

SEQUENCE CONTROLLER FOR 2 BOILERS

OPTIONAL
C ← BUS

C ← RING

XCC 602 Eng.



- **Sequence controller for two boilers with timed programming**
 - regulation of boiler manifold temperature at fixed point or variable
 - On-Off control of two single- or two-stage burners
 - On-Off control of two shut-off valves with delayed closure
- **Communication systems :**
 - **C-Ring** for exchanging data between local controllers.
 - **C-Bus XCC 602:** Telemangement optional;
to enable Telemangement use the “C-Bus Plug-in” type ACB 400,
to be ordered separately as accessory
- **Power supply 230 V AC (or 240 V AC for UK market); DIN rail mounting**

1. APPLICATION

XCC 602 is designed for sequencing two boilers with single- or two-stage burners and shut-off valves.

2. FUNCTIONS

The principal functions of XCC 602 are :

- Control of boiler manifold temperature at **fixed point** or variable value in relation to **outside temperature** or temperature requested by user plants (if controllers are connected in C-Ring to XCC 602).
 - On-Off control single- or two-stage burners
 - On-Of control of shut-off valves with adjustable closure delay
 - control of minimum and maximum limits of manifold temperature
 - self-adapting
 - remote control for reduction of desired temperature
 - fixed sequence or automatic timed change over
 - inversion of sequence in event of lockout of Lead boiler
 - theoretical metering of burner operating hours
 - theoretical metering of number of switchings on of burners
- Seven 24-hour and two 7-day programmes
- Programmes with dates for 25 holiday periods, 1 special period, heating season and summer time
- Inputs for :
 - 2 On-Off inputs for use as remote controls or for signalling status or alarms
 - 3 On-Off inputs for use for signalling status or alarms
 - 2 measurements with alarm option for flue gases temperature
- Alarm for short or open detector circuits and for abnormal operation of plant and controller
- Simulation of operation for testing wiring at commissioning stage
- Option of C-Ring setup with other controllers
- Optional C-Bus transmission of data with local PCs or remote Telemangement PC.

To enable data transmission and Telemangement use the “C-Bus Plug-in” type ACB 400

To communicate locally with a PC use the test Plug-in type ACX 232

3. DETECTORS

No.	Description	Type	Sensing element	Code	Data sheet
1	Essential : Manifold immersion temperature detector and/or	SIH 010	NTC 10 kΩ	B1	N 140
2	Boiler immersion temperature detectors	SIH 010	NTC 10 kΩ	B3-B4	N 140
1	Optional : Outside temperature detector	SAE 001	NTC 1 kΩ	B2	N 120
2	Flue gases temperature detectors	STF 001	PT 1 kΩ	B6-B7	N 165
1	Accessory for Telemangement Plug-in for communicating via C-Bus	ACB 400			

4. TECHNICAL DATA (factory setting in bold type)

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 AC
maximum switched current	5 (1) A
Construction standards	Italian Electrotech. Comm.(CEI)
Data storage	5 years

Mechanical

Case	DIN 6E module
Mounting	on DIN 35 rail
Materials:	
base	NYLON
cover	ABS
Ambient temperature:	
operating	0 ... 45 °C
storage	- 25 ... + 60 °C
Ambient humidity	Class F DIN 40040
Weight	1.0 kg

Programmes & periods

7-day programmes	0 ... 2
24-hour programmes	1 ... 7
24-hour periods	2 ... 6
Holiday periods	0 ... 25
Special period	1

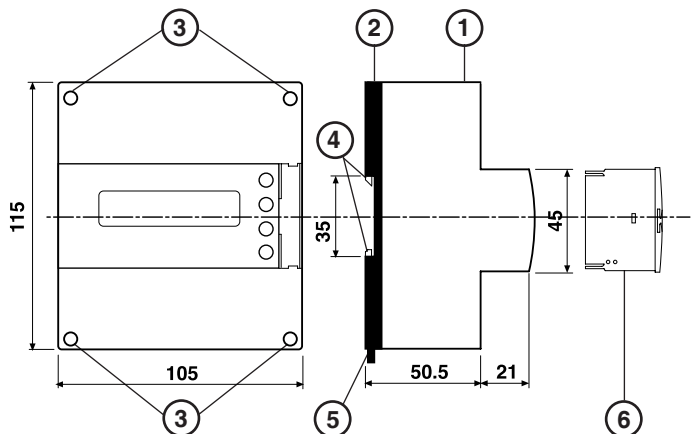
Measurement ranges

Temperature manifold and boilers	0 ... 99 °C
Outside temperature	- 30 ... + 40 °C
Flue gases temperature	0 ... 510 °C

Sequencing setting ranges

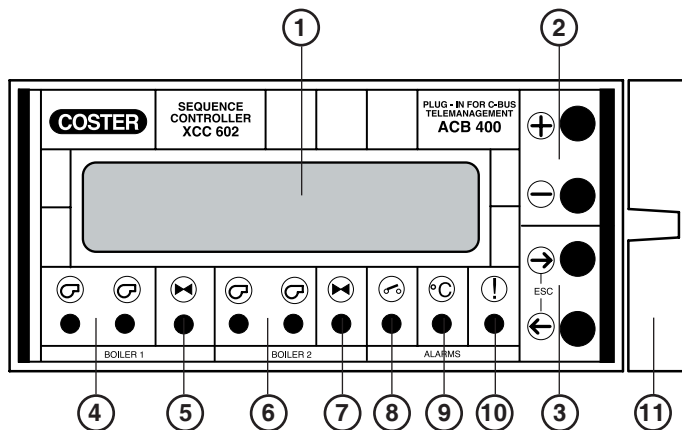
Temperature at Fixed Point	20 ... 80 ... 99 °C
Compensation:	
Design outside temperature	-30...- 5 ...+20 °C
Design boiler temperature	20 ... 80 ... 99 °C
Correction curve origin	20 ... 40 °C
Limits temperature boilers :	
Minimum	1 ... 99 °C
Maximum	1 ... 99 °C
Correction temp. requested by boilers	-20 ... 0 ... +20 °C
Temperature reduction by remote control	0 ... 99 °C
Differential stages	1 ... 3 ... 49 °C
Differential boilers	1 ... 5 ... 49 °C
Minimum On time boilers	1 ... 60 ... 250 sec.
Minimum Off time boilers	1 ... 60 ... 250 sec.
Delay closure valves	0 ... 5 ... 49 min.
Days automatic sequencing	1 ... 15 ... 88 days

