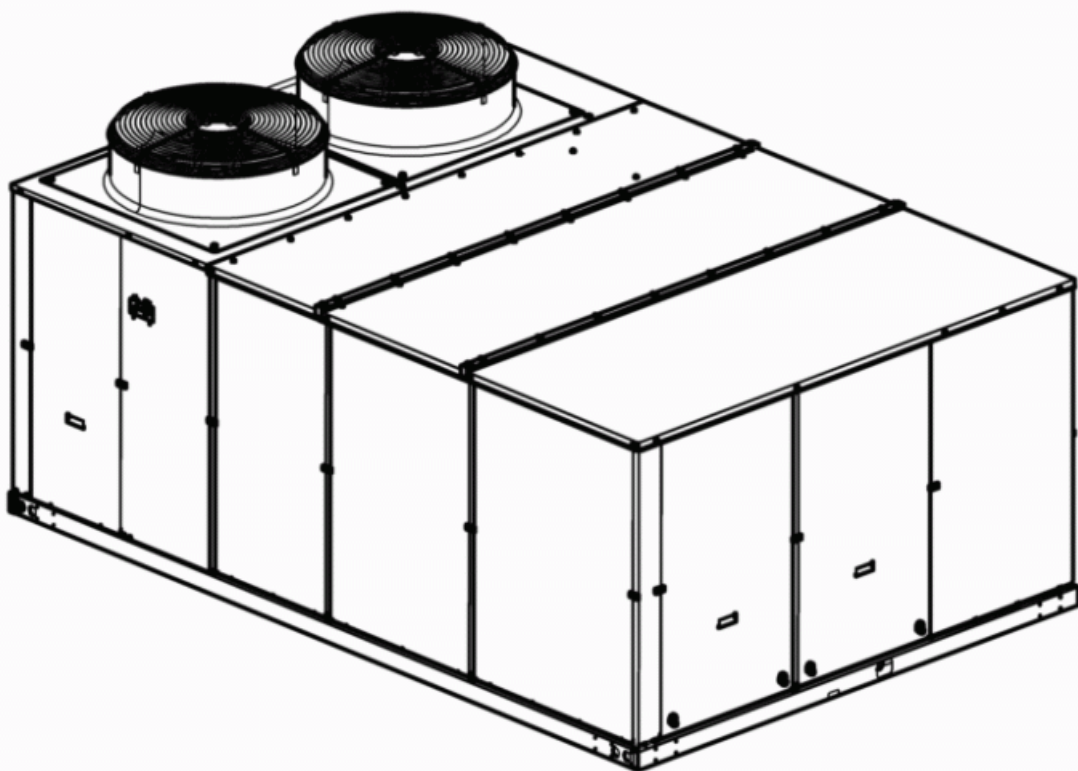




BY JOHNSON CONTROLS

Indoor air quality sensor.



Options and Accessories, Installation manual

Ref.: N-40175_EN 1107



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Indoor air quality sensor

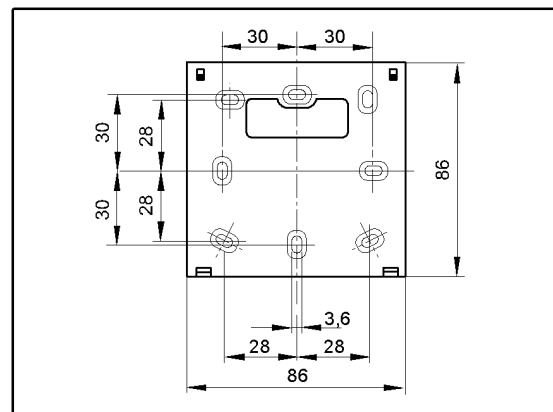
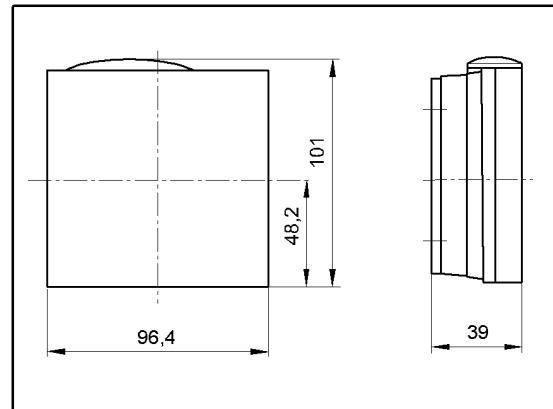
1.1 General Information

