

COMPENSATING CONTROLLER WITH SEASON SWITCHING

C ←RING

RCS 633 Eng. C2



- **Control of flow temperature with season switching**
- **Communication systems**
 - C-Ring for exchange of data between local controllers
- **Power supply 230 V ~ ; DIN rail compatible**

1. APPLICATION

RCS 633 controller is designed for winter and summer compensated control of flow water temperature in centralised boiler plants with fan coils or panels in, for example:

- public and commercial offices
- schools and universities
- residential complexes

2. FUNCTIONS

The principal functions of RCS 633 are:

- Winter and summer control of flow temperature in relation to outside temperature or at a fixed point with:
 - winter and summer minimum and maximum temperature limits
 - summer minimum temperature limit variable in relation to ambient dew point temperature
 - correction of heating curve origin
 - self-adapting of heating curve in relation to ambient authority
 - winter and summer Eco Off function
- Three-position modulating control or On-Off in two stages
- Control of plant pump by current programme of timed events with delayed switching off
- SPDT On-Off control for season switching of primary circuit
- Automatic season switching by dates or remote control
- 24-hour and 7-day programming of timed events
- Programming with dates: winter season; summer season
- Telecontrol for changing current programme of timed events
- C-Ring connection for local interchange data with other controllers.

3. DETECTORS & TELECONTROL

No.	Description	Type	Sensing element	Sensor H%	Code	Data sheet
1	Essential : Flow water temperature detector	immersion	SIH 010 NTC 10 kΩ	–	B1	–
1	Outside temperature detector		SAE 001 NTC 1 kΩ	–	B2	–
1	Optional : Ambient temperature detector		SAB 010 NTC 10 kΩ	–	B3	–
1	Humidity & ambient temp. detector		SAU 012 NTC 10 kΩ	capacitivo	B3-B6	–
1	Boiler anticondensing temp. detector	immersion	SIH 010 NTC 10 kΩ	–	B4	–
1	Telecontrol for modifying current programme		CDB 333 –	R	–	–

4. TECHNICAL DATA

• Electrical

Power supply	230 V~ ± 10%
Frequency	50 ... 60 Hz
Consumption	5 VA
Protection	IP40
Radio disturbances	VDE0875/0871
Vibration test	with 2g (DIN 40 046)
Voltage-free contacts:	
maximum switching voltage	250 V~
maximum switching current	5 (1) A
Construction standards	Italian Electrotech. Comm.(CEI)
Data storage	5 years
Software	Class A

• Mechanical

Case	DIN 6E module
Mounting	on DIN 35 rail
Materials:	
base	NYLON
cover	ABS
Ambient temperature:	
operation	0 ... 45°C
storage	- 25 ... + 60°C
Ambient humidity	class F DIN 40040
Dimensions	105 x 115 x 71.5
Weight	1.0 kg

• Programmes & winter periods

24-hour programmes	1 ... 3
24-hour events	2 ... 6
7-day programmes	1

• Programmes & summer periods

24-hour programmes	1 ... 3
24-hour events	2 ... 6
7-day programmes	1

• Measurement ranges

Flow temperature	0 ... 99 °C
Outside temperature	- 30 ... + 40 °C
Ambient temperature	0 ... 40 °C
Ambient humidity	20 ... 80 %

Boiler anticondensing temperature 0 ... 99 °C

• Winter temperature setting ranges

Design outside temperature	- 30 ... - 5 ... + 20 °C
Design flow temperature	0 ... 80 ... 99 °C
Correction winter curve origin	20 ... 40 °C
Minimum limit flow temperature	1 ... 99 °C
Maximum limit flow temperature	1 ... 99 °C
Normal ambient temperature	0 ... 20 ... 40 °C
Setback ambient temperature	0 ... 16 ... 40 °C
Frostprot ambient temperature	0 ... 6 ... 40 °C
Fixed flow temperature	0 ... 30 ... 99 °C
Winter ambient authority	0 ... +10 °C
Winter outside Eco Off temperature	0 ... 20 ... 40 °C
Boiler anticondensing temperature	0 ... 50 ... 99 °C

• Summer temperature setting ranges

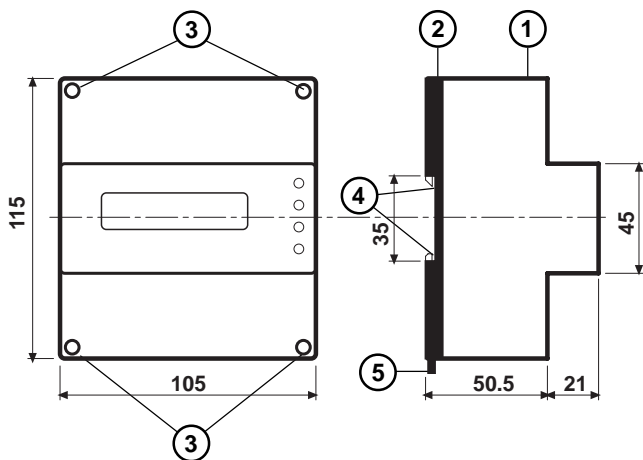
Design outside temperature	0 ... 35 ... + 40 °C
Design flow temperature	0 ... 10 ... 99 °C
Minimum limit flow temperature	1 ... 99 °C
Maximum limit flow temperature	1 ... 30 °C
Normal ambient temperature	10 ... 25 ... 40 °C
Fixed flow temperature	0 ... 12 ... 99 °C
Summer ambient authority	0 ... - 3 °C
Summer outside Eco Off temperature	0 ... 24 ... 40 °C
Correction dew point temperature	- 9 ... 0 ... + 9 °C

• Control setting ranges

Three-position modulating control output :	
valve run time	30 ... 630 ... 3,600 sec.
proportional band	± 0.5 ... 10 ... 30 °C
integral time	0 ... 20 ... 255 min.
On-Off (1or 2 stages) control output :	
stage differential	1 ... 10 ... 30 °C
integral time	0 ... 20 ... 255 min.

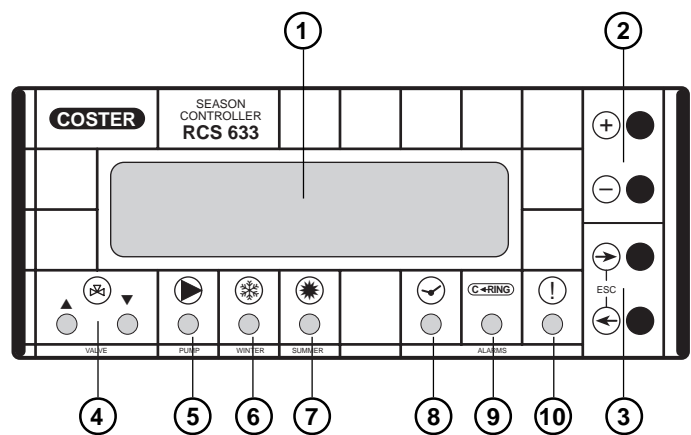
In the presence of electrical disturbances the output controls may change status but this will be restored automatically.

