

ELECTRONIC ROOM TEMPERATURE CONTROLLERS

C ← BUS

RTB 044 - 144 C3 Eng.
RTB 044 - 144 C1 S1 Eng.



- On-Off control of room temperature
- Three-speed control of fan and On-Off control of heating or cooling valve
- Room temperature sensor incorporated or alternative remote sensor
- Season switching: single (only for RTB..44) or centralised by UMT 704
- Option of adjusting temperature from controller or remotely
- Room occupied/unoccupied option (only RTB..44 S1)
- C-Bus connection to central display unit



1. APPLICATION

RTB 044/144 and RTB 044/144S1 controllers are designed for the control of room temperature in heating and air conditioning plants in: hotels and guest-houses, residential homes, commercial centres, schools and public buildings. They can be used :

- as single controllers without timed programming (RTB 144 and RTB 144 S1),
- as controller in a multizone system with autonomous timed programming, if connected via C-Bus to UMT 704 central display unit .

The following output controls are available :

- 1 On-Off output with three-wire electric control (common, opens, closes),
- 3 On-Off outputs for control of fan speed (for heating or cooling).

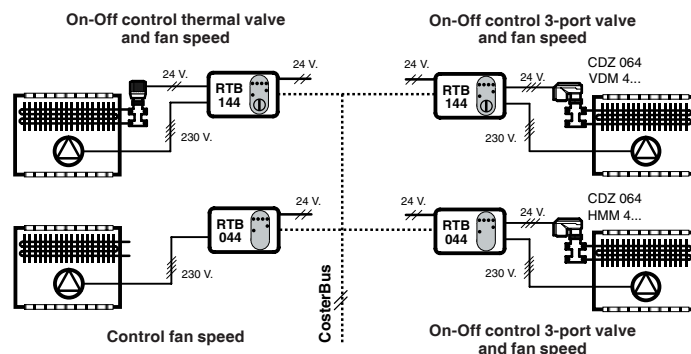
2. MODELS

Model	Window switch	Room occupied switch	Season switching	Set-point adjuster incorporated	Detector & set-point adjuster
RTB 044	Yes	No	Local or centralised	No	Yes
RTB 144	Yes	No	Local or centralised	Yes	Yes
RTB 044 S1	Yes	Yes	Centralised	No	No
RTB 144 S1	Yes	Yes	Centralised	Yes	No

3. ACCESSORIES

Description	Model	Sensing element	Code
Remote detectors (only for RTB .. 44): of room temperature :	SAB 010	NTC 10 kΩ	B1
or room with + 1 hour key	SAB 210	NTC 10 kΩ	B1
or room with set-point adjuster (only RTB 044)	SCB 110	NTC 10 kΩ	B3
or room with + 1 hour key and set-point adjuster (only RTB 044)	SCB 210	NTC 10 kΩ	B3
or for heating/cooling coils	STT 010	NTC 10 kΩ	B2
or for air duct	STA 010	NTC 10 kΩ	B2
Invertor cable for window switch (from open to closed and vice versa)	AIC 240	-	-

4. SCHEMATIC DIAGRAMS



5. TECHNICAL DATA**• Electrical**

Power supply	24 V ~ ± 10%
Frequency	50 ... 60 Hz.
Consumption	4 VA
Electromagnetic compatability	CEE 93/68
Voltage-free output contacts :	
Maximum switched voltage	250 V ~
Maximum switched current	5 (1) A
Construction standards	Italian Electrotech. Committee (CEI)

• Mechanical

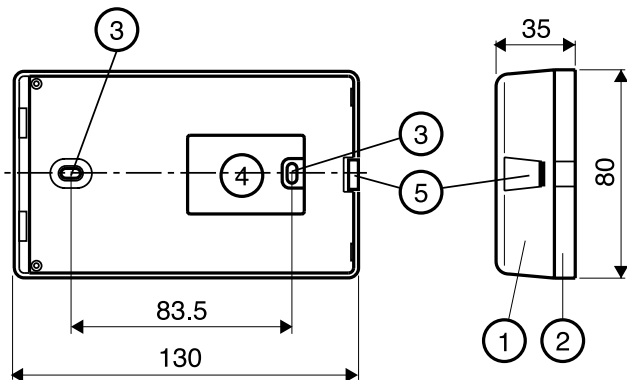
Enclosure	DIN 6E module
Materials :	
Base	NYLON
Cover	ABS
Ambient temperature :	
Operating	0 ... 45 °C
Storage	- 25 ... + 60 °C
Ambient humidity	Class F (DIN 40040)
Protection	IP 30
Weight	170 g
Heating or Cooling output :	
Control valve	On-Off
Control fan	3 On-Off

