HOODS & UNITS

MAKING THE WORLD, SAFER, HEALTHIER & MORE PRODUCTIVE

AFPRO® Filtration Group®

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Introduction

HEPA Filter Manufacturer

Since 1979, AFPRO Filters has been able to manufacture all standard and non-standard dimensions to meet the client's specific requirements. These products manufactured by AFPRO Filters are synonymous with quality, durability and innovation. To guarantee their quality, we have equipped ourselves with a laboratory in which daily tests are carried out to make our air filters more efficient and more durable.

Classification of Very High Efficiency Filters: Standard EN1822

Standard EN 1822:2009 is used to classify HEPA and ULPA filters based on MPPS efficiency. The table gives more detailed information on the European filter classification.

Please note: AFPRO Filters provides a white paper on HEPA filters

Classes of filters	Integral MPPS values		Local MPPS values	
	Efficiency (%)	Penetration (%)	Efficiency (%)	Penetration (%)
E10	85	15	-	-
E11	95	5	-	-
E12	99,5	0,5	-	-
H13	99,95	0,05	99,75	0,25
H14	99,995	0,005	99,975	0,025
U15	99,9995	0,0005	99,9975	0,0025
U16	99,99995	0,00005	99,99975	0,00025
U17	99,999995	0,000005	99,9999	0,0001

MPPS: Most Penetrating Particle Size = most difficult particle size to stop. Depending on the filters and the air flow speeds, the MPPS is between 0.1 and 0.2 µm

Air cleanliness in Controlled Environments: Standard 14644

ISO 14644-1:2015 classifies the cleanliness of the air in clean rooms, clean zones and separative devices as defined in ISO 14644 7, based on the concentration of particles suspended in the air.

The table to the right classifies the ISOs based on the number and size of the particles.

Classes of filters	0,1µM	0,2µM	0,3µM	0,5µM	1µM	5µM
ISO 1	10	-	-	-	-	-
ISO 2	100	24	10	-	0	-
ISO 3	1 000	237	102	35	8	-
ISO 4	10 000	2 370	1 020	352	83	-
ISO 5	100 000	23 700	10 200	3 520	832	-
ISO 6	1 000 000	237 000	102 000	35 200	8 320	293
ISO 7	-	-	-	352 000	83 200	2 930
ISO 8	-	-	-	3 520 000	832 000	29 300
ISO 9	-	-	-	35 200 000	8 320 000	293 000

Classification and Testing Methods of High-Efficiency Air Filters: Focus on ISO 29463 Standard

The ISO 29463 standard (inspired by the European standard EN 1822) is adapted for international use. Divided into five parts, it covers all aspects of filter design, testing, and classification to ensure harmonized performance criteria for these filters.

The adjacent table ISO 29463-1 classifies filters based on their efficiency in capturing the most penetrating particles.

Classes	Efficiency (%)	Filter Type IEST*	EN1822**	Remarks
ISO 15 E	≥ 95	-	E 11	
ISO 20 E	≥ 99			
ISO 25 E	≥ 99,5		E12	
ISO 30 E	≥ 99,9			
ISO 35 H	≥ 99,95		H 13	
-	≥ 99,97	A, B, E, H, I		
ISO 40 H	≥ 99,99	C, J, (K)		In common usage, the more efficient Type K is preferred over Type J for increased safety.
ISO 45 H	≥ 99,995	K	H14	Types A, B, and E are traditionally HEPA filters.
ISO 50 U	≥ 99,999	D		
ISO 55 U	≥ 99,9995	F	U 15	
ISO 60 U	≥ 99,9999	G		
ISO 65 U	≥ 99,99995	G	U 16	
ISO 70 U	≥ 99,99999	G		
ISO 75 U	≥ 99,999995	G	U 17	

**Filter types IEST A, B, C, D, E are classified based on tests using photometers according to the Mil 282 standard. Filter types F, G, H, I, J, K are classified based on test results using particle counters.*
***Filter class E10 of the EN 1822 standard does not fall within the efficiency range of the ISO standard.*

PHARMACEUTICAL, MICROELECTRONICS, FOOD INDUSTRY

Air treatment in the pharmaceutical, microelectronics and food industry

The EN ISO 14698 standard and biocontamination

The EN ISO 14698 standard (GMP) supplements the classification into ISO cleanroom classes and specifically deals with the control of biocontamination: general principles for monitoring risks and measuring methods for biocontamination in different environments (air, surfaces, textiles, liquids, maintenance of clothing, specific training for staff).

Specifically for the pharmaceutical sector, Good Manufacturing Practices or GMP have been developed, in which activities performed are classified into different classes based on risk level:

- Class A: zones in which hazardous operations are performed, such as aseptic preparation or filling processes; workplaces are located under a laminar airflow (guide value: homogeneous speed of 0.45m/s +/-20%).
- Class B: preparatory actions in the immediate vicinity of a class A work zone.
- Class C and D: areas with a controlled atmosphere where less risky operations in the production process of sterile medication take place (preparation of liquids, handling of accessories, etc.).

Classes	Equivalent class according to ISO 14644-1	At rest		In operation	
		Maximum number of particles per cubic meter, of size equal to or greater than:			
		0,5µm	5µm	0,5µm	5µm
A	ISO 5 at rest and in operation	3 520	20	3 520	20
B	ISO 5 at rest and ISO 7 in operation	3 520	29	352 000	2 900
C	ISO 7 at rest and ISO 8 in operation	352 000	2 900	3 520 000	29 000
D	ISO 8 at rest	3 520 000	29 000	Not specified	Not specified

Recommended limits for biocontamination				
Classes	Air sample cfu/m³	Settle plates (Diam : 90 mm) CFU / 4 hours	Contact plates (Diam : 55 mm) CFU / Plate	Glove prints including 5 fingers on both hands CFU/Glove
A	< 1	< 1	< 1	< 1
B	10	5	5	5
C	100	50	25	/
D	200	100	50	/

HL-PH Unit

Characteristics

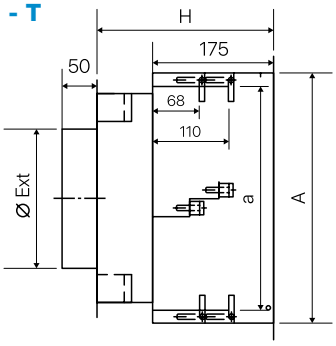
- Application: Air supply or return in clean rooms with turbulent flow and mounted HEPA filters with polyurethane gaskets
- Electro-galvanised steel 15/10^{e} and 20/10^{e}
- Epoxy paint RAL 9010, oven-baked
- Connection on the top or the side
- For HEPA filters 68 or 110 mm thick
- Pressure port 100% accessible from the room
- Grid: interchangeable perforated, helicoid-jet or 4-way
- Wall or ceiling installation

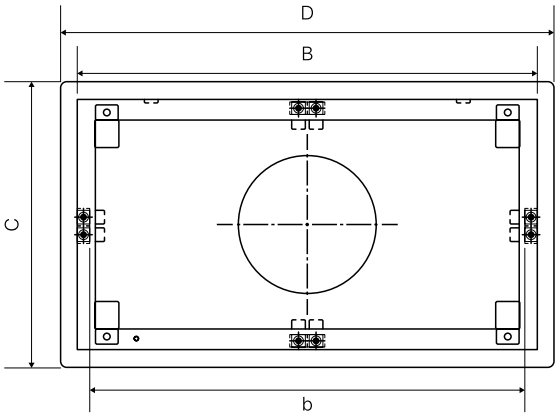
Advantages

- Robust, welded construction
- Rapid opening/closing of the diffusion grid
- Grid easy to remove
- Installation with universal system: Feet or brackets
- Wide choice of standard dimensions, compatible with most standard filters on the market
- Evolutive for filters that are 68 or 110 mm thick

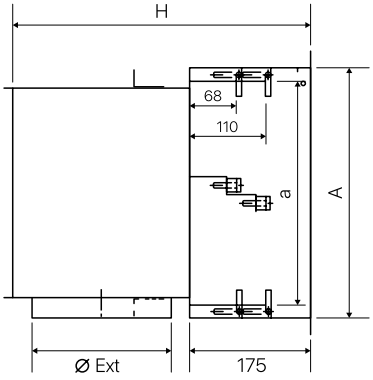
Type	Dimensions CxD (mm)	Dimensions AxB (mm)	Dimensions Reservations (mm)	Filter dimensions axb (mm)	Top connection T		Slide connection S	
					ø	H	ø	H
HL-HP/BBEQ	408x408	361x361	367x367	305x305x68/110	160	255	160	405
HL-HP/CCEQ	560x560	513x513	519x519	457x457x68/110	200	255	200	445
HL-PH/CCFPEQ	595x595	513x513	519x519	457x457x68/110	200	255	200	445
HL-HP/BEEQ	408x713	361x666	367x672	305x610x68/110	200	255	200	445
HL-HP/EEEQ	713x713	666x666	672x672	610x610x68/110	250	255	250	495
HL-HP/EGEQ	713x1018	666x971	672x977	610x915x68/110	315	255	315	560
HL-HP/EHEQ	713x1323	666x1276	672x1282	610x1220x68/110	315	255	315	560
HL-HP/SSEQ	638x638	591x591	597x597	535x535x68/110	200	255	200	445
HL-HP/FFEQ	865x865	818x818	824x824	762x762x68/110	315	255	315	560

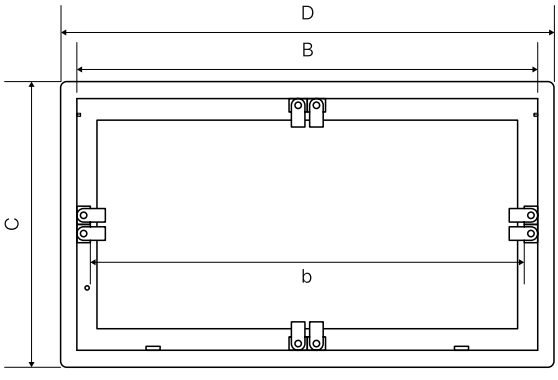
Top connection - T





Side connection - S





HL-PH Unit

Example of a configuration: HL-PH/ EE EQ W N P T G

1 2 3 4 5 6 7

1 - Dimensions	
BB	305 x 305 mm
CC	457 x 457 mm
CC-FP	457 x 457 mm
BE	305 x 610 mm
EE	610 x 610 mm
FF	762 x 762 mm
EG	610 x 915 mm
EH	610 x 1220 mm
SS	535 x 535 mm

