COMPENSATING OPTIMISER FOR CONTROL OF FLOW TEMPERATURE & OF FLOW RATE WITH ADJUSTABLE PUMP

B 243
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REV. 03

XTP 600 C1 Eng.

C ←RING

OPTIONAL
C ←BUS

UNIT OF THE COSTER *"TEM-PO"* FAMILY

MAXIMUM OUTPUT OF THE CONDENSATION BOILERS RETURN-TO-SITE TEMPERATURE MINIMISED WITH COMPENSATED TEMPERATURE & FLOW CONTROL

- **Control of a mixing valve**
- **Optimisation of heating circuit compensated temperature**
- **Optimisation of heating circuit flow**
- **Control storage tank by load or other pump**
- **Timed control for heating and DHW**
- **0…10 V output for variable-speed pump**
- **Power supply 230 V AC (or 240 V AC for UK market).**
- **Installation on DIN 6 unit rail**
- **Communication systems :**
  - **C-Ring** for exchange data of common interest between local controllers.
  - **C-Bus :** To Telemanage **XTP 600** use the accessory "**C-Bus Plug-in**" **type ACB 468 C1 or later**, (to be ordered separately)

1. APPLICATION

XTP 600 controller is designed for compensated control of winter heating in central heating zones.
Typical applications :
- Houses or blocks of flats.
- Public & commercial buildings;
- Schools;

2. FUNCTIONS

- Compensated control of heating zones.
  - control mixing valve actuator
  - optimisation of start and stop times
  - modulating compensated control of site pump in order to minimize return temperature
  - Frost protection
  - compensating curves for temperature and flow
- Temperature control of DHW storage tank
  - control of load pump or of diverting valve for DHW
  - priority and antibacteria functions
- Timed 24hour & 7day programming
- Programming with dates: 25 holiday periods; winter season; special period
- Automatic setting BST/GMT
- Periodic operation of summer site exercise for valves and pumps.
- Metering of degree-days.
- Remote control for changing program in use
- Four On-Off inputs for signalling status or alarm.
- **C-Ring** connection for local exchange of data with other COSTER controllers.
- Optional connection C-Bus for transmission data local PCs or remote PCs by Telemanagement.
  For transmission data and Telemanagement use "C-Bus Plug-in" type ACB 468 C1 or later
  To communicate locally with a PC use test plug-in type ACX 232

3. SENSORS AND ACCESSORIES

No.	Descriziption		Model	Sensing element t°	Code	Data sheet
	Essential sersors					
1	Heating flow temperature sensor:	surface	**SCH 010**	NTC 10 kΩ	B1	N 130
		immersion	**SIH 010**	NTC 10 kΩ	B1	N 140
1	Outside temperature sensor		**SAE 001**	NTC 1kΩ	B2	N 120
1	Return site temperature sensor	surface	**SCH 010**	NTC 10 kΩ	B4	N 130
		immersion	**SIH 010**	NTC 10 kΩ	B4	N 140
	Accessories					
1	DHW storage tank temperature sensor	immersion	**SIH 010**	NTC 10 kΩ	B5	N 140
1	Room temperature sensor		**SAB 010**	NTC 10 kΩ	B3	N 111
1	Flue gases temperature sensor		**STF 001**	PT 1 kΩ	B6	N 165
1	Remote control to change program in use		**CDB 300**		R	N 710
	Accessoris for Telemanagement					
1	Plug-in for communication via C-Bus		**ACB468 C1**	–	–	–

4. TECHNICAL DATA

• Electrical

Power supply	230 V AC ± 10% or 240 V AC for UK market
Frequency	50 … 60 Hz
Consumption	5 VA
Protection	IP40
Radio disturbances	VDE0875/0871
Vibration test	con 2g (DIN 40 046)
Voltage-free output contacts:	
maximum switched voltage	250 V ~
maximum switched current	5 (1) A
Construction standards	Italian Electrotech. Committee (CEI)
Life battery for clock & data storage in memory	without limit

• Mechanical

Enclosure	DIN 6 E module
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	0.9 kg

• Individual programs for heating & DHW

24hour programs	**1** … 7
24hour events	**2** … 6
7day programs :	**0** … 2
Holiday periods	**0** … 25
Special period	1
Remote Extension period	0 ... **3** ... 72 h

• Measurement ranges

Flow temperature	0 … 99 °C
Outside temperature	– 30 … + 40 °C
Room temperature	0 … 40 °C
Storage tank temperature	0 ... 99 °C
Flue gases temperaturei	0 ... 500 °C
Return temperature	0 … 99 °C

• Heating

Flow temperature:	
radiators	40 ... **70** ... 99 °C
convectors	40 ... **80** ... 99 °C
panels	20 ... **40** ... 50 °C
minimum limit	**1** … 99 °C
maximum limit	1 … **99 °C**
Heating flow	
pump	a giri variabili
pump input	0...10 Volt
setting input	completa
Iminimum limit revolutions	0...50%
maximum limit revolutions	50...100%
Outside design temperature	– 30 … **– 5** … + 20 °C
Correction curve origin	**20** … 40 °C
Run time valve actuator	30 ... **630** ... 3,600 s
Ambient authority	**0** ... 20 °C/°C
Temperature modes:	
room 5 Normal	0 … **19÷21** … 30 °C
room 2 Setback	0 … **12÷16** … 30 °C
2 set flows	0 … **20÷30** … 99 °C
room FROSTPROT	0 … **6.0** … 30 °C
room Remote Extension	0 … **21** … 30 °C
Optimisation of operating hours:	
Optimum start inertia	0.00 ... **1.00** ... 7.45 h
limit of “Normal” optimum start	0.00 ... **2.00** ... 12.00 h
limit of “Holidays” optimum start	0.00 ... **10.00** ... 40.00 h
optimum start boosting	0.0 ... **3.0** ... 10.0 °C
reduction Room T on optimum stop	0.0 ... **0.5** ... 3.5 °C
time constant	1 ... **48** ... 255 h

• Control storage tank

Temperature	0 ... **50.0** ... 99.0 °C
Differential	0.5 ... **5.0** ... 30.0 °C
Increase C-Ring over desired storage tank temp.	0 ... **5.0** ...50.0 °C

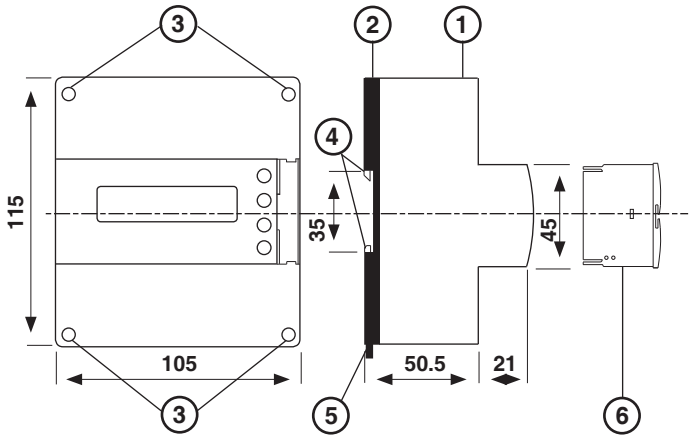
• Alarms

Configurable functional alarms	8
Alarms for sensors or other configurable	8

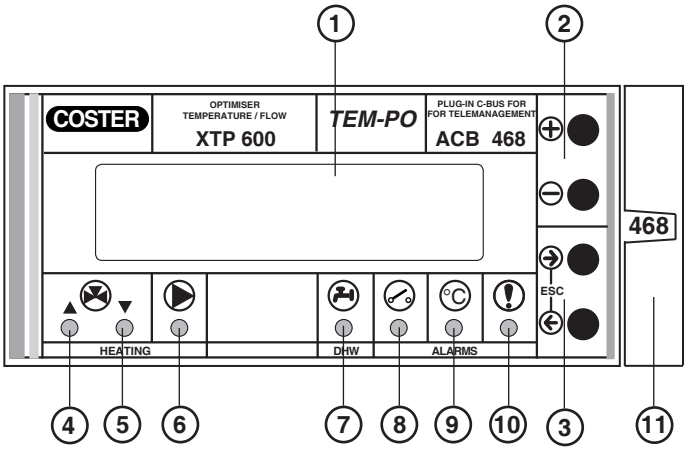
• Telemanagement

Speed C-Bus chosen from: 1200, 2400, 4800, 9600 baud
Data logger for all principal measurements

5. FACIA & 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 – Plug-in for C-Bus communication



1 - Two-line illuminated alphanumeric display
2 - + and – keys
3 - ← e → keys
4 - Mixing valve “OPENS”
5 - Mixing valve “CLOSES"
6 - Heating pump
7 - DHW
8 - On-Off alarms LED
9 - Measurement alarms LED
10 - LED for internal fault
11 - Plug-in type ACB 468 C1 for C-Bus communication

6. *"TEM-PO"* COSTER : COMPENSATED CONTROL OF TEMPERATURE & FLOW

Up until now compensating controllers for heating sites have controlled only the flow temperature to the heat emitters:
The flow temperature is compensated by the outside temperature and by the desired room temperature.
The pump (usually with a fixed number of revolutions) sends the water to the heat emitters always at the same speed and so always with the same flow.
The pump is almost always abundantly sized, with the following result:
The return-to-site temperature is only slightly below the flow temperature: usually only a few degrees.
The return-to-boiler temperature is the same as that of the return to site, that is, almost equal to that of the flow.
With normal boilers this does not create any significant problem since a return temperature above 60°C is necessary to avoid condensation.
Often a boiler recycle pump is used to ensure a return at 60°C when, in the intermediate seasons, the compensated temperature falls below this value.
All this is fine if the boilers are of the normal type: if, however, they are condensation boilers the situation is very different!
It is necessary to have as low a return temperature as possible in order to ensure condensation, even if the flow temperature has to be high in order to ensure a comfortable room temperature.

This means that you must have as high a thermal difference as possible between flow and return, compatible with a comfortable room temperature.

6.1 Mean temperature of heat emitters

Even if the reasoning made in this section holds good for any type of heat emitter, we shall, for simplicity, always refer to radiators.
When the return-to-site temperature is of no importance (normal boilers) the average temperature of the radiators is almost equal to the temperature of the flow, since the temperature at the radiator output does not differ much from that of the input.
Accordingly, the amount of heat emitted by the radiator can be considered a function of the flow only.
When it is important to reduce the return temperature as much as possible (condensing boilers), clearly the water temperature at the radiator output must be considerably lower than the entry temperature.
In order for this to take place the water has to remain longer in the radiator so as to provide more heat to the room and so cool down more.
Essentially, the water must flow through the radiator much more slowly: a low speed means a low flow.
In this event the amount of heat emitted by the radiator is a function of the mean between flow and return.
From a practical point of view, for existing sites the difference between flow and return site (radiators) can be controlled even up to and over 30°C. For example:
If the radiator requires a mean temperature of 50°C (outside temperature 7°C) the flow temperature can be 60°C and the return temperature 40°C: the mean is 50°C, the temperature required for compensation.
With a 40°C return a good condensating boiler has an efficiency gain of 8/9 points as a result of the low return temperature and, as a consequence, low flue gases.

6.2 Site flow temperature with COSTER "TEM-PO" control

Using ***COSTER "TEM-PO"*** the compensation curve, set using the same standard criteria, is re-calculated increasing the flow (with a higher upper limit) in order to permit a lower return temperature which, averaged with the flow, gives exactly the original compensation.
In this way the radiators provide the same amount of thermal energy since they have the exact compensated mean value to ensure the same comfortable room temperature.

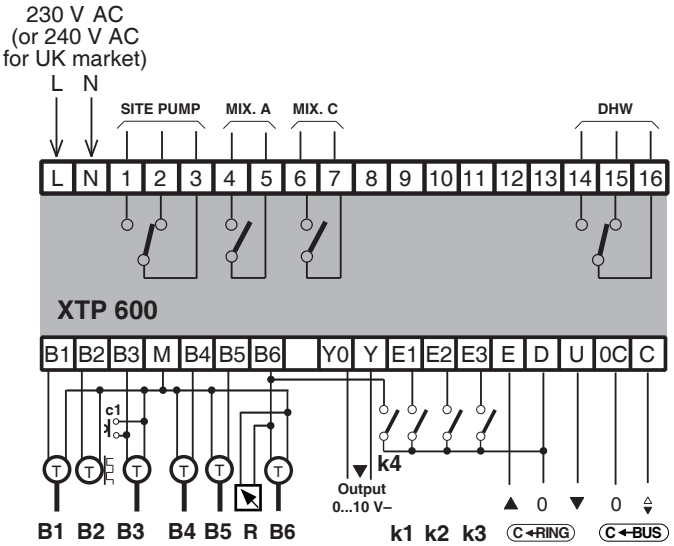
6.3 Flow of pump with variable speed in COSTER "TEM-PO" control system

In the ***COSTER "TEM-PO"*** control system the pump too is controlled in the compensating mode so as to optimise the flow to the radiators and so the thermal head of these, with a low return temperature:
The flow is controlled with this criterion:
– A MINIMUM FLOW ACCEPTABLE TO THE SITE when the weather is not too cold
– AN FLOW INCREASING TO A MAXIMUM, when the weather starts to become colder

The result of the compensated modulation of the flow is as follows:
– SEASON NOT AT ITS COLDEST: the compensated flow temperature is set on the high side and the pump is kept always at an acceptable minimum which ensures a low return temperature with a mean radiator temperature which ensures a comfortable conditions in the room.
The duration of this type of weather may account for up to 90% of the season.
It accounts for the major part of the seasonal energy consumption.
The condensing boiler will be in ideal conditions for condensation, thereby raising the seasonal output.
– SEASON OF MAXIMUM COLD: the compensated flow temperature stays at its maximum limit and the pump starts to increase its flow: the lower the outside temperature, the greater the flow.
The flow reaches its maximum when the outside temperature equals that of design: the duration of this part of the season does not generally exceed 10%: during this period the return temperature will rise as the outside temperature falls.
In view of the brevity of this very cold period the seasonal energy output is affected very little.

