

TFC-P Roof fan EC

TFC-S Roof fan EC



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1 Introduction

1.1 Product description

The product is a roof fan with an EC motor and a safety switch.

The TFC-S fan is supplied with a potentiometer for speed control.

The fan size 355 to 560 can communicate via MODBUS.

The TFC-P fan is supplied with a pressure control device for variable air volume control (VAV) with outdoor compensation that can communicate via MODBUS. The pressure control device can be changed to constant air volume control (CAV).

The product is not supplied with an external speed control or installation equipment, these parts are available and recommended as accessories.

1.2 Intended use

The product is used for transportation of clean or contaminated air with a maximum temperature of 60 °C in continuous operation.

The product is intended for installation outdoors on commercial and residential buildings, with connection to a duct system.

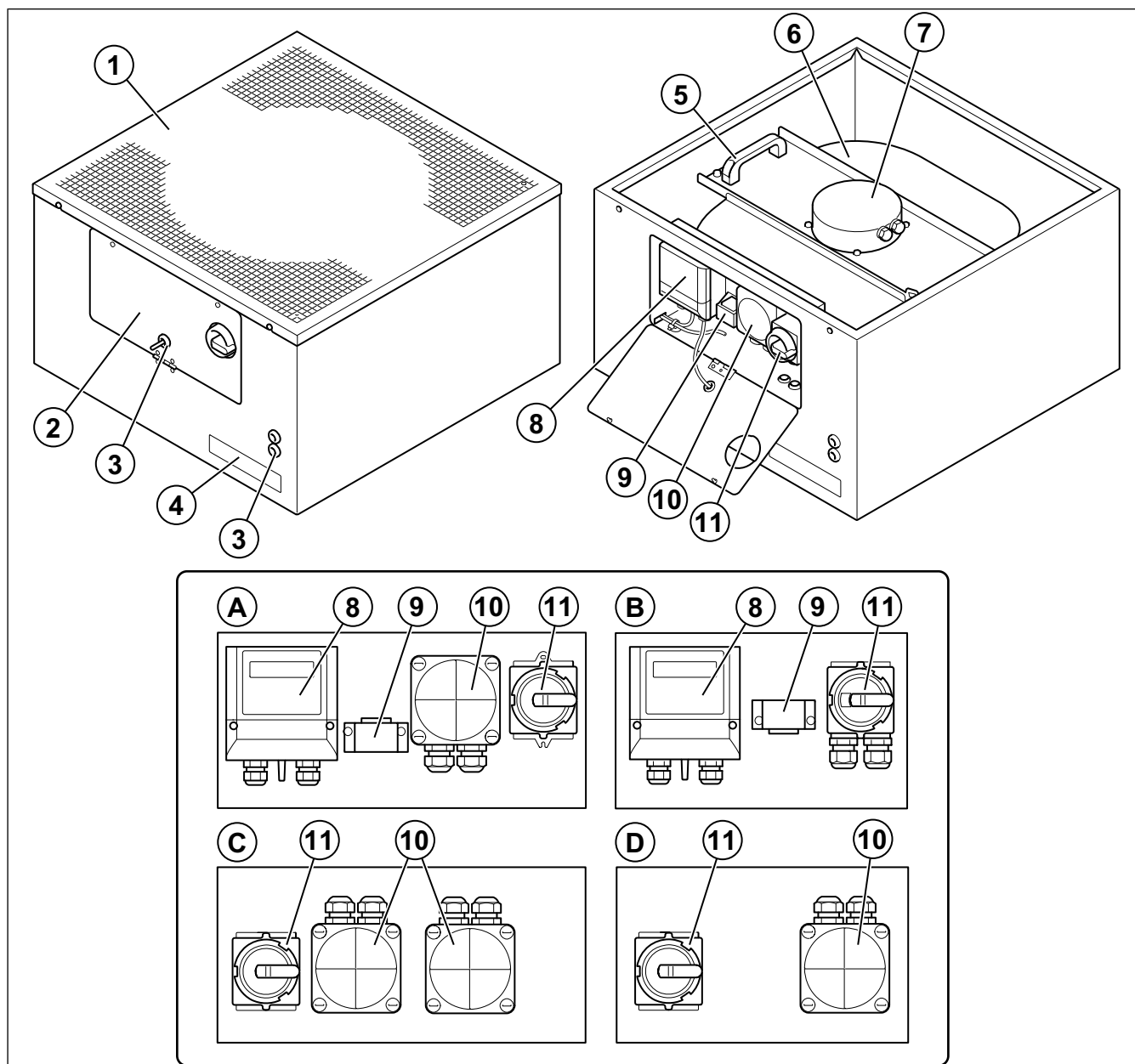
The product is not applicable for transportation of air that contains explosive, flammable or aggressive media. The product is not applicable for locations where there is a risk of explosion.

1.3 Document description

This document contains instructions for installation, operation and maintenance of the product. The procedures must be done by approved personnel only.

Speak to Systemair for more information on how to install the product in different installation locations.

1.4 Product overview



A. TFC-P 355 — 560

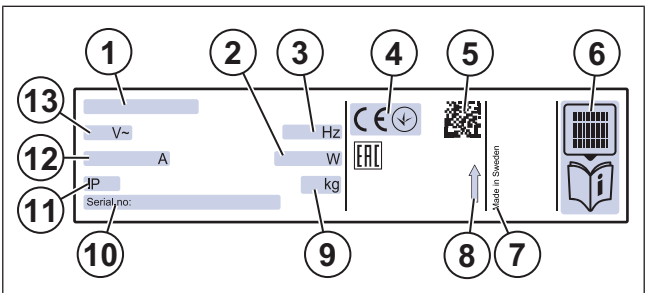
B. TFC-P 225 — 280

C. TFC-S 355 — 560

D. TFC-S 225 — 280

1. Service lid
2. Electric cabinet
3. Cable gland
4. Name plate
5. Swing-out motor bracket
6. Fan impeller
7. Motor
8. Pressure controller PCA-2 1000 D2
9. Transformer
10. Connection box
11. Safety switch

1.5 Name plate



1. Type designation: Product name, dimension and motor type. Refer to [1.5.1 Type designation](#)
2. Input power, W
3. Frequency, Hz
4. Certifications
5. Scannable code ¹
6. Find more information about the product on the Systemair documentation portal¹
7. Country of production
8. Airflow direction arrow
9. Weight, kg
10. Serial number: part number/production number/production date
11. IP class, enclosure class
12. Current, A
13. Voltage, V

Note:

The data on the name plate applies to “standard air” that is specified in the standard ISO5801.

1.5.1 Type designation

Product name	TFC-P		TFC-S	
Dimension	225	500	225	500
	280	560	280	560
	355		355	
	450		450	
Motor type	EC: Electronically commutated, 1-phase, 230 V	EC: Electronically commutated, 3-phase, 400 V	EC: Electronically commutated, 1-phase, 230 V	EC: Electronically commutated, 3-phase, 400 V

1.6 Product liability

Systemair is not liable for damages that the product causes in these conditions:

- The product is incorrectly installed, operated or maintained.
- The product is repaired with parts that are not original spare parts from Systemair.
- The product is used together with accessories that are not original accessories from Systemair.

2 Safety

2.1 Safety definitions

Warnings, cautions and notes are used to point out specially important parts of the manual.



Warning

If you do not obey these instructions, there is a risk of death or injury.

1. Use a mobile device to scan the scannable code and go to the Systemair documentation portal for more documentation and document translations.



Caution

If you do not obey these instructions, there is a risk of damage to the product, other materials or the adjacent area.

- Approved hearing protection
- Approved protective gloves
- Approved protective shoes
- Approved work clothing

Note:

Information that is necessary in a given situation.

2.2 Safety instructions



Warning

Read the warning instructions that follow before you do work on the product.

- Read this manual and make sure that you understand the instructions before you do work on the product.
- Obey local conditions and laws.
- The ventilation contractor and the operator are responsible for correct installation and intended use.
- Keep this manual at the location of the product.
- Do not install or operate the product if it is defective.
- Do not remove or disconnect safety devices.
- Make sure that you can read all warning signs and labels on the product when it is installed. Replace labels that have damage.
- Only permit approved personnel to work on the product and to be in the adjacent area during all work on the product.
- Make sure that you know how to stop the product quickly in an emergency.
- Use applicable safety devices and personal protective equipment during all work on the product.
- Before you do work on the product, stop the product and wait until the fan impeller stops. Make sure that there is no voltage on the motor terminals.
- If the maintenance is not correctly and regularly done, there is risk of injury and damage to the product.
- Only do the maintenance as given in this manual. Speak to Systemair technical support if other servicing is necessary.
- Always use spare parts from Systemair.
- Sound levels exceeding 70 dB(A) may occur depending on model and size. Visit www.systemair.com for more detailed information about your product.
- The product is not to be used by persons, including children, with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
- Do not allow children to play with the device.

2.3 Personal protective equipment

Use personal protective equipment during all work on the product.

- Approved eye protection
- Approved protective helmet

3 Transportation and storage



Warning

Make sure that the product does not become damaged or wet during transportation. A damaged or wet product can cause fire or electric shock.

- Before you move the product to the installation location, examine the packaging for damages.
- Do not move the product by the cables, terminal box, fan impeller, protection grille, inlet cone or silencer.
- If lifting equipment is used, make sure that the lifting equipment can hold the weight of the product. Refer to the name plate for information. Do not lift the product by the packaging.



Warning

Do not walk below a lifted product.

- Keep the correct side of the packaging up during transportation. Refer to the arrows on the packaging.
- Load and unload the product carefully.
- Keep the product in a dry and clean location during storage. Make sure that the ambient temperature during storage is between -10 and $+30$ °C. A stable ambient temperature prevents damage from condensation.
- Keep the product in storage for maximum 1 year.

4 Installation

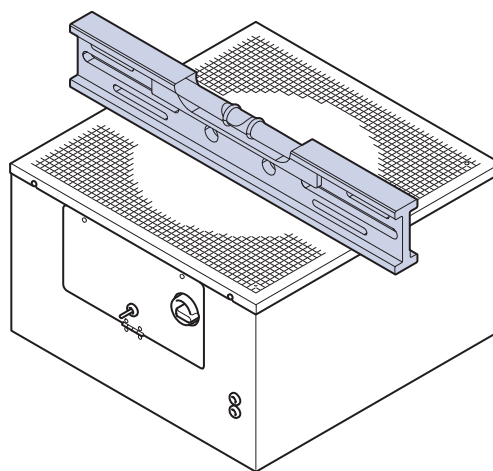
4.1 To do before installation

- Make sure that you have the necessary installation accessories:
 - If you install the product with free suction, it is necessary to install a protection grille. Make sure that the safety distance agrees with the standard ISO 12499.
- Use installation material with fire resistance rating suitable for the installation location.
- Examine the packaging for transportation damage. Make sure to remove the packaging from the product.
- Examine the product and all components for damage.
- Make sure that the motor effect and the fan performance agrees with the expectations at the installation location.
- Make sure that the information on the name plate and the motor name plate agrees with the operation conditions.
- Install the product in a location where there is space for commissioning, troubleshooting and maintenance.
- Make sure that the installation location is clean and dry, for full safety during electrical work.
- Make sure that the installation surface has sufficient capacity to hold the weight of the product.
- Refer to the airflow direction arrows on the name plate or on the product to install the product in the correct position.
- Make sure that all cable glands are tight against the cables to prevent leaks.

