

# DR 4000

## UNIVERSAL CONTROLLERS

Temperature regulators and process controllers



### Keys

<b>UP</b> Scrolls through menu items Increases values on the display Programmable by parameter (see par. H31)	<b>DOWN</b> Scrolls through menu items Decreases values Programmable by parameter (see par. H32)	<b>fnc</b> Opens QuickStart menu ESC (exit) function	<b>set</b> Opens Setpoint editing mode Opens the Programming Menu Activates functions Confirms commands	<b>aux</b> Programmable by parameter (see par. H34)

### 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.

	<b>S.Str</b> ON if the Soft Start function is active; OFF in all other cases;		<b>Alarm</b> ON if there is an alarm; otherwise OFF; flashes if an alarm is silenced;
	<b>out1 - out2</b> ON when output active; otherwise OFF;		<b>°C/°F</b> Indicates whether the temperature display is in °C or °F; OFF for other units of measurement
	<b>out2</b> Flashes if there is a delay, a protection, or activation is blocked		
	<b>aux</b> ON when output active; otherwise OFF		

### Setting the Setpoints

The following procedure is used to set the values of the 2 setpoints of the device: **SET1** and **SET2**



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



② The PV display shows the label **SET1**, and the SV display shows the current Setpoint value. Press the "Set" key again to display 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**.



**User level access:**

- When the main display is present, the user can press the "Set" key for 3 seconds to access the Parameter Programming menu; the **USER** label appears to indicate the user level of the menu.



**Installer level access (InSt):**

- When the label **USER** is displayed, press and release the "Set" key to open the folders containing the **user level parameters**.



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

#### How to change the parameter values (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 that 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.



- Press the "UP" and "DOWN" keys to change the value of the selected parameter. 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.

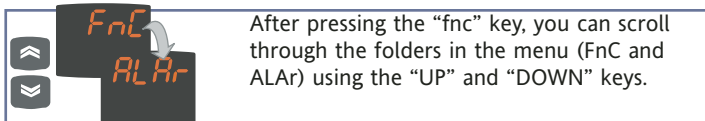


- Now press and release the "fnc" key to return to the previous display levels.

At any level of any of the menus, either 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.

## QuickStart Menu

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



After pressing the “fnc” key, you can scroll through the folders in the menu (FnC and ALAr) using the “UP” and “DOWN” keys.

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

### Functions folder

When the **FnC** label is shown on the display, you can press the “Set” key.



The label and the current status of the function will be displayed on the function. To scroll through all the available functions, use the “Set” key.



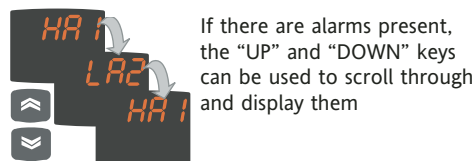
To change the status of a function, use the “UP” and “DOWN” keys.

Function	Function label	Default status	D.I. (H11)	Key (H31..H34)	Function active indication
Soft Start	SStr	ON	1	1	S.Str LED ON
Stand-by	Stnb	OFF	5	5	/

### Alarms folder\*

The **ALAr** label is shown on the display, press the “Set” key 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.



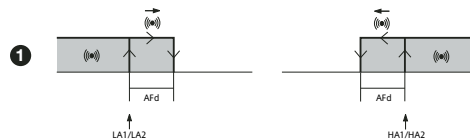
If there are alarms present, the “UP” and “DOWN” keys can be used to scroll through and display them

