

4. PRINCIPAL 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 with 2g (DIN 40 046)
 Voltage-free output contacts:
 maximum switched voltage 250 V ~
 maximum switched current 5 (1) A
 Construction standard Italian electrotech. Committee (CEI)
 Duration clock battery & data storage in memory practically 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 144 x 96 x 100
 Weight 0.9 kg

• Individual programs for heating & DHW
 24hour programs 1 ... 4
 24hour events 2 ... 6
 7day programs : 0 ... 1
 Special period 1
 Extension period 0 ... 3 ... 72 h

• Measurement ranges
 Flow temperature 0 ... 99 °C
 Outside temperature - 30 ... + 40 °C
 Room temperature 0 ... 40 °C
 Boiler temperature 0 ... 99 °C
 Calorifier temperature 0 ... 99 °C
 Flue gases temperature 0 ... 500 °C
 Anticondensing temperature 0 ... 99 °C

• Heating
 Flow temperature:
 radiators 40 ... 70 ... 99 °C
 convectors 40 ... 80 ... 99 °C
 pannels 20 ... 40 ... 50 °C

minimum limit 1 1 ... 99 °C
 maximum limit 1 ... 99 °C
Design external 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 :
 Normal room 0 ... 21 ... 30 °C
 Setback room 0 ... 16 ... 30 °C
 Fixed flow 0 ... 30 ... 99 °C
 Frosprot room 0 ... 6.0 ... 30 °C
 Optimisation of operating hours:
 Maximum duration optimum start 0.00 ... 2.00 ... 9.00 h
 Advance switching on boosting 0.0 ... 3.0 ... 9.0 °C
 Maximum duration optimum stop 0.00 ... 1.00 ... 5.00 h
 Maximum pump evening switching off 0.00 ... 6.00 ... 9.00 h

• Control burner
 POWER or TEMPERATURE
 Temperature 0 ... 50.0 ... 99.0 °C
 Maximum temperature limit 1 ... 99 °C
 Minimum temperature limit 1 ... 99 °C
 On-Off control burner 1 independent switch
 Raise burner control 1 independent switch
 Lower burner control 1 independent switch
 Modulation burner time 10 ... 45 ... 540 sec.

• Control calorifier
 Temperature 0 ... 50.0 ... 99.0 °C
 Differential 0.5 ... 5.0 ... 30.0 °C

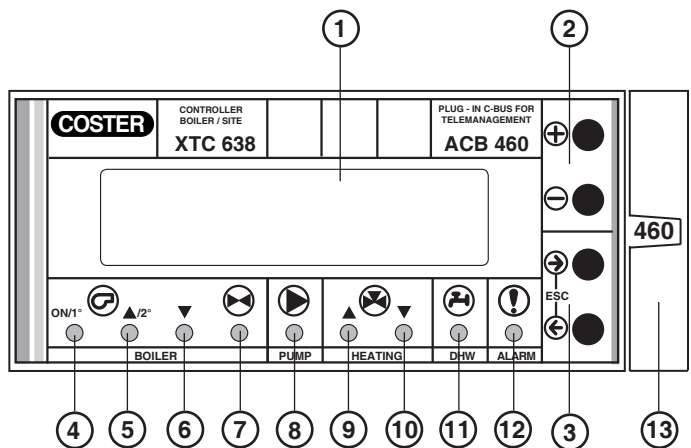
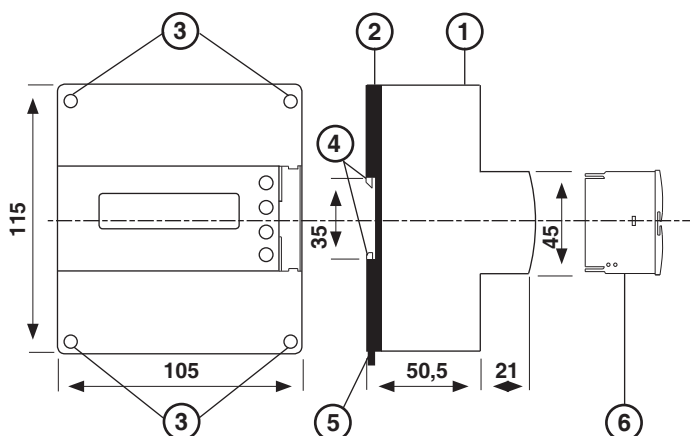
• Alarms
 Configurable functional alarms 8
 Sensor or other configurable alarms 8

• Telemangement
 Speed C-Bus chosen from 1200, 2400, 4800, 9600 bouds
 Data logger of all principal measurements

• Universal output
 This output can be programmed as:
 - status boiler off
 - status heating off
 - status manifold off
 - output 0 ... 10 V for control of:

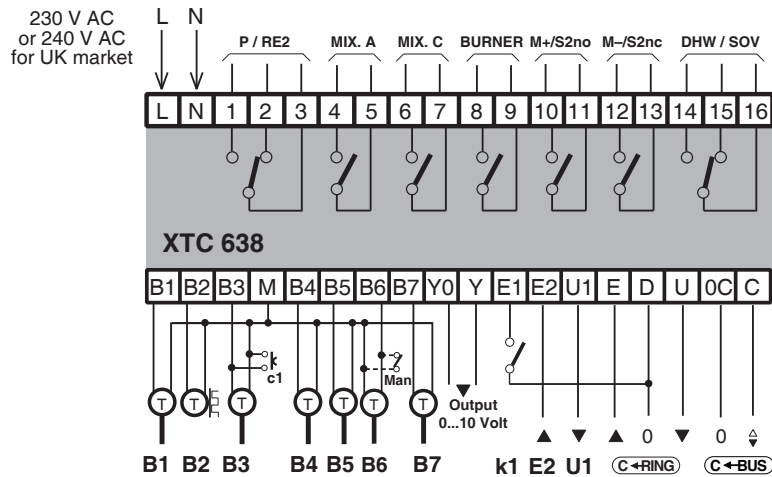
Boiler power
 Burner temperature
 Manifold power

5. FACIA & OVERALL DIMENSIONS



- 1 - Two-line illuminated alphanumeric display
- 2 - + and - operating keys
- 3 - ← and → operating keys
- 4 - Switching on burner or first stage
- 5 - Switching on second stage or increasing modulation
- 6 - Reduce modulation
- 7 - Boiler shut-off valve
- 8 - Pump for heating or other uses
- 9 - Open mixing valve
- 10 - Close mixing valve
- 11 - DHW
- 12 - Alarm internal fault controller
- 13 - Type ACB 460 C1 plug-in for C-Bus communication

6. WIRING DIAGRAM



- B1** – Site flow temp. sensor
- B2** – Outside temp. sensor (for Sole or Master controller)
- B3** – Room or flue gases sensor
- c1** – Push-button switch for control Remote Extension program
- B4** – Boiler temp. sensor
- B5** – Calorifier temp. sensor (DHW)
- B6** – Anticondensing sensor for boiler or manifold (as alternative to **Man**)
- Man** – Control for changing to manual for whole system, as alternative to anticondensing sensor for boiler (**B6**)
- B7** – Sensor manifold boilers in SEQUENCE
- Y0** – Universal optoisolated 0 ... 10 V output (cold pole)
- Y** – Universal optoisolated 0 ... 10 V output (hot pole)
- k1** – Input E1 = alarm switch for burner lockout
- E2** – **Master boiler** = input for all U1 outputs of Slave boilers. (repetition of burner lockout of secondary boilers in SEQUENCE)
 - **Slave boiler** = input for control relay switches 1, 2, 3 (for Master shut-off valve).
- U1** – **Master boiler** = output. (OPEN COLLECTOR) for input E2 of a Slave; controls relay switches 1, 2, 3 for shut-off valve of Master itself.
 - **Slave boiler** = output (OPEN COLLECTOR) repetition lockout burner for Master E2 input; communicates lockout burner to Master itself.
- C-Ring** – Transmission data between controllers
- C-Bus** – Transmission data for Telemangement.
 - C-Bus is enabled using Plug-in type ACB 460 C1
- L** – Line 230 Volt AC (or 240 Volt AC for UK market)
- N** – Neutral
- P/RE 2** – **Master boiler** = control pump (P)
 - Pump ON = switch 2,3 ON, switch 1,3 OFF
 - Pump OFF = switch 2, 3 OFF, switch 1, 3 ON
 - **Slave boiler** = control shut-off valve of Master boiler (operation carried out by a single Slave).
 - Switch 3 = Common
 - Switch 2 = Opening Master shut-off valve
 - Switch 1 = Closure Master shut-off valve
- Mix. A** – Control opens mixing valve site flow
- Mix. C** – Control closes mixing valve site flow
- BURNER** – On-Off control burner
- M+/S2 no** – **1-stage burner** = not used
 - **2-stages burner** = switch which CLOSES when intervention second stage requested (S2 no)
 - **Modulating burner** = control RAISES (M+)
- M-/S2 nc** – **1-stage burner** = not used
 - **2- stage burner** = switch which OPENS when intervention second stage requested (S2 no)
 - **Modulating burner** = control LOWERS (M –)
- DHW/SOV** – **Master boiler** = control DHW
 - Request DHW ON = switch 14, 16 ON, switch 14, 15 OFF
 - Request DHW OFF = switch 14, 16 OFF, switch 14, 15 ON
 - **Slave boiler** = control own shut-off Valve (SOV)
 - Switch 16 = Common
 - Switch 15 = Control opening shut-off valve
 - Switch 14 = Control closure shut-off valve

7. SITING OF CONTROLLER

7.1 Controller

The controller must be installed in a dry location that respects the ambient conditions specified above. 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 for the class of danger concerned.

7.2 Site flow temperature sensor 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 1.5 meters downstream of the control valve.

7.3 Outside temperature sensor B2

This must be installed outside the building on the north or north-west side, at least three meters from the ground, it must be protected from the sun's rays and away from windows, doors, fireplaces and other possible sources of direct thermal disturbances. To be connected to the Master controller in the event of several boilers in sequence.

7.4 Room temperature sensor B3 as an alternative to a flue gases sensor

This must be installed at a point which represents the average temperature of a representative space. If for flue gases temperature it must be installed in the flue.

7.5 B4 boiler sensor

This must be installed on the boiler flow pipe .

7.6 Calorifier temperature sensor B5

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

7.7 Anticondensing temperature sensor B6

This must be installed on the return pipe of the boiler or manifold.

7.8 Manifold temperature sensor B7

This must be installed on the flow of the common manifold, after the last boiler to be put in SEQUENCE, since it has to measure the temperature of the mixture of the flows of all the boilers.

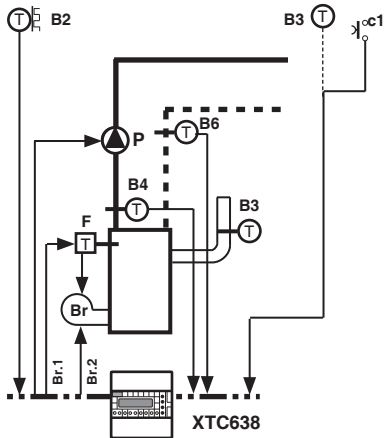
8. ELECTRICAL CONNECTIONS

- Make the electrical connections strictly according to the diagram and to the safety regulations in force, using the following cables: :
 - 1.5 mm² for the power supply and the relay control outputs.
 - 1 mm² for sensors and the remote control.
 - 1 mm² C-Bus and C-Ring. For length limits see Technical Data Sheets T 021 and T 022.
- Switch on power (230 V AC or 240 V AC) and check its presence at terminals L and N.

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

9. EXAMPLES OF CONTROL OF SITES WITH RELATIVE WIRING DIAGRAMS

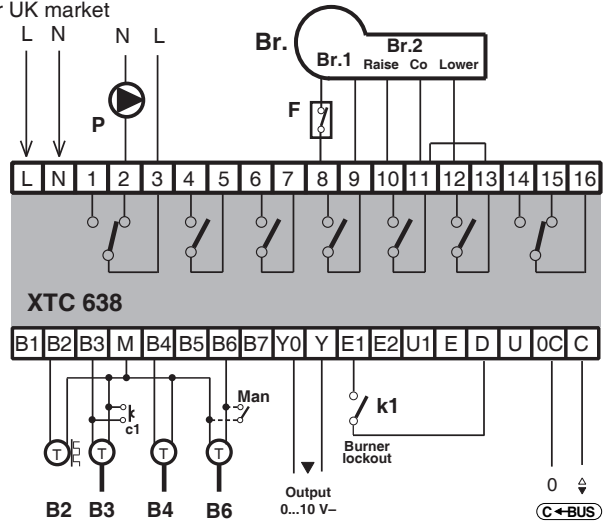
9.1 Single modulating boiler with 1, 2 stages, which provides heating directly, without production of DHW



Main Configuration:

- 4.1.0 CRing: NO SINGLE SITE
- 4.2.0 Control DHW NOT USED
- 4.3.0 Use of mixing valve : NO
- 4.4.0 Use of pump HEATING

230 V AC or 240 V AC for UK market



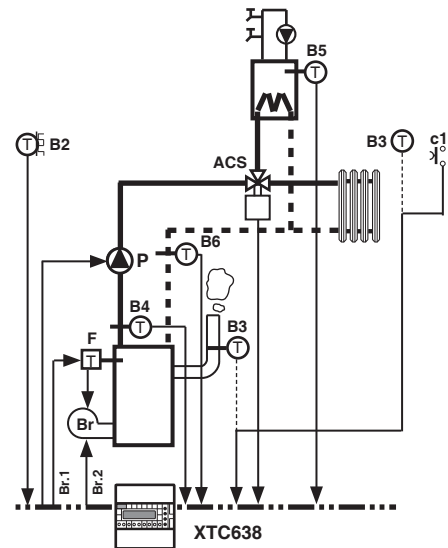
- B2** – Outside temp. sensor
- B3** – Flue gases temp. sensor or room temp. sensor
- c1** – Emergency switch
- B4** – Boiler temp. sensor
- B6** – Anticondensing sensor for boiler (as alternative to **Man** control)
- Man** – Switch for setting whole system on manual; alternative to anticondensing sensor for boiler (**B6**)
- k1** – Switch (voltage-free) for lockout burner
- Y** – Universal programmable optoisolated output
- Y0** – Zero (0) volts of optoisolated Y output
This output can be programmed to give information to the site for further automation (see section 4.19.0)

- L** – 230 V AC (or 240 V AC for UK market)
- N** – Neutral
- P** – Heating pump
- F** – Boiler thermostats in series with burner control
- Br** – Burner
- Br1** – On-Off control burner
- Br2** – Modulating control burner

Operation :

There is only one boiler and it can control any downstream hydraulic circuit, at fixed temperature or compensated. The pump P is programmed to operate only when the boiler is also in operation. In the example is shown a modulating burner, but the system can also operate with a 1- or 2-stage burner. If the burner should have a 0...10V input you can use the Y output (see section 13, page 12)

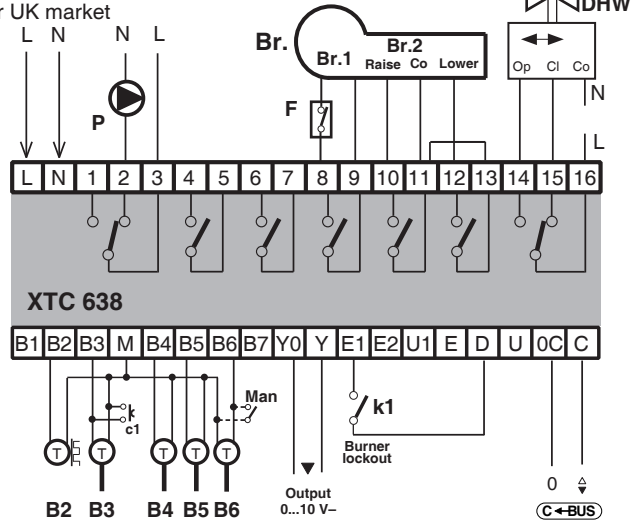
9.2 Single boiler which provides heating, with production of DHW via a diverting valve



Main configurations:

- 4.1.0 CRing: NO SINGLE SITE
- 4.2.0 Control DHW USED
- 4.3.0 Use of mixing valve : NO
- 4.4.0 Use of pump HEAT + PUMP

230 V AC or 240 V AC for UK market



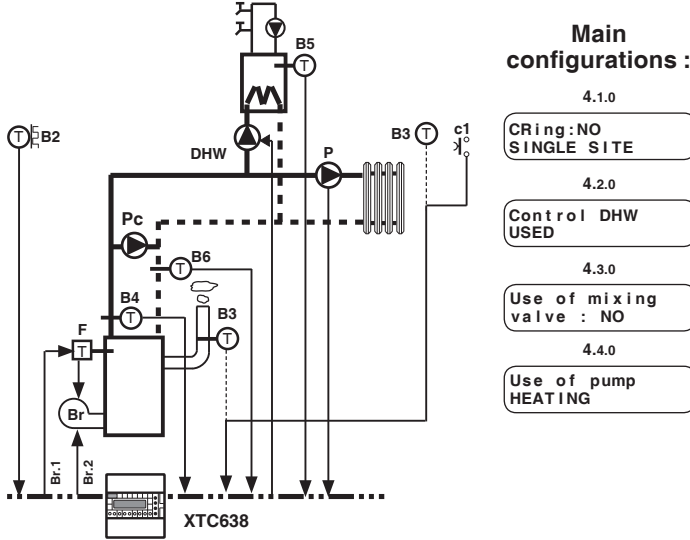
- B2** – Outside temp. sensor
- B3** – Flue gases temp. sensor or room temp. sensor
- c1** – Emergency switch
- B4** – Boiler temp. sensor
- B5** – DHW temp. sensor
- B6** – Anticondensing sensor for boiler (as alternative to **Man** control)
- Man** – Switch for setting whole system on manual; alternative to anticondensing sensor for boiler (**B6**)
- k1** – Switch (voltage-free) for lockout burner
- Y** – Universal programmable optoisolated output
- Y0** – Zero (0) volts of optoisolated Y output
This output can be programmed to give information to the site for further automation (see section 4.19.0)

- L** – 230 V AC (or 240 V AC for UK market)
- N** – Neutral
- P** – Single pump for heating & DHW
- F** – Boiler thermostats in series with burner control
- Br** – Burner
- Br1** – On-Off control of burner
- Br2** – Modulating control of burner
- DHW** – Diverting valve for feeding the DHW production circuit and at same time excluding heating

Operation :

The boiler is directly connected to heating via the diverting valve for the production of DHW. The pump P is programmed to operate when heating or DHW is requested. With this hydraulic system, DHW always has precedence over heating. In the example is shown a modulating burner, but the system can also handle a 1- or 2-stage burner. If the burner should have a 0...10V input you can use the Y output (see section 13, page 12).

