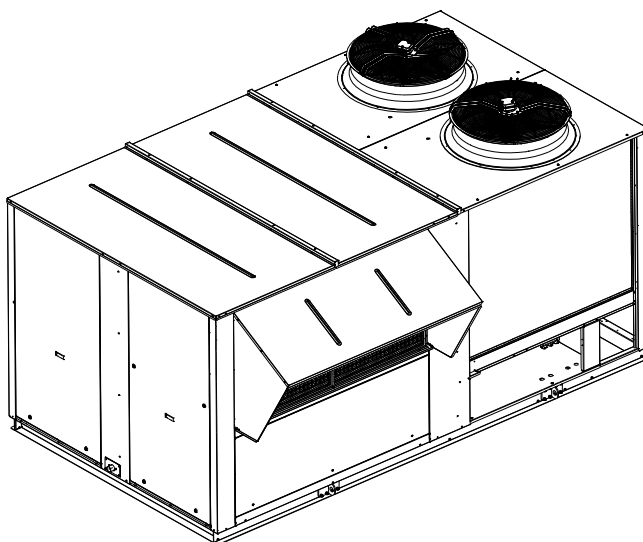




BY JOHNSON CONTROLS

# Economiser (Free cooling) for Roof Top ACTIVA 100/175



**Options and Accessories, Installation manual**

Ref.: N-40429\_EN 0913



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**Economiser (Free cooling) for ROOF  
TOP ACTIVA 100/175**

1.1 General information

### 1.1 General information

The economiser options is supplied installed inside the return section of the unit.

For transportation reasons, the rain protection is supplied separately, for on-site installation.

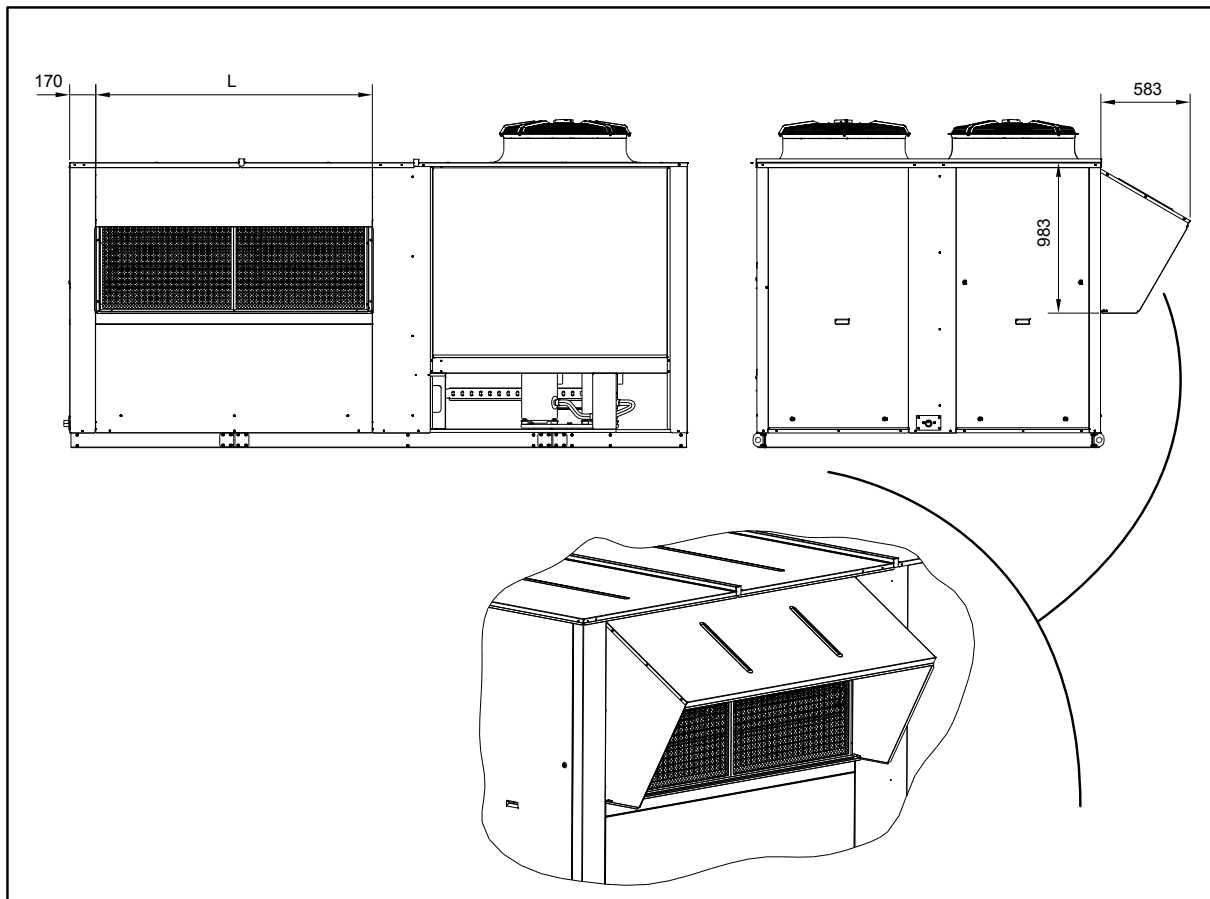
The two side panels, the upper panel and the two drip filters are located inside the unit in the free space between the return damper and the side cover.

