



CONNECT AND PROTECT

Air Filtered Fans

03/2022

Climate control – Air filtered fan

OVERVIEW

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Simple to fit without tools by clipping in (can also be bolted)



01108015

Easy tool-less change of filter mat



01108016

Fluted filter to increase degree of ingress protection from IP 54 to IP 55



01108013

Easy tool-less wiring with spring clamp connector

Climate control – Air filtered fan

OVERVIEW

AIR FILTERED FANS, INGRESS PROTECTION FROM IP 54 TO IP 55 IN ACCORDANCE WITH IEC 60529

- Simple to fit without tools by clipping in (can also be bolted)
- Easy conversion from pressure to suction operation
- Easy tool-less change of filter mat
- 7 performance classes with 6 different assembly dimensions



Air filtered fans

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AIR FILTERED FANS

- Airflow capacity of 25 m³/h ... 770 m³/h (FL 100 ... FL 600)
- 3 supply voltages (230 V_{AC}, 115 V_{AC}, 24 V_{DC})
- Outlet/inlet filter
- Fluted filter to increase degree of ingress protection from IP 54 to IP 55
- Side by side mounting of several air filtered fans is possible



Outlet/inlet filters

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Fluted filters

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SERVICEPLUS

- e.g. special colours
- e.g. other cabinet dimensions
- e.g. EMC solutions
- e.g. custom solutions

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Air filtered fans
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Climate control – Air filtered fans

AIR FILTERED FAN CALCULATIONS



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To establish the size of the air-filtered fan required, calculate the air throughput necessary to dissipate the amount of heat contained in the cabinet. The necessary airflow volume (at sea level) is calculated thus:

$$V = f \times (P_V - P_S) / \Delta T \text{ with}$$

V = airflow volume

f = air constant = 3.3 m³ K/Wh

P_V = thermal power loss

(sum of heat emitted by the equipment in the cabinet)

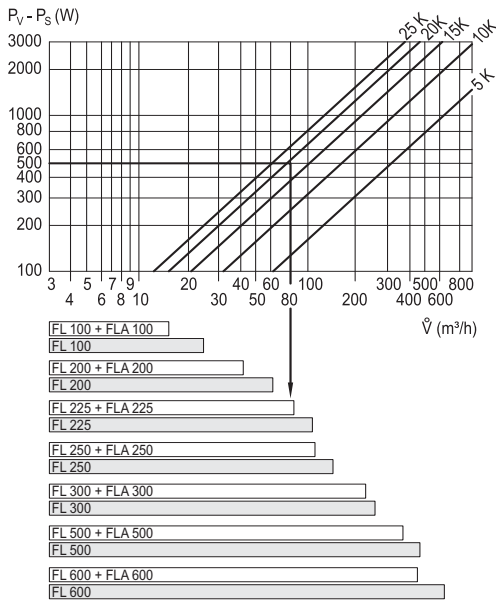
P_S = radiant power

(heat that is radiated from the cabinet without additional ventilation)

ΔT = temperature difference between the air drawn in (ambient temperature T_u) and the exhaust air (internal cabinet temperature T_i),

$$\Delta T = T_i - T_u$$

READING EXAMPLE



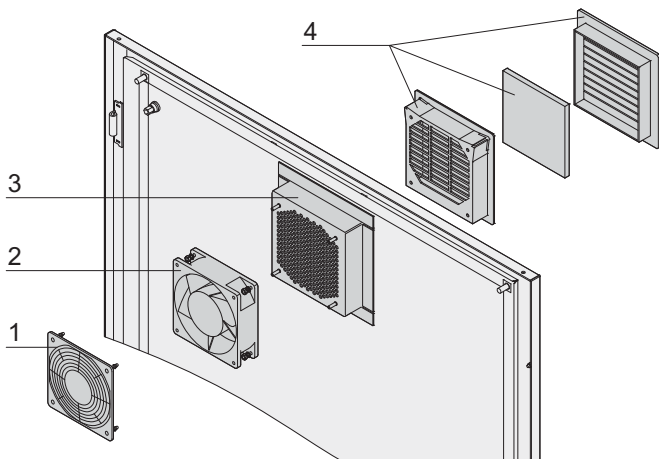
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The devices in the cabinet produce e.g. a power loss of 840 W. Of these 840 W, the cabinet releases 340 W to the environment via its surfaces. The air sucked in from outside the cabinet has a temperature of 20 °C. A maximum temperature of 40 °C is to be permitted in the cabinet.