2 - Filter depth	
EQ	68 / 110 mm
L	150 mm

3 - Connector type	
SS	Rectangular connector
T	Axial circular connector
S	Lateral circular connector
W	Without plenum

4 - Connector diameter	
A	160 mm
B	200 mm
C	250 mm
D	315 mm
E	355 mm
F	400 mm
N	-

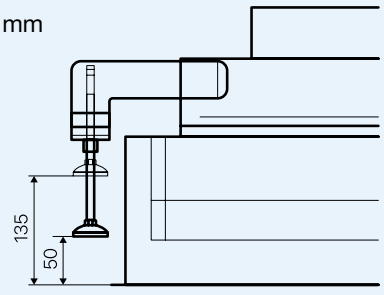
5 - Filter seal applied	
P	Polyurethane

6 - Closing system	
S	1/4 turn - Standard grid
T	1/4 turn - Swivel
M	Magnetic - Swivel

7 - Material	
G	Steel EZ RAL 9010
S	Inox 304L
SS	Inox 316L

Options

- Support feet for mounting on weight-bearing ceiling of thickness 50 to 135 mm
- Pivoting grid
- Magnetic grid closure
- Intermediate frame for the installation of 2 stages of filtration
- Rectangular connection
- Specific RAL paint color
- Manufactured in 304L or 316L stainless steel
- Special Production of 150 mm-thick filter (H +40 mm)



HL-PH-Gel Unit

Characteristics

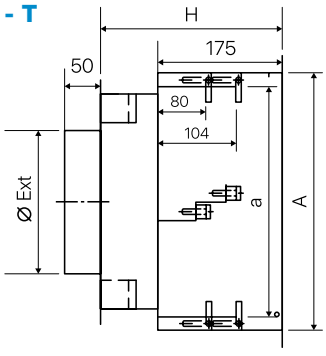
- Application: Supply or return of air in a clean room with turbulent flow and assembly of HEPA filters with gel seal
- Electro-galvanised steel 15/10e and 20/10e
- Baked epoxy paint RAL 9010
- Top or side connection
- For HEPA filters 80 or 104 mm thick
- Pressure tap 100% accessible from the room
- Grid: perforated, swirl, or 4 interchangeable directions
- Ceiling installation

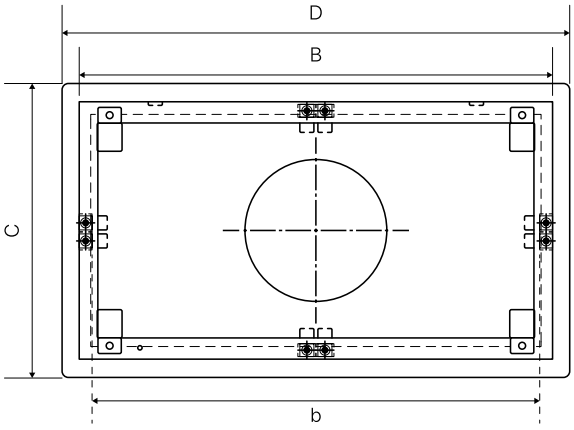
Advantages

- Rugged welded construction
- Quick opening / closing of the diffusion grid
- Easily removable grid
- Installation with universal system: Feet or brackets
- Large choice of standard sizes, compatible with most standard filters on the market

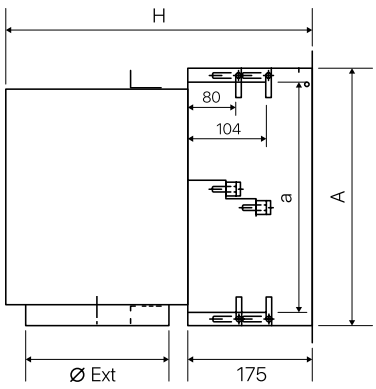
Type	Dimensions CxD (mm)	Dimensions AxB (mm)	Dimensions Reservations (mm)	Filter dimensions axb (mm)	Top connection T		Slide connection S	
					ø	H	ø	H
HL-PH/BBHV	408x408	361x361	367x367	305x305x80/104	160	255	160	405
HL-PH/CCHV	560x560	513x513	519x519	457x457x80/104	200	255	200	445
HL-PH/CC FPHV	595x595	513x513	519x519	457x457x80/104	200	255	200	445
HL-PH/BEHV	408x713	361x666	367x672	305x610x80/104	200	255	200	445
HL-PH/EEHV	713x713	666x666	672x672	610x610x80/104	250	255	250	495
HL-PH/EGHV	713x1018	666x971	672x977	610x915x80/104	315	255	315	560
HL-PH/EHHV	713x1323	666x1276	672x1282	610x1220x80/104	315	255	315	560
HL-PH/SSHV	638x638	591x591	597x597	535x535x80/104	200	255	200	445
HL-PH/FFHV	865x865	818x818	824x824	762x762x80/104	315	255	315	560

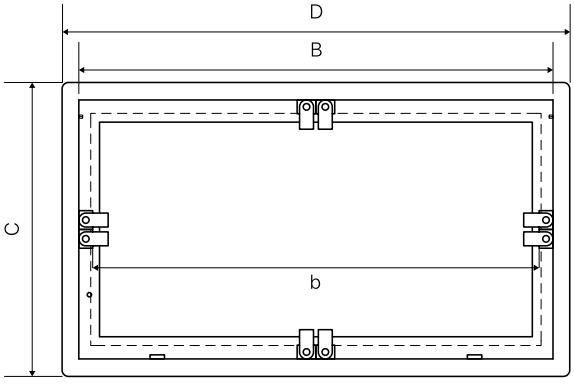
Top connection - T





Side connection - S





HL-PH-Gel Unit

Example of a configuration: HL-PH/ BB HV T A G T G

1 2 3 4 5 6 7

1 - Dimensions	
BB	305 x 305 mm
CC	457 x 457 mm
CC-FP	457 x 457 mm
BE	305 x 610 mm
EE	610 x 610 mm
FF	762 x 762 mm
EG	610 x 915 mm
EH	610 x 1220 mm
SS	535 x 535 mm

2 - Filter depth	
HV	80 / 104 mm

3 - Connector type	
SS	Rectangular connector
T	Axial circular connector
S	Lateral circular connector

4 - Connector diameter	
A	160 mm
B	200 mm
C	250 mm
D	315 mm
E	355 mm
F	400 mm

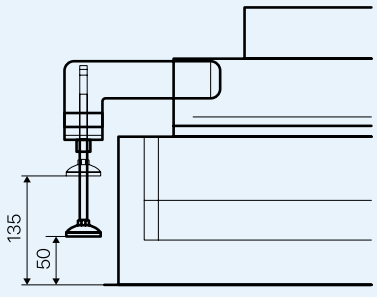
5 - Filter seal applied	
G	Gel

6 - Closing system	
S	1/4 turn - Standard grid
T	1/4 turn - Swivel
M	Magnetic - Swivel

7 - Material	
G	Steel EZ RAL 9010
S	Inox 304L
SS	Inox 316L

Options

- Support feet for mounting on load-bearing ceiling 50 to 135 mm thick
- Pivoting grid
- Magnetic grid closure
- Rectangular connection
- Specific RAL paint color
- Manufactured in 304L or 316L stainless steel



HL-PHR Unit

Characteristics

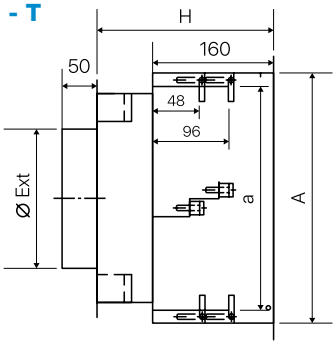
- Application: Clean room air intake with turbulent flow for mounting prefilters and fine filters
- Electro-galvanised steel 15/10e and 20/10e
- Baked epoxy paint RAL 9010
- Top or side connection
- For 48 or 96 mm thick filters
- Pressure tap accessible from the room
- Perforated grid
- Wall and ceiling installation

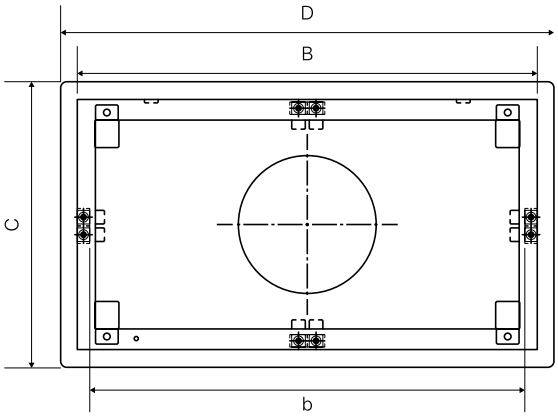
Advantages

- Rugged welded construction
- Quick opening / closing of the grid
- Easily removable grid
- Installation with universal system: Feet or brackets
- Scalable for 48 or 96 mm thick filter

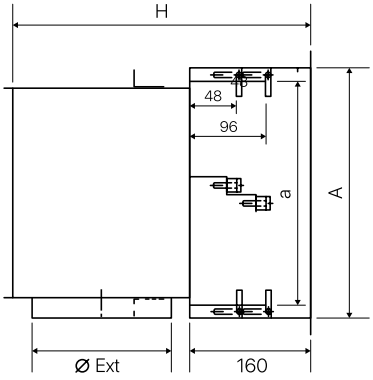
Type	Dimensions CxD (mm)	Dimensions AxB (mm)	Dimensions Reservations (mm)	Filter dimensions axb (mm)	Height without plenum	Top connection T		Slide connection S	
						ø	H	ø	H
HL-PHR/AA	408x408	361x361	367x367	287x287x48/96	160	160	245	160	395
HL-PHR/AD	408x713	361x666	367x672	287x592x48/96	160	200	245	200	435
HL-PHR/MM	611x611	564x564	570x570	490x490x48/96	160	250	245	250	485
HL-PHR/MM-FP	595x595	564x564	570x570	490x490x48/96	160	250	245	250	485
HL-PHR/DD	713x713	666x666	672x672	592x592x48/96	160	250	245	250	485
HL-PHR/DR	713x1018	666x971	672x977	592x892x48/96	160	315	245	315	550

