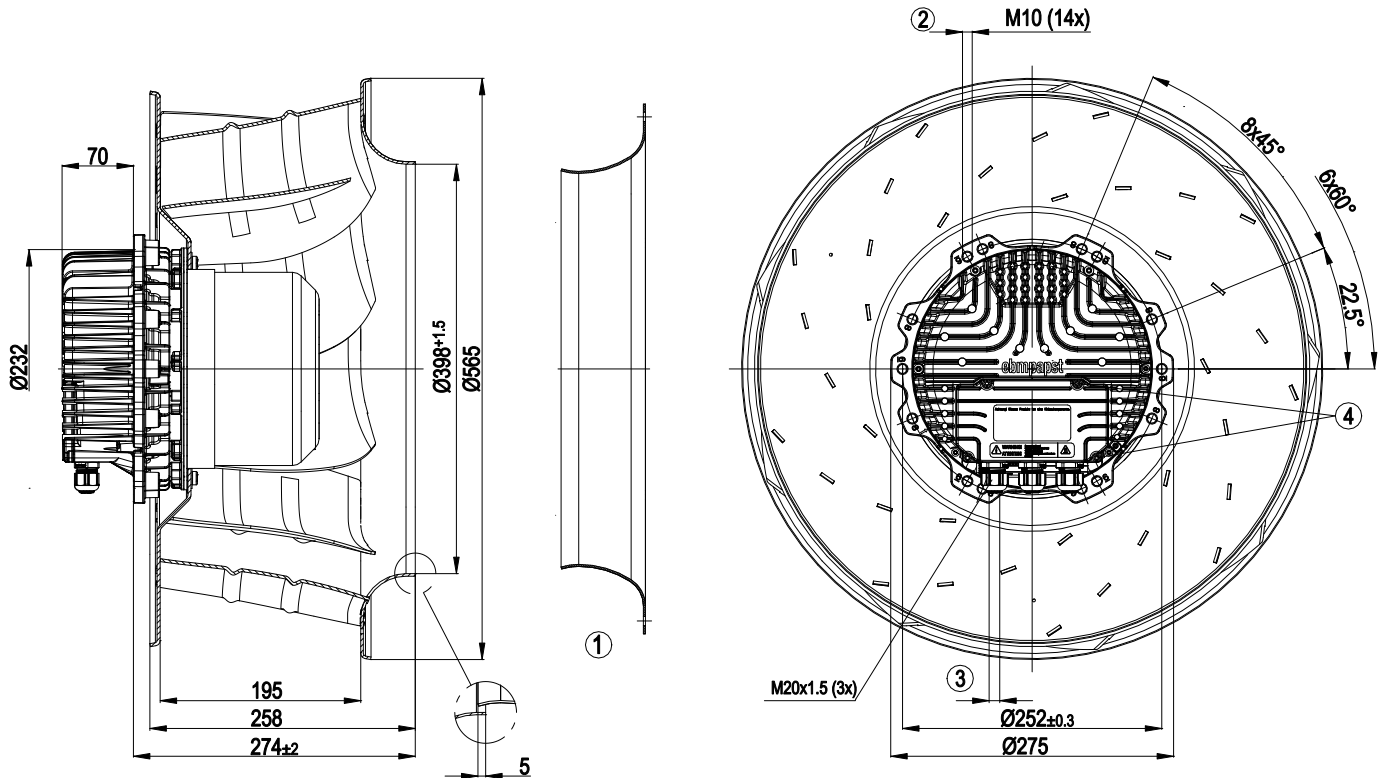


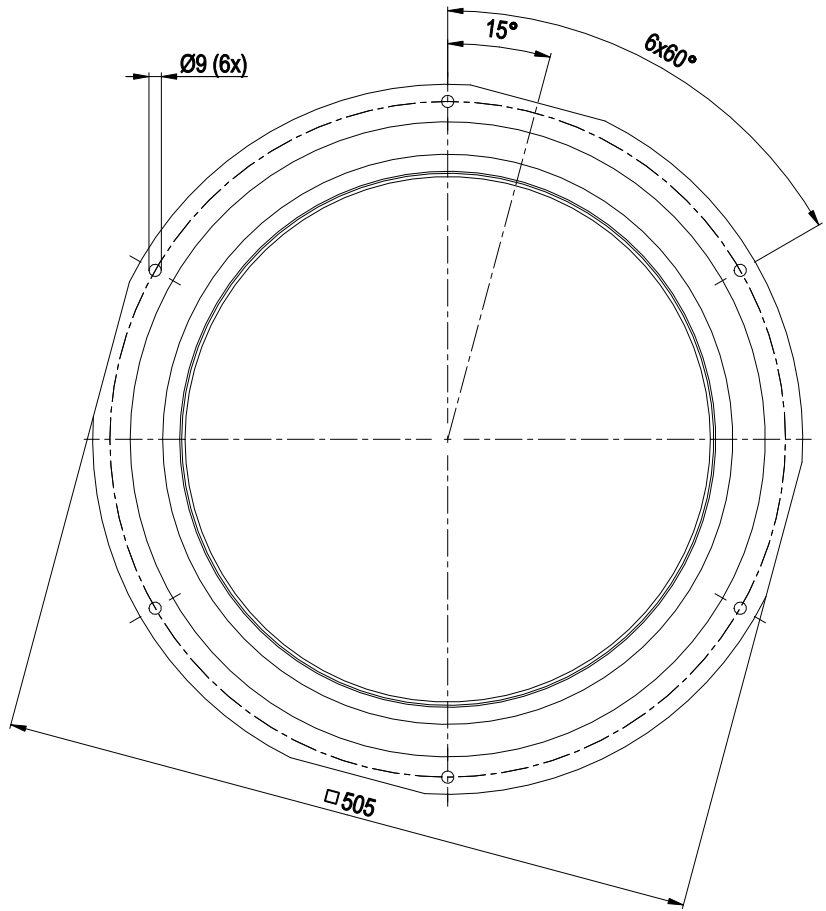
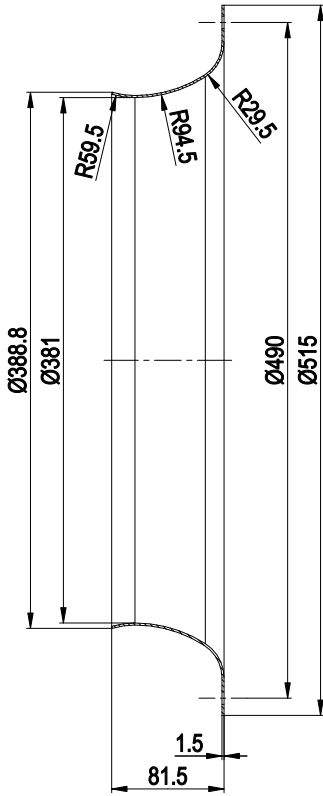
3. TECHNICAL DATA

3.1 Product drawing



All dimensions in mm.

| | |
|---|---|
| 1 | Accessory part: inlet ring 63071-2-4013 not included in scope of delivery |
| 2 | Max. clearance for screw 25 mm |
| 3 | Cable diameter min. 4 mm, max. 10 mm, tightening torque 4 ± 0.6 Nm |
| 4 | Tightening torque 3.5 ± 0.5 Nm |



All dimensions in mm.

| |
|-------------------------|
| Inlet ring 63071-2-4013 |
|-------------------------|



3.2 Nominal data

| | |
|---------------------------------|------------|
| Motor | M3G150-IF |
| Phase | 3~ |
| Nominal voltage / VAC | 400 |
| Nominal voltage range / VAC | 380 .. 480 |
| Frequency / Hz | 50/60 |
| Method of obtaining data | ml |
| Speed (rpm) / min ⁻¹ | 1520 |
| Power consumption / W | 3000 |
| Current draw / A | 4.6 |
| Min. ambient temperature / °C | -25 |
| Max. ambient temperature / °C | 60 |

ml = Max. load · me = Max. efficiency · fa = Free air
 cs = Customer specification · ce = Customer equipment