So which air filtered fan should be employed?

- $P_V = 840 \text{ W}$, $P_S = 340 \text{ W}$, read-off point $P_V - P_S = 500 \text{ W}$
- $\Delta T = T_i - T_a = 40 \text{ °C} - 20 \text{ °C} = 20 \text{ °C} = 20 \text{ K}$
- On the characteristic for 20 K we obtain, at $P_V - P_S = 500 \text{ W}$, a minimum necessary airflow volume of $V = 80 \text{ m}^3/\text{h}$.
- An FL 250 air filtered fan should be used that gives an airflow volume of 131 m³/h or, if used in combination with the FLA 250 exhaust filter, of 95 m³/h.

EMC SOLUTIONS



- EMC shielding in accordance with your requirements
- Customised developments

DELIVERY COMPRISES

Item	Description
1	Protective fan grille
2	Fan
3	EMC hood
4	FLA outlet/inlet filter

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Climate control – Air filtered fans

AIR FILTERED FAN FL 100



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- Airflow volume 19 m³/h
- Converts simply from push to pull operation
- Ingress protection IP 54, NEMA type 12
- Simple to fit without tools by clipping in



DELIVERY COMPRISES (completely assembled)

Item	Qty	Description
1	1	Front grille and case, plastic, ABS, RAL 7035, self-extinguishing, UL 94 V-0
2	1	Filter, filter class G 3 (EN 779)
3	1	Fan
4	1	2 wire connection, length 310 mm

ORDER INFORMATION

Description	24 V _{DC} Part no.	115 V _{AC} Part no.	230 V _{AC} Part no.
Air filtered fan FL 100	EF100-24R5	EF100-115R5	EF100R5
Air outlet/inlet filter FLA 100 (items 1 + 2 included), 1 piece			EFA100R5
Replacement filter IP 54 for FL 100 and FLA 100, filter class G 3 (EN 779), PU 5 pieces			EFM100

TECHNICAL DATA

Voltage	230 VAC	115 VAC	24 VDC
Frequency	50/60 Hz	50/60 Hz	DC
Airflow volume with filter (free blowing)	19/24 m ³ /h	19/24 m ³ /h	19 m ³ /h
Combination FL + FLA	12/14 m ³ /h	12/14 m ³ /h	12 m ³ /h
Max. static pressure	38 Pa	38 Pa	38 Pa
Noise level (in accordance with EN ISO 3741, 50 Hz)	33 dB(A)	33 dB(A)	33 dB(A)
Operating temperatures	-15 ... +55 °C	-15 ... +55 °C	-15 ... +55 °C
Power consumption	12/11 W	12/11 W	2.4 W
Filter efficiency	88 %	88 %	88 %
MTBF at 40 °C	52000 h	52000 h	70000 h
Approvals	CE, UL, cUL, GOST		

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Air outlet/inlet filter FLA 100

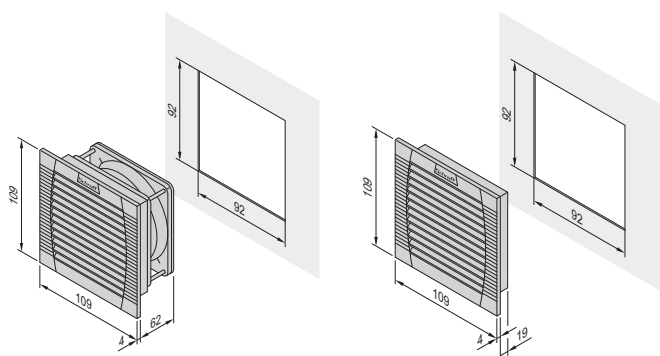


Replacement filter IP 54

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NOTE

- Mounting for sheet thicknesses from 1 to 3 mm
- Multiple fan solution on request
- Dimensions, cut-outs and tolerances see user manual



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Air outlet/inlet filter FLA 100

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Air filtered fan FL 100

Sheet thicknesses 1 ... 2 mm - cut-out 92 x 92 mm;
Sheet thicknesses >2 ... 3 mm - cut-out 93 x 93 mm

Climate control – Air filtered fans

AIR FILTERED FAN FL 200



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Air outlet/inlet filter FLA 200

