code. 9IS44054-1
rel. 11/21 - EN -

EW 7200

UNIVERSAL CONTROLLERS

Temperature regulators and process controllers



Keys

UP
Scrolls through menu items
Increases values
Programmable by parameter
(see par. H31)

DOWN
Scrolls through menu items
Decreases values
Programmable by parameter
(see par. H32)

fnc
Opens QuickStart menu
ESC (exit) function

set
Accesses the Setpoint
Opens the Programming Menu
Activates functions
Confirms commands

Display and Leds



Process value (PV):
Used to display the process value, and the labels of parameters, alarms and functions.

Set value (SV):
Used to display the setpoints, parameter values, function statuses, other statuses.

Tun
Flashes: when Autotuning is active;
OFF: otherwise;

S.Str
ON: if the Soft Start function is active;
Flashes: Reduced SET (OSP*) active
*** OSP = Offset Setpoint**
OFF: otherwise;

out1 - out2
ON: when output active; OFF: otherwise;
Flashes if there is a delay, a protection, or activation is blocked;

aux
ON: for output active;
OFF: otherwise

Allarme
ON: if there is an alarm;
Flashes: if an alarm is switched off;
OFF: otherwise;

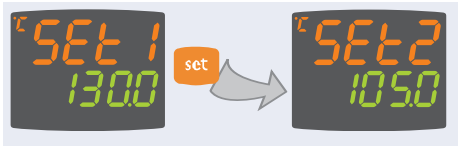
°C/°F
Indicates whether the temperature display is in °C o in °F;
OFF: for other units of measure

Setting the Setpoint

The following procedure is to be followed in order to set the 2 setpoint values in the device: **SEt1** and **SEt2**



① When the initial display is present, press and release the Set key.



② The **PV display** shows label **SEt1,** and the **SV display** shows the current Setpoint value. Press the Set key again to display the Setpoint 2 in the same way.



③ The UP and DOWN keys can be used to change the Setpoint value shown on the **SV display**.



④ When the Set or "fnc" key is pressed, or the timeout has elapsed (15 sec), the new value appears and the initial display returns

Programming menu

The programming menu contains all the parameters needed for setting the device functions, and is divided into two levels **user level** and **installer level:**



• When the Set is pressed on the main display for **3** seconds, the user can access the Parameter Programming menu;
the **USEr label** appears, to indicate user level of the menu.

User level access:



• Indicated by label **USEr** press and release the Set key to open the folders containing the user level parameters

Installer level access (InSt):



• Indicated by label **UsEr** the UP and DOWN keys can be used to display the **InSt label,** which indicates the access point of the folders containing the installer level parameters. When **InSt**is displayed, press and release the Set key

How to change the parameter values (in both levels):



• Press the UP and DOWN keys to scroll through all the user level folders and, on the desired folder, press the Set key to access the parameters in the folder (for example, the **ALAr folder**).



• When the Set key is pressed on the **ALAr folder,** the first parameter in the folder is displayed, as follows:
- PV display: parameter label (**PAO**)
- SV display: current parameter value (**0**)
The Set key can be used to scroll through all the parameters in the folder.



• To change the value of a displayed parameter, use the UP and DOWN keys. When the parameter has been set to the desired value, press "fnc", or allow the 15 second timeout to elapse, to save the new parameter setting.



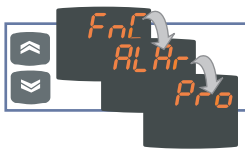
• Now press and release the "fnc" key to return to the previous display levels.

At any level of any of the menus, press the "fnc" key, or allow the 15 second timeout to elapse, in order to return to the previous menu level. The last value shown on the display will then be stored in memory.

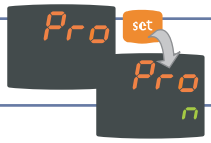
eliwell
by Schneider Electric

QuickStart Menu

In the main menu, the “fnc” key can be pressed to open the QuickStart menu and access the special functions, which are useful for setting and managing the device, for example the Functions Folder and the Alarms Folder (if at least one alarm is present).



After pressing the “fnc” key, the UP and DOWN keys can be used to scroll through the folders in the menu



When a label is selected, the Set key can be pressed to access the corresponding folder.

The following is a description of the menu structure and the functions in the individual folders:

Functions Folder

On the **FnC** label, the Set key can be pressed to access the functions.



The label will be displayed, with the current status of the function.
To scroll through the available functions, use the Set key.



To change the status of a function, use the UP and DOWN keys.

Function	Label function	Status of default	D.I.	Key	Indication function active
Soft Start	SStr	ON	1	1	LED S.Str ON
Stand-by	Stnb	OFF	5	5	/
Autotuning*	Auto	OFF	7	7	LED Tun flashing
Start work cycles/sequences**	StEP	OFF	8	8	/
Reset work cycles/sequences***	rStS	OFF	-	-	/
Reset PID*	rStP	OFF	-	-	/

Notes

* function visible if H01=2-3-7-8-9-10-11

** If pressed during a work cycle, the device goes into STOP status. In this status, the cycle time must stop and be re-started by a START command.

*** Visible only if work cycles have been enabled. When pressed, the cycle is reset and the device is brought into the STOP position.

Alarms Folder*

On the **ALAr label, press Set to** access the alarms folder.
This folder contains all the alarms managed by the device.

If no alarms are present, the folder does not appear in the menu.



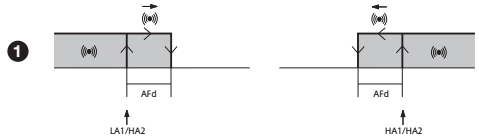
If there are alarms present, the UP and DOWN keys can be used to scroll through and display them

* Appears only if at least one alarm is present.

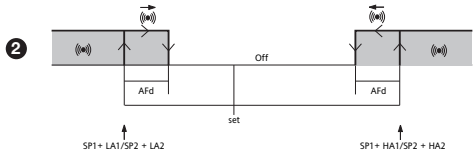
Label	Alarm	Cause	EFFECTS	Problem solving
E1	Probe 1 (regulation) faulty	• measured values are outside the nominal range • regulating probe faulty/short-circuited/open	Label **E1** shown on main display but not in the **ALAr folder**;	• check the probe wiring • replace probe
HA1	High temperature alarm	• value read by probe > HA1/2 after time “tAO”. (see “ALARMS MIN MAX” diagram and description of parameters “HA1/2” and “Att” and “tAO”)	Alarm created in the **ALAr folder** through label **HA1/HA2**	• Wait for the temperature value read by the probe to come back below **HA1/2-AFd**
LA1	Low temperature alarm	• value read by probe < LA1/2 after time “tAO”. (see “ALARMS MIN MAX” diagram and parameters “LA1/2” and “Att” e “tAO”)	Alarm created in the **ALAr folder** through label **LA1/LA2**	• Wait for the temperature value read by the probe to come back above **LA1/2-AFd**
EAL	External alarm	• alarm regulating with delay set by parameter **H14** from D.I. active if **H11**=9 or 10 (see **H11** and **H14**)	Alarm Led lit continuously; Alarm indicated in the **ALAr folder** through label **EAL**; If **H11**=10, the regulators are blocked.	• Stop the alarm manually by pressing a key • if **H11**=10, the regulators are activated again only after the digital input is disabled
tOA	Autotuning timeout	• Autotuning cycle aborted within AtO time out	Autotuning is blocked Label **tOA** shown on **SV** display	• Press 'set' button to restore the normal display
nOC	Autotuning failure	• Autotuning cycle failure before time out	Autotuning is blocked Label **nOC** shown on **SV** display	• Press 'set' button to restore the normal display

