



#### 4. TECHNICAL DATA (factory settings in bold type)

##### • Electrical

Power supply	230 V ~ ± 10%
Frequency	50...60 Hz
Consumption	5 VA
Protection	IP40
Radio disturbance	VDE0875/0871
Vibration test	with 2g(DIN 40 046)
Voltage-free output contacts:	
maximum switching voltage	250 V ~
maximum switching current	5 (1) A
Construction standards	Italian Electrot. Committee (CEI)
Storage data in memory	5 years

##### • Mechanical

Case	DIN 6E module
Mounting	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

##### • Measurement ranges

Primary temperature	0...99 °C or 0...40 °C
Limit temperature (min. and max.)	0...99 °C
Anticondensing temperature	0...99 °C
Auxiliary temperature	0...99 °C

##### • Setting ranges : Primary control

Desired temperatures:	
with detector B1	0...99 °C
with detector B3	0...40 °C

Set point adjuster desired temperature :

with detector B1 (0 ... 40 °C)	± 5 °C
with detector B3 (0 ... 99 °C)	± 10 °C
Temp. limit detector	1...99 °C
Anticondensing temp.	10... <b>50</b> ...99 °C
24-hour programmes	<b>1</b> ...4
7-day programmes	0... <b>1</b>
Holiday programmes	<b>0</b> ...25
Delay switching off pump	<b>0</b> ...60 min
Control output :	<b>- Three-wire modulating</b>
	- On-Off (1 or 2 stages)

Modulating :

actuator run time	30... <b>630</b> ...1,800 sec.
proportional band	0.5... <b>10</b> ...50 °C
integral time	0,5... <b>10</b> ...99,5 min.

On-Off :

On-Off differential	0.5... <b>10</b> ...50 °C
minimum Start time	0... <b>60</b> ...990 sec.
minimum Stop time	0... <b>60</b> ...990 sec.

##### • Setting ranges : Auxiliary control

Desired temperature	0... <b>20</b> ...99 °C
24-hour programmes	<b>1</b> ...3
7-day programmes	0... <b>1</b>
Holiday programmes	<b>0</b> ...25
Delay switching off heating pump	<b>0</b> ...60 min
Control output :	<b>- On-Off differential</b>
	- On-Off proportional

Data output On-Off differential :

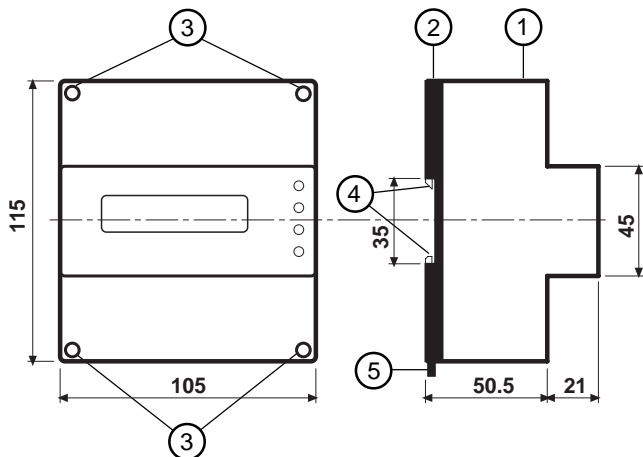
differential	0.5... <b>10</b> ...50 °C
minimum Start time	0... <b>60</b> ...990 sec.
minimum Stop time	0... <b>60</b> ...990 sec.

Data output On-Off proportional :

proportional band	0.5... <b>10</b> ...50 °C
integral time	0,5... <b>10</b> ...99,5 min.
half-cycle time	60... <b>120</b> ...990 sec.

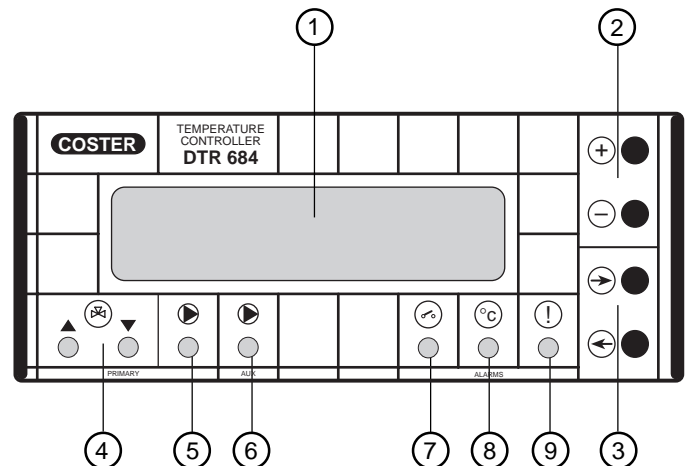
*In presence of electrical disturbances the output controls may change status but this will be restored automatically*

#### 5. OVERALL DIMENSIONS



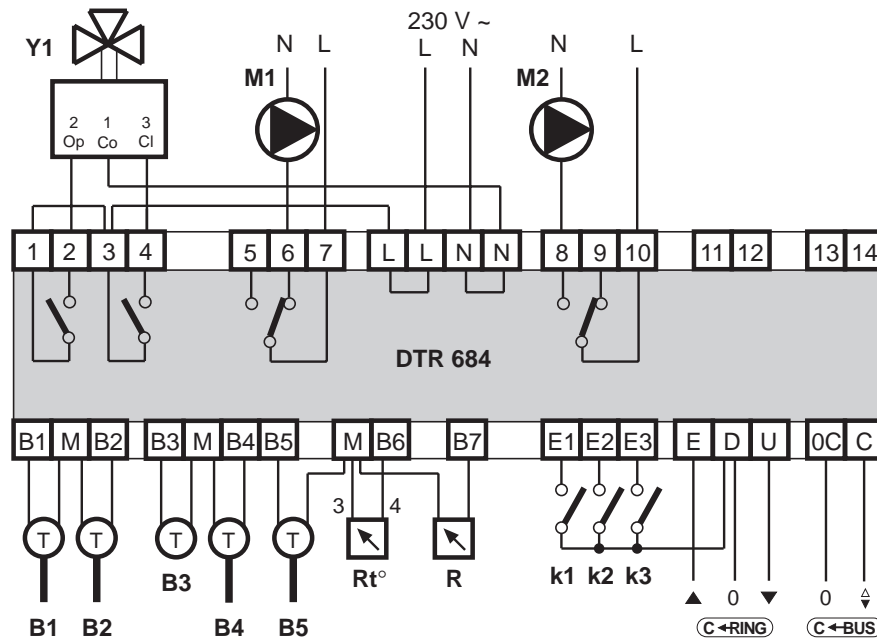
- 1 - Protective cover for electronic components
- 2 - Base with transformer, relay & terminal blocks
- 3 - Screws for fixing cover and base
- 4 - DIN rail securing elements
- 5 - DIN rail release lever

#### 6. FACIA



- 1 - Backlighted two-line alphanumeric display
- 2 - + and - operating keys
- 3 - ← and → operating keys
- 4 - LEDs for Opens-Closes Primary valve or 1<sup>st</sup> and 2<sup>nd</sup> stage
- 5 - Primary pump LED
- 6 - Auxiliary pump LED
- 7 - On-Off alarms LED
- 8 - Measurement alarms LED
- 9 - Fault LED

**7. WIRING DIAGRAM**



B1 – Primary t° detector (0 ...99 °C)  
 B2 – Primary flow limit t° detector  
 B3 – Primary t° detector (0 ... 40 °C)  
 B4 – Boiler anticondensing t° detector  
 B5 – Auxilliary t° detector

R – Remote control for modifying programmes  
 Rt° – Primary temperature set point adjuster  
 M1 – Primary circuit pump  
 M2 – Auxilliary circuit pump  
 Y1 – Primary control valve  
 k 1...3 – Alarm contacts

**8. SITING CONTROLLER**

The controller must be sited in a dry space which meets the relevant ambiental limits shown under 4. TECHNICAL DATA. If sited in a space classified as "Dangerous" it must be installed in a cabinet for electrical devices constructed according to the regulations in force for the danger class involved. The controller can be installed on a DIN rail or in a DIN modular enclosure.