4.2 To install the product

Note:

The product must be installed horizontally.



Note:

Systemair recommends to install the product together with a roof curb. The roof curb is available as an accessory.

Note:

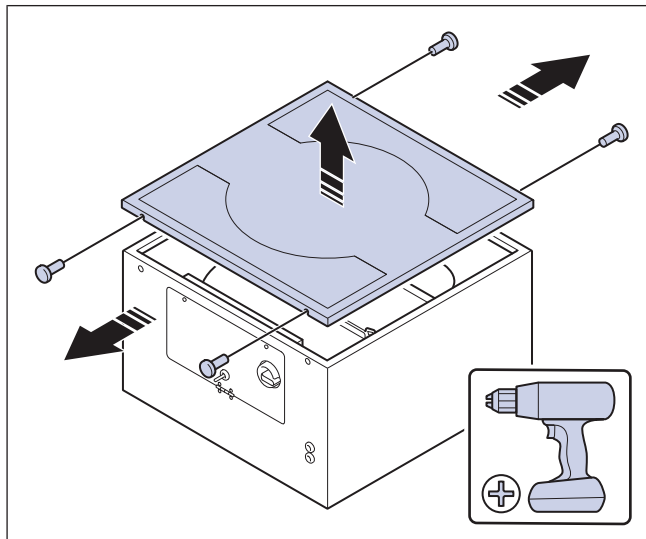
Obey local laws and regulations for installation of the roof curb on the roof.

4.2.1 To install the TFC-P fan and the TFC-S fan

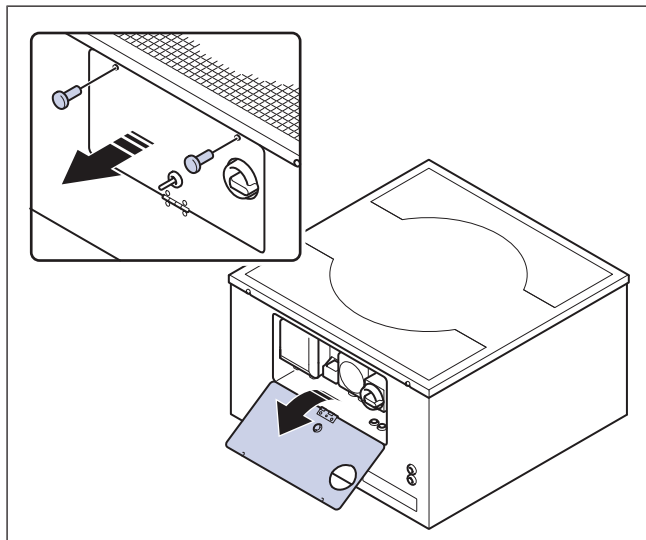
Note:

Make sure the installation location has space for maintenance, and that the roof joints can hold the weight of the product.

- 1 Loosen the screws on the service lid to access the inner area of the casing.



- 2 Loosen the screws on the electrical cabinet lid and open the lid to access the electric control area.



- 3 To access the motor compartment, use the handle and lift the motor bracket until the motor bracket lock engages. The hinge is equipped with a click-in locking mechanism which holds the lid up when fully opened. Release the lock by pulling the lever beside the lock.

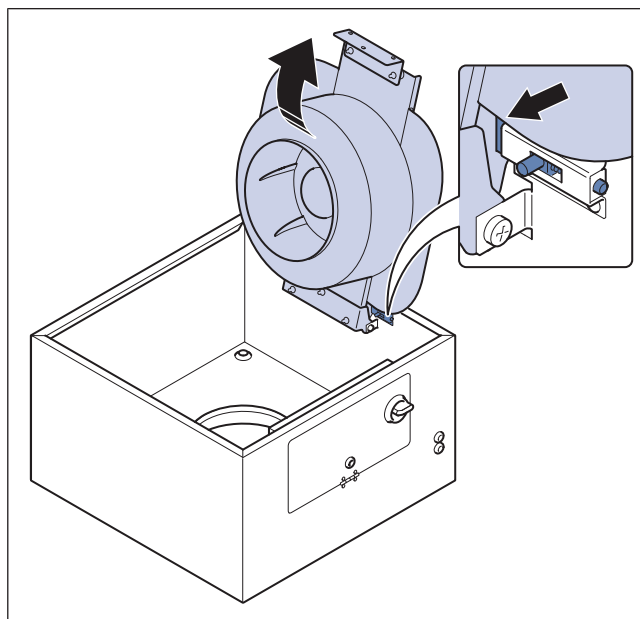


Caution

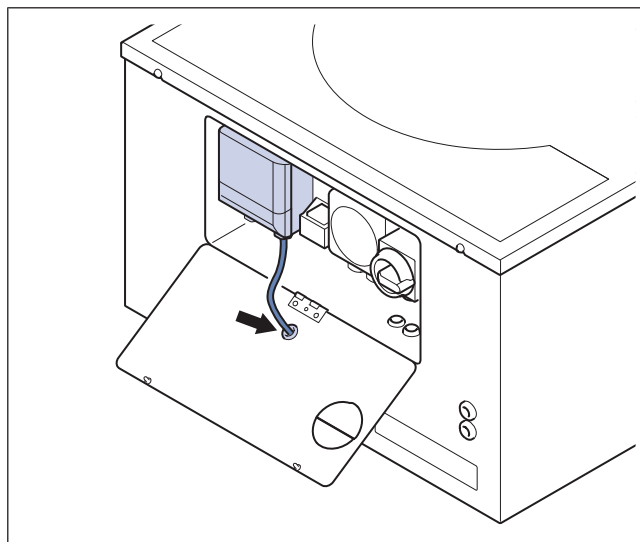
Keep fingers away from the back of the hinge. The back of the hinge is a potential pinch point.

Note:

TFC 225 and TFC 280 have no handle. Hold the motor bracket to lift the motor.



- 4 If a TFC-P is installed and the outdoor temperature compensation running mode is used, pull the sensor cable through the cable gland.



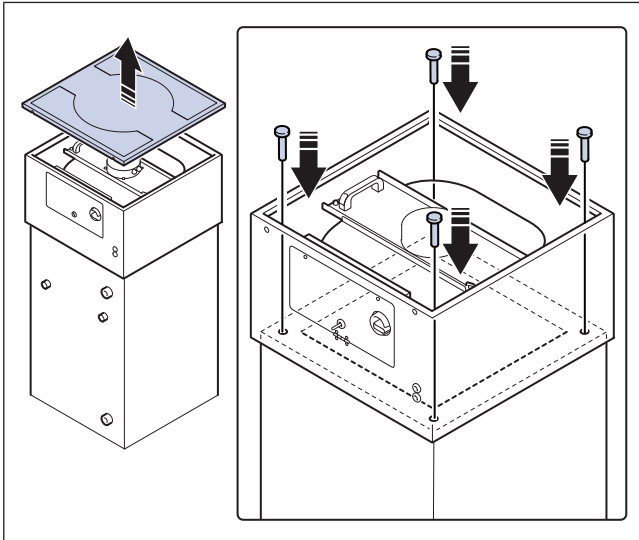
- 5 Install the fan so that unwanted vibrations are not transmitted to duct systems or roof beams.

Note:

Systemair recommends to install the product together with a roof curb. The roof curb is available as an accessory.

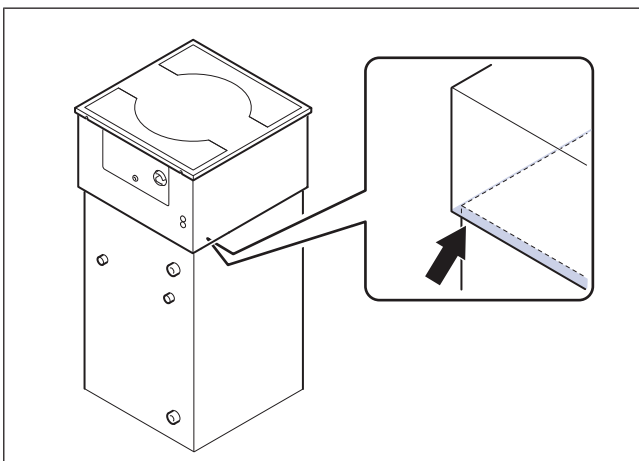
6 If a roof curb is used, obey these steps:

- A. Attach the fan on to the roof curb by screwing it in place using supplied screws to the bottom of the fan casing.



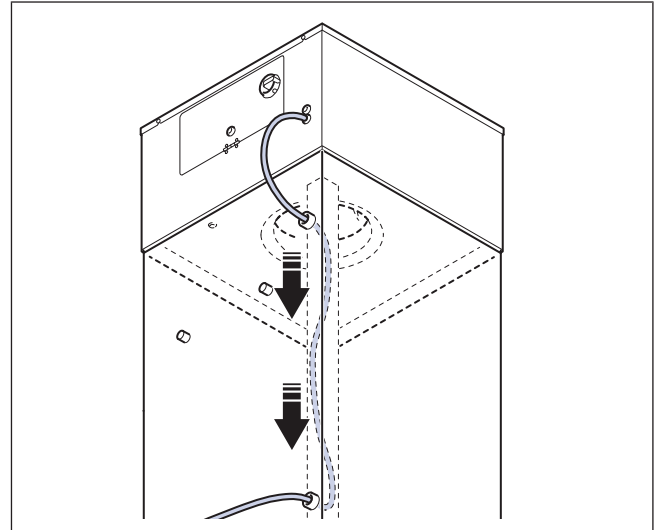
Note:

Do not fill the space at the bottom of the fan casing. The space is for drainage if water enters the fan.



- B. Connect the main electric supply to the main switch of the product, refer to [12.3 Wiring diagrams](#).
- C. Pull the main electric supply cable through the cable gland on the connection box and through the cable gland on the roof curb.

- D. Use the integrated cable hose to lead the main electric supply cable safely to the corner on the inner side of the roof curb.



- E. Install the roof curb on the roof in accordance with applicable building standards and connect the fan to a duct system.

Note:

Obey local laws and regulations for installation of the roof curb on the roof.

- 7 Close the electrical cabinet lid and tighten the screws.
- 8 Close the service lid and tighten the screws.

4.2.2 To operate the pressure controller

Pressure controller navigation buttons

P	P = Programming button and select menu.
▼	Arrow Down = Navigate down, decrease value.
▲	Arrow Up = Navigate up, increase value.
▲+▼	Arrow Down + Arrow Up = Leave menu.

Note:

Full instruction manual for PCA-2 1000 D2 controller is available at www.systemair.com.

4.2.3 To set up the controller for VAV

Note:

The pressure controller is supplied from the factory prepared for VAV.

- 1 Press "Down" to go to "Base set-up".
- 2 Press "P" to enter the menu.
- 3 Press "Down" to go to "Mode" and press "P" to choose 4.01 (the factory setting).