MAX-MIN ALARMS

Absolute temperature value (par “Att”=0) Abs(olute)



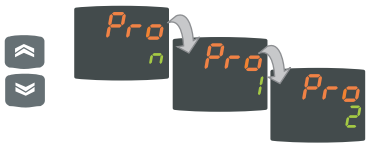
Temperature relative to Setpoint value (par “Att”=1) rEL(ative)



	Absolute temperature value (par “Att”=0) Abs(olute)	Temperature relative to Setpoint value (par “Att”=1) rEL(ative)
Minimum temperature alarm	Temperature less than or equal to LA1/2 (LA1/2 with sign)	Temperature less than or equal to set+LA1/2 (LA1/2 positive only)
Maximum temperature alarm	Temperature greater than or equal to HA1/2 (HA1/2 with sign)	Temperature greater than or equal to set+HA1/2 (HA1/2 positive only)
Returning from minimum temperature alarm	Temperature greater than or equal to LA1/2+AFd	Temperature greater than or equal to set + LA1/2 + AFd set -|LA1/2|+AFd
Returning from maximum temperature alarm	Temperature less than or equal to HA1/2-AFd	Temperature less than or equal to set+HA1/2-AFd

if Att=reL(ative) LA1/2 must be negative: therefore, set+LA1/2<set since set+(-\|LA1/2\|)=set-\|LA1/2\|

The unit can be used to program 2 different sequences, each with 8 steps; the individual steps can be set in the **StEP** folder in the parameter setting menu. (see “STEP Folder” on page 3)
The **Pro** folder can be opened and the desired steps in the 2 possible sequences (programs) can be set by pressing the Set key.



When the desired program has been set, it can be activated by selecting the special **StEP** function in the Functions folder.



To indicate that a program is running, the display on the device shows **SV** and the current step, from first (Step 0) to last (Step 7).

Copy Card

The Copy Card is an accessory which, when connected to the TTL serial port, allows quick programming of the device parameters (upload and download of a parameter map to or from one or more devices of the same type). The upload (label UL), download (label dL) and key formatting (label Fr) operations are performed as follows:



• The FPr folder, located in the **USEr level** of the programming menu, contains the commands necessary for using the Copy Card. Press Set to access the functions.
• Scroll with the UP and DOWN keys to find the desired function. Press the Set key and the desired function (upload, download or formatting) will be carried out.



• If the operation is successful, the display shows **y**; otherwise, it shows **n**.

Download reset: Connect the key with the device OFF. When the device is switched on, the programming parameters are loaded into the device; After the lamp test, the display shows the following for about 5 seconds:
• label dLY, if the operation is successful
• label DLn otherwise.



NOTES:
• after the reset download operation, the device will operate with the settings in the map that has been newly loaded.
• **see** folder **FPr,** "Parameters" on page 4-5
• Connect Copy Card with "MEMORY MODULE" label upside"

Passwords

Passwords can be set to limit the accesses to each parameter management level. The two different passwords can be activated by setting parameters PA1 and PA2 in folders "diSP" (PA1 at **USEr** level and PA2 at **InSt** level). The password is enabled if the value of parameter PA1/PA2 is different from 0.



• To access the "Programming" menu, hold down the "set" key for more than 5 seconds". If it has been set, the PASSWORD will be requested; press Set again.



• If activated (value different from 0), password PA1 must be entered. Carry out this operation by selecting the correct value using the UP and DOWN keys, then confirm by pressing the Set key.

If the password entered is incorrect, the device displays label PAS1 again and the operation must be repeated.

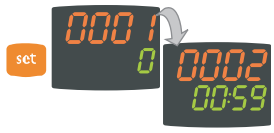
Password PAS2, for the **InSt** level, works in the same way as password **PAS1**.

STEP Folder

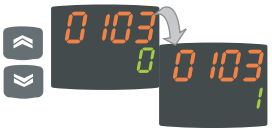
Only Installer level (**InSt**) shows the **StEP folder,** which can be used to store two working programs, each consisting of up to 8 steps; 9 parameters must be set for each step. The operations for setting these parameters correctly are described below.
Press and release the Set key on the **StEP folder label** to access the folder:



• Use the UP and DOWN keys to select one of the two programs available, and press Set on either **1** or **2**.

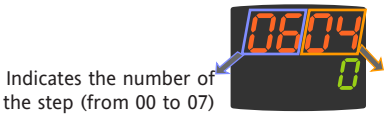


• The first parameter (01), corresponding to the first step (00) is then displayed; use the Set key to scroll through the parameters.



• To change the value of a parameter, use the UP and DOWN keys.

Each label is made up of 4 digits, which indicate the step and the number of the parameter it contains:



Indicates the number of the step (from 00 to 07)

Indicates the number of the parameter (from 01 to 09)

To exit from any level of the **StEP** folder, simply press the "fnc" key, or allow the 15 second timeout to elapse.

0x01 Step activation delay. Defines the delay at which the step is activated after starting.
If it is the first step in the program, it is activated by the "Start process" key
During the delay time, the working set is the one defined by Fine Step mode.
0x02 Step duration. Defines the length of time of the step: expressed in hours/minutes;
if set a - - - indicates that the step ends when a temperature is reached.
0x03 Length of time from start, or from when Setpoint is reached. Defines whether step duration is to be calculated from when the step started (value 0), or from when the Setpoint (value 1) is reached within the step.
0x04 Setpoint step. Defines the regulation set for the step.
0x05 Regulator active. Indicates which regulator is active in the step:
On1=on/off1; On2=on/off2; Ne=neutral zone; Cyc=cyclic;
PH=Pid heating; PC=Pid cooling; PHC=Pid heating/cooling;
0x06 Enable/disable Soft Start. Indicates whether the Soft Start function is enabled during the step.
0x07 AUX relay mode. Indicates a mode for the AUX relay, if configured, during the the step between ON, OFF and Duty Cycle
0x08 Fine step mode. Indicates the way in which the step ends; any of the following can be selected:
1= end program; 2*=go to next step, maintaining the current setpoint;
3*=go to next step waiting for the new set point (unregulated);
4=go back to start of sequence; 5=go back to sequence No. xx; 6=infinite duration, maintaining the setpoint
0x09 Go back to sequence No.xx. indicates the sequence number to go back to. This parameter has a value only if parameter **0x08** is set to 5.

