressor.

The instrument has one relay output and one input for PTC or NTC temperature probes, in addition can be equipped with an internal buzzer that is the sound system for alarms.

The model **Z31S** have the "S-touch" capacitive sensor keyboard system.

##### 1.2 - FRONT PANEL DESCRIPTION



**1 - Key P** : Used for setting the Set point (press and release) and for programming the function parameters (hold pressed for 5 sec.)

In programming mode is used to enter in parameters edit mode and confirm the values.

In programming mode it can be used together with the UP key to change the programming level of the parameters.

When the keyboard is locked it can be used together with the UP (hold pressed for 5 sec.) key to unlock the keyboard.

**2 - Key DOWN** : In programming mode is used for decreasing the values to be set and for selecting the parameters.

**3 - Key UP/DEFROST** : In normal mode can be used to start/stop manual defrosting (hold pressed for 5 sec.).

In programming mode is used for increasing the values to be set and for selecting the parameters.

In programming mode can be used together with key P to change parameters level.

Pressed together with the key P for 5 sec. allow the keyboard unlock

**4 - Key U** : Used (press and release) for visualising the instrument variables (measured temperatures etc.) .

In programming mode can be used to come back in normal mode (hold for 2 sec.).

It can also be programmed via the parameter "t.UF"

In normal mode and if par. "t.UF" = 4 it can be used to turning on and off (stand-by) the device (hold pressed for 1 sec.)

**5 - Led SET** : In normal mode it serves to indicate when a key is pressed.

In programming mode indicates the programming level of the parameters.

**6 - Led OUT - COOL** : Indicates the output status (compressor or temperature control device) when the instrument is programmed for cooling operation; on (on), off (off) or inhibited (flashing).

**7 - Led OUT - HEAT** : Indicates the output status (compressor or temperature control device) when the instrument is programmed for heating operation; on (on), off (off) or inhibited (flashing).

**8 - Led DEFROST** : Indicates defrosting in progress (on)

**9 - Led ALARM** : Indicates the alarm status (on), off (off) and silenced (flashing)

**10 - Led Stand-By**: Indicate the Stand-by status.

## 2 - PROGRAMMING

### 2.1 - FAST PROGRAMMING OF SET POINT

Press the key P then release it and the display will show "SP" alternating with the set value.

To change it press the UP key to increase the value or DOWN to decrease it.

These keys increase or decrease the value one digit at a time, but if the button is pressed for more than one second the value increase or decreases rapidly, and after two seconds pressed, the speed increases even more to all the desired valued to be reached rapidly.

When the desired value is set press the key P to exit from Set Point programming mode.

Exiting the Set mode is achieved by pressing the P key or automatically if no key is pressed for 10 seconds. After that time the display returns to the normal function mode.

### 2.2 - STANDARD MODE PARAMETERS PROGRAMMING

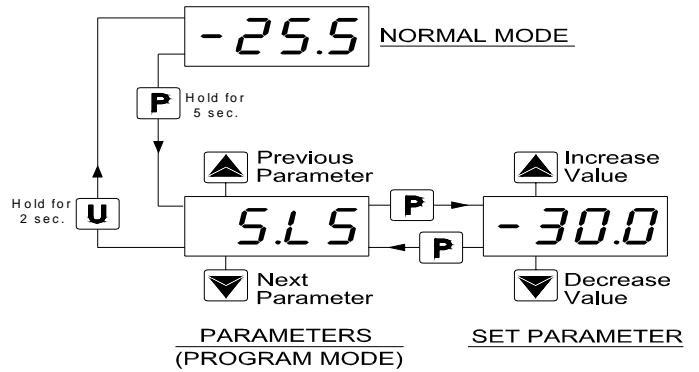
To access the instrument's function parameters when password protection is disable, press the key P and keep it pressed for about 5 seconds, after which the display will visualised the code that identifies the first parameter.

Using the UP and DOWN keys, the desired parameter can be selected and pressing the P key, the display will alternately show the parameter code and its setting that can be changed with the UP and DOWN keys.

Once the desired value has been set, press the key P again: the new value will be memorised and the display will show only the code of the selected parameter.

Pressing the UP and DOWN keys, it is possible to select another parameter and change it as described.

To exit the programming mode, do not press any key for about 30 seconds, or keep the U key pressed for 2 sec. until it exits the programming mode.



### 2.3 - PARAMETER PROTECTION USING THE PASSWORD

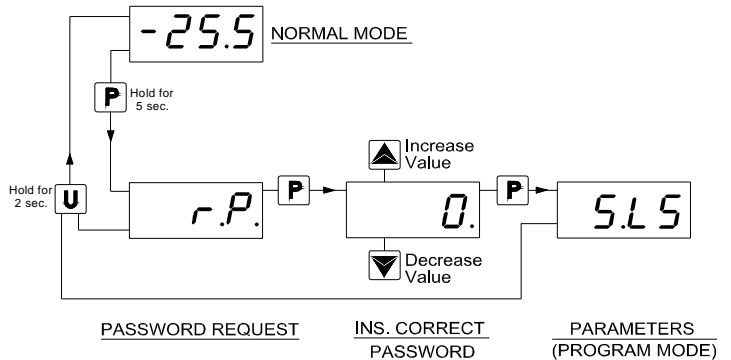
The instrument has a parameter protection function using a password that can be personalised, through the "t.PP" parameter. If one wishes to have this protection, set the password number desired in the parameter "t.PP".

