H 111
29.07.10 AM
REV. 02

DEGREE-DAYS METERING & RECORDING UNIT

OPTIONAL
C ←BUS

XGG 618 - 638 Eng.

- **Meters and totals standard degree-days**
- **Meters and totals ambient degree-days personalised for the site**
- **Meters and totals operating hours of XGG 6x8**
- **Stores the three daily totals for at least one heating season**
- **Calculates the partial totals between any two dates**
- **Calculates the total counts from the start of the heating season**
- **Relay outputs for external meters of degree-days and operating hours**
- **Protective codes against tampering**
- **Various alarms for tampering or errors**
- **Installation in cabinet with DIN 6 units.**
- **Power supply 230 V a.c. (or 240 V a.c. for UK market)**
- **Communication systems:**
  – **C-Bus : XGG 6x8** can be enabled for Telemanagement using C-Bus Plug-in type **ACB 460** (to be ordered separately as accessory).

1. APPLICATION

XGG 6x8 is designed for those situations where it is necessary to know the partial or total degree-days accumulated during the heating period.
XGG 6x8 can be installed in a certain climatic zone in order to know the seasonal fluctuations of that zone; it can also be used on each heating site to know how the degree-days vary with the exposition of the site.
Since XGG 6x8 is provided with a capacious Data Logger it is possible to know also the partial degree-days totalled between any two dates in order to allocate the heating charges for dwellings used on a temporary basis e.g. short-let flats.
XGG 6x8 is provided with several outputs in order to be able to total the various data externally (using independent counters).

2. FUNCTIONS

The principal functions of XGG 6x8 are:
- Calculation of degree-days according to legal requirements, measuring at each moment the difference between the external temperature and the conventional ambient temperature of 20°C.
- Calculation of the ambient degree-days linked to the difference between the external temperature and the desired ambient temperature in the zones to be heated, set as two values (e.g. a day value and a night value)
- Calculation of the hours during which XGG 6x8 has remained powered (switched on) in order to check the validity of the data totalled and for any corrections or compensations
- Daily collection of all the data from the three counts (standard degree-days, ambient degree-days and operating hours) in a Data Logger for 366 days, corresponding to a entire year (including leap-year).
- Possibility of knowing the total counts between any two dates as the sum of the memorised counts in the Data Logger.
- Immediate readout of the counts from the start of the heating season until the moment of the readout.

3. ACCESSORIES

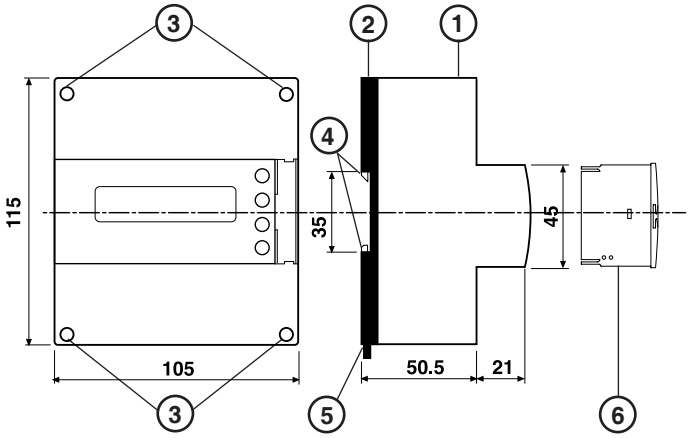
No.	Description	Model	Range	Sensing element	Code	Data
1	External temperature sensor	**SGG 001**	–50…+40 °C	Pt 1000	B1	–
	Accessory for Telemanagement					
1	Plug-in for communication via C-Bus	**ACB 460**	–	–	–	–

4. TECHNICAL DATA

Power supply	230 V a.c. ± 10% or 240 V a.c. for UK market
Frequency	50…60 Hz
Consumption	5 VA
Protection	IP40
Electrical immunity according to regulations	CEI EN 61000
Level 3	Class B
Vibration test	with 2g (DIN 40 046)
Construction standards	Italian Electrotech. Committee (CEI)
Enclosure	DIN 6E module
Installation	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
Accuracy of system	see section 12
Dimensions	105 x 115 x 71.5
Weight	0.6 kg

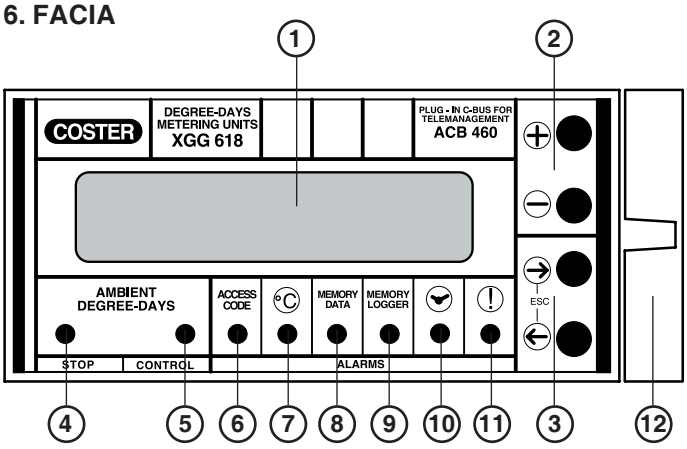
3 On-Off pulse relay outputs :	pulse duration 1 second
standard degree-days	
ambient degree-days	
operating hours	
3 On-Off relay outputs :	
general alarm active	
no power supply	
repetition stop counts	
Electrical features of the 6 relays	
maximum applicable voltage	250 V~
maximum current	5 (1) A
Ambient T. of standard reference	10... **20.**.. 30
Reference T ambient degree-days	10... **20**... 30
Measurement range of counters	(0...99999.9) cyclic
Count	
1 On-Off input :	
to switch the reference ambient temperature	
1 sensor input for external temperature	
measurement range	–50...+40 °C
sensititvity of measurement	± 0.1 °C
accuracy of measurement	± 0.2 °C

5. OVERALL DIMENSIONS



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

6. FACIA



1 – Alphanumeric display
2 – + and – keys
3 – ← and → keys

LEDs :
4 – Stop ambient degree-days count (switch sB)
5 – Choice temperature ambient degree-days (switch sA)