Subject to change

3.3 Data according to Commission Regulation (EU) 327/2011

| | Actual | Req. 2015 |
|--|--|-----------|
| 01 Overall efficiency η_{es} / % | 58.8 | 56.6 |
| 02 Measurement category | A | |
| 03 Efficiency category | Static | |
| 04 Efficiency grade N | 64.2 | 62 |
| 05 Variable speed drive | Yes | |
| 06 Year of manufacture | The year of manufacture is specified on the product's rating label. | |
| 07 Manufacturer | ebm-papst Mulfingen GmbH & Co. KG Amtsgericht (court of registration) Stuttgart · HRA 590344 D-74673 Mulfingen | |
| 08 Type | R3G560-AH23-01 | |
| 09 Power consumption P_{ed} / kW | 3.07 | |
| 09 Air flow q_v / m ³ /h | 8760 | |
| 09 Pressure increase total p_{fs} / Pa | 704 | |
| 10 Speed (rpm) n / min ⁻¹ | 1515 | |
| 11 Specific ratio* | 1.01 | |
| 12 Recycling/disposal | Information on recycling and disposal is provided in the operating instructions. | |
| 13 Maintenance | Information on installation, operation and maintenance is provided in the operating instructions. | |
| 14 Additional components | Components used to calculate the energy efficiency that are not apparent from the measurement category are detailed in the CE declaration. | |

* Specific ratio = $1 + p_{fs} / 100\,000\text{ Pa}$

Data obtained at optimum efficiency level. The efficiency values displayed for achieving conformity with the Ecodesign Regulation EU 327/2011 has been reached with defined air duct components (e.g. inlet rings). The dimensions must be requested from ebm-papst. If other air conduction geometries are used on the installation side, the ebm-papst evaluation loses its validity/the conformity must be confirmed again. The product does not fall within the scope of Regulation (EU) 2019/1781 due to the exception specified in Article 2 (2a) (motors completely integrated into a product).

3.4 Technical description

| | |
|--|--|
| Weight | 28.4 kg |
| Size | 560 mm |
| Motor size | 150 |
| Rotor surface | Painted black |
| Electronics housing material | Die-cast aluminum |
| Impeller material | Sheet aluminum |
| Number of blades | 9 |
| Direction of rotation | Clockwise, viewed toward rotor |
| Degree of protection | IP55 |
| Insulation class | "F" |
| Moisture (F) / Environmental (H) protection class | H1 |
| Installation position | Shaft horizontal or rotor on bottom; rotor on top on request |
| Condensation drainage holes | On rotor side |
| Mode | S1 |
| Motor bearing | Ball bearing |
| Technical features | <ul style="list-style-type: none"> - Output 10 VDC, max. 10 mA - Output 20 VDC, max. 50 mA - Output for slave 0-10 V - Input for sensor 0-10 V or 4-20 mA - External 24 V input (parameter setting) - External release input - Alarm relay - Integrated PID controller - Power limiter - Motor current limitation - PFC, passive - RS-485 MODBUS-RTU - Soft start - EEPROM write cycles: 100,000 maximum - Control input 0-10 VDC / PWM - Control interface with SELV potential safely disconnected from the mains - Thermal overload protection for electronics/motor - Line undervoltage / phase failure detection |
| Touch current according to IEC 60990 (measuring circuit Fig. 4, TN system) | ≤ 3.5 mA |
| Electrical hookup | Terminal box |
| Motor protection | Reverse polarity and locked-rotor protection |
| Protection class | I (with customer connection of protective earth) |
| Conformity with standards | CE; UKCA |
| Approval | UL 1004-7 + 60730-1; EAC; CSA C22.2 No. 77 + CAN/CSA-E60730-1 |



With regard to cyclic speed loads, note that the rotating parts of the device are designed for a maximum of one million load cycles. If you have special questions, consult ebm-papst for support.

⇒ Use the device in accordance with its degree of protection.

