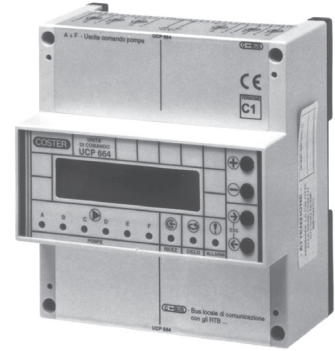# COSTER

# CONTROL UNIT FOR COSTERZONE SYSTEM

# UCP 664  C1  Eng.

- **Control of outputs according to heat or cool load requested**
- **Communication systems:**
  – Local CosterBus
- **Power supply: 24 V~; DIN rail mounting**

CE

## 1. APPLICATION

UCP 664 is used in the "Costerzone" system for sequencing pumps, boilers, refrigerator groups according to the heat or cold request by the zones served by them.

## 2. FUNCTIONS

The main functions of UCP 664 are:
- On-Off control of 6 outputs in:
  – Automatic: according to load requested via the local C-Bus
  – On: always On
  – Off: always Off
- Linking of each output to the zones served;
- Setting of minimum intervention load of the outputs;
- Safety status of all the outputs in the event of continuous absence of communication on Bus;
- Electrical testing of connections

## 3. OVERALL DIMENSIONS
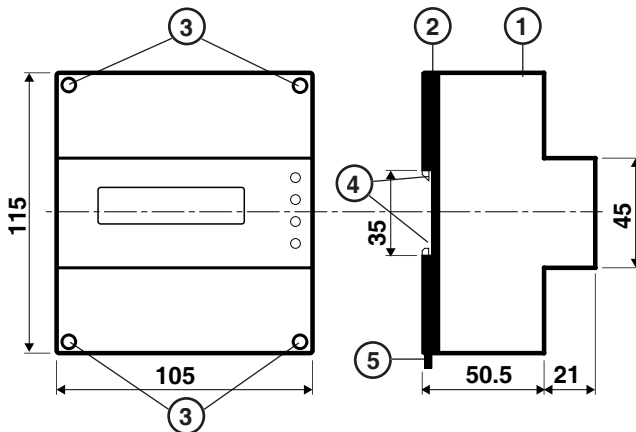


1 – Protective cover for electronic components
2 – Base with transformer, relay and terminal blocks
3 – Screws for securing base to cover
4 – DIN rail securing elements
5 – DIN rail release lever

## 4. FACIA
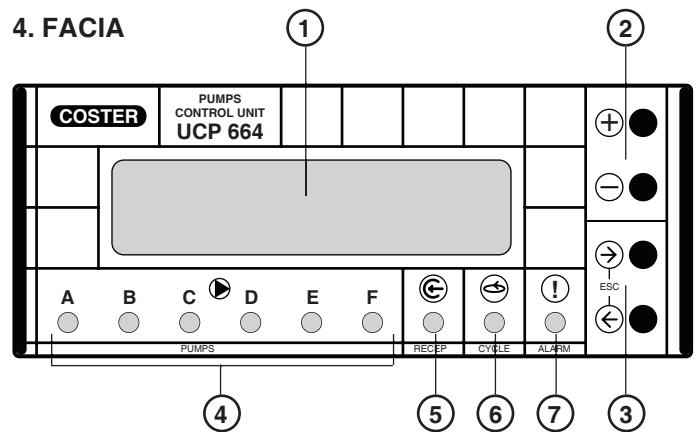


1 - Two-line alphanumeric display
2 - + and – keys
3 - ← and → keys
4 - Outputs status LEDs
5 - Data reading LED
6 - End of read-out cycle LED
7 - Fault LED

## 5. TECHNICAL DATA

### • Electrical

| | |
|---|---|
| Power supply | 24 V~ ± 10% |
| Frequency | 50 … 60 Hz |
| Consumption | 5 VA |
| Protection | IP40 |
| Radio disturbances | VDE0875/0871 |
| Vibration test | with 2g (DIN 40 046) |
| Voltage-free output contacts: | |
| maximum switched voltage | 250 V~ |
| maximum switched current | 5 (1) A |
| Construction standards | Italian Electrotech. Committee (CEI) |
| Data storage in memory | 5 year |

