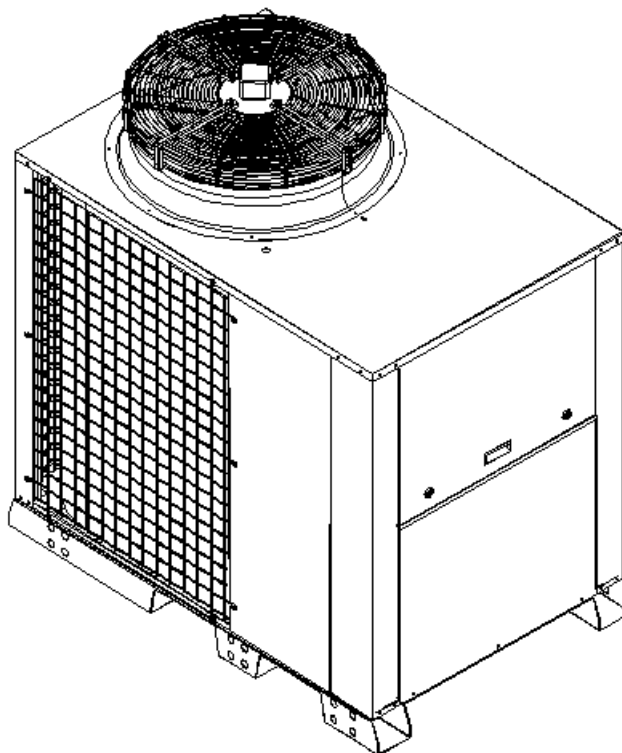




BY JOHNSON CONTROLS

## Low ambient kit for LARGE SPLIT AIR-AIR VITALITY SERIES Air Conditioners



**Options and Accessories, Installation manual**

Ref.: N-40361\_EN 0910