LABEL ALARM	CAUSE	EFFECTS*	Problem solving
<b>E1</b> Probe 1 (regulating) faulty	<ul style="list-style-type: none"> <li>measured values are outside the nominal range</li> <li>regulating probe faulty/short-circuit/open circuit</li> </ul>	Label <b>E1</b> shown on main display but not in the <b>ALAr</b> folder;	<ul style="list-style-type: none"> <li>check the probe wiring</li> <li>replace probe</li> </ul>
<b>HA1</b> High temperature alarm on probe 1 or 2	<ul style="list-style-type: none"> <li>value read by probe <math>\geq</math> HA1/2 after time “tAO” (see “MIN MAX ALARMS” diagram and description of parameters “HA1/2” and “Att” and “tAO”)</li> </ul>	Alarm created in the <b>ALAr</b> folder through label <b>HA1/HA2</b>	<ul style="list-style-type: none"> <li>Wait for the temperature value read by the probe to fall below HA1/2-AFd</li> </ul>
<b>LA1</b> Low temperature alarm on probe 1 or 2	<ul style="list-style-type: none"> <li>value read by probe <math>\leq</math> LA1/2 after time “tAO” (see “MIN MAX ALARMS” and parameters “LA1/2” and “Att” and “tAO”)</li> </ul>	Alarm created in the <b>ALAr</b> folder through label <b>LA1/LA2</b>	<ul style="list-style-type: none"> <li>Wait for the temperature value read by the probe to rise above LA1/2-AFd</li> </ul>
<b>EAL</b> External alarm	<ul style="list-style-type: none"> <li>alarm regulation with delay set by parameter <b>H14</b> from D.I. Active if <b>H11</b>=9 or 10 (see <b>H11</b> and <b>H14</b>)</li> </ul>	Alarm LED lit continuously; Alarm indicated in the <b>ALAr</b> folder through label <b>EAL</b> . If <b>H11</b> =10, the regulators are blocked.	<ul style="list-style-type: none"> <li>Silence the alarm manually by pressing a key</li> <li>If <b>H11</b>=10, the regulators are activated again only after the digital input is disabled</li> </ul>

\* Appears only if at least one alarm is present.

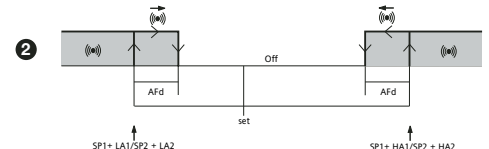
## MAX-MIN ALARMS

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



<b>Minimum temperature alarm</b>	Temperature less than or equal to LA1/2 (LA1/2 with sign)
<b>Maximum temperature alarm</b>	Temperature greater than or equal to HA1/2 (HA1/2 with sign)
<b>Return from minimum temperature alarm</b>	Temperature greater than or equal to LA1/2+AFd
<b>Return from maximum temperature alarm</b>	Temperature less than or equal to HA1/2-AFd

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

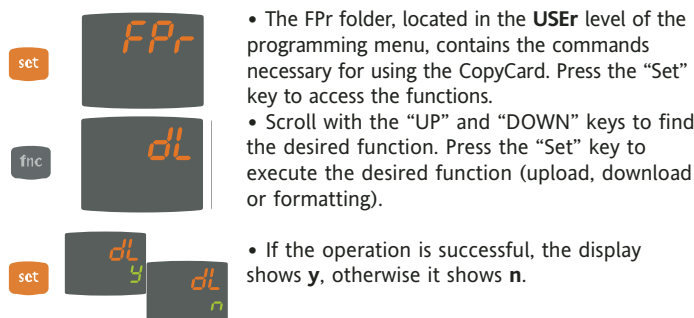


Temperature less than or equal to set+LA1/2 (LA1/2 positive only)
Temperature greater than or equal to set+HA1/2 (HA1/2 positive only)
Temperature greater than or equal to set + LA1/2 + AFd set -  LA1/2  + AFd
Temperature less than or equal to set+HA1/2-AFd

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

## 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 CopyCard. Press the “Set” key to access the functions.

• Scroll with the “UP” and “DOWN” keys to find the desired function. Press the “Set” key to execute the desired function (upload, download or formatting).

• 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 download operation, the instrument will work with the newly loaded parameters map.
- see folder **FPr** in ‘Parameters’ on pages 4-5
- connect the Copy Card so that the writing “MEMORY MODULE” is facing upwards.

## Passwords

Passwords can be set to restrict access to each parameter management level. The two different passwords can be activated by setting the parameters PA1 and PA2 in the 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.

set



- 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**.

