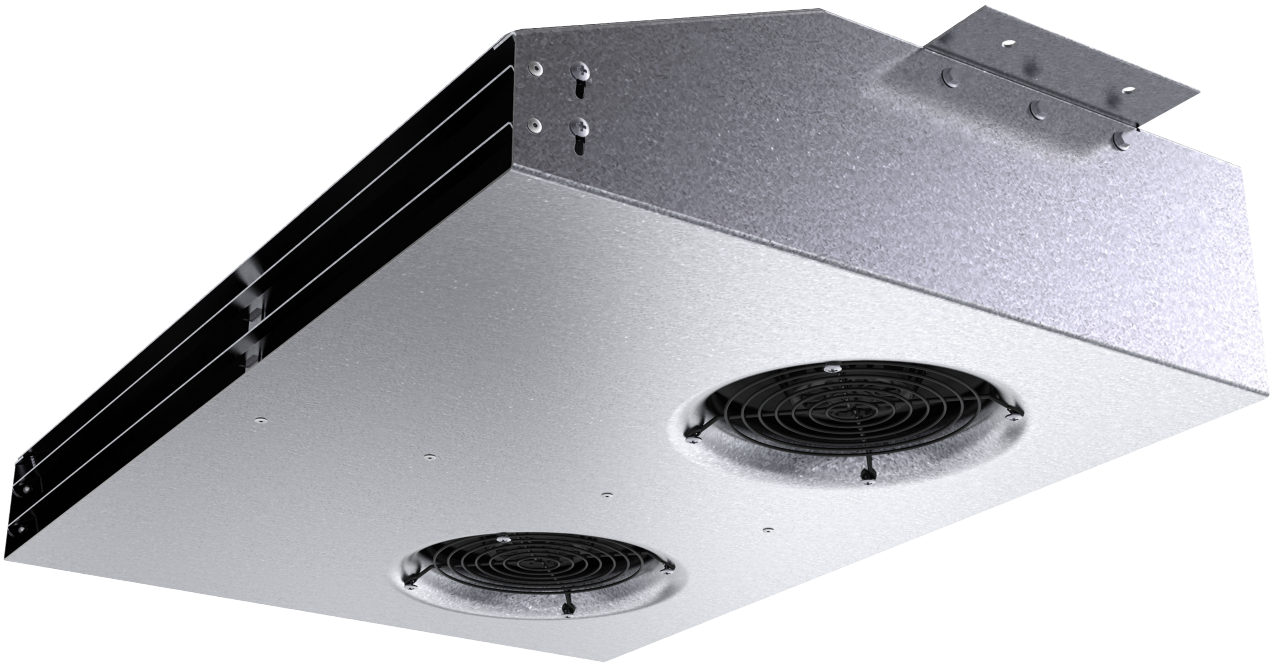
systemair

Installation, Operation and Maintenance instruction EN

IV Smart Centrifugal induction fan AC
IV Smart Centrifugal induction fan EC
IV Smart Centrifugal induction fan EC CO



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1 Introduction

1.1 Product description

The product is a centrifugal jet fan with a galvanized steel casing. The product has integrated ceiling mounting brackets.

The IV Smart AC fan is supplied with 2 AC motors. The IV Smart EC fan is supplied with 2 EC motors and an integrated speed potentiometer.

The IV Smart CO fan is supplied with 2 EC motors and a carbon monoxide control unit.

1.2 Intended use

The IV Smart fans are applicable for installation indoors in underground or aboveground garages. The product is intended for transportation of clean air with a maximum temperature of 55 °C.

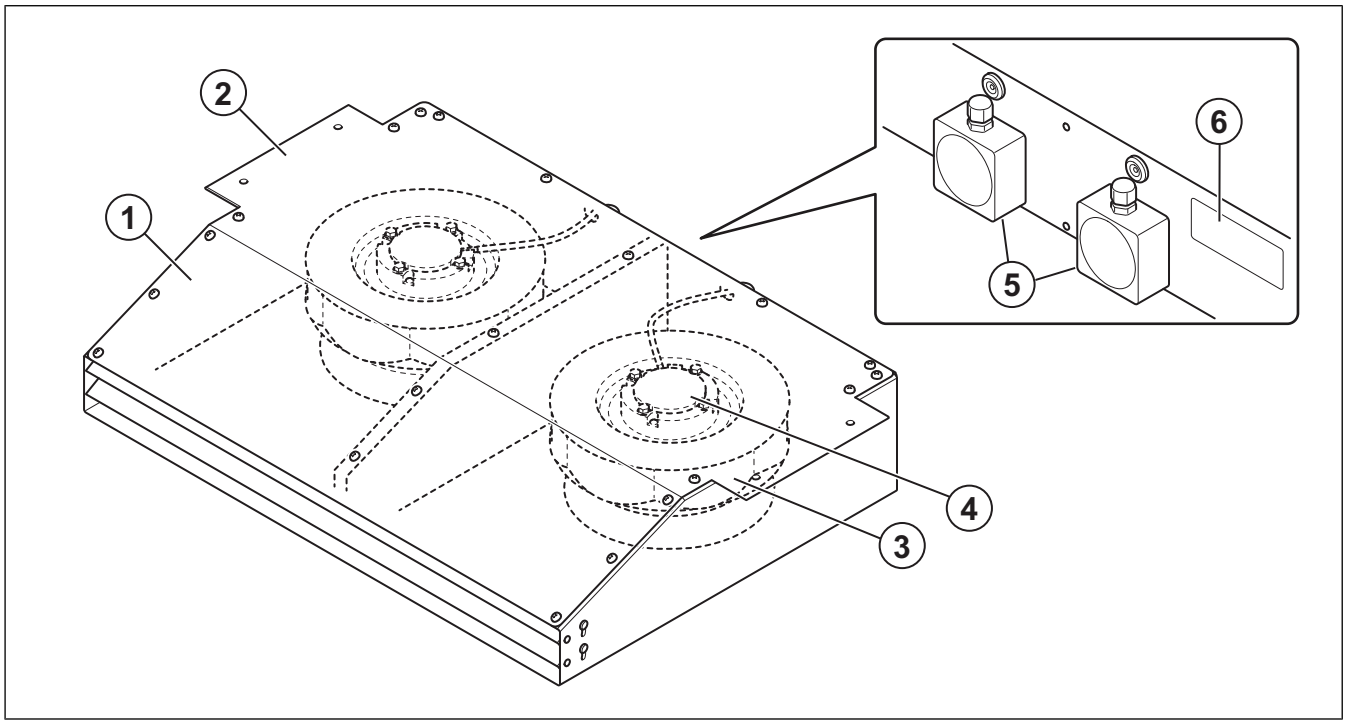
The product is not applicable for transportation of air that contains explosive, flammable or aggressive media. The product is not applicable for locations where there is a risk of explosion.