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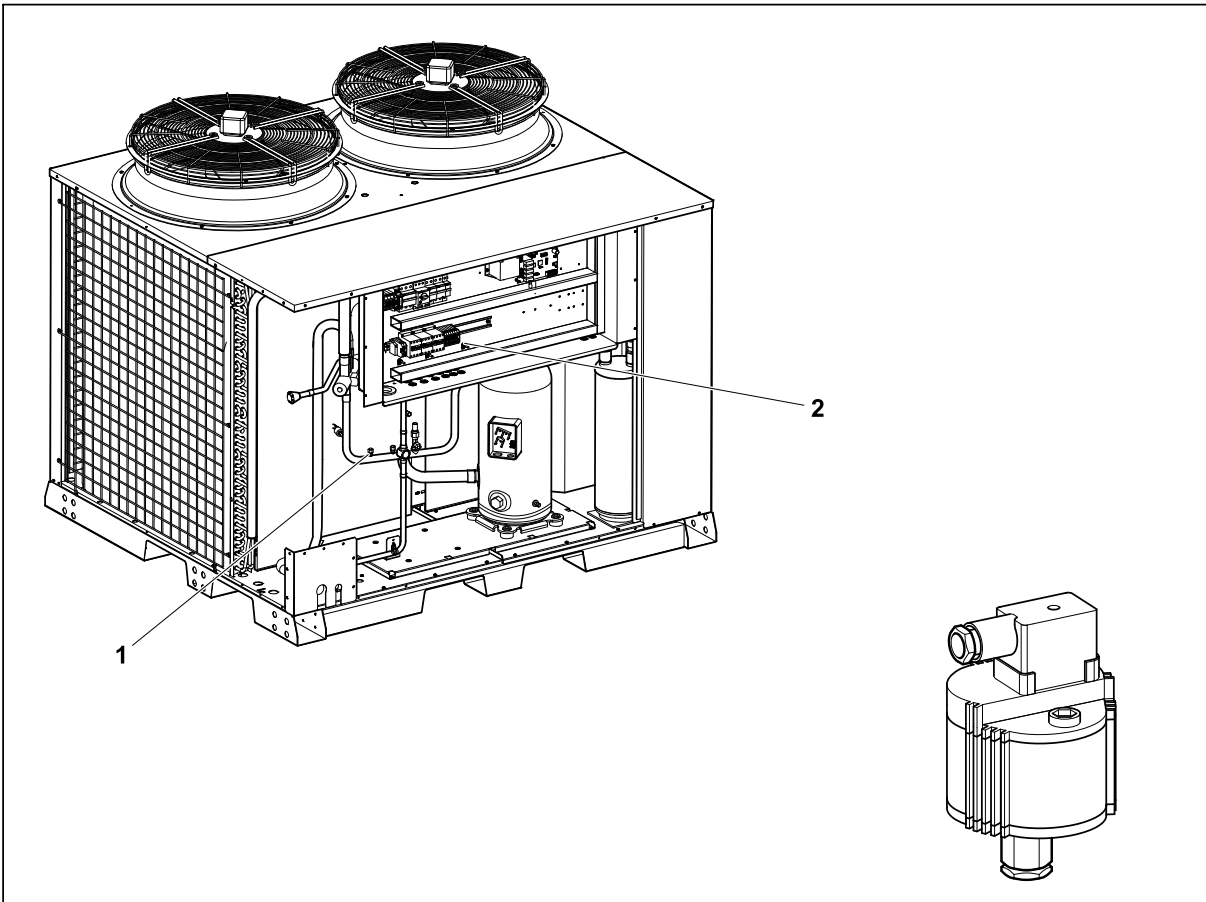
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**Low ambient kit for LARGE SPLIT AIR-  
AIR VITALITY SERIES**