The sensor measures the degree of pollution due to different reasons such as the level of room occupancy, tobacco, kitchen smoke, carbon monoxide, etc. When the pre-set limits are exceeded, the control acts on the economiser, adjusting the outside air damper.

This option requires the economiser for it to work properly.

1.2 General measurements

Measurements in mm



1.3 Technical specifications

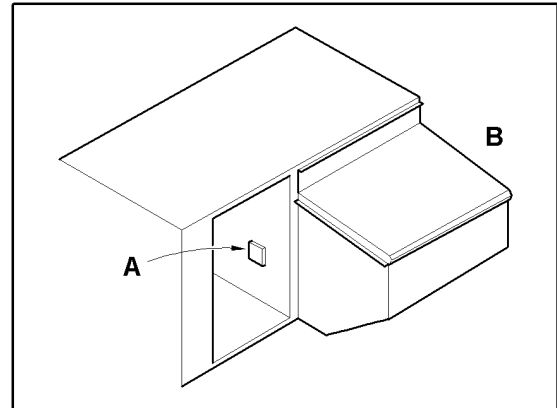
This accessory includes the following components:

- Air quality sensor.
- Signal conversion board from 230 V AC to 5 V DC.
- Connection cable for sensor fitting inside machines.

1.4 Assembly

Sensor installed on the return side inside the machine

- A. Indoor air quality sensor.
- B. Rain protection assembly and economiser (existing).



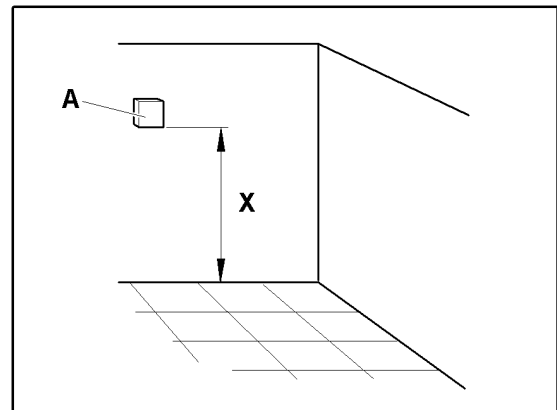
Sensor installed in room

The place where the indoor air quality sensor is to be installed in the room -**A**- must be representative of its air quality level.

It must be installed on a wall free of obstacles at a distance of 1.5 to 3 m from the floor.

Sensors should not be installed behind curtains or shelving or in gaps or areas where people are permanently present (in this case, the minimum distance should be 1 to 2 metres).

$X = 1.5 \div 3 \text{ m}$.



1.5 Operations

The air quality sensor has a VOC (volatile organic compounds) sensor that compares their concentrations in the air with the setting selected on the sensor. Where the value is higher than the setting, the sensor triggers output Y1 using a relay.

The 230 V AC output signal between Y1 and N is connected to conversion board of 230 V AC to 5 V DC. This board is fitted alongside the economiser control board. The 5V DC signal cable must be connected on connecting J18 on the economiser board.

Where the thermostat setting temperature of the room is met and there is an air quality request signal, the damper is opened to the programmed renewal minimum and the inside fan starts up. The damper then opens further, bearing in mind the maximum (30 °C) and minimum (12 °C) supply temperatures.