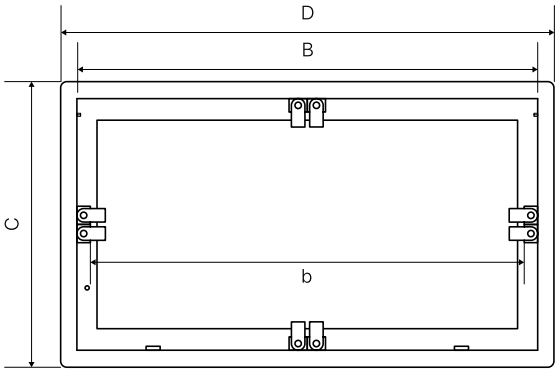
Top connection - T





Side connection - S





HL-PHR Unit

Example of a configuration: HL-PHR/ DD A T C P T G

1 2 3 4 5 6 7

1 - Dimensions	
AA	287 x 287 mm
AD	287 x 592 mm
MM	490 x 490 mm
MM-FP	490 x 490 mm
DD	592 x 592 mm
DR	592 x 892 mm

2 - Filter depth	
A	48 / 96 mm

3 - Connector type	
SS	Rectangular connector
T	Axial circular connector
S	Lateral circular connector
W	Without plenum

4 - Connector diameter	
A	160 mm
B	200 mm
C	250 mm
D	315 mm
N	-

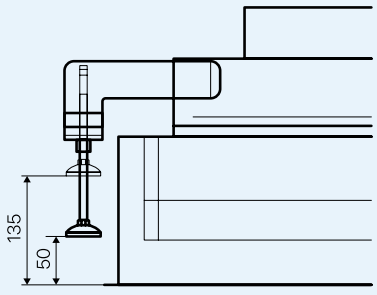
5 - Filter seal applied	
P	Polyurethane

6 - Closing system	
S	1/4 turn - Standard grid
T	1/4 turn - Swivel
M	Magnetic - Swivel

7 - Material	
G	Steel EZ RAL 9010
S	Inox 304L
SS	Inox 316L

Options

- Support feet for mounting on load-bearing ceiling 50 to 135 mm thick
- Removable pivoting grid
- Magnetic grid closure
- Rectangular connection
- Specific RAL paint color
- Manufactured in 304L or 316L stainless steel



Diffusion grids for HL-PH, HL-PH-G, HL-PHR

Example of a configuration: GR-PH/ BB P T G

1 2 3 4 5

1 - Group	
GR-PH	HL-HP
GR-PHR	HL-PHR

2 - Dimensions	
BB	305 x 305 mm
BE	305 x 610 mm
CC	457 x 457 mm
EE	610 x 610 mm
EG	610 x 915 mm
EH	610 x 1220 mm
EF	610 x 762 mm
FF	762 x 762 mm
AA	287 x 287 mm
AD	287 x 592 mm
MM	490 x 490 mm
MM-FP	490 x 490 mm
DD	592 x 592 mm
DR	592 x 892 mm

3 - Grid type	
4W	4 directions
P	Perforated
S	Helical

4 - Closing system	
S	1/4 turn - Standard grid
T	1/4 turn - Swivel
M*	Magnetic - Swivel

**Option "M" not available for 4D grids*

7 - Material	
G	Steel EZ RAL 9010
S	Inox 304L
SS	Inox 316L

4 way grid (4W)

Perforated grid (P)

Swirl grid (S)

Canister boxes SF-CH Bag in - Bag out

Characteristics

- Application: Installation on contaminated air extraction networks, safe replacement of the filter in a plastic bag
- 20/10e steel welded
- Baked epoxy paint RAL 9010
- Tear-resistant bag with integrated elastic
- Tightening of the filter by eccentric cams
- Maximum service temperature: 90°C

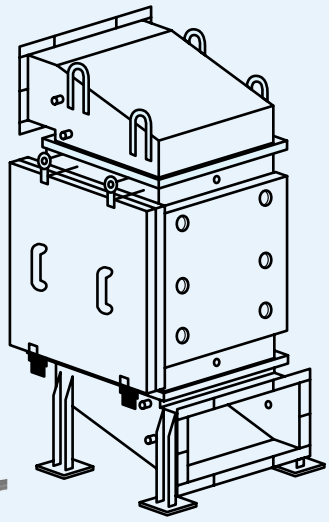
Advantages

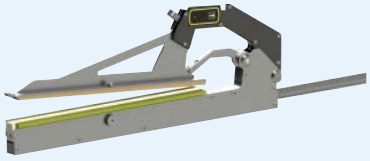
- Continuous welded
- Robust and modular
- Closing hatch with polarizing system, guaranteeing the correct installation of the filter
- Mechanical resistance +/-5000 Pa
- Qualified casing: Class D according to EN 12237, Class C according to Eurovent 2/2, L1 according to EN 1886
- Pressure taps with valves

Type	Box dimensions (mm)				Filter dimensions (mm)			Weight (Kg)
	C	B	B dual version	A	L	W	H	
SF-CH BB	450	498	996	376	305	305	98	16,2
SF-CH BBL	450	498	996	428	305	305	150	19,8
SF-CH BBM	450	498	996	570	305	305	292	26,6
SF-CH BE	450	804	1608	376	305	610	98	20,6
SF-CH BEL	450	804	1608	428	305	610	150	24,2
SF-CH BEM	450	804	1608	570	305	610	292	31
SF-CH EB	755	498	996	376	610	305	98	27,4
SF-CH EBL	755	498	996	428	610	305	150	31
SF-CH EBM	755	498	996	570	610	305	292	37,8
SF-CH EE	755	804	1608	376	610	610	98	31,8
SF-CH EEL	755	804	1608	428	610	610	150	35,4
SF-CH EEM	755	804	1608	570	610	610	292	42,2
SF-CF/EEM-DUO	755	804	-	900	610	610	98 + 292	42,2
SF-CH EF	755	956	1912	376	610	762	98	36,8
SF-CH EFM	755	956	1912	570	610	762	292	44

Options

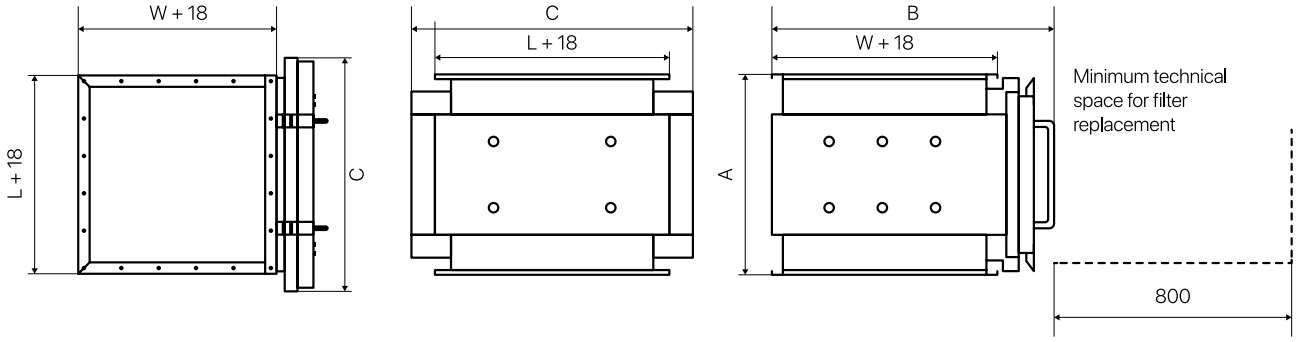
- Horizontal airflow
- SF-CH WALL for wall integration (room walls)
- Upper/lower manifold - Support feet
- AISI 304 or AISI 316 stainless steel version
- ATEX version
- Built-in manual test scan. Global integrity check according to ISO 14644-3
- Double version with only one door
- Reinforced version for mechanical resistance up to 50 000 Pa
- Casing with integrated pre-filter DUO Version
- Integrated maintenance table
- Door with inspection window
- Manometer with support
- Factory assembly or pre-assembly
- Individual test report according to EN12237 class D
- Scissors heat sealer



