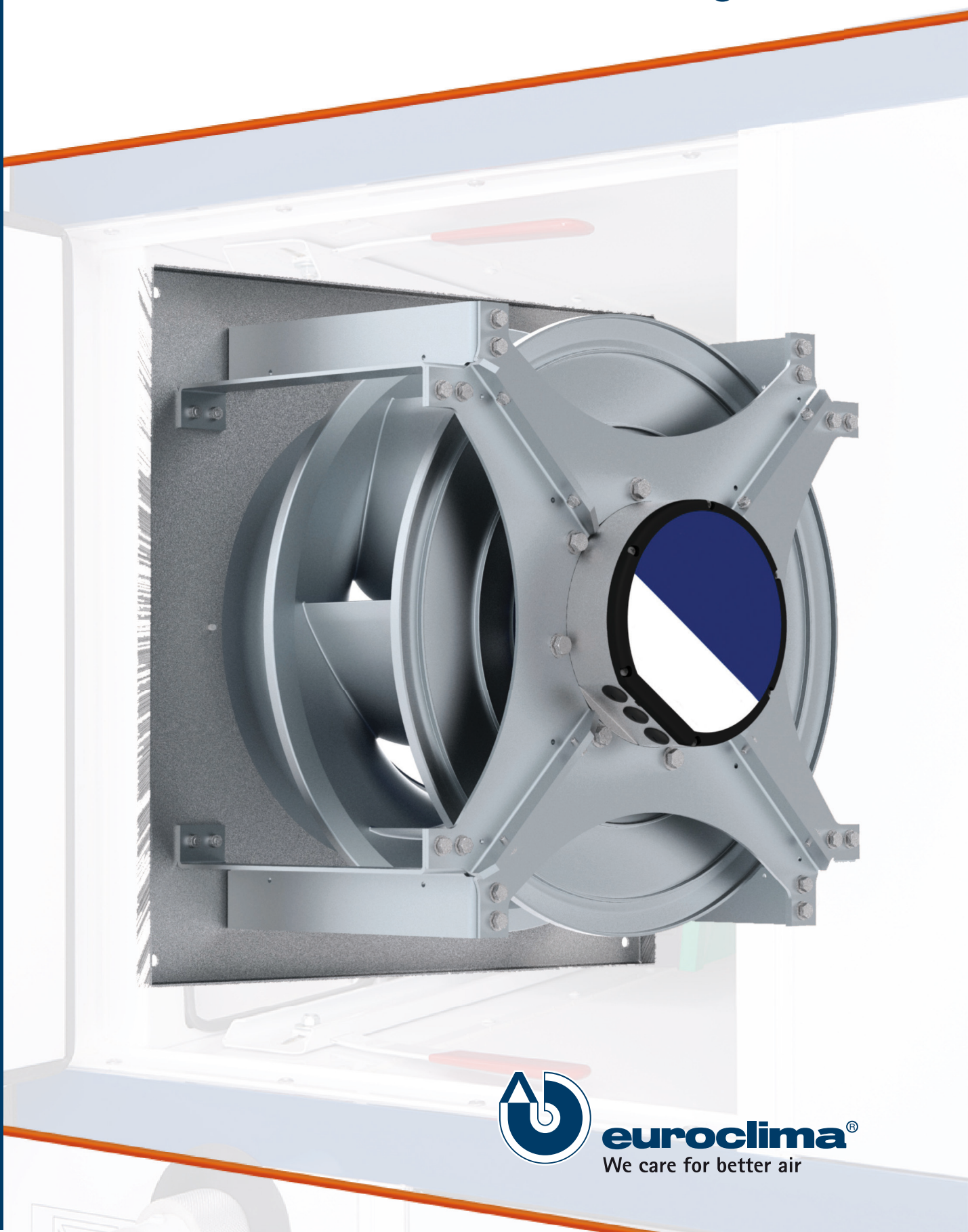


EC-MOTORS

*Connection diagrams
ZHK Air Handling Units*



euroclima®
We care for better air

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- Original instructions -

1 INTRODUCTION

These instructions are only valid for units without Euroclima control. For units with Euroclima control, an order-specific wiring diagram is generated by Euroclima and supplied with the unit.

Before you start connecting the EC motor, find out the manufacturer of the motor from the technical data under the fan specifications (see **Figure 1** to **Figure 3**).

Depending on the manufacturer specified in the technical data, continue in the corresponding chapter of these manual:

- **Chapter 2: EBM-PAPST**
- **Chapter 3: NICOTRA GEBHARDT**
- **Chapter 4: ZIEHL-ABEGG**
- **Chapter 5: ORA-VENT / NICOTRA GEBHARDT RQM & RLM E6**

VF	Supply air-Plug fan	610,0 [mm]	2,23 [m2]	102,00 [kg]	12 [Pa]
Fan	ebmpapst/K3G355-PH49-33*	EC-Motor			
Air volume [m³/h] (density: [kg/m³] 1,20)	1 x 5.000,00	M3G112GA			
External press [Pa]	250	Protection			
ext. press. on intake / outlet [Pa]	-50 / 200	Insulation class			
dyn.press.drop [Pa]	68	max electric absorbed power [kW]			
Tot. pressure [Pa]	679	Speed +-2% [1/min]			
Speed [1/min]	2.636	Current +-5% [A]			
sound power [dB(A)]	86,1	Voltage [V]			
System efficiency [%]	60,0	Tension Range [V]			
max. nom. RPM [1/min]	2.870	Electric absorbed power [kW]			
Calibration faktor K_A [m²s/h]	114	Motor efficiency class			
Speed control:	variable speed	Control voltage [V]			
shaft capacity [kW]	1,22	Connection diagram			
		No frequency converter needed!			

Figure 1: Example: technical data - ebm-papst

VF	Supply air-Plug fan	762,5 [mm]	4,19 [m2]	202,00 [kg]	9 [Pa]
Fan	2 x Nicotra/Gebhardt/COPRA PA-C35-JE56-C0	PM-Motor+FC			
Air volume [m³/h] (density: [kg/m³] 1,20)	2 x 6.975,00	2 x 0454146HAA54AA01			
External press [Pa]	550	Protection			
ext. press. on intake / outlet [Pa]	-50 / 500	Insulation class			
dyn.press.drop [Pa]	72	max electric absorbed power [kW]			
Tot. pressure [Pa]	1.076	Speed +-2% [1/min]			
Speed [1/min]	3.303	Current +-5% [A]			
sound power [dB(A)]	97,5	Voltage [V]			
System efficiency [%]	61,0	Tension Range [V]			
max. nom. RPM [1/min]	3.600	Electric absorbed power [kW]			
Calibration faktor K_A [m²s/h]	105	Motor efficiency class			
Speed control:	variable speed	Control voltage [V]			
		Connection diagram			
		No frequency converter needed!			

Figure 2: Example: technical data - Nicotra Gebhardt

VF	Supply air-Plug fan	762,5 [mm]	3,95 [m2]	192,00 [kg]	3 [Pa]
Fan	Ziehl-Abegg/GR56I-ZID.GG.CR	EC-Motor			
Air volume [m³/h] (density: [kg/m³] 1,20)	1 x 7.500,00	ECblue-IE5-50-115-0-3.4			
External press [Pa]	250	Protection			
ext. press. on intake / outlet [Pa]	-50 / 200	Insulation class			
dyn.press.drop [Pa]	12	max electric absorbed power [kW]			
Tot. pressure [Pa]	532	Speed +-2% [1/min]			
Speed [1/min]	1.228	Current +-5% [A]			
sound power [dB(A)]	75,3	Voltage [V]			
System efficiency [%]	70,9	Tension Range [V]			
max. nom. RPM [1/min]	1.610	Electric absorbed power [kW]			
Calibration faktor K_A [m²s/h]	275	Motor efficiency class			
Speed control:	variable speed	Control voltage [V]			
		Connection diagram			
		No frequency converter needed!			

Figure 3: Example: technical data - Ziehl-Abegg

Further information is available on the homepage of the respective manufacturer of the delivered motor.

2 EBM-PAPST

Check in the technical data section of the fan which connection diagram number is given under "Connection diagram", see **Figure 4**:

VF	Supply air-Plug fan			610,0 [mm]	2,23 [m2]	102,00 [kg]	12 [Pa]
Fan	ebmpapst/K3G355-PH49-33*			EC-Motor	M3G112GA		
Air volume [m³/h] (density: [kg/m³] 1,20)	1 x	5.000,00		Protection	IP54		
External press [Pa]		250		Insulation class	F		
ext. press. on intake / outlet [Pa]		-50 / 200		max electric absorbed power [kW]	1,900		
dyn.press.drop [Pa]		68		Speed +-2% [1/min]	2.870		
Tot. pressure [Pa]		679		Current +-5% [A]	3,00		
Speed [1/min]		2.636		Voltage [V]	3x400 / 50/60 Hz		
sound power [dB(A)]		86,1		Tension Range [V]	380 ... 480		
System efficiency [%]		60,0		Electric absorbed power [kW]	1,42		
max. nom. RPM [1/min]		2.870		Motor efficiency class	analog to IEC60034: IE 5		
Calibration faktor K_A [m²s/h]		114		Control voltage [V]	7.6		
Speed control:		variable speed		Connection diagram	M3 (RP1)		
shaft capacity [kW]		1,22		No frequency converter needed!			

Figure 4: Connection diagram number ebm-papst

and continue in the relevant chapter of this document:

- Connection diagram K1: **Chapter 2.1 (Connection schematic: K1 (with connection box)) or Chapter 2.2 (Connection schematic: K1 (pre-wired by ebm-papst))**
- Connection diagram M3: **Chapter 2.3 (Connection schematic: M3)**
- Connection diagram M5: **Chapter 2.4 (Connection schematic: M5)**
- Connection diagram L6: **Chapter 2.5 (Connection schematic: L6)**
- Connection diagram L7: **Chapter 2.6 (Connection schematic: L7)**
- Connection diagram L9: **Chapter 2.7 (Connection schematic: L9)**
- Connection diagram P2: **Chapter 2.8 (Connection schematic: P2)**
- Connection diagram P5: **Chapter 2.9 (Connection schematic: P5 (with connection box)) or Chapter 2.10 (Connection schematic: P5 (pre-wired by ebm-papst))**
- Connection diagram P6: **Chapter 2.11 (Connection schematic: P6 (with connection box)) or Chapter 2.12 (Connection schematic: P6 (pre-wired by ebm-papst))**
- Connection diagram P8: **Chapter 2.13 (Connection schematic: P8)**
- Connection diagram RP6: **Chapter 2.14 (Connection schematic: RP6)**
- Connection diagram RP9: **Chapter 2.15 (Connection schematic: RP9)**

The software "EC-Control" for direct digital control, visualisation and parameterisation of ebm-papst fans, drives and controllers can be downloaded from the manufacturer's homepage.

2.1 Connection schematic: K1 (with connection box)

Technical specifications:

- PFC (passive)
- Control input 0-10 VDC / PWM
- Output 10 VDC max. 1.1 mA
- Fault signal relay
- Overtemperature protection electronics / motor

Connection schematic:

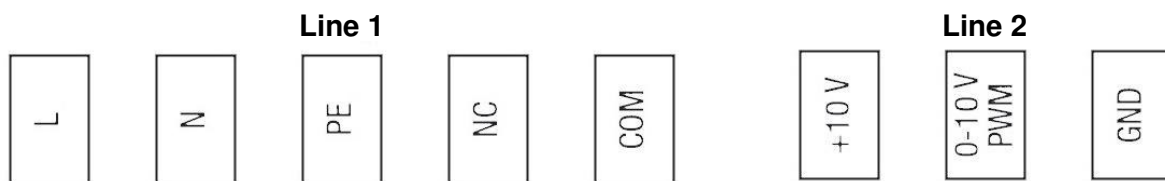


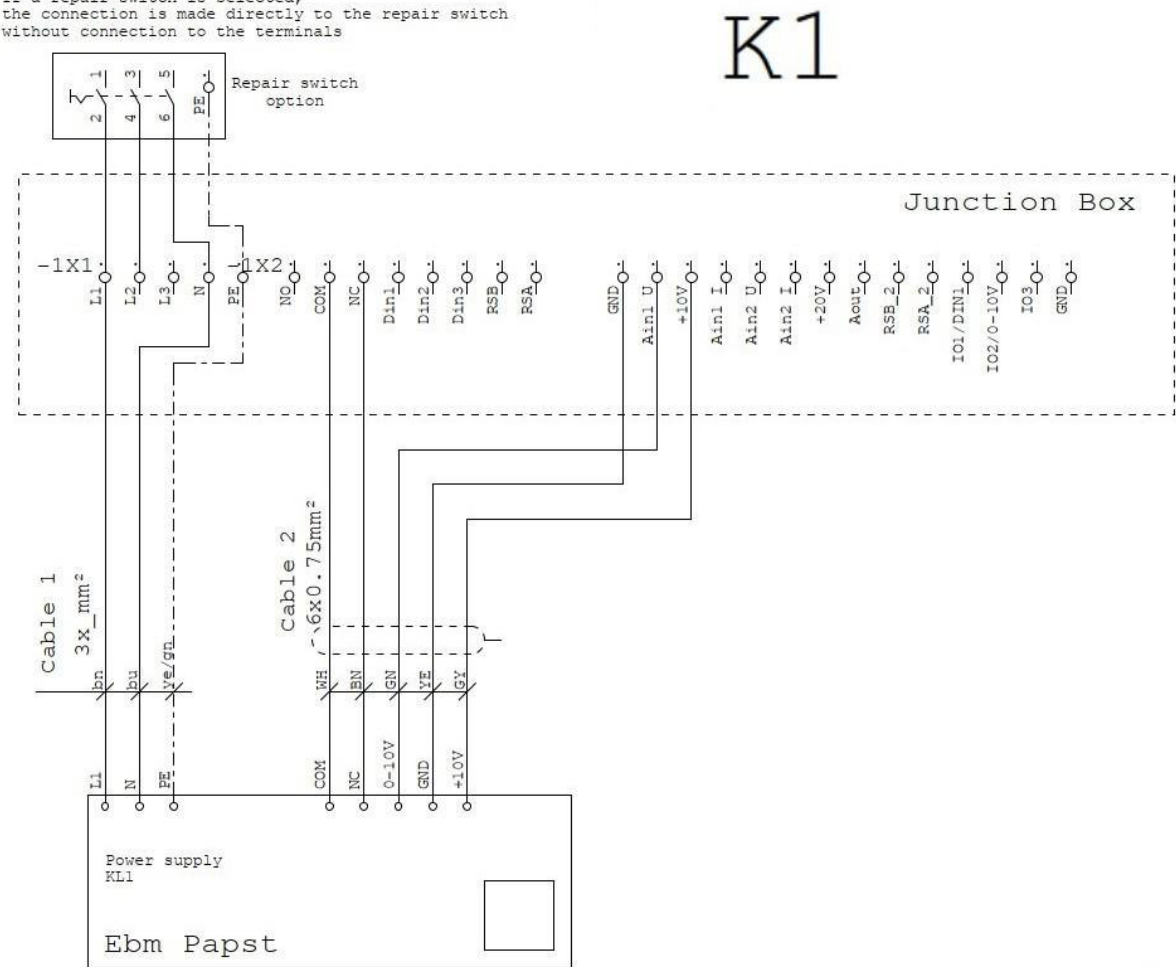
Figure 5: Connection schematic K1 with connection box

Line	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
1	L	L1	Brown (BN) / 2	1	Power supply, phase, see nameplate for voltage range
	N	N	Blue (BU) / 8	1	Power supply, neutral conductor, see nameplate for voltage range
	PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
	NC	NC	Brown (BN) / 2	2	Status relay, potential-free status signal contact, break contact in case of error
	COM	COM	White (WH) / 1	2	Status relay, potential-free status signal contact, change-over contact, common connection, (2 A, 250 V, min. 10 mA, AC1)
2	+10 V	+10 V	Green (GN) / 3	2	Voltage output +10 V max. 1.1 mA
	0-10 V/ PWM	Ain1 U	Yellow (YE) / 4	2	Control input (impedance 100 kΩ)
	GND	GND	Grey (GY) / 5	2	GND

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 1: Connections K1 with connection box

Attention!!
If a repair switch is selected,
the connection is made directly to the repair switch
without connection to the terminals



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 6: Connection diagram K1 with connection box

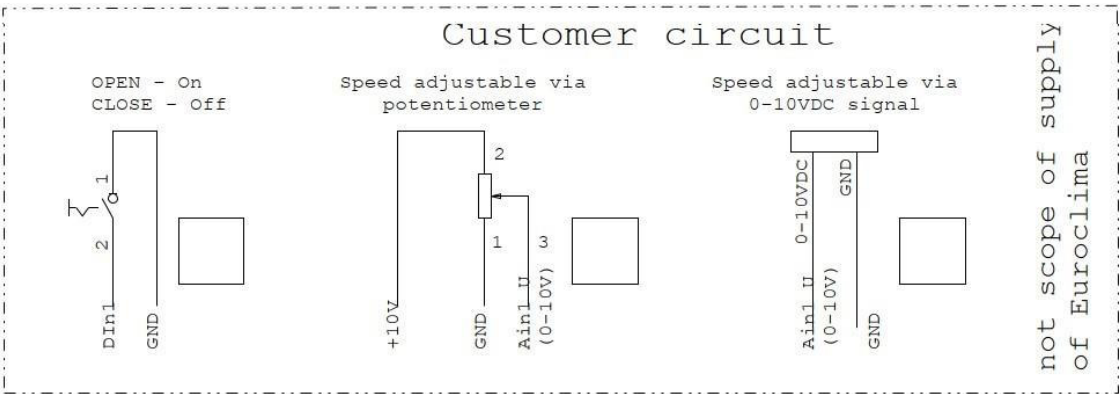


Figure 7: Connection customer K1 with connection box

2.2 Connection schematic: K1 (pre-wired by ebm-papst)

Technical specifications:

- PFC (passive)
- Control input 0-10 VDC / PWM
- Output 10 VDC max. 1.1 mA
- Fault signal relay
- Overtemperature protection electronics / motor

Connection schematic:

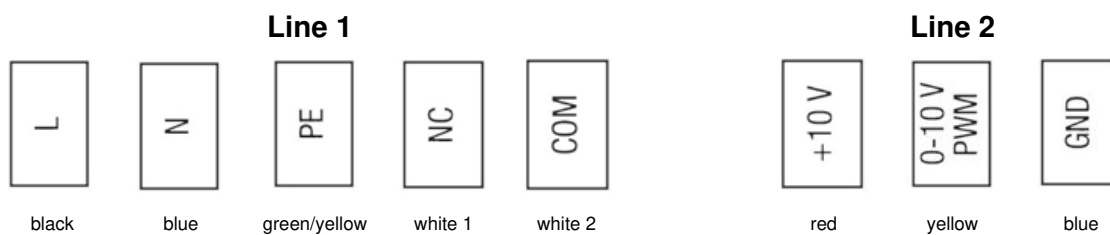


Figure 8: Connection schematic K1 pre-wired by ebm-papst

Line	Connection	Color / Number	Allocation / function
1	L	Black	Power supply, phase, see nameplate for voltage range
	N	Blue	Power supply, neutral conductor, see nameplate for voltage range
	PE	Green/Yellow	Protective earth
	NC	White 1	Status relay, potential-free status signal contact, break contact in case of error
	COM	White 2	Status relay, potential-free status signal contact, change-over contact, common connection, (2 A, 250 V, min. 10 mA, AC1)
2	+10 V	Red	Voltage output +10 V max. 1.1 mA
	0-10 V/ PWM	Yellow	Control input (impedance 100 kΩ)
	GND	Blau	GND

Table 2: Connections K1 pre-wired by ebm-papst

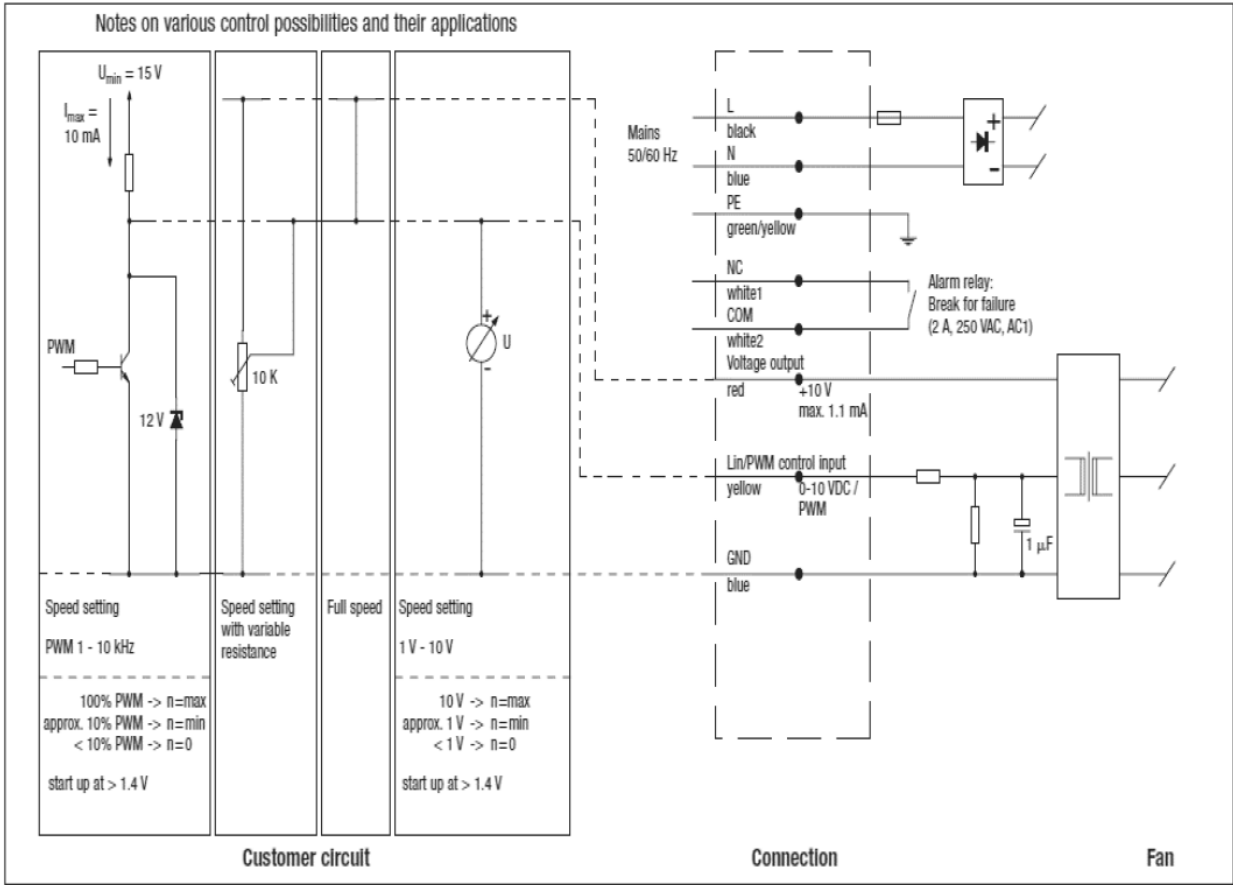


Figure 9: Connection diagram K1 pre-wired by ebm-papst

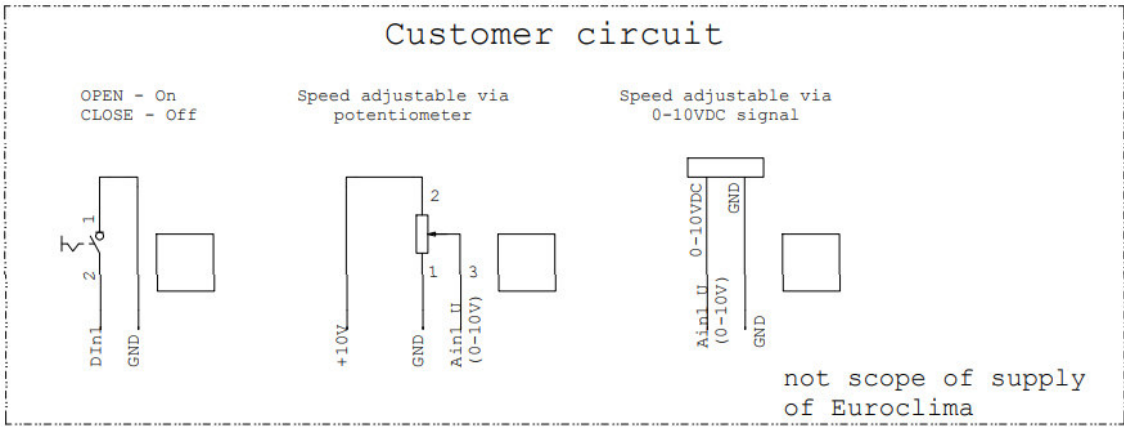


Figure 10: Connection customer K1 pre-wired by ebm-papst

2.3 Connection schematic: M3

Technical specifications:

- Control input 0-10 VDC/PWM
- Output 10 VDC (+10 %) max. 10 mA
- Output 20 VDC (+/-20 %) max. 50 mA
- Output for slave 0-10 V max. 5 mA
- Input for sensor 0-10 V resp. 4-20 mA
- Operating and fault message
- Integrated PI controller
- Reverse polarity and stall protection / soft start
- Motor current limiting / Fault alarm relay
- RS 485 MODBUS-RTU / PFC, passive
- Overtemperature protection electronics / motor
- Undervoltage / phase failure detection
- Control interface with SELV potential safely isolated from mains supply
- External enable input / external 24 V input (parameterization)

Connection schematic:

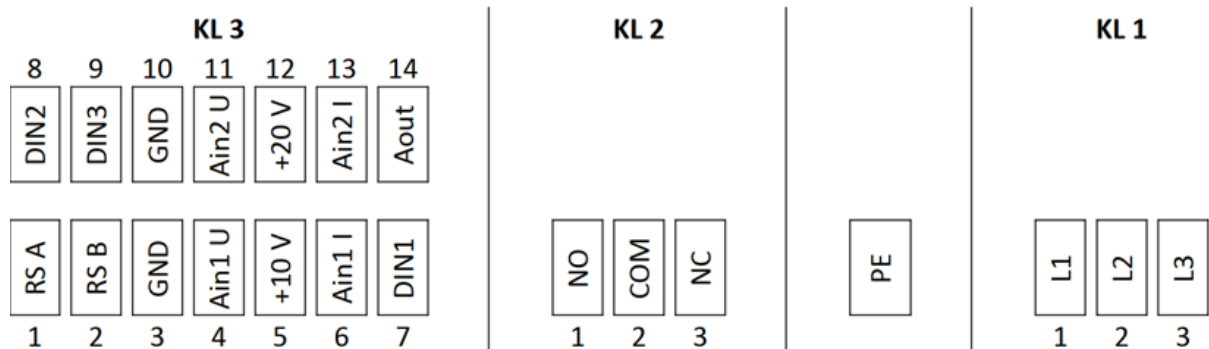


Figure 11: Connection schematic M3

KL	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
KL1	1	L1	L1	Brown (BN) / 2	1	Mains supply, supply voltage 3~380-480 VAC; 50/60 Hz
	2	L2	L2	Black (BK) / 11	1	Mains supply, supply voltage 3~380-480 VAC; 50/60 Hz
	3	L3	L3	Grey (GY) / 5	1	Mains supply, supply voltage 3~380-480 VAC; 50/60 Hz
PE		PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
KL2	1	NO	NO	White (WH) / 1	2	Status relay, potential-free status signal contact, normally open contact in case of error
	2	COM	COM	Brown (BN) / 2	2	Status relay, potential-free status signal contact, change-over contact, common connection, (2 A, 250 V, min. 10 mA, AC1)
	3	NC	NC	Green (GN) / 3	2	Status relay, potential-free status signal contact, break contact in case of error
KL3	1	RSA	RSA	Red (RD) / 10	2	Bus connection RS485; RSA; MODBUS RTU, SELV
	2	RSB	RSB	Blue (BU) / 8	2	Bus connection RS485; RSB; MODBUS RTU, SELV
	3/10	GND	GND	White (WH) / 1	3	GND, SELV