5. OVERALL DIMENSIONS



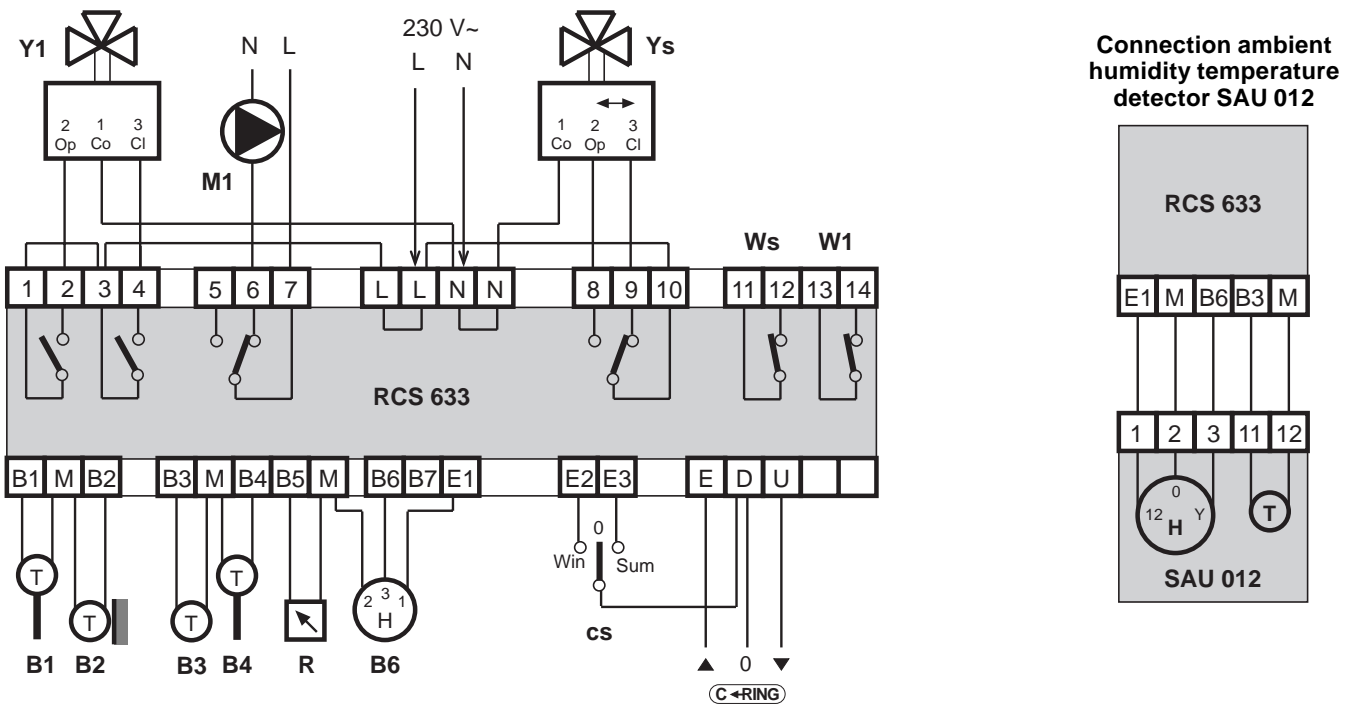
- 1 - Protective cover for electronic components
- 2 - Base with transformer, relay and terminal blocks
- 3 - Screws for securing cover and base
- 4 - DIN rail securing elements
- 5 - DIN rail release lever

6.FACIA



- 1 - Two-line backlit alphanumeric display
- 2 - + and - operating keys
- 3 - ← and → operating keys
- 4 - Valve control LEDs
- 5 - Plant pump control LED
- 6 - Winter Led
- 7 - Summer LED
- 8 - Real time clock alarm LED
- 9 - C-Ring alarm LED
- 10 - Fault LED

7. WIRING DIAGRAM



- B1 – Flow temp. detector
- B2 – Outside temp. detector
- B3 – Ambient temp. detector SAB 010 or SAU 012
- B4 – Anticondensing temp. detector
- B6 – Ambient humidity detector SAU 012
- cs – Season switch
- M1 – Plant pump
- R – Telecontrol for changing programmes
- Y1 – Regulating valve

- Ys – Season switching valve:
 Winter = 10-9 closed ; 10-8 open
 Summer = 10-9 open ; 10-8 closed
- W1 – On-Off repetition contact of current mode
 On = 13-14 closed
 Off = 13-14 open
- Ws – On-Off repetition contact season switch :
 Winter = 11-12 closed
 Summer = 11-12 open

8. SITING CONTROLLER & DETECTORS

8.1 Controller

The controller must be sited in a dry space which meets the relevant ambiantal conditions included in 4. *Technical Data*. If sited in a space classified as "Dangerous" it must be installed in an electric cabinet constructed according to the current regulations on the basis of the danger level involved.

8.2 Flow temperature detector B1

With plant pump on flow this must be installed downstream of this; with pump on return it must be installed at least 1.5 meters downstream of regulating valve.

8.3 Outside temperature detector B2

This must be installed outside the building on the north or north-west side, at least three meters from the ground, sheltered from direct sunlight and as far as possible from windows, doors, chimneys and other direct thermal disturbances.

8.4 Ambient temperature and/or humidity detector B3 or B6

This must be installed at a point which represents the average temperature and/or humidity of a representative space (eg living room) at a height of 1.5 ... 1.6 meters from the ground, on an internal wall and as far as possible from windows, doors and other sources of heat; corners, shelving and curtains must be avoided.

8.5 Anticondensing temperature detector B4

This can only be used if the boiler is fitted with an anticondensing pump and must be installed on the return pipe of the boiler between the anticondensing pump connection and the boiler itself.

9. WIRING

Proceed as follows :

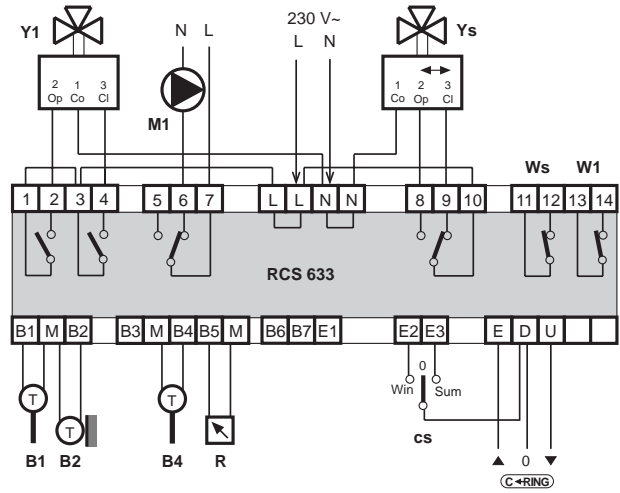
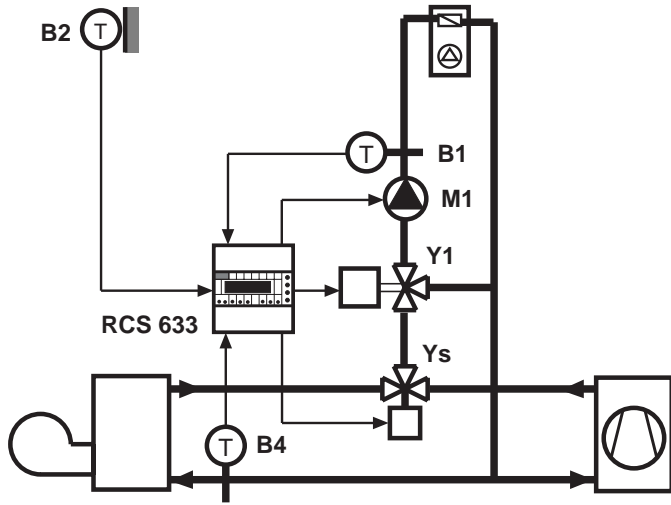
- Separate base and cover
- Mount base on DIN rail and check that securing elements (5.4) hold it firmly in place.
- Carry out wiring according to diagram and in observance of the relevant regulations in force, and using cables of :
 - 1.5 mm² for power and relay control outputs
 - 1 mm² for detectors and remote control
 - 1 mm² for C-Ring. For wire length limits please see technical data sheet and T 022.
- Switch on power (230 V~) and check voltage across terminals L and N.
- Switch off power, replace cover on base and secure it with the four screws supplied (5.3).

