H 420
16.07.01

WATER CONSUMPTION METERING UNIT

C ←BUS

UCA 668 Eng.

- **16 UNIVERSAL metering inputs (water, gas, electricity, ect.) :**
  – Season counts
  – Total counts
- **1 Historic counts recorder**
- **Communication Systems:**
  – telemanagement **C-Bus**
- **Power supply 230 V~, DIN rail mounting.**

CE

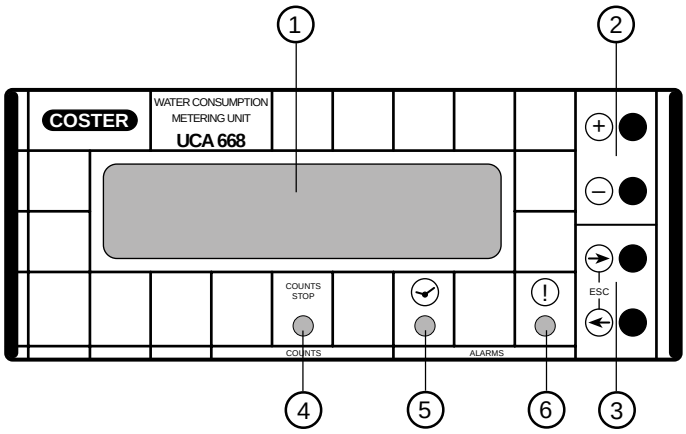
1. APPLICATION

The UCA 668 is a digital equipment with microprocessor, suitable to count the consumption by each user of water, thermal energy, electricity, gas oil and so on, measured by the relevant meters with pulse transmitters.

2. FUNCTIONS

The UCA 668 can record until 16 pulse transmitters coming from meters (of energy, of volume, ect).
For each of them it can carry out:
– the partial season counts of the measured value
– the total counts of the measured value.
Other available functions are:
• Event record during power cut.
• Historic record of all the counts (data - logger)
• Testing of the electrical connections at start.
• Possible C-Bus connection for telemanagement from central PC and/or local ones

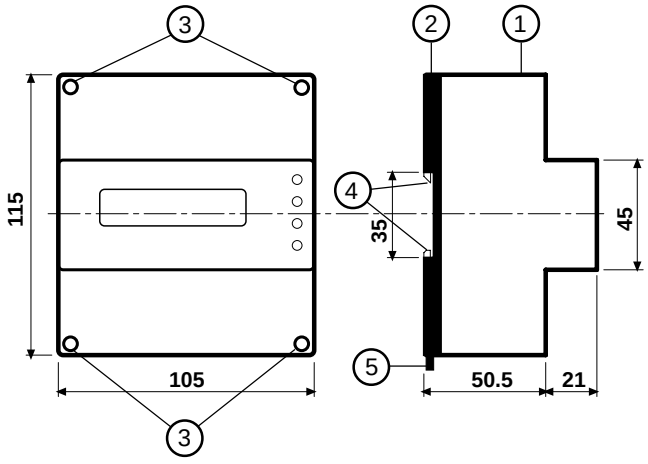
3. FACIA



1 – Alphanumeric display with 2 lines
2 – + and – operating keys
3 – ← and → operating keys

Led di segnalazione :
4 – Counts stop
5 – Clock and memories alarm
6 – Fault regulator alarm

4. OVERALL DIMENSIONS



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

5. TECHNICAL DATA (in bold characters the values on delivery)

• Electrical

Power supply	230 Volt ~. ± 10%
Frequency	50 … 60 Hz
Consumption	5 VA
Protection	IP40
Radiodisturbances	VDE0875/0871
Vibration test	with 2g (DIN 40 046)
Construction standards	Italian Electrotech. Comm. (CEI)
Data storage	5 years
Software	class A

• Mechanical

Case	Module DIN 6E
Installation	on DIN 35 rail
Materials:	
base	NYLON
cover	ABS

Room temperature	
operation	0 … 45 °C
storage	– 25 … + 60 °C
Room humidity	class F DIN 40040
Weight	0.5 kg

• Counts

Number of metering inputs :		1…16
Counts:	– partial	99999.0 xx
	– total	9999999 xx

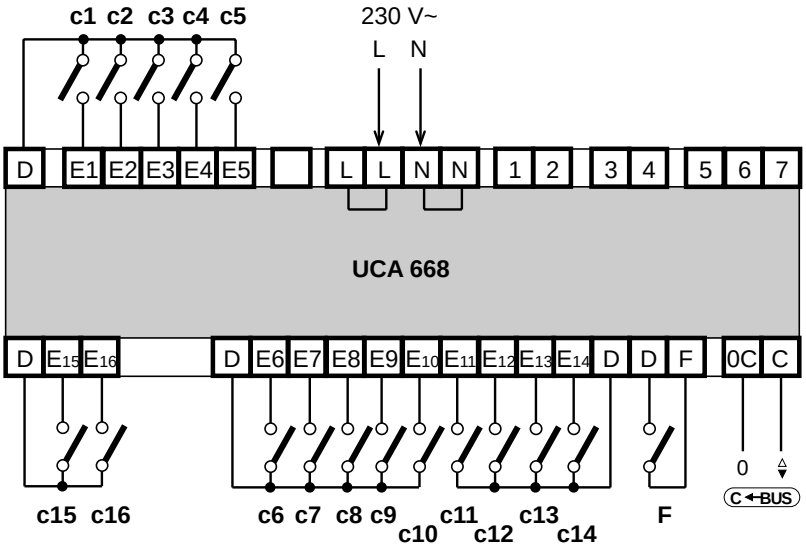
• Pulses

Minimum pulse duration	100 msec
Minimum interval between pulses	200 msec

• Telemanagement (setting by PC)

