B 281
11.10.04 LB

COMPENSATING CONTROLLER FOR DISTRICT HEATING

C◄BUS C◄RING

DTT 608 Eng.

- **Modulating temperature control of heating circuit**
- **Modulating or On-Off temperature control of DHW circuit**
- **Communication systems :**
  – **C-Bus** for telemanagement;
  – **C-Ring** for exchange of data between local controllers.
- **Power supply: 230 V~; DIN rail mounting**

CE

1. APPLICATION

DTT 608 controller is designed for the control of temperature in the secondary circuit of heat exchangers in district heating sub-stations.

2. FUNCTIONS

The principal functions of DTT 608 are:
- Control of flow temperature of secondary heat exchanger circuit :
  – Type of control :
    - variable according to outside temperature (compensated) or at fixed point ;
    - variable according to temp. requested by controllers of DHW/heating circuits (C-Ring).
  – Modulating (3-wire) control of primary circuit valve.
  – On-Off control of heating pump in relation to demand for heat.
  – Timed programming with seven 24hour and two 7day programs.
  – Functions: - Eco Off; - Frost Protection.
- Control of temperature at fixed point in DHW storage tank :
  – On-Off control of primary circuit valve or diverting valve and/or loading pump.
  – Timed control of DHW circulation pump.
  – Timed programming by seven 24hour programs and two 7day programs.
  – Antibacteria program.
- 25 annual periods with dates and with separate programming for heating and DHW.
- Forced closure valves for: - minimum opening; - minimum flow in primary circuit.
- Limits to opening valves for: - maximum opening; maximum flow primary circuit.
  - maximum difference temperature between primary and secondary return heating (reduction load peaks).
  - maximum temperature return primary circuit.
- Summer plant exercise valves and pumps.
- Automatic switching BST/GMT and summer/winter switching.
- Metering degree-days.
- One input for flow measurement or input for On-Off alarm.
- One input for program change switch or for On-Off alarm.
- Alarms for operational status of plant and for short or open detector circuits.
- Simulation of operation for testing electrical connections at commissioning.
- Internal recorder of operational data at adjustable intervals readable by PC.
- C-Ring connection for local exchange of data with other controllers..
- C-Bus connection for exchange data with local PCs or remote telemanagement PC

3. DETECTORS & REMOTE CONTROLS

No.	Description	Model	Sensing element	Code	Data sheet
1	Detector - Heating flow water temp. - Immersion	**SIH 010**	NTC 10 kΩ	B1	–
1	Detector - Outside temperature	**SAE 001**	NTC 1 kΩ	B2	–
1	Detector - Room temperature	**SAB 010**	NTC 10 kΩ	B3	–
1	Detector - Heating return water temp. - Immersion	**SIH 010**	NTC 10 kΩ	B4	–
1	Detector - Hot water tank - Immersion	**SIH 010**	NTC 10 kΩ	B5	–
1	Detector - DHW distribution - immersion	**SIH 010**	NTC 10 kΩ	B6	–
1	Detector - District heating return temp. - Immersion (0...200 °C)	**STP 001**	Pt 1 kΩ	B7	–
1	Remote control for changing heating program	**CDB 300**	–	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 output contacts:	
Maximum switching voltage	250 V~
Maximum switching current	5 (1) A
Construction standards	Italian Electrotech. Committee (CEI)
Storage data in memory	5 years
Software	Class A

• Mechanical

Enclosure	DIN 6E module
Mounting	on DIN 35 rail
Materials:	
Base	NYLON
Cover	ABS
Ambient temperature:	
operating	0 … 45°C
storage	– 25 … + 60°C
Ambient humidity	Class F DIN 40040
Dimensions	105 x 115 x 71.5
Weight	0.6 kg

• Programs and periods

24 hour programs	**1**…7
Daily events	**2**…6
7day programs	**0**…2
Annual periods	**0**…25
Special period heating	**1**
Emergency period heating :	
Room temperature	0…**21.0**…40 °C
Duration period	0…**3**…72 hours

• Measurement ranges

Primary return temperature	0…200 °C
Flow & secondary return temperature	0…99 °C
Outside temperature	– 30…+ 40 °C
Room temperature	0…40 °C
DHW temperature	0…99 °C

• Setting ranges - Heating

Type of control :	– **COMPENS.-FIXED P** – PLANTS
Valve run time	30…**75**…3,600 s
Proportional Band	±1…**±20**…±50 °C
Integral Time	0…**10**…255 min.
Increase flow temp. over plants temp	0…**5**…40 °C
Heat emitters :	– **RADIATORS** – FAN COILS – PANELS
Design outside temperature	– 30…**– 5**…20 °C
Design flow temperature	0…**80**…99 °C
Correction origin heating curve	**20**…40 °C
Minimum limit flow temperature	**1**…99 °C
Maximum limit flow temperature	1…**99** °C
Desired temperatures :	
Room (Normal 1...5, Setback 1-2, Frostprot)	0…40 °C
Flow fixed (Fixed Point 1-2)	0…99 °C
Ambient authority	**0**…20 °C
Cooling constant	1…**48**…255 hours
Outside temp. Eco Off	0…**18**…40 °C
Outside temp. Frostprot	– 30…**– 3**…20 °C
Flow temp. Frostprot	0…**30**…40 °C
Delay switching off pump	0…**30**…60 min.
Optimising operating hours:	
Starting up inertia	0…**1**…12 hours/°C
Optimum start max. “Normal”	0…**2**…12 hours
Optimum start max. “P. Annual”	0…**10**…36 hours
Boosting	0…**3**…20 °C
Reduction T. room for optimum stop	0…**0.5**…3.5 °C
Max. optimum stop “Normal”	0…**1**…12 hours

• Setting ranges - DHW

Type of control :	– **MODULATING** – ON - OFF
Valve run time	30…**70**…3,600 s
Proportional Band	±0.5…**±20**…±50 °C
Integral time	0…**60**…3,600 s
On-Off temperature differential	1…**5**…50 °C
Desired temp. DHW storage	0…99 °C
Desired temp. distribution DHW	0…**50**…99 °C
Antibacteria temp	0…**70**…99 °C
Duration Antibacteria	0…**90**…255 min

• Setting ranges - primary limits

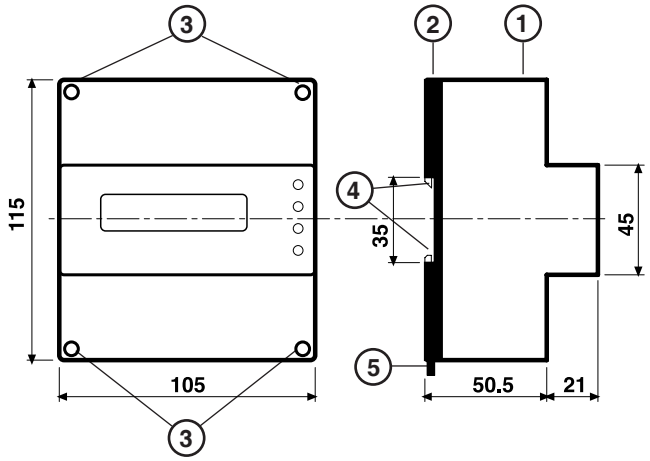
Flow measurement unit:	– **LITRES x PULSE** – PULSES x LITRE
Range flow measurement unit:	
litres x pulse	1.0…**10.0**…1,000.0
pulses x litre	0.1…**10.0**…300.0
Minimum flow limit	**0.01**…650 m^3h
Maximum flow limit	0.01…**650** m^3h
Proportional Band max. limit flow	1…**50**…100 %
Integral Time max. limit flow	–…**10**…255 min
Maximum temp. primary return	0…**99** °C
Outside temp. (OT) to eliminate maximum limits	**–30**…40 °C
Difference max. temp. returns	0…**99** °C
Limits valve run :	
minimum	**0**…100 %
maximum	0…**100** %
Reduction secondary T° for closure limits	1…**5**…15 °C

• Setting ranges - telemanagement & alarms

Telemanagement (setting by PC) :	
Attempts to send alarmsi	1…**5**…200
Interval between attempts	2…**10**…210 min
Alarm thresholds (setting by PC) :	
Diff. temp. flow (B1)	0…**5**…99 °C
Diff. temp. room (B3)	0…**1**…30°C
Diff. temp. returns (B6/B7-B4))	0…**5**…99 °C
Diff. temp. DHW storage (B5)	0…**5**…99 °C
Diff. temp. distribution DHW (B5)	0…**5**…99 °C
Diff. temp. primary return (B7)	0…**5**…99 °C
Delays alarms (from PC)	2…**30**…255 min
Interval recording data (from PC)	5…**30**…240 min

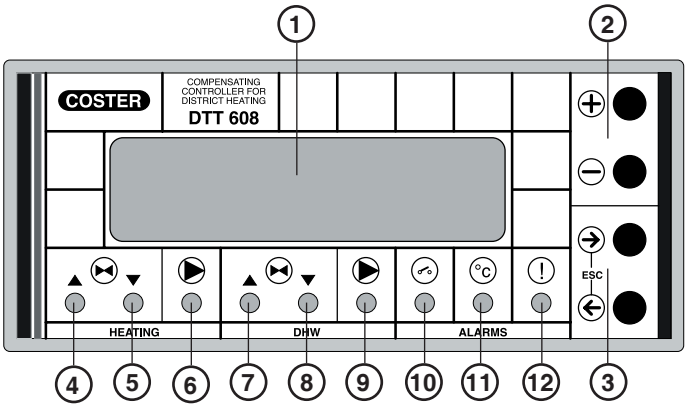
In the presence of electrical disturbances the output controls of the controller may change status but this will automatically return to normal.

5. OVERALL DIMENSIONS



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

6. FACIA



1 – Alphanumeric display
2 – + and – keys
3 – ← and → keys
LEDs:
4 – Heating valve “Opens”
5 – Heating valve “Closes”
6 – Heating pump or manifold
7 – Primary valve or distribution DHW “Opens"
or calorifier loading pump “On”
8 – Primary valve or distribution DHW “Closes”
9 – DHW circulation pump “On”
or pump or valve loading calorifier “On”
10 – On-Off alarms
11 – Measurement alarms
12 – Controller fault

7. ELECTRICAL CONNECTIONS

Proceed as follows:
- Separate the base and cover (remove the securing screws)
- Mount the base on the DIN rail and check that the securing elements (5.4) anchor it securely
- Make the electrical connections according to the diagram and in observance of the safety regulations in force, using the following cables
  – 1.5 mm^2 for power supply and the relay control outputs.
  – 1 mm^2 for detectors.
  – 1 mm^2 for C-Bus and C-Ring. For length limits see Technical Data Sheets T 021 and T 022
- Apply power (230 V~) and check its presence at terminals L and N.
- Remove power, replace the cover on the base/terminal block 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 a connector block.

8. SITING CONTROLLER & DETECTORS

8.1 Controller

The controller must be installed in a dry location that respects the relevant ambiental conditions given under 4.TECHNICAL DATA. If installed in a location classified as “Hazardous” it must be installed in a cabinet for electrical equipment constructed according to the regulations in force for the class of danger concerned.
The controller can be mounted on a DIN rail and housed in a standard DIN enclosure.

8.2 Heating flow temperature detector B1

This must be mounted on the flow pipe of the heat exchanger secondary circuit.

8.3 Outside temperature detector B2

This must be installed outside the building on the north or north-west side, and at least three metres from the ground. It must be sheltered from direct sunlight and be as far as possible from windows, doors, fireplaces and other sources of thermal disturbance.

8.4 Room temperature detector B3

This must be installed at a point in a space which represents the average temperature of the building (e.g. living room), at a height of 1.5 … 1.6 metres from the floor, on an internal wall and as far as possible from windows, doors, fireplaces and other sources of thermal disturbances..

8.5 Heating return temperature detector B4

This must be installed on the return pipe of the secondary circuit of the heat exchanger.

8.6 DHW temperature detector B5

This must be installed on the storage tank or on the flow pipe of the DHW distribution circuit.

8.7 DHW distribution temperature detector B6

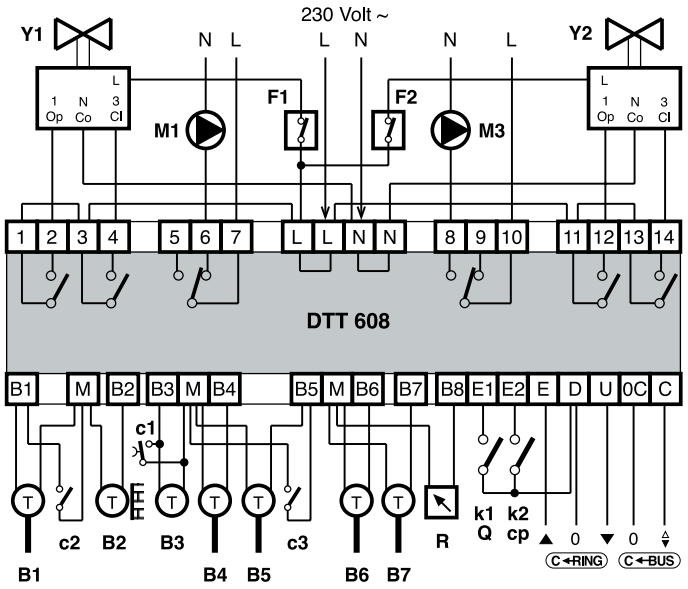
This must be installed on the flow pipe of the DHW distribution circuit below the control valve.

8.8 Primary return temperature detector B7

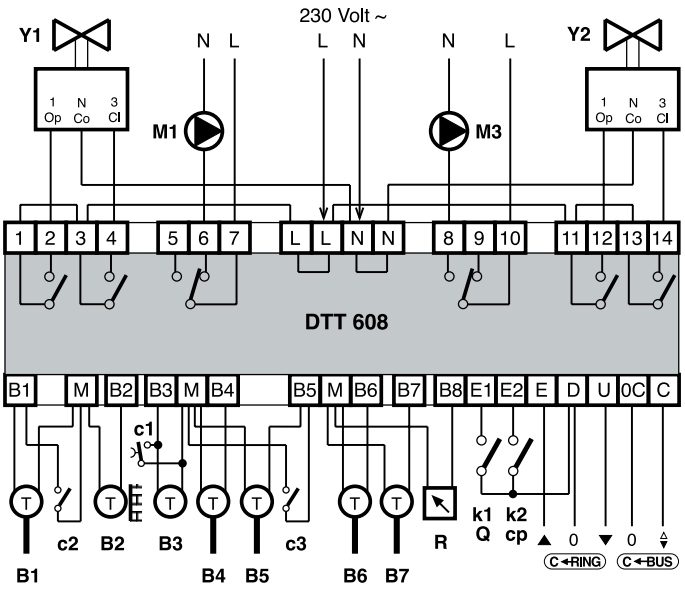
This must be installed on the return pipe of the district heating circuit..

9. WIRING DIAGRAMS

9.1 Plant with primary temp. above 100°C Valve actuators with spring-return closure



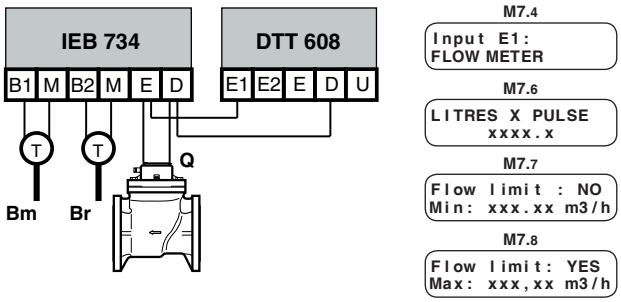
9.2 Plant with primary temp. below 100°C Valve actuators without spring-return closure



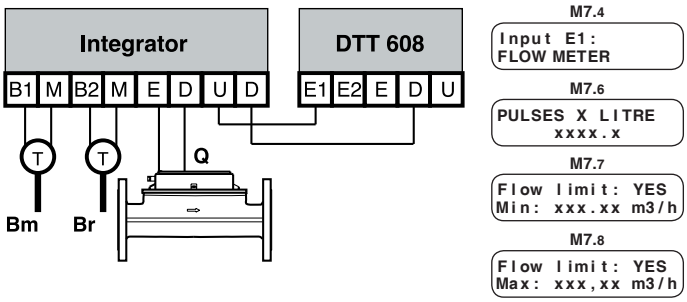
B1 – Heating flow temp. detector (NTC 10 kΩ ; 0…99 °C)
B2 – Outside temp. detector (NTC 1 kΩ ; –30…40 °C).
B3 – Room temp. detector (NTC 10 kΩ ; 0…40 °C)
B4 – Return heating temp. detector (NTC 10 kΩ ; 0…99 °C)
B5 – DHW temp. detector (NTC 10 kΩ ; 0…99 °C)
B6 – DHW distribution temp. detector (NTC 10 kΩ ; 0…99 °C, Only if B5 present (DHW storage temp.).
B7 – Primary return temp. detector (Pt 1 kΩ ; 0…200 °C)
c1 – Heating emergency button
c2 – Switch (closed) for closure heating valve Y1
c3 – Switch (closed) for closure DHW valve Y2
cp – Switch for changing heating program (as alternative to k2)
F1 – Safety thermostat heat exchanger heating
F2 – Safety thermostat heat exchanger DHW
k1 – On-Off alarm switch (as alternative to Q)
k2 – On-Off alarm switch (as alternative to cp)
M1 – Heating plant pump
M3 – DHW circulation pump
Q – Flow meter with Reed pulse transmitter or Burst signals (as alternative to k1)
Y1 – Modulating heating valve
Y2 – Modulating or On-Off DHW valve
R – Remote control for changing heating programs

Note : If the outside detector is used by other controllers connected in C-Ring, it must be connected to DTT 608 and not to the “Secondary” or “Slave “ controllers.