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.

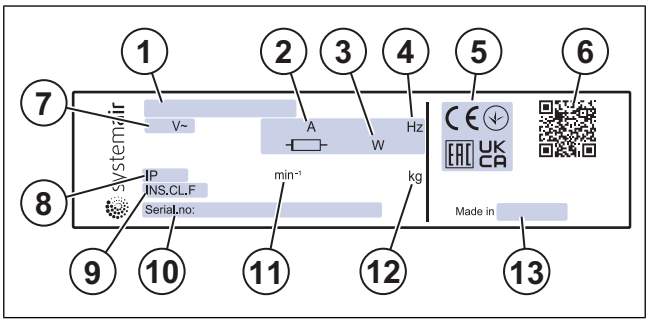
Speak to Systemair for more information on how to install the product in different installation locations.

1.4 Product overview



1. Casing
2. Mounting bracket
3. Fan impeller
4. Motor
5. Connection box (IV Smart AC and IV Smart EC CO has 1 single connection box)
6. Name plate

1.5 Name plate



1. Type designation: Product name, dimension and motor type. Refer to 1.5.1 Type designation.
2. Current, A
3. Input power, W
4. Frequency, Hz
5. Certifications
6. Scannable code[1]
7. Voltage, V
8. IP class, enclosure class
9. Insulation class
10. Serial number: part number/production number/production date
11. Nominal fan speed
12. Weight, kg
13. Country of production

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	IV Smart AC	IV Smart EC	IV Smart EC CO
Motor type	AC: 230 V, 2 pole, 1-phase	EC: Electronically commuted 230 V, 1–phase	EC: Electronically commuted 230 V, 1–phase

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.
- The product is used without motor protection.

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.

Caution

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

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.

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

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

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 the installation of the product

- Make sure that you have the necessary installation accessories:
  - The product can only be installed indoors, in garages. The product is not connected to a duct system.
- Refer to installation material with fire resistance rating for the installation location.
- Examine the packaging for transportation damage and remove the packaging from the product carefully.
- 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

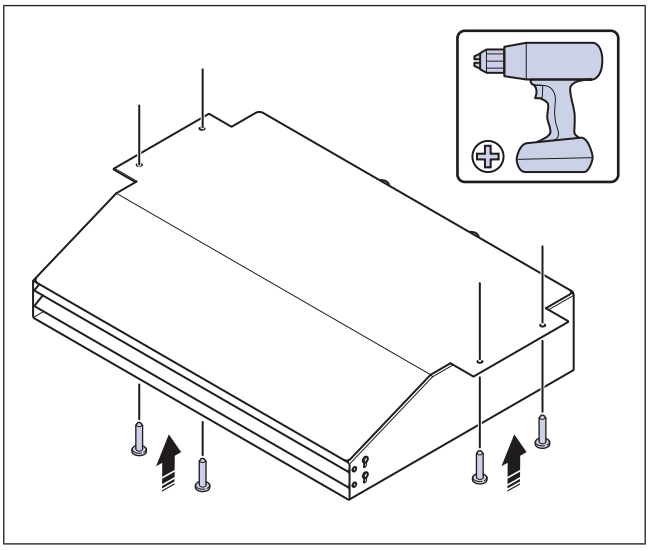
Note:

The product must be installed horizontally.

Note:

Make sure that there is free space around air inlets and air outlets.

1 Attach the mounting bracket integrated in the fan casing to the inner ceiling with 4 screws. The product can also be installed in the ceiling using pendulum bars or wires. Pendulum bars and wires are not supplied by Systemair.



4.3 IV Smart CO controller

Note:

Obey local laws and regulations for CO control.

The IV Smart EC CO fan is equipped with a controller unit for carbon monoxide control. If a CO sensor is installed, the CO sensor will measure the CO concentration level in the air and adjust the 0-10 V control signal to the EC fans to obtain a low level of CO concentration in the ventilated area.

The CO controller has an alarm function which is triggered based on pre-set CO alarm trigger values and time specifications according to DIN EN 50291-1.

Note:

The CO sensor is sold separately.

4.3.1 To set the minimum fan speed for operation during a low CO concentration

1 Set the minimum fan speed through the 0-10 V potentiometer in speed ranges between 2-4 V. The potentiometer is found in the connection box.

4.3.2 The Function test & warm-up

A Function test starts automatically when the supply voltage and the potential free contact are connected correctly.

A successful end of the Function test is indicated by:

- the green operation indicator is permanently on.
- the yellow fault alarm indicator is on for 2 seconds and then off.
- the red CO indicator alarm is on for 2 seconds and then off.

If a potential contact is not connected to X6 and X7, the test will not complete, refer to 12.3.5 Wiring overview for CO control unit.

During the product warm-up, 6.5 minutes, the product is on low speed. No CO level measurements or alarms are set off during the warm-up. When the warm-up completes, the product will automatically adjust the fan speed to the CO concentration level.

4.3.3 The automatic fan speed control function

The product will operate on the minimum fan speed that is set on the internal 0-10 V potentiometer at CO concentration levels to a maximum of 15 ppm. The fan speed will increase and decrease in relation to the CO concentration level in the installation area and will reach maximum speed at a CO concentration level of 50 ppm. If a sensor fault is detected, the product will operate at maximum speed in order to remove increased CO concentration in the air.