You are advised not to insert more than two cables in a single terminal of the controller and if necessary to use external junction boxes.

10. EXAMPLES OF INSTALLATIONS

10.1 Winter and summer compensated control flow water for fan coils

Configuration : 25.1
Type of plant
FAN COIL 25.3
Config detectors
1 2 4 5

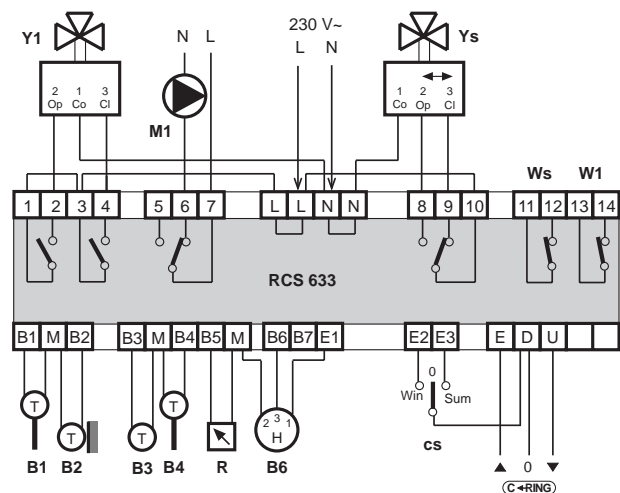
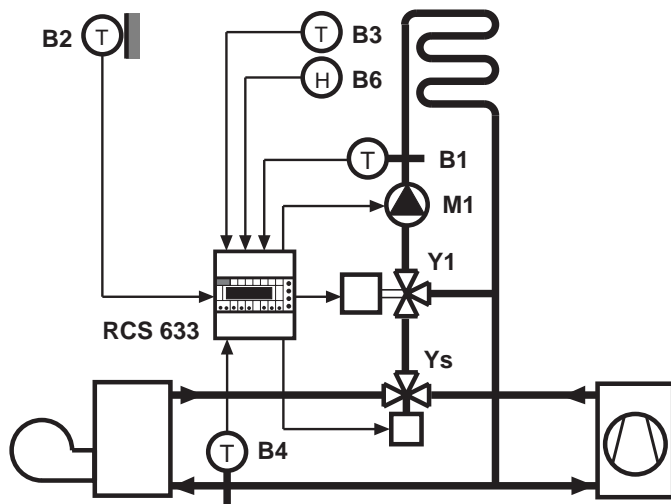


- B1 – Flow temp. detector
- B2 – Outside temp. detector
- B4 – Anticondensing temp. detector
- cs – Season switcher
- R – Remote control for modifying programmes

- M1 – Plant pump
- Y1 – Regulating valve
- Ys – Season switching valve
- W1 – On-Off contact programme repetition
- Ws – On-Off contact season repetition

10.2 Winter and summer compensated control for underfloor panels with ambient authority & dew point control

Configuration : 25.1
Type of plant
PANELS 25.3
Config detectors
1 2 3 4 5 6



- B1 – Flow temp. detector
- B2 – Outside temp. detector
- B3 – Ambient temp. detector
- B4 – Anticondensing temp. detector
- B6 – Ambient humidity detector
- cs – Season switcher

- R – Remote control for modifying programmes
- M1 – Plant pump
- Y1 – Regulating valve
- Ys – Season switching valve
- W1 – On-Off contact programme repetition
- Ws – On-Off contact season period repetition

11. COMMUNICATION

11.1 C-Ring: communication between controllers (for detailed information please see technical data sheet T 022)

RCS 633 controller can be **“Primary”** or **“Secondary”**.

In C-Ring the following signals are transmitted:

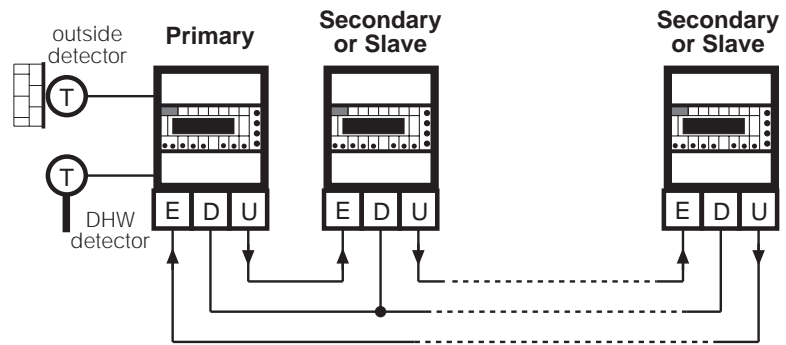
- permission for **Slave** controllers to operate
- value of **outside temperature** (use of single detector for several controllers)
- value of **flow temperature** requested by several controllers; used by “PRIMARY” controller for control of temperature boilers (if scheduled)
- **DHW priority** and/ or **anticondensing** = closure valves heating zones by modulating control action.

25.4

CRing connection
NO

- NO* = no connection to C-Ring
- PRIMARY* = connection to C-Ring as primary controller
- SECONDARY* = connection to C-Ring as secondary controller

11.2 C-Ring wiring diagram



12. OPERATION

RCS 633 is a digital controller with microprocessor for winter and summer control of flow water temperature.
Controls a three-position modulating valve or an electric On-Off device with one or two stages.

It is indispensable to configure the controller according to the detectors and controls connected.

25.3

Config detectors
1 2 - - - -

12.1 Type of plant

25.1

Type of plant
FAN COIL

The controller must be configured according to type of plant controlled:

- *Type of plant* : FAN COIL
PANELS

25.2

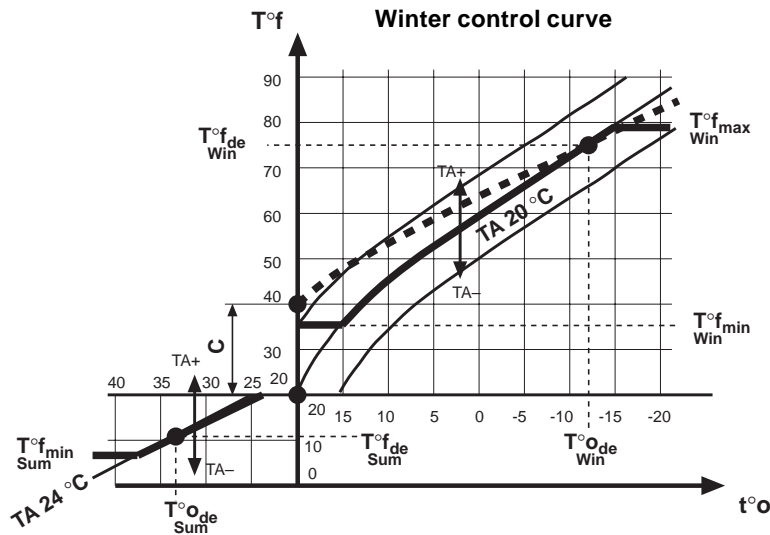
Control: VALVE
Time : 630sec

and of type of control necessary :

- *Control* : VALVE = control valve by three-position modulating actuator
ON-OFF = On-Off control in 1 or 2 stages
- *Time* : sec = *Control* : VALVE, enter complete run time (open/closed) of valve actuator, **useful** for correct operation of control.

