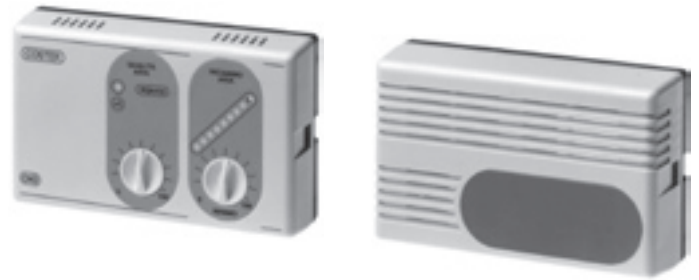


# AIR QUALITY CONTROLLER & DETECTOR

## RQA 410 - SQC 954 - SQS 954 Eng.



- **Dual-function controller**
  - Air quality control
  - Control minimum change of air
- **Dual output controller**
  - Progressive control of dampers
  - On-Off control extract fan or increase speed
- **Detector**
  - Sensor for monitoring general pollution (hydrogen, carbon dioxide, ethyl alcohol, etc)
  - Sensitivity similar to that of human sense of smell
- **Possibility of connecting several detectors in parallel (SQC 954)**



### 1. APPLICATION

Air quality controller RQA 410 is designed for use in air handling installations for spaces in which the number of persons present can vary greatly:

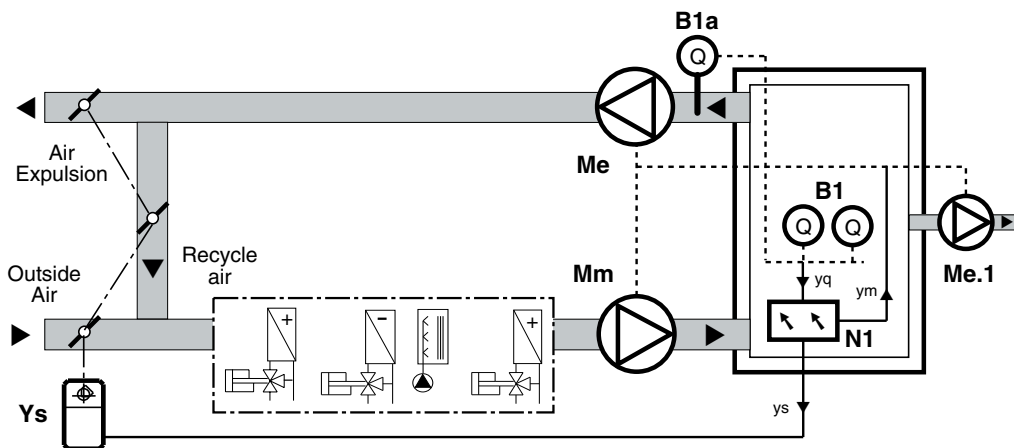
- canteens and restaurants
- lecture rooms and gymnasiums
- board rooms
- cinemas and theatres

Regulates, by controlling the damper motors, the quantity of outside air entering the space in relation to the air quality. This quality is monitored by one or more ambient detectors SQC 954, or by air duct detectors SQS 954. According to the minimum quantity of outside air requested switches the fans on or off. The controller cannot be used as a safety system for fire protection or gas leaks.

### 2. CONTROLLER & DETECTORS

Type	Description	Power supply	Pollution measurement range	Control dampers	Control fans
<b>RQA 410</b>	Air quality controller	24 V~	–	0...10 V –	On-Off
<b>SQC 954</b>	Ambient air quality detector	24 V~	1...100 ppM (H <sub>2</sub> )	–	–
<b>SQS 954</b>	Air duct air quality detector	24 V~	1...100 ppM (H <sub>2</sub> )	–	–

### 3. FUNCTIONAL DIAGRAM



B1 – Air quality ambient detector SQC 954  
 B1a – Air quality duct detector SQS 954  
 N1 – Air quality regulator RQA 410  
 Me – Plant extractor fan  
 Me.1 – Air renewal extraction fan

Mm – Plant discharge air fan  
 Ys – Dampers actuator  
 yq – Air quality signal  
 ym – On-Off control fans  
 ys – 0...10 V – control dampers

**4. TECHNICAL DATA****RQA 410 controller**

Power supply	24 V~ ± 10%
Frequency	50...60 Hz
Consumption	2 VA
Protection	IP30
Construction	According to Italian Electrotechnical Committee (CEI) standards
Input signal	0...8 V -
Outputs:	
- Progressive	0...10 V -
- On-Off voltage-free:	
- contacts	SPDT
- maximum switching voltage	250 V~
- maximum switching current	5 (1) A
Settings:	
- Air quality value requested	0...100 (stale air...clean air)
- Minimum value air change	0...100 (all air recycle...all outside air)
Signals:	
- Progressive output	9 LED (1...10 V -)
- On-Off output	1 LED
	Off = 6-7 closed ; 7-8 open On = 6-7 open ; 7-8 closed