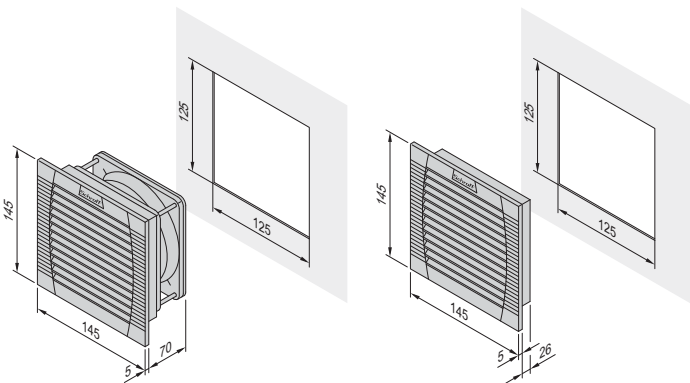
Fluted filter IP 55

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Replacement filter IP 54

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Air filtered fan FL 200

Air outlet/inlet filter FLA 200

Sheet thicknesses 1 ... 2 mm - cut-out 125 x 125 mm;
Sheet thicknesses >2 ... 3 mm - cut-out 126 x 126 mm

- Airflow volume 60 m³/h
- Converts simply from push to pull operation
- Ingress protection IP 54, with fluted filter IP 55, NEMA type 12
- Simple to fit without tools by clipping in (can also be bolted)



DELIVERY COMPRISES (Completely assembled)

Item	Qty	Description
1	1	Front grille and case, plastic, ABS, RAL 7035, self-extinguishing, UL 94 V-0
2	1	Filter, filter class G3 (EN 779)
3	1	Fan
4	1	Connection AC (terminal strip), connection DC (2 wires, 310 mm long)

ORDER INFORMATION

Description	24 V _{DC} Part no.	115 V _{AC} Part no.	230 V _{AC} Part no.
Air filtered fan FL 200	EF200-24R5	EF200-115R5	EF200R5
Air outlet/inlet filter FLA 200 (items 1 + 2 included), 1 piece			EFA200R5
Replacement filter IP 54 for FL 200 and FLA 200, filter class G 3 (EN 779), PU 5 pieces			EFM200
Fluted filter IP 55 for FL 200 and FLA 200, filter class G 4 (EN 779), PU 5 pieces			EFMP200

TECHNICAL DATA

Voltage	230 V _{AC}	115 V _{AC}	24 V _{DC}
Frequency	50/60 Hz	50/60 Hz	DC
Airflow volume with IP 54 filter (free blowing)	60/66 m ³ /h	60/66 m ³ /h	60 m ³ /h
Airflow volume with IP 55 filter (free blowing)	56/64 m ³ /h	56/64 m ³ /h	56 m ³ /h
Combination FL + FLA IP 54	38/42 m ³ /h	38/42 m ³ /h	38 m ³ /h
Combination FL + FLA IP 55	40/46 m ³ /h	40/46 m ³ /h	40 m ³ /h
Max. static pressure IP 54	60 Pa	60 Pa	60 Pa
Max. static pressure IP 55	57 Pa	57 Pa	61 Pa
Noise level in accordance with EN ISO 3741, 50 Hz)	44 dB(A)	44 dB(A)	44 dB(A)
Max. ambient temperature	15 ... +55 °C	-5 ... +55 °C	-25 ... +55 °C
Power consumption	19/18 W	19/18 W	5 W
Filter efficiency IP 54	83 %	83 %	83 %
Filter efficiency IP 55	91 %	91 %	91 %
MTBF at 40 °C	37000 h	37000 h	62000 h
Approvals	CE, UL, cUL, GOST		

NOTE

- Mounting for sheet thicknesses from 1 to 3 mm
- Multiple fan solution on request
- Dimensions, cut-outs and tolerances see user manual

Climate control – Air filtered fans

AIR FILTERED FAN FL 225



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- Airflow volume 98 m³/h
- Converts simply from push to pull operation
- Ingress protection IP 54, with fluted filter IP 55, NEMA type 12



DELIVERY COMPRISES (completely assembled)

Item	Qty	Description
1	1	Front grille and case, plastic, ABS, RAL 7035, self-extinguishing, UL 94 V-0
2	1	Filter, filter class G 3 (EN 779)
3	1	Fan
4	1	Connection AC (terminal block), DC (spring terminal strip)