Alarms :
6 – Access configuration parameters
7 – Fault external temperature sensor
8 – Error in principal memory
9 – Error in data logger memory (data storage)
10 – Clock error
11 – Microprocessor "Watch Dog" (fault or serious interference)
12 – Slot for Plug-in for C-Bus communication

7. EXTERNAL SENSOR

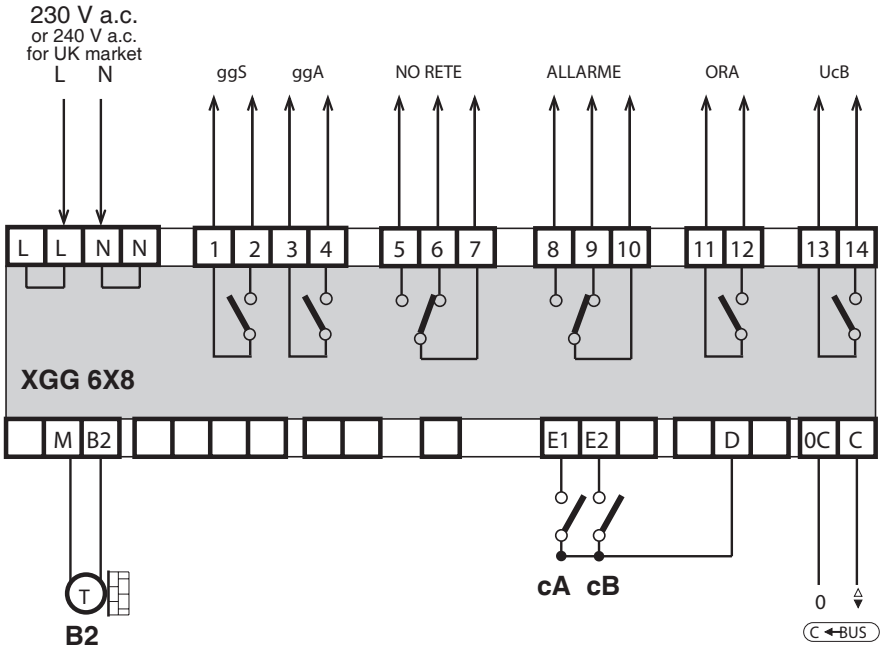
External sensor SGG 001 has been designed to ensure that the measurement of the external temperature is as close as possible to the standards applied in climatic monitoring stations.
The sensing element is a Pt 1000 (platinum thermoresistance) with a minimum built-in accuracy of+/– 0.1°C.
The sensor pocket is constructed in order to:
– cancel the influence of both radiant and conducted heat from the wall on which the sensor is installed.
– minimise the influence of direct or indirect radiant heat from the sun; this influence is alread greatly reduced if, as specified, the sensor is installed on a wall facing north or north-west (see section 10.2).
– a continuous microprocessor-based system of calibration ensures very accurate processing of the temperature.

8. ELECTRICAL CONNECTIONS

Proceed as follows :
- Separate base from cover after loosening the securing screws
- Mount the base on the DIN rail and check that it is firmly anchored by the securing elements (5.4)
- Carry out the wiring according to the diagram and in compliance with the regulations in force, and using :
  – 1.5 mm^2 cables for power supply and relay control outputs.
  – 1 mm^2 cables for the sensors.
  – 1 mm^2 for C-Bus. For length limits see data sheet T 021.
- Apply power (230 V a.c.; or 240 V a.c. for UK market) and check its presence across terminals L and N..
- Switch off power, replace cover on base/terminal block and secure it with the four screws supplied (5.3).

You are advised not to insert more than two cables in a single terminal and, if necessary, to use an external junction box.

9. WIRING DIAGRAM



B2 – External temperature sensor
sA – Switch for ambient degree-days :
Switch closed = first ambient reference temp
Switch open = second ambient reference temp.
sB – Switch to stop ambient degree-days

L – 230 V ~
N – Neutral
ddS – Output pulse each standard degree-day
ddA – Output pulse each ambient degree-day
HOUR – Output pulse each hour of operation
OsB – Output which repeats the input of the stop count ambient degree-days.
Switch closed = stop count off
Switch open = stop count on

NO MAINS – The relay switched off when no mains supply
Retay ON = switches 5 and 7 closed switches 6 and 7open
Retay OFF= switches 5 and 7 open switches 6 and 7 closed
ALARM – The relay is switched for any alarm in progress
Alarm on = switches 8 and 10 closed switches 9 and 10 open
Alarm off= switches 8 and 10 open switches 9 and 10 closed

C-Bus – Transmission data via Telemanagement;
C-Bus is enabled using ACB 460 plug-in

10. SITING

10.1 CONTROLLER

XGG 6x8 must be installed in a dry location that respects the ambient conditions given under 4.TECHNICAL DATA. If sited in a location classified as "Hazardous" it must be installed in a cabinet for electrical equipment constructed according to the current regulations for the class of danger concerned.
Since XGG 6x8 is a very accurate measuring instrument, it is suggested that it is installed in a separate wall-mounting enclosure, although it can be installed in a normal enclosure for electrical appliances.

10.2 B2 outside temperature sensor

This must be installed outside the building, on the north or north-west side, at a height of at least three meters from the ground, out of direct sunlight and as far as possible from windows, doors, fireplaces and other direct sources of thermal disturbance. Particular attention must be given to the above instructions because the accuracy of all the degree-day metering depends on the precision with which the outside temperature is measured.
For connecting the sensor use twin-core cable having a maximum length of 15 meters; each of the wires must have a cross-section section of at least 1.5 mm^2. For greater distances use cables with a proportionately greater cross-section.