**9. WIRING**

Proceed as follows :

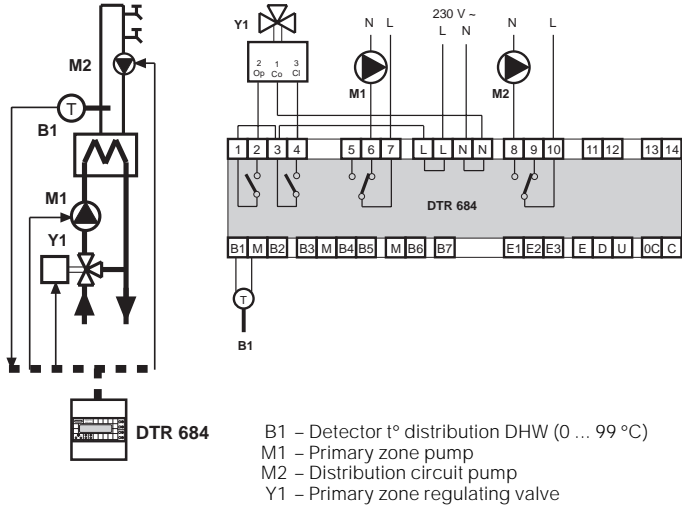
- Separate base and cover
- Mount base on DIN rail and check that securing elements (5.4) hold it firmly in place.
- Carry out the wiring according to the diagram and in observance of the regulations in force, using cables of :
  - 1.5 mm<sup>2</sup> for power and relay control outputs
  - 1 mm<sup>2</sup> for detectors and remote control
  - 1 mm<sup>2</sup> for C-Bus and C-Ring. For limits of cable length please see technical data sheets T 021 and T 022.
- Switch on power (230 V ~) and check the 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**

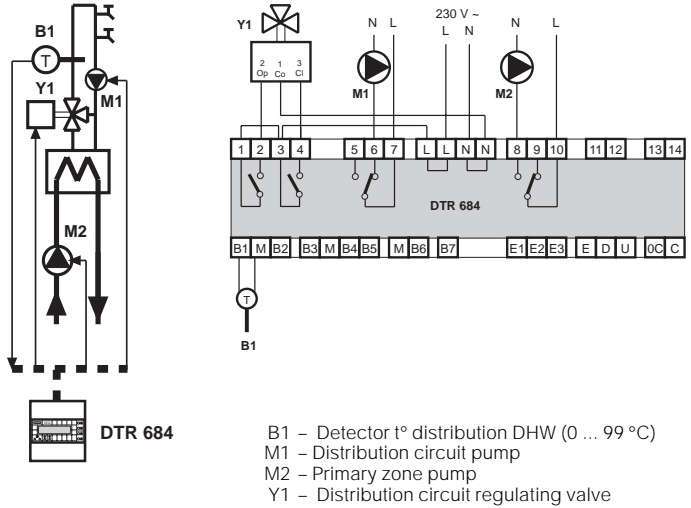
**10.1 Production of DHW by rapid heat exchanger :**

- Control of distribution temperature by modulating control of primary zone valve Y1.
- Timed control of primary pump M1 and distribution pump M2.



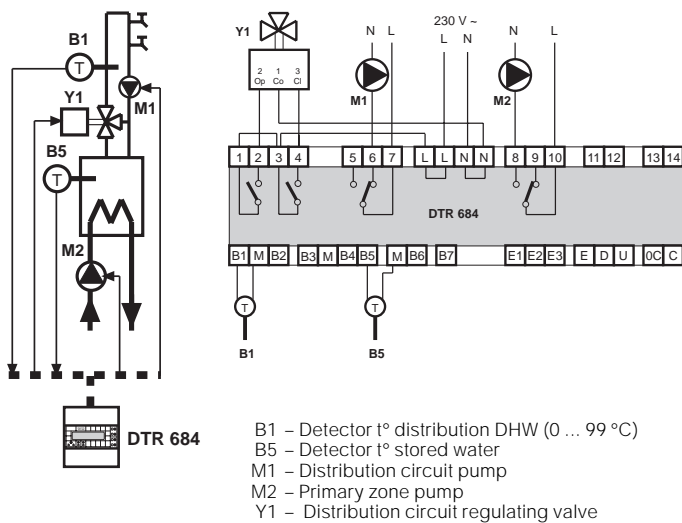
**10.2 Production of DHW by rapid heat exchanger :**

- Control of distribution temperature by modulating control of primary zone valve Y1.
- Timed control of distribution pump M1 and primary pump M2.



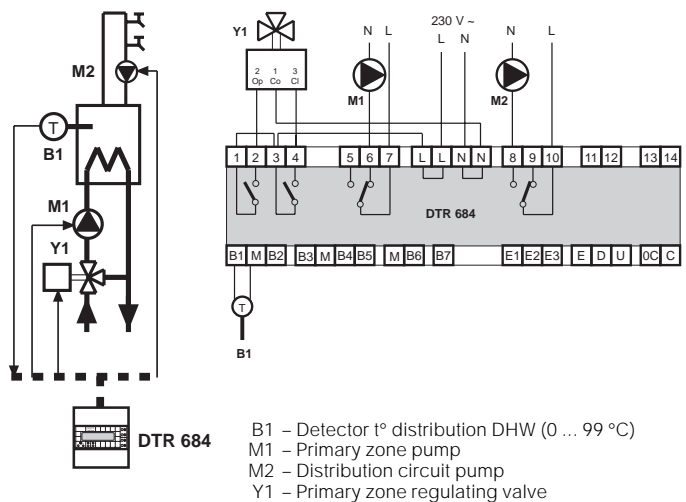
**10.3 Production of DHW with storage calorifier :**

- Control of distribution temperature by modulating control of primary zone valve Y1.
- Control stored water temp. by On-Off control of primary pump M2
- Timed control of distribution pump M1



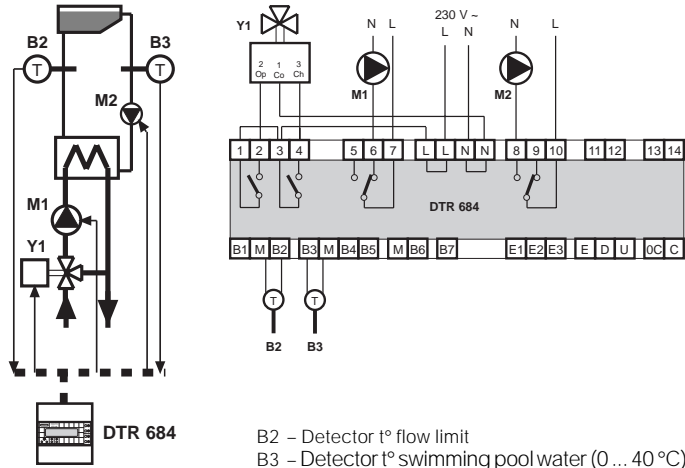
**10.4 Production of DHW with storage calorifier :**

- Control of distribution & storage temp. by modulating control of primary zone valve Y1.
- Timed control of primary pump M1 and distribution pump M2



**10.5 Heating swimming pool water :**

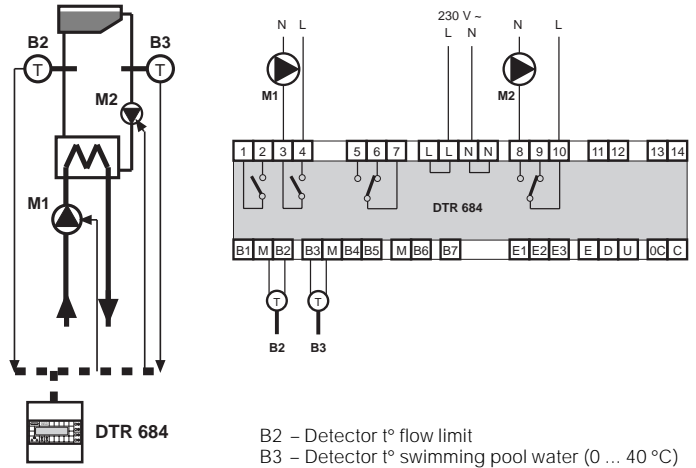
- Control of return to pool temp. and maximum limit flow by modulating control of primary zone valve Y1.
- Timed control of primary pump M1 and swimming pool pump M2



B2 - Detector t° flow limit  
 B3 - Detector t° swimming pool water (0 ... 40 °C)  
 M1 - Primary zone pump  
 M2 - Swimming pool circuit pump  
 Y1 - Primary zone regulating valve

**10.6 Heating swimming pool water :**

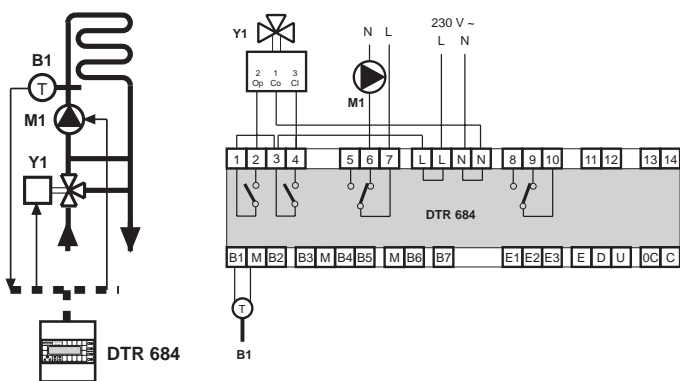
- Control of return to pool temp. and maximum limit flow by On-Off control of primary pump M1.
- Timed control of swimming pool pump M2