### 1.2 Technical specifications

The economiser is formed by:

- Return and outdoor air damper assembly.
- Modulating actuator motor with return spring.
- Temperature probes for return and outdoor air.
- Control plate with protective cover.
- Cable assembly, connected to the unit wiring.
- Return and outdoor air zone separator panel (with heat insulation).
- Rain protection assembly, with drip protection filters inside.

### 1.3 Installation of rain protection (Rain hood)



Model	L
100 / 125	1805
150 / 175	2255

The installation of the rain protection is mandatory, to avoid water filtrations from the outdoor air inlet. To do so:

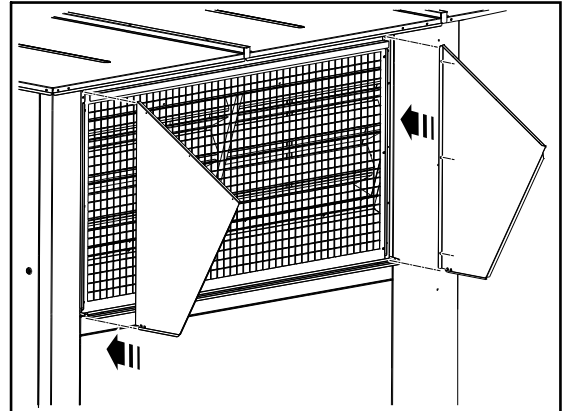
1. Place both side panels in the indicated position and attach them to the supports of the side of the unit with three bolts for each one.