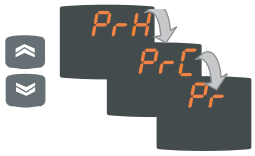
StEP Folder Parameters - Prog 1/2

Par.	Range	Default*	U.M.	Level
0x01	0...99:59	0	ore/min	InSt
0x02	0...99:59	00:59	ore/min	InSt
0x03	0...1	0	flag	InSt
0x04	-328...2910	0	°C/°F	InSt
0x05	On1/On2/Ne CyC/PH/PC/PHC	On1	num	InSt
0x06	0...1	0	flag	InSt
0x07	0...1	0	flag	InSt
0x08	1...7	2	num	InSt
0x09	0...7	0	num	InSt

*** NOTE: The values 2 and 3 are disabled only for parameter 0708, therefore the setting of values 2 and 3 is not possible for this parameter.**

Dynamic Parameter Folders

The two folders **Pid** and **Aut** are visible only if the device has been set for PID regulation, i.e. if parameter **H01** is equal to 2-3-7-8-9-10-11. These folders can be navigated along with their subfolders, and there is a procedure for saving values when exiting from these subfolders. How to navigate inside the two **Pid** and **Aut** dynamic parameter folders is described below:



Press the Set key on the **Pid** label the label of the first subfolder **PrH** is displayed. Scroll through the subfolders using the UP and DOWN keys.



Press the Set key on the desired subfolder to access the parameters. To scroll through the parameters, use the Set key, and to change a value, use the UP and DOWN keys.



When exiting the subfolders using the “fnc” key, or after the 15 second timeout has elapsed, the user will be asked whether to save any changes that have been made.



Use the UP and DOWN keys to select **y** (save changes) or **n** (not to save changes), then press Set to exit the folder.

Parameters Table

Regulator 1 - label rE1

Par.	Range	Default*	U.M.	Level
SP1	LS1...HS1	0,0	°C/°F	
SP2	LS2...HS2	0,0	°C/°F	
OS1	-30,0...+30,0	0	°C/°F	InSt
db1	0,0...+30,0	1,0	°C/°F	USEr/InSt
dF1	-30,0...+30,0	-1,0	°C/°F	USEr/InSt
HS1	LS1...HdL	999,9	°C/°F	USEr/InSt
LS1	LdL...HS1	-199,9	°C/°F	USEr/InSt
HA1	LA1...2910,0	999,9	°C/°F	USEr/InSt
	LA1...9999(*)	999,9(*)		
LA1	-328,0...HA1	-328,0	°C/°F	USEr/InSt
	-1999...HA1(*)	-199,9(*)		
dn1	0...255	0	sec	InSt
do1	0...255	0	min	InSt
di1	0...255	0	min	InSt
dE1	0...255	0	sec	InSt
On1	0...255	0	min	InSt
OF1	0...255	1	min	InSt

Regulator 2 - label rE2

OS2	-30,0...+30,0	0	°C/°F	InSt
db2	0,0...+30,0	1,0	°C/°F	USEr/InSt
dF2	-30,0...+30,0	-1,0	°C/°F	USEr/InSt
HS2	LS2...HdL	800,0	°C/°F	USEr/InSt
LS2	LdL...HS2	-200,0	°C/°F	USEr/InSt
HA2	LA2...2910,0	2910,0	°C/°F	USEr/InSt
	LA2...9999(*)	300(*)		
LA2	-328,0...HA2	-328,0	°C/°F	USEr/InSt
	-1999...HA2(*)	-50,0(*)		
dn2	0...255	0	sec	InSt
do2	0...255	0	min	InSt
di2	0...255	0	min	InSt
dE2	0...255	0	sec	InSt
On2	0...255	0	min	InSt
OF2	0...255	1	min	InSt

Regulator PID - label Pid(1)

PID Regulator - Pr				
run	0...1	1	flag	InSt
dut	-100...100	0	%	InSt
PID Heating - PrH**				
bP	0,1...999,9	50,0	°C/°F	USEr/InSt
tI	0...9999	600	sec	USEr/InSt
TD	0...9999	150	sec	USEr/InSt
bIA	-100...100	0	num	InSt
tt	0...9999	300	sec	USEr/InSt
c	0...100	0	num	InSt
SLO	0...100	0	num	InSt
SHI	0...100	100	num	InSt
PEd	20...1310	20	sec	USEr/InSt
PID Cooling - PrC***				
bP	0,1...999,9	50,0	°C/°F	USEr/InSt
tI	0...9999	600	sec	USEr/InSt
TD	0...9999	150	sec	USEr/InSt
bIA	-100...100	0	num	InSt
tt	0...9999	300	sec	USEr/InSt
c	0...100	0	num	InSt
SLO	0...100	0	num	InSt
SHI	0...100	100	num	InSt
PEd	20...1310	20	sec	USEr/InSt

label AUtO(2)

Autotuning - PA**				
tun(2)	0...1	0	flag	USEr/InSt
AtO	1...100	10	ore	USEr/InSt
Adt	0...1	1	flag	InSt
PrE	0...1	1	flag	InSt
ASA	0...1	1	flag	InSt
Autotuning Heating - PAH**				
Fun	P/Pi/Pd/Pid	Pid	num	InSt
APL	0...100	1	°C/°F	InSt
bIAt	0...100	50	num	InSt
APr	0...100	50	num	InSt
AHr	0,0...100,0	0,3	°C/°F	InSt
Autotuning Cooling - PAC***				
Fun	P/Pi/Pd/Pid	Pid	num	InSt
APL	0...100	1	°C/°F	InSt
bIAt	0...100	-50	num	InSt
APr	0...100	50	num	InSt
AHr	0,0...100,0	0,3	°C/°F	InSt

label AnOu ****

AOL	020/420/001/005/010	020	num	USEr/InSt
AOF	diS/rO/Er cPH/cPc	rO	num	USEr/InSt
AOS	Aon/AoF	AoF	flag	USEr/InSt
LAO	LdL...HdL	0	num	USEr/InSt
HAO	LdL...HdL	100,0	num	USEr/InSt

Step(3)