5. OVERALL DIMENSIONS



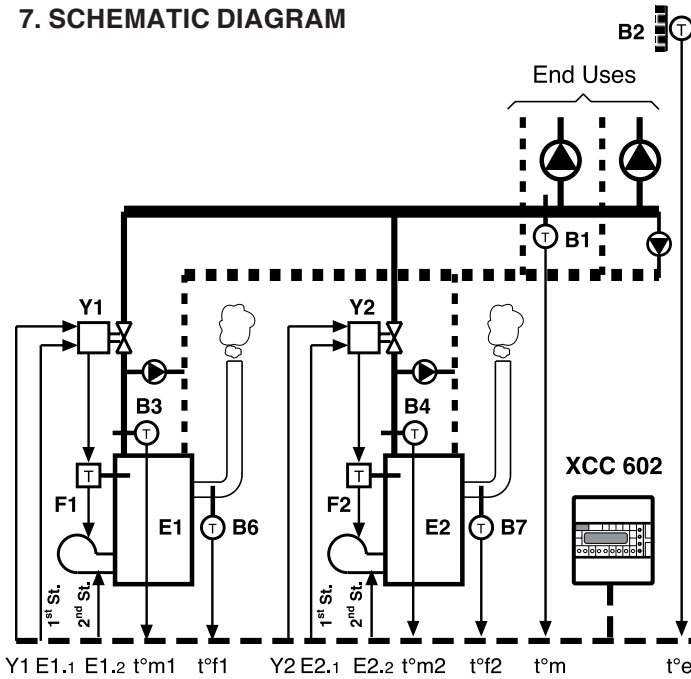
- 1 - Protective cover for electronic components
- 2 - Base with transformer, relay and terminal blocks
- 3 - Screws for securing cover-base
- 4 - DIN rail securing elements
- 5 - DIN rail release lever
- 6 - Plug-in type ACB 400 for C-Bus communication

6. FACIA



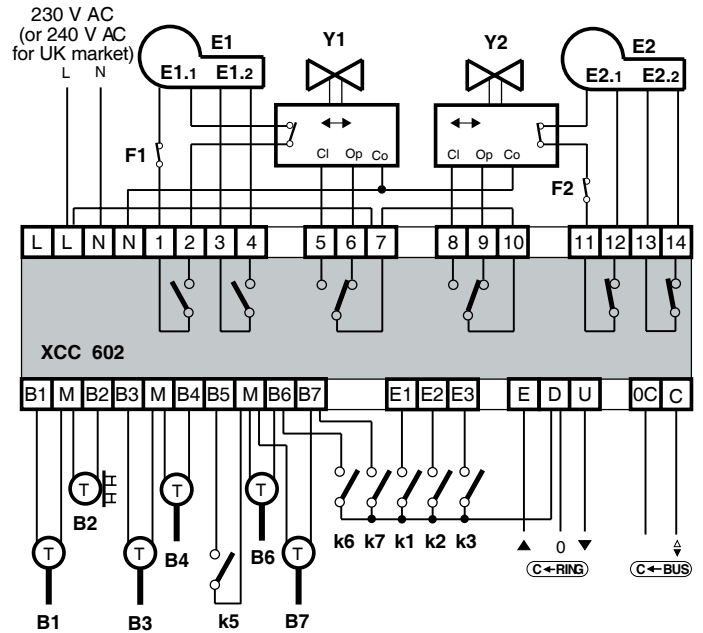
- 1 - Two-line backlighted alphanumeric display
- 2 - + and - operating keys
- 3 - ← and → operating keys
- LED indicators :
- 4 - Control 1st and 2nd stage burner 1
- 5 - Valve boiler 1
- 6 - Control 1st and 2nd stage burner 2
- 7 - Valve boiler 2
- 8 - Digital alarms (On-Off contacts)
- 9 - Detector & functional alarms
- 10 - Controller fault alarm
- 11 - Plug-in type ACB 400 for C-Bus communication

7. SCHEMATIC DIAGRAM



- B1 – Flow manifold temp. detector (t°f)
- B2 – Outside temp. detector (t°o)
- B3 – Boiler 1 flow temp. detector (t°f1)
- B4 – Boiler 2 flow temp. detector (t°f2)
- B6 – Boiler 1 flue gases temp. detector (t°fg1)
- B7 – Boiler 2 flue gases temp. detector (t°fg2)
- E1 – Boiler 1
- E1.1 – Control 1st stage boiler 1
- E1.2 – Control 2nd stage boiler 1
- E2 – Boiler 2
- E2.1 – Control 1st stage boiler 2
- E2.2 – Control 2nd stage boiler 2

8. WIRING DIAGRAM



- F1 – Boiler 1 thermostats
- F2 – Boiler 2 thermostats
- k1 – On-Off alarm contact or Remote On
- k2 – On-Off alarm contact or Remote Extension
- k3 – On-Off alarm contact
- k5 – Remote control reduction desired temperature
- k6 – Lockout burner 1 contact
- k7 – Lockout burner 2 contact
- L – Line 230 V AC (or 240 V AC for UK market)
- N – Neutral
- Y1 – Shut-off valve boiler 1
- Y2 – Shut-off valve boiler 2
- C-Bus – Transmission data via Telemangement;
C-Bus is enabled using the Plug-in type ACB 400
- C-Ring – Data transmission between controllers

9. SITING OF CONTROLLER, VALVES & DETECTORS

9.1 Controller

The controller must be sited in a dry ambience in accordance with the ambience requirements in 4. TECHNICAL DATA. If sited in an ambience classified as “Dangerous” it must be enclosed in an electrical cabinet constructed according to the current regulations for the level of danger involved. It can be installed on a DIN rail or in a DIN enclosure.

9.2 Boiler shut-off valves

These can be installed, indifferently, on the flow or return pipework of the boilers. If the flow is used, care must be taken to install them downstream of all the safety devices.

9.3 Manifold detector B1 and/or boiler detectors B3 and B4

To monitor the temperature of the boilers it is possible to use :

- Manifold detector (B1) : Can be used only when there is a circulation pump for the distribution manifolds and there is a sole point of passage for the water between the boilers and the user plants. If the two boiler detectors (B3-B4) are also connected they are used only for monitoring the temperatures of each boiler.
- 2 boiler detectors (B3-B4) : When the previous conditions do not exist, you can install two detectors directly on the boilers and the controller will consider the actual temperature to be that of the Lead boiler.

9.4 Outside detector B2

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

10. WIRING

Proceed as follows :

- Separate base and cover
- Mount base on DIN rail and check that securing elements (5.4) hold it firmly in place.
- Carry out wiring according to the diagram and in observance of the relevant regulations in force, and using cables of :
 - 1.5 mm² for power and relay control outputs
 - 1 mm² for sensors and remote control
 - 1 mm² for C-Bus and C-Ring. For wire length limits please see technical data sheets T 021 and T 022
- Reposition the cover on the base / terminal block and fasten with the 4 screws supplied (5.3).
- Check that voltage is correct and supplied by the dedicated auxiliary line, measuring it upstream of the protection (circuit breaker, fuse....).
- Power up the device.

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

11. COMMUNICATION

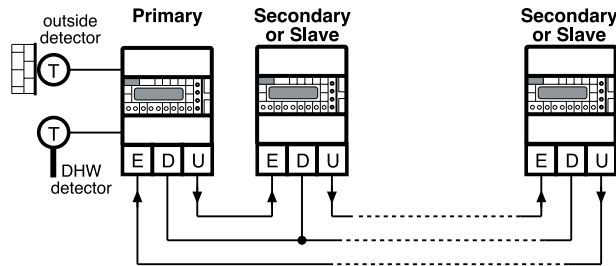
11.1 C-Ring for communication between controllers (for detailed information consult technical data sheet T 022)

The controller XCC 602 is **always a "Primary"**.
 The following signals are transmitted in C-Ring circuit :
 - permission for **Slave** controllers to operate
 - measurement of **outside temperature** - use of a single detector for several controllers
 - value of **flow temperature** requested by controllers in C-Ring, used by XCC 602 (Temperature boilers : PLANTS) to control temperature of boilers.
 - **DHW priority** and/or **anticondensing** = modulating control of closure valves of heating circuits.