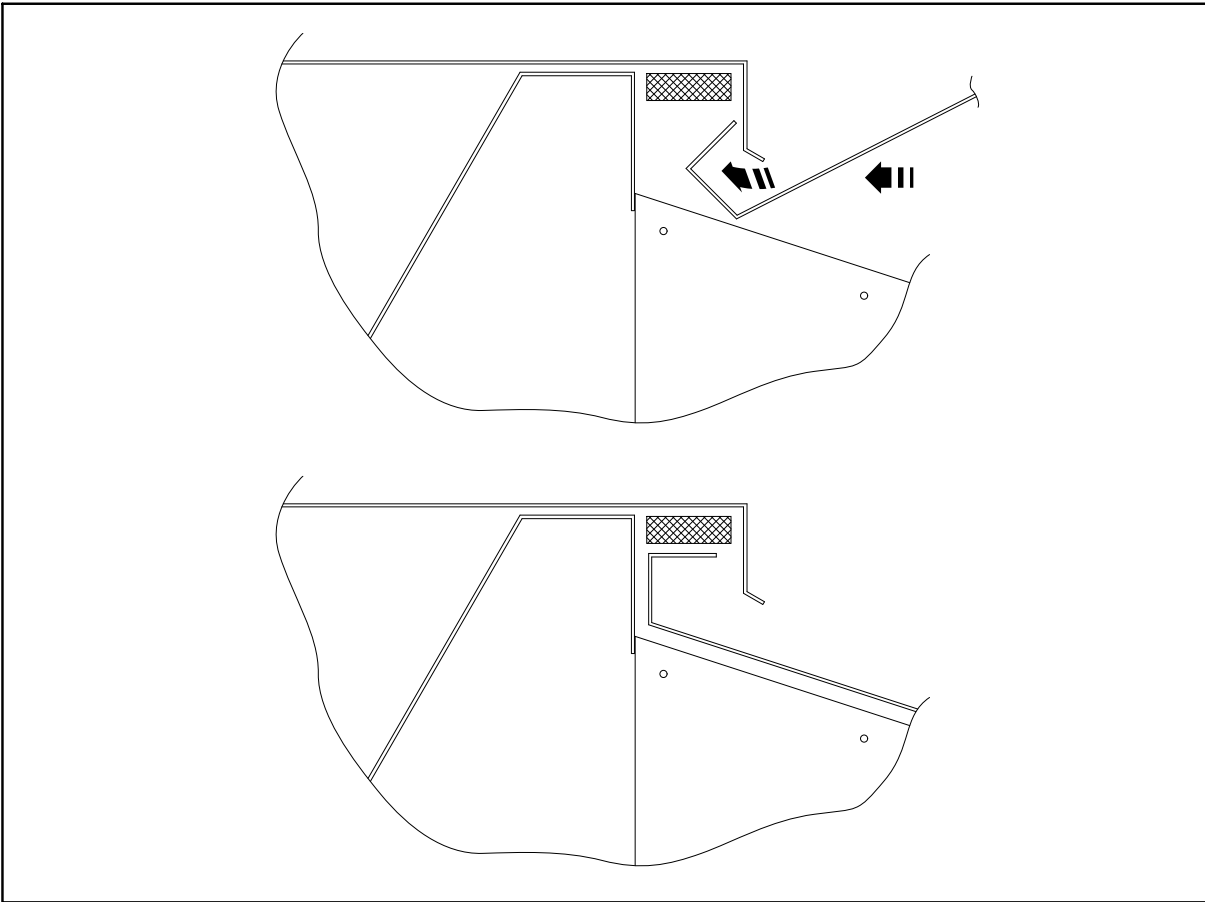
**NOTE**

- *The fixing holes in the supports on the side of the unit are hidden under the rubber sealing strip.*
- *It is not necessary to add a seal in addition to that present on the unit supports.*
- *The necessary nuts and bolts are supplied with the rain protection panels.*

2. Place the upper panel on both sides and slide it towards the roof of the unit.
3. Slightly lift up the panel until it is possible to fit its end under the side flange of the roof.