In the following cases:

- Disappearance of the air quality request signal,
- the thermostat makes a cold or heat request

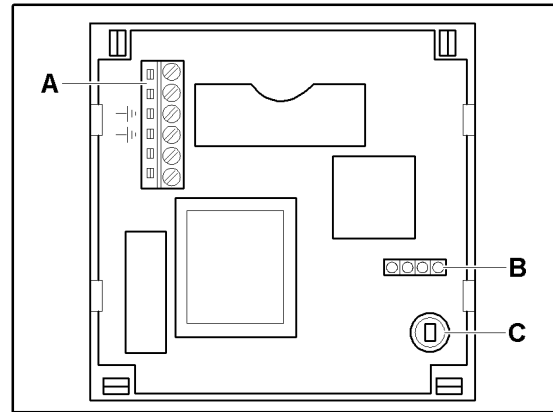
The damper returns to the renewal minimum. Where there is no request from the thermostat and the inside fan is in automatic mode, the fan will stop and the dampers will close.

1.6 Installation

- A. Connection terminals.
- B. Air quality level selection.
- C. VOC sensor.

Three air quality levels can be selected on the sensor according to the bridge positions:

- 0: Normal, default position.
- : Acceptable.
- +: Very good.



1.6 Installation



NOTE

- *The electrical connection for the sensor will be different depending on the place where it is installed.*
- *Bear in mind the current regulations in the country where the equipment is to be installed.*

Disconnect the power supply to the unit using the main switch -Q3- (See Installation Manual).

Install the air quality sensor on the return side of the economiser separator panel or inside the room.

Install the 230 V AC to 5 V DC signal conversion board alongside the economiser board. Previously remove the plastic cover and secure the board using the plastic separators on the plate support.

Connect the 5 V DC signal cable on connecting J18 on the economiser board.

Sensor installed on the return side inside the machine:

Connect the black and blue wires (386 and 387) of the economiser cable (inside the cable ducting on the electrical box side) to X1 terminals L and N, respectively. Then connect air quality sensor terminals L and N.

Run the brown (Y1) and blue (N) wires from the sensor to the signal conversion board.

Sensor installed in room:

Install a 4 x 1 mm² cable (black, blue, brown and yellow-green) from the electrical box on the unit to the location where the sensor is to be installed in the room.

Connect the black (L), blue (N), brown (Y1) and yellow-green (earth) wires to the X1 connector terminals and to the sensor. Then connect wires 387 (N) and 386 (Y1) to the side of the electrical box (connector X1) and to the side of the signal conversion board.

Checking the correct working order of the sensor:

Set the thermostat so that the room temperature is met.

Bridge terminals L and Y1 or make the sensor detect smoke to check that the output relay is triggered. The damper should open very slowly.



CAUTION

Loose connection terminals produce overheating of cables and terminals. The unit is working incorrectly and there is a risk of fire.

Check that the cables are firmly secured to their connection terminals.

**CAUTION**

Do not turn on the general switch on the unit or start the unit until all installation work has been completed.

1.6.1 Buttons and LED

Buttons

There is a button on the main electronics board called the test button that has several functions depending on the way it is pressed:

- As a LonWorks service pin: whenever it is pressed, it sends the Neuron ID via the LonWorks network.
- Shortens certain times and resets any fault detected if pressed until the green LED lights up.
- Identifies the optional accessories and sensors connected to the board if kept pressed down until the red LED lights up.

LED

There are three LED signalling diodes:

- The green LED indicates whether the equipment is working properly or if there are incidents. If the equipment is working properly, this LED will flash at a frequency of 1.43 Hz. (0.70 sec).
- The red LED indicates faults. If there are not faults, the LED will remain switched off. It also lights up when accessory configuration is being scanned.
- The yellow LED performs the functions of the LonWorks service LED and also indicates that a compressor time is running when it flashes.

Where the red and green LED remain lit, the configuration must be reloaded on the board. It can only pass through communications in the event of decommissioning.

There is a green LED on all accessories that flashes when communications are sent to them. It will therefore indicate that it has been correctly identified. If the LED remains on, it indicates that the accessory is powered but either it has not been correctly identified or it is not receiving the communications.

There is a yellow LED on the economiser that indicates that the outside air is favourable when it is lit and a button that, together with the potentiometer, stores the renewal minimum position (see the Economiser Installation Manual).