9.3 Connection to volumetric meter with Reed pulse transmitter to limit primary flow



9.4 Connection to volumetric meter with Burst signals to limit primary flow



Bm – Flow t° detector metering
Br – Return t° detector metering
Q – Flow meter

10. COMUNICAZIONE

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

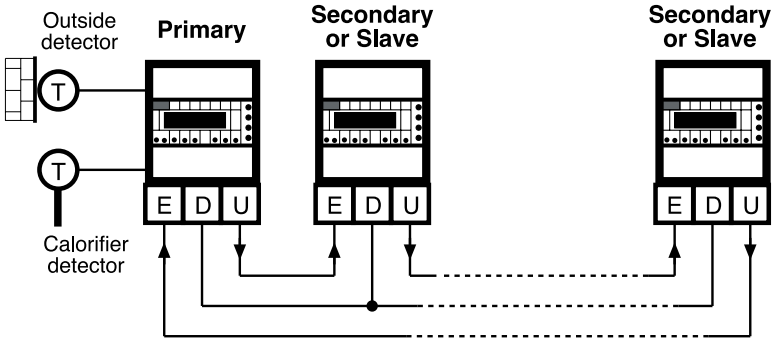
DTT 608 controller can only be **"Primary".**
In the serial C-Ring the following signals are transmitted:
- permission to operate as **Slave** controllers
- measurement of **outside temperature**: use of a single detector for several controllers.
- value of **flow temperature** requested by the DHW/heating circuit controllers, used by the "PRIMARY" controller for the control of temperature boilers (if scheduled).
- **calorifier priority** and/or **anticondensing** = modulating closure of heating circuit valves.

M7.17

```
CRing connection
NO
```

– NO = connection to C-Ring not scheduled
– PRIMARY = connected in C-Ring and configured as "Primary"

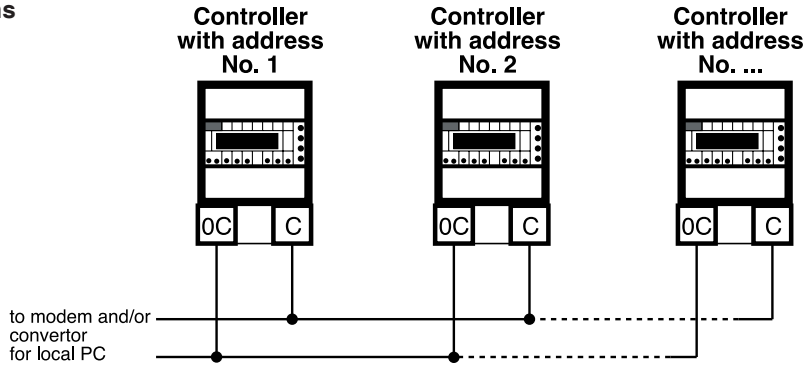
10.2 C-Ring electrical connections



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

Via C-Bus output DTT 608 can be telemanaged (two-way transmission of data) using one or more local PCs and /or a remote central PC via telephone landline.
From the PC(s) you can :
- see and/or change the data/values on the display pages of the controller and the configuration data of the units dedicated exclusively to the telemanagement (see "Technical Data")
- see the operational status of the plant components (pumps, auxiliaries in general)
- acquire alarms coming from the plant.
- read the detector measurements (temperatures: outside, flow, boiler, etc)

10.4 C-Bus electrical connections



10.5 Telemanagement address

M7.16

```
Address :  –
Group   :  –
```

In telemanagement, in order for the controllers to be identified by the central PC and/or by the local PCs, they must be assigned progressive address numbers. If required, the controllers can be divided into groups according to shared characteristics.

When telemanagement is not scheduled, leave the address in memory (–).
To cancel the values, keep + and – keys pressed at the same time.

10.6 Sending alarms

M7.15

```
Send alarms :NO
PassWTeleman:NO
```

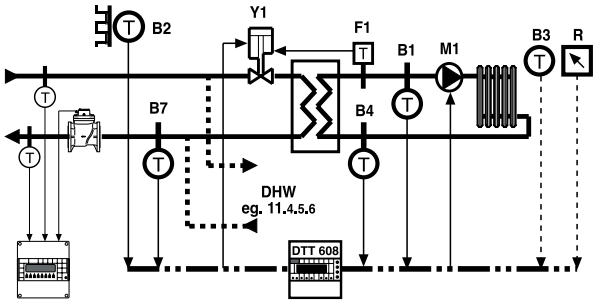
- **Send alarms** : NO = alarms not transmitted
  YES = alarms are transmitted to central PC.
- **PassWTeleman** : NO = password not enabled.
  YES = password enabled.

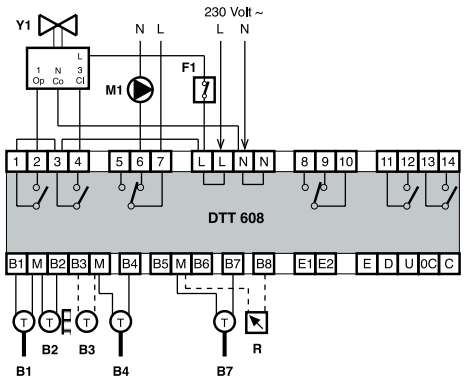
10.7 Data recording

Every 5…240 minutes (set by telemanagement PC) the controller records a series of data indicative of the operational status of the plant. *This data is displayed only on the telemanagement computer :*
- Current time, day and type of recording (change of mode or expiry time).- Values required and calculated by controller ; Values measured by detectors connected.- Calculated position of regulating valves Y; Status of On-Off switches.
  The controller can store 40 complete recordings and the last recording brings about the cancellation of the oldest one.

11. EXAMPLES OF SUBSTATIONS WITH TWO HEAT EXCHANGERS

11.1 • Heating: Compensated control of heating flow temp. B1 by modulating control Y1 primary valve and control of M1 heating pump.
• DHW : See Examples 11.4.5.6





CONFIG. CONTROLLER

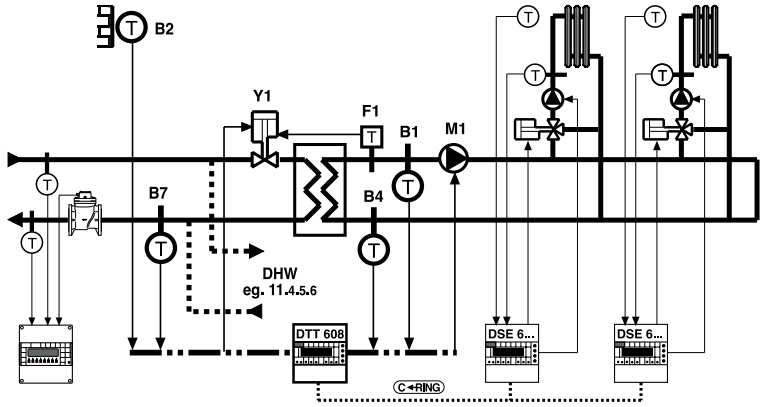
M7.1
Config detectors
1 2 3 4 7 8

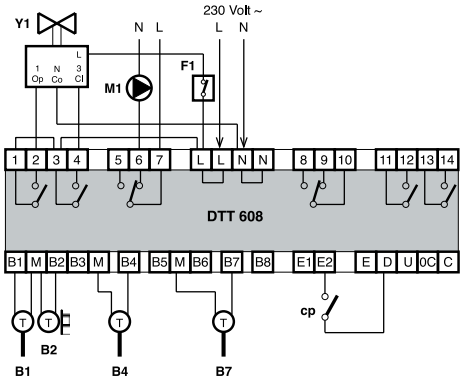
M7.3
5-6-7: Pump
HEATING

SETTING HEATING

M5.1
Control mode
COMPENS -FIXED P

11.2 • Heating : Control of temp; manifold B1 in relation to temp. requested by controllers in plants (C-Ring) by modulating control primary valve Y1 and control pump manifold M1.
• DHW : See Examples 11.4.5.6





CONFIG. DTT 608

M7.1
Config detectors
1 2 – 4 7 –

M7.3
5-6-7: Pump
HEATING

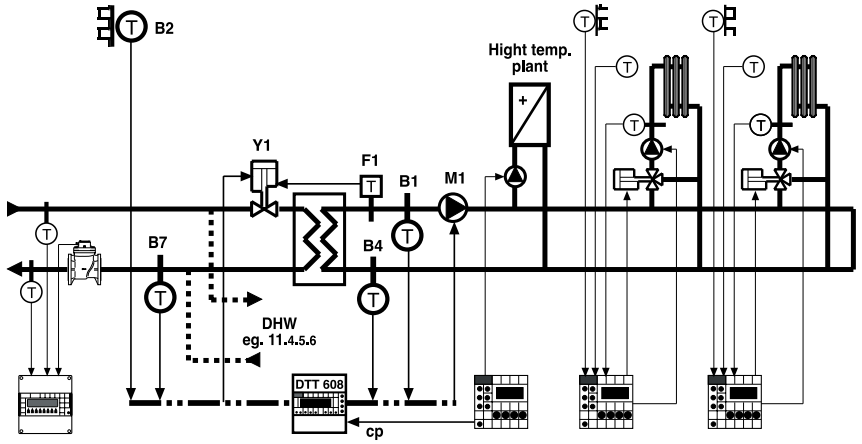
M7.17
CRing connection
PRIMARY

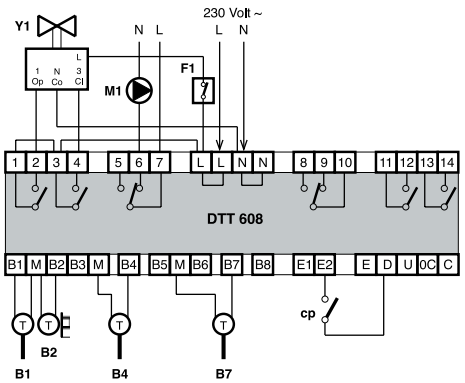
SETTING HEATING

M5.1
Control mode
PLANTS

M5.2
Increase flow T
on plants T:xxc

11.3 • Heating : Compensated control of B1 manifold temp. and change program by cp switch with modulating control of Y1 primary valve and control of M1 pump manifold.
• DHW : See Examples 11.4.5.6





CONFIG. DTT608

M7.1
Config detectors
1 2 – 4 7 –

M7.3
5-6-7: Pump
HEATING

M7.5
Input E2:
cp SWITCH

SETTING HEATING

M5.1
Control mode
COMPENS-FIXED P

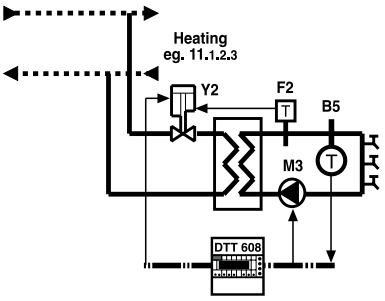
TEMPERATURES

M1.15
cp prog switch
FIXED POINT xxc

B1 – Heating flow temp. detector
B2 – Outside temp. detector
B3 – Room temp. detector
B4 – Heating return temp. detector
B7 – Primary return temp. detector
cp – Switch for changing heating program
R – Remote control for changing heating programs
M1 – Heating plant pump
Y1 – Primary valve heating heat exchanger
F1 – Heating safety thermostat

11.4 • Heating : **See Examples 11.1.2.3**
• DHW : **Control of B5 DHW temp. by modulating or On-Off control of Y2 primary valve and timed control of M3 recycle pump.**

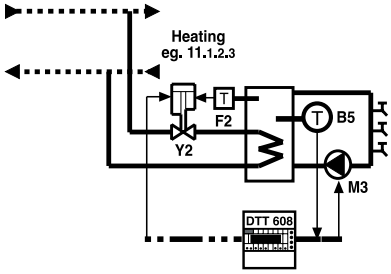
Rapid heat exchanger



SETTING DHW

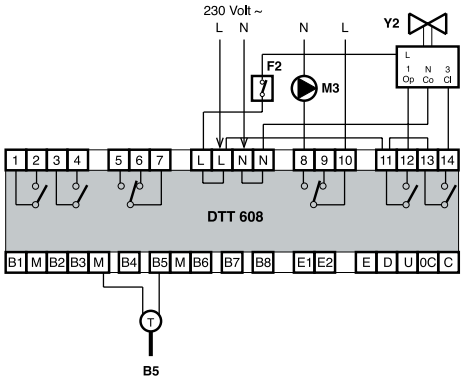
M6.1
Control DHW
MODULATING

Storage heat exchanger



SETTING DHW

M6.1
Control DHW
MODULATING
ON-OFF



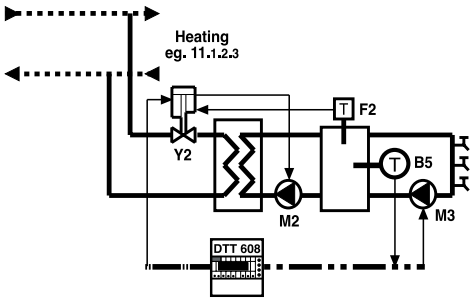
CONFIG. DTT 608

M7.1
Config detectors
5

M7.2
DHW with:
AUTON EXCHANGER

11.5 • Heating : **See Examples 11.1.2.3**
• DHW : **Control of B5 DHW temp. by modulating or On-Off control of Y2 primary valve, On-Off control of M2 storage pump and timed control of M3 recycle pump.**

Rapid heat exchanger and secondary storage



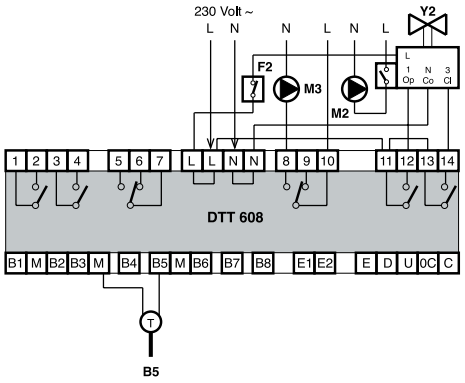
CONFIG. DTT 608

M7.1
Config detectors
5

M7.2
DHW with:
AUTON EXCHANGER

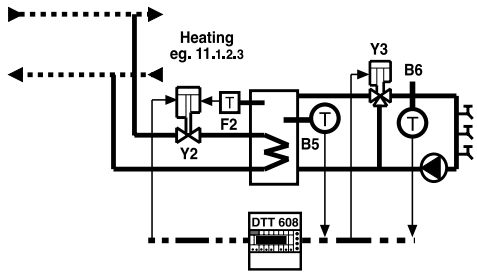
SETTING DHW

M6.1
Control DHW
MODULATING
ON-OFF



11.6 • Heating : **See Examples 11.1.2.3**
• DHW : **Control of B5 storage temp. by On-Off control of Y2 primary valve and of B6 distribution temp. by modulating control of Y3 valve.**

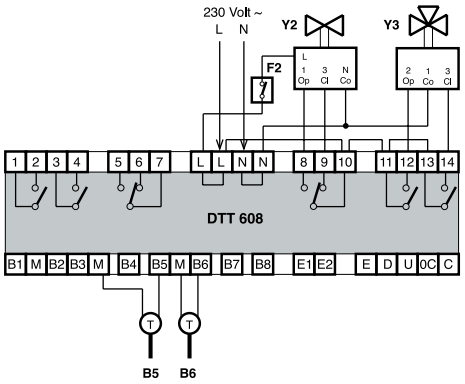
Storage heat exchanger



CONFIG. DTT 608

M7.1
Config detectors
5 6

M7.2
DHW with:
AUTON EXCHANGER



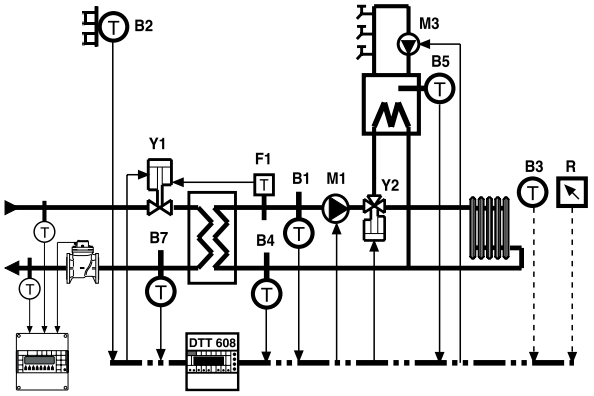
B5 – DHW temp. detector
B6 – DHW distribution temp. detector
M2 – DHW storage tank pump
M3 – DHW recycle pump

Y2 – DHW primary heat exchanger valve
Y3 – DHW distribution valve
F2 – DHW safety thermostat

12. EXAMPLES 0F SUBSTATIONS WITH ONE HEAT EXCHANGER

12.1 • Heating : Compensated control of B1 heating flow temp. by modulating control of Y1 primary valve and control of M1 heating pump.

• DHW : Control of B5 storage temp. by On-Off control of Y2 diverting valve and of M1 heating pump and timed control M3 recycle pump.