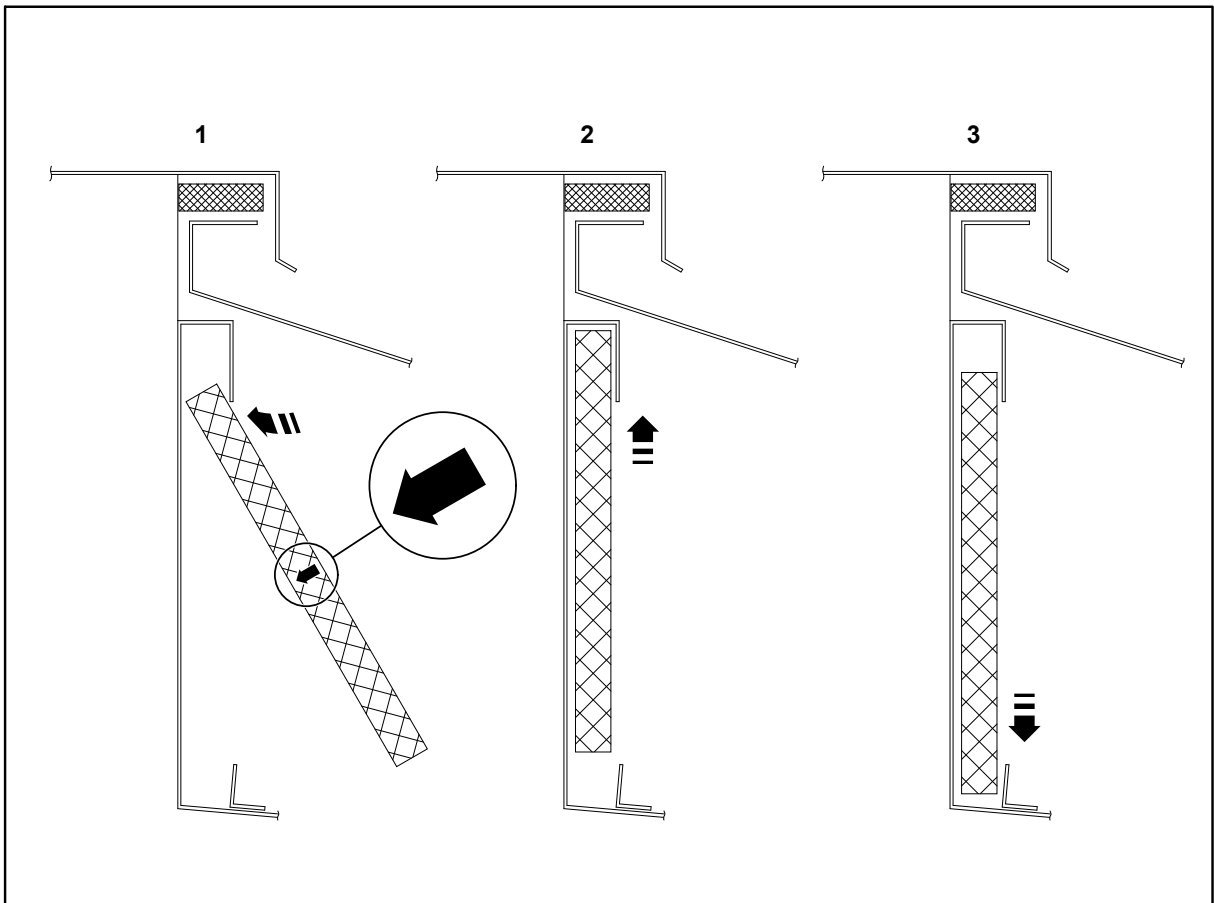
4. Attach both sides with three bolts and sealing washers.



**ATTENTION**

*The arrow stamped on the frame of the filters must point towards the inside of the unit to guarantee its correct position.*

5. Install the drip filters.



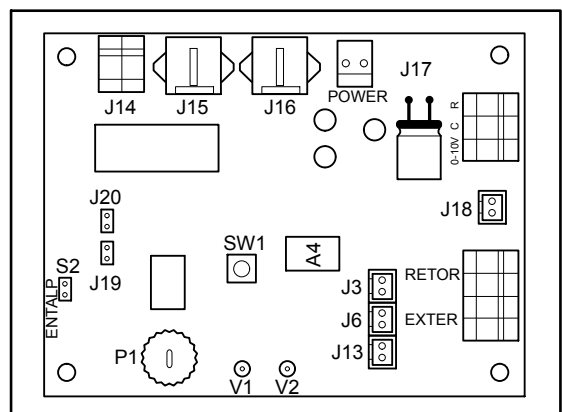
## 1.4 Installation of options

### Enthalpy probes, Ref. C7400A (Optional)

The enthalpy probes are optional. For installing them consult the “*Enthalpy probes (Optional) for Roof Top ACTIVA 100/175*” manual (N-40435).

### Jumper position selection

- Jumper J19, open by default: economiser operating. if closed, motorised damper operating.
- Jumper J20, open by default: outside damper closed with high temperature-smoke alarm. If closed, outside damper open with high temperature-smoke alarm.
- ENTALP jumper, S2, open by default: selection of operation with temperature probes. If it is closed, selection of operation with enthalpy probes. Disconnect outside probe B17 (connector J3) and keep return probe B15 connected (connector J13).



### Configuration of the economiser control board and minimum opening adjustment

Once the accessory has been fitted together with the necessary parts, connect the electricity supply for the unit through main switch Q3 (See Installation Manual).

Check that the green LED (V1) on the economiser control board (A4) remains lit.

## 1.4 Installation of options

To search and configure accessories, press the test button on the YKN2 Open board (A1) for more than three seconds, 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 it has switched off, check that the green LED (V1) on the economiser board is flashing to indicate that the accessory has been configured.

