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Blue e+ EC fan-and-filter unit



Fan-and-filter unit

SK 3240.9xx

SK 3241.9xx

SK 3243.9xx

SK 3244.9xx

SK 3245.8xx/.9xx

Assembly and operating instructions

ENCLOSURES

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Preface

EN

Preface

Dear Customer!

Thank you for choosing an EC fan-and-filter unit from Rittal.

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We are always happy to answer any technical questions regarding our entire range of products.

Contents

1	Notes on documentation.....	4	14	Connection diagrams	18
1.1	Other applicable documents.....	4	15	Declaration of conformity.....	21
1.2	Storing the documents	4			
1.3	Symbols used in these operating instructions ...	4			
2	Safety instructions.....	4			
3	Product description.....	4			
3.1	Functional description.....	5			
3.1.1	Main components	5			
3.1.2	Control	5			
3.1.3	Safety equipment	5			
3.1.4	Filter mats	5			
3.2	Intended use	5			
3.3	Scope of supply	5			
4	Assembly and connections	6			
4.1	Choosing the installation site	6			
4.2	Assembly instructions.....	6			
4.2.1	General	6			
4.2.2	Layout of the components in the enclosure	6			
4.3	Fitting the EC fan-and-filter unit or outlet filter ...	6			
4.3.1	Cutting out the enclosure	6			
4.3.2	Fitting the EC fan-and-filter unit	6			
4.3.3	Safety clip	7			
4.4	Notes on electrical connection.....	7			
4.4.1	Connection data.....	7			
4.4.2	Overvoltage protection and supply line load.....	7			
4.4.3	PE conductor connection	8			
4.4.4	Electromagnetic compatibility (EMC).....	8			
5	Carrying out the electrical connection... 8				
5.1	Connecting the power supply.....	8			
5.2	Rotating the voltage connection	8			
5.3	Interfaces	9			
5.3.1	Speed control.....	9			
5.3.2	Speed output	9			
5.3.3	Alarm relay	9			
5.3.4	ModBus	9			
5.4	Changing the direction of airflow.....	10			
6	Commissioning	10			
7	Installing and changing the filter.....	10			
7.1	Replacing the pleated filter	11			
7.2	Replacing the chopped-fibre filter	11			
8	Inspection and maintenance	12			
9	Storage and disposal	12			
10	Technical specifications.....	13			
11	Cut-out/drilling dimensions.....	15			
12	EMC fan/outlet filter.....	16			
13	Accessories	17			

1 Notes on documentation

These assembly and operating instructions are aimed at

- tradespersons who are familiar with assembly and installation of the EC fan-and-filter unit.
- trained specialists who are familiar with operation of the EC fan-and-filter unit.

1.1 Other applicable documents

The assembly and operating instructions available as paper documents for the unit types described here are included with the equipment.

We cannot accept any liability for damage associated with failure to observe these instructions. Where applicable, the instructions for any accessories used also apply.

1.2 Storing the documents

The assembly and operating instructions as well as all other applicable documents are an integral part of the product. They must be given to the plant operator. The operator is responsible for storage of the documents so they are readily available when needed.

1.3 Symbols used in these operating instructions



Danger!
A dangerous situation in which failure to comply with the instructions will result in death or severe injury.



Warning!
A dangerous situation which may cause death or serious injury if the instructions are not followed.



Caution!
A dangerous situation which may lead to (minor) injuries if the instructions are not followed.



Note:
Important notices and indication of situations which may result in material damage.

- This symbol indicates an "action point" and shows that you should perform an operation or procedure.

2 Safety instructions

Please observe the following safety instructions when assembling and operating the unit:

- Always wear the prescribed personal protective equipment when working on the EC fan-and-filter unit.
- Do not make any changes to the EC fan-and-filter unit other than those described in these and other applicable instructions.
- Carefully deburr the mounting cut-out before inserting the EC fan-and-filter unit.
- The EC fan-and-filter unit should be fitted with the membranes in a vertical position.
- The following work must only be carried out by qualified experts or trained personnel and with the system de-energised:
 - Assembly
 - Electrical connection
 - Changing the direction of airflow
 - Changing the mains connection position
 - Cleaning
 - Maintenance
 - Dismantling the EC fan-and-filter unit
- Connect the pre-fuse specified on the rating plate.
- Strip a maximum of 9 mm of the insulation from the individual wires in the electrical infeed and ensure that the cables are suitably secured.
- Never insert your fingers into the rotating fan blade.
- Never use flammable cleaning materials.
- Do not obstruct the air inlet and outlet of the fan-and-filter unit inside and outside the enclosure (see also section 4.2.2 "Layout of the components in the enclosure", page 6).
- The heat loss of the components installed in the enclosure must not exceed the specific air throughput of the EC fan-and-filter unit.
- Use only original spare parts and accessories.

3 Product description

Depending on the model chosen, your EC fan-and-filter unit may vary in appearance from the illustrations contained in these instructions. However, the functions are identical in principle.

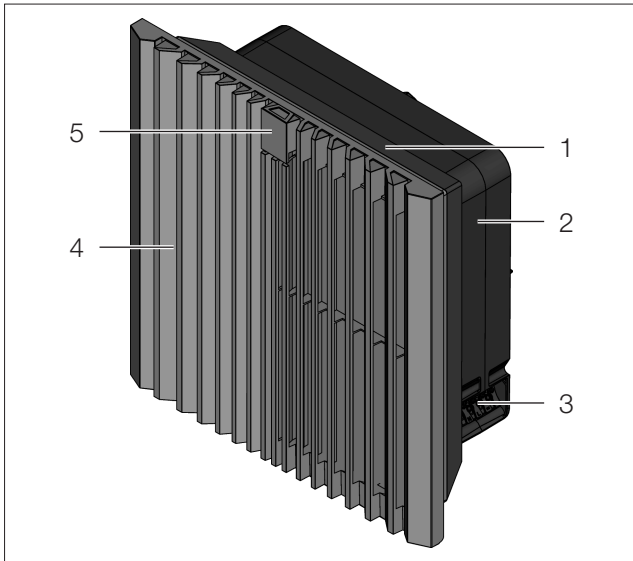


Fig. 1: Product description

Key

- 1 Filter box with filter mat
- 2 Fan housing
- 3 Variable electrical connection
- 4 Louvred grille
- 5 Function logo (to release the louvred grille)

3.1 Functional description

The EC fan-and-filter unit in conjunction with the corresponding outlet filter(s) is used to dissipate heat loss from enclosures, ventilate the enclosure and protect temperature-sensitive components. This is achieved via the direct infeed of ambient air, the temperature of which must be less than the admissible enclosure interior temperature. The system is fitted into prepared cut-outs.

3.1.1 Main components

The EC fan-and-filter unit is comprised of the following four main components: Fan motor, filter box, louvred grille with function logo and filter medium.

3.1.2 Control

EC technology is the most energy-efficient motor technology for fans. The significantly higher efficiency levels compared with conventional AC motors promote the responsible deployment of electrical energy. The integrated interfaces permit analogue and digital activation that so allows increased flexibility in controlling and monitoring fans.

A 0-10 V / PWM input is available for analogue activation. The fan has a tachometer signal output as well as an alarm relay to monitor the speed and the fan function. The connection is made

- via the Rittal control unit (Model No. 3235.460),
- via the Rittal sensor for speed control (Model No. 3235.450) or
- directly via a controller provided by the customer (e.g. PLC).

The corresponding wiring diagram can be found on page 19, fig. 21, and page 20, fig. 22, and a more detailed description in section 5.3.1 "Speed control". The fan has a ModBus interface for digital integration. This interface can be integrated either in the Rittal IoT interface (Model No. 3124.300) or in a system provided by the customer. See also section 5.3.4 "ModBus".

3.1.3 Safety equipment

The fan is equipped not only with thermal winding protection devices for protection against overload, but also has an electronic blocking protection.

3.1.4 Filter mats

The EC fan-and-filter unit / outlet filter is supplied with an installed pleated filter. The filter must be checked regularly in accordance with the level of dust exposure and replaced as necessary.



Note:

Special filter mats are required for EMC fan-and-filter units (see section 13 "Accessories").

3.2 Intended use

Rittal EC fan-and-filter units were developed and designed in accordance with the state of the art and the recognised rules governing technical safety. Nevertheless, if used improperly, they may pose a threat to life and limb or cause damage to property. The unit is only intended for ventilating enclosures and electronic cases. Any other use is deemed improper. The manufacturer will not be liable for any damages caused as a result of improper use, or for incorrect assembly, installation and use. All risk is borne solely by the user.

Proper usage also includes the observation of all valid documents and compliance with the inspection and servicing conditions.

3.3 Scope of supply

The fan is supplied in a packaging unit in a fully assembled state and ready to connect.