CONFIG. DTT 608

M7.1
Config detectors
1 2 3 4 5 – 7 8

M7.2
DHW with:
HEAT EXCHANGER

M7.3
5-6-7: Pump
HEATING + DHW

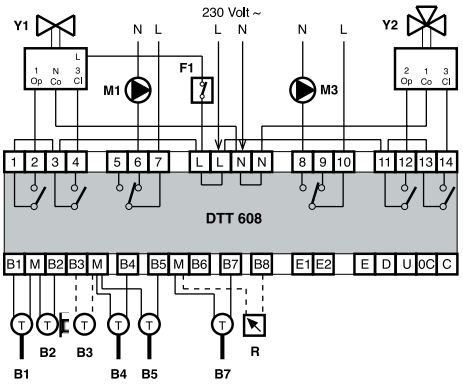
SETTING HEATING

M5.1
Control mode
COMPENS- FIXED P

SETTING DHW

M6.1
Control DHW
ON-OFF

M6.5
increase flow T
for DHW :xxc

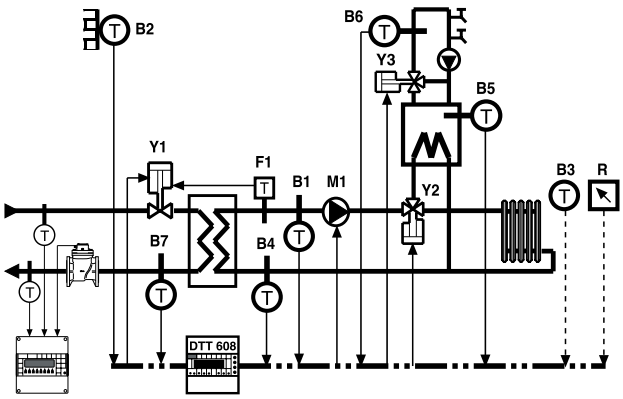


B1 – Heating flow temp. detector
B2 – Outside temp. detector
B3 – Room temp. detector
B4 – Heating return temp. detector
B5 – DHW temp. detector
B7 – District heating return temp. detector

R – Remote control for changing heating programs
M1 – Pump plant / DHW plant
M3 – DHW circulation pump
Y1 – District heating primary valve
Y2 – DHW heating / storage diverting valve
F1 – Safety thermostat

12.2 • Heating : as for 12.1

• DHW : Control of B5 storage temp. by On-Off control of Y2 diverting valve and of M1 heating pump and of B6 distribution temp. by modulating control of Y3 valve.



CONFIG. DTT 608

M7.1
Config detectors
1 2 3 4 5 6 7 8

M7.2
DHW with:
HEAT EXCHANGER

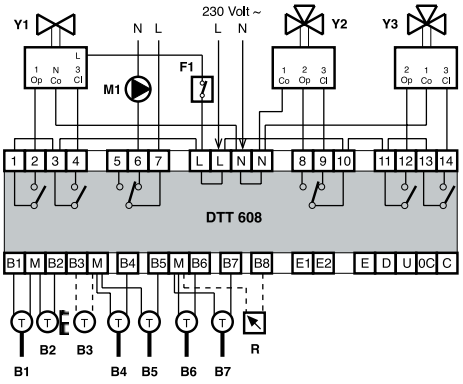
M7.3
5-6-7: Pump
HEATING + DHW

SETTING HEATING

M5.1
Control mode
COMPENS- FIXED P

SETTING DHW

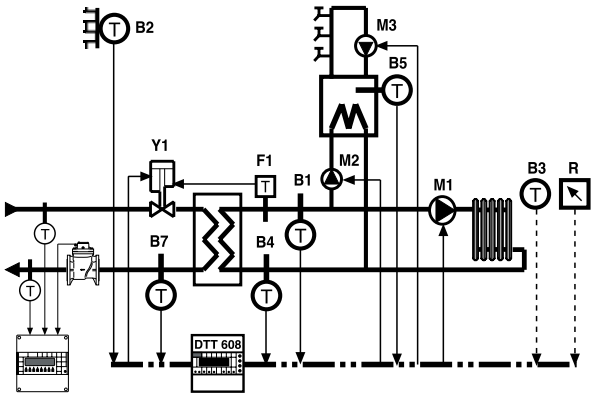
M6.5
Increase flow T
for DHW :xxc



B1 – Heating flow temp. detector
B2 – Outside temp. detector
B3 – Room temp. detector
B4 – Heating return temp. detector
B5 – DHW storage temp. detector
B6 – DHW distribution temp. detector
B7 – District heating return temp. detector

R – Remote control for changing heating programs
M1 – Pump heating plant / DHW storage
M3 – DHW circulation pump
Y1 – District heating primary valve
Y2 – DHW heating / storage diverting valve
Y3 – DHW distribution valve
F1 – Safety thermostat

12.3 • Heating : as for 12.1
• DHW : Control of B5 DHW temp. by On-Off control of M2 storage pump and timed control of M3 recycle pump.



CONFIG. DTT 608

M7.1
Config detectors
1 2 3 4 5 – 7 8

M7.2
DHW with:
HEAT EXCHANGER

M7.3
5-6-7: Pump
HEATING

SETTING HEATING

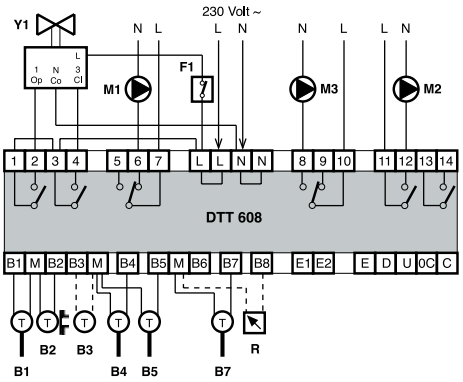
M5.1
Control mode
COMPENS-FIXED P

SETTING DHW

M6.1
Control DHW
ON-OFF

M6.5
Increase flow T
for DHW :xxc

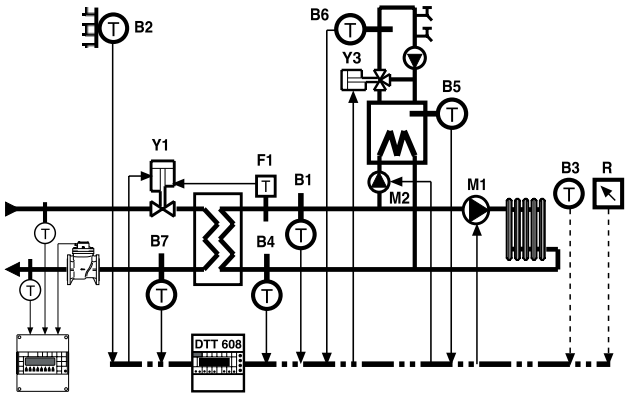
M6.9
DHW priority:YES



B1 – Heating flow temp. detector
B2 – Outside temp. detector
B3 – Room temp. detector
B4 – Heating return temp. detector
B5 – DHW temp. detector
B7 – District heating return temp. detector

R – Remote control for changing heating programs
M1 – Heating plant pump
M2 – DHW storage pump
M3 – DHW circulation pump
Y1 – District heating primary valve
F1 – Safety thermostat

12.4 • Heating : As for 12.1
• DHW : Control of B5 DHW temp. by On-Off control of M2 storage pump and of B6 distribution temp. by modulating control Y3 valve.



CONFIG. DTT 608

M7.1
Config detectors
1 2 3 4 5 6 7 8

M7.2
DHW with:
HEAT EXCHANGER

M7.3
5-6-7: Pump
HEATING

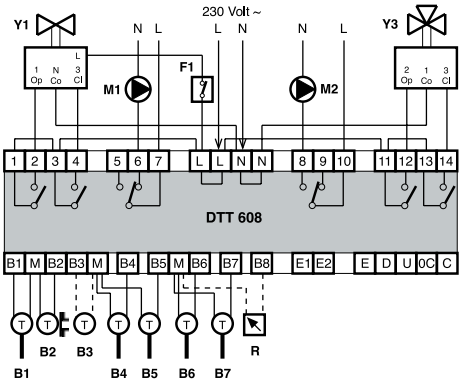
SETTING HEATING

M5.1
Control mode
COMPENS-FIXED P

SETTING DHW

M6.5
Increase flow T
for DHW :xxc

M6.9
DHW priority:YES

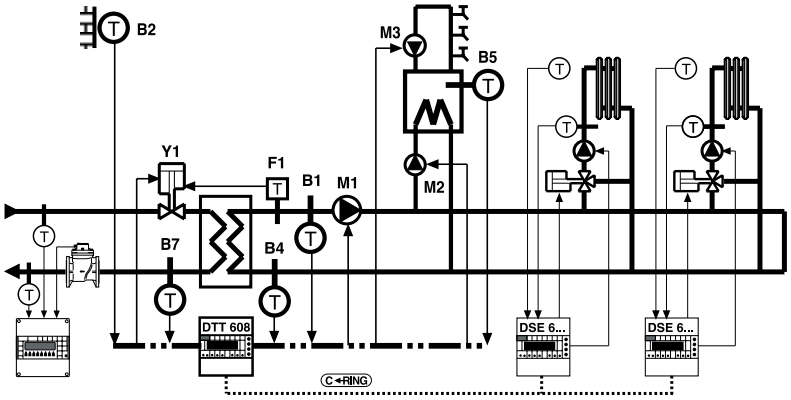


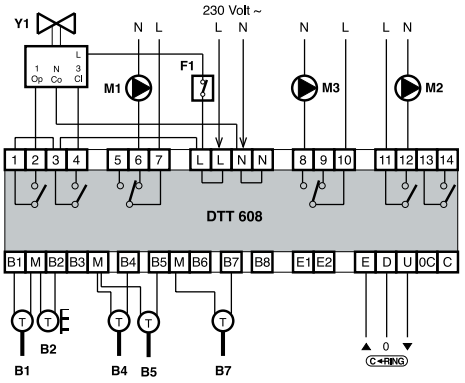
B1 – Heating flow temp. detector
B2 – Outside temp. detector
B3 – Room temp. detector
B4 – Heating return temp. detector
B5 – DHW storage temp. detector
B6 – Distribution DHW temp. detector
B7 – District heating return temp. detector

R – Remote control for changing heating programs
M1 – Heating plant pump
M2 – DHW storage pump
M3 – DHW circulation pump
Y1 – District heating primary valve
Y3 – DHW distribution valve
F1 – Safety thermostat

12.5 • Heating : Control of B1 manifold temp. in relation to temp. requested by DHW production and by plant controllers (C-Ring) by modulating control of Y1 primary valve and control M1 manifold pump.

• DHW : Control of B5 DHW temp. by On-Off control M2 storage pump and timed control of M3 recycle pump.





B1 – Flow manifold temp. detector
B2 – Outside temp. detector
B4 – Return manifold temp. detector
B5 – DHW (storage or distribution) temp. detector
B7 – District heating return temp. detector
M1 – Pump manifold
M2 – DHW storage pump
M3 – DHW circulation pump
Y1 – District heating primary valve
F1 – Safety thermostat

CONFIG. DTT 608

M7.1
Config detectors
1 2 – 4 5 – 7 –

M7.2
DHW with:
HEAT EXCHANGER

M7.3
5-6-7: Pump
HEATING + DHW

M7.18
CRing:
PRIMARY

SETTING HEATING

M5.1
Control mode
PLANTS

M5.2
Increase flow T
on plants T:xxc

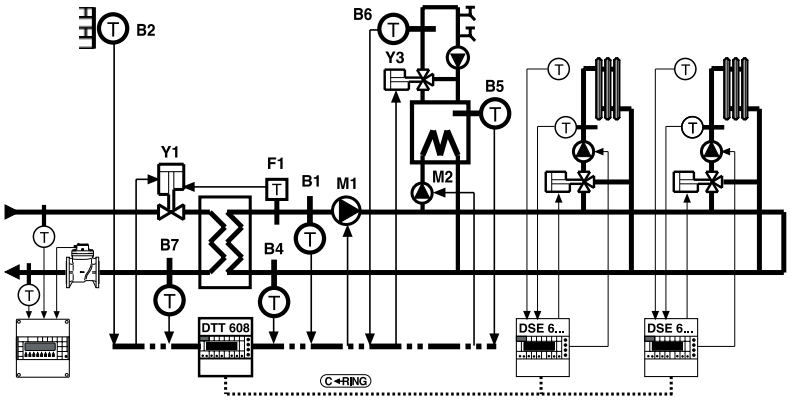
SETTING DHW

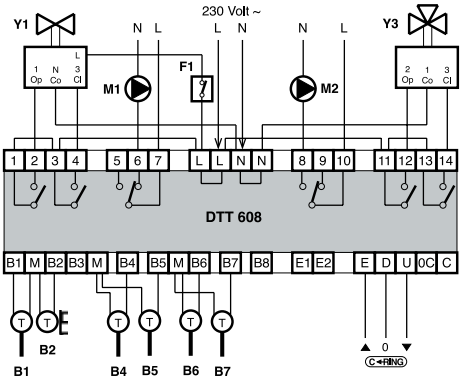
M6.1
Control DHW
ON-OFF

M6.5
Increase flow T
for DHW :xxc

12.6 • Heating : as for 12.5

• DHW : Control of B5 storage temp. by On-Off control M2 storage pump and of B6 distribution temp. by modulating control Y3 valve..





B1 – Flow manifold temp. detector
B2 – Outside temp. detector
B4 – Return manifold temp. detector
B5 – DHW (storage or distribution) temp. detector
B6 – DHW distribution temp. detector
B7 – District heating return temp. detector
M1 – Pump manifold
M2 – DHW storage pump
M3 – DHW circulation pump
Y1 – District heating primary valve
Y3 – DHW distribution valve
F1 – Safety thermostat

CONFIG. DTT 608

M7.1
Config detectors
1 2 – 4 5 6 7 –

M7.2
DHW with:
HEATNG EXCHANGER

M7.3
5-6-7: Pump
HEATING + DHW

M7.18
CRing:
PRIMARY

SETTING HEATING

M5.1
Control mode
PLANTS

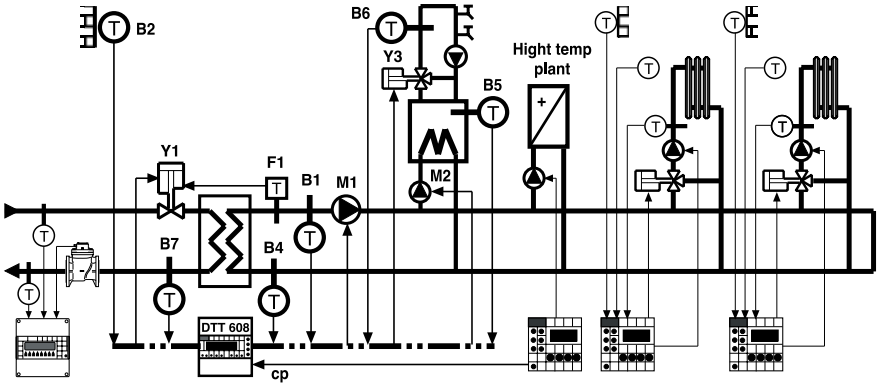
M5.2
Increase flow T
on plants T:xxc

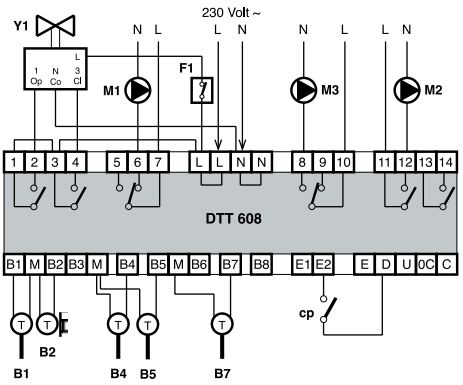
SETTING DHW

M6.5
Increase flow T
for DHW :xxc

12.7 • Heating: Compensated control of B1 manifold temp. for heating plant controllers, at fixed point, for DHW production and change of program by cp switch with modulating control of Y1 primary valve and control M1 manifold pump.

• DHW : Control of B5 DHW temp. by On-Off control M2 storage pump and timed control of M3 recycle pump.





B1 – Flow manifold temp. detector
B2 – Outside temp. detector
B4 – Return manifold temp. detector
B5 – DHW temp. detector
B7 – District heating return temp. detector
cp – Switch change heating program
M1 – Manifold pump
M2 – DHW storage pump
M3 – DHW circulation pump
Y1 – District heating primary valve
F1 – Safety thermostat

CONFIG. DTT 608

M7.1
`Config detectors 1 2 – 4 5 – 7 –`

M7.2
`DHW with: HEAT EXCHANGER`

M7.3
`5-6-7: Pump HEATING + DHW`

M7.5
`Input E2: cp SWITCH`

SETTING HEATING

M5.1
`Control mode COMPENS-FIXED P`

SETTING DHW

M6.1
`Control DHW ON-OFF`

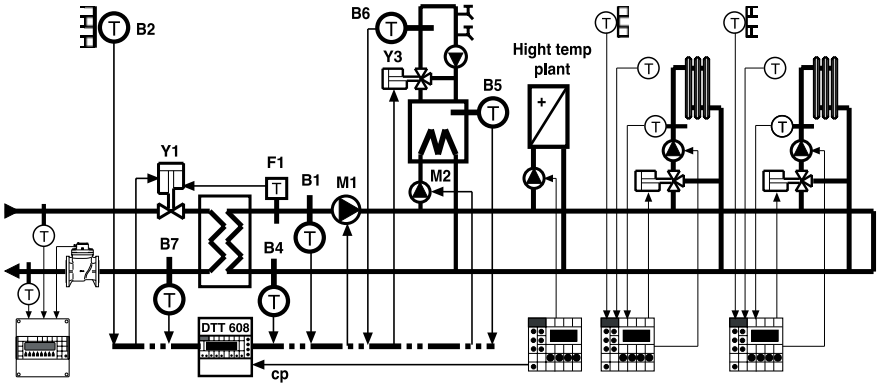
M6.5
`Increase flow T for DHW :xxc`

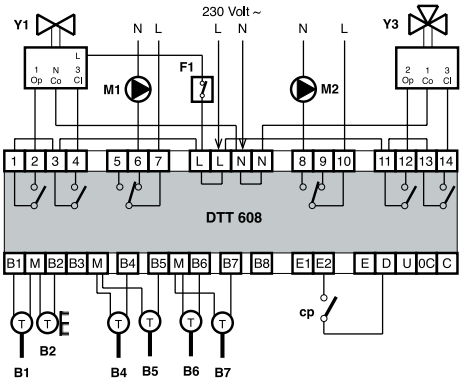
TEMPERATURES

M1.15
`cp prog switch FIXED POINT xxc`

12.8 • Heating : as for 12.7

• DHW : Control of B5 storage temp. by On-Off control M2 storage pump and of B6 distribution temp. by modulating control of Y3 valve.