When the protection is activate, press the P key to access the parameters and keep it press for about 5 seconds, after which the display will show "r.P".

At this point press P, the display show "0", using the UP and DOWN keys, set the password number programmed and press the key P.

If the password is correct, the display will visualise the code that identifies the first parameter and it will be possible to program the instrument in the same ways described in the previous section.

Protection using a password can be disabled by setting the parameter "t.PP" = 0F.



**Note:** If the Password gets lost, just swith off and on the instrument supply, push P key during the initial test and keeping the key pressed for 5 seconds.

In this way it's possible to have access to all the parameters, verify and modify the par. "t.PP".

### 2.4 - CUSTOMIZED MODE PARAMETER PROGRAMMING (PARAMETERS PROGRAMMING LEVEL)

The password protection hides all the configuration parameters behind a factory set password to avoid unwanted changes being made to the programming of the controller.

To make a parameter accessible without having to enter the password when "t.PP" password protection is activate follows this procedure.

Enter the programming using the Password "t.PP" and select the parameter which is desired to be accessible with no password protection.

Once the parameter has been selected, if the SET led is blinking, this means that the parameter is programmable by entering the password (it's then "protected") if it's instead on, this means the parameter is programmable without password (not protected).

If you want to change the accessibility of the parameter push P key, keep it pressed and press together also the key UP.

The led SET will change its state indicating the new access level of the parameter (on = not protected; blinking = protected by password).



- ON : means that the controller uses the control functions.  
 - STAND-BY : means that the controller does not use any control function and the display is turned off except for the led Stand-by.  
 If there is no power, and then power returns, the system always sets itself in the condition it was in before the black-out.  
 The ON/Stand-by function can be selected using the key U if the parameter "t.UF" = 4.  
 Pressing the key U for at least 1 sec., it is possible to switch the instrument from the ON status to Stand-by status and vice versa.

#### 4.2 - MEASURING AND DISPLAY

Via the parameter "i.SE" it is possible to select the type of probes that one wishes to use and which can be: thermistores PTC KTY81-121 (Pt) or NTC 103AT-2 (nt).

Via the parameter "i.uP", it is possible to select the temperature unit of measurement the desired measurement resolution (C0=°C / 1° ; C1=°C / 0.1° ; F0= °F / 1°; F1= °F / 0.1°).

The instrument allows the measuring to be calibrated, that can be used for re-calibrating the instrument according to application needs, through the parameters "i.C1".

Using the parameter "i.Ft", it is possible to set the time constant for the software filter for measuring the input values to be able to reduce the sensitivity to measurement disturbances (increasing the time).

The normal visualisation on the display is the measured temperature but it is possible to visualise the highest and lowest peak measurement values; by quickly pressing and releasing key U.

The display will alternately show:

"Lt" and the lowest peak temperature

"Ht" and the highest peak temperature

"Pr1" and the instant measured temperature

When the instrument is switched off, such values are always re-set. However, it is also possible to reset these values if the instrument is switched on by using the DOWN key hold for 3 sec. during peak visualization.

The display will show "---" and peaks memory will be reset.

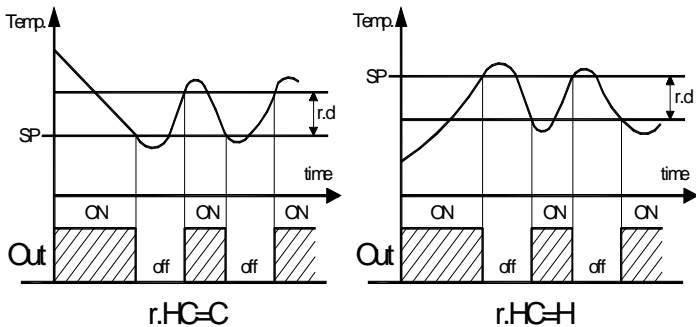
The exit of this visualisation mode occurs automatically 15 seconds after the last pressing on the key U.

Please remember that visualisation of the probe can be changed by the defrosting display lock function, by using the parameter "d.dL" (see defrost function).

#### 4.3 - TEMPERATURE CONTROL

The regulation of the instrument is ON/OFF and acts on the output depending on the measuring of probe, of the Set Point "SP", the intervention differential "r.d" and the function mode "r.HC".

Depending on the function mode programmed on the parameter "r.HC" the differential is automatically considered by the regulator with positive values for a Refrigeration control ("r.HC"=C) or with negative values for a heating control ("r.HC"=H).



In the event of probe error, it is possible to set the instrument so that the output continues to work in cycles according to the times programmed in the parameter "r.t1" (activation time) and "r.t2" (deactivation time).

If an error occurs on the probe the instrument activates the output for the time "r.t1", then deactivates it for the time "r.t2" and so on whilst the error remains.

Programming "r.t1" = 0F the output in probe error condition will remain switched off.

Programming instead "r.t1" to any value and "r.t2" = 0F the output in probe error condition will remain switched on.

Remember that the temperature regulation function can be conditioned by the "Compressor Protections", "Delay at power on" and "Desfrost" functions.