With COSTER "TEM-PO" control, flow and temperature are controlled by means of compensation curves designed so that the quantity of heat emitted by the radiators is exactly that required to provide a comfortable temperature.
The boiler is in ideal condensation conditions for the greater part of the heating period.

7. WIRING DIAGRAM



B1 – Site flow temp. sensor
B2 – Outside temp. sensor
B3 – Room temp. sensor
B4 – Return site temp. sensor
B5 – DHW storage tank temp. sensor
B6 – Flue gases temp. sensor (alternative to "R")
c1 – Remote Extension push-button switch
R – Room remote control (as alternative to B6 & k4
Y0 – Optoisolated output for control pump 0 … 10 V (cold pole)
Y – Optoisolated output for control pump 0 … 10 V (hot pole)
k1...k3 – Three On-Off alarm switches
k4 – Further alarm switch as alternative to "R" (CDB 300)
C-Ring – Exchange data between controllers C-Bus
C-Bus – Transmission data by Telemanagement.
C-Bus enabled using Plug-in type ACB 468 C1

L – Line 230 Volt AC (or 240 V AC for UK market)
N – Neutral
SITE PUMP – On-Off control site pump
Pump ON = switch 2, 3 ON,
switch 1, 3 OFF
Pump OFF = switch 2, 3 OFF,
switch 1, 3 ON
Mix. A – Control open mixing valve site flow
Mix. C – Control close mixing valve site flow
DHW – Control DHW
Request DHW ON = switch 14, 16 ON,
switch 14, 15 OFF
Request DHW OFF = switch 14, 16 OFF,
switch 14, 15 ON

8. SITING OF DEVICES

8.1 Controller

The controller must be installed in a dry location that respects the relevant ambient conditions already specified. If sited in a location classified as "Hazardous" it must be installed in a cabinet for electrical equipment constructed according to the regulations in force.

8.2 Temperature detector site flow B1

With the site pump on the flow it must be installed downstream of this; with the pump on the return it must be installed at least 0.5 meters downstream of the control valve.

8.3 Outside temperature detector B2

This must be installed outside the building on the north or north-west side, 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 direct thermal disturbance.

8.4 Room temperature detector B3

This must be installed at a point which represents the average temperature of a typical space.

8.5 Return site temperature detector B4

This must be installed on the return pipework of the site.

8.6 Storage tank temperature detector B5

This must be installed in the lower part (1/3 height) of the storage tank.

8.7 Flue gases temperature detector B6

This must be installed inside the flue at the output of the boiler.

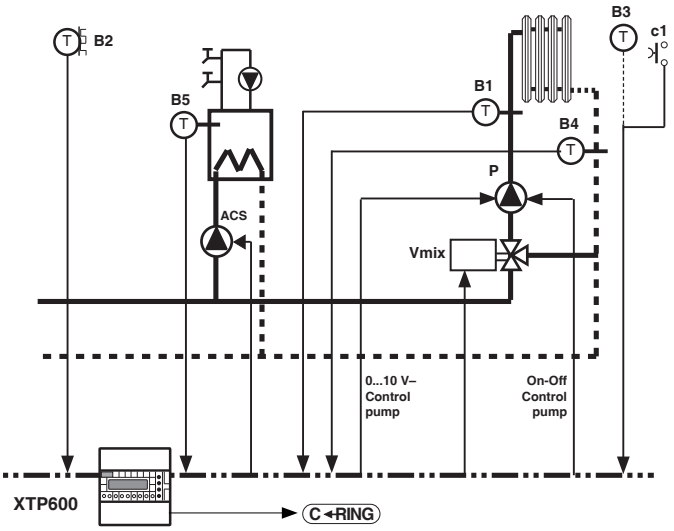
9. ELECTRICAL CONNECTIONS

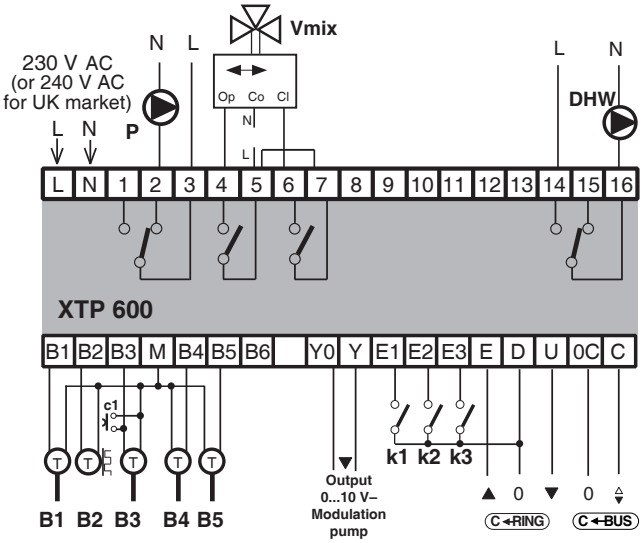
- Make the electrical connections according to the diagram and in respect of the safety regulations in force using the following cables :
  – 1.5 mm^2 for power supply and the relay control outputs.
  – 1 mm^2 for detectors and remote control.
  – 1 mm^2 for C-Bus and C-Ring. For length limits see Technical Data Sheets T 021 and T 022.
- Switch on power (230 V AC, 240 V AC for UK market) and check its presence at terminals L and N.

It is advisable not to insert more than two cables in a single terminal and, if necessary, to use an external terminal block.

10. EXAMPLES OF CONTROL SITES WITH COSTER "TEM-PO" (WITH WIRING DIAGRAMS)

10.1 Site with single flow, mixing valve and DHW production



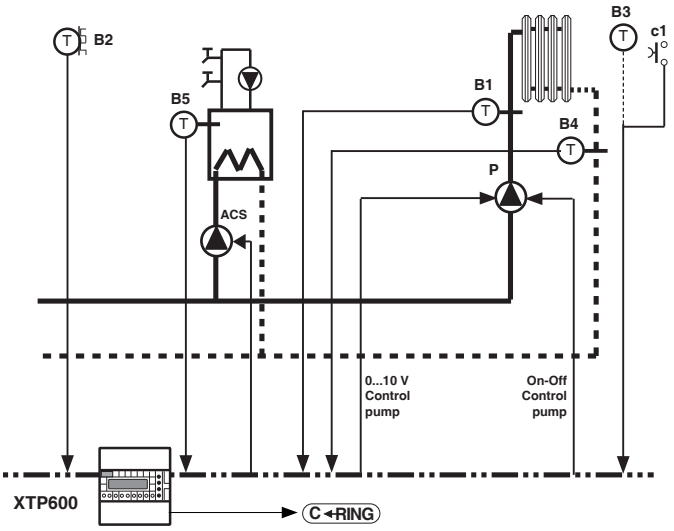


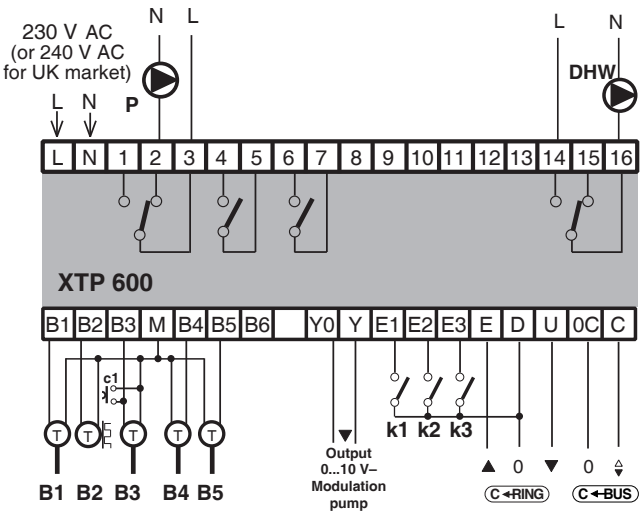
B1 – Site flow temp. sensor
B2 – Outside temp. sensor
B3 – Room temp. sensor
B4 – Return site temp. sensor
B5 – Storage tank (DHW) temp. sensor
c1 – Remote Extension push-button
k1...k3 – Three (voltage-free) switches for alarms
Y0 – Optoisolated output control pump 0 … 10 V (cold pole)
Y – Optoisolated output control pump 0 … 10 V (hot pole)
This output is the modulating compensated control of the variable-speed

L – 230 V AC (or 240 V AC for UK market)
N – Neutral
P – Variable-speed heating pump; this pump is controlled On-Off as well as 0…10 V modulating
V mix – Control actuator of mixing valve
DHW – Control storage tank (DHW) pump

C◄RING – XTP 600, by means of C-Ring communication bus sends desired temp. to boiler(s).
C◄BUS – Telemanagement Bus enabled by ACB 468 C1 accessory

10.2 Site with single flow (without mixing valve) and production of DHW





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B4 – Return site temp. sensor
B5 – Storage tank (DHW) temp. sensor
c1 – Remote Extension push-button switch
k1...k3 – Three (voltage-free) switches for alarms
Y0 – Optoisolated output control pump 0 … 10 V (cold pole)
Y – Optoisolated output control pump 0 … 10 V (hot pole)
This output is the modulating compensated control of the variable-speed pump output

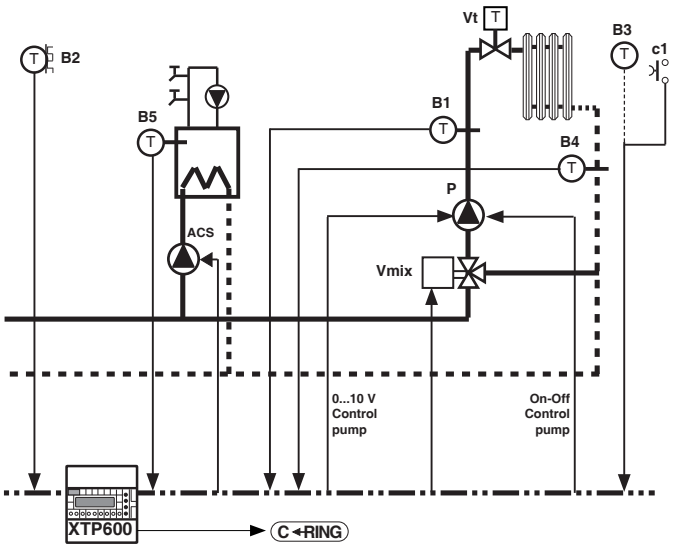
L – 230 V AC (or 240 V AC for UK market)
N – Neutral
P – Variable-speed heating pump; this pump is controlled On-Off as well as 0 … 10 V modulation
DHW – Control storage tank (DHW) pump

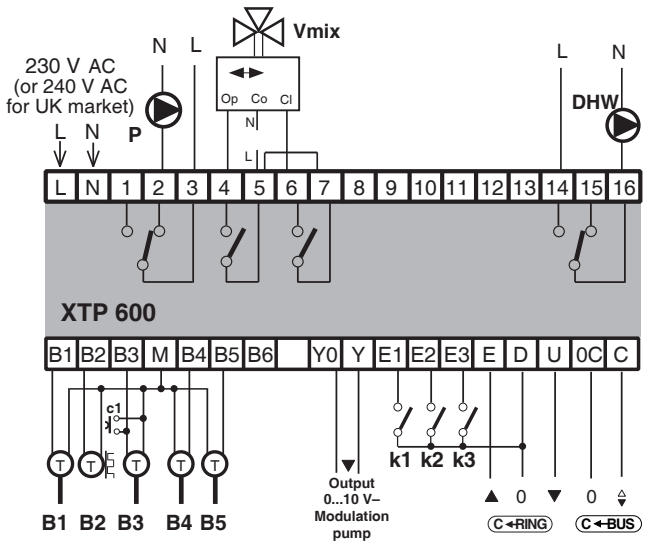
C◄RING – XTP 600, by means of C-Ring communication bus sends desired temp. to boiler(s).
C◄BUS – Telemanagement Bus enabled by ACB 468 C1 accessory

WARNING: in the two heating and DHW circuits it is necessary to provide "holding" valves (non-return valves) in order to be certain that the heating pump does not send water to the storage tank and, above all, that the reverse occurs.