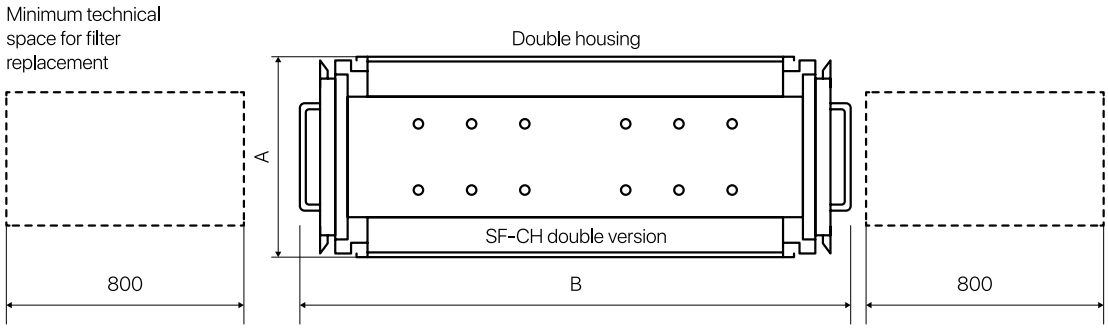


Canister boxes SF-CH Bag in - Bag out

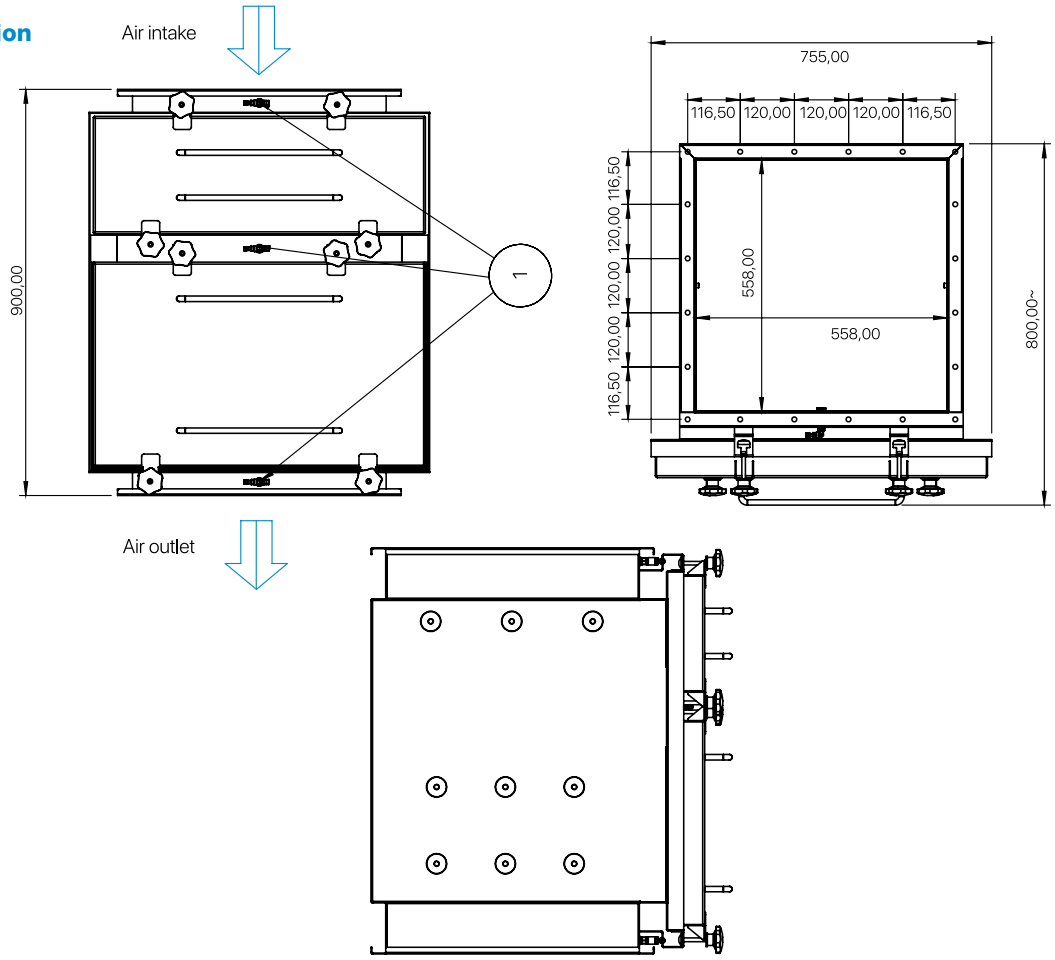
Single door version



Double door version

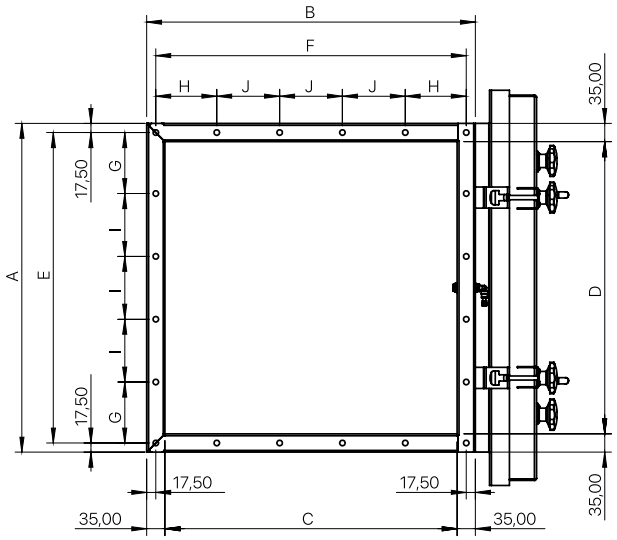


Duo version



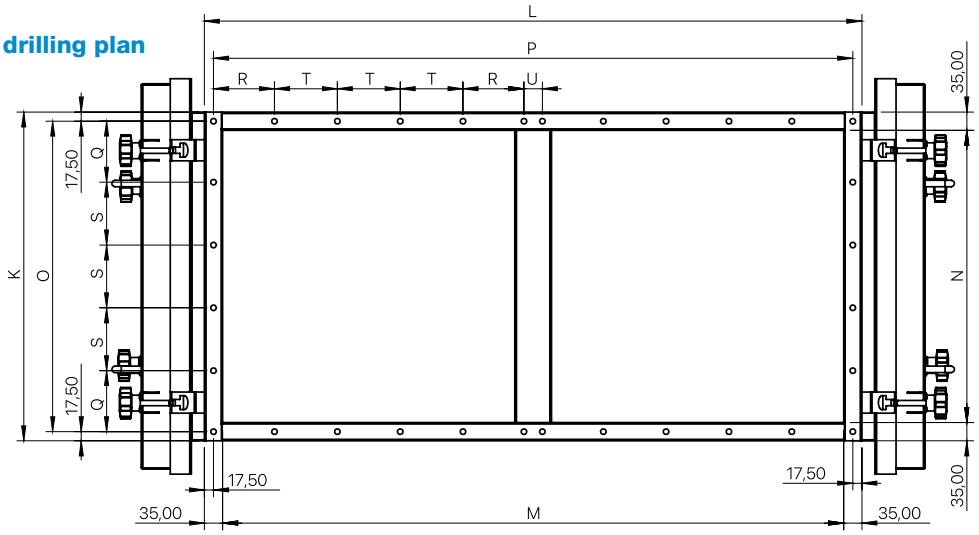
Canister boxes SF-CH Bag in - Bag out

Single door drilling plan



Reference	Dimensions (mm)										No. of holes
	A	B	C	D	E	F	G	H	I	J	
EEM EEL EE	628	628	558	558	593	593	116,5	116,5	120	120	20
EBM EBL EB	628	323	253	558	593	288	116,5	96	120	96	16
BEM BEL BE	323	628	558	253	288	593	96	116,5	96	120	16
BBM BBL BB	323	323	253	253	288	288	96	96	96	96	12
EFM EF	628	780	710	558	593	745	116,5	116,5	120	128	22

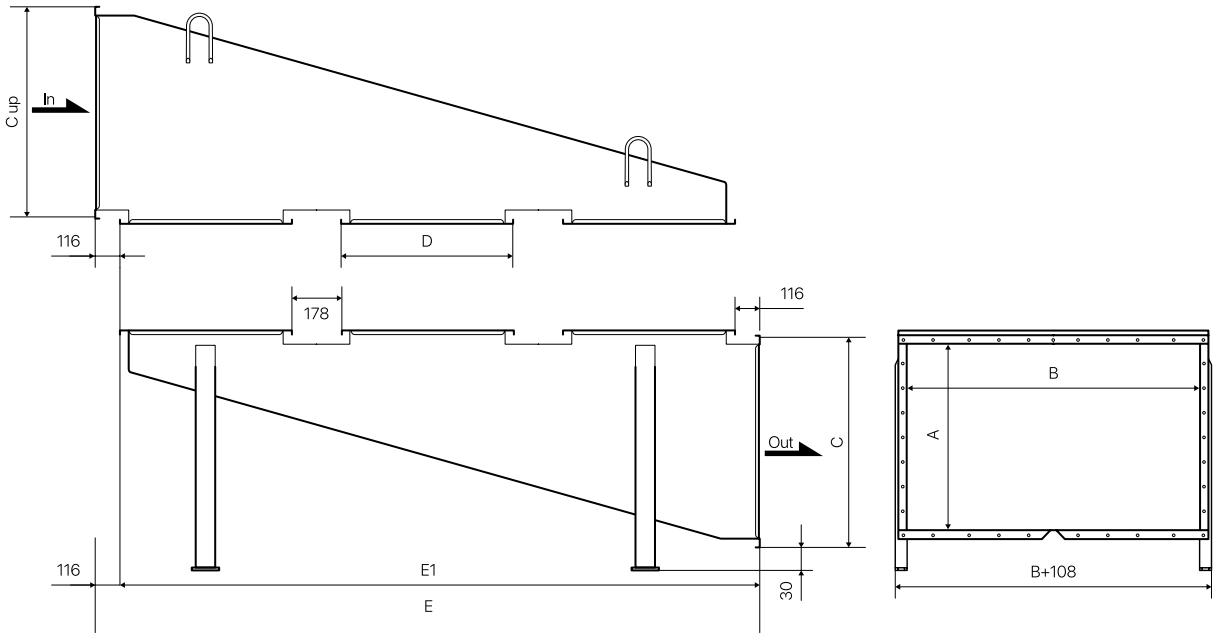
Double door drilling plan



Reference	K	L	M	N	O	P	Q	R	S	T	U	No. of holes
EEM EEL EE	628	1256	1186	558	593	1221	116.5	116.5	120	120	35	20

Canister boxes SF-CH Bag in - Bag out

Standard version



Number of enclosures	A	B	C	C up	D	E	E1
1	254	558	376	346	628	860	744
2	254	558	376	346	628	1666	1550
3	406	558	528	498	628	2472	2356
4	558	558	680	650	628	3278	3162
5	558	558	680	650	628	4084	3968
6	812	558	934	904	628	4890	4774
7	812	558	934	904	628	5696	5580
8	915	558	1037	1007	628	6502	6386

N.B.: the dimensions of the connectors apply to filter sizes 610x610 mm
Check the air speed at the entrance/exit of the collectors, it must be < 10 m/s