### • Mechanical

| | |
|---|---|
| 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 |
| Dimensions | 105 x 115 x 71.5 |
| Weight | 0.6 kg |

### • Setting ranges

| | |
|---|---|
| Control outputs: | **Automatic**/On/Off |
| Load outputs | **Heating**/Cooling/Heating + Cooling |
| Minimum On and Off times | 0 … **15** … 99 min. |
| Output control load: | |
| heating | 0 … **5** …100 % |
| cooling | 0 … **5** …100 % |
| Number of zones connected | 1 … **20** … 239 |
| Time Bus inactive: | 60 … **180** … 250 sec. |

**COSTER**

## 6. WIRING DIAGRAM
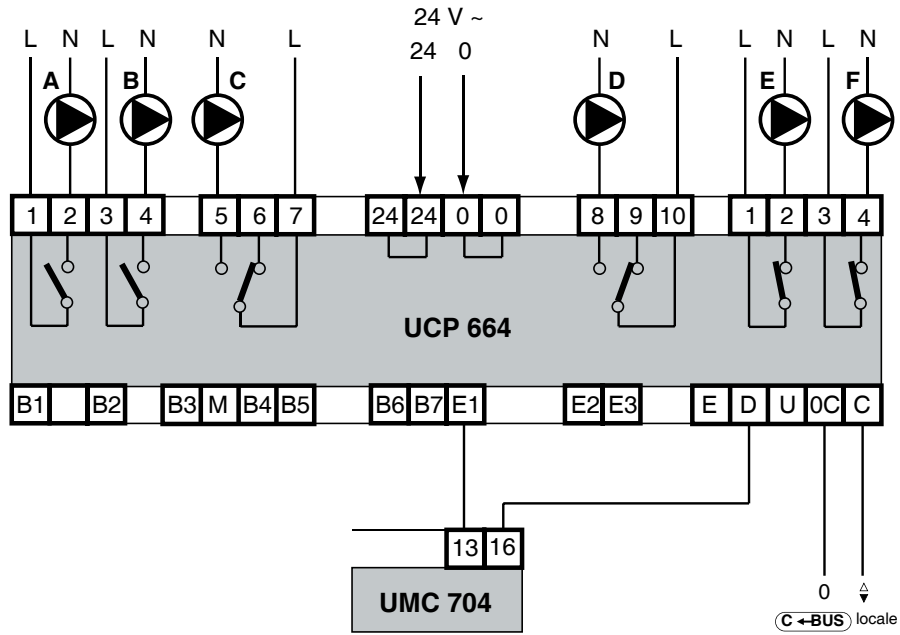


A to F – Load & pump control outputs
E1/ D – Connection to master
Local C-Bus – CosterBus communication ring with the RTB…

## 7. SITING

UCP 664 should be sited in a dry environment which meets the relevant conditions given under section 5.TECHNICAL DATA ", If installed in a location classified as "Hazardous" it must be installed in a cabinet for electrical equipment constructed according to the regulations in force for the class of danger concerned.
The controller can be mounted on a wall, on a DIN rail or in a standard DIN enclosure

## 8. ELECTRICAL CONNECTIONS

Proceed as follows:
• Separate base and cover after having removed the securing screws
• Mount the base on the DIN rail and check that the securing elements (3.4) is locked securely
• Make the electrical connections strictly according to the wiring diagram and to the safety regulations in force using the following cable sizes :
    – 1.5 mm$^2$ cross-section for the power supply and relay control outputs.
    – 1 mm$^2$ cross-section for CosterBus. For length limits see Technical Data Sheets T 021 and T 022.
• Switch on power (24 V~) and check its presence at terminals L and N.
• Switch off power, replace the cover on the base/terminal block and secure it with the two screws supplied (3.3).
**It is advisable not to insert more than two cables in a single terminal and, if necessary, use an external terminal block.**