Telemanagement password	**0** … 65535
Alarm calls	1 … **5** … 255
Interval alarm calls	2 … **10** … 255 min.

6. WIRING DIAGRAMS



c 1…16 – Pulse transmitter contacts of the meters
F – Counts prevention contact

7. ELECTRICAL CONNECTIONS

Proceed as follows:

- Detach base from cover
- Mount base on DIN rail and check that the securing elements (4.4) lhold it firmly in place
- Carry out wiring according to the diagram and in observance of the relevant regulations in force and using cables of:
  - – No. 2 minimum 1.5 mm^2 wires for power supply coming from appartment-block 230 V ~
  - – No. 2 minimum 1 mm^2 coming from each pulse transmitter of the connected meters
  - – for C-Bus see technical sheet T 021
- Switch on power (230 V~) and check voltage across terminals L and N.
- Switch off power, replace cover on base/terminal board and secure it with the four screws supplied (4.3).

You are advise not to insert more than two cables in a single terminal of the controller. If necessary use external junction box

8. SITING

The metering unit must be sited in a dry ambient to conform to the ambient limits shown in TECHNICAL DATA. If installed in an ambient classified as 'dangerous' it must be enclosed in a cabinet for electrical apparatus constructed according to the regulations in force for the class of danger involved. The unit can be installed on a DIN rail or in a DIN modular enclosure.

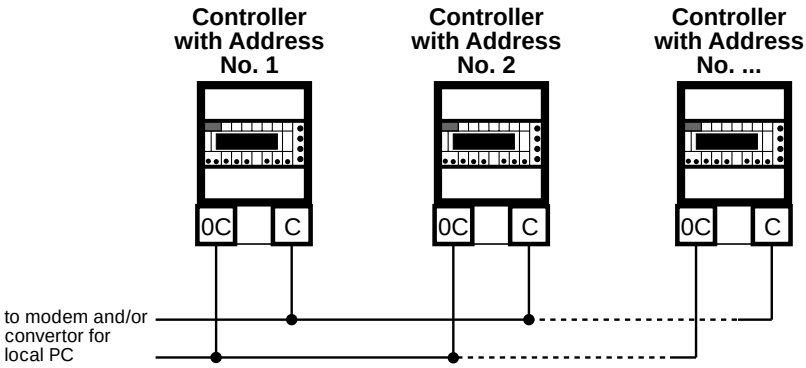
9. NETWORK APPLICATION

9.1 C-Bus telemanagement application (for more detailed information see data sheet T 021)

Via C-Bus the UCA 668 can be telemanaged with a bi-directional transmission of data, using one or more local PCs and/or those of the remote central site, via telephone line. Either from one or more PCs you can display and/or modify the following:

– data and set-values on the unit display and the configuration data related only to telemanagement (see 'Technical Data')
– read all the data recorded in the unit (partial counts, total counts, event recorder, ect.)

9.2 C-Bus link



9.3 Telemanagement address

23.4

Address	:	– –
Group	:	–

Within the telemanagement the controllers must have a progressive address-number in order to be identified by the central PC and/or the local PCs.
Furthermore, it is possible to subdivide the controllers into specific groups

Nota: if the site is not run on telemanagement keep the address in the memory (–).
To zero the values keep the + and – keys pressed at the same time.