Pro 1	parameters program 1	InSt
Pro 2	parameters program 2	InSt

label SFt

dSi	0...25	0	°C/°F	InSt
Std	0...255	0	ore/min/sec	InSt
unt	0...2	1	num	InSt
SEn	0...3	1	num	InSt
Sdi	0...30	0	°C/°F	InSt

cLc

Con	0...255	0	min	InSt
CoF	0...255	0	min	InSt

label Alar

Att	Abs/rEL	Abs	flag	InSt
AFd	1...50	2	°C/°F	InSt
PAO	0...10	0	ore	USEr/InSt
SAO	0...24	0	ore	USEr/InSt
tAO	0...255	0	min	USEr/InSt
AOP	nC/nO	nC	flag	InSt

label Add

PSt	t/d	t	flag	USEr/InSt
dEA	0...14	0	num	USEr/InSt
FAA	0...14	0	num	USEr/InSt
PtY	n/E/o	E	num	USEr/InSt
StP	1b/2b	1b	flag	USEr/InSt

ATTENTION:
This folder is available only if the instrument is Televis**System/Modbus** compatible.

label diSP

LOC	n/y	n	flag	USEr/InSt
PA1	0...999	0	num	USEr/InSt
PA2	0...999	0	num	InSt
ndt	n/y 0...3(*)	y 1(*)	flag num(*)	USEr/InSt
CA1	-30...30	0	°C/°F	USEr/InSt
CAi	0...2	2	num	InSt
LdL	-328,0...HdL -1999...HdL(*)	-328,0	°C/°F	InSt
HdL	LdL...2910,0 LdL...9999(*)	2910,0 999,9(*)	°C/°F	InSt
dro	0...1 0...6(*)	0 6(*)	flag	USEr/InSt

label CnF

H00	ntc/Ptc/pt10/tcJ/tcH/tcS/tcr/tct/Pt1 Pt1/020/420/t01/t05/t10(*)	Pt1 420(*)	flag	USEr/InSt

ATTENTION:
If the instrument displays value out of range, to verify if the probe type setting and the probe type used are the same.

H01	0...11	4	num	InSt
H02	0...15	5	sec	InSt
H03(*)	-1999...9999	20,0	num	USEr/InSt
H04(*)	-1999...9999	100,0	num	USEr/InSt
H06	n/y	y	flag	InSt
H08	0...3	3	num	InSt
H10	0...255	0	num	USEr/InSt
H11(4)	0...10	0	num	InSt
H13(4)	no/nc/noP/ncP	no	num	InSt
H14(4)	0...255	0	min	InSt
H21	0...4	0	num	InSt
H22	0...4	0	num	InSt
H23(5)	0...4	0	num	InSt
H25	0...1	0	num	InSt
H31	0...8	0	num	InSt
H32	0...8	0	num	InSt
reL	/	/	num	USEr/InSt
tab	/	/	num	USEr/InSt

ATTENTION:
After every change of one parameter in this folder, to switch off and switch on again the instrument in order to render effective the modifications.

label FPr

UL	/	/	/	USEr/InSt
dL	/	/	/	USEr/InSt
Fr	/	/	/	USEr/InSt

NOTES:

(1) Folder visible if **H01**= 2-3-7-8-9-10-11.
(2) The Parameter **tun** is visible only if H01=7
(3) see paragraph ”STEP Folder” on page 3.
(4) These parameters are visible only in models equipped with a digital input
(5) Parameter available only on 3 relay models (check label)
* Range and default values for versions with V/I/Pt100 analogue input
** These subfolder are visible only if **H01**=2-7-8-10
*** These subfolder are visible only if **H01**=3-7-9-11
**** Folder **AnOu** is visible in models equipped with an analog output

DESCRIPTION OF PARAMETERS

SP1/SP2 Setpoint 1/2 Control Setpoint

REGULATOR 1/2 (folder with label "rE1"/"rE2")

OS1/OS2 Offset Setpoint 1/2. Temperature value to be added arithmetically to the Setpoint if a reduced set is enabled; it cannot have a 0 value.

db1/db2 Response band above Setpoint 1/2

dF1/dF2 Setpoint 1/2 differential band. With negative sign Hot operation; with positive sign, Cold operation. If dF1=0 goes back above SP1/2, dF1=db1

HS1/HS2 Maximum value that can be assigned to setpoint 1/2.

LS1/LS2 Minimum value that can be assigned to setpoint 1/2.

HA1/HA2 Maximum temperature alarm. Temperature limit (the relative or absolute status of this value is controlled by "Att", present in the installer menu, folder ALAr), beyond which the alarm is activated.

LA1/LA2 Minimum temperature alarm. Temperature limit (the relative or absolute status of this value is controlled by "Att", present in the installer menu, folder ALAr) below which the alarm is activated.

dn1/dn2 Delay after which regulator 1/2 is started. The delay time indicated must elapse between the request for activation of the regulator relay and switch-on.

do1/do2 Delay time after switching off. The delay time indicated must elapse between deactivation of the regulator relay and the next switch-on.

di1/di2 Delay between switch-ons. The delay time indicated must elapse between two consecutive switch-ons of the regulator.

dE1/dE2 Switch-off delay. The delay time indicated must elapse between the request for deactivation of the regulator relay and switch-off.

NOTE: for parameters dn1/2, do1/2, di1/2, dE1/2, 0= not active

On1/On2 Switch-on time for regulator if probe faulty. If set to "1" with Of1/2 at "0", the regulator remains on continuously, and with Of1/2 >0, it operates in Duty Cycle mode. **See the Duty Cycle diagram.**

OF1/OF2 Regulator switch-off time if probe faulty. If set to "1" with On1/2 at "0", the regulator remains off continuously, and with On1/2 >0 it operates in Duty Cycle mode. **See the Duty Cycle diagram.**

PID REGULATOR (folder with label "Pid")
(folder visible only if H01=2-3-7-8-9-10-11)
PID regulator, common parameters
heating/cooling (subfolder with label Pr)

run Manual or automatic mode selection: 0=manual; 1=automatic;

dut PID Duty Cycle in manual mode.

PID heating regulator (subfolder with label PrH)/
PID cooling regulator (subfolder with label PrC)

bp PID proportional band

ti Total PID time; OFF if =0

td derivative time

biA Static PID polarization

tt total time for antireset windup (OFF if =0)

n derivative component limiting

b proportional setpoint weighting

c derivative setpoint weighting

SLO minimum output saturation

SHi maximum output saturation

PEd period divided with Duty Cycle

AUTOTUNING (folder with label "AutO")
(folder visible only if H01=2-3-7-8-9-10-11)
Autotuning, common parameters
heating/cooling (subfolder with label PA)

tun Hot/cold Autotuning selection; 0=hot, 1=cold;
IMPORTANT:parameter visible only if **H01**=7;

AtO Timeout for Autotuning

Adt Enable Autotuning of parameters

PrE Restore parameter default settings (pretuning): 0=no; 1=yes;

ASA Automatic saving of parameters after Autotuning: 0=no; 1=yes;

Heating Autotuning (subfolder with label PAH)/
Cooling Autotuning (subfolder with label PAC)

Fun PID regulator selection:
P=Proportional; 1=Proportional/supplementary;
2=Proportional/derivative; 3=Prop./supplementary/derivative;

APL amplitude of oscillation in Autotuning

biAt relay polarization in Autotuning

APr relay amplitude in Autotuning

AHr relay hysteresis in Autotuning

CONFIGURATION OF ANALOG OUTPUT (folder with label "AnOu")

AOL Analog output mode:
020=0...mA; 420=4...20mA; 001=0...10V;
005=0...5V; 010=0...10V;

AOF Analog output mode:
dis=output disabled;
ro=read out, output proportional to probe reading, within the range set by parameters LAO and HAO
Er=error, output proportional to error between setpoint 1 and the value read on the probe, within the error range specified by the parameters LAO and HAO
cPH= not to use.
cPC= not to use.