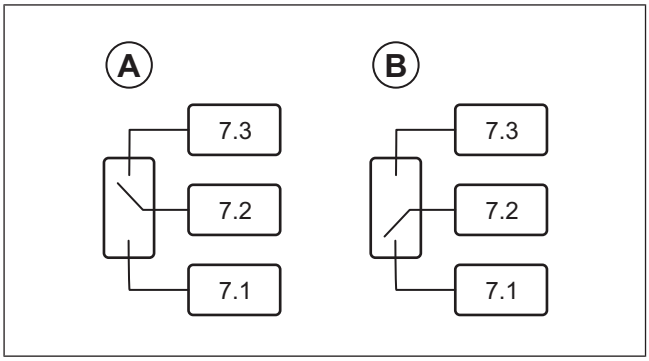
Specification for the automatic speed control function:

CO concentration	Speed specification values	Function
CO level below 15 ppm	0 V	Fan standstill
CO = 15 ppm	2 V...4 V (min.)	Speed is in relation to set value on the internal 0-10V potentimeter
CO = 15-50 ppm	Min....10 V	The linear curve analogue to the CO connection starts with the minimum fan speed through to the maximum fan speed.
CO level = 50 ppm or higher	10 V	Maximum fan speed
Fault detected	10 V	Maximum fan speed

4.3.4 Fault alarm function

The fault alarm is triggered in case of fan failure or sensor failure. The alarm is controlled by a potentially free contact which can be connected to an external alarm device, for example an alarm siren or an alarm light.

The illustrations shows the switching states of the alarm contact (with control terminals which can be used to connect an external alarm).



A. State of the alarm contact when voltage free

B. State of the alarm contact when operating OK

Failure required for activation of fault alarm	Alarm trigger point	Required value for automatic reset of the alarm
Fan failure	130 rpm	180 rpm
Sensor failure	14–20 mA ≥ 3.0 mA	14–20 mA ≥ 3.5 mA

4.3.5 CO alarm function

The CO alarm is triggered based on the time specifications of DN 50291–1 and the listed trigger points:

CO alarm trigger points:

CO concentration required for activation of CO alarm	Alarm trigger time	Required CO concentration for automatic reset of the alarm
up to 30 ppm	not triggered	No alarm reset required
50 ppm	triggered after 75 minutes	< 40 pmm
100 ppm	triggered after 25 minutes	< 40 pmm
300 ppm	triggered after 1 minute	< 40 pmm

To do in the event of an alarm:

Problem	Possible cause	Trouble-shooting
CO alarm is active	Critical CO concentration is detected	If car engines are running in the installation area - turn off the car engine. If no car engines are running, leave the area immediately and contact a local emergency gas central. Ensure that a gasfitter is informed to inspect possible gas line damages.
Fault alarm is active	Fan or power supply is out of function (alarm triggers after 10 seconds)	Contact Systemair
	Short circuit or break in sensor cable (alarm triggers after 3 seconds)	Contact Systemair

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 AC motors

Note:

The speed controller alternatives are different for different motor types. Make sure that your motor is compatible with the speed controller type before you use it.

The speed can be controlled by voltage reduction using a transformer. It is also possible to control the fan speed with frequency converter if the installed frequency converter has built in all-pole sine filter and shielded cables are not needed.

5.4 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.

5.5 To install motor protection for AC motors

- If the product has an built in motor protection, reset by disconnecting the product from power for 60 seconds.
- If the motor has temperature monitors such as thermal contacts (TK) or thermistors lead out into the terminal box, these must always be connected in the control circuit using appropriate motor protection.
- Make sure that an overheated motor cannot start again automatically when it becomes cool.
- Install the motor cables and the temperature monitor apart.
- If the motor does not have temperature monitors, install a motor protection switch.

5.6 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 AC motor

1 Set the installed safety switch in the ON position.

2 Install the external speed controller. Refer to the instruction manual for the installed speed controller.

7.2 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.

7.3 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.

7.3.1 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.	• 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. **Note:** This is applicable for EC motors only.	• 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.
	A phase loss occurred.	If the motor is a 3-phase motor, make sure that no phase is missing. **Note:** This is not applicable for EC motors.
	The motor is overheated.	• Do a check of the motor cooling impeller. • If it is possible, measure the resistance to do a check of the motor winding.
	The capacitor is not connected or not correctly connected. **Note:** This is not applicable for EC motors or 3–phase AC motors.	Connect the capacitor correctly. Refer to the included motor wiring diagram.
	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.
- Motor protection is used.
- 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