25.7
 CRing : NO

C-Ring : NO = connection to C-Ring not scheduled
 YES= connection to C-Ring scheduled

11.2 C-Ring wiring diagram

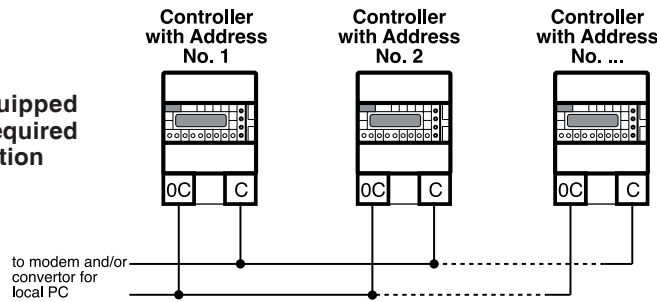


11.3 C-Bus communication for telemanagement (for detailed information please see technical data sheet T 021)

L' XCC 602 provides :
 - remote Telemanagement by when enabled by **C-Bus Plug-in type ACB 400**
 - local communication (e.g. setting via PC) when enabled with **Test Plug-in ACX 232**
 Telemanagement is bidirectional, with one or more local PCs and/or the remote central PC via PSTN.
 Local communication is direct to a portable PC to be connected directly to the unit..
 From PC or PCs it is possible to display and/or change :
 - the data and values entered on display pages of the controller and those of configuration dedicated exclusively to telemanagement (see 4.TECHNICAL DATA)
 - operational status of plant components (pumps, auxiliaries in general)
 - acquire alarms coming from boiler plant
 - read the measurements of the detectors (temperatures : outside, flow, boiler, etc)

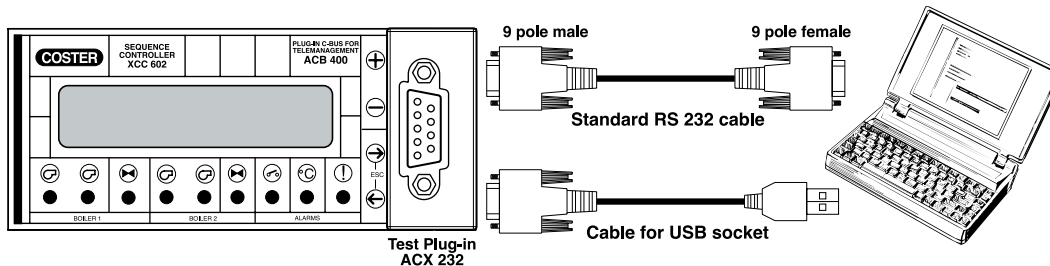
11.4 C-Bus electrical connection for local or remote Telemanagement

Each controller must be equipped with the C-Bus Plug-in of the required type for the controller in question



11.5 Connection to PC for local communication via test Plug-in ACX 232

Extract the C-Bus Plug-in and insert the test Plug-in ACX 232; use a standard cable to connect the RS232 plug to the PC (the cables are included in the "CONVENIENCE KIT".
 If the PC has only USB inputs use a standard RS232 to USB conversion cable.



ACCESSORIES

- Test Plug-in = **ACX 232**
 - The "Convenience kit" = **KIT RS 232**
- The "Convenience kit" contains the 2 cables & other useful accessories..

Observations : - Before communicating, ensure that the address entered in the controller is the address with which you wish to communicate via PC.
 - It is advisable to use a portable PC powered by battery with the connection to 230 Volts AC unplugged (or 240 for UK market), since the earth (0 Volts) of the controller is connected to that of the RS 232 and so to that of the PC. By connecting the two earths together you could have dispersed currents, if the earths have not been well made and if the PC has its 0 Volt connected directly to the central pole of the plug (as is usual)

12. OPERATION

XCC 602 is a digital controller with microprocessor for the regulation of the manifold temperature of boilers in sequence. Controls single- and two-stage burners and the shut-off valves.

12.1 Type and number of boilers

To adapt the controller to the characteristics of the plant, enter the type of burners used with the boilers :

25.1

Boiler1 Stage: 1
Boiler2 Stage: 1

- Boiler 1 Stage : 1 = boiler with single-stage burner
2 = boiler with two-stage burner

12.2 Minimum On and Off times of burners

24.1

Minimum On boilers: 60s

To ensure that too short On and Off times of the burners do not cause lockouts , enter minimum On and Off times.

24.2

Minimum Off boilers: 60s

12.3 Delay closure shut-off valves

24.3

Delay closure valves : 5 min

To avoid overheating of the boiler because of residual heat in the combustion chamber, the shut-off valve must be closed with a certain delay after switching off the burners (valid only for auxiliary boiler).

12.4 Sequencing

- With manifold detector **B1** (boiler detectors **B3** and **B4** optional)
The controller uses as the value of **actual** temperature that measured by the manifold detector B1 even if the two boiler detectors **B3** and **B4** are connected; the latter, when **B1** is present, serve only for reading the temperature of each of the two boilers.
- With boiler detectors **B3** and **B4** (without manifold detector **B1**)
The controller uses as the **actual** value that measured by the detector of the boiler which in that moment functions as Lead.

The sequencing of the boilers (opening valves and switching on burners) depends on the **difference** between the **actual** manifold temperature (detector B1) or boiler detector B3 and B4, and that desired.

23.7

Differential stages : 3.0c

- Differential stages = lowering of temperature for switching on burner. For two-stage burners the stage differential is the Differential Stages divided by 2.

23.8

Differential boilers: 5.0c

- Differential boilers = lowering of temperature for switching on Lag boiler

Note

The valve of the Lead boiler always remains open so as to ensure the flow of water in the manifold.

The sequence can be :

- Choice sequence : FIXED SEQ 1 → 2 = fixed sequence 1 Lead 2 Lag
FIXED SEQ 2 → 1 = fixed sequence 2 Lead 1 Lag
ONLY 1 ON = boiler 1 controlled, boiler 2 Off
ONLY 2 ON = boiler 2 controlled, boiler 1 Off
1+2 ALWAYS ON = boilers 1 & 2 On & controlled by boiler thermostats
AUTO CHANGE OVER = sequence with automatic rotation of Lead boiler each programmed period of time expressed as days in