Information on surface quality

The surfaces of the products conform to the generally applicable industrial standard. The surface quality may change during the production period. This has no effect on strength, dimensional stability and dimensional accuracy.

The color pigments in the paints used perceptibly react to UV light over the course of time. The product is to be protected against UV radiation to prevent the formation of patches and fading. Changes in color are not a reason for complaint and are not covered by the warranty. UV radiation in the frequency range and the intensity of natural solar radiation has no effect on the technical properties of the products.

3.5 Mounting data

Further mounting data can be taken from the product drawing or Chapter 4.1 Mechanical connection as required.

| | |
|---------------------------------|-----|
| Strength class of screws | 8.8 |
|---------------------------------|-----|

⇒ Secure the screws against unintentional loosening (e.g. use self-locking screws).

3.6 Transport and storage conditions

| | |
|---|--------|
| Max. permitted ambient temp. for motor (transport/storage) | +80 °C |
| Min. permitted ambient temp. for motor (transport/storage) | -40 °C |

3.7 Electromagnetic compatibility

| | |
|-------------------------------------|--|
| EMC immunity to interference | According to EN 61000-6-2 (industrial environment) |
| EMC interference emission | According to EN 61000-6-3 (household environment) |



If several devices are switched in parallel on the supply side so that the line current of the arrangement is in the range of 16-75 A, then this arrangement conforms to IEC 61000-3-12 provided that the short-circuit power S_{sc} at the connection point of the customer system to the public power system is greater than or equal to 120 times the rated output of the arrangement. It is the responsibility of the installation engineer or operator/owner of the device to ensure, if necessary after consultation with the network operator, that this device is only connected to a connection point with a S_{sc} value that is greater than or equal to 120 times the rated output of the arrangement.

4. CONNECTION AND STARTUP

4.1 Mechanical connection



CAUTION

Cutting and crushing hazard when removing fan from packaging

→ Carefully remove the device from its packaging, by the fan impeller. Strictly avoid shocks.

→ Wear safety shoes and cut-resistant safety gloves.



CAUTION

Device weighs over 25 kg! Heavy load when unpacking device.

Risk of physical injury, such as back injuries.

→ Use suitable hoisting equipment to remove the device from its packaging.



NOTE

Damage to the device from vibration

Bearing damage, shorter service life

→ The fan must not be subjected to force or excessive vibration from sections of the installation.

→ If the fan is connected to air ducts, the connection should be isolated from vibration, e.g. using compensators or similar elements.

→ Ensure stress-free attachment of the fan to the substructure.

⇒ Check the device for transport damage. Damaged devices are not to be installed.

⇒ Install the undamaged device in accordance with your application.



CAUTION

Possible damage to the device

If the device slips during installation, serious damage can result.

→ Ensure that the device is securely positioned at its place of installation until all fastening screws have been tightened.

- The fan must not be strained on fastening.

4.2 Electrical connection



DANGER

Voltage on the device

Electric shock

→ Always connect a protective earth first.

→ Check the protective earth.



DANGER

Faulty insulation

Risk of fatal injury from electric shock

→ Use only cables that meet the specified installation regulations for voltage, current, insulation material, capacity, etc.

→ Route cables so that they cannot be touched by any rotating parts.

**DANGER**

Electrical charge (>50 µC) between phase conductor and protective earth connection after switching off supply with multiple devices connected in parallel.

Electric shock, risk of injury

- Ensure sufficient protection against accidental contact. Before working on the electrical hookup, short the supply and PE connections.

CAUTION**Voltage**

The fan is a built-in component and has no disconnecting switch.

- Only connect the fan to circuits that can be switched off with an all-pole disconnection switch.
- When working on the fan, secure the system/machine in which the fan is installed so as to prevent it from being switched back on.

NOTE**Device malfunctions possible**

Route the device's control lines separately from the supply line.

- Maintain the greatest possible clearance. Recommendation: clearance > 10 cm (separate cable routing)

NOTE**Water ingress into wires or cables**

Water ingress at the customer end of the cable can damage the device.