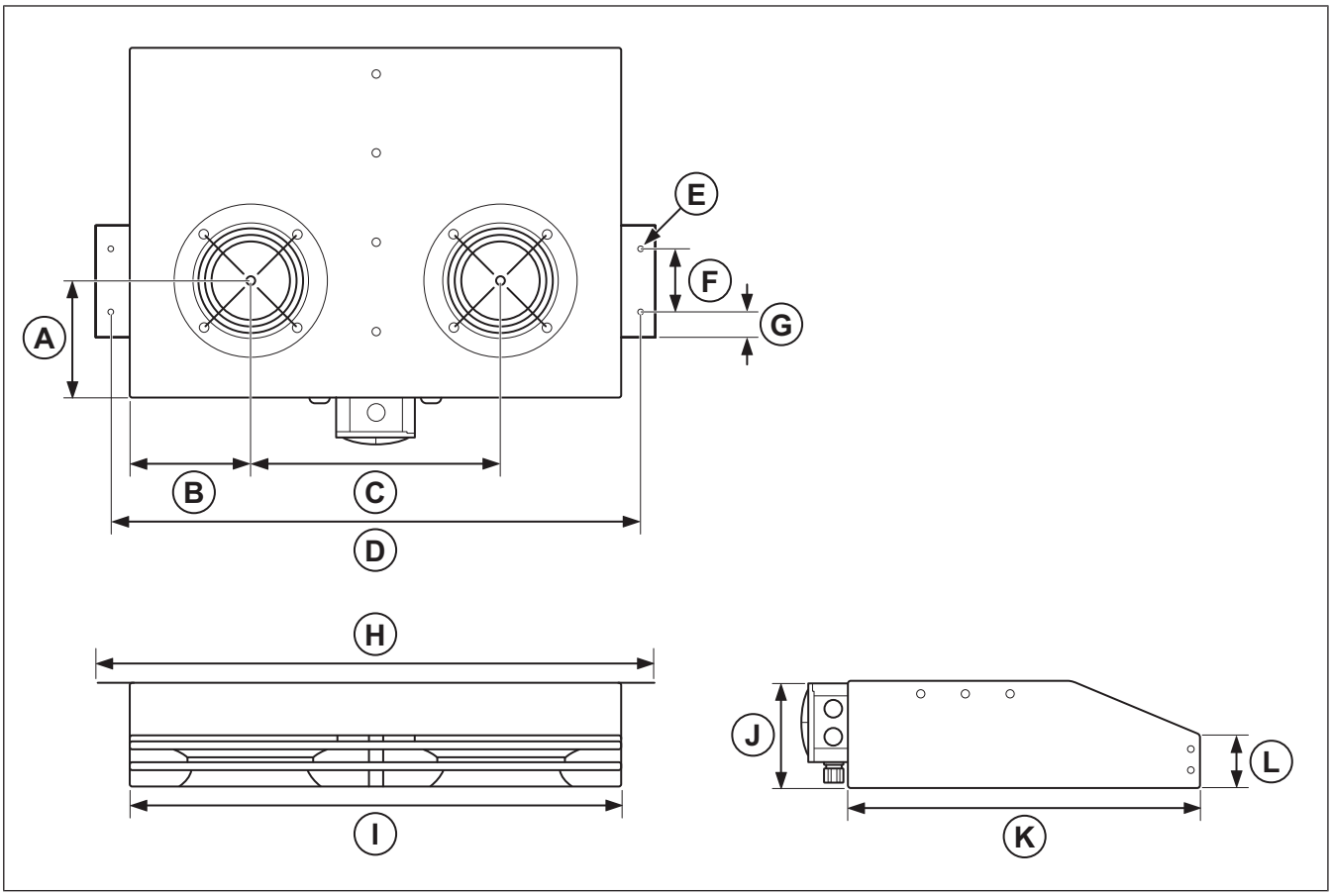
12.1 Technical data overview

Maximum temperature of transported air, °C	Refer to the data sheet in the online catalogue at www.systemair.com.
Maximum ambient temperature, °C	
Sound pressure, dB	
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.

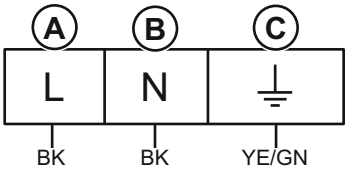


	A	B	C	D	ØE	F	G	H	I	J	K	L
IV Smart AV, IV Smart EC,IV Smart CO	169	173	360	760	8	140	36	800	700	150	554	67

12.3 Wiring diagrams

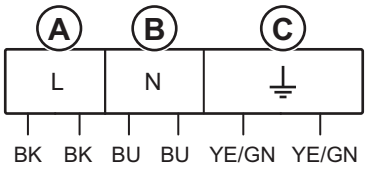
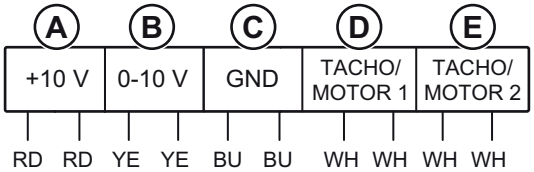
Abbreviation in wiring diagram	Cable colour
RD	Red
YE	Yellow
BU	Blue
WH	White
GN	Green
BN	Brown
BK	Black
GR	Grey
GY	Green/Yellow

12.3.1 Wiring diagrams for AC motors

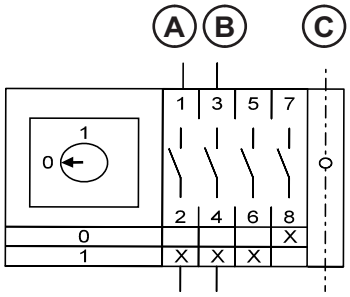
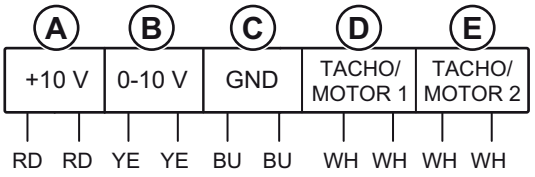
IV Smart AC, 230 V, 2 pole, 1-phase	
A. Supply voltage, L, 230V 50Hz B. Supply voltage, N C. Protective Earth, PE	

12.3.2 Wiring diagrams for EC motors

Note:
The connection cables of the 2 motors are located in the terminal boxes.

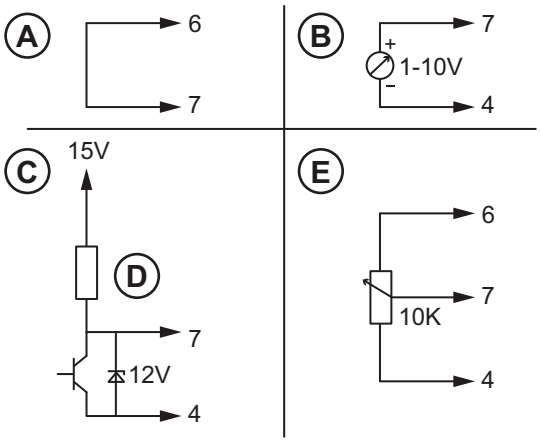
IV Smart EC, 230 V, 1–phase	
Terminal box 1 , power supply A. Supply voltage, L, 230V 50Hz B. Supply voltage, N C. Protective Earth, PE	
Terminal box 2 , control voltage A. +10 V = Voltage output +10 V max 10 mA B. 0-10 V = Analog input C. GND D. Tacho signal motor 1 E. Tacho signal motor 2	