## 9. EXAMPLE OF USE
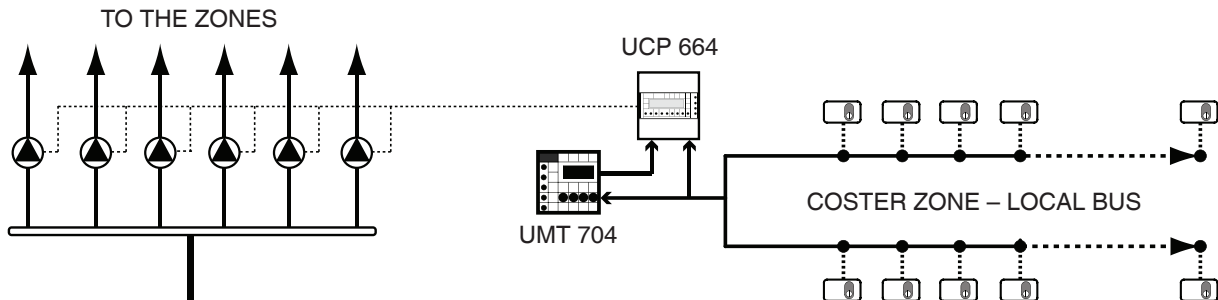


CosterZone Master system: UMT 704 C3
Control unit: UCP 664
Connection to local CosterBus

Connection to Master
UCP 664 control outputs

**GIE**

## 10. COMMUNICATION

N.B.: UCP 664 does not require an address for communication.
Up to a maximum of 5 devices can be connected to the same Master.

### 10.1 Local CosterBus (for detailed information please see Technical Data Sheet T 021).

By means of CosterBus local output, UCP 664 hears the request for data readout coming from the Master (UMT 704 C3) to the RTB… connected in Bus.

### 10.2 Connection to Master (E1 – D)

By means of this connection UCP 664 receives the replies from the RTB… to the Master's readout request; the reception is indicated on the facia by the LED (4.5) the flashing.
The end of the readout cycle for all the zones is shown on the facia by the LED (4.6) flashing.
.

## 11. OPERATION

UCP 664 is a microprocessor-based device of the "Costerzone" system used for the control of outputs (max. 6) in relation to the load requested.
It is provided with a CosterBus port by means of which it "listens to" the requests for data readouts to the RTB… controllers coming from the system Master (UMT 704 C3).
By means of a second connection with UMT 704, it receives the replies coming from the zone controllers.
The communication status is shown on the first page of the device's display:

**15.1**
```
Zone:   1 -> OK
Unreceived :  0
```

- Zone … : OK = correct readout;
  - ?? = wrong data from the zone (check addresses, Bus, etc);
  - .. = the zone has not replied;
- Zones unriceived : indicates the number of zones which have not replied

Terminated the scanning of all the zones it calculates the loads requested for each output and consequently controls the switching on or off of the respective outputs.

WARNING:
- The scanning is interrupted each time one of the four keys on the facia is pressed (4.2.3).
  Re-starts 8 seconds after the last key depression.
- In the event of a communications failure, UCP 664 assumes a safety condition by switching on or off all the outputs connected to it, depending on how it has been configured in :

**16.4**
```
Fault for   :180s
OutputsOn:ABCDEF
```

Immediately after its installation UCP 664 must be configured..

### 11.1 Configuration of the outputs

The outputs must be configured:

**15.2**
```
Output: A
AUTOMATIC
```

– type of control desired :
- •Output : A ... F        = choice of output
- •        : AUTOMATIC   = output controlled according to load
-          : ON          = output always On
-          : OFF         = output always Off

**16.1**
```
A:HEAT.+ COOLING
MinimumTime:  15m
```

– type of reference load :
- • Output : A ... F        = choice of desired output
- •        : HEAT+COOLING = output associated with heating & cooling load
-          : HEATING      = output associated with heating load
-          : COOLING      = output associated with cooling load
- • Minimum Time : … m     = period of time in which output remains On, when
                            switched On, how long it remains Off when switched Off.

### 11.2 Programming zones

The calculations of the individual heating and cooling loads are made at the end of each cycle of calls to the zone controllers.
Accordingly, it is essential to carry out the following on each device:

**1)** Configuration of the total number of controllers connected in CosterBus ring:

**17.1**
```
Number of zones
connected:    20
```

- Connected zones : 1 … 239 = total number of zones connected to CosterBus

**2)** Assign the loads of each zone to the desired outputs :

**17.2**

```
Outputs Zone:1
Heat.:A  Cool.:–
```

- Zone outputs : 1 … 239 = address of the desired zone
- Hot : A … F = output coupled with thermal load of the zone displayed. Appear only the outputs configured as "HEATING" or as "HEAT. + COOLING".