B1 – Flow manifold temp. detector
B2 – Outside temp. detector
B3 – Room temp. detector
B4 – Return manifold temp. detector
B5 – DHW storage temp. detector
B6 – DHW distribution temp. detector
B7 – District heating return temp. detector
cp – Switch change heating program
M1 – Manifold pump
M2 – DHW storage pump
M3 – DHW circulation pump
Y1 – District heating primary valve
Y3 – DHW distribution valve
F1 – Safety thermostat

CONFIG. DTT 608

M7.1
`Config detectors 1 2 – 4 5 6 7 –`

M7.2
`DHW with: HEAT EXCHANGER`

M7.3
`5-6-7: Pump HEATING + DHW`

M7.6
`Input E2: cp SWITCH`

SETTING HEATING

M5.1
`Control mode COMPENS-FIXED`

SETTING DHW

M6.5
`Increse flow T for DHW :xxc`

TEMPERATURES

M1.15
`cp prog switch FIXED POINT1 xxc`

13. OPERATION

DTT 608 is a microprocessor-based digital controller for temperature control in district heating sub-stations. It comprises: :

– Two separate heat exchangers for heating and for DHW production.
or
– A single heat exchanger for heating and for DHW production.

M7.2
DHW with:
AUTON EXCHANGER

• DHW with :
– AUTON EXCHANGER : The DHW production plant uses its own district heating (11. Examples of substrations with two heat exchangers).
– HEAT EXCHANGER.: The DHW production plant uses the same district heating heat exchanger used for heating (12. Examples of substations with one heat exchanger). The desired DHW temperature influences the desired flow temperature of the secondary circuit..

M7.1
Config detectors
1 – – – – – – –

To adapt the controller to the plant requirements you have to configure acxcording to the detectors connected : dash = detector not connected; number = detector connected.

1 : **B1** heating flow temp. detector. Factory setting = configured.
2 : **B2** outside temp. detector.
3 : **B3** room temp. detector.
4 : **B4** heating return temp. detector.
5 : **B5** DHW temp. detector.
6 : **B6** distribution DHW temp. detector. Can be configured only if B5 is configured
7 : **B7** primary return detector (0...200°C).
8 : **R** remote control for changing programs.

14. CONTROL FLOW TEMPERATURE IN HEATING PLANT

The flow temperature is monitored by the B1 detector and can be controlled in two modes :

M5.1
Control mode
COMPENS -FIXED P

– PLANTS;
– COMPENS - FIXED P.

14.1 Plants

The “Plants” control mode can be used when DTT 608 is connected in C-Ring with controllers in the DHW/heating circuits and is therefore able to know the maximum temperature requested by these circuits (see Examples of Plants 11.2 and 12.5.6).
The controller is able to program automatically according to the requirements of the DHW/heating circuits without the need for its own timed program.

M5.1
Control mode
PLANTS

M5.2
Increase flow T
on plants T :xxc

The value of the flow temp. **Tf** calculated in relation to the requests from the plants can be increased to ensure that the DHW/heating circuits always have available a sufficiently high temperature.

14.2 Fixed Point

The “Fixed Point” control mode is for use when the “Plants” or “Compensated” mode is not possible because the controller is not able to know the temperature requested by the plants or the plant control modes are not only of the compensated type.

M5.1
Control mode
COMPENS -FIXED P

In drawing up the **M2** timed programs you must use

M1.9
Heating flow T
FIXED POINT1 xxc

M1.10
Heating flow T
FIXED POINT2 xxc

The controller keeps the flow temperature of the heating plant constant at the desired temperature “FIXED POINT 1" or "FIXED POINT 2” set by the operating mode.

14.3 Compensated

The “Compensated “ control mode can be used when :

M5.1
Control mode
COMPENS -FIXED P

– the secondary circuit of the heat exchanger feeds a single heating circuit without its own control valve (see Example Plants 11.1 ; 12.1.2.3.4).
– the secondary circuit of the heat exchanger feeds one or more heating circuits with their own compensating controllers not connected in C-Ring to DTT 608 and must be kept at a “basic” compensated temperature such that will satisfy the requests of the controllers (see Examples of Plants 11.3 ; 12.7.8).

The controller calculates the desired flow temperature **Tf** according to the outside temperature **to** measured by the B2 detector (or coming from the C-Ring) and from the **heating curve**, with reference to a desired room temperature of 20°C set by:

M5.3
Heat emitters
RADIATORS

- Type of heat emitters: - RADIATORS; - FAN COILS; - PANELS. Defines the path of the heating curve in relation to the efficiency curve of the heat emitters .

M5.4
Design outside
temp :±xx.xc

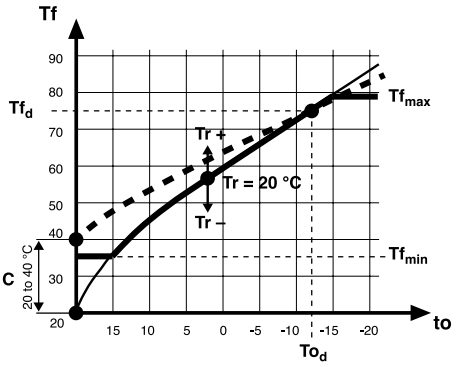
- Design outside temperature **Tod**: used to calculate winter heat losses from the building. This depends on the climatic zone in which the building is situated (e.g. Milan = - 5°C; Rome = 0°C).

M5.5
Design flow
temp :±xx.xc

- Design flow temperature **Tfd**, used for sizing the plant.(e.g. radiators = 70°C; fan coils = 80°C; panels = 40°C).

M5.6
CurveOrigin OT20
Flow T: xx.xc

- The origin of the heating curve **C** (flow temp. = 20°C with outside temp. = + 20°C) can be adjusted by an increase in the flow temperature (0...40°C). This may be necessary to avoid problems due to a reduced heating period in the intermediate seasons (mild outside temperatures).



The desired flow temperature value **Tf** depends on the value of the room temperature **Tr** requested by the current operating mode (parallel shift +/– of the curve). Room temperature set in **M1.1...8**.

14.4 Ambient authority

M5.10
AmbientAuthority
on flow :xx.xc

When the B3 room detector is connected, the "Compensated" control is able to correct the desired flow temperature **Tf** in relation to the difference between the desired and actual room temperatures. The magnitude of the correction depends on the value of the Ambient Authority set..

- xx.x c = value in °C of increase or decrease in desired flow temp. **Tf** for each degree of difference from the room temperature..

When detector B3 is not connected the correction acts only in the *Setback/Frostprot* modes and uses the room temperature value calculated in relation to the Cooling Time Constant.

14.5 Minimum and maximum limits of flow temperature

M5.7
Flow T Limits
Min:xxc Max:xxc

The desired flow temp. **Tf** calculated by the "Compensated" control mode or requested by "Plants" can be limited by a minimum or maximum value. Under "Compensated" the minimum limit applies only to the Normal 1...5 room temperature modes..

Warning :
The maximum temperature limit is not a substitute for the safety measures required by law.

14.6 Operating mode

M0.2
Heating program
24 HOUR 1

It is possible to program the heating control according to consumer requirements :
If **M5.1** is COMPENS - FIXED P :

– 7DAY 1-2		= with one of two 7day programs set in **M2.9...15**;
– 24HOUR1…7		= with one of seven 24hour programs set in **M2.2...7**;
– NORMAL 1…5	xx.x c	= with one of five Normal room temp. programs set in **M1.1...5**;
– SETBACK 1-2	xx.x c	= with one of two Setback room temp. programs set in **M1.6-7**;
– FROSTPROT	xx.x c	= with Frostprot room temp. set in **M1.8**;
– FIXED P 1-2	xx c	= with one of two flow temp. set in **M1.9-10**;
– OFF		= always off (valve closed).

When in place of program appears :

– PLANTS	= in **M5.1** is PLANTS.
– ANNUAL xx	= one of annual periods in progress..
– SPECIAL	= the Special period in progress.
– REMOTE EMERGENCY	= the EMERGENCY period is current (**c1** button has been pressed)
– REMOTE PROGRAM	= **cp** switch is closed .
– REMOTE NORMAL 1	= remote control **R** is on "NORMAL".
– REMOTE SETBACK 1	= remote control **R** is on "SETBACK".
– REMOTE +2C	= remote control **R** is on "AUT + 2".
– REMOTE FROSTPROT	= emote control **R** is on "FROSTPROT".
– REMOTE OFF	= remote control **R** is on "OFF.
– SUMMER	= summer period is in progress (dates in **M4.5**).

M0.3

```
Htg:Normal 1
DT20.0c Var±0.0c
```

The *operating mode* in progress depends on the program set in **M0.2** ;

• Heat : xxxxxxxxx = mode set by program.
If **M5.1** is COMPENS + FIXED P this can be :
– NORMAL 1…5 = control with one of 5 Normal room temperatures ;
– SETBACK 1-2 = control with one of 2 Setback room temperatures ;
– FROSTPROT = control with Frostprot room temperature ;
– FIXED POINT 1-2 = control with one of two Fixed Point flow temperatures;
– OFF = Off (valve closed) ;
– EMERGENCY = period of Emergency (**c1** button has been pressed).
– ECO OFF = Eco Off function is active.
– BOOSTING = period of optimum start from Optimim Start.
– OPT OFF = period of optimum stop from Optimum Stop.
If **M5.1** PLANTS there will appear :
– PLANTS = control with desired flow temp. requested by C-Ring.
In any situation can be :
– FROSTPROT = Frostprot function active.
– MAX RET PRIM = limit of maximum primary return temperature active.
– MIN VALVE RUN. = minimum limit valve run active.
– MAX VALVE RUN = maximum limit valve run active.
– MAX DIFF RET = maximum difference return temperature limit active.
– MAX FLOW = maximum flow limit is active.
– MIN FLOW = minimum flow limit is active.

• DT xx.x c = value of desired temperature.
• Var ± x.x c = variation in desired temperature (max ± 20 °C).

14.7 Changing programs by remote control

The remote control **R** (CDB 300), if configured in **M7.1**, permits changing manually from a distance the current program (set in **M0.2**).
By means of the remote control **R** you can enter:
– OFF = plant off (valve closed).
– FROSTPROT = continuous operation at desired *Frostprot* temperature.
– NORMAL = continuous operation at desired *Normal 1* temperature.
– SETBACK = continuous operation at desired *Setback 1* temperature.
– AUT +2c = increase of 2°C in temperature desired by current mode.
– AUTOMATIC = operation with program set in **M0.2**.

14.8 Program changing switch

M7.5

```
Input E2:
cp SWITCH
```

The closure of the **cp** switch, if **M7.5** is cp SWITCH, permits setting an operating program that replaces the one currently running (set in **M0.2**) even if changed by the remote contro R

M1.15

```
cp prog switch
OFF
```

• cp prog switch :
If **M5.1** is COMPENS – FIXED P : – 7DAY 1-2 ; – 24HOUR 1…7 ; – NORMAL 1…5 xx.x c;
– SETBACK 1-2 xx.x c ; – FROSTPROT xx.x c ; – FIXED POINT 1-2 xx c ; – OFF.
If **M5.1** is PLANTS : – 7 DAY 1-2 ; – 24HOUR.1…7 ; – FIXED POINT 1-2 xx c ; – OFF.

14.9 Y1 control output

The controller compares the desired flow temperature **T°f** of the current mode with the temperature measured by the **B1** detector and responds with the control signal **Y1** in relation to the difference between the temperature and the parameters set:

M5.8

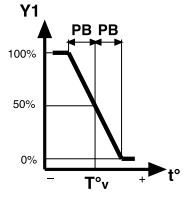
```
Prop Band ±20c
Integ time 10m
```

• Proportional Band in ± °C.
• Integral time in minutes.

M5.9

```
Valve run
Time : 75sec
```

• Time in seconds for complete run (open/closed))
of valve actuator.



The closure of the **c2** switch, in parallel with the flow detector B1 (B1-M), permits the complete closure of the Y1 valve.e.g. absence of circulation in secondary circuit (pressure switch or pumps off or valves closed, etc).

14.10 Control M1 pump

If **M7.2** is DHW with: AUTON CHANGE, the output 5-6-7 is for the control of heating pump **M1**.
If **M7.2** is DHW with: HEATING CHANGE, the output 5-6-7 can be used for :

M7.3

```
5-6-7: Pump
HEATING
```

• 5 - 6 - 7 : Pump
– HEATING = switched on only at request of heating.
if **M6.9** is DHW priority: YES, at request DHW storage it turns off (Examples Plants 12.4.3).
– HEATING + DHW = switched on for demand for heating and DHW storage (Examples Plants 12.1.2.5.6.7.8).

The **M1** pump can be controlled :

- Heating pump : – ON = always in operation.
  – TIMED = If **M5.1** is PLANTS: does not appear
  If **M5.1** is COMPENS – FIXED P, depends on current mode :
  - On with : Normal 1…5 ; Setback 1-2 ; Frostprot ; Fixed P 1-2.
  - Off with: Off; Eco Off.

  – TEMP. = If **M5.1** is COMPENS – FIXED P, depends on current mode and on room temperature :
  - On with : Normal 1…5 ; Fixed Point 1-2 ; Emergency.
  - On with : Setback 1-2 e and Frostprot only when desired Tr > actual or calculated Tr.
  - Off with : Off ; Eco Off.

  If **M7.5** is PLANTS, depends on temp. desired by plants :
  - On with : desired T°f for plants > 0.
  - Off with : desired T°f for plants = 0.

M5.20
```
Heat pump :TIMED
Delay Off:30min
```

- Delay Off : xx min = Delay time in stopping for dissipating heat accumulated in plant.

M5.15
```
Time constant
Cooling:48hours
```

When room detector B3 is not connected, during the Setback 1-2 and Frostprot modes the controller calculates the value of the room temperature in relation to the “Cooling Time Constant” parameter.

14.11 Eco off function

This function can be used when **M5.1** is COMPENS - FIXED P.
It permits switching off the heating plant (valve closed and pump idle) in control modes with room temp. Normal 1...5, Setback 1-2, when the outside temp. is higher than the value set, and switches on again when it is 2°C below the value set.

M1.17
```
Eco off      :NO
Outside T  :+18c
```

- Eco off : – NO ; – YES : function enabled.
- Outside T : + xx c : Value of outside temp. to switch off heating plant.

14.12 Anti-Frost function

M1.18
```
Anti Frost :
NO
```

This function can be used in the Off and/or Frostprot modes to prevent the plant pipework from freezing.

- Anti Frost : – NO = function disabled
  – Mode OFF = enabled in Off mode
  – Mode FROSTPROT = enabled in Frostprot mode
  – Mode OFF + FROSTPROT= enabled in Off and Frostprot modes.

The controller switches on the **M1** heating pump when the outside temp. is below the **Ot** value and regulates the flow water temp. to the **Ft** value; it switches off when the outside temp. exceeds by 2°C the **Ot** value.

M5.18
```
Anti Frost temp
Ot:–3c   Ft:20c
```

- Ot : – xx c : Value of outside temp. below which the pump is switched on.
- Ft : xx c : Value of flow temp.control.

M5.19
```
Delay action
AntiFrost: 30min
```

The Anti-frost action can be delayed so as to avoid pointless enablings.

14.13 Summer plant exercise

This function makes it possible to avoid valve and/or pump lockouts in the heating plant when it is idle during the summer months. Each Sunday at 11.00 the valve is opened for 15 minutes and at 12.00 the pump is switched on for five minutes.

M5.21
```
Summer exercise
plant :NO
```

- Summer exercise plant : – NO = not enabled
  – VALVE = enabled for valve only
  – PUMP = enabled for pump only
  – VAL+PUM = enabled for both

14.14 Metering degree-days

M0.19
```
Degree days
20:0000Room:0000
```

DTT 608 makes two meterings of degree-days:

- 20 = metering of degree days with reference to conventional room temperature of 20 °C
- Room = metering of degree days with reference to actual room temperature (with B3 detector) or to that calculated (without B3)

To cancel, keep pressed + and – keys for five seconds.

15. OPTIMISATION

The Optimum Start and Optimum Stop functions can be used with the COMPENSATED heating control mode for buildings with discontinous occupation such as: schools, block of flats offices.

These functions can be activated independently.