9.3 Single boiler which provides heating, with production of DHW via its own pump

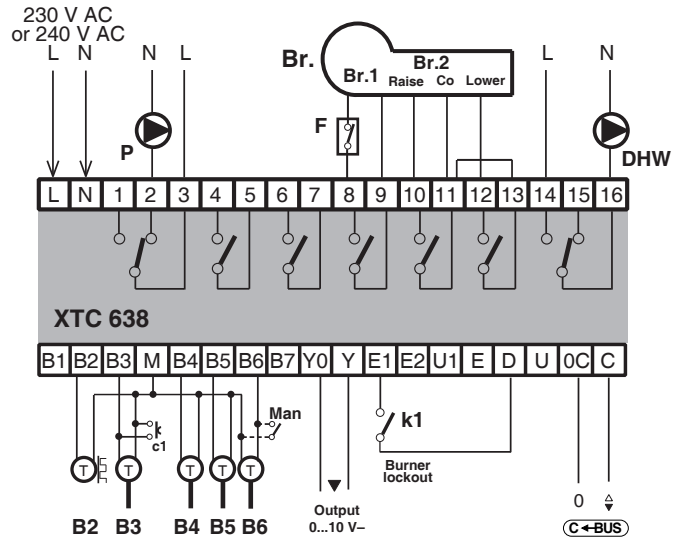


- Main configurations :**
- 4.1.0 CRing: NO SINGLE SITE
 - 4.2.0 Control DHW USED
 - 4.3.0 Use of mixing valve : NO
 - 4.4.0 Use of pump HEATING

- B2** – Outside temp. sensor
- B3** – Flue gases temp. sensor or room temp. sensor
- c1** – Emergency switch
- B4** – Boiler temp. sensor
- B5** – DHW temp. sensor
- B6** – Anticondensing sensor for boiler (as alternative to **Man** control)
- Man** – Switch for setting whole system on manual; alternative to anticondensing sensor for boiler (**B6**)
- k1** – Switch (voltage-free) for lockout burner
- Y** – Universal programmable optoisolated output
- Y0** – Zero (0) volts of optoisolated Y output
This output can be programmed to give information to the site for further automation (see section 4.19.0)

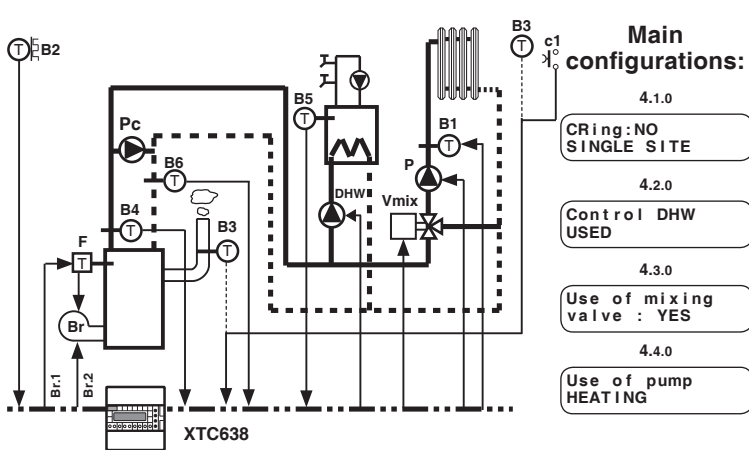
Operation :

The boiler is in direct contact with the heating via its own pump **P**. The **DHW** pump switches on when the DHW calorifier requests heat. With this hydraulic scheme the DHW may or may not have precedence over heating. In the example is shown a modulating burner, but the system can also run a 1- or 2-stage burner. If the burner should have a 0 ... 10 V input you can use the **Y** output (see section 13 on page 12).



- L** – 230 V AC (or 240 V AC for UK market)
- N** – Neutral
- P** – Heating pump
- F** – Boiler thermostats in series to control burner
- Br** – Burner
- Br1** – On-Off burner
- Br2** – Modulating control burner
- DHW** – Pump DHW production
- Pc** – Optional boiler recycle pump controlled by **Y** – **Y0** output (programmed for boiler OFF), converted to relay by ACR 328 device (manufactured by COSTER).

9.4 Single boiler which provides heating with mixing and the production of DHW via its own pump

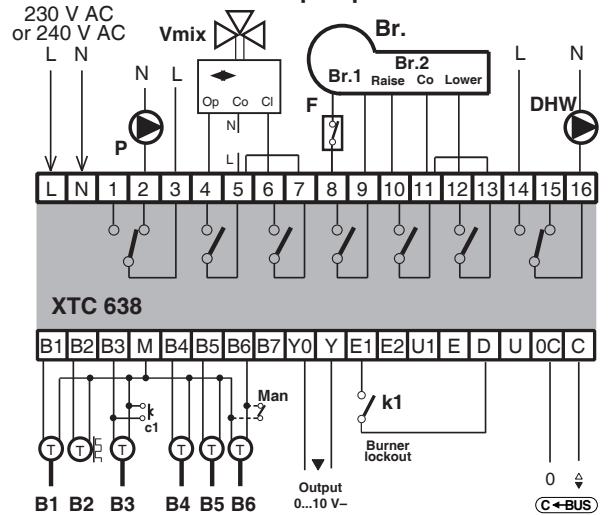


- Main configurations :**
- 4.1.0 CRing: NO SINGLE SITE
 - 4.2.0 Control DHW USED
 - 4.3.0 Use of mixing valve : YES
 - 4.4.0 Use of pump HEATING

- B1** – Site flow temp. sensor
- B2** – Outside temp. sensor
- B3** – Flue gases temp. sensor or room temp. sensor
- c1** – Emergency switch
- B4** – Boiler temp. sensor
- B5** – DHW temp. sensor
- B6** – Anticondensing sensor for boiler (as alternative to **Man** control)
- Man** – Switch for setting whole system on manual; alternative to anticondensing sensor for boiler (**B6**)
- k1** – Switch (voltage-free) for lockout burner
- Y** – Universal programmable optoisolated output
- Y0** – Zero (0) volts of optoisolated Y output
This output can be programmed to give information to the site for further automation (see section 4.19.0)

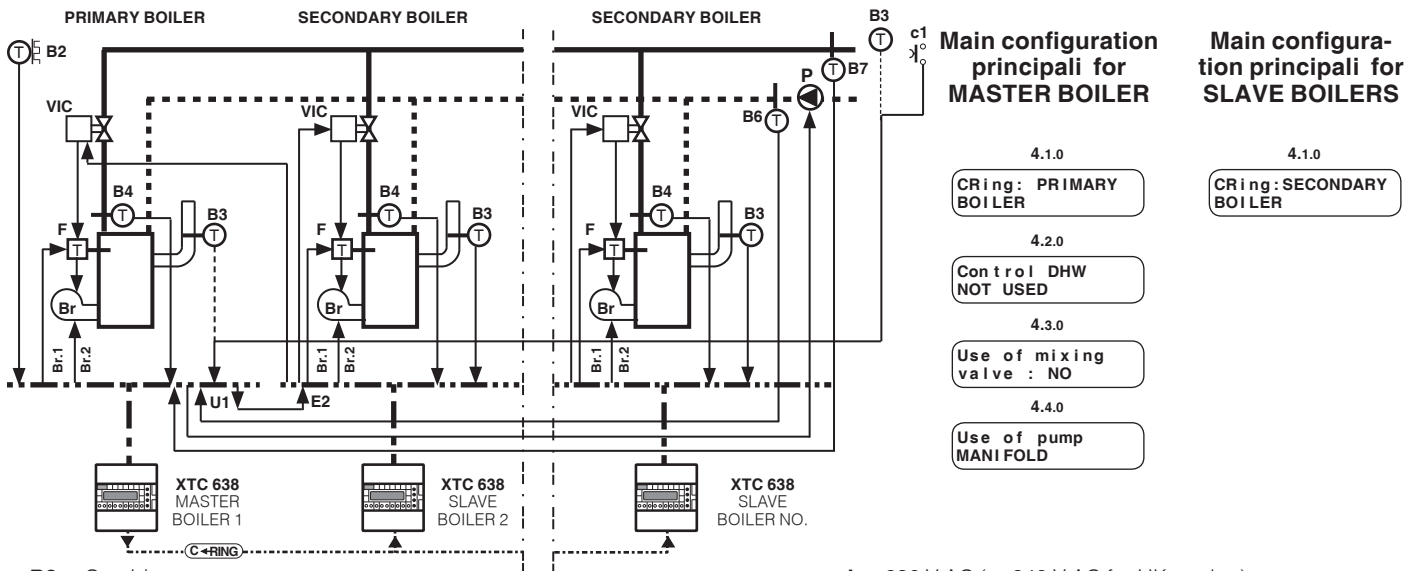
Operation :

The boiler supplies the heating via the mixing valve and the site pump. The **DHW** pump is switched on when the DHW calorifier calls for heat. With this hydraulic system the DHW can or cannot have precedence over heating. In the example is a modulating burner, but the system can also run a burner with 1 or 2 stages. If the burner should have a 0 ... 10 V input you can use the **Y** output (see section 13 on page 12).



- L** – 230 V AC (or 240 V AC for UK market)
- N** – Neutral
- P** – Heating pump
- F** – Boiler thermostats in series to control burner
- Vmix** – Site mixing valve
- F** – Boiler thermostats in series to control burner
- Br** – Burner
- Br1** – On-Off burner
- Br2** – Modulating control burner
- DHW** – Pump DHW production
- Pc** – Optional boiler recycle pump controlled by **Y** – **Y0** output (programmed for boiler OFF), converted to relay by ACR 328 device (manufactured by COSTER).

9.5 Multiple boilers in SEQUENCE which supply heating directly, without the production of DHW



**Main configuration
principali for
MASTER BOILER**

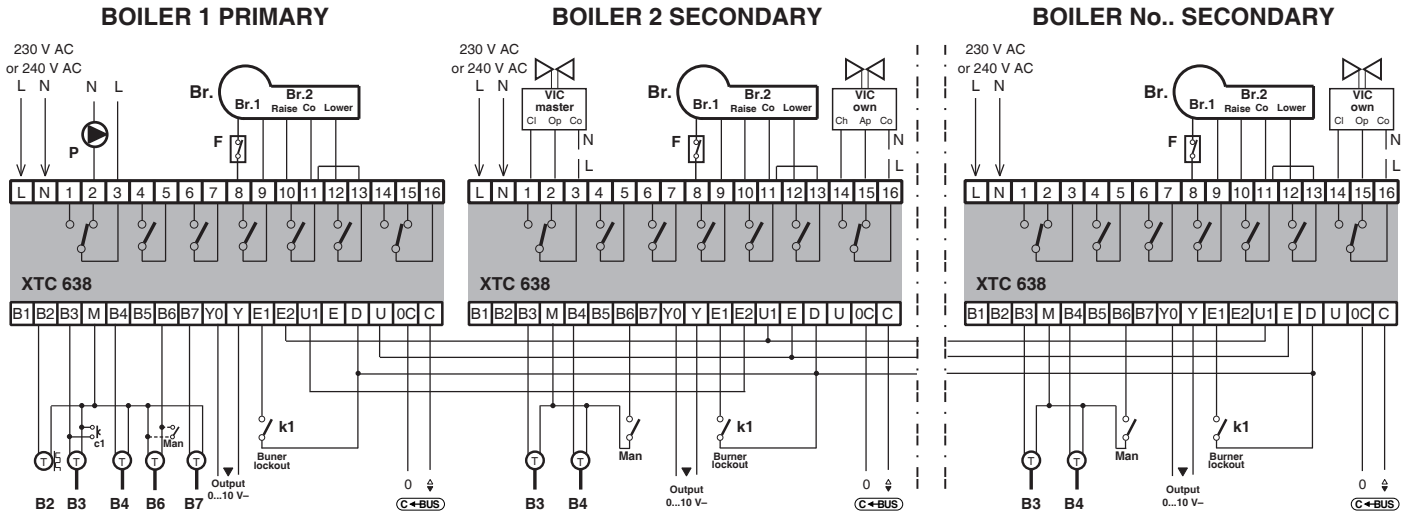
**Main configura-
zioni principali for
SLAVE BOILERS**

- 4.1.0
CRing: PRIMARY BOILER
- 4.2.0
Control DHW NOT USED
- 4.3.0
Use of mixing valve : NO
- 4.4.0
Use of pump MANI FOLD

- 4.1.0
CRing: SECONDARY BOILER

- B2** – Outside temp. sensor
 - B3** – Flue gases temp. sensor or room temp. sensor
 - c1** – Emergency switch
 - B4** – Boiler temp. sensor
 - B6** – Anticondensing sensor for boiler (as alternative to **Man** control)
 - Man** – Switch for setting whole system on manual; alternative to anticondensing sensor for boiler (**B6**)
 - B7** – Manifold temp. sensor
 - k1** – Switch (voltage-free) for lockout burner
 - Y** – Universal programmable optoisolated output
 - Y0** – Zero (0) volts of optoisolated **Y** output
- This output can be programmed to give information to the site for further automation (see section **4.19.0**)

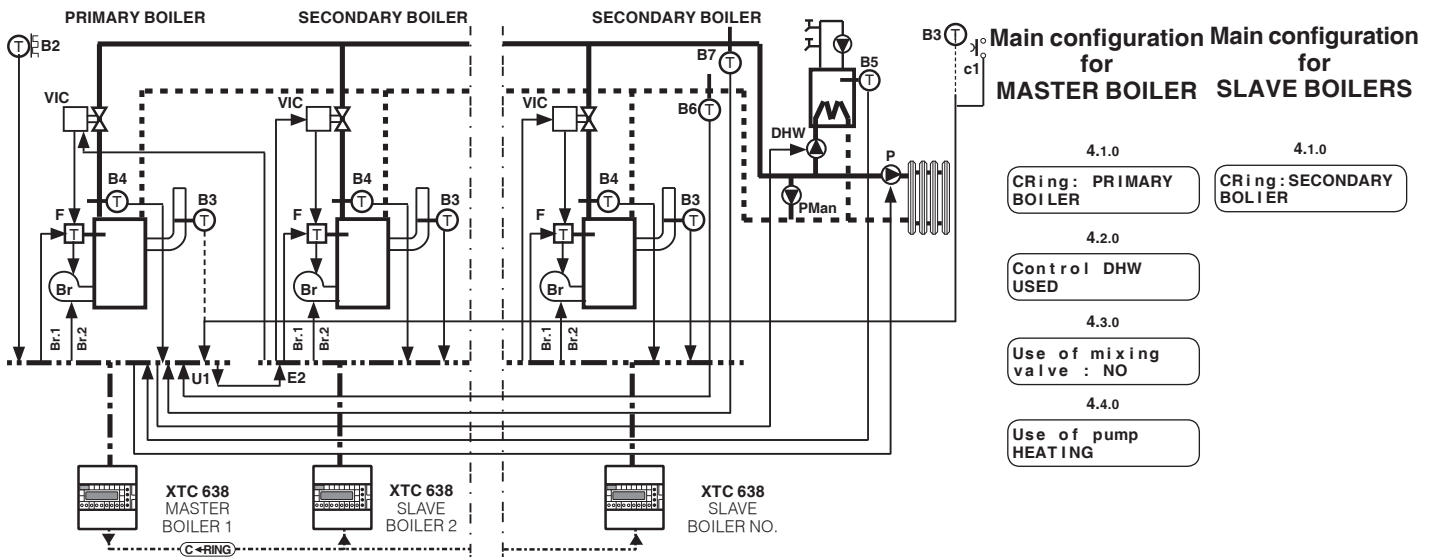
- L** – 230 V AC (or 240 V AC for UK market)
- N** – Neutral
- P** – Manifold pump
- VIC own** – Shut-off valve own boiler
- VIC master** – Shut-off valve master control burner
- F** – Boiler thermostats in series with burner control
- Br** – Burner
- Br1** – On-Off control burner
- Br2** – Modulating control burner



Operation :

The No. boilers are connected to the manifold and controlled in SEQUENCE.
 The heating site is in direct ?
 The simplest system of a site with several boilers in SEQUENCE , where the uses can be of any type, but do not have the ability to communicate with the heat production system.
 In the example are shown modulating burners, but the system can also handle 1- or 2-stage burners.
 If the burners should have 0...10 V inputs you can use the **Y** output (see section 13 on page 12).

9.6 Multiple boilers in SEQUENCE which feed the heating directly, with production of DHW



- Main configuration for MASTER BOILER**
- 4.1.0 CRing: PRIMARY BOILER
 - 4.2.0 Control DHW USED
 - 4.3.0 Use of mixing valve : NO
 - 4.4.0 Use of pump HEATING
- Main configuration for SLAVE BOILERS**
- 4.1.0 CRing: SECONDARY BOILER

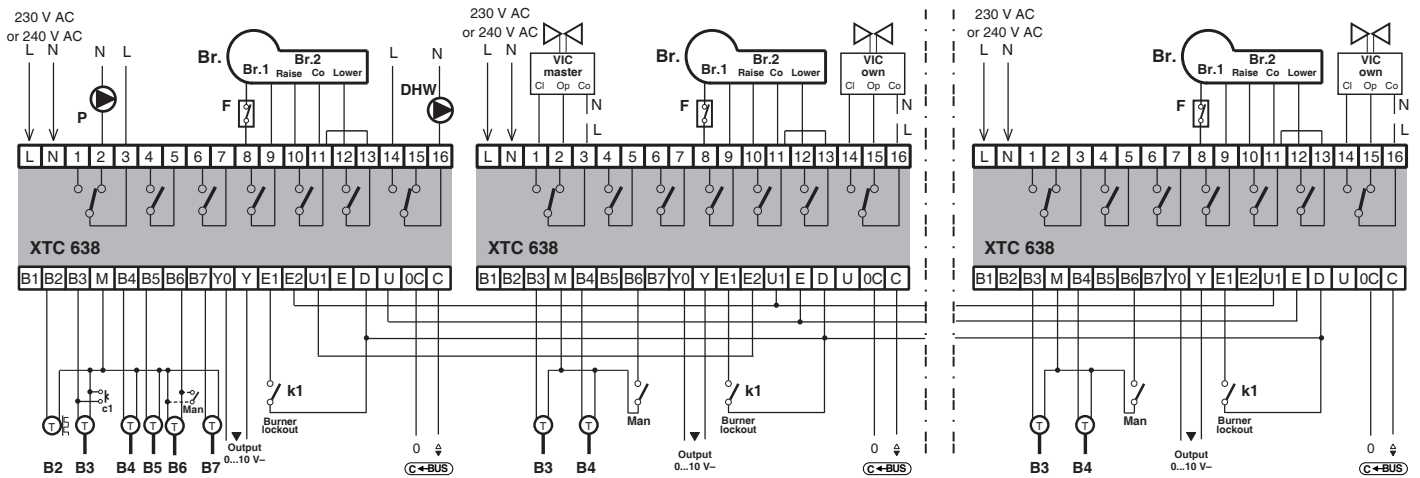
- B2** – Outside temp. sensor
- B3** – Flue gases temp. sensor or room temp. sensor
- c1** – Emergency switch
- B4** – Boiler temp. sensor
- B5** – DHW temp. sensor
- B6** – Anticondensing sensor for boiler (as alternative to Man control)
- Man** – Switch for setting whole system on manual; alternative to anticondensing sensor for boiler (**B6**)
- B7** – Manifold temp. sensor
- k1** – Switch (voltage-free) for lockout burner
- Y** – Universal programmable optoisolated output
- Y0** – Zero (0) volts of optoisolated output
This output can be programmed to give information to the site for further automation (see section 4.19.0)

- L** – 230 V AC (or 240 V AC for UK market)
- N** – Neutral
- P** – Manifold pump
- P Man.** – Manifold recycle pump. For control this pump the Y output of the primary boiler can be used (if not already in use to control burner: see section 4.18.0)
- VIC own** – Shut-off valve own boiler
- VIC master** – Shut-off valve master control burner
- F** – Boiler thermostats in series with burner control
- Br** – Burner
- Br1** – On-Off control burner
- Br2** – Modulating control burner
- DHW** – Pump DHW production

BOILER 1 PRIMARY

BOILER 2 SECONDARY

BOILER No. SECONDARY



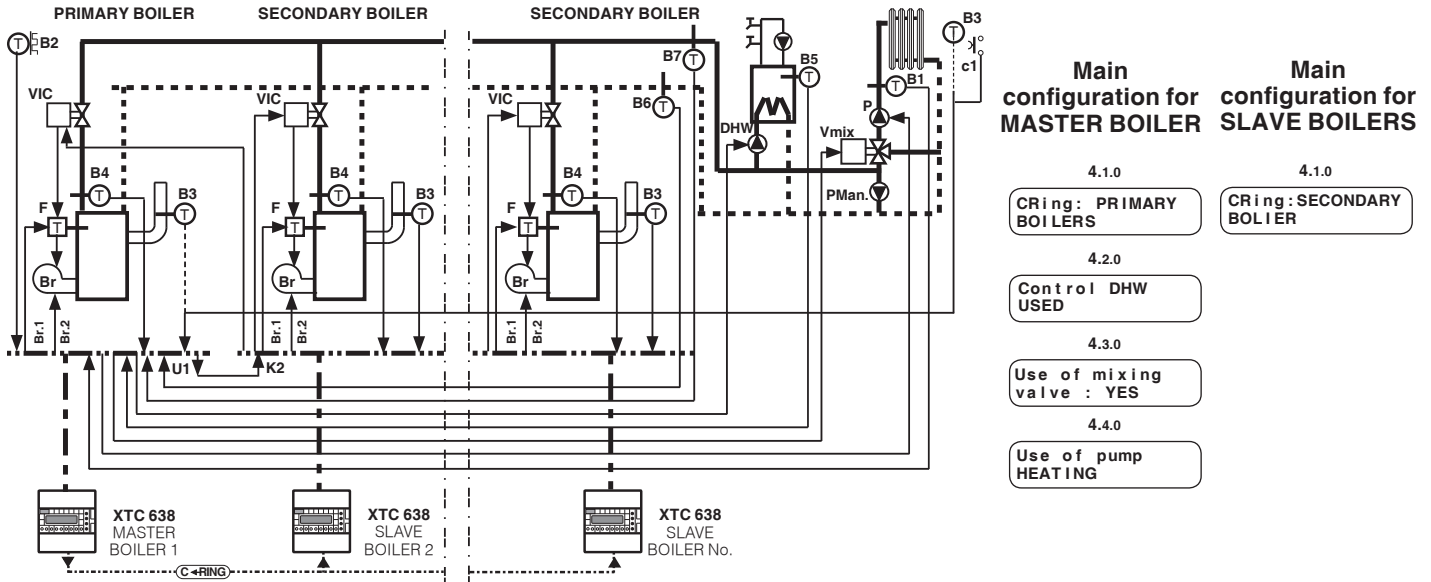
Operation :

The No. boilers are connected to the manifold and controlled in SEQUENCE.
 The heating site is in direct ?
 It is assumed DHW produced by means of own pump.
 In example are shown modulating burners, but the system can also control 1- or 2-stage burners.
 If the burners have 0...10 V inputs the Y output can be used (see section 13 on page 12).