- 4 Press "Down" to go to "Metrics units" and press "P" to choose "1: metric unit" (The factory setting, measures in Pa, m3/h, K-factor).
- 5 Press "Down" to go to "Measuring range" and press "P" to set the measuring range:
 - 1 = 0-1000 Pa
 - 2 = 0-500 Pa
 - 3 = 0-300 Pa
 - 4 = 0-200 Pa
- 6 Press "Up" and "Down" at the same time to leave the "Base set-up" menu.
- 7 Press "Down" to go to "Settings".
- 8 Press "Down" to go to "Set the pressure set point" and set the pressure setpoint:
 - Setpoint 1 — The normal operation pressure setpoint.
 - Setpoint 2 — The pressure setpoint during a secondary operation mode. The factory setting is 50% of the measuring range. Setpoint 2 is active when there is a connection between input 1 and 2.

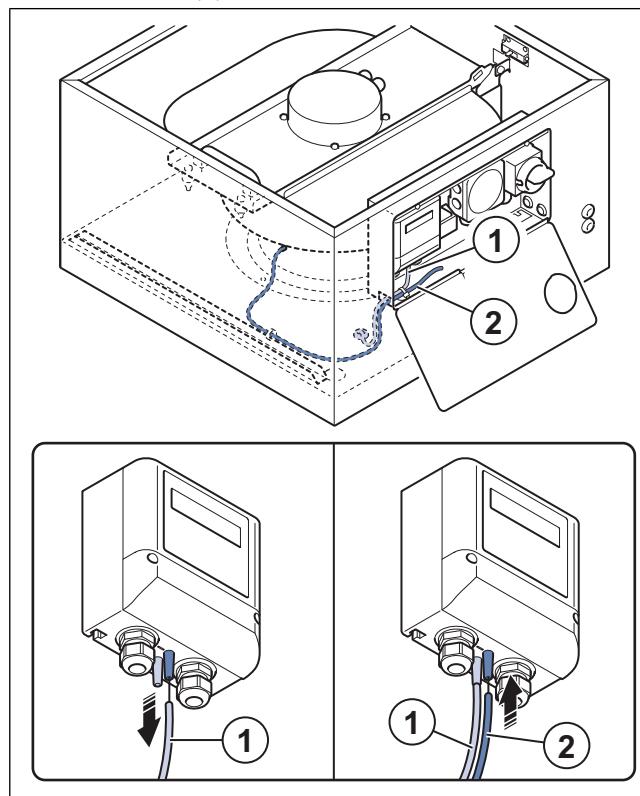
The active setpoint is shown in "Info" with a moon symbol when setpoint 2 is active.

To set up the controller for VAV with outdoor compensation

- 1 Press "Down" to go to "Base set-up".
- 2 Press "P" to enter the menu.
- 3 Press "Down" to go to "Mode" and press "P" to choose 4.02.
- 4 Press "Down" to go to "Metrics units" and press "P" to choose "1: metric unit", (the factory setting, measures in Pa, m3/h, K-factor).
- 5 Press "Down" to go to "Sensor type" and press "P" to choose sensor type:
 - KTY81210 (the factory setting)
 - PT1000
- 6 Press "Down" to go to "Measuring range" and press "P" to select the desired measuring range:
 - 1 = 0-1000 Pa
 - 2 = 0-500 Pa
 - 3 = 0-300 Pa
 - 4 = 0-200 Pa
- 7 Press "Up" and "Down" at the same time to leave the "Base set-up" menu.
- 8 Press "Down" to go to "Settings".
- 9 Press "Down" to go to "Set the pressure set point" and set the pressure setpoint:
 - Setpoint 1 — The normal operation pressure setpoint.
 - Setpoint 2 — The pressure setpoint during a secondary operation mode.
- 10 Press "Down" to go to "T-Band SA" and set the temperature range in which the setpoint changes with the outdoor temperature (The factory setting is: 30.0 K).
- 11 Press "Down" to go to "T-Start SA" and set the temperature for when reduction starts (The factory setting is: 15 °C).
- 12 Press "Down" to go to "Min. setpoint" to set the minimum pressure for a very low outdoor temperature (The factory setting is: 500 Pa).

4.2.4 To change from VAV control to CAV control

- 1 Loosen the screws on the casing and the electrical cabinet and open the lids, refer to [4.2.1 To install the TFC-P fan and the TFC-S fan](#).
- 2 Remove the tube (1) from the minus inlet (-) and put it on the plus inlet (+) on the pressure controller.



- 3 Put the blue tube (2) on the minus inlet (-) on the pressure controller. The other end of the blue tube (2) is installed on the fan impeller cone from the factory.

4.2.5 To set up the controller for CAV

- 1 Press "Down" to go to "Base set-up".
- 2 Press "P" to enter the menu.
- 3 Press "Down" to go to "Mode" and press "P" to choose 5.01 CAV control.
- 4 Press "Down" to go to "Metrics units" and press "P" to choose "1: metric unit" (The factory setting, measures in Pa, m3/h, K-factor).
- 5 Press "Down" to go to "Measuring range" and press "P" to set the measuring range:
 - 1 = 0-1000 Pa
 - 2 = 0-500 Pa
 - 3 = 0-300 Pa
 - 4 = 0-200 Pa
- 6 Press "Down" to go to "K-Factor" and set the K-factor depending on your product size. Refer to the table [Table 1 K-factor](#).
- 7 Press "Up" and "Down" at the same time to leave the "Base set-up" menu.
- 8 Press "Down" to go to "Settings".

- 9 Press “Down” to go to “Set the pressure set point” and set the pressure setpoint:
 - Setpoint 1 — The normal operation pressure setpoint.
 - Setpoint 2 — The pressure setpoint during a secondary operation mode. The factory setting is 50 % of the measuring range. Setpoint 2 is active when there is a connection between input 1 and 2.

The active setpoint is shown in “Info” with a moon symbol when setpoint 2 is active.

4.2.6

To use MODBUS communication

To set up MODBUS communication, refer to the MODBUS communication tag list available at www.systemair.com.

Table 1 K-factor

Model	K-factor
TFC 225	57
TFC 280	79
TFC 355	134
TFC 450	212
TFC 500	289
TFC 560	554

To set up the controller for CAV with outdoor compensation

- 1 Press “Down” to go to “Base set-up”.
- 2 Press “P” to enter the menu.
- 3 Press “Down” to go to “Mode” and press “P” to choose 5.02 CAV control.
- 4 Press “Down” to go to “Metrics units” and press “P” to choose “1: metric unit” (The factory setting, measures in Pa, m3/h, K-factor).
- 5 Press “Down” to go to “Measuring range” and press “P” to select the desired measuring range:
 - 1 = 0-1000 Pa
 - 2 = 0-500 Pa
 - 3 = 0-300 Pa
 - 4 = 0-200 Pa
- 6 Press “Down” to go to “K-Factor” and set the K-factor depending on your product size. Refer to the table [Table 1 K-factor](#).
- 7 Press “Up” and “Down” at the same time to leave the “Base set-up” menu.
- 8 Press “Down” to go to “Settings”.
- 9 Press “Down” to go to “Set the pressure set point” and set the pressure setpoint:
 - Setpoint 1 — The normal operation pressure setpoint.
 - Setpoint 2 — The pressure setpoint during a secondary operation mode.
- 10 Press “Down” to go to “T-Band SA” and set the temperature range in which the setpoint changes with the outdoor temperature (The factory setting is: 30.0 K).
- 11 Press “Down” to go to “T-start SA” and set the temperature for when reduction starts (The factory setting is: 15 °C).
- 12 Press “Down” to go to “Min. setpoint” to set the minimum pressure for a very low outdoor temperature (The factory setting is: 500 Pa).

5 Electrical connection

5.1 To do before the electrical connection

- Make sure that the electrical connection agrees with the product specification on the motor name plate.
- Make sure that the environment for electrical connection is clean and dry.
- Make sure that the wiring diagram that is included with the supply of the product agrees with the terminals in the connection box.

5.2 To connect the product to the power supply

- Complete the electrical connection for the motor. Refer to the motor wiring diagram that is included with the product.
- Make sure that the cross section of the protective earthing is equal to or larger than the cross section of the phase conductor.
- Install a circuit breaker in the permanent electrical installation, with a contact opening of a minimum 3 mm at each pole.
- If a residual current device (RCD) is installed, make sure that it is an all-current sensitive RCD. Consider if the product has a frequency converter, uninterruptible power supply (UPS), or an EC motor. EC motors have a leakage current to earth that is ≤ 3.5 mA.

5.3 Speed controller for EC motors

- EC motors are controlled through a stepless 0–10 V signal.
- Do not use power supply for the speed controller.
- Refer to [12.3 Wiring diagrams](#) and the instruction manual for the external speed controller.

5.4 Motor protection for EC motors

EC motors have an integrated motor protection. Reset the motor protection by disconnecting the fan from power supply for 60 seconds.

6 Commissioning



Caution

- If strong vibrations occur during commissioning, immediately increase or decrease the fan speed until the vibrations are decreased. Continuous strong vibrations can cause damage to components.
- Do not increase the fan speed to a higher rpm value than the maximum value that is given on the name plate.

The commissioning report is found at www.systemair.com.

6.1 To do before the commissioning

- Make sure that the installation and electrical connection are correctly done.
- Visually examine the product and accessories for damage.
- Make sure that the safety devices are correctly installed.
- Make sure that there are no blockages in the air inlet and the air outlet.
- Make sure that installation material and unwanted objects are removed from the product and the ducts.

6.2 To do the commissioning

- 1 Set the installed safety switch in the OFF position.
- 2 If it is possible to get access to the fan impeller, do the steps that follows:
 - a. If it is necessary, remove parts of the installation.
 - b. Turn the fan impeller by hand and make sure that it turn easily.
 - c. Record the result in the commissioning report.
- 3 Make sure to turn the product in a direction that agrees with the related arrow on the product.
 - a. Record the result in the commissioning report.
- 4 If you removed parts of the installation to get access to the fan impeller, install the removed parts again.
- 5 Set the installed safety switch in the ON position.
- 6 Start the product.
- 7 Set the minimum operation speed.
- 8 Increase the operation speed gradually to the maximum operation speed.
 - a. Examine the vibrations in the casing and the bearing areas at all speed levels.
 - b. Make sure that the vibrations agree with the specifications in ISO 14694.
 - c. Make sure that none of the speed levels cause unwanted noise in the product.
 - d. Record the result in the commissioning report.
- 9 Record the necessary data in the commissioning report.

7 Operation



Caution

EC motors must be set to ON/OFF via the control input. To stop the product via mains supply decreases the life time of the motor. Systemair recommends to install external speed controller for easy access to control the input signal.

7.1 To start a product with an EC motor

- 1 Make sure that the 0–10 V signal is set to “0” with the speed controller.
- 2 Set the installed safety switch in the ON position and wait 5 seconds.
- 3 Adjust the fan speed with the 0–10 V signal speed controller. If an external speed controller is not installed, adjust the fan speed directly with the integrated potentiometer.