Canister boxes SF-CH Bag in - Bag out

Standard version

Atex version

Reinforced version

DAMPER DAM-SF-CH/DAM-DUCT Serie

Leakage rate

- Test Report accomplishment to: EN12599 EN 12237 Class D (six time better than Class 4 on DIN 1946 T4)
- Third Part welding Certification: EN1289:2006, ISO23277, EN12668-1

Characteristics

- Application: HVAC, chemical plants, dust collectors, pharmaceutical, gas filtration, air conditioning sectors
- Use: Isolation of BIBO systems
- Temperature condition: Operating temperature -20°C / +100°C (Highest temperature on demand)
- Operating pressure: ±5000 Pa / 0,05 bar (Highest pressure on demand)
- Operating torque Nm: 50 Nm

Technical features

- Welding: MIG and TIG
- Pivot and blade: Blade and pivots are assembled with stainless steel devices
- Air tightness:
  Class D inside/outside
  Class C upstream/downstream
- Dimensions: See the table “Technical data” for the standard configuration, with * custom manufacturing
- Controls: Manual control on default, motorizable on request

Production data

- Frame: Powder Coated Steel 15/10 – Stainless Steel AISI304 15/10 – Stainless Steel AISI316 15/10
- Blade: Powder Coated Steel 30/10 – Stainless Steel AISI304 30/10 – Stainless Steel AISI316 30/10
- Pivot: Stainless Steel AISI316
- Blade gasket: EPDM
- Pivot seal ring: Viton
- Transmission: Powder Coated Steel 20/10 – Stainless Steel AISI304 20/10 – Stainless Steel AISI316 20/10
- Bush front and behind: Stainless Steel AISI316
- Actuator plate: Powder Coated Steel 15/10 – Stainless Steel AISI304 15/10 – Stainless Steel AISI316 15/10
- ATEX (on request): Powder Coated RAL7021 with dissipative material for ATEX application or Stainless Steel
- Pressure drop: 50Pa @ 4000m³/h/filter cell 610x610x292 mm

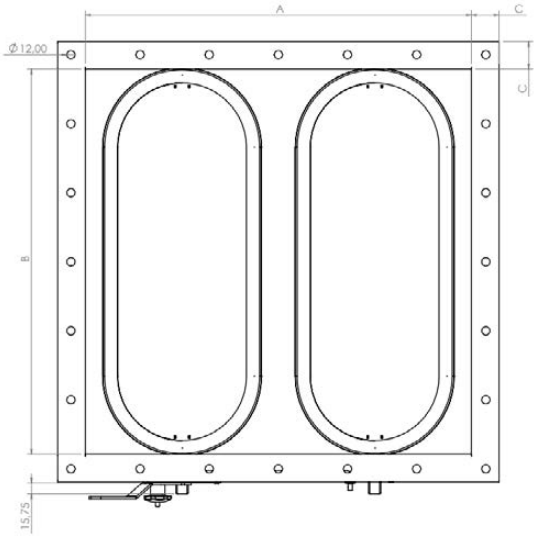
Technical data DAM-SF-CH series

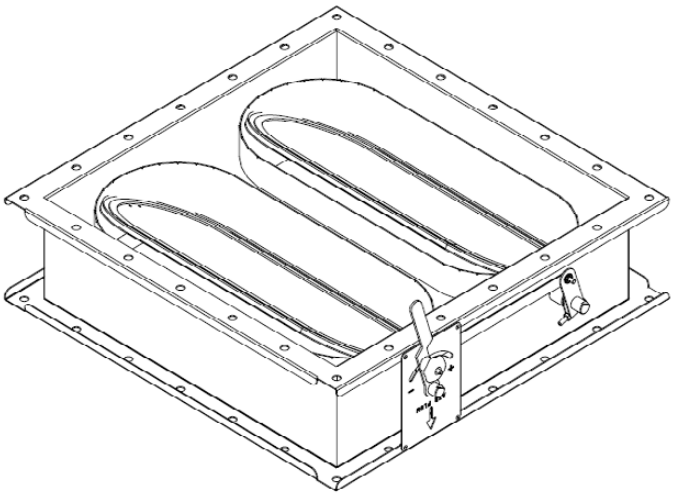
Dimensions-mm DAM-SF-CH	254X254	254X558	558X558	254X863	863X254	558X558	558X710
Side A*	254	254	558	254	863	558	558
Side B*	254	558	558	863	254	558	710
Side C*	35	35	35	35	35	35	35
Diameter of Holes*	12	12	12	12	12	12	12
Number of Holes*	12	16	16	20	20	20	20
Side H*	170/210	170/210	170/210	170/210	170/210	170/210	170/210
Torque Nm	50	50	50	50	50	50	50
Number of Blades	1	1	1	1	1	2	2
Axis Diameter	18	18	18	18	18	18	18

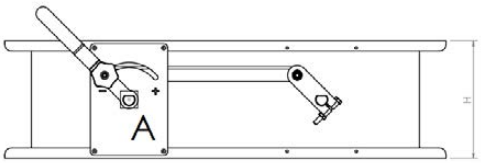
DAMPER DAM-SF-CH/DAM-DUCT Serie

Technical data DAM-SF-CH series

Dimensions-mm DAM-SF-CH	D1 (254 x 254)	D1 (254 x 558)	D2 (558 x 558)	D3 (700 x 558)	D4 (840 x 558)	D5 (1100 x 558)	D6 (1400 x 558)	D7-D* (1000 x 1000)
Side A*	254	254	558	700	863	558	558	558
Side B*	254	558	558	558	254	558	710	710
Side C*	40	40	40	40	40	40	40	40
Diameter of Holes*	12	12	12	12	12	12	12	12
Number of Holes*	10	18	24	28	32	36	36	40
Side H*	170	170	170	170	170	170	170	170
Torque Nm	50	50	50	50	50	50	50	50
Number of Blades	1	1	2	4	4	4	5	4
Axis Diameter	18	18	18	18	18	18	18	18







Check and test

- Unit leak test:
  Test Report accomplishment to: EN12599 EN 12237
  Class D
- Leakage test blade:
  Test Report accomplishment to: EN12599 EN 12237
  Class C
- Overall leakage:
  6x better than class 4 according to DIN 1946 T4

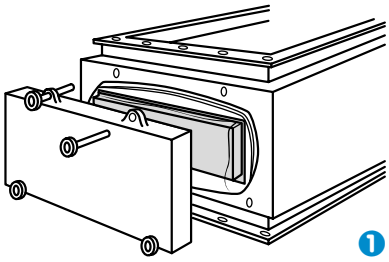
Alternative design: Circular Damper

Canister boxes SF-CH - Maintenance procedure

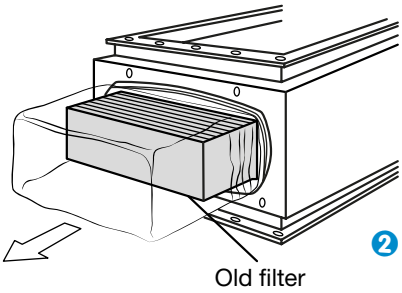
FILTER REPLACEMENT PROCEDURE

Replace filter

- Turn off the fan
- Close the registers upstream and/or downstream (if present)
- Adjust the pressure using the balancing valve (if present)
- Loosen the star knobs and remove the door
- Release the filters by turning the handles horizontally

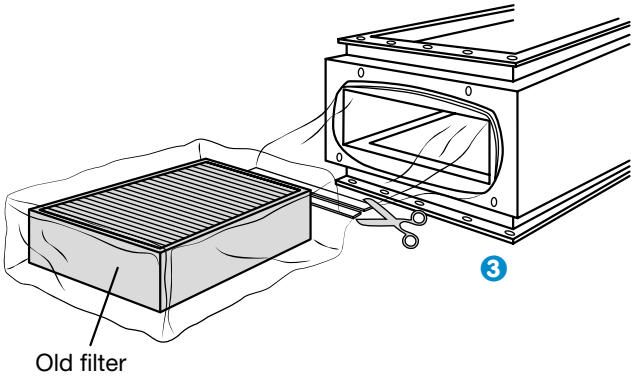


- Unroll the plastic bag
- Pull the filter into the plastic bag and place it on a flat surface or maintenance table



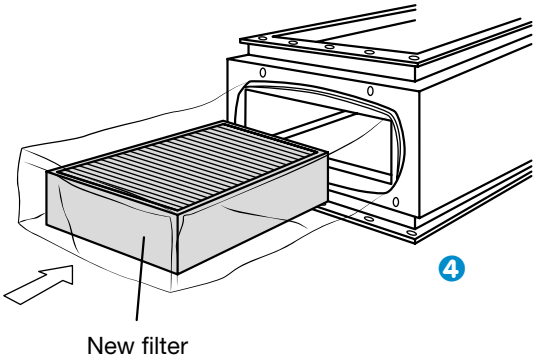
Sealing the plastic bag

- Flatten the bag without creases
- Seal the bag with a thermal welding machine at 2 points and cut the bag between the 2 welds



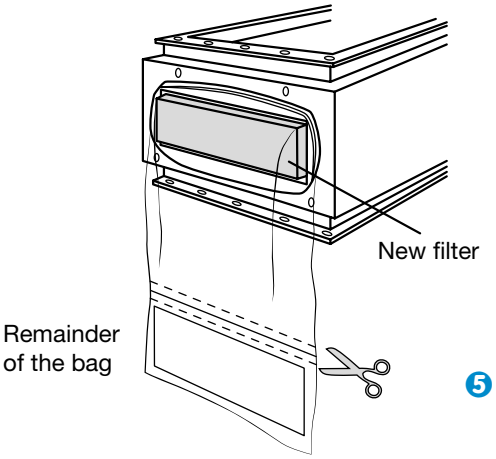
Placing a new filter

- Place the filter in the bag with the seal facing up towards the air inlet
- Place the elastic of the new plastic bag over the groove around the opening of the housing



Remove the rest of the old plastic bag

- Detach the remainder of the old bag from the housing and pull it into the recess provided in the new bag
- Slide the new filter with the gasket on the top to prevent gasket damage and ensure the airtightness
- Use the lever system to tighten the filter
- Roll up the plastic bag with the remainder of the old bag and place it against the filter
- Replace the door and tighten the knobs



Canister boxes SF-CH

Example of a configuration: SF-CH/ EF M S G -

1 2 3 4 5

1 - Dimensions	
BB	305x305 mm
BE	305x610 mm
EB	610x305 mm
EE	610x610 mm
EF	610x762 mm

2 - Filter depth	
-	98 mm
L	150 mm
HV	292 mm

3 - Version	
S	Single version
Bi-Side	Double version

4 - Material	
G	Steel RAL 9010
S	AISI 304L
SS	AISI 316L

5 - Option	
DUO	Filter 610*610*292 + 610*610*98 (48)

HOSPITAL SECTOR

Air treatment in hospitals

NF S 90 351 standard defines four types of risk areas

- Zone 1 (low risk) for areas where only comfortable climate control is required.
- Zone 2 (moderate risk) for external consultations, rehabilitation services, maternity hospitals, outpatient clinics for infectious diseases.
- Zone 3 (high risk) for CPR, intensive care, surgery, chemotherapy, etc.
- Zone 4 (very high risk) for aseptic operating rooms, cancer care, transplants, ophthalmology, etc.

