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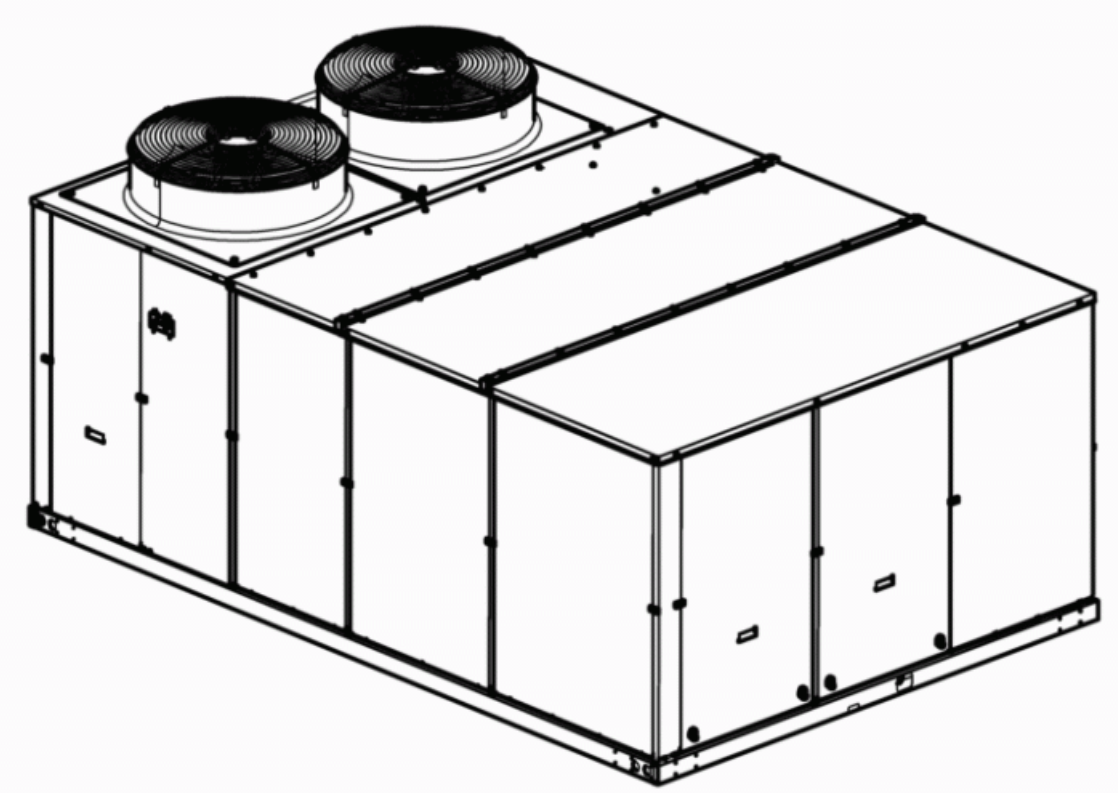
BY JOHNSON CONTROLS

Electric resistors for Roof Top ACTIVA 045-090



Options and Accessories, Installation manual

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AENOR ISO 14001 Gestión Ambiental CGM-97/013