20.6

Choice Sequence AUTO CHANGE OVER

24.4

Auto Change boilers days:15

20.7

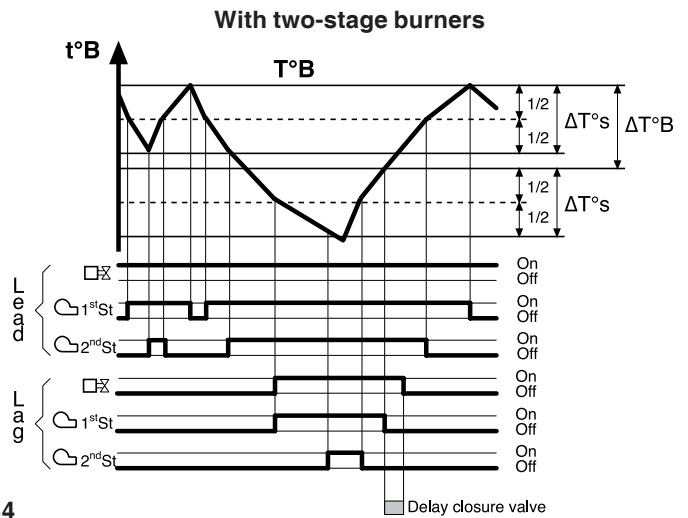
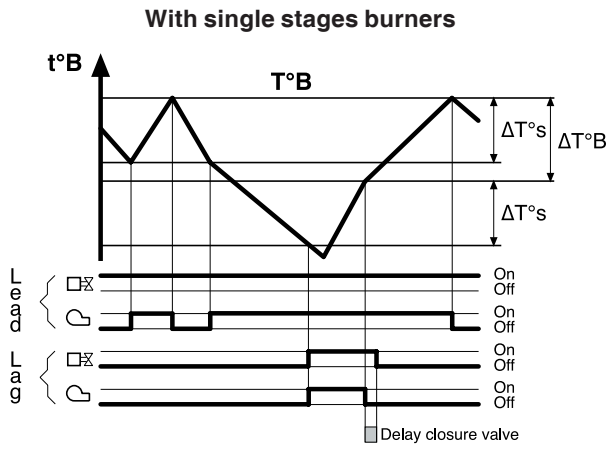
Current Sequence LEAD 1 LAG 2

It is possible to change, at any time, the Lead boiler set by the auto change over without changing the Choice Sequence.

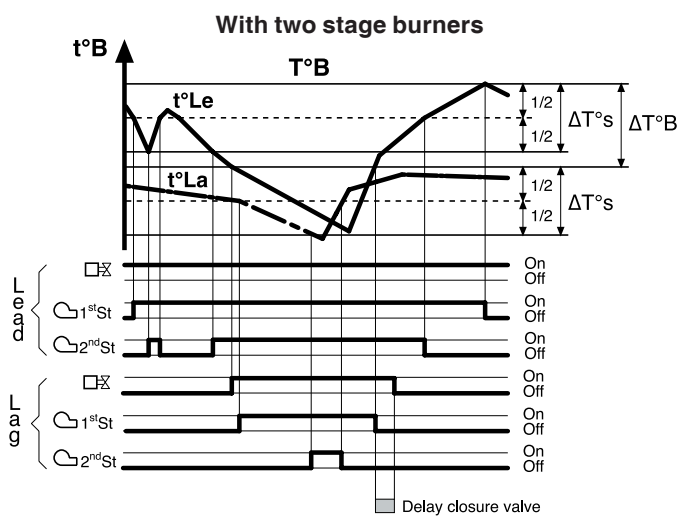
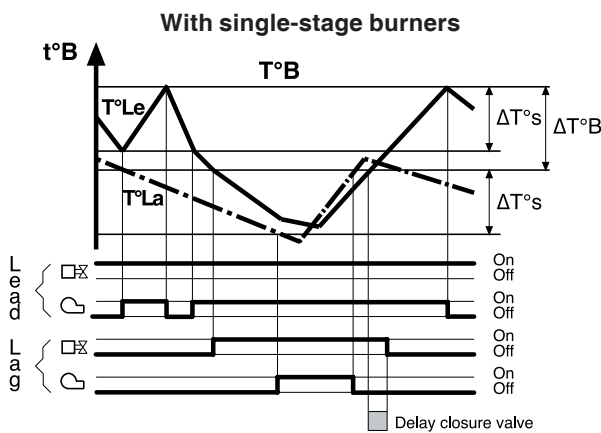
In event of a change over, the new sequence remains for the days still available before the auto change over.

If the lockout contacts of the burners **k6** and **k7** are connected, in the event of a lockout of the Lead boiler, the Lag boiler is automatically made to operate as Lead.

12.5 Examples of sequencing with manifold detector B1



12.6 Examples of sequencing with 2 boiler detectors B3 and B4



13. PROGRAMMES & PERIODS WITH DATES

13.1 24-hour programmes

21.1

How many 24hour programmes ? 1

Enter number of programmes you wish to use so as to avoid viewing unused display pages.

21.2

P1 :ON :06.00
:OFF :22.00

Each 24-hour programme (P1 ...P7) can contain a maximum of three ON times and three OFF times

- ON : boilers regulated according to choice made in Temp boilers
FIXED POINT

- OFF : boilers according to choice made in Boilers with htg
Off :OFF

Note

The times of start of period must be entered in increasing order.
The times not used are excluded by pressing the two keys + and - at the same time until --- appears on the display.
Times not used (---) must not be left between programmed times.

13.2 7-day programmes

21.3

How many 7day programmes ? 0

Enter number of programmes you wish to use so as to avoid viewing unused display pages.

The pages of the days of the week are displayed only when 1 or 2 is entered.

21.4

7day 1 :MTWTFSS
24hr P :1111111

In each 7-day programme you can assign to each day of the week one of following programmes :
- 1 ... 7 : 24-hour programmes

- A : Always On, boilers controlled according to choice made in Temp boilers
FIXED POINT

- S : Always Off, boilers according to choice made in Boilers with htg
Off :OFF

13.3 Holiday periods

21.5

How many holiday periods ? 0

21.6

Holiday program: OFF

21.7

Last day of holiday: ON

21.8

Hol 01 Start NO
Fr - - . - - to - - . - -

Set an operating programme, equal for all the periods, which replaces that in use. At the end of each holiday period the controller reverts to normal operation.

Enter the number of holiday periods or bank holidays you wish to use so as to reduce the number of display pages dedicated to the entering of data. If left at 0 the programming pages do not appear.

Choose the programme to be used during all the holiday periods and the programme to be used on the last day of the holiday so as to prepare the building for the return to occupancy.

- 24 HOUR 1 ... 7 ;
- 7DAY1 or 2 ;
- ON ;
- OFF

Enter the data of period :

- Hol 01 = selection of the periods made available by 21.5
How many holiday periods ? 0
- Start : NO = holiday period not used
- 00 = start period at 00.00 hours
- 12 = start period at 12.00 hours
- Fr - - . - - to - - . - - = day and month of start and end of holiday period

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

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

13.4 Remote extension

23.11

Remote Extension for hours: 3

25.4

Input E2
REMOTE EXTENSION

If the input E2 has been configured as

when the press-button k2 is pressed for more than a second the Remote

Extension period is enabled; this imposes with absolute priority the operation

23.1
Temp Boilers
FIXED POINT

of the boilers according to the choice made in

23.11
Remote Extension for hours: 3

13.5 Special period

20.5

Special : 24HR 1
Fr - - . - - to - - . - -

Period in which an operating programme is set which replaces temporarily the one in use in order to meet particular requirements, chosen from :

- Special : 24 HOUR 1 ... 7 ;
- 7DAY1 or 2 ;
- ON ;
- OFF
- Fr - - . - - to - - . - - = day and month of start and end of special period.