• Factory setting:

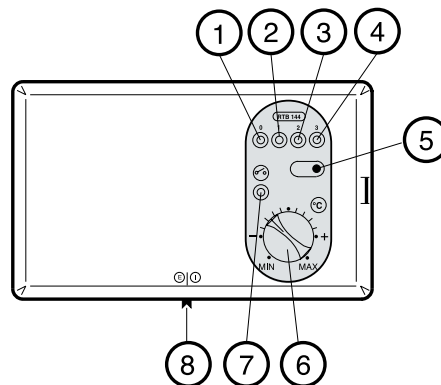
Temp. heating Day	20 °C
Temp. heating Night	16 °C
Temp. Frostprot	6 °C
Temp. cooling Day	25 °C
Temp. cooling Night	excluded
Half-load cycle	± 8 min.
Proportional Band - Heating	± 2 °C
Proportional Band - Cooling	± 1 °C
Integral Time - Heating	20 minutes
Integral Time - Cooling	20 minutes

• Settings ranges from UMT 704 central unit::

Temp. Heating (Day-Night)	---- (excluded) ... 25 °C
Temp. Cooling (Day-Night)	---- (excluded) ... 30 °C
Limits local set-point adjuster - Heating (RTB 144)	0 ... + 5 °C
Limits local set-point adjuster - Cooling (RTB 144)	0 ... - 5 °C
Half-load cycle	10 ... 510 seconds
Proportional Band	± 0,5 ... ± 10 °C
Integral Time	1 ... 99 minutes

6. OVERALL DIMENSIONS

- 1 – Protective cover
- 2 – Base
- 3 – Holes for fixing screws
- 4 – Cable entry hole
- 5 – Cover/base securing clip

7. FACIA

- 1 – Fan Off LED
- 2 – First fan speed LED
- 3 – Second fan speed LED
- 4 – Third fan speed LED
- 5 – Maximum fan speed button
- 6 – Set-point adjuster
- 7 – Valve control LED
- 8 – SUMMER- WINTER switch (only for RTB .44 C2)

8. INSTALLATION

RTB .44 / .44 S1 controllers, if using the incorporated room detector, must be installed at a height of 1.5 to 1.6 metres from the floor, on an internal wall of the space and at a point which represents the average temperature. They must be as far as possible from windows, doors and sources of heat and corners and curtains must be avoided. If a remote detector is used (only for RTB..44) the controller can be installed anywhere convenient..

• Separate the base and cover :

- Using a screwdriver, release the cover/base securing clip (6.5).
- Rotate the cover on the hinge elements until it separates from the base.

- Fix the base on the wall or on the panel-mounting patress using the pre-drilled holes (6.3), taking care to pass the electric cables through the cable entry (6.4).

Warning :

- If the wall is not perfectly flat, do not tighten up the fixing screws too much otherwise the base will become deformed and it will be difficult to replace the cover.
- If the base is mounted on a panel-mounting patress, the sensor may become colled by cold air from the cable duct. In this event the rear of the controller base must be installed.
- If the controllers are connected, via C-Bus, to a management system, assign to each of them an address before re-mounting them on their bases.
- Replace the cover on the base by inserting the hinge elements and closing the two parts carefully until they snap into place.

9. OPERATION

RTB 044/144 and 044/044S1 are a range of microprocessor-based temperature controllers with all the setting data pre-set. The data for heating and cooling are separate and the controllers use one or the other according to the local (7.8) or centralised season switching. When they are connected to a management system via C-Bus parallel connection they can use 24hour and 7day programs.