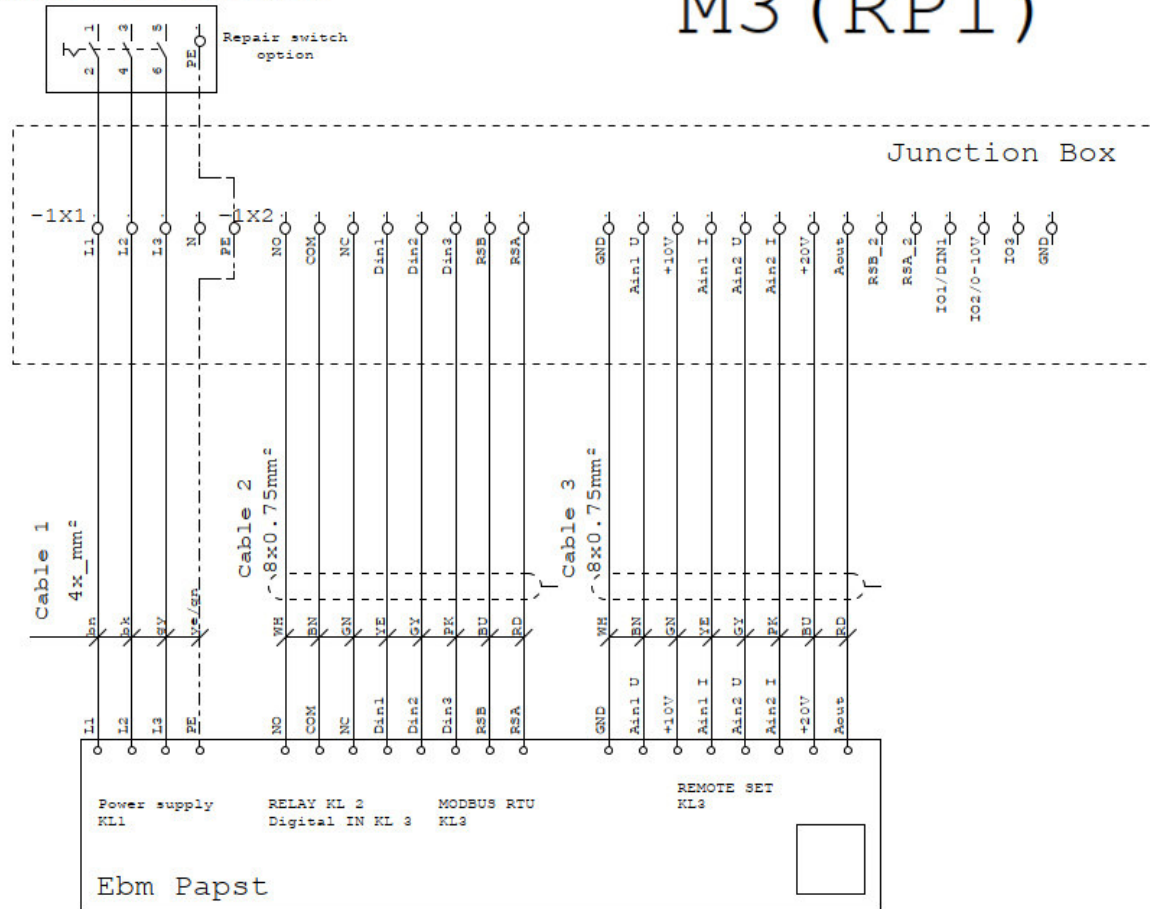
KL	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
	4	Ain1 U/PWM	Ain1 U/PWM	Brown (BN) / 2	3	Analog input 1 (setpoint); 0-10 V; Ri=100kΩ; characteristic curve can be parameterized; can only be used as an alternative to input Ain1 I, SELV
	5	+10 V	+10 V	Green (GN) / 3	3	Fixed voltage output 10 VDC; +10 V +/-3 %; max. 10 mA; permanent short-circuit proof; supply voltage for external devices (e.g. potentiometer), SELV
	6	Ain 1 I	Ain 1 I	Yellow (YE) / 4	3	Analog input 1 (setpoint); 4-20 mA; Ri=100Ω; characteristic curve can be parameterized; can only be used as an alternative to input Ain1 U, SELV
	7	Din1	Din1	Yellow (YE) / 4	2	Digital input 1: Enable electronics; Enable: Pin open or applied voltage 5...50 VDC; Disable: Bridge to GND or applied voltage < 1 VDC; Reset function: Trigger a software reset after a level change to < 1 VDC, SELV
	8	Din2	Din2	Grey (GY) / 5	2	Digital input 2: Switchover parameter set 1 / 2; after EEPROM setting, the valid / used parameter set can be selected via BUS or via digital input Din2. Parameter set 1: Pin open or applied voltage 5...50 VDC; Parameter set 2: Bridge to GND or applied voltage < 1 VDC, SELV
	9	Din3	Din3	Pink (PK) / 6	2	Digital input 3: sense of action of the integrated controller; after EEPROM setting, the sense of action of the integrated controller can be selected via BUS or via digital input normal / inverse; normal: pin open or applied voltage 5...50 VDC; inverse: bridge or applied voltage < 1 VDC, SELV
	11	Ain2 U	Ain2 U	Grey (GY) / 5	3	Analog input 2; process value 0-10 V; Ri=100kΩ; characteristic curve can be parameterized; can only be used as an alternative to input 11 Ain 2 I, SELV
	12	+20 V	+20 V	Blue (BU) / 8	3	Fixed voltage output 20 VDC; +20 V +25/-10%; max. 50 mA; permanent short-circuit proof; supply voltage for external devices (e.g. sensor), SELV
	13	Ain2 I	Ain2 I	Pink (PK) / 6	3	Analog input 2; actual value 4-20 mA; Ri=100Ω; characteristic curve can be parameterized; can only be used as an alternative to input Ain2 U, SELV
	14	Aout	Aout	Red (RD) / 10	3	Analog output 0-10 V; max. 5 mA; output of the current motor output level / the current motor speed. Characteristic curve parameterizable, SELV

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 3: Connections M3

Attention!!!
If a repair switch is selected,
the connection is made directly to the repair switch
without connection to the terminals

M3 (RP1)



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 12: Connection diagram M3

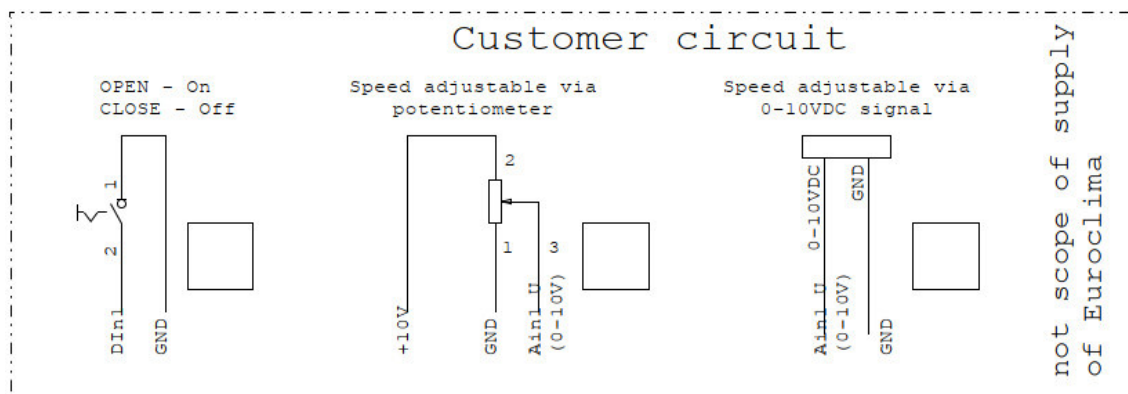


Figure 13: Connection customer M3

2.4 Connection schematic: M5

Technical specifications:

- Control input 0-10 VDC/PWM
- Output 10 VDC max. 10 mA
- Operating and fault message
- Integrated PI controller
- Fault signal relay
- Soft start
- PFC, passive
- Reverse polarity and blocking protection
- Motor current limitation
- RS 485 MODBUS-RTU
- Overtemperature protection electronics / motor
- Undervoltage / phase failure detection
- Control interface with SELV potential safely isolated from mains supply
- External enable input / external 24 V input (parameterization)

Connection schematic:

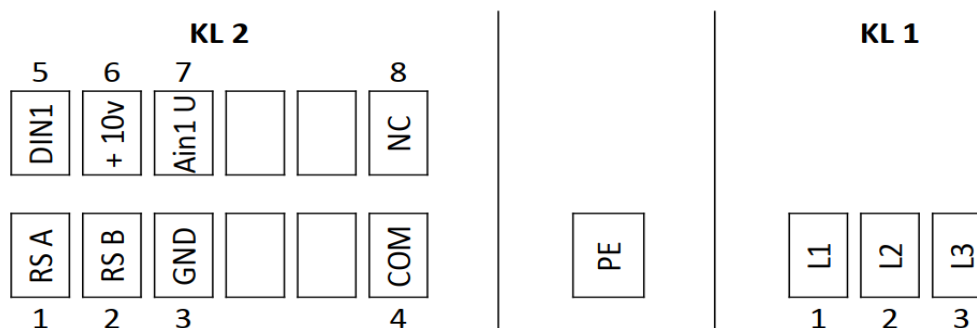


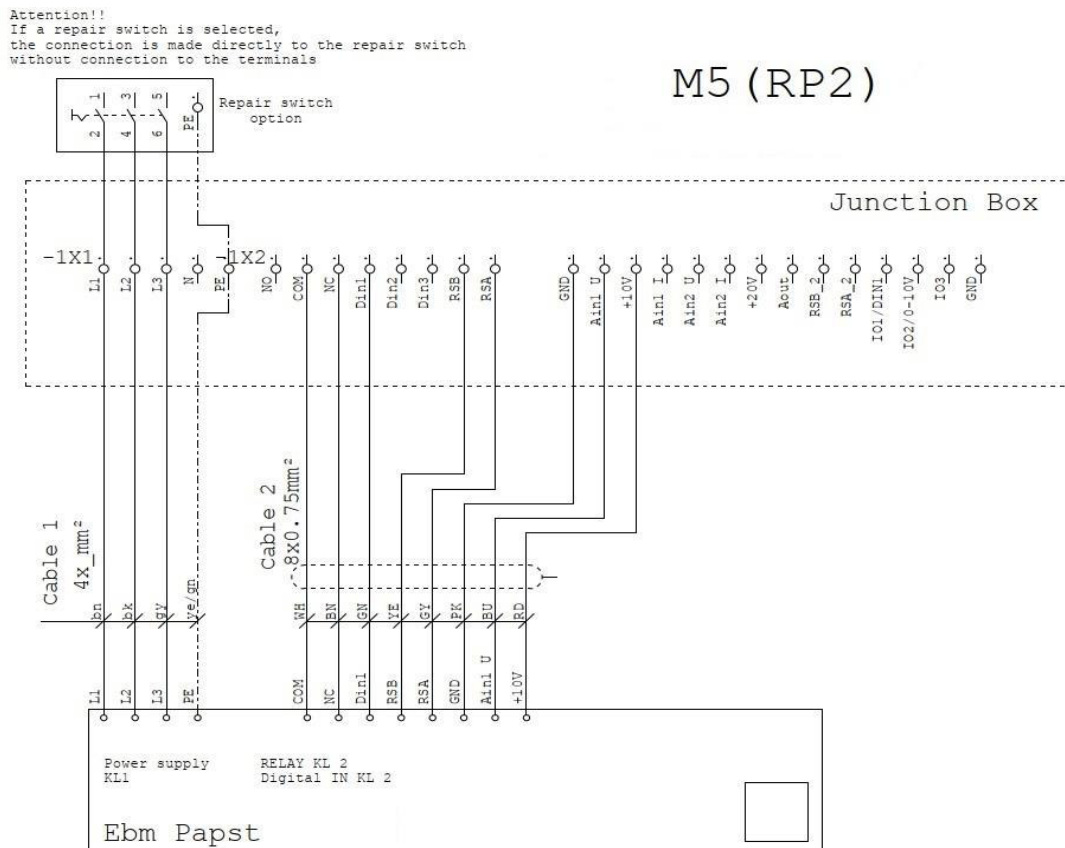
Figure 14: Connection schematic M5

KL	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
KL1	1	L1	L1	Brown (BN) / 2	1	Mains supply, supply voltage 3~380-480 VAC; 50/60 Hz
	2	L2	L2	Black (BK) / 11	1	Mains supply, supply voltage 3~380-480 VAC; 50/60 Hz
	3	L3	L3	Grey (GY) / 5	1	Mains supply, supply voltage 3~380-480 VAC; 50/60 Hz
PE		PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
KL2	1	RSA	RSA	Grey (GY) / 5	2	Bus connection RS485; RSA; MODBUS RTU, SELV
	2	RSB	RSB	Yellow (YE) / 4	2	Bus connection RS485; RSB; MODBUS RTU, SELV
	3	GND	GND	Pink (PK) / 6	2	GND, SELV
	4	COM	COM	White (WH) / 2	2	Status relay, potential-free status signal contact, change-over contact, common connection, Contact rating 250 VAC / 2 A (AC1)
	5	Din1	Din1	Green (GN) / 3	2	Digital input 1: Enable electronics; Enable: Pin open or applied voltage 5...50 VDC; Disable: Bridge to GND or applied voltage < 1 VDC; Reset function: Trigger a software reset after a level change to < 1 VDC, SELV
	6	+10 V	+10 V	Red (RD) / 10	2	Fixed voltage output 10 VDC; +10 V +/-3 %; max. 10 mA; permanent short-circuit proof; supply voltage for external devices (e.g. potentiometer), SELV

KL	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
	7	Ain1 U	Ain1 U	Blue (BU) / 8	2	Analog input 1 (setpoint); 0-10 V; Ri=100kΩ; characteristic curve parameterizable, SELV
	8	NC	NC	Brown (BN) / 2	2	Status relay, potential-free status signal contact, break contact in case of error

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 4: Connections M5



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function.

Figure 15: Connection diagram M5

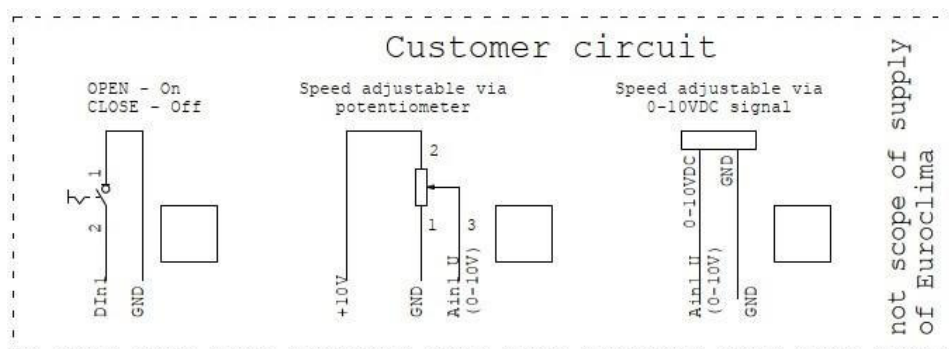


Figure 16: Connection customer M5

2.5 Connection schematic: L6

Technical specifications:

- Control input 0-10 VDC/PWM
- Input for sensor 0-10 V resp. 4-20 mA
- Output for slave 0-10 V max. 5 mA
- Output 20 VDC (+ 25 % / - 10 %) max. 50 mA
- Output 10 VDC (+/- 3 %) max. 10 mA
- Integrated PI controller
- PFC, passive
- Motor current limiting / fault signal relay
- RS 485 MODBUS-RTU
- Overtemperature protection electronics / motor
- Undervoltage / phase failure detection
- Blocking protection / Soft start
- External 24V input (parameterization)
- Control interface with SELV potential safely separated from mains supply

Connection schematic:

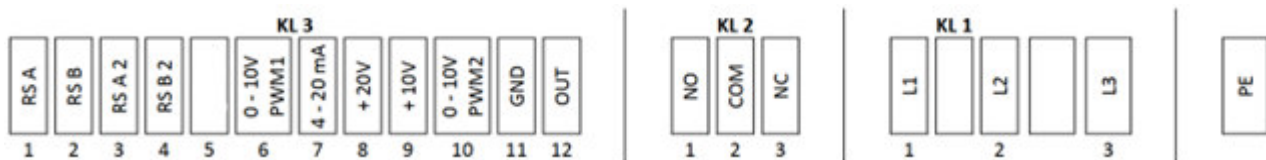


Figure 17: Connection schematic L6

KL	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
KL1	1	L1	L1	Brown (BN) / 2	1	Power supply; see nameplate for voltage range; 50/60 Hz
	2	L2	L2	Black (BK) / 11	1	Power supply; see nameplate for voltage range; 50/60 Hz
	3	L3	L3	Grey (GY) / 5	1	Power supply; see nameplate for voltage range; 50/60 Hz
PE		PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
KL2	1	NO	NO	White (WH) / 1	2	Status relay, potential-free status signal contact, normally open contact in case of error
	2	COM	COM	Brown (BN) / 2	2	Status relay, potential-free status signal contact, change-over contact, common connection, (2 A, 250 V, min. 10 mA, AC1)
	3	NC	NC	Green (GN) / 3	2	Status relay, potential-free status signal contact, break contact in case of error
KL3	1	RSA1	RSA	Yellow (YE) / 4	3	RS485 interface for MODBUS-RTU; RSA; SELV
	2	RSB1	RSB	Green (GN) / 3	3	RS485 interface for MODBUS-RTU; RSB; SELV
	3	RSA2	RSA2	Pink (PK) / 6	3	RS485 interface for MODBUS-RTU; RSA; SELV
	4	RSB2	RSB2	Grey (GY) / 5	3	RS485 interface for MODBUS-RTU; RSB; SELV
	5		---			
	6	0 - 10V/PWM1	Ain2 U	Brown (BN) / 2	3	Control / actual value input 0-10 VDC; (impedance 100kΩ); only use as alternative to 4-20 mA input, SELV

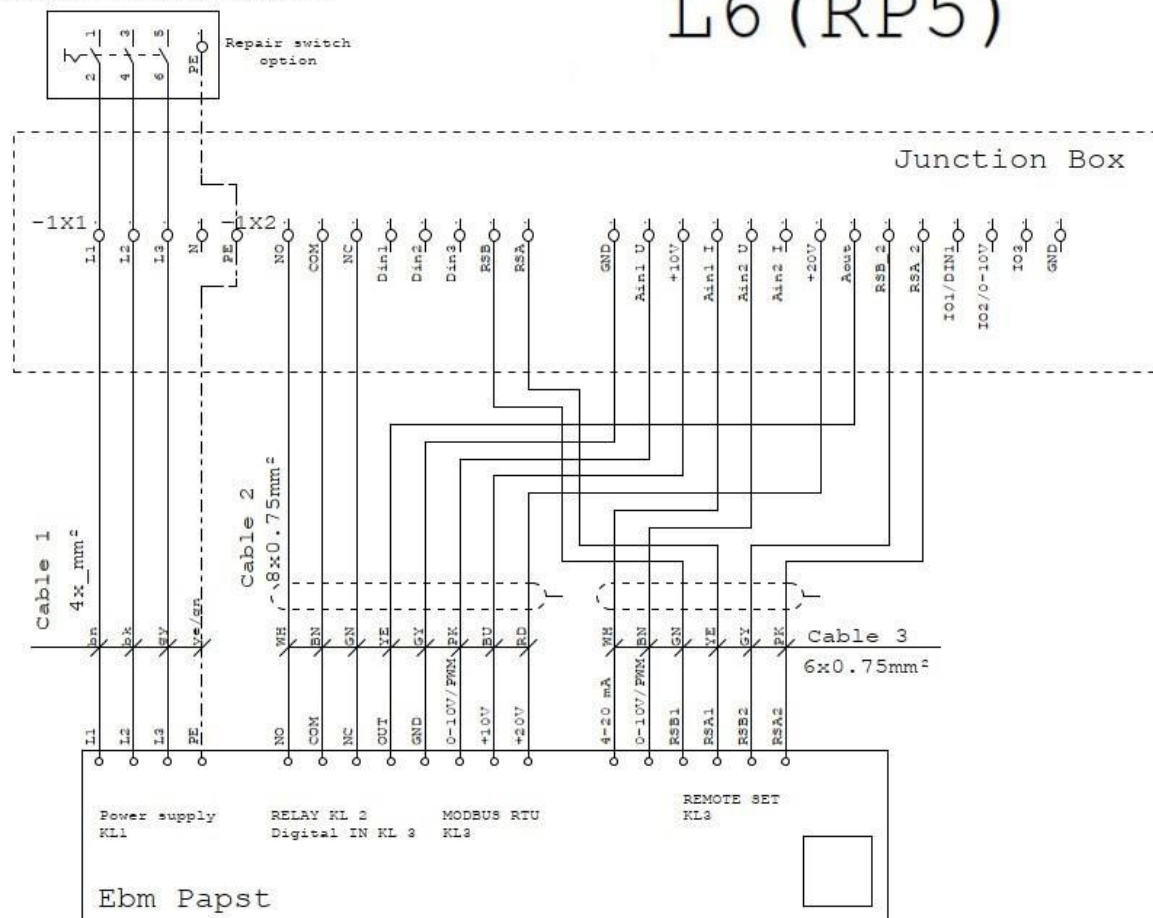
KL	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
	7	4 - 20 mA	Ain1 I	White (WH) / 1	3	Control / actual value input 4-20 mA; (impedance 100kΩ); only use as alternative to 0-10 VDC input, SELV
	8	+20 V	+20 V	Red (RD) / 10	2	Voltage output 20 VDC (+ 25 %/- 10 %); max. 50 mA; supply voltage for external devices (e.g. sensor), SELV
	9	+10 V	+10 V	Blue (BU) / 8	2	Voltage output 10 VDC (+/-3 %), max. 10 mA; supply voltage for external devices (e.g. potentiometer), SELV
	10	0 - 10V/PWM2	Ain1 U	Pink (PK) / 6	2	Control / actual value input 0-10 VDC; (impedance 100kΩ); only use as alternative to 4-20 mA input, SELV
	11	GND	GND	Grey (GY) / 5	2	GND
	12	OUT	Aout	Yellow (YE) / 4	2	Master output 0-10VDC max. 3 mA; SELV; output of the current motor output level: 1 V corresponds to 10 % output level, 10 V corresponds to 100 % output level

1) if present: if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 5: Connections L6

Attention!!
If a repair switch is selected,
the connection is made directly to the repair switch
without connection to the terminals

L6 (RP5)



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 18: Connection diagram L6

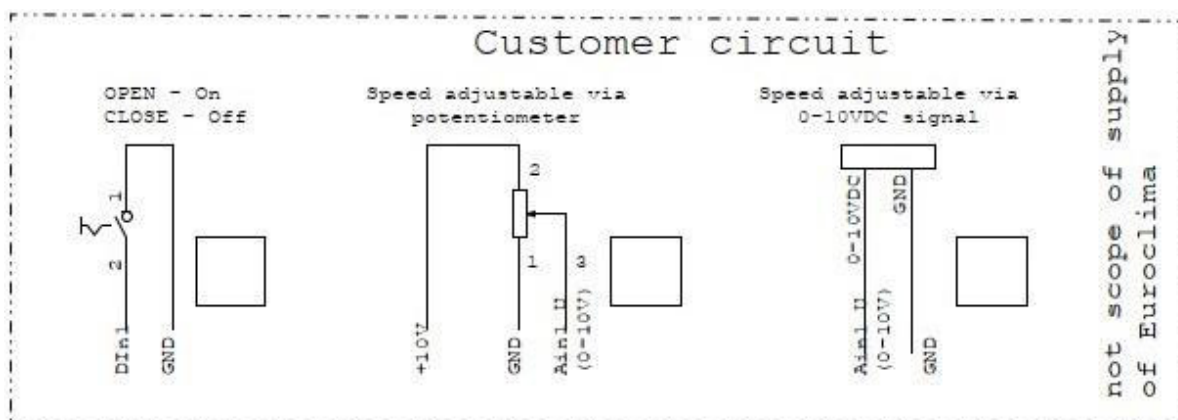


Figure 19: Connection customer L6

2.6 Connection schematic: L7

Technical specifications:

- PFC (active)
- Integrated PI controller
- Control input 0-10 VDC / PWM
- Input for sensor 0-10 V or 4-20 mA
- Output for slave 0-10 V max. 3 mA
- Output 20 VDC (+/- 20 %) max. 50 mA
- Output 10 VDC (+ 10 %) max. 10 mA
- RS 485 MODBUS
- Fault detection relay
- Undervoltage detection
- Motor current limitation
- Overtemperature protection electronics / motor
- Block protection
- Soft start

Connection schematic:

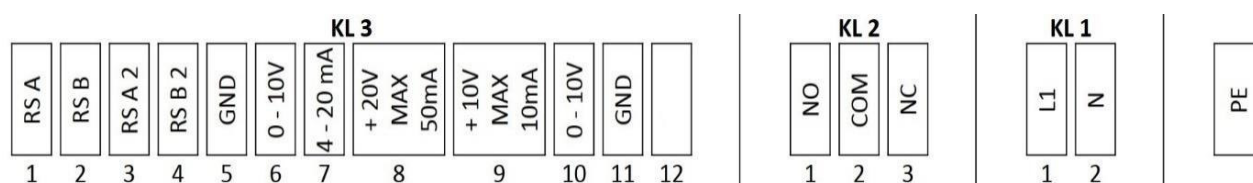


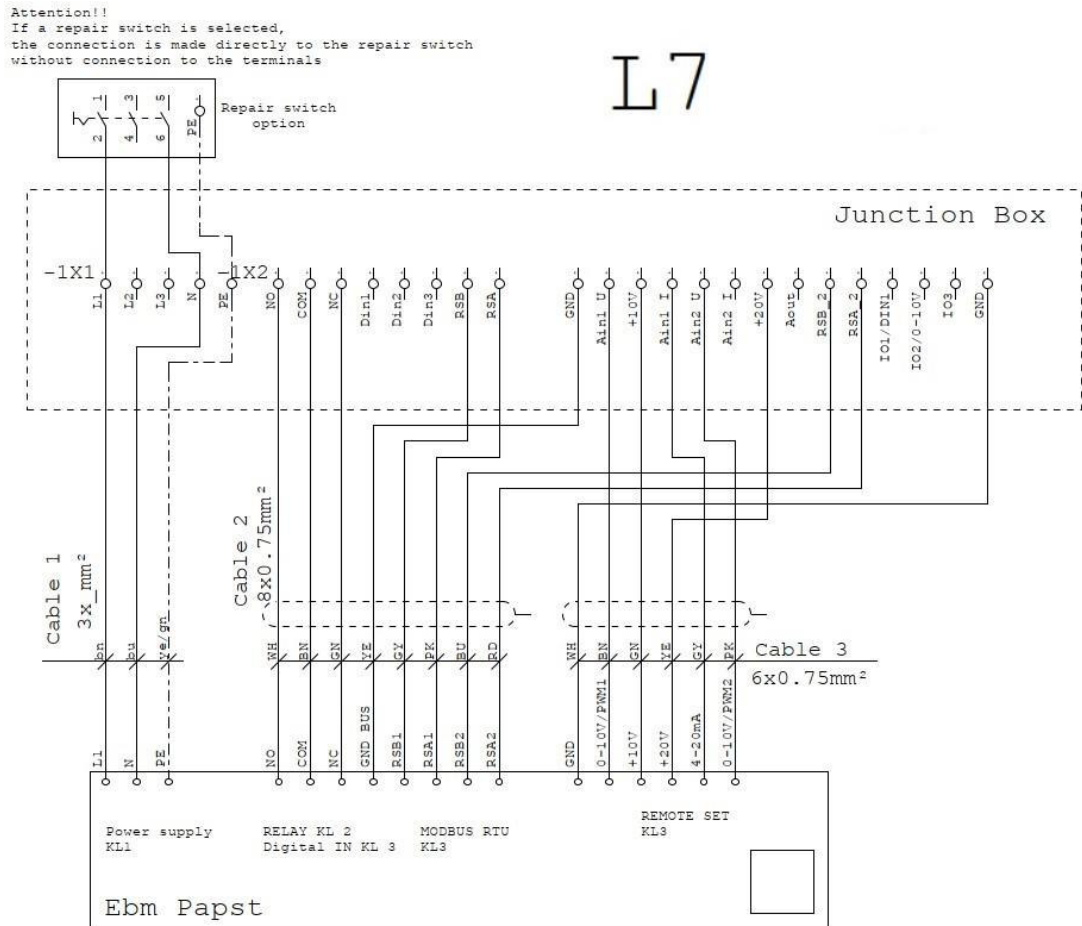
Figure 20: Connection schematic L7

KL	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
PE		PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
KL1	1	L1	L1	Brown (BN) / 2	1	Power supply, phase, 50/60 Hz
	2	N	N	Black (BK) / 11	1	Power supply, neutral conductor, 50/60 Hz
KL2	1	NO	NO	White (WH) / 1	2	Status relay, potential-free status signal contact, normally open contact in case of error
	2	COM	COM	Brown (BN) / 2	2	Status relay, potential-free status signal contact, change-over contact, common connection, (2 A, 250 V, min. 10 mA, AC1)
	3	NC	NC	Green (GN) / 3	2	Status relay, potential-free status signal contact, break contact in case of error
KL3	1	RSA	RSA	Pink (PK) / 6	2	RS485 interface for MODBUS-RTU; RSA; SELV
	2	RSB	RSB	Grey (GY) / 5	2	RS485 interface for MODBUS-RTU; RSB; SELV
	3	RSA2	RSA2	Red (RD) / 10	2	RS485 interface for MODBUS-RTU; RSA; SELV
	4	RSB2	RSB2	Blue (BU) / 8	2	RS485 interface for MODBUS-RTU; RSB; SELV
	5	GND	GND	Yellow (YE) / 4	2	GND
	6	0 - 10V/PWM1	Ain1 U	Brown (BN) / 2	3	Control / actual value input
	7	4 - 20 mA	Ain1 I	Grey (GY) / 5	3	Control / actual value input
	8	+20 V	+20 V	Yellow (YE) / 4	3	Supply external sensor, 20 VDC (±20 %) max. 50 mA
	9	+10 V	+10 V	Green (GN) / 3	3	Supply external potentiometer, 10 VDC (+10 %) max. 10 mA
	10	0 - 10V/PWM2	Ain2 U	Pink (PK) / 6	3	Control / actual value input (impedance 100 kΩ)

KL	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
	11	GND	GND	White (WH) / 1	3	GND
	12	---	---			

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 6: Connections L7



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 21: Connection diagram L7

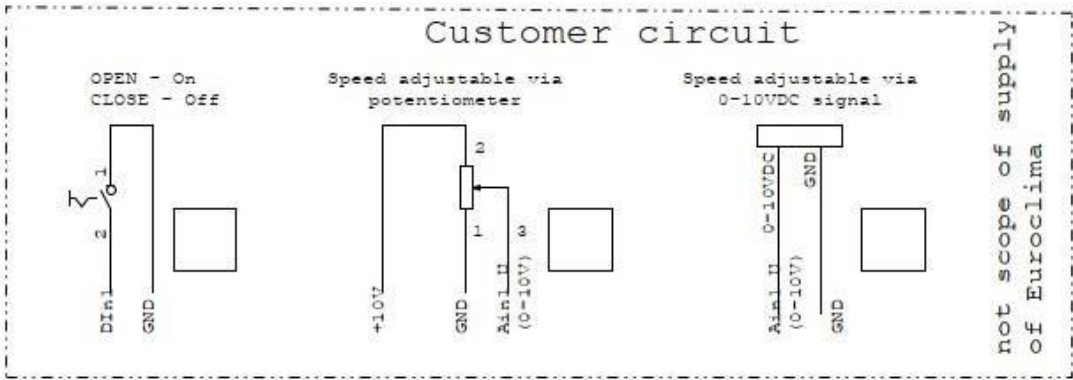


Figure 22: Connection customer L7

2.7 Connection schematic: L9

Technical specifications:

- PFC (active)
- Integrated PI controller
- Control input 0-10 VDC / PWM
- Input for sensor 0-10 V or 4-20 mA
- Output for slave 0-10 V max. 3 mA
- Output 20 VDC (+/- 20 %) max. 50 mA
- Output 10 VDC (+ 10 %) max. 10 mA
- RS 485 MODBUS
- Fault detection relay
- Undervoltage detection
- Motor current limitation
- Overtemperature protection electronics / motor
- Block protection
- Soft start

Connection schematic:

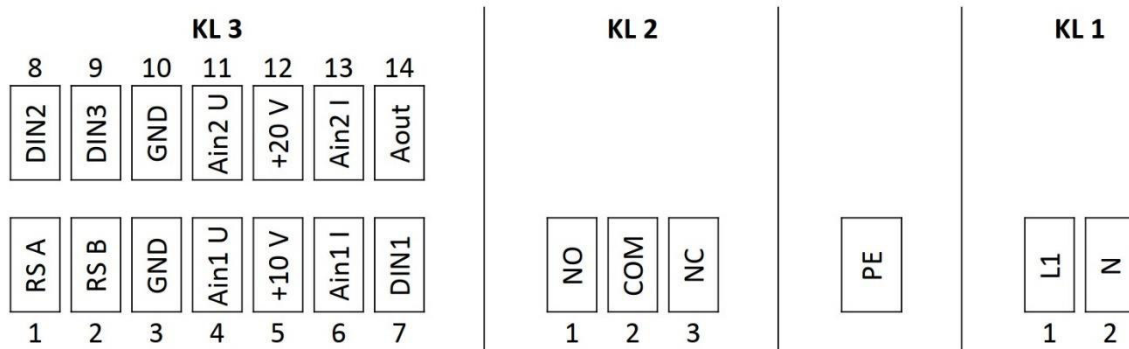


Figure 23: Connection schematic L9

KL	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
PE		PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
KL1	1	L1	L1	Black (BK) / 11	1	Power supply; L1
	2	N	N	Blue (BU) / 8	1	Power supply; neutral conductor
KL2	1	NO	NO	White (WH) / 1	2	Status relay, potential-free status signal contact, normally open contact in case of error
	2	COM	COM	Brown (BN) / 2	2	Status relay, potential-free status signal contact, change-over contact, common connection, (2 A, 250 V, min. 10 mA, AC1)
	3	NC	NC	Green (GN) / 3	2	Status relay, potential-free status signal contact, break contact in case of error
KL3	1	RSA	RSA	Red (RD) / 10	2	RS485 interface for MODBUS-RTU; RSA
	2	RSB	RSB	Blue (BU) / 8	2	RS485 interface for MODBUS-RTU; RSB
	3/10	GND	GND	White (WH) / 1	3	GND
	4	Ain1 U / PWM	Ain1 U / PWM	Brown (BN) / 2	3	Analog setpoint input, 0-10 V (impedance 100 kΩ), only use as alternative to connection Ain1 I
	5	+10 V	+10 V	Green (GN) / 3	3	Supply external potentiometer, 10 VDC (±3 %) max. 10 mA

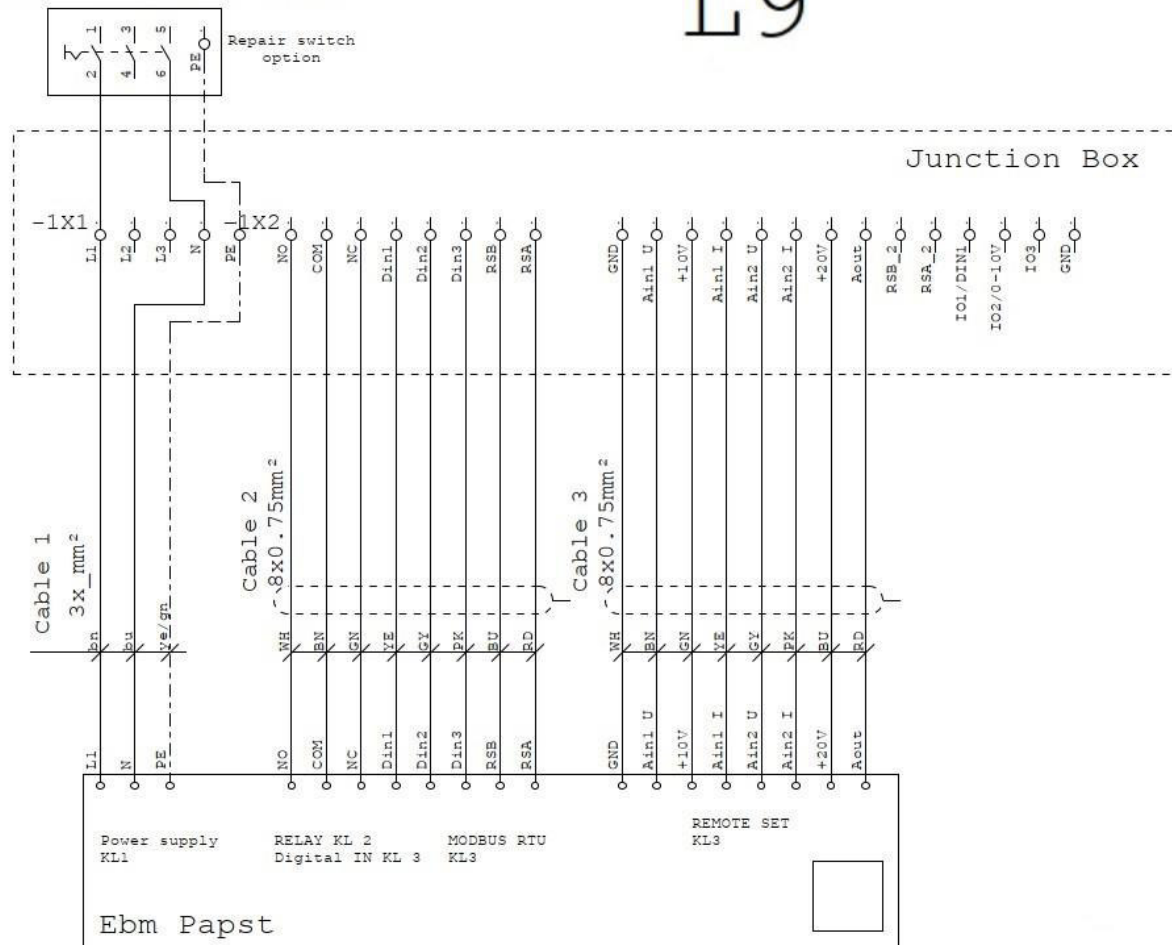
KL	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
	6	Ain1 I	Ain1 I	Yellow (YE) / 4	3	Analog setpoint input, 4-20mA (impedance 100 Ω), only use as alternative to connection Ain1 U
	7	Din1	Din1	Yellow (YE) / 4	2	Digital input 1 (enable / disable electronics), enable: pin open or applied voltage 5...50VDC, disable: bridge to GND or applied voltage < 1VDC
	8	Din2	Din2	Grey (GY) / 5	2	Digital input 2 (switching day / night), the preset parameter set can be selected via BUS or via digital input day / night. Day: Pin open or applied voltage 5...50 VDC. Night: Bridge to GND or applied voltage < 1 VDC.
	9	Din3	Din3	Pink (PK) / 6	2	Digital input 3 (changeover normal/inverse), the preset direction of action of the integrated controller can be selected via BUS or via digital input normal/inverse. Normal: Pin open or applied voltage 5...50 VDC. Inverse: Bridge to GND or applied voltage < 1 VDC.
	11	Ain2 U	Ain2 U	Grey (GY) / 5	3	Analog actual value input, 0-10 V (impedance 100 kΩ), only use as alternative to connection Ain2 I
	12	+20 V	+20 V	Blue (BU) / 8	3	Supply external sensor, 20 VDC (+25 % / -10%) max. 40 mA
	13	Ain2 I	Ain2 I	Pink (PK) / 6	3	Analog actual value input, 4-20 mA (impedance 100 Ω), only use as alternative to connection Ain2 U
	14	Aout	Aout	Red (RD) / 10	3	Analog output 0-10 V max. 5 mA, output of the current motor speed/current motor output level

1) if present: if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 7: Connections L9

Attention!!
If a repair switch is selected,
the connection is made directly to the repair switch
without connection to the terminals

L9



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 24: Connection diagram L9

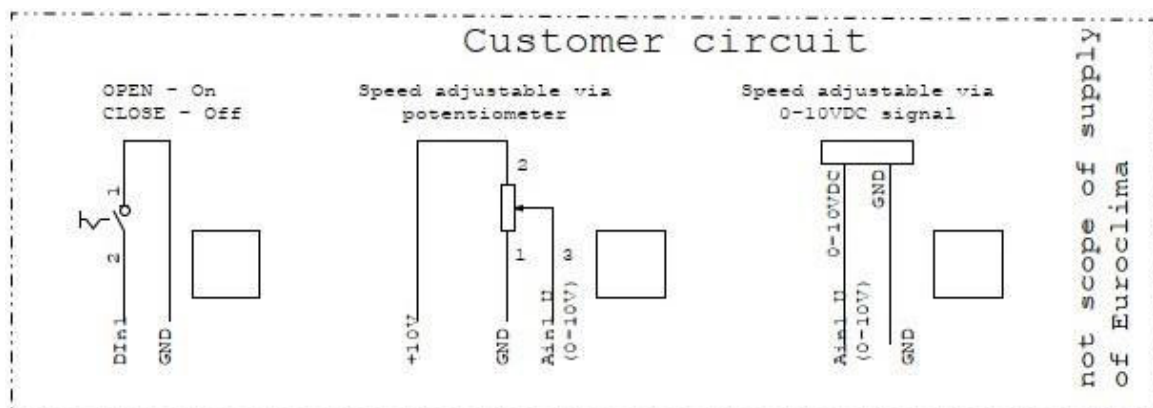


Figure 25: Connection customer L9

2.8 Connection schematic: P2

Technical specifications:

- PFC (passive)
- Integrated PI controller
- Control input 0-10 VDC/PWM
- Input for sensor 0-10 V or 4-20 mA
- Output for slave 0-10 V max. 5 mA
- Output 20 VDC (+/-25 % / -10 %) max. 50 mA
- Output 10 VDC (+3 %) max. 10 mA
- External 24 V input (parameterization)
- RS 485 MODBUS-RTU
- Motor current limiting / fault alarm relay
- Undervoltage / phase failure detection
- Overtemperature protection electronics / motor
- Blocking protection, soft start
- Control interface with SELV potential safely isolated from mains supply

Connection schematic:

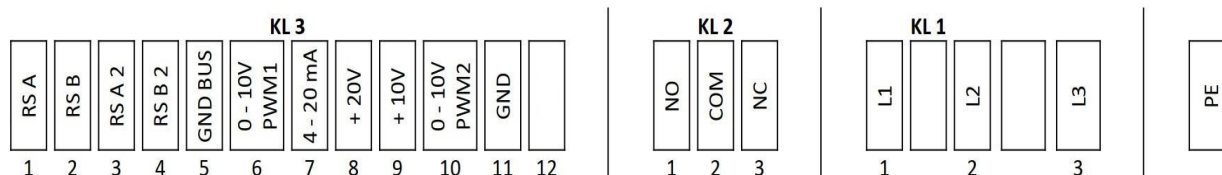


Figure 26: Connection schematic P2

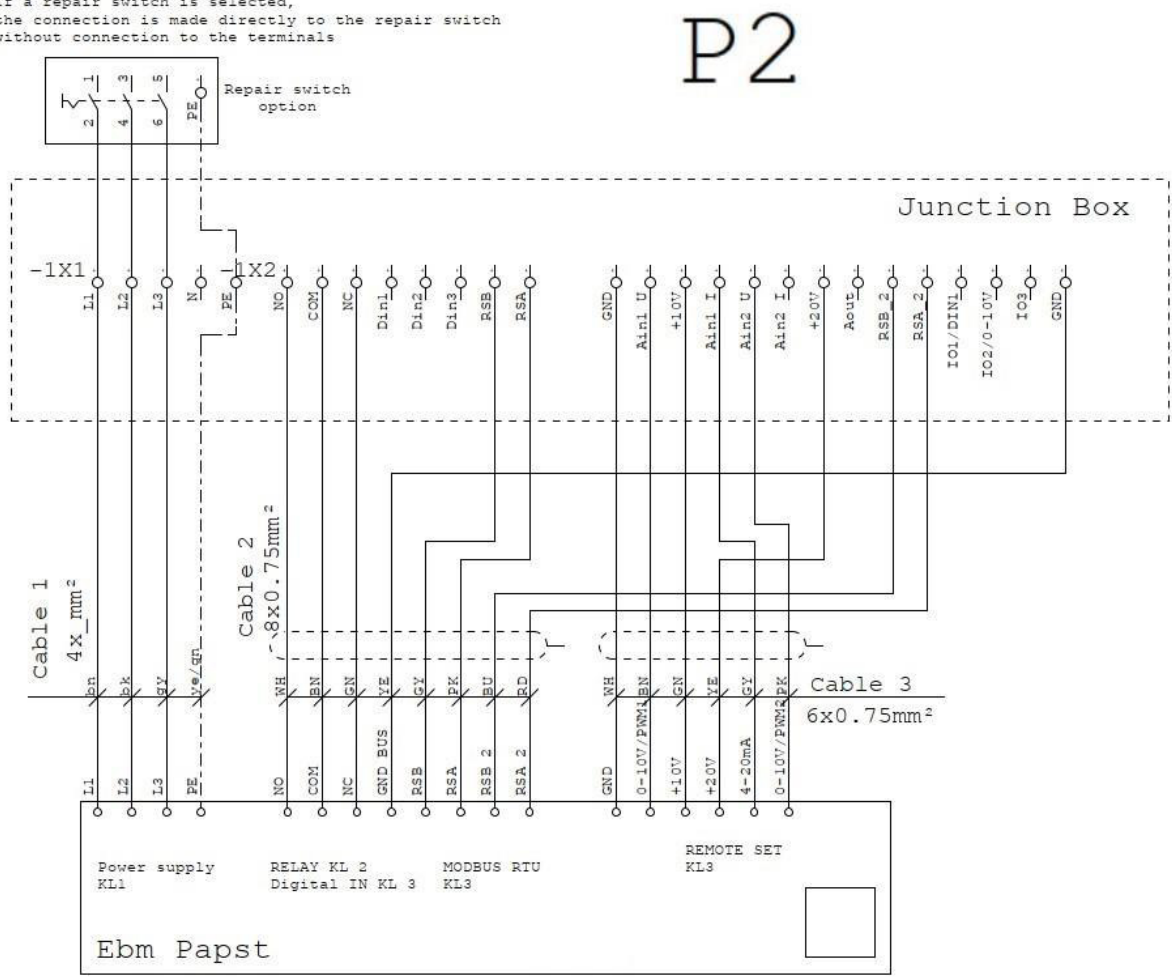
KL	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
PE		PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
KL1	1	L1	L1	Brown (BN) / 2	1	Mains supply, supply voltage 3~380-480 VAC; 50/60 Hz
	2	L2	L2	Black (BK) / 11	1	Mains supply, supply voltage 3~380-480 VAC; 50/60 Hz
	3	L3	L3	Grey (GY) / 5	1	Mains supply, supply voltage 3~380-480 VAC; 50/60 Hz
KL2	1	NO	NO	White (WH) / 1	2	Status relay, potential-free status signal contact, normally open contact in case of error
	2	COM	COM	Brown (BN) / 2	2	Status relay, potential-free status signal contact, change-over contact, common connection, (2 A, 250 V, min. 10 mA, AC1)
	3	NC	NC	Green (GN) / 3	2	Status relay, potential-free status signal contact, break contact in case of error
KL3	1	RSA	RSA	Red (RD) / 10	2	Bus connection RS485; RSA; MODBUS RTU, SELV
	2	RSB	RSB	Blue (BU) / 8	2	Bus connection RS485; RSB; MODBUS RTU, SELV
	3	RSA 2	RSA 2	Pink (PK) / 6	2	Bus connection RS485; RSA; MODBUS RTU, SELV
	4	RSB 2	RSB 2	Grey (GY) / 5	2	Bus connection RS485; RSB; MODBUS RTU, SELV
	5	GND BUS	GND	White (WH) / 1	2	GND; SELV

KL	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
	6	0-10 V / PWM 1	Ain1 U	Pink (PK) / 6	3	Control/actual value input 0-10 VDC, impedance 100 kΩ; only use as alternative to 4-20 mA input, SELV
	7	4-20 mA	Ain1 I	Grey (GY) / 5	3	Control/actual value input 4-20 mA, impedance 100 Ω; only use as alternative to 0-10 V input, SELV
	8	+ 20 V	+ 20 V	Yellow (YE) / 4	3	Voltage output 20 VDC (+25 % / - 10 %), max. 50 mA; supply voltage for external devices (e.g. sensors), SELV
	9	+ 10 V	+ 10 V	Green (GN) / 3	3	Voltage output 10 VDC (±3 %), max. 10 mA; supply voltage for external devices (e.g. potentiometer), SELV
	10	0-10 V / PWM 2	Ain2 U	Brown (BN) / 2	3	Control/actual value input 0-10 VDC, impedance 100 kΩ; only use as alternative to 4-20 mA input, SELV
	11	GND	GND	Yellow (YE) / 4	3	GND KL3; SELV
	12	---	---			

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 8: Connections P2

Attention!!
If a repair switch is selected,
the connection is made directly to the repair switch
without connection to the terminals



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 27: Connection diagram P2

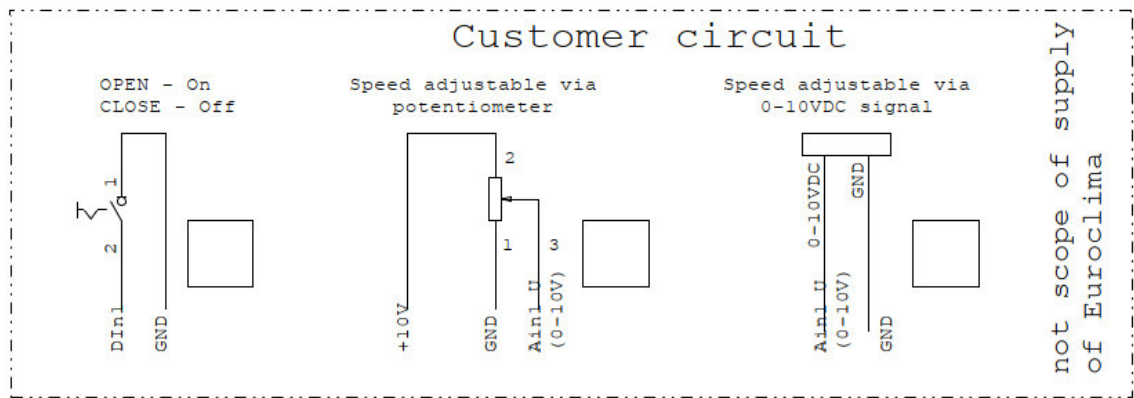


Figure 28: Connection customer P2

2.9 Connection schematic: P5 (with connection box)

Technical specifications:

- Control input 0-10 VDC/PWM
- Output 10 VDC max. 10 mA
- Operating and fault signal
- Fault signal relay
- Blocking protection, soft start
- Power limitation
- PFC (active)
- Motor current limitation
- RS 485 MODBUS-RTU
- Undervoltage / phase failure detection
- Overtemperature protection electronics / motor
- Control interface with SELV potential safely isolated from mains supply

Connection schematic:

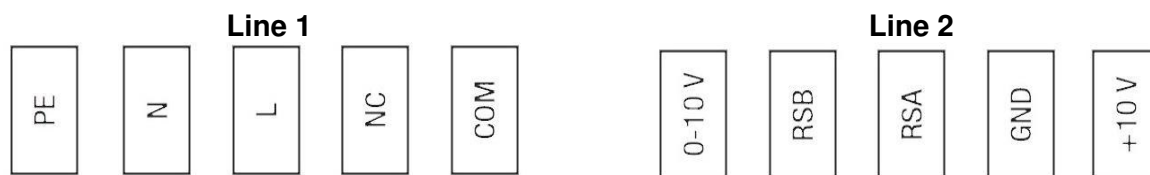
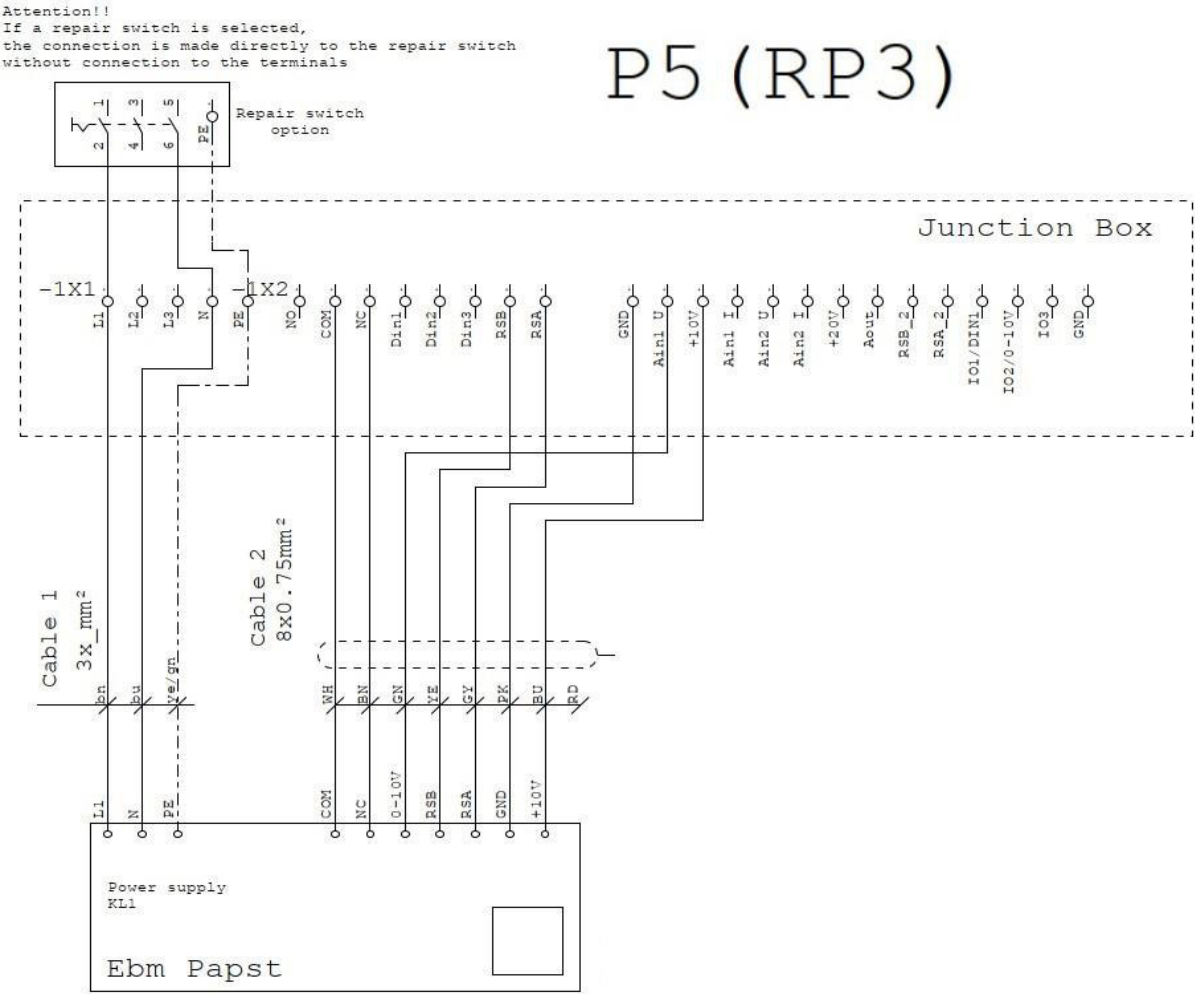