M1.16

```
Optim start   :NO
Optim stop    :NO
```

- Optimum Start: - NO; - YES.
  Calculates the time of the first daily start-up of the plant so as to obtain the desired room temp. at the time the building is first occupied (first Event time).
- Optimum Stop: - NO; - YES.
  Calculates the time of the last switching off of the plant so as to obtain a pre-set reduction of desired room temp. when the occupation of the building ends (last Event time).

The use of the optimisation functions requires setting operating programs with the times of start and end occupation of the building and not the times of starting up and shutting down the plant.
The functions are not enabled in the FIXED POINT 1 and 2 modes.

15.1 Switching on inertia and Cooling Time Constant

These are the two fundamental parameters used by the controller to calculate :
– optimum start time necessary to bring the room temperature to the value desired at the time when occupation starts (first Event time).
– the optimum stop time necessary to have the reduction of room temperature ready for the end of occupation (last Event time)..

- Start on inertia = Time (0…12 hours) required by heating plant to increase room temp. by 1°C.
  – MANUAL x.xx h/c : the value can be set and, if required, corrected manually (minimum correction 15 min)
  – AUTOMATIC x.xx h/c : appears only if B3 room detector connected and configured; the value increase automatically by 15 minutes if the actual room temperature reaches the desired value after the start occupation time, and is reduced by 15 minutes if it reaches it before.

M5.11

```
Start inertia
MANUAL    1.00h/c
```

M5.15

```
Time constant
Cooling: 48 hrs
```

- Time constant
  Cooling : xxx hours = Time (hours) required by building, with heating plant off, to reach the mean room temp. value between the comfortable (20°C) temp. and the outside temperature. With this parameter control is able to calculate the presumed room temp. for the OFF, SETBACK and FROSTPROT modes even without the B3 room detector.

15.2 Optimum Start with B3 room detector

The time of the first daily start-up is established by the meeting point of the curve of the reduction of the actual room temperature (B3 detector), in the OFF or SETBACK or FROSTPROT mode, with the full capacity curve for the plant calculated in relation to the parameter “Start-up Inertia” and to the reference point Time of Start Occupation - Desired room temperature.

With “Start Inertia” on AUTOMATIC :

M5.11

```
Start inertia
AUTOMAT   1.00h/c
```

– if the actual room temp. reaches the desired value after the time occupation starts, the inertia value is automatically increased by 15 minutes with the consequent lengthening of the optimum start period on the following day,
– if the actual room temp. reaches the desired value before the time occupation starts, the inertia value is automatically reduced by 15 minutes with the consequent shortening of the optimum start period the following day.

15.3 Optimum start without B3 room detector B3

The time of the first daily start-up is established by the meeting point of the calculated curve of the reduction of the room temperature (Cooling Constant), in the OFF or SETBACK or FROSTPROT mode, with the full capacity curve for the plant calculated in relation to the parameter “Start-up Inertia” and with the reference point Time of Start Occupation - Desired room temperature.

With “Start Inertia” on MANUAL (AUTOMATIC is not possible):

M5.11

```
Start inertia
MANUAL    1.00h/c
```

– if the actual room temp. reaches the desired value after the time occupation starts, the inertia value must be increased manually to lengthen the optimum start period on the following day.,
– if the actual room temp. reaches the desired temp. before the time occupation starts, the inertia value must be manually decreased to shorten the optimum start period the following day.

15.4 Boosting

M5.14
Optinum start
Boosting: 3.0c

During the optimum start period the compensated control uses the room temp. required by the timed program for the start of occupation to calculate the desired flow temperature.
For the plant to reach full capacity quickly and to reduce the optimum start period it is possible, during this period, to increase the desired room temperature (Boosting) and accordingly to increase the desired flow temperature.
Using B3 room detector: if the actual room temperature reaches the desired value before the time for the start of occupation, the control interrupts boosting and continues to control according to the programmed temperature.
Without B3 room detector: boosting is interrupted at the time occupation starts.

15.5 Optimum stop

M5.16
Optimum stop
reduct RT : 0.5c

This function permits an appreciable energy saving by switching off the plant early in respect of the time occupation ends (last Event time of 24hour program in use: start of Setback or Frostprot or Off mode) so that the room temperature falls by a pre-set value which does not, however, compromise a comfortable room temperature.

The controller calculates the optimum off time necessary for the room temperature to fall by the value set using the figure.

M5.15
Time Constant
Cooling :48hours

When detector B3 is connected, if the room temperature falls by the amount pre-set before the time occupation ends, the controller restarts the compensating function as for the program in use.

15.6 Maximum duration of optimum start and optimum stop periods

It is possible to set limits for the maximum duration of the periods of Optimum Start and Optimum Stop.

M5.12
OptimumStart Max
Normal : 2.00h

- Maximum duration in hours permitted to Optimum Start period when a 24hour or 7day program is running.

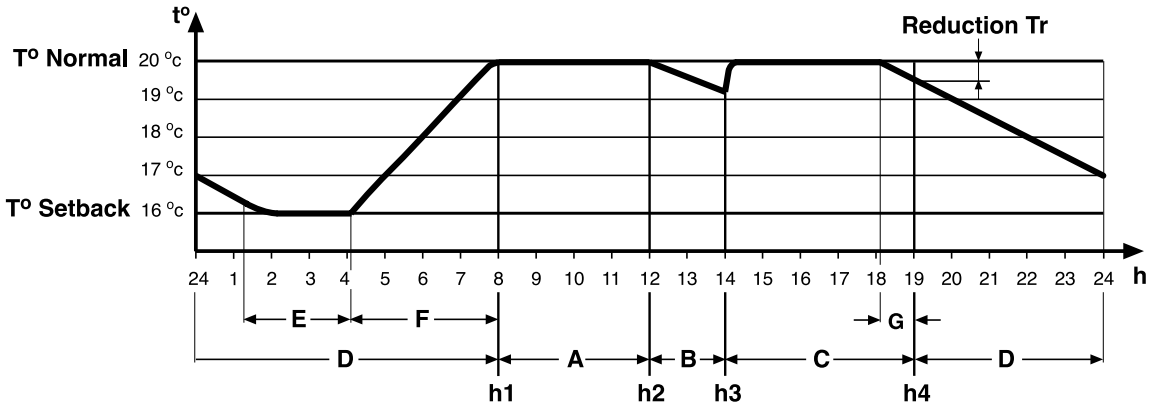
M5.13
OptimumStart Max
Annual P :10.00h

- Maximum duration in hours permitted to Optimum Start period after use of an annual period.

M5.17
Optimum Stop
Maximum : 1.00h

- Maximum duration in hours permitted to Optimum Stop period.

15.7 Example of optimisation



E – Period of operation to keep temperature at 16 °C
F – Period of Optimum Start set by Optimum Start function
G – Period of Optimum Stop set by Optimum Stop function
Reduct.Tr – Reduction of desired temp. at time of end occupation
h1 – 1st Event (start occupation): start period A with Normal temp. 20°C
h2 – 2nd Event: start period B with temperature Setback 16°C
h3 – 3rd Event: start period C with temperature Normal 20°C
h4 – 4th Event (end occupation): start period D with Setback temperature 16°C

16. CONTROL TEMPERATURE OF DHW PLANT

For DHW production two types of plant can be used:

M7.2
DHW with:
AUTON EXCHANGER
DHW with:
HEAT EXCHANGER

- DHW with :
  – AUTON EXCHANGER: the DHW production plant uses a district heating exchanger with **Y2** valve on primary. See: 11. Examples Substations with two heat exchangers.
  Control of the DHW temp. (B5 detector) is completely autonomous.
  – HEAT EXCHANGER: The DHW production plant and the heating plant are fed by the secondary circuit (B1detector) of the only district heating exchanger with **Y1** valve on the primary. See: 12. Examples of substations with one exchanger.
  With the request for DHW the desired DHW temperature (B5 detector) increased by the value set in **M6.5**, replaces the desired heating temperature (B1 detector) if the latter is lower.
  If the two plants use a single pump. the call for DHW opens the Y2 diverting valve and switches on pump M1 (Examples Plants 12.1.2).
  If the two plants use separate pumps, the DHW request switches on the M2 pump and, if **M6.9** is DHW priority : yes, the M1 heating pump is turned off (Examples Plants 12.3.4).

M6.5
Icrease flow T
for DHW :10c

M7.3
5-6-7: Pump
HEATING + DHW
5-6-7: Pump
HEATING

16.1 Control with detector B5 only

M7.1
Config detectors
– – – – 5 – – –

Using only the B5 detector it is possible to do the following :

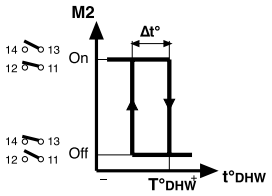
– Control temp. by modulating or On-Off control of output 11-12-13-14 (**Y2** district heating valve or **M2** storage pump or **Y2** diverting valve heating /DHW): :
  - Opens / On = 11-12 closed , 13-14 open. - Closes / Off = 11-12 open , 13-14 closed.
– Timed control of output 8-9-10 (**M3** recycle pump) :
  - On = 8-10 closed , 9-10 open. - Off = 8-10 open , 9-10 closed.

According to the program assigned in **M0.6**,the controller compares the temp. **T°DHW** required by the mode in progress (set in **M1.11** and **M1.12**) with the temp. measured by the **B5** detector and controls the **Y2** valve or the **M2** pump according to the difference between the temperature and the parameters set. :

if M6.1 Control DHW ON-OFF

- Differential On-Off **Δt°**

M6.4
Differential
Storage : 5c



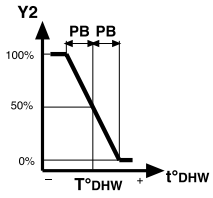
if M6.1 Control DHW MODULATING

- Valve run time in seconds

M6.2
Valve run
time : 75s

- Proport Band : x x c = Proportional Band **PB** in °C
- Integral Time : x x x s = Integral Time in seconds

M6.3
Prop Band ±20c
Integ Time 60s



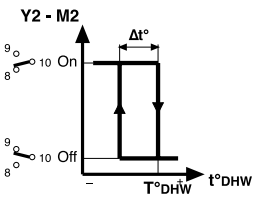
16.2 Control with B5 and B6 detectors

M7.1
Config detectors
– – – – 5 6 – –

Using B5 and B6 detectors it is possible to do the following :

– Control distribution temp. by modulating control of output 11-12-13- 14 11-12-13-14 (valve **Y3**):
  - Opens = 11-12 closed , 13-14 open. - Closes = 11-12 open , 13-14 closed.
– Control storage temp. by On-Off control of output 8-9-10 (district heating valve **Y2** or storage pump **M2** or diverting valve heating /DHW **Y2**):
  - On = 8-10 closed , 9-10 open. - Off = 8-10 open , 9-10 closed.

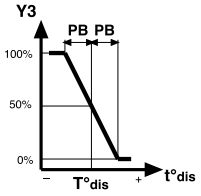
According to the program assigned in **M0.6**, the controller compares the desired storage temp. **T°DHW** required by the mode in progress (set in **M1.11** and **M1.12**) with the temp. measured by the **B5** detector and sends On-Off signals to the **Y2** valve or to the **M2** pump according to the difference between the temperature and the parameters set :



M6.4
Differential
Storage : 5c

- On-Off differential Storage **Δt°**

The controller compares the temp. required by distribution **T°dis** (set in **M1.13**) with the temp. measured by the **B6** detector and responds with a modulating control signal to the **Y3** valve according to the temperature difference and the parameters set:



M6.2
Valve run
time : 75s

- Valve run time in seconds

M6.3
Prop Band ±20c
integ time 60s

- Proport Band : x x c = Proportional Band **PB** in ± °C.
- Integral Time : x x x s = Integral Time in seconds

16.3 Operating mode

It is possible to program DHW control according to the requirements of the DHW circuits:

M0.6
DHW program
24HOUR 1

- DHW program :
  – 7DAY 1-2 = with one of two 7day programs set in **M3.9...15**.
  – 24HOUR.1…7 = with one of seven 24hour programs set in **M3.2...7**.
  – DHW 1-2 xxc = with one of two DHW temp. set in **M1.11-12**;
  – OFF = always off (valve closed or On-Off control off).

The operating mode in progress depends on the program set in **M0.6**;

M0.7
DHW : DHW 1
Dt 50c Var ± 0c

- Water : DHW 1-2 = mode with one of the two DHW temperatures set in **M1.11-12**;
  Off = off mode (valve closed or On-Off control off).
- Dt xx c = value of desired temp.
- Var ± xx c = variation of desired temp.(max ± 20°C).

16.4 Antibacteria function

The antibacteria function prevents the formation of bacteria in the DHW distribution circuits by periodically raising the temperature for a certain time.

M6.6
Antibacteria
NO

- Antibacteria : – NO = function excluded.
  – STORAGE = function enabled only for storage.
  – STORAGE+DISTRIB = function enabled for storage & for distribution circuit

M6.7
AntibacteriaT70c
02.00 for 90m

- Antibacteria : xx c = desired temp.
- xx.xx for xxx min = time of enabling function and its duration in minutes.

M6.8
Antibact days
M T W T F S S

- M T W T F S S = days of week on which function enabled.
  Replace dashes with first letters of the chosen days.

16.5 DHW priority

M6.9
DHW priority: NO

- DHW priority : NO = function excluded ; YES = function enabled

When the function is enabled and **M7.3** is 5-6-7: HEATING pump, the M1 heating pump turns off when DHW control switches on the M2 storage tank filling pump.

When DTT 608 is connected in C-Ring with other controllers and the Priority function is enabled :
– DHW control sends via C-Ring the difference between its own desired temperature and the actual one;
– the controllers in C-Ring with the Anticondensing function enabled reduce their own desired flow temperature by 4°C for each °C of difference so as to give precedence to the DHW control by DTT 608.

16.6 Summer function

It is possible to establish if the use of the DHW production plant has to be limited to the winter season (possible use of electric boilers in the summer).

M6.9
DHW summer : NO

- DHW summer : – YES = functions even in summer season
  – NO = functions only in winter season

M4.5
Heating season
Fr:xx.xxto:xx.xx

16.7 Summer plant exercise

The function can be used only if **M6.9** is DHW summer: NO.
Permits avoiding lockouts of the valve and/or pump in the DHW plant when the plant is idle during the summer. Each Sunday at 11.00 the valve is opened for 15 minutes and at 12.00 the pump is switched on for 5 minutes.

M6.10
Summ er exercise
plant :NO

- Summer exercise plant : – NO = not enabled
  – PUMP = enabled only for pump
  – VAL+PUM = enabled for both

16.8 c3 switch for closure Y2 primary valve

The closure of the **c3** switch, in parallel with the B5 detector (B5-M), permits the complete closure of the Y2 valve. e.g. plant with rapid heat exchanger without M3 recycle pump or with pump not controlled by the controller (pressure or pump switch off, etc).

17. PROGRAMS & PERIODS WITH DATES

The programming of **Heating** control and of **DHW** control are independent and each can use:
– Seven 24hour programs
– Two 7day programs
and both :
– 25 annual programs with dates

17.1 Assigning programs

You can assign operating programs separately for the control of heating and of DHW

M0.2

```
Heating program
24HOUR 1
```

• Heating program :
– 7DAY 1-2 = one of two 7day programs set in **M2.9...15**.
– 24HOUR1…7 = one of seven 24hour programs set in **M2.2...7**.
– NORMAL 1…5 xx.x c = one of five Normal room temp. set in **M1.1...5** ;
– SETBACK 1-2 xx.x c = one of two Setback room temp. set in **M1.6-7** ;
– FROSTPROT xx.x c = Frostprot room temp. set in **M1.8** ;
– FIXED POINT1-2 xx c = one of two Fixed Point flow temperatures set in **M1.9-10** ;
– OFF = always off.

M0.6

```
DHW program
24HOUR 1
```

• DHW program :
– 7DAY. 1-2 = one of two 7day programs set in **M3.9...15**.
– 24HOUR 1...7 = one of seven 24hour programs set in **M3.2...7**.
– DHW 1-2 xx c = one of two DHW temp. programs set in **M1.11-12** ;
– OFF = always off.

17.2 24 hour programs

In each 24hour program you can set a maximum of six event start times (**Ev1...Ev6**) assigning to each the desired mode:

M2.1

```
Number of 24hour
Programs : 1
```

• Number of 24hour programs (1...7) for **Heating** to be used.

M2.2...7

```
24H1 Ev1 06.00
FIXED POINT1 70c
```

• 24Hxx : no. prog. (1…7); • Evx : no. event (2…6); • Fr xx.xx : time start event
• mode assigned to period :
– NORMAL 1…5 xx.x c = one of five Normal room temp. set in **M1.1...5** ;
– SETBACK 1-2 xx.x c = one of two Setback room temp. set in **M1.6-7** ;
– FROSTPROT xx.x c = Frostprot room temp. set in **M1.8** ;
– FIXED POINT1-2 xx c = one of two Fixed Point temperatures flow set in **M1.9-10** ;
– OFF = always off.

M3.1

```
Number of 24hour
Programs : 1
```

• Number of 24hour programs (1...7) for **DHW** to be used.

M3.2...7

```
24H1 Ev1 06.00
DHW 1 50c
```

• 24Hxx : no. progr.(1...7); * Evx: no. event (2...6); • Fr xx.xx : time start event.
• mode assigned to period :
– DHW 1-2 xx c = one of two DHW temperatures set in **M1.11-12** ;
– OFF = always off (valve closed).

The start event times must be entered in increasing order.
The unused times must be excluded by pressing the + and - keys at the same time (– – –).
Unused times (– – –) must not be left between programmed times.