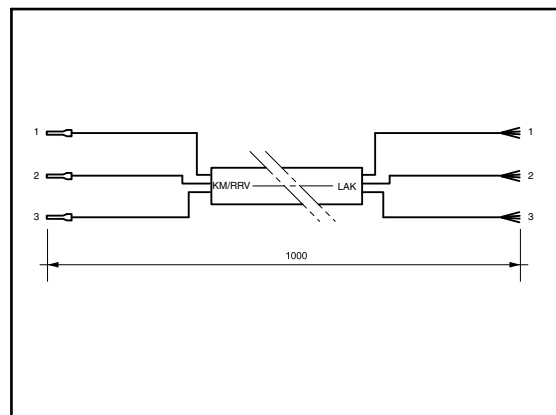
1.1 Components

# 1.1 Components

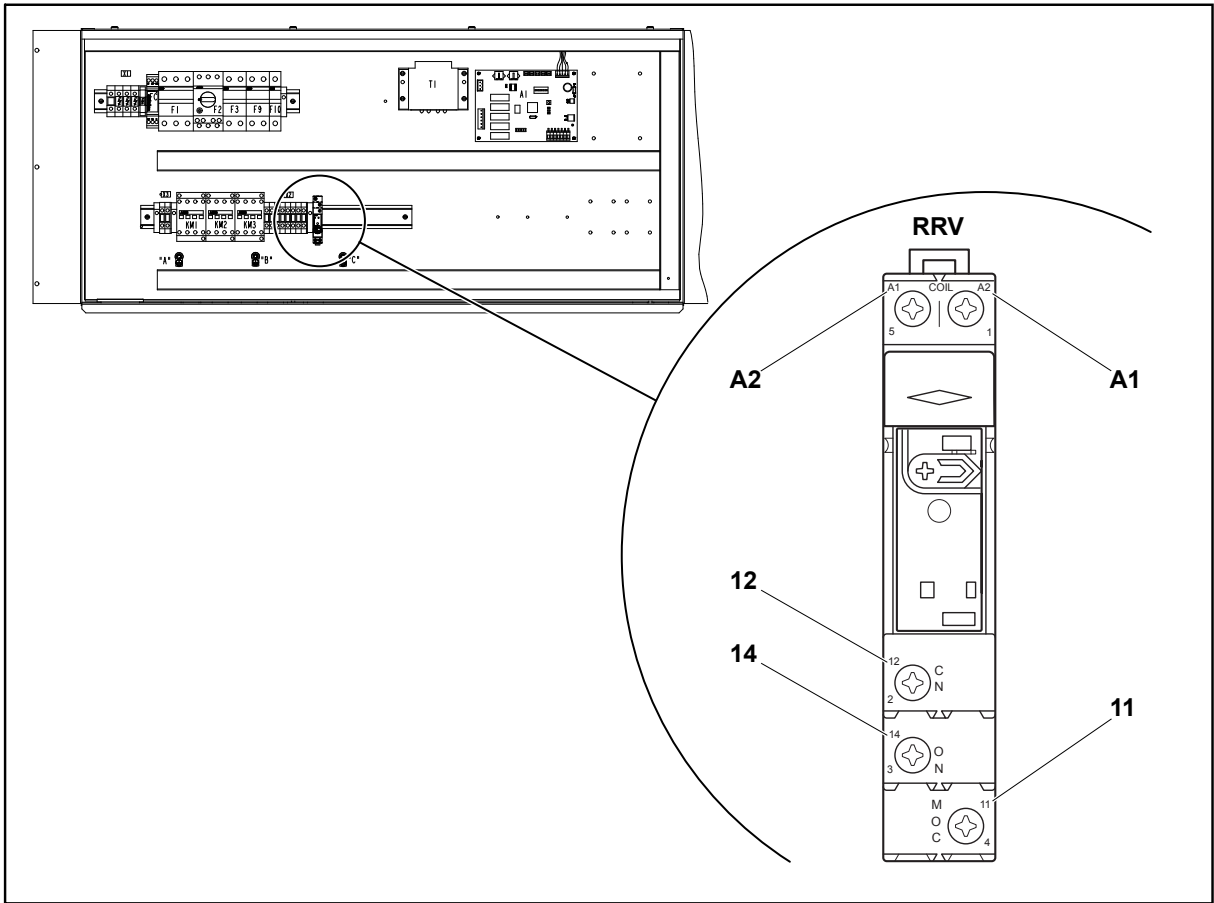


- 1. Single-phase regulator (LAK)
- 2. 24 Vac relay (RRV), only for VAH models

Electrical box side		LAK side	
1.	Brown	1.	LAK-1
2.	Grey	2.	LAK-2
3.	Black	3.	LAK-3