9.4 Alarm transmission

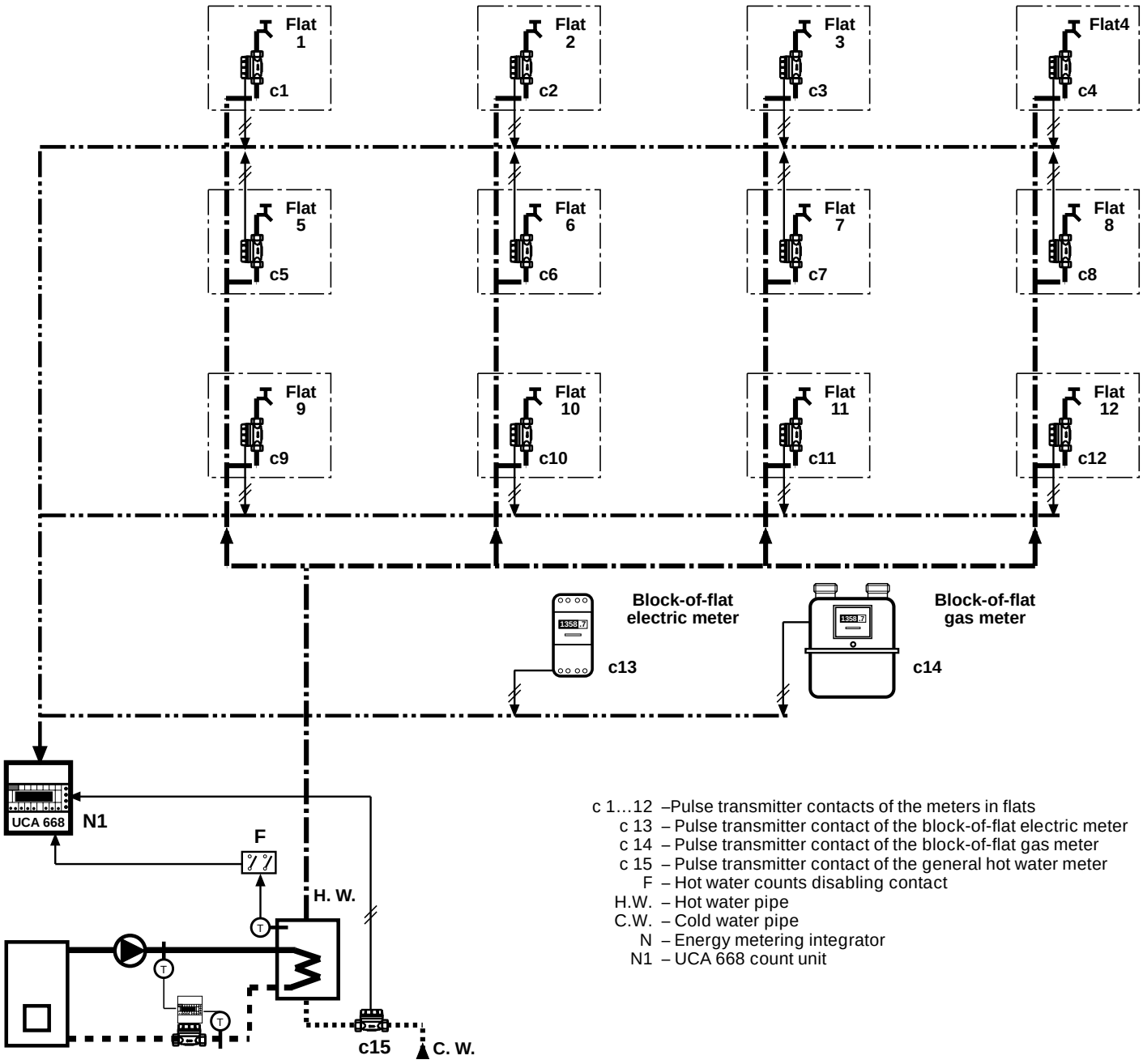
23.3

Alarns Send	:	NO
TelemanPassw	:	NO

- **Alarm sending** : NO = alarms will not be transmitted
  YES= alarms will be transmitted to central PC
- **Telemanpassw.** : NO = key not enabled
  YES= key enabled

10. EXAMPLES OF INSTALLATIONS

10.1 Hot water counts with 1 meter per flat, one general meter for cold water and block of flats meters for electricity and gas.



c 1…12 –Pulse transmitter contacts of the meters in flats
c 13 – Pulse transmitter contact of the block-of-flat electric meter
c 14 – Pulse transmitter contact of the block-of-flat gas meter
c 15 – Pulse transmitter contact of the general hot water meter
F – Hot water counts disabling contact
H.W. – Hot water pipe
C.W. – Cold water pipe
N – Energy metering integrator
N1 – UCA 668 count unit

UCA 668 adjustment for the above described use.

1) 22.3 — `Meter No. : xx` / `imp:10 LT.HOT` — Configuration of the meters c01 ÷ c 12 c12 as 'hot water meters'
Repeat the operation for each of the 12 connected volumetric hour run meter

2) 22.3 — `Meter No. : 13` / `imp:100 WH` — Configuration of the meter c13 as 'electric meter'

