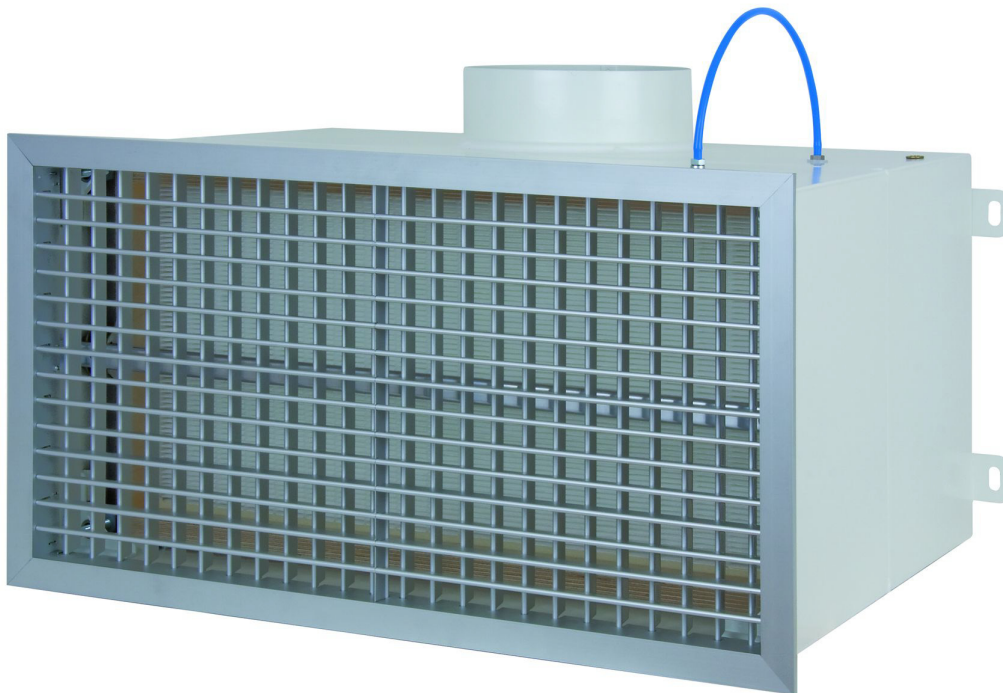




Particle Filter Box Model FKU-W



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Particle Filter Box Model FKU-W

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Particle Filter Box Model FKU-W

Description

The particle filter box, type FKU, has been particularly developed for use in clean rooms required by the pharmaceutical, electronic, precision mechanical and optical industries in hospitals, nuclear power stations and laboratories. The integrated particle filter (to DIN EN 1822) removes particles, radioactive dust, mist, bacteria, viruses etc. from the supply or return air. This ensures that the incoming and outgoing air is extremely clean and germ-free.

The filter box type FKU-W consists of electrolytically galvanised sheet steel painted to RAL 9010 (white). A filter pressure device in the filter box ensures a safe seal. As a standard feature, a differential pressure measuring device is integrated in the particle filter box. It may also be omitted if required by the mounting situation.

Attention:

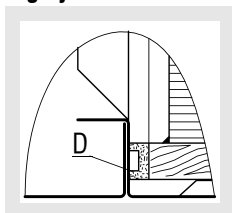
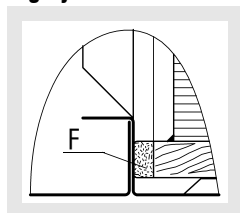
We would like to point out that we supply the filter boxes with integrated spacer for fitting the filter clamps and the diffuser assembly pole brace. This makes it possible to fit the outlet without additional expense, even when the filter has not yet been inserted into the filter box.

The assembly of the air diffusers is effected via a central fastening device (VM). This allows the diffusers to be easily taken off for filter replacement and decontamination.

The following air diffusers are suitable for fitting the particle filter box type FKU-W: DBB and AL 2.

If required, the suitable particle filters can be included in the delivery.

Rubber seal on particle filter (for safe sealing) without seal leakage monitoring system **with seal leakage monitoring system**



D = Leakage-proof seal
F = Flat seal (standard)

Leakage seal monitoring test for terminal filters from H 13 through leakage test according to (DIN EN ISO 14644 and VDI 2083)

Attention!

The filter boxes in stainless steel model 1.4301/1.4571 powder-coated in the colour sand silver are suitable for use in visible areas.

Attention!

We would like to point out that only suitable cleaning materials may be used for cleaning the stainless steel design!

Construction

Shut-off damper

- Galvanised sheet steel (for FKU-W...-HV / -E / -EF)

Differential pressure measuring device

- includes measuring pipe inside the box, for hose connection with an inner diameter of 4 mm.

Filter box

- Electrolytically galvanised sheet steel inside and outside painted to RAL 9010 (white)
- Stainless steel 1.4301 powder-coated in the colour sand silver (at an extra charge) (for use in visible areas).
- Stainless steel 1.4571 powder-coated in the colour sand silver (at an extra charge) (for use in visible areas).
- The colour sand silver looks similar to a ground stainless steel surface.

Ventilation grille type AL2

- made of aluminium natural colour anodised (E6/EV1), with horizontal air deflection blades at the front and additionally with vertical, pivoting air deflection blades.

Air diffuser type DBB-A

- Sheet steel faceplate painted to RAL 9010 (white).
- Blades made of plastic RAL 9005 (black) or RAL 9010 (white) or aluminium painted in the RAL colour of the faceplate (at an extra charge)

Model

- FKU-W1-... - for filter with frame depth = 90 mm (standard)
- FKU-W-... - for filter with frame depth = 150 mm
- FKU-W...-H - with vertical, round, gas-tight sealed connection pipe on the box top or bottom side
- FKU-W...-H - with round, gas-tight sealed connection pipe on the box top or bottom side and manually adjustable shut-off damper sealing air-tight to DIN 1946/Part 4
- FKU-W...-V - with round, gas-tight sealed connection pipe at the box rear.
- FKU-W...-E - with round, gas-tight sealed connection pipe on the box top or bottom side and electrically (actuator OPEN/CLOSED 24 V) adjustable shut-off damper sealing air-tight to DIN 1946/Part 4.
- FKU-W...-EF - with round, gas-tight sealed connection pipe on the box top or bottom side and electrically (spring return actuator 24 V) adjustable shut-off damper sealing air-tight to DIN 1946/Part 4.
- FKU-W...-RE - with rectangular, gas-tight sealed connection pipe on the box top or bottom side, with connection flange.