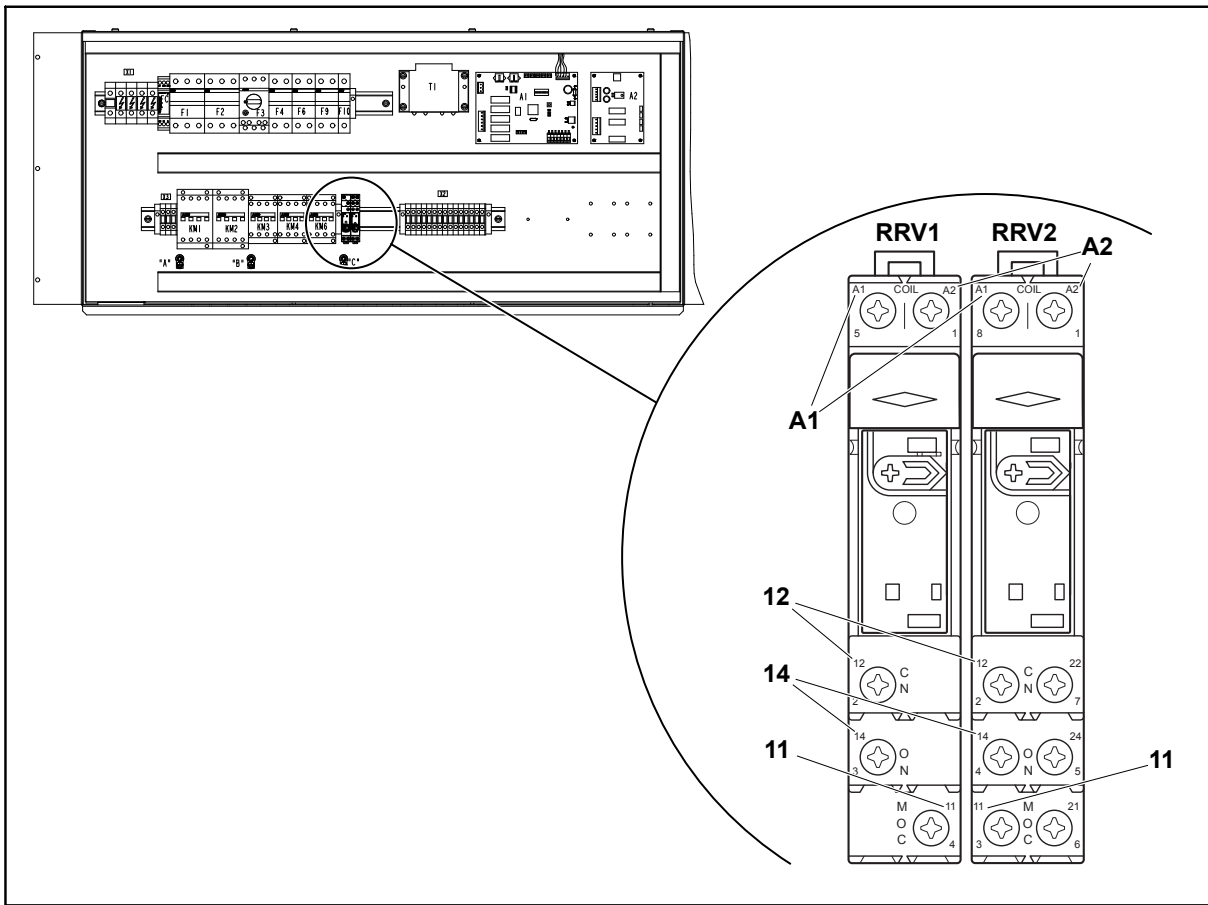
**RRV relay for VAC/VAH 20-40 A**



1 Low ambient kit for LARGE SPLIT AIR-AIR VITALITY SERIES

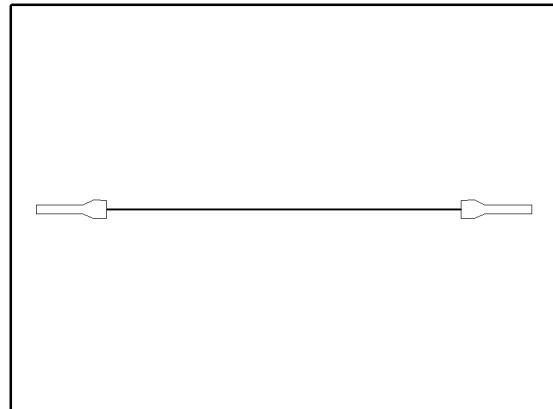
1.2 Connection wiring

RRV1 and RRV2 relays for VAC/VAH 45-90 A



1.2 Connection wiring

Wiring used for connection



**VAC/VAH 20 - 40 A units**

Wire no.	Colour	Cross section (mm <sup>2</sup> )	From	To	Length (mm)
1	Black	1	KM3-2	RRV-11	200
2	Red	1	X2-4	RRV-A1	140
3	White	1	X2-B	RRV-A2	200

**VAC/VAH 45 - 90 A units**

Wire no.	Colour	Cross section (mm <sup>2</sup> )	From	To	Length (mm)
1	Black	1	KM4-2	RRV1-11	200
2	Black	1	KM6-2	RRV2-11	200
3	Red	1	X2-14	RRV1-A1	400
4	Red	1	X2-24	RRV2-A1	400
5	White	1	X2-B	RRV1-A2	350
6	White	1	X2-B	RRV2-A2	350