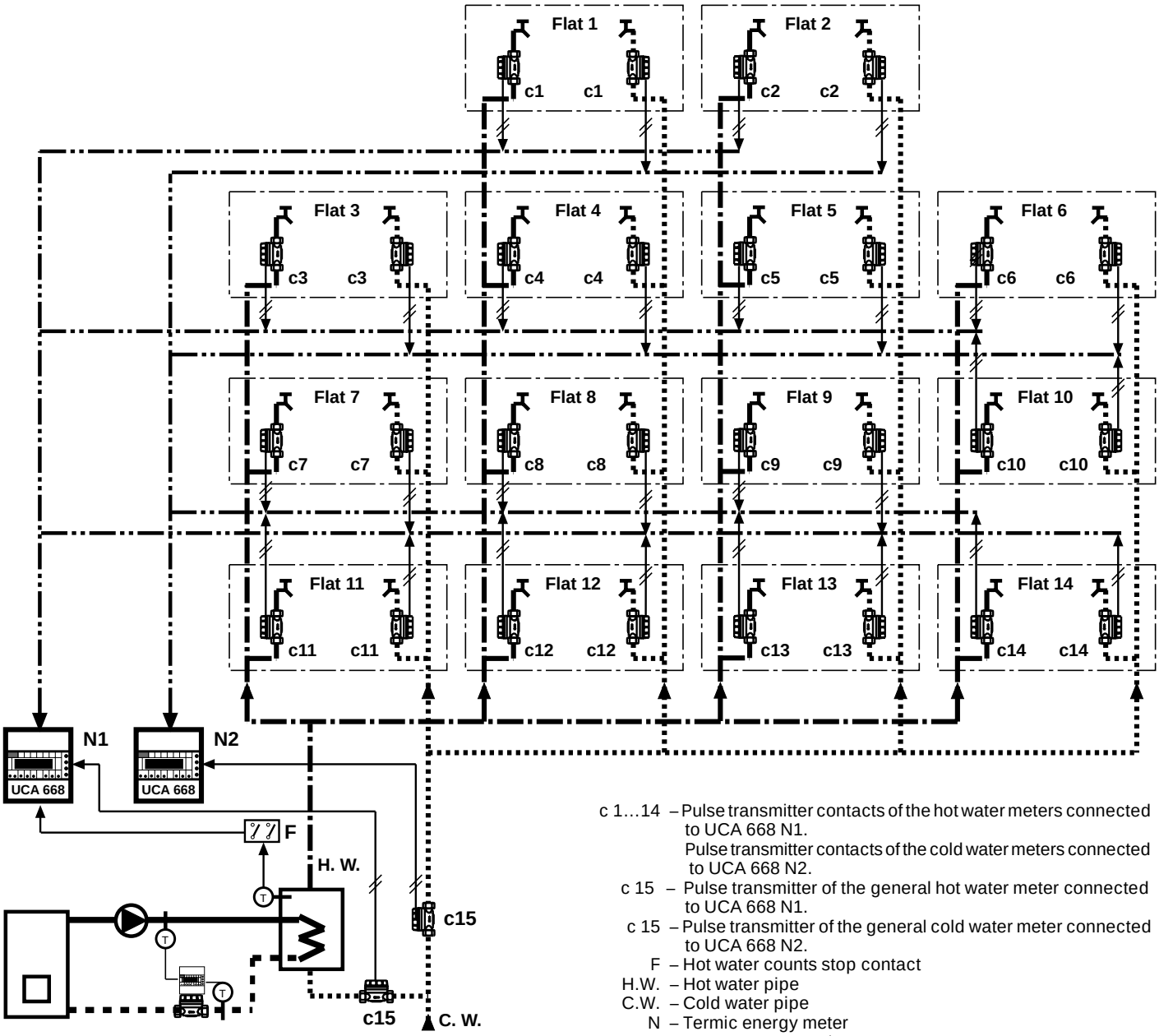
3) 22.3 — `Meter No. : 14` / `imp:10 LT.GAS` — Configuration of the meter c 14 as 'gas meter'

4) 22.3 — `Meter No. : 15` / `imp:100 LT.HOT` — Configuration of the meter c 15 as 'general hot water meter'

5) 22.18 — `Counts Stop` / `CONTACT CLOSED` — Hot water counts stop when the thermostat on the water heater has closed contact and signals that the storage temperature is below the necessary minimum for domestic hot water.

6) 22.19 — `Counts Stop` / `123456789012--5-` — Choice of the meters involved in the counts stop when the minimum temperature thermostat of the water heater has closed contact.

10.2 Hot and cold water counts with 2 meters per flat



c 1…14 – Pulse transmitter contacts of the hot water meters connected to UCA 668 N1.
Pulse transmitter contacts of the cold water meters connected to UCA 668 N2.
c 15 – Pulse transmitter of the general hot water meter connected to UCA 668 N1.
c 15 – Pulse transmitter of the general cold water meter connected to UCA 668 N2.
F – Hot water counts stop contact
H.W. – Hot water pipe
C.W. – Cold water pipe
N – Termic energy meter
N1 - 2 – UCA 668 count unit

UCA 668 "N1" adjustment for the above described use.

1) 22.3 — `Meter No. : xx imp:10 LT. HOT` — Configuration of the meters c 01 ÷ c 14 as 'hot water meters'
Repeat the operation for each of the 14 connected volumetric hour run meters

2) 22.3 — `Meter No.: 15 imp:100 LT. HOT` — Configuration of the meter c15 as 'hot water general meter'.

3) 22.18 — `Counts Stop CONTACT CLOSED` — Hot water counts stop when the thermostat on the has closed contact and signals that the storage temperature is below the necessary minimum for domestic hot water.

4) 22.19 — `Counts Stop 123456789012345-` — Choice of the meters involved in the counts stop when the minimum temperature thermostat of the water heater has closed contact.

UCA 668 "N2" adjustment for the above described use.