7.2 To stop the product

- 1 Set the installed speed controller in the OFF position. Refer to the instruction manual for the installed speed controller.
- 2 Set the installed safety switch in the OFF position.

7.2.1 To stop the product in an emergency

- Set the installed safety switch in the OFF position.

8 Maintenance



Warning

Set the installed safety switch in the OFF position before you do the maintenance unless the instructions tell you differently. Make sure that the safety switch is not accidentally set in the ON position.

8.1 Maintenance schedule

The intervals are calculated from continuous operation of the product.

Maintenance task	Usual operation conditions		Unusual operation conditions. ¹		
	Each 6 months	Each year	Each 3 months	Each 6 months	Each year
Visually examine the product and its components for damage, corrosion and dirt.		X		X	
Examine the fan impeller for damage and imbalance.		X		X	
Clean the product and the ventilation system.	X		X		
Do a check of all fasteners and make sure that they are fully tightened.		X			X
Make sure that the product and its components are correctly operated.	X			X	
Measure the power consumption and compare the result with the information on the name plate.		X		X	
If vibration dampers are installed, make sure that they operate correctly and examine them for damage and corrosion.		X			X
Make sure that the electrical protective equipment and the mechanical protective equipment operates correctly.		X			X
Make sure that you can read the name plates of the product.		X		X	
Examine all cable connections for damage. Make sure that the cable glands are tight against the cables.		X			X
If flexible connections are installed, examine them for damage.	X			X	

1. The unusual operation conditions are classified as follows: If a stable ambient temperature is higher than 30 °C or lower than -10° C, if the temperature changes are large or if very contaminated air is transported.

8.2 To clean the product



Caution

- Do not clean the product with a high-pressure washer.
- Do not clean the product with steel brushes or sharp objects.
- Do not bend the fan impeller blades.
- Be careful not to move the balance weights on the fan impeller.

- Remove dirt from the fan and the duct.
- If access to the fan impeller is possible, clean the fan impeller with a moist cloth or soft brush.

8.3 Spare parts

- When you send an order for spare parts, include the serial number of the product. The serial number is found on the name plate.
- For more information about spare parts, contact technical support.
- Always use spare parts from Systemair.
- To find spare parts, refer to the scannable code on the name plate.

9 Troubleshooting

Note:

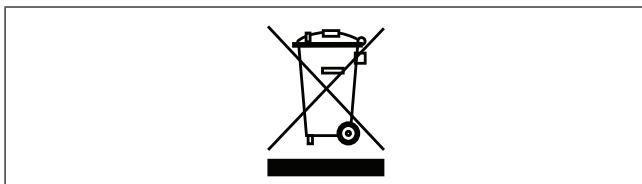
If you cannot find a solution to your problem in this section, speak to Systemair technical support.

Problem	Cause	Solution
The product does not operate smoothly.	The fan impeller is not correctly balanced.	Speak to Systemair technical support.
	There is dirt on the fan impeller.	Clean the fan impeller carefully. Refer to 8.2 To clean the product .
	The fan impeller has damages or deformations because the transported air contains aggressive media.	Speak to Systemair technical support.
	The fan impeller does not turn in the correct direction.	Make sure that the electrical connection is correctly done.
	The fan impeller has deformations because of too high temperatures.	<ul style="list-style-type: none"> Replace the fan impeller. Make sure that the temperature of the transported air is not higher than the value on the name plate.
	There are unusually strong vibrations in the product or the duct system.	Make sure that the product is correctly installed. Do a check of the duct system.
	The product is operated in a resonant frequency range.	Increase or decrease the fan speed until the product operates smoothly. Refer to 6 Commissioning .
The air output is not sufficient.	The fan impeller does not turn in the correct direction.	Make sure that the electrical connection is correctly done.
	The electrical connection is not correctly done.	Make sure that the electrical connection agrees with the wiring diagrams.
	The air pressure is too low because of incorrect installation.	Do the necessary changes in the duct system and installed components to increase the air pressure. Refer to 6 Commissioning .
	The spring return damper on outdoor or exhaust duct is closed or not fully open.	Adjust the spring return damper.
	There is blockage in the air inlet or the duct system.	Remove the blockage.
	The product is not applicable for the installation location.	Make sure that the product is applicable for the installation location.
	The motor power is decreased because of too high temperature in the motor.	<ul style="list-style-type: none"> Do a check of the ambient temperature. Make sure that the space around the motor is sufficient to keep the temperature down.
There is unusual noise when the product starts or operates.	There is strain in the connections of the duct system.	Loosen the connections, align the parts of the duct system correctly and tighten the connections.

Problem	Cause	Solution
Thermal contacts, PTC or resistors are released.	The fan impeller does not turn in the correct direction.	Make sure that the electrical connection is correctly done.
	The motor is overheated.	<ul style="list-style-type: none"> Do a check of the motor cooling impeller. If it is possible, measure the resistance to do a check of the motor winding.
	There is blockage in the motor.	Speak to Systemair technical support.
The fan speed does not get the nominal value.	Defective motor winding.	If it is possible, measure the resistance to do a check of the motor winding.
	The speed control is not correctly set.	Set the speed control correctly.
	The fan impeller cannot turn freely because of mechanical blockage.	Remove the blockage.
	Phase loss occurs.	If the motor is a 3-phase motor, make sure that no phase is missing.
The motor does not rotate.	A component in the power supply is defective.	Do a check of the power supply. Replace defective components and connect the power supply again.
	The electrical connection is not correctly done.	Make sure that the electrical connection agrees with the wiring diagrams.
	The motor protection is released because the motor is overheated.	Let the motor become cool. Reset the motor protection. Find the cause of the overheated motor.
	A phase loss occurred.	If the motor is a 3-phase motor, make sure that no phase is missing.
The electronic components or the motor is overheated.	The motor is overloaded or the ambient temperature is too high.	Let the motor become cool. Reset the motor protection. Find the cause of the overheated motor.
	The motor is overloaded.	Make sure that the product is applicable for the installation location.
	The ambient temperature is too high.	Make sure that the product is applicable for the installation location.
	The cooling of the product is not sufficient.	Make sure that the space around the motor is sufficient to keep the temperature down.

10 Disposal

The product follows the WEEE directive. This symbol on the product or the packaging of the product shows that this product is not domestic waste. The product must be recycled at an approved disposal location for electrical and electronic equipment.



10.1 To disassemble and discard the parts of the product

- 1 Disconnect and disassemble the product in the opposite sequence of electrical connection and installation.
- 2 Recycle the product parts and the packaging at an applicable disposal location.
- 3 Obey the local and national requirements for disposal.

11 Warranty

For warranty claims, send a written maintenance plan and the commissioning report to Systemair. The warranty is only applicable for these conditions:

- The product is correctly installed and operated.
- The instructions in the data sheets are obeyed.
- Maintenance instructions are obeyed.
- The product is operated for a minimum of 1 hour each month.

12 Technical data

12.1 Technical data overview

Maximum temperature of transported air, °C	60
Sound pressure, dB	Refer to the data sheet in the online catalogue at www.systemair.com .
Corrosion class	
IP class	
Voltage, current, frequency, enclosure class, weight	Refer to the name plate. Refer to 1.5 Name plate for more information.
Motor data	Refer to the motor name plate or the technical documentation from the motor manufacturer.

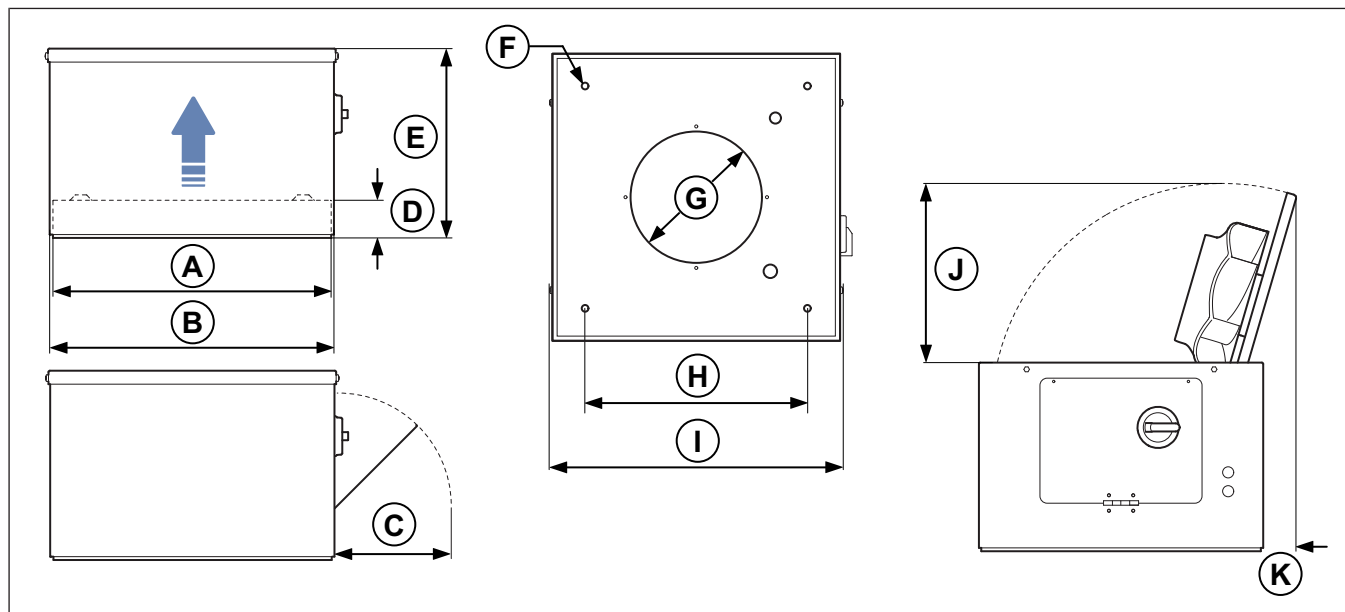
12.2 Product dimensions

Note:

If the unit of measure is not specified, the dimensions are given in millimetres.

Note:

The arrow in the dimension drawing shows the direction of the airflow.