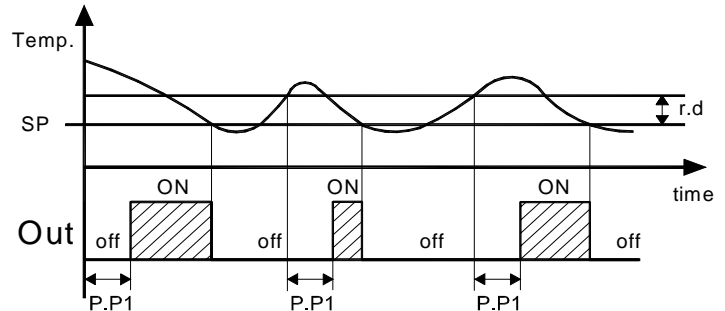
#### 4.4 - COMPRESSOR PROTECTION FUNCTION AND DELAY AT POWER-ON

The function "Compressor Protection" aims to avoid close start ups of the compressor controlled by the instrument in cooling applications.

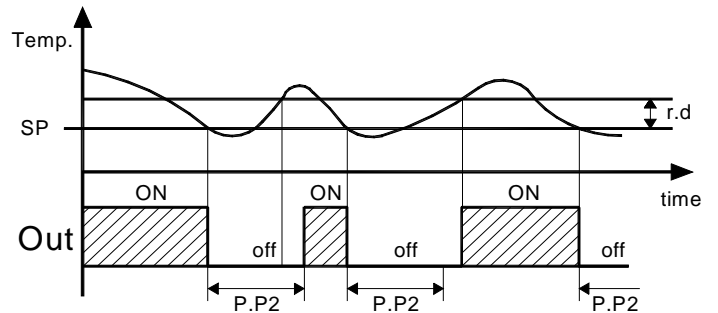
This function foresees 3 time controls on the switching on of the output associated with the temperature regulation request.

The protection consists of preventing the output being switched on during the times set in the parameters "P.P1", "P.P2" and "P.P3" and therefore that any activation occurs only after all the times has finished.

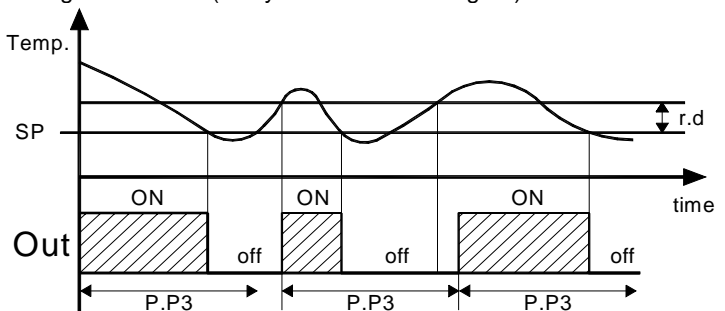
First control (par. "P.P1") foresees a delay to the output activation (switching-on delay).



Second control (par. "P.P2") foresees an inhibition to the activation of the output by a time delay that starts when the output is turning off (delay after switching-off).



Third control (par. "P.P3") foresees an inhibition to the activation of the output "Out" by a time delay that starts when the output was turning on last time (delay between switching-on).



During the output inhibition the led OUT (Cool o Heat) blinking.

It is also possible to prevent activation of the output after the instrument is turned on, for the time set in the parameter "P.od".

During the power on delay phase, the display shows the indication od, alternating with the normal visualisation.

All the functions are disabled by relative parameters = 0F.

#### 4.5 - DEFROST CONTROL **The Z31-"A" Does NOT have defrost control**

The automatic control of defrost, that is by stopping compressor, occurs by interval times

The automatic defrost function is activate when at the parameter "d.di" is set the defrost interval time.

The first defrost after switching on can be set by par. "d.Sd"

This allows to perform the first defrost to a different interval from "d.di." time.

If it is desired that to every instrument power on a defrost cycle is realized program the par. "d.Sd" = oF.

Instead if is desired all defrost to the same interval program "d.Sd" = "d.di."

Automatic defrost function is disable when "d.di" = oF.

The instrument provides to switch off the output for the time "d.dE" each "d.di" time (of "d.Sd" in case of first defrost after power on)

#### 4.5.1 - MANUAL DEFROST

To start up a manual defrosting cycle, press the key UP/DEFROST when it is not in programming mode and keep it pressed for about 5 seconds after which, if the conditions are correct, the led Defrost will light up and the instrument will carry out a defrosting cycle.

To stop a defrosting cycle, press the key UP/DEFROST during the defrost and keep it pressed for about 5 seconds.

#### 4.5.2 - DEFROST DISPLAY LOCK

Through par. "d.dL" and "A.dA" it's possible to define the display behaviour during defrost.

The "d.dL" parameter permits the display visualization lock on the last temperature reading ("d.dL" = on) during all the defrost cycle until, at the end of defrost, the temperature has not reached the lock value or the value ["SP" + "r.d"] or is elapsed the time setted on par. "A.dA".

Or it permits only the visualization of label "dEF" ("d.dL" = Lb) during the defrost cycle and, after the defrost, of label "PdF" until, at the end of defrost, the temperature has not reached the lock value or the value ["SP" + "r.d"] or is elapsed the time setted on par. "A.dA".

The display will otherwise ("d.dL"= oF) continue to visualize the temperature measured by the probe during the defrost cycle.