AOS Analog output mode if probe faulty:
Aon=analog output ON; **AoF**=analog output OFF;

LAO Analog output minimum limit

HAO Analog output maximum limit

PROGRAM 1/2 PARAMETERS FOLDER
(folder with label "StEP")
Program 1/2 parameters subfolder
Inside folder **StEP** there are 2 subfolders that contain the parameters that make up the steps in each program. It is possible to set 2 different programs, each with 8 steps and each step made up of 9 parameters. **see "STEP Folder" on page 3**

SOFT START REGULATOR (folder with label "SFt")
see "Soft Start", page 7

dSi Soft Start regulator step value

Std Duration of step for Soft Start regulator (unit of measurement defined by **unt**)

unt Unit of measurement for step duration (defines the unit of measurement for **Std**): 0=hours; 1=minutes; 2=seconds;

SEn Regulator selection for Soft Start function. Determines the regulator on which the Soft Start function is to be enabled.
0=disabled; 1=enabled on regulator 1;
2=enabled on regulator 2 3=enabled on regulators 1 and 2;

Sdi Automatic return band for Soft Start function

CYCLIC REGULATOR (folder with label "cLc")
see "Cyclic Regulator", page 7

Con ON time for cyclic regulator output

CoF Off time for cyclic regulator output

ALARM REGULATOR (folder with label "ALAr")

Att Modes of parameters HA1/HA2 and LA1/LA2:
Abs=absolute; rEL=relative;

Afd Alarm differential

PAO Alarm exclusion time after the device is switched on, following a power failure.

SAO Timeout for "set point not reached" alarm indication

tAO Time delay for temperature alarm indication.

AOP Alarm output polarity:
nc=normally closed; no=normally open;

COMMUNICATION (folder with label "Add")

Pts Protocol selection: t=Televis; d=Modbus

dEA index of the device within the family (valid values from 0 to 14)

FAA device family (valid values from 0 to 14)
The pair of values FAA and dEA represents the network address of the device and is indicated in the format "FF.DD" (where FF=FAA and DD=dEA).

PtY Modbus parity bit: n=none; E=Even; o=odd;

StP Modbus stop bit: 1b=1 bit; 2b=2 bit;

DISPLAY (folder with label "diSP")

LOC Keyboard lock (set and keys). It is still possible to go into parameter programming and modify the parameters, including this one, in order to allow keyboard unlocking. y = yes; n = no.

PA1 Password 1. When enabled (value other than 0), this is the access key to the user level parameters (**USEr**).

PA2 Password 2. When enabled (value other than 0), this is the access key to the installer level parameters (**inSt**).

ndt Format with decimal point. y = yes; n = no.
N.B.: in models with Pt100 analogue input it is possible to display until 3 decimal digits:
0 = integer value; 1 = 1 digit; 2 = 2 digits; 3 = 3 digits.

CA1 Calibration 1. Positive or negative temperature value added to the value read from probe 1, according to the setting of parameter "CA"

CAi Calibration operation:
0=sum with displayed temperature only;
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;

LdL Minimum value that can be displayed by the device.

HdL Maximum value that can be displayed by the device.

dro Selection of °C or °F for displaying the temperature read from the probe. 0 = °C, 1 = °F.

PLEASE NOTE: if °C is changed to °F or vice versa, the values for setpoint, differential, etc., are not changed. (for example, set=10°C becomes 10°F)

NOTE 2: Other engineering units can be set in the models with V/I/Pt100 analogue input (0 =°C; 1 =°F; 2 =Bar; 3 =%RH; 4 =Pa; 5=Psi; 6=void) by means of management with Televis**Compact**

CONFIGURATION PARAMETERS (folder with label "CnF")

H00 Selection of probe type for models NTC/PTC/Pt100/Pt1000/TC:
ntC=Ntc; PtC=Ptc; Pt10=Pt1000; tcJ=tcJ; tcH=tCK;
tcS=tcS; tcr=tcr; tct=tct; Pt1=Pt100;
Selection of probe type for models V/I/Pt100:
Pt1=Pt100; 020=0...20mA; 420=4...20mA;
t01=0...1V⎓; t05=0...5V⎓; t10=0...10V⎓;

H01 Configuration of regulators:

H01	Description	OUT1	OUT2
0	free	H21	H22
1	ON/OFF	H/C	H22
2	PID Heating	H	H22
3	PID Cooling	C	H22
4	two independent ON/OFFs	H/C	H/C
5	two related ON/OFFs	H/C	H/C
6	neutral zone	H/C	H/C
7	PID Heating-Cooling	H	C
8	PID Heating-O/OFF	H	H/C
9	PID Cooling-ON/OFF	C	H/C
10	PID Heating-Alarm	H	Alarm
11	PID Cooling-Alarm	C	Alarm

H02 Activation time for keyboard functions. For the ESC, UP and DOWN keys, which are configured with a second function, a time is set for activation of the second function. One exception is the AUX function, which has a fixed delay of 0.5 sec.

H03 Current/voltage input lower limit
(only for models V-I-Pt100, see parameter H00)

H04 Current/voltage input upper limit
(only for models V-I-Pt100, see parameter H00)

H06 Key or aux/light digital input active with the device OFF:
0=n=not active; 1=y=active;

H08 Stand By mode:
0= Only display switches off.
1= Display on, control devices and alarms off.
2= Display off, control devices and alarms off.
3= **PV** display with label **OFF** and control devices off.

H10 Delay for output activation after Power On; Minimum delay time for connection of utilities in the event of restart after a power failure;

H11 Configurability and polarity of digital input:
0=disabled; 1=activate/deactivate Soft Start;
2=activate/deactivate OSP; 3=activate/deactivate cyclic regulator;
4=activate/deactivate Aux output; 5=activate/deactivate Stand-by;
6=call for maintenance; 7=activate/deactivate Autotuning;
8=activate/deactivate step control; 9=external alarm;
10=external alarm to lock controllers;

H13 Polarity and priority of digital inputs:
no=normally open; nc=normally closed;
noP=normally open with priority;
ncP=normally closed with priority;

H14 Activation delay for digital inputs;

H21* Configurability of digital output 1:
0=disabled; 1=alarm; 2=cyclic; 3=aux/light;
4=stand-by; 5=buzzer;

H22* Configurability of digital output 2: Same as H21

H23* Configurability of digital output 3(if present) :Same as H21

*** see table of H01 parameter**

H25 Buzzer enabling (only if buzzer present):
n=not enabled; y=enabled;

H31 Configurability of UP key:
0=disabled; 1=activates/deactivates soft start;
2=activates/deactivates OSP; 3=activates/deactivates cyclic regulator;
4=activates/deactivates aux output; 5=activates/deactivates stand-by;
6=request maintenance; 7=activates/deactivates autotuning;
8=activates/deactivates step control;

H32 Configurability of DOWN key: Same as H31

rEL Device version. read-only parameter.

tAb Reserved. Read-only parameter.