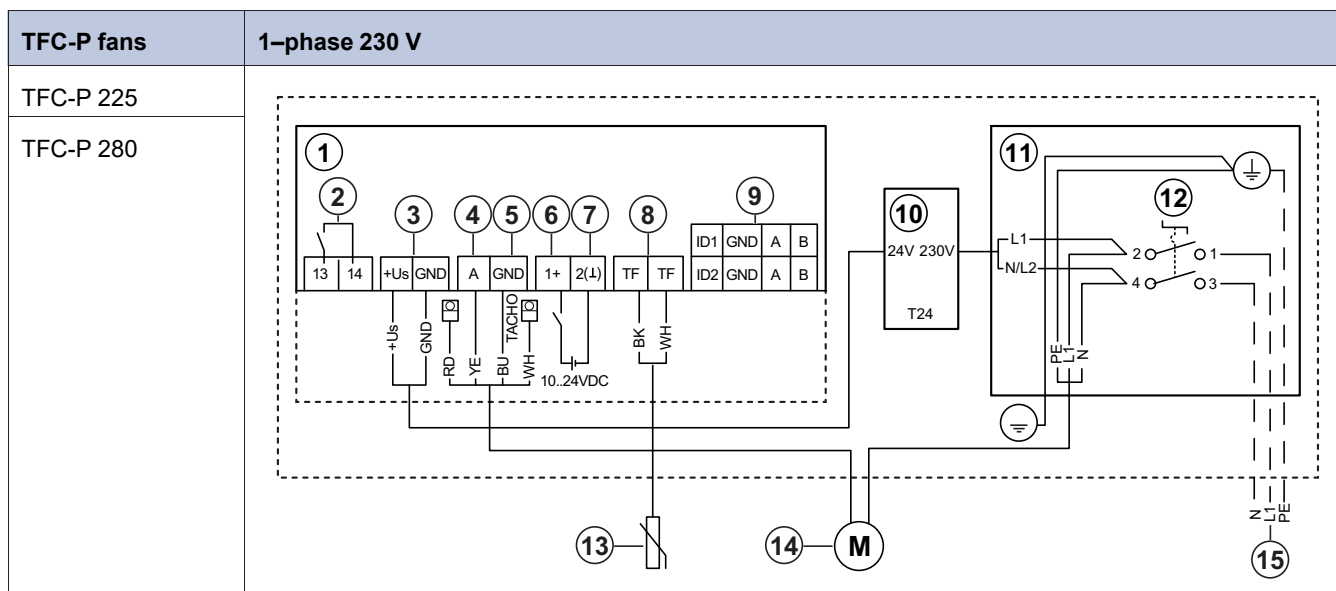


	A	B	C	D	E	F	ØG	H	I	J	K
TFC 225	413	422	185	55	281	M8	195	330	435	266	49
TFC 280	514	523	185	55	333	M10	245	450	535	368	86
TFC 355	618	627	185	55	376	M10	300	535	637	491	150
TFC 450	924	934	185	55	531	M10	375	840	946	650	76
TFC 500	924	934	185	55	531	M10	400	840	946	695	200
TFC 560	924	934	185	55	531	M10	470	840	946	744	279

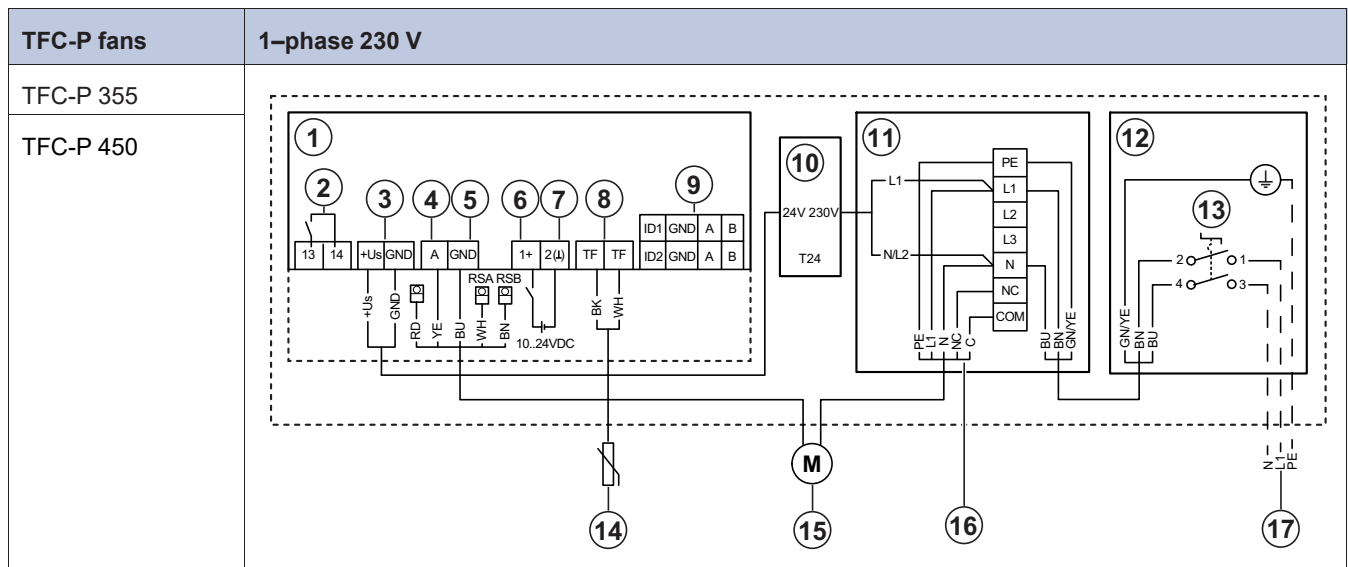
12.3 Wiring diagrams

Abbreviation in wiring diagram	Cable colour
RD	Red
YE	Yellow
BU	Blue
WH	White
GN	Green
BN	Brown
BK	Black
GR	Grey
GY	Green/Yellow

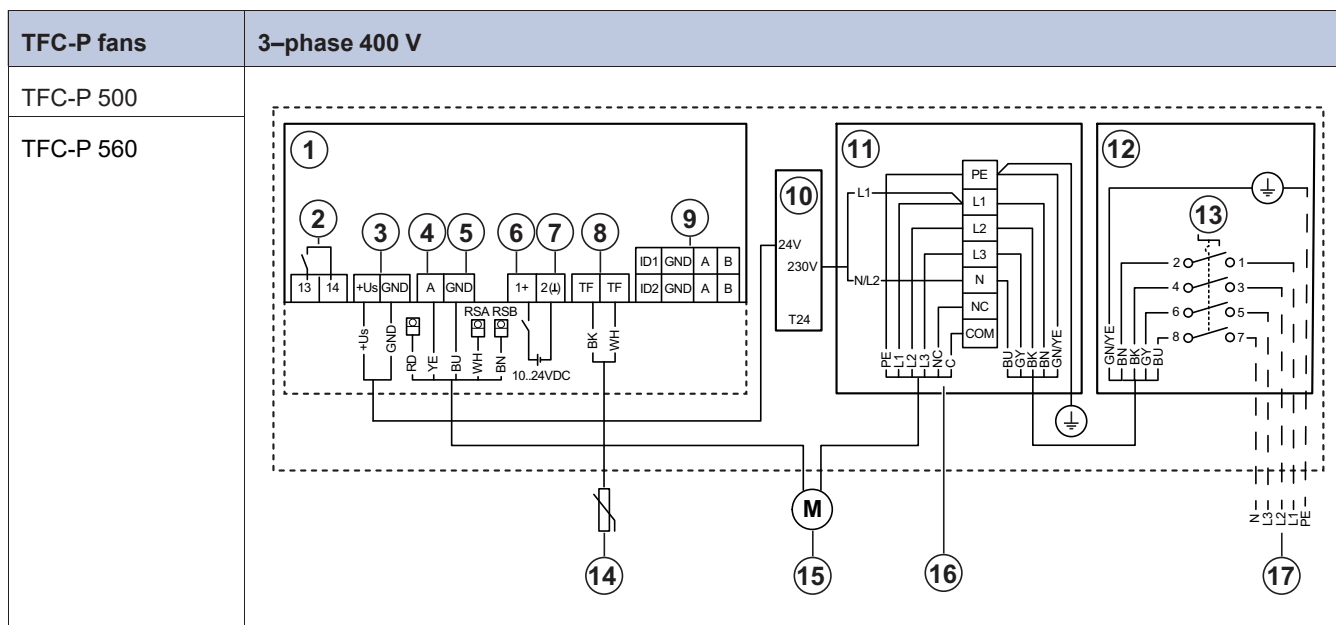
12.3.1 Wiring diagrams for TFC-P fans



1. Safety switch
2. Aux. contact/Sign relay
3. 24 V DC
4. 0-10 V out
5. 0-10 V out
6. Digital input
7. Digital input
8. Temperature
9. Modbus slave
10. Transformer
11. Pressure controller PCA-2 1000 D2
12. ON/OFF
13. PTC/PT 1000
14. Motor
15. 230 V 1~



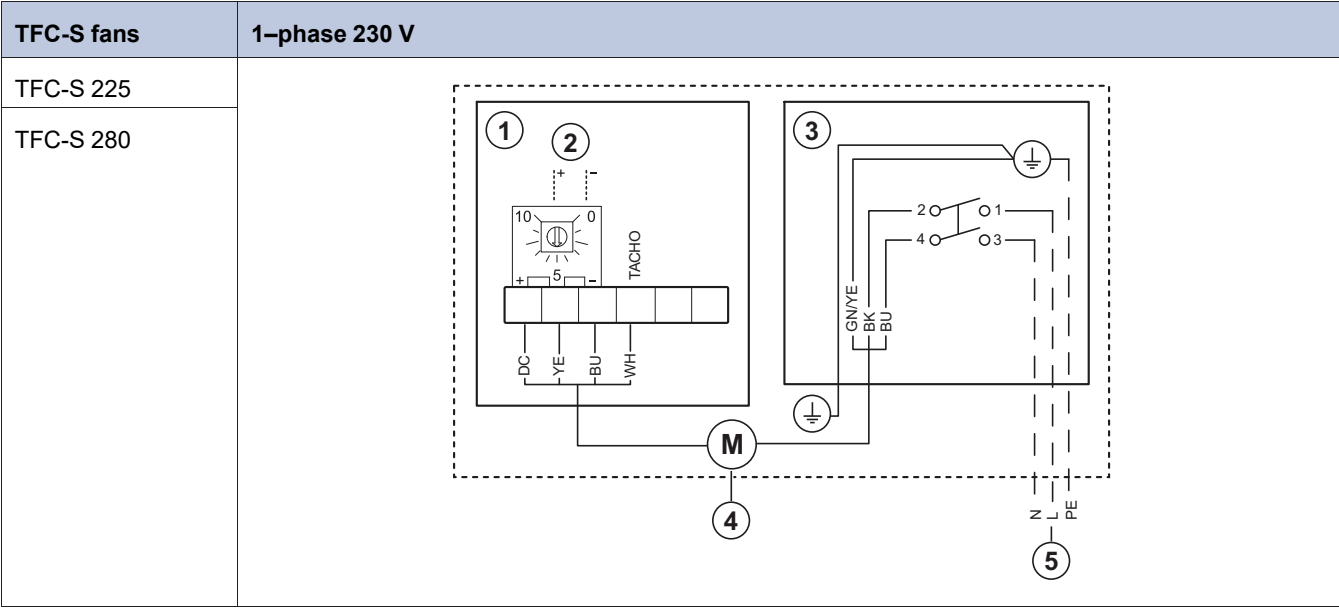
1. Safety switch
2. Aux. contact/Signal relay
3. 24 V DC
4. 0–10 V out
5. 0–10 V out
6. Digital input
7. Digital input
8. Temperature
9. Modbus slave
10. Transformer
11. Connection box
12. Pressure controller PCA-2 1000 D2
13. ON/OFF
14. PTC/PT 1000
15. Motor
16. Alarm output
17. 230 V 1~