- Make sure the end of the cable is connected in a dry environment.



Only connect the device to circuits that can be switched off with an all-pole disconnection switch.

4.2.1 Requirements

- ⇒ Check whether the information on the nameplate matches the connection data.
- ⇒ Before connecting the device, make sure the power supply matches the device voltage.
- ⇒ Only use cables designed for the current level indicated on the nameplate. For determining the cross-section, note the sizing criteria according to EN 61800-5-1. The protective earth must have a cross-section equal to or greater than that of the phase conductor. We recommend the use of 105 °C cables. Ensure that the minimum cable cross-section is at least AWG 26 / 0.13 mm².

4.2.2 Supply connection and fuses

Assignment of supply cable cross-sections and their required fuses (line protection only, no equipment protection).

| Nominal voltage | Fuse | | Automatic circuit breaker | Cable cross-section | Cable cross-section |
|---------------------------|------|------|---------------------------|---------------------|---------------------|
| | VDE | UL | VDE | mm ² | *AWG |
| 3/PE AC 380-480 VAC | 16 A | 15 A | C16A | 1.5 | 16 |

| | | | | | |
|---------------------------|------|------|------|-----|----|
| 3/PE AC 380-480 VAC | 20 A | 20 A | C20A | 2.5 | 14 |
| 3/PE AC 380-480 VAC | 25 A | 25 A | C25A | 4.0 | 12 |

* AWG = American Wire Gauge

4.2.3 Reactive currents

Because of the EMC filter integrated for compliance with EMC limits (interference emission and immunity to interference), reactive currents can be measured in the supply line even when the motor is at a standstill and the line voltage is switched on.

- The values are typically in the range < 250 mA
- At the same time, the effective power in this operating state (operational readiness) is typically < 5 W.

4.2.4 Residual current circuit breaker (RCCB)

If the use of a residual current device (RCD) is required in your installation, only AC/DC-sensitive residual current devices (type B or B+) are permissible. As with variable frequency drives, residual current devices cannot provide personal safety while operating the device. When the device power supply is switched on, pulsed charging currents from the capacitors in the integrated EMC filter can lead to the instant tripping of residual current devices. We recommend the use of residual current circuit breakers (RCCB) with a trip threshold of 300 mA and delayed tripping (super-resistant, characteristic K).

4.2.5 Leakage current

For asymmetrical power systems or if a phase fails, the leakage current can increase to a multiple of the nominal value.

4.2.6 Locked-rotor protection

Due to the locked-rotor protection, the starting current (LRA) is equal to or less than the nominal current (FLA).

4.3 Connection in terminal box**4.3.1 Preparing cables for connection**

Only strip the cable as far as necessary, ensuring that the cable gland is sealed and there is no strain on the connections. For tightening torques, see Chapter 3.1 Product drawing.

**NOTE**

Tightness and strain relief are dependent on the cable used.

- This must be checked by the user.



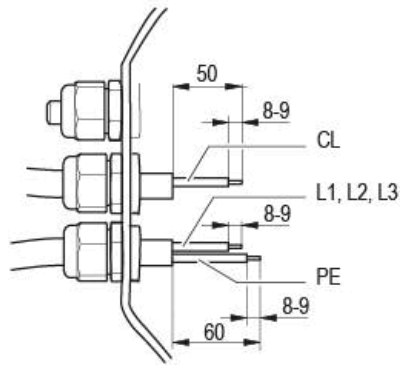


Fig. 1: Recommended stripped lengths in mm (inside terminal box)

Legend: CL = control lines

4.3.2 Connecting wires to terminals



WARNING

Live terminals and connections even with device switched off

Electric shock

→ Wait five minutes after disconnecting the voltage at all poles before opening the device.

- ⇒ Remove the cap from the cable gland.
 - Only remove caps where cables are fed in.
 - ⇒ Equip the cable glands with the seals provided in the terminal box.
 - ⇒ Route the wire(s) (not included in scope of delivery) into the terminal box.
 - ⇒ First connect the "PE" (protective earth).
 - ⇒ Connect the wires to the corresponding terminals.
- Use a screwdriver to do so.
When connecting, ensure that no wire ends fan out.