  The symbol "–" indicates that the thermal load of the zone is not taken into consideration.
- Cold : A … F = output associated with refrigeration load of the zone displayed. Appear only the outputs configured as "COOLING" or as "HEAT.+COOLING".

  The symbol "–" indicates that the thermal load of the zone is not taken into consideratio.

## 11.3 Configuration intervention load thresholds

**15.2**

```
Output: A
AUTOMATIC
```

If the outputs are configured as "AUTOMATIC" in ___ they are switched on when: the calculated load thresholds, on the basis of the zones to which they are assigned, exceed the load thresholds set.

– Load threshold calculated during the "HEATING" action, appears only if the chosen output has been configured as "HEATING" or

**16.1**

```
A:HEAT.+ COOLING
MinimumTime: 15m
```

"HEAT.+COOLING" in ___

**16.2**

```
A:HeatThold:    5%
  Heat Load:100%
```

- Output : A … F = choice of desired output
- HeatThold : 0 … 100 % = value of threshold intervention heating load
- HeatLoad : 0 … 100 % = valore del carico riscaldamento calcolato

– Load threshold calculated during the "COOLING" action; appears only if the chosen output has been configured as "COOLING" or

**16.1**

```
A:HEAT.+ COOLING
MinimumTime: 15m
```

"HEAT.+COOLING" in ___

**16.3**

```
A:CoolThold:    5%
  Cool Load:100%
```

- Output : A … F = choice of desired output
- CoolThold : 0 … 100 % = value of threshold intervention heating load
- CoolLoad: 0 … 100 % = valore del carico raffreddamento calcolato

WARNING:
For each zone not reading a demand, then heating and cooling loads equal to 100% is assumed.

## 12. COMPLEMENTARY FUNCTIONS

### 12.1 Safety intervention

```
COMMUNICATION
INTERRUPTION
```

When the message appears on the display ___ the possible causes are:

– reversal or break in C-BUS (0C – C) connection
– reversal or break in E1 – D connection

UCP 664 switches the desired outputs to On

UCP 664 switches the desired outputs to On

**16.4**

```
Fault for :180s
OutputsOn:ABCDEF
```

- Fault for : 60 … 250 s = maximum time lack of communication on C-Bus before safety outputs control.

- On Outputs : A … F = outputs with On status during safety period; To set "Off" replace letter with dash "–", using + or – keys when cursor is positioned over output to be configured

### 12.2 Access keynumber

**17.3**

```
Password choice
    - - - -
```

```
  Password
    - - - -
```

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

When the keynumber is enabled, if + or – keys are pressed a request will appear on the display to enter the keynumber. Only after having typed the exact keynumber can the + and – keys be used. If for 15 minutes no key is pressed the keynumber is automatically re-enabled..

## 13. TESTING AT SITE STARTUP

### 13.1 Testing control outputs

With + and – keys select :

**18.1**

```
OUTPUT : A
Status : OFF
```

• output to test :
– A … F;

• the status :
– ON ; OFF.

Check the result.