Risk class	Class	Elimination-kinetics particles	Microbiological purity class	Differential pressure (positive or negative)	Temperature range	Airflow type in protected zone	Other specifications minimum value
4 (1)	ISO 5	CP 5	M1	15 Pa ± 5Pa	19 °C à 26°C	Unidirectional airflow	Area under the plenum airspeed 0.25 m/s to 0.35 m/s Air exchange rate for the space ≥ 6 volumes/hour
3	ISO 7	CP 10	M10	15 Pa ± 5Pa	19 °C à 26°C	Unidirectional or non-unidirectional airflow	Ventilation rate ≥ 15 volumes/hour
2	ISO 8	CP 20	M100	15 Pa ± 5Pa	19 °C à 26°C	Non-unidirectional airflow	Ventilation rate ≥ 10 volumes/hour

(1) With unidirectional airflow, the ventilation rate must be determined separately for the area below the plenum and for the total room.

Calculation example:

For a 200 m^3 operating room with a recirculated unidirectional airflow of 3 m x 4 m. A 3 x 4 m ceiling blowing air at a velocity of 0.3 m/s produces 12,960 m^3/h.

The volume of the area under the airflow is 40 m^3, which gives a ventilation rate of 324 vol/h.

Assuming that 6 vol/h of fresh air is sufficient to create overpressure in the room and remove pollutants, the required air flow rate is 1,200 m^3/h of fresh air.

When the air is blown into the room via the unidirectional airflow, the area under the airflow is covered by 11,760 m^3/h of recirculated air and 1,200 m^3/h of fresh air. For risk zone 4 (or 3 in case of a unidirectional airflow) the following is therefore required:

- A unidirectional airflow with sufficient dimensions to protect the entire risk zone for the patient
- An air velocity sufficient to ensure air cleanliness for the entire volume below the plenum
- An air exchange rate that is sufficient to remove the contaminants in the room and to ensure overpressure according to the surrounding environment.

Operating room ceiling HD-CE

HD-CE

Diffuser ceiling equipped with very high efficiency filters allowing the creation of risk 3 or risk 4 operating theaters according to standard NFS-90351

Characteristics

- Construction in galvanized steel, powder coated, plenum and filter housing airtight assembled in the factory, total height 450 mm
- Design: in one or more parts for mounting on site, depending on the dimensions and design
- Standard construction with sealed passage for surgical light
- Air supply connection on the side
- 25 mm finishing profile around the plenum
- Fixing system above for the suspension and support
- Connection 100% point for the integrity tests and differential pressure measurement filters
- 1-piece sealing surface to ensure airtightness
- Fixing for 68 or 90 mm thick dry-seal filters
- Perforated grids covering the entire surface allow for uniform air distribution, preventing dead zones and ensuring consistent airflow

Type	Dimensions AxBxH (mm)	Number of parts	Number of filters				Flow rate m³/h		Weight (kg)
			305×610×68	610×610×68	610×915×68	610×1220×68	0,25 m/s	0,32 m/s	
A	2730x1330x450	1	2			3	2350	3000	160
B	2000x2060x450	2		2	4		2670	3420	160
C	2610x2060x450	2			2	4	3670	4700	200
D	2975x2060x450	2			7	1	4170	5340	250
E	2670x2730x450	2			10		5000	6400	220
F	3280x2730x450	4			2	8	6340	8110	300
G	3280x3400x450	4				12	8000	10240	350
H	4070x3280x450	4	2			14	9670	12380	430

Type	Dimensions AxBxH (mm)	Number of parts	Number of filters				Flow rate m³/h		Weight (kg)
			260x560x68	560x560x68	560x860X68	560x1160x68	0,25 m/s	0,32 m/s	
E1	2510x2530x450	2			10		4330	5540	210
F1	3110x2530x450	4			2	8	5530	7075	290
G1	3110x3150x450	4				12	7000	8960	340
H1	3770x3110x450	4	2			14	8430	10780	420

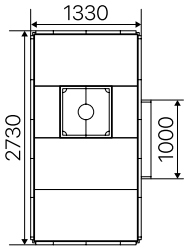
Variants and options

- Stainless steel construction
- Construction without a scialytic passage (WS) or with an eccentric scialytic passage (ES)
- Construction for mounting filters with a gel seal
- Construction for 110 mm high filters for lower resistance
- Specially sized air inlet
- Lowered construction of 300 mm possible, max. height air inlet is 100 mm

Operating room ceiling HD-CE

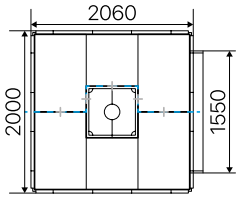
Standard configurations

A



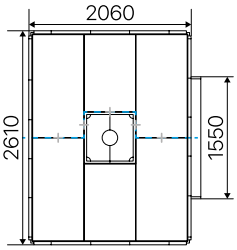
Type 2,5 x 1,5

B



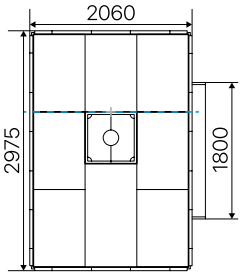
Type 2 x 2

C



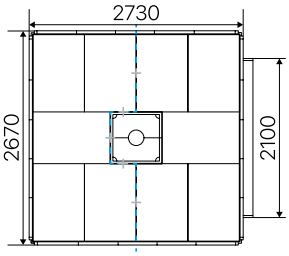
Type 2,5 x 2

D



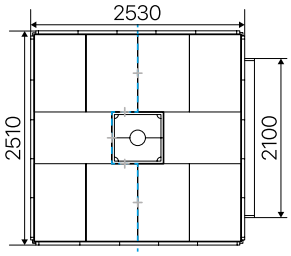
Type 3 x 2

E



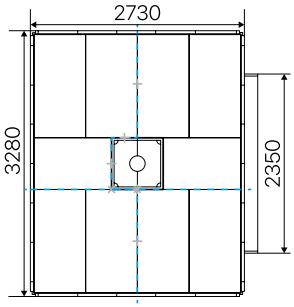
Type 2,5 x 2,5

E1



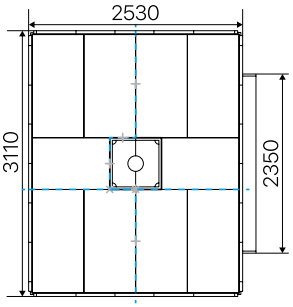
Type 2,4 x 2,4

F



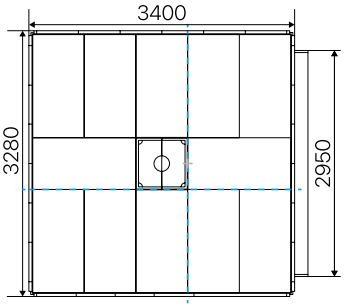
Type 3 x 2,5

F1



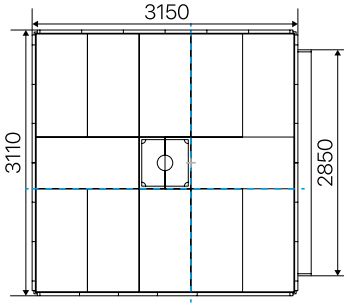
Type 3 x 2,4

G



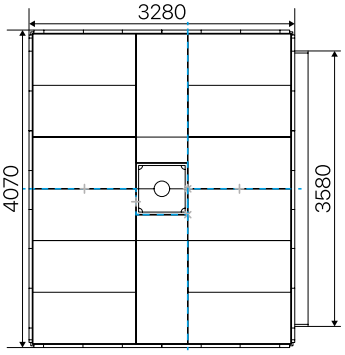
Type 3,5 x 3

G1



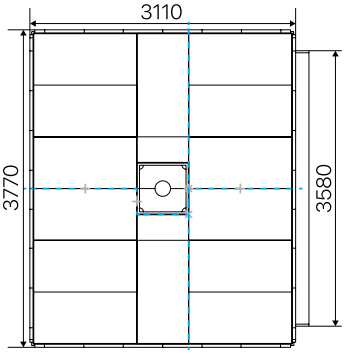
Type 3 x 3

H

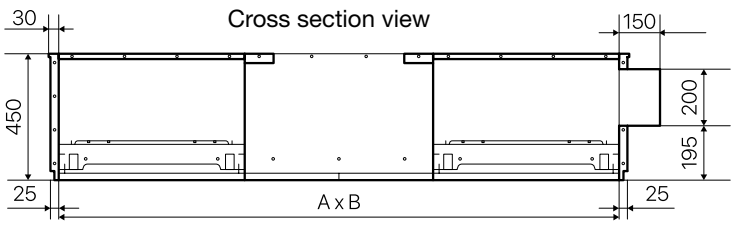


Type 4 x 3

H1



Type 3,6 x 3



Dividing line

Operating room ceiling HD-CE

Example of a configuration: HD-CE/ B P A CS G -

1 2 3 4 5 6

1 - Dimensions	
A	2730 x 1330 mm
B	2000 x 2060 mm
C	2610 x 2060 mm
D	2975 x 2060 mm
E	2730 x 2670 mm
F	3280 x 2730 mm
G	3280 x 3400 mm
H	4070 x 3280 mm
E1	2530 x 2510 mm
F1	2530 x 3110 mm
G1	3150 x 3110 mm
H1	3110 x 3770 mm