To control the manifold recycle pump (PMan) you can use the Y – Y0 output (programmed for output OFF manifold) of the PRIMARY boiler, converted to relay control by the ACR 328 device (COSTER manufacture).

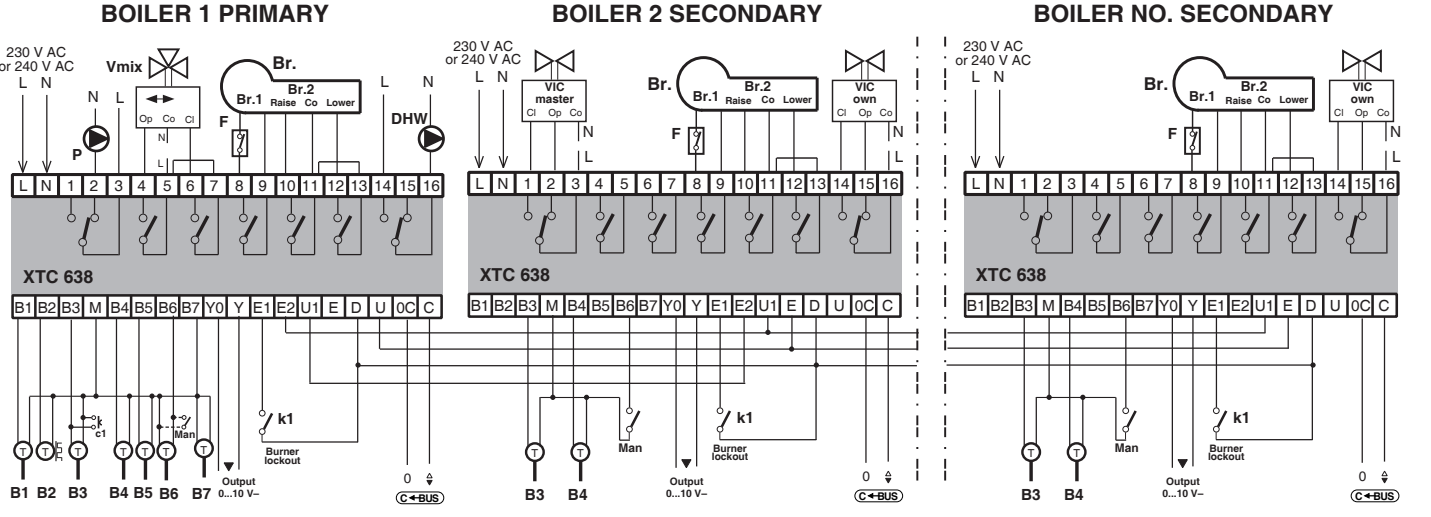
If this output were to be used to control a burner with 0...10 V input, the control of the manifold recycle pump must be achieved by other means (e.g. separate timer/programmer).

9.7 Boilers in SEQUENCE which feed the heating with mixing and DHW production with own pump



- B1** – Site flow temp. sensor
 - B2** – Outside temp. sensor
 - B3** – Flue gases temp. sensor or room temp. sensor
 - c1** – Emergency switch
 - B4** – Boiler temp. sensor
 - B5** – DHW temp. sensor
 - B6** – Anticondensing sensor for boiler (as alternative to **Man** control)
 - B7** – Manifold temp. sensor
 - Man** – Switch for setting whole system on manual; alternative to anticondensing sensor for boiler (**B6**)
 - k1** – Switch (voltage-free) for lockout burner
 - Y** – Universal programmable optoisolated output
 - Y0** – Zero (0) volts of optoisolated Y output
- This output can be programmed to give information to the site for further automation (see section **4.19.0**)

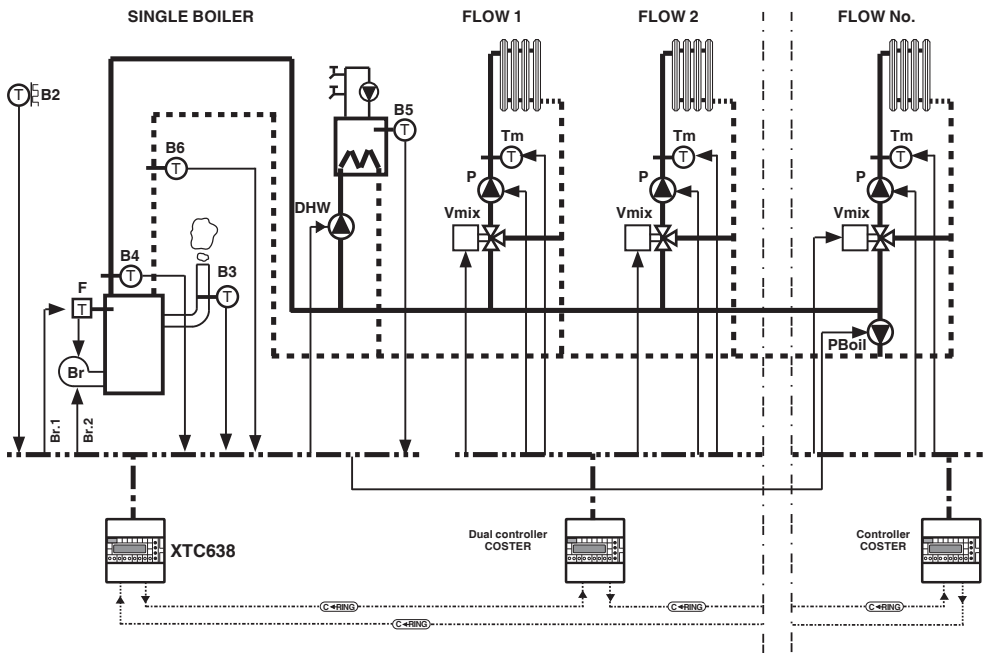
- L** – 230 V AC (or 240 V AC for UK market)
- N** – Neutral
- P** – Heating pump
- P Man.** – Manifold recycle pump. For control this pump see note below on operation
- VIC own** – Shut-off valve own boiler
- VIC master** – Shut-off valve master control burner
- Vmix** – Site mixing valve
- F** – Boiler thermostats in series with burner control
- Br** – Burner
- Br1** – On-Off control burner
- Br2** – Modulating control burner
- DHW** – Pump DHW production



Operation :
 The No. boilers are connected to the manifold and controlled in SEQUENCE.
 The heating installation comprises the mixing valve (VMix) and the pump (P) on the flow.
 It is assumed DHW production uses own pump (DHW).
 In example are shown modulating burners, but the system can also control 1- or 2-stage burners.
 If the burners have 0...10 V inputs the Y output can be used (see section 13 on page 12).

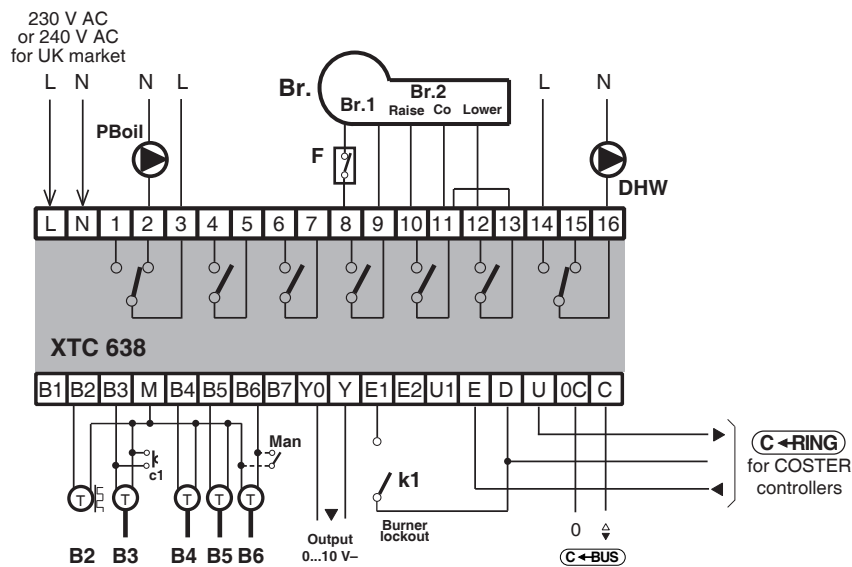
**To control the manifold recycle pump (PMan) the Y – Y0 output (programmed for output OFF manifold) of the PRIMARY boiler can be used, converted to relay control of the ACR 328 device (COSTER manufacture).
 If this output were to be used to control a burner with 0...10 V input, the control of the manifold recycle pump must be achieved by other means (e.g. separate time/programmer).**

9.8 Single boiler which supplies the manifold with any number of flows with mix and various uses. DHW is obtained by means of own pump



- Main configurations**
- 4.1.0
CRing: PRIMARY SITES
 - 4.2.0
Control DHW USED
 - 4.4.0
Use of pump BOILER

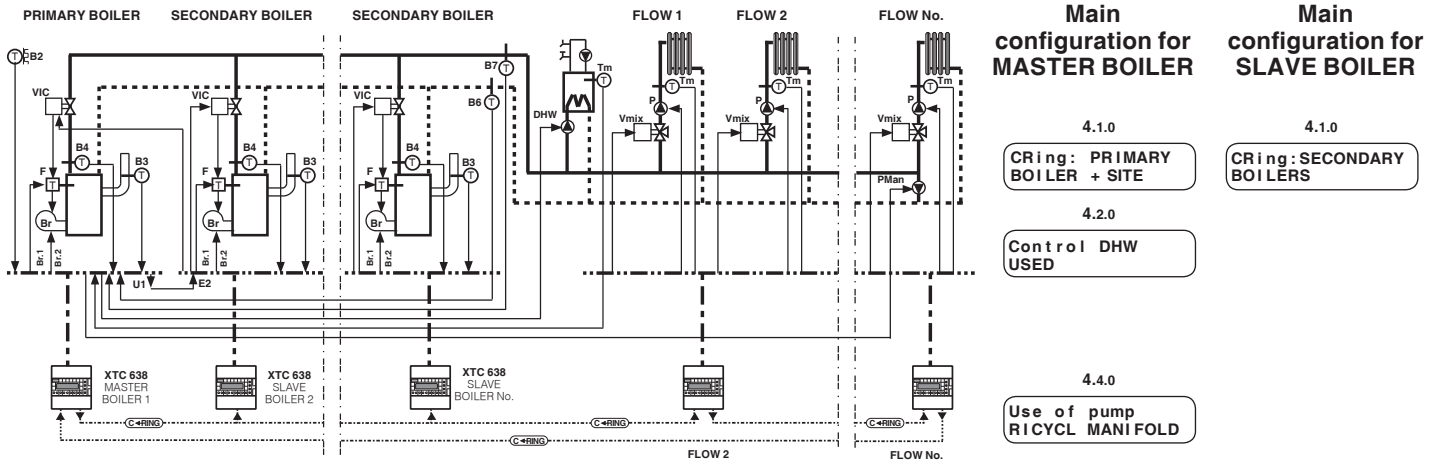
- B2** – Outside temp. sensor
- B3** – Flue gases temp. sensor
- B4** – Boiler temp. sensor
- B5** – DHW temp. sensor
- B6** – Anticondensing sensor for boiler (as alternative to **Man** control)
- Man** – Control for switching whole system to manual, as alternative to boiler anticondensing sensor (**B6**)
- k1** – Voltage-free switch burner lockout
- Y** – Uscita optoisolata universale programmabile
- Y0** – Zero volt optoisolated Y output
This output can be programmed to give information to the site for further automations (see page **4.19.0**)
- L** – 230 V AC (or 240 V AC for UK market)
- N** – Neutral
- P Boil** – Boiler pump
- F** – Boiler thermostats in series with burner control
- Br** – Burner
- Br1** – On-Off control burner
- Br2** – Modulating control burner
- DHW** – Pump production DHW



Operation :

The boiler feeds the manifold from which all the flows and the uses of the site originate. If the flows and the uses are controlled by COSTER devices, the boiler is automatically controlled according to the requirements of the whole system, in order to optimize the use of energy. DHW is generated using its own pump (**DHW**). The boiler pump (**PBoil**) is controlled directly by the XTC 638 controller. In the example, a modulating burner is shown, but a 1- or 2-stage burner is also suitable. If the burner has a 0...10 V input you can use the Y output (see section 13 on page 12).

**9.9 Several boilers in SEQUENCE which feed the manifold, with any number of flows with mix and various uses.
DHW is obtained by means of own pump**



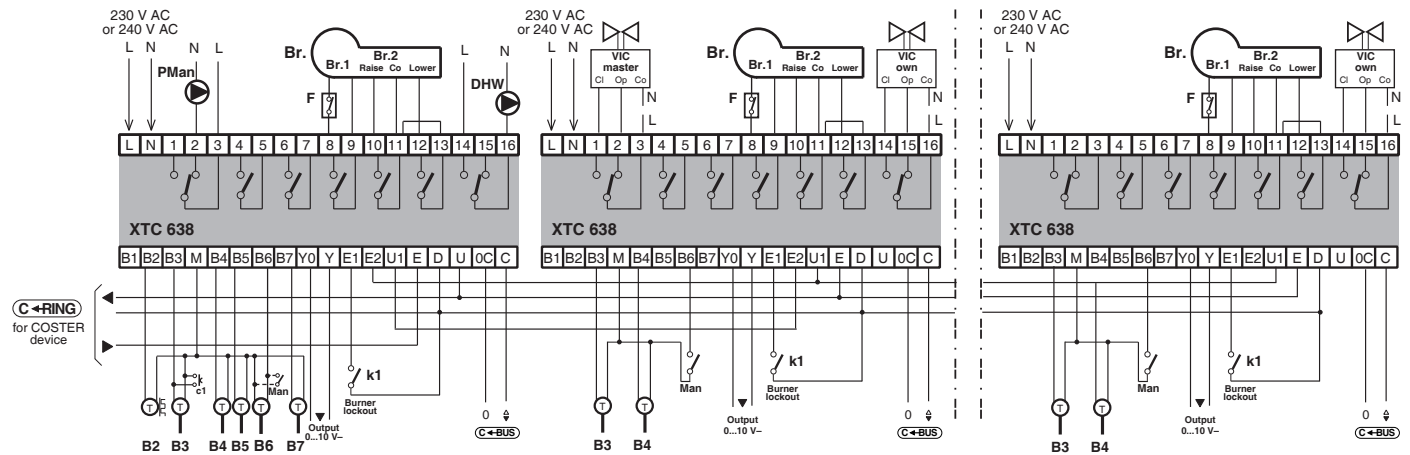
- B2** – Outside temp. sensor
- B3** – Flue gases temp. sensor
- B4** – Boiler temp. sensor
- B5** – DHW temp. sensor
- B6** – Anticondensing sensor for boiler (as alternative to **Man** control)
- Man** – Control for switching whole system to manual, as alternative to boiler anticondensing sensor (**B6**)
- k1** – Voltage-free switch burner lockout
- Y** – Uscita optoisolata universale programmabile
- Y0** – Zero volt optoisolated Y output
This output can be programmed to give information to the site for further automations (see page **4.19.0**)

- L** – 230 V AC (or 240 V AC for UK market)
- N** – Neutral
- P Man.** – Manifold recycle pump. For control this pump see note below on operation
- VIC own** – Shut-off valve own boiler
- VIC master** – Shut-off valve master control burner
- F** – Boiler thermostats in series with burner control
- Br** – Burner
- Br1** – On-Off control burner
- Br2** – Modulating control burner
- DHW** – Pump production DHW

BOILER 1 PRIMARY

BOILER 2 SECONDARY

BOILER No. SECONDARY



Operation :

The boilers in SEQUENCE feed the manifold from which all the flows and the end uses of the site can originate. If the flows and end uses are controlled by COSTER devices, the sequence of the boilers is automatically controlled according to the requirements of the whole system, thereby optimizing the use of energy. DHW is generated using its own pump (**DHW**). The manifold recycle pump (**PMan**) is controlled directly by the XTC 638 controller. In the example, a modulating burner is shown, but a 1- or 2-stage burner is also suitable. If the burner has a 0...10 V input you can use the Y output (see section 13 on page 12).

OBSERVATION :

The above diagrams illustrate the most typical uses, XTC 638 offers ample possibilities for other types of programming in order to produce hydraulic layouts of the most complex types.

Among the complex hydraulic schemes which can be realised by this system, there are those which involve different types of heat generators, such as, for example: heat exchanger, co-generators, boilers using solid fuels and so on.

Contact COSTER to receive suggestions for optimizing controls in order to provide maximum comfort and at the same time save energy.

10. C-RING COMMUNICATION

XTC 638 is provided with complete C-Ring communication which performs two functions:

10.1 Communication between several XTC 638 in order to control several boilers in sequence.

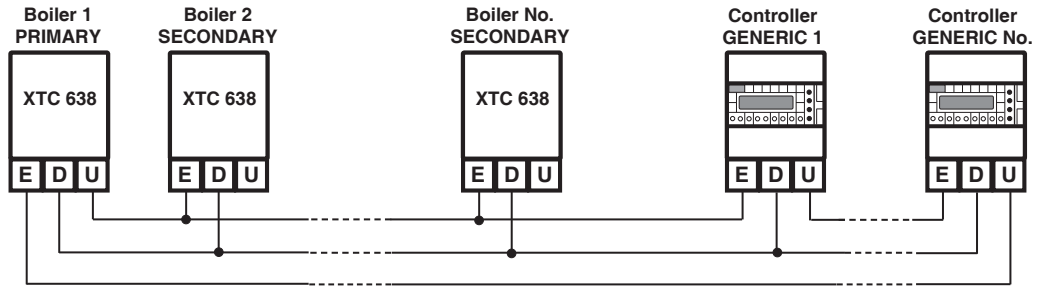
The boiler chosen as Master (PRIMARY BOILER for C-Ring) controls the sequence of itself and the other boilers. For details of the connections you are referred to the wiring diagrams.

10.2 Comunicazione fra XTC 638 Master e altri regolatori COSTER dotati di C-Ring

In this situation the boiler chosen as Master receives, from the C-Ring of the other controllers, the data necessary for the operation of the heat generator(s) (boiler(s) :

- gives approval for the operation of the **Slave** controllers
- receives and transmits the measurement of the **outside temperature**, using a single sensor for the whole site
- receives the value of the **maximum flow temperature** requested by the user outlets
- communicates the priority of the calorifier = modulating closure of the valves of the heating circuits

10.3 Electrical connection C-Ring



The XTC 638 controller of the primary boiler controls, via C-Ring, all the secondary boilers in order to achieve the sequence, whilst, still via C-Ring, it communicates with the other COSTER controllers in order to have all the information regarding the user outlets. On the basis of this information it decides on the best strategy for the system.