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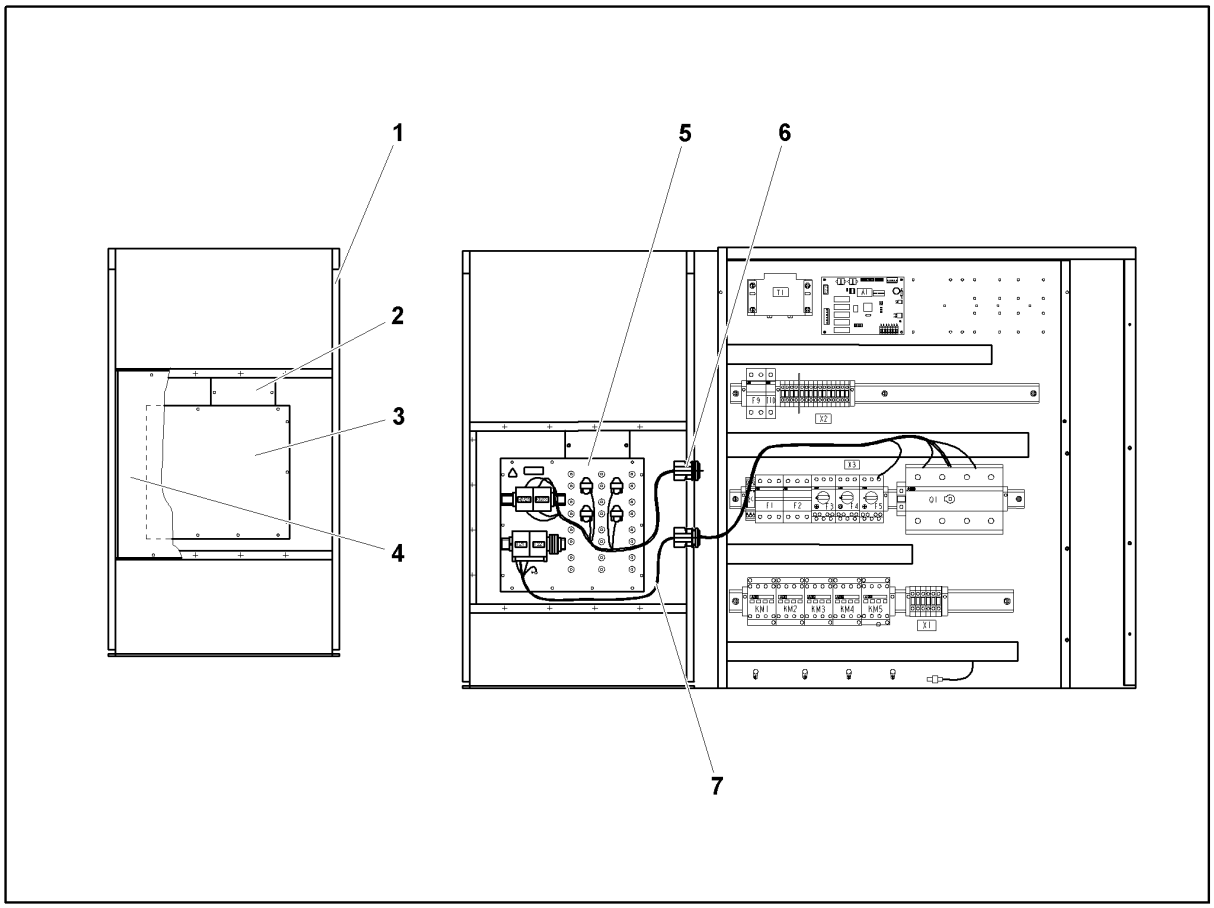
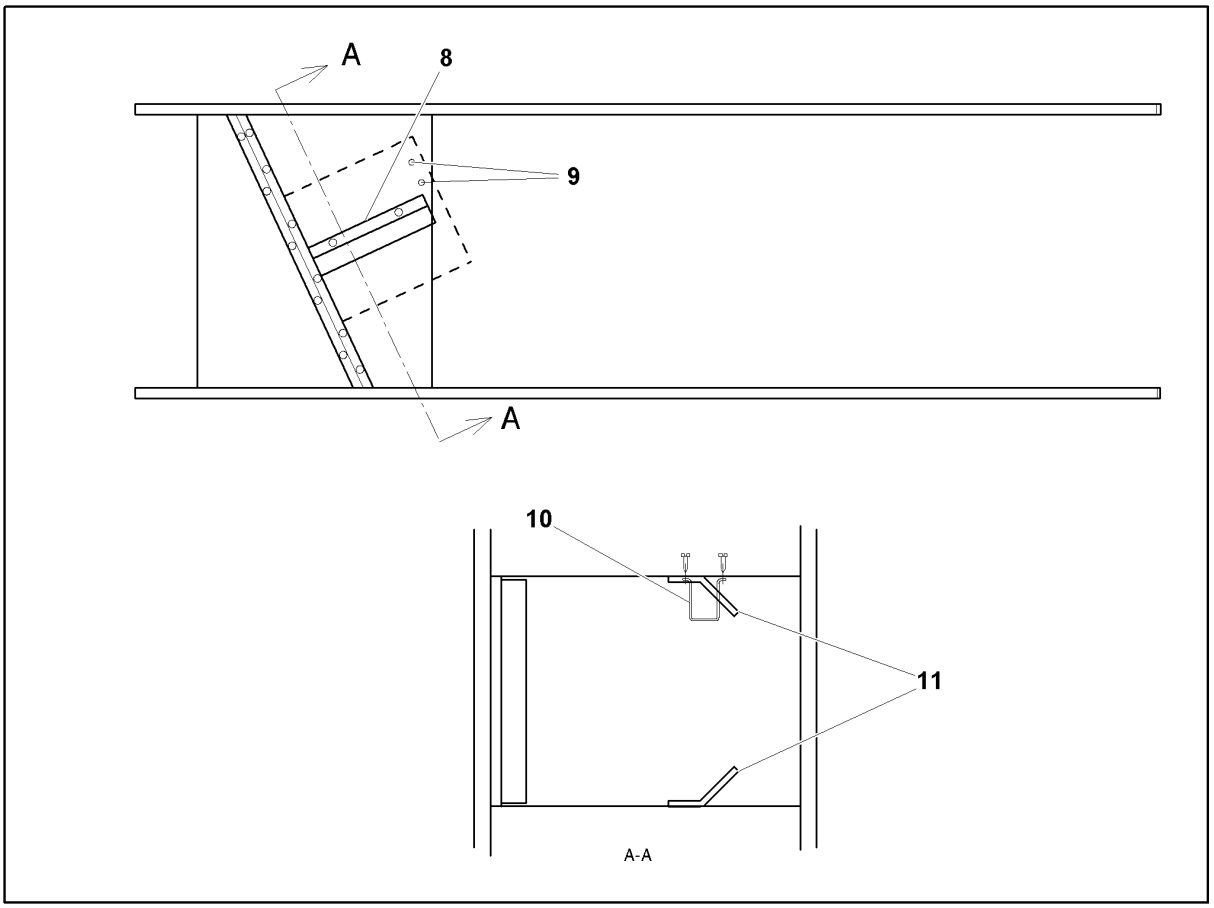
1.1 Electric resistor installation