## 1.3 General Information

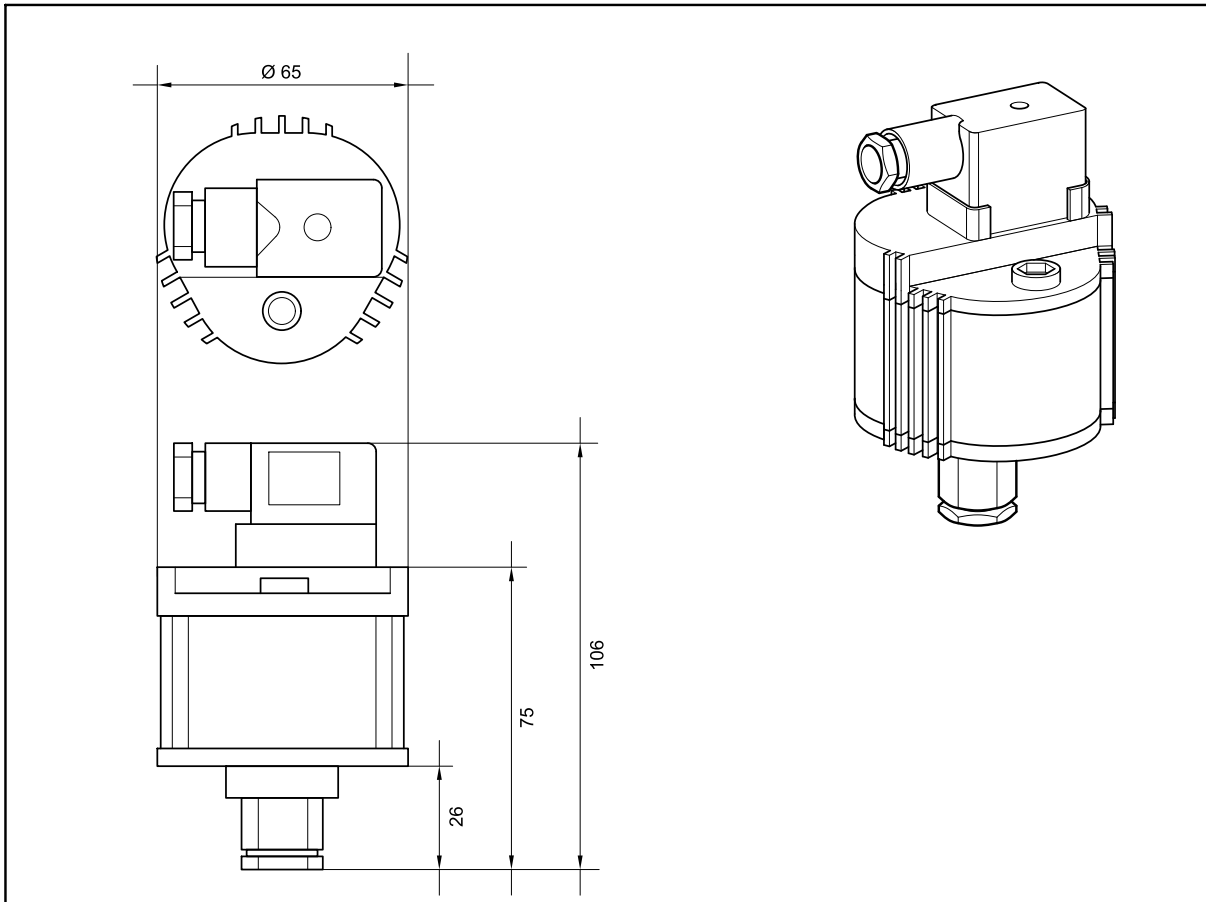
This direct-installation kit operates with pressure, changing the speed of the condenser fan with single-phase motors. The kit regulates the speed of the outdoor fan during the cold cycle to keep the condensing pressure constant with low outside temperature. There is no regulation during the winter cycle and the fans run at 100%.