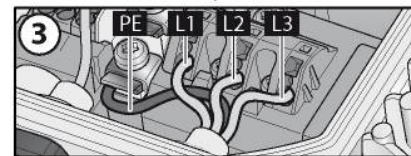
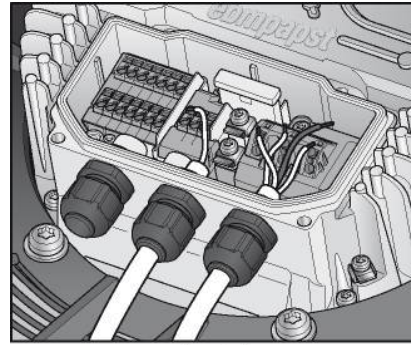


Fig. 2: Connecting wires to terminals

⇒ Seal the terminal box.

4.3.3 Cable routing

Water must be prevented from reaching the cable gland along the cable.



NOTE

Damage caused by moisture penetration.

Moisture can penetrate into the terminal box if water is constantly present at the cable glands.

- To prevent the constant accumulation of water at the cable glands, the cable should be routed in a U-shaped loop wherever possible.
- If this is not possible, a drip edge can be produced by fitting a cable tie directly in front of the cable gland for example.

When routing the cable, make sure that the cable glands are located at the bottom. The cables must always be routed downward.