## Parameters table

Par.	Range	Default*	U.o.M.	Level
<b>SP1</b>	LS1...HS1	0.0	°C/°F	
<b>SP2</b>	LS2...HS2	0.0	°C/°F	
<b>OS1</b>	-30.0...30.0	0	°C/°F	InSt
<b>db1</b>	0.0...30.0	1.0	°C/°F	USer/InSt
<b>dF1</b>	-30.0...30.0	-1.0	°C/°F	USer/InSt
<b>HS1</b>	LS1...HdL	800.0	°C/°F	USer/InSt
<b>LS1</b>	LdL...HS1	-200.0	°C/°F	USer/InSt
<b>HA1</b>	LA1...2910.0	2910	°C/°F	USer/InSt
<b>LA1</b>	-328.0...HA1	-328.0	°C/°F	USer/InSt
<b>dn1</b>	0...255	0	sec	InSt
<b>do1</b>	0...255	0	min	InSt
<b>di1</b>	0...255	0	min	InSt
<b>dE1</b>	0...255	0	sec	InSt
<b>On1</b>	0...255	0	min	InSt
<b>OF1</b>	0...255	1	min	InSt
<b>OS2</b>	-30.0...30.0	0	°C/°F	InSt
<b>db2</b>	0.0...30.0	1.0	°C/°F	USer/InSt
<b>dF2</b>	-30.0...30.0	-1.0	°C/°F	USer/InSt
<b>HS2</b>	LS2...HdL	800.0	°C/°F	USer/InSt
<b>LS2</b>	LdL...HS2	-200.0	°C/°F	USer/InSt
<b>HA2</b>	LA2...2910.0	2910	°C/°F	USer/InSt
<b>LA2</b>	-328.0...HA2	-328.0	°C/°F	USer/InSt
<b>dn2</b>	0...255	0	sec	InSt
<b>do2</b>	0...255	0	min	InSt
<b>di2</b>	0...255	0	min	InSt
<b>dE2</b>	0...255	0	sec	InSt
<b>On2</b>	0...255	0	min	InSt
<b>OF2</b>	0...255	1	min	InSt

label AnOu (2)	<b>AOL</b>	020/420/001/005/010	020	num	USer/InSt
	<b>AOF</b>	rO/Er/cPH/cPc/diS	Er	num	USer/InSt
	<b>AOS</b>	Aon/AoF	AoF	Flag	USer/InSt
	<b>LAO</b>	LdL...HdL	0	num	USer/InSt
	<b>HAO</b>	LdL...HdL	100.0	num	USer/InSt
label SFT	<b>dSi</b>	0...25	0	°C/°F	InSt
	<b>Std</b>	0...255	0	hours/min/sec	InSt
	<b>unt</b>	0...2	1	num	InSt
	<b>SEn</b>	0...3	1	num	InSt
	<b>Sdi</b>	0...30	0	°C/°F	InSt
label clc	<b>Con</b>	0...255	0	min	InSt
	<b>CoF</b>	0...255	0	min	InSt
label AlAr	<b>Att</b>	AbS/rEL	AbS	flag	InSt
	<b>AfD</b>	1...50	2	°C/°F	InSt
	<b>PAO</b>	0...10	0	hours	USer/InSt
	<b>SAO</b>	0...24	0	hours	USer/InSt
	<b>tAO</b>	0...255	0	min	USer/InSt
label Add	<b>PtS</b>	t/d	t	flag	USer/InSt
	<b>dEA</b>	0...14	0	num	USer/InSt
	<b>FAA</b>	0...14	0	num	USer/InSt
label dISp	<b>PtY</b>	n/E/o	E	num	USer/InSt
	<b>StP</b>	1b/2b	1b	flag	USer/InSt
	<b>LOC</b>	n/y	n	Flag	USer/InSt
label rPr	<b>PA1</b>	0...999	0	num	USer/InSt
	<b>PA2</b>	0...999	0	num	InSt
	<b>ndt</b>	n/y	y	Flag	USer/InSt
	<b>(3)</b>	0...3	1	num	
	<b>CA1</b>	-30...30	0	°C/°F	USer/InSt