### 4.6 - ALARM FUNCTIONS

The alarm conditions of the instrument are:

- Probe errors "E1", "-E1"
- temperature alarms "Hi" and "Lo"

The alarm functions of the instrument work on the led ALARM and on the internal buzzer, if present and configured via the parameter "o.bu", **The Z31-"A" Does NOT have an internal buzzer**

The possible selections of the parameter "o.bu" are:

- = oF - Buzzer always disable
- = 1 - Buzzer signal active alarms only
- = 2 - Buzzer signal key pressed only (no alarm)
- = 3 - Buzzer signal active alarms and key pressed

Any active alarm is shown on the instrument display with the lighting up of the ALARM led, the silenced alarm status is shown by the ALARM led flashing .

The buzzer (if "o.bu" = 1 or 3) is activated in alarm and can be disabled (alarm silencing) manually by pressing any key of the instrument .

#### 4.6.1 - TEMPERATURE ALARMS

The temperature alarms work according to the probe measurement, the type of alarm set in the parameter "A.Ay" the alarm thresholds set in parameters "A.HA" (maximum alarm) and "A.LA" (minimum alarm) and the relative differential "A.Ad".

Through the parameter "A.Ay" it is possible to set the alarm thresholds "A.HA" and "A.LA" which must be considered as absolute ("A.Ay"=1) or relative to the Set Point ("A.Ay"=2).

Using some parameters it is also possible to delay the enablement and the intervention of these alarms.

These parameters are:

"A.PA" - is the temperature alarm exclusion time on switching on the instrument if the instrument is in alarm status when it is switched on.

If the instrument is not in alarm status when it is switched on the time "A.PA" it is not considered.

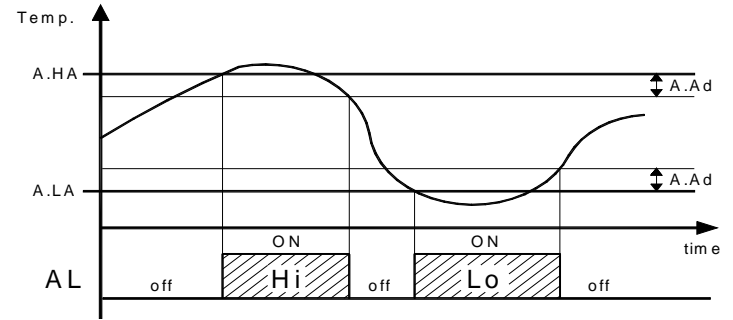
"A.dA" - is the temperature alarm exclusion time at the end of defrosting

"A.At" - is the temperature alarm delay activation time

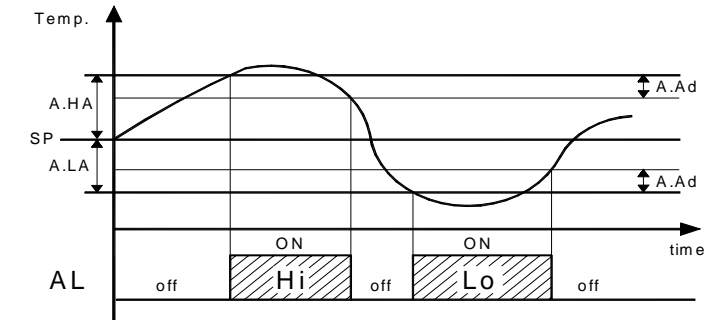
The temperature alarm is enabled at the end of exclusion time and is enabled after the "A.At" time when the temperature measured by

the probe exceeds or goes below the respective maximum and minimum alarm thresholds.

The alarm thresholds will be the same as those set on the parameters "A.HA" and A.LA" if the alarms are absolute ("A.Ay"=1)



Or values will be ["SP"+"A.HA"] and ["SP"+"A.LA"] if alarms are relative ("A.Ay"=2).



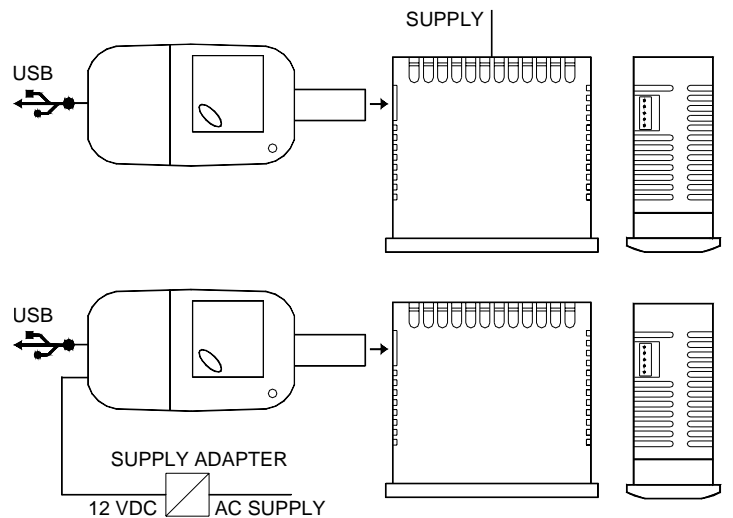
Temperature alarms of maximum and minimum can be disabled by setting the parameters "A.HA" and "A.LA" = oF.

### 4.7 - ACCESSORIES

The instrument is equipped with a connector that allows the connection of some accessories described as follow.