The potentiometer P1 on the economiser board allows for the damper to be modulated by hand to check its correct working order. The damper will return to its operating position after 30 sec.

Whenever the inside fan is activated, the damper will be open by a certain percentage to renew the air in the room. The factory-set default value is 10%. This minimum percentage can be set using potentiometer P1 or via the communications network. To set it using the potentiometer, set it until the minimum opening required is obtained and then press configuration button SW1 for 3 seconds to save the value.

### Air quality probe (optional)

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

The 230 VAC output signal between Y1 and N is connected to the 230 VAC to 5 VDC conversion board. This board is fitted alongside the economiser control board. The 5 VDC signal wire must be connected when J18 is connected 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:

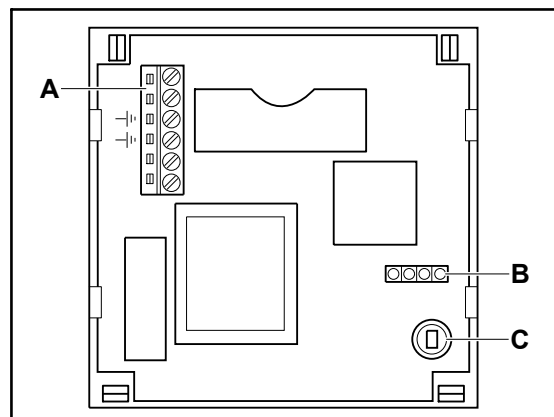
- Disappearance of the air quality request signal,
- the thermostat makes a cold or heat request

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.

- Connection terminals.
- Air quality level selection.
- VOC sensor.

Three air quality levels can be selected on the probe according to the jumper positions:

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



### Exhaust fan (optional)

The function of the return exhaust fan is to increase the air extraction capacity of the room. When the outdoor air damper is open more than 30%, the output of relay K1 on the economiser control board, connector J14, cables 582 and 583, is activated.

See the wiring diagram for details on connections and motor trip switch adjustment.



### DANGER

- *Loose connection terminals produce overheating of cables and terminals.*
- *The unit will work incorrectly and there is a risk of fire. Check that the cables are firmly secured to their connection terminals.*



## 1.5 Operation

Allows for cold to be generated by modulating the outdoor air inlet damper.

If the conditions are favourable, the yellow LED V2 will be lit up and the damper will be modulated to ensure the supply temperature is 12 °C.