9.1 Temperature monitoring

Room temperature is measured by an incorporated NTC 10kΩ or (for RTB..44 only) by a remote detector which, if jumper 12-13 is removed, automatically excludes the internal sensor.

In event of use as remote sensor of an analogue output of another controller, it is necessary to respect the polarity.

The output B is connected to terminal 14 and output M to terminal 15.

The value of the desired temperature (heating or cooling) can be modified using the incorporated set-point adjuster (7.6) or by means of the set-point adjuster on the room temperature detector SCB 110 or SCB 210.

It is possible to limit the adjustment range mechanically by means of two stops; or electronically if the controller is connected to UMT 704 central display unit.

9.2 Outputs

- 1 voltage-free On-Off SPDT output for control of valve,
- 3 voltage-free SPST outputs for control of fan speed.

9.3 Operating features

When the output is 0% the valve control is always Off; when it is 100% the valve control is always On.

To control the fan, two methods are available :

- automatic: the fan speed is established by the controller according to the demand for heat and the maximum speed set by the user (button 7.5)
- manual : the fan speed is fixed and does not vary according to the demand for heat..

The choice of the operating mode can be made from UMT 704 central display unit or using the telemanagement program.

The maximum fan speed set is signalled by the controller by means of a LED on the fascia.

9.4 Season switching

It is possible to invert the outputs i.e. to pass from winter to summer operation, in two ways :

- single switching by means of the incorporated season switch (7.8). This operation cannot be carried out on RTB 044/144S1 controllers.
- centralised by means of the UMT 704 central display unit.

9.5 Window switch

An electric switch installed on the window of the space controlled and connected to terminals 16-17, permits switching on the heating to Frost Protection or excluding cooling, when the window is opened.

9.6 + 1 hour key

The room detectors SAB 210 and SCB 210 are provided with a key which permits the user to extend by one hour the heating period at normal (day) temperature. The key does not function in cooling periods.

This function cannot be used with RTB 044/144 S1 controllers.

9.7 Timer switch

RTB controller, if connected via C-Bus to UMT 704 central display unit can operate as a timer switch (the room detector must be excluded by removing the jumper between terminals 13 and 14).

9.8 Room occupied switch

In RTB..44 S1 an input is available (terminals 14-15) for the automatic selection of two different operating programs according to the status of the input:

- room occupied program (e.g. normal 20°C) when input live;
- room unoccupied program (e.g. setback of off).

You can choose if the input is to be active with switch closed or open.

10. ELECTRIC WIRING

Carry out the electric wiring according to the diagrams and in accordance with the regulations in force, using the following types of cable:

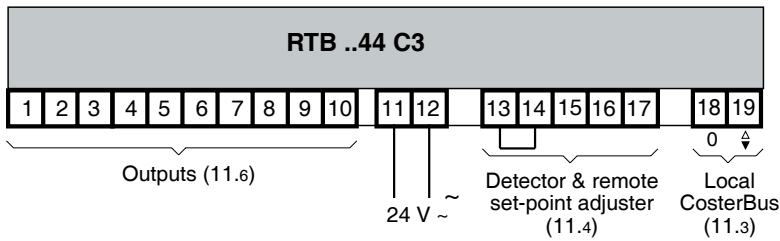
- Power supply 24 V~ and actuator: 1.5 mm² cables;
- Connections detectors and remote controls: 1mm² minimum cables.
- **C-Bus connections: 1.5 mm² cables of two different colours; maximum length 5 km.**

Pay careful attention to polarity.

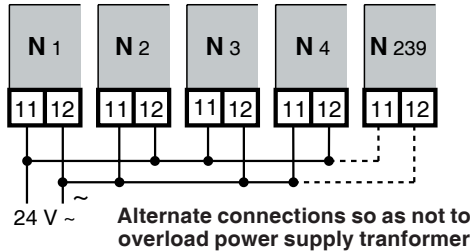
You are advised not to insert more than two cables in a single terminal and, if necessary, to use an external terminal block.