1. Outer panel and protective cover
2. Lid
3. Electric resistor cover
4. Protective cover
5. Electric resistor
6. Switching cables
7. Power cables



8. Deflector plates
9. Holes (2) for securing the electric resistor
10. Resistor support
11. Deflectors

1.2 General Information

The optional electric resistors can be factory or site-fitted. These resistors are located on the inside of the central section of the unit, with the heating elements in the air supply section *Electric resistor installation , see on page 2*.

All electric resistors are two-stage (except the 12 kW, which is one-stage) and are supplied with circuit breakers for each one.

The electronic boards, the cables and all the material for the installation are supplied with this accessory.

The tables of this document list the electrical specifications of the resistors depending on the model of the equipment in which they are fitted. Section *Air flow limits , see on page 6* specifies the minimum flow rate of the indoor fan.

1.3 Technical specifications

The electric resistors include the following components:

- Galvanised plate casing, covers and supports.
- Electric resistors with exposed chrome-nickel wires, mounted on insulated supports.
- Power contactor with 24 V AC coil.
- Two thermal trip switches located on the front and thermal-magnetic resistor breaker. The former, with automatic reset, disconnects it when the temperature reaches 77 °C. The latter, with manual reset, disconnects the resistor when it reaches a temperature of 105 °C. There are four thermal trip switches (2 per stage) on 2-stage resistors.
- Interlocking with the indoor fan thermal relay. The unit control system does not enable the resistor to operate in the event of a fault in the indoor fan thermal relay.
- Control boards (A6 and A7) for resistor switching.

1.4 Installation

NOTE

- *Bear in mind the current regulations on electrical installation in the country where the unit is to be installed.*
- *Also see Electric resistor installation , see on page 2 for coil connection details.*