- Please check the scope of supply for completeness.

Quantity	Description
1	EC fan-and-filter unit
4	Mounting screws
1	Assembly and operating instructions
1	Drilling template, self-adhesive
1	Pleated filter or EMC filter mat

Tab. 1: Scope of supply

4 Assembly and connections

4.1 Choosing the installation site

When choosing the installation site for the enclosure, please observe the following:

- The site for the enclosure, and hence the arrangement of the EC fan-and-filter unit, must be carefully selected so as to ensure good ventilation.
- The site must be free from excessive dirt and moisture.
- EC fan-and-filter units must always be installed on vertical panels (door or walls).
- The ambient temperature must be lower than the permissible enclosure interior temperature.
- The mains connection data as stated on the rating plate of the unit must be guaranteed.

4.2 Assembly instructions

4.2.1 General

- Check the packaging carefully for signs of damage. Any packaging damage may be the cause of a subsequent functional failure.
- The EC fan-and-filter unit and outlet filter must always be mounted on an enclosure in order to ensure air exchange.



Note:
The outlet filter should be at least the same size as the EC fan-and-filter unit.

- The enclosure must be sealed on all sides (IP54). If the enclosure has a leak, unfiltered, contaminated air may enter the enclosure, depending on the direction of airflow of the fan.
- To allow the louvred grille to be opened without problem when the EC fan-and-filter units are bayed vertically, a minimum separation should be observed.
- This is either 15 mm measured between drilling templates or 46 mm measured between the associated mounting cut-outs.

4.2.2 Layout of the components in the enclosure

- Observe the air flows from the internal fans of installed electronic components.

For installation, it is important to ensure that the airflows of fans and built-in electronic components do not have a negative influence on one another (air short-circuit). To ensure unimpeded air circulation, a minimum distance must be maintained between the fan and the component that corresponds to half the EC fan-and-filter unit's mounting cut-out.

4.3 Fitting the EC fan-and-filter unit or outlet filter

The EC fan-and-filter unit or outlet filter is mounted on a vertical panel of the enclosure:

- For this purpose, the appropriate door, side or rear panel must be cut out using the supplied drilling template.

The EC fan-and-filter unit is generally fitted in the lower part of the enclosure, and the outlet filter in the upper part.

4.3.1 Cutting out the enclosure

- Stick the self-adhesive drilling template supplied to the envisaged position on the door, side or rear panel of the enclosure.

Lines indicating the dimensions of cut-outs and drilling specifications for mounting and fixing of the fan (only necessary for sheet metal thickness 2.5 mm and above) are to be found on the drilling template. See also fig. 17 and fig. 18, page 16.

- Make the cut-outs including the line width as per the drilling template.



Risk of injury!
Carefully deburr all cut-outs to prevent injuries caused by sharp edges.

- Deburr the cut-outs.

4.3.2 Fitting the EC fan-and-filter unit

- The fan may be fitted without tools, by simply snapping into the preconfigured mounting cut-out.
- Make sure that the clips have snapped into place properly to guarantee secure mounting.
- From a sheet metal thickness of 2 mm, the clips should be pressed in individually.
- From a sheet metal thickness of 2.5 mm, the EC fan-and-filter unit must be screw-fastened in addition (tightening torque, see section 11 "Cut-out/drilling dimensions").
- To drill the lower holes, it is necessary to remove the louvred grille as shown in fig. 2. To do this, first loosen one hinge side and then the other.

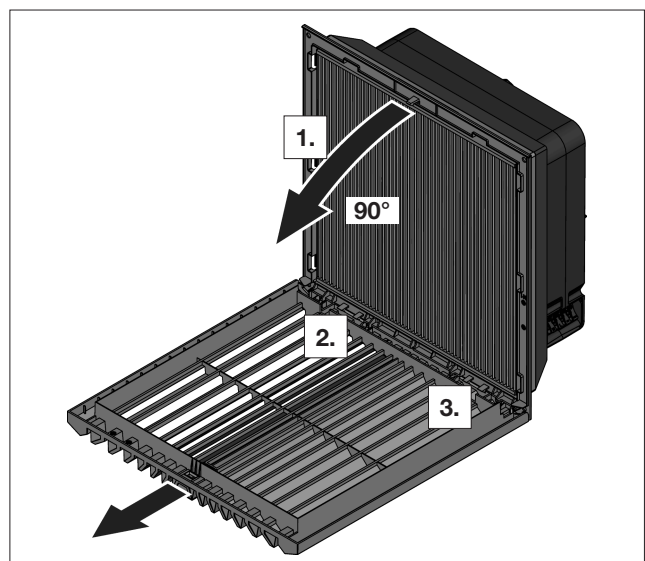


Fig. 2: Removing and mounting the louvred grille

- After screw-fastening the fan, the louvred grille must be mounted again in the reverse sequence.
- If transporting, it is necessary that you screw-fasten the fan to prevent it from falling out of the mounting cut-out.
- The EC fan-and-filter unit is a rotating component that may transfer vibrations and oscillations. Appropriate measures to decouple vibration must be taken in advance by the company responsible for the overall plant or system.
- The protection category can be increased by means of the following accessories:
 - IP55 by using a pleated filter and absorber mat.
 - IP56 by using a hose-proof hood.

4.3.3 Safety clip

To prevent undesired opening of the louvred grille in special situations, the safety clip (see section 13 "Accessories") can be mounted below the function logo without tools. This can be used, for example, during tests or for transport.

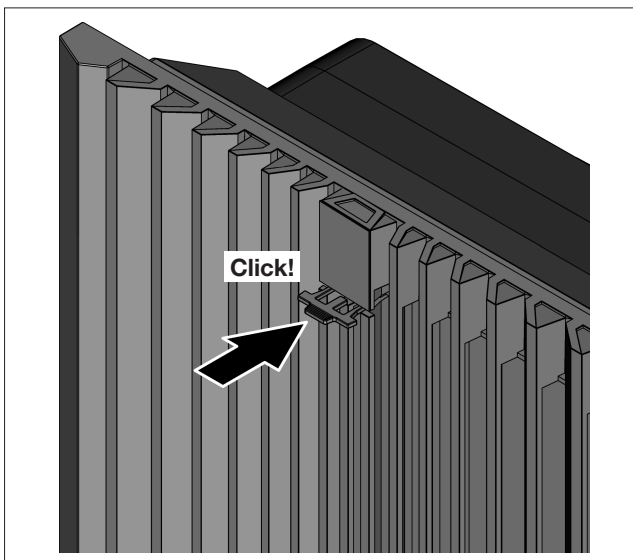


Fig. 3: Inserting the safety clip

- Use a small screwdriver to lever out the safety clip if it needs to be removed, e.g. to remove the louvred grille.

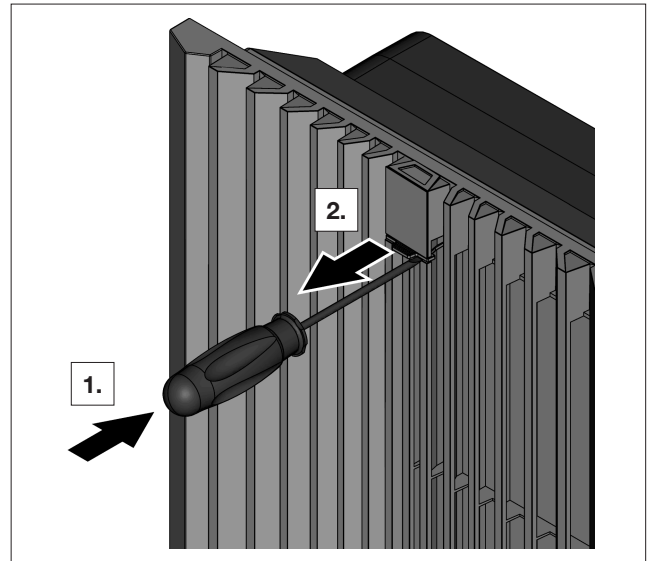


Fig. 4: Removing the safety clip

4.4 Notes on electrical connection

When performing the electrical connection, it is important to observe all valid national and regional regulations as well as the provisions of the responsible power supply company. Electrical connection must only be carried out by a qualified electrician who is responsible for compliance with the existing standards and regulations.

4.4.1 Connection data

- The voltage and frequency of the connection must correspond to the values stated on the rating plate.
- For UL applications, the data on the fan manufacturer's rating plate must be observed.
- If the emergency cooling function is activated via the ModBus interface (see section 5.3.4 "ModBus"), observe the modified maximum connection data on the fan manufacturer's rating plate.
- Electrical connection and any repairs may only be carried out by authorised specialist personnel.
- Use only original spare parts!
- Install the pre-fuse cited on the rating plate (circuit-breaker or slow fuse) to protect the cable and fan from short circuits. If several fans are operated on a single fuse, observe the total connected load.
- The direction of airflow and the direction of rotation are each marked on the motor housing with an arrow.
- If a phase is missing, the fan will not start. If the rotary field is incorrect, the fan will run backwards.