Ambient temperature :

- operation

0...45 °C

- storage

- 20...+60 °C

Dimensions

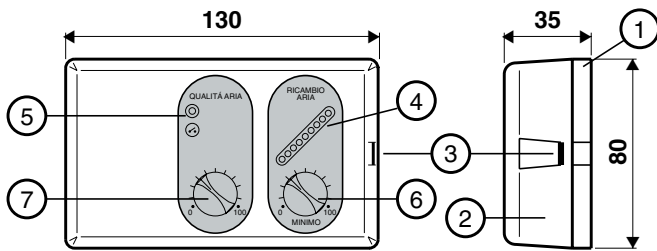
130 x 80 x 35

Weight

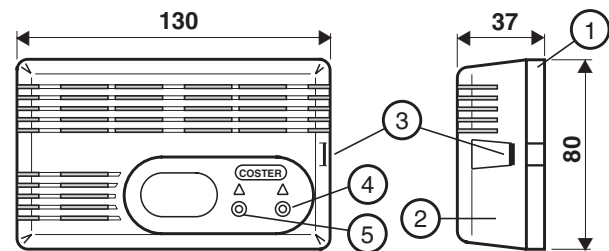
170 g

**SQC / SQS 954 detector**

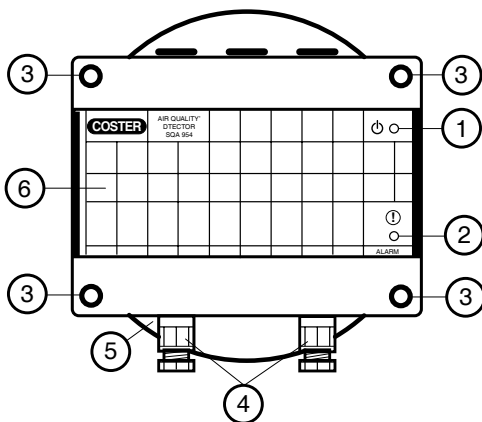
Power supply	24 V~ ± 10%
Frequency	50...60 Hz
Consumption	2 VA
Protection :	
- SQC 954 (container)	IP 42
- SQS 954 (container)	IP 54
Construction	According to Italian Electrotechnical Committee (CEI) standards
Output signal	0...8 V -
Ambient temperature :	
- operation	0...45 °C
- storage	- 20...+60 °C
Dimensions :	
- SQC 954	130 x 80 x 37
- SQS 954	105 x 83 x 231.5
Weight (SQC 954)	170 g
Weight (SQS 954)	300 g

**5. OVERALL DIMENSIONS RQA 410**

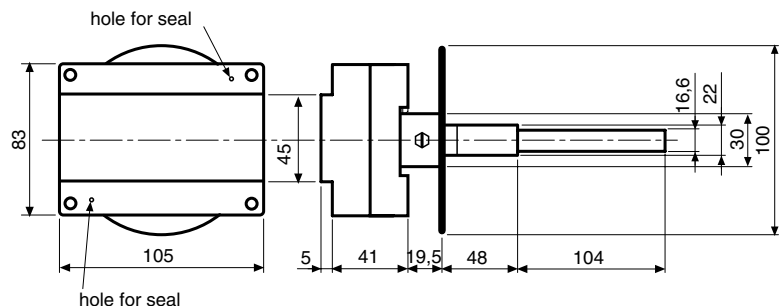
- 1 - Base
- 2 - Cover
- 3 - Cover securing clip (press to open)
- 4 - Indicator progressive position dampers
- 5 - Indicator status On-Off switch fans
- 6 - Value of Minimum Air Exchange
- 7 - Value of air quality threshold