WARNING: XTC 638 is provided with C-Ring compatible with all COSTER controllers provided with C-Ring manufactured not earlier than the end of June 2004 (series number 426 onwards).

Compatibility with older controllers is possible: contact COSTER for advice on how to do this.

The document which explains in detail the C-Ring system is: COMMUNICATION SYSTEM BETWEEN CONTROLLERS (T 022).

11. C-BUS COMMUNICATION (LOCAL OR REMOTE TELEMAGEMENT)

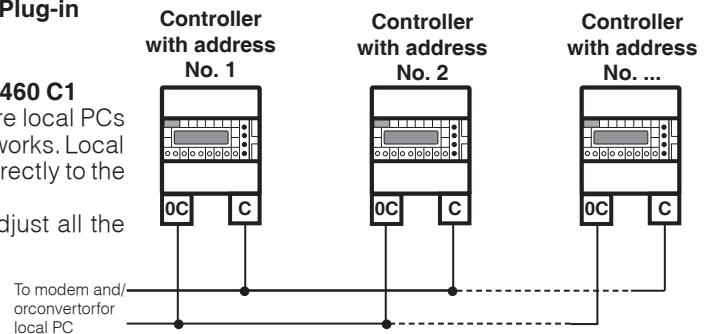
Each controller must be supplied with the appropriate C-Bus Plug-in

XTC 638 provides :

- Remote Telemagement via C-Bus **Plug-in type ACB 460 C1**

The Telemagement is two-directional, with one or more local PCs and/or a remote central control via telephone or other networks. Local communication is to a PC (portable) to be connected directly to the unit.

From the PC or PCs(s) you can see displayed and/or adjust all the parameters of the controller and read all the data.

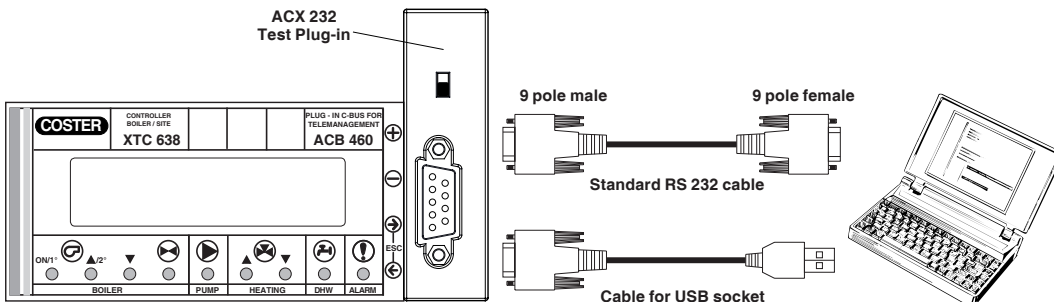


XTC 638 can communicate at various speeds (see page 27, display 4.26.0). If on the site were to be connected in C-Bus other devices having different speeds, it would be necessary to bring into line the speeds of all the units and of the modem.

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

Withdraw the C-Bus Plug-in and insert the test Plug-in ACX 232; use the 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 AC 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 are not well-made and if the PC has its 0V connected directly to the central pole of the plug (as normally happens)

13. CONTROL OF BURNERS AND OF SYSTEMS OF MODULAR BOILERS WITH 0...10 V INPUT

XTC 638, besides controlling any type of 1-, 2-stage or modulating burner, can control burners with 0...10 V input. These burners already have an incorporated, inseparable, controller; two situations can be distinguished:

- **Input 0...10 V in temperature:** the value of the voltage applied at the input is proportional to the value of the temperature at which you want the boiler to run, This input is generally configured with a correspondence between the input voltage and temperature, with a scale already pre-established and fixed.

XTC 638 can adapt its output to any type of scale.

The controller incorporated in the burner is provided with its own sensor and so the boiler sensor for XTC 638 is not strictly necessary, even if very useful for reading the temperature of the boiler locally and Telematically via Telemangement.

- **Input 0...10 V in power:** the most complete burners offer the possibility of configuring the 0...10 V input as power instead of temperature, The burner goes to a power proportional to the value in volts at the input. Generally 0 V corresponds to 0 power and 10 V corresponds to 100%.

It does not matter if the burner has different scales, since the 0...10 V output of XTC 638 can, as for temperature, be calibrated as you wish.

With this input the boiler sensor is indispensable, since the real controller of the boiler becomes that incorporated in XTC 638, which clearly has to know the boiler temperature in order to control it.

The use of the 0...10 V output of XTC 638 is universal and so can control any type of heat generator as, for example, a co-generator, a heat exchanger, a boiler running on solid fuel, etc.

From time to time any site using several heat generators of different types should be inspected to see if it is possible to automatise even more complex sequences. For example:

- a traditional boiler + a co-generator.
- one or more traditional boilers + a heat exchanger for District Heating.
- groups of different boilers, using different fuels and with different means of control.

WARNING: IN COMPLEX SYSTEMS IT IS VERY IMPORTANT TO HAVE A DETAILED TECHNICAL SURVEY IN ORDER TO BE ABLE TO CONTROL THE SEQUENCES BY MEANS OF THE VARIOUS XTC 638 IN ORDER TO ACHIEVE:

- **STABILITY IN THE CONTROL SYSTEM**
- **FLATTENING OF THE POWER PEAKS**
- **OPTIMISATION OF ENERGY CONSUMPTION, FUEL COSTS AND ECOLOGICAL PROBLEMS**

14. FUNCTIONS OF CONFIGURATION, SETTING & CALIBRATION OF THE SYSTEM

In this section are described, without entering into detail, all the functions of XTC 638, since the subject will be dealt with in depth when the programming pages are examined in detail.

The order in which you have to operate on the controllers at the moment of installation is the same as that in which the sub-paragraphs are presented.

14.1 Configuration site (CONFIGURATION menu) (under CONFIGURATION KEY)

By CONFIGURATION SITE is meant the adaptation of XTC 638 to the site it has to serve.

As we have seen in the examples of sites, it is necessary to provide XTC 638 with all the details of the site so that it can perform its functions correctly.

Without a correct SITE CONFIGURATION, XTC 638 will be unable to carry out its functions.

The principal items of information required for configuration are:

- SINGLE BOILER OR SEVERAL BOILERS IN SEQUENCE
- TYPE OF HEATING INSTALLATION (MONO- OR MULTIFLOW)
- USE OF DHW
- USE OF PUMP
- TYPE OF BURNER
- CHOICE OF THE ACCESS KEY
- FEATURES OF TELEMAGEMENT
- OTHER PARTICULAR FUNCTIONS

14.2 Setting burner + boiler (menu BURNER + BOILER) (under SETTING KEY)

The functions which the burner control has to carry out are the most important because on the correctness of these functions depends the energy production of the whole system with a single burner or with several burners in SEQUENCE.

For more details on the theoretical criteria on which the system of sequence is based you are referred to the following document: "CONTROL IN SEQUENCE OF SEVERAL NORMAL OR CONDENSATION BOILERS, WITH MODULATING OR NORMAL BURNERS" (Definitions for SF 4-070, document provided by COSTER on request).

The main settings are:

- TYPE OF CONTROL: POWER (suggested for the normal boilers) or TEMPERATURE (suggested for condensation boilers).
- POINT FOR SWITCHING OFF BURNER: this function generates various operating criteria when there are several boilers in SEQUENCE.
 - NORMAL: the burner is switched off as soon as possible
 - OPTIMISED: the burner takes into account the type of boiler and burner which precede it in SEQUENCE, before switching itself off. For example, it allows the second stage of the burner which precedes it to modulate instead of switching itself off completely. In the document referred to above this subject is discussed in detail.
- MANY OTHER PARAMETERS to optimize the production of energy.

14.3 Functions of the sequence of several boilers (menu MANIFOLD + SEQ)(under SETTING Key)

- FORMATION OF THE SEQUENCES: you can form as many different sequences as there are boilers present. The switch between sequences can be automatic (timed) or manual..
- REDUCTION OF BOILERS IN USE FOR DHW ONLY: when the boiler system serves only for DHW (e.g. in summer) it is possible to limit automatically the number of boilers concerned. The automatic system calls in other boilers when those dedicated to DHW are temporarily out of use.

14.4 Compensated control and optimization (menu SETTING COMPENS.) (UNDER SETTING Key)

XTC 638 also includes a complete compensated control with all the optimum starts, stops and the use of the heating site pump.

Compensated control is established on the basis of the type of heating bodies, on the value of the design outside temperature and that of the flow design temperature; it also includes the adjustment of the origin of the compensation curve so as to obtain a more comfortable temperature in the intermediate seasons.

14.5 Control mixing valve site flow (menu FLOW WITH MIX) (under SETTING KEY)

XTC 638 also incorporates a complete compensating controller for the flow temperature to the heat emitters.

It is possible to choose all the parameters necessary for a correct setting.

14.6 Control of Domestic Hot Water (DHW) (under SETTING KEY)

XTC 638 also includes a controller for the production of DHW, provided with its own timer independent of that for heating.

The ANTIBACTERIA and PRIORITY functions are available.

14.7 Testing (TESTING menu) (under SETTING KEY)

XTC 638 is provided with a sophisticated system for testing all the connections to outside. It is absolutely essential to test the whole electrical system connected to these controllers before assuming that the whole system is functioning correctly.

14.8 Programmable optoisolated output (Y, Y0)

XTC 638 is provided with an optoisolated output which can be programmed for many uses:

- indication of Off status of heating
- indication of Off status of boiler
- indication of Off status of manifold
- output 0...10 V: used to control :
 - a burner provided with a 0...10 V input in power or temperature with any scale
 - a group of boilers (e.g. modular boilers) with 0...10 V in power or temperature with any scale.

IMPORTANT: There is no point in discussing the practical use of the controllers - site system without having completed all the operations summarised in this section: in other words, it is useless to operate as described in the next section (USE FUNCTIONS) without having completed all the operations just described.

15. USE FUNCTIONS

These functions comprise those operations which the user can carry out to employ the controller as he thinks fit.

The use functions can be classified in three groups:

- USE WITH RAPID ACCESS: these are the choices the user makes daily. These choices are under the access KEY at the lowest level (USER KEY), if set.
- NORMAL USE: these are the choices for the creation and/or adjustment of the heating programs and of DHW. These choices, too, are under USER KEY.
- ALARMS & MEASUREMENTS: all the information and the measurements which serve mainly to inform the technical staff how the system is functioning. The alarms and measurements are freely accessible since they are readouts only, with the exception of a small amount of data which can be readout freely but the adjustment of which is protected by a KEY..
- VARIOUS CONTROLS: these represent the rather more technical settings which can, however, be used by an operator with the required amount of expertise. These choices are protected by the access KEY for an operator with a medium level of expertise (KEY SETTING), if entered.

The KEY SETTING (medium level) permits access also to whoever is under USER KEY.

15.1 Use with rapid access (under USER KEY)

With the first two pages you can adjust the room temperature and the DHW temperature desired at that moment by the system: essentially, the user makes a very simple manoeuvre to adjust these two values.

With the second two pages you can choose the programs for heating and for DHW.

The four rapid access pages enable the user to adjust the most important parameters which influence the comfort factor.

15.2 Normal use (under USER KEY)

This is a group of pages by means of which you can construct the timed heating and DHW programs, at the same time choosing the most suitable temperatures for the user.

In the same group of pages you can also define the heating season, the extension period and the special period.

15.3 Alarms and measurements (free access except when under KEY)

This group of pages includes all the measurements, the alarms and the counts which

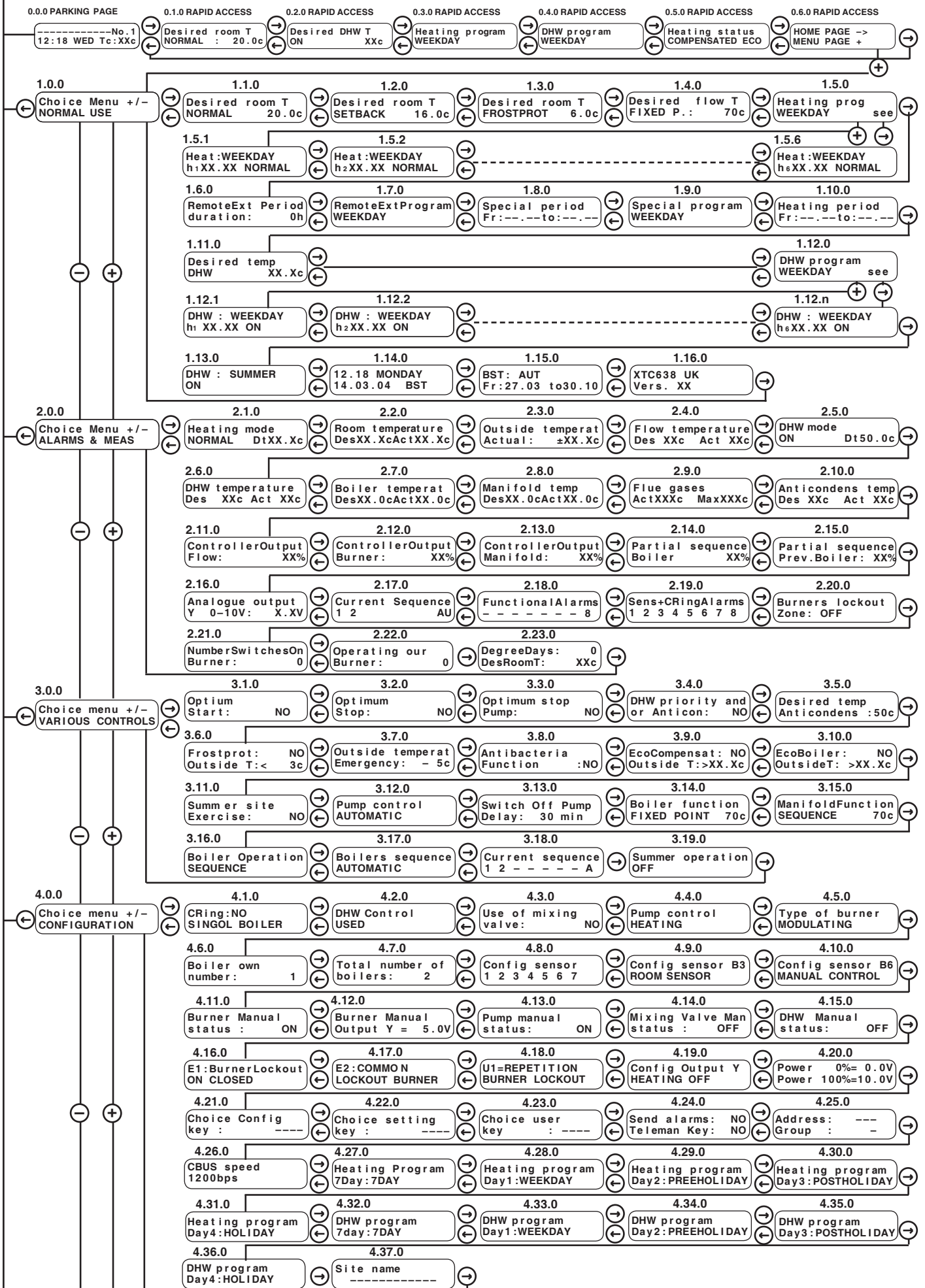
Indicate how the system is functioning. There is free access to all these pages except those regarding the choice of desired alarms (KEY SETTING) and those regarding the meter readings, the cancellation of which is protected by the CONFIGURATION KEY which permits the cancelling of these data only by an operator of the highest level.

15.4 Various controls (under KEY SETTING)

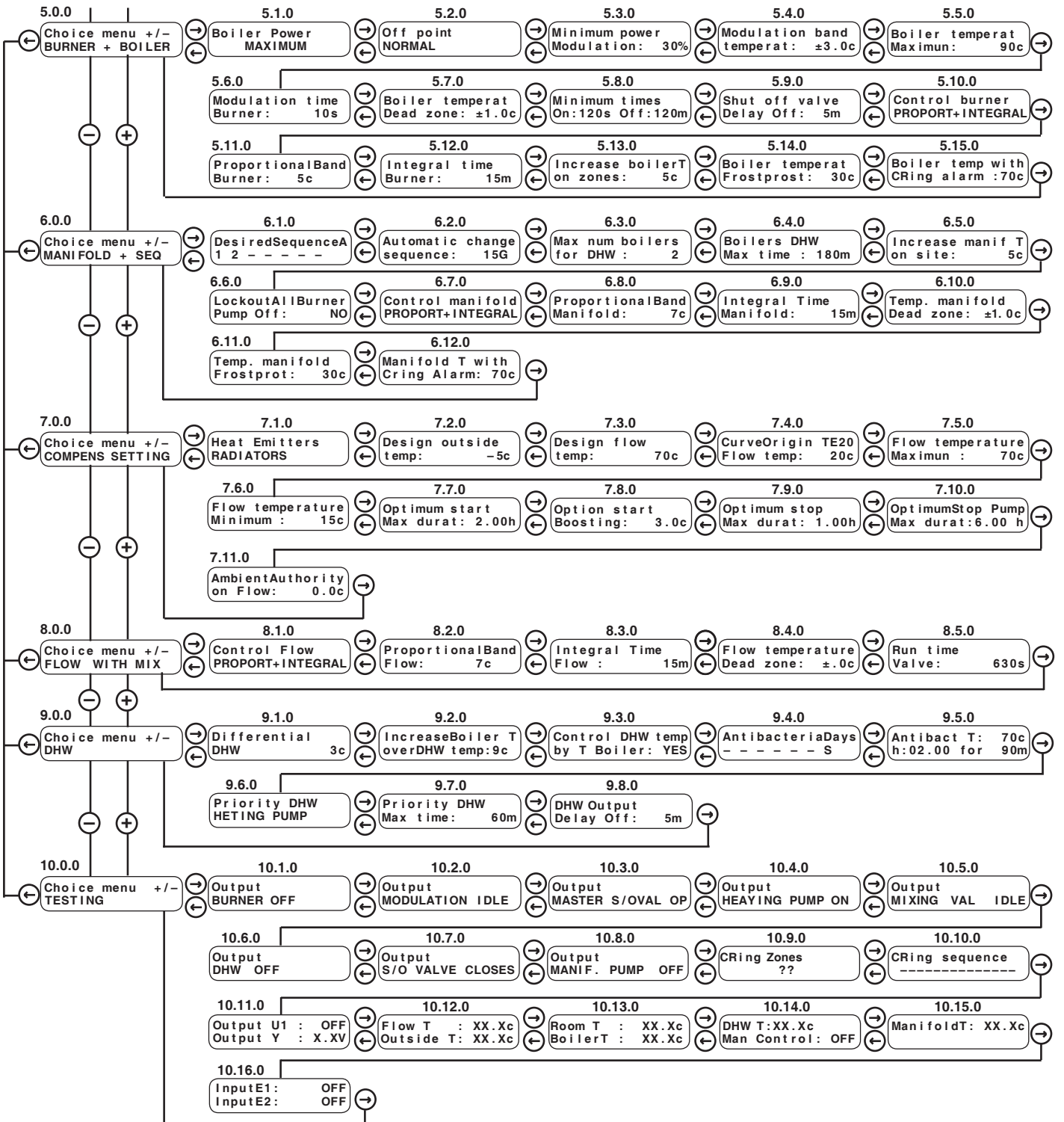
In this group are included all the parameters for defining the operation of the system according to the requirements of the correct running of the site: e.g. optimisation, priority, Frospot, antibacteria for DHW, economy, summer plant exercise, choice of the sequence and accessory functions of the boiler.

In general, these are functions which, once established, do not have to be changed.

16. SEQUENCE OF DISPLAY PAGES (THE DATA ARE THOSE IN MEMORY AT CONSIGNMENT)



FOLLOWS FROM PAGE 14



NUMBERING OF THE PAGES

The pages are numbered with three digits. For greater clarity we give three examples :

- page 9.3.0 = 9 represents the menu (DHW), 3 represents the page number in the menu (Antibacteria Days) and 0 which represents any sub-pages of the preceding page.
The sub-pages are pages which are opened by a certain page, which in this case functions also as a sub-menu
- page 1.5.6 = this is menu 1, the page 5 generates a sub-menu, the page 6 of the sub-menu
- special pages : 0.0.0 = parking page: this is the page to which the system automatically returns if the controls 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 = pages for rapid access: these are pages for immediate use, very easily and rapidly accessible

N.B.: Some pages may appear differently or even not appear at all; this depends on the configuration of the controller in relation to the site where it is to be used.