Particle Filter Box Model FKU-W

Accessories

Aerosol monitoring device

- with measuring pipe inside the box.
- with measuring pipe outside box, for hose connection with inner diameter of 12 mm.

Seal leakage monitoring system (-DP)

- inside the box.

Differential pressure measuring device

- with measuring pipe on box outside, for hose connection with an inner diameter of 4 mm.

Rubber lip seal (-GD)

- Special rubber (not for FKU-W...-RE)

Particle filter UXS-W...-D, UXS-W...-F (standard)

- with rubber seal on filter housing, filter frame H=90/150 mm, made of MDF wood, filter class H13 ($\geq 99.95\%$) or H14 ($\geq 99.995\%$) oil thread test checked according to DIN EN 1822, temperature-resistant up to 80°C, filter wrapped in film
- with double-sided handle cover (-G2) (at an extra charge)
- Scan test checked according to DIN EN 1822 (at an extra charge)

Particle filter UXA-W...-D, UXA-W...-F

- with rubber seal on filter housing, filter frame H=90/150 mm, made of aluminium with double-sided handle cover, filter class H13 ($\geq 99.95\%$) or H14 ($\geq 99.995\%$) oil thread test checked according to DIN EN 1822, temperature-resistant up to 80°C, filter wrapped in film
- Scan test checked according to DIN EN 1822 (at an extra charge)

Fastening

Concealed mounting (-VM)

- Pole brace fastening (standard)

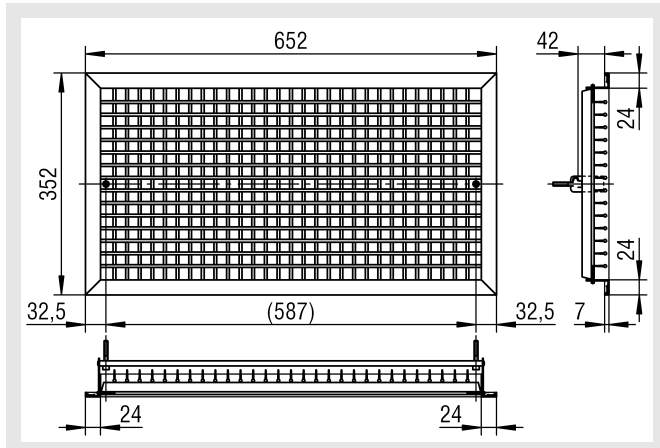
Particle Filter Box Model FKU-W

Models and dimensions

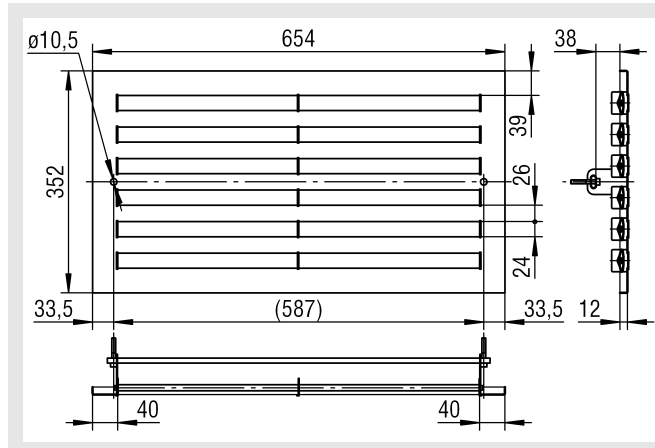
Dimensions

Air diffusers:

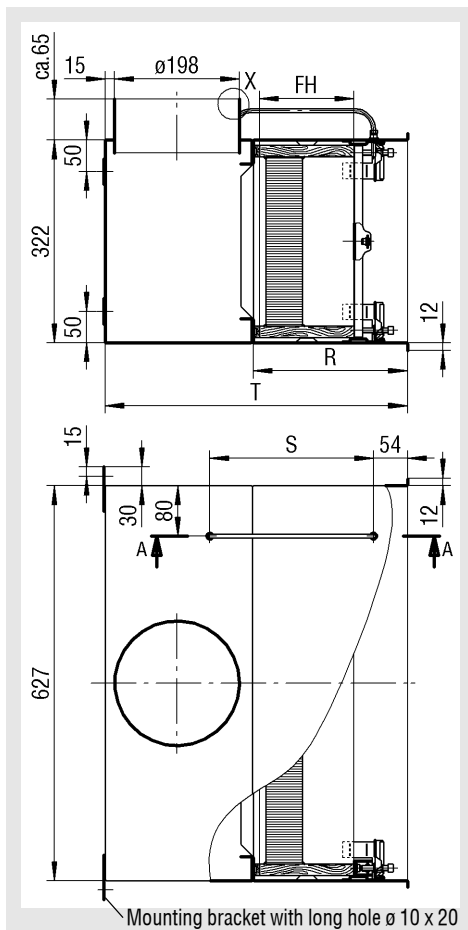
Ventilation grille type AL2



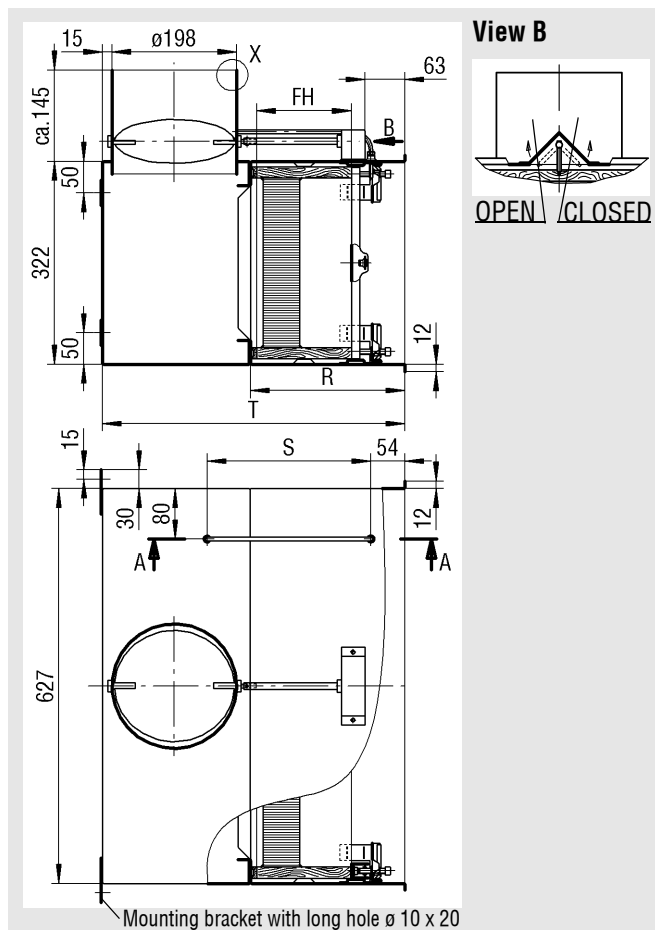
Air diffuser type DBB-A



FKU-W...-H



FKU-W...-HV

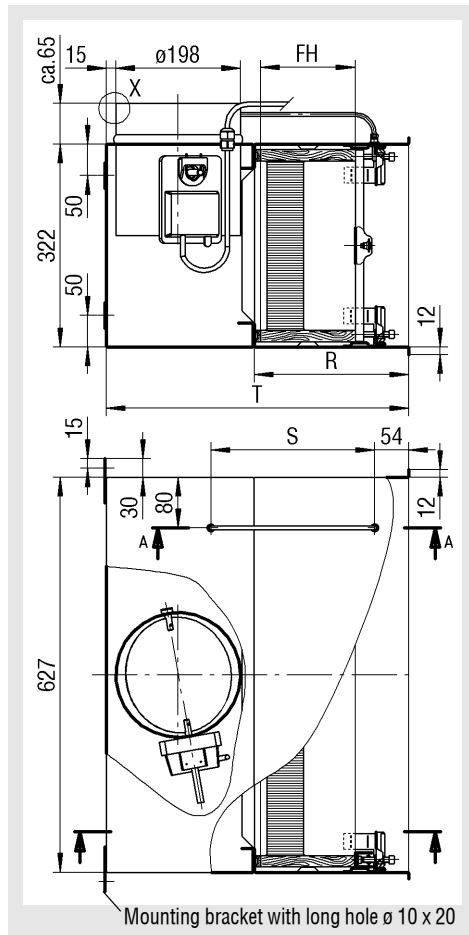


Dimensions

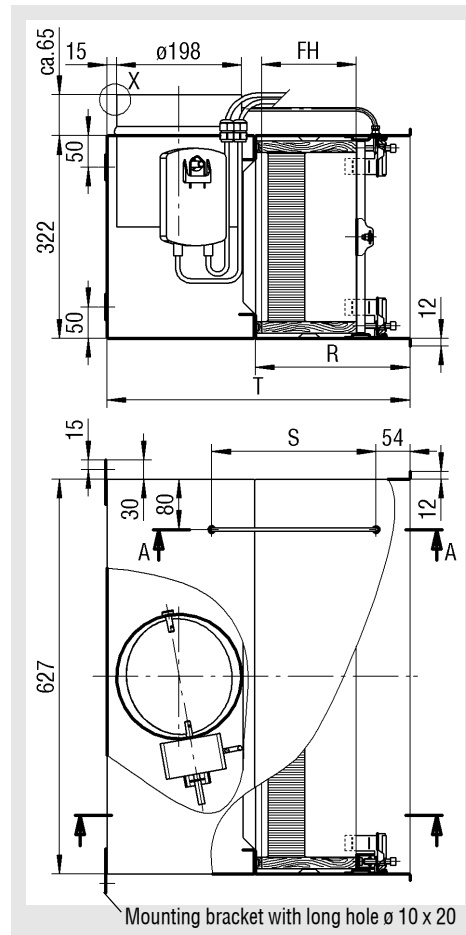
	T	FH	S	R
FKU-W-H / -HV	480	150	260	245
FKU-W1-H / -HV	420	90	200	185

Particle Filter Box Model FKU-W

FKU-W...-E



FKU-W...-EF



Dimensions

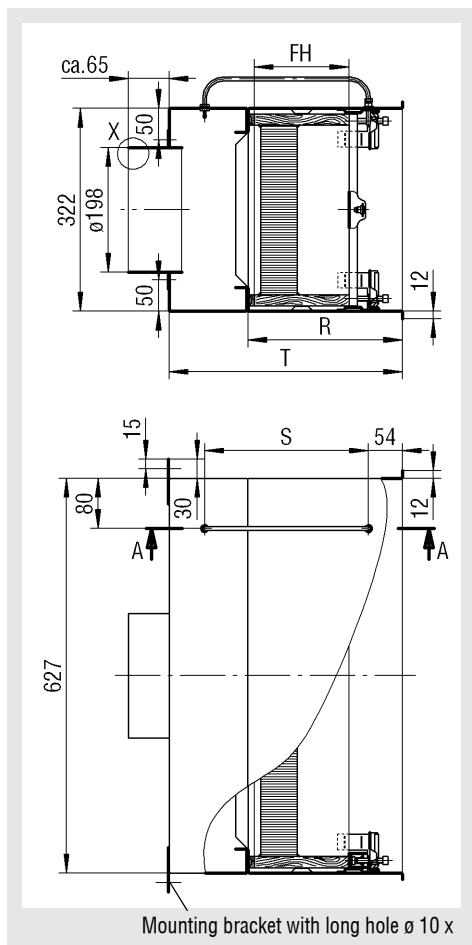
	T	FH	S	R
FKU-W-E / -EF	480	150	260	245
FKU-W1-E / -EF	420	90	200	185

Attention!