#### 4.7.1 - PARAMETERS CONFIGURATION BY "A01"

It's possible to upload the complete set of programmed functional parameters from an instrument to the A01 device via the 5 pole connector on the instrument. These parameters may then be downloaded to an unlimited number of instruments from the A01. The A01 device is mainly used for the serial programming of instruments that need to have the same parameter configuration or to keep a copy of the programming of an instrument and allow its rapid retransmission. The same device can connect the instrument via USB to a PC and through the proper configuration software tools "TECNOLOGIC UniversalConf", it's possible to configure the operating parameters.

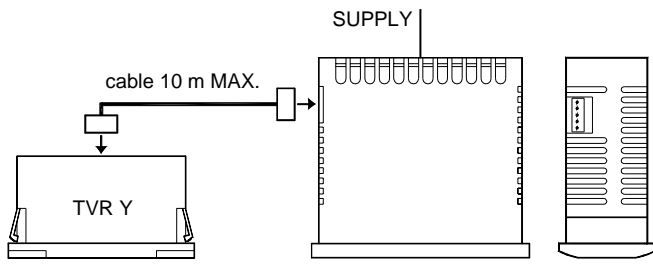


For additional info, please have a look at the A01 instruction manual.

#### 4.7.2 - "TVRY" REMOTE DISPLAY

To the instrument it is possible to connect the remote display TVR Y through the special cable that can have a maximum length of 10

m. The device TVR Y, directly supplied by the instrument, it allows to visualize the temperature measured by the probe Pr1 through a 2 1/2 digit display.



For additional info, please have a look at the TVR Y instruction manual.

#### 4.7.3 - RS 485 SERIAL INTERFACE BY "TLCNV"

The instrument can be connected by a special cable to the TLCNV device (mod. C - TTL/RS485 interface), by means of which it is possible to connect the regulator with a net to which other instruments (regulators of PLC) are connected, all depending typically on a personal computer used as plant supervisor.

Using a personal computer it is possible to acquire all the function information and to program all the instrument's configuration parameters.

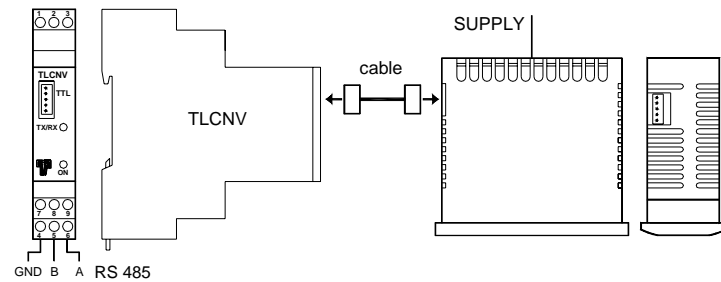
The software protocol adopted for the instrument is a MODBUS RTU type, widely used in several PLC and supervision programs available on the market (Y and Z series protocol manual is available on request).

If the instrument is used with TLCNV program by the parameter "t.Ad" the station Address.

Set a different number for each station, from 1 to 255.

**Note:** The baud-rate are fixed at 9600 baud.

TLCNV interface is directly supplied by the instrument.



For additional info, please have a look at the TLCNV instruction manual.

### 5 - PROGRAMMABLE PARAMETERS TABLE

Here below is a description of all the parameters available on the instrument. Some of them may not be present because depend on the model/type of instrument.

Par.	Description	Range	Def.	Note
<b>S. - parameters relative to Set Point</b>				
1	<b>S.LS</b> Minimum Set Point	-99.9 ÷ HS	-50.0	
2	<b>S.HS</b> Maximum Set Point	LS ÷ 999	99.9	
3	<b>SP</b> Set Point	LS ÷ HS	0.0	4 °C
<b>i. - parameters relative to inputs</b>				
4	<b>i.SE</b> Probes Type	Pt / nt	nt	
5	<b>i.uP</b> Unit of measurement and resolution (decimal point) C0 = °C with 1° res. F0 = °F with 1° res. C1 = °C with 0.1° res. F1 = °F with 0.1° res.	C0 / F0 / C1 / F1	C1	
6	<b>i.Ft</b> Measurement filter	oF ÷ 20.0 sec	2.0	oF OFF
7	<b>i.C1</b> Probe Calibration	-30.0 ÷ 30.0	0.0	

		°C/°F		
<b>r. - parameters relative to temperature control</b>				
8	<b>r.d</b> Differential (Hysteresis)	0.0 ÷ 30.0 °C/°F	2.0	0.0
9	<b>r.t1</b> Output activation time for probe error	oF/ 0.01 ÷ 9.59 (min.sec) ÷ 99.5 (min.sec.x10)	oF	
10	<b>r.t2</b> Output deactivation time for probe error	oF/ 0.01 ÷ 9.59 (min.sec) ÷ 99.5 (min.sec.x10)	oF	
11	<b>r.HC</b> Output operating mode H= Heating C= Cooling	H - C	C	

#### d. - parameters relative to defrosting control Z31-A omits defrost

12	<b>d.di</b> Defrosting interval	oF/ 0.01 ÷ 9.59 (hrs.min.) ÷ 99.5 (hrs.min.x10)	oF	
13	<b>d.Sd</b> Delay first defrost after power-on (oF = Defrost at power-on)	oF/ 0.01 ÷ 9.59 (min.sec) ÷ 99.5 (min.sec.x10)	oF	
14	<b>d.dE</b> Length of defrost cycle	oF/ 0.01 ÷ 9.59 (min.sec) ÷ 99.5 (min.sec.x10)	oF	
15	<b>d.dL</b> Defrost display Lock oF= display free on= Lock on temperature Pr1 before defrost Lb= Lock on label "dEF" (during defrosting) and "PdF" (during post-defrosting)	oF - on - Lb	oF	