12.2 Control curve

The flow temperature requested by controller (detector B1) is adjusted in relation to *outside* temperature (detector B2 or value transmitted via C-Ring) and by *heating control curve*, for winter period, or *cooling control curve*, for summer period.



- C = correction curve origin
- T^{of} = desired flow temperature
- T^{of}_{de win} = design winter flow temperature
- T^o_{de win} = design winter outside temperature
- T^{of}_{max Win} = winter maximum limit flow
- T^{of}_{min win} = winter minimum limit flow
- T^{of}_{de sum} = design summer flow temperature
- T^o_{de sum} = design summer outside temperature
- T^{of}_{max Sum} = summer maximum limit temperature
- T^{of}_{min Sum} = summer minimum limit temperature
- t^o = outside temperature

Summer control curve

The *winter heating control curve*, having reference to a desired ambient temperature of 20 °C, is established by :

- *design winter outside temperature*, used for calculation of winter dissipation of heat from building, depends on climatic zone where this situated.
- *design winter flow temperature*, used for sizing plant (eg: fan coils = 80 °C, panels = 40 °C).
- *origin of heating curve* = winter flow temperature with outside temperature of 20 °C.

The *summer cooling control curve*, having reference to a desired ambient temperature of 24 °C, is established by :

- *design summer outside temperature*, used for calculating summer heat losses from building, depends on climatic zone in which latter situated.
- *design summer flow temperature*, used for sizing the plant (eg: fan coils = 10 °C, panels = 14 °C).

The winter or summer flow temperature requested by the controller depends also on the value of the *ambient temperature desired* by winter or summer operating mode *Normal, Setback, Frostprot* (parallel +/- shift of curve).

23.1

Win: Design outside T: - 5.0c

23.2

Win: Design flow temp : 80.0c

24.1

Sum: Design outside T: +35.0c

24.2

Sum: Design flow temp : 10.0c

The controller records the *difference* between the actual flow temperature and that requested and to cancel it produces an output signal :

23.6
Win:PrBand: 10.0c
Integ time: 20m

24.6
Sum:PrBand: 10.0c
Integ time: 20m

23.6
Win:Diff: 10.0c
Integ time: 20m

24.6
Sum:Diff: 10.0c
Integ time: 20m

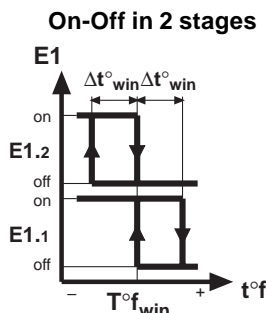
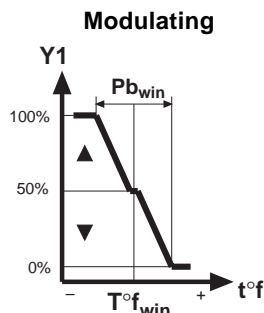
- three-position modulating in relation to winter and summer proportional bands and integral times set, if has been chosen

25.2
Control: VALVE
Time: 630sec

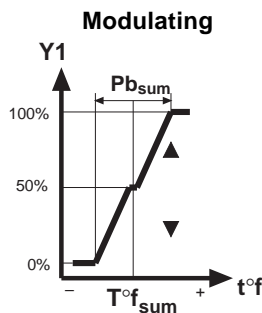
- On-Off in two stages in relation to temperature differential and winter and summer integral times set, if has been chosen

25.2
Control: ON-OFF

Output winter control



Output summer control



Y1 - 3-position modulating output
 E1 - On-Off two-stage output
 E1.1 - Control 1st stage
 E1.2 - Control 2nd stage

Pb win - Winter proportional band
 Pb sum - Summer proportional band
 Δt°_{win} - Winter stage differential
 Δt°_{sum} - Summer stage differential

$t^\circ f$ - Actual flow temperature
 $T^\circ f_{win}$ - Winter desired flow temperature
 $T^\circ f_{sum}$ - Summer desired flow temperature

12.3 Heating curve origin

23.3
CurveOrigin TO20
Flow T: 20.0c

The conventional point of origin of the heating curve (+ 20 °C flow at + 20 °C outside) can be adjusted by an increase in flow temperature (max. + 20 °C). The adjustment may be necessary to avoid possible unevenness in the output of the heat emitters with high outside temperatures (intermediate seasons).

12.4 Minimum and maximum limits flow temperature

23.4
Win:Flow limits
Min: 1c Max: 99c

24.3
Sum:Flow limits
Min: 1c Max: 30c

When desired winter or summer flow temperature reaches one of its limit values it is kept constant at this value.

- Eg :
- winter minimum limit to avoid circulationn of cold air in fan coils.
 - winter maximum limit to avoid dangerous overtemperatures in panels.
 - summer minimum limit to avoid condensation on floor in panel installations.

Warning :

the maximum winter temperature limit does not substitute observance of the safety regulations in force.

12.5 Ambient authority

23.5
Win:AmbientAuth
on flow : - - - - c

24.5
Sum:AmbientAuth
on flow : - - - - c

When ambient detector B3 is connected, the controller is able to correct the winter and summer desired flow temperature according to the ambient authority set.

- *Ambient authority on flow* = value in °C of adjustment (increase/decrease) in flow temperature for each degree of shift between actual ambient temperature and that desired.

12.6 Eco Off function

19.7
Win: Eco Off :NO
Outside T: 20.0c

19.8
Sum: Eco Off :NO
Outside T: 24.0c

Permits excluding plant both for winter and summer operation when weather conditions do not call for heating or cooling :

- *Eco Off Win* : NO = not enabled
 YES = enabled for winter heating
- *Outside T: 20.0c* = value of outside temperature above which valve is closed and pump idle
- *Eco Off Sum*: NO = not enabled
 YES = enabled for summer cooling
- *Outside T. : 24.0c* = value of outside temperature below which valve is closed and pump idle

12.7 Control temperature dew point

In plants with underfloor panels, when there is fall of temperature in summer cooling the problem arises of avoiding condensation on the floor by controlling the dew point temperature. This can be done in two ways:

- by *minimum flow limit temperature* set at such a value 24.3 that an excessive cooling of the floor is prevented.
- by the use of a humidity and an ambient temperature detector B6 and B3 which permit varying automatically the *minimum limit flow temperature* so that the floor never reaches the dew point temperature.
 - *Dew point* : NO = automatic control dew point disabled
YES = automatic control dew point enabled
 - 14.0c = value temperature dew point calculated
 - Var : + 0.0c = correction value temperature dew point (max. $\pm 9^\circ\text{C}$)

24.3

Sum: Flow Limits
Min: 18c Max: 30c

24.4

Dew Point : NO
14.0c Var : +0.0c

12.8 Operating programmes

It is possible to programme the operation of the plant separately for the winter season and the summer season according to use requirements:

18.2

Site: -----
Win: 7DAY

For *winter* season:

- 7DAY (Win); - 24HOUR1 ...3 (Win); - NORMAL (Win); - SETBACK (Inv.);
- FLOW (Win); - FROSTPROT; - OFF.

In place of programme the following may appear:

- TELENORMAL = telecontrol R is in "Normal" position
- TELESETBACK = telecontrol R is in "Setback" position
- TELEFROSTPROT = telecontrol R is in "Frostprot" position
- TELEOFF = telecontrol R is in "Off" position "

18.4

Site: -----
Sum: 7DAY

For *summer* season:

- 7DAY (Sum); - 24HOUR 1 ...3 (Sum); - NORMAL (Sum); - FLOW (est.);
- OFF.