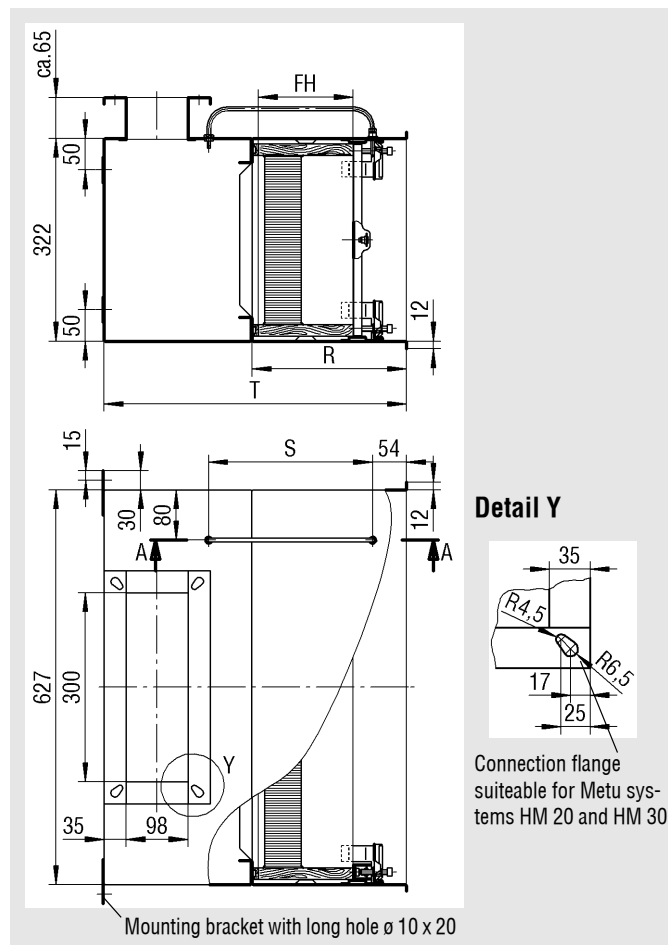
With modified connection piece, a motor cannot be fitted to the shut-off damper!

Particle Filter Box Model FKU-W

FKU-W...-V



FKU-W...-RE



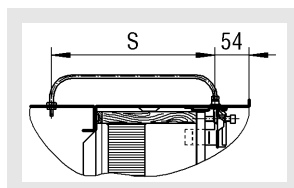
Dimensions

	T	FH	S	R
FKU-W-V	370	150	260	245
FKU-W1-V	310	90	200	185

Dimensions

	T	FH	S	R
FKU-W-RE	480	150	260	245
FKU-W1-RE	420	90	200	185

Internal differential pressure measuring device (standard) Section A-A

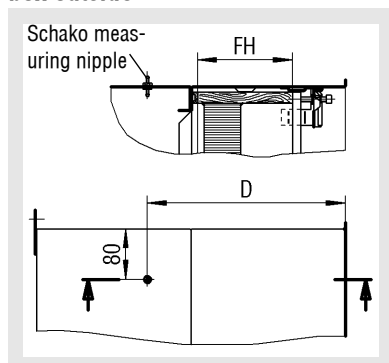


When ordering an aerosol monitoring device, the standard integrated differential pressure measuring device is not required. Nor is an internal differential pressure measuring device required, when ordering a differential pressure measuring device on the outside.

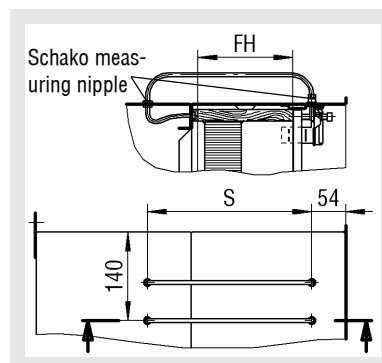
Particle Filter Box Model FKU-W

Dimensions of accessories

Differential pressure measuring device with measuring pipe on box outside

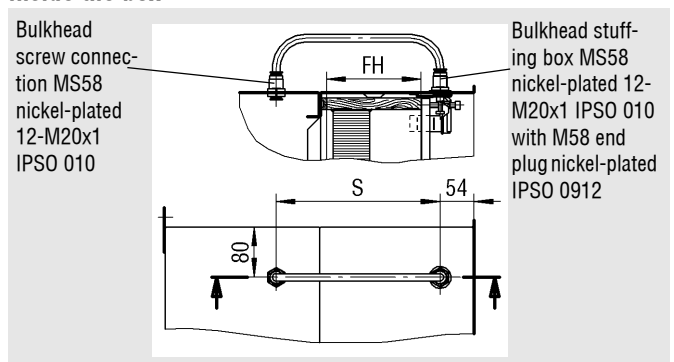


Seal leakage monitoring system inside the box

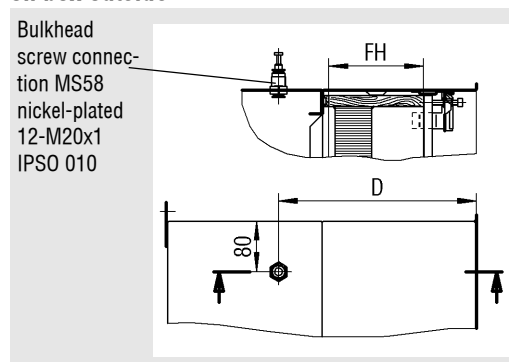


When ordering a differential pressure measuring device for the outside, the standard integrated differential pressure measuring device is not included.

Aerosol monitoring device with measuring connection piece inside the box



Aerosol monitoring device with measuring connection piece on box outside

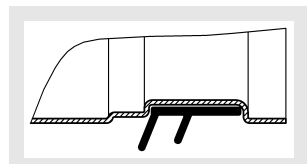


When ordering an aerosol monitoring device, the standard integrated differential pressure measuring device is not required.