1) 22.3 — `Meter No. : xx imp:10 LT.COLD` — Configuration of the meters c 01 ÷ c 14 as 'cold water meters'
Repeat the operation for each of the 14 connected volumetric hour run meters.

2) 22.3 — `Meter No. : 15 imp:100 LT.COLD` — Configuration of the meter c15 as 'cold water general meter'

11. OPERATION

Each UCA 668 is able to count up to 16 meters, and it is possible to set one or more meters to the input 'F' function so as to block its count when input 'F' changes its status (eg the lockout of the domestic hot water caused by a thermostat for the minimum storage temperature)

11.1 Possible readouts

The UCA 668 converts each received pulse into the absolute value of the calculated measure, according to 22.3 `Meter No.: 01 imp=100 LT.HOT` and for each connected meter, it runs the progressive total and partial counts.

- **Accessible to everybody without the need of a password - partial counts (seasonal).**
  Partial counts for the current season, which is to say from the last season start.

19.2
```
New data after
the xx/xx/xxxx
```
.

19.3
```
Meter      No.: xx
mc HOT     :xxxxx.x
```

– Meter No. xx = displayed volumetric hour run meter, from 1 to 16
– mc HOT = type of count related to what has been set in 22.3 : mc HOT; mc COLD; mc GAS; LT.COMB.; PULSES; kWH; MEGAJOUL; MWH.
– xxxxx.x = seasonal progressive of the carried out count;

- **Accessible only with pasword - total counts (multiseasonal)**
  Total counts calculated from the start of the equipment to the present date - they can't be deleted

20.1
```
Meter      No.: xx
mc HOT     :xxxxxxx
```

– Meter No. *xx* = displayed volumetric hour run meter
– mc HOT = type of count related to what has been set in 22.3 : mc HOT; mc COLD; mc GAS; LT.COMB.; PULSES; kWH; MEGAJOUL; MWH.
– xxxxxxx = total progressive of the carried out count.

12. ADJUSTMENTS

12.1 Adjustment of the counts inputs (typical data of the meters)

Each count input must be adjusted in relation to the tecnical and functional characteristics of the meter here connected. For each of the 16 meters connected enter:

22.3
```
Meter No. : 01
imp=100 LT. HOT
```

– Meter : xx = number of the refered volumetric hour run meter
– pulse : *100* = value of each pulse coming from the meter
– LT. HOT = quantity choice for each pulse: LT.HOT; LT.COLD; LT.GAS; LT.COMB.; PULSES; WH; KILOJOUL; KWH.

12.2 Counts stop setting

By using the contact 'F' it is possible to stop the counts of all or of some meters. For example, by connecting the thermostat of minimum storage temperature it is possible to stop the counts of the hot water meters when the storage water goes below such minimum value that it is no longer possible to use it as domestic hot water.
To use this function correctly you must:

22.18
```
Counts Stop
NO
```

- **adjust the status of the contact 'F' for the counts stop:**

– Counts Stop = NO : the counts stop is not used
CONTACT OPEN : counts stop with open contact
CONTACT CLOSED : counts stop with closed contact

- choose the meters that must stop the counts when the function 'Counts Stop' is enabled

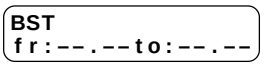
22.19
```
Counts Stop
----------------
```

– Counts Stop = by using the keys '+' and '–' substitute the dashes with the corresponding number of the meters whose counts we want to stop.

N.B.: after number 9, set 0 for 10, 1 for 11 and so on until 6 for 16.

12.3 BST

22.2



The controller automatically adjustes the clock accordingly to the BST period.
- fr : - -.- - = enter the date of the last Sunday in March. The clock will automatically move one hour forward.
- to : - -.- - = enter the date of the last Saturday in October. The clock will automatically move one hour backward.

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

13. SETTING

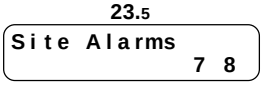
13.1 Alarms

When the number is flashing = alarm trigged

The alarm results have been 1-minute delayed.

Alarm types, causes and results:

23.5

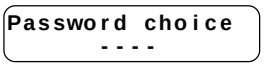


7 = memories; it is not possible to disable it:
- when the main memory of the system signals wrong values;
- led 3.6 on; the memory of the meter with error is being reset

8 = internal clock; it is not possible to disable it:
- when the clock
- led 3.5 on.

13.2 Password

23.6

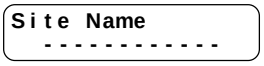


The choice and enabling of the password will prevent the use of the + and – keys and therefore whatever change of the data.
Type a four-character code (alphanumeric):
- use the ← and → keys to place the cursor
- use the + and – keys to substitute dashes with numbers.

Once the password has been set, if you press the + or – key the display will show the request for the password. Only after having entered the correct password you will be able to use the + and – keys. If no keys are pressed during the following 15 minutes the password will need to be re-entered.

13.3 Site naming

23.1



Entering of the site name which appears on the first page of the display **19.1**.
By using the + and – keys, each dash can be substituted with either a letter of the alphabet (A...Z) or a number (0...9). Use the → key to move the cursor.