N.B.: In the following sections the menus, any sub-menus and the pages are shown in the order in which they are presented by the controller.

WARNING : Before using these pages read the last page (section 27).

The values of the parameters shown on the pages are factory (DEFAULT) settings: they can be left as they are except those regarding the type of HVAC site.

All the parameters which can be adjusted using + and – keys are shown by




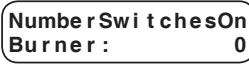


Many pages or whole menus may not appear, or appear in a different form, according to the configuration which has been made in order to adapt XTC 638 to the site.

17. MENU No. 0		RAPID ACCESS PAGES (ACCESS WITH USER KEY IF ENTERED)	
Page No.	Display	Description	Sect.
0.0.0	-----No 1 12:18 WED Tc:XXc	This is called: PARKING PAGE = the page to which the controller returns automatically (after 15 minutes). The first line gives the site name, shown on page 4.37.0 : n.1 : Number of the boiler, only if there are several boilers in SEQUENCE 12:18 WED Time & day of week XXc Actual temperature of boiler Time & day of week can alternate with one of following indications : – ALARM = one or more alarms in progress (see pages 2.18.0 and 2.19.0) – MANUAL = whole system controlled on MANUAL (control B6 On) – REMOTE EXTENSION = Remote Extension period On – SPECIAL = Special period in progress – SUMMER = Summer period	15.1
0.1.0	Desired room T NORMAL 20.0c	Room heating temperature currently programmed appears. With + and – keys this can be adjusted. This adjustment remains: this increase or decrease is easy to set. More complex settings will be explained in the following pages. If in that moment the program requests: OFF or FROSPROT it is not possible to make adjustments; to restart the heating you have to change the program in the following pages. If at that moment the program requires a fixed flow temperature (SETPOINT), in place of Desired Room T there will appear Desired Flow T : this temperature can be adjusted.	
0.2.0	Desired DHW T ON 50c	You can adjust the desired DHW temperature . If, at that moment, the program requires OFF, you have to change the program on the following pages. WARNING: if the actual boiler temperature is not at least 3°C higher than the actual DHW temperature, the relative control command has no effect so as not to transfer the calorifier heat to the boiler.	
0.3.0	Heating program WEEKDAY	You can choose the required heating program from the four 24HOUR programs, the 7DAY program and, always, from NORMAL, SETBACK, FROSPROT, FLOW TEMPERATURE, (SETPOINT) and OFF.	
0.4.0	DHW program WEEKDAY	You can choose the DHW program you require from another four 24HOUR programs, the 7DAY program and always ON, OFF, or FOLLOWS HEATING. This last choice switches on DHW when the heating is switched on. If the choice is Off or Frosprot this switches off the DHW. The program is updated during the summer period (see page 1.13.0, section 18, menu 1 on page 18).	
0.5.0	Heating status COMPENSATED ECO	This page appears if the heating status is different from normal operation. There will appear one or more of the following indications: COMPENSATED ECO (the heating has changed to compensated economic, see page 3.8.0), ECO BOILER (the boiler has passed to economy, see page 3.9.0), FROST PROTECTION (frost protection, see page 3.5.0).	
0.6.0	HOME PAGE -> MENU PAGE +	This page serves to separate the menu of the rapid access pages from all the other menus which have a technical content which is different or of a higher level. By pressing -> key = you return to parking page By pressing + key = you go to next menu	
X.X.X	Enter key -----	ENTERING ACCESS KEY (IF SET) The key is entered using + and – keys and moving the cursor with <- and ->.keys. Once the correct key has been entered, you return to the page from which you started and you can operate the keys. The access key, once entered, remains active for 15 minutes after having pressed any key; in practice, if, for 15 minutes after having entered the key, no key is pressed, the key is again requested. The key to be entered is that required by the menu you are using, or a key for a higher level (see display page 4.20.0 section 20, page 26).	

18. MENU NO. 1 NORMAL USE (ACCESS WITH USER KEY, IF ENTERED)		
Page No.	Display	Description
1.0.0	Choice Menu +/- NORMAL USE	This is menu selected. The whole of this menu is protected by USER KEY.
1.1.0	Desired room T NORMAL 20.0c	The room temperature desired for the normal heating periods is entered: usually this temperature coincides with the day temperature.
1.2.0	Desired room T SETBACK 16.0c	The room temperature desired for the setback heating periods is entered: usually this temperature coincides with the night temperature.
1.3.0	Desired room T FROSTPROT: 6.0c	The room temperature desired for the Frosprot periods is entered in order to ensure that in these periods the room temperature does not fall below a critical value when the spaces are not inhabited
1.4.0	Desired flow T FIXED P.: 70c	A fixed flow temperature (SETPOINT) is entered for the heating site. This temperature can be useful for providing a minimum of heat to the radiators when the spaces are only partially used. This setting is useful also when you require a fixed flow temperature e.g. when user satellites are used with the heat exchanger for DHW. These four temperatures are those which will be entered in the timed programs for heating (illustrated in the following pages).
1.5.0	Heating program WEEKDAY see	This page is the starting point for the creation or adjustment of the timed program indicated. Using + and - keys select the program you want to create or modify. The available programs are: 7DAY, WEEKDAY, PREHOLIDAY, POSTHOLIDAY, HOLIDAY. These five names are the standard factory settings: on the configuration pages you can change them at will to make it easier for the user to remember and select them. Once the program has been selected, position -> key on the word "see" and with the + key enter the relative submenu of the program itself.
1.5.1	Heat :WEEKDAY h1 06.00 NORMAL	h1 = set start time of first period NORMAL = select the desired temperature from: NORMAL, SETBACK, FROSTPROT, SETPOINT, OFF
1.5.2	Heat :WEEKDAY h2 22.00 SETBACK	h2 = set start time of second period NORMAL = select the desired temperature from: NORMAL, SETBACK, FROSTPROT, SETPOINT, OFF
	⋮	
1.5.6	Heat :WEEKDAY h6 XX.XX NORMAL	h6 = set start time of sixth & last period. NORMAL = select desired temperature from: NORMAL, SETBACK, FROSTPROT, SETPOINT, OFF. Should not all 6 periods be required, delete the relative start time by pressing simultaneously + and - keys: there will appear: --.--- Continue for the other four 24hour programs
1.5.n	Heat :7DAY MON :WEEKDAY	If on page 1.5.0 the 7DAY program has been selected to create or adjust it, and you have entered the relative submenu with the word "see", there will appear 7 of these pages in a row, with the 7 days of week; for each day you can select a 24hour program from the following: WEEKDAY, PREHOLIDAY, POSTHOLIDAY, HOLIDAY and the temperatures NORMAL, SETBACK, FROSTPROT, SETPOINT, OFF.
1.6.0	RemoteExt Period duration: 0h	Set the number of hours for which you want the extension heating period to be switched on, using the c1 button (see wiring diagram). The Extension period heating is useful when, with the heating program OFF, you want to switch heating on for a certain period of time: this can be done by means of a simple push-button switch. Example: an office normally closed on Saturday, and so with the heating programmed OFF, is used temporarily in the morning for a meeting. The push-button could be under lock and key and sited in an easily-accessible place. To activate the EXTENSION PERIOD, press the push-button c1 for at least 1 second and, to exit before the set time has expired (the meeting lasts for a shorter time than expected), press the c1 button for at least 10 seconds
1.7.0	RemoteExt Program WEEKDAY	Set the program you require during the Emergency period
1.8.0	Special period Fr:---.---to:---.---	Enter a special period between two dates (included) so as to have a pre-established program in that period, Example: period of special closure of an office, or a period of special opening. By pressing + and - at the same time you see displayed: Fr ---.---to ---.---. This function is particularly useful also for setting in advance special periods. By using the COSTER SWC 701 program appropriately it is possible to program any number of periods with dates, even for the whole year.
1.9.0	Special program WEEKDAY	Set the program you require during the special period.

18. MENU NO. 1 NORMAL USE (ACCESS WITH USER KEY, IF ENTERED)			
Page No.	Display	Description	Sect.
1.10.0	<div style="border: 1px solid black; padding: 2px;"> Heating period Fr : 15.10 to : 15.04 </div>	Set the period during which you require heating. The system automatically sets heating for the "summer" period. On page 3.19.0 you can set the operation you require during the summer period for the whole boiler/boilers system. For example: you require the boiler to be in operation.	15.2
1.11.0	<div style="border: 1px solid black; padding: 2px;"> Desired temp DHW 50c </div>	Set the temperature you require for DHW	
1.12.0	<div style="border: 1px solid black; padding: 2px;"> DHW program WEEKDAY see </div>	This page is the starting point for the creation or amendment of the timed program indicated. Using + and - keys, select program you want to create or amend. The possible programs are: 7DAY, WEEKDAY, PREHOLIDAY, POSTHOLIDAY, HOLIDAY. These five names are the standard factory settings: on the configuration pages these can be changed as required so as to make it easier for the user to adopt names he can remember easily. Besides these five programs you can also choose the program FOLLOWHTG. With this program DHW is available even when the heating has been programmed ON (i.e. not FROSTPROT or OFF). Once the operating program has been selected, click the -> key on the word "see" and with the + key enter the submenu of the program itself. The procedure is perfectly similar to that of heating.	
1.12.1	<div style="border: 1px solid black; padding: 2px;"> DHW : WEEKDAY h1 06.00 ON </div>	The choice is between: ON and OFF. Along with these two choices you can choose FOLLOWHTG. With this program DHW is available also when the heating has been programmed On (i.e. not FROSTPROT or OFF)..	
	⋮		
1.12.n	<div style="border: 1px solid black; padding: 2px;"> DHW: 7DAY MON. :WEEKDAY </div>	The choice for every day of the week is from: WEEKDAY, PREHOLIDAY, POSTHOLIDAY, HOLIDAY and ON, OFF. Along with the above 6 choices you can choose FOLLOWHTG. With this program DHW is available when even the heating has been programmed On: i.e. not FROSTPROT or OFF.	
1.13.0	<div style="border: 1px solid black; padding: 2px;"> DHW Summer ON 50c </div>	Set the DHW program you require when the heating is off, since you are out of the period on the previous page. You can select any of the programs for DHW, exactly as on page 0.4.0. The chosen program is automatically displayed on the rapid access page 0.4.0. Clearly, from the rapid access page this summer program can be changed as required..	
1.14.0	<div style="border: 1px solid black; padding: 2px;"> 12.18 MONDAY 14.03.04 GMT </div>	This is the system clock and calendar and must be adjusted. The internal clock is a high-precision instrument and has a battery life (when the controller is switched off) of more than 10 years	
1.15.0	<div style="border: 1px solid black; padding: 2px;"> BST: AUT Fr : 27.03 to : 30.10 </div>	The clock can change automatically (AUT) from GMT to BST and vice versa in accordance with the dates established by the European Community. If on manual (MAN) you can set other dates if you are not following those of the European Community or if, in the future, the latter should change.	
1.16.0	<div style="border: 1px solid black; padding: 2px;"> XTC638 UK Vers. XX </div>	The identity card of the controller. Version XX = the software version which corresponds to the technical features.	
1.0.0	<div style="border: 1px solid black; padding: 2px;"> Choice Menu ± NORMAL USE </div>	Continuing, you return to the first page of the menu. If you want to select another menu, use + and - keys; if you want to return for a check on the menu just used, use the -> key. For ease of use, when you reach any page with a choice of menu, there is a delay of a few seconds to give the user the possibility of deciding whether to remain on the current menu or exit definitely. This holds good for all the other menus.	

18. MENU NO. 2		ALARMS, MEASUREMENTS & COUNTS (FREE ACCESS EXCEPT 5 PAGES)	
Page No.	Display	Description	Sect.
2.0.0	Choice Menu +/- ALARMS & MEAS	This is the menu selected. The whole of this menu is freely accessible with the exception of certain pages. The pages requiring ACCESS KEY are indicated. In this menu are included all the alarms, measurements & counts: this menu is of particular interest to the site engineer who needs to know how the whole system is functioning. Usually, the measurements not required by the configuration are without the relative pages or are indicated by dashes.	15.3
2.1.0	Heating mode NORMAL Dt XX.Xc	On this page you can read the heating temperature mode which is operating at that moment. Next to the temperature modes contained in the programs appear also the special conditions PREOFF (evening optimisation) and BOOSTING (morning optimisation).	
2.2.0	Room temperature DesXX.XcActXX.Xc	Des= Temperature desired by programs Act = Actual temperature measured by the sensor (if configured & installed)	
2.3.0	Outside temperat Actual: ±XX.Xc	The outside temperature measured by the relative sensor (if connected to the controller). If the outside temperature arrives via C-Ring (see section 10.2) instead of Actual will appear C-Ring.	
2.4.0	Flow temperature Des XXc Act XXc	This is the temperature of the site heating flow, if between the boiler/ boilers there is a mixing valve.	
2.5.0	DHW mode ON Dt50.0c	On this page you can read the DHW mode in progress at that moment. Next to the ON and OFF modes appear also the special conditions: ANTIBACTERIA (in progress the antibacterial overtemperature) and FOLLOWHTG.	
2.6.0	DHW temperature Des XXc Act XXc		
2.7.0	Boiler temperat Des50.0cAct50.0c	Des = desired temperature (SETPOINT) If the boiler is in SEQUENCE with others, and controlled IN POWER, "Des" (Desired) does not appear Act = actual temperature If everything is functioning correctly the desired temperature should be almost equal to the actual temperature, bearing in mind the transitory phases. This rule holds good also for all the subsequent measurements.	
2.8.0	Manifold temp Des70.0cAct70.0c	This measurement obviously appears only when the system has several boilers in SEQUENCE, connected to the manifold of the system	
2.9.0	Flue gases temp ActXXXc MaxXXXc	This page is dedicated to the temperature of the boiler flue gases. Act = Actual temperature at that moment Max = Maximum temperature reached by the flue gases from the last cancelling of the memory; to erase the memory press + and - keys at the same time for a few seconds.	
2.10.0	Anticondens temp Des XXc Act XXc	Obviously this measurement appears only when the anticondensing sensor is configured, as we have seen with non-condensing boilers.	
2.11.0	ControllerOutput Flow: XX%	This is the controller output of the output of the controller of the mixing valve. In practice, this is the thermal power (expressed as a percentage of the maximum) requested at that moment by the heating site. (Heating power)	
2.12.0	ControllerOutput Burner: XX%	This is the thermal power (expressed as a percentage of the maximum) requested at that moment from the burner. Having overcome the transitory phases it should be fairly close to what is indicated on the burner. (Burner power)	
2.13.0	ControllerOutput Manifold XX%	This is the thermal power (expressed as a percentage of the maximum) requested at that moment from the total boiler system. Having overcome the transitory phases it should be fairly close to what is indicated on the burner. (Manifold power)	
2.14.0	Partial sequence Boiler XX%	This is the share of the total power to be supplied by the boiler when in SEQUENCE. This value depends above all on its position in this sequence	
2.15.0	Partial sequence Prev. Boiler:XX%	This has the same significance as the above page except that it relates to the boiler preceding it in the SEQUENCE. It is useful to know this measurement so as to have information on the POINT OF OPTIMISED STOP (see section 14.2 and document referred to in this section)..	
2.16.0	Analogue output Y 0-10V: 0.0V	On this page you can read the value in Volts of the 0... 10V analogue output if this has been configured on page 4.20.0 of the CONFIGURATION menu..	
2.17.0	Current Sequence 1 2 AU	This is the sequence the system follows when there are several boilers. AU = sequence with automatic timed exchange FI = fixed sequence established in menu VARIOUS CONTROLS	

18. MENU NO. 2		ALARMS, MEASUREMENTS & COUNTS (FREE ACCESS EXCEPT 5 PAGES)	
Page No.	Display	Description	Sect.
2.18.0		<p>This page is protected by the SETTING ACCESS KEY.</p> <p>On this page you can select and display the functional alarms of the system.</p> <p>Each alarm can be:</p> <ul style="list-style-type: none"> - CONFIGURED but not triggered = fixed number appears - CONFIGURED and triggered = the number alternating with letter A appears - ALARM NOT CONFIGURED (not required) = in place of number a dash appears. <p>Each alarm can be selected with the cursor: At each position of the cursor appears the type of functional alarm:</p> <ul style="list-style-type: none"> - ALARM 1 = BOILER TEMPERATURE - ALARM 2 = FLOW TEMPERATURE - ALARM 3 = DHW TEMPERATURE - ALARM 4 = ROOM TEMPERATURE - ALARM 5 = FLUE GASES TEMPERATURE - ALARM 6 = MANIFOLD TEMPERATURE - ALARM 7 = LOCKOUT BURNER - ALARM 8 = THE CLOCK ALARM <p>Each alarm can be programmed for difference between desired temperature and actual temperature, or as limit(Max) for the flue gases temperature. The delays can be programmed. This programming is carried out by local or remote Telemanagement.</p>	15.3
2.19.0		<p>This page is protected by the SETTING ACCESS KEY.</p> <p>These alarms function in exactly the same way as those described above.</p> <p>They are alarms regarding open- or short-circuited sensors.</p> <p>The alarms for the obligatory sensors are already set.</p> <p>Each alarm can be selected with the cursor:</p> <p>For each position of the cursor appears the type of functional alarm:</p> <ul style="list-style-type: none"> - ALARM 1 = FLOW SENSOR - ALARM 2 = OUTSIDE SENSOR - ALARM 3 = ROOM SENSOR or FLUE GASES SENSOR (if configured in this way) - ALARM 4 = BOILER SENSOR - ALARM 5 = DHW SENSOR - ALARM 6 = MANUAL CONTROL or ANTICONDENSING SENSOR - ALARM 7 = MANIFOLD SENSOR - ALARM 8 = CRING NOT FUNCTIONING 	
2.20.0		<p>This page exists when the controller is MASTER of the sequence of several boilers.</p> <ul style="list-style-type: none"> - OFF: at least one burner in lockout on zone. - ON: all the site burners are in lockout (e.g. lack of fuel) <p>Each single burner has already sent its lockout alarm (if configured).</p>	
2.21.0		<p>In view of importance of the measurement, this page is protected by the CONFIGURATION ACCESS KEY.</p> <p>This is the total number of times the burner is switched on (if 2-stage, of the first stage).</p> <p>This figure is useful for optimizing the sequence so as to have the maximum seasonal performance.</p> <p>To zero the count memory, press at the same time the + and - keys for at least 9 seconds; the cancellation is protected by the CONFIGURATION KEY (if entered).</p>	
2.22.0		<p>In view of importance of measurement, this page is protected by the CONFIGURATION ACCESS KEY.</p> <p>It is the total number of operating hours of the burner; if the burner is in lockout the counter stops.</p> <p>This figure too is useful for optimizing the sequence so as to have the maximum seasonal performance.</p> <p>To zero the count memory, press at the same time the + and - keys for at least 9 seconds; the cancellation is protected by the CONFIGURATION KEY (if entered).</p>	
2.23.0		<p>In view of importance of the measurement, this page is protected by the CONFIGURATION ACCESS KEY, It totals the number of Degree-Days since the last zeroing.</p> <p>20c = the reference room temperature for the calculation of Degree-Days (officially 20°C).</p> <p>To zero the count memory, press at the same time the + and - keys for at least 5 seconds; the cancellation is protected by the CONFIG KEY (if entered). The change of the reference temperature is also protected by the ACCESS KEY.</p> <p>These last three counts, together with the fuel consumption data, are fundamental for assessing the advantage on the energy consumptions which can be achieved by means of a correct configuration and management of the site.</p>	