B2 - Detector t° flow limit  
 B3 - Detector t° swimming pool water (0 ... 40 °C)  
 M1 - Primary zone pump  
 M2 - Swimming pool circuit pump

**10.7 Heating by underfloor panels :**

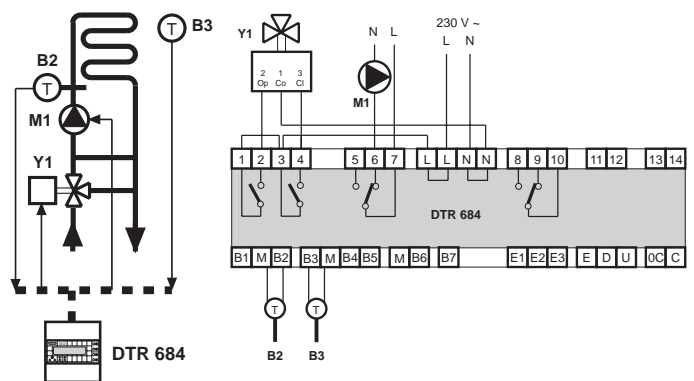
- Control flow temp. by modulating control of valve Y1.
- Timed control of pump M1



B1 - Detector t° flow (0 ... 99 °C)  
 M1 - Panels circuit pump  
 Y1 - Panels circuit regulating valve

**10.8 Heating by underfloor panels :**

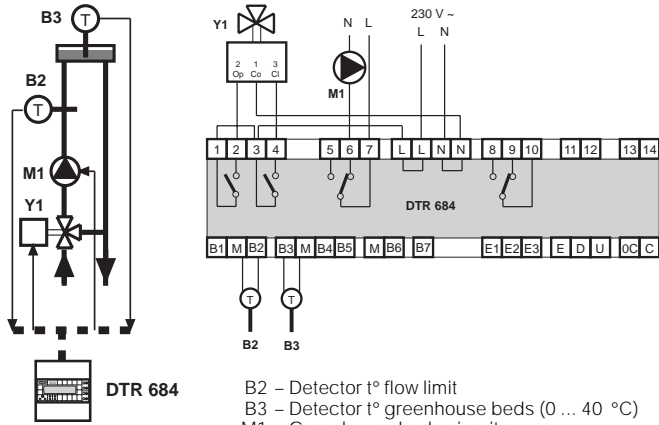
- Control ambient temp. and maximum limit flow by modulating control of valve Y1.
- Timed control of pump M1



B2 - Detector t° flow limit  
 B3 - Detector t° ambient (0 ... 40 °C)  
 M1 - Panels circuit pump  
 Y1 - Panels circuit regulating valve

**10.9 Heating greenhouse beds :**

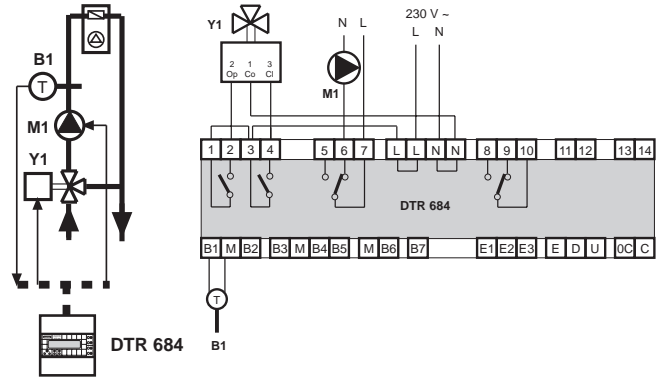
- Control temp. beds and maximum limit flow by modulating control of valve Y1.
- Timed control of pump M1



B2 - Detector t° flow limit  
 B3 - Detector t° greenhouse beds (0 ... 40 °C)  
 M1 - Greenhouse beds circuit pump  
 Y1 - Greenhouse beds circuit regulating valve

**10.10 Heating by fan coils :**

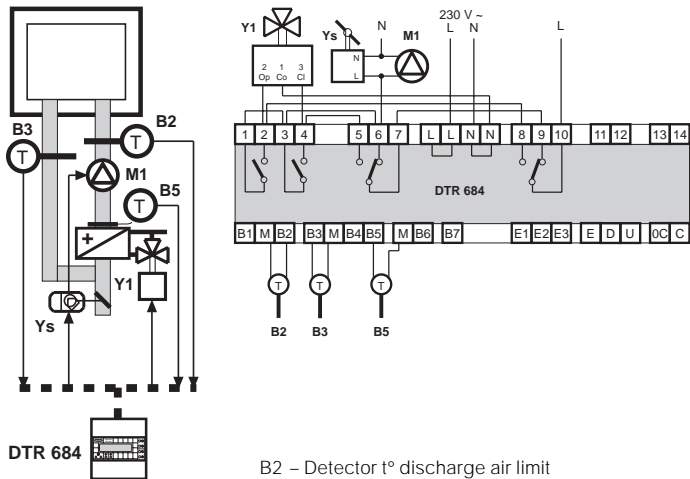
- Control flow temp. by modulating control of valve Y1.
- Timed control of pump M1



B1 - Detector t° flow (0 ... 99 °C)  
 M1 - Fan coils circuit pump  
 Y1 - Fan coils circuit regulating valve

**10.11 Heating by air handling units :**

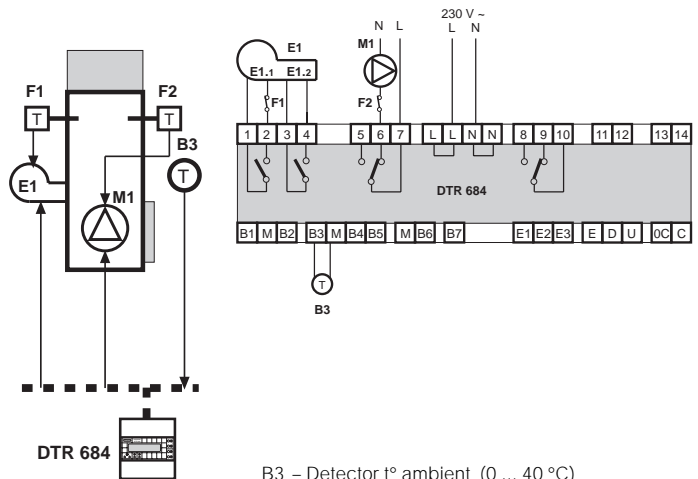
- Control ambient temp. and minimum discharge air limit by modulating control of valve Y1.
- Timed control of fan M1 and outside air damper Ys with frost protection control



B2 - Detector t° discharge air limit  
 B3 - Detector t° ambient or extract air (0 ... 40 °C)  
 B5 - Detector t° frost protection  
 M1 - Fan  
 Y1 - Air handling unit regulating valve  
 Ys - Outside air damper

**10.12 Heating ambient by hot air generator :**

- Control of ambient temp. by On-Off control burner in 1 or 2 stages
- Timed control of fan M1



B3 - Detector t° ambient (0 ... 40 °C)  
 E1 - Burner  
 M1 - Fan

**11. COMMUNICATION**

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

DTR 684 controller can be **“Primary”** or **“Secondary”**.

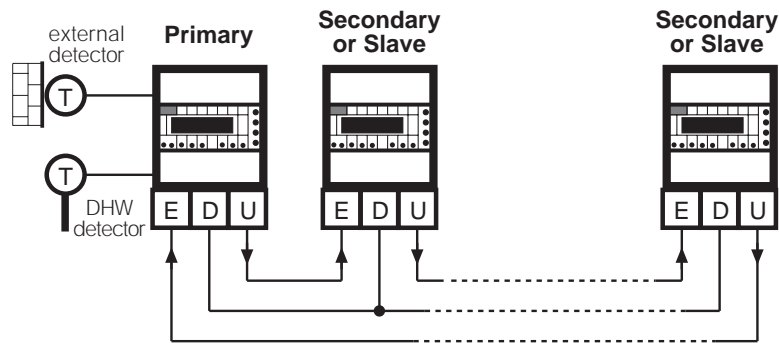
In C-Ring the following signals are transmitted :

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

26.4  
**CRing connection**  
**NO**

*NO* = connection to C-Ring not scheduled  
*PRIMARY* = connected to C-Ring and configured as *“Primary”*  
*SECONDARY* = connected to C-Ring and configured as *“Secondary”*

**11.2 C-Ring wiring diagram**



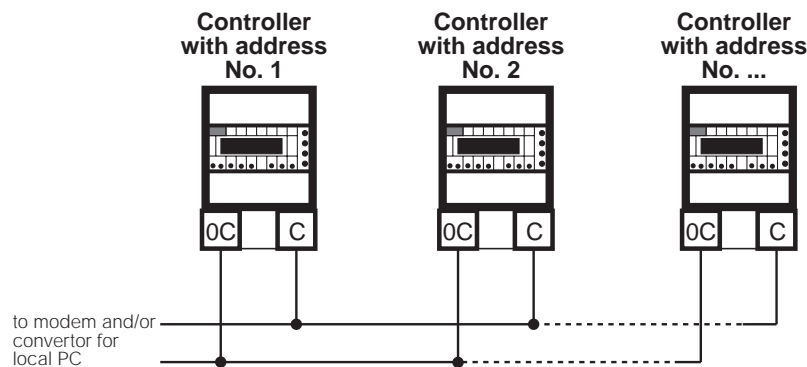
**11.3 C-Bus communication for telemanagement** (for detailed information please see technical data sheet T 021)

By means of C-Bus output DTR 684 can be telemanaged : two-way communication of data with one or more local PCs and / or remote central PC via telephone network.