11. C-BUS COMMUNICATION

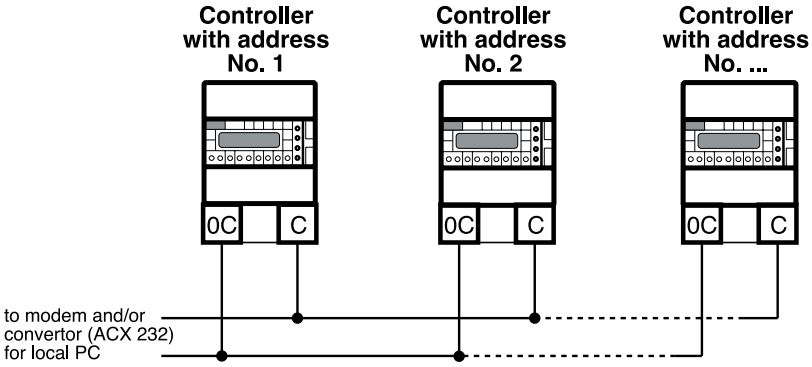
11.1 C-Bus for local communication and for Telemanagement (please see Data Sheet T 021)

XGG 6x8 can provide :
– remote Telemanagement by means of the C-Bus ACB 460 plug-in
– local communication (e.g. setting via PC) using a C-Bus – RS232 cable (ACX 232)

Telemanagement is bi-directional, from one or more local PCs and/or from a remote central computer via PSTN.
Local communication is to a portable PC connected directly to XGG 6x8.
From the PC(s) it is possible to:
– see and adjust the data and values set on the display pages of XGG 6x8 as well as the configuration data dedicated exclusively to Telemanagement
– the operational status of the system
– receive any alarms for tampering or faults
– read the various measurements
– process the data received

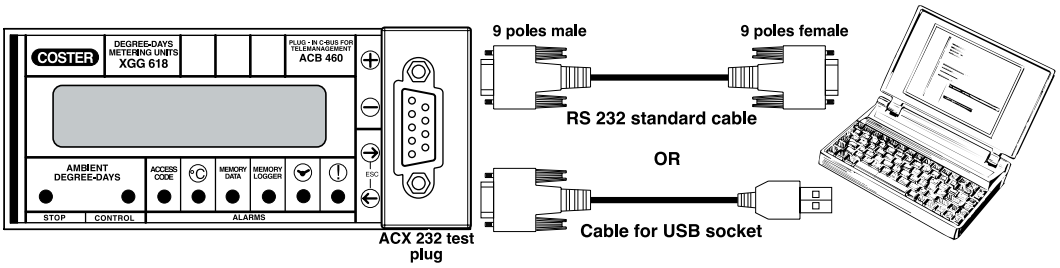
11.2 C-Bus electric wiring for remote Telemanagement

Each controller must be provided with the required type C-Bus plug-in



11.3 Connection to PC for local communication via ACX 232 test plug-in

Remove the C-Bus plug-in and insert ACX 232 test plug-in; use a standard cable to connect the RS232 plug to the PC (the cables are contained in the "Accessories Kit").
If the PC has only USB inputs use a standard RS232 – USB conversion cable.



ACCESSORIES :
– Test plug = **ACX 232**

– Accessories Kit = **RS 232 KIT** The "Accessories Kit" contains the 2 cables and other useful accessories.
– Insulating cable for RS 232 = **PRS 232** lines

Observation : – Before starting to communicate ensure that the address entered in XGG 6x8 is the one with which you want to communicate via PC.
– It is indispensable to use a battery-powered portable PC with the connection for 230 V (or 240 V for UK market) removed.
If the PC is powered directly from the mains it is advisable to use insulator cable PRS 232.

12. IMMUNITY FROM ELECTRICAL DISTURBANCES & RADIO WAVES

The relevant standard is CEI EN 61000 with all amendments and all the sections relevant to this type of controller.
The guaranteed level is number three and the device class is B.

13. ACCURACY OF THE SYSTEM

The accuracy of the system depends on the precision of the measurement of the external temperature.
Sensor: the sensor type PLATINUM 1000 (Pt 1000) has been chosen for its measurement precision of **+/– 0.1°C**.
Measurement: the measurement chain ensures an overall accuracy of **+/– 0.2°C**.
Internal clock: the error is negligible (a few parts per million).
Global error in measurement of degree-days: the maximum global error during the metering of a heating season (six months) depends on the difference between 20°C and the mean external temperature (Tem) during the this season, since the error in measuring the temperature has greater weight the smaller is the difference just mentioned.

$$\text{Global error \%} = +/- \frac{100 \times 0.2}{20 - \text{Tem}}$$

Example: in Milan the mean external temperature (Tem) equals + 5.5°C (according to Presidential Decree DPR 412 / 93).

$$\text{Global error \%} = +/- \frac{100 \times 0.2}{20 - 5.5} = +/- 1.4\%$$

The greater the importance of heating in a certain area, the greater will be the accuracy; for climatic zones such as the Po valley the maximum global error for the whole season will not exceed +/– 1.5%.
For zones in the alpine range the total error will certainly be below +/– 1%.
For zones much less cold such as central and southern Italy the total error is around 2%.

WARNING: The degree-days regarding a particular building, situated in a certain place, may differ slightly from the official degree-days measured at sites in the open and a long way from buildings such as airports.
The mean temperatures in towns are usually slightly higher in view of the overall heating of the dwellings.

14. FUNCTIONS OF SYSTEM

14.1 Principle of measuring standard degree-days

The total of standard degree-days during a heating season is the parameter that best answer the question: “How cold has it been”during the season.
The colder the external temperature and the longer it has lasted the more degree-days there will be.
The number of degree-days is the index which best expresses the energy consumption for heating during the winter season. Conventionally (standard degree-days), rooms in Italy are considered to be heated to a temperature of 20°C (Decree of the President of the Republic 412/93).
The measurement of standard degree-days should always be carried out with reference to 20°C in order to be in line with the official standards; the user can require a different ambient temperature as a reference standard but must take this into account when comparing his data with the official ones.