Page No.	19. MENU NO. 3 Display	VARIOUS CONTROLS (ACCESS WITH SETTING KEY, IF ENTERED) Description	Sect.
3.0.0	Choice menu +/- VARIOUS CONTROLS	This is the chosen menu. The whole of this menu is protected by SETTING KEY. In this menu are included all the parameters for defining the operation of the system according to the requirements for efficient running of the site. These are functions which, once established, hardly ever need be changed.	15.4
3.1.0	Optimum Start: NO	You can decide whether or not you want an optimum morning stop, whilst the setting of all the relative parameters is covered in a successive technical menu	
3.2.0	Optimum Stop: NO	You can decide whether or not you want an optimum evening start, whilst the setting of all the relative parameters is covered out in a successive technical menu.	
3.3.0	Optimum stop Pump: NO	You can decide if or not you want optimisation for the evening switching off of the heating circuit circulation pump; whilst the setting of all the relative parameters is covered in a successive technical menu. The reason for this nocturnal optimal stop is, above all, to avoid the noise inevitably generated by the pump (especially annoying at night); the pump is switched off for as long as there is no point in running it, and it is switched on again (usually in the morning) when the thermal balance of the system calls for heat.	
3.4.0	DHW priority and or Anticon: NO	You can decide if or not you wish give priority to DHW production & to Anticondensing. The type of priority for DHW is decided by the configuration choice and is shown on page 33 display 9.5.0. The priority for DHW and the Anticondensing function are eliminated or applied together..	
3.5.0	Desired temp Anticondens: 50c	On this page you can set the value of the minimum temperature to avoid acid condensation in the boiler, when the boiler is a normal gas or gasoil type (not condensation). Obviously the above applies only if the boiler is not a condensation type; in this type of boiler you want to keep the return temperature as low as possible in order to increase the fuel performance and so the condensation is requested .	
3.6.0	Frostprot: NO Outside T:< -3c	You can decide if you want the FROSTPROT function (to protect the site from freezing) and below which outside temperature this function has to be activated. The temperature is chosen ?? This function protects all the elements of the system (boiler, pipework, etc) even when the system is programmed OFF	
3.7.0	Outside temperat Emergency: -5c	The whole system is controlled on the basis of the outside temperature measured by the appropriate sensor, or received from other controllers via C-Ring. If for any reason (short circuit, break in cable) information on the outside temperature should no longer arrive, you can select a fixed emergency value for this so that the site continues to function under acceptable emergency conditions (a sort of spare wheel). Clearly, under these circumstances an alarm is raised.	
3.8.0	Antibacteria Function: NO	You can decide if or not you want the antibacterial function for DHW. The ways in which this function operates are programmed in a following technical menu.	
3.9.0	EcoCompensat:NO OutsideT: >18.0c	You can decide if or not you want to program the ECONOMY function for the boiler.This function permits the total exclusion of the boiler alone or in SEQUENCE, when the outside temperature rises above a pre-set value.In this way the less advantageous boilers from the energy point of view can be excluded even if the SEQUENCE calls for them, in the conditions in which the site does not request a large amount of thermal energy. This function is particularly useful in the morning after the night switching off, in the intermediate seasons.	
3.10.0	EcoBoiler: NO OutsideT :>18.0c	You can decide if or not you want to program the ECONOMY function for the boiler. This function permits the total exclusion of the boiler alone or in SEQUENCE, when the outside temperature rises above a pre-set value.In this way the less advantageous boilers from the energy point of view can be excluded even if the SEQUENCE calls for them, in the conditions in which the site does not request a large amount of thermal energy. This function is particularly useful in the morning after the night switching off, in the intermediate seasons	
3.11.0	Summer site Exercise: NO	You can decide if or not you require the Summer Plant Exercise function. During the summer period (heating off) all the devices connected to the controller (valves, pumps) are individually activated at least once a week. This operation takes place on Sundays around midday, a time at which any noise does not cause annoyance.	
3.12.0	Pump control AUTOMATIC	You can decide how you want the pump to operate when it is used.AUTOMATIC: the pump is switched on only when required.ALWAYS ON: the pump is always switched on.	
3.13.0	Switch Off Pump Delay: 30 min	You can program a delay in switching off the pump when it is controlled in automatic mode: this delay serves to recover the thermal energy on the site.Whilst the factory setting is 30 minutes you can program this delay from 0 to 150 minutes..	

Page No.	19. MENU' N. 3 Display	VARIOUS CONTROLS (ACCESS WITH KEY , IF ENTERED) Description	Sect.
3.14.0	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> Boiler functions FIXEDPOINT 70c </div>	<p>This page exists if there is only one boiler and if there is a mixing valve, or if there is only one boiler and the C-Ring is PRIMARY SITES (see page 4.1.10, CONFIGURATION, section 20). On this page you can establish the boiler functions (there is only one on site), above all taking into consideration the best energy performance. This programming is valid only for the winter period.</p> <p>The choice are:</p> <ul style="list-style-type: none"> - FIXEDPOINT XXc: the boiler is programmed at a fixed temperature. Clearly, this is only possible if the heating site is equipped with a mixing valve and its own pump. - ZONES: the boiler follows the temperature requested by the heating installation(s). In particular, it follows the compensation of the mixing valve controlled by XTC 638 and, if necessary, all the other sites which communicate with the boiler via C-Ring (COSTER controllers). - ZONES + MIN XXc: exactly the same as the preceding function, with a minimum temperature for the boiler itself. <p>This function is useful when it is necessary to ensure a minimum temperature from the boiler, since, besides the consumptions controlled by COSTER controllers there also exist other consumptions without, or with controllers of any type which are unable to communicate with XTC 638.</p> <ul style="list-style-type: none"> - OFF: you require the boiler to be always switched off 	15.4
3.15.0	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> ManifoldFunction FIXEDPOINT 70c </div>	<p>This page exists if there are several boilers on the site, and this is the PRIMARY BOILER with mixing valve, or the C-Ring is PRIMARY SITES + BOILERS (see page 4.1.0 menu CONFIGURATION, section 20).</p> <p>The functions are exactly the same as those on the previous page, but selected for the manifold, when there is more than one boiler in SEQUENCE, even if the OFF function is never used.</p> <p>These program settings are valid only for the winter period.</p> <p>These last two pages are alternatives.</p>	
3.16.0	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> Boiler operation SEQUENCE </div>	<p>This page exists only if the boiler is part of a sequence of several boilers and so is an alternative to page 3.14.0.</p> <ul style="list-style-type: none"> - SEQUENCE : the boiler normally follows the SEQUENCE. - OFF : the boiler is excluded from the SEQUENCE. <p>These programs are always valid for both summer and winter.</p>	
3.17.0	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> Boilers sequence AUTOMATIC </div>	<p>On this page you can select the type of SEQUENCE you require.</p> <ul style="list-style-type: none"> - AUTOMATIC: the various SEQUENCES (formed in the next technical menu) exchange between themselves after a certain number of days (subsequently arranged) - FIXED TYPE A, (B, C, and so on): you choose which is the SEQUENCE to be used always among those already formed. <p>This choice is generally used when, for example, there are two boilers, one condensation and the other not, to have the most efficient one always operate first.</p>	
3.18.0	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> Current sequence 1 2 - - - - A </div>	<p>This page completes the previous one.</p> <p>If the preceding page is AUTOMATIC you can choose the SEQUENCE with which you want to start: in practice, you set the first starting SEQUENCE for the cycle of automatic exchange which will take place after the preset number of days (page 6.2.0. menu 6, section 22).</p> <p>If the previous page is FIXED TYPE A (B, C, and so on) you see the chosen SEQUENCE which remains always the same.</p>	
3.19.0	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> Summer operation OFF </div>	<p>This page refers to the boiler, if single, or to the manifold if the site has several boilers in SEQUENCE. It represents the programming of the system out of the heating period (SUMMER).</p> <ul style="list-style-type: none"> - OFF: the system is completely OFF during the summer. - ZONES + MIN 40 c: the system follows the request of the sites connected via C-Ring with a minimum temperature which can be preset (e.g. following heating on conditioning sites). - ZONES: the system follows the request of the sites, if the controllers concerned are of COSTER manufacture (provided with C-Ring). Programming which is useful, for example, following heating in air-conditioning sites. - FIXEDPOINT: XXc: the whole system is kept at a pre-set temperature; if this temperature should be below that necessary to produce DHW it is automatically raised. - DHW ONLY: the system is used only to produce DHW. <p>To this function are later added other functions to avoid too many boilers being used only for DHW.</p>	

WARNING: The next menu (No. 4) is the most important of all the system since it configures XTC 638 on the true heating site; if this menu is not correctly configured it is pointless to use the controller. Since it can display and request parameters not suitable for the actual site.

20. MENU NO. 4		CONFIGURATION (ACCESS WITH CONFIGURATION KEY IF ENTERED)	
Page No.	Display	Description	Sect.
4.0.0	<p>Choice menu +/- CONFIGURATION</p>	<p>This is the chosen menu. The whole of this menu is protected by ACCESS KEY YOU ARE STRONGLY ADVISED TO ENTER THE KEY IN ORDER TO PROTECT THIS MENU.</p> <p>WARNING: Access to this menu must be protected, since an error or tampering, besides interfering with the control, can cause the whole site to malfunction. Press -> key There will appear the page: :</p>	14.1
4.1.0	<p>TECHNICAL PAGES! PRESS + KEY</p> <p>CRing : NO SINGLE BOILER</p>	<p>PRESS + KEY: there will appear the message PRESS -> KEY. As soon as you press -> you enter CONFIGURATION. This procedure is necessary to ensure that inexperienced users do not make errors which could lead to incorrect configuration. This concept has been repeated several times in order to emphasize its importance.</p> <p>This is the most important page of the whole system, since it communicates the true heating site to XTC 638 which can then act as required.</p> <p>The choice is between: - NO - SINGLE BOILER : on site there is a single boiler and XTC 638 is not connected to other flows having COSTER controllers. Examples of this type of site are to be found in sections 9.1, 9.2, 9.3 and 9.4. The most common sites have one boiler and are with or without the production of DHW and with or without a mixing valve on the single heating flow. C-Ring is not used since there are no other flows with COSTER controllers. This choice is valid even if there are other flows with or without other types of controllers (non-COSTER).</p> <p>- PRIMARY BOILERS: on site there are several boilers in SEQUENCE and XTC 638 is not connected to other flows with COSTER controllers. Examples of this type of site are given in sections 9.5, 9.6 and 9.7. The most common type of site has several boilers, with or without DHW production, and with or without the mixing valve on the single heating flow. This choice is valid even if there are other flows with or without other types of controller (non-COSTER). C-Ring is used only between boilers to be able to send all the information regarding the SEQUENCE. Since there are several boilers (all provided with XTC 638) which have to operate in SEQUENCE, it is necessary for one of the XTC 638 (and, consequently, one of the boilers) to be selected as PRIMARY. The XTC 638 chosen as PRIMARY is the one which pilots the SEQUENCE of its own and of the other boilers. It is clear that in this instance all the other boilers will have to be configured as SECONDARIES. Even if this XTC 638 is the PRIMARY, the respective boiler is controlled exactly in the same way as all the others, so as not to give a different type of operation during the SEQUENCE.</p> <p>- PRIMARY ZONES : on the site there is a single boiler and XTC 638 is connected to other flows with COSTER controllers. An example of this type of site is given in section 9.8. These are sites with a single boiler, with or without the production of DHW, and several flows piloted by mixing valves, controlled by COSTER controllers. C-Ring communication is used between XTC 638 and the other COSTER controllers; C-Ring is not used between the boilers since there is only a single boiler. In this instance the part regarding the control of the mixing valve inside XTC 638 is not used; whilst the DHW control can be used.</p> <p>- PRIMARY BOILERS + ZONES: this is a combination of the last two choices; there exist several boilers to be controlled in SEQUENCE, and several flows controlled by COSTER controllers. All the comments made on the previous two choices can be applied to this choice. An example of this type of site is given in section 9.9. Included in this choice are more complex sites comprising: UP TO 7 BOILERS of any type and with any type of burner. PRODUCTION OF DHW. ANY NUMBER OF FLOWS of any type: sites can also be served which have several flows controlled by COSTER controllers and others not. In this instance the part regarding the control of the mixing valve within XTC 638 is not used, while the DHW control can be used.</p> <p>- SECONDARY BOILER : this is the necessary choice for a boiler to be put in SEQUENCE in a group of boilers where another has been declared PRIMARY (see choices PRIMARY BOILERS and PRIMARY BOILERS + ZONES). In this event the controller associated with the boiler is used as a mere "SLAVE", and so the part regarding the control of the mixing valve and the production of DHW are not used. These functions are carried out by the PRIMARY controller and/or by other COSTER controllers</p>	

Page No.	20. MENU' NO. 4 Display	CONFIGURATION (ACCESS WITH CONFIGURATION KEY IF ENTERED) Description	Sect.
		WARNING: it is pointless going ahead and configuring further pages if you are not absolutely sure that the previous page has been completed correctly. The choice for the previous configuration prepares for almost the whole system of further pages, removing those which are pointless or amending others.	14.1
4.2.0	DHW control USED	This page does not exist if XTC 638 has been configured as SECONDARY BOILER, since the relative output is used to control the shut-off valve of the boiler itself. You can choose between: – NOT USED: production of DHW not used, or this is carried out in another way. – USED: the control is used	
4.3.0	Mixing valve control: NO	This page does not exist if the configuration does not permit the use of the mixing valve (see choices PRIMARY SITES, PRIMARY BOILERS + SITES, SECONDARY BOILERS) You can choose between: – NO: no mixing valve because the heating site is in direct contact with the boiler(s). – YES: there is a mixing valve towards the heating site.	
4.4.0	Pump control HEATING	This page does not exist if the configuration is SECONDARY BOILER, since the relative output can be used to control the PRIMARY boiler shut-off valve. (see section 6 and diagrams 9.5, 9.6, 9.7 and 9.9): this output essentially duplicates the E2 input at terminal E2 and can be used for any purpose. You can choose between: – NOT USED: the pump control is not use – HEATING; the pump is dedicated to the heating circuit with or without mixing valve, and so is switched on only when heating is requested. – HEATING + DHW: the pump is used both for heating and for DHW (e.g. diagram section 9.2), and so is switched on in both cases. – BOILER: the pump is brought into action when the boiler is called into action by any control signal (see diagram in section 9.8). – RECYCLE MANIFOLD: the pump is dedicated to the manifold for several boilers in SEQUENCE (e.g. recycle), the pump is switched on when the manifold, in any mode, is ordered to operate by the program.	
4.5.0	Type of burner MODULATING	On this page you choose the type of burner: – MODULATING – ONE STAGE – TWO STAGES	
4.6.0	Boiler own number: 1	This page exists only if on site there are several boilers in SEQUENCE: you assign to each boiler a number from 1 onwards according to the number of boiler in the SEQUENCE.	
4.7.0	Total numbers of boiler: 2	This page exists only if on site there are several boilers in SEQUENCE: you enter the total number of boilers present on the site.	
4.8.0	Config Sensors 1 2 3 4 5 6 7	On this page you can configure the sensors present, bearing in mind that those absolutely indispensable on the basis of the CONFIGURATION made in the preceding pages are automatically entered and cannot be removed, while those not necessary are automatically excluded. Example: If DHW is not used the relative sensor and all the related pages are eliminated. When the cursor is on the number of the sensor, for convenience this is indicated clearly on the page.- – 1: SITE FLOW SENSOR: always exists if the mixing valve has been configured (page 4.3.0) – 2: OUTSIDE SENSOR: configured automatically, except when the boiler is SECONDARY. – 3: ROOM (or FLUE GASES) SENSOR: (choice to make on next page), this sensor is always optional. – 4: BOILER SENSOR: this sensor is always obligatory. – 5: DHW SENSOR: this sensor is obligatory only if DHW control is used. – 6: CONTROL CHANGE SYSTEM TO MANUAL: more than a sensor this is an On-Off input (On = input closed), to pass the whole system to a status (can be chosen at will) which excludes completely all activity on the site by XTC 638. In place of MANUAL CONTROL this input can be configured as ANTICONDENSING SENSOR (page 4.10.0).- 7: MANIFOLD SENSOR: this sensor is obligatory if there are several boilers in SEQUENCE.	
4.9.0	Config Sensor B3 ROOM SENSOR	On this page you can choose the type of sensor for input B3. – FLUE GASES SENSOR: this input is used to measure the temperature of flue gases. This choice is strongly recommended when the boiler is SECONDARY, since Room would not be useful. – ROOM SENSOR: this input is used for measuring the temperature of the spaces heated. This last choice is recommended for the single boiler or for the primary boiler of several boilers in SEQUENCE, even if it remains free. The choice and the existence of the room sensor will condition the completeness of the compensating function as will be seen in the relative menus (page 7.11.0).	

Page No.	20. MENU' N. 4 Display	CONFIGURATION (ACCESS WITH CONFIGURATION KEY IF ENTERED) Description	Sect.
4.10.0	<p>Config Sensor B6 MANUAL CONTROL</p>	<p>On this page you can choose the type of sensor or control for input B6</p> <ul style="list-style-type: none"> – MANUAL CONTROL : CONTROL CHANGE TO MANUAL: more than a sensor this is an On-Off input (On = input closed), to change the whole system to a status (chosen at will) which excludes completely every site activity by XTC 638. – ANTICONDENSING SENSOR: this input is used to measure the temperature of the return from boiler (if only one), or of the manifold, falling below levels damaging for the creation of acid condensation. <p>Obviously, if the boiler is a condensation type the anticondensing function does not have to be programmed.</p>	14.1
4.11.0	<p>Burner manual status: ON</p>	<p>On this and the next four pages you can choose the status to give to the various outputs of XTC 638 when the CONTROL TO MANUAL OF SYSTEM (page 4.8.0 and page 4.10.0) is activated. You can choose from:</p> <ul style="list-style-type: none"> – ON: ON: the burner control is activated and the shut-off valve is open – OFF : the burner control is deactivated and the shut-off valve is closed <p>If the burner has two stages the first and second stages are switched onlf the burner is modulating it is switched on or brought to the maximum modulation (POWER or TEMPERATURE) Clearly, in these conditions the burner will be controlled by other devices (e.g. thermostats).</p>	
4.12.0	<p>Burner Manual Output Y = 10.0V</p>	<p>Value of output Y is set when in MANUAL CONTROL. It appears if : 4.11.0 is "ON" and 4.10.0 is "MANUAL CONTROL" and 4.19.0 is "0 - 10 V BURNER POW" or "0 - 10 V BURNER T"</p>	
4.13.0	<p>Pump manual status: ON</p>	<p>You can choose between:</p> <ul style="list-style-type: none"> – ON: the pump is always ON – OFF: the pump is always OFF 	
4.14.0	<p>Mixing valve man status: IDLE</p>	<p>You can choose (provided mixing valve exists) from:</p> <ul style="list-style-type: none"> – OPEN: the valve is completely opened – CLOSED: the valve is completely closed – IDLE: the valve is left in the position in which it is in at that moment 	
4.15.0	<p>DHW manual status: OFF</p>	<p>You can choose (provided DHW control exists) between:</p> <ul style="list-style-type: none"> – ON: the operation depends on the control – OFF: the control is always OFF 	
4.16.0	<p>E1 : Burner Lockout ON CLOSED</p>	<p>On this page you can decide if, and how, to inform XTC638 that there is a burner lockout. The burner must have a voltage-free switch to connect to input k1, terminal E1. The choice is between: ON CLOSED = the burner switch closes in the event of a lockout ON OPEN = the burner switch opens in the event of a lockout</p>	
4.17.0	<p>E2 : COMMON LOCKOUT BURNERS</p>	<p>This page is not a choice but merely information given to engineer for his use if required.The E2 input can have 2 functions:</p> <ul style="list-style-type: none"> – WITH PRIMARY BOILER of a sequence of several boilers: this is an input (COMMON LOCKOUT BURNERS) to which are connected all the U1 outputs of the Slaves (next page 4.18.0) which represent the repetition of of the burner lockout of the individual boilers. The primary boiler of the sequence can know when all the boilers are locked out (e.g. total lack of fuel) and control all the alarm and emergency functions (e.g. stop the pump or pumps when all the burners are locked out and so all the relative shut-off valves can be closed in order to avoid cavitation). – WITH SECONDARY BOILER: this input is at the disposal of the primary boiler, and controls the shut-off valve of the primary itself (VALV.INT.MASTER).WARNING: the control of the shut-off valve of the primary boiler is carried out by a single XTC 638 of a secondary boiler chosen at will, since there is only one primary shutoff valve. All the other XTC 638 have this free function and so can be used for other applications.Via Telemangement (program SWC 701) you can see further information as, for example, when the function is not used. 	
4.18.0	<p>U1=REPETITION BURNER LOCKOUT</p>	<p>This page is not a choice but simply information given to the engineer for his convenience. The output U1 can have 2 functions:</p> <ul style="list-style-type: none"> – WITH PRIMARY BOILER of a sequence of several boilers: it is the output (SHUTOFF VALVE MASTER) to connect to input E2 (page 4.17.0) of any secondary boiler, to control the shut-off valve of the primary boiler. – WITH SECONDARY BOILER: this is the output (REPETITION BURNER LOCKOUT) to connect to input E2 of the primary boiler.On this page and on the related page 4.17.0 the engineer is informed on these two functions which are very useful for a correct energy management of the system. 	