In place of programme the following may appear:

- TELENORMAL = telecontrol R is in "Normal" position
- TELEOFF = telecontrol R is in "Setback" position

12.9 Operating mode

18.3

Win: NORMAL 21.0c
Td2 1.0c Var +0.0c

The current mode depends on the programme set in according season and can be seen on the display :

18.2

Site: -----
Win: 7DAY

or in

18.4

Site: -----
Sum: 7DAY

- Win = winter period
- Sum = summer period
- Current mode : NORMAL ; SETBACK ; FLOW ; FROSTPROT ; OFF.
- Td - - . - : Temperature desired by current mode
- Var + - . - c : Manual adjustment of desired temperature ($\pm 2^\circ\text{C}$).

12.10 Control plant pump

19.9

Pump : AUT
Delay Off : 60min

The plant pump can be controlled in two ways:

- Pump : MAN = Pump always in operation
- AUT = Pump controlled by current programme event times
- Delay Off : - - min = Delay in switching off to dissipate heat accumulated in plant.

12.11 Modifying programmes by telecontrol

Telecontrol R (CDB333) permits modifying from a distance the current operating programme:

For *winter* season :

- 1 - OFF = plant excluded
- 2 - FROSTPROT = continuous operation at desired *Frostprot* (Win) ambient temperature
- 3 - SETBACK = continuous operation at desired *Setback* (Win) ambient temperature
- 4 - NORMAL = continuous operation at desired *Normal* (Win) ambient temperature
- 5 - TAd + 2 °C = increase of 2 °C in temp. desired by current mode.
- 6 - AUTOMATIC = operation with programme chosen for controller.

For *summer* season :

- 1...3 - OFF = plant excluded
- 4 - NORMAL = continuous operation at desired *Normal* (Sum) ambient temperature
- 5 - TAd - 2 °C = increase of 2 °C in temp. desired by current mode.
- 6 - AUTOMATIC = operation with programme chosen for controller.

12.12 Season switching

The controller switches its operation (winter heating or summer cooling) and the position of the season switching valve Ys in relation to the position of the *season switch cs* (terminals D-E2-E3).

- D-E2 closed & D-E3 open = winter control :
Ys opens heating circuit (10-9 closed; 10-8 open).
- D-E2 open & D-E3 closed = summer control
Ys opens cooling circuit (10-9 open; 10-8 closed).

When **cs** :

- *not connected*
- *in position 0* (contacts open)

The controller follows setting of the two seasons

21.15

Winter season
Fr : 15.10 to : 15.04

22.15

Summer season
Fr : 15.06 to : 15.09

In this situation following conditions can be present :

21.15	22.15
<p>Winter season Fr : 15.10 to : 15.04</p>	<p>Summer season Fr : 15.06 to : 15.09</p>

- *seasons cancelled* :

<p>Winter season Fr : - - - - to : - - - -</p>	<p>Summer season Fr : - - - - to : - - - -</p>
---	---

Result : = control Off; Ys: idle in last position assumed.

- *sequential seasons*:

<p>Winter season Fr : 15.10 to : 15.04</p>	<p>Summer season Fr : 16.04 to : 14.10</p>
---	---

Result : without intermediate periods

- Fr 15.10 to 15.04 = winter control; Ys: heating circuit open
- Fr 16.04 to 14.10 = summer control; Ys : cooling circuit open

- *shortened seasons* :

<p>Winter season Fr : 15.10 to : 15.04</p>	<p>Summer season Fr : 15.05 to : 15.09</p>
---	---

Result : intermediate periods with plant Off

- Fr 15.10 to 15.04 = winter control; Ys: heating circuit open
- Fr 16.04 to 14.05 = control Off ; Ys: heating circuit open
- Fr 15.05 to 15.09 = summer control; = Ys : cooling circuit open
- Fr 16.09 to 14.10 : = control Off; = Ys : cooling circuit open

The following are possible only if

19.7	19.8
<p>Win Eco Off : YES Outside T : 20.0c</p>	<p>Sum Eco Off : YES Outside T : 24.0c</p>

- *overlapping seasons*

<p>Winter season Fr : 01.09 to : 15.05</p>	<p>Summer season Fr : 15.03 to : 01.11</p>
---	---

Result : overlapping periods in relation to outside temperature

- Fr 02.11 to 14.03 : = winter control; Ys: heating circuit open
- Fr 16.05 to 31.08 : = summer control; Ys: cooling circuit open
- Fr 15.03 to 15.05 and Fr 01.09 to 01.11 :

- with actual outside temp. > *Winter Eco Off Outside T* and < *Summer Eco Off Outside T*
= control off ; Ys : idle in last position assumed
- with actual outside temperature < *Winter Eco Off Outside T*
= winter control ; Ys: heating circuit open
- with actual outside temperature > *Summer Eco Off Outside T*
= summer control ; Ys: cooling circuit open

- *coinciding seasons* :

<p>Winter season Fr : 01.01 to : 31.12</p>	<p>Summer season Fr : 01.01 to : 31.12</p>
---	---

Result: switching only in relation to outside temperature for whole year:

- with actual outside temperature > *Winter Eco Off Outside T* and < *Summer Eco Off Outside T*
= control Off , Ys idle in last position assumed
- with actual outside temperature < *Winter Eco Off Outside T*
= winter control ; Ys: heating circuit open
- with actual outside temperature > *Summer Eco Off Outside T*
= summer control; Ys: cooling circuit open

12.13 On-Off contact for repetition current mode (W1)

The output contact W1 (terminals 13-14), when the controller is in winter or summer control, repeats with On-Off action the current mode:

- *NORMAL* = On, contact closed
- *SETBACK* = On, contact closed
- *FLOW* = On contact closed
- *FROSTPROT* = On, contact closed
- *OFF* = Off, contact open

12.14 Control boiler anticondensing temperature

The anticondensing function prevents the formation of condensation in the combustion chamber of the boiler. It sets a decrease of 4 °C in the desired flow temperature for each °C decrease in the actual return to boiler temperature (detector B4) in respect of the value set, thereby bringing about the progressive closure of the regulating valve.

19.10

Anticondense : NO
Desired T : 50.0c

- Anticondense : NO = function disabled
 YES = function enabled
- Desired T : 50.0c =value of minimum limit of return to boiler temperature.

If there is a C-Ring connection the differential value is transmitted to all the controllers connected which are thus able to carry out the anticondensing function with a single detector. The minimum limit value considered is that set on the controller to which the anticondensing detector is connected. On the other controllers appears *Desired T* : - - . -c.

13. PROGRAMMES & PERIODS WITH DATES

All the programmes with timed events and with dates operate independently in respect of **winter** and **summer** season.

13.1 24-hour programmes

21.1

Win:How many
24hour progs ? 1

Enter number of 24-hour programmes you wish to use (from 1 to 3) for the winter season and for the summer season so as to avoid viewing unused display pages.

22.1

Sum :How many
24hour progs ? 1

21.2

P 1WinEv1 06.00
NORMAL 21.0c

In each 24-hour programme for winter (**WinP1 ... WinP3**) and summer (**SumP1 ... SumP3**) you can enter a maximum of six event start times (**Evnt1 ... Evnt6**) assigning to each one of the following modes:

- Winter season :
- NORMAL : compensated control with winter NORMAL ambient temperature
 - SETBACK : compensated control with winter SETBACK ambient temperature
 - FLOW : control with winter fixed FLOW temperature
 - FROSTPROT : compensated control with FROSTPROT ambient temperature
 - OFF : plant Off, valve closed and pump idle.