4.4.2 Overvoltage protection and supply line load

The unit does not have its own overvoltage protection. Measures must be taken by the operator at the supply end to ensure effective lightning and overvoltage protection. The mains voltage must not exceed a tolerance of $\pm 10\%$.

Carrying out the electrical connection

EN

4.4.3 PE conductor connection

A PE conductor connection system is not necessary as the EC fan-and-filter units are intrinsically safe.

4.4.4 Electromagnetic compatibility (EMC)

In order to comply with EMC Directive 61000-6-3 (Emission standard for residential, commercial and light-industrial environments) it may be necessary, depending on the application, to take the following interference suppression measures:

- Fan type 3245.900 – install an upstream 2 mH, 2.5 A interference suppression choke.

5 Carrying out the electrical connection

5.1 Connecting the power supply

- Complete the electrical connection by following the wiring plans.



Note:
For technical data, refer to the rating plate.

- Insert the connection cable with wire end ferrules into the screwless spring terminals.

Choose an appropriate pre-fuse according to the line cross-section (2 x 0.75 – 2.5 mm² multi-wire, 2 x 1.5 – 2.5 mm² fine-wire soldered).



Caution!
If no wire end ferrules are used, the insulation of the individual wires should be stripped to a max. of 9 mm (to comply with clearance and creepage distances).

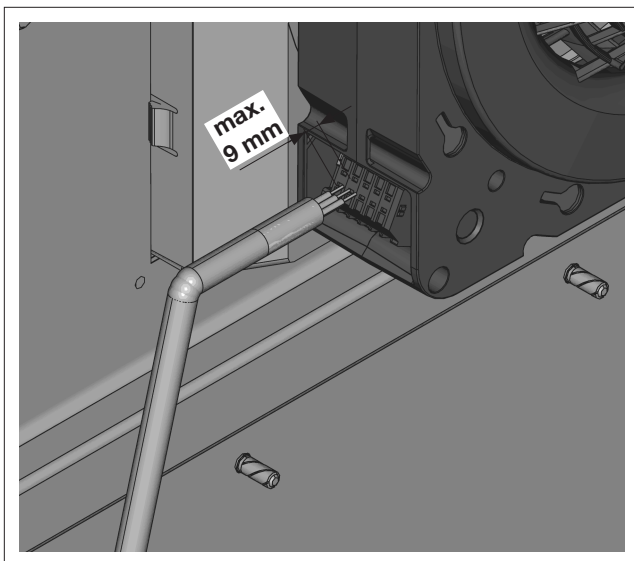


Fig. 5: Maximum permissible insulation stripping

- Fasten the connection cable at an appropriate location, e.g. the enclosure frame.

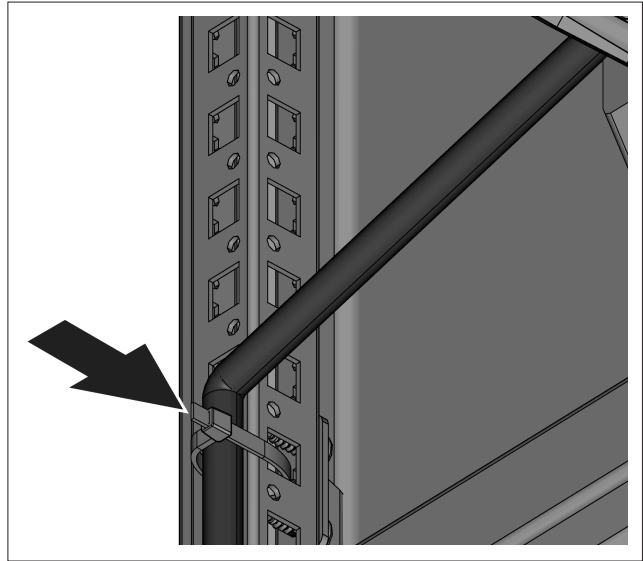


Fig. 6: Cable fastening with cable ties on the enclosure frame (example)

5.2 Rotating the voltage connection

If the position of the voltage connection is not ideally accessible, it may be rotated through 90° and snapped into position.

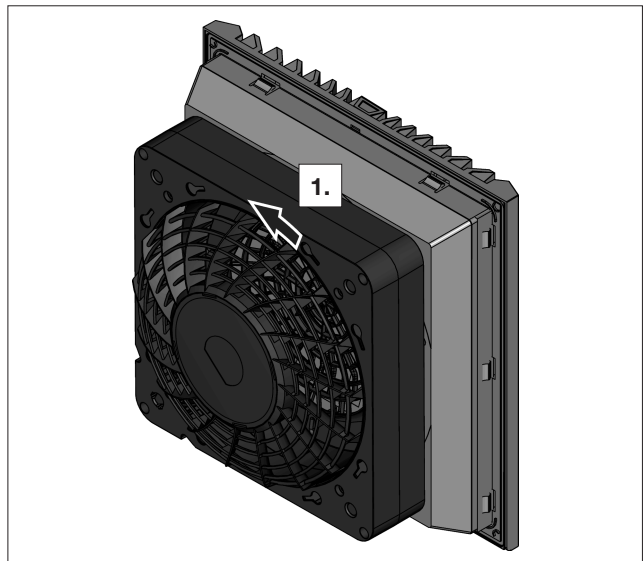


Fig. 7: Release the bayonet connection

- Turn the fan housing counter-clockwise to release the bayonet connection.
- Pull the fan housing backwards away from the filter box.

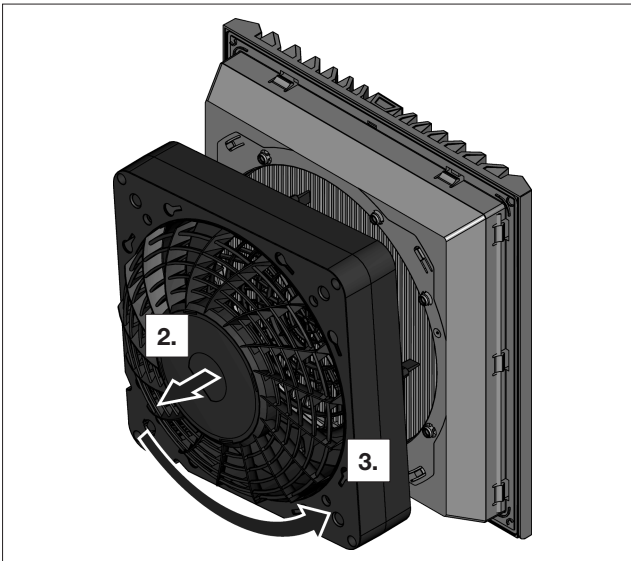


Fig. 8: Turning the fan housing

- Then turn the fan housing by 90°, 180° or 270° so that the electrical connection is in the desired position (see fig. 8).
- Place the fan housing back on the filter box (see fig. 9).

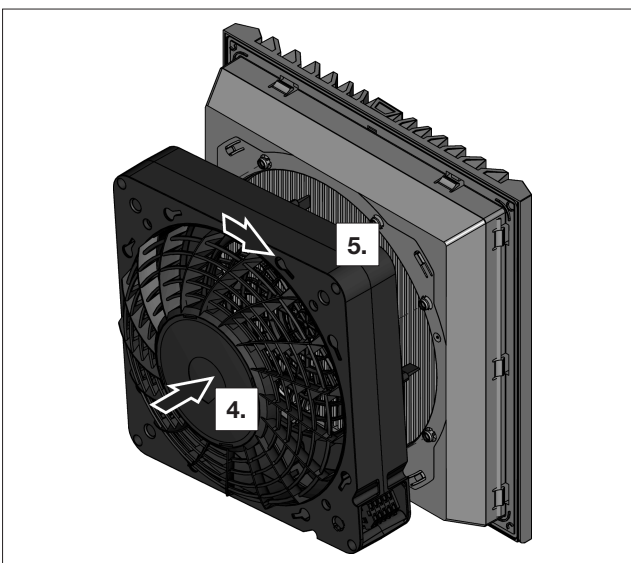


Fig. 9: Locking the bayonet connection

- Turn the fan housing clockwise until the bayonet connection latches.

5.3 Interfaces



Note:
If there is no activation via one of the interfaces described below, the unit is operated at its maximum rated speed.

5.3.1 Speed control

The speed of the EC fan-and-filter units can be controlled via an external 0-10 V DC or PWM signal. Either Rittal control units (3235.450 or 3235.460) or an exter-

nal signal source can be used for this purpose. Activation options, see fig. 21 and fig. 22.