Figure 29: Connection schematic P5 with connection box

Leitung	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
1	1, 2	PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
	3	N	N	Blue (BU) / 8	1	Power supply, neutral conductor, see nameplate for voltage range, 50/60 Hz
	5	L	L	Black (BK) / 11	1	Power supply, phase, see nameplate for voltage range, 50/60 Hz
	6	NC	NC	Brown (BN) / 2	2	Status relay, potential-free status signal contact, break contact in case of error, contact load 250 VAC / 2 A (AC1), min. 10 mA, basic isolation to mains and reinforced isolation to control interface
	7	COM	COM	White (WH) / 1	2	Status relay, potential-free status signal contact, common connection, contact rating 250 VAC / 2 A (AC1), min. 10 mA, basic isolation to mains and reinforced isolation to control interface
2	8	0-10 V	0-10 V	Green (GN) / 3	2	Analog input (setpoint), SELV 0-10 V, impedance 100 kΩ, characteristic curve parameterizable
	10	RSB	RSB	Yellow (YE) / 4	2	RS485 interface for MODBUS, RSB, SELV
	11	RSA	RSA	Grey (GY) / 5	2	RS485 interface for MODBUS, RSA, SELV
	12	GND	GND	Pink (PK) / 6	2	GND, SELV
	13	+ 10 V	+ 10 V	Blue (BU) / 8	2	Fixed voltage output 10 VDC, SELV +10 V +/- 3%, max. 10 mA, permanent short circuit proof, supply voltage for ext. devices (e.g. potentiometer)

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 9: Connections P5 with connection box



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 30: Connection diagram P5 with connection box

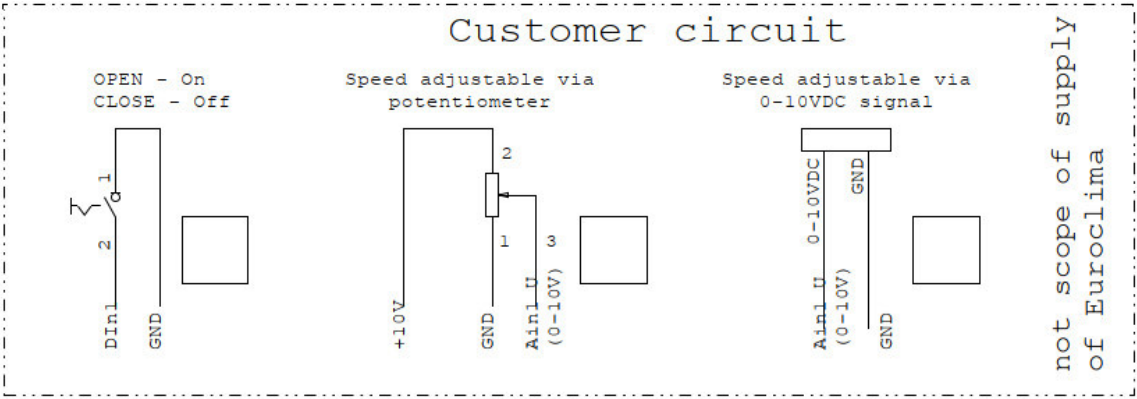


Figure 31: Connection customer P5 with connection box

2.10 Connection schematic: P5 (pre-wired by ebm-papst)

Technical specifications:

- Control input 0-10 VDC / PWM
- Output 10 VDC max. 10 mA
- Operating and fault signal
- Fault signal relay
- Blocking protection, soft start
- Power limitation
- PFC, active
- Motor current limitation
- RS 485 MODBUS-RTU
- Overtemperature protection electronics / motor
- Undervoltage / phase failure detection
- Control interface with SELV potential safely isolated from mains supply

Connection schematic:

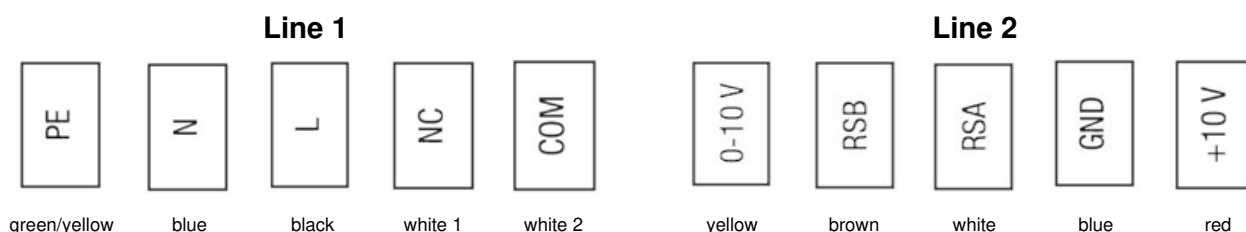


Figure 32: Connection schematic P5 pre-wired by ebm-papst

Line	No.	Connection	Color / Number	Allocation / function
1	1, 2	PE	Green/Yellow	Protective earth
	3	N	Blue	Power supply, neutral conductor, see nameplate for voltage range, 50/60 Hz
	5	L	Black	Power supply, phase, see nameplate for voltage range, 50/60 Hz
	6	NC	White 1	Status relay, potential-free status signal contact, break contact in case of error, contact rating 250 VAC / 2 A (AC1),
	7	COM	White 2	Status relay, potential-free status signal contact, change-over contact, common connection, (2 A, 250 V, min. 10 mA, AC1), min. 10 mA, basic insulation to mains and reinforced insulation to control interface
2	8	0-10 V/ PWM	Yellow	Analog input (setpoint), SELV 0-10 V, impedance 100 kΩ, characteristic curve parameterizable
	10	RSB	Brown	RS485 interface for MODBUS, RSB, SELV
	11	RSA	White	RS485 interface for MODBUS, RSA, SELV
	12	GND	Blue	GND, SELV
	13	+10 V	Red	Fixed voltage output 10 VDC, SELV, +10 V (+/- 3%), max. 10 mA, permanent short circuit proof, supply voltage for ext. devices (e.g. potentiometer)

Table 10: Connections P5 pre-wired by ebm-papst

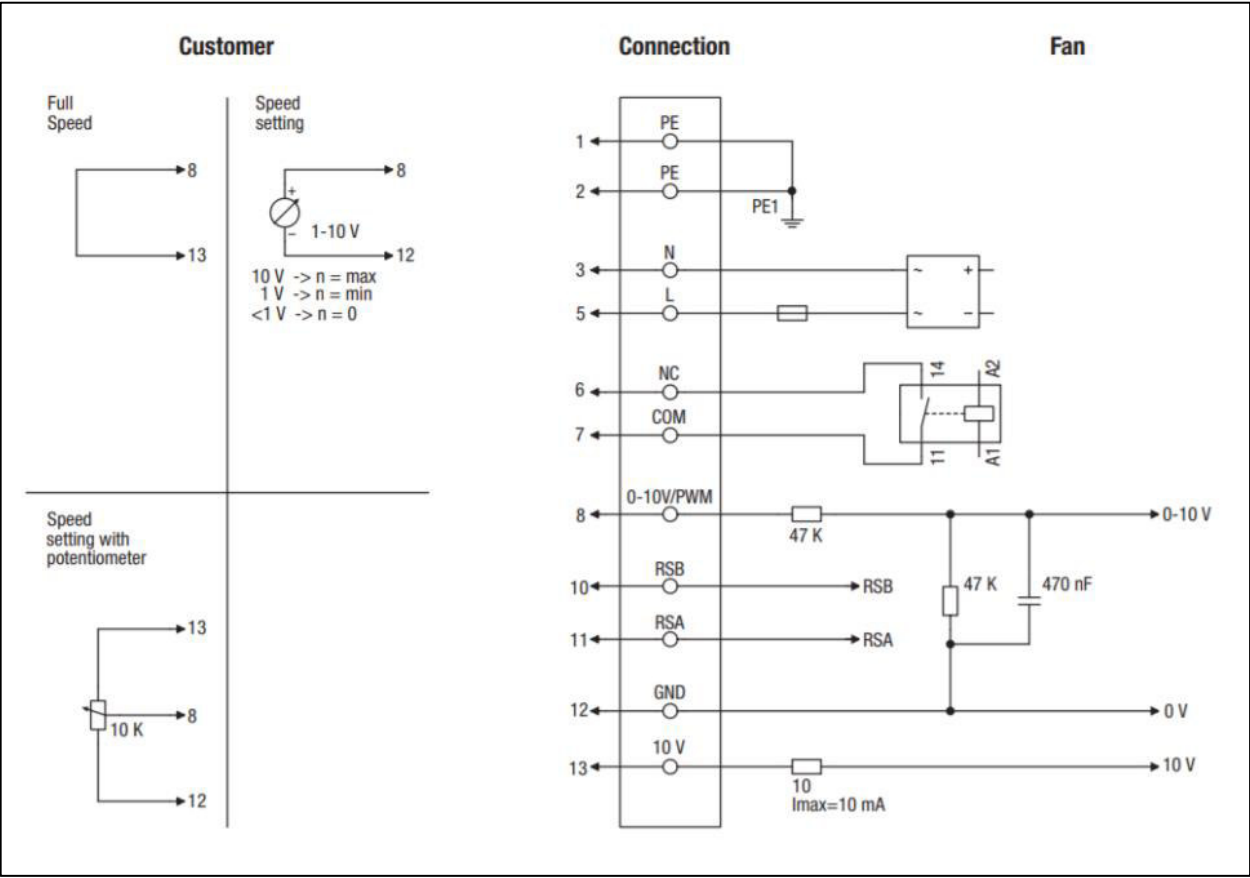


Figure 33: Connection diagram P5 pre-wired by ebm-papst

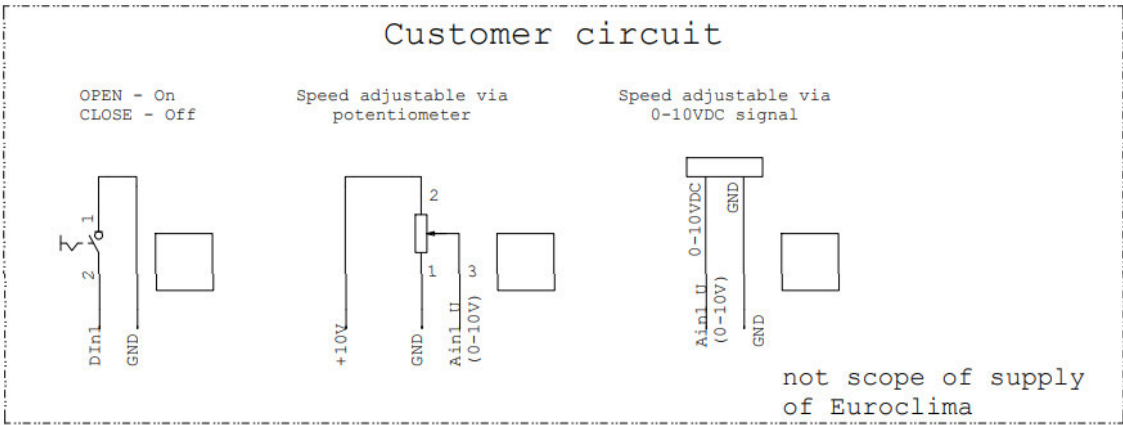


Figure 34: Connection customer P5 pre-wired by ebm-papst

2.11 Connection schematic: P6 (with connection box)

Technical specifications:

- Control input 0-10 VDC/PWM
- Output 10 VDC max. 10 mA
- Operating and fault indication
- Integrated PI controller
- Fault signal relay
- Blocking protection, soft start
- PFC (passive)
- Motor current limitation
- RS 485 MODBUS-RTU
- Overtemperature protection electronics / motor
- Undervoltage / phase failure detection
- External 24V input (parameterization)
- EEPROM write cycles maximum 100,000
- Control interface with SELV potential safely separated from mains supply

Connection schematic:

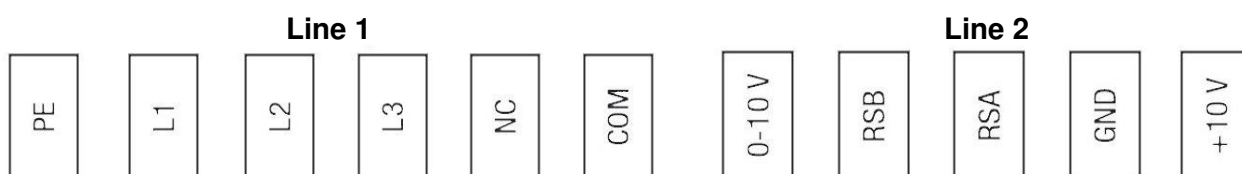


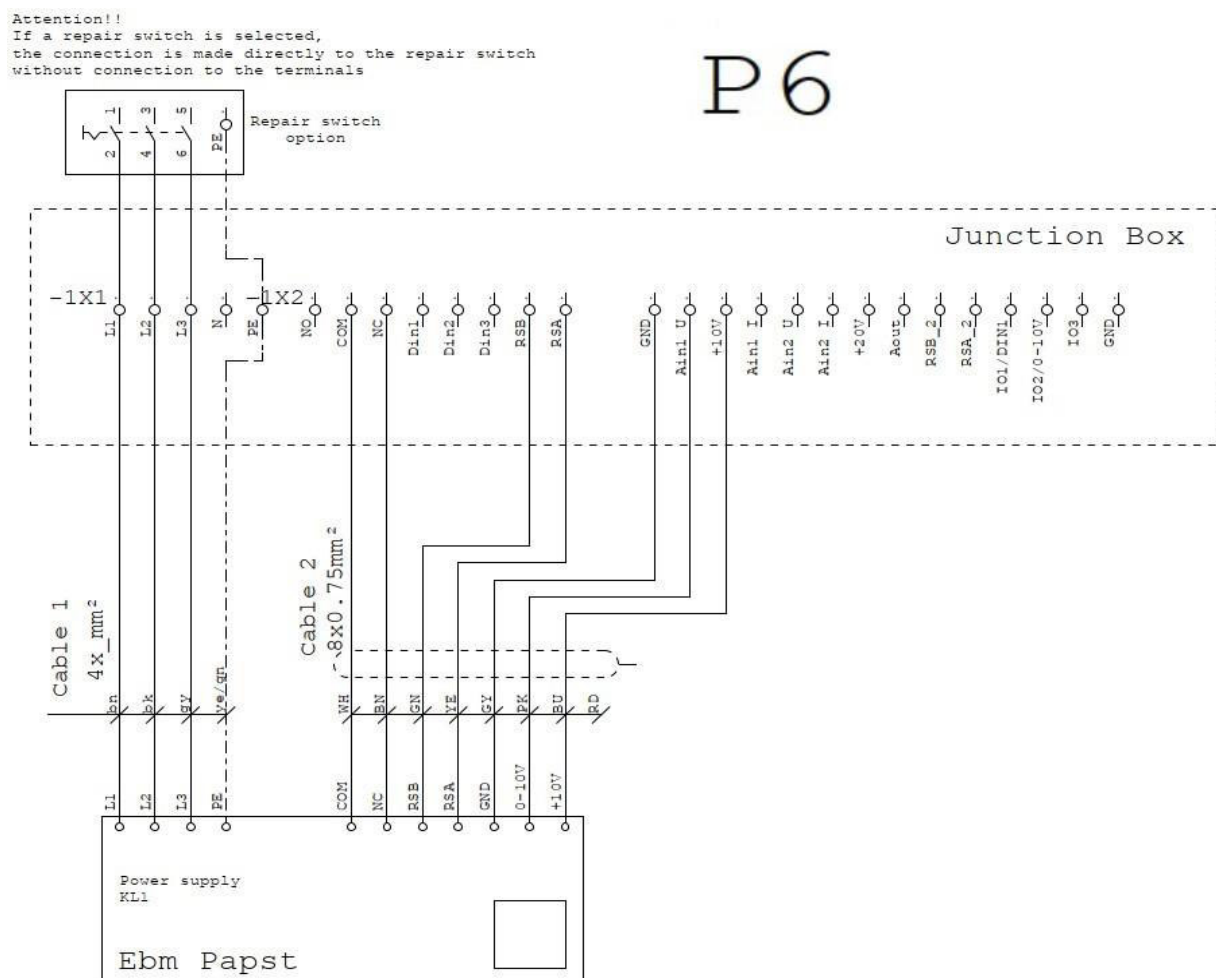
Figure 35: Connection schematic P6 with connection box

Line	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
1	1, 2	PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
	3	L1	L1	Brown (BN) / 2	1	Power supply, phase, see nameplate for voltage range, 50/60 Hz
	4	L2	L2	Black (BK) / 11	1	Power supply, phase, see nameplate for voltage range, 50/60 Hz
	5	L3	L3	Grey (GY) / 5	1	Power supply, phase, see nameplate for voltage range, 50/60 Hz
	6	NC	NC	Brown (BN) / 2	2	Status relay, potential-free status signal contact, break contact in case of error, contact rating 250 VAC / 2 A (AC1), min. 10 mA, reinforced insulation to mains and basic insulation to control interface
	7	COM	COM	White (WH) / 1	2	Status relay, potential-free status signal contact, common connection, contact rating 250 VAC / 2 A (AC1), min. 10 mA, reinforced insulation to mains and basic insulation to control interface
2	8	0-10 V	Ain1 U	Pink (PK) / 6	2	Analog input (setpoint), SELV 0-10 V, impedance 100 kΩ, characteristic curve parameterizable
	10	RSB	RSB	Green (GN) / 3	2	RS485 interface for MODBUS, RSB, SELV

Line	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
	11	RSA	RSA	Yellow (YE) / 4	2	RS485 interface for MODBUS, RSA, SELV
	12	GND	GND	Grey (GY) / 5	2	GND, SELV
	13	+ 10 V	+ 10 V	Blue (BU) / 8	2	Fixed voltage output 10 VDC, SELV, +10 V (+/- 3%), max. 10 mA, permanent short-circuit proof, supply voltage for external devices (e.g. potentiometer), fixed voltage output 24 VDC for parameterization via MODBUS without mains voltage supply

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Figure 36: Connections P6 with connection box



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 37: Connection diagram P6 with connection box

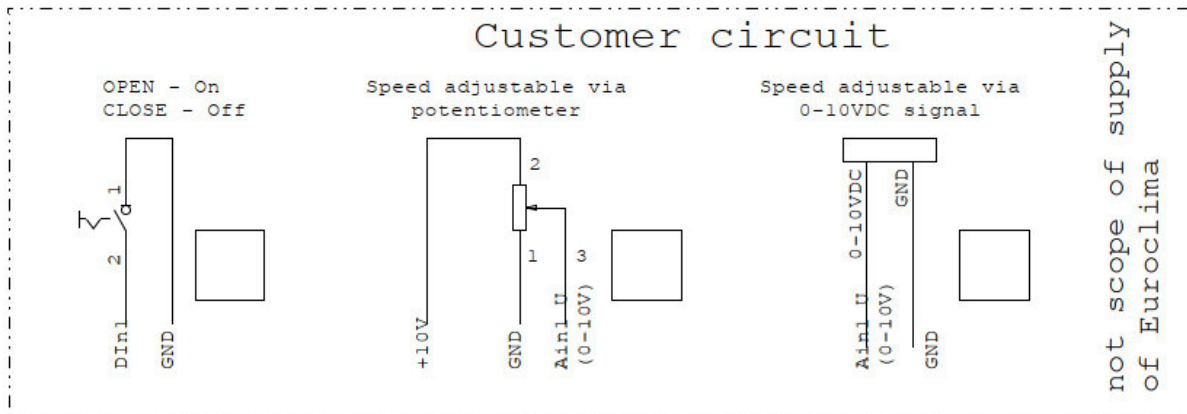


Figure 38: Connection customer P6 with connection box

2.12 Connection schematic: P6 (pre-wired by ebm-papst)

Technical specifications:

- Control input 0-10 VDC/PWM
- Output 10 VDC max. 10 mA
- Operating and fault indication
- Integrated PI controller
- Fault signal relay
- Blocking protection, soft start
- PFC (passive)
- Motor current limitation
- RS 485 MODBUS-RTU
- Overtemperature protection electronics / motor
- Undervoltage / phase failure detection
- External 24V input (parameterization)
- EEPROM write cycles maximum 100,000
- Control interface with SELV potential safely separated from mains supply

Connection schematic:

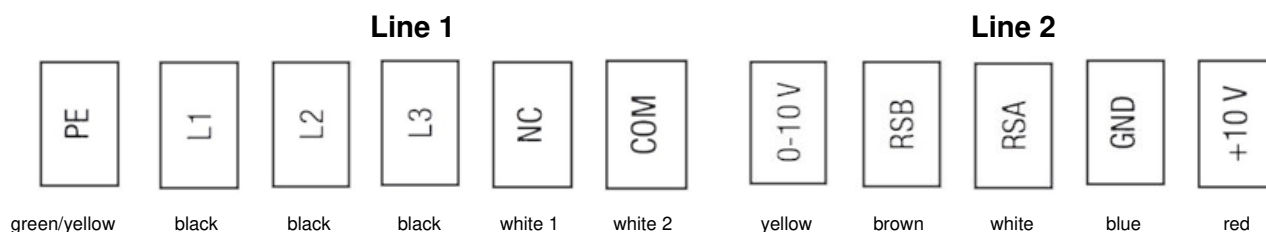


Figure 39: Connection schematic P6 pre-wired by ebm-papst

Line	No.	Connection	Color / Number	Allocation / function
1	1, 2	PE	Green/Yellow	Protective earth
	3, 4, 5	L1, L2, L3	Schwarz	Power supply, phase, see nameplate for voltage range, 50/60 Hz
	6	NC	White 1	Status relay, potential-free status signal contact, break contact in case of error, contact rating 250 VAC / 2 A (AC1), min. 10 mA, reinforced insulation to mains and basic insulation to control interface
	7	COM	White 2	Status relay, potential-free status signal contact, common connection, contact rating 250 VAC / 2 A (AC1), min. 10 mA, reinforced insulation to mains and basic insulation to control interface
2	8	0-10 V/ PWM	Yellow	Analog input (setpoint), SELV 0-10 V, impedance 100 kΩ, characteristic curve parameterizable
	10	RSB	Brown	RS485 interface for MODBUS, RSB, SELV
	11	RSA	White	RS485 interface for MODBUS, RSA, SELV
	12	GND	Blue	GND, SELV
	13	+10 V	Red	Fixed voltage output 10 VDC, SELV, +10 V (+/- 3%), max. 10 mA, permanent short circuit proof, supply voltage for ext. devices (e.g. potentiometer)

Table 11: Connections P6 pre-wired by ebm-papst

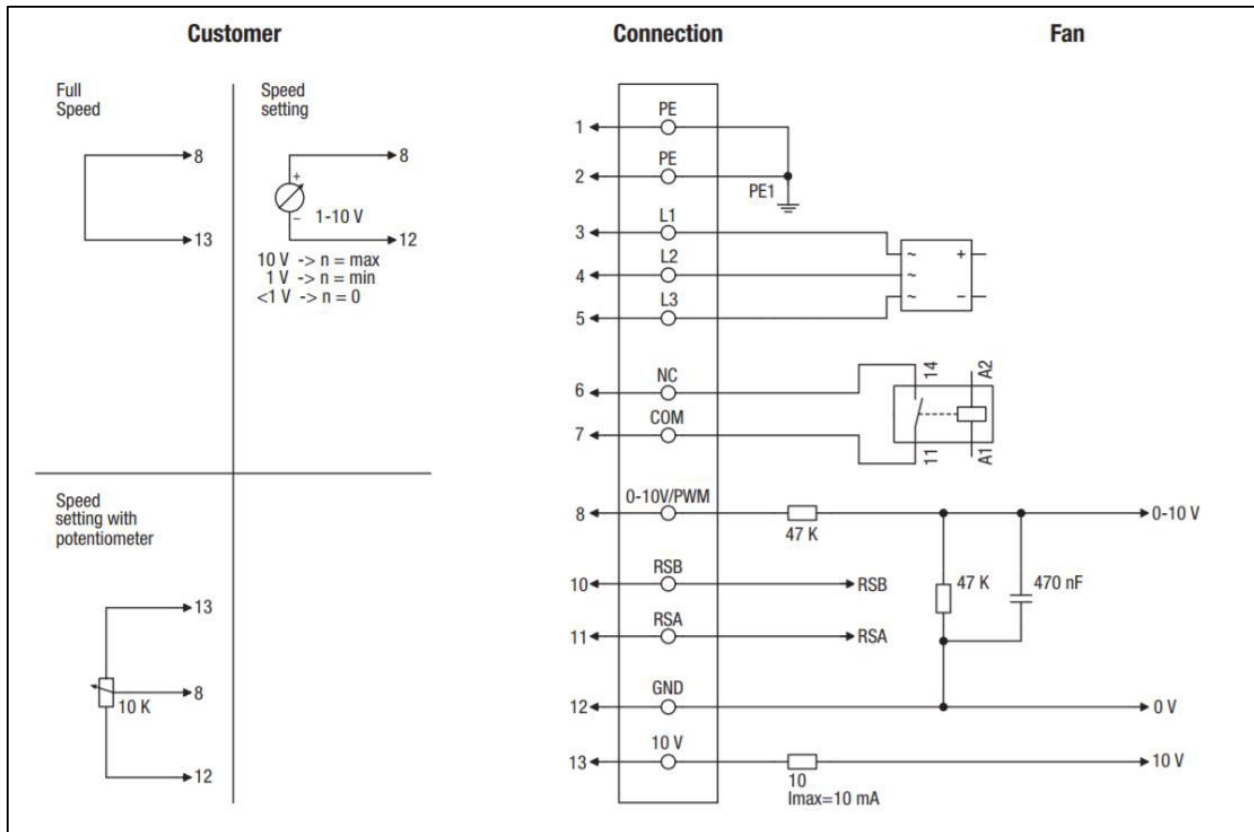


Figure 40: Connection diagram P6 pre-wired by ebm-papst

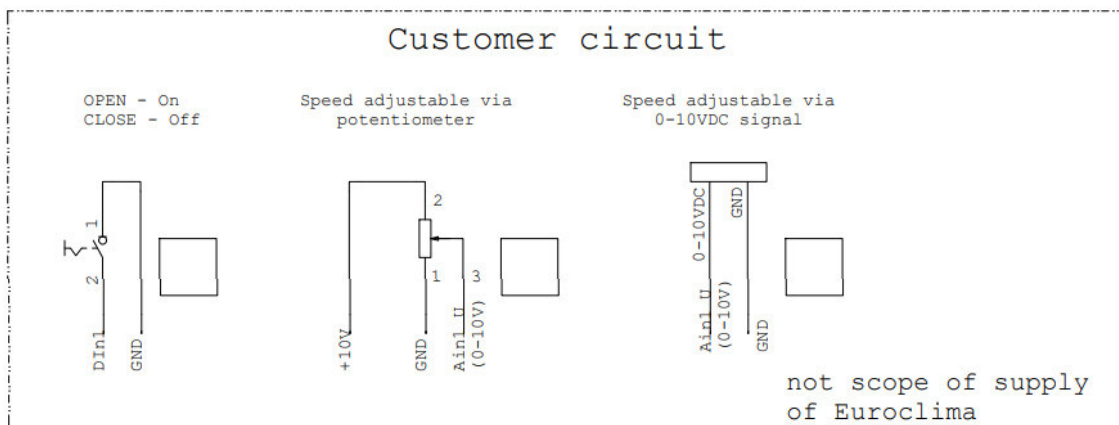


Figure 41: Connection customer P6 pre-wired by ebm-papst

2.13 Connection schematic: P8

Technical specifications:

- Control input 0-10 VDC/PWM
- Output 10 VDC max. 10 mA
- Operating and fault indication
- Integrated PI controller
- Fault signal relay
- Blocking protection, soft start
- PFC (passive)
- Motor current limitation
- RS 485 MODBUS-RTU
- Overtemperature protection electronics / motor
- Undervoltage / phase failure detection
- External 24V input (parameterization)
- EEPROM write cycles maximum 100,000
- Control interface with SELV potential safely separated from mains supply

Connection schematic:

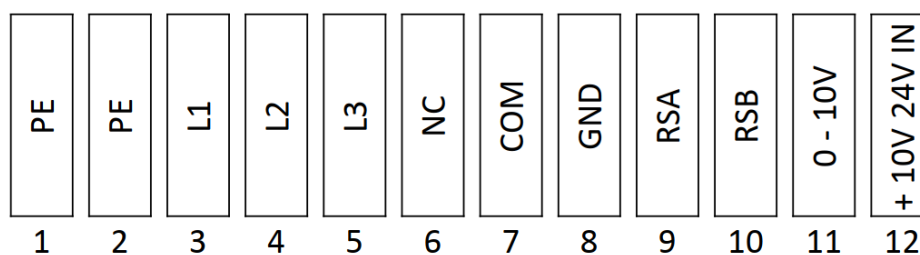


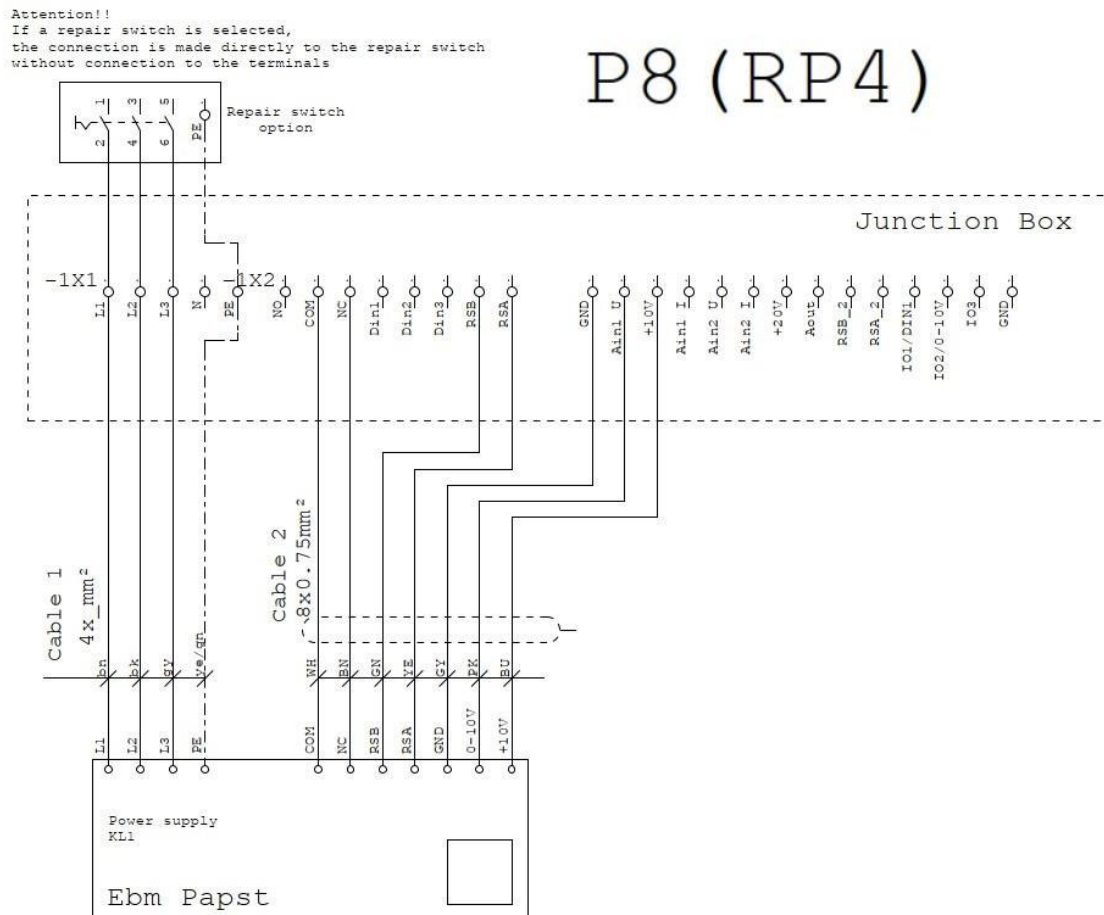
Figure 42: Connection schematic P8

Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
1, 2	PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
3	L1	L1	Brown (BN) / 2	1	Power supply, see nameplate for voltage range, 50/60 Hz
4	L2	L2	Black (BK) / 11	1	Power supply, see nameplate for voltage range, 50/60 Hz
5	L3	L3	Grey (GY) / 5	1	Power supply, see nameplate for voltage range, 50/60 Hz
6	NC	NC	Brown (BN) / 2	2	Status relay, potential-free status signal contact, break contact in case of error, contact rating 250 VAC / 2 A (AC1), min. 10 mA, reinforced insulation to mains and basic insulation to control interface
7	COM	COM	White (WH) / 1	2	Status relay, potential-free status signal contact, common connection, contact rating 250 VAC / 2 A (AC1), min. 10 mA, reinforced insulation to mains and basic insulation to control interface
8	GND	GND	Grey (GY) / 5	2	GND, SELV
9	RSA	RSA	Yellow (YE) / 4	2	RS485 interface for MODBUS, RSA, SELV
10	RSB	RSB	Green (GN) / 3	2	RS485 interface for MODBUS, RSB, SELV
11	0-10 V	Ain1 U	Pink (PK) / 6	2	Analog input (setpoint), SELV 0-10 V, impedance 100 kΩ, characteristic curve parameterizable
12	+ 10 V	+ 10 V	Blue (BU) / 8	2	Fixed voltage output 10 VDC, SELV, +10 V (+/- 3%), max. 10 mA, permanent short-circuit proof, supply voltage for external devices (e.g. potentiometer), fixed voltage

Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
					output 24 VDC for parameterization via MODBUS without mains voltage supply.

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 12: Connections P8



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 43: Connection diagram P8

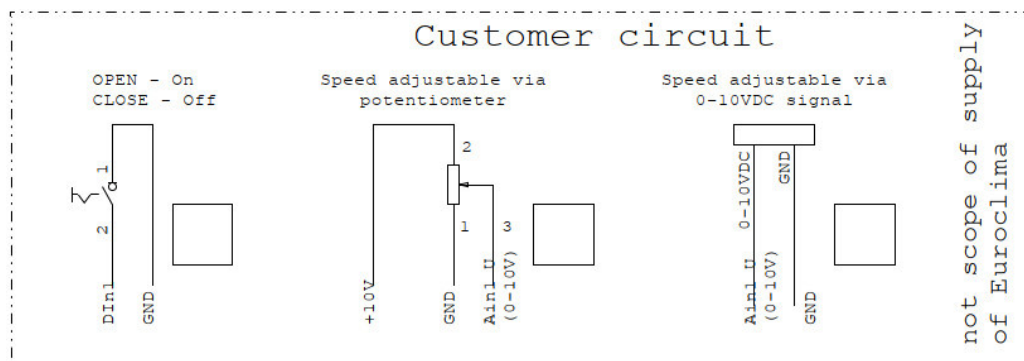


Figure 44: Connection customer P8

2.14 Connection schematic: RP6

Technical specifications:

- Configurable inputs / outputs (I/O)
- RFID - ISO 15693 compatible
- Operation and fault indication via LED
- Integrated PI controller
- Blocking protection
- Motor current limiting / fault signal relay
- Soft start
- Voltage output 3, 3-24 VDC, Pmax = 800 mW
- RS 485 MODBUS-RTU / MODBUS V6
- Overtemperature protection electronics / motor
- Undervoltage / phase failure detection
- Control interface with SELV potential safely isolated from mains supply
- External 15-50 VDC input (parameterization)

Connection schematic:

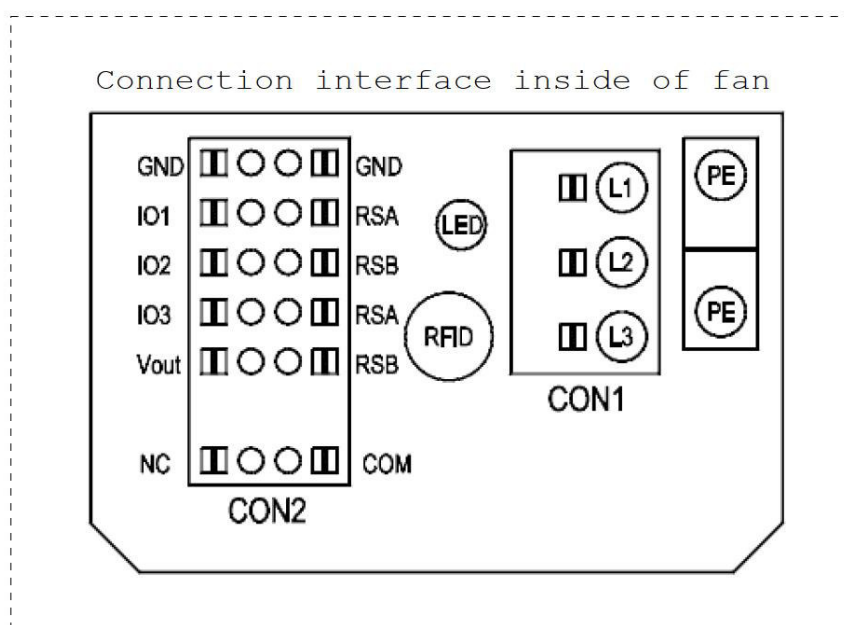


Figure 45: Connection schematic RP6

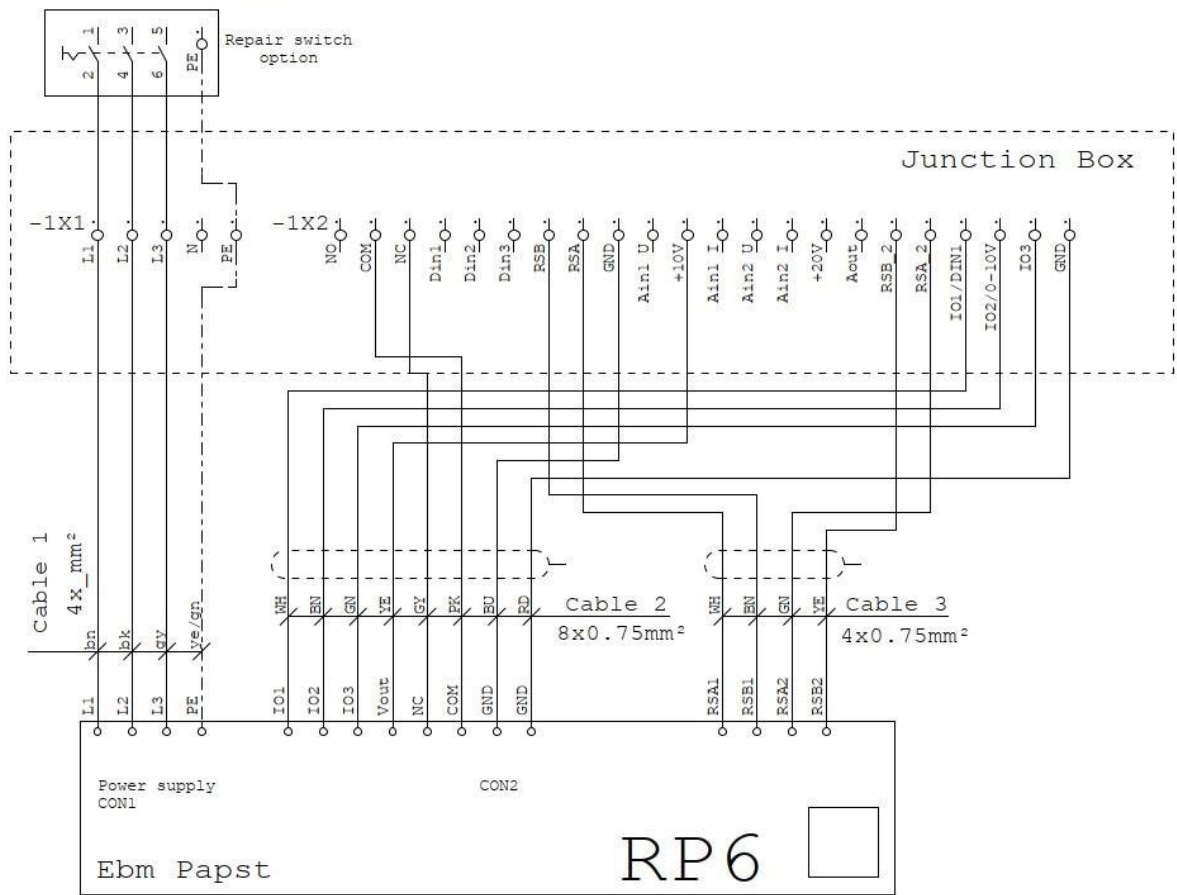
KL	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
CON1	L1	L1	Brown (BN) / 2	1	Power supply, phase, see nameplate for voltage range
	L2	L2	Black (BK) / 11	1	Power supply, phase, see nameplate for voltage range
	L3	L3	Grey (GY) / 5	1	Power supply, phase, see nameplate for voltage range
PE	PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
CON2	RSA1	RSA	White (WH) / 1	3	RS485 interface for MODBUS, RSA, SELV
	RSA2	RSA2	Green (GN) / 3	3	RS485 interface for MODBUS, RSA, SELV
	RSB1	RSB1	Brown (BN) / 2	3	RS485 interface for MODBUS, RSB, SELV
	RSB2	RSB2	Yellow (YE) / 4	3	RS485 interface for MODBUS, RSB, SELV

KL	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
	GND	GND	Blue (BU) / 8	2	GND, SELV
	GND	GND	Red (RD) / 10	2	GND, SELV
	IO1	IO1/DIN1	White (WH) / 1	2	IN2: Digital input - positive logic (factory setting Enable), function parameterizable, SELV - normal: pin open or applied voltage < 1.5 VDC - inverse: applied voltage 3.5-50 VDC
	IO2	IO2/0-10V	Brown (BN) / 2	2	IN1: Analog input 0-10 V 0-10 V, Ri=100 K, parameterizable as setpoint or actual value (factory setting setpoint), characteristic curve parameterizable, SELV
	IO3	IO3	Green (GN) / 3	2	OUT1: Analog output 0-10 V 0-10 V, max 5 mA, function parameterizable (factory setting output level) max. output frequency 300 Hz, SELV
	Vout	+10V	Yellow (YE) / 4	2	Voltage output 3.3-24 VDC +/-5 %, Pmax=800 mW, voltage parameterizable (factory setting 10 VDC); permanent short-circuit proof, supply for external devices, SELV; alternatively: 15-50 VDC input for parameterization via Modbus without mains voltage
	COM	COM	Pink (PK) / 6	2	Status relay, potential-free status signal contact, contact load 250 VAC / 2 A (AC1) min. 10 mA, reinforced isolation to mains and control interface
	NC	NC	Grey (GY) / 5	2	Status relay, potential-free status signal contact, option 1: normally closed contact in case of error, option 2: normally closed contact in case of error message; run monitoring

1) if present: if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 13: Connections RP6

Attention!!
If a repair switch is selected,
the connection is made directly to the repair switch
without connection to the terminals



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 46: Connection diagram RP6

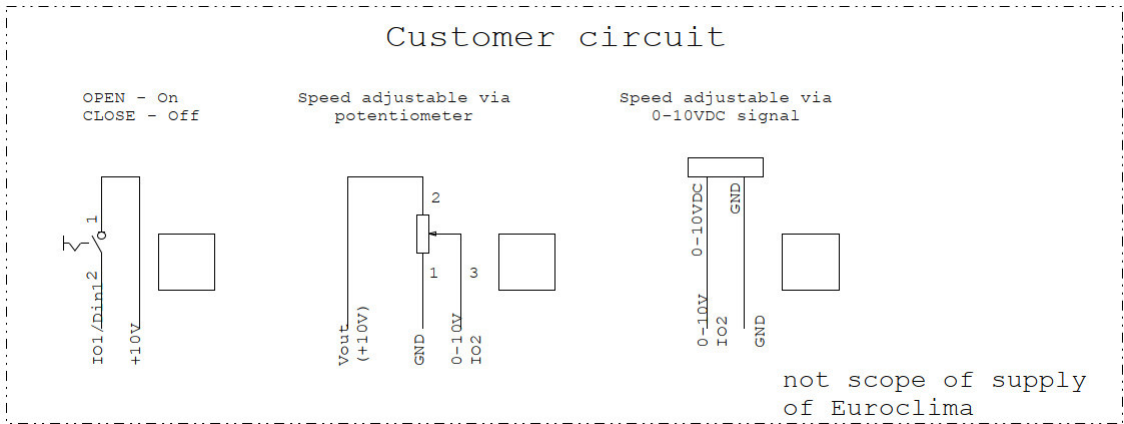


Figure 47: Connection customer RP6

2.15 Connection schematic: RP9

Technical specifications:

- Control input 0-10 VDC
- Output 10 VDC max. 10 mA
- Output for salve 0-10 V
- Motor current limitation
- Reverse polarity and blocking protection
- Integrated PI controller
- Power limitation
- Soft start / PFC, passive
- RS 485 MODBUS-RTU / fault signal relay
- Overtemperature protection electronics / motor
- Undervoltage / phase failure detection
- Control interface with SELV potential safely isolated from mains supply
- External enable input / External 24 V input (parameterization)

Connection schematic:

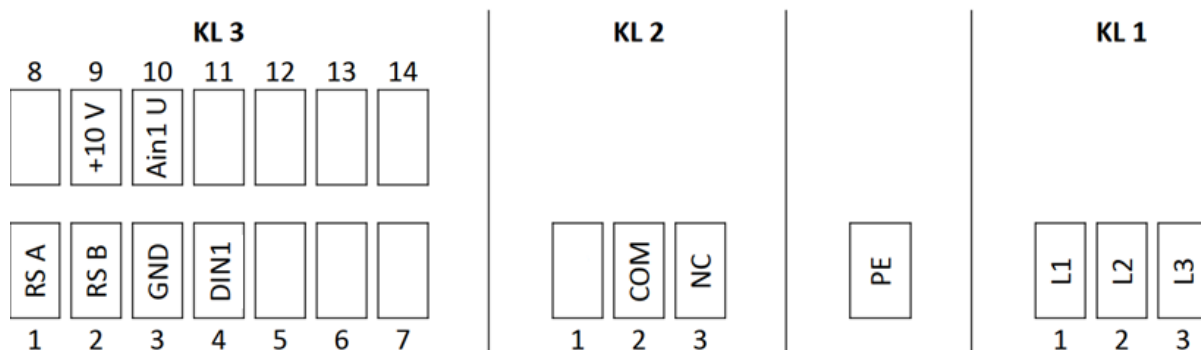


Figure 48: Connection schematic RP9

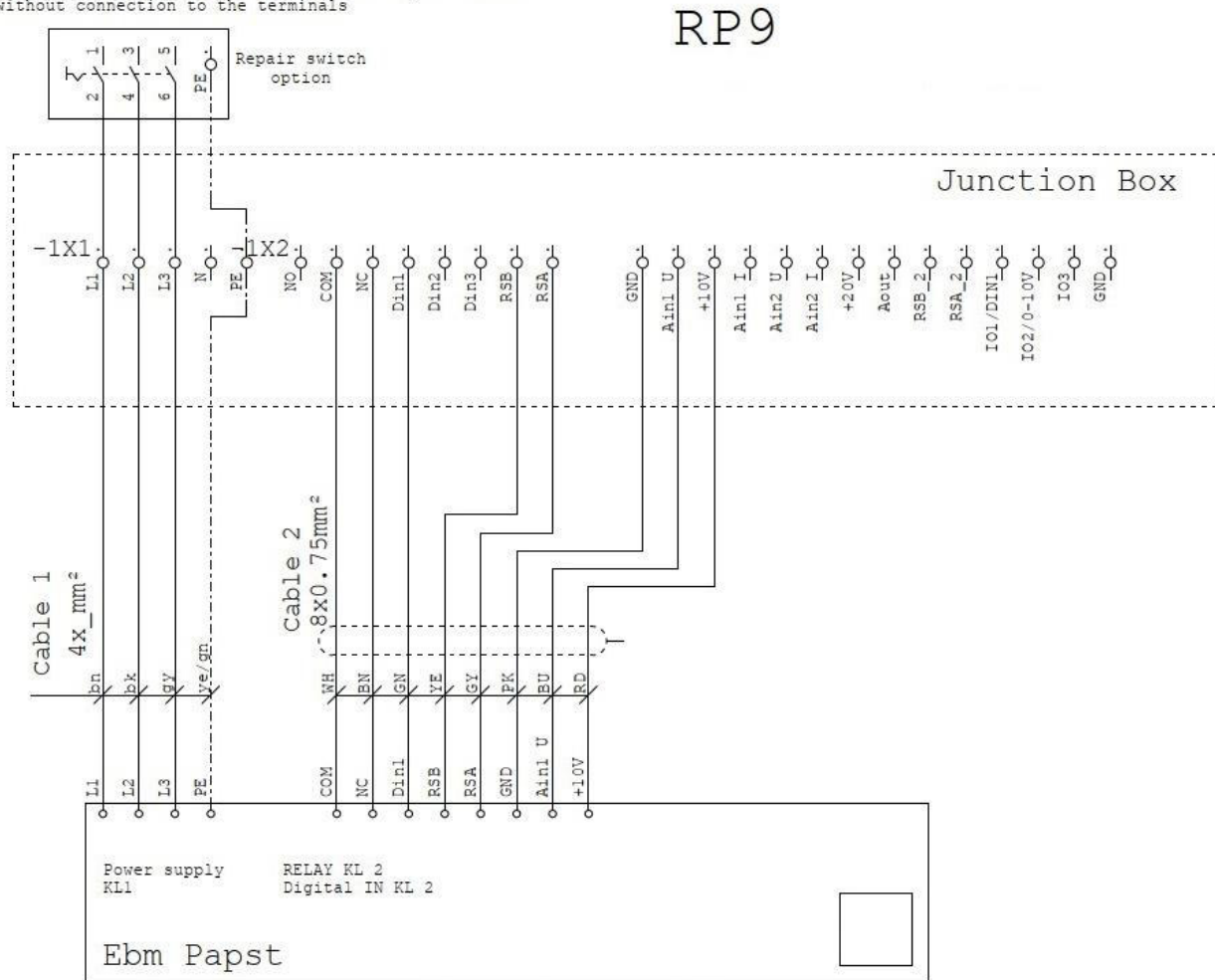
KL	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
KL1	1	L1	L1	Brown (BN) / 2	1	Power supply, phase, see nameplate for voltage range
	2	L2	L2	Black (BK) / 11	1	Power supply, phase, see nameplate for voltage range
	3	L3	L3	Grey (GY) / 5	1	Power supply, phase, see nameplate for voltage range
PE		PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
KL2	1		---			
	2	COM	COM	White (WH) / 1	2	Status relay, potential-free status signal contact, common connection, contact load 250 VAC / 2 A (AC1) min. 10 mA, reinforced isolation to mains and control interface
	3	NC	NC	Brown (BN) / 2	2	Status relay, potential-free status signaling contact, option 1: NO contact on error, option 2: NO contact on error message; run monitoring
KL3	1	RSA	RSA	Grey (GY) / 5	2	RS485 interface for MODBUS, RSA, SELV
	2	RSB	RSB	Yellow (YE) / 4	2	RS485 interface for MODBUS, RSB, SELV
	3	GND	GND	Pink (PK) / 6	3	GND, SELV

KL	Pin	Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
	4	Din1	Din1	Green (GN) / 3	2	Digital input 1: Enable electronics; Enable: Pin open or applied voltage 5...50 VDC; Disable: Bridge to GND or applied voltage < 1 VDC; Reset function: Trigger a software reset after a level change to < 1 VDC, SELV
	5		---			
	6		---			
	7		---			
	8		---			
	9	+10 V	+10 V	Red (RD) / 10	2	Voltage output, supply voltage for external devices (e.g. potentiometer), SELV
	10	Ain1 U	Ain1 U	Blue (BU) / 8	2	Analog input 1; setpoint 010 V; Ri= 100 kΩ; characteristic curve parameterizable, SELV
	11		---			
	12		---			
	13		---			
	14		---			

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 14: Connections RP9

Attention!!
If a repair switch is selected,
the connection is made directly to the repair switch
without connection to the terminals



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 49: Connection diagram RP9

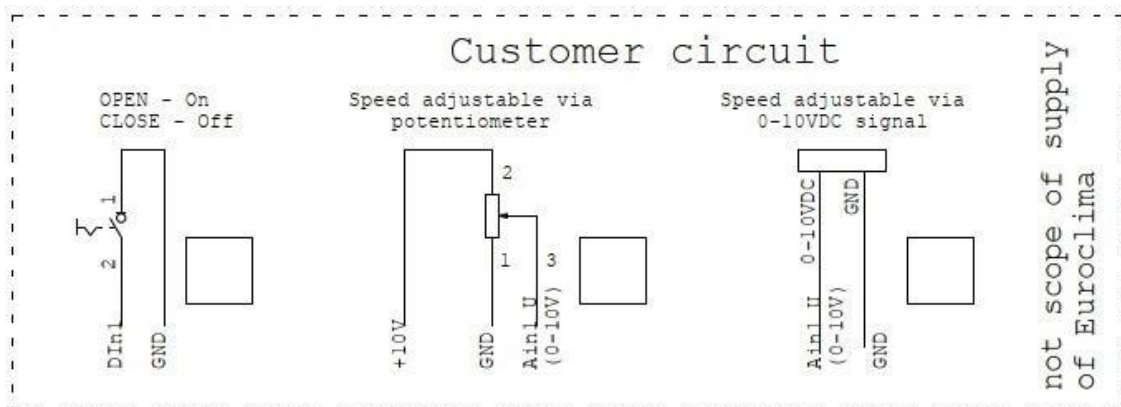


Figure 50: Connection customer RP9

3 NICOTRA GEBHARDT

Check in the technical data section of the fan which connection diagram number is given under "Connection diagram", see **Figure 51**:

VF	Supply air-Plug fan	762,5 [mm]	4,19 [m ²]	202,00 [kg]	9 [Pa]
Fan	2 x Nicotra/Gebhardt/COPRA PA-C35-JE56-C0	PM-Motor+FC	2 x	0454146HAA54AA01	
Air volume [m ³ /h] (density: [kg/m ³] 1,20)	2 x 6.975,00	Protection		IP54	
External press [Pa]	550	Insulation class		F	
ext. press. on intake / outlet [Pa]	-50 / 500	max electric absorbed power [kW]	2 x	4,450	
dyn.press.drop [Pa]	72	Speed +-2% [1/min]		3.600	
Tot. pressure [Pa]	1.076	Current +-5% [A]	2 x	7,10	
Speed [1/min]	3.303	Voltage [V]		3x400 / 50/60 Hz	
sound power [dB(A)]	97,5	Tension Range [V]		380 ... 420	
System efficiency [%]	61,0	Electric absorbed power [kW]	2 x	3,19	
max. nom. RPM [1/min]	3.600	Motor efficiency class		analog to IEC60034: IE 6	
Calibration faktor K_A [m ² s/h]	105	Control voltage [V]		9.1	
Speed control:	variable speed	Connection diagram		NI_COPRA	
		No frequency converter needed!			