10.3 Site with single flow, mixing valve, radiators with thermostats and DHW production

***COSTER "TEM-PO"* (control temperature/flow) PUTS THE THERMOSTATIC VALVES IN IDEAL CONDITIONS**





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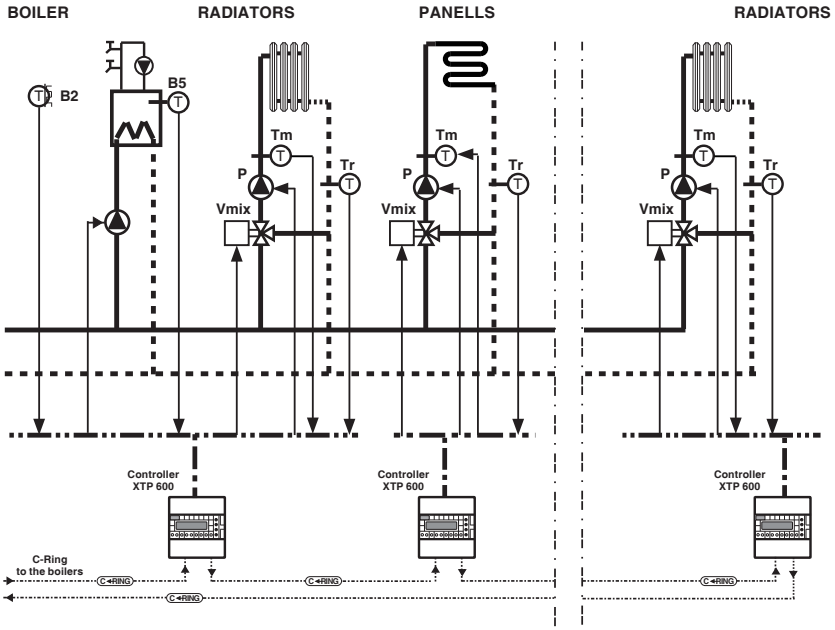
This output is the modulating compensated control of the variable-speed pump output

L – 230 V AC (or 240 V AC for UK market)
N – Neutral
P – Variable-speed heating pump: this pump is controlled On-Off as well as 0 … 10 V modulating
V mix – Control actuator of mixing valve
DHW – Control storage tank (DHW) pump
Vt – Valvola termostatica radiatore

C◄RING – XTP 600, by means of C-Ring communication bus, sends desired temp. to boiler(s).
C◄BUS – Telemanagement Bus enabled by ACB 468 C1 accessory

Operation: The temperature/flow control puts the thermostatic valves in ideal operating conditions.
The compensated control is set so that temperature and flow are slightly greater than what is necessary at that moment in order to meet the requests of the actual outside temperature and of the desired room temperature.
Accordingly, the thermostatic valves should intervene only to make fine adjustments, or to switch off the radiators completely if the user so desires.
The thermostatic valves function in a field of thermal power to already "SET" by the centralised temperature/flow control: they function perfectly even if they are not put in ideal conditions for room temperature control.
Under these conditions even valves which are not very quick-acting function very satisfactorily..

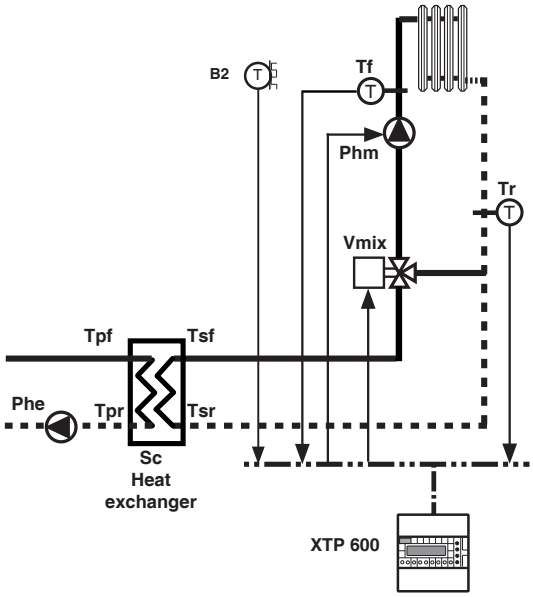
10.4 Site with several flows (any number) of different types

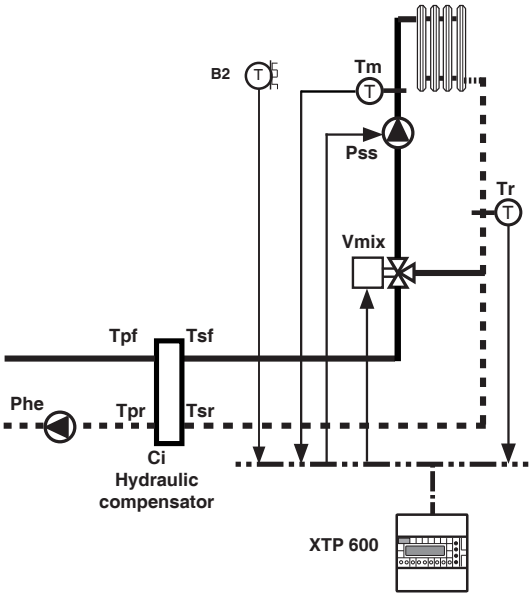


Operation :
– **CONTROL DHW STORAGE TANK**: controlled by the first controller
– **RADIATORS**: controlled by the first controller for temperature and flow
– **PANELS**: controlled by the second controller for temperature and flow
– **C-RING TO BOILER(S)**: all the various controllers are connected in C-Ring which communicates, to the single boiler or to the boilers in sequence, the temperature requested to satisfy all the zones without compromising condensation.
Clearly, condensation will be better ensured if all the flows are controlled both for temperature and flow..

10.5 Sites with heat exchanger and/or hydraulic compensators

HYDRAULIC DIAGRAMS TO BE USED ONLY IF ABSOLUTELY NECESSARY, SINCE THESE SYSTEMS TEND TO INCREASE THE RETURN-TO-BOILER TEMPERATURE, THEREBY REDUCING THE CONDENSATION CONSIDERABLY.





Phe = Pump primary circuit of heat exchanger: this pump can be of the adjustable speed type and be regulated by a controller which optimises the flow and/or return-to-boiler temperature.Pss
Phm = Pump secondary site circuit: this pump has adjustable speed and is controlled by XTP 600.

– SITE WITH HEAT EXCHANGER:
The heat exchanger, on any type of site, should be used only if absolutely necessary.
The heat exchanger becomes absolutely necessary only when the two circuit have to be separated hydraulically. e.g.:
– large differences of hydrostatic pressure (e.g. in very high buildings)
– hydraulic separation of boilers and use circuits
– very complex circuits
The use of a heat exchanger, even one of very generous dimensions, alters the boiler temperature:

- **Tpf** = Temperature primary flow.
  This temperature has to be, in real situations, at least 10°C above the temperature requested by the zones.- Tsf = Temperature secondary flow.
  This is the radiators flow temperature, calculated by the temperature /flow controller.
- **Tsr** = Temperature secondary return
  This is the return-from-radiators temperature, obtained by means of a correct flow regulated by pump Psc.
- **Tpr** = Temperature primary return: at least 10°C above return-from-radiators temperature
- **Pph** = Circulation pump for primary circuit of heat exchanger; this pump, correctly sized, is of the adjustable speeds type; it sends in circulation a certain flow between flow and return of manifold of the boiler/s.
  Result: the flow temperature to the boiler must be at least 10°C higher than that of the flow of the radiators, and the temperature of the return-to-boiler at least 10°C higher than that of the radiators.

THE USE OF THE HEAT EXCHANGER CAUSES THE LOSS OF AT LEAST 3 TO 4 PERCENT TO THE CONDENSATION BOILER

Pci =Pump primary circuit of heat exchanger: this pump can be of the adjustable speed type and be regulated by a controller which optimises the flow and/or return-to-boiler temperature
Pim = Pump secondary site circuit: this pump has adjustable speed and is controlled by XTP 600.

– SITE WITH HYDRAULIC COMPENSATOR:
The hydraulic compensator, on any type of site, should be used only if absolutely necessary.
The hydraulic compensator is used in very long circuits, where it is necessary to use several pumps in sequence.
With variable-speed pumps, correctly sized, use of hydraulic compensator finds little justification.

The use of the hydraulic compensator, even if correctly sized, alters the temperature in the boiler.
The way this alterations take place is very complex, since it depends on the interplay of water flow inside the compensator itself: this play depends on many hydraulic factors such as the head of pumps and pressure drop of consumer outlets.

-**Flow inside the compensator**: The flow inside the compensator can be nil, positive (from the flows to the returns) or negative (from the returns to the flows), according to the hydraulic characteristics at each moment of the pumps and of the site..
  - **No circulation**: the hydraulic system is in perfect balance, as if the compensator did not exist. This condition is usually that of design, even if in the actual operation of the site it happens quite rarely.
  - **Positive circulation**: from the flows to the returns. The return-to-boiler is heated by this recycling.
  - **Negative circulation**: from the returns to the flows. The temperature of the flow-to-zone is mixed with the return-to-site, requesting a higher temperature from the boiler flows.

Result: the flow or the return to boiler is modified by an amount difficult to estimate during operation.

THE USE OF THE COMPENSATOR CAUSES A PERCENTAGE LOSS WHICH IS DIFFICULT TO CALCULATE FOR CONDENSATION BOILERS

11. COMMUNICATION BETWEEN CONTROLLERS

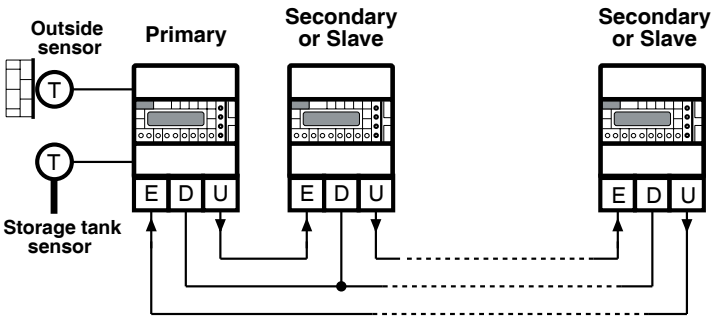
11.1 C-Ring communication between controllers (for detailed information consult Data Sheet 022)

XTP 600 controller can be **Primary or Secondary**.
In the serial C-Ring the following signals are transmitted:
– permission for operation of **Slave** controllers
– measurement of outside temperature; use of a single sensor for several controllers
– value of flow temperature requested by the controllers to use as desired temperature for the boiler/s controllers.
– priority storage tank = modulating closure of valves for heating zones.

XX.x
Anello CRing: NO

– NO= connection to C-Ring not programmed
– PRIMARY= connection to C-Ring as primary controller programmed XX.x
– SECONDARY = connection to C-Ring as secondary controller programmed C-Ring: NO

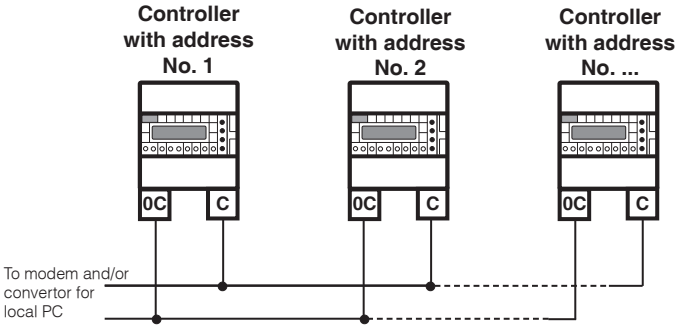
11.2 Electrical connection C-Ring



12. C-BUS COMMUNICATION (LOCAL OR REMOTE TELEMANAGEMENT)

Each controller has to be provided with the C-Bus Plug-in of the correct type

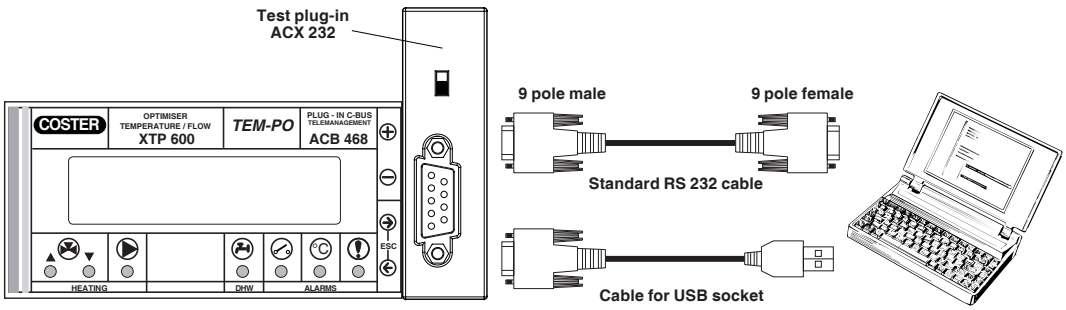
XTP 600 provides :
– Remote Telemanagement using **C-Bus Plug-in** type **ACB 468 C1.**
Telemanagement is bidirectional, with one or more local PCs and/or a remote central position via telephone or other networks.
Local communication is with a PC (portable) to connect directly to the controller.From the PC(s) you can see and/or modify all the parameters of the controller and readout all the data.