21.7

P 1WinEv6 22.00
OFF

22.2

P 1SumEv1 06.00
NORMAL 25.0c

- Summer season:
- NORMAL : compensated control with summer NORMAL ambient temperature
 - FLOW : control with summer fixed FLOW temperature
 - OFF : control with summer fixed FLOW temperature

22.7

P 1SumEv6 22.00
OFF

The event start times must be entered in increasing order.
Events not used are excluded by pressing + and - keys at same time.
You must not leave unused times (- -) between programmed events.

13.2 7-day programmes

One 7-day programme is available for the winter season and one for the summer season.

21.8

Win7day MONDAY
24HOUR 1

In each 7-day programme you can assign to each day of the week one of the following programmes.

- Winter season :
- 24HOUR 1 ... 3 (Win) ;
 - NORMAL (Win) ;
 - SETBACK (Win) ;
 - FLOW (Win) ;
 - FROSTPROT ;
 - OFF.

21.14

Win7day SUNDAY
24HOUR 1

22.8

Sum7day MONDAY
24HOUR 1

- Summer season :
- 24HOUR 1 ... 3 (Sum) ;
 - NORMAL (Sum) ;
 - FLOW (Sum) ;
 - OFF.

22.14

Sum7day SUNDAY
24HOUR 1

13.5 Season periods

21.15

Winter season
Fr : 15.10 to : 15.04

22.15

Summer season
Fr : 15.06 to : 15.09

These establish the *winter* and *summer* periods.

Enter the day and month of start and end of *winter season*, period in which controller is in heating stage.

Enter the day and month of start and end of *summer season*, period in which controller is in cooling stage.

To cancel periods keep pressed + and – keys at same time.

For use of season periods see 12.12 *Season switching*.

13.6 BST

21.16 - 22.16

Summer time
Fr : 29.03 to : 26.10

The controller is able to change automatically the current time in relation to the GMT/BST period.

– Fr - - - - = the night of the last Saturday in March the clock is put forward automatically one hour.

– to - - - - = the night of the last Saturday in October the clock is put back automatically one hour.

To cancel the period keep pressed + and – keys at the same time.

14. COMPLEMENTARY FUNCTIONS

14.1 Access keynumber

25.5

Choice keynumber
- - - -

Access keynumber
- - - -

Choice and enabling of access keynumber which prevents use of + and – keys and consequently any tampering with the data. Enter the number (1900 ... 1999) using + and – keys.

To cancel keynumber, press + and – keys at same time.

When keynumber is enabled, if + and – keys pressed there will appear on the display the request to introduce access keynumber. Only after having entered correct keynumber is it possible to use + and – keys.

If for 15 minutes no key is pressed the keynumber is automatically re-enabled.

14.2 Site (Plant) name

25.6

Site (Plant) name
- - - - -

Entering of site (plant) name which appears on first page of display. Using + and – keys, replace each dash with a letter of the alphabet (A ... Z) or by a digit (0 ... 9).

The ← and → keys serve to position the cursor.

14.3 Display measurements

20.1

Des Amb T : 21.0c
Act Amb T : 21.0c

20.2

Des Flow T : 80.0c
Act Flow T : 80.0c

20.3

Outside temp
actual : - 2.0c

20.4

DesAnt icon : 50.0c
ActAnt icon : 58.0c

20.5

Humidity : 60.0%
Dew point : 14.0c

The controller displays all the measurements made by the detectors and other data useful for monitoring the operational status of the plant.

Appears only if detector **B3** connected and configured.

- *ambient* temperature *desired* by current mode.
- *actual* temperature measured by detector **B3**.

- *flow* temperature *desired* by current mode.
- *actual* temperature measured by detector **B1**.

• *actual outside* temperature. If detector **B2** is not connected to the controller, in place of *actual* appears *C-Ring* and value is that coming via C-Ring.

- *desired anticondensing* temperature.
- *actual anticondensing* temperature. If detector **B4** not connected to the controller in place of "actual" appears "C-Ring" and in place of the measurement appears – . . – c.

Appears only if detector **B6** connected and configured.

- *ambient humidity* measured by detector **B6**.
- *dew point* calculated by controller.

15. ALARMS

The controller is able to signal certain operating faults by means of three LEDs situated on the facia:

- fault internal real time clock (led 6.8)
- fault in C-Ring (led 6.9)
- fault in microprocessor (led 6.10)

16. TESTING AT COMMISSIONING STAGE

Testing to be carried out when installation completed and wiring and configuration concluded and tested.

16.1 Testing C-Ring

25.6

CRing connection
PRIMARY

CRing connection
SECONDARY

The page of C-Ring testing appears only if configured in

Ensure that all the other controllers wired in C-Ring are :

26.1

CRing : ??

- correctly mains powered (230 V-).

- Slave controllers or those configured as SECONDARY in

CRing connection
SECONDARY

- selected on testing page

CRing : ??

The "PRIMARY" controller sends via C-Ring a signal every ten seconds: on all displays appears "??". If wiring is correct "OK" replaces "??" on all the displays. If on one or more displays "OK" does not appear, this means that there is a break between the last controller with "OK" and the first with "??".

Examples of testing a C-Ring setup with four controllers:

- Cont.1 "YES" - Cont.2 "YES" - Cont.3 "YES" - Cont.4 "YES" : *C-Ring OK*
- Cont.1 "??" - Cont.2 "YES" - Cont.3 "YES" - Cont.4 "YES" : *Fault between 4 and 1*
- Cont.1 "??" - Cont.2 "YES" - Cont.3 "??" - Cont.4 "??" : *Fault between 2 and 3*
- Cont.1 "??" - Cont.2 "??" - Cont.3 "??" - Cont.4 "??" : *Fault between 1 and 2*