**6. OVERALL DIMENSIONS SQC 954**

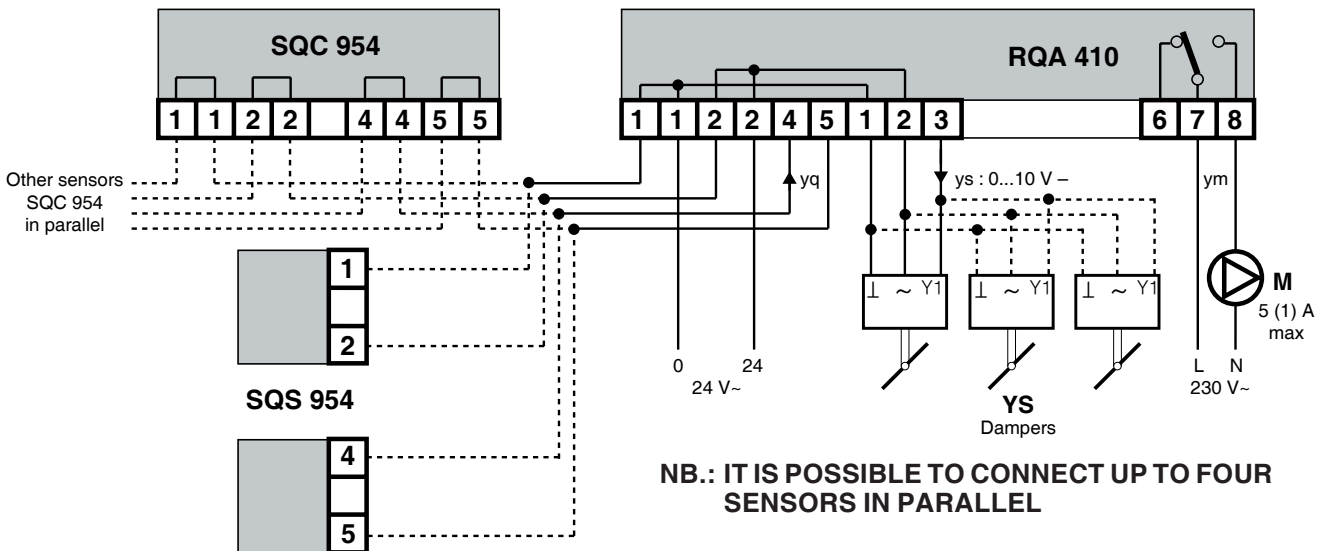
- 1 - Base
- 2 - Cover
- 3 - Cover securing clip
- 4 - Fault LED
- 5 - Line LED

**7. FACIA SQS 954**

- 1 - Line LED
- 2 - Fault alarm LED
- 3 - Cover securing screws
- 4 - Cable entry glands
- 5 - Fixing flange
- 6 - Protective cover

**8. OVERALL DIMENSIONS SQS 954**

**9. WIRING DIAGRAM**



**10. WIRING**

Proceed as follows:

- Install RQA 410 controller in the most suitable position in the space.
- Install ambient detector SQC 954 or SQS 954 in the air duct in a suitable position and remove the cover.
- Make the electrical connections as in the wiring diagram, in accordance with the safety regulations in force, and using the following cable types:
  - 1.5 mm<sup>2</sup> for power supply and the relay output controls and damper motors
  - 1 mm<sup>2</sup> for the detectors
- Switch on the power supply (24 V~) and check its presence at terminals 1 and 2
- Check that the power (0...10 V –) is reaching the damper motors; terminals 1 and 3
- Replace the cover and secure it with its screws

It is advisable not to insert more than two cables in a single terminal and if necessary to use external terminals

**11. INSTALLATION**

**Controller RQA 410**

Must be installed where it can be seen and be easily accessible so that the authorised people can check the readings and adjust, according to requirements, the desired values.

**Detector SQC 954**

If the space controlled is very large several detectors, connected in parallel, should be installed. They must be positioned at the height of a man, and as far as possible from windows, doors and heat sources; corners and curtains, which may mask them from the free circulation of air, must be avoided.

**Detector SQS 954**

The detector must be installed on the extract ambient air duct, as near as possible to its protection grill at a point where it will not be subject to any turbulences created by the fan (position it as far away from it as possible).

**12. TESTING**

- Check the electrical connections and power up the controller and the detectors: LED (6.5 – SQC 954) or (7.1 – SQS 954) lit.
- Set Air Quality (5.7) and Minimum Change Air (5.6) on 0: outside dampers and expulsion closed, recycling damper open.
- Set Minimum Air Change (5.6) at 50: outside dampers, expulsion and recycling open 50%.
- Set Minimum Change Air (5.6) at 100: outside dampers and expulsion open, recycle damper closed.

**13. SETTING & USE**

The setting can be carried out after the detector has been charged continuously for at least 48 hours and the space is being used normally

- Set Air Quality (5.7) and Minimum Exchange Air (5.6) on 0.
- When the air in the room becomes stuffy, increase gradually the Air Quality setting until the fans LED (5.5) lights. The number of LEDs lit (5.4) indicates the percentage opening of the outside air damper. If the fans LED does not light up even when Air Quality is at 100 this means either that the pollution level is not high or that the detector has not been well sited.
- Set Minimum Air Change to a value of about 50% of the Air Quality value.
- If the ambient air does not become “clean” in a reasonable time (10... 15 minutes), increase by one unit the Air Quality value.
- If, after the air has become “clean” again, it is noted that the position of the dampers continues to remain at the value set by Minimum Air Change, reduce by one unit the Minimum value.
- If LED (6.4 - SQC 954) or LED (7.2 - SQS 954) light up this means that the detector is faulty.

**Amendments data sheet**

Date	Revision No.	Page	Section	Details of amendments
27.02.07		3	9. WIRING DIAGRAM	Update wiring diagram
11.09.07 DA	<b>01</b>	3	9. WIRING DIAGRAM	Add note about sensors connection

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