13.6 Heating season

21.9

Heating season
Fr 15.10 to 15.04

Defines the period of heating according to the regulations of the various climatic zones.

Enter the day and month of the start and end of the heating period.
To cancel the period keep pressed the + and – keys at the same time.

13.7 Summer time

21.10

Summer Time
Fr 29.03 to 26.10

The controller is able to change automatically the current time of day in relation to the summer time period.

- Fr - - . - - = the night of the last Saturday of the month of March, the time of day is automatically put forward one hour.
- to - - . - - = the night of the last Saturday of the month of October, the time of day is automatically put back one hour.

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

14. CONTROL TEMPERATURE BOILERS

The temperature of the boilers can be monitored by :

- manifold detector B1 (if detectors B3 and B4 are connected they serve only to monitor the temperatures of the boilers)
- boiler detectors B3 and B4 (the controller considers as the actual value that monitored by the lead boiler detector)

Can be controlled in three ways:

- FIXED POINT ;
- COMPENSATION ;
- PLANTS.

23.1

**Temp boilers
FIXED POINT**

14.1 Fixed point

23.2

**Temperature
Fixed Point: 80c**

To be used when PLANTS or COMPENSATED is not possible because the controller is not able to know the temperature requested by the plants or the control of the plants is not only of the compensated type.

Keep constant the temperature at the programmed value.

14.2 Compensated

23.3

**Design outside
temp : - 5.0c**

- design outside temperature

23.4

**Design boilers
temp : 80c**

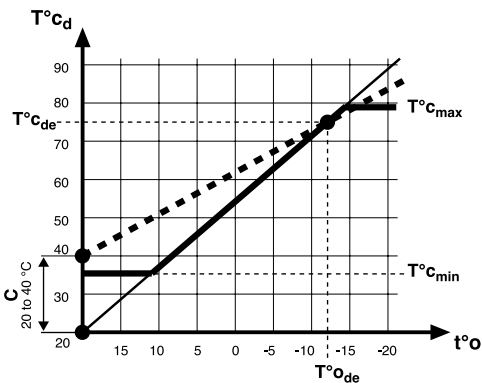
- design boilers temperature

23.5

**CurveOrigin T020
T BOILERS: 20c**

The **point of origin of the heating curve** (+ 20 °C boilers with + 20 °C outside) can be changed by an increase in the temperature of the boilers (0 ... 40 °C). It may be necessary so as to avoid difficulties due to possible unbalances in the output of the heat emitters owing to mild outside temperatures and to the reduced period of heating during the intermediate seasons.

Heating curve



- C = correction curve origin
- Tc_v = temperature boilers desired by compensation
- Tc_p = design temperature boilers
- Te_p = design outside temperature
- Tc_p^{max} = maximum limit manifold
- Tc_p^{min} = minimum limit manifold
- t^oe = actual outside temperature

14.3 Plants

20.2

**SB : - - - - -
PLANTS**

Setting to be used when XCC 602 is connected in C-Ring with other controllers so that the temperature of the boilers is always that of the maximum flow requested by the plant controllers.

In this case the controller is able to regulate the boilers automatically according to the requirements of the plants, without the need for a timed programme. On the page for choosing the programmes appears the word **PLANTS** and it is not possible to change it.

14.4 Minimum and maximum limits

23.6

**Limits T boilers
Min:01c Max:99c**

When the temperature of the boilers reaches one of the limit values it is kept constant at that value (the controller no longer takes into account the heating curve or the request for maximum temperature coming from the plants via C-Ring).

Warning !

The maximum temperature limit does not replace the safety measures prescribed by the regulations.

14.5 Operating programmes

20.2

SB :-----
PROGRAM :ON

If the type of control is Compensated or Fixed Point, it is possible to programme the operation of the boilers according to the requirements of the plants :
 - 24HOUR 1 ... 7 ; - 7DAY 1 or 2 ; - ON ; - OFF.

When, in place of the programme, appears :

- PLANTS = has been set 23.1
Temp boilers
PLANTS
- REMOTE ON = remote control Remote On has been enabled (paragraph **15.1**).
- SPECIAL = special period has been enabled (para. **13.5**).
- SUMMER = summer period in use (para. **13.6**).
- HOLIDAY = one of holiday periods in use (para. **13.3**).
- REMOTE EXTENSION (REM EXT) = Remote Extension period enabled (para. **13.4**).
- FOLLOWS BOILER = when one of detectors B1, B2, B3 is faulty or is
- C-RING ? = when C-Ring connection is faulty 20.6
Choice Sequence
1+2 ALWAYS ON

14.6 Operating mode and variation temperature boilers

20.3

Mode :ON
Td: 80c Var :+ 0c

The current operating mode depends on the programme entered in and is displayed on a page of display :

- Mode : ON ;
OFF ; 20.2
SB :-----
PROGRAM :24HR 1
- Td 80 = desired temperature for current mode
- Var 0.0 = increase in temperature requested by current mode so that it is sufficient to satisfy requests of end uses.

15. REMOTE CONTROLS

15.1 Remote on

25.2

Input E1
REMOTE ON

The input E1-D can be used as a remote control for the function of REMOTE ON.

When contact k1 is closed there will appear 20.2
SB :-----
REMOTE ON: and control is 23.2
Temperature
Fixed Point: 80c with priority over all the other functions and programmes, according to choice :

25.3
Remote On
LEAD AT FIXED T in operation Lead boiler only

25.3
Remote On
SEQ AT FIXED T in operation the two boilers in sequence

15.2 Remote extension

25.4

Input E2
REMOTE EXTENSION

The input E2-D can be used for enabling the REMOTE EXTENSION period (paragraph **13.4**).

15.3 Remote reduction

23.10

Reduct T without
use : --C

When contact k5, connected to input B5-M, is closed, the controller imposes a reduction of the desired temperature according to the setting.

16. COMPLEMENTARY FUNCTIONS

16.1 Access keynumber

25.11

Choice Keynumber

Choice and enabling of access keynumber which prevents the use of + and – keys thereby preventing any modification of the data. Enter the number (1900...1999) using + and – keys.
To cancel the keynumber press + and – at the same time until the dashes re-appear.

When the keynumber has been enabled, if the + and – keys are pressed there will appear on the display the request to enter the access keynumber. Only after having entered the correct number can the + and – keys be used.
If for 15 minutes no key is pressed the keynumber is automatically re-enabled.

16.2 Denomination of plant

25.12

Name Heating Plant

Composition of name of plant which appears on first page of display.
Each dash can be replaced, using the + and – keys, by a letter of the alphabet (A ... Z) or by a number (0 ... 9). The → key serves for positioning the cursor.

16.3 Display measurements

22.1

T boiler1: 75.0c
T boiler2: 70.0c

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

- temperatures measured by boiler detectors **B3** and **B4**.

22.2

T outside: - 2.0
T manif : 75.0c

- temperature measured by outside detector **B2**.
- temperature measured by manifold detector **B1**.

22.3

Temp boilers
desired : 80.0c

- desired temperature

22.4

T flgas 1 :185c
T flgas 2 :185c

- temperatures measured by flue gases detectors **B6** and **B7**.