16.2 Testing outputs

26.2

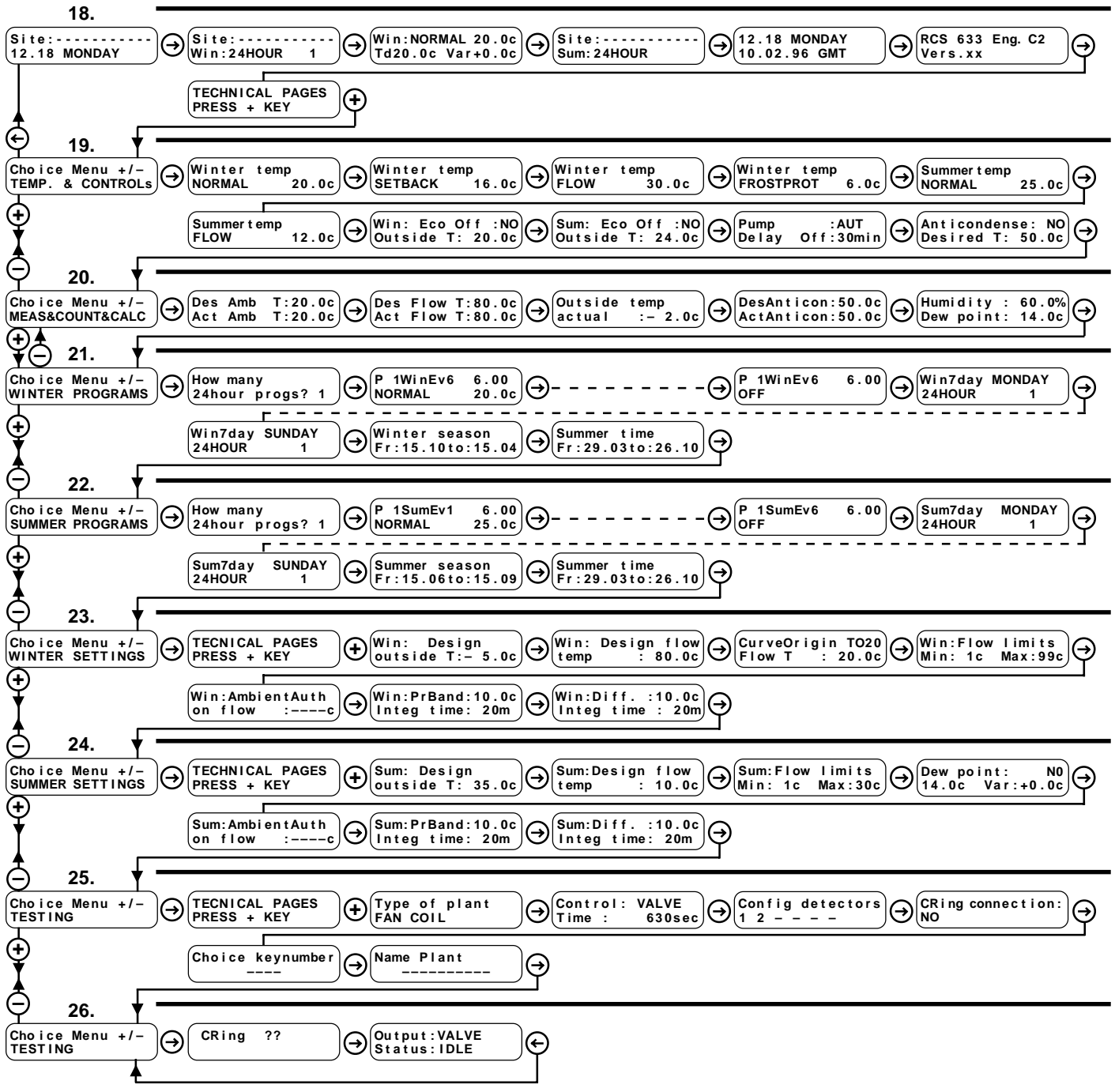
Output : VALVE
Stato : CLOSED

With + and - keys choose:

- Output to be tested:
 - VALVE ;
 - PUMP ;
 - Ys ;
 - Ws ;
 - W1.
- Status :
 - with VALVE : IDLE ; CLOSED ; OPEN
 - PUMP , Ys , Ws , W1 : ON ; OFF.

Check the results.

17. SEQUENCE OF DISPLAY PAGES (the data and functions are those in memory at time of delivery)



← → Keys for scrolling the display pages and positioning the cursor | on data which can be modified on these pages.

The modifiable data in the following descriptive list of display pages are highlighted thus

By pressing these keys at the same time for a few seconds, or in any event after 15 minutes the first page returns to the display

Site:-----
12.18 MONDAY

⊖ ⊕ Keys for : - changing the values highlighted by the cursor |

- displaying the configuration options of a function eg :

Type of plant
FAN COIL

or

Type of plant
PANELS

- passing directly from one menu (series of pages) to another.

18. NORMAL USE				
Ref.	Display	Description	Notes	Sect.
18.1	Site:----- 12.18 MONDAY	Name plant Current time & day	Set in 25.6 Set in 18.5	
18.2	Site:----- Win:24HOUR 1	Choice winter programme: 7DAY; 24HOUR 1 ... 3 ; NORMAL; FLOW; FROSTPROT; OFF. Current time & day	In winter period page is in position 18.4 . Instead of programme may appear : TELENORMAL; TELESETBACK; TELEFROSPROT; TAd + 2C; TELEOFF; SEASON OFF.	12.8
18.3	Win:NORMAL 20.0c Td20.0c Var+0.0c	Current winter (Win) or summer (Sum) mode. Td: Mode desired temperature + setpoint adjuster R. Var: Manual adjustment desired temp. (max ± 2°C)	Winter modes: NORMAL; SETBACK; FLOW; FROSTPROT; OFF. Summer modes: NORMAL; FLOW; OFF.	12.9
18.4	Site:----- Sum:24HOUR 1	Choice summer programme: 7DAY; 24HOUR 1 ... 3; NORMAL; FLOW; OFF.	In summer period page is in position 18.2 . Instead of programme may appear: TELENORMAL; TAd + 2c; TELEOFF; SEASON OFF.	12.8
18.5	12.18 MONDAY 10.02.96 GMT	Setting: Time, day of week & date. Current time period: GMT or BST	Dates BST set in 21.16 & 22.16	
18.6	RCS 633 Eng. C2 Vers. xx	Identifying data of controller		

19. TEMPERATURES & CONTROLS				
Ref.	Display	Description	Notes	Sect.
19.1	Winter temp NORMAL 20.0c	Value of desired NORMAL ambient temp. for winter period.		13.1
19.2	Winter temp SETBACK 16.0c	Value of desired SETBACK ambient temp. for winter period.		13.1
19.3	Winter temp FLOW 30.0c	Value of desired FLOW temp. for winter period.		13.1
19.4	Winter temp FROSTPROT 6.0c	Value of desired FROSTPROT ambient temp. for winter period.		13.1
19.5	Summer temp NORMAL 25.0c	Value of desired NORMAL ambient temp. for summer period.		13.1
19.6	Summer temp FLOW 12.0c	Value of desired FLOW temp. for summer period.		13.1
19.7	Win:Eco Off :NO Outside T: 20.0c	Winter Eco Off: YES; NO Value of Eco Off outside temperature.	With higher outside temperatures = valve closed & pump idle.	12.6
19.8	Sum:Eco Off :NO Outside T: 24.0c	Summer Eco Off: YES; NO Value of Eco Off outside temperature.	With lower outside temperatures = valve closed & pump idle.	12.6
19.9	Pump :AUT Delay Off :30min	Control of plant pump : MAN; AUT. Delay in switching off pump.	MAN: always On ; AUT: On according current timed programme	12.10
19.10	Anticondens : NO Desired T: 50.0c	Anticondensing function: YES; NO Value of desired boiler anticondensing temp.	With lower temps = modulating closure valve If B4 not configured & value via C-Ring -- . - will appear.	12.14

20. MEAS&COUNT&CALC				
Ref.	Display	Description	Notes	Sect.
20.1	Des Amb T :20.0c Act Amb T :20.0c	Desired ambient temp. required by current mode. Temp. measured by ambient detector B3.		14.3
20.2	Des Flow T :80.0c Act Flow T :80.0c	Flow temp. required by current mode. Temp. measured by flow detector B1.		14.3
20.3	Outside temp actual :- 2.0c	Actual outside temp. measured by B2 or coming via C-Ring.	If outside detector B2 not connected & value comes via C-Ring, Actual is replaced by C-Ring & -- . - appears.	14.3
20.4	DesAnt icon :50.0c ActAnt icon :58.0c	Desired anticondensing temperature. Temp. measured by anticondensing detector B4.	If outside detector B4 not connected & value comes via C-Ring, Actual is replaced by C-Ring & -- . - appears.	14.3
20.5	Humidity: 60.0% Dew Point: 14.0c	Ambient humidity measured by B6.	Appears only if in 25.3 detector B6 configured.	14.3