#### P. parameters relative to compressor protection and power on delay

16	<b>P.P1</b> Out delay at switch on	oF/ 0.01 ÷ 9.59 (min.sec) ÷ 99.5 (min.sec.x10)	oF	
17	<b>P.P2</b> Out delay after switch off	oF/ 0.01 ÷ 9.59 (min.sec) ÷ 99.5 (min.sec.x10)	oF	
18	<b>P.P3</b> Out delay between switching-on	oF/ 0.01 ÷ 9.59 (min.sec) ÷ 99.5 (min.sec.x10)	oF	
19	<b>P.od</b> Delay at power on	oF/ 0.01 ÷ 9.59 (min.sec) ÷ 99.5 (min.sec.x10)	oF	

#### A. - parameters relative to alarms

20	<b>A.Ay</b> Temperature alarms Type: 1 = Absolute 2 =Relative to Set	1 / 2 ( / 3 / 4 / 5 / 6 / 7 / 8 = don't use)	1	
21	<b>A.HA</b> High temperature Alarm threshold	oF / -99.9 ÷ 999 °C/°F	oF	
22	<b>A.LA</b> Low temperature Alarm threshold	oF / -99.9 ÷ 999 °C/°F	oF	
23	<b>A.Ad</b> Temperature Alarms Differential	0.0 ÷ 30.0 °C/°F	1.0	
24	<b>A.At</b> Temperature Alarms delay	oF/ 0.01 ÷ 9.59 (min.sec) ÷ 99.5 (min.sec.x10)	oF	

25	<b>A.PA</b>	Temperature Alarms delay at power on	oF/ 0.01 ÷ 9.59 (hrs.min. ) ÷ 99.5 (hrs.min.x10)	2.00	
26	<b>A.dA</b>	Temperature Alarms delay and unlock display delay after defrost	oF/ 0.01 ÷ 9.59 (hrs.min. ) ÷ 99.5 (hrs.min.x10)	1.00	
<b>o. -parameters relative to buzzer</b> Z31-A Does NOT have a buzzer					
27	<b>o.bu</b>	Buzzer function mode oF = disable 1 = active alarms only 2 = key pressed only 3 = active alarms and key pressed	oF / 1 / 2 / 3	3	
<b>t. - parameters relative to configuration of the keyboard</b>					
28	<b>t.UF</b>	Function mode key U oF= No function 4= Switch on/Switch off (Stand-by)	oF / 4 (1 / 2 / 3 = don't use)	oF	
29	<b>t.Lo</b>	Keyboard lock function delay	oF/ 0.01 ÷ 9.59 (min.sec ) ÷ 30.0 (min.sec.x10)	oF	
30	<b>t.PP</b>	Access Password to parameter functions	oF ÷ 999	oF	
31	<b>t.AS</b>	MODBUS Station address (for serial communication)	0 ÷ 255	1	

## 6 - PROBLEMS, MAINTENANCE AND GUARANTEE

### 6.1 - SIGNALLING

Error	Reason	Action
<b>E1</b> <b>-E1</b>	The probe may be interrupted (E) or in short circuit (-E), or may measure a value outside the range allowed	Check the correct connection of the probe with the instrument and check the probe works correctly
<b>EPr</b>	Internal EEPROM memory error	Press key P
<b>Err</b>	Fatal memory error	Replace the instrument or ship to factory for repair

#### Other Signalling:

Message	Reason
<b>od</b>	Delay at power-on in progress
<b>Ln</b>	Keyboard lock
<b>dEF</b>	Defrosting in progress with "d.dL"=Lb
<b>PdF</b>	Post-defrosting in progress with "d.dL"=Lb
<b>Hi</b>	Maximum temperature alarm in progress
<b>Lo</b>	Minimum temperature alarm in progress

### 6.2 - CLEANING

We recommend cleaning of the instrument only with a slightly wet cloth using water and not abrasive cleaners or solvents.

### 6.3 - GUARANTEE AND REPAIRS

The instrument is under warranty against manufacturing flaws or faulty material, that are found within 12 months from delivery date. The guarantee is limited to repairs or to the replacement of the instrument.

The eventual opening of the housing, the violation of the instrument or the improper use and installation of the product will bring about the immediate withdrawal of the warranty's effects.

In the event of a faulty instrument, either within the period of warranty, or further to its expiry, please contact our sales department to obtain authorisation for sending the instrument to our company.

The faulty product must be shipped to ASCON TECNOLOGIC with a detailed description of the faults found, without any fees or

charge for ASCON TECNOLOGIC, except in the event of alternative agreements.

## 7 - TECHNICAL DATA

### 7.1 - ELECTRICAL DATA

Power supply: 12 VAC/VDC, 12...24 VAC/VDC, 100...240 VAC +/- 10%

Frequency AC: 50/60 Hz

Power consumption: 3 VA approx.

Input/s: 1 input for temperature probes: PTC (KTY 81-121, 990 Ω @ 25 °C) or NTC (103AT-2, 10KΩ @ 25 °C).