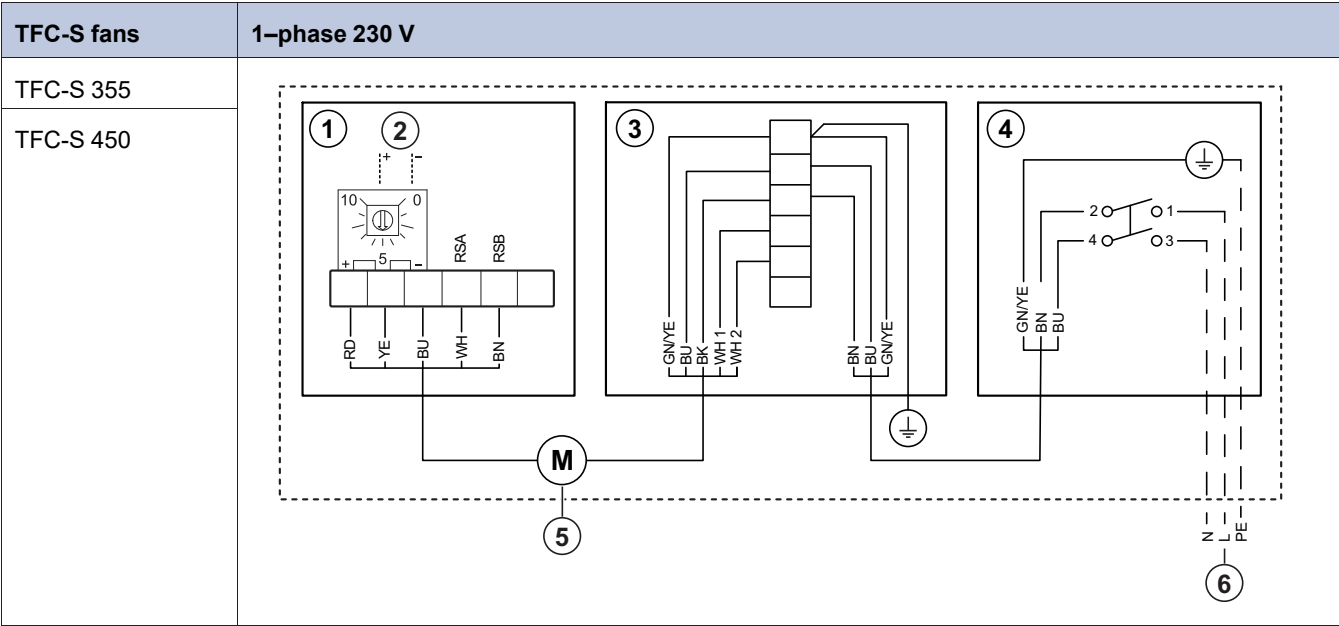
1. Safety switch
2. Aux. contact/Signal relay
3. 24 V DC
4. 0–10 V out
5. 0–10 V out
6. Digital input
7. Digital input
8. Temperature
9. Modbus slave
10. Transformer
11. Connection box
12. Pressure controller PCA-2 1000 D2
13. ON/OFF
14. PTC/PT 1000
15. Motor
16. Alarm output
17. 400 V 3~

12.3.2 **Wiring diagrams for TFC-S fans**

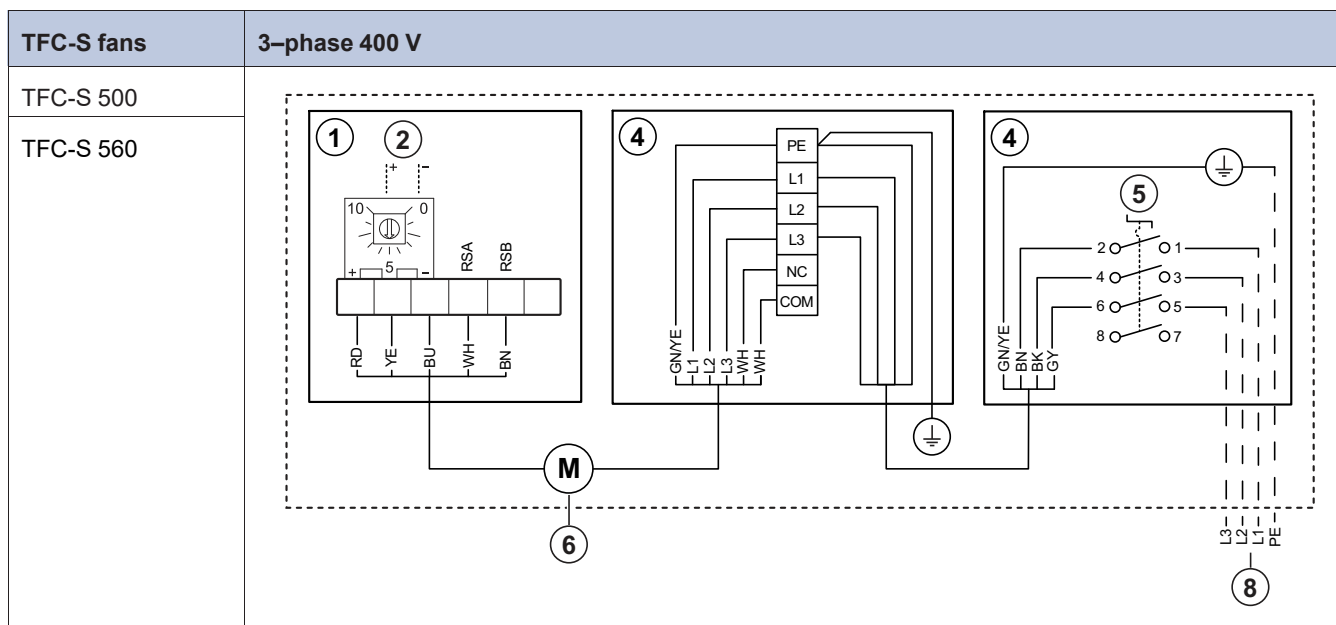
Note:
An internal potentiometer is installed on the terminal block from the factory. Remove the internal potentiometer when you use an external speed controller for the EC fan.



- 1. Connection box
- 2. 0–10 V DC External
- 3. Safety switch
- 4. Motor
- 5. 230 V 1~



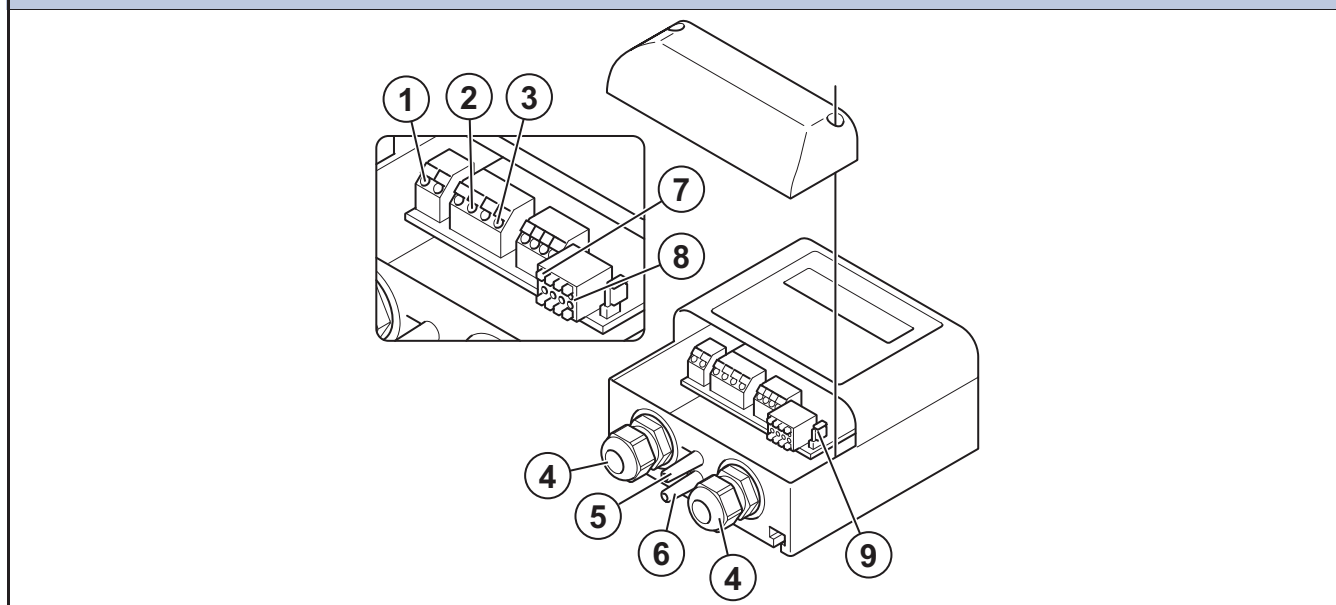
- 1. Connection box
- 2. 0–10 V DC External
- 3. Alarm
- 4. Safety switch
- 5. Motor
- 6. 230 V 1~



1. Connection box
2. 0–10 V DC External
3. Alarm
4. Safety switch
5. ON/OFF
6. Motor
7. 400 V 3~

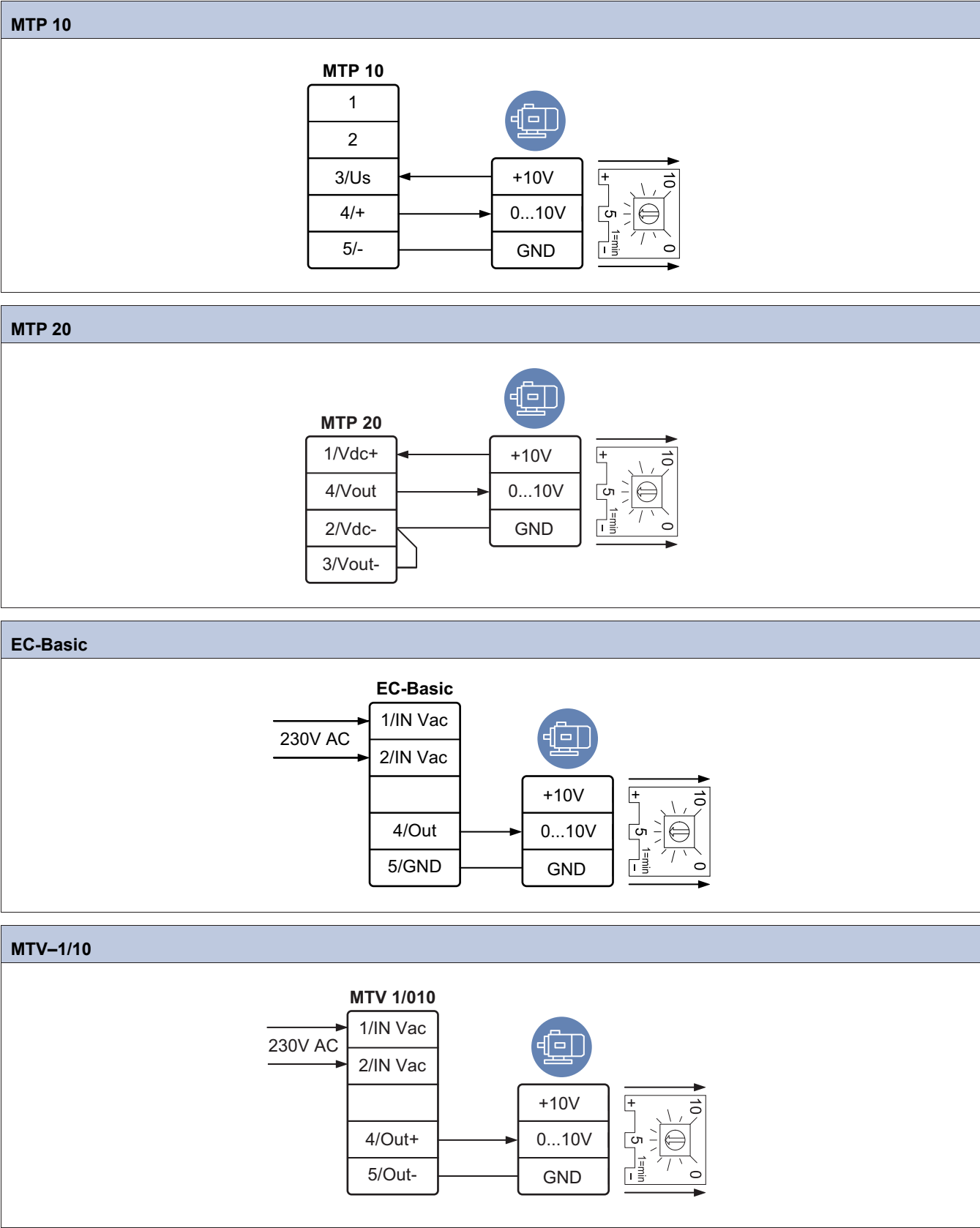
12.3.3 Pressure controller connection overview