label dISp	<b>CAi</b>	0...2	2	num	InSt
	<b>LdL</b>	-328...HdL	-40.0 - 328(*)	°C/°F	InSt
	<b>HdL</b>	LdL...2910.0	2910.0	°C/°F	InSt
	<b>dro</b>	0...1	0	Flag	USer/InSt
	<b>H00 (4)</b>	ntc/Ptc/Pt10/Pt1	Pt1	num	USer/InSt
label CnF	<b>H01</b>	0...11	4	num	InSt
	<b>H02</b>	0...15	5	sec	InSt
	<b>H03(5)</b>	-1999...9999	20	num	InSt
	<b>H04(5)</b>	-1999...9999	100	num	InSt
	<b>H06</b>	n/y	y	flag	InSt
	<b>H08</b>	0...2	2	num	InSt
	<b>H10</b>	0...255	0	num	USer/InSt
	<b>H11(6)</b>	0...10	0	num	InSt
	<b>H13(6)</b>	no/nc/noP/ncP	no	num	InSt
	<b>H14(6)</b>	0...255	0	min	InSt
	<b>H21</b>	0...4	0	num	InSt
	<b>H22(7)</b>	0...4	0	num	InSt
	<b>H25(8)</b>	0...1	0	num	InSt
	<b>H31</b>	0...8	0	num	InSt
	<b>H32</b>	0...8	0	num	InSt
<b>H34</b>	0...8	0	num	InSt	
<b>rEL</b>	/	/	num	USer/InSt	
<b>tAb</b>	/	/	num	USer/InSt	
label rPr	<b>UL</b>	/	/	/	USer/InSt
	<b>dL</b>	/	/	/	USer/InSt
	<b>Fr</b>	/	/	/	USer/InSt

### NOTES:

- File visible only on DR4020, DR4021 and DR4022 models
- File visible only on DR4021, DR4011 and DR4022 models
- the parameter **ndt** is not visible on TC models. On V/I/Pt100 versions it is possible to display up to 3 decimal places (range 0...3 on V/I/Pt100 models only)

(4) The range and default values depend on the model of probe used. **Check the availability of probes and models.**

- Parameters visible only on V/I models (see probes table)
- These parameters are only visible on DR4021, DR4011 and DR4022 models
- Parameter visible only on DR4020, DR4021 and DR4022 models
- Parameter H25 is only present on models with a buzzer output.

## Description of parameters

<b>SP1/SP2</b>	Setpoint 1/Setpoint 2 <b>REGULATOR 1/2 (folder with label “rE1”/“rE2”)</b>
<b>OS1/OS2</b>	Offset Setpoint 1/2. Temperature value to be added arithmetically to the Setpoint if a reduced setpoint is enabled; it cannot assume the value 0.
<b>db1/db2</b>	Response band above Setpoint 1/2
<b>dF1/dF2</b>	Setpoint 1/2 differential band. With negative sign Hot operation; with positive sign, Cold operation. If dF1=0 returns on SP1/2, dF1=db1
<b>HS1/HS2</b>	Maximum value that can be assigned to setpoint 1/2.
<b>LS1/LS2</b>	Minimum value that can be assigned to setpoint 1/2.
<b>HA1/HA2</b>	Maximum temperature alarm. Temperature limit (the relative or absolute status of this value is controlled by “Att”, present in the installer menu, folder ALAr), over which the alarm is activated.
<b>LA1/LA2</b>	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.
<b>dn1/dn2</b>	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.
<b>do1/do2</b>	Delay time after switching off. The delay time indicated must elapse between deactivation of the regulator relay and the next switch-on.
<b>di1/di2</b>	Delay between switch-ons. The delay time indicated must elapse

<b>dE1/dE2</b>	between two consecutive switch-ons of the regulator. Switch-off delay. The delay time indicated must elapse between the request for deactivation of the regulator relay and switch-off. <b>NOTE: for parameters dn1/2, do1/2, di1/2, dE1/2, 0= not active</b>
<b>On1/On2</b>	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. <b>See the Duty Cycle.</b>
<b>OF1/OF2</b>	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. <b>See the Duty Cycle.</b>

### CONFIGURATION OF ANALOG OUTPUT (folder with label “AnOu”)

<b>AOL</b>	Analog output mode: 020=0...20mA; 420=4...20mA; 001=0...1V; 005=0...5V; 010=0...10V;
<b>AOF</b>	Analog output mode: <b>dis</b> =output disabled; <b>ro</b> =read out, output proportional to probe reading, within the range set by parameters LAO and HAO <b>Er</b> =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**= PID Hot control variable, output proportional to the percentage power output, if PID Hot is selected.  
**cPC**= PID control variable, output proportional to the percentage power output, if PID Cold is selected.