21. WINTER PROGRAMS				
Ref.	Display	Description	Notes	Sect.
21.1	How many 24hour progs ?1	Choice number 24-hour programmes to be used (1 ... 3) in winter period.	Avoids scrolling unnecessary display pages	13.1
21.2 ↓ ↓ 21.7	P1 WinEv1 6.00 NORMAL 20.0c P1 WinEv6 22.00 OFF	Number of programme, number of event & time of start period in programme. Choice mode to assign to period: NORMAL; SETBACK; FROSTPROT; FLOW; OFF. Further groups of 6 pages according figure in 21.1	Max. 6 periods. To cancel unused period press + and - together; -- . - will appear Events must be in increasing order. You must not leave -- . - between programmed events. Modes set are winter ones.	13.1

21. WINTER PROGRAMS				
Ref.	Display	Description	Notes	Sect.
21.8 ↓ ↓ 21.14	Win7day MONDAY 24HOUR 1	Choice of winter programme for each day of week : 24HOUR 1 ... 3; NORMAL; SETBACK, FROSTPROT; FLOW; OFF.		13.2
21.15	Win7day SUNDAY 24HOUR 1			
21.15	Winter season Fr:15.10to:15.04	Dates of start & end of winter season.		13.5
21.16	Summer time Fr:29.03to:26.10	Dates of start & end of BST period.		13.6
22. SUMMER PROGRAMS				
Ref.	Display	Description	Notes	Cap.
22.1 ↓ ↓ 22.7	Sum: How many 24hour progs? 1	Choice number of 24-hour programmes to be used (1 ... 3) in summer period.	Avoids scrolling unnecessary display pages.	13.1
22.2 ↓ 22.7	P 1SumEv1 6.00 NORMALE 25.0c			
22.7	P 1SumEv6 22.00 OFF	Number of programme, number of event & time of start period in programme. Choice mode to assign to period: : NORMAL; FLOW; OFF. Further groups of 6 pages according to number in 22.1	Max. 6 periods. To cancel unused period press + and - together; - - - - will appear Events must be in increasing order. You must not leave - - - - between programmed events. Modes set are for summer.	13.1
22.8 ↓ ↓ 22.14	Sum7day MONDAY 24HOUR 1	Choice of programme for each day of week : 24HOUR 1 ... 3; NORMAL; FLOW; OFF.		13.2
22.14	Sum7day SUNDAY 24HOUR 1			
22.15	Summer time Fr:15.06to:15.09	Dates of start and end summer season.		13.5
22.16	Summer time Fr:29.03to:26.10	Dates start and end BST period.		13.6
23. WINTER SETTINGS				
Ref.	Display	Description	Notes	Sect.
23.1	Win: Design outside T: -5.0c	Design outside temp. for winter compensated control.		12.2
23.2	Win: Design flow temp : 80.0c	Design flow temp. for winter compensated control.	If in 25.1 PANELS selected 40.0c appears.	12.2
23.3	CurveOrigin TO20 Flow T : 20.0c	Correction of heating curve origin.		12.3
23.4	Win: Flow limits Min: 1c Max: 99c	Minimum and maximum limits of flow temperature.		12.4
23.5	Win: AmbientAuth on Flow : ----c	Ambient authority. Variation ± °C flow temp. with ± 1°C difference ambient temp.	Appears only if in 25.3 ambient detector B3 configured	12.5
23.6	Win: PrBand: 10.0c Integ time: 20m	Proportional band and integral time for winter control.	Appears if in 25.2 VALVE is entered. To cancel integral time press + and - together.	12.2
	Win: Diff : 10.0c Integ time : 20m	Difference in stage and integral time for winter control.	Appears only if in 25.2 ON-OFF entered. To cancel integral time press + and - together.	
24. SUMMER SETTINGS				
Ref.	Display	Description	Notes	Sect.
24.1	Sum: Design outside T: 35.0c	Design outside temp. for summer compensated control		12.2
24.2	Sum: Design flow temp : 10.0c	Design flow temp. for summer compensated control.		12.2
24.3	Sum: Flow limits Min: 1c Max: 30c	Minimum and maximum summer flow temp. limits.	Min:xx c = minimum limit which can be set at fixed or variable value in relation to ambient humidity (only if B6 configured).	12.3
24.4	Dew point : NO 14.0c Var: +0.0c	Enabling control dew point: YES; NO. Calculated value. Correction of desired value.	Appears only if detector B6 configured. Maximum correction ± 9 °C.	12.7
24.5	Sum: AmbientAuth on flow : ----c	Ambient authority. Variation ± °C flow temp. with ± 1°C difference ambient temp.	Appears only if ambient detector B3 connected and configured.	12.5
24.6	Sum: PrBand: 10.0c Integ time: 20m	Proportional band & integral time for s u m m e r control.	Appears if in 25.2 VALVE entered. To cancel integral T press + and - together.	12.2
	Sum: Diff : 10.0c Integ time: 20m	Stage differential & integral time for summer control.	Appears if in 25.2 ON-OFF entered.. To cancel integral T press + and - together.	

25. CONFIGURATION RCS 633				
Ref.	Display	Description	Notes	Sect.
25.1	Type of plant FAN COIL	Choice type plant <i>FAN COIL; PANELS</i>		12.1
25.2	Control: VALVE Time : 630sec	Choice type control: <i>VALVE; ON-OFF</i> Run time valve (only if <i>VALVE</i>).	<i>VALVE</i> = 3-position modulating control <i>ON-OFF</i> = On-Off control in 1 or 2 stages.	12.1
25.3	Config detectors 1 2 - - - -	Configuration detectors connected (inputs B-M). - = detector not connected number = detector connected Factory setting: configured only B1 and B2.	1 : Flow temp. detector B1 2 : Outside temp. detector B2 3 : Ambient temp. detector B3 4 : Boiler anticondensing temp. detector B4 5 : Telecontrol change programmes R 6 : Ambient humidity detector B6 .	12.
25.4	CRing connection NO	<i>NO</i> : Not wired in C-Ring. <i>PRIMARY</i> : wired as Primary. <i>SECONDARY</i> : wired as Secondary		11.1
25.5	Choice keynumber - - - -	Choice keynumber to prevent use + & - keys. - 1901 ... 1999	To cancel keynumber press + and - together.	14.1
25.6	Site (Plant) name - - - - - - - -	Entering name plant.	Use + and - to enter letters or digits. Use ← and → to position cursor.	14.2
26. TESTING				
Ref.	Display	Description	Notes	Sect.
26.1	CRing: ??	Page of testing C-Ring connections. ?? = C-Ring test in progress or test failed. YES = test OK.	Appears only if in 25.4 <i>PRIMARY</i> or <i>SECONDARY</i> entered.	16.1
26.2	Output: VALVE Status: IDLE	Choice outputs to be tested Choice output status	Choice output : <i>VALVE; PUMP; Ys; Ws; W1</i> . Choice status : With <i>VALVE</i> : <i>IDLE; CLOSED; OPEN</i> With <i>PUMP, Ys, Ws, W1</i> : <i>ON; OFF</i> .	16.2

LB 22/01/99 Rev.: LB 18/07/02



20132 Milan Head Office & Sales
Via San G.B. De La Salle, 4/a Tel. +39.02.2722121 (TI)
Tel. +39.02.45476193 (FW)
Fax +39.02.2593645

00146 Rome Reg. Off. Central & Southern
Viale G. Marconi, 437 Tel. +39.06.5573330
Fax +39.06.5566517

25048 Edolo (BS) Orders and Shipping
Via Gen. Treboldi 190/192 Tel. +39.0364.7732.00/02
Fax +39.0364.770016

Web: www.coster.info E-mail: info@coster.info



D 33109