Pressure controller PCA-2 1000

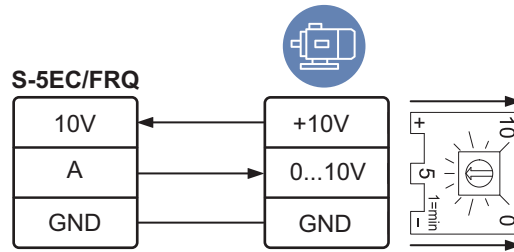


1. Signal relay (terminals: 13, 14)
2. Supply voltage (terminals: U_S, GND)
3. Output signal 0...10 V (terminals: A, GND)
4. Cable gland M16
5. “Minus” — connection in areas with lower pressure
6. “Plus” + connection in areas with higher pressure
7. Digital input D1 (terminals: 1, 2)
8. Input outdoor temperature sensor (terminals: TF, TF)
9. MODBUS interface (terminals: GND, A, B, ID1, ID2 and jumper J1)

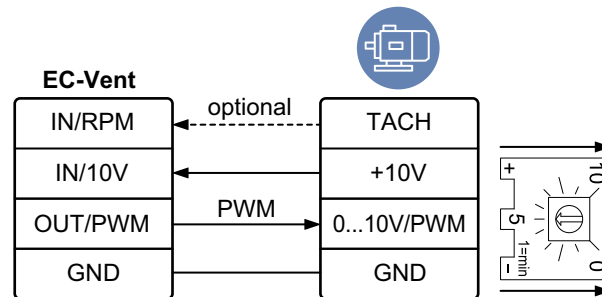
12.3.4 **Wiring diagrams for speed controllers for EC motors**



S-5EC/FRQ

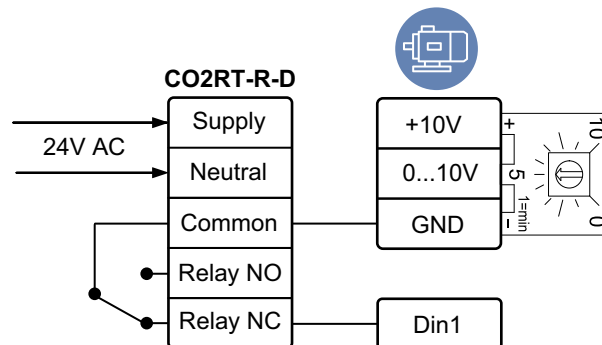


EC-Vent

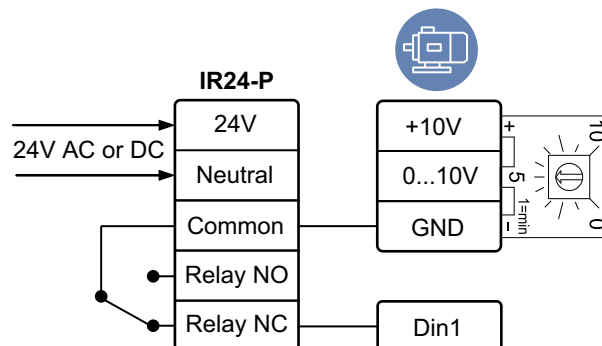


12.3.5 Wiring diagrams for ON/OFF controls for EC motors

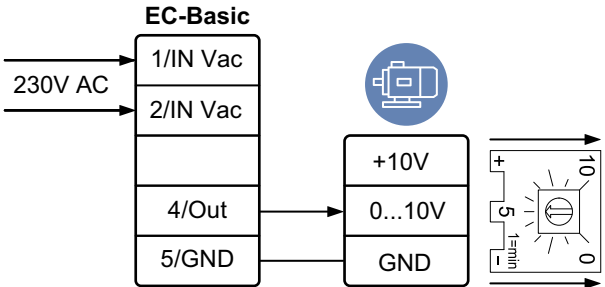
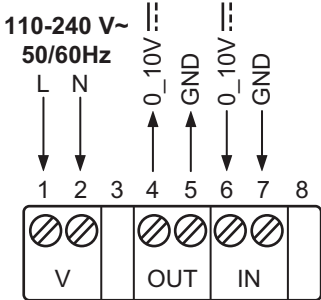
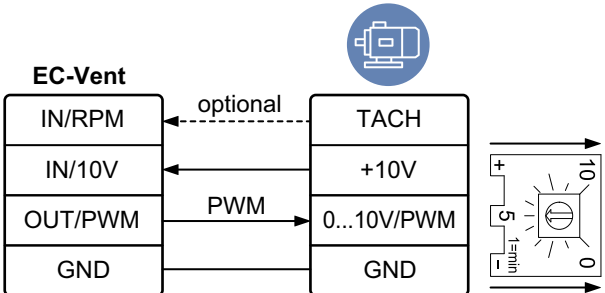
CO2RT-R(-D)