17.3 7day programs

In each 7day program you can assign a program to each day of the week.

M2.8

```
Number 7day
Programs : 0
```

• Number of 7day programs (0-2) to be used for **HEATING** control..

M2.9...15

```
7DAY 1-MONDAY
24 HOUR 1
```

• 7day x: number of program 1-2 ; • XXXXXXXXX : day of week ;
• program assigned to day of week :
– 24HOUR 1…7 = one of seven 24hour programs set in **M2.2...7**.
– NORMAL 1…5 xx.x c = one of five Normal room temp. set in **M1.1...5** ;
– SETBACK 1-2 xx.x c = one of two Setback room temp. set in **M1.6-7** ;
– FROSTPROT xx.x c = Frostprot room temp. set in **M1.8** ;
– FIXED POINT1-2 xx c = one of two Fixed Point temp. set in **M1.9-10** ;
– OFF = always off (valve closed).

M3.8

```
Number 7day
programs : 1
```

• Number of 7day programs (0-2) to be used for **DHW** control.

M3.9...15

```
7DAY 1 MONDAY
programs 1
```

• 7day x : number of program 1-2 ; • XXXXXXXXX : day of week ;
• program assigned to day of week :
– 24HOUR.1…7 = one of seven 24hour programs set in **M3.2...7**.
– DHW1-2 xx c = one of two DHW temp. set in **M1.11-12** ;
– OFF = always off (valve closed).

17.4 Annual periods

The annual periods with dates (max. 25) can be used at the same time by the Heating controller and by the DHW controller or by only one of these. Each annual period, defined by the dates of start and end, sets an operating program which replaces the one in use. At the end of each period the control returns to the one in use.

M4.1

```
Number of annual
periods    :   0
```

• Number of annual periods you wish to use (0...25).

Enter the data for each single period:

• AP xx : period number (1…25);

M4.2

```
Ap01 for:--- ---
Fr:--.--to:--.--
```

• for : - - - - - - : replace the dashes (+ or – keys) by the outputs concerned with the period:
- - - - - - = unused period.
HEA - - - = period used only by heating controller.
- - - DHW = period used only by DH W controller.
HEA DHW = period used by both controllers.

• Fr : - - . - - t o : - - . - - : day and month of start and end of annual period.

For a period of a single day enter the same date for start and end.
To cancel the dates of the annual period keep + and – keys pressed at the same time.
Choose, for each annual period, the program to be used for the required controls:

M4.3

```
Ap01-Heating:
OFF
```

• AP 1 - Heating. :
– 7 DAY 1-2 = one of two 7day programs set in **M2.9...15.**
– 24 HOUR.1…7 = one of seven 24hour programs set in **M2.2...7.**
– NORMAL 1…5 xx.x c = one of five Normal room temp. set in **M1.1...5** ;
– SETBACK 1-2 xx.x c = one of two Setback room temp. set in **M1.6-7** ;
– FROSTPROT xx.x c = Frostprot room temp. set in **M1.8** ;
– FIXED POINT1-2 xx c = one of two Fixed Point flow temp. set in **M1.9-10** ;
– OFF = always off.

M4.4

```
Ap01-DHW:
OFF
```

• AP 1 -DHW :
– 7 DAY 1-2 = one of two 7day programs set in **M3.9...15.**
– 24 HOUR 1…7 = one of seven 24hour programs set in **M3.2...7.**
– DHW 1-2 xx c = one of two DHW temp. set in **M1.11-12** ;
– OFF = always off.

17.5 Special period

Period in which, for the control of Heating (COMPENS - FIXED P), an operating program is set to meet particular requirements and which replaces temporarily the current program set in **M0.2** o or set by the remote control **R** :

M0.4

```
Special program
24HOUR 1
```

• Special program :
– 7DAY 1-2 = one of two 7day programs set in **M2.9...15.**
– 24HOUR1…7 = one of seven 24hour programs set in **M2.2...7.**
– NORMAL 1…5 xx.x c = one of five Normal room temp. set in **M1.1...5** ;
– SETBACK 1-2 xx.x c = one of two Setback room temp. set in **M1.6-7** ;
– FROSTPROT xx.x c = Frostprot room temp. set in **M1.8** ;
– FIXED POINT1-2 xx c = one of two Fixed Point flow temp. set in **M1.9-10** ;
– OFF = always off.

M0.5

```
Special period
Fr:--.--to:--.--
```

• Fr - - . - - t o - - . - - = day and month of start of special period.

17.6 Emergency period

The emergency period, which has priority over all the programs and modes in progress for Heating control (COMPENS - FIXED P), obliges heating to operate for the period and at the temperature set.
The **c1** switches must be connected. To enable the Emergency function, keep the **c1** button pressed for at least one second and not more than 30 seconds. At the end of the hours programmed automatic control operation is restored.

M1.14

```
Emergency  21.0c
for hours     3
```

• Emergency xx.x c = setting desired room temperature during Emergency period
• for hours : x = setting number of hours duration Emergency period

When the emergency period is enabled, on the display appears M0.2

```
Heating program
REMOTE EMERGENCY
```

To interrupt the period before it has elapsed, press + and – keys at the same time.

17.7 Heating season period

Defines the winter season period during which the heating plant has to be in operation.

M4.5

```
Heating season
Fr:15.10to:15.04
```

- Heating season.
  Fr - - . - - t o - - . - - = day and month of start and end of Heating Season period.

This also applies to DHW control if **M6.9** is DHWSummer : NO..
To cancel the period keep pressed + and – keys at the same time.

17.8 BST (British Summer Time)

The controller changes automatically the current time in relation to the British Summer Time (BST) period.

M4.6

```
BST : AUT
Fr:31.03to:27.10
```

- BST : – MAN = Changes time on the dates set.
  – AUT = Changes the time automatically :
  - at 02.00 on the last Sunday of March the time is put forward one hour;
  - at 02.00 on the last Sunday in October the time is put back one hour;
- Fr - - . - - to - - . - - = day and month of start and end of BST period (only if MAN)

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

18. PRIMARY CIRCUIT LIMITS

The district heating primary circuit may have limits imposed by the energy supply contractual terms:
– Maximum limit primary return temperature
– Minimum and maximum limits primary flow
– Minimum and maximum limits opening heating control valve
– Maximum limit difference between primary and secondary return temperatures.

18.1 Maximum limit return temperature of primary circuit

This limit is determined by the operation of the district heating central plant.
It can be used only if **B7** detector is connected and configured.

M7.10

```
Return limit:NO
Temp Max.:   99c
```

- Primary return. : – NO = limit not enabled
  – YES = limit enabled
- Temp. max. : xx c = value of maximum primary return limit.

When the return temperature of the primary district heating circuit (B7) exceeds the maximum limit, the controller gradually closes the valve **Y1** until it falls below the maximum value.
To ensure that the possible complete closure of the valve (water stationary in the primary circuit) does not allow the temperature to fall, the controller nevertheless suspends the maximum limit function and restores normal operation when the flow temperature (B1) falls, in respect of the temperature required by the controller, by the value set in **M7.14**.
The controller regains control of the maximum limit when the B1 temperature returns to its desired value.

M7.14

```
Reduct Second T
with limits : 5c
```

18.2 Flow limits of primary circuit

M7.4

```
Input E1:
FLOW METER
```

M7.6

```
LITRES X PULSE
    0010.0
```

The controller uses the E1-D input (as alternative to Alarm input) to acquire the flow metering signal from the volumetric turbine-driven flow meter (with Reed pulse transmitter) or ultrasound (Burst signal).

- You must set the flow metering unit :
  – LITRES x PULSE = 1.0…1,000,0 l/pul. : volumetric turbine-driven or ultrasound > DN 80.
  – PULSES x LITRE = 0.1…300.0 pul/l : volumetric with ultrasound < DN 100 (Burst signals).

The **minimum limit** of flow prevents the consumer from withdrawing energy from the district heating plant with unacceptably large metering errors (flows below Qmin of volumetric flow meter).

M7.7
```
Flow limit   :NO
Min:  000.01m3/h
```

- Flow limit : – NO = minimum limit not enabled.
  – YES = minimum limit enabled.
- Min : xxx,xx m^3/h = value of minimum flow limit.

When the value measured is below the minimum set, the controller closes the **Y1** valve until the temp. measured by the B1 detector falls, in respect of the temp. desired by the controller, by the value set in **M7.14**.
The controller restores normal operation and then examines the minimum limit only when the temp. measured by detector B1 returns to the desired value.

M7.14
```
Reduct Second T
with limits :xxc
```

The **maximum limit** of flow prevents the user withdrawing too much energy and thereby avoiding shortage crises at the district heating plant, especially at the first daily start-up or in periods of severe cold.

M7.8
```
Flow limit   :NO
Max:  650.00m3/h
```

- Flow limit : – NO = maximum limit not enabled.
  – YES = maximum limit enabled.
- Max : xxx,xx m^3/h = value of maximum flow limit.

When the value measured (E1-D) is above the maximum value set, the controller regulates the valve with the parameters set in **M7.9** so as to keep the flow value below the maximum requested level.

M7.9
```
PB flow: xx%
Integ T   :xxxm
```

18.3 Minimum and maximum limit opening Y1 valve

Instead of the minimum and maximum flow limits it is possible to use the minimum and maximum run limits for valve **Y1**.
When the percentage opening of the valve, calculated by the controller, is below the minimum, the controller closes the valve **Y1** completely until the calculated position becomes greater. When the percentage opening of the valve **Y1** is greater than the maximum value set, the controller keeps it at the maximum valvue until the calculated value falls below it.

M7.13
```
Valve run %
Min:00   Max:100
```

18.4 Maximum limit of temperature difference between heating primary and secondary returns

To reduce load peaks in district heating systems it is possible to use the maximum temperature difference limit between primary **B7** and secondary **B4** returns.
When the difference between the two temperatures reaches the maximum value set, the controller gradually closes the control valve so that the limit is not exceeded.
If the temp. measured by detector B1 falls, in respect of the temp. desired by the controller, by the value set in **M7.14**, the controller suspends the maximum limit function and restores normal operation until the temp. B1 returns to its desired value.

M7.12
```
Different Return
   Max:99c
```

M7.14
```
Reduct Second T
with Limits : 5c
```

18.5 Removal of maximum limits for outside temperature

To prevent heating plants becoming insufficient when the outside temperature (B2) is very low, it is possible to set an outside temperature below which the maximum limits (Flow, maximum valve run, maximum return temp. and difference maximum temp. returns) are no longer operative.

M7.11
```
OT to cancel
Max limits :–30c
```

19. COMPLEMENTARY FUNCTIONS

19.1 Access keynumber

M7.21

```
Choice keynumber
User      :----
```

M7.22

```
Choice keynumber
Configurat :----
```

Choice and enabling of User access keynumber: prevents the use of + and - keys thereby preventing any change to data. Enter the number (1900...1999) using + and - keys. To cancel the keynumber, press + and – keys at the same time unti the dashes re-appear.

Choice and enabling of Configuration access key number: prevents use of + and – keys in CONFIG. DTT 608 thereby preventing any change to data.
Enter the number (0000...9999) using the + and – keys.

```
Access keynumber
User      :----
```

```
Access keynumber
Configurat :----
```

When the key number is enabled, if you press the + or - keys there will appear on the display the request to enter the keynumber.
Only after having entered the exact key number can you use the + and – keys.
If for 15 minutes no key is pressed the key number is automatically enabled.

19.2 Name of plant site

M7.23

```
Name plant site
----------
```

Entering name of plant site which appears on first page of display. Using the + and - keys, replace each dash by a letter of the alphabet (A…Z) or by a digit (0...9). The → key serves to position the cursor.

19.3 Display of measurements and operational data

The controller displays all the measurements made by the detectors and the data which serve to understand operational status of the plant:

M0.8

```
Room temperature
D:20,0c  A:20,0c
```

- room temp : D = desired by Compensated control
  A = measured by **B3** detector ; if not connected, C appears (calculated)

M0.9

```
Flow Temp
D: 80c    A: 80c
```

- Heating flow temp.: D = desired by current mode.
  A = measured by **B1** detector .

M0.10

```
Outside temp
Actual : –02,0c
```

- outside temp.: Actual = measured by **B2** detector; ;
  C-Ring = if coming from another controller via C-Ring.

M0.11

```
Return temp
Heating : 70c
```

- Heating return temp. measured by **B4** detector.

M0.12

```
Valve position
heating :100%
```

- position of Heating control valve calculated by controller.

M0.13

```
DHW temperature
D: 50c    A: 50c
```

- temp. DHW (if configured B5 only): D = desired by current mode.
  A = measured by **B5** detector.

```
DHW storage T
D: 50c    A: 50c
```

- temp. DHW storage (if B5 and B6 configured): D = desired by current mode.
  A = measured by **B5** detector.

M0.14

```
DHW distribut T
D: 50c    A: 50c
```

- temp.DHW distribution (if B5 and B6 configured): D = Desired by current mode.
  A = measured by **B6** detector.

M0.15

```
Valve position
DHW :100%
```

- position of DHW control valve calculated by controller.
  (if B5 and B6 configured or if **M6.1** is MODULATING).

M0.16

```
Return primary T
D: 50c    A: 75c
```

- temp. primary return: D: of desired maximum limit.
  A : measured by **B7** detector.

M0.17

```
Diff returns T
D: 10c    A:  5c
```

- difference temperature returns: D: maximum desired difference.
  A: difference measured between **B7** and **B4** detectors.

M0.18

```
Flow m3/h
000,10
```

- flow (if **M7.4** is FLOW METER) of the primary circuit.
  Appears “calculation” if the controller is making a calculation between one pulse and another.

19.4 Data recording

Every 5...240 minutes (figure set by telemanagement PC) the controller records a series of data indicative of its operational status. *These can be displayed only on the telemanagement PC*.

– Current time, day and type of recording (change of mode or expiry program).
– Values desired and calculated by controller.
– Values measured by detectors connected.
– Calculated position of Y1 and Y2 control valves.
– Status of On-Off output switches..

The controller can store 40 complete recordings. The last recording brings about the cancellation of the oldest one.

20. ALARMS

The alarms processed by the controller are of three types :
- – alarms for faulty operation of the controller (LED 6.12) and of the plants controlled (LED 6.11)
- – alarms for short or open circuits to the detectors connected (LED 6.11)
- – alarms from external switches (LED 6.10)

The alarm status is signalled by the LEDs on the facia of the controller and can be identified, on the configuration page, by the letter “A” alternating with the number of the alarm concerned.
With C-Bus they can be transmitted to a local PC and/or to the central telemanagement PC.

20.1 Funzional alarms

The functional alarms are triggered in the presence of prolonged differences between the actual and desired values.

M7.18
```
FunctionalAlarms
– – – – – – – 8
```

With the exception of the internal clock alarm (8) these do not affect the correct operation of the controller.
Factory setting: all disabled except for internal clock alarm (8).
Using + and – keys enable the alarms of interest by replacing dashes with numbers.
When the number flashes = alarm triggered.
The limit values and delay times for sending alarms can be changed only by PC.

Type of alarm and causes:

1 = Heating flow temperature (B1)
- – enabled with pump M1 and M2 in operation
- – triggered when actual temperature above or below that desired.

2 = limits run Heating valve (Y1)
- – enabled when pump M1 in operation
- – triggered when intervention of flow limit or flow or valve run limit brings about valve closure.

3 = room temperature (B3)
- – enabled in NORMAL 1...5 modes and with outside temp. below that of desired room.
- – triggered when actual temperature above or below that required.

4 = difference between primary and secondary return temperatures (B7 - B4)
- – enabled when pump M in operation
- – triggered when difference between actual and desired temperature greater than desired.

5 = DHW temperature (B5)
- – not enabled in Off mode
- – triggered when actual temperature below or above that desired.

6 = DHW distribution temperature(B6)
- – disabled in Off mode
- – triggered if actual temperature above or below that desired.

7 = maximum temperature primary return (B7)
- – enabled with M1 pump in operation
- – triggered when actual temperature greater than that desired.

8 = internal clock – cannot be disabled.
- – triggered when clock shows incoherent values.

20.2 Detector alarms

M7.19
```
Detector alarms
– – – – – – – –
```

The detector alarms are triggered in the event of **short** or **open** detector circuits.
The presence of the alarm is indicated after one minute.
Factory setting: all disabled .
Using + and – keys enable alarms of interest by replacing dashes with numbers.

Type of alarm and effect :

1 = Heating flow detector (B1). Alarm for open circuit only.
2 = outside detector (B2).
3 = room detector (B3).
4 = Heating return detector (B4).
5 = DHW storage detector (B5). Alarm for open circuit only.
6 = DHW distribution detector (B6).
7 = primary return detector (B7).
8 = C-Ring: open electric circuit or fault in one of controllers in ring.

20.3 Alarms or status by external switches (K)

Only if configured

M7.4
```
Input E1:
ALARM
```

M7.5
```
Input E2:
ALARM
```

M7.20
```
K alarms
– –
```

Alarms triggered by closure of voltage-free switches **k1** and **k2**, by plant components (pumps, burners, etc).
The presence of the alarm is signalled after about 60 seconds.
Factory setting: disabled.
With + key enable the alarms of interest by replacing the dashes with numbers
If not used as alarms they can be used to signal status.

21. TESTING AT PLANT COMMISSIONING

Testing to be carried out when installation has been completed, electric wiring and configuration carried out and checked.