The mathematical basis of the metering is as follows: :

- Every five minutes you measure the external temperature Te; five minutes is ample time since in this period of time the external temperature does not change by a measurable amount.
- Every five minutes, you calculate the difference (20 -Te), where 20°C is the official reference ambient temperature. If another value is chosen for the reference temperature then this value is used.
  If the difference is negative, this means that the external temperature is higher than 20°C and it is assumed that heating was not used: in this event the difference is considered equal to 0 (zero).
- Every day, at midnight, you calculate the mean of all the differences measured over 24 hours:this mean is the value of the degree-days totalled in the 24 hours .
- Every day you add together the value of the degree-days totalled day by day; finally, if you carry out this operation every day for a certain period of time you obtain the figure for the degree-days totalled during the same period.
- If the period of totalling corresponds to the heating period, the figure corresponds exactly to the total quantity of degree-days for that particular period of heating
- NOTE: XGG 6x8 functions in a more sophisticated way so as to ensure the metering of the degree-days continuously throughout the day. The metering is totalled every 20 minutes and stored in memory so that it is also possible to know, at any moment, the partial degree-days recorded throughout the whole day.
  At midnight all the partial meter readings are totalled so as to obtain, finally, the degree-days totals for the 24 hours just concluded.

If the spaces are heated at ambient temperatures different from 20°C or with ambient temperatures which change during the day (e.g. normal and setback temperature) it is very useful to make a second calculation using all these different reference temperatures: these degree-days are known as “ambient”.

14.2 Principle of measuring ambient degree-days

The principle is analogous to that above, except that instead of using the conventional 20°C ambient you use a reference temperature equal to that set for the ambience.
In particular, you can pre-set two ambient temperatures which can be chosen by means of an external switch (cA).
A second external switch (cB) is used for stopping completely the metering of ambient degree-days. In this way you can meter ambient degree-days of spaces heated with different ambient temperatures: for example, normal ambient temperature, setback ambient temperature and heating switched off.
The function of stopping metering is repeated at the UcB output (switches13 and 14): the purpose of this function is:

- **Stop metering in progress** : when you stop the metering of ambient degree-days it means that you do not want to heat the spaces for the period in which the stoppage period is valid; the UcB switch can be opened to prevent switching on the heating site in order to prevent malicious stoppage of the metering with the heating switched on.
- **Stop metering not in progress**: under these circumstances the metering of ambient degree-das proceeds normally and the UcB switch is closed: this permits switching on the heating site only when metering is in progress.

14.3 Metering operating hours

To check on the time during which XGG 6x8 has remained switched on (when switched off clearly it cannot meter degree/days), there is a third meter which totals the hours switched on.

14.4 Totalling the meter readings

The three meter readings just described are totalled in the same way as a milometer counts the number of miles – total and partial :

- **Total meter readings**: the number of standard degree-days, of ambient degree-days and of the number of operating hours are totalled by three meters and cannot be cancelled.
  These counts start when the life of XGG 6x8 starts, in exactly the same way as a milometer in an automobile.
  They are the trustworthy readings.
- **Partial meter readings**: as with partial milometer readings (reset at the start of a journey), there are three other partial counters which can be zeroed at the start of the heating season: the readout is direct, so you do not have to read the total meters at the start and end of the season and then calculate the difference.
  The partial meters are, therefore, only for convenience and are reliable only if correctly set at the start of the season.
- **Daily meter readings**: for greater convenience, at midnight each day the three meter readings made during the day are recorded in the incorporated Data Logger .
  The Data Logger has a capacity of 366 days and records both the three meter readings and the date.
  In this way it is possible to know both the meter reading made day by day during the last 366 days of metering; and also to know which meter readings have been totalled between any two dates.
  This last function is very useful if it is necessary to know the total of degree-days when the heating used for brief periods is paid for e.g. when a flat in a short-let residence is let, the heating can be charged on the basis of the amount of cold during the period of use.

14.5 Control of the events of switching on and switching off XGG 6x8

Besides totalling the number of operating hours, XGG 6x8 can record up to 16 switching on events and 16 switching off events; the recording takes place by memorising the hours totalled at the moment of switching on, the exact time and date of the 16 events. With all this data it is possible to check the validity of the meter readings and make estimates for compensating for the time XGG 6x8 has remained switched off.

14.6 Auxiliary functions

Besides the basic functions just described XGG 6x8 is provided with several auxiliary functions :

– **Forwarding count of standard degree-days to an external counter (ddS)**; for each standard degree-day totalled, relay number 1 (switches 1 and 2) is switched on for a second thereby sending a closure pulse which can be used by an external counter.

– **Forwarding count of ambient degree-days to an external counter (ddA)**: analogous to ddS, but applied to ambient degree-days. The relay is number 2 (switches 3 and 4).

– **Forwarding lack of power to XGG 6x8 (NO MAINS SUPPLY)**: relay number 3 (switches 5, 6 and 7) is turned off when there is no mains power; can be used to trigger a local or remote outside alarm.

– **Forwarding general alarm (ALARM)**: relay number 4 (switches 8, 9 and 10) switches on in the presence of any type of alarm.

– **Forwarding count of XGG 6x8 operating hours (HRS)**: a pulse is forwarded at each hour of operation of XGG 6x8. The relay is number 5 (switches 11 and 12).

– **Forwarding of stop metering ambient degree-days (OsB)**: relay number 6 (switches 13 and 14) is switched on, repeating the function of stopping the metering of ambient degree-days (sB). Useful for switching off all the organs which generate heating when you stop metering in order to avoid theft of tampering.

14.7 Alarms and safety warnings

The principal alarms are shown on the facia. Any alarm controls the ALARM relay output for a local warning and triggers the procedure for transmission via Telemanagement.
When alarms are triggered or operations performed which tend to affect the seasonal meter readings, a special security process is set in motion to save essential data which could be lost or intentionally damaged..

– **Alarm for use of access code (functional alarm No. 4, page M0.11)** : every time the access code is entered, in order to be able to modify any setting parameter, an alarm is triggered and its time and date recorded; this permits tracing the history of all operations (including malicious ones) performed on XGG 6x8.
The transmission of the alarm via Telemanagement includes all the data metered at that time.