Rubber lip seal (-GD)

not for models FKU-W-RE and FKU-W1-RE!

Detail X



Attention:

Please note that the O-rings (sealing rings) of the screw connection can dry out over the months. When the O-rings are dried out, the hose can only be inserted applying higher force. A common procedure of reoiling these bulkhead screw connections is to add a universal oil, for example from Ballistol, to a cloth drop by drop and wipe the hose before inserting it. This small amount is sufficient to make the bulkhead screw connection run smoothly again.

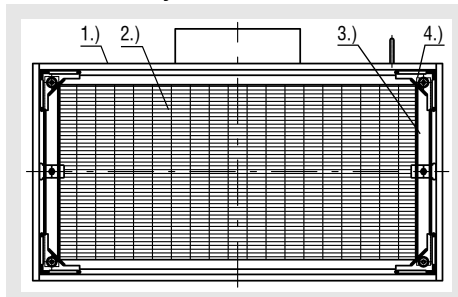
Dimensions

	FH	S	D
FKU-W	150	260	314
FKU-W1	90	200	254

Particle Filter Box Model FKU-W

Installation

Filter assembly instruction



Press the particle filter unit (2) with the sealing rubber (see page 3) into the filter housing (1). Take care that the filter material is not irreparably damaged. The VM pole braces (3) are placed on the filter housing and fastened using the filter corner clamps (4). Tighten the filter corner clamps until a tight fit of the filter cell is obtained. Care must be taken that the filter corner clamps are tightened cross-wise to 4 Nm maximum.

If required, a seal leakage test can be carried out before assembly.

Dismounting

Unscrew air diffuser, loosen filter clamps, remove VM pole braces and take out the particle filter unit toward the front.

Attention!

The particle filter cell may fall out of the filter housing when the filter clamps are removed!

Maintenance

In addition to keeping machines and equipment clean, the maintenance of the filters is especially important. A constant control of the filters is as essential as changing them when the maximum allowed particle absorption has been reached. The inspection must take place at short enough intervals to allow faults that have occurred or become apparent to be eliminated in time. The necessary intervals are set depending on the local conditions. The measured variable for the particle absorption of the filter is the pressure difference. This is why a differential pressure measuring device must be attached to each filter step to monitor its operating condition.

Periodical repetitions of the seal leakage test should be ordered at regular intervals (at least once a year) by the operator/owner.

The filter is changed when the terminal resistance is reached, which is set in advance when designing the ventilator capacity of the ventilation system. The terminal resistance is normally twice the starting resistance.

Particle Filter Box Model FKU-W

Technical Data

Pressure loss

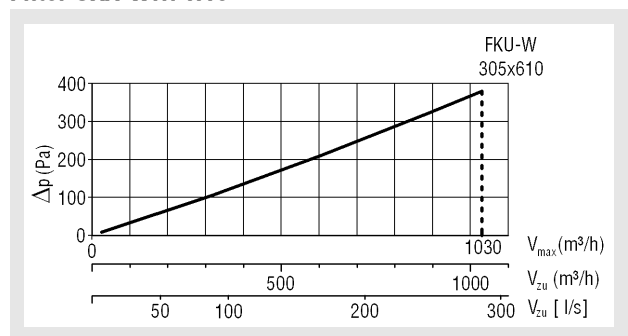
Type	V _{nenn} / pressure difference [m ³ /h/PA]	
	H13	H14
UXS-W1-90*	300 / 100	300 / 100
UXS-W-150	300 / 100	300 / 100

*only FKU-W1-...

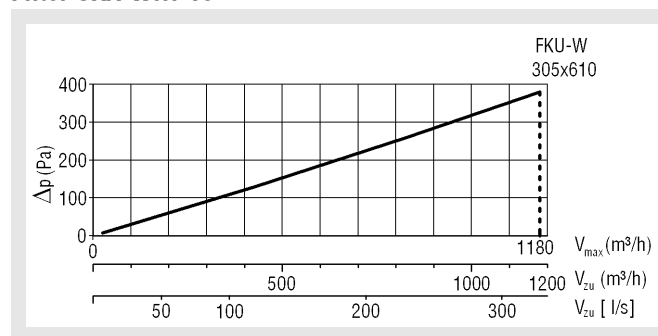
Type	V _{nenn} / pressure difference [m ³ /h/PA]	
	H13	H14
UXA-W1-90*	300 / 90	300 / 90
UXA-W-150	300 / 90	300 / 90

*only FKU-W1-...

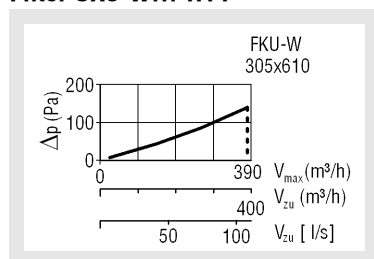
Filter UXA-W...-H13



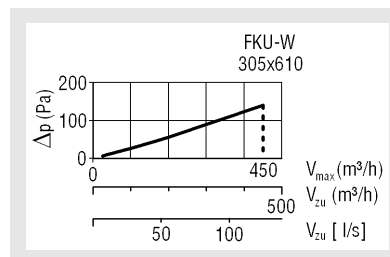
Filter UXA-W...-13



Filter UXS-W...-H14



Filter UXA-W...-H14



An H13 filter cell cannot be used as H14 filter!

If the particle filters are designed according to filter class H14, make sure that the air volume at the front plates is checked. Thus, it may happen that the air volume is too low for the selected faceplate, resulting in an uncontrolled jet drop. In this case, we recommend using a front plate with a smaller perforation, for example a 600 front plate with a 500 perforation.