Figure 51: Connection diagram number Nicotra Gebhardt

and continue in the relevant chapter of this document:

- Connection diagram NI_COPRA: **Chapter 3.1 (Connection schematic: NI_COPRA)**
- Connection diagram NI_PFP: **Chapter 3.2 (Connection schematic: NI_PFP 230V)** for 230V motors or **Kapitel 3.3 (Connection schematic: NI_PFP 400V)** for 400V motors
- for RQM and RLM E6 series motors/ventilators see **Chapter 5 (ORA-VENT / NICOTRA GEBHARDT RQM & RLM E6).**

3.1 Connection schematic: NI_COPRA

Technical specifications:

- Protection functions:
 - Overvoltage
 - Undervoltage
 - Overtemperature
 - Input phase failure
- Protective functions UL safety core:
 - Rotor locked
 - Output phase failure
 - Overload
 - Hardware faults
- Integrated electronics
- Volume flow up to 28.000 m³/h
- Static pressures up to 2,000 Pa
- Volume flow measuring device IMV
- Protection function of the electronics (malfunctions and motor protection)
- RS 485 MODBUS-RTU

Connection schematic:

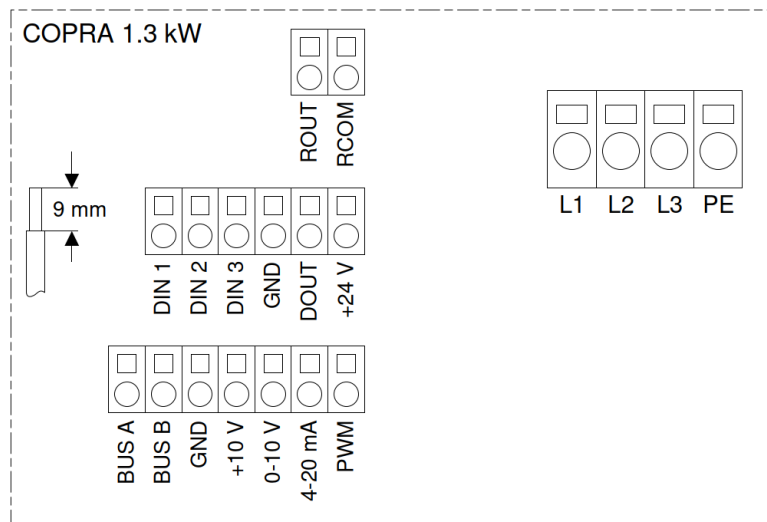


Figure 52: Connection schematic NI_COPRA 1.3 kW

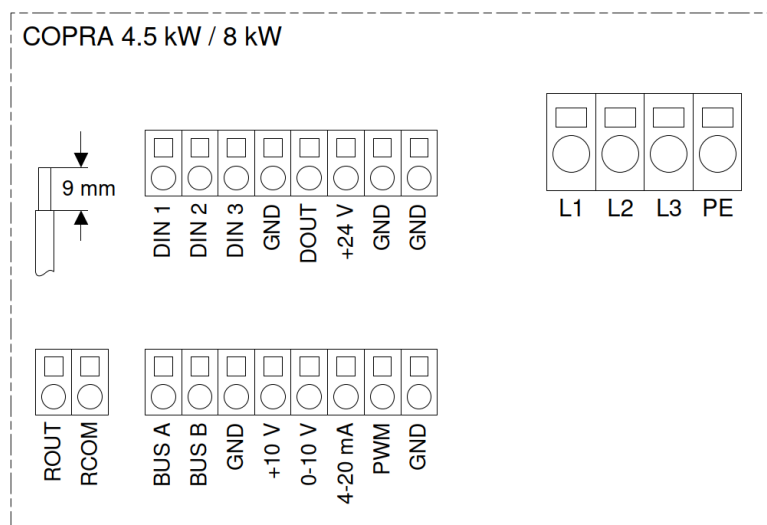


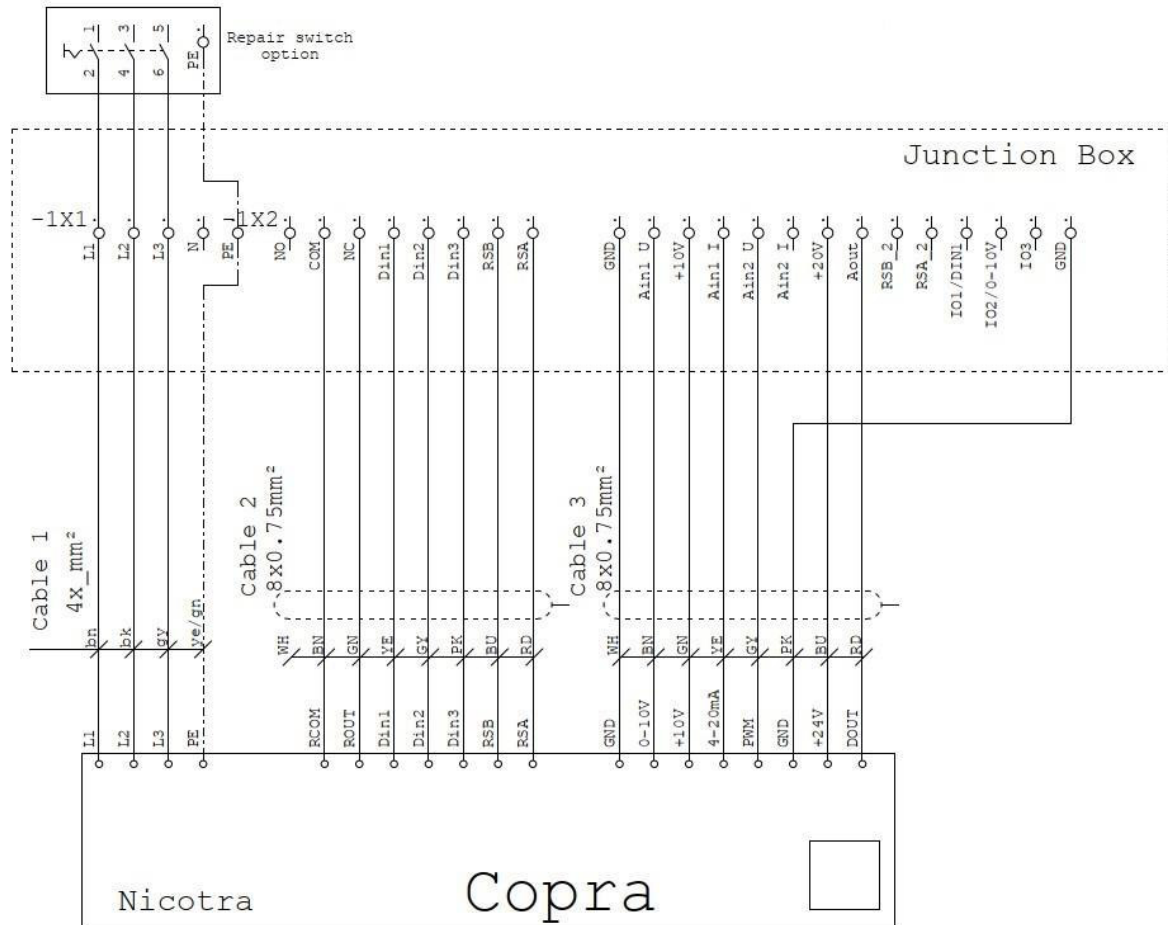
Figure 53: Connection schematic NI_COPRA 4.5 kW / 8 kW

Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
L1	L1	Brown (BN) / 2	1	Power supply, see nameplate for voltage range, 50/60 Hz
L2	L2	Black (BK) / 11	1	Power supply, see nameplate for voltage range, 50/60 Hz
L3	L3	Grey (GY) / 5	1	Power supply, see nameplate for voltage range, 50/60 Hz
PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
RCOM	COM	Brown (BN) / 2	2	Potential-free relay contacts for indication of faults or operation; factory setting: indication of faults (wire-break-proof design; contact closes briefly after switching on the power supply and opens in the event of a fault or interruption of the power supply), max. switching voltage/current: 100 mV 2 A max./30 VDC or 2 A max./30 VAC, nominal contact resistance: 100 mΩ
ROUT	NC	Green (GN) / 3	2	
Din1	Din1	Yellow (YE) / 4	2	Digital input 1; factory setting: enable occurs when +10 - 24 Vdc is applied; input impedance of 67 kΩ, max. voltage: 24 VDC, LOW/HIGH: 3.3 VDC
Din2	Din2	Grey (GY) / 5	2	Digital input 2; factory setting: default fixed speed (see manufacturer's operating instructions); input impedance of 67 kΩ, max. voltage: 24 VDC, LOW/HIGH: 3.3 VDC
Din3	Din3	Pink (PK) / 6	2	Digital input 3; factory setting: default fixed speed (see manufacturer's operating instructions); input impedance of 67 kΩ, max. voltage: 24 VDC, LOW/HIGH: 3.3 VDC
RSB	RSB	Blue (BU) / 8	2	RS485 interface for MODBUS RSB
RSA	RSA	Red (RD) / 10	2	RS485 interface for MODBUS RSA
GND	GND	White (WH) / 1	3	GND
0-10V	Ain1 U	Brown (BN) / 2	3	Analog input for 0-10 V control signal; input impedance: 11 kΩ, max. voltage: 24 VDC (0 -11.5 V readable)
+10V	+10V	Green (GN) / 3	3	10 VDC supply for external potentiometer; max. current: 100 mA
4-20mA	Ain 1 I	Yellow (YE) / 4	3	Analog input for 4-20 mA control signal; input impedance: 150 Ω, max. voltage: 24 VDC, max. current 30 mA (0 -22 mA readable)
PWM	Ain2 U	Grey (GY) / 5	3	Analog input for pulse-width modulated voltage signal; voltage range: 10 - 24 V, frequency range: 50 - 1000 Hz, control range duty cycle: 5 - 95 % (0 - 100 % readable)
+24V	+20V	Blue (BU) / 8	3	VDC supply for external display/control/regulation devices; max. current: 100 mA
DOUT	Aout	Red (RD) / 10	3	Digital output; factory setting: display of actual speed via PWM signal (3.3 VDC / 100 Hz)

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 15: Connections NI_COPRA

Attention!!
If a repair switch is selected,
the connection is made directly to the repair switch
without connection to the terminals



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 54: Connection diagram NI_COPRA

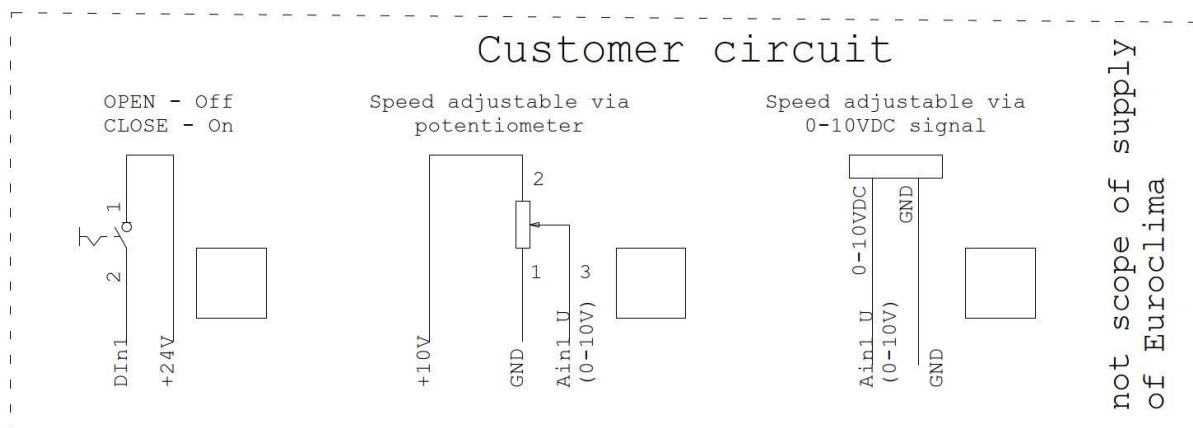


Figure 55: Connection customer NI_COPRA

3.2 Connection schematic: NI_PFP 230V

Technical specifications:

- Supply voltage 220V-240V or 400V-3Ph +/- 10% (50/60Hz)
- Sensorless sinusoidal control
- Active integrated power factor control for single-phase units
- Simple cable connection with cage clamps
- Integrated Modbus RTU interface
- Integrated analog interface 0-10V
- Tachometer output available
- Internal PID available
- Soft start
- Adjustable limits and operating mode
- Implementation of protection strategies
- High efficiency
- NTC avoided during operation
- PFC deactivated at stop
- Protective functions:
 - Lack of motor phase protection
 - Short circuit protection
 - Overvoltage protection
 - Overheating protection
 - Impeller lockout protection
 - Safe operating range (speed, power and current limitation)

Connection schematic:

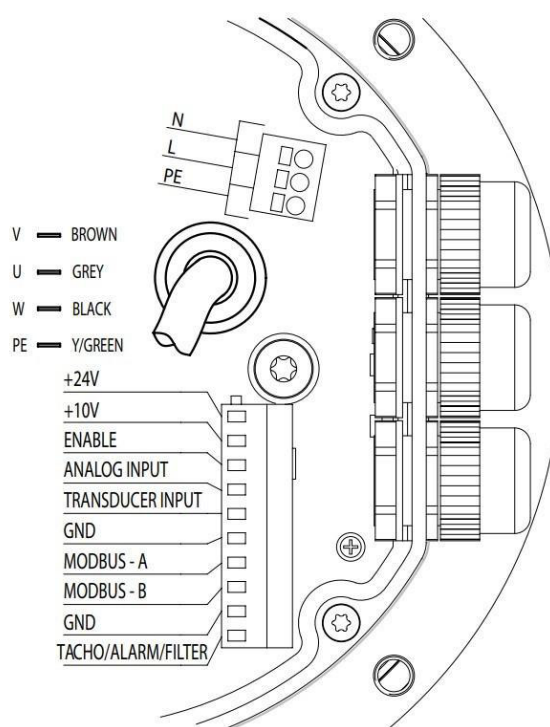


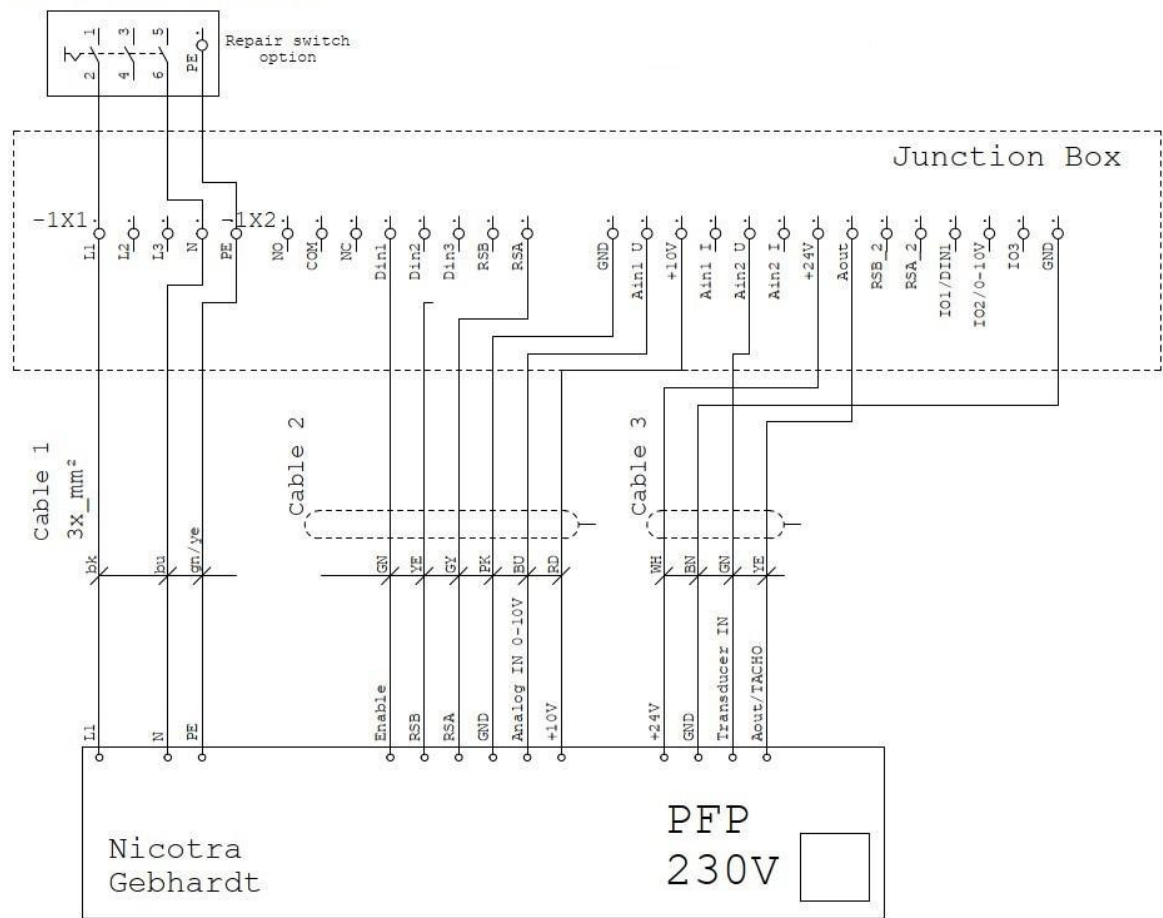
Figure 56: Connection schematic NI_PFP 230V

Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
L	L	Black (BK) / 11	1	Power supply, phase, see nameplate for voltage range, 50/60 Hz
N	N	Brown (BN) / 2	1	Power supply, neutral conductor, see nameplate for voltage range, 50/60 Hz
PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
ENABLE	Din1	Green (GN) / 3	2	Digital input 1; enable occurs when +10 - 24 VDC are applied
RSB	RSB	Yellow (YE) / 4	2	RS485 interface for MODBUS RSB
RSA	RSA	Grey (GY) / 5	2	RS485 interface for MODBUS RSA
GND	GND	Pink (PK) / 6	2	GND
ANALOG IN 0-10V	Ain1 U	Blue (BU) / 8	2	Analog input for 0-10 V control signal; minimum potentiometer: 2 kΩ, max. current consumption: 5mA; input impedance: 20 kΩ
+10V	+10V	Red (RD) / 10	2	10 VDC supply for external potentiometer
+24V	+24V	White (WH) / 1	3	VDC supply for external display/control/regulation devices; max. current: 50 mA
GND	GND	Brown (BN) / 2	3	GND
TRANSDUCER IN	Ain2 U	Green (GN) / 3	3	Analog input 0-10VDC for an external sensor (pressure or air flow meter)
TACHO/ALARM/FILTER	Aout	Yellow (YE) / 4	3	The analog output channel is factory configured to provide a PWM tachometer output signal. The tach output generates a PWM waveform between 0 and 10 V at 1 kHz.

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 16: Connections NI_PFP 230V

Attention!!!
If a repair switch is selected,
the connection is made directly to the repair switch
without connection to the terminals



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 57: Connection diagram NI_PFP 230V

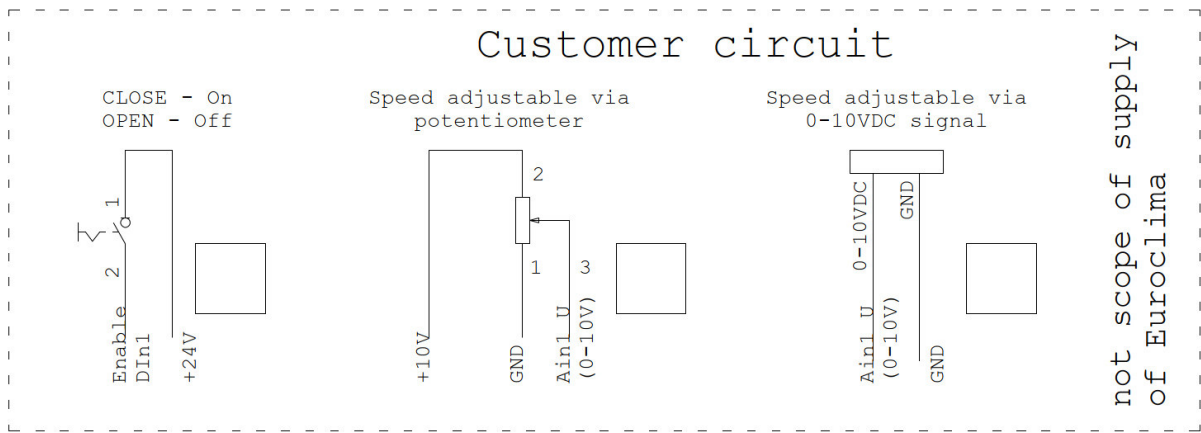


Figure 58: Connection customer NI_PFP 230V

3.3 Connection schematic: NI_PFP 400V

Technical specifications:

- Supply voltage 220V-240V or 400V-3Ph +/- 10% (50/60Hz)
- Sensorless sinusoidal control
- Active integrated power factor control for single-phase units
- Simple cable connection with cage clamps
- Integrated Modbus RTU interface
- Integrated analog interface 0-10V
- Tachometer output available
- Protective functions:
 - Lack of motor phase protection
 - Short circuit protection
 - Overvoltage protection
 - Overheating protection
 - Impeller lockout protection
 - Safe operating range (speed, power and current limitation)
- Internal PID available
- Soft start
- Adjustable limits and operating mode
- Implementation of protection strategies
- High efficiency
- NTC avoided during operation
- PFC deactivated at stop

Connection schematic:

2.6 kW:

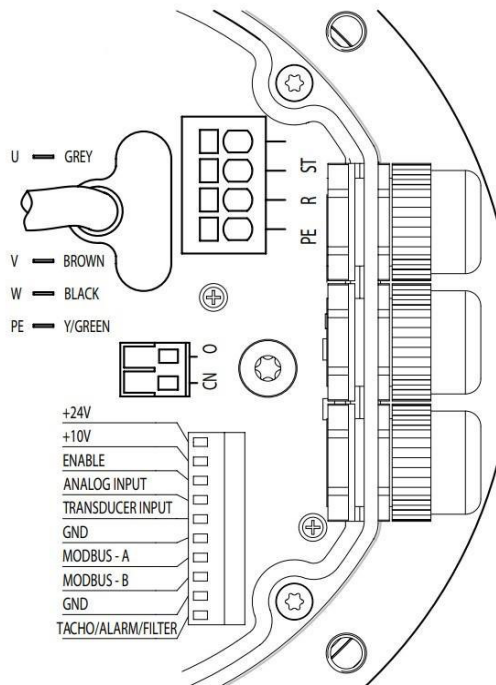


Figure 59: Connection schematic NI_PFP 400V 2.6 kW

4 kW / 5.5 kW:

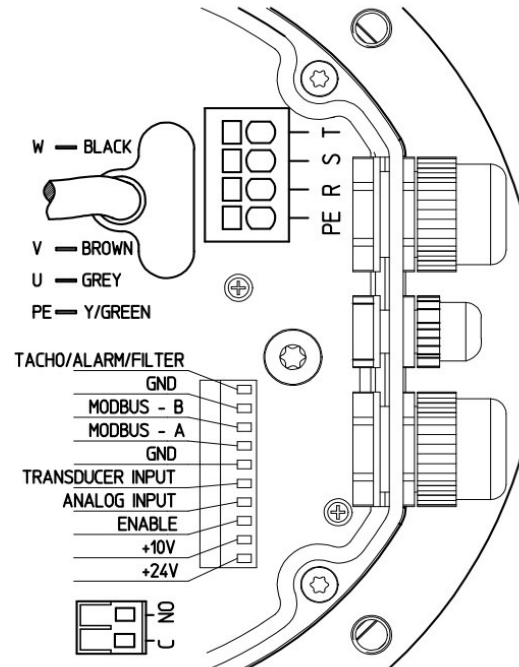


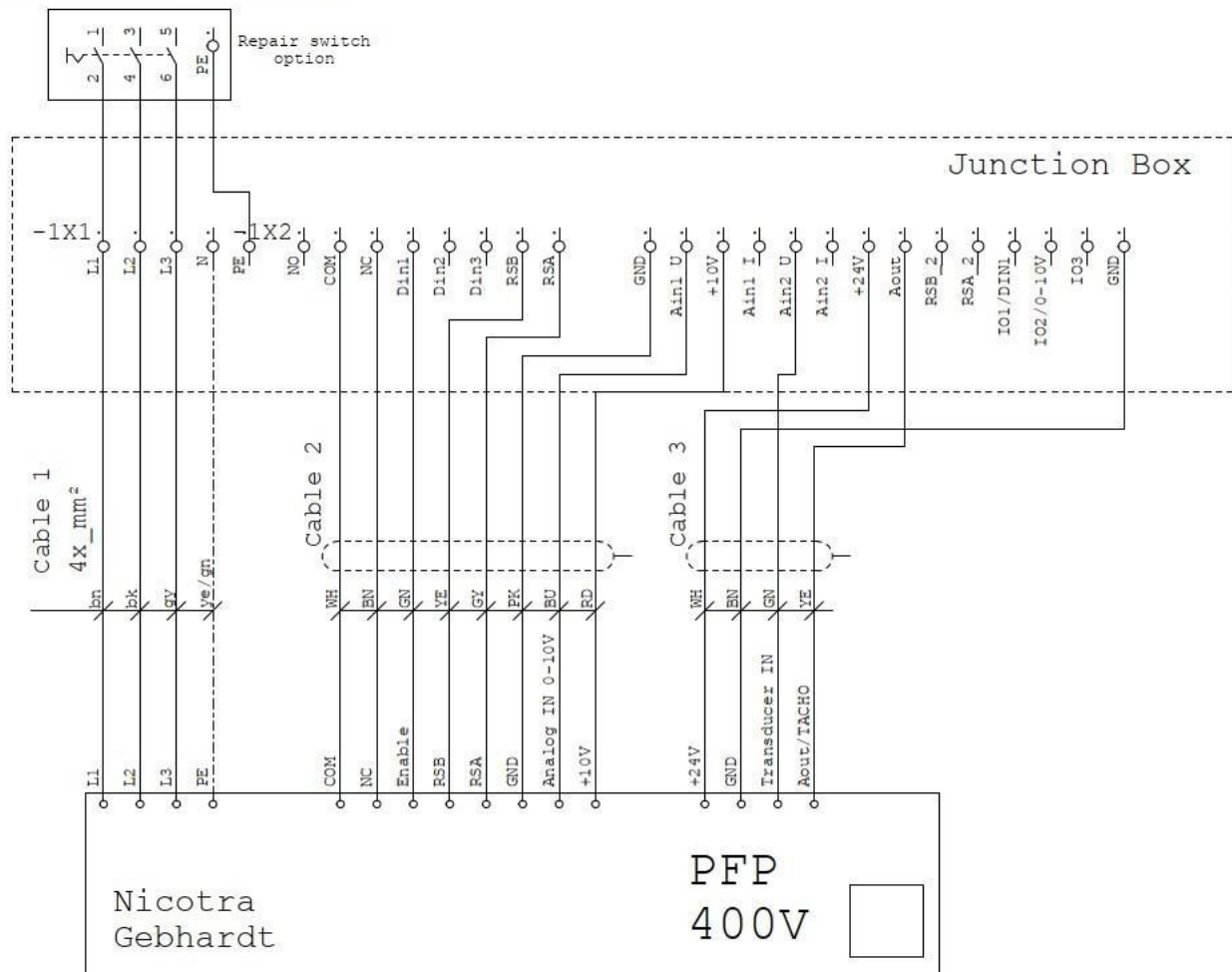
Figure 60: Connection schematic NI_PFP 400V 4 kW / 5.5 kW

Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
L1	L1	Brown (BN) / 2	1	Power supply, see nameplate for voltage range, 50/60 Hz
L2	L2	Black (BK) / 11	1	Power supply, see nameplate for voltage range, 50/60 Hz
L3	L3	Grey (GY) / 5	1	Power supply, see nameplate for voltage range, 50/60 Hz
PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
COM	COM	White (WH) / 1	2	Potential free relay contacts for indication of faults or operation; power supply: 250VAC / 30VDC 5A; when inverter is switched off, the relay is "open" (normally open contact) -> the labeling on the printed circuit boards indicates C-NO. During operation, the relay is "normally closed" (N.C.) when there is no alarm and "open" (N.O.) when there is an alarm.
NC	NC	Brown (BN) / 2	2	
ENABLE	Din1	Green (GN) / 3	2	Digital input 1; enable occurs when +10 - 24 VDC are applied; input impedance: 200 kΩ
RSB	RSB	Yellow (YE) / 4	2	RS485 interface for MODBUS RSB
RSA	RSA	Grey (GY) / 5	2	RS485 interface for MODBUS RSA
GND	GND	Pink (PK) / 6	2	GND
ANALOG IN 0-10V	Ain1 U	Blue (BU) / 8	2	Analog input for 0-10 V control signal; minimum potentiometer: 2 kΩ, max. current consumption: 5mA; input impedance: 200 kΩ
+10V	+10V	Red (RD) / 10	2	10 VDC supply for external potentiometer
+24V	+24V	White (WH) / 1	3	VDC supply for external display/control/regulation devices; max. current: 50 mA
GND	GND	Brown (BN) / 2	3	GND
TRANSDUCER IN	Ain2 U	Green (GN) / 3	3	Analog input 0-10VDC for an external sensor (pressure or air flow meter); input impedance: 200 kΩ
TACHO/ALARM/FILTER	Aout	Yellow (YE) / 4	3	The analog output channel is factory configured to provide a PWM tachometer output signal. The tach output generates a PWM waveform between 0 and 10 V at 1 kHz.