### 13.2 Information page

On this page of the display are shown, zone by zone, the loads calculated and the result of the communication.
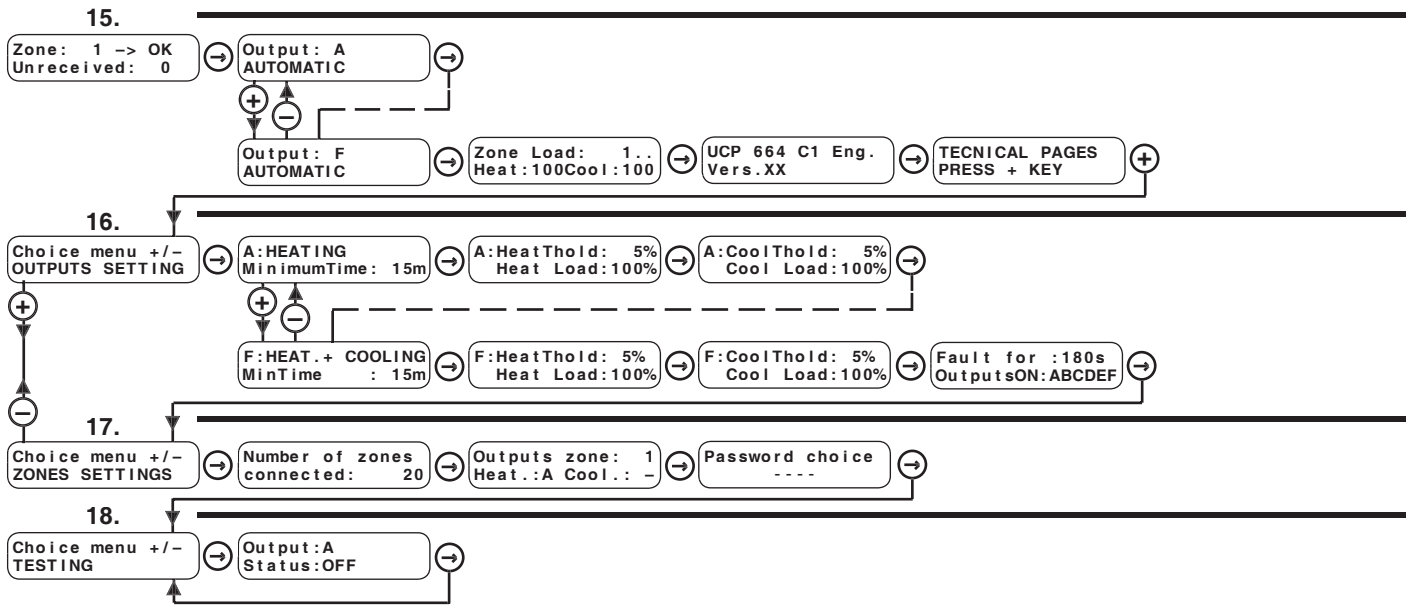The display of the zones is automatic and follows the scanning made by the Master.

**15.3**

```
Zone Load     1..
Heat:100Cool:100
```

• LoadZone : 1 … X   = zone displayed
• Hea   : 0 … 100%  = value of thermal load
• Coo   : 0 … 100%  = value of cold load
•         : – OK      = correct reading
          – ??      = incorrect data reading
          – ..      = zone has not replied

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

**15.**

```
Zone:  1 -> OK        Output: A
Unreceived:  0    →   AUTOMATIC          →

                  (+)
                  (-)

                      Output: F          Zone Load:   1..     UCP 664 C1 Eng.    TECNICAL PAGES
                      AUTOMATIC      →   Heat:100Cool:100  →  Vers.XX         →  PRESS + KEY        (+)
```

**16.**

```
Choice menu +/-       A:HEATING            A:HeatThold:   5%    A:CoolThold:   5%
OUTPUTS SETTING   →   MinimumTime: 15m  →  Heat Load:100%   →  Cool Load:100%   →

(+)               (+)
                  (-)

(-)                   F:HEAT.+ COOLING     F:HeatThold: 5%      F:CoolThold: 5%      Fault for :180s
                      MinTime    : 15m  →  Heat Load:100%   →   Cool Load:100%   →   OutputsON:ABCDEF    →
```

**17.**

```
Choice menu +/-       Number of zones      Outputs zone:   1    Password choice
ZONES SETTINGS    →   connected:    20  →  Heat.:A Cool.: -  →  ----               →
```

**18.**

```
Choice menu +/-       Output:A
TESTING           →   Status:OFF         →
```

(←) (→)  Keys for scrolling the display pages and positioning the cursor on adjustable data on the pages.

The adjustable data, in the following descriptive list of display pages, are highlighted thus ▓▓▓▓

By pressing these keys at the same time for a few seconds, or if no buttons are pressed for 15 minutes, the first page appears
```
Zone:  1 -> OK
Unreceived:  0
```

(-) (+)  Keys for : – adjusting the values indicated by the cursor.