Filter class according to DIN EN 1822

Filtration efficiency in MPPS: H13 = $\geq 99,95\%$

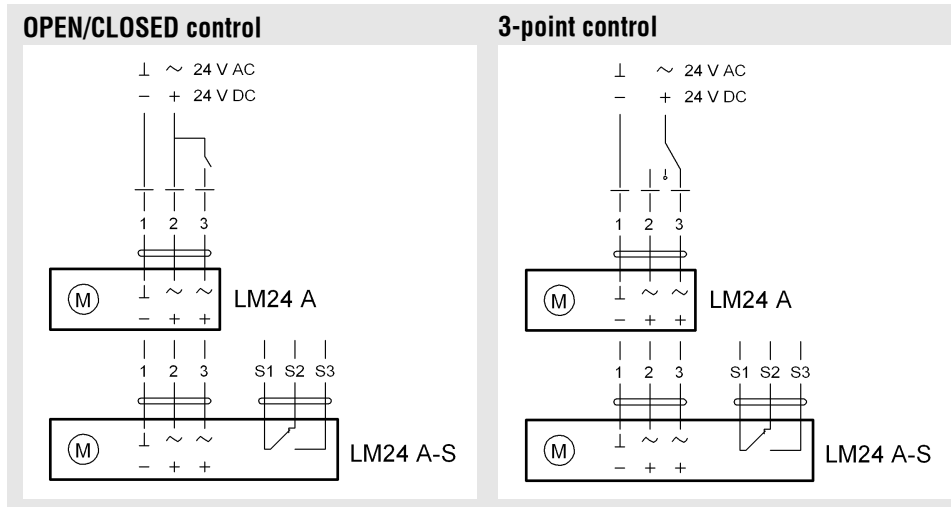
H14 = $\geq 99,995\%$

Allowed final pressure: max. 500 Pa

Particle Filter Box Model FKU-W

Circuit diagram

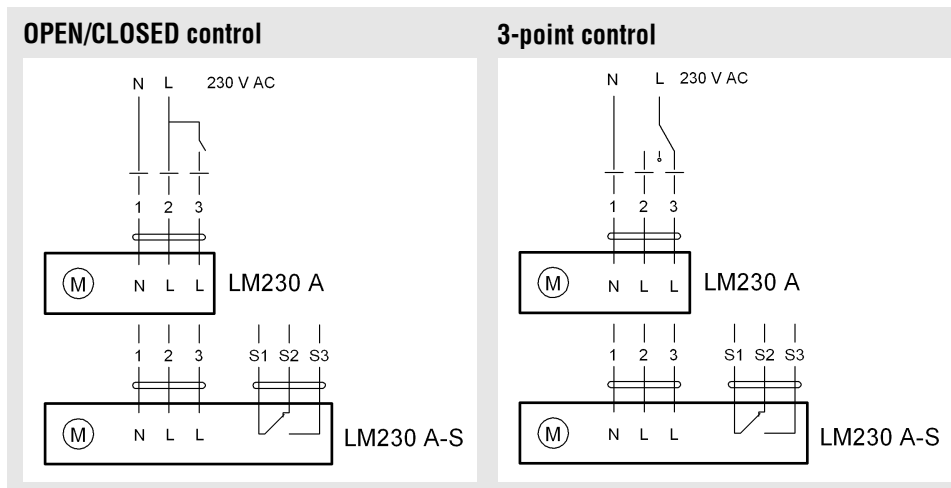
Connection diagram LM24A / LM24A-S



Attention!

- Connection via safety transformer.
- Parallel connection of further drives is possible. Observe specifications.

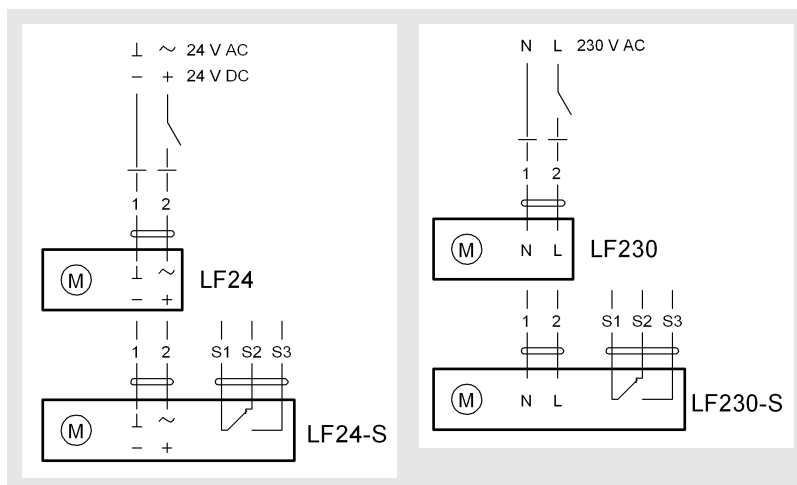
Connection diagram LM230A / LM230A-S



Attention!

- Mains voltage connected!
- Parallel connection of further drives is possible. Observe specifications.

Connection diagram LF24 / LF24-S, LF230 / LF230-S



Attention!

- Connection via safety transformer.
- Parallel connection of further drives is possible. Observe specifications.

Particle Filter Box Model FKU-W

Technical data of motors

LM24A / LM24A-S (make Belimo)

Rated voltage:	24 V AC/DC, 50/60 Nm
Functional range:	19,2...28,8 V AC/DC
Power consumption:	- Operation: - Idle position: 0.2 W
Dimensioning:	2 VA
Torque:	Min. 5 Nm
Running time:	150 s
Sound power level:	35 dB (A)
Protection class:	III Safety extra low voltage
Protection type:	IP54 in all mounting positions
EMC:	CE according to 89 / 336 / EEC

LM230A / LM230A-S (make Belimo)

Rated voltage:	AC 100...240V, 50/60 Hz
Functional range:	AC 85...265 V
Power consumption:	- Operation: 1.5 W - Idle position: 0.4 W
Dimensioning:	4 VA
Torque:	min. 5 Nm
Running time:	150 s
Sound power level:	35 dB (A)
Protection class:	II protective insulation
Protection type:	IP54 in all mounting positions
EMC:	CE according to 89 / 336 / EEC
Low voltage directive:	CE according to 73 / 23 / EEC

LF24 / LF24-S (make Belimo)