1 Disconnect the main switch on the unit.
2 Remove the access panels from the electric box and from the resistor section.
3 Remove the covers from the electric resistor.
4 Fit deflector plates in the upper and lower areas.
5 Open the top of the cardboard box in which the resistor is packed and remove carefully. Check that the set of resistors and the ceramic insulation have not been damaged during transport (a wire of the resistor and the metal support assembly can be touched).
6 Fit the electric resistor using the screws around the support plate and secure the resistor support to the upper area using two screws to avoid vibrations.
7 Fit the rectangular lid in the upper area.
8 Run the power cables and secure the packing gland on the side separation panel. Then connect the power cables to the main switch and the earthing cable to the terminal supplied. Secure the cables with ties to prevent them from moving due to vibrations.
9 Connect the resistor switching cables according to the wiring diagram (connectors J5 and J4 on A6 and A7) *Wiring diagram , see on page 7* . Connect the telephone cable to the accessory bus connector.
10 Check the fitting, ensuring it is correct.
11 Check that the manual and automatic reset terminals are closed (F12, F13, F15 and F16).
12 Switch circuit breakers F21 and F22 ON.
13 Fit the outer electric resistor cover and the access panels.
14 Reconnect the main switch on the unit.
15 Check that the green LED on board A6 remains lit. Then search for and configure accessories by pressing the test button on the YKN2Open board (A1) for more than three seconds until the red LED switches on. 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, check that the green LED on the board is flashing to indicate that the accessory has been configured.
16 Check the switching and the working order of the resistor by selecting the Emergency heat function on the unit control ambient thermostat.

CAUTION

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

1.5 Electrical specifications

1.5.1 ARC units with electric heater

ARC Model	Electric power supply V/Ph/Hz	Electric resistor			Maximum total current of the unit (A)	Maximum circuit breaker (K Curve) (1)	Minimum cable cross-section (mm^2) (2)
		Power (kW)	Stages (No.)	Current (A)			
045	400/3/50	12	1	18	32	50	10
		25	2	36	38	50	10
		37	2	54	60	80	25
		50	2	72	78	100	35
060	400/3/50	12	1	18	42	50	10
		25	2	36	42	50	10
		37	2	54	60	80	25
		50	2	72	78	100	35
075	400/3/50	12	1	18	54	63	16
		25	2	36	54	63	16
		37	2	54	62	80	25
		50	2	72	80	100	35
090	400/3/50	12	1	18	70	80	25
		25	2	36	70	80	25
		37	2	54	70	80	25
		50	2	72	84	100	35

(1) K Curve (DIN, VDE 0660-104).

(2) Based on copper conductors 105 °C.

1.5.2 ARH units with electric heater

ARH Model	Electric power supply V/Ph/Hz	Electric resistor			Maximum total current of the unit (A)	Maximum circuit breaker (K Curve) (1)	Minimum cable cross-section (mm^2) (2)
		Power (kW)	Stages (No.)	Current (A)			
045	400/3/50	12	1	18	50	63	16
		25	2	36	68	80	25
		37	2	54	86	100	35
		50	2	72	104	125	50
060	400/3/50	12	1	18	60	80	25
		25	2	36	78	100	35
		37	2	54	96	125	50
		50	2	72	114	125	50
075	400/3/50	12	1	18	72	80	25
		25	2	36	90	100	35
		37	2	54	108	125	50
		50	2	72	126	160	70
090	400/3/50	12	1	18	88	100	35
		25	2	36	106	125	50
		37	2	54	124	160	70
		50	2	72	142	160	70