There is also a yellow LED on the hot water coil that indicates if the water temperature is favourable (LED remains lit) or if the coil is performing a defrost function (LED flashing).

1.6.2 Configuration

Every time the electronic board is powered with 24 V AC the system configuration is checked as follows:

- 1 Micro-switch reading.
- 2 Communications transceiver identification.
- 3 Thermostat communication check.
- 4 Check and enabling of all located accessories.

The first two tasks are not carried out at any other time. The third is carried out once a minute when communication cannot be established. The fourth task is also carried out on resetting faults and when accessories are located.

The micro-switches are consulted every time the electronic board is powered with 24 VAC. The board will act according to their positions.

**NOTE**

Where SW1 and SW2 are OFF, configuration is carried out remotely via the communications system.

Micro-switch configuration:

Number	Status	Meaning
1 / 2	OFF/OFF	Pay no attention to the SW, they are programmed via communications.
	ON/OFF	Defrosting time 0 sec.
	OFF/ON	Defrosting time 60 sec.
	ON/ON	Defrosting time 90 sec.
	ON	Crossed coils.
	OFF	Independent coils.
4	ON	Compressor delay 2 sec.
	OFF	Compressor delay 5 sec.
5	ON	Cold only selection.
	OFF	Heat pump selection.
6	ON	4-way valve active in heat.
	OFF	4-way valve active in cold.
7	ON	Thermostat with signal B.
	OFF	Thermostat with signal O.
8	ON	Fan enabled during defrost.
	OFF	Fan disabled during defrost.

Transceiver ID

Every time the electronic board is powered with 24 V, the transceiver installed is recognised and the communications parameters adapted. If the identifier is unknown, an incident will be indicated.

When an SMX transceiver is used, the green LED on the board will flash at a frequency of 0.8 Hz (1.25 sec) to indicate that it has recognised it.

1.6.3 Accessories and sensors

Accessories are installed for the extended operating of the equipment. These accessories can be factory or site-fitted.

Disconnect the power supply to the unit using the main switch **-Q3-** (See Installation Manual).