21.1 Testing C-Ring

M8.1

```
CRing:??
```

The C-Ring testing page appears only if it is configured in M7.17 `CRing connection PRIMARY`

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

– correctly powered at mains voltage (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 10 seconds. On all the displays appears "??". If the connection if satisfactory the word "YES" replaces "??" on all the displays. If on one or more displays "YES" does not appear this means that there is a break in the connection between the last controller with "YES" and the first with "??".
Examples of testing a C-Ring with four controllers:

– Cont.1 "YES" – Cont.2 "YES" – Cont.3 "YES" – Cont.4 "YES" : Connection OK
– Cont.1 "??" – Cont.2 "YES" – Cont.3 "YES" – Cont.4 "YES" : Break between 4 & 1
– Cont.1 "??" – Cont.2 "YES" – Cont.3 "??" – Cont.4 "??" : Break between 2 & 3
– Cont.1 "??" – Cont.2 "??" – Cont.3 "??" – Cont.4 "??" : Break between 1 & 2

21.2 testing outputs

M8.2

```
Output.: 1-2-3-4
Status : IDLE
```

With + and – keys select :

- output to test : – 1-2-3-4 ;
  – 5-6-7 ;
  – 8-9-10 ;
  – 11-12-13-14;
- the status : – IDLE ; – CLOSES ; – OPENS : with output. = 1-2-3-4 or 11-12-13-14
  – On ; – Off : with output = 5-6-7 or 8-9-10

Check the result..

⊖ ⊕ Keys for scrolling the display pages and positioning the cursor ▮ on adjustable data on the pages.
The adjustable data, 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

```
Site:----------
12.18 MONDAY
```

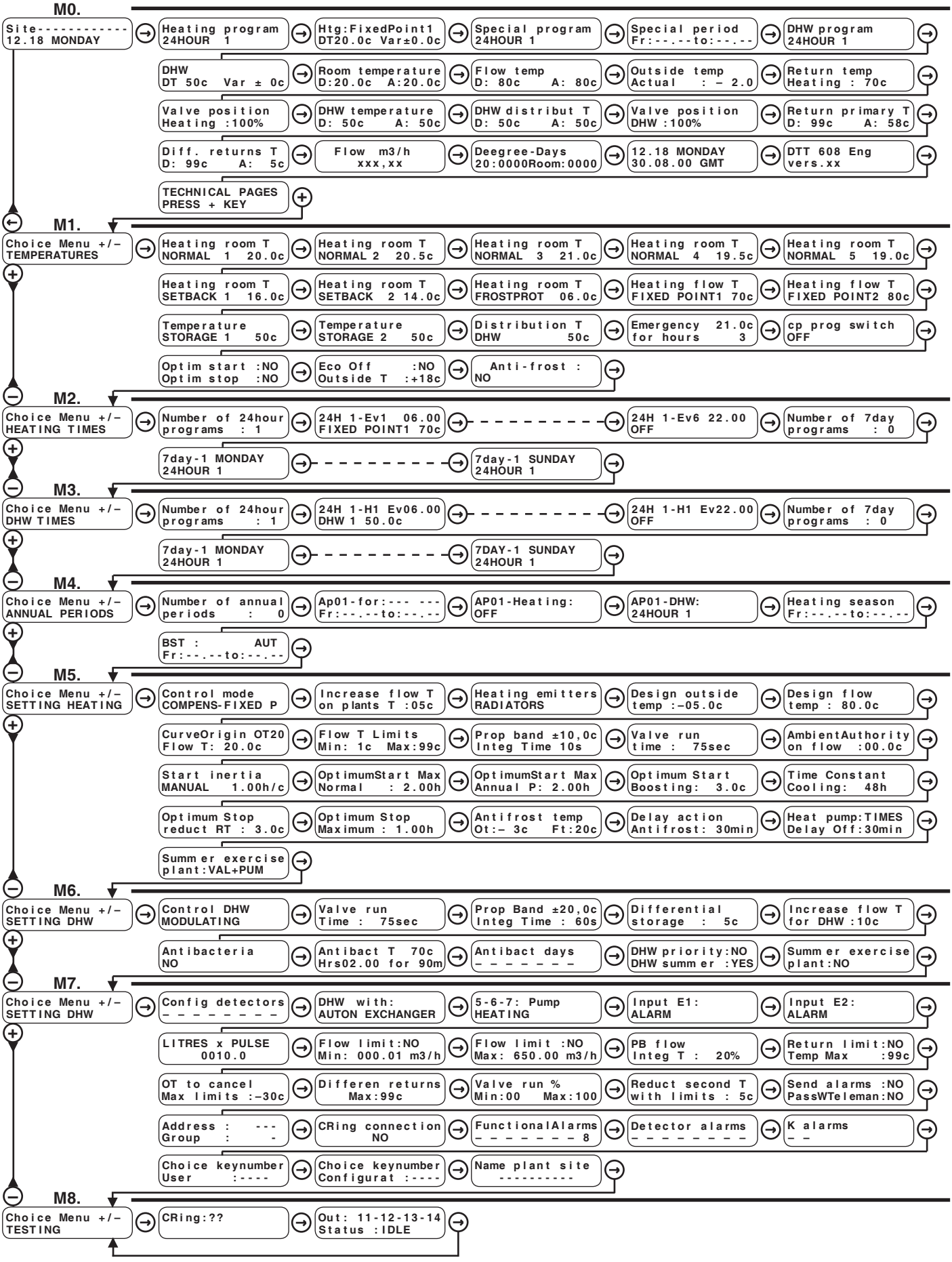
⊖ ⊕ Keys for : – adjusting the values indicated by the cursor ▮
– seeing the possibility of configuring a function, e.g :
– passing directly from one menu (series of pages) to another.

```
Input E1:
ALARM
```

or

```
Input E1:
FLOW METER
```

22. SEQUENZA DELLE PAGINE DISPLAY



M0. NORMAL USE

Ref.	Display	Description	Notes	Sect.
M0.1	Site---------- 12.18 MONDAY	Name plant site. Current time & date.	Set in **M7.23** Set in **M0.21**	
M0.2	Heating program 24HOUR 1	Choice program for heating plant if **M5.1** is COMPENS-FIXED P : – 7DAY 1…2 : set in **M2.9...15** ; – 24HOUR 1…7 : set in **M2.2...7** ; – NORMAL 1…5 xx.x c : set in **M1.1...5** ; – SETBACK 1-2 xx.x c : set in **M1.6-7** ; – FROSTPROT xx.x c : set in **M1.8** ; – FIXED POINT 1-2 xx c : set in **M1.9-10** ; – OFF	Instead of program one of following may appear (cannot be changed): PLANTS : **M5.1** is PLANTS. ANNUAL xx : one of annual periods current. SPECIAL : Special period current. REMOTE EMERGENCY : Emergency period current (**c1** has been pressed). REMOTE PROGRAM : when **cp** is closed. REMOTE NORMAL 1 : remote control **R** is on "NORMAL". REMOTE SETBACK1: remote control **R** is on "SETBACK". REMOTE +2C : remote control **R** is on "AUT +2". REMOTE FROSTPROT: remote control **R** is on "FROSTPROT". REMOTEOFF : remote control **R** is on "OFF". SUMMER : summer period (dates in **M4.5**) is current	**14.6** **17.1**
M0.3	Heat:FixedPoint1 DT20.0c Var±0.0c	Current mode for heating plant. DT : Desired temp. current mode. Var : Variation in desired temp max ± 3 °C in Normal & Setb. mode max ± 20 °C in Fixed P or Plants mode Td xx.xc Var ± x.x c can be replaced by: – Minimum flow ; – Maximum flow ; – Max primary ret ; – Max diff returns ; – Min valve run ; – Max valve run ;	The modes can be : If **M5.1** is PLANTS : PLANTS If **M5.1** is COMPENS - FIXED P : Normal 1…5 ; Setback 1-2 ; Frostprot ; Fixed point 1-2 ; Off ; Boosted ; Optimum off ; Emergency ; Eco-off ; Antifrost.	**14.6**
M0.4	Special program 24HOUR 1	Choice program for special period: – As **M0.2**.	Page does not appear if **M5.1** is PLANTS.	**17.5**
M0.5	Special period Fr --.--to --.--	Dates of start and end of special period.	Page does not appear if **M5.1** is PLANTS. Press + and – together to cancel	**17.5**
M0.6	DHW program 24HOUR 1	Choice program for control DHW (B5 detector): – 7 DAY. 1…2 : set in **M2.9...15** ; – 24 HOUR 1…7 : set in **M2.2...7** ; – DHW 1-2 xx.x c : if only B5 configured set in **M1.11-12** ; – STORAGE 1-2 xx.x c : if configured B5 e B6 set in **M1.11-12** ; – OFF.	Appears only if B5 detector configured. Instead of prog there may appear indication : "not adjustable". ANNUAL xx : one of Annual periods current.	**16.3** **17.1**
M0.7	DHW DT 50c Var ± 0c	Current mode for DHW plant. DT : Desired temp. for current mode. Var : Variation in desired temp.: max ± 20 °C.	Appears if B5 only detector configured Modes: DHW 1-2; Off; ANTIBACTERIA	**16.3**
M0.8	Room temperature D:20.0c A:20.0c	Room temp. required by current mode. Actual temp. measured by B3 room detector.	Appears if **M5.1** is COMPENS - FIXED P. If B3 detector not configured, instead of actual detector.value (A) calculated value (C) will appear.	**19.3**
M0.9	Flow temp D: 80c A: 80c	Room temp. required by current mode. Actual temp. measured by B1 flow detector.	Heating only if **M7.2** is AUTON EXCHANGE	**19.3**
M0.10	Outside temp Actual : –02.0	Outside temperature.	Appears if B2 detector configured	**19.3**
M0.11	Return temp Heating : 70c	Heating return temp. measured by B4.	Appears only if B4 detector configured	**19.3**
M0.12	Valve position Heating :100%	Calculated position of heating valve.		**19.3**
M0.13	DHW temperature D: 50c A: 50c	Desired temp. DHW (storage or distrib.). Actual temp. measured by B5 detector.	Appears if only B5 detector configured	**19.3**
	DHW storage T D: 50c A: 50c	Desired temp. DHW storage. Actual temp. measured by B5 detector.	Appears if B5 & B6 detectors configured	
M0.14	DHW distribut T D: 50c A: 50c	Desired temp. distribution DHW. Actual temp. measured by B6 detector	Appears if only B6 detector configured	**19.3**
M0.15	Valve position DHW : 100%	Calculated position of DHW valve.	Appears if B6 detector configured or if **M6.1** is MODULATING.	**19.3**
M0.16	Return primary T D: 50c A: 75c	Max temp, limit desired primary return. Actual temp. measured by B7 return detector	Appears only if B7 detector configured.	**19.3**
M0.17	Diff returns T D: 99c A: 5c	Max desired temp. difference between primary and secondary return Difference actual temp. measured between B7 and B4 detectors.	Appears only if B7 and B4 detectors configured	**19.3**

M0. NORMAL USE

Ref.	Display	Description	Notes	Sect.
M0.18	Flow m3/h xxx.xx	Value of primary flow (from volumetric meter).	Appears if **M7.4** is FLOW METER	**19.3**
M0.19	Degree-days 20:0000 Amb:0000	Metering degree days.	20: referred to room temp. fixed at 20 °C. Room : refers to actual or calculated room temp.	**14.14**
M0.20	12.18 MONDAY 30.08.00 GMT	Setting: Time, day of week and date Current time period: GMT or BST	.	
M0.21	DTT 608 Eng Vers.xx	Identifying data of controller .		

M1. TEMPS & CONTROLS

Rif.	Display	Descrizione	Note	Cap.
M1.1	Heating room T NORMAL 1 20.0c	Desired room temp. NORMAL 1	Appears if in **M5.1** is COMPENS - FIXED P	**14.6** **17.1.2.3**
M1.2	Heating room T NORMAL 2 20.5c	Desired room temp. NORMAL 2	Appears if in **M5.1** is COMPENS - FIXED P	**14.6** **17.1.2.3**
M1.3	Heating room T NORMAL 3 21.0c	Desired room temp. NORMAL 3	Appears if in **M5.1** is COMPENS - FIXED P	**14.6** **17.1.2.3**
M1.4	Heating room T NORMAL 4 19.5c	Desired room temp. NORMAL 4	Appears if in **M5.1** is COMPENS - FIXED P	**14.6** **17.1.2.3**
M1.5	Heating room T NORMAL 5 19.0c	Desired room temp. NORMAL 5	Appears if in **M5.1** is COMPENS - FIXED P	**14.6** **17.1.2.3**
M1.6	Heating room T SETBACK 1 16.0c	Desired room temp. SETBACK 1	Appears if in **M5.1** is COMPENS - FIXED P	**14.6** **17.1.2.3**
M1.7	Heating room T SETBACK 2 14.0c	Desired room temp. SETBACK 2	Appears if in **M5.1** is COMPENS - FIXED P	**14.6** **17.1.2.3**
M1.8	Heating room T FROSTPROT 06.0c	Desired room temp. FROSTPROT	Appears if in **M5.1** is COMPENS - FIXED P	**14.6** **17.1.2.3**
M1.9	Heating flow T FIXED POINT1 70c	Desired flow temp. FIXED POINT 1	.	**14.2.6** **16.1.2**
M1.10	Heating flow T FIXED POINT2 80c	Desired flow temp. FIXED POINT 2	.	**14.2.6** **16.1.2**
M1.11	Temperature DHW 1 50c	Desired temp. DHW 1 storage or distribution (B5).	Appears if only **B5** configured	**16.1.2** **17.1.2.3**
	Temperature STORAGE 1 50c	Desired temp. Storage 1 (B5).	Appears if **B5** and **B6** configured	
M1.12	Temperature DHW 2 50c	Desired temp. DHW 2 storage or distribution (B5).	Appears if only **B5** configured	**16.1.2** **17.1.2.3**
	Temperature STORAGE 2 60c	Desired temp. Storage 2 (B5).	Appears if **B5** and **B6** configured	
M1.13	Distribution T DHW 50c	Desired temp. DHW distribution (B6).	Appears if **B5** and **B6** configured.	**16.2**
M1.14	Emergency 21.0c for hours 3	Desired room temp. for Emergency period. Duration of Emergency period	Appears only if **M5.1** is COMPENS - FIXED P. The Emergency period is enabled by pressing for at least one second, the c1 button.	**17.6**
M1.15	cp prog switch OFF	Choice of program for heating plant by closing **cp** switch : – As **M0.2**.	Appears if **cp** program changing switch is configured in **M7.5** .	**14.8**
M1.16	Optim start :NO Optim stop :NO	Optimum start function: - YES; - NO Optimum stop function: - YES; - NO	Appears only if **M5.1** is COMPENS - FIXED P.	**15.**
M1.17	Eco Off :NO Outside T :+18c	Eco Off function : – YES ; – NO. Outside temp. for enabling Eco Off	Appears if **M5.1** is COMPENS - FIXED P and if in **M7.1 B2** is configured	**14.11**
M1.18	Anti-Frost : NO	Anti-frost function : if **M5.1** is COMPENS - FIXED P : – NO : function not enabled – OFF mode : enabled in OFF mode – FROSTPROT mode : enabled in Frostprot mode – OFF+FROSTPROTmode:enabled in OFF and in Frostprot modes. If **M5.1** is PLANTS : – NO ; – OFF	Appears if in **M7.1 B2** is configured.	**14.12**

M2. HEATING TIMES (LEDs 6.4 , 6.5 and 6.6 flashing)

Ref.	Display	Description	Notes	Sect.
M2.1	Number of 24hour programs : 1	Choice number 24hr programs to use (1...7) for control Heating.	Cancel unused display pages.	17.2
M2.2 ⇓ ⇓ M2.7	24H1 Ev1 06.00 FIXED POINT1 70c 24H1 Ev6 22.00 OFF	24 hour xx : number of 24hr progs (1…7) ; Evx : number of Event (1…6) ; Fr xx.xx : time of start Event ; Choice mode to assign to Event : – NORMAL 1…5 xx.x c : set in **M1.1...5** ; – SETBACK 1-2 xx.x c : set in **M1.6-7** ; – FROSTPROT xx.x c : set in **M1.8** ; – FIXED POINT 1-2 xx c : set in **M1.9-10** ; – OFF. **Other groups of 6 pages according figure in M2.1**	Max 6 periods. To cancel an unused period press + and – together : **- - . - -** appears. The Events must be in increasing order. Do not leave - - . - - between programmed events.	17.2
M2.8	Number of 7day programs : 0	Choice of number of 7day programs to use (0...2) for control Heating.	Cancel unused display pages.	17.3
M2.9 ⇓ ⇓ M2.15	7day1-MONDAY 24HOUR 1 7day1-SUNDAY 24HOUR 1	7day x : number of 7day program (1 or 2) ; Day of the week. Choice of program for each day of week: – 24HOUR 1…7 : set in **M2.2...7** ; – NORMAL 1…5 xx.x c : set in **M1.1...5** ; – SETBACK 1-2 xx.x c : set in **M1.6-7** ; – FROSTPROT xx.x c : set in **M1.8** ; – FIXED POINT 1-2 xx c : set in **M1.9-10** ; – OFF. **Other groups of 7 pages according figure in M2.8**	Appear if **M2.8** is 1 or 2.	17.3

M3. DHW TIMES (Appears only if B5 configured; LEDs 6.7 and 6.8 flash)