2 - Grid type	
P	Standard perforated grid - screw fixing
PT	Perforated grid with 1/4 turn latches

3 - Connector type	
A	On side A
B	On side B
SP	Special air inlet

4 - Operating lamp	
CS	Centered passage operating light
WS	Without passage for operating light
ES	Off-center passage operating light

5 - Material	
G	Steel RAL 9010
S	AISI 304L
SS	AISI 316L

6 - Type of filter	
-	Polyurethane gasket
G	Gel gasket

HL-HD Terminal hoods

Characteristics

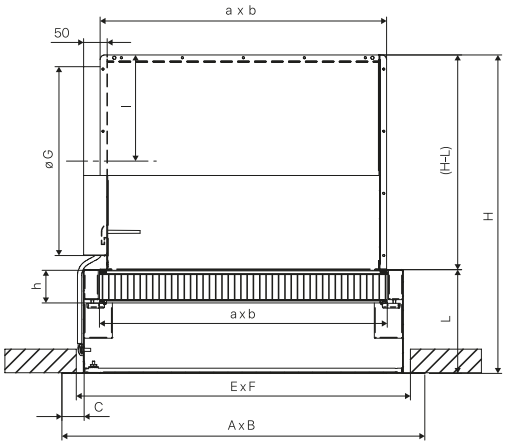
- Galvanized steel, powder coated RAL9010
- Top or side connection
- 68/110 mm or 150 mm thick HEPA filters
- 2 differential pressure connection ports
- Interchangeable diffusion grid: perforated, swirl or 4-way
- Wall and ceiling mounting

Advantages

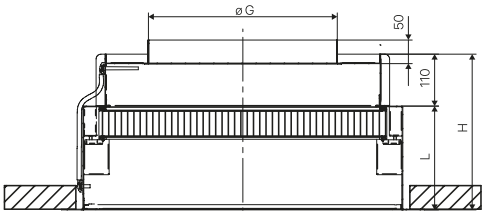
- Multifunctional application: air supply/ extraction, wall or ceiling installation
- 3 models of diffusers adapted to different types of distribution:
  - Perforated grid for a vertical diffusion
  - Helicoidal grid for a diffusion of air by mixing
  - 4-way grid for a multidirectional diffusion
- L1 tightness according to EN 1881, class C EN1775

Type	Filter dimensions (mm)			Installation dimensions (mm)			Height connection H		External dimensions (mm)		Flange	Shaft connection	øG (mm)
	a	b	h	E	F	L	S	T	A	B	C	I	
HL-HD/BBE	305	305	68-110	410	410	180	390	290	469	469	47	105	159
HL-HD/BBQ	305	305	68-110	410	410	180	430	290	469	469	47	125	199
HL-HD/BBL	305	305	150	410	410	220	470	330	469	469	47	125	199
HL-HD/BEE	305	610	68-110	410	710	180	430	290	469	769	47	125	199
HL-HD/BEQ	305	610	68-110	410	710	180	480	290	469	769	47	150	249
HL-HD/BEL	305	610	150	410	710	220	520	330	469	769	47	150	249
HL-HD/CCE	457	457	68-110	560	560	180	430	290	635	635	55	125	199
HL-HD/CCQ	457	457	68-110	560	560	180	480	290	635	635	55	150	249
HL-HD/CCL	457	457	150	560	560	220	585	314	635	635	55	150	314
HL-HD/EEE	610	610	68-110	710	710	180	480	290	769	769	47	150	249
HL-HD/EEQ	610	610	68-110	710	710	180	545	290	769	769	47	225	314
HL-HD/EEL	610	610	150	710	710	220	670	330	769	769	47	225	399
HL-HD/EGE	915	610	68-110	1010	710	180	545	290	1069	769	47	182.5	314
HL-HD/EGQ	915	610	68-110	1010	710	180	630	290	1069	769	47	225	399
HL-HD/EGL	915	610	150	1010	710	220	670	330	1069	769	47	225	399
HL-HD/EHE	1220	610	68-110	1310	710	180	545	290	1369	769	47	182.5	314
HL-HD/EHQ	1220	610	68-110	1310	710	180	630	290	1369	769	47	225	399
HL-HD/EHL	1220	610	150	1310	710	220	670	330	1369	769	47	225	399
HL-HD/CCE-FPE	457	457	68-110	560	560	180	430	290	595	595	35	125	199
HL-HD/CCQ-FPQ	457	457	68-110	560	560	180	480	290	595	595	35	150	249
HL-HD/CCL-FPL	457	457	150	560	560	220	585	314	595	595	35	150	314
HL-HD/CQE-FPE	1057	457	68-110	1160	560	180	545	290	1195	595	35	182.5	314
HL-HD/CQQ-FPQ	1057	457	68-110	1160	560	180	630	290	1195	595	35	225	399
HL-HD/CQL-FPL	1057	457	150	1160	560	220	670	330	1195	595	35	225	399

HL-HD S
Side connection



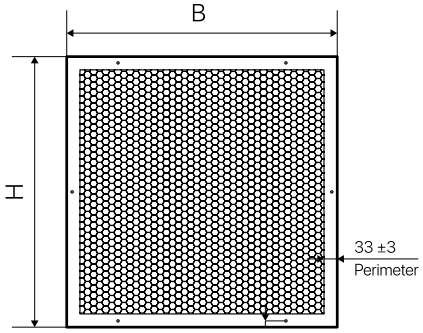
HL-HD T
Top connection



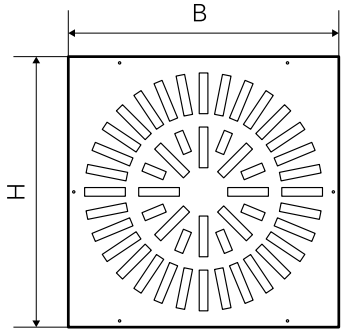
HL-HD Terminal hoods

HL-HD diffusion grid

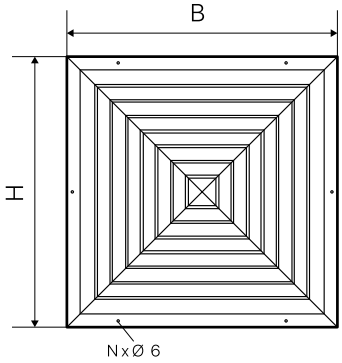
P



S



4W

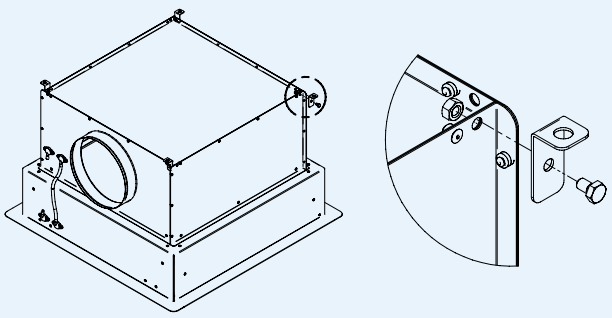


Type	Total BxH (mm)	Perforated grid Max. flow rate (m³/h)		Helicoid grid Max. flow rate (m³/h)		4-way grid Max. flow rate (m³/h)	
		Filter E10	Filter H14*	Filter E10	Filter H14	Filter E10	Filter H14
GR-HD/BBE	373x373	240	150	200	150	240	150
GR-HD/BBQ	373x373	350	300	200	200	350	300
GR-HD/BBL	373x373	480	300	200	200	480	300
GR-HD/BEE	373x673	480	300	480	300	480	300
GR-HD/BEQ	373x673	700	600	480	400	700	600
GR-HD/BEL	373x673	700	600	480	400	800	650
GR-HD/CCE	523x523	500	335	500	335	600	335
GR-HD/CCQ	523x523	700	700	500	500	750	750
GR-HD/CCL	523x523	700	700	500	500	950	950
GR-HD/EEE	673x673	700	600	700	600	700	600
GR-HD/EEQ	673x673	1000	1000	1000	1000	1200	1200
GR-HD/EEL	673x673	1400	1200	800	800	1500	1500
GR-HD/EGE	673x973	1200	900	1200	900	1200	900
GR-HD/EGQ	673x973	1300	1300	1350	1350	1550	1550
GR-HD/EGL	673x973	1300	1550	1350	1350	1550	1550
GR-HD/EHE	673x1273	1200	1200	1200	1200	1200	1200
GR-HD/EHQ	673x1273	1800	1800	1800	1800	1850	1850
GR-HD/EHL	673x1273	1800	1800	1800	1800	1850	1850
GR-HD/CCE-FPE	523x523	500	335	500	335	600	350
GR-HD/CCQ-FPQ	523x523	700	700	500	500	750	750
GR-HD/CCL-FPL	523x523	700	700	500	500	950	950
GR-HD/CQE-FPE	1123x523	1100	780	1150	780	1200	780
GR-HD/CQQ-FPQ	1123x523	1500	1500	1500	1500	1500	1500
GR-HD/CQL-FPL	1123x523	1500	1500	1500	1500	1600	1600

** Adjustable according to the installation height of the grids. Perforated grids are generally used with 68 mm filters.*

Options

- HL-HD-S version available with damper adjustable from the room
- Mounting kit (see adjacent drawing)



HL-HD Terminal hoods

Example of a configuration: HL-HD/ BB Q T B P T G -
1 2 3 4 5 6 7 8

1 - Dimensions	
BB	305 x 305 mm
CC	457 x 457 mm
CC.FP	457 x 457 mm
BE	305 x 610 mm
EE	610 x 610 mm
EG	610 x 915 mm
EH	610 x 1220 mm
CQ.FP	457 x 1057 mm