Output/s: 1 relay output SPST-NO or SPDT

	EN 61810	EN 60730	UL 60730
Out - 16A - 1HP 250V, 1/2HP 125 VAC	16 (9) A	10 (4) A	12 A Res., 30 LRA, 5 FLA

12 A Max. for extractable terminal block model

Electrical life for relay outputs: 100000 op. (EN60730)

Action type: type 1.B (EN 60730-1)

Overvoltage category: II

Protection class : Class II

Insulation: Reinforced insulation between the low voltage part (supply H type and relay output) and front panel; Reinforced insulation between the low voltage section (supply H type and relay output) and the extra low voltage section (inputs); Reinforced between supply and relay output; No insulation between supply F or G type and inputs.

### 7.2 - MECHANICAL DATA

Housing: Self-extinguishing plastic, UL 94 V0

Heat and fire resistance category : D

Ball Pressure Test secondo EN60730: accessible parts 75 °C;

support live parts 125 °C

Dimensions: 78 x 35 mm, depth 64 mm

Weight: 120 g approx.

Mounting: Incorporated Flush in panel (thickness max. 12 mm) in 71 x 29 mm hole

Connections: 2,5 mm<sup>2</sup> screw terminals block or 2,5 mm<sup>2</sup> extractable screw terminals block for 0,2...2,5 mm<sup>2</sup> / AWG 24...14 cables.

Degree of front panel protection : IP 65 (NEMA 3S) mounted in panel with gasket

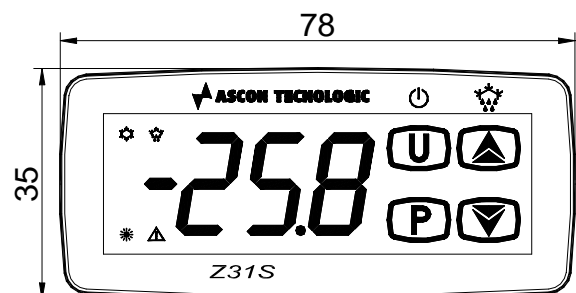
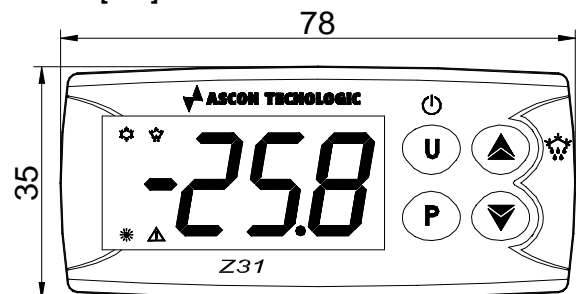
Pollution situation: 2

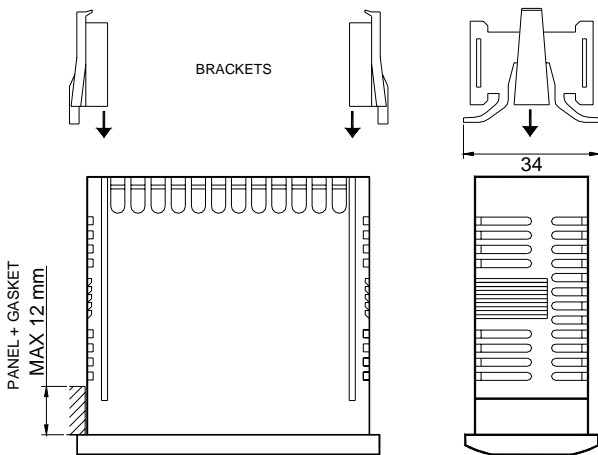
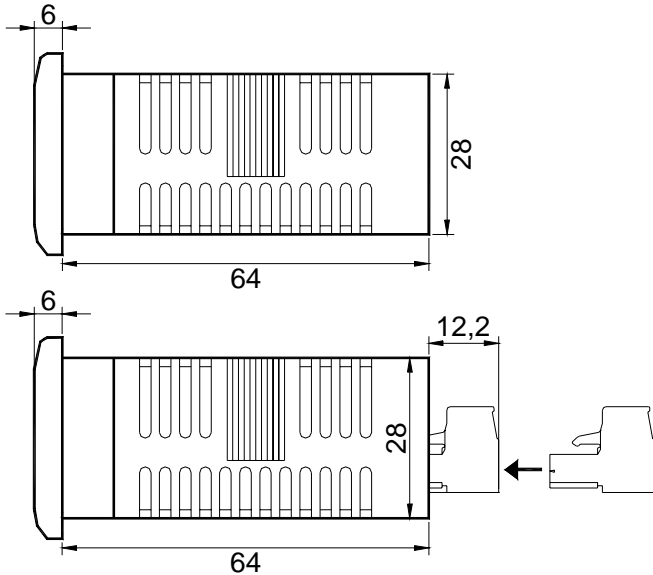
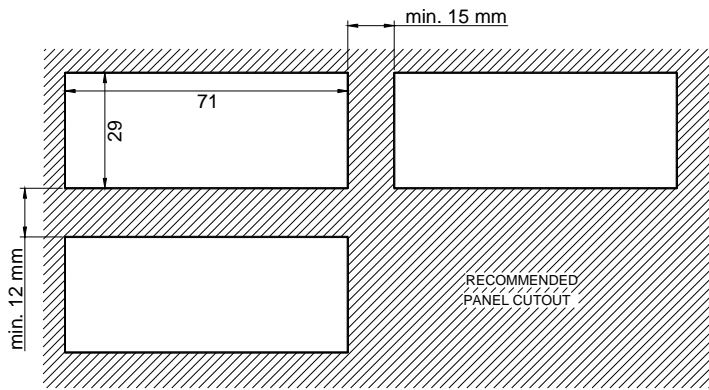
Operating temperature: 0 T 50 °C