### Favourable conditions

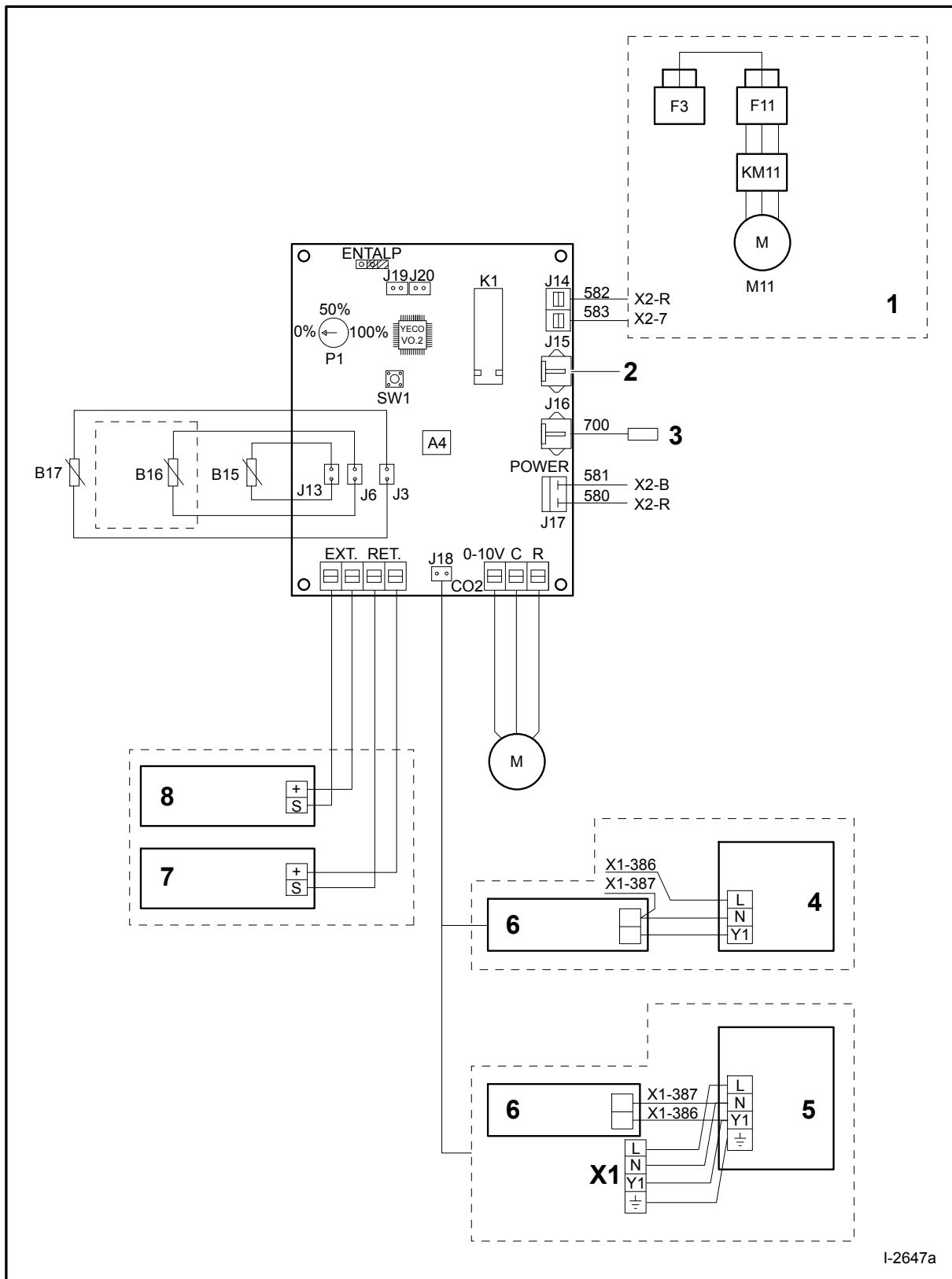
- Temperature mode. Favourable conditions in temperature mode are when the outside temperature is below 20 °C and, in turn, below the return temperature.
- Enthalpy mode. Favourable conditions in enthalpy mode are when the outside enthalpy is 5% below the return enthalpy and the outside temperature is below 20 °C. The probes must be connected and a jumper fitted to S2 for the unit to run in enthalpy mode. Incident 4, 1, 5 is indicated if the enthalpy probes are faulty.

The yellow LED on the board will be switched off when conditions are not favourable. Whenever the inside fan is activated, the outside damper will be open by a certain percentage to renew the air in the room (10% by default, adjustable value).

In the winter cycle, if the thermostat requests heat and no heat stage can be enabled, e.g. due to a fault, the damper will remain closed with the inside fan activated.

Where a fault is detected on the indoor fan by the YKN2 Open board, the outdoor air damper is fully closed.

## 1.6 Wiring diagram



I-2647a

1.	F11	Optional <ul style="list-style-type: none"> <li>• Reg. 2,5 A (017, 022).</li> <li>• Reg. 5,5 A (032, 040).</li> <li>• Reg. 1,4 A (045, 060).</li> <li>• Reg. 3A (0,75, 090).</li> </ul>	<ul style="list-style-type: none"> <li>• Reg. 3,2 A (100, 125).</li> <li>• Reg. 4,7 A (150, 175).</li> </ul>
	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 probe, optional, fitted on return (inside machine)		
	L	Black	
	N	Blue	
	Y1	Brown	
5.	Air quality probe, optional, fitted on ambient (machine exterior)		
	L	Black	
	N	Blue	
	Y1	Brown	
	⊥	Yellow-Green	
6.	Air quality board (green)		
7.	Enthalpy probe C7400A return, optional		
	+	Red	
	S	White	
8.	Enthalpy probe C7400A outside, optional		
	+	Red	
	S	White	
B15	Return probe (black)		
B16	Supply probe, optional depending on model (yellow)		
B17	Outdoor probe (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.