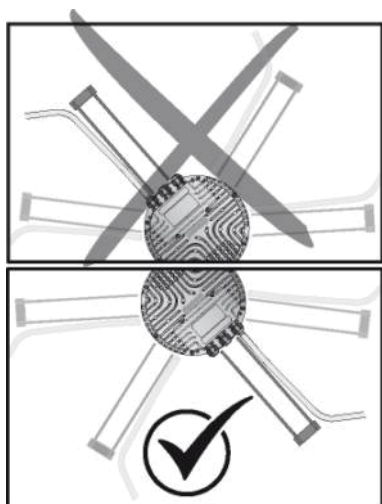


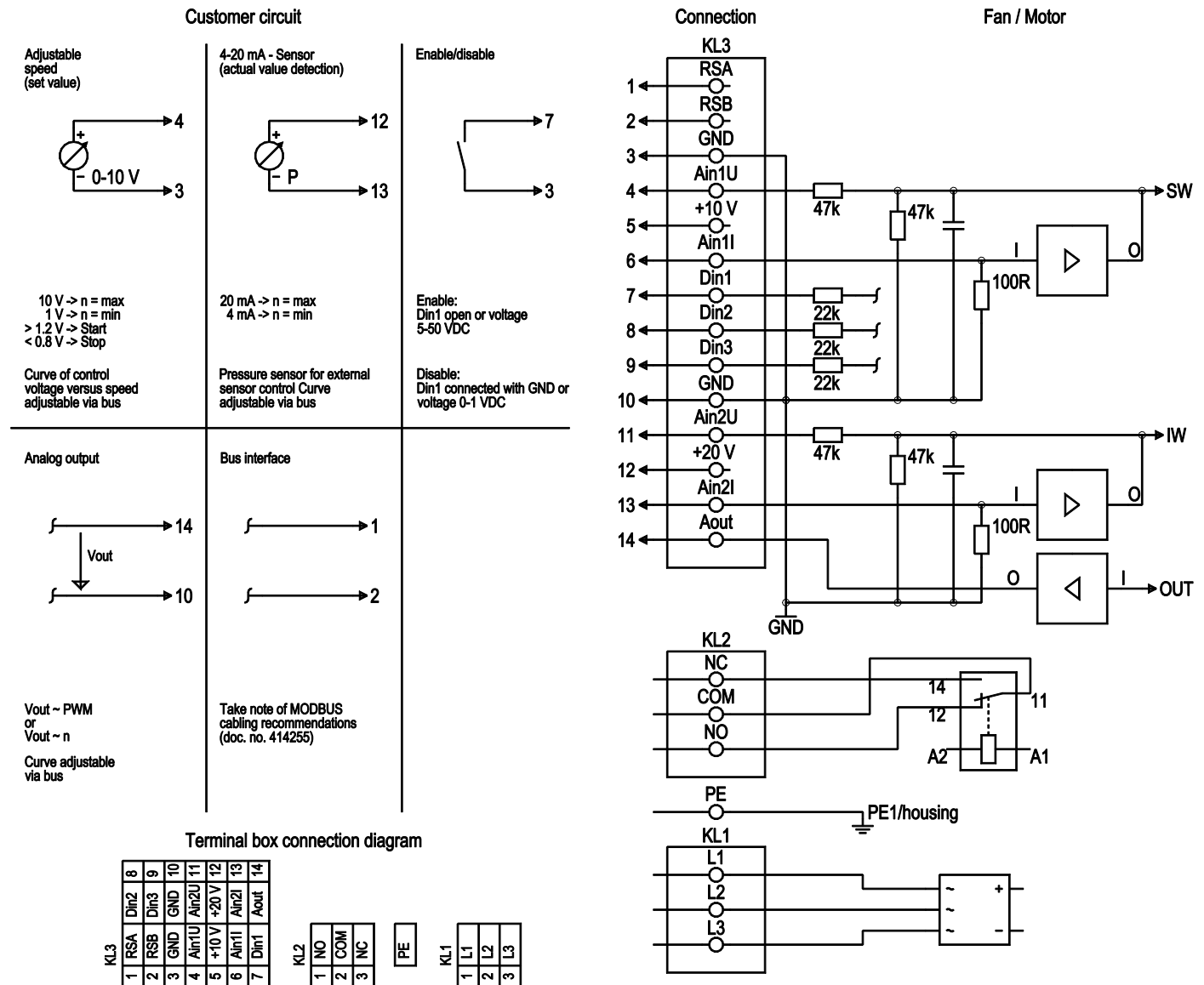
Fig. 3: Cable routing for fans installed upright.

4.4 Factory settings

Factory settings made for the device by ebm-papst.

| | |
|--|--------------------|
| Mode parameter set 1 | PWM control |
| Mode parameter set 2 | PWM control |
| Fan/device address | 01 |
| Max. PWM / % | 100 |
| Min. PWM / % | 5 |
| Save set value to EEPROM | Yes |
| Set value requirement | Analog (linear) |
| Direction of action parameter set 1 | Positive (heating) |
| Direction of action parameter set 2 | Positive (heating) |

4.5 Connection diagram



Drawing preliminary!

| No. | Conn. | Designation | Function/assignment |
|------|--------|-------------|--|
| KL 1 | 1 | L1 | Supply connection, power supply; for nominal voltage range see technical data |
| KL 1 | 2 | L2 | Supply connection, power supply; for nominal voltage range see technical data |
| KL 1 | 3 | L3 | Supply connection, power supply; for nominal voltage range see technical data |
| PE | | PE | Ground connection, PE connection |
| KL 2 | 1 | NO | Status relay, floating status contact, make for failure |
| KL2 | 2 | COM | Status relay, floating status contact, changeover contact, common connection, contact rating 250 VAC / max. 2 A (AC1) / min. 10 mA |
| KL2 | 3 | NC | Status relay, floating status contact, break for failure |
| KL 3 | 1 | RSA | Bus connection RS485, RSA, MODBUS-RTU; SELV |
| KL 3 | 2 | RSB | Bus connection RS485, RSB, MODBUS-RTU; SELV |
| KL 3 | 3 / 10 | GND | Reference ground for control interface; SELV |
| KL 3 | 4 | Ain1 U | Analog input 1, set value: 0-10 V, Ri = 100 kΩ, adjustable curve, only usable as alternative to input Ain1I; SELV |
| KL 3 | 5 | + 10 V | Fixed voltage output 10 VDC, +10 V ±3%, max. 10 mA, short-circuit-proof power supply for external devices (e.g. pot); SELV |