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 17: Connections NI_PFP 400V

Attention!!
If a repair switch is selected,
the connection is made directly to the repair switch
without connection to the terminals



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 61: Connection diagram NI_PFP 400V

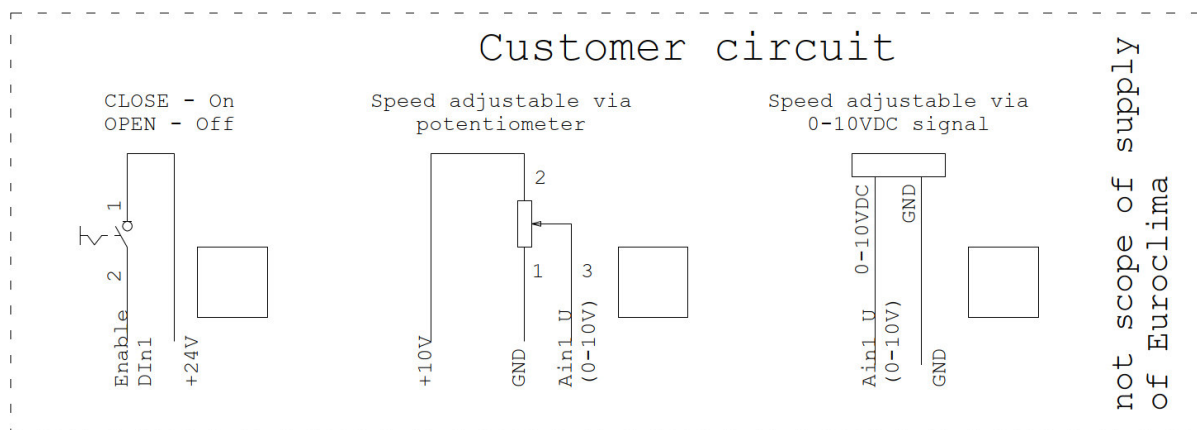


Figure 62: Connection customer NI_PFP 400V

4 ZIEHL-ABEGG

Check the series of the supplied fan and continue in the relevant chapter of this document:

- 230V series: **Chapter 4.1 (Connection schematic: 230V)**
- 400V series: **Chapter 4.2 (Connection schematic: 400V)**
- 400V series with 1x MODBUS: **Chapter 4.3 (Connection schematic: 400V series with 1x MODBUS)**
- 400V series with 2x MODBUS: **Chapter 4.4 (Connection schematic: 400V series with 2x MODBUS)**

4.1 Connection schematic: 230V series

Technical specifications:

- Integrated power electronics
- Integrated motor protection
- Integrated overload protection
- Stepless speed control via 0-10V, PWM signal or MODBUS
- Active temperature management
- Power factor correction
- 0-10V analog input
- Output +10 V max. 10 mA
- Integrated filter for interference emission according to EN 61000-6-3

Connection schematic:

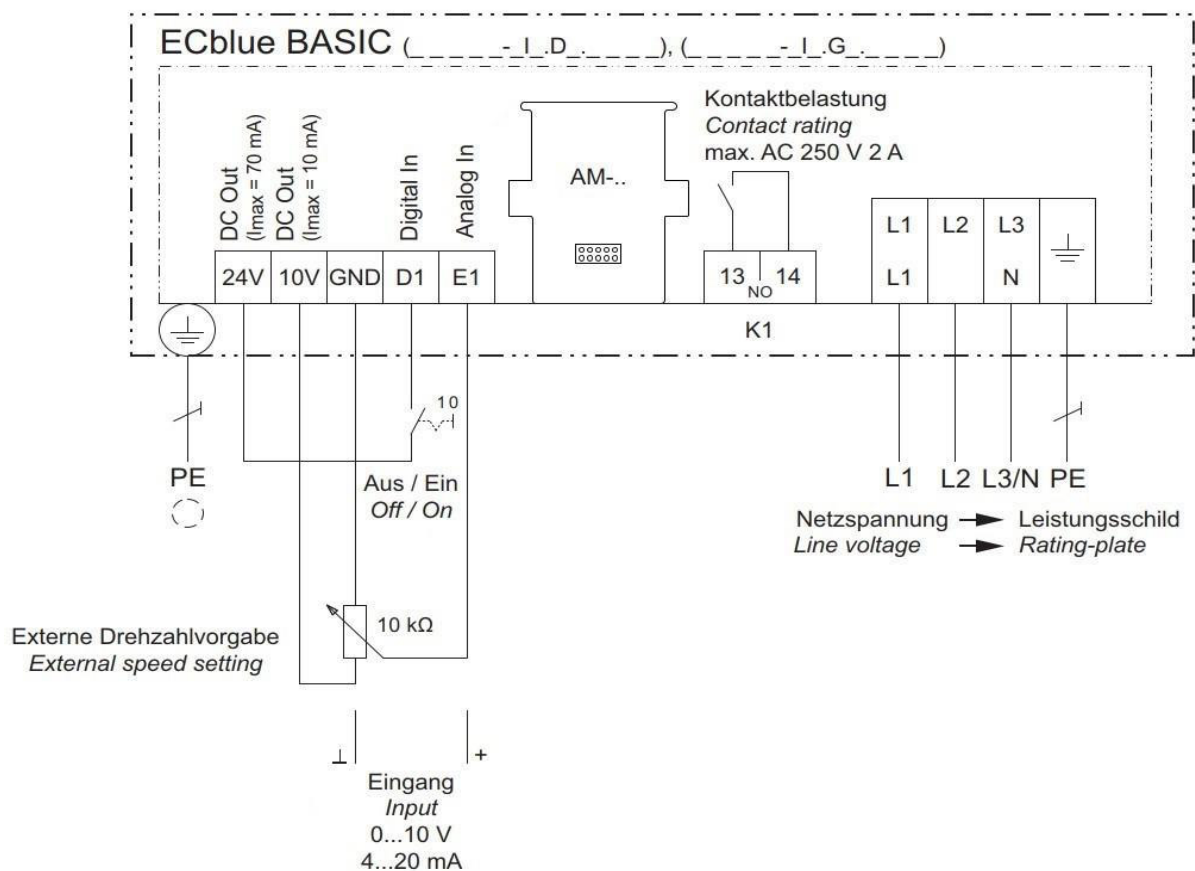


Figure 63: Connection schematic 230V series

Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
L1	L1	Black (BK) / 11	1	Power supply, phase, see nameplate for voltage range, 50/60 Hz
N	N	Brown (BN) / 2	1	Power supply, neutral conductor, see nameplate for voltage range, 50/60 Hz
PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
14	NO	White (WH) / 1	2	Status relay, potential-free alarm signal contact, common connection (2 A, 250 V)

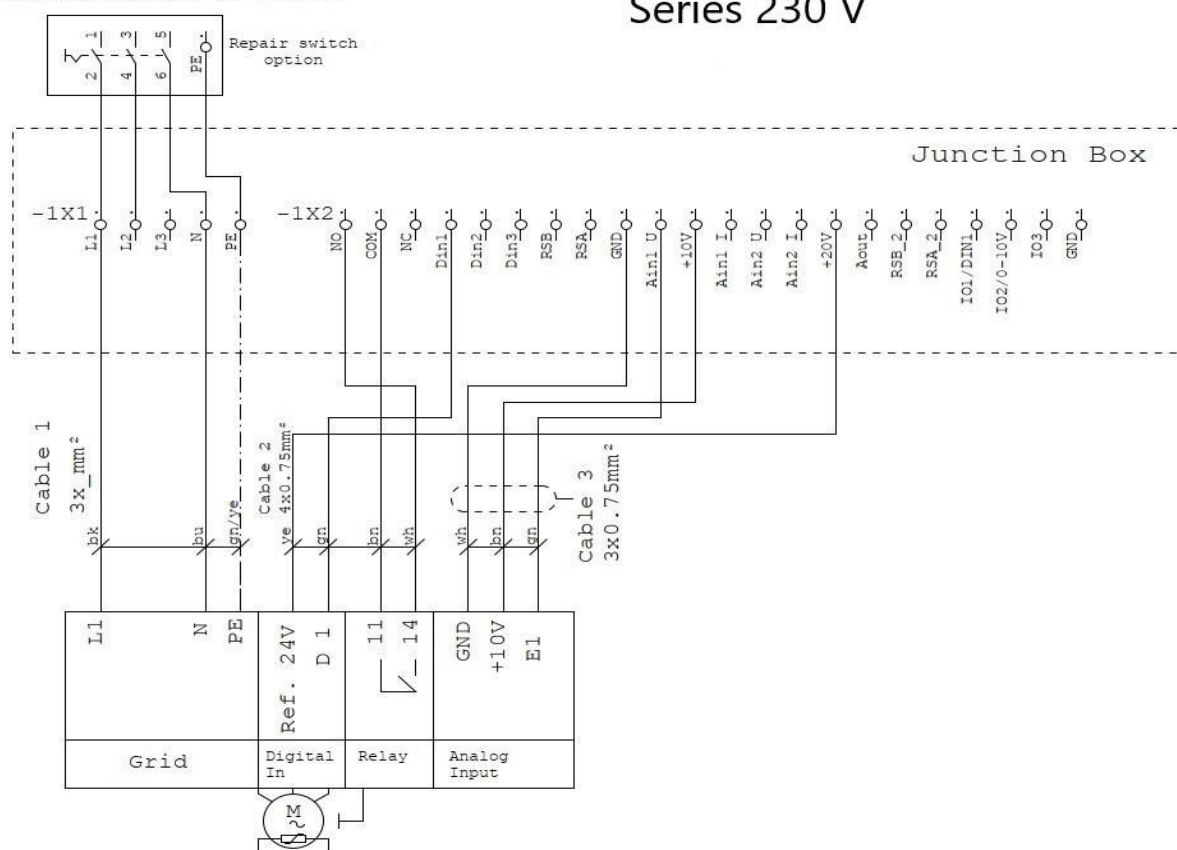
Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
11/13	COM	Brown (BN) / 2	2	Status relay, potential-free alarm signal contact, opens on error
Ref. 24V	+20 V	Yellow (YE) / 4	2	Fixed voltage output 24 VDC; +24 V; supply voltage for external devices (e.g. sensor)
D1	Din1	Green (GN) / 3	2	Digital input 1: Enable electronics; Enable: Bridge to 24V; Disable: Pin open
GND	GND	White (WH) / 1	3	GND
+10 V	+10 V	Brown (BN) / 2	3	Fixed voltage output 10 VDC; +10 V; supply voltage for external devices (e.g. potentiometer)
E1	Ain1 U	Green (GN) / 3	3	Analog input (setpoint); 0-10 V

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 18: Connections 230V Serie

Attention!!
If a repair switch is selected,
the connection is made directly to the repair switch
without connection to the terminals

Series 230 V



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 64: Connection diagram 230V Serie

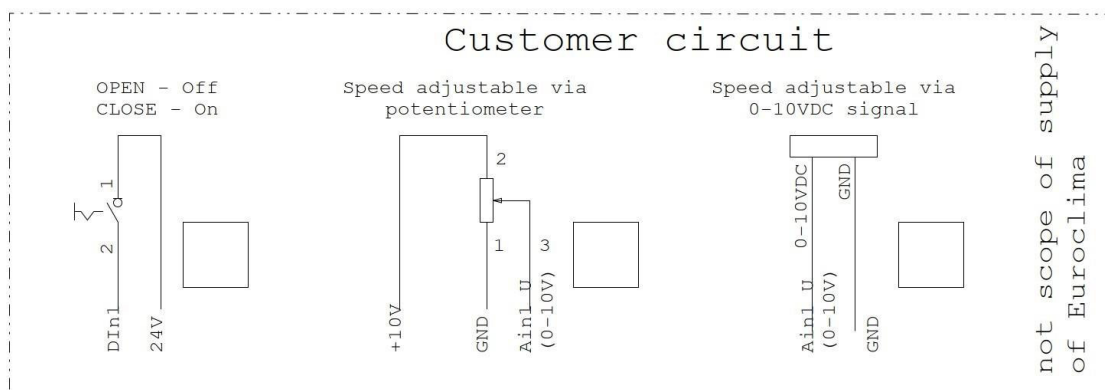


Figure 65: Connection customer 230V Serie

4.2 Connection schematic: 400V series

Technical specifications:

- Integrated power electronics
- Integrated motor protection
- Integrated overload protection
- Stepless speed control via 0-10V, PWM signal or MODBUS
- Active temperature management
- Power factor correction
- 0-10V analog input
- Output +10 V max. 10 mA
- Integrated filter for interference emission according to EN 61000-6-3

Connection schematic:

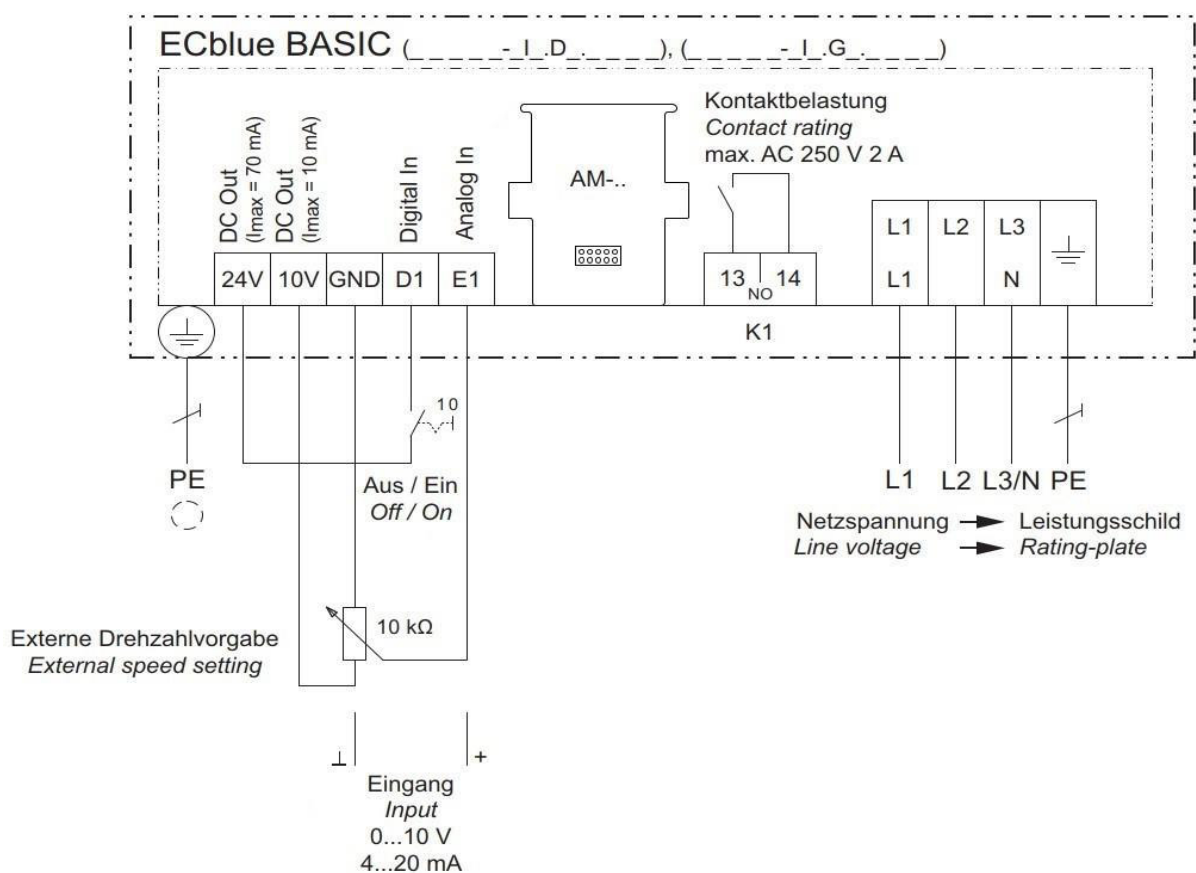


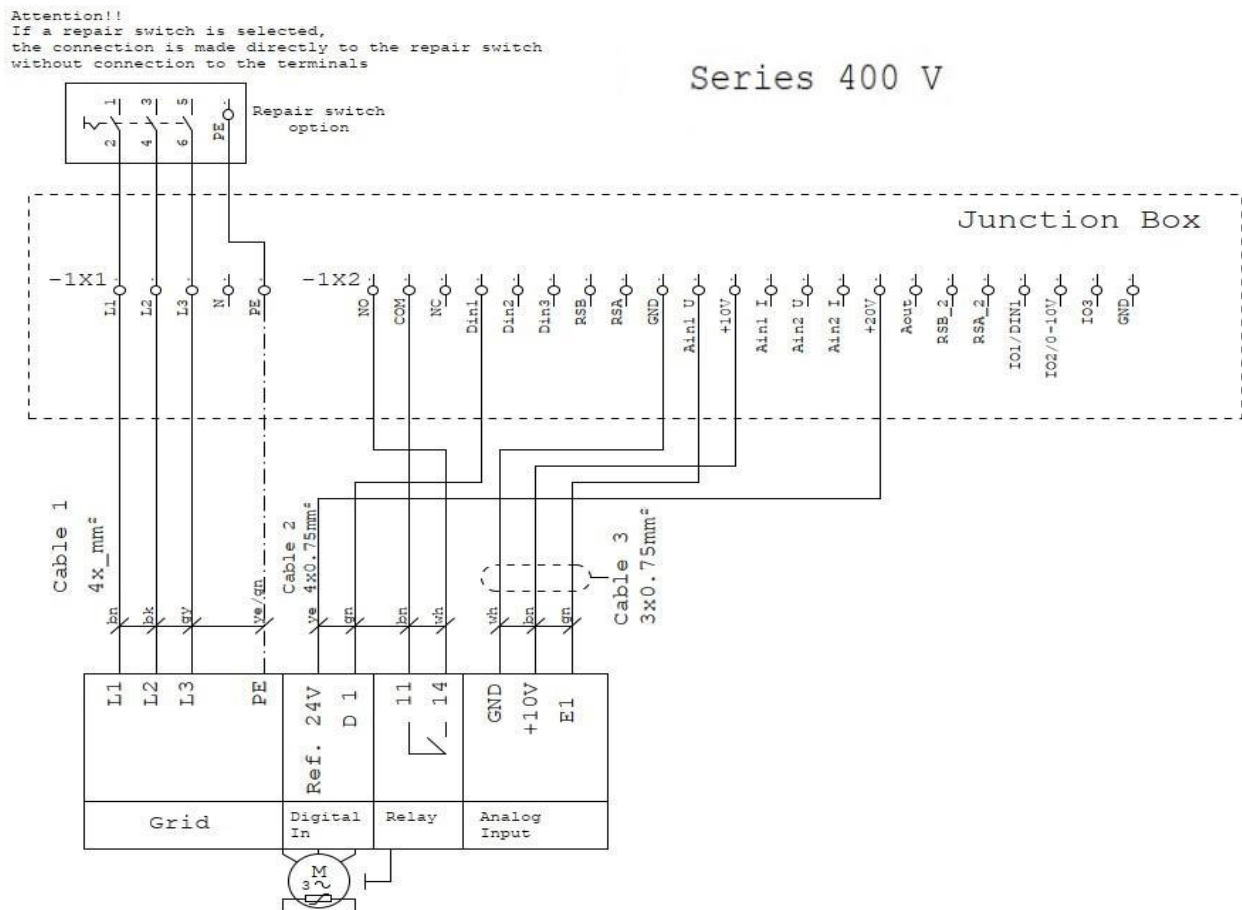
Figure 66: Connection schematic 400V Serie

Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
L1	L1	Brown (BN) / 2	1	Power supply, see nameplate for voltage range, 50/60 Hz
L2	L2	Black (BK) / 11	1	Power supply, see nameplate for voltage range, 50/60 Hz
L3	L3	Grey (GY) / 5	1	Power supply, see nameplate for voltage range, 50/60 Hz
PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
14	NO	White (WH) / 1	2	Status relay, potential-free alarm signal contact, common connection (2 A, 250 V)

Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
11/13	COM	Brown (BN) / 2	2	Status relay, potential-free alarm signal contact, opens on error
Ref. 24V	+20 V	Yellow (YE) / 4	2	Fixed voltage output 24 VDC; +24 V; supply voltage for external devices (e.g. sensor)
D1	Din1	Green (GN) / 3	2	Digital input 1: Enable electronics; Enable: Bridge to 24V; Disable: Pin open
GND	GND	White (WH) / 1	3	GND
+10 V	+10 V	Brown (BN) / 2	3	Fixed voltage output 10 VDC; +10 V; supply voltage for external devices (e.g. potentiometer)
E1	Ain1 U	Green (GN) / 3	3	Analog input (setpoint); 0-10 V

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 19: Connections 400V Serie



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 67: Connection diagram 400V Serie

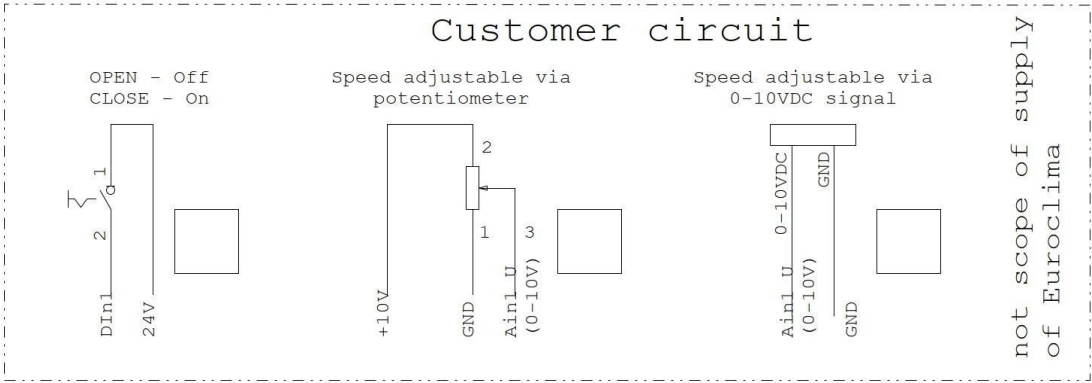


Figure 68: Connection customer 400V Serie

4.3 Connection schematic: 400V series with 1x MODBUS

Technical specifications:

- Integrated power electronics
- Integrated motor protection
- Integrated overload protection
- Stepless speed control via 0-10V, PWM signal or MODBUS
- Active temperature management
- Power factor correction
- 0-10V analog input
- Output +10 V max. 10 mA
- Integrated filter for interference emission according to EN 61000-6-3

Connection schematic:

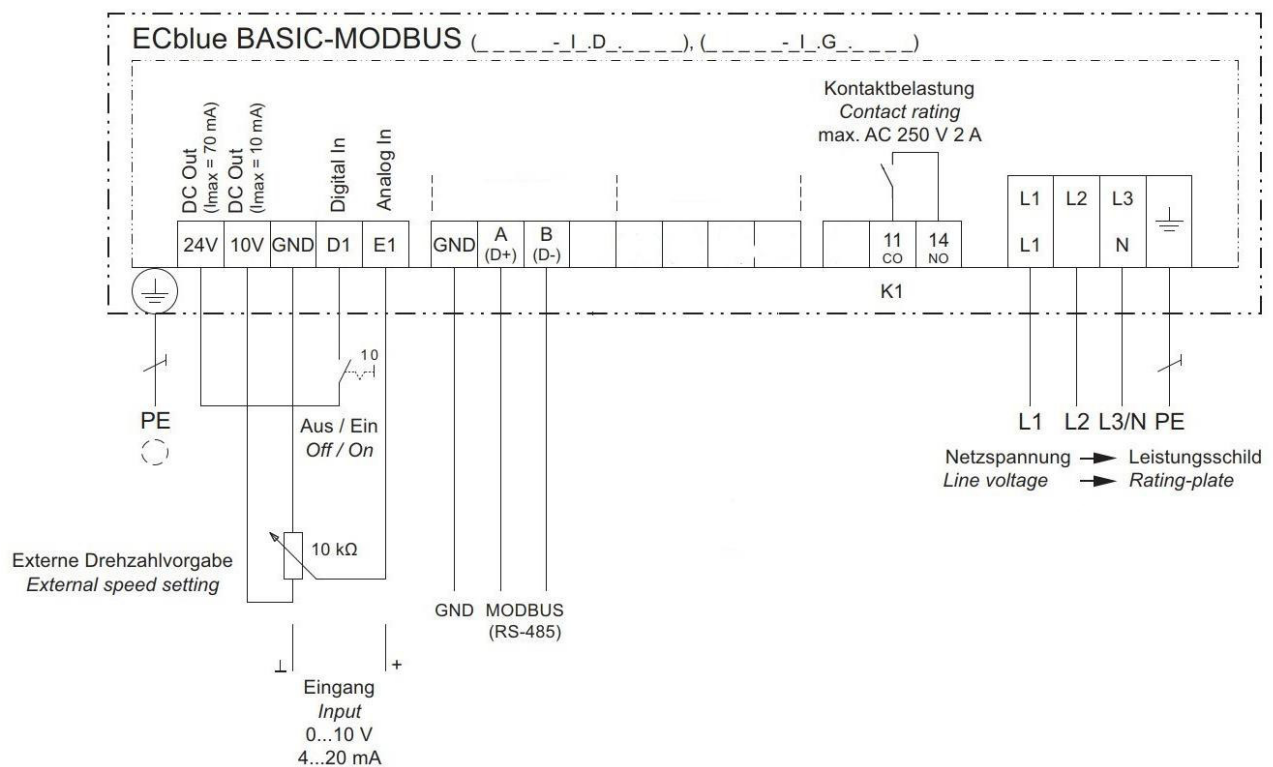


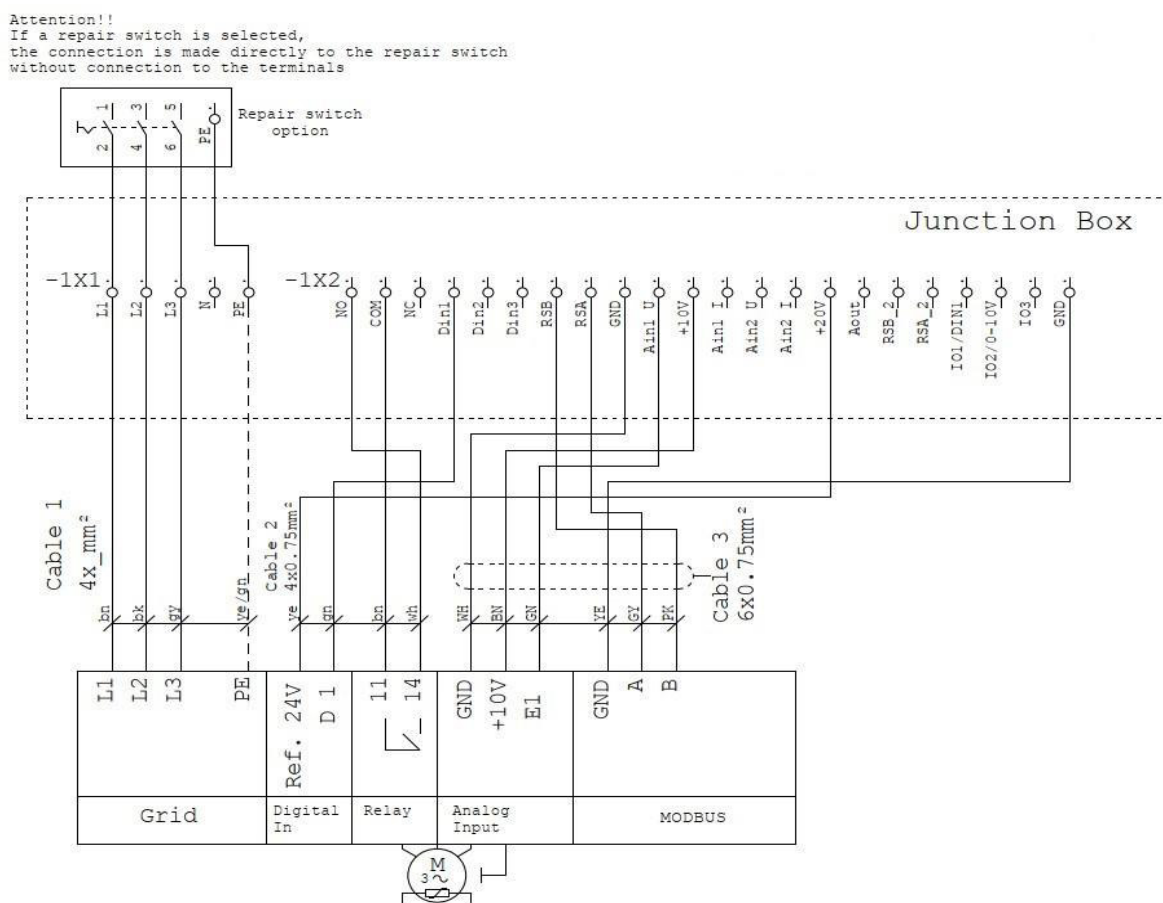
Figure 69: Connection schematic 400V series with 1x MODBUS

Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
L1	L1	Brown (BN) / 2	1	Power supply, see nameplate for voltage range, 50/60 Hz
L2	L2	Black (BK) / 11	1	Power supply, see nameplate for voltage range, 50/60 Hz
L3	L3	Grey (GY) / 5	1	Power supply, see nameplate for voltage range, 50/60 Hz
PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
14	NO	White (WH) / 1	2	Status relay, potential-free alarm signal contact, common connection (2 A, 250 V)
11/13	COM	Brown (BN) / 2	2	Status relay, potential-free alarm signal contact, opens on error

Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
Ref. 24V	+20 V	Yellow (YE) / 4	2	Fixed voltage output 24 VDC; +24 V; supply voltage for external devices (e.g. sensor)
D1	Din1	Green (GN) / 3	2	Digital input 1: Enable electronics; Enable: Bridge to 24V; Disable: Pin open
GND	GND	White (WH) / 1	3	GND
+10 V	+10 V	Brown (BN) / 2	3	Fixed voltage output 10 VDC; +10 V; supply voltage for external devices (e.g. potentiometer)
E1	Ain1 U	Green (GN) / 3	3	Analog input (setpoint); 0-10 V
GND	GND	Yellow (YE) / 4	3	GND
A	RSA	Grey (GY) / 5	3	RS485 interface for MODBUS RSA
B	RSB	Pink (PK) / 6	3	RS485 interface for MODBUS RSB

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 20: Connections 400V series with 1x MODBUS



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 70: Connection diagram 400V series with 1x MODBUS

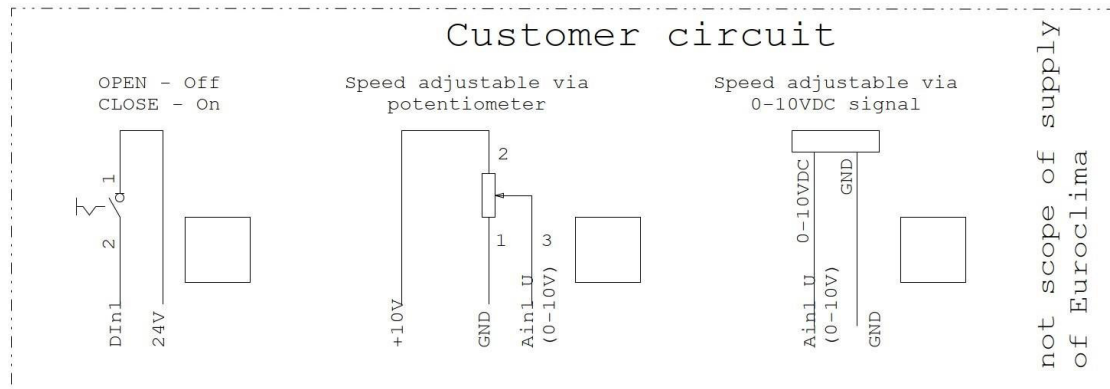


Figure 71: Connection customer 400V series with 1x MODBUS

4.4 Connection schematic: 400V series with 2x MODBUS

Technical specifications:

- Integrated power electronics
- Integrated motor protection
- Integrated overload protection
- Stepless speed control via 0-10V, PWM signal or MODBUS
- Active temperature management
- Power factor correction
- 0-10V analog input
- Output +10 V max. 10 mA
- Integrated filter for interference emission according to EN 61000-6-3

Connection schematic:

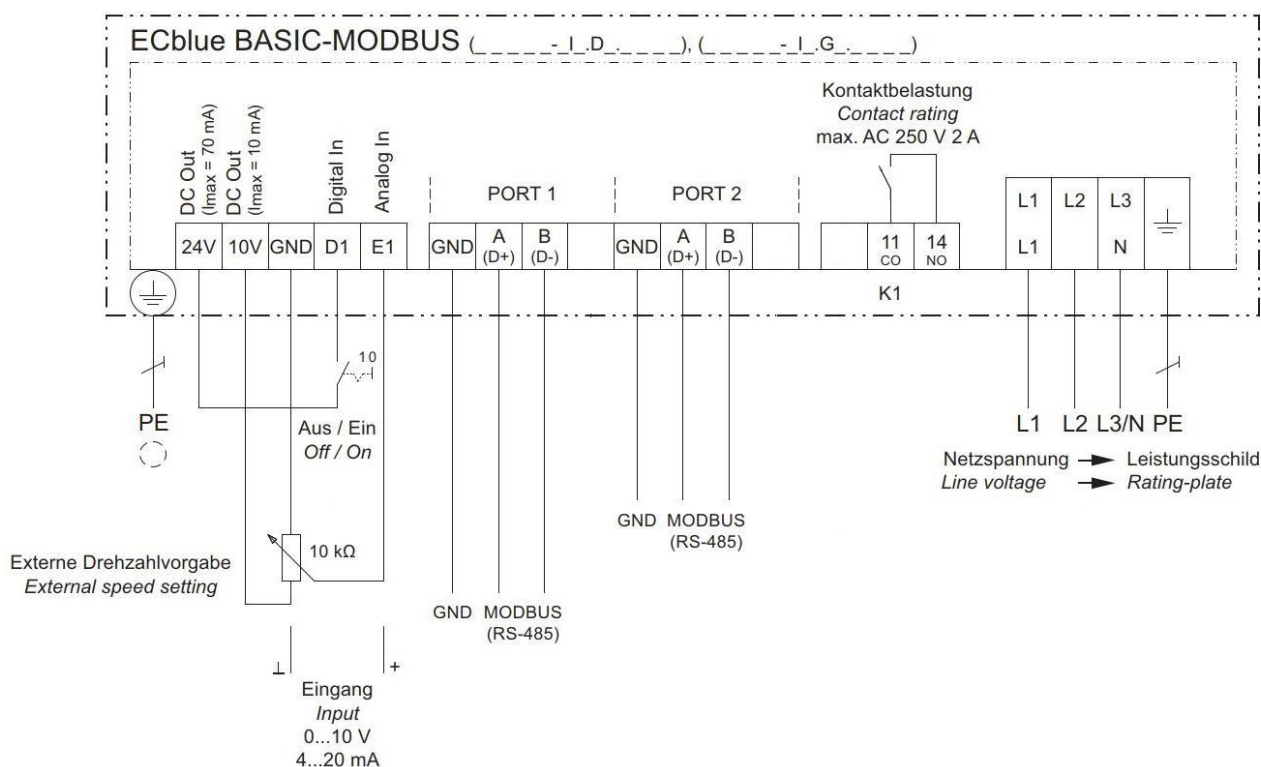


Figure 72: Connection schematic 400V series with 2x MODBUS

Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
L1	L1	Brown (BN) / 2	1	Power supply, see nameplate for voltage range, 50/60 Hz
L2	L2	Black (BK) / 11	1	Power supply, see nameplate for voltage range, 50/60 Hz
L3	L3	Grey (GY) / 5	1	Power supply, see nameplate for voltage range, 50/60 Hz
PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
14	NO	White (WH) / 1	2	Status relay, potential-free alarm signal contact, common connection (2 A, 250 V)
11	COM	Brown (BN) / 2	2	Status relay, potential-free alarm signal contact, opens on error

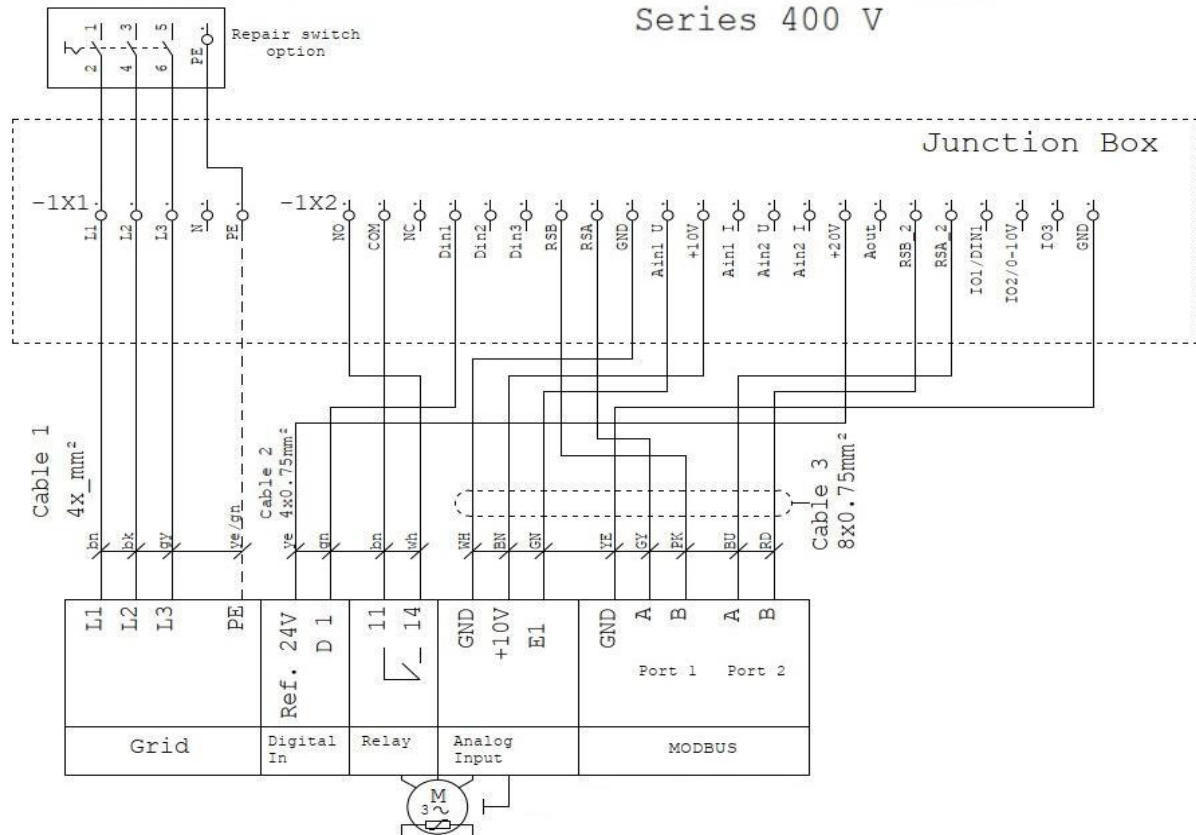
Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
Ref. 24V	+20 V	Yellow (YE) / 4	2	Fixed voltage output 24 VDC; +24 V; supply voltage for external devices (e.g. sensor)
D1	Din1	Green (GN) / 3	2	Digital input 1: Enable electronics; Enable: Bridge to 24V; Disable: Pin open
GND	GND	White (WH) / 1	3	GND
+10 V	+10 V	Brown (BN) / 2	3	Fixed voltage output 10 VDC; +10 V; supply voltage for external devices (e.g. potentiometer)
E1	Ain1 U	Green (GN) / 3	3	Analog input (setpoint); 0-10 V
GND	GND	Yellow (YE) / 4	3	GND
A Port 1	RSA	Grey (GY) / 5	3	RS485 interface for MODBUS RSA
B Port 1	RSB	Pink (PK) / 6	3	RS485 interface for MODBUS RSB
A Port 2	RSA2	Brown (BN) / 2	3	RS485 interface for MODBUS RSA
B Port 2	RSB2	Red (RD) / 10	3	RS485 interface for MODBUS RSB

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 21: Connections 400V series with 2x MODBUS

Attention!!
If a repair switch is selected,
the connection is made directly to the repair switch
without connection to the terminals

ECblue BASIC-MODBUS Series 400 V



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 73: Connection diagram 400V series with 2x MODBUS

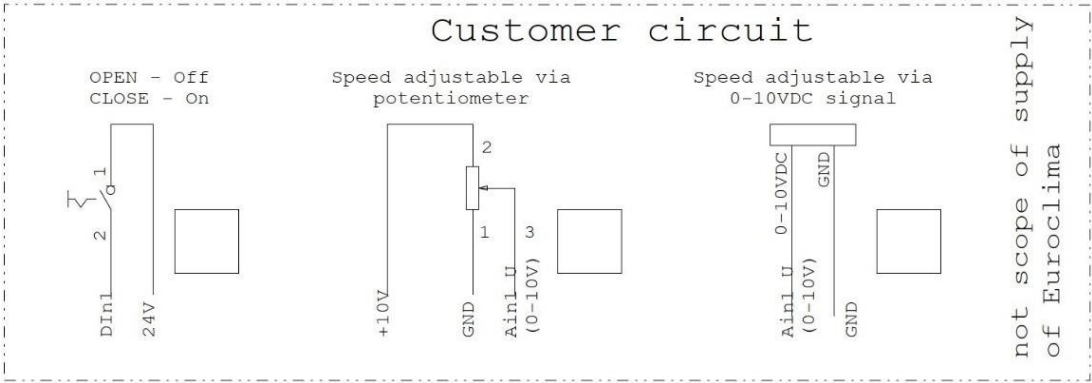


Figure 74: Connection customer 400V series with 2x MODBUS

5 ORA-VENT / NICOTRA GEBHARDT RQM & RLM E6

For ORAvent fans and fans of the RQM series from Nicotra Gebhardt, the connection diagram number "OJ-DV" applies., see **Figure 75**:

VF	Zuluft-Ventilator, freilaufendes Rad	610,0 [mm]	1,86 [m2]	81,00 [kg]	12 [Pa]
Ventilator	oravent xxx	EC-Motor	M3G112GA		
Luftmenge [m³/h] (Dichte: [kg/m³] 1,20)	1 x 4.000,00	Schutz	IP54		
Externe Press. [Pa]	400	Isolationsklasse	F		
Ext. Druckanteil Eintritt / Austritt [Pa]	-50 / 350	max elektrisch absorbierte Leistun	2,950		
dyn. Druckabfall [Pa]	70	Geschwindigkeit +-2 % [1/min]	4.000		
Tot. Pressung [Pa]	878	Strom +-5% [A]	4,60		
Drehzahl [1/min]	3.187	Spannung [V]	3x400 / 50/60 Hz		
Schallleistung [dB(A)]	88,6	Nennspannungsbereich [V]	380 ... 480		
System Wirkungsgrad [%]	59,5	Elektrisch absorbierte Leistung [kW]	1,51		
max. nom. Drehzahl [1/min]	4.000	Motor Effizienzklasse	analog to IEC60034: IE 5		
Kalibrierfaktor K_A [m²s/h]	89	Kontrollspannung [V]	6,9		
Drehzahlregelung:	drehzahlgeregelt	Connection diagram	OJ-DV		
Wellenleistung [kW]	1,26	Kein Frequenzumformer notwendig!			

Figure 75: Connection diagram number ORAvent & Nicotra Gebardt RQM & RLM E6

Technical specifications:

- Overvoltage and overtemperature protection
- Transient protection with VDR
- Mains phase failure monitoring
- Motor protection by limiting the motor current
- Full motor protection with PTC evaluation
- Emergency operation with reduced speed in case of overtemperature, undervoltage or failure of a mains phase
- Adjustable ramp-up and ramp-down times
- Synchronization to already running motor
- Separate inverter operating hours counter, kWh counter, fault message memory
- 1 x analog control (0-10 V DC)
- 10 V DC output for setpoint potentiometer
- 2 x RS-485 connection for Modbus RTU; connection via RJ12 connector
- 1 x Modbus connection via terminal block (contacts "A" and "B")
- 2 x digital input: (individually programmable)
- In1: For alarm reset
- In2: Start / Stop
- 1 x digital output, programmed as alarm output

Connection schematic:

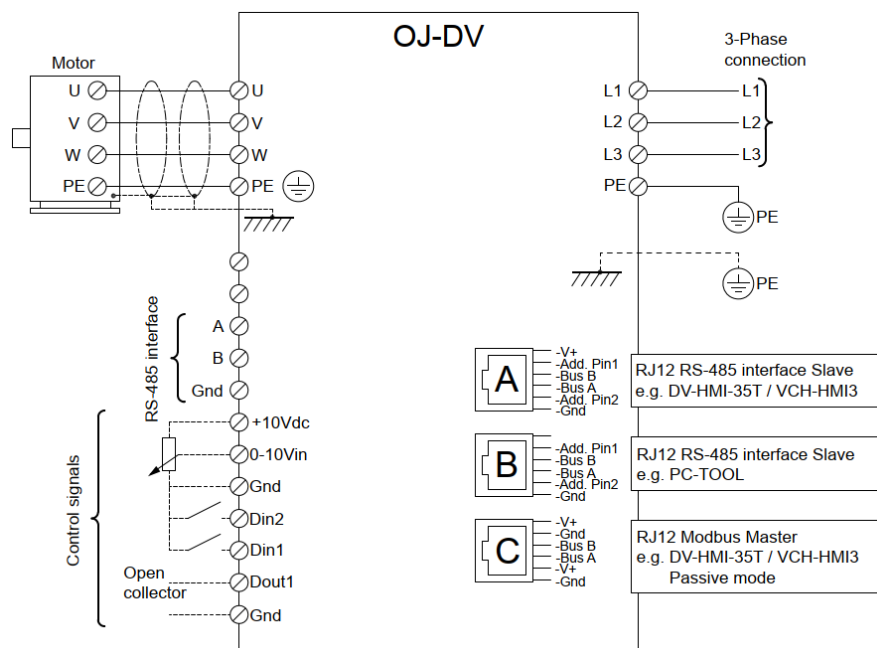


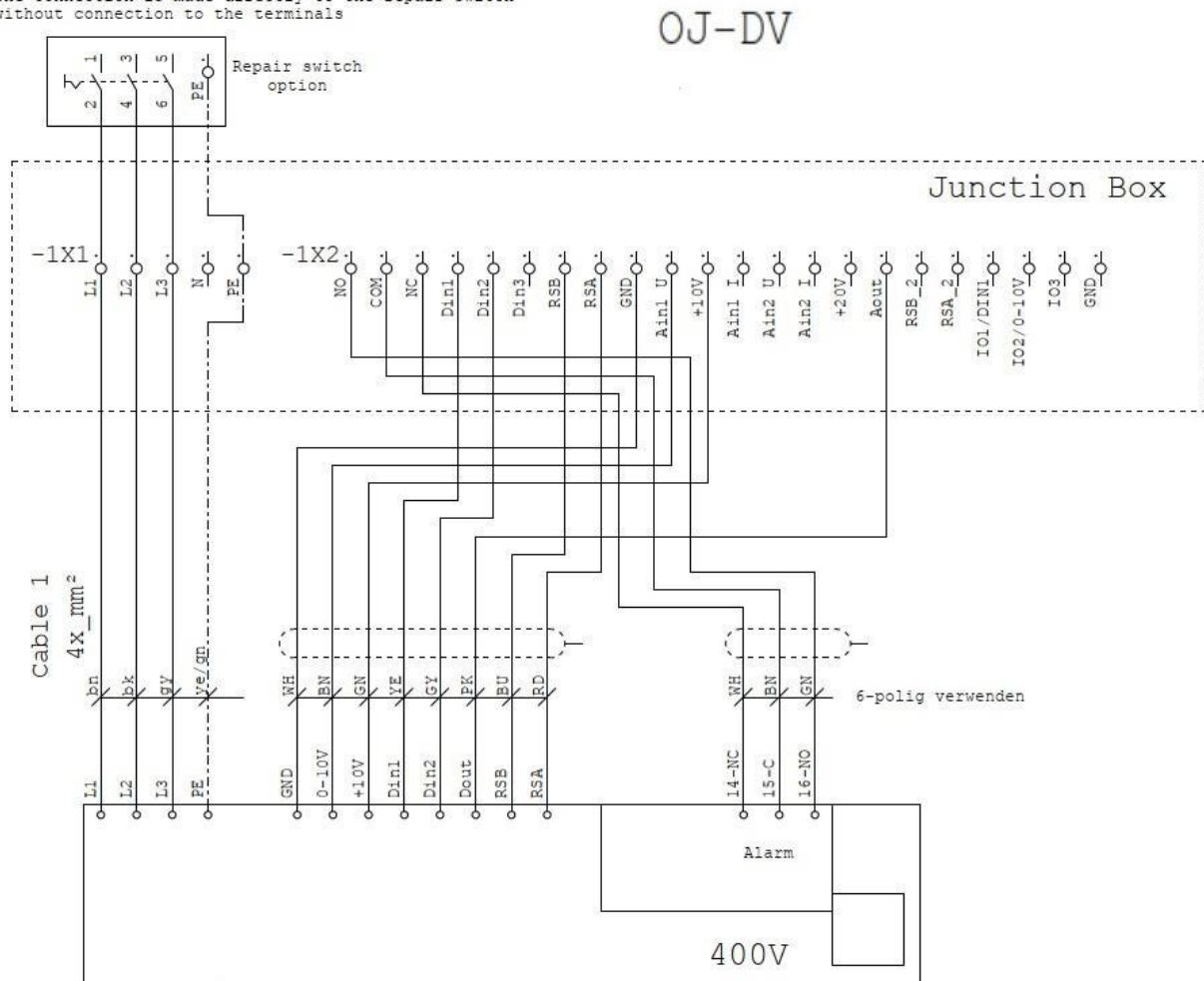
Figure 76: Connection schematic OJ-DV

Connection	Terminal junction box ¹⁾	Color / Number	Cable	Allocation / function
L1	L1	Brown (BN) / 2	1	Power supply, phase, see nameplate for voltage range
L2	L2	Black (BK) / 11	1	Power supply, phase, see nameplate for voltage range
L3	L3	Grey (GY) / 5	1	Power supply, phase, see nameplate for voltage range
PE	PE	Yellow/Green (YE/GN) / 4/3	1	Protective earth
GND	GND	White (WH) / 1	2	GND
0-10V	Ain1 U	Brown (BN) / 2	2	Analog input 1 (setpoint); 0-10 V; Ri=60kΩ; potentiometer min. 500 Ω; recommended 4.7 kΩ
+10 V	+10 V	Green (GN) / 3	2	Fixed voltage output 10 VDC; +10 V +/-3 %; short-circuit proof; supply voltage for external devices (e.g. potentiometer)
Din1	Din1	Yellow (YE) / 4	2	Digital input 1: Enable electronics; Enable: Pin open; Disable: Bridge to GND
Din2	Din2	Grey (GY) / 5	2	Digital input 2: Alarm reset
Dout	Aout	Pink (PK) / 6	2	Tachometer out
RSB	RSB	Blue (BU) / 8	2	RS485 interface for MODBUS RSB, SELV
RSA	RSA	Red (RD) / 10	2	RS485 interface for MODBUS RSA, SELV
14-NC	NC	White (WH) / 1	3	Status relay, potential-free alarm contact, closes on error
15-C	COM	Brown (BN) / 2	3	Status relay, potential-free alarm contact, change-over contact, common connection (max. 30VAC/24VDC/1A)
16-NO	NO	Green (GN) / 3	3	Status relay, potential-free alarm contact, opens on error

1) if present; if more than 1 fan is planned in the AHU, several terminal blocks are available - 1 terminal block is present per fan. The first number of the terminal block always corresponds to the respective fan, for example: -1x2 for the 1st fan, -2x2 for the 2nd fan, etc.

Table 22: Connections OJ-DV

Attention!!
If a repair switch is selected,
the connection is made directly to the repair switch
without connection to the terminals



Note: The junction box is prepared for maximum use - not all fans are equipped with all optional contacts - terminals that are not connected to the fan are without function

Figure 77: Connection diagram OJ-DV

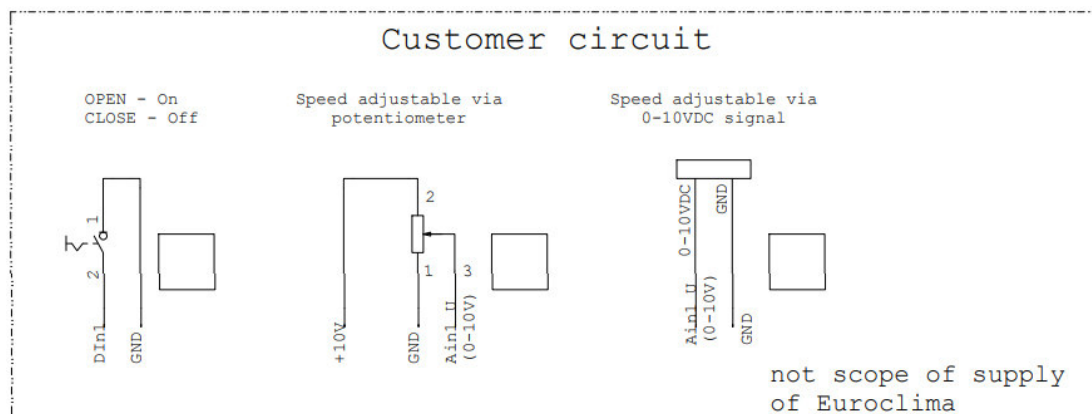


Figure 78: Connection customer OJ-DV

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