XTP 600 can communicate at various speeds (see page XX display x.xx.x)
If on the site were connected via C-Bus other controllers with different speeds, it would be necessary to make uniform the speed of all the units and the modem.

13. CONNECTION TO PC FOR LOCAL COMMUNICATION BY MEANS OF ACX 232 TEST PLUG-IN

Withdraw the C-Bus Plug-in and insert the ACX 232 test Plug-in; use a standard cable to connect the RS 232 plug to the PC (the cables are to be found in the "HANDY KIT").
If the PC has only USB inputs use a standard RS232 to USB conversion cable.



ACCESSORIES :

– Test plug-in =**ACX 232**

– Handy kit = **KIT RS 232**

The Handy Kit contains the two cables & other accessories useful for servicing.

Notes : – Before communicating ensure that the address entered in the controller is the address with which you want to communicate via PC
– It is recommended to use a battery
– Powered portable PC with the connection to 230 V removed (or 240 V for UK market), since the earth (0 V) of the device is connected to that of RS232 and so to that of the PC. By connecting the two earths together you can create a situation of dispersed currents, if the earths have not been efficiently made and if the PC has its 0 V connected directly to the central pole of the plug (as is usual).

14. PRINCIPAL FUNCTIONS OF COMPENSATING CONTROLLER/OPTIMISER

XTP 600 is a compensating controller/optimiser for a heating site, which, besides maintaining the correct mean temperature of the heat emitters, also controls the flow in order to optimise the return-to-boiler temperature.
In this section will be described briefly all the functions of XTP 600, without entering into details, since these will be dealt with when the programming pages are examined.

The order in which you have to carry out operations on the controller from the moment it is installed is the same as that in which the following sub-sections are presented.

14.1 Configuration of site: menu No. 6. CONFIGURATION CONTROLLER

By "configuration of site" is meant the adaptation of XTP 600 to the site it has to serve.
Without a correct SITE CONFIGURATION XTP 600 cannot carry out its functions correctly.
Configuration comprises essentially of the following:
– COMMUNICATION RING BETWEEN CONTROLLERS (C-Ring): the controller is informed if it has to operate on its own or with other controllers controlling other sites and controlling the boilers.
– SENSORS CONNECTED & VARIOUS ALARMS: the necessary sensors and all the alarms of the system are configured.
– TELEMANAGEMENT: all information necessary for Telemanagement of the site is configured.
– ACCESS KEY: an access key can be entered to prevent tampering.
– SITE NAME: the site name can be entered so it can be recognised immediately on the display.

14.2 Setting heating and storage tank for DHW: menu No. 4. SETTING HEATING/STORAGE TANK

In this menu are entered all the parameters for the correct settings of: compensated control of temperature, optimum start and stop and production of DHW.
– SETTING COMPENSATED CONTROL: this setting is the same as that carried made on the standard COSTER compensating controllers. The same simplicity of use has been maintained, notwithstanding this controller controls flow as well as temperature.
– SETTING MORNING OPTIMUM START & EVENING OPTIMUM STOP: these functions, too, follow the same COSTER criterion of simplicity of use.
– SETTING ON-OFF CONTROL of the circulation pump: the circulation pump, besides having an adjustable speed (see relative menu) can also be switched On and Off, with all the operational optimisations which provide economic and comfortable heating.
– SETTING PRODUCTION DHW.

14.3 Setting circulation pump: menu number 5. SETTING CIRCULATION PUMP

This menu deals specifically with the control of the variable-speed pump.
Control of the pump is by means of a 0 … 10 V output, adjustable as required,
Setting the parameters concerning the site circulation has been made as simple as possible in order to achieve a comfortable room temperature combined with the possibility of condensation in the boiler so as to obtain the maximum energy output.
The procedure for this setting and for the subsequent check is explained in detail in the relative menu and in a dedicated section.

14.4 Electrical/hydraulic testing of the site: menu number 7.TESTING

This controller, too, has a dedicated menu for the testing procedure.

14.5 Programming desired temperatures & various controls: menu No. 1. TEMPERATURES & CONTROLS

In this menu you can set various desired temperatures to make up the heating programs,
– DESIRED NORMAL ROOM TEMPERATURES: you can choose from five different normal room temperatures to assign as required to the different events of the timed programs.
– DESIRED SETBACK ROOM TEMPERATURES: you can choose from two different setback room temperatures to assign as required to the different events of the timed programs.
– FROSTPROT ROOM TEMPERATURE: you can set a room frost protection temperature.
– DESIRED SET FLOW TEMPERATURES: you can choose from two fixed flow temperatures to assign as required to the timed programs.
– TEMPERATURE & PROGRAMS FOR DHW: you can set the temperature and the timed program for DHW.
– REMOTE EXTENSION, ECO OFF, OPTIMISATION & SUMMER SITE EXERCISE: auxiliary functions which are very useful for efficient management of the heating site.

14.6 24hour, 7day and annual programming: menu No. 2 TIMES & PERIODS

In this menu you can set a series of timed programs:
– UP TO SEVEN 24HOUR PROGRAMS each with six event times
– UP TO TWO 7DAY PROGRAMS
– UP TO 25 ANNUAL HOLIDAY PROGRAMS
– HEATING SEASON PERIOD

14.7 Readout of all measurements and counts: menu No. 3. MEASUREMENTS/COUNTS

In this menu you can read all the temperature and other values regarding the site.
– TEMPERATURES: you can see the desired and actual temperatures
– TEMPERATURE DIFFERENCES: you can also see the differences between two temperatures which are of importance for monitoring the performance of the site.
– THERMAL LOAD FACTOR: you can readout the percentage power value which the heating site is providing to the zones in respect of the maximum.
– MEASUREMENTS REGARDING CIRCULATION PUMP: you can readout the percentage values for the control of the variable-speed pump.
– MEASUREMENTS REGARDING STORAGE TANK
– MEASUREMENTS REGARDING BOILER FLUE GASES: this measurement is an accessory which can give an idea of the true possibility of boiler condensation.
– DEGREE-DAYS: you can see the degree-days regarding the heating period.

14.8 Rapid use controls: menu No. 0. RAPID ACCESS PAGES FOR NORMAL USE

In this menu you can set:
– DESIRED HEATING PROGRAM
– A SMALL ADJUSTMENT TO DESIRED ROOM TEMPERATURE: a quick way of increasing or decreasing the programmed room temperature.
– SPECIAL PROGRAMMING: a simple way of choosing a particular program to be in operation for a determined period of time. e.g. switching on heating during a period when it is normally switched off.

14.9 Remote control of existing program: use of CDB 300 accessory

Using the CDB 300 accessory, to be installed in any convenient place, you can control the heating program remotely without having to go to the boiler site.

14.10 Remote Extension button: c1 on wiring diagram

You can connect a remote push-button switch for switching on heating for a certain period in the event of an emergency (e.g. unforeseen occupation of flat, offices).

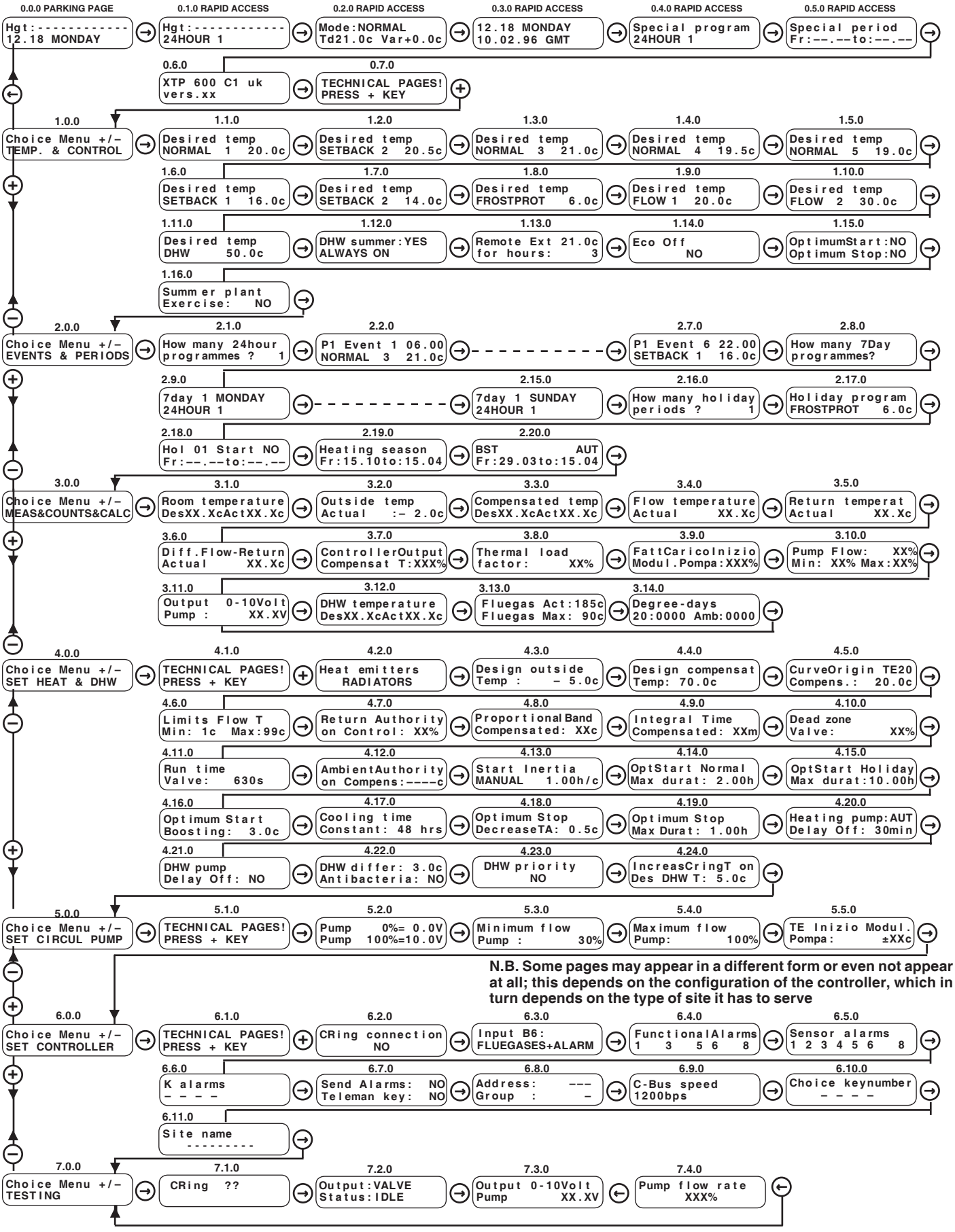
14.11 Use of control output DHW storage tank as clock.

When the control for the DHW storage tank is not used it is possible to use this to create a clock that can be used for any other auxiliary function.

14.12 Control based on the mean of flow and return temperatures

The operating principles of this type of compensated control are explained in section 6.
XTP 600, in its C1 version, provides compensated control which controls directy the mean temperature of the heat emitters instead of controlling only the flow.
If the circulation pump has too great an output (it has been chosen with a greater flow than necessary for the site) the modulation by XTP 600 can compensate only in part for an excessively fast circulation.
In this event the return temperature has a thermal head in respect of the flow which is not very high; the mean temperature of the radiators would rise.
Direct control of the heat emitters would put matters right by lowering the flow temperature until the mean temperature is correct from the compensation point of view.
If, on the other hand, the pump is inadequate, the flow temperature will be raised to compensate for a lower return temperature and so obtain a correct mean from the compensation point of view.

15. SEQUENCE OF DISPLAY PAGES (the data are those in memory at consignment)



NUMBERING OF THE PAGES: The pages are numbered using three digits. For greater clarity here is an example:

– page 9.3.0 = 9 represents the menu (DHW), 3 represents the page number ofthe menu (Antibacteria days) and 0 represents any sub-page of the preceding page. The sub-pages are pages which are opened by a particular page, which in this case functions also as a sub-menu

– special pages: 0.0.0 = parking page: this is the page to which the system reverts automatically when the push-button switches have not been used for a certain period (about 15 minutes). The parking protects the system from involuntary tampering.