From PC or PCs it is possible to display and / or change :

- the data and values entered on display pages of controller and configuration data dedicated exclusively to telemanagement (see 4.TECHNICAL DATA)
- operational status of plant components (pumps, auxiliaries in general)
- acquire alarms coming from boiler plant
- read the detector measurements (temperatures : outside, flow, boiler, etc)

**11.4 C-Bus wiring**



**11.5 Address for telemanagement**

26.3  
**Address : - - -**  
**Group : -**

*Note*

With telemanagement setup, in order to be identified by the central PC and / or by the local PCs, the controllers must have a progressive address number.

If required, it is also possible to subdivide the controllers in groups.

*When telemanagement is not scheduled leave the address in memory (- - -).*

*To cancel the values keep + and - keys pressed at the same time.*

**11.6 Sending alarms**

26.2  
**Send alarms : NO**  
**PassWTeleman : NO**

- **Send alarms** : NO = alarms not sent  
 YES= alarms are sent to central PC and indicated by appearance of word **“ALARM”** on display.
- **PassWTeleman** : NO = keynumber not enabled  
 YES= keynumber enabled

**12. OPERATION**

DTR 684 is a digital controller with microprocessor which can control temperature in two zones each with independent settings and timed events :

- Primary control
- Auxiliary control

26.1

**Config detectors**  
1 - - - - -

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

**13. PRIMARY CONTROL**

DTR 684 can operate with two different and independent **measurement ranges** :

• 0...99 °C (hot water) : detector **B1**, terminals B1-M 26.1  
**Config detectors**  
1 -

• 0...40 °C (cold water or ambient) : detector **B3**, terminals B3-M 26.1  
**Config detectors**  
- 3

DTR 684 can control by two different systems :

- With only the Primary detector (B1 or B3)
- With the Primary detector (B1 or B3) and the flow detector (B2)

**13.1 Control with the Primary detector only (B1 or B3)**

The controller compares the desired temperature **T°d** from the current programme chosen with the temperature measured by the detector B1 or B3 and adopts control action **Y1** or **E1** according to the temperature difference and the parameters set :

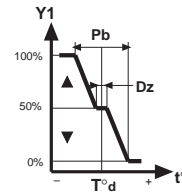
20.2  
**Pri:-----**  
**24HOUR 1PRIMARY**

24.3

**Prop band : 10.0c**  
**Integ time: 10m**

24.1  
if **Control: MODULATING**

- *Prop band* : - - - - c = proportional band **Pb** in ± °C.
- *Integ time* : - - - m = integral time in minutes

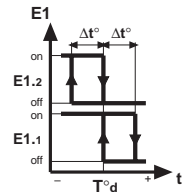


24.5

**Diff : 10.0c**  
**Integ time: 10m**

24.1  
if **Control: ON-OFF DIFF**

- *Diff* : - - - - c = On-Off differential of stage  $\Delta t^\circ$
- *Integ time* : - - - m = integral time in minutes



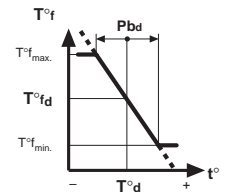
**13.2 Control with Primary detector (B1 or B3) & flow detector (B2)**

The controller compares the temperature measured by detector B1 or B3 with the desired temperature of the current programme **T°d** and calculates the *desired flow temperature T°fd* in relation to the difference measured and the parameters set. :

24.9 - 24.13

**Prop Band : 10.0c**  
**Integ time: 10m**

- *Prop band* : - - - - c = proportional band **Pb** in ± °C of primary control
- *Integ time* : - - - m = integral time in minutes of primary control.



24.11 - 24.15

**Control flow**  
**Min: 1c Max: 99c**

- *Min* : - - c *Max* : - - C = minimum and maximum limits of flow temp : establish range of proportional band of primary control (24.9 - 24.13).

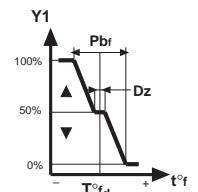
The controller compares the temperature measured by flow detector B2 with value calculated **T°fd** and adopts control action **Y1** or **E1** in relation to difference measured and parameters set.

24.10

**Flow temp**  
**Prop band : 10.0c**

24.1  
if **Control: MODULATING**

- *Prop band* : - - - - c = proportional band **Pbf** in ± °C of flow control

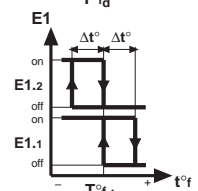


24.14

**Flow temp**  
**Diff : 10.0c**

24.1  
if **Control: ON-OFF DIFF**

- *Diff* : - - - - c = On-Off differential of stage  $\Delta t^\circ$  of flow control





**13.3 Control output Y1**

24.1

**Control :**  
**MODULATING**

The control output of the primary control Y1 (1-2 ; 3-4) can be :

- Control : *MODULATING* = control valve by three-wire modulating actuator
- ON-OFF DIFF* = On-Off control in two stages

24.2 - 24.8

**Actuat run time**  
**630sec**

If MODULATING, enter :

- complete run time (open/closed) of valve actuator ; indispensable for correct control operation.

24.4 - 24.12

**Dead band**  
**NARROW**

- dead zone **Zn** of modulating action : *NARROW* ; *MEDIUM* ; *WIDE*.

24.6 - 24.16

**Minimum start time** : **60s**

If *ON-OFF DIFF*, enter if necessary for electric device controlled :

- minimum start time of On-Off control
- minimum stop time of On-Off control

24.7 - 24.17

**Minimum stop time** : **60s**

**13.4 Operating mode**

21.1 - 21.5

**Desired Primary temp 1** **20.0c**

You can set five temperatures *Desired Primary temp 1 ... 5* to be used in creating the four programmes of timed events *24HOUR 1 ... 4 PRIMARY* which in turn are used for creating the 7-day programme *7DAY PRIMARY*

It is possible to programme the operation of primary control according to requirements of the zones :

- *7 DAY PRIMARY* = operation with timed events using 7-day prog.
- *24 HOUR 1 ... 4 PRIMARY* = operation with timed events using one of four 24 hour progs.
- *TEMP 1...5* = continuous operation using one of 5 desired temps.
- *OFF* = always Off

when in place of programme appears :

- *HOLIDAY* = one of holiday periods is current.
- *REMOTE TEMP 1...4* = remote control R is in "Temperature 1 ... 4" position.
- *REMOTE OFF* = remote control R is in "Off" position.

The current *operational mode* depends on the programme set.

20.3

**Pri mode: TEMP 1**  
**Td20.0cVar+ 0.0c**

- Pri Mode : *TEMP 1* = control set by programme :
  - *TEMP 1...5* = control with one of *Desired Primary temp*
  - *OFF* = control Off
- Td 20.0 c = value of desired temp. for current mode.
- Var + 0.0c = manual adjustment of desired temperature (use + or - keys), with B1 max ± 10 °C; with B3 max ± 5 °C.

**13.5 Temperature set point adjuster**

If setpoint adjuster Rt° is connected and configured, it is possible to adjust from a distance value

20.4

**Setpoint adjust Td** : **+ 0.0c**

of current desired temp. within the limits set :

24.18

**Set point adjust min limit:- 0.0c**

24.19

**Set point adjust max limit:+ 0.0c**

The value of the adjustment made is shown on the display.

**13.6 Variation programmes by remote control**

26.1

**Config detectors**  
- - - - - 7

If remote control R is connected and configured in

it is possible to modify from a distance the current operating programme :

- 1 - *OFF* = plant excluded
- 2 - *TEMP 4* = continuous operation at desired temperature 4
- 3 - *TEMP 3* = continuous operation at desired temperature 3
- 4 - *TEMP 2* = continuous operation at desired temperature 2
- 5 - *TEMP 1* = continuous operation at desired temperature 1
- 6 - *AUTOMATIC* = operation with programme chosen on controller.