- Use a screwdriver to open the terminal and insert the connection cable of the control line in accordance with the wiring diagram on page 19 and page 20 (conductor cross-section 0.8 – 1.5 mm², fine-wire).
- Remove the screwdriver.

5.3.2 Speed output

EC fan-and-filter units offer the option of querying the current fan speed via a tachometer signal. In conjunction with the Rittal control unit (3235.460), a setpoint / actual value comparison is performed to trigger an alarm signal in the event of a deviation. The signal can also be processed in an external evaluation unit.

- Connect an appropriate connection cable to the "Speed" terminal on the signal terminal (wiring diagram, see fig. 23 on page 20).
- Whereby, observe the following notes:
 - The applied voltage can be between 5 V and 24 V.
 - The pull-up resistor must be dimensioned so that the maximum current does not exceed 10 mA.
 - Typical values would be, for example, 5 V DC or 24 V DC with a 10 kΩ pull-up resistor.
 - The level difference between High and Low then results from the ratio of the two resistors and the applied voltage.

5.3.3 Alarm relay

Status messages of the EC fan-and-filter unit can be output to an external signal source via a potential-free relay output.

The relay output is NC (Normally Closed) in the de-energised state. The alarm relay opens when voltage is applied to the fan-and-filter unit. The alarm relay picks up and closes the contact when a status message occurs or the power supply is interrupted.

- Connect an appropriate connection cable to the "NC" and "COM" terminals on the screwless spring terminal strip (see wiring diagram on page 18).

5.3.4 ModBus

The EC fan-and-filter units are equipped with an RS485 interface with which they can be interconnected with the customer's monitoring, energy management and/or higher-level systems via the ModBus RTU communication protocol.

This can be done via the Rittal IoT interface (3124.300) to which up to 8 EC fan-and-filter units can be connected. The interface can be used to activate the following exclusive functions on the EC fan-and-filter unit:

- Emergency cooling mode: In the event of an abnormal temperature increase in the enclosure, the EC fan-and-filter unit temporarily releases additional air throughput to prevent or delay overheating of the enclosure components. The protection category can be reduced in this mode.

- Automatic filter cleaning: Automatic filter cleaning can be activated to extend the filter maintenance interval. Whereby, the fan reverses the air flow direction briefly in periodic cycles to blow the filter free. This allows the maintenance interval to be extended by up to +20%.
- Filter maintenance indicator: The filter maintenance indicator can be activated to include filter change times in the service schedules in a customised and pre-planned manner. Whereby, the operating hours of the fan are weighted according to its speed and thus the actual filter operating time determined. This shows the remaining operating time of the filter.

All further information on connecting to the IoT interface (Model No. 3124.300) can be found in the appropriate guide.

Alternatively, the Modbus protocol can also be integrated directly by the customer. For this purpose, a Modbus specification can be downloaded from the Rittal homepage.

5.4 Changing the direction of airflow

The direction of airflow blows into the enclosure from the outside as standard.

Should it become necessary to change the direction of airflow for technical reasons (space, specific component air routing etc.), this is easily achieved.

- Unlock the bayonet connection and detach the fan housing from the filter box.

This is done in the same way as described in section 5.2 "Rotating the voltage connection", page 8.

- Turn the fan housing by 180°.

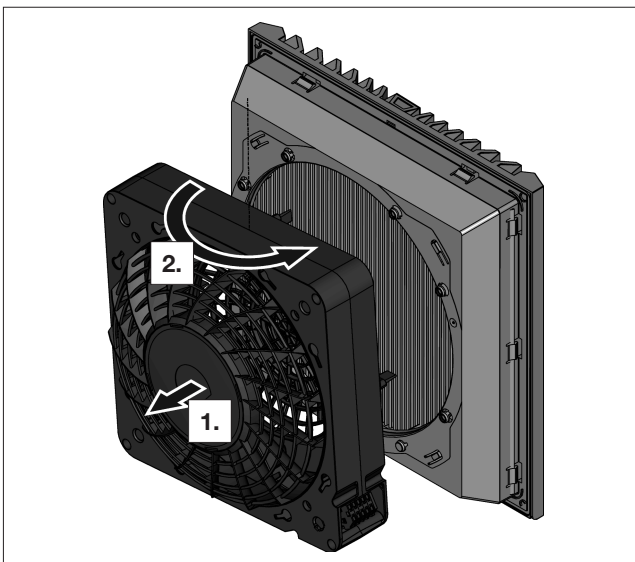


Fig. 10: Changing the direction of airflow

- Place the fan housing back on the filter box in this position and lock the bayonet connection.

This is done in the same way as described in section 5.2 "Rotating the voltage connection", page 8.

- Please also observe the instructions outlined under section 4.2.1 "General", page 6.



Note:

If the direction of airflow is changed, the fan-and-filter unit blows air out of the enclosure.

- In this case, ensure that the fan-and-filter unit can draw sufficient air freely through the outlet filter(s).

Otherwise there is a risk of an air short-circuit and, in the event of exposure to water, of water droplets being drawn into the enclosure.

6 Commissioning

The EC fan-and-filter unit operates automatically, in other words, the fan will start up once the power has been switched on.

7 Installing and changing the filter

The EC fan-and-filter unit and outlet filter are supplied as standard with a pleated filter for pre-filtering dry coarse dust and lint in the ambient air.



Note:

A chopped-fibre filter is installed as standard for the EMC fan- and-filter units.

The filter should be checked at regular intervals in accordance with the level of dust exposure (recommended: At the latest after 2,000 operating hours) and replaced as necessary.



Note:

Use only original Rittal filters which bear the Rittal logo in order to safeguard the designated protection category, air throughout and operating approvals.

The pleated filter supplied for the EC fan-and-filter unit must be removed and disposed of when a chopped-fibre filter is deployed.



Risk of injury!

Only change the filter mat while the fan rotor is stationary.

Never insert your fingers into the fan rotor. Filter installation or replacement only when de-energised.

To insert or replace the filter, proceed as follows (direction of airflow: Drawing from outside and blowing into the enclosure).

7.1 Replacing the pleated filter

- To unlock the louvred grille, press the function logo from above (see fig. 14).
- Fold the louvred grille down to an angle of approx. 90°.
- Remove the soiled pleated filter or the soiled chopped-fibre filter mat.
- Place the pleated filter in the louvred grille. The "Top" logo indicates the insertion direction (see fig. 11).

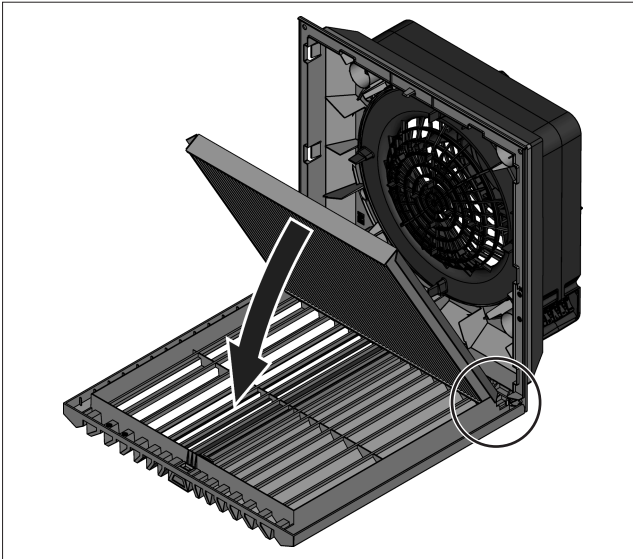


Fig. 11: Installing the IP54 pleated filter

- To seal properly, ensure that the side tabs of the pleated filter are placed over the ribs of the louvred grille.

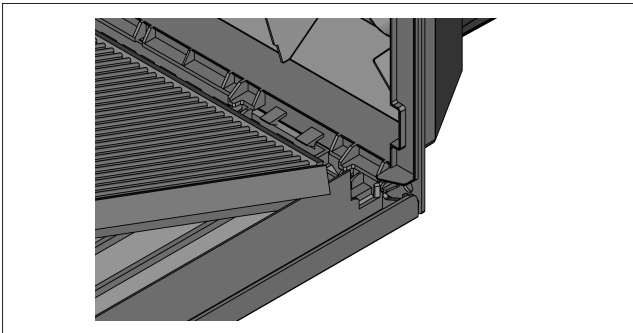


Fig. 12: Positioning of the side tabs

- For IP55 only: Place the IP55 absorber mat supplied with the pleated filters on the previously placed pleated filter (see fig. 13). The installation direction of the absorber is not critical.