22.5

T fgas1 max:185c
T fgas2 max:185c

- maximum temperatures measured by flue gases detectors **B6** and **B7**.

22.6

Boil 1:00000 hrs
Times On :00000

- metering of operating hours of boiler **1**.
- metering of number of switchings on of boiler **1**.

22.7

Boil 2:00000 hrs
Times On :00000

- metering of operating hours of boiler **2**.
- metering of number of switchings on of boiler **2**.

22.8

- 2.0c 80.0c ASV
C80c 75c 70c ASV

Summary of operational status:

- outside temperature ; desired temperature ; status boiler 1
- manifold temperature ; boiler 1 temperature ; boiler 2 temperature ; status boiler 2.

Status boilers : **A** = delay switching on burner in progress
S = delay switching off burner in progress
V = delay closure valves in progress

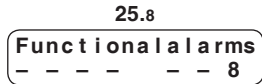
17. ALARMS

The alarms processed by the controller are of three types :
 – alarms for abnormal operation of controller (LED 6.10) and of plants controlled (LED 6.9)
 – alarms for short or open circuits of detectors connected (LED 6.9)
 – alarms for external contacts (LED 6.8)

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

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

17.1 Functional alarms



The functional alarms are triggered in the presence of prolonged differences between the actual measurements and those desired.
 They do not prejudice the correct operation of the controller with the exception of the timeswitch alarm (8).

Factory setting : all alarms disabled except for the timeswitch alarm (8).

Using the + key enable the alarms which are of interest by replacing the dashes with numbers.

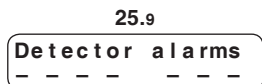
When the number blinks = alarm triggered.

The limit or differential values and the delay time for sending the alarms can be changed only by means of a PC.

Types of alarm and purposes :

- 1 = overtemperature manifold (B1) or boiler 1 (B3)**
 – when the temperature remains above 95 °C for a programmable time.
- 2 = overtemperature boiler 2 (B4)**
 – when the temperature remains above 95 °C for a programmable time.
- 3 = difference temperature manifold (B1) or boiler 1 (B3)**
 – when the temperature remains below that desired for a programmable time.
- 4 = difference temperature boiler 2 (B4)**
 – when the temperature remains below that desired for a programmable time.
- 6 = maximum temperature flue gases 1 (B6)**
 – when the temperature exceeds the maximum threshold set
- 7 = maximum temperature flue gases 2 (B7)**
 – when the temperature exceeds the maximum threshold set
- 8 = internal timeswitch, cannot be disabled**
 – when the timeswitch assumes abnormal values.

17.2 Detector alarms



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

The triggering of the alarms is delayed by one minute and takes place only if the relative alarms are enabled.

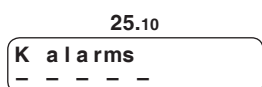
Factory setting : all detector alarms disabled

Using the + key enable the alarms which are of interest by replacing the dashes with numbers.

Type of alarm and effect :

- 1 = manifold detector (B1)**
 – boilers in operation controlled by thermostats
- 2 = outside detector (B2)**
 – uses last value monitored
- 3 = boiler 1 detector (B3)**
 – if B1 not connected, operating boilers controlled by thermostats
- 4 = boiler 2 detector (B4)**
 – if B1 not connected, operating boilers controlled by thermostats
- 6 = flue gases 1 detector (B6)**
 – alarm triggered only for open or short circuit
- 7 = flue gases 2 detector (B7)**
 – alarm triggered only for open or short circuit
- 8 = C-Ring : break in electrical connection or fault in one of controllers in ring.**

17.3 Alarm or status



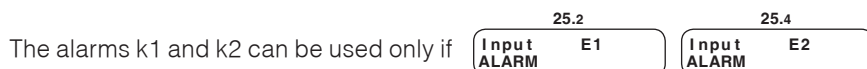
Alarms triggered by closure of voltage-free contacts **k1, k2, k3, k6, k7** of components of plant (pumps, burners, etc).

The presence of the alarm is indicated after about 60 seconds.

Factory setting : alarms disabled

Using + key enable the alarms which are of interest by replacing dashes with numbers.

If not used as alarm they can be used as status indicators.



18. COMMISSIONING PLANT

Testing to be carried out when installation has been completed and the wiring and configuration carried out and tested.

18.1 Testing C-Ring

The page for testing C-Ring appears only if YES entered in

25.7

CRing:NO

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

26.1

CRing:??

– correctly power by 230 V AC (or 240 V AC only for UK market)

– Slave controllers or configured as SECONDARIES in

CRing:SECONDARY

– selected on test page

CRing ??

XCC 602 sends via C-Ring a signal every 5 seconds: on all the displays the symbol “??” appears. If the connections are correct the symbol “YES” replaces “??” on all the displays. If on one or more display “YES” does not appear this means that there is a short or open circuit between the last controller with “YES” and the first with “??”.

Examples of testing a C-Ring with four controllers :

- Contr.1 "YES" – Contr.2 "YES" – Contr.3 "YES" – Contr.4 "YES" : Connections OK
- Contr.1 "??" – Contr.2 "YES" – Contr.3 "YES" – Contr.4 "YES" : Break between 4 and 1
- Contr.1 "??" – Contr.2 "YES" – Contr.3 "??" – Contr.4 "??" : Break between 2 and 3
- Contr.1 "??" – Contr.2 "??" – Contr.3 "??" – Contr.4 "??" : Break between 1 and 2

18.2 Testing control outputs

26.2

Valve 1:CLOSED
Boiler 1:OFF

With + and – keys choose :