**13.7 Primary zone priority function**

24.21

**Primary zone priority : NO**

- *Primary zone priority* : NO = function excluded  
YES = function enabled

When DTR 684 is connected in C-Ring with other controllers and the priority function has been enabled :

- Primary control sends via C-Ring the differential value between its own desired temperature and the actual one ;
- the C-Ring controllers with anticondensing function enabled reduce the desired flow temperature by 4 °C for each °C difference so as to give precedence to the primary control of DTR 684.

Note

When the priority function is used and the boiler requires the presence of the anticondensing detector it is indispensable to connect it to the first DTR 684 in the C-Ring.

**13.8 Control pump plant M1**

24.22

**Pri pump :AUT  
Delay Off : 0min**

The plant pump can be controlled in two ways :

- *Pri Pump* : MAN = pump always in operation  
AUT = pump controlled by timed events of current programme
- *Delay Off* : -- min = delay time in switching Off

**14. AUXILIARY CONTROL**

If detector B5 is not connected and not configured , the output M2 can be used as a **time switch** with programme chosen in

20.5  
**Aux : -----  
24HOUR 1 AUX**

If detector B5 is connected but not configured in it functions only as a **temperature monitor**

22.3  
**Des Aux T : ---.c  
Act Aux T : 50.0c**

If detector B5 is connected and configured in

26.1  
**Config detectors  
5**

the **auxiliary control**, according to programme chosen in

20.5  
**Aux : -----  
24HOUR 1 AUX**

compares the temperature measured with the desired temperature set in

21.6  
**Desired Aux temp 50.0c**

and controls (On-Off) the output M2 according to temperature difference and parameters set :

25.1  
if **Control : ON-OFF DIFFERENTIAL**

- *Diff* : ---.c = On-Off stage differential
- *Integ time* : -- m = not used

25.2  
**Diff : 10.0c  
Integ time : ---m**

25.1  
if **Control : ON-OFF PROPORTIONAL**

- *Prop band* : ---.c = proportional band in ± °C.
- *Integ time* : -- m = integral time in minutes

25.2  
**Prop band : 10.0c  
Integ time : 10m**

- *Half cycle time* --- sec = Start and Stop time when actual temp. is equal to desired temp.

25.3  
**Half cycle time 120sec**

**14.1 Control output M2**

25.4

Minimum start  
time : 60s

25.5

Minimum stop  
time : 60s

25.7

Auxiliary pump  
Delay Off: 0min

The start and stop controls of output M2, depend not only on the control parameters set but also on :

- *Minimum start time* : -- sec = minimum start time
- *Minimum stop time* : -- sec = delay time in switching off .
- *Delay Off* : -- min = delay time in switching off.

**14.2 Operating mode**

21.6

Desired Aux  
temp 20.0c

20.5

Aux : -----  
24HOUR 1 AUX

The *Desired Aux temp*

is used in establishing the three programmes of timed events *24 HOUR 1 ... 3 AUX* which , in turn, are used to establish the 7-day programme *7 DAY AUX*.

It is possible to programme the operation of the auxiliary control according to the requirements of the zones :

- *7 DAY AUX* = in operation 7-day programme with timed events
- *24 HOUR 1 ... 3 AUX* = in operation one of three 24-hour progs. with timed events
- *ON* = continuous operation at *Desired Aux temp*
- *OFF* = always Off

when in place of programme appears :

- *HOLIDAY* = one of holiday periods is current.

The current *operational mode* depends on programme set.

- Aux mode : *ON* = mode set by programme :
  - *ON* = control with *Desired Aux temp*
  - *OFF* = control Off
- Tv 20.0 c = value of temperature desired by current mode.
- Var + 0.0 c = manual adjustment of desired temperature (use + or - keys); max. ± 10°C.

20.6

Aux mode : ON  
Td20.0cVar+ 0.0c

**14.3 Auxiliary control priority function**

25.6

Auxiliary zone  
priority : NO

- *Auxiliary zone priority* : *NO* = function excluded  
*YES* = function enabled

When DTR 684 is wired in C-Ring with other controllers and priority function is enabled :

- the auxiliary control sends via C-Ring the differential value between its own desired temperature and the actual one ;
- the controllers in C-Ring, with the anticondensing function enabled, decrease their own desired flow temp. by 4 °C for each °C of difference so as to give precedence to the auxiliary control of DTR 684.

Note

When the priority function is used and the boiler asks for the presence of the anticondensing detector it is indispensable to connect it to the first DTR 684 controller in the C-Ring.

## 15. PROGRAMMES & PERIODS WITH DATES

There are separate programmes of timed events for primary control and for auxiliary control.

### 15.1 24-hour programmes

23.1 - 23.8  
 --- -Num 24hr  
 programmes ? 1

Set the number of 24-hour programmes you wish to use for the primary zone (1 ... 4) and for the auxiliary zone (1 ... 3) so as to avoid scrolling unnecessary pages.

In each 24-hour programme you can set a maximum of six event start times (**h1 ... h6**) assigning to each one of following modes :

23.2 - 23.7  
 P1 Event 1 6.00  
 TEMP 3 21.0c

for *primary* zone :

- TEMP 1...5 : control with desired primary temp 1 ... 5 set in
- OFF : plant Off, valve closed and pump idle

21.1 - 21.5  
 Desired Primary  
 temp 20.0c

23.9 - 23.14  
 P1 Event 1 6.00  
 ON 50.0c

for *auxiliary* zone :

- ON : control with desired aux temp set in
- OFF : plant Off, valve closed and pump idle

21.6  
 Desired Aux  
 temp 20.0c

The times of start of period must be entered in increasing order.

Events not used must be excluded by pressing + and - keys at the same time (- - -).

Unused events(- - -) must not be left between programmed events.

### 15.2 7-day programmes

23.15 - 23.23  
 --- -Num 7day  
 programmes ? 1

Set the number of 7-day programmes you wish to use for the primary zone (0 ... 1) and for the auxiliary zone (0 ... 1) so as to avoid scrolling unnecessary pages.

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

23.16 - 23.22  
 7day 1: MONDAY  
 24HOUR 1 PRI

for *primary* control :

- 24 HOUR 1 ... 4 PRI; TEMP1...5; OFF.

23.24 - 23.30  
 7day 1: MONDAY  
 24HOUR 1 AUX

for *auxiliary* control:

- 24 HOUR 1 ... 3 AUS; ON; OFF.

### 15.3 Holiday periods

These impose one operating programme for Primary control and one for auxiliary control, equal for all periods, which replace those in use. At the end of each holiday period the controller returns to normal operation.

Set the number of holiday periods or bank holidays you wish to use (0 ... 25) so as to reduce the number of display pages dedicated to the setting of dates.

If left at 0, the programming pages do not appear.

23.31  
 How many holiday  
 periods ? 0

Select the programme to be used during *all the holiday periods* :

23.32  
 Pri holiday prog  
 OFF

for *primary* control ::

- 7 DAY PRIMARY; 24 HOUR 1 ... 4 PRI; - TEMP1...5; OFF.

23.33  
 Aux holiday prog  
 OFF

for *auxiliary* control:

- 7 DAY AUX; 24 HOUR 1 ... 3 AUX; ON; OFF.

Set the dates for each single period :

23.34  
 Hol 01: NO  
 Fr - - - - to - - - -

- Hol 01 = selection of periods made available by
- NO = unused holiday period
- Pri = enabled only for primary control
- Aux = enabled only for auxiliary control
- Pri + Aux = enabled for both Pri and Aux control
- Fr - - - - to - - - - = day and month of start and end of holiday period.

23.31  
 How many holiday  
 periods ? 0

For a single day of holiday set the same date for the start and end.

To cancel a holiday period keep pressed at the same time + and - keys.

### 15.4 Summer time (BST) period

The controller is able to change automatically the time of day according to the current time period (GMT or BST).

- 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.

23.35  
 Summer time  
 Fr - - - - to - - - -

## 16. COMPLEMENTARY FUNCTIONS

### 16.1 Control of boiler anticondensing temperature

24.20

Anticondens : NO  
Desired T: 50.0c

The anticondensing function prevents the formation of condensation in the boiler combustion chamber. It imposes 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.

- *Anticondens* : NO = function disabled  
YES = function enabled
- *Desired T* : --.- °C = minimum limit value of return to boiler temperature.

If the controller is in C-Ring the differential value is transmitted to all the controllers connected, and these are able to perform the anticondensing function with a single detector. The value of the desired anticondensing temp. is that set on the controller to which the anticondensing detector is connected.

### 16.2 Access keynumber

26.8

Choice keynumber  
----

To enable the access keynumber enter the number (1900 ... 1999) using + and – keys. The keynumber prevents the use of + and – keys for changing data. To cancel the keynumber, press + and – at the same time until the dashes reappear.

When keynumber is enabled, if + or – keys are pressed on display appears Access keynumber  
---- Only after having entered the exact keynumber can + and – keys be used. If for 15 minutes no key is pressed the keynumber is automatically re-enabled.