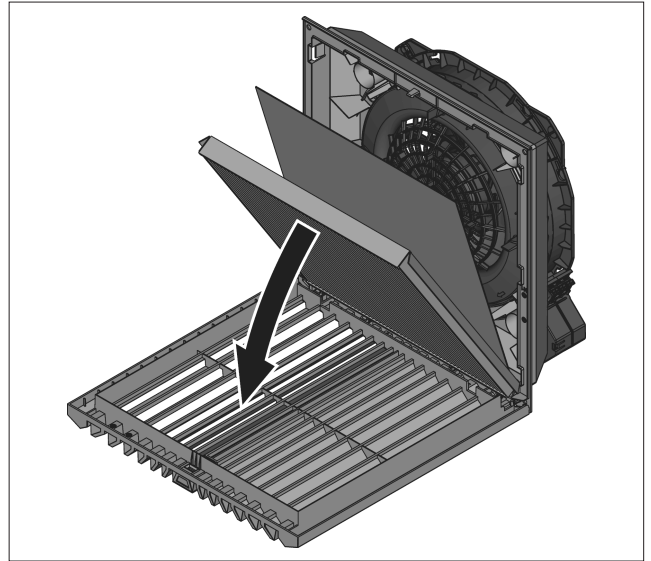


Fig. 13: Installing the IP55 pleated filter

- Now push the louvred grille back onto the enclosure until it snaps audibly into position.

7.2 Replacing the chopped-fibre filter

- To unlock the louvred grille, press the function logo from above (see fig. 14).

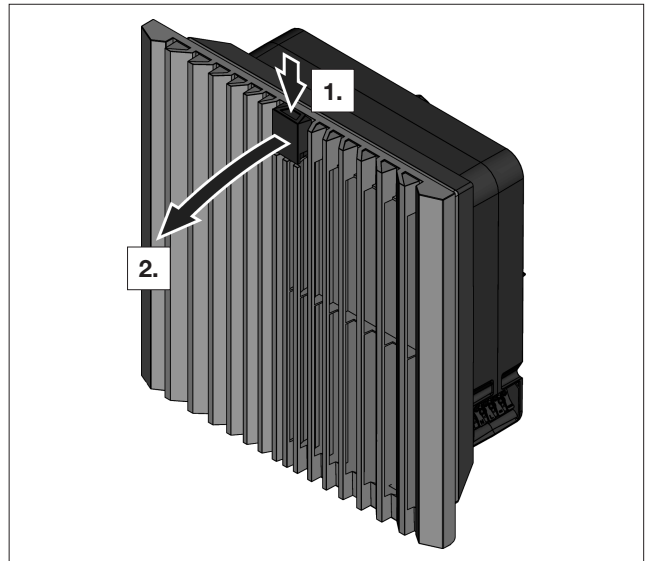


Fig. 14: Unlocking the louvred grille

- Fold the louvred grille down to an angle of approx. 90°.
- Remove the soiled pleated filter or the soiled chopped-fibre filter mat.
- Place a new chopped-fibre filter mat in the filter housing.

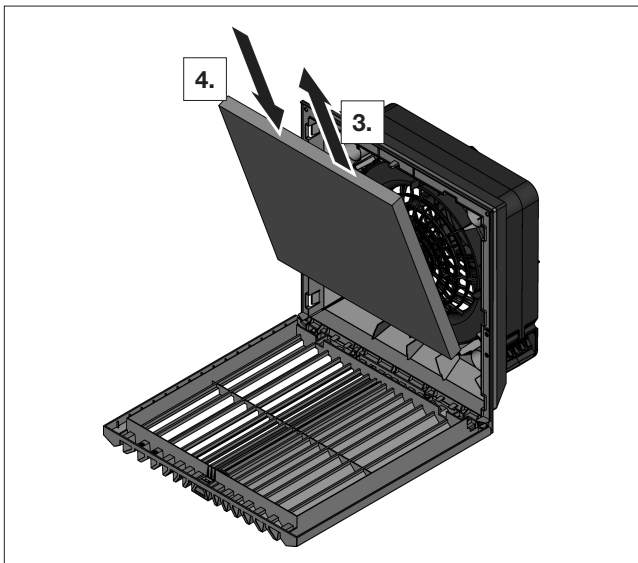


Fig. 15: Removing or inserting a chopped-fibre filter mat

- When installing, ensure that the roughened side with the Rittal logo points inside.



Note:
If it becomes necessary to change the direction of the airflow (see section 5.4 "Changing the direction of airflow", page 10), the installation is reversed accordingly.

- Now fold the louvred grille back onto the housing until it latches audibly.

8 Inspection and maintenance



Risk of electric shock!
The unit is live.
Switch off the power supply before opening, and take suitable precautions against it being accidentally switched back on.

The built-in, maintenance-free fan is mounted on a ball bearing and is protected against humidity and dust, and equipped with a temperature monitor.

The life expectancy is at least 40,000 operating hours (L10, 40 °C). The EC fan-and-filter unit is thus largely maintenance free.

From time to time, the components may need to be cleaned using a vacuum cleaner or compressed air if they become visibly dirty.

Any stubborn, oily stains may be removed using a non-flammable detergent, such as degreaser.



Caution!
Risk of fire!
Never use flammable liquids for cleaning.

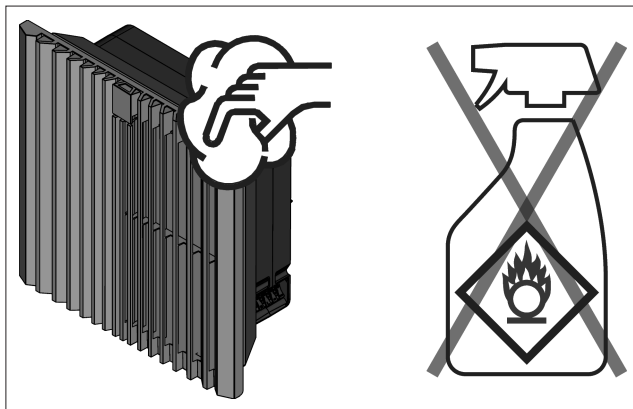


Fig. 16: Cleaning

Sequence of maintenance measures:

- Check the level of dirt.
- Filter soiling?
Replace the filter.
- Fan membranes soiled?
Clean.
- Check the noise generation of the fan.
- Compressed air cleaning

9 Storage and disposal



Note:
Risk of damage!
The EC fan unit must not be stored at temperatures above +70 °C or below -25 °C.

Disposal can be performed at the Rittal plant.

- Please contact us for advice.

10 Technical specifications

■ Observe the mains connection data (voltage and frequency) as per the rating plate.

■ Observe the pre-fuse as per the specifications on the rating plate.

	Unit	Model No.			
Fan-and-filter unit RAL 7035		3240.900	3241.900	3243.900	3244.900
Fan-and-filter unit RAL 9005		-	-	-	-
EMC fan-and-filter unit RAL 7035		-	-	-	-
Electrical specifications					
Rated operating voltage	V Hz	100–240, 50/60			
Rated current max.	A	0.2	0.3	0.88	1.97
Tolerance rated operating voltage	%	±10			
Power consumption	W	13.4	19.8	55.1	116.4
Pre-fuse T	A	6			
Rated insulation voltage (Ui)	V	240			
Rated impulse withstand voltage (Uimp)	kV	2.5	2.5	2.5	2.5
Interfaces		0–10 V / PWM input, Speed output, Potential-free fault signal contact, RS485 (ModBus)			
Air throughputs (further information can be found in the characteristic curves on the Rittal homepage)					
Unimpeded airflow with chopped-fibre filter	m³/h	175	225	540	700
With outlet filter including chopped-fibre filter	m³/h	130	173	444	535
Unimpeded airflow with pleated filter	m³/h	218	272	625	867
With outlet filter including pleated filter	m³/h	188	240	565	715
Increased air throughput in emergency cooling mode		+32%	+18%	+41%	+16%
Electromagnetic compatibility					
Immunity to interference		EN 61 000-6-2			
Emitted interference		EN 61 000-6-3			
Other					
Weight (net)	kg	1.77	2.6	3.1	
Fan		Diagonal, EC motor			
Fan bearing		Ball bearing			
Noise pressure level	dB (A)	48	54	65	66
Operating temperature	°C	-25...+55			
Storage temperature	°C	-25...+70			
Protection category (to IEC 60 529)		IP54 with pleated filter (standard) IP54 with chopped-fibre filter IP55 with pleated filter and absorber mat IP56 with hose-proof hood			
Protection category (according to NEMA)		NEMA 12 with pleated filter (standard) or chopped-fibre filter NEMA 3, 3R, 4, 4X with hose-proof hood			
Outlet filter					
RAL 7035		3240.300	3243.300		
RAL 9005		3240.308	3243.308		
EMC RAL 7035		3240.400	3243.400		

Tab. 2: Technical specifications

Technical modifications reserved.