11. WIRING DIAGRAMS

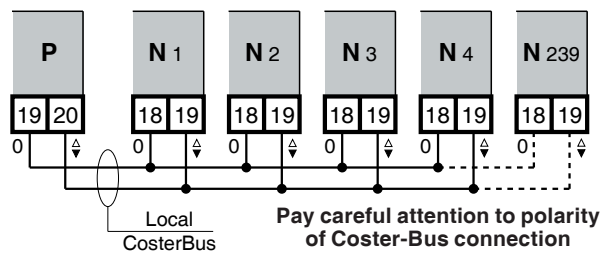
11.1 General



11.2 Centralised power supply



11.3 C-Bus connection with central unit



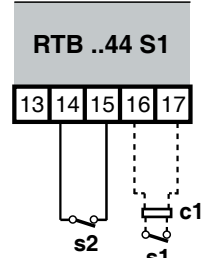
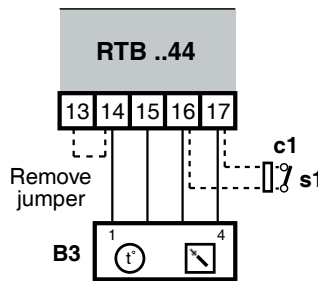
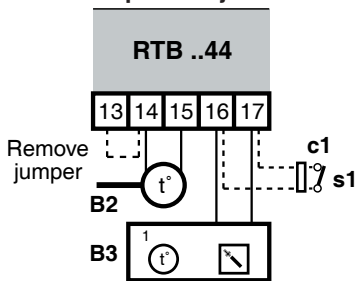
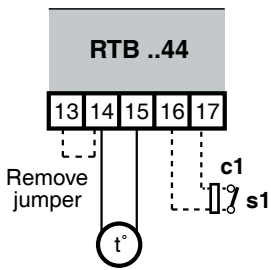
11.4 Detectors & remote set-point adjuster (only for RTB .44)

Room detector or fan-coil extract air

Fan-coil extract air detector & remote set-point adjuster

Room detector & set-point adjuster

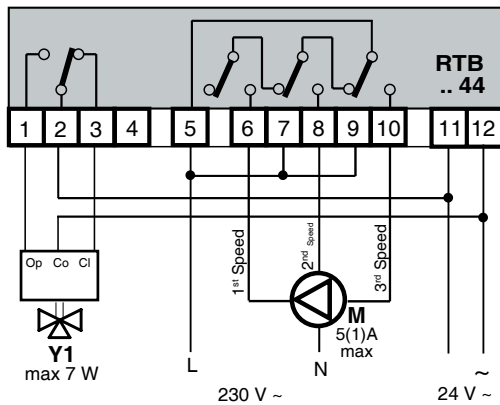
11.5 Room occupied switch
S2 = Room occupied switch only for RTB .44 S1



To use internal sensor leave jumper 13-14
With remote sensor remove jumper 13-14
With remote sensor from analogue output. The M output = 0 V goes to terminal 15.

NB: c1 - For electrical connection see Technical Data Sheet D 615 - AIC 240

11.6 Outputs



- B1 – SAB 010 room detector
 - B2 – STT 010 fan-coil extract air detector or STA 010 air duct detector
 - B3 – SCB 110 room detector with set-point adjuster
 - P – UMT 704 central display unit
 - N – RTB..44 controllers
 - c1 – AIC 240; reversal cable for window switch;
 - s1 – Window switch
Window open = switch closed & controller on Frost protection
 - s2 – Room occupied switch N.C. or N.O.
 - Y1 – Valve with 3-wire control
 - M – Fan-coil fan
- WARNING: The AIC 240 cable is required only if it is necessary to reverse the operation of the window switch (s1)

Date	Revision No.	Page	Section	Details of amendments	Firmware Version	Software Version
21.06.06 MZ		3	9.3 Operating features	The speed control relay as been improved		
13.07.06 MZ		3	9.1 Temperature monitoring	Note included regarding use of remote sensor		
16.10.06 MC		4	11.4 Sensors & set point adjuster	Inserted detail for reversal window switch (cable AIC 240).		
26.09.07 MC	01	4	11.6. Outputs	The numbers of the terminals shown in the actuators have been eliminated	07	≥ 0.98.2295



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