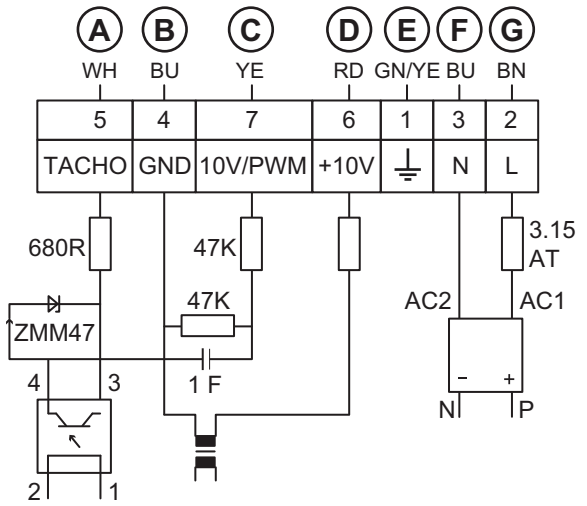
12.3.3 Wiring diagrams for EC motors and REV

IV SmartEC + REV ,230 V , 1-phase	
REV- Switch , Power supply A. Supply voltage, L, 200...240V 50/60Hz B. Supply voltage, N C. Protective Earth, PE	
A. +10 V = Voltage output +10 V max 10 mA B. 0-10 V = Analog input C. GND D. Tacho signal motor 1 E. Tacho signal motor 2	

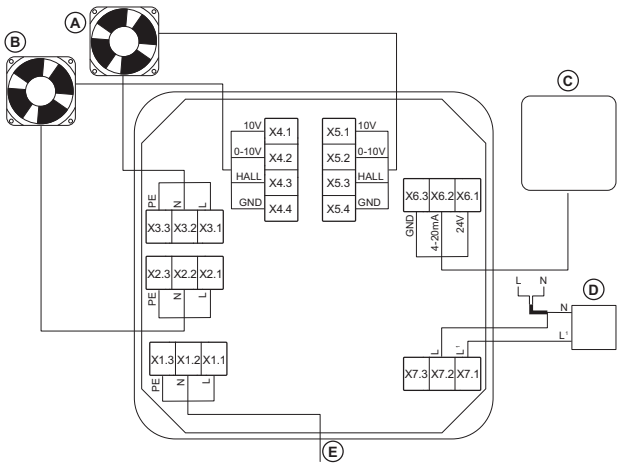
12.3.4 0-10 V speed control options IV Smart EC and IV Smart EC CO

The wiring diagram shows connection possibilities for different speed control options. The available speed control options are explained in the list that follows.

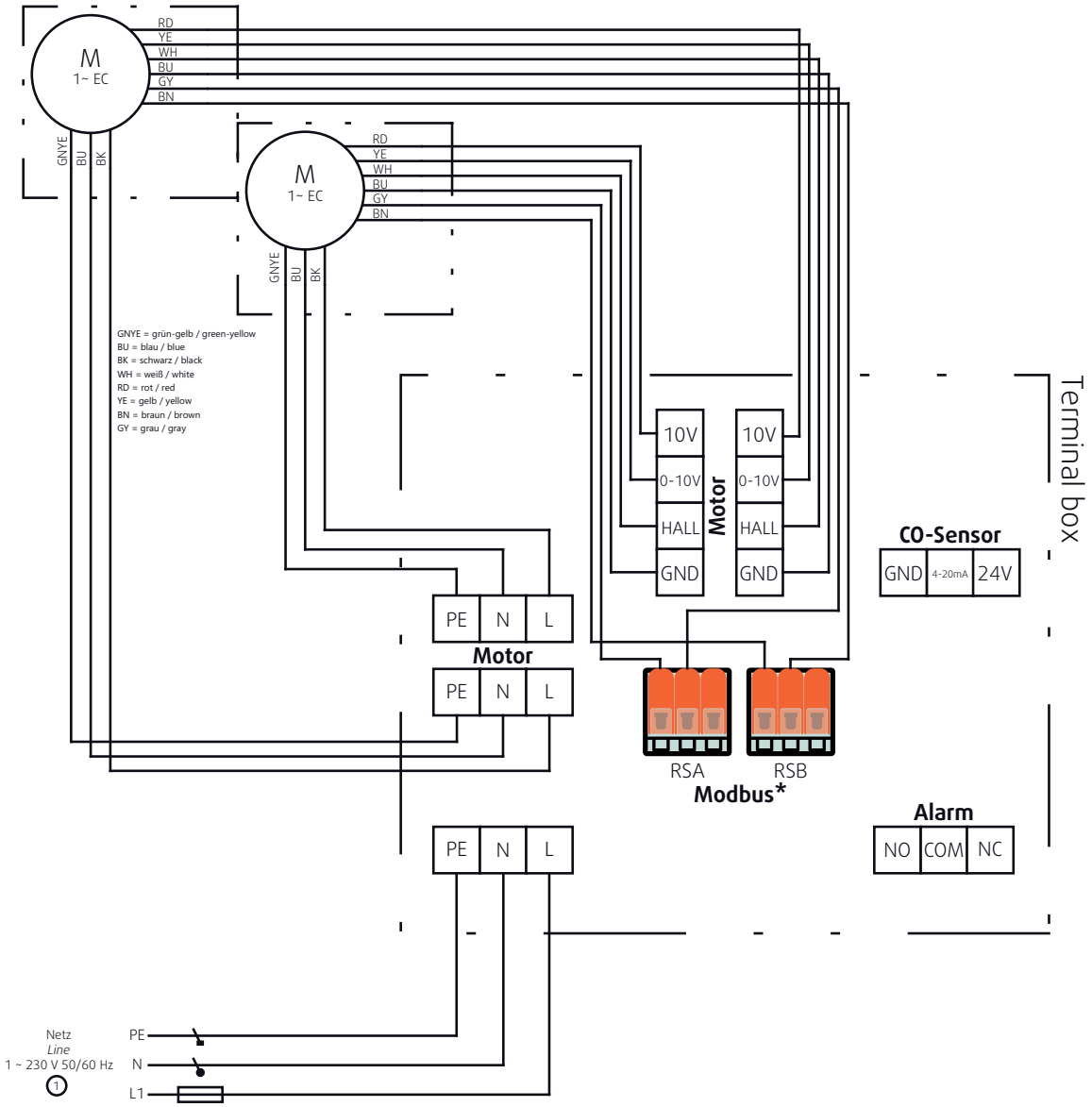
IV Smart EC	
A. Connection for maximum speed B. Connection for adjustable speed using an external potentiometer: – 10 V = maximum – 1 V = minimum – <1 V = fan stops C. Connection for adjustable speed via PWM (pulse width modulation) (1–10 kHz): – 100% PWM *maximum – 10% PWM *minimum – <10% PWM = 0 D. Imax (maximum current) = 10 mA E. Connection if using internal potentiometer (B)	