Operating humidity: < 95 RH% without condensation

Storage temperature: -25 T +60 °C

### 7.3 - MECHANICAL DIMENSIONS, PANEL CUT-OUT AND MOUNTING [mm]





## 7.5 - INSTRUMENT ORDERING CODE

**Z31-** (instrument with mechanical keyboard )  
**Z31S** (instrument with Sensitive Touch keyboard )

**a b c d e f g h ii jj**

### **a : POWER SUPPLY**

**H** = Supply 100..240 VAC  
**G** = Supply 12..24 VAC/VDC  
**F** = Supply 12 VAC/VDC

### **b : OUT**

**R** = Out Relay SPST-NO 16A  
**S** = Out Relay SPDT 16A

### **c : BUZZER**

- = (No)  
**B** = Buzzer

### **d : TERMINAL BLOCK**

- = (Standard)  
**E** = Extractable screw terminal block complete  
**N** = Extractable terminal block without removable connectors

### **e : DISPLAY**

- = Red  
**B** = Blue

### **f, g, h : INTERNAL CODES**

### **ii, jj : SPECIAL CODES**

## 7.4 - FUNCTIONAL FEATURES

Temperature Control: ON/OFF mode

Defrost control: interval cycles by stopping compressor

Measurement range: NTC: -50...109 °C / -58...228 °F; PTC: -50...150 °C / -58 ... 302 °F

Display resolution: 1 ° or 0.1 ° (range -99.9 ...99.9 °)

Overall accuracy: +/- (0.5 % fs + 1 digit)

Sampling rate: 130 ms.

Display: 3 Digit Red (or Blue as option) h 15.5 mm

Software class and structure : Class A

Compliance: Directive 2004/108/CE (EN55022: class B;

EN61000-4-2: 8KV air, 4KV cont.; EN61000-4-3: 10V/m;

EN61000-4-4: 2KV supply and relay outputs, 1KV inputs;

EN61000-4-5: supply 2KV com. mode, 1 KV\ diff. mode;

EN61000-4-6: 3V);

Directive 2006/95/CE (EN 60730-1, EN 60730-2-9).

Regulation 37/2005/CE (EN13485 air, S, A, 2, -50°C +90°C with probe NTC 103AT11).

**ADVANCED THERMOELECTRIC**

PO Box 1003, White River, VT 05055 USA

**Toll-free: 1-866-665-5434**

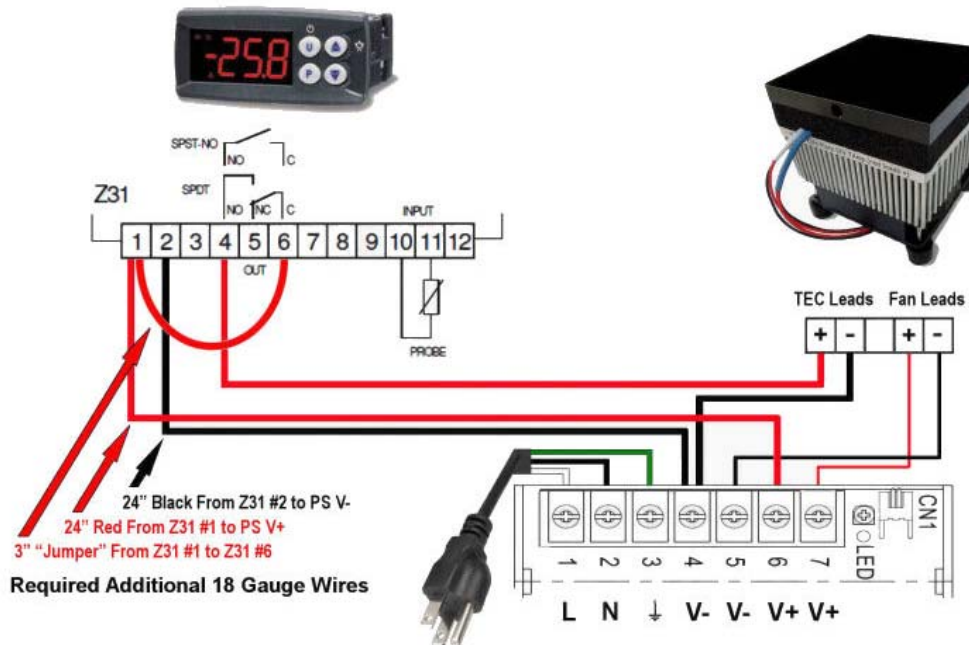
(603) 888-2467 [sales@electracool.com](mailto:sales@electracool.com)

Z31-A Web Page & On-line Ordering



# Z31-A Controller and any ElectraCOOL™ Assembly Wiring

## COOLING Mode



## WARMING Mode

Connect the black lead/s from the TE/s (heavier gauge than fan leads) to Z31-A slot 4, marked "NO" for Normally Open. Then connect the red lead/s from the TE/s to a **NEGATIVE (V-)** post on the power supply (to change the polarity). Make all other connections to the Z31-A and power supply, as described and illustrated below (red to + and black to -).