### 16.3 Denomination zones

26.9

Name Pri zone  
-----

Entering names of primary and auxiliary zones which appear on relative pages of choice of programmes.

26.10

Name Aux zone  
-----

Using + and – keys, each dash can be replaced by a letter of the alphabet (A ... Z) or by a number (0 ... 9). The → key serves to position the cursor.

### 16.4 Display measurements

22.1

Des Pri T : 20.0c  
Act Pri T : 20.0c

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

- temperature *desired* by current mode for primary control.
- *actual* temperature measured by detector **B1** or **B3**.

22.2

Des flow T : 20.0c  
Act flow T : 20.0c

- Appears only if detector **B2** is connected and configured.
- flow temperature *desired* by primary control.
  - *actual* flow temperature measured by detector B2.

22.3

Des Aux T : 20.0c  
Act Aux T : 20.0c

- Appears only if detector **B5** is connected and configured.
- temperature *desired* by current mode for auxiliary control.
  - *actual* temperature measured by detector B5.

22.4

Des anticT : 20.0c  
Act anticT : 20.0c

- Appears only if detector **B4** is connected and configured.
- *desired* anticondensing temperature.
  - *actual* temperature measured by detector B4.

### 16.5 Recording data

The controller, at each change of mode, and every two hours, records a series of data indicating the operational status of the zones controlled :

- Current time, current day and type of recording (change of mode or end of two-hour period);
- Primary control : current mode, desired and actual primary temp., calculated and actual flow temp. ;
- Auxiliary control : current mode, desired and actual auxiliary temp.;
- Desired and actual anticondensing temperature.
- Status output relays.

The controller can memorise 22 complete recordings and the last recording brings about the cancellation of the oldest one.

If the first page does not appear on the display the controller makes the recording at the end of the two-hour period, but not that at the change of mode because it presumes changes to the setting data are in progress.

*The recordings can be displayed only by the telemanagement computer.*

## 17. ALARMS

The alarms processed by the controller are of three types :

- alarms for the abnormal operation of the controller (LED 6.9) and of the zones controlled (LED 6.8)
- alarms for short or open circuits to detectors connected (LED 6.8)
- alarms from external contacts (LED 6.7)

The alarm status is indicated by the LEDs situated on the controller facia and by the word ALARM appearing on the display when the alarm is sent to the PC and is identified, on the configuration page, by the letter "A" alternating with the number of the alarm concerned.

*With C-Bus the alarms can be sent to a local PC and/or to the central telemanagement PC.*

### 17.1 Functional alarms

26.5

<b>F u n c t i o n a l A l a r m s</b>
- - - - - 8

The functional alarms are triggered in the presence of persisting differences between actual and desired measurements.

With the exception of the real time clock alarm (8) these alarms do not affect the normal operation of the controller.

*Factory setting : all disabled except for real time clock alarm (8)*

Using + and - keys enable the alarms of interest by replacing the dashes with numbers.

*When the number blinks = alarm triggered.*

*The minimum and maximum wait times for sending the alarms can be modified only by PC.*

Type of alarm and reason :

- 1** = difference *primary* temperature **B1** or **B3**
  - enabled when pump M1 in operation
  - triggered when actual is less than desired temperature.
- 2** = difference *limit* temperature **B2**
  - enabled when pump M1 in operation
  - triggered when actual temperature below minimum limit or above maximum limit.
- 5** = difference *auxiliary* temperature **B5**
  - enabled when pump M2 in operation
  - triggered when actual temperature below that desired
- 8** = internal real time clock : *cannot be disabled*
  - triggered when clock assumes meaningless values

### 17.2 Detector alarms

26.6

<b>D e t e c t o r a l a r m s</b>
- - - - - -

The detector alarms, for the detectors connected, are triggered in the event of **open** or **short circuits**.

*The effect of the alarm situation is delayed by one minute.*

*Factory setting : all disabled.*

Using + key enable alarms of interest by replacing dashes by numbers.

Type of alarm and effect :

- 1** = *primary* detector **B1** (0 ... 99 °C) : valve stops where it is at moment of alarm and pump M1 controlled by current timed events programme.
- 2** = *flow* detector **B2** : valve stops where it is at moment of alarm and pump M1 controlled by timed events programme.
- 3** = *primary* detector **B3** (0 ... 40 °C) : valve stops where it is at moment of alarm and pump M1 controlled by current timed events programme.
- 4** = *anticondensing* detector **B4** : anticondensing function cancelled also in C-Ring.
- 5** = *auxiliary* detector **B5** : Pump M2 idle..
- 8** = C-Ring : electric connection interrupted or defective controller in C-Ring.

### 17.3 Alarms or status from external contacts (k)

26.7

<b>K A l a r m s</b>
- - -

Alarms triggered by closure of voltage-free contacts **k1**, **k2** and **k3** by plant components (pumps, burners, etc).

*The triggering of the alarm is signalled after about 60 seconds.*

*Factory setting : all disabled.*

Using + key enable alarms of interest by replacing dashes by numbers.

If not used as alarms can be used as status indicators.

**18. COMMISSIONING PLANT**

Testing to be carried out at conclusion of installation and when wiring and configuration completed and tested.

**18.1 Testing C-Ring**

27.1

CRing: ??

26.4

CRing connection  
PRIMARY  
CRing connection  
SECONDARY

The C-Ring testing page appears only if it has been configured in

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

- correctly powered by 230 V ~

- Slave controllers or configured as SECONDARIES in

CRing connection  
SECONDARY

- selected on testing page

CRing: ??

The PRIMARY controller sends via C-Ring a signal every five seconds : on all the displays appears "??". If the wiring is correct the word "YES" replaces "??" on all the displays. If on one or more displays "YES" does not appear, this means that there is an open circuit between the last controller displaying "YES" and the first displaying "??".

Examples of testing a C-Ring 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" : *C-Ring faulty between 4 and 7*
- Cont.1 "??" - Cont.2 "YES" - Cont.3 "??" - Cont.4 "??" : *C-Ring faulty between 2 and 3*
- Cont.1 "??" - Cont.2 "??" - Cont.3 "??" - Cont.4 "??" : *C-Ring faulty between 1 and 2*

**18.2 Testing outputs**

27.2

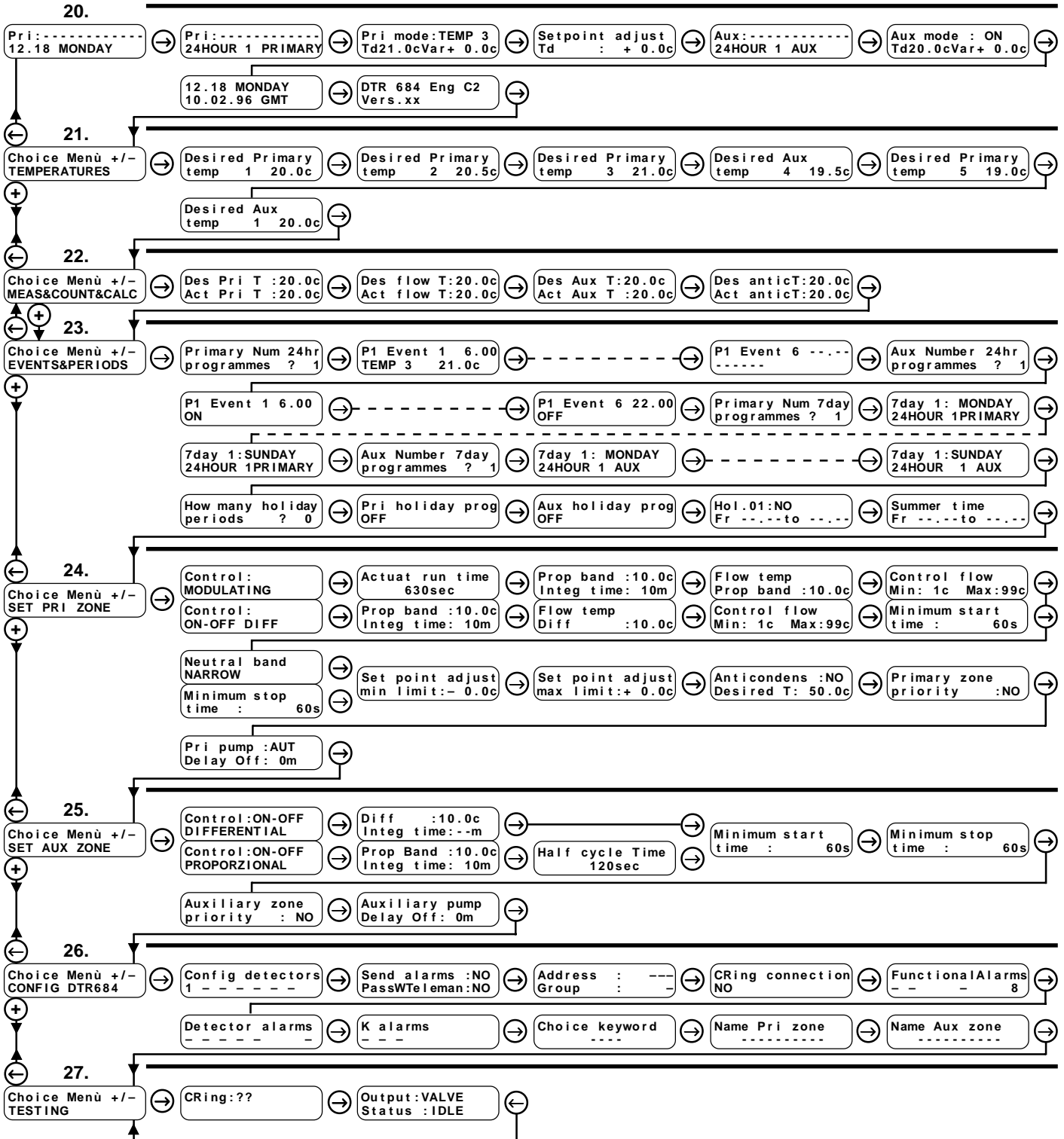
Output : VALVE  
Status : IDLE

Using + and - keys select :