Page No.	20. MENU NO. 4 Display	CONFIGURATION (ACCESS KEY CONFIGURATION IF ENTERED) Description	Sect.
4.19.0	<div style="border: 1px solid black; padding: 2px; width: fit-content;"> Config Output Y HEATING OFF </div>	<p>Output Y can be programmed in many ways in order to control other functions related to the heating site. This is a further opportunity for an exchange between XTC 638 and other components of the heating site so as to obtain automation which is very useful for the operation of the system. This output is optoisolated and can be converted, using the ACR 328 accessory, into a relay output (Common, Normally Open, Normally Closed) or used directly as a 0...10V output.</p> <ul style="list-style-type: none"> - HEATING OFF = switches on (at 4.5 V- fixed) when the heating, in any mode, is switched off. It can be used to synchronize the heating OFF function with other external functions. - BOILER OFF = the same function as above related to the switching off of the boiler - MANIFOLD OFF = again the same function related to the manifold. This function can be used to switch on or off the manifold recycle pump when the pump control already in XTC 638 is used for other functions (e.g. heating). See for an example, see hydraulic diagram in section 9.7 (on page 8). - 0 - 10 V BURNER POW = the output generates a 0...10V- signal proportional to the power demanded from the burner. - 0 - 10 V- BURNER T = the output generates a 0...10V- signal proportional to the temperature demanded from the burner. - 0 - 10 V- MANIF-POWER = the output generates a 0...10V- signal proportional to the power you require at the manifold, when there are modulating boilers or generators too complex for the whole manifold of the system. - 0 - 10 V- MANIF -TEMP = the output generates a 0...10V- signal proportional to the temperature you wish to have at the manifold, when there are modulating boilers or generators too complex for the whole manifold of the system. <p>This output, correctly programmed and provided with the necessary accessories, can automatise sequences in complex and mixed systems :</p> <ul style="list-style-type: none"> • Heat exchanger in sequence with boilers • Several boilers using various types of fuel, to create sequences that always use the most economic fuel • Heating sites with boilers and co-generators. 	14.1
4.20.0	<div style="border: 1px solid black; padding: 2px; width: fit-content;"> Power 0% = 0.0V Power 100% = 10.0V </div>	<p>This page appears if on previous page the 0...10V- output has been chosen as power. You can program two points on the scale to calibrate the output as you wish and make it compatible with the features of the input for the system you want to pilot.</p> <p>Eg. : Power 5% = 2.0 V Power 90% = 9.5 V</p> <p>With this setting you send 2 volts when you want to control a power of 5% and 9.5 V when you want to control a power of 90%; for intermediate values the scale is linear. The factory settings for the scale are very simple: 0 volts = 0% power 10 volts = 100% power</p>	
4.20.0 bis	<div style="border: 1px solid black; padding: 2px; width: fit-content;"> Temp 0c = 0.0V Temp 99c = 10.0V </div>	<p>This page appears if on page 4.19.0 has been chosen the 0...10 V temperature output. You can program two points on the scale to set the output as you wish and make it compatible with the characteristics of the input of the system you want to pilot.</p> <p>e.g. Temp. 5c = 1.0V Temp 85c = 9.0 V</p> <p>With this setting you send 1 V when you want to control a temperature of 5°C and 9 V when you want to control a temperature of 85°C; for intermediate values the scale is linear.</p> <p>The scale is factory set very simply: 0 V = 0°C temperature 10 V = 100°C temperature, even if 100°C will never be used because the safety thermostat will intervene first.</p>	
4.21.0	<div style="border: 1px solid black; padding: 2px; width: fit-content;"> Choice config key : ---- </div>	<p>You are strongly advised to enter at least the CONFIGURATION KEY which prevents access to non-authorized persons, and so avoids errors and tampering, given the importance of what is configured in this menu. The CONFIGURATION, SETTING & USER key have a decreasing hierarchy:</p> <ul style="list-style-type: none"> - entering the CONFIGURATION KEY permits entering the other two key. - entering the SETTING KEY permits entering the USER KEY. <p>It is very important not to forget the access keys because, once entered, they prevent change the relative parameters.</p> <ul style="list-style-type: none"> - the CONFIGURATION KEY permits operating in SETTING and in USER USE, even without knowing these last two passwords. The same holds good for SETTING KEY and USER KEY. - - - - : no key has been entered. You can enter 4-character ALPHANUMERIC KEY using + and - keys to choose the letters and <- and -> to position the cursor. Once the KEY has been chosen and the page exited there are 15 minutes from the last depression of a key before the access key is again requested. <p>****: there exists an access key which has already been entered previously. Only by knowing this key is it possible to operate: once the key has been entered using the previous method you can cancel by pressing at the same time the + and - key for a few seconds.</p>	14.1

20. MENU N. 4 CONFIGURATION (ACCESS CONFIGURATION KEY IF ENTERED)		
Page No.	Display	Description
4.22.0	Choice setting key : <input type="text"/>	On this page you can choose the SETTING KEY which permits access to the setting menus and the related pages. The SETTING KEY is the second in the hierarchy; if you know this key you can access also the parts protected by the USER KEY. The whole procedure of entering, changing or cancelling is the same as that for the preceding pages.
4.23.0	Choice user key : <input type="text"/>	On this page you can choose the USER KEY which permits access to the menus and related pages. The USER KEY is the lowest in the hierarchy and permits the use of the whole system by a normal user. The pages accessible with this key are straightforward and within the capacity of a non-expert. The whole procedure of entering, changing or cancelling is the same as that for the preceding page.
4.24.0	Send alarms: <input type="checkbox"/> NO Teleman key: <input type="checkbox"/> NO	This and the next two pages concern local or remote Telemangement which is achieved by means of the type ACB 460 C1 C-Bus Plug-in. - SEND ALARMS: you can enable the automatic dispatch of the alarms to a local or remote computer. - TELEMAN KEY: you can enable a key (which has no relation to the previous ones) which makes possible local or remote Telemangement. This key can be entered only via PC since it serves only the PC.
4.25.0	Address: <input type="text"/> Group: <input type="text"/>	Address: you enter the address of the controller (from 1 to 239). Group: you enter the group to which this controller has been assigned. Address and Group are two items of data necessary for Telemangement in order to be able to identify precisely the controller with which you wish to connect.
4.26.0	CBus speed 1200bps	The speed of the communication bus (C-Bus) can be chosen from: 1200, 2400, 4800, 9600 bouds. The speed must be chosen on the basis of the other devices on the site and on the type of modem to be used
4.27.0	Heating Program 7Day: 7DAY	This and the next 9 pages are convenience pages which enable you to set 24hour and 7day programs for heating and DHW, and to name each of these programs as you think fit. This makes things easier for the user when he has to choose a program which, instead of having a number, has a name which clearly indicates the use of the program. Each program already has its name assigned at the factory. 7day: 7DAY factory-set. Any other name is set using the usual method.
4.28.0	Heating program 24h1: WEEKDAY	Page for heating, similar to previous page. Day 1; Factory setting: WEEKDAY. Any other name is set using the usual method.
4.29.0	Heating program 24h2: PREHOLIDAY	Page for heating, similar to previous page. Day 2: Factory setting: PREHOLIDAY. Any other name is set using the usual method.
4.30.0	Heating program 24h3: POSTHOLIDAY	Page for heating, similar to previous page. Day3: Factory setting: POSTHOLIDAY. Any other name is set using the usual method..
4.31.0	Heating program 24h4: HOLIDAY	Page for heating, similar to previous page. Day4: Factory setting: HOLIDAY. Any other name is set using the usual method.
4.32.0	DHW program 7Day: 7DAY	Page similar to previous page but for DHW. 7day: Factory setting: 7DAY. Any other name is set using the usual method.
4.33.0	DHW program 24h1: WEEKDAY	Similar to previous page but for DHW. Day1: Factory setting: WEEKDAY. Any other name is set using the usual method.
4.34.0	DHW program 24h2: PREHOLIDAY	Similar to previous page but for DHW. Day2: Factory setting: PREHOLIDAY. Any other name is set using the usual method.
4.35.0	DHW program 24h3: POSTHOLIDAY	Similar to previous page but for DHW. Day3: Factory setting: POSTHOLIDAY. Any other name is set using the usual method..
4.36.0	DHW program 24h4: HOLIDAY	Similar to previous page but for DHW. Day4: Factory setting: HOLIDAY. Any other name is set using the usual method.
4.37.0	Site name -----	On this page you can enter the name of the site with XTC 638. This same name appears on the parking page 0.0.0.

21. MENU NO. 5 BURNER + BOILER (ACCESS KEY SETTING IF ENTERED)		
Page No.	Display	Description
5.0.0	Choice menu +/- BURNER + BOILER	This is the menu chosen. The whole of this menu is under SETTING KEY. In this menu are included all the parameters to describe the operation of the burner. This menu also is of strategic importance for the efficient operation of the whole system.
5.1.0	Boiler power MAXIMUM	Type of control POWER. This page exists only if there are several boilers which are in SEQUENCE. If there is only one boiler the burner can be controlled only for TEMPERATURE. – MAXIMUM (POWER): the burner (in SEQUENCE) is controlled so as to produce a certain amount of power, independently of the temperature to which it is supplying heat. It is the SEQUENCE which tells each burner how much power it has to provide at any moment. The boiler has a maximum temperature limit which it cannot exceed for safety reasons; this limit has to be slightly lower than the thermostats of the boilers. With the control on MAXIMUM (POWER): the SEQUENCE, before calling on the next boiler in sequence, waits until the preceding one has provided the maximum of its power. These concepts are illustrated more fully in the document already referred to in section 14.2. – SHARED (TEMPERATURE): the burner in SEQUENCE receives a temperature "set point" to maintain at the boiler output. Each of the boilers called on to operate in the SEQUENCE each provide the same power output, when they are controlled according to NEW STARTUP (TEMPERATURE). These concepts are discussed in more detail in the document referred to in section 14.2. The choice of this parameter and of the parameter illustrated on the next page provides the best weapon to optimize the seasonal output of the SEQUENCE.
5.2.0	Off point NORMAL	This page exists only if several boilers are in SEQUENCE. It does not appear on the controller of the main boiler. The Off point is the moment at which the burner of the boiler called to function in SEQUENCE is switched off. The criterion of switching off a burner, once switched on, can influence the output of the burner itself, since the moment of switching on is the least advantageous from the energy point of view: frequent stops and starts, besides wearing out the burner reduce its seasonal output. For further details on these concepts you are again referred to the document referred to in section 14.2. – NORMAL: the burner is switched on when the others can no longer manage and is switched off as soon as possible: the start time is minimized but not the number of starts. – OPTIMISED: the burner is switched off, first allowing for the power of the previous burner, reducing the number of starts and stops, particularly if the previous one is 2-stage or modulating. For condensation boilers, particularly those with modulating gas burners, the best criterion is certainly: Type of control = TEMPERATURE and Off point = OPTIMISED Clearly, other criteria are applicable, and have to be decided from time to time depending on the type of site and on the data obtained from the readings referred to on pages 2.21.0, 2.22.0 and
5.2.0 bis	Off point Burner: 15%	This page exists if the burner is modulating and if in 4.1.0 it is SINGLE SITE or PRIMARY SITES, or, in case of BOILER SEQUENCE, if 5.2.0 is NORMAL. Determines the point at which burner goes from minimum modulation (5.3.0) to Off.
5.3.0	Minimum power modulation: 30%	This page exists if the burner is modulating; you set the minimum power which the burner has to maintain until the OFF point set in 5.2.0 bis
5.4.0	Modulation band temperat: ± 3.0c	This page exist if the burner is controlled on TEMPERATURE. It is the modulation which is given to the temperature "set point" in order to stabilize the whole system of the SEQUENCE. The factory setting of +/- 3.0°C is a value which is generally satisfactory. Increase this value only in event of instability of the system (boilers differing greatly in power between each other). The instability of the system manifests itself in the excessive switching on and off of the boilers..
5.5.0	Boiler temperat Maximum: 90c	You establish the maximum temperature at which to regulate the boiler, in whatever way it is controlled. This temperature has to be below the temperature of the boiler thermostats otherwise they start to function too soon, thereby altering the SEQUENCE.
5.6.0	Modulation time Burner: 45s	This page exists if the burner is modulating. You establish the time the burner takes to go from minimum to maximum POWER. A difference of +/- 5 seconds in respect of the speed of the modulation motor has no influence on the operation of the burner..
5.7.0	Boiler temperat Dead Zone: ± 1.0c	This is the interval between desired and actual temperature in which you consider control to be satisfactory. It is suggested to set this at +/- 1°C; you stabilize the system and avoid overworking the modulation.
5.8.0	Minimum times On: 120s Off: 120s	On = the minimum switching on time corresponding to the cyclic control of the burner. You are advised to set this time to be at least equal to or slightly higher than that of the cycle time: this avoids switching off the burner before the switching on cycle has ended. Off = the minimum switching off time of the burner. You avoid switching off the burner immediately after switching it on. It is recommended to set this time at least equal to or slightly above that of any "post-washing" in order to avoid interrupting it. Factory setting: 120 seconds
5.9.0	Shutoff valve Delay Off: 5m	This page exists only if you use the boiler shutoff valve and so there are several boilers on the site. The shut-off valve opens when the burner is switched on and closes, with a certain delay, when the burner is completely switched off, this is in order to recover the residual energy accumulated in the hot boiler. Recommended value: 5 minutes.

21. MENU NO. 5 BURNER + BOILER (SETTING ACCESS KEY IF ENTERED)		
Page No.	Display	Description
5.10.0	Burner lockout ALARM ONLY	This page exists only if there are several boilers which are in SEQUENCE. - ALARM ONLY: lockout burner triggers an alarm. - ALARM + VAL CLOSED: besides triggering an alarm, the burner lockout also causes the shut-off valve to close in order to prevent a boiler without a burner from being a deadweight on the site.
5.11.0	Control burner PROPORT+INTEGRAL	The type of controller applied to the burner. PROPORT+INTEGRAL = the controller is proportional + integral (PI); for the burner this programming is usually the best. INTEGRAL = the controller is integral (I) only: this type of control dampens the use of the burner..
5.12.0	Proportional Band Burner: 5c	This is the proportional band of the burner controller, if controlled for TEMPERATURE; and of the controller of maximum if controlled for POWER. Value suggested is 5°C, even if the best value should be found in relation to the operation of the system. Examining the collection of data via Telemangement it is easy to understand if there are any swings, and to increase the value accordingly.
5.13.0	Integral Time Burner: 15m	A page similar to the previous one. Recommended value: 15 minutes.
5.14.0	Increase boiler T on zones: 5c	This page exists if there is only one boiler and there is a mixing valve; or if there is only one boiler and the C-Ring is PRIMARY SITES (see page 4.1.0 CONFIGURATION menu, section 20). On this page you can set the increase in temperature to give to the burner, in respect of the demand of the heating site controlled by XTC 638 via the mixing valve and/or in respect of how much all the other site flows, (provided with COSTER controllers) request via C-Ring. Factory setting: 5°C
5.15.0	Boiler temperat Frostprot: 30c	This page exists if there is only one boiler. You set the minimum temperature desired for the boiler if Frospot is used (see page 3.6.0 of VARIOUS CONTROLS).
5.16.0	Boiler temp with CRing alarm: 70c	This page exists if there is only one boiler or the C-Ring is PRIMARY SITES or SECONDARY BOILER (see page 4.1.0 of CONFIGURATION menu, section 20). You set the desired temperature for the boiler, when the value it should receive via the C-Ring no longer arrives (cable break or short circuit). The boiler operates at this fixed temperature ensuring the Remote extension, Absence of C-Ring obviously triggers an alarm.

14.2

Page No.	Display	Description	Sect.
22. MENU NO. 6 MANIFOLD + SEQ. (ACCESS KEY SETTING IF ENTERED)			
		The whole of this menu exists only if there are several boilers and, consequently, a SEQUENCE	
6.0.0	Choice menu +/- MANIFOLD + SEQ	This is the chosen menu. The whole of this menu is protected by SETTING KEY. This menu includes all the parameters for defining the operation of the SEQUENCE when there are several boilers. This menu is also of strategic importance for the correct operation of the whole system.	14.3
6.1.0	DesiredSequence A 1 2 - - - -	There are as many of these pages as there are boilers in sequence. On these pages you can program, as you wish, as many different sequences as there are boilers. The sequences are indicated by the letters A, B, C etc. The starting sequences, already pre-formed, are the natural ones, i.e.: 1, 2 ...n; 2...n.1; n...1,2; and so on. These sequences can be formed as desired and so the most efficient boilers can be assigned to the first positions, and the others to the later ones..	
6.2.0	Automatic change sequence: 15d	You can set after how many days the SEQUENCE changes. The natural order for changing coincides with that of the formation.	
6.3.0	Max num boilers for DHW: 2	On this page you can set a maximum number of boilers (in respect of those existing) to be used only for DHW production. Particularly in summer perhaps a single boiler will be sufficient to meet DHW requirements	
6.4.0	Boilers DHW Max time : 180m	On this page you can set the maximum time for the boiler(s) dedicated to DHW production (previous page) before requesting help from the other boilers. If, for example, on site there are 2 boilers and one is dedicated to DHW alone and this boiler cannot manage (perhaps the burner is locked out), after this interval of time the second boiler comes into play; naturally an alarm is triggered for the burner lockout.	
6.5.0	Increase manif T over zones: 5c	This page exists if there are several boilers on the site and this is the PRIMARY BOILER with mixing valve, or C-Ring is PRIMARY BOILER + SITES (see page 4.1.0 menu CONFIGURATION section 20). On this page you can set the temperature increase to give to the manifold, in respect of that requested by the heating site controlled by XTC 638 via the mixing valve and/or in respect of how much all the other site flows (provided with COSTER controllers) request via the C-Ring. Factory setting: 5°C	
6.6.0	Lockout All Burner Pump Off: NO	On this page you can decide whether to stop the pump when all the burners are locked out (e.g, lack of fuel) and consequently all the shutoff valves are closed: you avoid cavitation. - NO: you do not stop the pump-YES: you stop the pump	
6.7.0	Control manifold PROPORT+INTEGRAL	It is the type of controller applied to the manifold. PROPORT + INTEGRAL = this type of controller permits getting the site up to full capacity after a period of shutdown very rapidly. INTEGRAL = the controller is purely integral (I): this type of controller renders the system run more smoothly and avoids unnecessary switching on of burners during the transitory phases. Considerably reduces (almost eliminates) the problems of condensation in the boilers during the transitory stages. Clearly it is a slower type of control at start up.	
6.8.0	Proportional Band Manifold: 7c	This is the Proportional Band of the manifold controller. The suggested value is 7°C, but the optimum value should be found in relation to the operation of the system. By examining the collection of data via Telemanagement it is easy to understand if there are any swings, and, if there are, to adjust the setting.	
6.9.0	Integral Time Manifold: 15m	A similar page to the previous one. Recommended value: 15 minutes.	
6.10.0	Manifold temp Dead Zone: ± 1.0c	The temperature interval between desired and actual in which the control of the manifold is considered satisfactory. It is suggested to set at +/- 1°C, the system will be stabilized and overworking the sequence will be avoided	
6.11.0	Manifold temp Frostprot: 30c	The minimum temperature desired for the manifold is set in the event frost protection is used (see page 3.6.0 of VARIOUS CONTROLS)..	
6.12.0	Manifold T with CRing alarm: 70c	This page appears only if the CONFIGURATION (page 23, display 4.1.0) is: PRIMARY BOILER+ SITES. You set the desired temperature for the manifold, when the value you should receive via C-Ring does not arrive (short or open circuit). The manifold operates at this set temperature ensuring remote extension. Clearly, the absence of C-Ring triggers an alarm.	