Technical specifications

EN

	Unit	Model No.	
Fan-and-filter unit RAL 7035		3245.900	3245.910
Fan-and-filter unit RAL 9005		3245.908	3245.918
EMC fan-and-filter unit RAL 7035		3245.800	3245.810
Electrical specifications			
Rated operating voltage	V Hz	200–240, 50/60	100–130, 50/60
Rated current max.	A	1.38	2.52
Tolerance rated operating voltage	%	±10	
Power consumption	W	173.5	174.6
Pre-fuse T	A	6	
Rated insulation voltage (Ui)	V	240	130
Rated impulse withstand voltage (Uimp)	kV	2.5	1.5
Interfaces		0–10 V / PWM input, Speed output, Potential-free fault signal contact, RS485 (ModBus)	0–10 V / PWM input, Speed output
Air throughputs (further information can be found in the characteristic curves on the Rittal homepage)			
Unimpeded airflow with chopped-fibre filter	m ³ /h	931	
With outlet filter including chopped-fibre filter	m ³ /h	728	
Unimpeded airflow with pleated filter	m ³ /h	1161	
With outlet filter including pleated filter	m ³ /h	969	
Increased air throughput in emergency cooling mode		–	–
Electromagnetic compatibility			
Immunity to interference		EN 61 000-6-2	
Emitted interference		EN 61 000-6-3	
Other			
Weight (net)	kg	3.1	3.2
Fan		Diagonal, EC motor	
Fan bearing		Ball bearing	
Noise pressure level	dB (A)	72	
Operating temperature	°C	-25...+55	
Storage temperature	°C	-25...+70	
Protection category (to IEC 60 529)		IP51 with pleated filter (standard) IP51 mit with chopped-fibre filter IP52 with pleated filter and absorber mat IP56 with hose-proof hood	
Protection category (according to NEMA)		NEMA 12 with pleated filter (standard) or chopped-fibre filter NEMA 3, 3R, 4, 4X with hose-proof hood	
Outlet filter			
RAL 7035		3243.300	
RAL 9005		3243.308	
EMC RAL 7035		3243.400	

Tab. 3: Technical specifications

Technical modifications reserved.

11 Cut-out/drilling dimensions

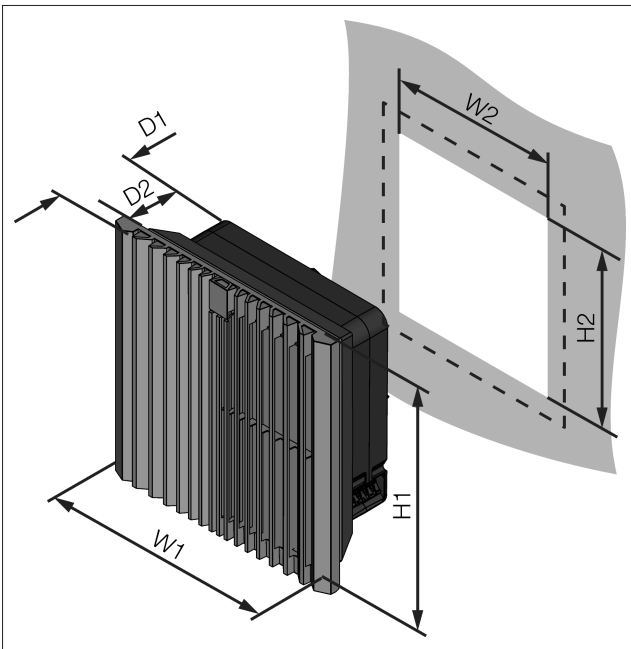


Fig. 17: Cut-out dimensions

Model No.	W1 x H1 mm	D1 mm	W2 x H2 mm	D2 mm
3240.900	255 x 255	137.5	224 x 224	116.5
3241.900	255 x 255	137.5	224 x 224	116.5
3243.900	323 x 323	156.5	292 x 292	136.5
3244.900	323 x 323	161	292 x 292	141
3245.x0x	323 x 323	161	292 x 292	141
3245.x1x	323 x 323	156	292 x 292	136

Tab. 4: Cut-out dimensions

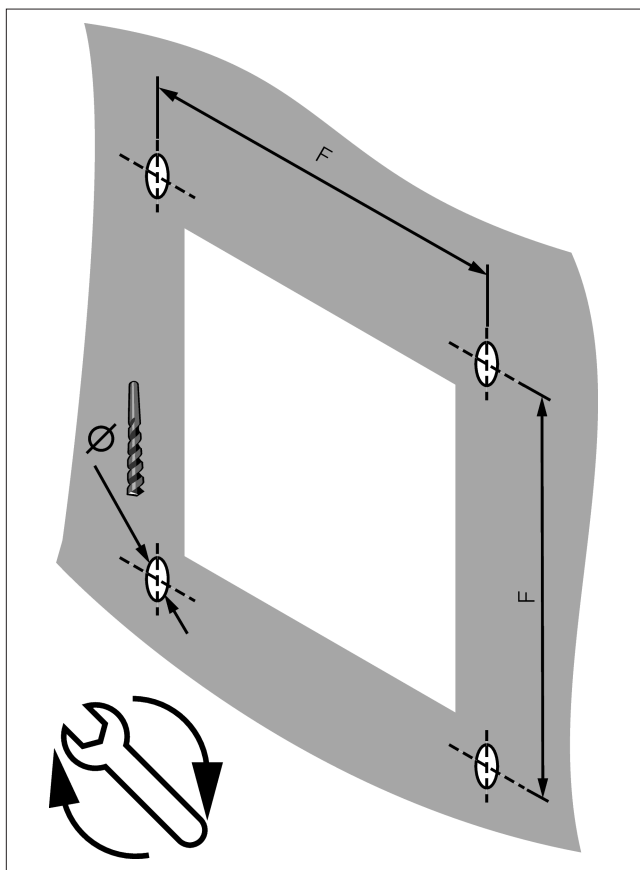



Fig. 18: Drilling pattern



Note:
The cut-out must be increased by 1 mm each side for wall thickness above 2.5 mm (see accompanying drilling template).

Model No.	Ø mm	F mm	 Nm
3240.xxx	4.5	234	2
3241.xxx	4.5	234	2
3243.xxx	4.5	302	3
3244.xxx	4.5	302	3
3245.xxx	4.5	302	3

Tab. 5: Drilling dimensions

12 EMC fan/outlet filter

To achieve EMC protection, the EMC fans and EMC outlet filters should be snapped into the mounting cut-out and screw-fastened using the screws supplied. Next, the four contact foils should be stuck on allround between the EC fan-and-filter unit and the inside of the enclosure as shown in the following illustration.

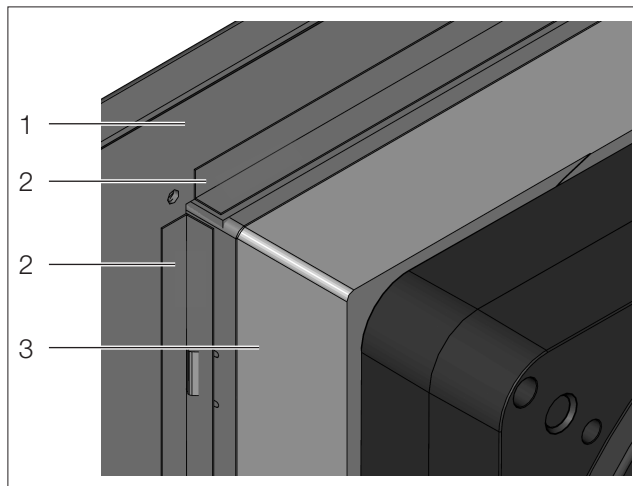


Fig. 19: EMC contact foils

Key

- 1 Enclosure interior
- 2 EMC contact foils
- 3 Fan housing



Note:
EMC protection can only be guaranteed when using original Rittal EMC filter media (Model no. 3243.066).