ORDER INFORMATION

Description	115 V _{AC} Part no.	230 V _{AC} Part no.
Air filtered fan FL 225	EF220-115R5	EF220R5
Air outlet/inlet filter FLA 225 (items 1 + 2 included), 1 piece		EFA220R5
Replacement filter IP 54 for FL 225 and FLA 225, filter class G 3 (EN 779), PU 5 pieces		EFM220
Fluted filter IP 55 for FL 225 and FLA 225, filter class G 4 (EN 779), PU 5 pieces		EFMP220



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Air outlet/inlet filter FLA 225

Fluted filter IP 55



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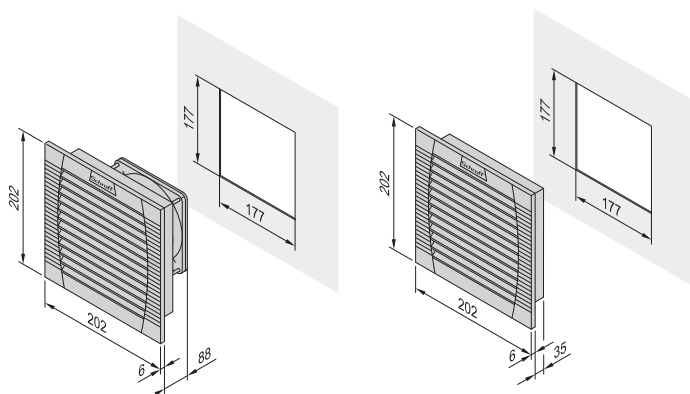
Replacement filter IP 54

TECHNICAL DATA

Voltage	230 VAC	115 VAC
Frequency	50/60 Hz	50/60 Hz
Airflow volume with IP 54 filter (free blowing)	98/108 m ³ /h	98/108 m ³ /h
Airflow volume with IP 55 filter (free blowing)	100/110 m ³ /h	100/110 m ³ /h
Combination FL + FLA IP 54	73/80 m ³ /h	73/80 m ³ /h
Combination FL + FLA IP 55	55/64 m ³ /h	55/64 m ³ /h
Max. static pressure IP 54	66 Pa	66 Pa
Max. static pressure IP 55	61 Pa	61 Pa
Noise level (in accordance with EN ISO 3741, 50 Hz)	40 dB(A)	40 dB(A)
Max. ambient temperature	-15 ... +55 °C	-15 ... +55 °C
Power consumption	19/18 W	19/18 W
Filter efficiency IP 54	88 %	88 %
Filter efficiency IP 55	91 %	91 %
MTBF at 40 °C	37000 h	37000 h
Approvals	CE, UL, cUL, GOST	

NOTE

- Mounting for sheet thicknesses from 1 to 3 mm
- Multiple fan solution on request
- Dimensions, cut-outs and tolerances see user manual



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Air filtered fan FL 225

Air outlet/inlet filter FLA 225

Sheet thicknesses 1 ... 2 mm - cut-out 177 x 177 mm;
Sheet thicknesses >2 ... 3 mm - cut-out 178 x 178 mm

Climate control – Air filtered fans

AIR FILTERED FAN FL 250



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- Airflow volume 125 m³/h
- Converts simply from push to pull operation
- Ingress protection IP 54, with fluted filter IP 55, NEMA type 12
- Simple to fit without tools by clipping in (can also be bolted)



DELIVERY COMPRISES (completely assembled)

Item	Qty	Description
1	1	Front grille and case, plastic, ABS, RAL 7035, self-extinguishing, UL 94 V-0
2	1	Filter, filter class G 3 (EN 779)
3	1	Fan
4	1	Connection spring terminal strip

ORDER INFORMATION

Description	115 V _{AC} Part no.	230 V _{AC} Part no.
Air filtered fan FL 250	EF250-115R5	EF250R5
Air outlet/inlet filter FLA 250/300 (items 1 + 2 included), 1 piece		EFA250-300R5
Replacement filter IP 54 for FL 250/300 and FLA 250/300, filter class G 3 (EN 779), PU 5 pieces		EFM250-300
Fluted filter IP 55 for FL 250/300 and FLA 250/300, filter class G 4 (EN 779), PU 5 pieces		EFMP250-300