– **Alarm for fault in external sensor (functional alarm No. 1, page M0.11)**: when the external sensor is disconnected or shortcircuited an alarm is triggered.
During the period of this sensor alarm the meter readings are not made since they would clearly be unreliable.
By examining the data logger it is possible to trace the complete history of this alarm in order to know the reasons for the abortive meter readings and calculate any compensation due

– **Alarm for error in the central memory (functional alarm No. 2, page M 0.11)**: this is the memory which contains the basic setting data; in the event of error in this memory the meter readings continue with the default setting data (FACTORY SETTINGS).
The principal meter readings (total and seasonal) are protected by means of a double memory; accordingly, it is practically impossible to lose this essential data. As a final precaution the data should be downloaded occasionally via PC (Telemanagement) or, if Telemanagement is not available, read and written down.

– **Alarm for error in the data logger memory (functional alarm No. 3, page M 0.11)**: since these data are not essential for the operation of the general totalling system, only an alarm is triggered

– **Alarm for clock (functional alarm No. 8, page M 0.11)**: this alarm is triggered when the internal clock provides incoherent data; this alarm does not affect the basic functioning of the essential meter readings

– **Watch dog** : the microprocessor is provided with a continuous operational control. Whatever should happen to the microprocessor will not affect the meter readings already totalled; the latter can always be recuperated by means of the appropriate procedures.

– **Start of new season (functional alarm No. 5, page M 0.11)**: when a new season is started, with all the protection procedures, all the data regarding the preceding season are, as a precaution, stored in memory.
These back-up data can be read either by a local PC o via Telemanagement.
With this procedure all the meter readings for the previous season can be reconstructed e.g. in the event of errors or tampering.

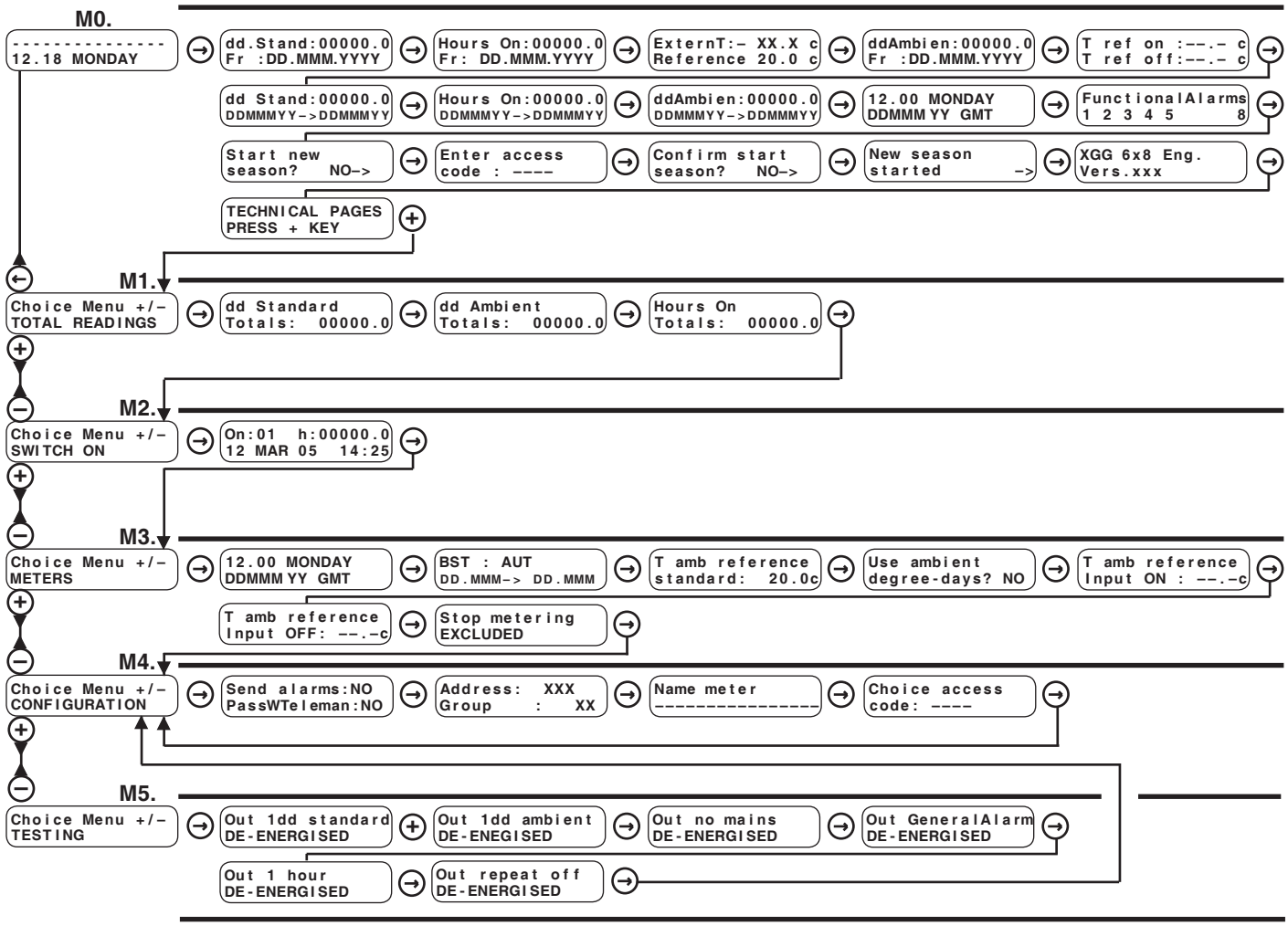
14.8 Access keynumber

XGG 6x8 is provided with an access password of four alphanumeric characters.
All the data can be read without this access password, but in order to make any adjustment to the settings the access password must be entered. This is to prevent malicious tampering..

14.9 Start of heating season

The seasonal meter readings start at the moment in which the heating season starts; the procedure for the start of the season is especially protected in order to avoid malicious tampering.

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



⊖ ⊕ Keys for scrolling the display pages and positioning the cursor ▮ on adjustable data.
The adjustable data, in the following description of the display pages, are indicated by
By pressing at the same time, or after 15 minutes, you return to the first page

```
----------------
12.18 MONDAY
```

⊖ ⊕ Keys for : – changing the values indicated by the cursor ▮
– passing directly from one menu (block pages) to another.