14. START OF A NEW SEASON (resetting of the pertial counts of the previous season)

It defines the date from which a new counts season starts and from which the new partial counts will start again, resetting the partial ones of the previous season and all the "EVENT LOG"

19.2

```
New data after
the xx/xx/xxxx
```

xx/xx/xxxx = day, month and year in which the new heating season has been started

New season start procedures:

19.20

```
Start New
Season  ? NO  ->
```

– NO = when you do not want to start a new season of counts
– YES = when you want to start a new season of counts. It will then appear:

19.21

```
Insert
Password  :----
```

– "- - - -" = enter the password set in **23.6** `Password choice ----` , then follow the instructions in the display

19.22

```
Did you read all
well?      NO  ->
```

– enter YES then press → key if you like to carry on, followed by:

19.23

```
Confirm Season
Start   ? NO  ->
```

– enter YES then pres → key if you like to carry on, the display will show:

19.24

```
New Season
starting...
```

19.25

```
New Season
Started       ->
```

press → key to go out of this diplay page

15. EVENT RECORDER

The UCA 668 has enough memory for the recording of the events of the equipment itself. All the recordings are reset when you start the new season so that they are only related to the present season.

15.1 Storage of the starting time and date of the UCA 668

With these data it is possible to clearly define the period in which the UCA 668 was not able to carry out the counts because it was switched off either for service or tampering.
If the number of hours during which the equipment has been off are few compared to the total seasonal hours, it does not effect the counts for the proper allocation of expenses, other wise it is necessary to take it into account.

21.1

```
On:xx   hrs:xxxx
12.18 of10.02.99
```

– On : xx = progressive number of the switching-on times (max. 16 times) after any switching off
– hours : xxxx = time in hours during which the equipment has been on, from the first switching on until the switching off. These hours and events are reset when the new season starts and the date and time of the season start is being recorded.
– 12.18 of 10.02.99 = time and date of the event.

16. HISTORIC RECORDER

The UCA 668 has a data logger that allows the storage of 48 recordings at setable intervals:
– EVERY HOUR : the recordings will happen every hour;
– EVERY DAY : the recordings will happen every day;
– EVERY WEEK : the recordings will happen every week.
The type of recorder is "first in - first out" which means that at any new recording the oldest one will be deleted. This "data logger" is always available in the equipment memory and can be diplayed via a computer reading of the UCA 668.

23.2

```
Recordings
EVERY HOUR
```

17. CONNECTION TESTING

Once the mechanical and electrical installation of the UCA 668 has been completed, the electrical connections must be tested before the connection of the volumetric hour run meters.

Please procede as follows:

- Switch on the UCA 668
- Position the diplay on the first page of the menu "TESTING" (follow instructions as in"DISPLAY PAGES SEQUENCE" on p. 10);

24.1

```
Reset test
Counts ? NO
```

– Reset Counts ? : YES = the equipment reset all the meters for testing pulses (sequent display pages)
NO = the reset are not carried out.

Always reset the pulses meters in the menu 'TESTING' before the actual testing. In so doing it will be much easier to check the result of the testing itself.
Warning: this reset has no influence on the partial and total counts until then stored.

- Go to the meter showed with the number '01' in the UCA 668 (c1 : terminals D - E1) and using the connecting cables from the UCA 668 simulate a pulse by touching the ends of the two cables together.

- Go to the meter showed with the number '02' in the UCA 668 (c2 : terminals D - E2) and using the connecting cables from the UCA 668 simulate two pulses by touching the ends of the two cables twice together

- Go then to each of the meter and simulate a number of pulses equal to the number with which each meter is diplayed in the UCA 668.

- Once you have carried out such operation with each of the volumetric hour run meters, go back to the UCA 668 position the display on the menu pages 'TESTING' and check in each meter the number of pulses recorded (we strongly advice you to note down the reading for each meter). If:

24.2

```
Meter No.: 01
Impulses= 001
```

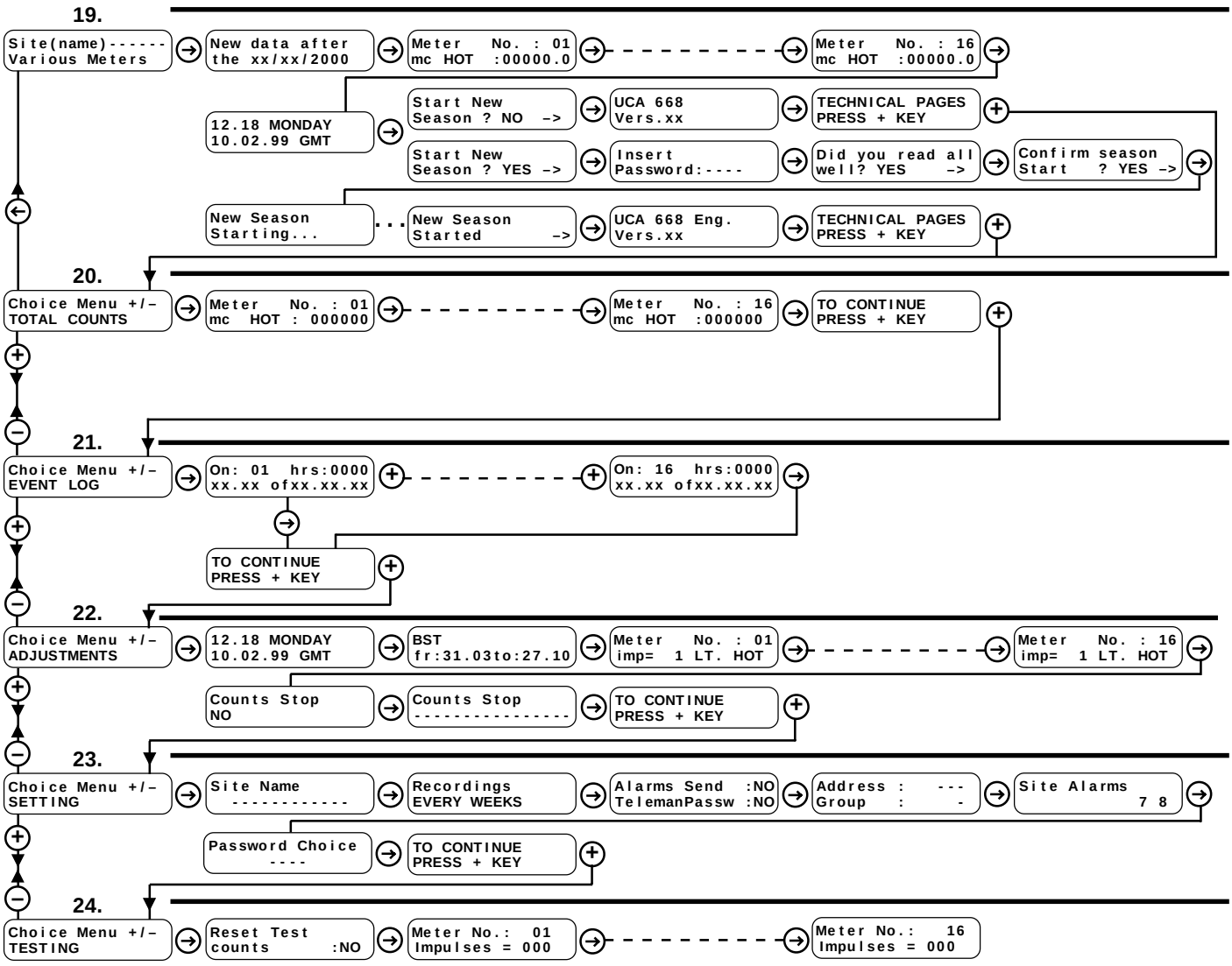
– all the meters present the same number of recorded pulses to the ones of identification of the displayed volumetric hour run meter (e.g. meter 03, pulses = 03) the electrical connections are correct.

– one or more meters do not display any recording. In this case there is an open circuit in the connections between the UCA 668 and the volumetric hour run meter in question. Alternatively the connections have been carried out incorrectly.
Reset the connections and repeat the testing.

– two or more counts present a different number of pulses from the identification one of the diplayed meter (e.g. meter 03, pulses = 05; meter 05, pulses = 03): the meters in question have not been connectted to the counting unit in the corresponding inputs (iin the given example they have been inverted).
Go to one of these meters, create a short-circuit between the connecting cables, then go back to the UCA 668 and by using a digital tester, find the 'short circuit'. Once you have found it connect the corresponding cables to the input in the UCA 668 of the short-circuited meter.
Carry on this operation until you have corrected all the wrong connections, then repeat the testing and check its result.

- After the positive result of the electrical testing, connect all the meters.

18. SEQUENCE OF DISPLAY PAGES (the data and functions are those set at factory)



⊖ ⊕ Keys for scrolling the display pages and positioning the cursor ▮ on adjustable data on the pages
The adjustable data, in the following descriptive tables of display pages are highlighted by

By pressing these keys together, or in any event after 15 minutes, the first page returns to the display

Site(name)------
Various Meter

⊖ ⊕ Keys for : – adjusting the values highlighted by the cursor ▮
– displaying the configuration options of a function, e.g. :

Counts Stop :
NO

or

Counts Stop:
CONTACT OPEN

– switch directly from one menu (block of pages) to another.