Air outlet/inlet filter FLA 250/300



Fluted filter IP 55

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Replacement filter IP 54

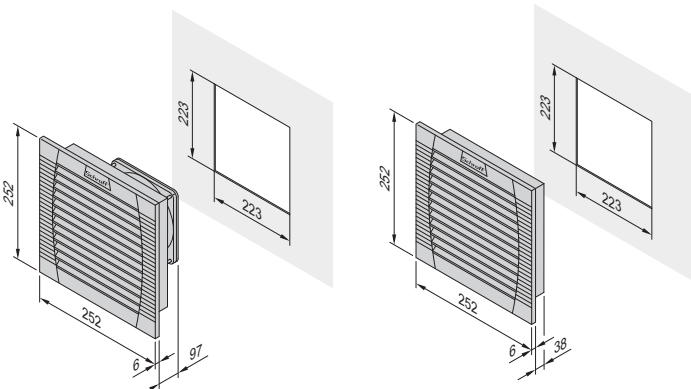
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TECHNICAL DATA

Voltage	230 VAC	115 VAC
Frequency	50/60 Hz	50/60 Hz
Airflow volume with IP 54 filter (free blowing)	125/138 m ³ /h	125/138 m ³ /h
Airflow volume with IP 55 filter (free blowing)	145/160 m ³ /h	145/160 m ³ /h
Combination FL + FLA IP 54	93/102 m ³ /h	93/102 m ³ /h
Combination FL + FLA IP 55	109/113 m ³ /h	109/113 m ³ /h
Max. static pressure IP 54	52 Pa	52 Pa
Max. static pressure IP 55	49 Pa	49 Pa
Noise level (in accordance with EN ISO 3741, 50 Hz)	40 dB(A)	40 dB(A)
Max. ambient temperature	-15 ... +55 °C	-15 ... +55 °C
Power consumption	18/17 W	18/17 W
Filter efficiency IP 54	88 %	88 %
Filter efficiency IP 55	91 %	91 %
MTBF at 40 °C	40000 h	40000 h
Approvals	CE, UL, cUL, GOST	

NOTE

- Mounting for sheet thicknesses from 1 to 3 mm
- Multiple fan solution on request
- Dimensions, cut-outs and tolerances see user manual



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Air filtered fan FL 250
Sheet thicknesses 1 ... 2 mm - cut-out 223 x 223 mm;
Sheet thicknesses >2 ... 3 mm - cut-out 224 x 224 mm

Air outlet/inlet filter FLA 250/300

Climate control – Air filtered fans

AIR FILTERED FAN FL 300



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- Airflow volume 223 m³/h
- Converts simply from push to pull operation
- Ingress protection IP 54, with fluted filter IP 55, NEMA type 12
- Simple to fit without tools by clipping in (can also be bolted)



DELIVERY COMPRISES (completely assembled)

Item	Qty	Description
1	1	Front grille and case, plastic ABS, RAL 7035, self-extinguishing, UL 94 V-0
2	1	Filter, filter class G 3 (EN 779)
3	1	Fan
4	1	Connection spring terminal strip

ORDER INFORMATION

Description	115 V _{AC} Part no.	230 V _{AC} Part no.
Air filtered fan FL 300	EF300-115R5	EF300R5
Air outlet/inlet filter FLA 250/300 (items 1 + 2 included), 1 piece		EFA250-300R5
Replacement filter IP 54 for FL 250/300 and FLA 250/300, filter class G 3 (EN 779), PU 5 pieces		EFM250-300
Fluted filter IP 55 for FL 250/300 and FLA 250/300, filter class G 4 (EN 779), PU 5 pieces		EFMP250-300



Air outlet/inlet filter FLA 250/300

Fluted filter IP 55

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Replacement filter IP 54

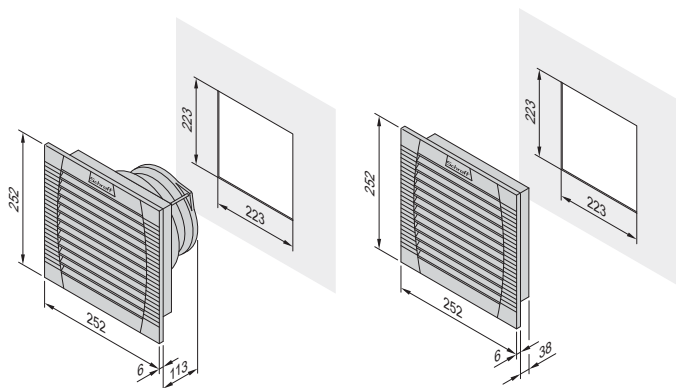
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TECHNICAL DATA