16. NORMAL USE

Ref.	Display	Description	Notes	Sect.
M0.1	---------- 12.18 MONDAY	Name meter. Current time and day.	Set in **M 4.3** Current time is set in **M 0.10** while day is set in **M 3.1** under access code.	
M0.2	dd.Stand:00000.0 Fr :DD.MMM.YYYY	Read out standard seasonal degree-days. Date of start season (D = day, M = month, Y = year e.g. 24AUG06)	The date of start season has its own procedure described later	
M0.3	Hours On:00000.0 Fr :DD.MMM.YYYY	Reado ut hours of season switching on. Date of start of season.	The date of start season has its own procedure described later	
M0.4	ExternT: – 2.0 c Reference 20.0 c	Measurement of external temp. External reference temp. for standard dd	External reference temp. for standard degree-days can be adjusted in **M 3.3**	21.1
M0.5	ddAmbien:00000.0 Fr :DD.MMM.YYYY	Readout of seasonal ambient degree-days. Date of start season.	The date of start season has its own procedure described later	
M0.6	T ref on :--.- c T ref off:--.- c	Reference T for dd Amb with **sA** = ON Reference T for dd Amb with **sA** = OFF	The two ambient reference temperatures for metering ambient degree-days. To be set in **M 3.5** and **M 3.6**	21.1
M0.7	dd Stand:00000.0 DDMMMYY–>DDMMMYY	dd Standard between the two dates set below. They are the dates of start & end metering period. With + and – keys you can scroll all the dates present in the daily recorder & choose the two between which you want to know the count. – the dates which can be chosen are those present in the recorder (some date may be missing because the recorder was switched off)	They are the total of the standard degree-days between the two dates set. – if the recorder has all the days included between the two chosen dates, after a few seconds will appear the meter reading for that period. – if between the two dates chosen some days are missing from the recording, after a few seconds will appear the day with the meter reading alternating with ? – if the choice of the two dates is wrong, asterisks will appear	21.2
M0.8	Hours On:00000.0 DDMMMYY–>DDMMMYY	Hours switched on between the two dates entered below. They are dates of start & end of metering period.	The hours switched on totalled between the two dates set. The dates are set with the same procedure as that in **M 0.7**	21.2
M0.9	ddAmbien:00000.0 DDMMMYY–>DDMMMYY	dd Ambient between the two dates entered below. These are the dates of start & end of metering period	The sum of the ambient degree-days between the two dates set. The dates are set in same way as in **M 0.7**	21.2
M0.10	12.18 MONDAY DDMMMYY GMT	Entering current time	Only time can be entered. For day & date you must go to page **M 3.1**	
M0.11	FunctionalAlarms 1 2 3 4 5 8	The alarm functions are always enabled since the triggering of ay of these alarms can affect the metering of the degree-days, or may indicate an attempt at tampering. X = number of the alarm X alternating with A = alarm in progress. The alarms are: 1 = Sensor fault 2 = Primary memory fault 3 = Secondary memory for daily recording faulty.	4 = Warning that correct access code entered, with automatic forwarding via Telemanagement of all counts so as to have a reserve recording in event tampering is taking place. This alarm ceases after about 15 minutes. 5 = Warning that a new season has been started, with automatic forwarding via Telemanagement of data from previous season, as a reserve. 8 = Clock alarm not congruent.	
M0.12	Start new season ? NO–>	NO = do not want to start new season; If you don't want to start a new season, press button → to go to page. **M 0.16** To start a new season press button **+**. The device displays: YES = start a new season, press button → to go to page **M 0.14**		21.4
M0.13	Enter access code: ----	Entering of access code requested. Once code entered return to page **M 0.12**, to confirm wish to start new season	Appears if in **M 4.4** is was entered an access code.	21.3
M0.14	Confirm start season? NO–>	This page requires further confirmation to start the new season. NO = do not start a new season, press button → to go to page **M 0.16** YES = start a new season, press button → to go to page **M 0.15**	Start of the new season: – cancel all the season meter readings – record all the season data of season just finished (for future check) – leave unaltered all other meter readings or recordings so as to be able work also with historic data.	21.4
M0.15	New season started –>	Indication new season has been started. With → key go to page **M 0.1**		21.4
M0.16	XGG 6x8 Eng. Vers.XXX	Identifying data of controller.		

17. TOTAL METER READINGS

Ref.	Display	Description	Notes	Sect.
M1.1	dd Standard Totals: 00000.0	Total of Standard degree-days from date of manufacture of XGG 6x8. This figure can in no way be altered.	This figure is comparable to that of total milometer reading in a car.	
M1.2	dd Ambient Totals: 00000.0	Total of ambient degree-days from date of manufacture of XGG 6x8. This figure can in no way be altered..	This figure is comparable to that of total milometer reading in a car.	
M1.3	Hours On Totals: 00000.0	Total hours XGG 6x8, switched on from its date of manufacture. This figure cannot in any circumstances be altered.	This figure is comparable to that of total milometer reading in a car.	

18. SWITCHINGS ON

Ref	Display	Description	Notes	Sect.
M2.1	On: yy h: XXXXX.X DD.MMM.YY MM.HH	yy = order number of starts of XGG 6x8. Lowest numbers are most recent starts. The lowest number corresponds to the event of start new season if, at same time, zero hours are indicated. If in this last condition hours indicated were not zero, this indicates that events of switching on + start new season exceed 16. h: XXXXX.X = start hours accumulated by XGG 6x8 from start season which corresponds also to first event. Value of start hours is that which XGG 6x8 has accumulated up to moment of start of number "yy".	DD.MMM.YY MM.HH = = date & time of switching on start number "yy". Scrolling all these starts you can know the exact history of operation of XGG 6x8 during whole season, provided the total number of starts + the event of start new season is below or equal to16. These recordings are cancelled at start of a new season. The hours indicator equals zero at start of new season.	21.5