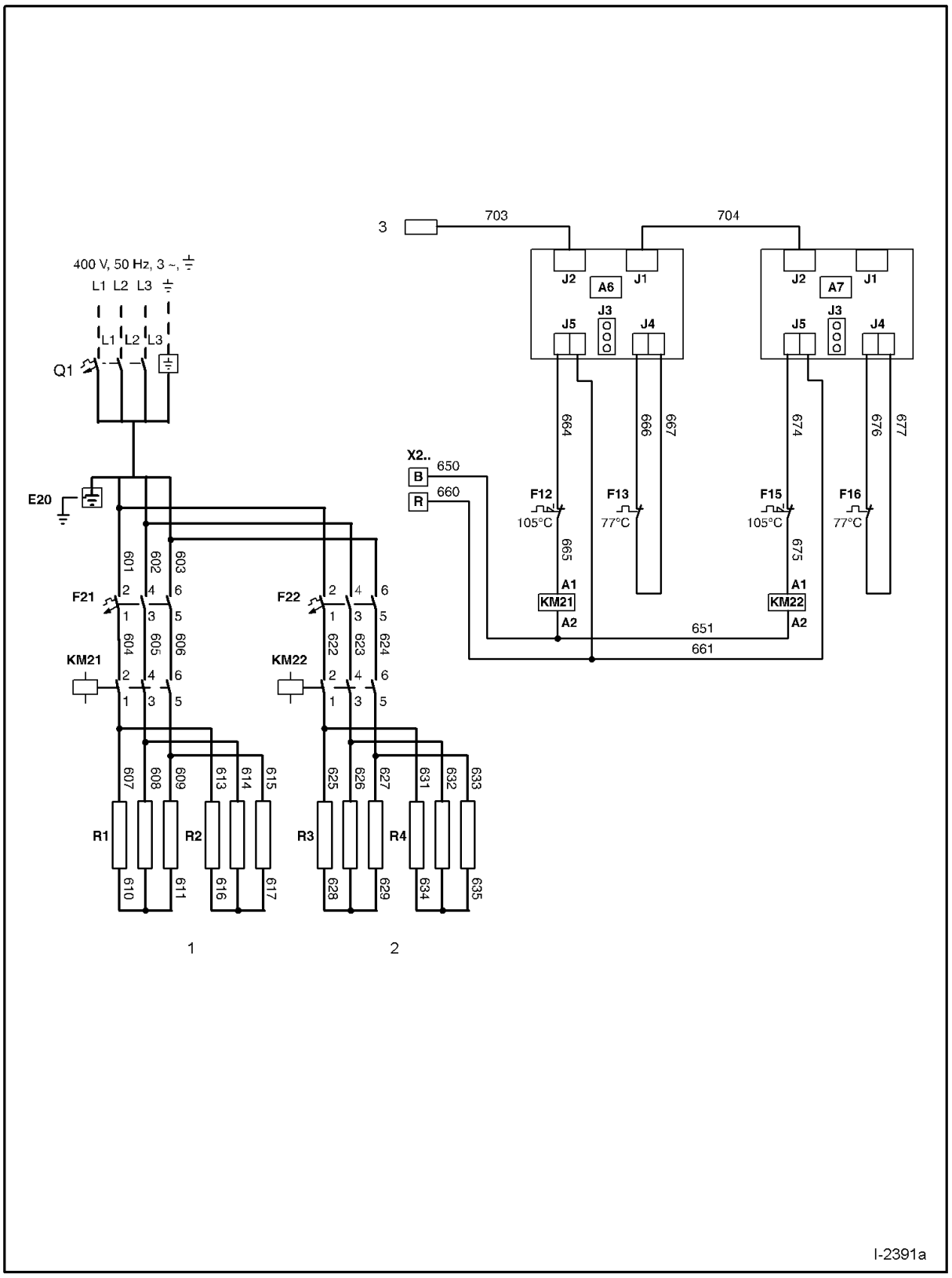
(1) K Curve (DIN, VDE 0660-104).

(2) Based on copper conductors 105 °C.

1.6 Air flow limits

Models		ARC/ARH	045	060	075	090
Indoor fan	Rated flow	m^3/h	8500	11500	13500	16000
	Maximum flow		10000	13500	16000	18000
	Minimum flow		7000	9500	11500	13000
	IP55 Motor (standard)	kW	3	4	5,5	7,5

1.7 Wiring diagram



1.	1st stage
2.	2nd stage
3.	Accessories
A6.	Auxiliary resistor 1 accessory
A7.	Auxiliary resistor 2 accessory
F12	Manual reset thermal trip switch, 105 ºC
F15	Manual reset thermal trip switch, 105 ºC
F13	Automatic reset thermal trip switch, 77 ºC
F16.	Automatic reset thermal trip switch, 77 ºC
F21.	Circuit breaker
F22.	Circuit breaker
KM21.	Power contactor, 24 V AC coil.
KM22.	Power contactor, 24 V AC coil.
R1.	Resistor, 1st stage
R2.	Resistor, 1st stage
R3.	Resistor, 2nd stage
R4.	Resistor, 2nd stage
X2.	24 V AC switching terminal strip

Power (kW)	Stages	Circuit breaker	
		F21 (A)	F22 (A)
12	1 (R1)	25	-
25	2 (R1, R3)	25	25
37	2 (R1, R2, R3)	50	25
50	2 (R1, R2, R3, R4)	50	50

Data and measurements subject to changes without prior notice.