Voltage	230 VAC	115 VAC
Frequency	50/60 Hz	50/60 Hz
Airflow volume with IP 54 filter (free blowing)	223/247 m ³ /h	223/247 m ³ /h
Airflow volume with IP 55 filter (free blowing)	233/265 m ³ /h	233/265 m ³ /h
Combination FL + FLA IP 54	201/223 m ³ /h	201/223 m ³ /h
Combination FL + FLA IP 55	180/207 m ³ /h	180/207 m ³ /h
Max. static pressure IP 54	116 Pa	116 Pa
Max. static pressure IP 55	112 Pa	112 Pa
Noise level (in accordance with EN ISO 3741, 50 Hz)	42 dB(A)	42 dB(A)
Max. ambient temperature	-15 ... +55 °C	-15 ... +55 °C
Power consumption	45/39 W	50/45 W
Filter efficiency IP 54	88 %	88 %
Filter efficiency IP 55	91 %	91 %
MTBF at 40 °C	40000 h	40000 h
Approvals	CE, UL, cUL, GOST	

NOTE

- Mounting for sheet thicknesses from 1 to 3 mm
- Multiple fan solution on request
- Dimensions, cut-outs and tolerances see user manual



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Air filtered fan FL 300 Air outlet/inlet filter FLA 250/300
Sheet thicknesses 1 ... 2 mm - cut-out 223 x 223 mm;
Sheet thicknesses >2 ... 3 mm - cut-out 224 x 224 mm

Climate control – Air filtered fans

AIR FILTERED FAN FL 500



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- Airflow volume 480 m³/h
- Converts simply from push to pull operation
- Ingress protection IP 54, with fluted filter IP 55, NEMA type 12
- Simple to fit without tools by clipping in (can also be bolted)



DELIVERY COMPRISES (completely assembled)

Item	Qty	Description
1	1	Front grille and case, plastic, ABS, RAL 7035, self-extinguishing UL 94 V-0
2	1	Filter, filter class G3 (EN 779)
3	1	Fan
4	1	Connection spring terminal strip

ORDER INFORMATION

Description	115 V _{AC} Part no.	230 V _{AC} Part no.
Air filtered fan FL 500	EF500-115R5	EF500R5
Air outlet/inlet filter FLA 500/600 (items 1 + 2 included), 1 piece		EFA500-700R5
Replacement filter IP 54 for FL 500/600 and FLA 500/600, filter class G 3 (EN 779), PU 5 pieces		EFM500-700
Fluted filter IP 55 for FL 500/600 and FLA 500/600, filter class G 4 (EN 779), PU 5 pieces		EFMP500-700



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Air outlet/inlet filter FLA 500/600

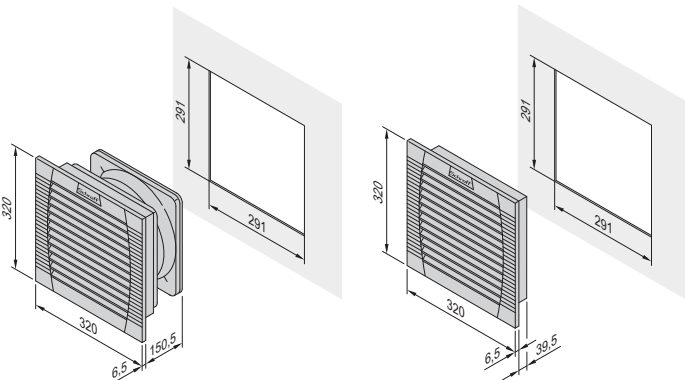
Fluted filter IP 55

TECHNICAL DATA

Voltage	230 VAC	115 VAC
Frequency	50/60 Hz	50/60 Hz
Airflow volume with IP 54 filter (free blowing)	480/480 m ³ /h	480/480 m ³ /h
Airflow volume with IP 55 filter (free blowing)	505/505 m ³ /h	505/505 m ³ /h
Combination FL + FLA IP 54	370/370 m ³ /h	370/370 m ³ /h
Combination FL + FLA IP 55	380/380 m ³ /h	380/380 m ³ /h
Max. static pressure IP 54	76 Pa	76 Pa
Max. static pressure IP 55	74 Pa	74 Pa
Noise level (in accordance with EN ISO 3741, 50 Hz)	54 dB(A)	54 dB(A)
Max. ambient temperature	-15 ... +55 °C	-15 ... +55 °C
Power consumption	80/100 W	90/110 W
Filter efficiency IP 54	88 %	88 %
Filter efficiency IP 55	91 %	91 %
MTBF at 40 °C	40000 h	40000 h
Approvals	CE, UL, cUL, GOST	