- Output to be tested :
  - VALVE ;
  - PUMP ;
  - AUXILIARY ;
- status :
  - with VALVE : IDLE ; CLOSES ; OPENS
  - PUMP and AUXILIARIES : ON ; OFF.

Check the results.

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



← → Keys for scrolling the pages on the display and positioning the cursor ■ on the data which can be changed.

The data which can be changed, in the following descriptive list of display pages, are highlighted thus

By pressing these keys at the same time, or in any event after 15 minutes, the first page appears on the display. Pri:----- 12.18 MONDAY

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

- viewing the configuration options of a function, for example :

Control: MODULATING

OR

Control: ON-OFF DIFFERENTIAL

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



20. NORMAL USE				
Ref.	Display	Description	Notes	Sect
20.1	Pri :----- 12.18 MONDAY	Name Primary zone Current time and day	Set in <b>26.9</b> Set in in <b>20.7</b>	
20.2	Pri :----- 24HOUR 1 PRIMARY	Name Primary zone Choice programme : 24HOUR 1...4 PRI ; 7DAYPRI ; TEMP 1...5 ; OFF.	Instead of programme may appear : HOLIDAY ; REMOTE TEMP 1...4 ; REMOTE OFF.	13.4
20.3	Pri mode : TEMP 3 Td21.0cVar+ 0.0c	Current operating mode Td : Desired temp. for mode Var : Variation of desired temp.	Pri mode : TEMP1...5 ; OFF. Var : use + or - keys (with B1 max ± 10 °C ; with B3 max ± 5 °C).	13.4
20.4	Set point adjust Td : + 0.0c	Variation of temperature set on set-point adjuster	Appears only if set-point adjuster <b>Rt°</b> has been configured in <b>26.1</b> .	13.5
20.5	Aux :----- 24HOUR 1 AUX	Name Auxiliary zone Choice programme : 24HOUR 1...3 AUX ; 7DAY AUX ; ON ; OFF.	Set in <b>26.10</b> Instead of programme may appear : HOLIDAY.	14.2
20.6	Aux mode : ON Td20.0cVar+ 0.0c	Current operating mode. Td : Desired temp. for mode Var : Variation of desired temp.	Aux mode : ON ; OFF. Var : use + or - keys ( max ± 10 °C) ;	14.2
20.7	12.18 MONDAY 10.02.96 BST	Setting : time, day of week & date Current time period : GMT or BST	Accordinging dates BST set in <b>23.35</b>	
20.8	DTR 684 Eng. C2 Vers.xx	Identifying data of controller		

21. TEMPERATURES				
Ref.	Display	Description	Notes	Sect
21.1	Desired Primary temp 1 20.0c	Value of desired temp. 1 for primary zone		13.4
21.2	Desired Primary temp 2 20.5c	Value of desired temp. 2 for primary zone		13.4
21.3	Desired Primary temp 3 21.0c	Value of desired temp. 3 for primary zone		13.4
21.4	Desired Primary temp 4 19.5c	Value of desired temp. 4 for primary zone		13.4
21.5	Desired Primary temp 5 19.0c	Value of desired temp. 5 for primary zone		13.4
21.6	Desired Aux temp 20.0c	Value of desired temp. for auxiliary zone		14.2

22. MEAS & COUNT & CALC				
Ref.	Display	Description	Notes	Sect.
22.1	Des Pri T :20.0c Act Pri T :20.0c	Desired temp. for primary zone Temperature measured by detectors B1 or B3		16.4
22.2	Des flow T :50.0c Act flow T :50.0c	Desired flow temp. for primary zone Temperature measured by detector B2	Appears only if detector <b>B5</b> has been configured in <b>26.1</b> .	16.4
22.3	Des Aux T :20.0c Act Aux T :20.0c	Desired flow temp. for auxiliary zone Temperature measured by detector B5	Appears only if detector <b>B5</b> has been configured in <b>26.1</b> .	16.4
22.4	Des anticT :50.0c Act anticT :50.0c	Desired anticondensing temperature Temperature measured by detector B4	Appears only if detector <b>B4</b> has been configured in <b>26.1</b> .	16.4

23. EVENTS & PERIODS				
Ref.	Display	Description	Notes	Sect.
23.1	Primary Num 24hr programmes ? 1	Choice of number of 24-hour programmes to be used (1 ... 4) for primary zone	Avoids scrolling unnecessary display pages	15.1
23.2	P1 Event 1 6.00 TEMP 21.0c	Number of programme, number of event and start time programmed.	Max 6 periods. To eliminate an unused period press + and - together : --.-- will appear.	15.1
23.7	P1 Event 2 22.00 OFF	Choice type of mode to assign to period : TEMP 1...5 ; OFF. <b>Further groups of 6 pages according to figure in 23.1</b>	The events must be in increasing order. Do not leave --.-- between programmed events.	
23.8	Aux-Number 24hrs programmes ? 1	Choice number of 24-hour programmes to be used (1...3) for auxiliary zone.	Avoids scrolling unnecessary display pages	15.1
23.9	P1 Event 1 6.00 ON	Number of programme, number of event and start time programmed.	Max 6 periods. To eliminate an unused period press + and - together : --.-- will appear	15.1
23.14	P1 Event 2 22.00 OFF O	Choice type of mode to assign to period : ON ; OFF. <b>Further groups of 6 pages according to figure in 23.1</b>	The events must be in increasing order. Do not leave --.-- between programmed events.	

23. EVENTS & PERIODS				
Ref.	Display	Description	Notes	Sect.
23.15	Primary Num 7day programmes ? 1	Choice of number of 7-day programmes to be used (0...1) for primary zone.	Avoids scrolling unnecessary display pages	15.2
23.16	7Day 1: MONDAY 24HOUR 1 PRIMARY	Choice of programme for each day of week : 24HOUR 1...4 PRI ; TEMP 1...5 ; OFF.		15.2
23.22	7Day 1: SUNDAY 24HOUR 1 PRIMARY			
23.23	Aux Number 7day programmes ? 1	Choice of number of 7-day programmes to be used (0...1) for Auxiliary zone.	Avoids scrolling unnecessary display pages	15.2
23.24	7day 1: MONDAY 24HOUR 1 AUX	Choice of programme for each day of week 24HOUR 1...3 AUX ; ON ; OFF.		15.2
23.30	7day 1: SUNDAY 24HOUR 1 AUX			
23.31	How many holiday periods ? 0	Choice of number of holiday periods to be used (0...25).	Avoids scrolling unnecessary display pages	15.3
23.32	Pri holiday prog OFF	Choice of programme for all holiday periods assigned to Primary zone : 7DAY PRI ; 24HOUR 1...4 PRI ; OFF.	Appears only if in 23.31 number is greater than 0.	15.3
23.33	Aux holiday prog OFF	Choice of programme for all holiday periods assigned to auxiliary control : 7DAY AUX ; ON ; OFF.	Appears only if in 23.31 number is greater than 0.	15.3
23.34	Hol 01: NO Fr: ---to: ---	NO =period not used Pri =enabled only for Primary zone Aus =enabled only for Auxiliary zone Pri+Aus =enabled for both zones; Dates of start and end of holiday period. <b>Further pages according number selected in 23.31</b>	Appears only if in 23.31 number is greater than 0.	15.3
23.35	Summer Time Fr: 29.03to: 26.10	Dates of start and end of BST period.		15.4