0.0.1 ... 0.0.4 = rapid-access pages: these are pages for immediate use which are very easily and rapidly accessible.

N.B. IN THE FOLLOWING SECTIONS THE MENUS, ANY SUBMENUS AND THE PAGES ARE SHOWN IN THE ORDER IN WHICH THEY ARE SHOWN ON THE CONTROLLER.

WARNING: The values of the parameters shown on the pages are factory (default) settings: these can be left as they are, except for those regarding the type of hydraulic site.
All the parameters which can be modified using + and – keys are indicated thus:

Many pages, or even entire menus, might not appear, or appear differently, according to the configuration which has been adopted to adapt XTP 600 to the site.

16. MENU' NO. 0 RAPID-ACCESS PAGES FOR NORMAL USE

N.Pag.	Display	Descrizione	Cap.
0.0.0	Htg:---------- 12.18 MONDAY	Site name entered on page **6.11.0** Current time and day entered on page **0.3.0**	
0.1.0	Htg:---------- 24HOUR 1	Choice program from: 7DAY 1-2; 24HOUR 1…7; NORMAL 1…5; SETBACK 1-2; FLOW 1-2; FROSTPROT; OFF. These choices can be replaced by special conditions: SUMMER SEASON with heating excluded. HOLIDAY = in progress a day or a period of HOLIDAY of the 25 available. SPECIAL = in progress a SPECIAL program of fixed duration (pages 0.4.0, 0.5.0). REMOTE EXTENSION = in progress a REMOTE EXTENSION program controlled by push-button switch c1. REMOTE NORMAL 1 = in progress NORMAL 1 room temperature selected by remote control R. REMOTE SETBACK 1 = in progress SETBACK 1 room temperature selected by remote controlR. REMOTE FROSTPROT = in progress FROSTPROT program selected by remote control R.REMOTE OFF = in progress OFF program selected by remote control R. REMOTE + 2C = in progress desired AUTOMATIC program, resident in the controller, with room temperature increased by 2°C.Choice always by means of remote control **R**	
0.2.0	Mode:NORMAL Td21.0c Var+0.0c	Current mode. The current modes can be: NORMAL = the program requires in that moment a NORMAL room temperature. SETBACK = the program requires in that moment a SETBACK room temperature. FLOW = the program required in that moment a FIXED FLOW temperature. FROSTPROT = the program requires in that moment the FROSTPROT room temperature. OFF = the program requires in that moment heating switched OFF. ECO OFF = the heating in that moment is in the ECO OFF condition (page 1.15.0). BOOSTING = the heating in that moment is in the MORNING BOOST condition. OPTIMUM OFF = the heating in that moment is in the EVENING OPTIMUM OFF condition. REMOTE EXTENSION = the heating in that moment is in the REMOTE EXTENSION condition (c1 switch). Td: Temperature desired by mode in progress at that moment, including the adjustment. Var: Variation of desired temperature (max. ± 3°C); this variation is useful when you want to adjust the current programmed room temperature in a simple and straightforward way	
0.3.0	12.18 MONDAY 10.02.96 GMT	Setting: Time, day of week and date. Current time period: GMT or BST	
0.4.0	Special program 24HOUR 1	Choice of program for Special period, entered on next page. The choice is valid only during this period: it is very useful to choose a heating program to be used in non-programmed periods.The choice is the standard one. **This choice has precedence over any other type of choice**	
0.5.0	Special period Fr:--.--to:--.--	Dates of start and end of Special Period	
0.6.0	XTP 600 uk Vers.xx	Identifying data of controller	
0.7.0	TECHNICAL PAGES! PRESS + KEY	This is the last page of the menu for normal use. By pressing + key you can pass to the next menu.	
X.X.X	Enter keynumber ----	**ENTERING ACCESS KEY (IF USED)** If the ENTER KEYNUMBER (page 6.11.0) has been entered it is not possible to change this menu since the + and – keys are blocked. When you try to use the + and – keys this page appears. At this point it is necessary to enter the key using the + and – keys which are enabled only for this function. Once enabled, the key remains active for 15 minutes following the last depression of any key.	

17. MENU' NO. 1 PROGRAMMING TEMPERATURES & CONTROLS

Page No.	Display	Description	Sect.
1.0.0	Choice Menu +/– TEMP & CONTROLS	This is the menu chosen. It is protected by ACCESS KEY (if entered).	
1.1.0 1.5.0	Desired temp NORMAL 1 20.0c	This is a group of five pages by means of which you can set five NORMAL values, for the desired room temperature, to be entered in the various heating programs.	
1.6.0 1.7.0	Desired temp SETBACK 1 16.0c	This is a group of two pages in which you can set two SETBACK values, for the desired room temperature, to be entered in the various heating programs.	
1.8.0	Desired temp FROSTPROT 6.0c	On this page you can set the FROSTPROT value for the desired room temperature, to be entered in the various heating programs.	
1.9.0 1.10.0	Desired temp FLOW 1 20.0c	This is a group of two pages in which you can set two values for the FIXED FLOW temperature, to be entered in the various heating programs	
1.11.0	Desired temp DHW 50.0c	On this page you can set the temperature of the storage tank for DHW.	
1.12.0	DHW summer: YES ALWAYS ON	**YES** =Use of storage tank in summer period: YES or NO **ALWAYS ON** = Choice of program to use for DHW, which is valid for whole heating period and for summer period if it is decided to use storage tank also in this season (YES on first line of this page).The programs to associate with STORAGE TANK are the same as those formed and/or chosen for heating. The operation of the storage tank is tied to the temperature mode set by the heating programs: – NORMAL 1…5, SETBACK 1-2 = STORAGE TANK switched on – FLOW 1-2, FROSTPROT, OFF = STORAGE TANK switched off. The program for the STORAGE TANK can be chosen as required and can be different from the heating program. – 7DAY 1-2;- 24HOUR 1…7; – FOLLOWS HEATING: program same as that chosen for heating; – ALWAYS ON: STORAGE TANK always on; – ALWAYS OFF: STORAGE TANK always off. **WARNING: the STORAGE TANK is always switched off in the summer period if NO has been selected on the first line of this page, independently of choice of program.** **WARNING: if storage tank not used (sensor B5 SWITCHED OFF) the related relay (terminals 8, 9, 10) can be used as a clock, assigning to it any program, as for the storage tank.** **The functions of this clock become:** **– relay switched on with NORMAL & SETBACK program** **– relay switched off with FLOW, FROSTPROT & OFF program**	
1.13.0	Remote Ext 21.0c for hours: 3	**21.0c** =Desired room temperature during REMOTE EXTENSION period, switched on by **c1** switch.3 **3** = Duration in hours of REMOTE EXTENSION period. **To switch on the REMOTE EXTENSION period keep pressed for 5 seconds the push-button switch c1 (see wiring diagram). To switch off, press ← and → at the same time on the first page of the display.**	
1.14.0	Eco Off NO	**NO**= ECO OFF function not required. **YES** = ECO OFF function required. The ECO OFF function is operative in the NORMAL and SETBACK modes and functions as follows: – the room temperature is measured or calculated. – if this actual room temperature is at least 2°C above the calculated flow temperature, the heating is switched off. This means that the outside temperature is so mild that heating is useless; or that the desired room temperature has fallen to a value very close to the outside temperature; in both situations heating is pointless.Heating is switched on when the flow temperature exceeds the room temperature by at least 4°C: this means that the need for heating has returned.	
1.15.0	OptimumStart:NO Optimum Stop:NO	You decide if or not you require OPTIMISATIONS for the first morning start or at the last evening stop (or reduction).	
1.16.0	Summer plant exercise: NO	You can establish if you want summer site exercise for the controllers. To avoid blockages during the summer period the controller switches on the valves and pumps periodically without transferring heat to the radiators.	

18. MENU' NO. 2 PROGRAMMING EVENTS & PERIODS

Page No.	Display	Description	Sect.
2.0.0	Choice Menu +/– EVENTS & PERIODS	This is the chosen menu. It is protected by ACCESS KEY (if entered).	
2.1.0	How many 24hour programmes ? 1	Choice of number of 24hour programs to be used	
2.2.0 ⇓ ⇓ ⇓ ⇓	P1 Event 1 6.00 NORMAL 3 21.0c ⇓ ⇓ ⇓ ⇓	– **PG1** = first 24hour program in progress – **h1** = start time of first event at desired temperature – **NORMAL 3** = decided to use this room temperature for the first event. Choice is between: NORMAL 1…5; SETBACK 1–2; FROSTPROT; FLOW 1–2 – **21.0c** = room temperature for heating program for the chosen event. These pages continue for the 6 start times of the 6 events for all the 24hour programs it has been decided to use.	
2.7.0	P1 Event 6 22.00 SETBACK 1 16.0c	To eliminate a period not used, press + and – at same time: there will appear **- - - -** . The times must be in increasing order. You must not leave - - - - between program times.	
2.8.0	How many 7day programmes ? 0	Choice of number of 7day programs to be used (1–2)	
2.9.0 ⇓ ⇓ ⇓ ⇓	7day 1 MONDAY 24HOUR 1 ⇓ ⇓ ⇓ ⇓	– **7day1** = first 7day program in progress – **MONDAY** = first day of week to which to assign desired program. – **24HOUR 1** = choice of program for day of week indicated : 7DAY 1…7 ; NORMAL 1...5; SETBACK 1 - 2; FROSTPROT ; FLOW 1 - 2; OFF.	
2.15.0	7day 1 SUNDAY 24HOUR 1	**Continue with a further 7 pages to complete the week and with other pages for any second 7day program required.**	
2.16.0	How many holiday periods ? 0	Choice of number of holiday periods to be used (0...25)	
2.17.0	Holiday program FROSTPROT 6.0c	Choice of program for all the holiday periods: 7DAY 1-2; 24HOUR 1…7; NORMAL 1…5; SETBACK 1…2; FROSTPROT; FLOW 1–2; OFF	
2.18.0	Hol 01 start NO Fr:--.--to:--.--	– **Hol. 01** = first holiday period – **NO** = not to be used; – **00** = period to use with start at 00.00 hours – **12** = period to be used with start at 12.. – **Fr: --.-- to: --.--** = dates of start and end of holiday period (day & month). The holiday period is considered to include the first and last day.If the two dates coincide the period lasts one day. **There follow other pages for each desired holiday period.**	
2.19.0	Heating season Fr:15.10to:15.04	Dates of start and end of heating season.	
2.20.0	BST: AUT Fr:29.03to:26.10	The clock is able to change automatically (AUT) the time from GMT to BST and vice versa, according to the dates established by the European Community.If on manual (MAN), you can set other dates if those of the European Community are not followed, or if these should change in the future.	