IV Smart EC CO	
A. Tacho output: open collector, 1 pulse per revolution, electrically insulated, Isink_max=10mA B. Ground C. Control input, 0-10 V or PWM, electrically insulated D. Voltage output, 10 V/10 mA, electrically insulated E. PE F. Neutral G. Main supply, 230 V AC, 50-60Hz, see type plate for voltage range	

12.3.5 Wiring overview for CO control unit

IV Smart CO, 230 V, 1–phase	
A. Fan 2 B. Fan 1 C. CO sensor D. Alarm siren E. Mains supply	

IV Smart CO, Modbus 7.0

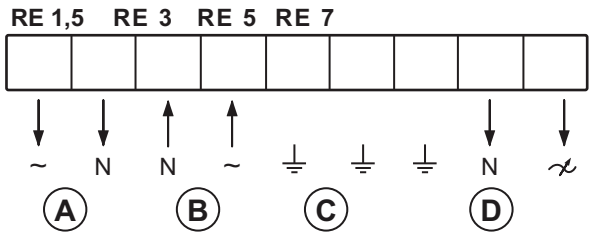


Electrical connections			
Name	**Connection**	**Designation**	**Designation**
X1	1. L	X1 = mains supply connection	Supply connection to the control unit.
	2. N		
	3. PE		
X2	1. L	X2 = FAN 1 supply voltage connection	Supply voltage for fan 1. The voltage corresponds to the supply voltage of the control unit.
	2. N		
	3. PE		
X3	1. L	X3 = FAN 2 supply voltage conntection	Supply voltage for fan 2. The voltage corresponds to the supply voltage of the control unit.
	2. N		
	3. PE		
X4	1. 10 V	4X = speed control connection FAN 1	Control connection to Fan 1. Speed specification and speed feedback. If the fan has a 10 V output, it can be connected to terminal X4. 1.
	2. 0–10 V		
	3. HALL		
	4. GND		
X5	1. 10 V	5X = speed control connection FAN 2	Control connection to Fan 2. Speed specification and speed feedback. If the fan has a 10 V output, it can be connected to terminal X4. 1.
	2. 0–10 V		
	3. HALL		
	4. GND		
X6	1. 24 V	X6 = SENSOR CONNECTION	Connection for CO sensor supply connection and measure signal connection.
	2. 4–20 mA		
	3. EARTH		
X7	1. NC	X7 = ALARM CONNECTION	Potential-free alarm connection option for an alarm siren or other auxiliary device.
	2. COM		
	3. NO		

12.3.6 Wiring diagrams for speed controller for AC motors

Note:

The selection of electrical accessories must be done in line with the technical parameters of the product.

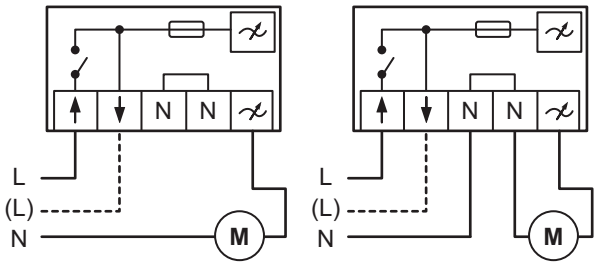
RE	
Manual 5-step transformer.	

A. Relay connection. There is always 230 V between line and neutral when the transformer knob is in one of the positions 1–5.

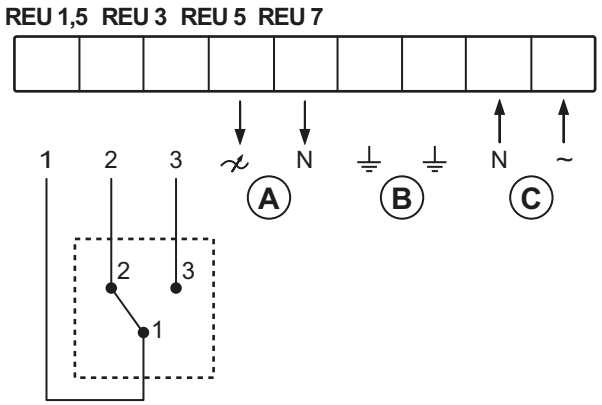
B. Supply voltage

C. PE

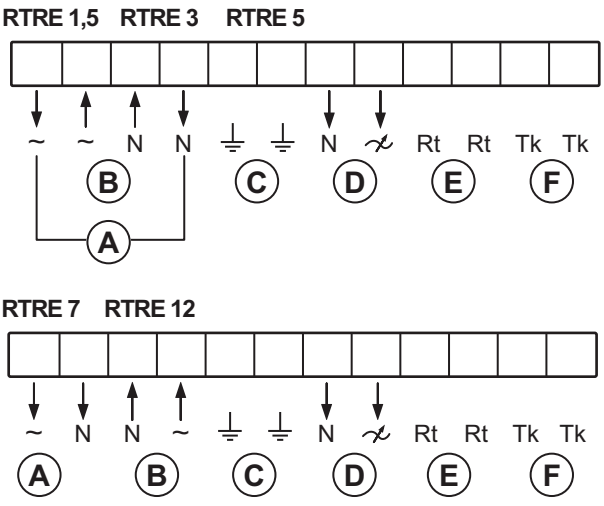
D. Fan

REE — Thyristor	
REE 1 and REE 2 - Surface mounting or with flush mounting casing included. REE 4 - Surface mounting. **Note:** Starting currents must be considered when you select the speed controller type. Products that are used with this speed controller must have a built-in overheating protection and must be designed for thyristor speed control.	