COPY CARD (folder with label "Fpr")
see "Copy Card", page 3

UL UpLoad: transfer parameters from device to CopyCard.

dL downLoad: transfer parameters from Copy Card to device.

Fr Format. Erase all data entered in the key.

Description of Regulators

The PID regulator is available as an alternative to the on/off regulator, if greater control precision is required.

Enabling:
The PID regulator is enabled if:

- **H01** = 2-3-7-8-9-10-11 (see Parameters, folder **CnF**)

This setting of parameter **H01** enables display of the **PId** and **Aut folders** in the parameter Programming Menu.

Parameter settings:
It is also necessary to set the **run** parameter. This parameter is used to select the regulating mode: manual* (Duty Cycle) or automatic (PID). The **run parameter is therefore set to**=1.

The device is now enabled for PID regulation; the **PId folder** is visible in the Programming Menu, and the parameters in it can be modified in order to improve regulating performance: these parameters can also be modified in automatic mode using the **Autotuning function**.

* if manual regulation is selected (**run**=0), the activation percentage must be set **dut** (see 'Parameters' on page 4). Then set the period divided with the Duty Cycle, using the **PEd parameter** (see 'Parameters on ages 4-5)

Autotuning
The setting of the PID regulation parameters can be simplified using the Autotuning function, which can calculate the PID parameters automatically. Autotuning is activated through a dedicated function in the Functions Folder (see QuickStart Menu on page 2), or by using a key if appropriately configured (see par. **H31**, **H32** in 'Parameters' on page 5).
The **Tun Led on the device flashes to indicate when Autotuning is in progress**.

Mode setting
If parameter **H07** is set to 7 (PID hot-cold regulation), Autotuning must be carried out twice: once for cold and once for hot.
In this mode, the **tun parameter is also visible in** the **PA subfolder** contained in the **Aut folder**; this parameter is used to select the Autotuning mode: hot (**tun**=0)/cold (**tun**=1).
To carry out autotuning in PID hot-cold mode (**H01**=7), therefore, proceed as follows:

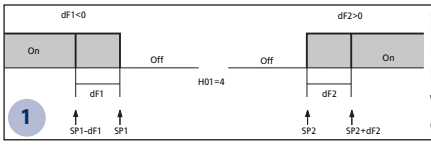
- set **H01**=7
- set **tun**=0
- activate the Autotuning function in the Functions Folder
- wait for the Autotuning function to be performed
- set **tun**=1
- activate the Autotuning function in the Functions Folder

The device has two ON/OFF type regulators that can be configured by the user through the H01 parameter:

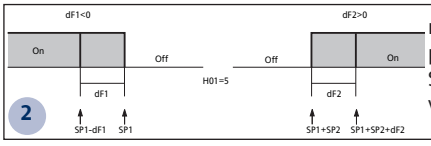
- **H01**=4, 5 threshold regulator
- **H01**=6 regulator with window

dF1<0	dF2>0	H01	regulation type
hot	cold	4	independent setpoints
hot	cold	5	relative setpoints
-	-	6	Neutral Zone (or window)

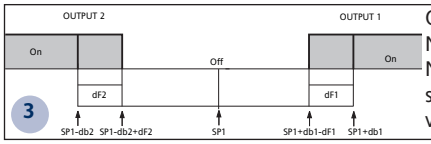
NOTE: examples with dF1<0 ((hot) and dF2>0 (cold)



independent ON-OFF regulation plan. The two outputs regulate as though they were completely independent of each other

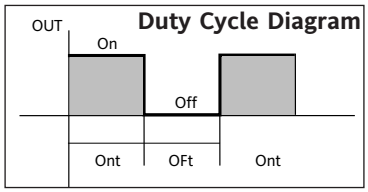


relative ON-OFF regulation plan.
Setpoint SP2 regulates relative to SP1



ON-OFF regulation plan with Neutral Zone (or window).
NOTE: if both dF1 and dF2 are set to 0, the outputs are deactivated when SP1 is reached

Outputs protection



An error condition in the probe causes one of the following actions:
- code E1 is shown on the display
- the regulator is activated as indicated by parameters On1/On2 and OF1/OF2 if set for Duty Cycle

On1/On2	OF1/OF2	Compressor output
0	0	OFF
0	>0	OFF
>0	0	ON
>0	>0	dc

parameters On1/On2, OF1/OF2 set for Duty Cycle

Auxiliary Regulator

The auxiliary regulator can be activated through the digital input if this is set to auxiliary (parameter H11=4), or by a key (parameter **H31** or **H32**=4): in this case, the regulator control must be configured as Aux by setting parameters H21(22) to 3.
This function is used to energize the relay if it was de-energized, or vice versa. The relay state is stored in order to maintain correct operation in the event of a power failure, unless parameter H11 is set to 4 (aux); in this case, the relay reflects the state of the digital input.
Parameter H13 can also be used to set the priorities/polarities for activation by key or digital input.
NOTE: The significance of the Digital Input (D.I.) must remain the same: for example, when activating the relay by D.I. and switching off with a key, if the D.I. is repositioned, the relay does not change state when de-energized by key

Soft Start

NOTE: The SOFT START function can be selected by key, by D.I. or by a function.
The Soft Start regulator can be used to set the temperature gradient over which a given setpoint is reached within a predefined time.
With this function, the regulation Setpoint is raised progressively and automatically from value Ta (ambient temperature when switched on) to the value actually set on the display; this allows the initial temperature rise to be slowed down and thus reduce the risk of "overshoot".

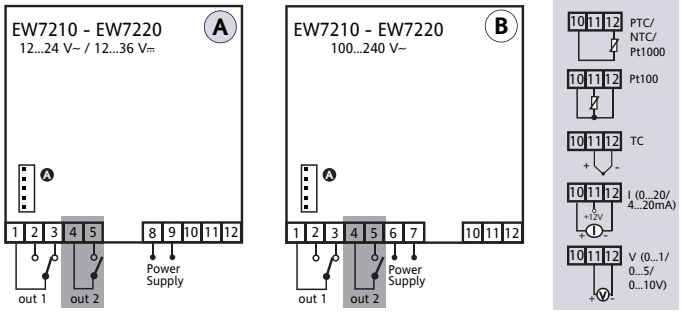
Cyclic Regulator

NOTE: The PERIODIC CYCLE function can be selected by key or by digital input
This function can be associated with both the outputs by relay (by setting parameters H21, H22 to 2), and can be used to actuate "Duty Cycle" regulation with the intervals set by parameters Con and CoF.