Ref.	Display	Description	Notes	Cap.
M3.1	Number of 24hour programs : 1	Choice number of 24hour programs to use (1...7) for DHW control.	Cancel unused display pages	17.2
M3.2 ⇓ ⇓ M3.7	24H1 Ev1 06.00 DHW 1 50c 24H1 Ev6 22.00 OFF	Number of program, number of Event and start time Event in program. Choice mode to assign to Event: – DHW 1-2 xx.x c : if only B5 config set in **M1.11-12** ; – STORAGE 1-2 xx.x c : if B5 & B6 config set in **M1.11-12** ; – OFF. **Other groups of 6 pages according figure in M3.1**	Max 6 Events. To cancel an unused period press + and – together: **- - . - -** appears. Events must be in increasing order. Do not leave - - . - - between programmed times	17.2
M3.8	Number of 7day programs : 0	Choice of number of 7 day programs to use (0...2) for DHW control.	Cancel unused display pages.	17.3
M3.9 ⇓ ⇓ M3.15	7DAY 1 MONDAY 24HOUR 1 7DAY 1 SUNDAY 24HOUR 1	Choice program for each day of week: – 24HOUR 1…7 : set in **M3.2-7** ; – DHW 1-2 xx.x c : if config. only B5 set in **M1.11-12** ; – STORAGE 1-2 xx.x c : if config B5 and B6 set in **M1.11-12** ; – OFF. **Other groups of 7 pages according figure in M3.8**	Appears if **M3.8** is 1 or 2.	17.3

M4. ANNUAL PERIODS

Ref.	Display	Description	Notes	Sect.
M4.1	**Number of annual periods : 0**	Choice number of annual periods to use (0…25).	Cancel unused display pages.	**17.4**
M4.2	**AP01 for: --- --- Fr: --.-- to: --.--**	AP xx : number of annual period. For : --- ---: replace dashes with outputs concerned with period : HEA ---=for Heating ; --- DHW = for DHW ; HEAT DHW= for heating and DHW; --- --- =period not used; Fr : --.-- : date of start period. to : --.-- : date of end period.	Appears only if **M4.1** > 0.	**17.4**
M4.3	**AP01-Heating: OFF**	Choice program assigned for period to Heating controller : – 7 DAY. 1…2 : set in **M2.9...15** ; – 24HOUR 1…7 : set in **M2.2...7** ; – NORMAL 1…5 xx.x c : set in **M1.1...5** ; – SETBACK 1-2 xx.x c : set in **M1.6-7** ; – FROSTPROT xx.x c : set in **M1.8** ; – FIXED POINT 1-2 xx c : set in **M1.9-10** ; – OFF.	Appears only if **M4.2** has been assigned HEATING	**17.4**
M4.4	**AP01-DHW: OFF**	Choice program assigned for period to DHW controller : – 7DAY 1…2 : set in **M3.9...15** ; – 24HOUR 1…7 : set in **M3.2...7** ; – DHW 1-2 xx.x c : if only B5 config. set in **M1.11-12** ; – STORAGE 1-2 xx.x c : if configured B5 e B6 set in **M1.11-12** ; – OFF. **Other pages like M4.2.3.4. according figure in M4.1**	Appears only if **M4.2** has been assigned DHW	**17.4**
M4.5	**Heating season Fr: 15.10 to: 15.04**	Dates of start and end of heating season.		**16.6** **17.7**
M4.6	**BST : AUT Fr: 31.03 to: 27.10**	– AUT : Automatic change of time (March - October). – MAN : Change time at dates set. Dates of start and end of BST period : if AUT : the date automatically appears ; if MAN : appears - - .- - to set manually.	.	**17.8**

M5. SETTING HEATING (LEDs 6.4 , 6.5 and 6.6 flash)

Ref.	Display	Description	Notes	Sect.
M5.1	Control mode COMPENS- FIXED P	Control mode for heating flow temp : – COMPENS - FIXED P : in relation to outside o a temp. or at fixed point. – PLANTS : in relation to temp. requested by plants (C-Ring). Can be set only if **M7.17** is PRIMARY.	.	**14.**
M5.2	Increase flow T on plants T: 5c	Increase of heating flow temp. in respect of temp. requested by plants in C-Ring.	Appears only if **M5.1** is PLANTS.	**14.1**
M5.3	Heat emitters RADIATORS	Choice type heat emitters: RADIATORS; FAN COILS; PANELS.	Appears only if **M5.1** is COMPENS - FIXED P	**14.3**
M5.4	Design outside temp :–05.0c	Value of design outside temp. for compensated control	Appears only if **M5.1** is COMPENS - FIXED P	**14.3**
M5.5	Design flow temp : 80.0c	Value of design flow temp. for compensated control	Appears only if **M5.1** is COMPENS - FIXED P	**14.3**
M5.6	CurveOrigin OT20 Flow T : 20.0c	Correction of heating curve origin .	Appears only if **M5.1** is COMPENS - FIXED P	**14.3**
M5.7	Flow T limits Min: 1c Max:99c	Value of minimum & maximum limits of flow temperature.	In COMPENS - FIXED P the min. limit applies only to NORMAL 1...5 modes.	**14.5**
M5.8	PropBand ±20c Integ Time 10m	Proportional Band in ± °C and Integral Time of control heating in minutes.		**14.9**
M5.9	Valve run time : 75sec	Valve run time.		**14.9**
M5.10	AmbientAuthority on flow :00.0c	Ambient authority. Variation ± °C of flow temp. with ± 1 °C difference in room temp.	Appears only if **M5.1** è CLIMAT.-P.FISSO.	**14.4**
M5.11	Start inertia MANUAL 1.00h/c	MANUAL : the inertia value can be adjusted only manually. AUTOMAT. : Only with B3 room detector. Value corrected automatically by controller.	Appears only if **M1.16** è Optimum Start: YES	**15.1.2.3**
M5.12	OptimumStartMax Normal : 2.00h	Maximum duration of optimum start with 24hour or 7day programs.	Appears only if **M1.16** is Optimum Start: YES	**15.6**
M5.13	OptimumStartMax Annual P :10.00h	Maximum duration of optimum start period after an annual period.	Appears only if **M1.16** is Optimum Start: YES	**15.6**
M5.14	Optimum Start Boosting: 3.0c	Increase in °C of desired room temp during optimum start period.	Appears only if **M1.16** is Optimum Start: YES	**15.4**
M5.15	Time Constant Cooling : 48hrs	Time required by building to reach mean temp. value between comfortable room (20 °C) and outide temperature.	Appears if **B3** not configured Serves to calculate room temp. in modes Setback 1-2 & Frostprot for control pump when **M5.15** is T EMP.	**14.10** **15.1.5**
M5.16	Optimun Stop reduct RT: 0.5c	Reduction of desired room temp. at time of end occupation.	Appears only if **M1.16** is Optimum Stop: YES	**15.5**
M5.17	Optimum Stop Maximum : 1.00h	Maximum duration of Optimum Stop period.	Appears only if **M1.16** is Optimum Stop: YES	**15.6**
M5.18	Antifrost temp Ot:– 3c Ft:20c	Temp. of Anti-Frost function. Ot : outside temp. for switching on pump. Ft : flow temp. regulated by valve	Appears if **M1.18** is not NO.	**14.12**
M5.19	Delay action: Antifrost 30min	Delay AntiFrost action.	Appears if **M1.18** is not NO.	**14.12**
M5.20	Heat pump: TIMES Delay Off: 30min	Control heating pump: – ON ; – TIMED ; – TEMP. ; Delay in switching off pump in minutes	ON : always on ; TIMES : If **M5.1** is PLANTS: does not appear. If **M5.1** is COMPENS - FIXED P : On with : Normal1…5, Setback1-2, Frostprot, Fixed Point1-2. Off with : Off ; Eco Off. TEMP. : If **M5.1** is COMPENS - FIXED P On with : Normal1…5, Fixed Point1-2. On with : Setback1-2, Frostprot only if Tr desired > Tr actual or calculated. Off con : Off ; Eco Off. if **M5.1** is PLANTS : On with : Tf desired plants > 0 Off with : Tf desired plants = 0	**14.10**

M5. SETTING HEATING (LEDs 6.4 , 6.5 and 6.6 flash)

Rif.	Display	Description	Notes	Sect.
M5.21	Summer exercise plant : NO	Summer exercise plant for heating plant : – NO : function not enabled ; – VALVE : enabled only for valve ; – PUMP : enabled only for pump ; – VAL+PUM : enabled for both ;		14.13

M6. SETTING DHW (Appears only if B5 configured,LEDs 6.7 , 6.8 & 6.9 flash)

Ref.	Display	Description	Notes	Sect.
M6.1	Control DHW MODULATING	Choice control mode : – MODULATING : Three-wire modulating control. – ON-OFF : On-Off control. On = 11-12 closed ; 13-14 open Off = 11-12 open ; 13-14 closed.	If **B5** and **B6** configured page does not appear and output 11-12, 13-14 is automatically MODULATING for control of distribution temp. (B6) and the output 8-9-10 is On-Off for control of storage temp. (B5).	16.1
M6.2	Valve run time : 75sec	Run time of modulating valve	Appears if **B5** and **B6** configured or if **M6.1** is ON-OFF	16.1.2
M6.3	Prop Band ±20c IntegTime 60s	Proportional Band in ± °C e & Integral Time of DHW control in seconds	Appears if **B5** and **B6** configured or if **M6.1** is MODULATING	16.1.2
M6.4	Differential storage : 5c	On-Off differential for DHW storage .	Appears if **B5** and **B6** configured or if **M6.1** is ON-OFF	16.1.2
M6.5	Increase flow T for DHW :10c	Increase flow temp. (B1) in respect desired DHW temp. (**M0.8**).	Appears if **M7.2** is HEAT EXCHANGER	16.
M6.6	Antibacteria NO	Antibacteria function : – NO : function excluded. – STORAGE: function enabled only for storage – STORAGE + DISTRIB: function enabled for both storage and distribution	.	16.4
M6.7	Antibact T 70c hrs02.00 for 90m	Temperature of antibacteria function. Time of activation & duration in minutes of antibacteria function.	.	16.4
M6.8	Antibact days M T W T F S S	Days on which antibacteria function activated. Use + and – keys to replace dashes with initials of days selected	.	16.5
M6.9	DHW priority: NO DHW summer :YES	DHW priority function : – YES; – NO. Use of DHW plant in summer : – YES ; – NO.		16.5 16.6
M6.10	Summer exercise plant :NO	Summer exercise plant for DHW plant : – NO : function not enabled ; – PUMP : enabled only for pump ; – VAL.+PUMP: enabled for both ;	Appears if **M6.9** is DHW SUMMER: NO	16.7

M7. CONFIG DTT 608

Ref.	Display	Description	Notes	Sect.
M7.1	Config detectors 1 – – – – – – –	Configuration detectors connected (inputs B-M). – = detector not connected; Number = detector connected. B6 can be configured only if B5 is configured.	1 : Heating flow temp. detector **B1**. 2 : Outside temp. detector **B2**. 3 : Room temp. detector **B3**. 4 : Heating return temp. detector **B4**. 5 : DHW temp. detector **B5**. 6 : DHW distribution temp. detector **B6**. 7 : Primary return detector (0...200 °C) **B7**. 8 : Remote control **R** for changing programs.	**13.**
M7.2	DHW with: AUTON EXCHANGER	– HEAT EXCHANGER : The DHW plant uses the primary heating exchanger. The desired DHW temp. influences the desired flow temp. of the secondary exchanger. – AUTON EXCHANGER : The DHW plant uses an autonomous primary exchanger.	Appears if **B5** configured	**13.** **16.**
M7.3	5-6-7: Pump HEATING	Use of control output 5-6-7 : – HEATING = switched on only at request of heating. If **M6.9** is DHW priority : YES, with request DHW switches off. – HEATING + DHW = switched on at request heating & at request DHW (B5)	Appears if **B5** configured and if **M7.2** is HEATING EXCHANGER	**14.10** **16.**
M7.4	Input E1: ALARM	Configuration input E1-D: – ALARM = **k1** alarm switch is connected. – FLOW METER = connected a flow meter **Q** with Reed pulse transmiiter or with Burst signals emitter.		**18.2** **20.3**
M7.5	Input E2: ALARM	Configuration input E2-D : – ALARM = **k2** alarm switch is connected. – cp SWITCH = **cp** switch for changing program is connected	.	**14.8** **20.3**
M7.6	LITRES x PULSE 0010,0	Flow measurement unit: : – LITRES x PULSE = 1.0...1,000.0 l/pul. Used with volumetric turbine (Reed pulse transmitter) or volumetrici volumetric ultrasound > DN 80. – PULSES x LITRE = 0.1…300.0 pul/l. Used with volumetric ultrasound < DN 100 (Burst signals)	Appears if **M7.4** is FLOW METER.	**18.2**
M7.7	Flow limit :NO Min: 000,01 m3/h	Minimum flow limit in primary circuit. – NO = limit not enabled. – YES = limit enabled: closes **Y1** primary valve Minimum limit value (0.01…650.00 m^3/h).	Appears if **M7.4** is FLOW METER.	**18.2**
M7.8	Flow limit : NO Max: 650.00 m3/h	Maximum flow limit in primary circuit. – NO = limit not enabled. – YES = limit enabled: closes **Y1** primary valve Maximum limit value (0.01…650.00 m^3/h).	Appears if **M7.4** is FLOW METER and if **M7.8** is YES	**18.2**
M7.9	PB flow : 50% Integ T: 10m	Proportional Band and Integral Time of control of maximum flow limit.	Appears if **M7.4** is FLOW METER .	**18.2**
M7.10	Return limit :NO Temp Max :99c	Max limit primary return temp. : – NO = limit not enabled. – YES = limit enabled, gradually closes **Y1**. primary valve Value of maximum limit temperature.	Appears only if **B7** configured.	**18.1**
M7.11	OT to cancel Max limits :–30c	Outside temp. below which controller does not take into account all the maximum limits set.	Appears only if **B2** configured.	**18.5**
M7.12	Differen returns Max:99c	Limits of temp. difference between primary return temp. **B7** and heating return **B4**. Gradually closes **Y1** heating valve.	Appears only if **B7** and **B4** configured Gradually closes valve. Reduces load peaks in district heating network.	**18.4**
M7.13	Valve run % Min: 0 Max:100	Limits to run of **Y1** heating valve.	Min. : when calculated position valve **Y1** is lower it is closed completely, viene chiusa completamente. Max. : when calculated position valve **Y1** is higher, it is maintained at maximum value.	**18.3**
M7.14	Reduct second T with limits: 5c	Desired reduction of secondary temp. to restore control after intervention of a limit which imposes closure of a valve.	Used when the valve is closed by limits : min. flow (**M7.7**) ; max. primary return temp (**M7.10**) ; max. difference temp. returns (**M7.12**).	**18.1.2.4**

M7. CONFIGURATION DTT 608

Ref.	Display	Description	Notes	Sect.
M7.15	Send alarms : NO PassWTeleman: NO	Triggering alarms to send to teleman. PC. Enabling telemanagement keynumber	Only if connected in C-Bus	10.6
M7.16	Address : --- Group : –	Telematic address of controller Group to which controller assigned	Only if connected in C-Bus	10.5
M7.17	CRing connection NO	NO : Not connected in C-Ring. PRIMARY : Connected in C-Ring as Primary.		10.1
M7.18	FunctionalAlarms – – – – – – – 8	Enabling of functional alarms Factory setting: only 8 enabled (cannot be disabled)	1 : Heating flow temp. alarm **B1**. 2 : Heating valve run limits alarm **Y1**. 3 : Room temp. alarm **B3**. 4 : Difference temp. returns alarm **B7-B4**. 5 : DHW temp. alarm **B5**. 6 : Distribution DHW temp. alarm **B6**. 7 : Max. primary return temp. alarm **B7**. 8 : Internal clock alarm.	20.1
M7.19	Detector alarms – – – – – – – –	Enabling of alarms for short or open detector circuits. Factory setting all disabled.	1 : Heating flow detector **B1**. 2 : Outside detector **B2**. 3 : Room detector **B3**. 4 : Heating return detector **B4**. 5 : DHW detector **B5**. 6 : DHW distribution detector **B6**. 7 : Primary return detector **B7**. 8 : C-Ring alarm.	20.2
M7.20	K alarms – –	Enabling On-Off alarms. Factory setting: all disabled	1 : Alarm with k1 closed. If **M7.4** is ALARM. 2 : Alarm with k2 closed. If **M7.5** is ALARM.	20.3
M7.21	Choice keynumber User : - - - -	Choice keynumber to prevent use + and – keys. – 1901 … 1999.	To cancel keynumber press + and – together	19.1
M7.22	Choice keynumber Configurat : - - - -	Choice keynumber to prevent use of + and – keys in menu CONFIG DTE 608. – – – ...9999	To cancel keynumber press + and – together.	19.1
M7.23	Name plant site - - - - - - - - - -	Entering name plant site.	Use + and – to enter letters and digits. Use ← and → to change position cursor.	19.2

M8. TESTING

Ref.	Display	Description	Notes	Sect.
M8.1	CRing:??	Page of testing C-Ring connections ?? = test C-Ring in progress or test negative YES = test positive	Appears only if **M7.17** is YES.	21.1
M8.2	Out :11-12-13-14 Status :IDLE	Choice outputs to test Choice status outputs.	Choice output : – 1-2-3-4 ; – 5-6-7 ; – 8-9-10 ; – 11-12-13-14 ; Choice status: with 1-2-3-4 : – IDLE ; – CLOSES ; – OPENS. with 5-6-7 : – 0N-0FF ; with 8-9-10 : – 0N-0FF ; with 11-12-13-14 : – IDLE ; – CLOSES ; – OPENS.	21.2

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