- L: the connection with cutting function on the speed control.
- (L): the connection without cutting function.

REU	
Manual 5-step transformer for high/low speed operation. Used together with a change-over contact, for example a timer or a thermostat.	

1. External change-over contact
2. Left selector switch
3. Right selector switch

RTRE	
Manual 5-step transformer with motor protection.	

A. Relay connection. There is always 230 V between line and neutral when the transformer knob is in one of the positions 1–5.

B. Mains supply

C. PE

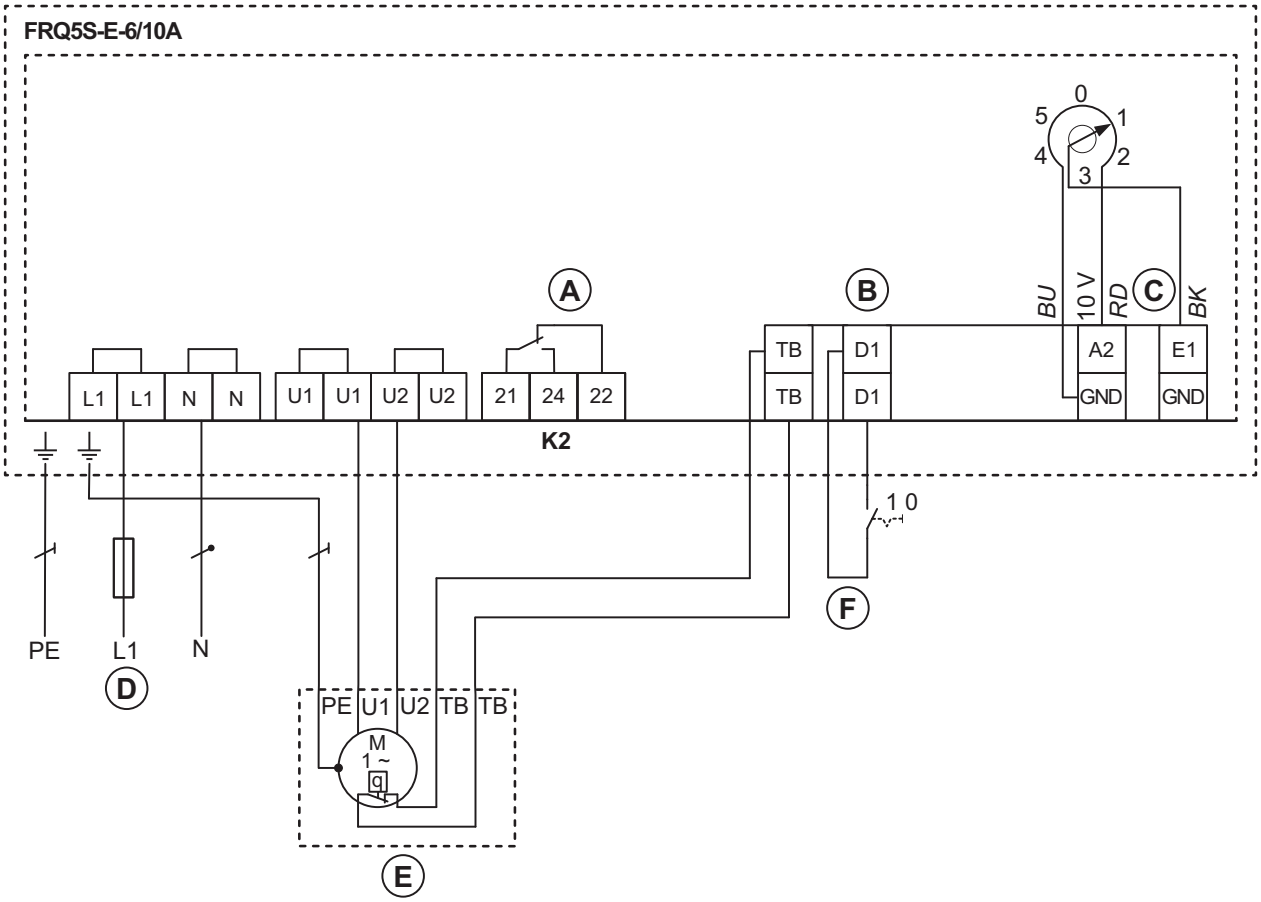
D. Fan

E. Thermostat

F. Motor protection. If the motor protection is not in use, Tk must be looped together.

FRQ5S-E-6A

Frequency converter with built in all pole sine filter and 5-step switch.



A. Contact rating, maximum AC 250 V/2 A

B. Main supply, 1–phase 208...277 V, 50/60 Hz

C. Motor with internal thermostats

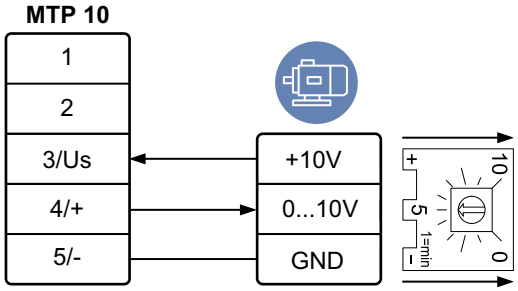
D. OFF/ON

12.3.7 Wiring diagrams for speed controllers for EC motors

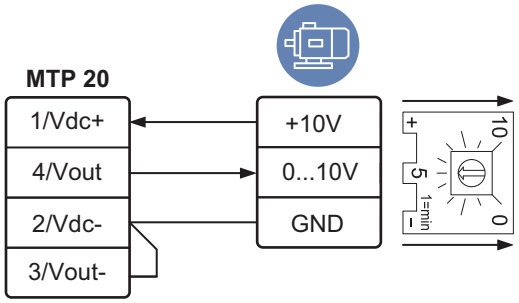
Note:

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.