– seeing the options for configuring a function, e.g :
```
A:HEAT.+ COOLING
MinimumTime:   0m
```
or
```
A:HEATING
MinimimTime  :15m
```

– passing directly from one menu (series of pages) to another.

## 15. NORMAL USE

| REf. | Display | Description | Notes | Sect. |
|---|---|---|---|---|
| 15.1 | `Zone: 1 –> OK` `Unreceived: 0` | • Zone read – result of readout:<br>– OK = readout made correctly<br>– ?? = wrong data from readout<br>– . . = zone has not replied<br>• Total number of unreceived zones. | Readout cycle completed on zones entered in **16.5**. | 11. |
| 15.2 | `Output: A` `AUTOMATIC` | • Choice of desired output<br>• Type of control to apply to output:<br>– AUTOMATIC; – ON; – OFF. | + and – keys to go quickly to other outputsuscite. | 11.1 |
| 15.3 | `Zone load 1..` `Heat:100Cool:100` | Appears before readout of first zone.<br><br>Page displaying loads for each zone:<br>• Zone displayed;<br>• Desired heating load from zone displayed;<br>• Desired cooling load from zone displayed.<br>• Result of communication with zone displayed:<br>– OK = readout correct;<br>– ?? = wrong data from zone;<br>– . . = zone has not replied. | | 13.2 |
| 15.4 | `UCP 664 C1 Eng` `Vers.xx` | Identifying data of controller. | | |

## 16. OUTPUTS SETTING

| Ref. | Display | Description | Notes | Sect. |
|---|---|---|---|---|
| 16.1 | `A:HEATING` `MinimumTime: 15m` | • Choice of desired output<br>• Configuration of loads associated with output:<br>– HEATING;<br>– COOLING;<br>– HEAT. + COOLING<br>• Minimum time period in which output remains On, when switched On, or remains Off when switched Off. | + and – keys to pass quickly to other outputs | 11.1 |
| 16.2 | `A:HeatThold: 5%` `Heat Load:100%` | • Choice of desired output<br>• Threshold of heating load intervention<br>• Calculated heating load | Appears only if **16.1** configured: "HEATING" | 11.3 |
| 16.3 | `A:CoolThold: 5%` `Cool Load : 0%` | • Choice of desired output<br>• Threshold of cooling load intervention<br>• Calculated cooling load | Appears only **16.1** configured: "COOLING" or "HEAT. + COOLING | 11.3 |
| 16.4 | `Fault for :180s` `OutputsON:ABCDEF` | • Duration of communication break in CosterBus for intervention safety status;<br>• Choice outputs On during safety status | - letter A … F : relative output = On<br>- "–" : relative output = Off | 12.1 |

## 17. ZONES SETTING

| Rif. | Display | Description | Notes | Sect. |
|---|---|---|---|---|
| 17.1 | `Number of zones` `connected: 20` | Total number of zones connected in CosterBus | | 11.2 |
| 17.2 | `OutputsZone: 1` `Heat.:A Cool.: -` | • Coiche of desired zones<br>• Pairing zone displayed to output used for heating<br>• Pairing zone displayed to output used for cooling | • In "Heat" appear only the outputs configured as "HEATING" in **16.1**.<br>• In "Cool" appear only the outputs configured as "COOLING" in **16.1**.<br>• The dash indicates that respective load not counted. | 11.2 |
| 17.3 | `Password choice` `- - - -` | Choice keynumber to disable + and –keys.<br>– 1901 … 1999 | To eliminate keynumber press + and – at same time. | 12.2 |

## 18. TESTING

| Rif. | Display | Description | Notes | Sect. |
|---|---|---|---|---|
| 18.1 | `Output:A` `Status:OFF` | • Choice of output to test: A … F<br>• Choice of output status: – ON; – OFF. | | 13.1 |

**Amendment to data sheet**

| Date | Revision No. | Page | Section | Details of amendment |
|---|---|---|---|---|
| 12.06.00 | | all | General | Construction data sheet |
| 06.07.09 MC | **01** | 3<br>4 | 11. OPERATION<br>12. COMPLEMENTARY<br>FUNCTION | Update section WARNING!<br>Uddate section 12.1. Safety intervention |

We reserve the right to make changes without notice