**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  
**SOFTSTART REGULATOR (folder with label "Sft")**  
**see "Soft Start", page 5**

**dSi** Soft Start regulator step value  
**Std** Duration of step for Soft Start regulator (unit of measurement defined by **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 5**

**Con** ON time for cyclic regulator output  
**CoF** Off time for cyclic regulator output  
**ALARm REGULATOR (folder with label "ALAr")**

**Att** Parameter modes 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 "setpoint 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**=Televi; **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** Display format with decimal point: **y** = yes; **n** = no  
**NOTE:** for V/Pt100 models with analog input only, can display up to 3 decimal places:  
 0=whole value; 1=1 digit; 2=2 digit; 3=3 digit

**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=add to displayed temperature only;  
 1=add to the temperature used by the regulators only, not to the display, which remains unchanged;  
 2=add to the temp. displayed, which 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 display of the temperature read by 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).**

**CONFIGURATION PARAMETERS (folder with label "CnF")**

**Selection of probe type for NTC/PTC/Pt1000/Pt100 models:**  
**ntC**=Ntc; **PtC**=PtC; **Pt10**=Pt1000; **Pt1**=Pt100;  
**Selection of probe type for V/I models:**  
**020**=0...20mA; **420**=4...20mA; **t01**=0...1V<sub>rms</sub>;  
**t05**=0...5V<sub>rms</sub>; **t10**=0...10V<sub>rms</sub>;  
**Selection of probe type for TC models:**  
**tcj**=tcj; **tcH**=tCK; **tcS**=tcS; **tcR**=tcR; **tct**=tct;

**H00**

H01	Description	OUT1	OUT2
0	free	H21	H22
1	ON/OFF	H/C	H22
2 and 3	not used	-	-
4	two independent ON/OFFs	H/C	H/C
5	two interdependent ON/OFFs	H/C	H/C
6	neutral zone	H/C	H/C
7...11	not used	-	-

**H01**

Regulators configuration:  
 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**

Lower current/voltage limit for input (only for V-I models, see parameter H00)

**H04**

Upper current/voltage limit for input (only for V-I models, 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 and regulators off  
 2= display off and regulators off

**H10**

Delay for output activation after Power On; minimum delay time for connection of loads 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=7=8=not used; 9=external alarm;

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

**H22\***

Configurability of digital output 2 (if present):  
 Same as H21

**\* see table, parameter H01**

**H25**

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

**H31**

Configurability of "UP" key:  
 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=7=8=not used;

**H32**

Configurability of "DOWN" key: Same as H31

**H34**

Configurability of AUX 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 2**

**UL**

UpLoad: transfer parameters from device to Copy Card.

**dL**

downLoad: transfer parameters from Copy Card to device.

**Fr**

Format. Erase all data entered in the key.

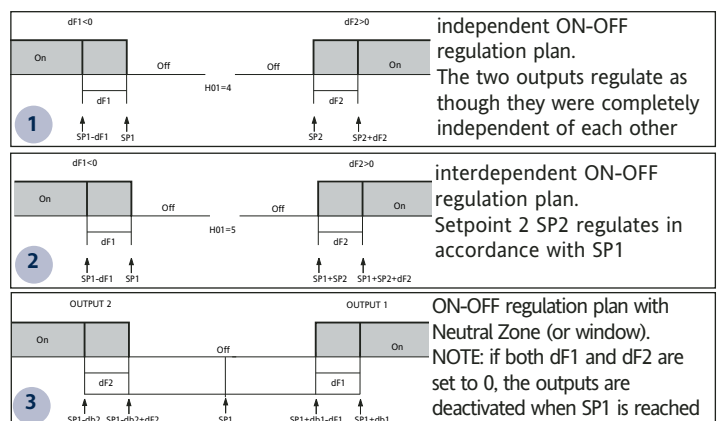
## Description of Regulators

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

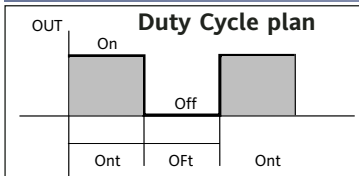
- **H01=4, 5** threshold regulator
- **H01=6** regulator with window

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

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



## Output protection



An error condition in the probe causes one of the following actions:

- code E1 is shown on the display
- activation of regulator as indicated by parameters On1/On2 and OF1/OF2 if programmed 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 4.

This function is used to energize the relay if it was de-energized, or vice versa. The relay status is stored in order to maintain correct operation in the event of a power failure, unless parameter H11 = 4 (aux); in this case, the relay reflects the status 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 subsequently deactivated the relay status will not be changed as it has been switched off by a 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".