24. SETTING PRIMARY ZONE				
Ref.	Display	Description	Notes	Sect.
24.1	Control: MODULATING	Choice of type of control MODULATING ; ON-OFF DIFF	MODULATING : three-wire modulating control. ON-OFF DIFF : On-Off control in two stages	13.1.2.3
Pages 24.2, 24.3 and 24.4 appear if detector <b>B2 is not connected</b> and if in 24.1 choice is MODULATING.				
24.2	Actuat run time 630sec	Valve actuator run time in seconds.		13.3
24.3	Propband : 10.0c Integ time: 10m	Proportional band in $\pm$ °C. Integral time in minutes.		13.1
24.4	Dead band NARROW	Dead band of modulating output : NARROW ; MEDIUM ; WIDE.		13.3
Pages 24.5, 24.6 and 24.7 appear if detector <b>B2 is not connected and</b> if in 24.1 choice is ON-OFF DIFF				
24.5	Diff : 10.0c Integ time: 10m	Temperature differential On-Off per stage. Integral time in minutes.		13.1
24.6	Minimum start time : 60s	Minimum start time for On-Off control.		13.3
24.7	Minimum stop time : 60s	Minimum stop time for On-Off control.		13.3
Pages 24.8, 24.9, 24.10, 24.11, 24.12 appear if detector <b>B2 connected and</b> if in 24.1 choice is MODULATING.				
24.8	Actuator runtime 630sec	Valve actuator run time in seconds.		13.3
24.9	Prop band : 10.0c Integ time: 10m	Proportional band in $\pm$ °C of Primary temperature. Integral time of Primary temperature.		13.2
24.10	Flow temp Prop band : 10.0c	Proportional band of flow temperature.		13.2
24.11	Control flow Min: 1c Max: 99c	Minimum & maximum limits of flow temperature. Establish range of Proportional band of Primary temperature (24.9)		13.2
24.12	Dead band NARROW	Dead band of modulating output : NARROW ; MEDIUM ; WIDE.		13.3

24. SETTING PRIMARY CONTROL				
Ref.	Display	Description	Notes	Sect
	Pages <b>24.13, 24.14, 24.15, 24.16, 24.17</b> appear if detector <b>B2</b> is connected and if in <b>24.1</b> choice is ON - OFF DIFF.			
24.13	<b>Prop band :10.0c</b> <b>Integ time: 10m</b>	Proportional band in $\pm$ °C of Primary temperature. Integral time of Primary temperature.		13.2
24.14	<b>Flow temp</b> <b>Diff :10.0c</b>	Flow temperature differential.		13.2
24.15	<b>Control flow</b> <b>Min: 1c Max:99c</b>	Minimum & maximum flow temp. limits. Establish range of Proportional band of Primary temperature ( <b>24.13</b> ).		13.2
24.16	<b>Minimum start time : 60s</b>	Minimum start time for On-Off control.		13.3
24.17	<b>Minimum stop time : 60s</b>	Minimum stop time for On-Off control.		13.3
24.18	<b>Set point adjust min limit:- 0.0c</b>	Minimum limit of variation permitted to Rt°. With B1 : 0...- 10 °C; with B3 : 0...- 5 °C.	Appears only If in <b>26.1</b> set point adjuster Rt° has been configured	13.5
24.19	<b>Anticondens Desired T:+ 0.0c</b>	Maximum limit of variation permitted to set point adjuster Rt°. With B1 : 0...+10 °C; with B3:0...+5°C.	Appears only If in <b>26.1</b> set point adjuster Rt° has been configured	13.5
24.20	<b>Primary zone: NO</b> <b>priority: 50.0c</b>	Anticondensing function : YES ; NO. Value of desired boiler anticondensing temp.	If in <b>26.1</b> detector <b>B4</b> has not been configured & value comes via C- Ring -- . - will appear.	16.1
24.21	<b>Primary zone priority : NO</b>	Priority function of Primary zone : YES ; NO.		13.7
24.22	<b>Pri pump :AUT</b> <b>Delay Off: 0min</b>	Control of plant pump : MAN ; AUT. Delay in switching off pump.	MAN : always On AUT : On according to current events programme;	13.8

25. SETTING AUXILIARY CONTROL				
Ref.	Display	Description	Notes	Sect
25.1	<b>Control:ON-OFF</b> <b>DIFFERENTIAL</b>	Choice type On-Off control : DIFFERENTIAL ; PROPORTIONAL	DIFFERENTIAL : with pure differential. PROPORTIONAL : with Proportional control action (ambient)	14.
25.2	<b>Diff :10.0c</b> <b>Integ time: --m</b>	Differential On-Off temp.	Appears if in <b>25.1</b> DIFFERENTIAL.has been chosen.	14.
	<b>Prop band :10.0c</b> <b>Integ time: 10m</b>	Proportional Band in $\pm$ °C. Integral time in minutes	Appears if in <b>25.1</b> PROPORTIONAL.has been chosen.	14.
25.3	<b>Half cycle time</b> <b>120sec</b>	Time of half cycle at half load : this is time of On or Off when actual temp. is equal to desired temp.	Appears if in <b>25.1</b> PROPORTIONAL.has been chosen.	14.
25.4	<b>Minimum start time : 60s</b>	Minimum start time for On-Off control.		14.1
25.5	<b>Minimum stop time : 60s</b>	Minimum stop time for On-Off control.		14.1
25.6	<b>Auxiliary zone priority : NO</b>	Priority function for Auxiliary control : YES ; NO.		14.3
25.7	<b>Auxiliary pump Delay Off: 0min</b>	Delay in switching off Auxiliary zone pump.		14.1

26. CONFIGURATION CONTROLLER				
Ref.	Display	Description	Notes	Sect.
26.1	<b>Config detectors</b> 1 - - - - -	Configuration detectors connected (inputs B - M) - = detector not connected number = detector connected. Factory setting : only B1 configured. B1 and B3 are alternatives.	1 : Primary zone detector <b>B1</b> (0 ... 99 °C) 2 : Primary zone flow detector <b>B2</b> . 3 : Primary zone detector <b>B3</b> (0 ... 40 °C). 4 : Anticondensing detector <b>B4</b> . 5 : Auxiliary zone detector <b>B5</b> (0 ... 99 °C). 6 : Set point adjuster Primary temperature <b>Rt°</b> . 7 : Remote programme selector <b>R</b> .	12.
26.2	<b>Send Alarms : NO</b> <b>PassWTeleman : NO</b>	Enabling alarms to send to telemanagement PC. Enabling telemanagement keynumber.	Only necessary if connected in C-Bus.	11.6
26.3	<b>Address : ---</b> <b>Group : -</b>	Telematic address of controller. Group to which controller assigned.	Only necessary if connected in C-Bus.	11.5
26.4	<b>CRing connection</b> NO	<i>NO</i> : Controller not connected in C- Ring. <i>PRIMARY</i> : Connected as Primary. <i>SECONDARY</i> : Connected as Secondary.		11.1
26.5	<b>Functional Alarms</b> - - - 8	Enabling functional alarms. Factory setting : enabled only 8 (cannot be disabled).	1 : Primary temp. alarm <b>B1</b> or <b>B3</b> . 2 : Flow temp. alarm <b>B2</b> . 5 : Auxiliary temp. alarm <b>B5</b> . 8 : Real time clock alarm.	17.1
26.6	<b>Detector alarms</b> - - - - -	Enabling alarms for short or open detector circuits. Factory setting : all disabled. B1 & B3 are alternatives.	1 : Primary detector <b>B1</b> (0 ... 99 °C) 2 : Flow detector <b>B2</b> . 3 : Primary detector <b>B3</b> (0...40 °C). 4 : Anticondensing detector <b>B4</b> . 5 : Auxiliary detector <b>B5</b> . 8 : C- Ring alarm	17.2
26.7	<b>K Alarms</b> - - -	Enabling On-Off alarm. Factory setting : disabled.	1, 2, 3 : Inputs E1-E2-E3, alarm with k1-2-3 closed.	17.3
26.8	<b>Choice keynumber</b> ----	Choice keynumber for preventing use + and - : 1901 ... 1999	To eliminate keynumber press + and - together.	16.2
26.9	<b>Name Pri zone</b> -----	Entering name primary zone.	Use + and - to enter letters or numbers. Use ← and → to position cursor.	16.3
26.10	<b>Name Aux zone</b> -----	Entering name auxiliary zone.	Use + and - to enter letters or numbers. Use ← and → to position cursor.	16.3
27. TESTING				
Ref.	Display	Description	Notes	Sect
27.1	<b>CRing: ??</b>	?? = C- Ring test in progress or test failed YES = test ok	Appears if in <b>26.4</b> choice is PRIMARY or SECONDARY.	18.1
27.2	<b>Output : VALVE</b> <b>Status : IDLE</b>	Choice outputs to be tested Choice status output.	Choice output : VALVE ; PUMP ; AUXILIARY Choice output : With VALVE : IDLE ; CLOSES ; OPENS With PUMP & AUXILIARY : ON ; OFF.	18.2