13 Accessories

EMC filter mat

To fit Model No.	Filter class in accordance with DIN EN 779	In accordance with ISO 16890	Packs of	Model No.
3245.xxx	G3	ISO coarse 50%	5 pc(s).	3243.066

Tab. 6: EMC filter mat

Chopped-fibre filter mat for EC fan-and-filter unit

To fit Model No.	Filter class in accordance with DIN EN 779	In accordance with ISO 16890	Packs of	Model No.
3240.xxx/3241.xxx	G3	ISO coarse 50%	5 pc(s).	3172.100
3243.xxx/3244.xxx/3245.xxx	G3	ISO coarse 50%	5 pc(s).	3173.100

Tab. 7: Chopped-fibre filter mat for EC fan-and-filter unit

IP54 pleated filter for EC fan-and-filter unit

To fit Model No.	Filter class in accordance with DIN EN 779	In accordance with ISO 16890	Packs of	Model No.
3240.xxx/3241.xxx	G4	ISO coarse 70%	5 pc(s).	3172.120
3243.xxx/3244.xxx/3245.xxx	G4	ISO coarse 70%	5 pc(s).	3173.120

Tab. 8: IP54 pleated filter for EC fan-and-filter unit

IP55 pleated filter for EC fan-and-filter unit

To fit Model No.	Filter class in accordance with DIN EN 779	In accordance with ISO 16890	Packs of	Model No.
3240.xxx/3241.xxx	G4	ISO ePM10 55%	5 pc(s).	3182.125
3243.xxx/3244.xxx/3245.xxx	G4	ISO ePM10 55%	5 pc(s).	3183.125

Tab. 9: IP55 pleated filter for EC fan-and-filter unit

Blanking cover for EC fan-and-filter unit / outlet filter

To fit Model No.	IP protection category in accordance with IEC 60529	Packs of	Model No.
3240.xxx/3241.xxx	IP54	2 pc(s).	3240.020
3243.xxx/3244.xxx/3245.xxx	IP54	2 pc(s).	3243.020

Tab. 10: Blanking cover for EC fan-and-filter unit / outlet filter

Hose-proof hoods

To fit Model No.	W x H x D mm	Protection category	Packs of	Model No.
3240.xxx/3241.xxx	282 x 390 x 85	NEMA 1, NEMA 12, NEMA 3, NEMA 3R, NEMA 4, NEMA 4X	1 pc(s).	3240.080
3243.xxx/3244.xxx/3245.xxx	350 x 480 x 110	NEMA 1, NEMA 12, NEMA 3, NEMA 3R, NEMA 4, NEMA 4X	1 pc(s).	3243.080

Tab. 11: Hose-proof hoods

Connection diagrams

EN

Safety clip

To fit Model No.	Packs of	Model No.
3240.xxx/3241.xxx/3243.xxx/3244.xxx/3245.xxx	10 pc(s).	3201.941

Tab. 12: Safety clip

14 Connection diagrams

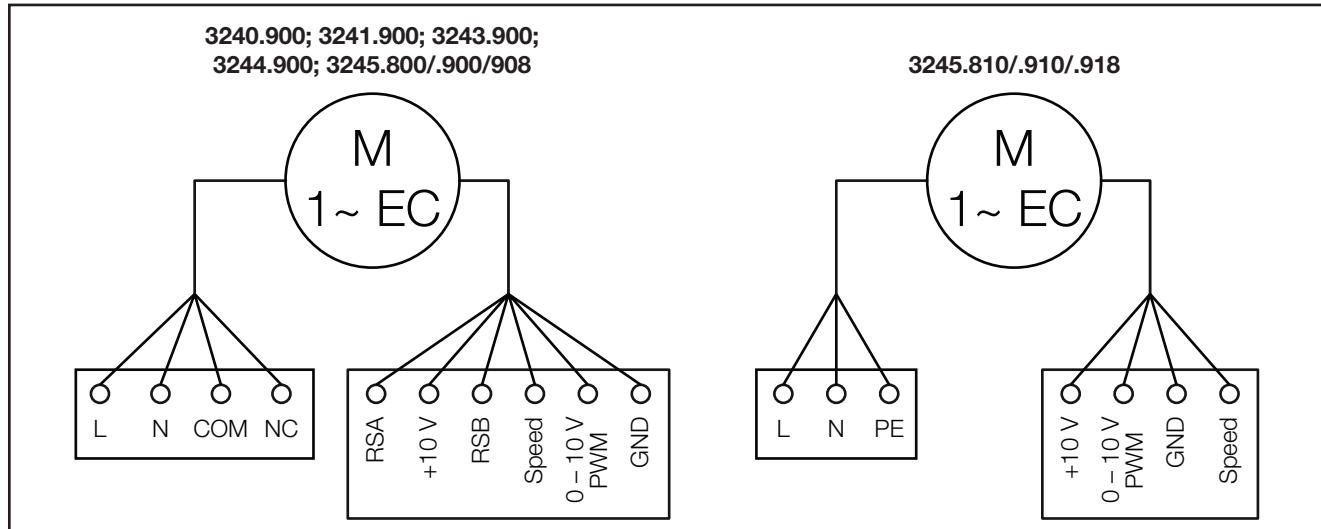


Fig. 20: Connection diagrams

Connection	Function/Assignment
Voltage supply/alarm relay terminal	
L	Supply voltage, phase, voltage range, see rating plate
N	Supply voltage, neutral conductor, voltage range, see rating plate
COM	Alarm relay, potential-free fault signalling contact, common connection, contact load 250 V AC/30 V DC 2 A, minimum contact load 10 mA, reinforced insulation to the signal interface
NC	Alarm relay, potential-free fault signalling contact, normally closed for fault, contact load 250 V AC/30 V DC 2 A, minimum contact load 10 mA, reinforced insulation to the signal interface
Signal terminal	
GND	Reference ground to control interface, SELV
0 – 10 V /	Analogue input (setpoint), 0 – 10 V, $R_i = 100 \text{ k}\Omega$
PWM	PWM: $U_{min} = 0 \text{ V}$, $U_{max} = 10 \text{ V}$, $f_{min} = 1 \text{ kHz}$, $f_{max} = 10 \text{ kHz}$, SELV
Speed	Speed output: Open collector, 1 pulse per revolution, SELV
RSB	RS485 interface for ModBus, RSB, SELV
+10 V	Fixed voltage output 10 V DC, $+10 \text{ V} \pm 3\%$, max. 10 mA, permanently short-circuit proof, supply voltage for ext. units (e.g potentiometer), SELV
RSA	RS485 interface for ModBus, RSA, SELV

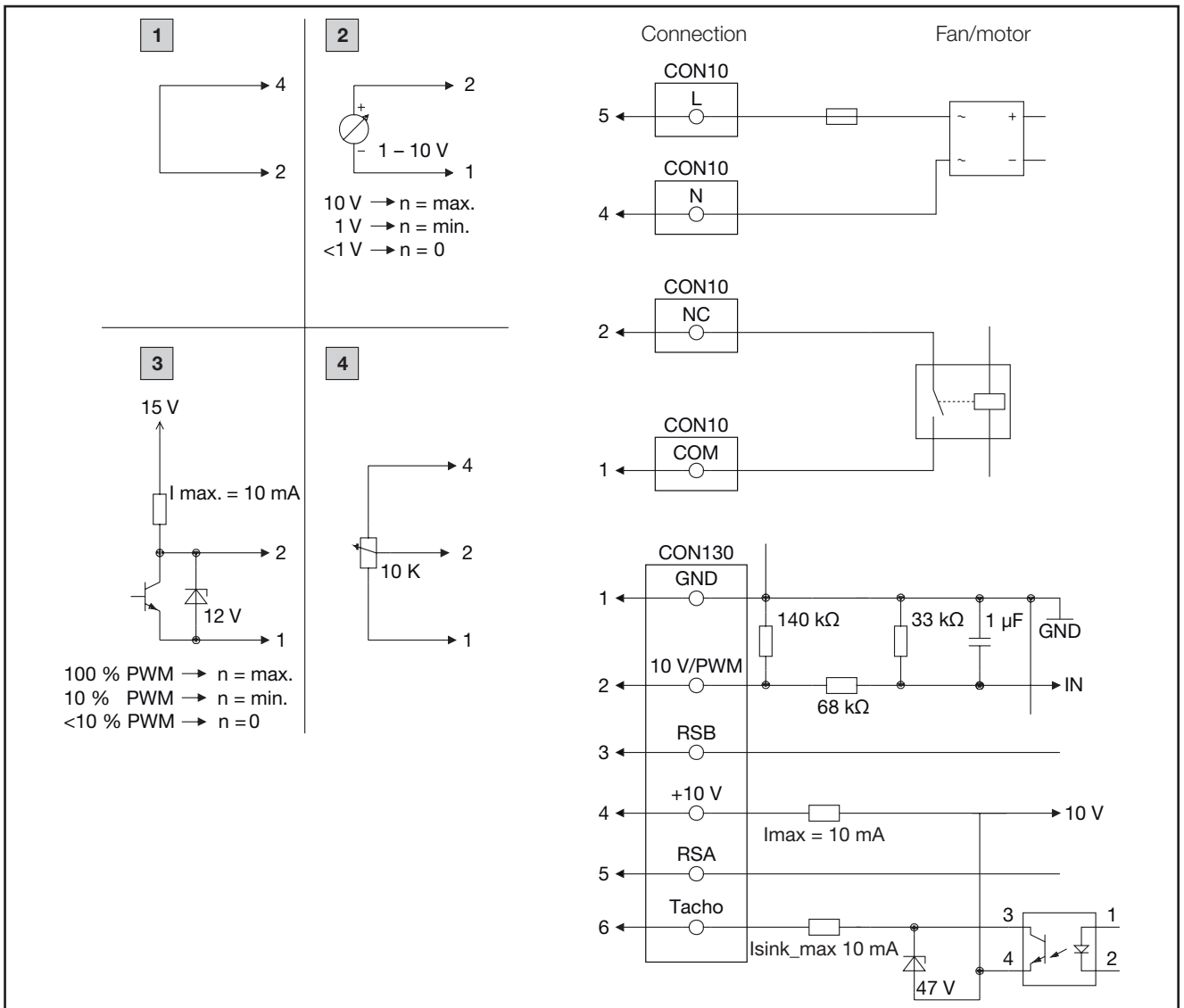


Fig. 21: Connection diagram 3240.900; 3241.900; 3243.900; 3244.900; 3245.800/.900/908