19. MENU' NO. 3 READOUT OF MEASUREMENTS & COUNTS

Page No.	Display	Description	Sect.
3.0.0	Choice Menu +/– MEAS&COUNT&CALC	This is the chosen menu. It is protected by ACCES KEY (if entered)	
3.1.0	Room temperature Des20.0cAct20.0c	**Des** = Room temperature desired by current program. **Act** = Room temperature measured by B3 sensor (if installed). In place of Act can appear Cal: this means that the B3 room sensor has not been installed, and the value of the actual room temperature is calculated on the basis of the characteristics of the site.	
3.2.0	Outside temp Actual :– 2.0c	Actual outside temperature measured by B2 or coming from C-Ring. If the B2 outside sensor is not connected and the value comes from C-Ring, Actual is replaced by C-Ring..	
3.3.0	Compensated temp Des56.0cAct54.5c	**Des** = This is the mean temperature required by the heat emitters in order to provide the thermal power calculated according to the compensating curve of the site, set on pages **4.2.0, 4.3.0, 4.4.0, 4.5.0**.The calculation also takes into account all the other possible variations (desired room temperature, various optimizations and so on). **Act** = This is the real mean temperature (between input and output) of the heat emitters	
3.4.0	Flow temperature Actual 64.0c	**Actual** = The actual flow temperature which corresponds to that of the input of the heat emitters, which corresponds to that measured by the B1 sensor (site flow).	
3.5.0	Return temperat. Actual 48.5c	**Actual** = This is the actual return temperature at the output of the heat emitters	
3.6.0	Diff.Flow Return Actual 12.3c	**Actual** = This is the actual temperature difference between input and output of the heat emitters Essentially, it is the temperature difference between flow and return-to-site (the loss to the risers is almost symmetrical).	
3.7.0	ControllerOutput CompensatT: XXX%	This is the controller output of the compensating controller which operates on the mean value between site flow and return temperatures in order to ensure a correct mean temperature at the heat emitters.	
3.8.0	Thermal load factor: 52%	The thermal load factor represents the thermal heating power provided at that moment to compensate for the heat lost to the outside.The load factor is expressed as a percentage of the maximum power.. 0% = power requested when the outside temperature is equal to the desired room temperature (20°C): heating pointless (none). 100% = power requested when outside temperature is equal to that of design minimum: heating at design maximum. XX% = power requested when outside temperature has a certain intermediate value	
3.9.0	FattCaricoInizio Modul.Pompa:XXX%	Viene presentato il valore del carico termico reale che dà inizio all'aumento della portata. – Se il **fattore di carico termico reale** è **inferiore** al **fattore carico termico di inizio portata climatica** la pompa lascia la portata al minimo, poichè la richiesta di calore è bassa (clima mite). – Se il **fattore di carico termico reale** è **superiore** al **fattore carico termico di inizio portata climatica** la pompa incomincia ad aumentare la portata, poichè la richiesta di calore cresce (clima più freddo). – Se il **fattore di carico termico reale** arriva al **100%** la pompa comanda la portata al **massimo**.	
3.9.0	Pump Flow: 30% Min: 30%Max:100%	**Pump flow** = instantaneous percentage flow **Min** = Minimum flow value with which the circulation has been set. **Max** = Maximum flow value with which the circulation has been set.	
3.10.0	Output 0-10 Volt Pump: 3.0V	This page represents the measurement in volts of the analogue output for control of variable-speed pump.	
3.11.0	DHW temperature Des50.0cAct49.3c	**Des** =DHW Storage tank temperature desired in On mode. **Act** =Actual temperature of DHW storage tank (B5 sensor).	
3.12.0	FluegasAct: 47c FluegasMax: 90c	**Fluegas Act** = Actual temperature of fluegases if B6 sensor used . **Fluegas Max** = Maximum temperature of fluegases recorded in the period. To re-start the period and cancel the previous maximum, keep pressed + or – for at least 5 seconds.	
3.13.0	Degree-Days 20:0000Room:0000	**20** = degree-days accumulated with reference room temperature equal to 20°C. **Room** = degree-days accumulated with reference room temperature equal to real temperature measured or calculated if the sensor is not installed. To cancel this temperature value keep pressed at same time + and – keys for 5 seconds.	

20. MENU' N. 4 SETTING HEATING & DHW STORAGE TANK

Page. No	Display	Description	Sect.
4.0.0	Choice Menu +/– SET HEAT & DHW	This is the chosen menu. It is protected by ACCESS KEY (if entered).	
4.1.0	TECHNICAL PAGES! PRESS + KEY	In view of the importance of the menu: SETTING HEATING & DHW STORAGE TANK, this page appears to serve as a filter before entering in the menu itself	
4.2.0	Heat emitters RADIATORS	Choice of type of heat emitters on site: RADIATORS; PANELS; CONVECTORS	
4.3.0	Design outside temp : – 5.0c	Value of mean design temperature of heat emitters in order to have a correct compensated control.	
4.4.0	Design compensat temp : 70.0c	Value of mean design temperature of heat emitters in order to have a correct compensated control. **WARNING: In compensating controllers having a single temperature control (without flow control) this temperature coincides with that of the flow.** **With controllers of temperature and flow, the compensation coincides with the mean of flow and return temperature of the heat emitters, as explained more fully in section 6.** The parameter to enter on this page has a significance similar to that of the flow temperature in the controllers which control only the temperature. The factory (DEFAULT) values are: – for RADIATORS = 70°C – for CONVECTORS = 80°C – for PANELS = 40°C	
4.5.0	CurveOrigin TO20 Compens :20.0c	The compensated curve can be slightly moved from the origin (when the outside temperature is equal to the desired room temperature) by a few degrees °C so as to increase the temperature to a comfortable level when the outside temperature is very mild.From the physiological point of view, the human body requests slightly more heat in the rooms when passing from a very mild outside temperature to a heated space. For example: – When the outside temperature is 17°C (very mild) the human body wants to have a sensation of warmth when entering a heated space: in this case, the room temperature should be a few degrees above that which you have in the middle of winter (1…2°C more). – When the outside temperature is 0°C (rather cold) the human body has a strong sensation of heat when entering a space heated normally: in this case the room temperature should be the normal one without increase. **Essentially, you raise the desired room temperature slightly, proportionately more as the outside temperature is mild, by means of a movement of the compensating curve origin.** **20.0** = no adjustment is required when the compensated temperature is kept at 20°C when the outside temperature is 20°C and the desired room temperature is always 20°C. **It is advisable to limit this adjustment to not more than 25°C so as not to upset the balance the site too much when the outside temperature is a comfortable one .**	
4.6.0	Flow T Limits Min: 1c Max:73c	These are minimum and maximum limits which the actual temperature of the flow to the heat emitters must absolutely not exceed. **WARNING: these are not limits imposed on the compensated temperature, which is the mean between flow and return, but imposed on the real flow temperature.** – **Min** = minimum temperature below which the flow must never fall. This limit can be useful in preventing the site temperature from falling below values which could lead to freezing.Factory setting: 1°C – **Max** = temperatura massima sopra la quale la mandata non deve mai andare. E' un limite di sicurezza per i corpi scaldanti – for RADIATORS = 73°C – for CONVECTORS = 85°C – for PANELS = 40°C	

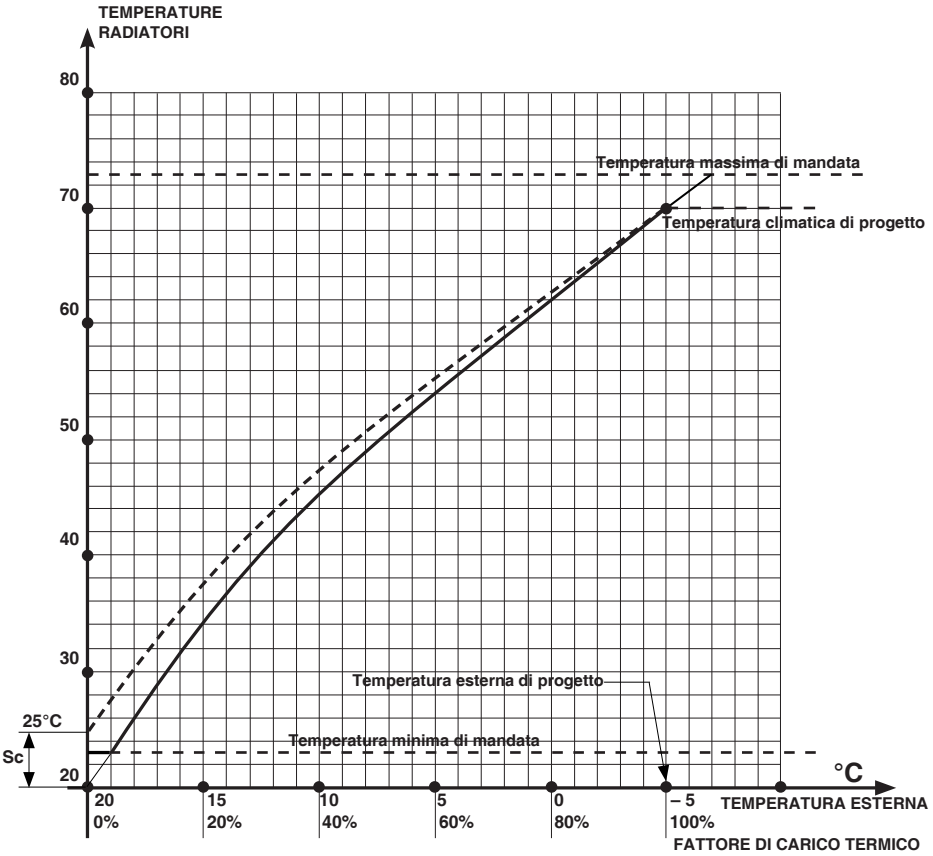
20. MENU' NO. 4 SETTING HEATING & DHW STORAGE TANK

Page No.	Display	Description	Sect.

Le ultime 5 pagine (**4.2.0....4.6.0**) rappresentano i 5 parametri fondamentali per creare la **curva climatica di riscaldamento** per la temperatura media dei corpi scaldanti.
In questo esempio si usano i radiatori, con taratura tipica della pianura padana

CURVA CLIMATICA = curva dei valori di temperatura media che devono avere i corpi scaldanti per erogare la potenza termica necessaria a riscaldare i locali, in base alla temperatura esterna e altri parametri di correzione.

CURVA CLIMATICA = CURVA DELLA TEMPERATURA MEDIA DEI CORPI SCALDANTI



Temperatura esterna di progetto = valore fissato a pagina **4.3.0** (esempio: –5°C)
Temperatura climatica di progetto = valore fissato a pagina **4.4.0** (esempio: 70°C)
Sc (**origine curva Te 20)** = valore fissato a pagina **4.5.0** (esempio: 25°C)
Temperatura minima di mandata = valore fissato a pagina **4.6.0** (esempio: 23°C)
Temperatura massima di mandata = valore fissato a pagina **4.6.0** (esempio: 73°C)

QUESTO DIAGRAMMA RAPPRESENTA LA CURVA CLIMATICA DELLA TEMPERATURA MEDIA DEI RADIATORI, CON LA TEMPERATURA AMBIENTE NOMINALE VOLUTA A 20 °C.
LA CURVA VIENE RICALCOLATA PER TENERE CONTO IN OGNI MOMENTO DELLA TEMPERATURA AMBIENTE VOLUTA REALE, E DI TUTTE LE ALTRE VARIANTI COME : OTTIMIZZAZIONE, SPOSTAMENTO ORIGINE DELLA CURVA, RIDUZIONI DI PRESPEGNIMENTO E ALTRO.

20. MENU' NO. 4 SETTING HEATING & DHW

No.Pag.	Display	Description	Sect.
4.7.0	Return Authority on Control: XX%	XX% = This is the authority which the return temperature exercises on the control of the mean temperature between flow and return. This setting is necessary to stabilise the control system of the whole site, since a variation in the return temperature is felt after a long delay in the return-to-site pipe.In practice it is necessary to wait until the water has circulated around all the zones before arriving in the heating site: when the pump is set at minimum (mild seasons) about ten seconds may be required. With these delays, and if the sites are old, hunting may arise. The first way to stop the hunting is to raise the Proportional Band and the Integral Time (page xx.x); if not sufficient it is necessary to reduce the authority of the return water temperature on the control of the whole system. XX% = 30% (factory setting), mean authority which usually should be satisfactory. XX% = 0% nil authority and so the return temperature does not influence the control. This situation can occur on an old and badly sized site where you have to remove the influence of the return temperature, and leave everything to the pump modulation. XXX% = 50% - maximum authority. In the control the return temperature counts as much as that of the flow, thereby automatically controlling the mean temperature of the heat emitters. This is the ideal condition which is attained on correctly designed sites	
4.8.0	Proportional Band Compensated: XXc	This is the Proportional Band of the compensating controller which acts on the mean of flow/return. The factory setting depends on the type of heat emitters. PANELS = 5°C RADIATORS = 20°C CONVECTORS = 30°C These values are equal to the mean difference design flow and return. This means that the total Proportional Band equals 100% under manufacturing conditions.An excessive Proportional Band would certainly stabilise the system but it could render it so slow that it would compromise the speed of the transitories (program changes).It is necessary to raise the Proportional Band to a point where the system becomes stable.	
4.9.0	Integral Time Compensated: XXm	This is the Integral Time of the compensating controller which acts on the mean between flow and return. The factory setting is 30 minutes (for a medium-size site).The values can be set from 1 to 99 minutes. Below the value 1 appears "- - ".- - = the controller changes to pure proportional in order to increase the stability for problem sites e.g. old and badly plannedi.	
4.10.0	Dead zone Valve: XX%	The dead zone of the valve represents the minimum acceptable error when positioning the valve.It can be adjusted from 0 to 20%. Factory setting = 0%.This dead zone is very useful for limiting the control on the valve actuator, when the adjustment to be made is practically insignificant for controlling the temperature.Small and useless adjustments are to be avoided; their only effect is to increase the wear and tear of the valve/actuator system. **Operation of the compensating controller XTP 600, version C1**. The compensating controller XTP 600, version C1, automatically controls the correct mean temperature of the heat emitters which is proportional to the heat emitted. The need to control the mean temperature is illustrated in section 6, and is the main feature of the "TEM-PO" system: compensated control of temperature and flow. When you control the mean temperature, over time hunting can arise; these are slow but can be very annoying. The elimination of this hunting can almost always be ensured by leaving all the control setting values at their factory settings. If, in some instance, hunting should arise, you can operate with new settings, making them one at a time in the order indicated: – FIRST OPERATION: double the Proportional Band (page **4.8.0**) – SECOND OPERATION: double the Integral Time (page **4.9.0**) – THIRD OPERATION: lower the return temperature authority to 25% (page **4.7.0**)	
4.11.0	Run time Valve: 630s	On this page you set the speed of the mixing valve actuator. This is the time for a run between total opening and closing	