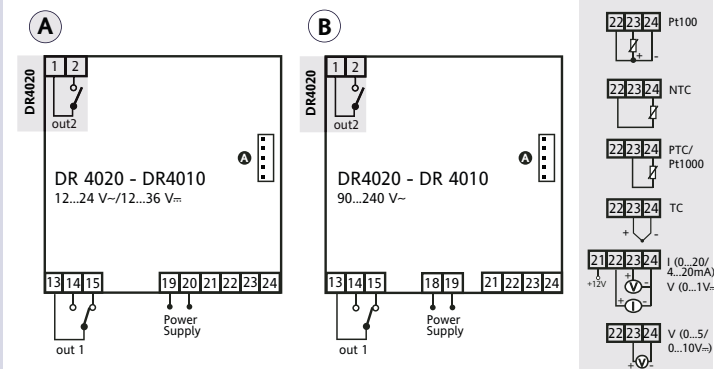
## Cyclic Regulator

**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 DR4020 - DR4010

Enclosure	plastic housing 4 DIN modules
Dimensions	Front panel 70x85 mm, depth 61 mm
Mounting	on DIN guide (Omega 3) or panel mounting with 70x45 drilling template
Operating 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 <b>Probes Table</b>
Analog input	1 input selectable by parameter <b>H00</b>
Serial	TTL for connection to Copy Card or to TelevisSystem
Digital outputs (configurable)	
- OUT1	1 SPDT 8(3)A 250 V~
- OUT2 (only 4020)	1 SPST 8(3)A 250 V~
Buzzer output	only on models where this is provided
Accuracy	See <b>Probes Table</b>
Resolution	See <b>Probes Table</b>
Power consumption	4W max
Power supply	2 possible types of Switching power supply: model B: 90...240 V~ ±10% 50/60Hz model A: 12...24 V~ / 12...36 V~ ±10% 50/60Hz

## WIRING DIAGRAM



### TERMINALS

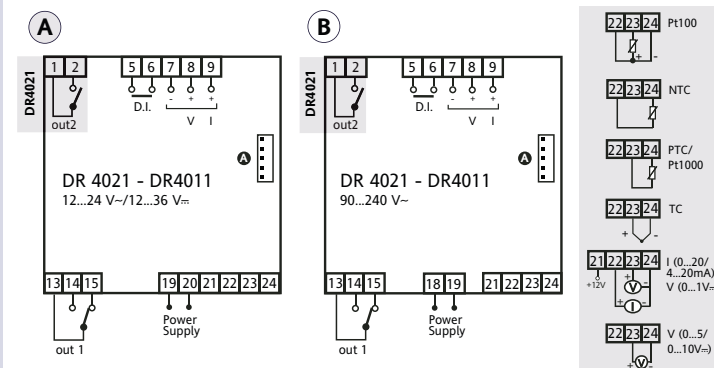
13-15	N.C. relay out1 par. H21	19-20	Power (model A)
13 - 14	N.O. relay out1 par. H21	18-19	Power (model B)
1 - 2*	N.O. relay out2 par. H22	A	TTL input for Copy Card and Televis system
21-22-23-24	Probe input		* present only in DR4020 model

**Important!** Check the availability of the probes and models.

## TECHNICAL DATA DR4021-DR4011

Enclosure	plastic housing 4 DIN modules
Dimensions	Front panel 70x85 mm, depth 61 mm
Mounting	on DIN guide (Omega 3) or panel mounting with 70x45 drilling template
Operating 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 <b>Probes Table</b>
Analog input	1 input selectable by parameter <b>H00</b>
Digital input	1 digital input free of voltage
Serial	TTL for connection to Copy Card or to TelevisSystem
Digital outputs (configurable)	
- OUT1	1 SPDT 8(3)A 250 V~
- OUT2(only 4021)	1 SPST 8(3)A 250 V~
Analog output*	Output V-I: 0-1V,0-5V,0-10V, 0...20mA, 4...20mA
Buzzer output	buzzer output present
Accuracy	See <b>Probes Table</b>
Resolution	See <b>Probes Table</b>
Power consumption	4W max
Power supply	2 possible types of Switching power supply: model B: 90...240 V~ ±10% 50/60Hz model A: 12...24 V~ / 12...36 V~ ±10% 50/60Hz