- 1** Max. speed / when CON130 not connected or:
- 2** Adjustable speed
- 3** Adjustable speed via PWM 1 – 10 kHz
- 4** Adjustable speed via potentiometer

Connection diagrams

EN

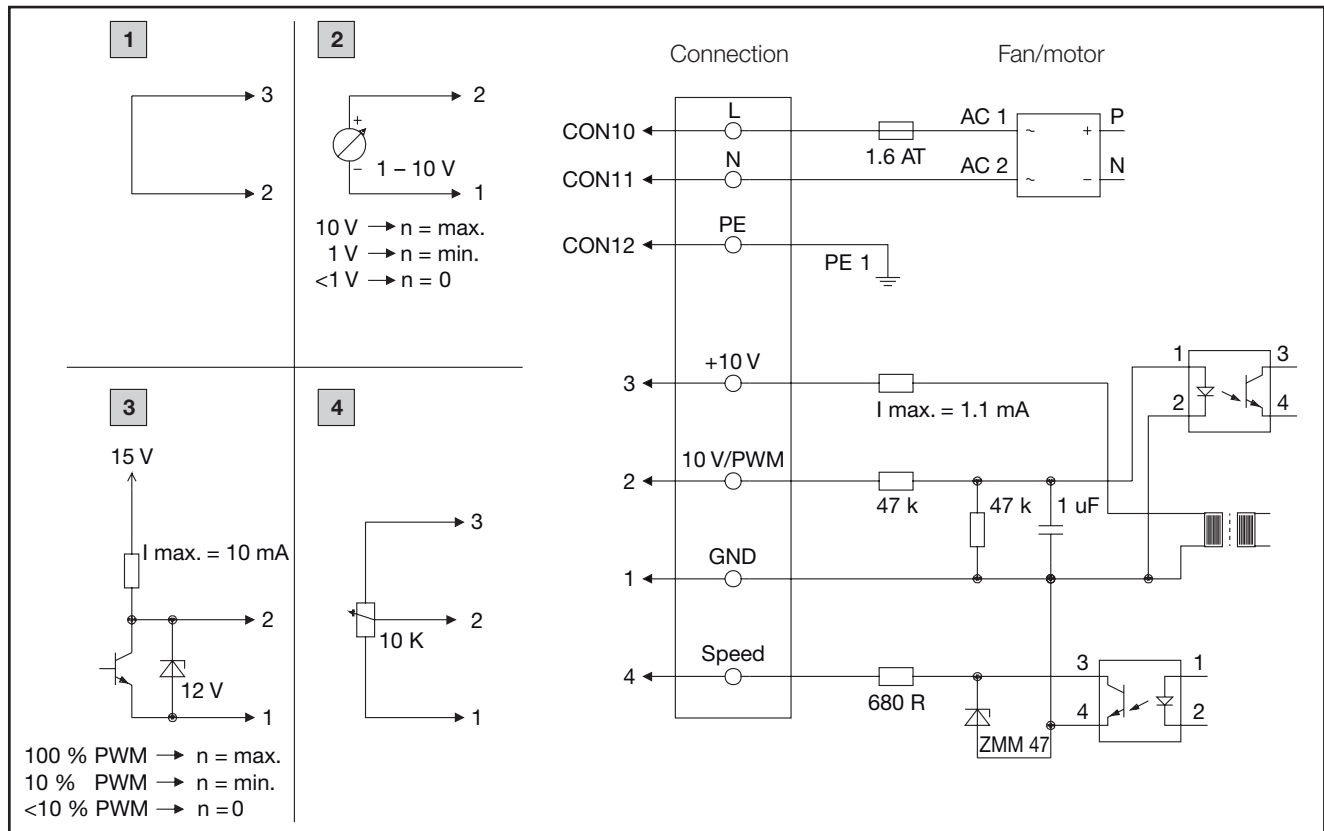


Fig. 22: Connection diagram 3245.810/910/918

- 1** Max. speed (as delivered)
- 2** Adjustable speed
- 3** Adjustable speed via PWM 1 – 10 kHz
- 4** Adjustable speed via potentiometer

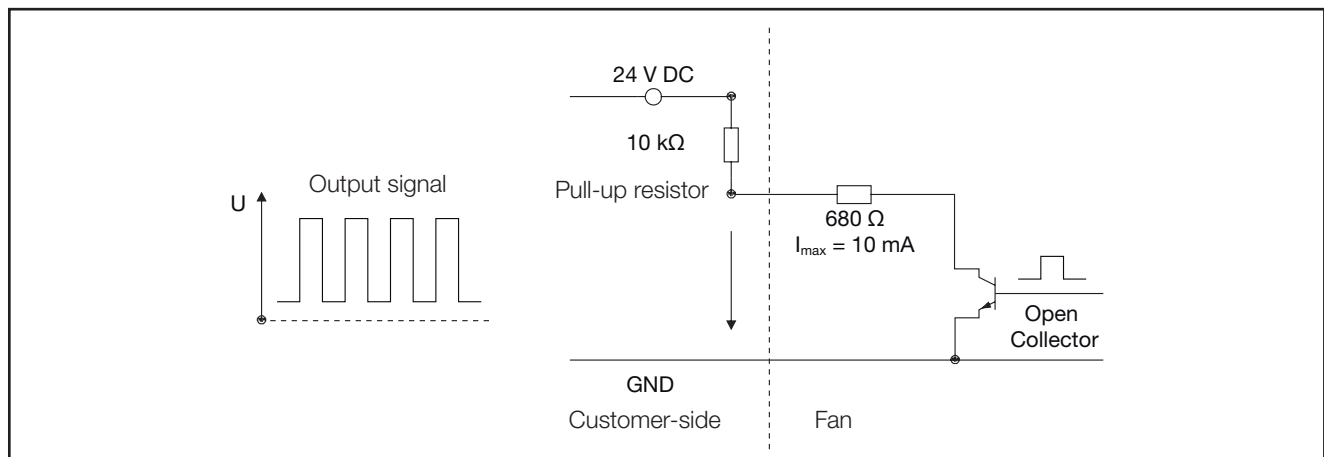


Fig. 23: Connection diagram speed output

15 Declaration of conformity

Vereinfachte EU-Konformitätserklärung / Simplified EU Declaration of Conformity



Wir, / We,

Rittal GmbH & Co. KG • Auf dem Stützelberg • 35745 Herborn

Erklären, dass die Produkte / declare that the products

Serienbezeichnung:
Serial name:

**Filterlüfter
Fan-and-Filter Unit**

Handelsbezeichnung:
Commercial part no.:

SK 3238.700	SK 3238.708	SK 3238.710	SK 3238.718	SK 3238.800	SK 3238.810
SK 3239.700	SK 3239.708	SK 3239.710	SK 3239.718	SK 3239.800	SK 3239.810
SK 3240.700	SK 3240.708	SK 3240.710	SK 3240.718	SK 3240.800	SK 3240.810
SK 3240.900	SK 3241.700	SK 3241.708	SK 3241.710	SK 3241.718	SK 3241.800
SK 3241.810	SK 3241.900	SK 3243.700	SK 3243.708	SK 3243.710	SK 3243.718
SK 3243.800	SK 3243.810	SK 3243.900	SK 3244.700	SK 3244.708	SK 3244.710
SK 3244.718	SK 3244.740	SK 3244.800	SK 3244.810	SK 3244.900	SK 3245.800
SK 3245.810	SK 3245.900	SK 3245.908	SK 3245.910	SK 3245.918	

folgender Richtlinie entsprechen: / conform to the following Directive

2006/42/EC Machinery Directive

Weitere Richtlinien: / Additional Directives:

**2011/65/EU Hazardous Substances Directive (RoHS)
2014/30/EU EMC Directive**

Verantwortlich für Dokumentation
Responsible for documentation

Rittal GmbH & Co. KG
Auf dem Stützelberg
35745 Herborn



Notes

A large grid of graph paper for taking notes, consisting of 20 columns and 30 rows of small squares.

A large grid of graph paper for taking notes, consisting of 20 columns and 30 rows of small squares.

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