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Replacement filter IP 54



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Air filtered fan FL 500/600 Air outlet/inlet filter FLA 500/600
 Sheet thicknesses 1 ... 2 mm - cut-out 223 x 223 mm;
 Sheet thicknesses >2 ... 3 mm - cut-out 224 x 224 mm

NOTE

- Mounting for sheet thicknesses from 1 to 3 mm
- Multiple fan solution on request
- Dimensions, cut-outs and tolerances see user manual

Climate control – Air filtered fans

AIR FILTERED FAN FL 600



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- Airflow volume 640 m³/h
- Converts simply from push to pull operation
- Ingress protection IP 54, with fluted filter IP 55, NEMA type 12
- Simple to fit without tools by clipping in (can also be bolted)



DELIVERY COMPRISES (completely assembled)

Item	Qty	Description
1	1	Front grille and case, plastic, ABS, RAL 7035, self-extinguishing, UL 94 V-0
2	1	Filter, filter class G 3 (EN 779)
3	1	Fan
4	1	Connection spring terminal strip

ORDER INFORMATION

Description	115 V _{AC} Part no.	230 V _{AC} Part no.
Air filtered fan FL 600	EF600-115R	EF600R5
Air outlet/inlet filter FLA 500/600 (items 1 + 2 included), 1 piece		EFA500-700R5
Replacement filter IP 54 for FL 500/600 and FLA 500/600, filter class G 3 (EN 779), PU 5 pieces		EFM500-700
Fluted filter IP 55 for FL 500/600 and FLA 500/600, filter class G 4 (EN 779), PU 5 pieces		EFMP500-700



Air outlet/inlet filter FLA 500/600



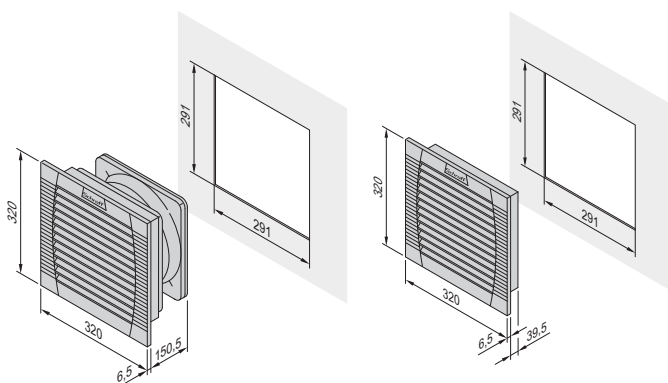
Fluted filter IP 55

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Replacement filter IP 54

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Air filtered fan FL 500/600 Air outlet/inlet filter FLA 500/600
 Sheet thicknesses 1 ... 2 mm - cut-out 223 x 223 mm;
 Sheet thicknesses >2 ... 3 mm - cut-out 224 x 224 mm

TECHNICAL DATA

Voltage	230 VAC	115 VAC
Frequency	50/60 Hz	50/60 Hz
Airflow volume with IP 54 filter (free blowing)	640/653 m ³ /h	640/653 m ³ /h
Airflow volume with IP 55 filter (free blowing)	770/785 m ³ /h	770/785 m ³ /h
Combination FL + FLA IP 54	445/445 m ³ /h	445/445 m ³ /h
Combination FL + FLA IP 55	490/501 m ³ /h	490/501 m ³ /h
Max. static pressure IP 54	134 Pa	134 Pa
Max. static pressure IP 55	132 Pa	132 Pa
Noise level in accordance with EN ISO 3741, 50 Hz)	63 dB(A)	63 dB(A)
Max. ambient temperature	-15 ... +55 °C	-15 ... +55 °C
Power consumption	120/160 W	130/170 W
Filter efficiency IP 54	88 %	88 %
Filter efficiency IP 55	91 %	91 %
MTBF at 40 °C	40000 h	40000 h
Approvals	CE, UL, cUL, GOST	

NOTE

- Mounting for sheet thicknesses from 1 to 3 mm
- Multiple fan solution on request
- Dimensions, cut-outs and tolerances see user manual

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