TECHNICAL DATA EW7210-EW7220

Front protection	IP54
Container	PC+ABS plastic resin body PC+ABS UL94 V-0
Dimensions	front 72x72 mm, depth 80 mm
Mounting	and panel with 67x67 mm drilling template
Usage temperature	-5°C ... 55°C
Storage temperature	-20°C ... 85°C
Ambient humidity in use and in storage	10% ... 90% RH (non-condensing)
Display range	See **Probes Table**
Analog input	1 input selectable by parameter **H00**
Serial	TTL for connection to Copy Card or Televis**System***
Digital outputs (configurable)	
- output OUT1	1 SPDT 8(3) A 250 V~
- output OUT2	1 SPST 8(3) A 250 V~ (**only EW7220**)
Buzzer output	only on models where this is provided
Accuracy	See **Probes Table**
Resolution	See **Probes Table**
Consumption	4W max
Power supply	2 Switching power types: mod.**B**: 100...240 V~ ±10% 50/60Hz mod.**A**: 12...24 V~ / 12...36 V⎓ ±10% 50/60Hz

WIRING DIAGRAM



TERMINALS

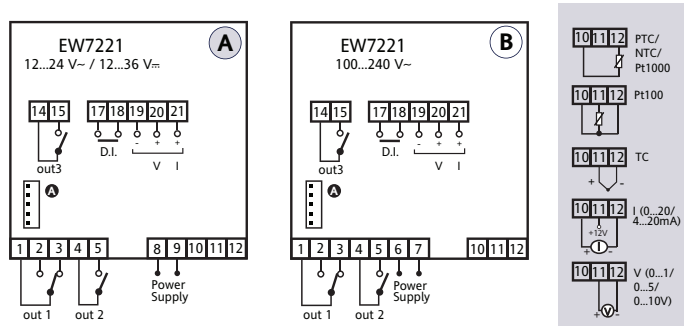
1 - 3	N.C. out1 relay par. H21	8 - 9	Power Supply (model A)
2 - 3	N.A. out1 relay par. H21	6 - 7	Power Supply (model B)
4 - 5	N.A. out2 relay par. H22	A	TTL input for Copy Card and Televis**System**
10-11-12	Probe input		

Important! Check the probes and models available.
* Only for Televis**System/Modbus** compatible models.

TECHNICAL DATA EW7221

Front protection	IP54
Container	PC+ABS plastic resin body PC+ABS UL94 V-0
Dimensions	front 72x72 mm, depth 80 mm
Mounting	and panel with 67x67 mm drilling template
Usage temperature	-5°C ... 55°C
Storage temperature	-20°C ... 85°C
Ambient humidity in use and in storage	10% ... 90% RH (non-condensing)
Display range	See **Probes Table**
Analog input	1 input selectable by parameter **H00**
Digital input	1 digital input free of voltage
Serial	TTL for connection to Copy Card or Televis**System***
Digital outputs (configurable)	
- output OUT1	1 SPDT 8(3) A 250 V~
- output OUT2	1 SPST 8(3) A 250 V~
- output OUT3	1 SPST 5 A 250 V~
Analog output	output V-I: 0-1V,0-5V,0-10V, 0...20mA, 4...20mA
Buzzer output	present
Accuracy	See **Probes Table**
Resolution	See **Probes Table**
Consumption	4W max
Power supply	2 Switching power types: mod.**B**: 100...240 V~ ±10% 50/60Hz mod.**A**: 12...24 V~ / 12...36 V⎓ ±10% 50/60Hz

WIRING DIAGRAM



TERMINALS

1 - 3	N.C. out1 relay par. H21	10-11-12	Probe input
2 - 3	N.A. out1 relay par. H21	14-15	N.A. out3 relay par. H23
4 - 5	N.A. out2 relay par. H22	17-18	Digital Input - D.I.
8 - 9	Power Supply (model A)	19-20-21	Analog Output V-I
6 - 7	Power Supply (model B)	A	TTL input for Copy Card and Televis**System**

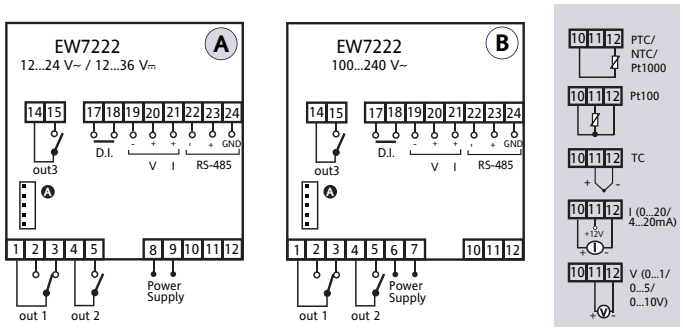
Important! Check the probes and models available.
* Only for Televis**System/Modbus** compatible models.

The technical specifications in the document that relate to measurement (range, accuracy, resolution, etc.,) refer to the device in the strict sense, not to any of the accessories supplied, for example probes. Consequently, any errors introduced by the probe must be added to the characteristic error of the device.

TECHNICAL DATA EW7222 WIRING DIAGRAM

Front protection	IP54
Container	PC+ABS plastic resin body PC+ABS UL94 V-0
Dimensions	front 72x72 mm, depth 80 mm
Mounting	and panel with 67x67 mm drilling template
Usage temperature	-5°C ... 55°C
Storage temperature	-20°C ... 85°C
Ambient humidity in use and in storage	10% ... 90% RH (non-condensing)
Display range	See **Probes Table**
Analog input	1 input selectable by parameter **H00**
Digital input	1 digital input free of voltage
Serial	TTL for connection to Copy Card or Televis**System*** and serial port RS-485
Digital outputs (configurable)	
- output OUT1	1 SPDT 8(3) A 250 V~
- output OUT2	1 SPST 8(3) A 250 V~
- output OUT3	1 SPST 5 A 250 V~
Analog output	output V-I: 0-1V,0-5V,0-10V, 0...20mA, 4...20mA
Buzzer output	present
Accuracy	See **Probes Table**
Resolution	See **Probes Table**
Consumption	4W max
Power supply	2 Switching power types: mod.**B**: 100...240 V~ ±10% 50/60Hz mod.**A**: 12...24 V~ / 12...36 V⎓ ±10% 50/60Hz

Important! Check the probes and models available.
* Only for Televis**System/Modbus** compatible models.