19. SETTINGS

Ref	Display	Description	Notes	Sect.
M3.1	12.00 MONDAY DDMMMYY GMT	Entering current time, day & date. Indication GMT or BST		
M3.2	BST: AUT DD.MMM –> DD.MMM	AUT = dates of start & end of BST are those of European Union. MAN. = dates of start & end of BST can be entered as required.		
M3.3	T amb reference standard: 20.0c	The **ambientr eference temperature for standard degree-days** can be set between 10 and 30°C. **(Only for XGG 618)**	Remember that the reference standard for Italy is 20°C.	21.1
M3.4	Use ambient degree-days? NO	NO = ambient degree-days not used. YES = ambient degree-days used.		
M3.5	T amb reference Input ON: --.-c	Set **ambient reference temperature** for **ambient degree-days** you want to use with switch **sA** closed. In order not to meter when input is ON, press + and – at same time and – – .– will be displayed..	Usually, this reference temperature is the ambient temperature which is set during normal heating hours (e.g. day). This page exists if **M 3.4 = YES**	21.1
M3.6	T amb reference Input OFF: --.-c	Set ambient **reference temperature** for **ambient degree-days** you want to use with switch **sA** open. In order not to meter when input is OFF, press + and – at same time and – – .– will be displayed.	Usually, this reference temperature is the ambient temperature which is set during setback heating hours (e.g. night). This page exists if **M 3.4 = YES**	21.1
M3.7	Stop metering EXCLUDED	Stop metering refers to switch **sB** EXCLUDED = switch not used. SWITCH OPEN = metering stopped when switch **sB** open. SWITCH CLOSED = metering stopped when switch **sB** closed.	**Stop metering acts only on ambient degree-days**. This page exists if **M 3.4 = YES**	

20. CONFIGURATION

Ref.	Display	Description	Note	Sect.
M4.1	Send alarms :NO PassWTeleman :NO	Enabling alarms to send to Telemanagement PC. Enabling Telemanagement password..	Only if connected in C-Bus	
M4.2	Address : --- Group : --	Telematic address of XGG 6x8. Group to which XGG 6x8 assigned.	Only if connected in C-Bus	
M4.3	Name meter ----------	Enter name of meter	Use + and – to enter letters or numbers Use ← and → to change position	
M4.4	Choice access code: ****	- - - - = access code never chosen so XGG 6x8 can be accessed without code. An access code can also be entered. * * * * = access code exists. Without this it is possible to read all data but not to adjust parameters. If attempt made to adjust any parameter, page **M0.13** appears; this requests entering of access code. Also to change access code it is necessary to know previous code. x x x x = code chosen & entered.		**21.3**

21. TESTING

Ref.	Display	Description	Note	Sect.
	Also for testing the access code is necessary, if it has been entered, because you going to switch on the output relays which create a meter reading for any redundant external meters			
M5.1	Out 1dd standard DE-ENERGISED	You test the output relay which gives a pulse for each standard degree-day & the electrical connections towards consumer outlets.		
M5.2	Out 1dd ambient DE-ENERGISED	You test the output relay which gives a pulse for each standard degree-day & the electrical connections towards consumer outlets		
M5.3	Out no mains DE-ENERGISED	You test the output relay which switches off in event lack of power & the electrical connections to user outlets.		
M5.4	Out generalAlarm DE-ENERGISED	You test the output relay which switches on in event of alarm of any kind, & the electric connections to user outlets..		
M5.5	Out 1 hour DE-ENERGISED	You test the output relay which gives a pulse for each hour of operation of XGG 6x8 & the electric connections to user outlets.		
M5.6	Out repeat off DE-ENERGISED	You test the relay which repeats the input of stop metering ambient degree-days & the electric connections to user outlets.		

22. FUNCTIONAL DETAILS

In this final part of the data sheet is explained in detail the significance of certain display pages.

22.1 Ambient reference temperature

M0.4

```
ExternalT:±XX.Xc
Reference 20.0 c
```

M3.3

```
T amb reference
standard:  XX.Xc
```

M0.6

```
T ref on :XX.X c
T ref off:XX.X c
```

M3.5

```
T amb reference
Input ON:  XX.Xc
```

M3.6

```
T amb reference
Input OFF: XX.Xc
```

– AMBIENT REFERENCE TEMPERATURE FOR STANDARD DEGREE-DAYS
On this page appears the external temperature measured in that moment; and the chosen ambient reference temperature.
As we have seen, the official ambient reference temperature is 20°C (in Italy) but can be slightly adjusted when calibrating the system for particular uses (page **M 3.3**). **(Only for XGG 618)**.

– AMBIENT REFERENCE TEMPERATURE FOR AMBIENT DEGREE-DAYS
These are the two ambient reference temperatures for ambient degree-days.
These temperatures can be chosen as desired.

Reference temperature on = ambient reference temperature you wish to have when switch **sA** (input terminals E1 & D) is CLOSED (ON). In order not to meter when the input is ON, press + and – at same time and - - . - will be displayed.
The closure of this switch can mean that the heating site has been programmed for the ambient temperature indicated (e.g. normal for daytime)..

Reference temperature off = ambient reference temperature you wish to have when switch **sA** (input terminals E1 & D) is OPEN (OFF). In order not to meter when the input is OFF, press + and – at same time and - - . - will be displayed.
The closure of this switch can mean that the heating site has been programmed for the ambient temperature indicated (e.g. setback for night).

22.2 Readouts of totalled meter readings between any two days

M0.7

```
dd Stand:XXXXX.X
DDMMMYY–>DDMMMYY
```

M0.8

```
Hours On:XXXXX.X
DDMMMYY–>DDMMMYY
```

M0.9

```
ddAmbien:XXXXX.X
DDMMMYY–>DDMMMYY
```

As already noted, the recorder of the daily meter readings records all the totals made during any day for 366 days; if XGG 6x8 was switched off during any of these days, the recording obviously cannot be made and consequently these days will be missing on the recorder.
The three counts shown on the display pages on the left can be made by selecting the two dates.
Non-existent dates cannot be selected (XGG 6x8 on those dates was switched off) & so only the existing ones are displayed.
The following cases can occur:
– the dates selected coincide = totalling of counts for that day
– the two dates selected are different and between these two dates are all the daily recordings: the counts appear for this period.
– the two dates are different, but between these two dates some are missing: the counts appear in any event but alternate with "?????.?" so as to warn that the counts do not include several days.
You can know which are the missing days by scrolling all the existing dates.
Knowing which and how many days are missing you can make the necessary compensations and adjustments.
In a later section (menu: SWITCHINGS ON) you can know the history of the on and off states of XGG 6x8 for further compensations or adjustments.
– the two dates have been chosen erroneously (e.g. the first date is later than the second): asterisks appear to signal that the calculation is not possible.