Rated voltage:	24 V AC/DC, 50/60 Nm
Functional range:	19.2...28.8 V AC, 21.6...28.8 V DC
Power consumption:	- running: 5 W - holding: 2.5 W
Torque:	-motor Min. 4 Nm -Spring return: Min. 4 Nm
Running time:	-motor 40...75 s(0...4 Nm) -Spring return: 20 s (60 s at -30°C)
Sound power level:	-motor 50 dB (A) -Spring return: 62 dB (A)
Protection class:	III Safety extra low voltage
Protection type:	IP54
EMC:	CE according to 89 / 336 / EEC
Low voltage directive:	CE according to 73 / 23 / EEC

LF230 / LF230-S (make Belimo)

Rated voltage:	AC 230 V 50/60 Hz;
Functional range:	AC 198...264 V
Power consumption:	- running: 5 W - holding: 3 W
Torque:	-motor Min. 4 Nm -Spring return: Min. 4 Nm
Running time:	-motor 40...75 s (0...4 Nm) -Spring return: 20 s (-20...50°C)
Sound power level:	-motor 50 dB (A) -Spring return: 62 dB (A)
Protection class:	II protective insulation
Protection type:	IP54
EMC:	CE according to 89 / 336 / EEC
Low voltage directive:	CE according to 73 / 23 / EEC

Auxiliary switch for LM24A-S / LM230A-S / LF24-S / LF230-S

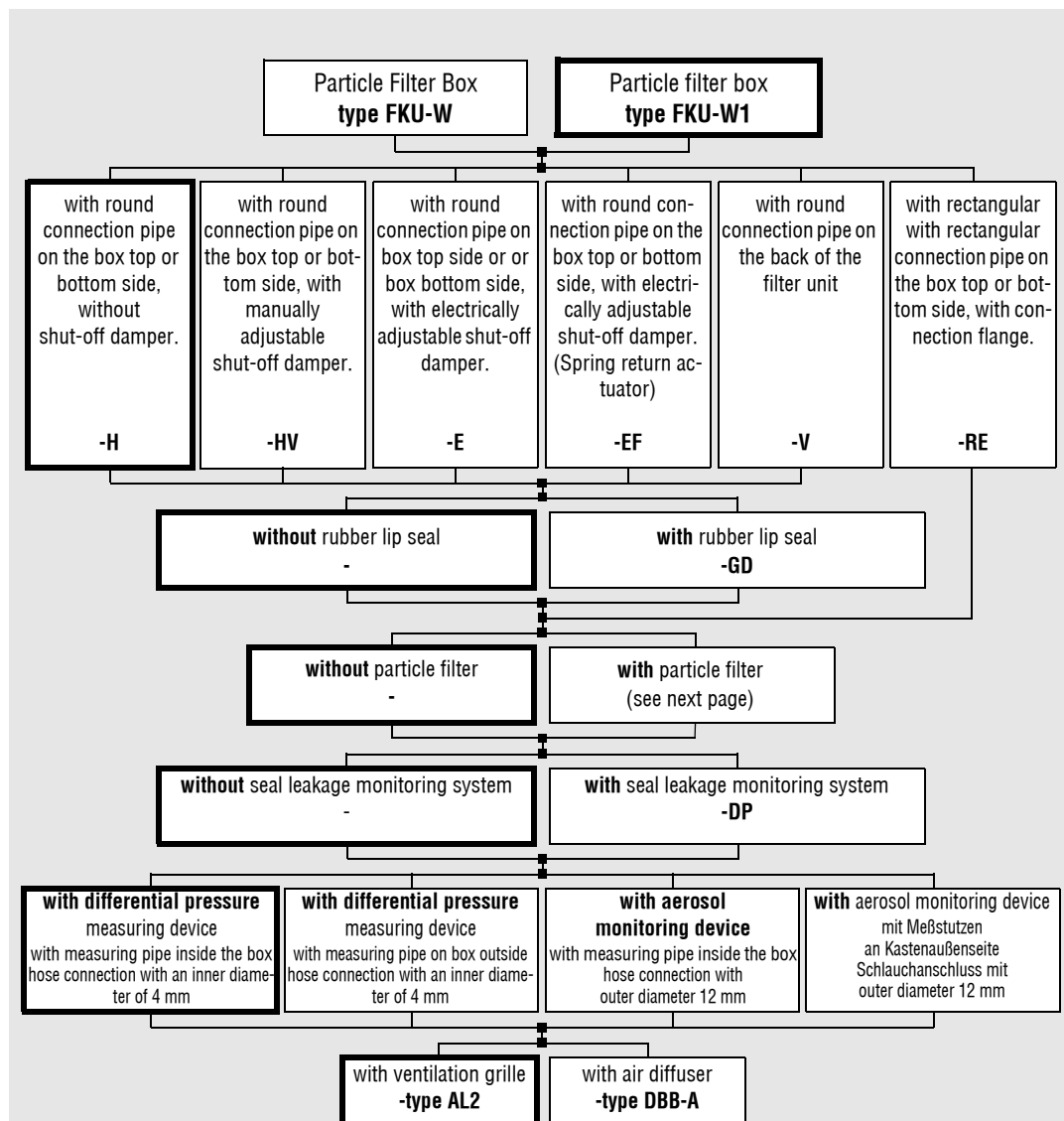
- 1 EPU, 1 mA...3 (0.5) A, AC 250 V adjustable 0...100%

Legend

V_{ZU} (m ³ /h) [l/s]	= Supply air volume
V_{nenn} (m ³ /h)[l/s]	= Nominal volume
V_{max} (m ³ /h)[l/s]	= Maximum volume
Δp (Pa)	= Pressure difference
H13	= Filter class H13
H14	= Filter class H14