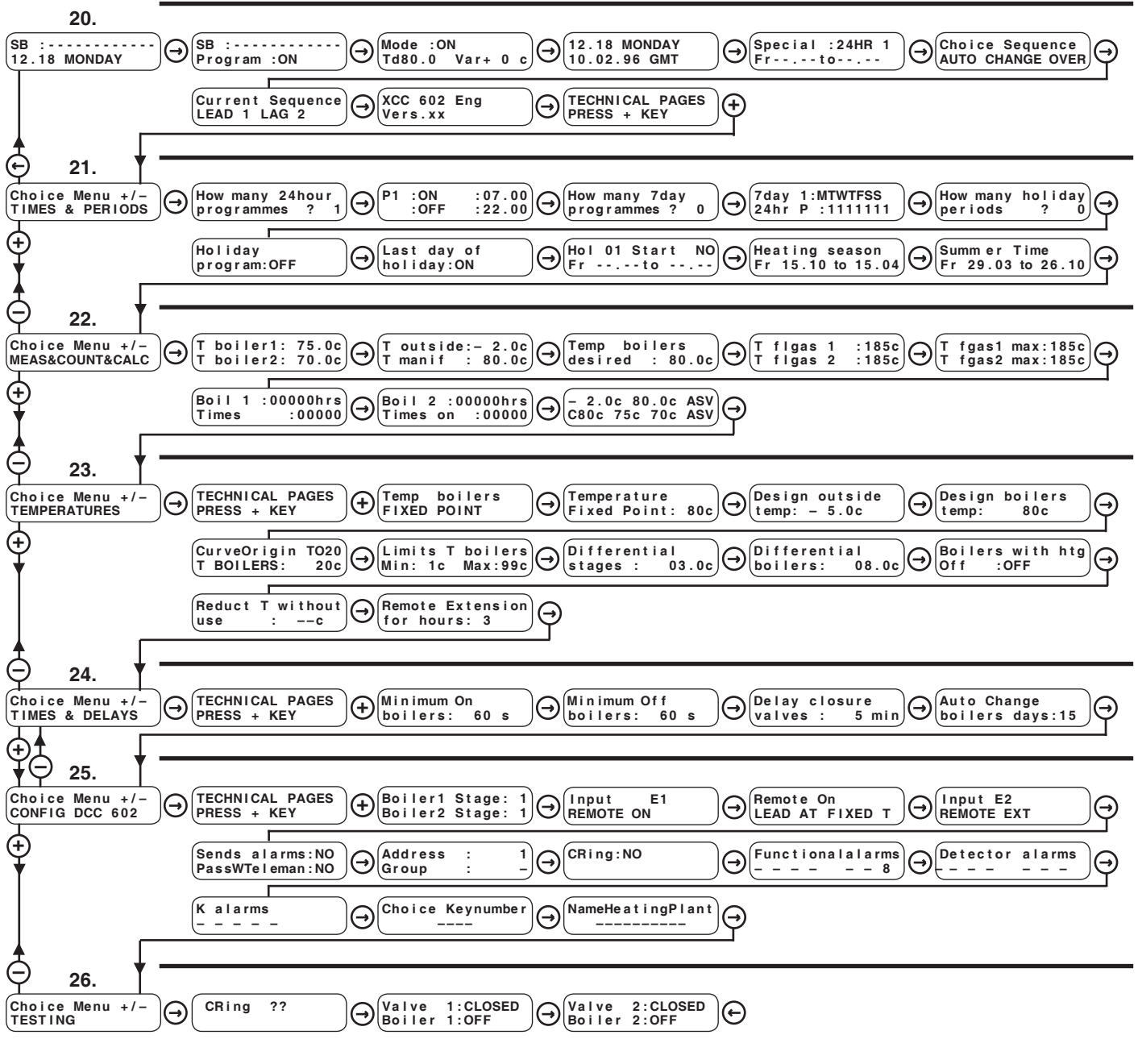
- Valve 1 : CLOSED = shut-off valve boiler 1 closing
OPEN = shut-off valve boiler 2 opening
- Boiler 1 : OFF = boiler 1 Off
ON S1 = On 1st stage boiler 1
ON S1+2 = On 1st and 2nd stage boiler 1
- Valve 2 : CLOSED = shut-off valve boiler 2 closing
OPEN = shut-off valve boiler 2 opening
- Boiler 2 : OFF = boiler 2 Off
ON S1 = On 1st stage boiler 2
ON S1+2 = On 1st and 2nd stage boiler 2

26.3

Valve 2:CLOSED
Boiler 2:OFF

Check the result.

19. SEQUENCE OF DISPLAY PAGES (the data and functions are those in memory on delivery)



⬅ ➡ Keys for scrolling the display pages and positioning the cursor ■ on data which can be adjusted.

The adjustable data are highlighted thus ■ in the subsequent descriptive list of display pages.

By pressing the + and - keys at the same time for a few seconds, or in any event after 15 minutes, the first page is displayed.

⊖ ⊕

Keys for : - adjusting the values highlighted by the cursor ■

- displaying the configuration options of a function eg :

Temp boilers FIXED POINT or Temp boilers COMPENSATION

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

Htg:-----
12.18 MONDAY

20. NORMAL USE				
Ref.	Display	Description	Notes	Sect.
20.1	SB :----- 12.18 MONDAY	Name plant Current time & date	Entered in 25.12 Entered in 20.4	
20.2	SB :----- PROGRAM :ON	Choice programme boilers : 24HR 1...7 ; 7DAY 1 or 2 ; ON ; OFF.	Instead of PROGRAM may appear: PLANTS; REMOTE ON; SPECIAL; SUMMER; HOLIDAY; REM EXT; FOLLOWS BOILER ; C-RING ?.	14.5
20.3	Mode :ON Td:80c Var:+ 0c	Current mode operation boilers Temperature requested by mode variation.	Mode : ON; OFF.	14.6
20.4	12.18 MONDAY 10.02.96 GMT	Setting : Time, day of week & date Current time period : GMT or BST	According to dates Summer time entered in 21.10	
20.5	Special :24HR 1 Fr --- to ---	Choice programme for Special period 24HR 1...7 ; 7DAY 1-2 ; ON ; OFF. Date of start & end of Special period.	Press + and – keys together to cancel	13.5
20.6	Choice Sequence AUTO CHANGE OVER	Choice type of sequence: AUTO CHANGE OVER ; FIXED SEQ 1→2; FIXED SEQ 2→1; ONLY 1 ON ; ONLY 2 ON ; 1+2 ALWAYS ON.		12.4
20.7	Current Sequence LEAD 1 LAG 2	Current sequence : LEAD 1 LAG 2 ; LEAD 2 LAG 1.	Appears only if in 20.6 choice is AUTO CHANGE OVER.	12.4
20.8	XCC 602 Eng. Vers.xx	Identity data of controller	You can change with + and – keys.	

21. TIMES & PERIODS				
Ref.	Display	Description	Notes	Sect.
21.1	How many 24hour programmes ? 1	Choice of number of 24-hour programmes to be used (1 ... 7).	Avoids viewing unused pages	13.1
21.2	P1 :ON :07.00 :OFF :22.00	Number of programme, time switching On time switching Off Other groups of 3 pages in relation to choice made in 21.1	Max. 3 periods. To eliminate an unused period press + and – keys together - - - - The times must be in increasing order. Do not leave - - - - between programme times.	13.1
21.3	How many 7day programmes ? 0	Choice of number of 7-day programmes be used (0 ... 2).	Avoids viewing unused pages	13.2
21.4	7day 1 :MTWTFSS 24hr P :1111111	Programme for each day of week : 1...7 : 24-hour programmes; A : Always On ; S : Always Off. Other pages if in 21.3 choice is 2.	Appears only if in 21.5 choice is greater 13.3	13.2
21.5	How many holiday periods ? 0	Choice of number of holiday periods to be used (0 ... 25).	Avoids viewing unused pages	13.3
21.6	Holiday program:OFF	Holiday programme : 24HR 1...7 ; 7DAY 1-2 ; ON ; OFF.	Appears only if in 21.5 choice is greater than 0.	13.3
21.7	Last day of holiday:ON	Programme for last day of holiday 24HR 1...7 ; 7DAY 1-2 ; ON ; OFF.	Appears only if in 21.5 choice is greater than 0.	13.3
21.8	Hol 01 Start NO Fr --- to ---	NO=unused period; 00=start 00 hours; 12=start at 12 hours noon Dates of start & end of holiday period.	Appears only if in 21.5 choice is greater than 0.	13.3
21.9	Heating season Fr 15.10 to 15.04	Dates of start & end of heating season.		13.6
21.10	Summer Time Fr 29.03 to 26.10	Dates of start & end of Summer time period.		13.7