TERMINALS

1 - 3	N.C. out1 relay par. H21	14-15	N.A. out3 relay par. H23
2 - 3	N.A. out1 relay par. H21	17-18	Digital Input - D.I.
4 - 5	N.A. out2 relay par. H22	19-20-21	Analog Output V-I
10-11-12	Probe input	22-23-24	Porta seriale RS 485
8 - 9	Power Supply (model A)	A	TTL input for Copy Card and Televis**System**
6 - 7	Power Supply (model B)		

* maximum loads controlled by the analog output:

output type	**maximum load**
0-1 V	20mA with minimum load resistance 50 Ohm
0-5 V	20mA with minimum load resistance 250 Ohm
0-10 V	20mA with minimum load resistance 500 Ohm
0-20mA	350 Ohm
4-20mA	350 Ohm

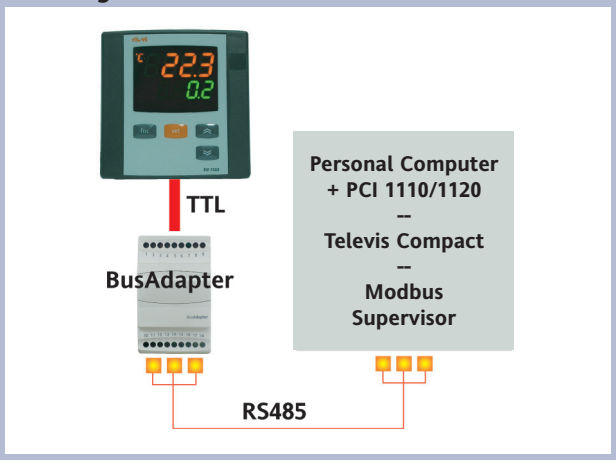
Probes Table

Probe*	Range	Probe error limits	Resolution	Accuracy**
Ptc	-55...150°C	-60...155°C	0,1°C (0,1°F)	0.5% end of scale + 1 digit
Ntc	-50...110°C	-55...115°C	0,1°C (0,1°F)	0.5% at end of scale + 1 digit
Pt1000	-200...800°C	-210...810°C	0,2°C	0.5% end of scale + 1 digit
TCj	-40...760°C	-50...770°C	0,6°C (0,6°F)	0.4% end of scale + 1 digit
TCk	-40...1350°C	-50...1360°C	0,6°C (0,7°F)	0.5% end of scale + 1 digit
TCS	0...1600°C	-10...1610°C	0,6°C (0,8°F)	0.5% end of scale + 1 digit
TCR	0...1600°C	-10...1610°C	0,6°C (0,7°F)	0.5% end of scale + 1 digit
TCT	-40...350°C	-50...360°C	0,6°C (0,7°F)	0.5% end of scale + 1 digit
Pt100	-200...800°C	-210...810°C	0,1°C (0,2°F)	0.5% end of scale + 1 digit (over entire scale) 0.2% end of scale + 1 digit (-150...300°C)
V-I (1)	0...1 V 0...5 V 0...10 V 0...20 mA 4...20 mA	-1...10 % -0,20...10 % -0,10...3 % 0,05...5 % -6,25...6,25 %	1 digit if **ndt**=0 0,1 digit if **ndt**=1 0,01 digit if **ndt**=2 0,001 digit if **ndt**=3	0.5% end of scale + 1 digit

*** Important!** Check the probes and models available.
** **NOTE:** The accuracy values shown are valid for an ambient temperature of 25°C
(1) The maximum load present on the +12V feed of the sensor is 60mA

IMPORTANT! CHECK THE AVAILABILITY OF THE MODELS AND RELATED ACCESSORIES DESCRIBED IN THIS DOCUMENT

Televis**System/Modbus**



Only for model with the Televis**System/Modbus** connectivity.

The device can be connected to Televis remote control systems through a TTL serial port (use TTL- RS interface module 485 BUS ADAPTER 130 or 150) or, in models where provided for (EW7222), by means of direct RS485 connection. To configure the device for this purpose, open the folder identified by the “Add” label and use parameters “dEA” and “FAA”.

MECHANICAL ASSEMBLY

The device is designed for panel mounting. Make a 45x45 mm drill hole and insert the device; fix it with the special brackets provided. Do not mount the device in damp and/or dirt-laden areas. It is suitable for use in places with ordinary or normal levels of pollution. Keep the area around the device cooling slots adequately ventilated

ELECTRICAL CONNECTIONS

Warning! Switch off the device before working on the electrical connection

The device is equipped with screw or removable terminals for connecting electric cables of 2.5 mm^2 maximum cross-section (one wire per terminal in the case of power connections): for the capacity of the terminals, see the label on the device. The relay outputs are free of voltage. Do not exceed the maximum permitted current; for higher loads, use a contactor with sufficient power capacity. Make sure that power supply is the correct voltage for the device. Note that the length of the analogue I/O cables can affect the EMC performance of the instrument, so that it is important to take all possible precautions with the cabling. We recommend keeping I/O cable runs under 3 metres.

The probe cables, power supply cables and the TTL serial cable should be kept separate from the power cables.

RESPONSIBILITY AND RESIDUAL RISKS

Eliwell Controls will not be liable for damage resulting from:
- installation/uses other than those specified and, in particular, which do not comply with the safety requirements set out in the regulations and/or stated herein;
- use on panels that do not provide adequate protection against electric shock, water or dust when assembled;
- use on panels that allow access to dangerous parts without having to use tools;
- tampering and/or modification of the product;
- installation/use on panels that do not comply with the current standards and regulations.

DISCLAIMER

This document is the property of Eliwell alone and may not be reproduced or circulated unless expressly authorized by Eliwell Controls. All possible care has been taken to ensure the accuracy of this document; Eliwell Controls 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 reserves the right to make changes , whether stylistic or functional, at any time and without prior notice.

Eliwell Controls s.r.l.
Via dell’Industria, 15 • Z.I. Paludi
32016 Alpago (BL) - ITALY
T: +39 0437 986111
www.eliwell.com

Customer’s Technical Support:
T: +39 0437 986300
E: Techsuppeliwell@se.com

Sales:
T: +39 0437 986100 (Italy)
T: +39 0437 986200 (other countries)
E: saleseliwell@se.com

MADE IN ITALY

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 according to the application, and must also 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 harmonised European reference standards. It is classified as follows:
- depending on construction, as a built-in automatic electronic control device;
- according to its automatic operating characteristics, as a type 1B control type device;
- according to its software class and structure, as a Class A device.

USES NOT PERMITTED

The device must not be used for applications other than those described.
Note that the relay contacts provided are of a functional type and therefore subject to malfunction: Any protection devices required by product standards, or suggested by common sense, must be installed externally to the instrument for obvious safety reasons.

UK Authorized Representative:
Schneider Electric Limited
Stafford Park 5
Telford, TF3 3BL
United Kingdom

© 2021 Eliwell - All rights reserved.