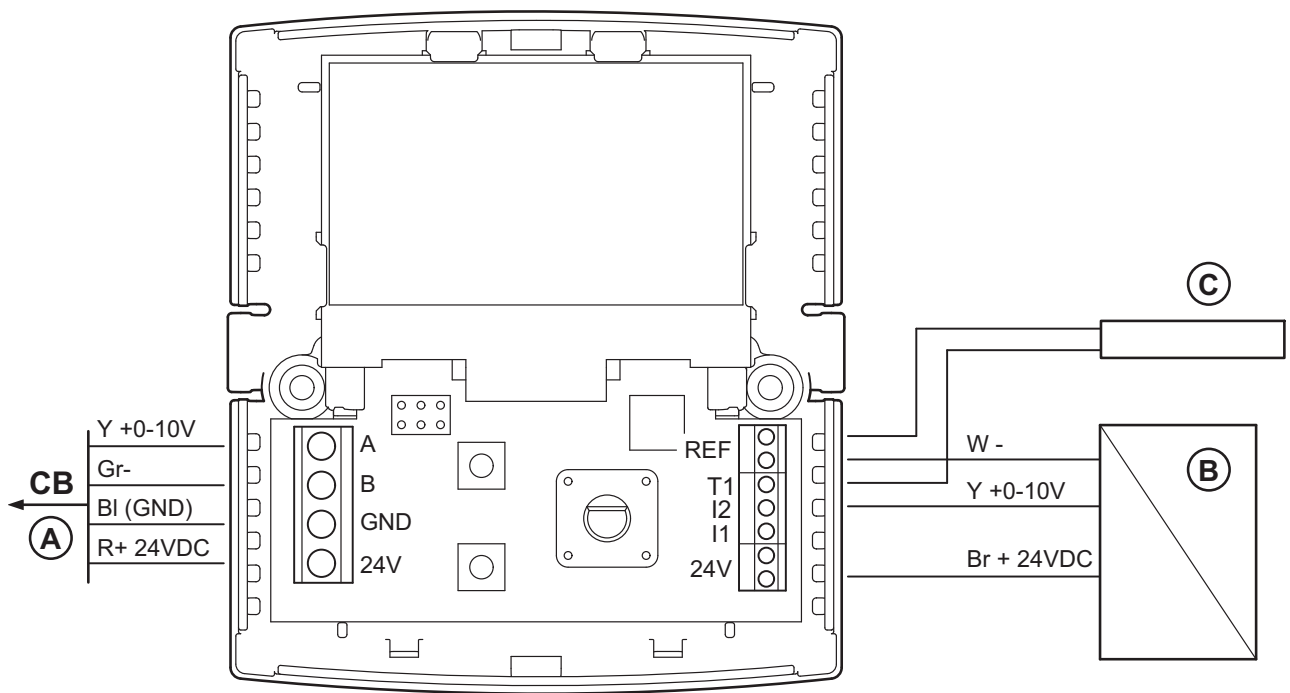


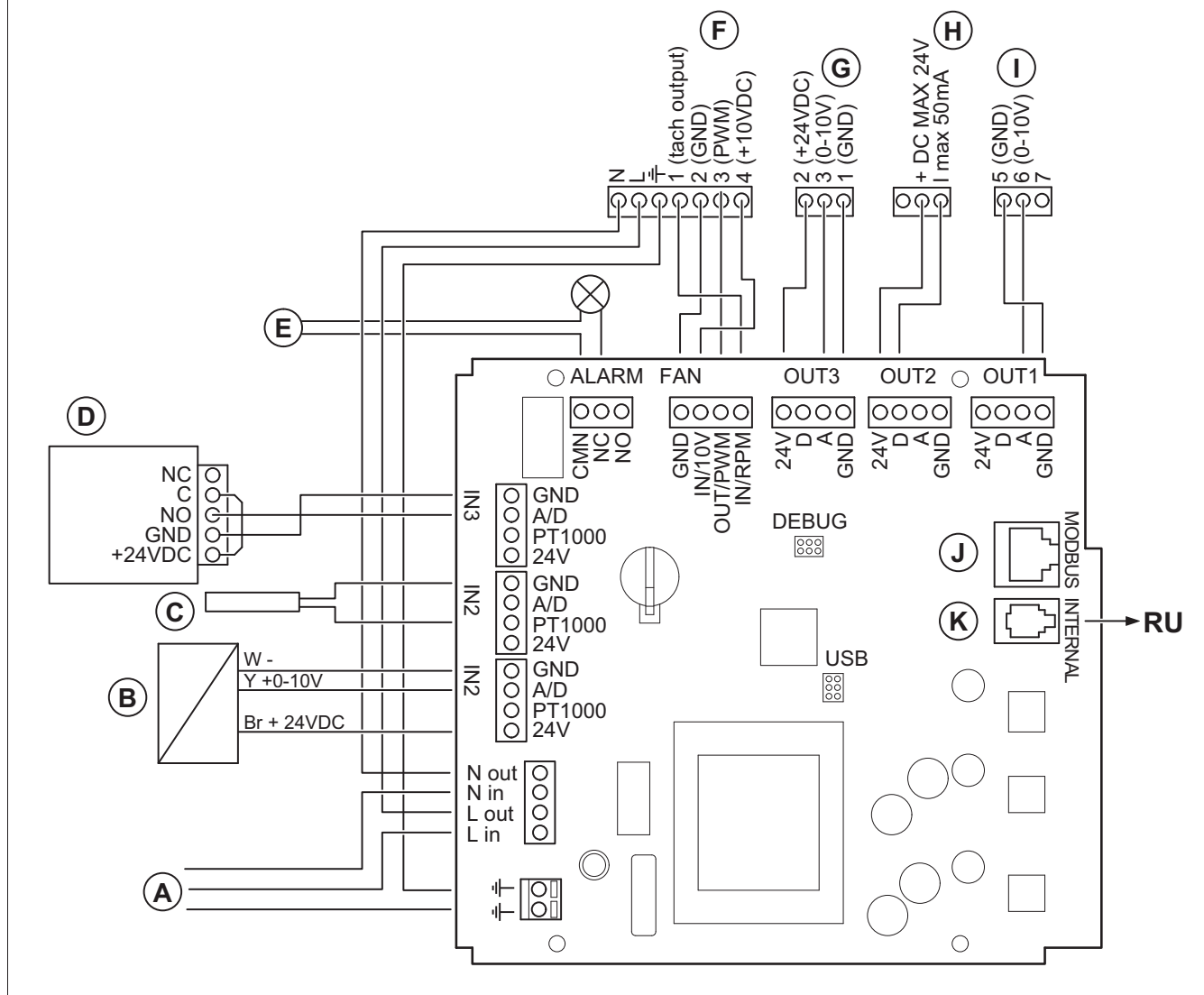
IR24-P



12.3.6 **Wiring diagrams for demand control for EC motors**

EC Basic	
EC Basic-T for temperature control	
EC Basic-CO2/T for temperature and CO2 control	
EC Basic-H for humidity control	
EC Basic-U	
EC Basic-U for universal 0-10 V control	
EC-Vent	
Demand control for up to 5 external sensors, 2 fans, dampers, heaters and coolers. The EC vent system has 2 units. The control board (CB) and the room unit (RU). Connect the fan to the control board and remove the internal potentiometer.	





- A. Mains supply, 230 V 1~AC (10 A)
- B. Analogue sensor (for example, pressure sensor)
- C. Analogue sensor (for example, pressure sensor type PT1000)
- D. Digital sensor (for example, IR presence detector)
- E. Alarm output (maximum 24 V AC/DC, maximum 500 mA Cosφ >0.95)
- F. Output to EC fan
- G. Output to analogue actuator with 24 V DC supply
- H. Output to digital signal (DC, maximum 24 V, 1 maximum 50 mA)
- I. Output to analogue actuator (for example, heat regulator)
- J. Connection to Modbus
- K. Connection to room unit (RU)

MM6-24/D output signal selector

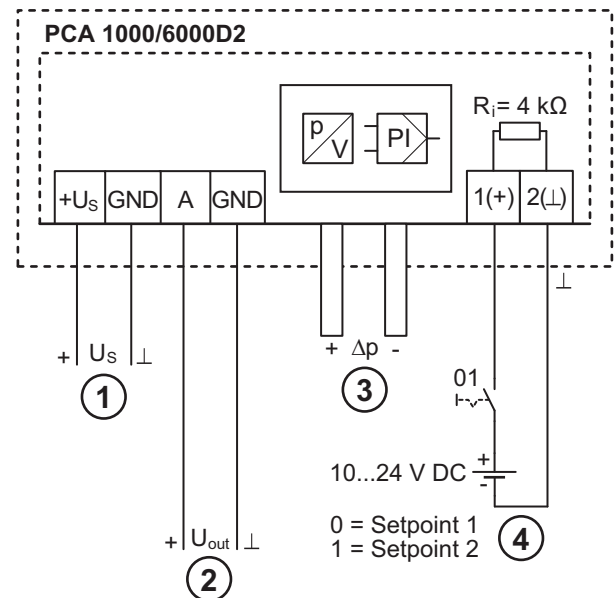
Compares signals from connected inputs and transfers the signal to the control output.

1	Input 1	0...10 V
2	Input 2	0...10 V
3	Input 3	0...10 V
4	Input 4	0...10 V
5	Input 5	0...10 V
6	Input 6	0...10 V

7	System neutral	Mains supply
8	24 V AC	
9	Signal neutral	
10	Signal neutral	
11	Output minimum	0...10V
12	Output maximum	0...10V

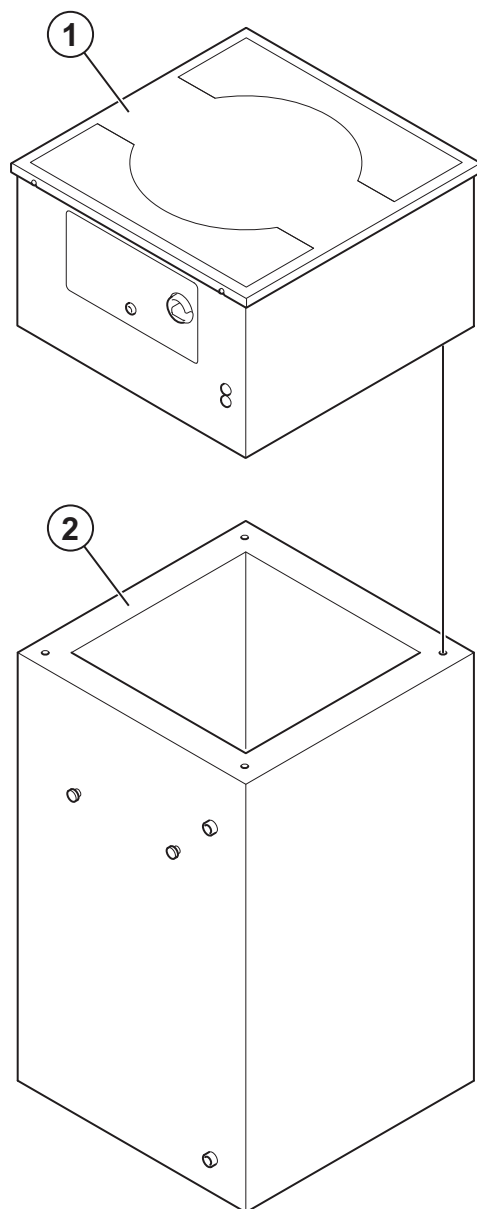
PCA 1000D2 Pressure controller

For constant air volume control (CAV) or variable air volume control (VAV).



1. Mains supply 10...24 V DC
2. Output 0...10 V
3. Pressure connections
4. Voltage input for switch on Setpoint 1/Setpoint 2

13 Accessory overview



1. TFC-P/TFC-S fan
2. Roof curb TG

Note:

The selection of accessories shown are not supplied with the product. For more information and other available accessories, refer to www.systemair.com or speak to Systemair technical support.

14 EU Declaration of Conformity

We, the manufacturer

Manufacturer	Systemair Production AB
Address	Industrivägen 3 739 30 Skinnskatteberg Sweden

declare under our sole responsibility that the products

Machine	Roof fan
Type/Model	TFC-P, TFC-S

fulfils the relevant provisions of following directives and standards

Machinery Directive 2006/42/EC

EN ISO 12100:2010

Safety of machinery – General principles for design - Risk assessment and risk reduction

EN ISO 13857:2019

Safety of machinery – Safety distances to prevent hazard zones being reached by upper or lower limbs

EN 60204-1:2018

Safety of machinery – Electrical equipment of machines – Part 1: General requirements

EN 60335-1:2012

Household and similar electrical appliances – Safety Part 1: General requirements.

EN 60 335-2-80:2003

Household and similar electrical appliances – Safety – Part 2-80: Particular requirements for fans.

EN 50106:2008

Safety of household and similar appliances – Particular rules for routine tests referring to appliances under the scope of EN 60 335-1.

EN 60529:2014

Degrees of protection provided by enclosures (IP Code).

Directive electromagnetic compatibility (EMC) 2014/30/EU

EN 62233:2008

Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure

EN 61000-6-2:2005

Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments.

EN 61000-6-3:2007

Electromagnetic compatibility (EMC) – part 6-3: Generic standards – emission standard for residential, commercial and light-industrial environments.

RoHS Directive 2011/65/EU and amendment (EU) 2015/863

EN IEC 63000:2018

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Ecodesign Directive 2009/125/EC

327/2011 Requirements for fans above 125W

1253/2014 Requirements for ventilation units above 30W

1254/2014 Requirements for energy labelling of residential ventilation units

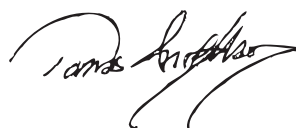
EN ISO 5801:2017

Fans – Performance testing using standardized airways.

EN 13142:2021

Ventilation for buildings – Components/Products for residential ventilation – required and optional performance characteristics.

Persons authorized to compile the technical file:



Tomas Angelhag

Head Of Engineering

This declaration relates exclusively to the machinery in the state in which it was placed on the market and excludes components which are added or operations carried out subsequently by the final user.

Skinnskatteberg, Sweden 2025-05-05



Sofia Rask

Managing Director

15 UK Declaration of Conformity

We, the manufacturer

Manufacturer	Systemair Production AB
Address	Industrivägen 3 SE-73930 Skinskatteberg Sweden

declare under our sole responsibility that the products

Machine	Roof fan
Type/Model	TFC-P, TFC-S

fulfils the relevant provisions of following directives and standards

Supply of Machinery (Safety) Regulations 2008

EN ISO 12100:2010

Safety of machinery – General principles for design - Risk assessment and risk reduction

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EN 60204-1:2018

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EN 60335-1:2012

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EN 60 335-2-80:2003

Household and similar electrical appliances – Safety – Part 2-80: Particular requirements for fans.

EN 50106:2008

Safety of household and similar appliances – Particular rules for routine tests referring to appliances under the scope of EN 60 335-1.

EN 60529:2014

Degrees of protection provided by enclosures (IP Code).

Electromagnetic Compatibility Regulations 2016

EN 62233:2008

Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure

EN 61000-6-2:2005

Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments.

EN 61000-6-3:2007

Electromagnetic compatibility (EMC) – part 6-3: Generic standards – emission standard for residential, commercial and light-industrial environments.

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

EN IEC 63000:2018

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

The Ecodesign for Energy-Related Products and Energy Information (Amendment) (EU Exit) Regulations 2019

327/2011 Requirements for fans above 125W

1253/2014 Requirements for ventilation units above 30W

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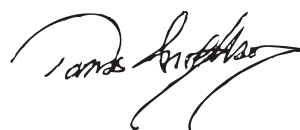
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Sofia Rask

Managing Director



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