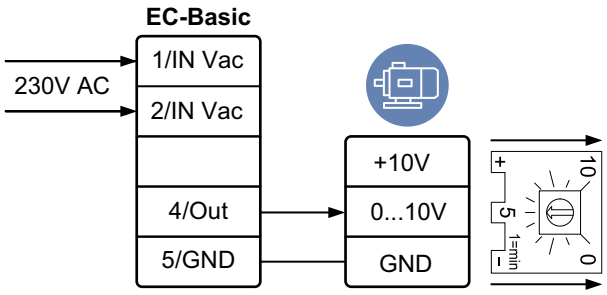
MTP 10



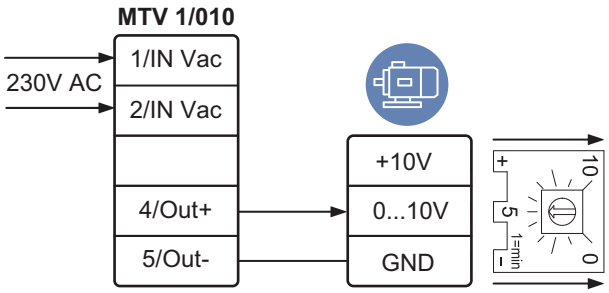
MTP 20



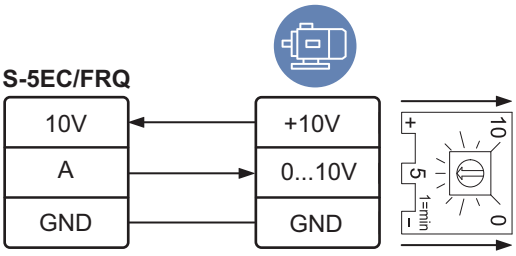
EC-Basic



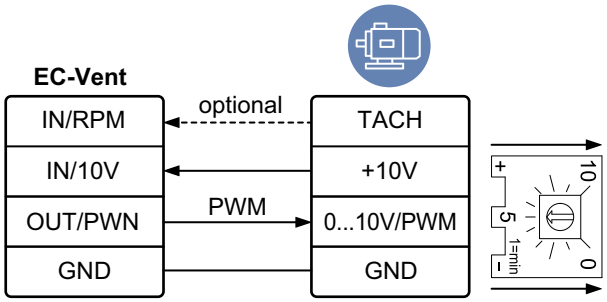
MTV–1/10



S-5EC/FRQ



EC-Vent



13 EU Declaration of Conformity

We, the manufacturer

Company	Systemair GmbH
Address	Seehöfer Straße 45 97944 Boxberg Germany

declare under our sole responsibility that the product

Product designation	Jet fans
Type/Model	AJR 315–400; AJR(B) 315–400; AJR(F) 315–400; AJR-TR; AJ8 315–400; AJ8(B) 315–400; AJ8(F) 315–400; AJ 315–1600; AJ(K) 315–1600; AJ(B) 315–1600; AJ(F) 315–1600; IV Smart; IV 50–100; IV 50 EC; IV 50–100 (B); IV 50–100 (F)

fulfils all relevant provisions of the

Machinery directive	**2006/42/EC** **DIN EN ISO 12100:2013** Safety of machinery - General principles for design Riskassessment and risk reduction **DIN EN 60204-1:2019-06** Safety of machinery - Electrical equipment of machines - Part 1: General requirements
Directive electromagnetic compatibility (EMC)	**2014/30/EU** **DIN EN IEC 61000-6-1:2019-11** Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments **DIN EN IEC 61000-6-4:2020-09** Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments
RoHS directive	**2011/65/EU** **IEC 63000:2016** Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
ErP guidelines	**2009/125/EC** **327/2011** Only for fans above 125W
	DIN EN 12101–3:2015 (only for Smoke extract fans) Smoke and heat control systems — Part 3: Specification for powered smoke and heat exhaust ventilators

Person authorized to compile the technical file:

i.V Matthias Hennegriff
Technical Director

This declaration relates exclusively to the machinery in the state in which it was placed on the market and excludes components which are added and/or operations carried out subsequently by the final user. Boxberg, Germany 2021–11–12

Stefan Fischer
Managing Director

14 UKCA Declaration of Conformity

We, the manufacturer

Company	Systemair GmbH
Address	Seehöfer Straße 45 97944 Boxberg Germany

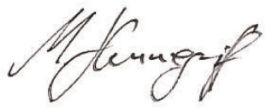
declare under our sole responsibility that the product

Product designation	Jet fans
Type/Model	AJR 315–400; AJR(B) 315–400; AJR(F) 315–400; AJR-TR; AJ8 315–400; AJ8(B) 315–400; AJ8(F) 315–400; AJ 315–1600; AJ(K) 315–1600; AJ(B) 315–1600; AJ(F) 315–1600; IV Smart; IV 50–100; IV 50 EC; IV 50–100 (B); IV 50–100 (F)

fulfils all relevant provisions of the

Supply of Machinery (Safety) Regulations 2008	**DIN EN ISO 12100:2013** Safety of machinery - General principles for design Riskassessment and risk reduction **DIN EN 60204-1:2019-06** Safety of machinery - Electrical equipment of machines - Part 1: General requirements
Electromagnetic Compatibility Regulations 2016	**2014/30/EU** **DIN EN IEC 61000-6-1:2019-11** Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments **DIN EN IEC 61000-6-4:2020-09** Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012	**IEC 63000:2016** Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
	DIN EN 12101–3:2015 (only for Smoke extract fans) Smoke and heat control systems — Part 3: Specification for powered smoke and heat exhaust ventilators

Person authorized to compile the technical file:



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