## WIRING DIAGRAM



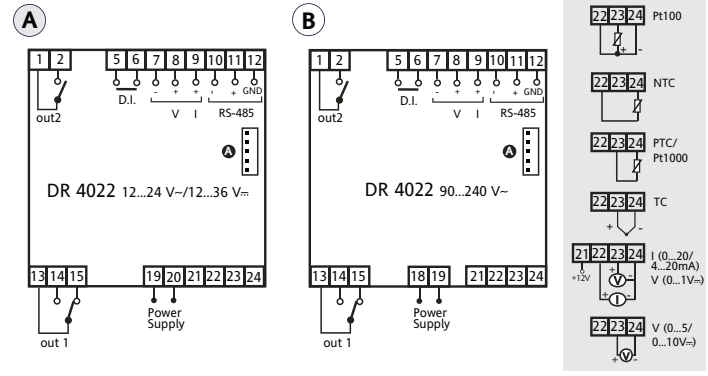
### TERMINALS

13-15	N.C. relay out1 par. H21	18-19	Power (model B)
13 - 14	N.O. relay out1 par. H21	5-6	Digital input
1 - 2*	N.O. relay out2 par. H22	7-8-9	Analog output V-I
21-22-23-24	Probe input	A	TTL input for Copy Card and Televis system
19-20	Power (model A)		* present only in DR4021 model

**Important!** Check the availability of the probes and 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

Enclosure	plastic housing 4 DIN modules
Dimensions	Front panel 70x85 mm, depth 61 mm
Mounting	on DIN guide (Omega 3) or panel mounting with 70x45 drilling template
Operating 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 <b>Probes Table</b>
Analog input	1 input selectable by parameter <b>H00</b>
Digital input	1 digital input free of voltage
Serial	TTL for connection to Copy Card or to Televis <b>System</b> + RS-485 serial port
Digital outputs (configurable)	
- OUT1	1 SPDT 8(3)A 250 V~
- OUT2	1 SPST 8(3)A 250 V~
Analog output*	Output V-I: 0-1V,0-5V,0-10V, 0...20mA, 4...20mA
Buzzer output	buzzer output present
Accuracy	See <b>Probes Table</b>
Resolution	See <b>Probes Table</b>
Power consumption	4W max
Power supply	2 possible types of Switching power supply: model <b>B</b> : 90...240 V~ ±10% 50/60Hz model <b>A</b> : 12...24 V~ / 12...36 V~ ±10% 50/60Hz



**TERMINALS**

13-15	N.C. relay out1 par. H21	18-19	Power (model B)
13 - 14	N.O. relay out1 par. H21	5-6	Digital input (DI).
1 - 2	N.O. relay out2 par. H22	7-8-9	Analog output V-I
21-22-23-24	Probe input	10-11-12	RS-485 serial port
19-20	Power (model A)	A	TTL input for Copy Card and Televis system

**Important!** Check the availability of the probes and models.

\* maximum loads that can be piloted from the analog output:

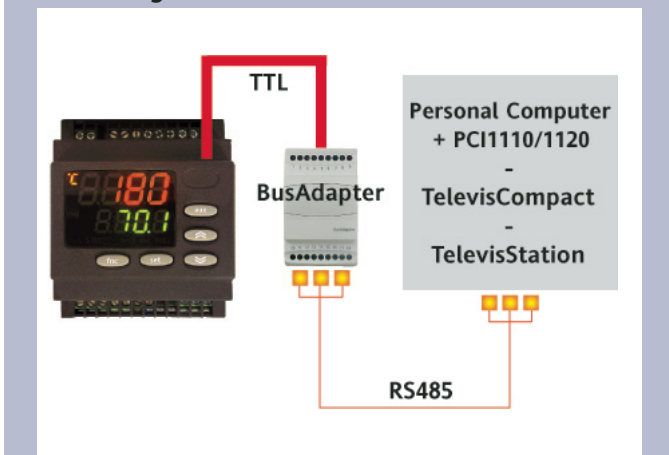
output type	maximum load
0-1 V	20mA with minimum load resistance 50 Ohm
0-5 V	20mA with minimum load resistance 250 Ohm
0-10 V	20mA with minimum load resistance 500 Ohm
0-20mA	350 Ohm
4-20mA	350 Ohm