22.3 Access code

XGG 6x8 can be protected against errors or tampering by means of an access code in order to enter and adjust data on which accurate measurements depend.
The procedures for using the access code are essentially three:

M4.4

```
Choice access
code: ----
```

– **An access code has never been entered & you want to introduce it**: on this page the access code of 4 alphanumeric characters is entered. It is important to remember this access code: should it be forgotten it is necessary to resort to a procedure which, in order to avoid tampering, can be carried out only by COSTER engineers. Once entered, the access code remains displayed for15 minutes in order to allow the user to remember it or note it down.
During these15 minutes the access code remains valid for all settings except those for starting a new season; this operation is even more safeguarded in order to avoid errorsi

M0.13

```
Enter access
code: ----
```

– **An access code has already been entered**: 15 minutes after the access code has been entered, all attempts to change important metering data are blocked by the request for the access code. i.e. this page appears.Until the correct access code is entered this request is repeated.
Once the correct code has been entered, XGG 6x8 accepts changes up to 15 minutes after the last depression of any key (except for start of new season when procedure is different)..

M4.4

```
Choose access
code: ****
```

– **An access code has been entered and you want to change it:** if you want to change the existing access code, the existing code is automatically requested as specified on display page **M 0.13**

21.4 Start of new heating season

The start of a new season involves the following functions:

– cancels all the previous seasonal meter readings; readings start from zero at the moment of the new start
– cancels all the recordings of previous starts and begins the new recordings: these recordings are referred to in section 18 (STARTS) and described in detail in Section **21.5**.
– creates a reserve memory of data regarding the previous season

The start of a new heating season is especially protected since with a false start the metering is started from zero, even if, for safety, previous data is recorded.
However, the start of a new season leaves unaltered all the daily recordings for the past 366 days, and these can always be used independently of the season.
The start of a new season does not change in any way the total meter readings which represent always the reference point of the system. Before starting a new season ensure that the clock shows the exact time and date, since to indicate the moment of starting the system the internal clock is the reference point.
It is suggested that the date of starting the new season be noted down in order to be certain that no errors are made.
The new season can be started either locally or via Telemanagement.

M0.12

```
Start new
season ?      NO–>
```

This is the start of the procedure: if you want to proceed enter YES.

M0.13

```
Enter access
code:         ____
```

If you enter YES for start of the new season, the access code will be requested.
Entering the access code for the start is valid only for this operation and is immediately cancelled at the end of the operation itself so as to avoid errors to any other data.

M0.14

```
Confirm start
season ?      NO–>
```

To be certain that a request to start a new season has been made, the question is repeated: by entering YES the new season starts; by entering NO you exit this procedure without having started a new season.

M0.15

```
New Season
started         –>
```

The appearance of this page confirms that the procedure has been completed and so the new season has started.

The procedure has been made intentionally rather detailed so as to avoid involuntary errors.

21.5 Recording all XGG 6x8 start events

The moment (date & time) at which the start season operation is executed and all the moments when XGG 6x8 is switched on (obviously after being switched off), are all recorded (up to a maximun of 16 events).
This memory is sufficient to describe in detail the history of XGG 6x8 during an entire heating season.
With these data it is possible to identify accurately the periods in which XGG 6x8 was not able to carry out metering because it was switched off for maintenance or because of tampering.
It the hours switched off are few in respect of the whole season then the counts can be considered sufficiently valid.
If, on the other hand, the number of hours is considerable, it is possible, knowing exactly when XGG 6x8 remained off, to add a number of degree-days similar to the number accumulated in a period not far removed in time when XGG 6x8 was switched on. In general, all the data are available for making corrections or compensations.

M2.1

```
On : yy    h : XXXXX . X
DD . MMM. YY    HH . MM
```

yy = order number of the starts: the most recent start is that with the lowest order number: the number 01 is the last event.
The highest number is 16: one for the recording of the start of season and 15 for any subsequent starts (obviously following stops).
XXXXX.X = the number of hours accumulated up to the moment of the start “yy”, from the start of the season.
The recording of the start of the season has a higher number.
DD.MMM.YY HH.MM = date (e.g.18DEC06) and time (e.g.18.20) of the event

The recording of the start of the season, always the first in order of time, is that with the highest number; set the number of the hours equal to zero, since this number is cancelled at the moment the new season starts.
To recognise for certain the event of the start of the new season it is necessary to look for the event with the highest number and check that the corresponding number of hours is equal to zero. If the number of the highest event is equal to 16, and the number of the corresponding hours does not equal zero, this means that the event of starting a new season has escaped from the memory, which contains a maximum of 16 events.

Amendment to data sheet

Date	Revision No.	Page	Section	Amendment description	Firmware version	Software version
30.11.09 VM	**01**	8	15. NORMAL USE.	Update display M0.12 description	-	-
29.07.10 SD	**02**	various	various	Add new model XGG 638		

COSTER
CIE CONTROLLI TEMPERATURA ENERGIA
COSTER TECNOLOGIE ELETTRONICHE S.p.A.
Sede Legale: 20132 Milano - Via San G.B. De La Salle, 4/a

Head Office & Sales
Via San G.B. De La Salle, 4/a — Tel. +39 022722121
20132 - Milano — Fax +39 022593645
Orders — Fax +39 0227221239
Reg. Off. Central & Southern
Via S. Longanesi, 14 — Tel. +39 065573330
00146 - Roma — Fax +39 065566517
Shipping
Via Gen. Treboldi, 190/192 — Tel. +39 0364773200
25048 - Edolo (BS) — Tel. +39 0364773202

E-mail: info@coster.info — Web: www.coster.eu

D 33315