A pressure-operated regulator offers a faster and more direct response to pressure variations in a cooling system. The controller changes the supply voltage of the motor from 30% up to at least 95% of the proportional band, applying the phase cut-off principle.

The controller must be installed in vertical position in relation to the coolant pipe, and it comes with an EMC suppression filter.

The rubber seal has to be placed between the fast connector and the controller terminals, in order to maintain the protection class IP65.

## 1.4 General dimensions



All measurements in mm.

## 1.5 Technical specifications

The accessory includes the following components:

- Three-phase speed regulator, Ref. P215PR-9202. Set to 26 bar.
- 24 Vac relay terminal (RRV, RRV1, RRV2), only for VAH models, heat pumps.
- Cables, terminals, bushings and plastic ties.



## 1.6 Installation instructions

Disconnect the main power supply to the unit using switch Q1 (see the figures for details on assembly and electrical connections).

Install the condensation control system as described below:

- 1 Remove the access panels from:
  - a electrical box
  - b compressor.
- 2 Install the speed regulator (LAK) to the high pressure port and check that there are no leaks.
- 3 Connect the cables according to the *Wiring diagram*, see on page 9. In VAH heat pump models install the 24 Vac relay (RRV, RRV1, RRV2).
- 4 Refit the access panels, except the one for the electrical box.
- 5 Testing operations:
  - For VAC/VAH 20 -40 A models:
    - a Connect the power to switch Q1.
    - b Activate the cold stage and check that the following contactors switch on:
      - KM1 (compressor),
      - KM2 (indoor fan),
      - KM3 (outdoor fan 1–2),
      - and the outdoor fan is off.



### NOTE

*When the pressure is higher than the set value, the fan is activated, regulating the speed to maintain the pressure.*

- c Deactivate the stage.
- For VAC/VAH 45 -90 A models:
  - a Connect the power to switch Q1.
  - b Activate cold stage 1 and check that the following contactors switch on:
    - KM1 (compressor),
    - KM3 (indoor fan),
    - KM4 (outdoor fan 1–2),
    - and the outdoor fan is off.



### NOTE

*When the pressure is higher than the set value, the fan is activated, regulating the speed to maintain the pressure.*

- c Deactivate cold stage 1.
- d Activate cold stage 2 and check that the following contactors switch on:
  - KM2 (compressor),
  - KM3 (indoor fan),
  - KM6 (outdoor fan 3–4),
  - and the outdoor fan is off.



### NOTE

*When the pressure is higher than the set value, the fan is activated, regulating the speed to maintain the pressure.*

- e Deactivate cold stage 2.

1.7 Operation

- 6 If the unit is fitted with a heat pump, activate the heat stage and check that the outdoor fan turns at 100%. Then deactivate the stage.
- 7 Fit the access panels.



**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.*

## 1.7 Operation

During the summer cycle, it regulates the speed of the outdoor fan to keep the condensing pressure constant with low outside temperature.

The pressure set point can be adjusted with the adjustment screw -1-.



**ATTENTION**

*Turning it clockwise increases the pressure and anti-clockwise decreases it.*

The set point is preset at 90% of the output value. The minimum established speed or stoppage value is 30% of the supply voltage.