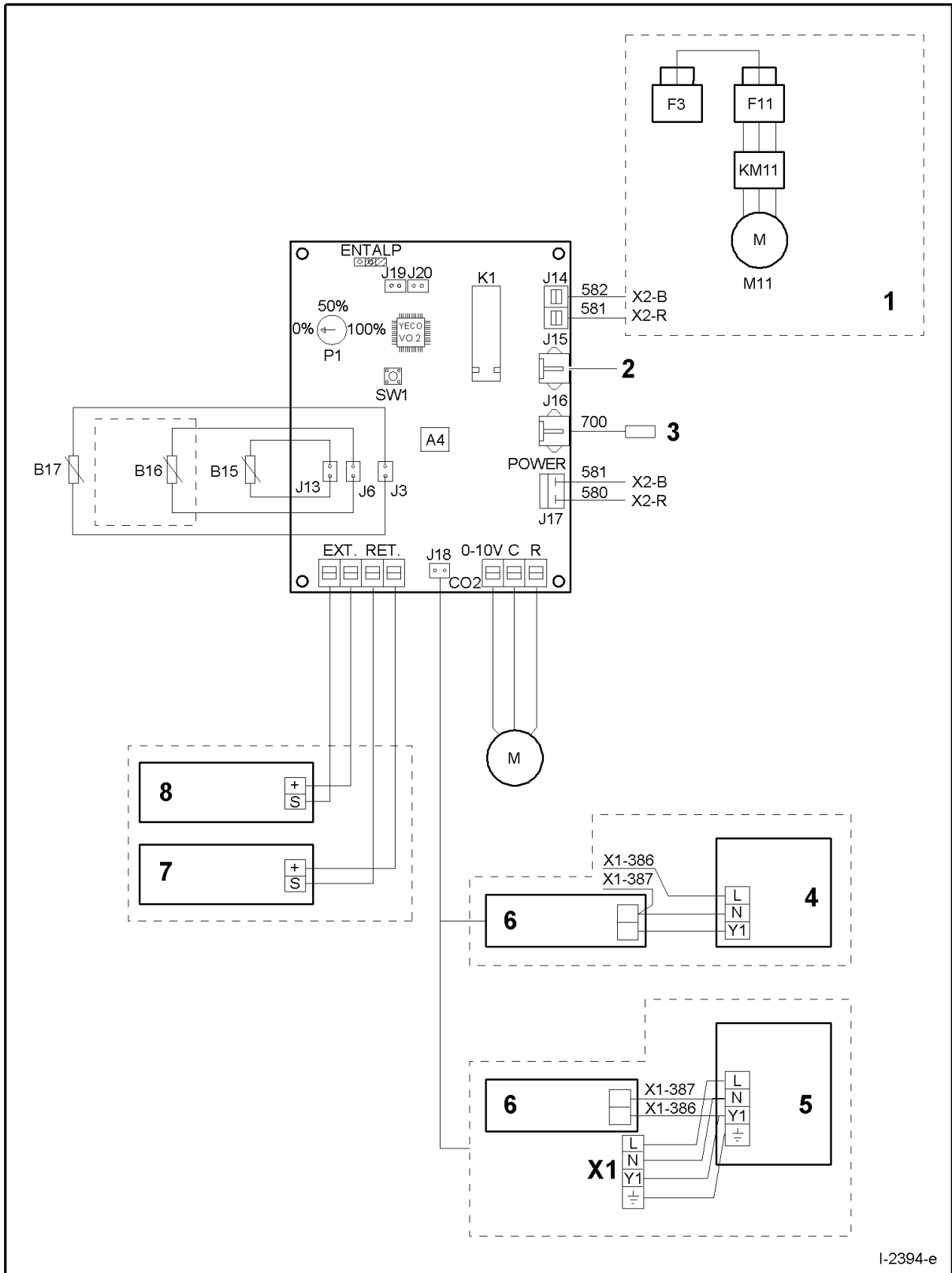
Then install the accessory and all necessary parts and re-connect the power supply.

Press the test button for more than three seconds to search for and configure the accessories installed until the red LED lights up. When the search and configuration process starts, the red LED on the board will light up and will remain on until the operation is completed. Once switched off, the board will manage the located accessories.

The optional sensors to be connected to the board are also chosen during the search. If any of the optional sensors configured ceases to generate correct values, an incident is generated.

In the case of the supply sensor, which may be fitted to connector J6 on the second compressor board, to connector J6 on the economiser board or to connector J6 on the hot water coil board, an attempt will first be made to identify it on the second compressor and, where it is not located, on the economiser or on the hot water coil.

1.7 Wiring diagram



1.7 Wiring diagram

1.	F11	Optional <ul style="list-style-type: none"> • Reg. 1 A (090, 120, 150). • Reg. 1.4 A (180, 240, 300). • Reg. 1.4 A (180, 240, 300).
	KM11	A1 to X2-7 (Cable 583) A2 to X2-B
	M11	Exhaust fan
	X2-R	24 VAC Phase-R switching
	X2-7	To A1 from KM11
2.	Accessories	
3.	Accessories	
4.	Air quality sensor, optional, fitted on return (inside machine)	
	L	Black
	N	Blue
	Y1	Brown
5.	Air quality sensor, optional, fitted on ambient (machine exterior)	
	L	Black
	N	Blue
	Y1	Brown
	\perp	Yellow-Green
6.	Air quality board (green)	
7.	Enthalpy sensor C7400A return, optional	
	+	Red
	S	White
8.	Enthalpy sensor C7400A outside, optional	
	+	Red
	S	White
B15	Return sensor (black)	
B16	Discharge sensor, optional depending on model (yellow)	
B17	Inside sensor (white)	
M10	Damper	
	0-10 V	Grey
	C	Black
	R	Red
X1	Cables to be installed on site (not supplied)	

Data and measurements subject to changes without prior notice.
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