**Probes Table**

Probe*	Range	Probe error limits	Resolution	Accuracy**
<b>Ptc</b>	-55...150°C	-60...155°C	0.1°C (0.1°F)	0.5% full scale + 1 digit
<b>Ntc</b>	-50...110°C	-55...115°C	0.1°C (0.1°F)	0.5% full scale + 1 digit
<b>Pt1000</b>	-200...800°C	-210...810°C	0.2°C	0.5% full scale + 1 digit
<b>TCj</b>	-40...760°C	-50...770°C	0.6°C (0.6°F)	0.4% full scale + 1 digit
<b>Tck</b>	-40...1350°C	-50...1360°C	0.6°C (0.7°F)	0.5% full scale + 1 digit
<b>TCS</b>	0...1600°C	-10...1610°C	0.6°C (0.8°F)	0.5% full scale + 1 digit
<b>TCR</b>	0...1600°C	-10...1610°C	0.6°C (0.7°F)	0.5% full scale + 1 digit
<b>TCT</b>	-40...350°C	-50...360°C	0.6°C (0.7°F)	0.5% full scale + 1 digit
<b>Pt100</b>	-200...800°C	-210...810°C	0.1°C (0.2°F)	0.5% full scale + 1 digit (over entire scale) 0.2% full scale + 1 digit (-150...300°C)
<b>V-I (1)</b>	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 with <b>ndt</b> =0 0.1 digit with <b>ndt</b> =1 0.01 digit with <b>ndt</b> =2 0.001 digit with <b>ndt</b> =3	0.5% full scale + 1 digit

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

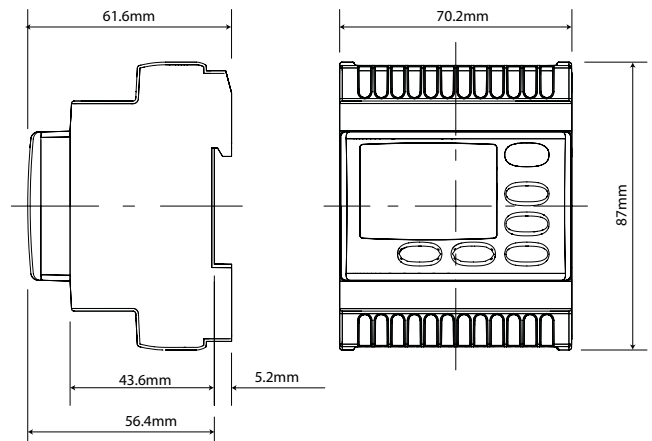
## Televis System connection



The device can be connected to Televis remote control systems through a TTL serial port (use the TTL- RS interface module 485 BUS ADAPTER 130 or 150), or, on certain models (DR4022), via a direct RS-485 connection. To configure the device for this purpose, open the folder identified by the "Add" label and use parameters "dEA" and "FAA".

**IMPORTANT! CHECK THE AVAILABILITY OF COMPATIBLE MODELS WITH REMOTE CONTROL SYSTEMS.**

## Dimensions



## MECHANICAL INSTALLATION

The device is designed for wall or panel mounting on DIN guides. Make a hole 70x45 mm and insert the device, securing it with the fixings provided. Do not install the device in damp and/or dirt-laden areas; it is suitable for use in places with ordinary or normal levels of pollution. Ensure that the area around the device cooling slots is adequately ventilated.

## ELECTRICAL CONNECTIONS

**Important! Switch off the device before working on the electrical connections.**

The device is equipped with screw terminals for connecting electric cables of 2.5 mm<sup>2</sup> 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 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 the correct voltage for the device. Note that the length of the wiring used for analog inputs and outputs wiring can affect the EMC (electro-magnetic compatibility) characteristics of the device and it is therefore important to take great care when wiring up the device; we recommend that you do not use cables over 3 metres in length. The probe cables, power supply cables and the TTL serial cable should all be kept separate from the power cables.

## RESPONSIBILITY AND RESIDUAL RISKS

Eliwell Controls srl shall 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.

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## 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:

- with regard to its construction, as a built-in automatic electronic control device;
- with regard to its automatic operating characteristics, as a type 1B control type device;
- with regard 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.