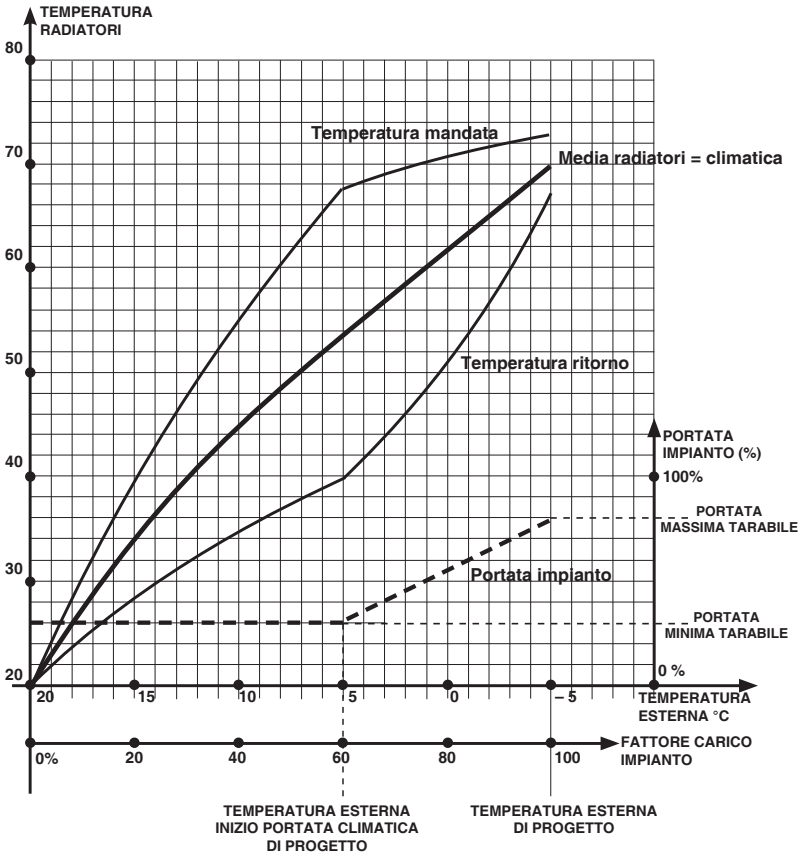
20. MENU' NO. 4 SETTING HEATING & DHW

N.Pag.	Display	Descrizione	Cap.
4.12.0	AmbientAuthority on Compens: ----c	Ambient Authority. Variation ± ----°C of compensated temperature with ± 1 °C of room deviation. Appears only if room sensor B3 is connected and configured.	
4.13.0	Start inertia MANUAL 1.00h/c	This is the time in hours necessary for the rooms to increase the room temperature by 1°C **MANUAL** = you can correct the value only manually **AUTOMATIC** = the value can be corrected automatically if the room sensor is installed. The calculation for the automatic correction is carried out at the start of the first 24hour program and is limited to a maximum of +/- 15 minutes at a time so as to avoid sudden variations. The automatic correction depends to a great extent on the correct installation of the room sensor which must not be subjected to extraneous thermal variations. Usually, it is not advisable rely on the automatic correction and to pass to manual after a maximum of ten days; in this way you avoid abnormal settings if the room sensor is not installed correctly.	
4.14.0	OptStart Normal Max durat: 2.00h	Maximum duration of optimum start period after a period of 24hour or 7day operation. This is the limit for optimum start in whatever mode it has been generated.	
4.15.0	OptStart Holiday Max durat:10.00h	Maximum duration of optimum start period after a holiday period. This is the limit for optimum start in whatever mode it has been generated	
4.16.0	Optimum Start Boosting: 3.0c	During the period of optimization at the first start (optimum start) you can give a boosting, expressed directly in room temperature in order to speed up reaching full capacity.	
4.17.0	Cooling Time Constant: 48 hrs	Time taken by room temperature, with site excluded, to reduce by 2/3 the initial value. Used by the controller to calculate the room temperature (in SETBACK/FROSTPROT modes) when the site is without room sensor.	
4.18.0	Optimum Stop DecreaseTA: 0.5c	Amount of acceptable reduction in room temperature after last daily stop of heating site. Site pre-switched off accepting that in the optimum stop period the room temperature can fall below this value.	
4.19.0	Optimum Stop Max durat: 1.00h	Maximum duration of optimum stop period, independently of reduction accepted.	
4.20.0	Heating pump:AUT Delay Off: 30min	**MAN** = pump always working **AUT** = pump controlled according to heating programs in progress – OFF: pump always off – ECO OFF : pump always off – EXTENSION : pump always on – NORMAL: pump always on – SETBACK, FROSTPROT & OPTIMUM STOP: the pump is switched off after the Off delay and is switched on again when the controller recognizes the need for heating the spaces served. The decision for supplying heating is taken when the temperature required for the heat emitters exceeds the actual or calculated room temperature, and so the need to heat the spaces arises – BOOSTED : pump always on – FLOW : pump always on **Delay Off** =Delay (can be preset in minutes) in switching off the Pump	
4.21.0	DHW pump Delay Off: NO	**YES** = switching off storage tank pump is delayed for 5 minutes in order to recover heat. **NO** = delay not applied.	
4.22.0	DHW differ: 3.0c Antibacteria: NO	– Value of control differential of storage tank pump in °C. – Enabling of antibacteria function: NO; YES. The antibacteria function is switched on every Wednesday at 2 a.m. bringing the desired temperature for the storage tank to 70°C for 90 minutes	
4.23.0	DHW Priority NO	Enabling priority DHW storage tank over heating.The priority is obtained by reducing the desired temperature for the heat emitters in order not to overload the boiler. This function is also communicated to any other controllers if these are connected with each other via C-Ring	
4.24.0	IncreasCRingT on Des DHW T: 5.0c	In order to reduce heating time of storage tank you can increase temperature of boiler in respect of desired temperature for DHW. This control signal is sent to boiler via C-Ring. **WARNING:** **When the storage tank is not used and the output is used as an auxiliary clock (see page 6.6.0) all these last four pages (regarding the storage tank) always exist, but do not influence the function of the auxiliary clock.** **These pages are retained so that, if required, everything is ready should the storage heater be installed at a later date.**	

21. MENU' N. 5 SETTING CIRCULATION PUMP

Page No.	Display	Description	Sect.
5.0.0	Choice Menu +/– SET CIRCUL PUMP	This is the menu selected. It is protected by ACCESS KEY (if entered) **This menu is fundamental for setting compensated control of the flow.** **It is similar to the setting of the compensated control of the temperature.**	XX.5
5.1.0	TECHNICAL PAGES! PRESS + KEY	In view of the importance of the menu SETTING OF CIRCULATION PUMP this page appears to create a filter before entering the menu itself	
5.2.0	Pump 0%= 0.0V Pump 100%=10.0V	On this page you establish the control input scale of the pump with variable-flow/discharge head. The factory-set scale is almost always correct for the most commonly-used commercial pumps.	
5.3.0	Minimum flow Pump : 30%	On this page you establish the minimum flow for the pump, when the demand for heat is medium or low: a Minimum Flow which must not create imbalances on the site. **30%** = factory setting: this value is almost always satisfactory provided the pump has been sized fairly accurately for the site. Often the pumps are oversized, and so this value should be reduced, even if almost all the pumps on the market will not go below 30% of the minimum revolutions so as not to compromise the operation of the motor. On the other hand, this value should be raised if the site is “unbalanced”: that is to say, the spaces farther away from the heating site have been served by pipework which is incorrectly sized, or old and encrusted.Raising this value to compensate for these deficiencied means having to accept a higher return temperature, thereby reducing the output of the condensation boilers. If you have to reach values above 60%, to balance the site this implies: – the pump is decidedly undersized, or – the site is rather unbalanced as regards the flow pipework. Up to a value of 50% the site is acceptable. **If, even after having reduced the minimum flow below 30% the site circulation remains too rapid and generates low differences between flow and return, this means that the pump is decidedly oversized. In this event it should be changed.** **If this is not possible, you can “throttle” some valve in the flow or return pipe in order to obtain a fall in temperature which allows a return temperature low enough to ensure condensation in the boiler.**	
5.4.0	Maximum flow Pump: 100%	On this page you establish the maximum flow for the pump when the request for heat is maximum. This Maximum Flow can ensure a return temperature which is low enough, even at maximum flow temperatures, corresponding to the minimum outside temperatures.	
5.5.0	TE Inizio Modul. Pompa: ±XXc	In questa pagina si fissa la temperatura esterna sotto la quale la pompa deve incominciare ad aumentare la sua velocità (e di conseguenza la portata), quando la temperatura ambiente richiesta è 20 °C. Questo valore dipende dalle caratteristiche dell'impianto e della pompa. Corrisponde un po' alla temperatura esterna minima di progetto, necessaria per creare la curva climatica della temperatura dei radiatori. **Valore di fabbrica = 5 °C** : questo valore va normalmente bene nella valle padana e con gli impianti non estremamente sbilanciati. Questo valore rappresenta la temperatura esterna sotto la quale è necessario che la portata incominci a crescere, poichè l'impianto sta chiedendo maggiore potenza termica. Se la temperatura ambiente richiesta è minore di 20 °C (ambiente nominale) la portata incomincerà a crescere ad una temperatura esterna inferiore di questo valore. Viceversa se la temperatura ambiente richiesta è maggiore di 20 °C. E' analogo a quello che fa la curva climatica della temperatura dei radiatori quando si varia in più o in meno la temperatura ambiente dai 20 °C nominali. **E' IN PRATICA LA CREAZIONE DELLA CURVA CLIMATICA DELLA PORTATA NELLE CONDIZIONI STANDARD DI PROGETTO.** – Quanto più si alza la temperatura esterna di inzio portata climatica di progetto, tanto più si alza la portata anche a temperature esterne miti. E' il caso di impianti vecchi e mal dimensionati. – Quanto più si abbassa la temperatura esterna di inzio portata climatica di progetto, tanto meno si alza la portata anche a temperature esterne miti. E' il caso di impianti abbastanza equilibrati, che consentono un abbassamento maggiore della temperatura di ritorno, e un conseguente miglior rendimento delle caldaie a condensazione. **Si consiglia di non tarare questa temperatura ad un valore superiore alla temperatura esterna media stagionale (pianura padana 5 ... 8 °C), per non penalizzare troppo la condensazione.**	

21. MENU' N. 5 CURVA CLIMATICA *"TEM-PO"* TEMPERATURA - PORTATA



Media radiatori = climatica: è la curva climatica per radiatori tipica della pianura padana.

Temperatura mandata : è la curva della temperatura di mandata dei radiatori, che viene generata dal regolatore in base alla curva climatica e alla taratura della pompa.

Temperatura ritorno : è la curva della temperatura di ritorno dai radiatori, che viene generata dal regolatore in base alla curva climatica e alla taratura della pompa.
Il regolatore garantisce in ogni momento che la media fra la mandata e il ritorno corrisponda alla climatica richiesta ai radiatori.

Portata impianto : è la curva climatica della portata dell'impianto, in funzione della temperatura esterna.

Portata minima : è la portata minima tarata per l'impianto con temperatura esterna mite.

Portata massima : è la portata massima tarata per l'impianto con temperatura esterna al minimo di progetto. Garantisce un apporto di calore sufficiente anche quando la temperatura esterna arriva ai valori più rigidi.

In questo esempio la temperatura di ritorno resta inferiore ai 45 °C fino a temperatura esterna di circa 2 °C.
Viene garantita la condensazione per la maggior parte del periodo di riscaldamento, portando il guadagno di rendimento stagionale a valori elevati.

QUESTO DIAGRAMMA RAPPRESENTA LA CURVA CLIMATICA DELLA PORTATA, CON LA TEMPERATURA AMBIENTE NOMINALE VOLUTA A 20 °C.
LA CURVA VIENE RICALCOLATA PER TENERE CONTO IN OGNI MOMENTO DELLA TEMPERATURA AMBIENTE VOLUTA REALE, E DI TUTTE LE ALTRE VARIANTI COME : OTTIMIZZAZIONE, SPOSTAMENTO ORIGINE DELLA CURVA, RIDUZIONI DI PRESPEGNIMENTO E ALTRO.

TARATURA POMPA DI CIRCOLAZIONE A GIRI VARIABILI

La taratura della pompa di circolazione viene fatta nel menù appena descritto.
Per facilitare tutte le operazioni è consigliabile seguire una procedura precisa.