19. NORMAL USE

Ref.	Display	Description	Notes	Sect.
19.1	Site(name)------ Various Meters	Site name	Set in **23.1**	.
19.2	New data after the xx/xx/2000	It stands for the starting date of the counts which you read on the pages that follow. They are the so called partial counts for the seasonal consumption.		14.
19.3 ⇓ ⇓	Meter No. : 01 mc HOT :00000.0	- Number of the displayed meter; - Type of Count: - mc HOT (m^3 of hot water); - mc COLD (m^3 of cold water); - mc GAS (m3 of gas) - LT.*COMB.* - PULSES*;* - kWH*;* - ME*GAJOUL;* - MWH*;* - Partial counts of the displayed meter. There are other 15 similar pages for the other connected volumetric hour run meters to follow.	According to what has been set in **22.3**	11.1
19.19	12.18 MONDAY 10.02.99 GMT	Time and day of the week Date and either BST or GMT period.	According to dates and times set in **22.1**	
19.20	Start new Season ? NO –>	Whenever you start the beginning of a new season all the partial counts for the consumptions will restart from that date: – NO: season start not required – YES : season start required	Choose 'YES' then press → key to start the season	14.
19.21	Insert Password :----	Enter password set in **23.6**	Enter password then press → key and follow the instructions for season start	
19.22	Did you read all well ? NO –>	– NO: stop season start – YES : continue season start	Press → key and follow the instructions for season start	14.
19.23	Confirm Season Start ? NO –>	– NO: terminare l'avvio di stagione; – YES : continue season start	Press → key to get out of the page	14.
19.24	New Season starting...	It will appear only if there is "YES" in **19.20**, **19.22** and **19.23**.		14.
19.25	New Season Started –>	It will appear only if there is "YES" **19.20**, **19.22** and **19.23**.	Press → key to get out of the page	14.
19.26	UCA 668 Eng. Vers.xx	Identity data of the controller.		

20. TOTAL COUNTS

Ref.	Display	Description	Notes	Sect.
20.1	Meter No. : 01 mc HOT :0000000	- Number of the displayed meter; - Type of count: - see point - see point **19.3**. - Total counts of the displayed meter. There are other 15 pages for the other connected volumetric hour run meters to follow.	According to what has been set in **22.3**	11.1

21. EVENT LOG

Ref.	Display	Description	Notes	Sect.
21.1 ⇓ ⇓	On:01 hrs:0000 --.-- of--.--.--	On: xx = it varies from 1 to 16 and it is the progressive number of the data that the controller records when switched on. 01 = most recent, 16 the furthest back It will be = 1 at the start of a new season hrs : total number of hours during which the controller was on from the latest season start. At the same time the hours, minutes and date of that switching on are being recorded.	The counts of the hours will be reset at the start of each new season.	15.1
	On:16 hrs:0000 --.-- of--.--.--	To follow there are the same number of pages as the recorded events **(max 16).**		

22. ADJUSTMENT

Ref.	Display	Description	Notes	Sect.
22.1	12.18 MONDAY 10.02.99 GMT	Setting: Time, Day of the week and Date	.	
22.2	BST fr:31.03to:27.10	BST period		12.3
22.3	Meters No. : 01 imp=1 LT.HOT	Setting of the characteristics of the displayed meter: – Choice of the value for the single pulse: 1- 2,5 - 5 - 10 - 25 - 50 -100 - 250 - 500 - 1000; – Choice of function for each pulse: - LT.HOT (litres of hot water); - LT.COLD (litres of cold water); - LT.GAS; - LT.COMB. - PULSES; - WH; - KILOJOUL; - KWH. **There are other 15 pages for the other connected volumetric hour run meters to follow.**		12.1
22.18	Counts Stop NO	Counts stop with contact "F": NO, CONTACT OPEN; CONTACT CLOSED.		12.2
22.19	Counts stop ----------	Contacts that must stop tounts with "counts stop" active Replace the dash with the corresponding number to couple the count to the function 'counts stop'	Use + and – to replace the dash with the number Use ← and → to the cursor position "0" means10, l'"1" after"0" stands for 11 and so on.	12.2

23. SETTING

Ref.	Display	Description	Notes	Sect.
23.1	Site Name ----------	Site name setting	Use + and – to enter letters and numbers Use ← and → to change position	13.3
23.2	Recordings EVERY WEEK	Recorder frequency setting: EVERY HOUR = recordings every hour EVERY DAY = recordings every day EVERY WEEK = recordings every week		16.
23.3	Alarms Send :NO TelemanPassw :NO	Alarms enabling to send to telemanagement PC Enabling telemanpassw.	Necessary only if connected to C-Bus	9.4
23.4	Address : --- Group : -	Controller address Controller group	Only if connected to C-Bus	9.3
23.5	Site Alarms 7 8	7 : Memories alarm 8 : Internal clock alarm	Alarms 7 and 8 can not be disabled	13.1
23.6	Password choice ----	Password choice for prevention + and – keys. To cancel password press + and – keys at the same time.	Use + and – to enter letters and numbers Use ← and → to change position	13.2

24. TESTING

Ref.	Display	Description	Notes	Sect.
24.1	Reset test Counts :NO	– YES: all the pulses meters of the following testing pages are reset; – NO: all the pulses meters of the following testing pages are not reset;		17.
23.2 ⇓ ⇓	Meter No.: 01 Impulses 000	01 = volumetric hour run meter whose connections to UCA 668 need to be tested; Impulses = number of received pulses		17.
	Meter No.: 16 Impulses 000	**There are other 15 pages for the other connectd volumetric hour run meters to follow.**		

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