22. MEAS&COUNT&CALC				
Ref.	Display	Description	Notes	Sect.
22.1	T Boiler1: 75.0c T Boiler2: 70.0c	Actual temperature of the two boilers	Only if detectors B3-B4 connected	16.3
22.2	T outside: - 2.0 T manif : 75.0c	Outside temperature from B2 or from C- Ring Manifold temperature measured by B1		16.3
22.3	Temp boilers desired : 80.0c	Temperature desired or calculated by controller		16.3
22.4	T flgas 1 :185c T flgas 2 :185c	Temperature measured by flue gases detector B6		16.3
22.5	T fgas1 max:185c T fgas2 max:185c	Maximum temperature measured by detector B6 Maximum temperature measured by detector B6 Maximum temperature measured by detector B7		16.3
22.6	Boil 1:00000 hrs Times On :00000	Metering hours On boiler 1. Metering number of switchings On boiler 1		16.3
22.7	Boil 2:00000 hrs On :00000	Metering hours On boiler 2. Metering number of switchings On boiler 2		16.3
22.8	- 2.0c 80.0c ASV C80c 75c 70c ASV	Summary of operational status	T° outside & desired ; status boiler 1 T° manifold, boiler 1, boiler 2; Status boilers : A = delay swit. on burner S =delay swit. off burner V =delay closure valve	16.3
23. TEMPERATURES				
Ref.	Display	Description	Notes	Sect.
23.1	Temp boilers FIXED POINT	Type of temperature control : FIXED POINT; COMPENSATION; PLANTS.		14.
23.2	Temperature Fixed Point: 80c	Value of desired temp. at FIXED POINT.	Appears always, even if in 23.1 FIXED POINT not selected.	14.1
23.3	Design outside temp : - 5.0c	Value of design outside temp. for compensated control	Appears only if in 23.1 COMPENSATION se-	14.2
23.4	Design boilers temp : 80c	Value of design boiler temp. for compensated control	Appears only if in 23.1 COMPENSATION se-	14.2
23.5	CurveOrigin TO20 T BOILERS: 20c	Correction of heating curve origin	Appears only if in 23.1 COMPENSATION se-	14.2
23.6	Limits T boilers Min:01c Max:99c	Minimum & maximum limit values of temp. boilers		14.4
23.7	Differential stages: 3.0c	Temp. differential On-Off burner		12.4
23.8	Differential boilers: 5.0c	Differential temp. switching on lag boiler		12.4
23.9	Boilers with htg Off :OFF	Type of operation when temp. requested by C- Ring or by compensation is 0 °C. OFF : boilers Off;; ON : boilers controlled at minimum limit 23.6.	Appears if in 23.1 COMPENSATION or PLANTS selected	13.1 é
23.10	Reduct T without use : --c	Reduction of desired temp. boilers with k5 contact k5 closed.		15.3
23.11	Remote Extension for hours: 3	Duration of Remote Extension period.		13.4
24. TIMES & DELAYS				
Ref.	Display	Description	Notes	Sect.
24.1	Minimum On boilers: 60 s	Minimum duration switching on burners		12.2
24.2	Minimum Off boilers: 60 s	Minimum duration switching off burners		12.2
24.3	Delay closure valves : 5 min	Delay time closure valves		12.3
24.4	Auto Change boilers days:15	Number of days for automatic change over		12.4

25. CONFIGURATION XCC 602				
Ref.	Display	Description	Notes	Sect.
25.1	Boiler1 Stage: 1 Boiler2 Stage: 1	Type burners : NO = boiler not present ; 1 = single-stage ; 2 = two-stage.		12.1
25.2	Input E1 REMOTE ON	Use input E1 : REMOTE ON : Remote On contact ; ALARM : alarm contact		15.1
25.3	Remote On LEAD AT FIXED T	Type action of Remote On : LEAD AT FIXED T : Lead boiler at FIXED POINT; SEQ AT FIXED T : Sequence at FIXED POINT.		15.1
25.4	Input E2 REMOTE EXTENSION	Use input E2 : REMOTE EXTENSION : Remote Extension push- button; ALARM : alarm contact		15.2
25.5	Send alarms:NO PassWTeleman :NO	Enabling alarms to send to telemanagement PC. Enabling telemanagement keyword.		11.6
25.6	Address : --- Group : -	Telematic address of controller Group to which controller belongs	Indispensable only if wired C- Bus	11.5
25.7	CRing:NO	NO : Not wired C- Ring YES: Wired C- Ring (Primary)		11.1
25.8	Functional Alarms - - - - - 8	Enabling functional alarms - = alarm not enabled number = alarm enabled Factory setting : only 8 enabled (cannot be disa- bled)	1 : Overtemperature manifold B1 or boiler 1 B3 2 : Overtemperature boiler 2 B4 3 : Difference temp. manifold B1 or boiler 1 B3 4 : Difference temp. boiler 2 B4 6 : Max. temp. flue gases 1 B6 7 : Max. temp. flue gases 2 B7 8 : Alarm internal timeswitch	17.1
25.9	Detector alarms - - - - -	Enabling alarms short or open circuit detectors. Factory setting : all disabled.	1 : Manifold detector B1 2 : Outside detector B2 3 : Boiler 1 detector B3 3 : Boiler 2 detector B4 6 : Flue gases detector 1 detector B6 6 : Flue gases detector 2 B7 8 : C- Ring alarm	17.2
25.10	K alarms - - - - -	Enabling On-Off alarms Factory setting : all disabled.	1...3 : Inputs E 1 ... 3, alarm with k1 ... 3 closed 4 : Parallel input to B6, alarm with k6 closed 5 : Parallel input to B7, alarm with k7 closed	17.3
25.11	Choice Keynumber - - - -	Choice keynumber to prevent use of + and - keys 1901 ... 1999	To eliminate keynumber press +	16.1
25.12	Name Heating Plant - - - - -	Entering name heating plant	Use + and - keys to enter letters or numbers Use ← and → keys to position cursor.	16.2

26. TESTING

No.	Display	Description	Notes	Sect.
26.1	CRing:??	?? = C- Ring test in progress or test negative YES= test positive	Appears only if in 25.7 choice is YES.	18.1
26.2	Valve 1:CLOSED Boiler 1:OFF	Valve 1: CLOSED ; OPEN Boiler 1: OFF ; ON S1 : On 1 st stage ; ON S1+2 : On 1 st and 2 nd stage		18.2
26.3	Valve 2:CLOSED Boiler 2:OFF	Valve 2: CLOSED ; OPEN Boiler 2: OFF ; ON S1 : On 1 st stage ; ON S1+2 : On 1 st & 2 nd stage		18.2

Amendments to data sheet

Data	Revision No.	Page	Section	Details of amendments	Firmware version	Software version
28.07.06 AM		3	8. WIRING DIAGRAM	Amended wiring diagram		
06.11.07 AM	01	3	8. WIRING DIAGRAM	The numbers of the terminals shown in the actuators have been eliminated	29	≥ 0.92.2100
22.11.10 VM	02	3	10. Wiring	Wiring procedure modified	29	≥ 0.92.2100



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