21.1 Taratura della pompa di circolazione
In un primo tempo lasciare il valore della portata minima di fabbrica (pagina **5.3.0** = 30%) che generalmente va bene in impianti normali.
21.2 Controllo dell'equilibrio dell'impianto.
Questo controllo è bene farlo a temperatura esterna media: fra 5 e12 °C (stagione non troppo fredda, con fattore di carico fra 30 e 60%).
L'equilibrio dell'impianto si può controllare in due modi:
– CONTROLLO DELLA TEMPERATURA DI RITORNO DEI RADIATORI PIU' SFAVORITI (LONTANI)
- Leggere la temperatura reale di ritorno impianto (pagina **3.5.0**)
- Con un termometro ad infrarossi misurare la temperatura di ritorno di qualche corpo scaldante (radiatore) supposto non equilibrato
- Controllare che la differenza con la temperatura ritorno impianto non superi i 4°C; sotto questa differenza l'equilibrio è sufficiente.

Se la differenza fosse maggiore è necessario operare per un migliore equilibrio

– CONTROLLO DELLA TEMPERATURA AMBIENTE DEI LOCALI PIU' SFAVORITI (LONTANI)
- Attendere qualche giorno o qualche settimana le eventuali comunicazioni degli inquilini, per temperatura ambiente inferiore a quella programmata (generalmente 20°C).
- E' necessario in questo caso controllarla veramente con un termometro affidabile.

Se i valori della temperatura ambiente fossero veramente inferiori è necessario operare per un migliore equilibrio

Per equilibrare l'impianto (se squilibrato) si deve alzare la portata minima della pompa: conviene portarla dal valore minimo del 30% al 50%. Dopo questa operazione è necessario ricontrollare la portata con il metodo appena descritto, poichè si è alterata la circolazione.
Il processo di controllo si può rifare più volte attendendo un certo tempo fra una prova e l'altra.
Aumentando la portata minima si equilibrano le zone sfavorite, ma ovviamente si aumenta la temperatura di ritorno dell'impianto con i conseguenti svantaggi sulla condensazione.

21. MENU' N. 5 CURVA CLIMATICA *"TEM-PO"* TEMPERATURA - PORTATA

21.3 Controllo della curva climatica
Se tutte le zone avessero una temperatura ambiente diversa da quanto stabilito dai programmi, si può procedere ad un ritocco della taratura della curva climatica, esattamente come si fa nei regolatori con il controllo della sola temperatura di mandata e non della portata.

21.4 Miglioramento della condensazione, attraverso ulteriore diminuzione del ritorno
Se l'impianto risulta equilibrato oppure con una differenza media mandata e ritorno, notevolmente più bassa di quanto indicato nel diagramma (con radiatori), vuol dire che la pompa, anche comandata al minimo (30%), è sovrabbondante.
Questo vuol dire che la circolazione è troppo veloce e non consente una buona diminuzione del ritorno anche con la pompa al minimo.
In questo caso si può strozzare un pò la circolazione con la valvola manuale, sulla mandata o ritorno impianto, generalmente sempre presente e procedere ad un nuovo controllo di taratura.

21.5 Controllo della taratura della massima portata
Questo controllo è meno critico perchè lasciando la massima portata al valore di default, si influisce sulla circolazione solo quando la temperatura esterna si avvicina al minimo contrattuale, cosa che capita poche volte durante la stagione di riscaldamento.

21.6 Casi particolari di impianti con valvole termostatiche o con cassette di distribuzione e contabilizzazione
Questi casi sono molto più semplici, poichè sia le valvole termostatiche sia le cassette fungono da veri e propri equilibratori di portata e di temperatura: sono infatti dei regolatori di temperatura veri e propri che modulano con continuità oppure On-Off la portata al singolo radiatore oppure alla singola zona.
Sono proprio questi regolatori ambiente che rendono uniformi le temperature ambiente.
La taratura climatica sarà quella standard, mentre la temperatura ambiente voluta potrà essere alzata di qualche grado: sarà il termostato ambiente o la valvola termostatica a riportare la temperatura ambiente al valore voluto, zona per zona o radiatore per radiatore.
Il controllo climatico della portata facilità il lavoro delle valvole termostatiche o delle cassette, garantendo sia un miglior comfort, sia una miglior temperatura di ritorno per la condensazione.
La taratura della pompa di circolazione a giri variabili può essere lasciata di fabbrica (default), poichè come si è visto, saranno i regolatori locali ad equilibrare l'impianto.

TARATURA POMPA DI CIRCOLAZIONE A GIRI FISSI

E' sconsigliabile usare una pompa di circolazione a giri fissi.
XTP 600, comunque, permette anche in questo caso di migliorare la diminuzione della temperatura di ritorno per una migliore condensazione.
E' consigliabile seguire una procedura precisa.

21.7 Taratura della pompa di circolazione a giri fissi
In questo caso la taratura della pompa si può fare solo agendo direttamente sulla pompa, attraverso il commutatore manuale delle 3 velocità, sempre presente nelle buone pompe in commercio.
Mettere il commutatore nella seconda velocità.

21.8 Controllo dell'equilibrio dell'impianto.
La procedura del controllo dell'equilibrio impianto è esattamente uguale a quella descritta per la pompa a giri variabili (paragrafo 21.2).
Nel caso si debba equilibrare l'impianto, portare il commutatore della pompa al valore massimo.
Aumentando la portata si equilibrano le zone sfavorite, ma si aumenta la temperatura di ritorno dell'impianto con i conseguenti svantaggi sulla condensazione.

Nella maggioranza degli impianti le pompe sono sempre sovradimensionate e perciò questa operazione non dovrebbe essere mai necessaria; occorrerà invece diminuire ulteriormente la circolazione secondo quanto spiegato al paragrafo 21.10

21.9 Controllo della curva climatica
Se tutte le zone avessero una temperatura ambiente diversa da quanto stabilito dai programmi, si può procedere ad un ritocco della taratura della curva climatica, esattamente come si fa nei regolatori con il controllo della sola temperatura di mandata e non della portata.

21.10 Miglioramento della condensazione, attraverso ulteriore diminuzione del ritorno
Se l'impianto risulta equilibrato, vuol dire che la pompa anche commutata al valore medio, è sovrabbondante.
La circolazione è troppo veloce e non consente una buona diminuzione del ritorno anche con la pompa al medio.
In questo caso si può portare la pompa al valore minimo, e ripetere i controlli di taratura.
Se anche con il valore minimo della pompa, l'impianto resta equilibrato e presenta una differenza di temperatura fra mandata e ritorno radiatori bassa, si può "strozzare" la valvola manuale, sulla mandata o ritorno impianto, generalmente sempre presente e procedere ad un nuovo controllo di taratura.

21.11 Casi particolari di impianti con valvole termostatiche o con cassette di distribuzione e contabilizzazione
In questi casi è assolutamente sconsigliabile utilizzare la pompa a giri fissi, poichè può compromettere il buon funzionamento di tutto l'impianto

22. MENU' N. 6 SETTING CONTROLLER

Page No.	Display	Description	Sect.
		IN THIS MENU THE PAGES MUST BE ORDERED IN A MANNER SIMILAR TO THE PRESENT ORDER OF THE LAST CONTROLLERS	
6.0.0	Choice Menu +/– SET CONTROLLER	This is the chosen menu. It is protected by ACCESS KEY (if entered)	
6.1.0	TECHNICAL PAGES! PRESS + KEY	In view of the importance of SETTING CONTROLLER menu, this page appears as a kind of filter before actually entering in the menu	
6.2.0	CRing connection NO	NO = C-Ring not used. This means that the controller is on its own or that there are no other controllers to which it must supply data which circulate in C-Ring bus. PRIMARY = C-Ring is used and this controller is PRIMARY in the ring. That is, it is the one which starts the operations for exchange of data via C-Ring and which permits the operation of any SLAVE controllers which may be present.SECONDARY SECONDARY = C-Ring is used and this controller is SECONDARY in the ring. It replies only if it receives the communication from the preceding unit and sends the data to following unit.	
6.3.0	Input B6 FLUEGASES+ALARM	– FLUEGASES+ALARM= B6 input is used to measure the temperature of the flue gases of a boiler, and at the same time to function as a closing alarm switch (**k4**) – REMOTE CONTROL = B6 input is used for remote contro "R" (CDB 300)	
6.4.0	FunctionalAlarms 1 3 5 6 8	Disabling functional alarms. Factory setting: only 8 enabled (cannot be disabled) 1 : Flow temp. alarm **B1**. 3 : Room temp. alarm **B3**. 5 : Storage tank temp. alarm **B5**. 6 : Flue gases temp. alarm 1 **B6**. 8 : Internal clock alarm.	
6.5.0	Sensor alarms 1 2 3 4 5 6 8	On this page you can enable the alarms regarding the sensors.By enabling these alarms you automatically enable the sensors too, according to the type of site they serve. The alarms regard short- or broken-circuits. Factory setting: all enabled. 1 : Flow sensor **B1**. 2 : Storage tank temp. alarm **B2**. 3 : Room sensor **B3**. 4 : Return site sensor **B4**. 5 : Storage tank sensor **B5**. 6 : Flue gases sensor **B6**. 8 : C-Ring alarm (if used) **WARNING: if the storage tank is not used (B5 sensor NOT SWITCHED ON) the associated output relay (terminals 8, 9 10) can be used as a clock, assigning to it any program you would use for the storage tank.** **The functions of this clock become:** **– relay enabled with NORMAL & SETBACK program** **– relay disabled with FLOW, FROSTPROT & OFF program** **The B5 sensor can still be connected and serve for measuring any temperature.**	
6.6.0	K alarms – – – –	Enabling On-Off alarms. Factory setting: all switched off	
6.7.0	Send Alarms: NO Teleman key: NO	Enabling alarms to send to Telemanagement PC. Enabling Telemanagement key.	
6.8.0	Address : --- Group : –	Telematic address of controller. Telematic group to which controller belongs	
6.9.0	C-Bus speed 1200bps	Choice of C-Bus communication speed. Options: 1200, 2400, 4800, 9600 baud.	
6.10.0	Choice keynumber ----	Choose key to prevent use of + and – keys.To make it easier to remember, the key can be chosen from the range1901 – 1999; within this series of numbers there will undoubtedly be the date of birth of someone you know! To eliminate the key press + and – together.	
6.11.0	Site name ----------	Entering name of site. Use + and – to enter letters or numbers. Use ←and→ to change position.	

23. MENU' NO. 7 TESTING

Page Mo.	Display	Description	Sect.
7.0.0	Choice Menu +/– TESTING	This is the chosen menu. It is protected by ACCESS KEY (if entered).	
7.1.0	CRing:??	Testing the C-Ring line is necessary in order to check the connections and the configurations between the various electronic devices which have to communicate via C-Ring. This page appears only if C-Ring is configured as PRIMARY or SECONDARY (page **6.2.0**). La procedura è la seguente: Ensure that all the other controllers connected in the C-Ring are: – powered from the mains (230 V AC, or 240 V AC for UK market). – at least one controller in C-Ring is configured as PRIMARY. – all the other controllers in the ring are configured as SECONDARY. – all the controllers in the ring must be inserted in the TESTING menu of the C-Ring.. The PRIMARY controller sends via C-Ring a signal every 5 seconds: on all the displays appears "??".If the testing is successful, the "??" are replaced by "OK" on all the displays.If on one or more displays "OK" does not appear, this means that there is a break in the connection between the last controller with "OK" and the first with "??". Examples of testing a C-Ring with 4 controllers configured as follows . PRIMARY – SECONDARY – SECONDARY – SECONDARY – Con.1 "OK" – Con. 2 "OK" – Con.3 "OK" – Con.4 "OK" : Positive test – Con.1 "??" – Con. 2 "OK" – Con.3 "OK" – Con.4 "OK" : Break between 4 & 1 – Con.1 "??" – Con. 2 "OK" – Con.3 "??" – Con.4 "??" : Break between 2 & 3 – Con.1 "??" – Con. 2 "??" – Con.3 "??" – Con.4 "??" : Break between 1 & 2	
7.2.0	Output:VALVE Status:IDLE	VALVE = test of mixing valve IDLE = choice of test actions: IDLE, CLOSES, OPENS PUMP = test of heating pump ON = choice of test actions: ON, OFF DHW = testing of DHW storage tank pump or of control of this ON = choice of testing actions ON, OFF	
7.3.0	Output 0-10 Volt Pump: 0.0V	This page represents the measurement in volts of the analogue output for control of variable-speed pump.	
7.4.0	Pump flow rate 0%	This page is the complementary testing of the previous page.During this testing the control relay of the heating pump is switched on. XXX = you can set directly as a percentage the pump speed, in order to test the control. The value of the flow rate to set for the testing can exceed the limits configured for the minimum and the maximum.	

Amendment to data sheet

Date	Revision No.	Page	Section	Description of amendment	Firmware version	Software version
04.06.08 AM	01	5 - 6	10. EXAMPLE OF SITE ...	B6 sensor eliminated (not envisaged) in the examples of wiring diagrams		
30.04.09 AM	02	All	All	New version C1		
10.11.09 DZ	03	vaious	various	Updare Plug-in version		≥0.99.2650

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