Particle Filter Box Model FKU-W

Order details

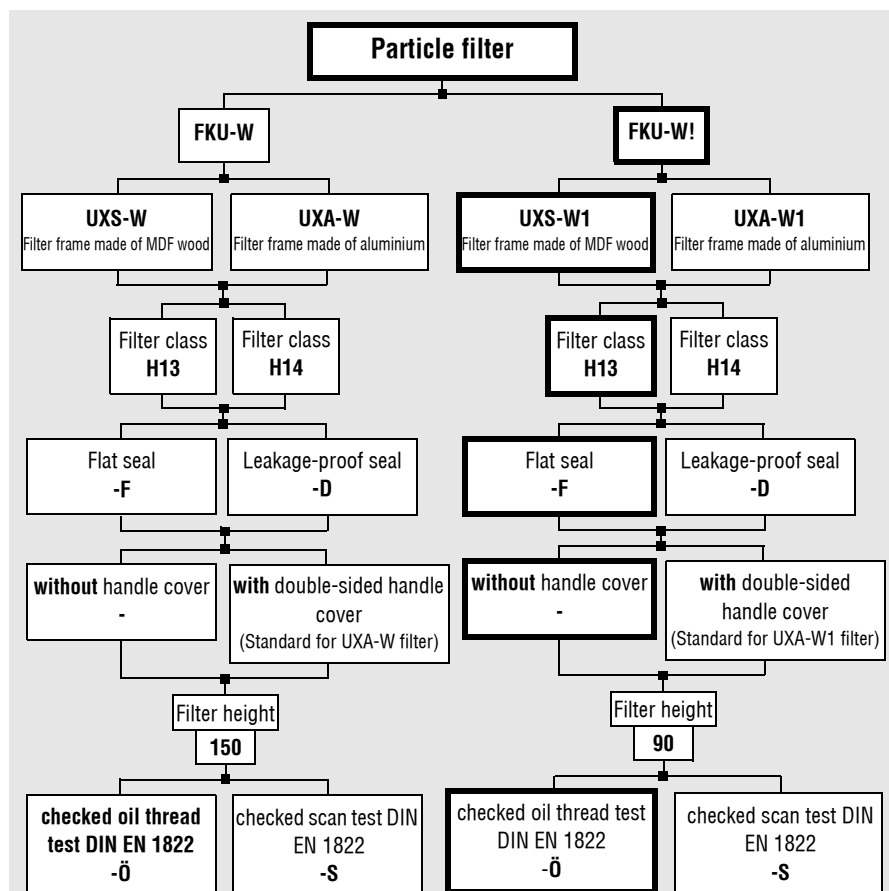


Order example:
FKU-W1-H-GD-AL2

Unless stated otherwise, the thick-frame model will be delivered!

Particle Filter Box Model FKU-W

Particle filter Order details



Order example:
UXS-W1-13-F-90-Ö

Attention!
Filter UXA-W... as standard with double-sided handle protection
Filter wrapped in film
Unless stated otherwise, the standard filter will be delivered!

Particle Filter Box Model FKU-W

Specification texts

Particle filter box with safely sealing press device. Filter box is made of electrolytically galvanised sheet steel painted inside and outside to RAL 9010 (white), with round, gas-tight sealed connection pipe in box top side or bottom side. With integrated differential pressure measuring device with measuring connection pipe inside the box, for hose connection with an inner diameter of 4 mm. Air diffuser fastening with concealed mounting (-VM).
Product: SCHAKO **type FKU-W-H / type FKU-W1-H**

- with round, gas-tight sealed connection pipe on the box top or bottom side and manually adjustable shut-off damper sealing air-tight to DIN 1946/Part 4

Product: SCHAKO **type FKU-W-HV / type FKU-W1-HV**

- with round, gas-tight sealed connection pipe on the box top or bottom side and electrically (actuator OPEN/CLOSED 24 V) adjustable shut-off damper sealing air-tight to DIN 1946/Part 4.

Product: SCHAKO **type FKU-W-E / type FKU-W1-E**

- with round, gas-tight sealed connection pipe on the box top or bottom side and electrically (spring return actuator 24 V) adjustable locking damper sealing air-tight to DIN 1946/Part 4.

Product: SCHAKO **type FKU-W-EF / type FKU-W1-EF**

- with round, gas-tight sealed connection pipe at the box rear.

Product: SCHAKO **type FKU-W-V / type FKU-W1-V**

- with rectangular, gas-tight sealed connection pipe on the box top or bottom side, with connection flange.

Product: SCHAKO **type FKU-W-RE / type FKU-W1-RE**

- Filter box made of (at an extra charge):

- Stainless steel 1.4301 powder-coated in the colour sand silver
- Stainless steel 1.4571 powder-coated in the colour sand silver

- with air diffuser, consisting of:

- Ventilation grille type AL2 made of aluminium natural colour anodised (E6/EV1), with horizontal air deflection blades at the front and additionally with vertical, pivoting air deflection blades.
- Air diffuser type DBB-A, with faceplate made of sheet steel painted to RAL 9010 (white), with plastic blades painted to RAL 9005 (black) or RAL 9010 (white) or made of aluminium painted to the colour of the faceplate.

Accessories (at an extra charge):

Particle filter UXS-W...-D, UXS-W...-F

- with rubber seal on filter housing, filter frame H=90/150 mm, made of MDF wood, filter class H13 ($\geq 99.95\%$) or H14 ($\geq 99.995\%$) oil thread test checked according to DIN EN 1822, temperature-resistant up to 80°C, filter wrapped in film
- with double-sided handle cover (-G2) (at an extra charge)
- Scan test checked according to DIN EN 1822 (at an extra charge)

Particle filter UXA-W...-D, UXA-W...-F

- with rubber seal on filter housing, filter frame H=90/150 mm, made of aluminium with double-sided handle cover, filter class H13 ($\geq 99.95\%$) or H14 ($\geq 99.995\%$) oil thread test checked according to DIN EN 1822, temperature-resistant up to 80°C, filter wrapped in film
- Scan test checked according to DIN EN 1822 (at an extra charge)
- Differential pressure measuring device, with measuring pipe on box outside, for hose connection with an inner diameter of 4 mm (standard differential pressure measuring device not required)
- Aerosol monitoring device, for hose connection with an outer diameter of 12 mm:
 - with measuring pipe inside the box (standard differential pressure measuring device not required)
 - with measuring pipe on box outside (standard differential pressure measuring device not required)
- Seal leakage monitoring system (-DP), inside the box
- Rubber lip seal (-GD), only on round connection pipe