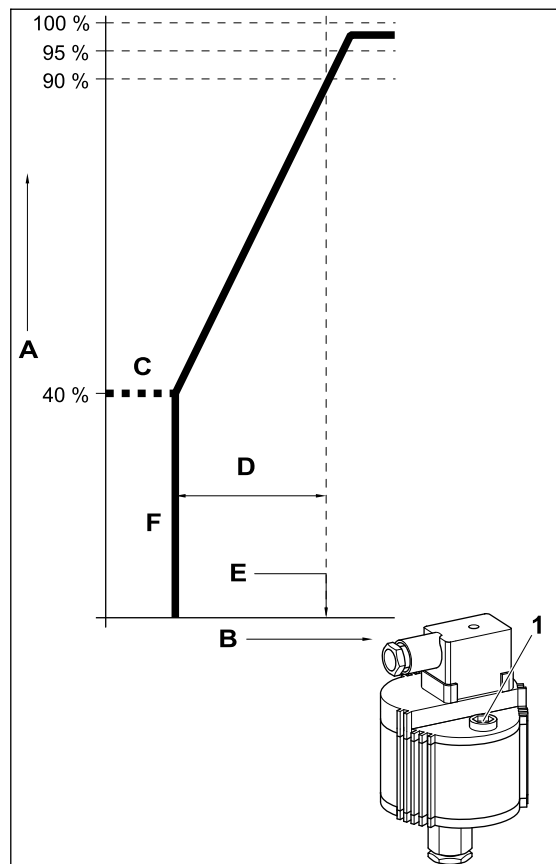


**ATTENTION**

*The load and supply voltage can affect the specifications of the controller.*

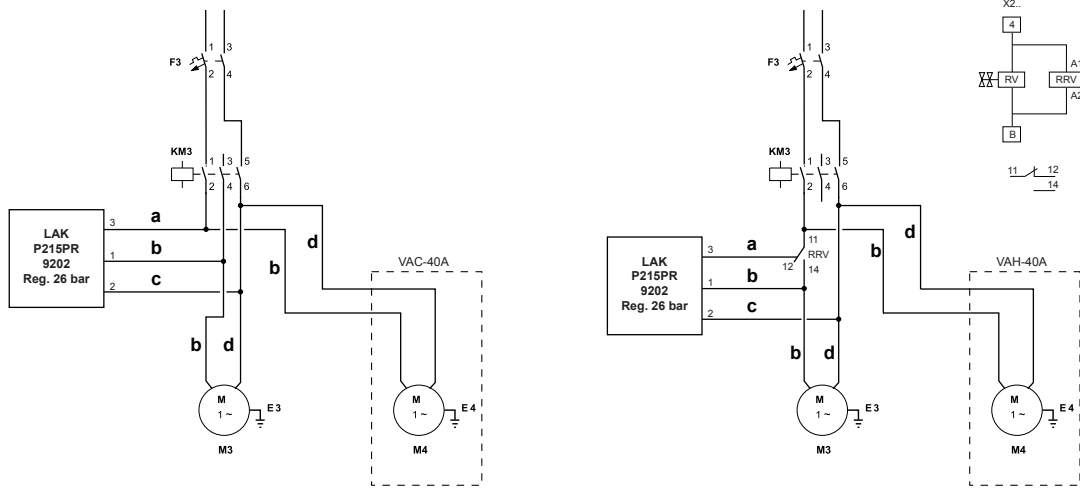
**Controller specifications**

- A Output to engine (% of output voltage)
- B Pressure [bar]
- C Minimum speed
- D Prop. band
- E Set point
- F Cut-off mode
- 1 Set point adjustment screw