Page No.	23. MENU NO. 7 Display	COMPENSATION SETTINGS (ACCESS KEY SETTING IF ENTERED) Description	Sect.
		This menu only exists if there is a single boiler or if the boiler is PRIMARY BOILER (does not exist if it is PRIMARY SITES, PRIMARY BOILERS + SITES or SECONDARY BOILER)	14.4
7.0.0	Choice menu +/- COMPENS SETTING	This is the chosen menu. The whole of this menu is protected SETTING KEY. In this menu are included all the parameters to define the compensating function; it is important to have good "comfort" together with good energy saving.	
7.1.0	Heat Emitters RADIATORS	On this page you enter the type of heat emitter : RADIATORS, CONVECTORS, PANELS. Factory setting: RADIATORS.	
7.2.0	Design outside temp : -5.0c	On this page you set the design outside temperature for the heating site. Factory setting: -5°C.	
7.3.0	Design flow temp : 70c	On this page you set the design flow temperature for the heat emitters, when the outside temperature is the design minimum. Factory setting: 70°C.	
7.4.0	CurveOrigin OT20 Flow temp: 20c	On this page you enter a correction to the flow temperature from the compensating curve when the outside temperature is 20°C. You can adjust slightly the start of the compensation curve (intermediate seasons) so as to have a more comfortable temperature. Factory setting: 20°C (cannot be adjusted).	
7.5.0	Flow temperature Maximum : 70c	You set the maximum permitted temperature for the heating site flow. It is advisable to avoid temperatures which are too high for the heat emitters should there be errors or incorrect settings. Factory setting: 70°C.	
7.6.0	Flow temperature Minimum : 15c	This is the complementary page to the previous one, for the minimum values. Factory setting: 15°C	
7.7.0	Optimum start Max durat: 2.00h	This page and the next permit selecting the most suitable parameters for optimizing the morning optimum start. On this page you set the maximum duration in hours desired for the optimum start. By increasing this maximum duration you can reduce the boosting on the following page. The criteria for these choices are often of a personal nature. Factory setting: 2 hours	
7.8.0	Optimum start Boosting: 3.0c	This is the second parameter for the morning optimum start. Boosting is the increase in room temperature you desire during the optimisation itself in order to compensate more quickly for the loss of heat during the night. Factory setting: 3°C The increase in desired room temperature, a basic value for compensation, is converted into an increase in flow temperature as high as the outside temperature is low. You do not boost simply by increasing the flow temperature but you increase the flow itself by a value tied to the actual thermal requirement. The pre-switching on time is equal to the maximum desired on the previous page, with the outside temperature at the design minimum, and is equal to 0 (zero) when the outside temperature is equal to the value that is required for the spaces (heating not necessary). The optimum start time has to be correctly modulated for the intermediate situations.	
7.9.0	Optimum stop Max durat: 1.00h	This page permits choosing the most suitable parameters for optimizing the afternoon or evening pre-switching off. You set the maximum duration you require for the optimum stop. Factory setting: 1 hour The optimum stop is maximum when the outside temperature is equal to the temperature you require for the rooms and is 0 (zero) when the outside temperature is equal to the minimum design value. The calculation is made continuously for all the other values.	
7.10.0	OptimumStop Pump Max durat: 6.00 h	This page exists if the pump is used for heating. This optimisation functions as follows: - When, in the evening, it switches off or lowers the desired room temperature, the pump continues to operate for a certain period to recover the heat of the site (see page 3.13.0). - After this delay the pump switches off particularly in order to avoid making a noise at night. - The pump remains off for a period of time; this period depends on the outside temperature and the nightly reduction in temperature: the higher the outside temp. and the lower the nightly fall in this temperature the longer the pump remains switched off. The system makes all the calculations as for the optimum starts/stops referred too above. Factory setting: 6 hours	
7.11.0	Ambient Authority on Flow: 0.0c	If the ROOM SENSOR is installed and configured, this sends to XTC 638 the measured value, and, if this is different from the value required by the program, corrects the flow temperature with a certain authority. The authority represents the value of the increase or decrease in the flow temperature which you require with a negative or positive difference from the room sensor of 1°C. Factory setting: 0°C (authority excluded)	

24. MENU NO. 8 FLOW WITH MIX (ACCESS KEY IF ENTERED)		
Page No.	Display	Description
		This menu exists only if there is a single boiler or if the boiler is PRIMARY BOILER (does not exist if it is PRIMARY SITES, PRIMARY BOILERS + SITES or SECONDARY BOILER), and at the same time there is a mixing valve.
8.0.0	Choice menu +/- FLOW WITH MIX	This is the chosen menu. The whole of this menu is protected by SETTING KEY. These are the calibration functions for the mixing valve (if there is one). Usually the factory settings are satisfactory.
8.1.0	Control Flow PROPORT+INTEGRAL	This is type of controller applied to the flow with mixing valve. PROPORT + INTEGRAL = The controller is proportional + integral (PI): this type of controller is the most common for the control of the mixing valve. INTEGRAL = the controller is pure integral (I): this type of controller for the flow renders "smoother" the request for power when there are large movements (e.g. morning start). Helps to reduce the problems of condensation in the boiler during the transitory phases.
8.2.0	Proportional Band Flow: 7c	This is the proportional band of the of the mixing valve controller (if there is one): Suggested value: 7°C, but the optimum value depends on the operation of the flow. By examining the data via Telemangement it is easy to understand if there are any swings and, if so, to adjust the value.
8.3.0	Integral Time Flow : 15m	A page similar to the previous one.Suggested value: 15 minutes.
8.4.0	Flow temperature Dead Zone: ±1.0c	This is the interval between desired and actual temperature for which control is considered satisfactory.It is suggested to set this at +/- 1°C; this stabilizes the system and avoids overworking the valve.
8.5.0	Run time Valve: 630s	On this page you set the time in seconds for the whole run of the valve actuator.Factory setting: 630 seconds (typical for CVH actuators).
		14.5

25. MENU NO. 9 DHW (ACCESS KEY SETTING IF ENTERED)		
Page No.	Display	Description
		The whole of this menu exists if there is the production of DHW and if the boiler is not SE-CONDARY BOILER..
9.0.0	Choice menu +/- DHW	This is the chosen menu. The whole of this menu is protected by ACCESS KEY. These are the setting functions for the production of DHW. Usually the factory settings are satisfactory
9.1.0	Differential DHW 3c	This is the On-Off differential for the DHW controller. Factory setting: 3°C. This differential is below the desired temperature in order to avoid excessive temperatures..
9.2.0	IncreaseBoilerT overDHWtemp: 9c	Antibacteria T: XXc = temperature for disinfestation of the water. Factory setting: 70°C.H: XX.XX = time at which you want this function. Factory setting: 02.00.XXXm = duration in minutes of antibacterial function. Factory setting: 9°C. This increase is necessary in order to have a fairly efficient thermal exchange with the water heater and thereby reduce the heating times of the water heater itself.
9.3.0	Control DHW temp boiler T: YES	Stops action water heater pump if temperature of boiler/manifold is below temperature measured by water heater sensor. - YES = Stop On (factory setting) - NO = Stop Off
9.4.0	AntibacteriaDays - - - - - S	On this page you set the days of the week on which you want the antibacterial function to operate against the formation of Legionella in the water heater.It is suggested 1 or, maximum, 2 days a week.
9.5.0	Antibact T: 70c h:02.00 for 90m	Antibacteria T: XXc = temperature for disinfestation of the water. Factory setting: 70°C.H: XX.XX = time at which you want this function.Factory setting: 02.00.XXXm = duration in minutes of antibacterial function. Factory setting: 90 minutes.All the factory settings have been chosen for normal application; in the event that, for mechanical or hydraulic reasons there should be difficulty in reaching all the points where Legionella is developing, it will be necessary to increase times and temperature.
9.6.0	DHW priority HEATING PUMP.	This page exists if the pump (page 4.4.0 CONFIGURATION menu, section 20), is not configured as HEATING + DHW, since in this instance the priority is determined by the diverting valve DHW/heating:The choice of this page is automatic if the CONFIGURATION is PRIMARY SITES or PRIMARY BOILER + SITES: the priority is sent to the sites via C-Ring, and limits the sites flow temperature to a value which gives DHW the maximum power . In the other instances the choice is between: - HEATING PUMP: the heating pump is switched off when the production of DHW is called for. - MIXING VALVE: opening of the mixing valve is limited so as to leave the maximum power for the production of DHW.
9.7.0	DHW priority Max time: 60m	This page exist if the pump (page 4.4.0 CONFIGURATION menu, section 20), is not configured as HEATING + DHW.On this page you set a maximum time for the priority of the DHW since, if the request of the function exceeds a certain interval of time (excessive consumption or some problem with the water heater e.g. encrustation) you can restart the heating so as not to cool down the site too much. Factory setting: 60 minutes.
9.8.0	DHW Output Delay Off: 5m	On this page you can introduce a delay in switching-Off the request for heating the water heater for DHW. This delay is very useful to prevent boilers with a small amount of water (e.g. condensation) coming to the boil when you suddenly remove the load from its boiler: The burner is controlled immediately to the temperature requested before the boiler was switched on; whilst the pump continues to function for a while to remove the heat from the combustion chamber. This is a method for raising the boiler temperature considerably when DHW is requested, without the risk of causing it to boil as a result of this request.

14.6

26. MENU N. 10 TESTING (ACCESS KEY IF ENTERED)		
Page No.	Display	Description
		<p>This menu serves to check all the electric wiring between XTC 638 and: The burner, the pump(s), the valve(s), the measurement sensors, the service inputs and outputs. It serves also to simulate the controller outputs in order to check the operation of the whole system.</p>
10.0.0	<p>Choice menu +/- TESTING</p>	<p>This is the menu selected. The whole of this menu is protected by SETTING KEY. The functions are those regarding the testing of the electrical system. You are again advised to carry out a complete check before using the system.</p> <p>WARNING: access to this menu has special protection because incorrect use of TESTING could supply power to the various site components at the wrong times.</p> <p>Press -> key: the following page will appear.</p>
	<p>TECHNICAL PAGES! PRESS + KEY</p>	<p>PRESS + KEY: there will appear PRESS -> KEY. As soon as -> key is pressed you enter TESTING. This procedure is necessary to ensure that inexperienced users cannot manipulate On/Off switches incorrectly The testing must be carried out when manual On/Off switching cannot cause damage to persons or things.</p>
10.1.0	<p>Output BURNER OFF</p>	<p>Using + and - keys you can switch on or off the control output of 1, 2 stage or modulating burners</p>
10.2.0	<p>Output MODULATION IDLE</p>	<p>This page differs depending on whether the burner is 1 or 2 stages modulating. - If it is 1 stage there appears: second STAGE NOT USED - If it is 2 stages there appears: 2 STAGE ON with + and - keys you can switch on or off the control output of the second stage of the burner. - If the burner is modulating there will appear: MODULATION LOWER. with + or - keys you can choose: LOWER, RAISE, IDLE.</p>
10.3.0	<p>Output MASTER S/OVAL OP</p>	<p>This page appears only if XTC 638 is configured to control a secondary boiler in sequence (SECONDARY BOILER page 4.1.0). It is not a page for controlling the Master shutoff valve but only an indication if this valve is open or closed. To control this valve it is necessary to operate on XTC 638 Master (page 10.7.0 bis). For simplicity, operate at the same time on page 10.7.0 bis of the Master and check the operation on this page of the Slave: in this way you check the connection between Master and Slave and, at the same time, between Slave and valve.</p>
10.4.0	<p>Output HEATING PUMP OFF</p>	<p>On this page you test the connection with the pump. The message which appears is related to the choice made for the pump in the CONFIGURATION menu (page 4.4.0 of section 20). With + and - keys you switch On-Off.</p>
10.5.0	<p>Output MIXING VAL IDLE</p>	<p>On this page you test the connection with the mixing valve (if this exists). With + and - keys you can choose: OPENS, CLOSES and IDLE.</p>
10.6.0	<p>Output DHW OFF</p>	<p>On this page you test the connections with the device for the production of DHW (if it exists). Using + and - keys you switch On-Off.</p>
10.7.0	<p>Output S/O VALVE CLOSES</p>	<p>This page appears only if XTC 638 is configured to control a secondary boiler in sequence (SECONDARY BOILER page 4.1.0). On this page you test the connection with the boiler shutoff valve, obviously in the event there are several boilers in SEQUENCE. With + and - keys you can select: OPENS, CLOSES.</p>
10.7.0 bis	<p>Output MASTER S/OVAL OP</p>	<p>This page appears only if XTC 638 is configured to control the primary boiler in sequence (PRIMARY BOILER or PRIMARY BOILERS + SITES page 4.1.0). OP = opens the shutoff valve of the boiler served by the Master controller. CL = closes the shutoff valve of the boiler served by the Master controller. Clearly, this testing procedure can be carried out only by the controller which controls the secondary boiler which carries out these functions for the Master (e.g. see diagrams 9.5, 9.6, 9.7 and 9.9).</p>
10.8.0	<p>Output MANIF. PUMP OFF</p>	<p>On this page you test the connection with the manifold pump; if it has been configured as such (page 4.4.0, section 20). If it is not used there will appear: MANIFPUMP UNUSED. With + and - keys you control On-Off..</p>
		14.7

26. MENU' NO. 10 TESTING (ACCESS KEY IF ENTERED)			
Page No.	Display	Description	Sect.
10.9.0	CRing Zones ??	This page exists if the C-Ring (Bus for communication between controllers, page 4.1.0 of configuration menu, section 20) has been configured as PRIMARY SITE or PRIMARY BOILERS + SITE. The correct connection between XTC 638 (primary) and all the other COSTER controllers on the site is tested. If all the connections are correct, after a few seconds, in place of the question marks "YES" appears. If there is some error in the connection or some controller does not respond because incorrectly configured, the question marks "??" remain.	14.7
10.10.0	CRing sequence -----	This page exists if there are several boilers in SEQUENCE, and has two variations according to the configuration of the XTC 638 C-Ring. - C-Ring = PRIMARY BOILER or PRIMARY BOILER + SITES. There will appear the message PAUSE TXT MSG (awaiting transmission message); once the message has been transmitted there will appear TEXT MESSAGE (transmission message effected). - C-Ring = SECONDARY BOILER There will appear the message AWAITING TXT MSG (await reception message) as soon as the message sent by the primary boiler has been received, there will appear MSG RECEIVED (message received). This information serves to check if the secondary boilers receive the message.	
10.11.0	Output U1 : OFF Output Y : XX.XV	On this page you can simulate the outputs U1 and Y (configured on pages 4.18.0 and 4.19.0, CONFIGURATION menu, section 20). Output U1: you can simulate the On-Off status (remember that this output is an OPEN COLLECTOR). Output Y: you can simulate from 0 to 10 the value in volts, if it has been configured. If this output has been configured as 0...10 V (page 4.19.0) the value can be simulated between 0 and 10 V using the + and - keys. If this output has not been configured as 0...10 V (page 4.19.0) the choice is between On and Off (On = 4.5 V; Off = 0V)	
10.12.0	Flow T : XX.Xc Outside T: XX.Xc	This and all the following pages are readout pages, included in the testing for convenience. If the measurements are correct with acceptable values, this means that the connections with the sensors are also correct.	
10.13.0	Room T : XX.Xc Boiler T : XX.Xc	Alternatively, Fluegases T is the B3 sensor has been configured as such.	
10.14.0	DHW T : XX.Xc Man control: OFF	You can check if the external switch connected to the manual control input is correctly connected. In place of "Manual swit": ON/OFF, appears "Anticond T : XX.Xc" if the B6 input has been configured as anticondensing sensor.	
10.15.0	ManifoldT: XX.Xc		
10.16.0	InputE1: OFF InputE2: OFF	Input E1= Burner lockout: you read if the connection to the burner is correct or not. OFF = no burner lockout ON = burner lockout Input E2= You can see the status of this input. . This input has a different significance depending on whether the controller controls a Master or Slave boiler. MASTER BOILER: the input for all the U1 outputs of the Slave boilers; these communicate the burner lockout to the Master. SLAVE BOILER: the input for the relay switches 1, 2, 3 for the control of the Master shutoff valve. This input, in this instance, is connected to the U1 output of the Master in order to serve as a shutoff valve (as already explained elsewhere).	

27. QUICK GUIDE TO THE CONTENTS OF THIS MANUAL

– A : FOR THE NON-EXPERT USER (XTC 638 MUST HAVE ALREADY BEEN CONFIGURED AND SETTINGS MADE):

Read only the menu No. 0 (zero), section 17, page 16.
From the parking page :

PRESS → : with + and – keys adjust the heating temperature; the adjustment regards the NORMAL or SETBACK temperature which is currently programmed.

PRESS → : with + and – keys adjust the desired DHW temperature.

PRESS → : with + and – keys select the desired heating program .

PRESS → : with + and – keys select the desired program for DHW..

If you cannot find these pages this means: these services have been provided by another XTC 638, since on the site there is more than one boiler and consequently more than one XTC 638, identify the correct one.

When you have finished it does not matter how you leave the pages.

If the user ACCESS KEY exists you have to enter it.

– B : FOR THE RATHER MORE EXPERT USER (XTC 638 MUST HAVE ALREADY BEEN CONFIGURED & SETTINGS MADE):

Read menus No. 0 (zero), section 17 on page 16, and No. 1, section 18 on pages 17 and 18.

With these menus you can set up timed programs and other commonly-used functions.

– C : FOR THE SITE ENGINEER (XTC 638 MUST ALREADY HAVE BEEN CONFIGURED & SETTINGS MADE):

Read menus No. 0 (zero), No. 1, No. 2 and No.3.

With these menus you can understand how the whole system is functioning and decide on the most common type of operations.

– D : FOR THE EXPERIENCED ENGINEER (XTC 638 HAS STILL TO BE CONFIGURED AND SETTINGS MADE) :

Read all the menus and proceed as follows in order to set up each XTC 638, in the following order:

- MENU NUMBER 4
- MENU NUMBER 5
- MENU NUMBER 6 (if the CONFIGURATION provides for it)
- MENU NUMBER 7 (if the CONFIGURATION provides for it)
- MENU NUMBER 8 (if the CONFIGURATION provides for it)
- MENU NUMBER 9 (if the CONFIGURATION provides for it)
- MENU NUMBER 10: this is the testing of the whole site, and is, in fact, the responsibility of this engineer
- MENU NUMBER 3
- MENU NUMBER 2: for checking the measurements
- MENU NUMBER 1 and 0: to explain the operation to the users.
- E: FOR THE MANAGER WHO WANTS TO REDUCE ENERGY WASTE:

Read the whole document carefully and read also the document Definitions for SF 4-070 (referred to in section 14.2 on page 12. This document can be obtained from COSTER who will be happy to give advice on running the sites with the maximum energy efficiency.

Amendments to data sheet

Date	Revision No.	Page	Section	Amendment description	Firmware version	Software software
24.04.07 AM	01	15 - 28 15 - 33	21. MENU 5 25. MENU 9	Eliminated screen shot "Maximum Power Modulation" Added screen shot "Delay Off control calorifier"		
04.06.07 AM	02	9	9.8 Single boiler....	Amended wiring diagram & operational diagram	≥ 04	≥ 0.98.2295
07.10.07 AM	03	1	3. Sensor & accessories	Details on description SIH sensors	≥ 04	≥ 0.98.2295
25.06.08 VM	04	5	9. Example of control of sites 9.3 e 9.4	In functional diagrams: Sensor B6 moved to branch recycle pump	≥ 04	≥ 0.98.2295
25.07.08 VM	05	15 e 33	23. MENU 9	Added screen shot "Control DHW temp boiler T"	≥ 06	≥ 0.98.2360
15.06.09 VM	06	28	21. MENU 5	Added screen shot 5.2.0 bis (Off point burner)	≥ 07	>0.99.2502
10.11.09 DZ	07	various	various	Update Plug-in version	≥ 07	>0.99.2502
15.12.09 VM	08	various	20. MENU 4; 21. MENU 5,	Manual burner setting menu changed (output Y)		