<b>Range</b>	<b>360°</b>
22 - 42	approx. 3.7 bar

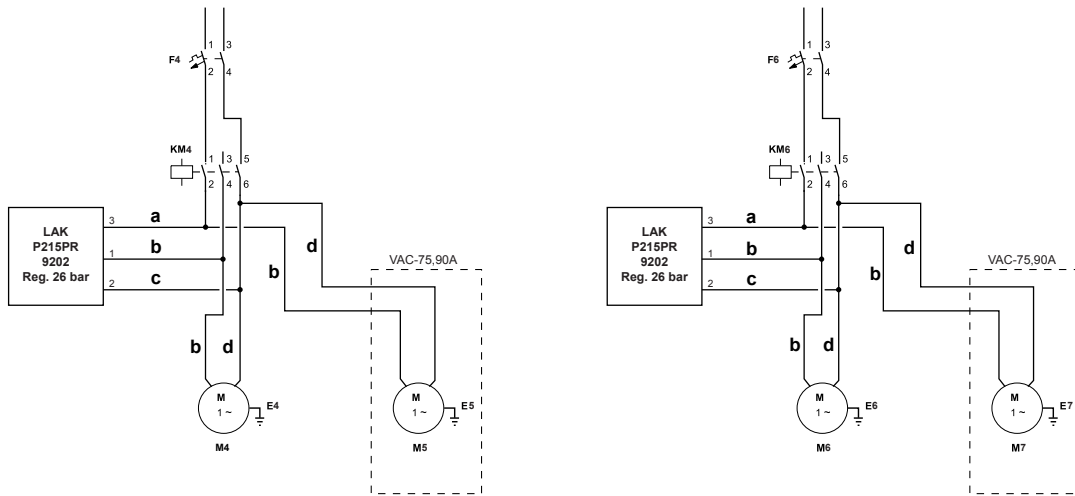
## 1.8 Wiring diagram



I-2635a  
LAK VAC/VAH-20,25,30,40A

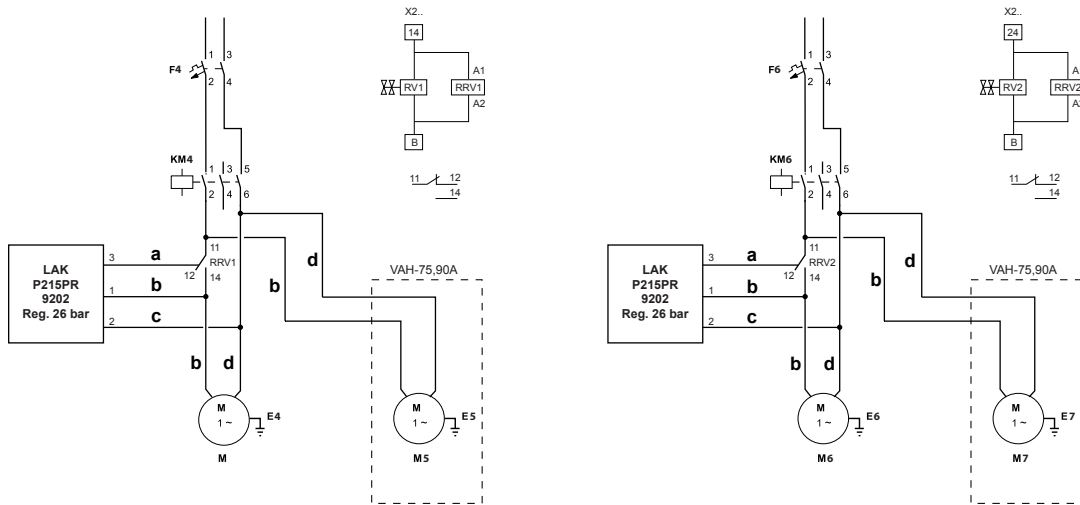
F3	Motor trip switch for outdoor fan	a	Black
KM3	Contactors for outdoor fan	b	Brown
LAK	Regulator	c	Grey
M3, M4	Outdoor fan	d	Blue
RRV	Auxiliary cycle change relay		

1.8 Wiring diagram



I-2636-1a  
LAK VAC/VAH-45,60,75,90A

F4, F6	Motor trip switch for outdoor fan	a	Black
KM4, KM6	Contactor for outdoor fan	b	Brown
LAK	Regulator	c	Grey
M4, M5, M6, M7	Outdoor fan	d	Blue



I-2636-2a  
LAK VAC/VAH-45,60,75,90A

F4, F6	Motor trip switch for outdoor fan	a	Black
KM4, KM6	Contactors for outdoor fan	b	Brown
LAK	Regulator	c	Grey
M4, M5, M6, M7	Outdoor fan	d	Blue
RRV1, RRV2	Auxiliary cycle change relay		

Data and measurements subject to changes without prior notice.