2 - Filter depth	
E	68/110 mm
Q	68/100 mm
L	150 mm

3 - Connector type	
T	Top connection
S	Side connection

4 - Connector diameter	
A	160 mm
B	200 mm
C	250 mm
D	315 mm
E	355 mm
F	400 mm

5 - Filter seal applied	
P	Polyurethane

6 - Closing system	
S	Screwed
T	1/4 turn closures

7 - Material	
G	Steel RAL 9010
S	AISI 304L
SS	AISI 316L

8 - Option	
R	Register

GR-HD Diffusion grids

Example of a configuration: GR-HD/ BB P T G

1 2 3 4 5

1 - Group	
GR-HD	HL-HD

2 - Dimensions	
BB	305 x 305 mm
BE	305 x 610 mm
CC	457 x 457 mm
EE	610 x 610 mm
EG	610 x 915 mm
EH	610 x 1200 mm
CQ	457 x 1057 mm

3 - Grid type	
4W	4-way
P	Perforated
S	Helical

4 - Closing system	
S	Screwed
T*	1/4 turn closures

** Version not available for 4D grids*

5 - Material	
G	Steel RAL 9010
S	AISI 304L
SS	AISI 316L

HL-RB Air Return grid

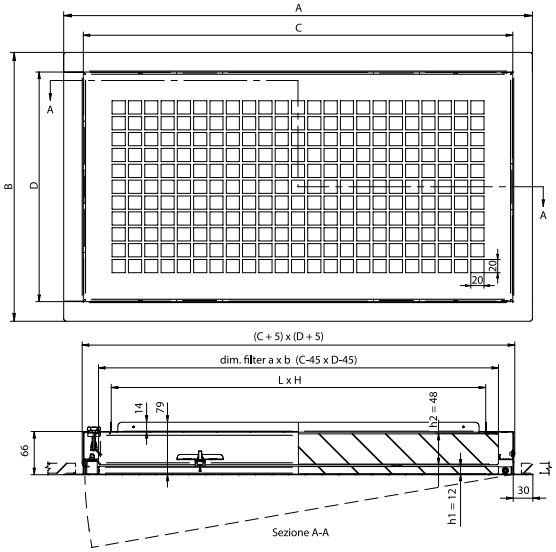
Characteristics

- Application: Air return in cleanroom for installation of pre-filter and fine filters
- Galvanized steel RAL 9010 powder coating
- Top or side connection
- Factory pre-assembled plenum and filter support
- Disassembly on site possible
- Sealable on site
- For 48 mm thick filters
- Mounted pressure ports
- Grid can be opened/closed (on B side) without tools
- Wall and ceiling installation
- A square mesh perforated grid 20 x 20 mm

Option

- Installation of a 12 mm thick pre-filter on grid

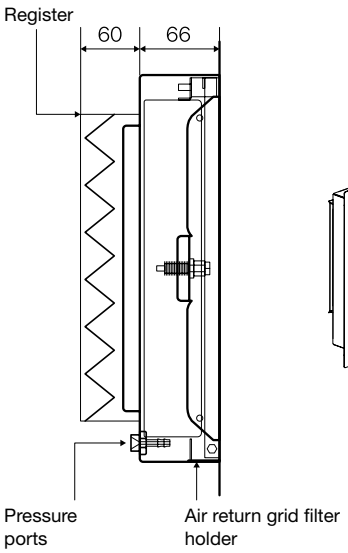
Size	Filter dimensions (mm)				Grid dimensions (mm)				Dimensions damper plenum (mm)		Maximal flow rate (m^3/h)
	a	b	h1	h2	A	B	C	D	L	H	
3.1	305	150	12	48	410	255	350	195	266	116	200
4.1	395	150	12	48	500	255	440	195	366	116	320
3.3	305	305	12	48	410	410	350	350	266	266	500
3.4	305	395	12	48	410	500	350	440	266	366	540
3.5	305	490	12	48	410	595	350	535	266	466	800
5.3	490	305	12	48	595	410	535	350	466	266	800
4.4	395	395	12	48	500	500	440	440	366	366	840
3.6	305	610	12	48	410	715	350	655	266	571	970
6.3	610	305	12	48	715	410	655	350	571	266	970
4.5	395	490	12	48	500	595	440	535	366	466	1000
4.6	395	610	12	48	500	715	440	655	366	566	1220
5.5	490	490	12	48	595	595	535	535	466	466	1220
5.6	490	610	12	48	595	715	535	655	466	566	1560
6.6	610	610	12	48	715	715	655	655	566	566	1950
5.9	490	915	12	48	595	1020	535	960	466	866	2340
7.4	762	395	12	48	867	500	807	440	716	366	1570
7.7	762	762	12	48	867	867	807	807	717	731	3030

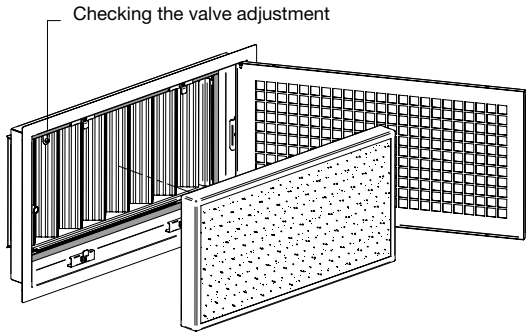


HL-RB Air Return grid

HL-RB + Register

Size	Filter dimensions (mm)	
	a	b
3.1	305	150
4.1	395	150
3.3	305	305
3.4	305	395
3.5	305	490
5.3	490	305
4.4	395	395
3.6	305	610
6.3	610	305
4.5	395	490
4.6	395	610
5.5	490	490
5.6	490	610
6.6	610	610
5.9	490	915
7.4	762	395
7.7	762	762

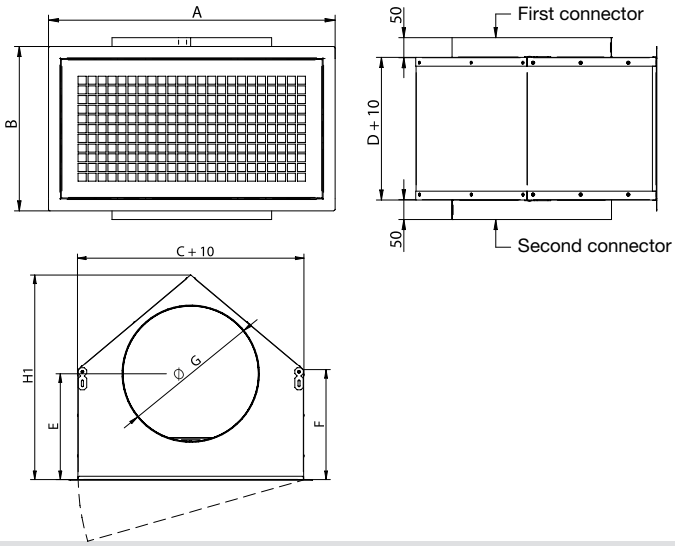




HL-RB + Triangular Plenum

Size	Grid dimensions (mm)				Plenum (mm)							
					1 connector				2 connectors			
	A	B	C	D	H1	E	øG	F	H1	E	øG	F
3.1	410	255	350	195	260	140	124	110	340	180	199	190
4.1	500	255	440	195	300	160	159	115	410	215	249	225
3.3	410	410	350	350	340	170	199	190	450	240	249	300
3.4	410	500	350	440	350	185	199	200	350	185	199	200
3.5	410	595	350	535	420	220	249	270	420	220	249	270
5.3	595	410	535	350	-	-	-	-	560	290	354	335
4.4	500	500	440	440	410	215	249	225	490	245	314	305
3.6	410	715	350	655	450	240	249	300	-	-	-	-
6.3	715	410	655	350	-	-	-	-	600	310	399	325
4.5	500	595	440	535	490	245	314	305	-	-	-	-
4.6	500	715	440	655	490	245	314	305	-	-	-	-
5.5	595	595	535	535	490	255	314	265	600	310	399	375
5.6	595	715	535	655	560	290	354	335	-	-	-	-
6.6	715	715	655	655	600	310	399	325	-	-	-	-
5.9	595	1020	535	960	600	310	399	375	-	-	-	-
7.4	867	500	807	440	-	-	-	-	710	355	499	370
7.7	867	867	807	807	710	355	499	370	-	-	-	-

Note: The connection is by definition at the length C

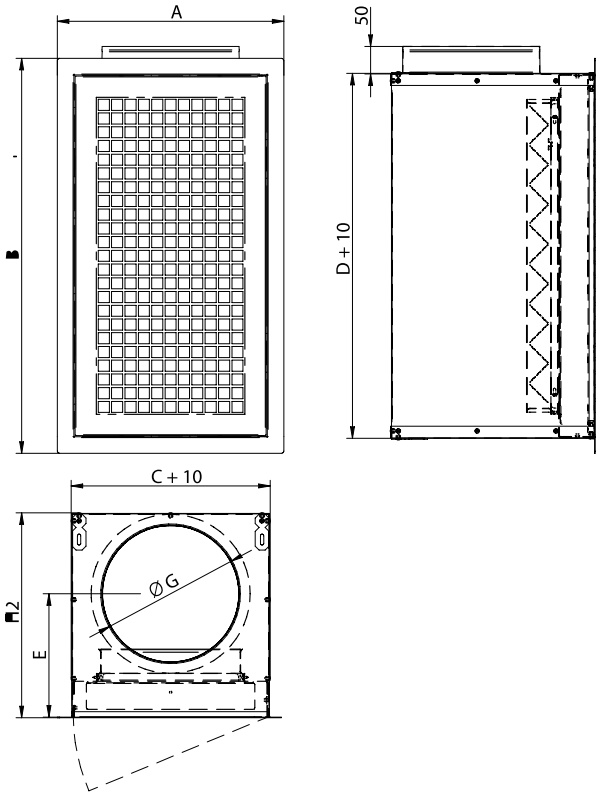


HL-RB Air Return grid

HL-RB + Lateral Plenum

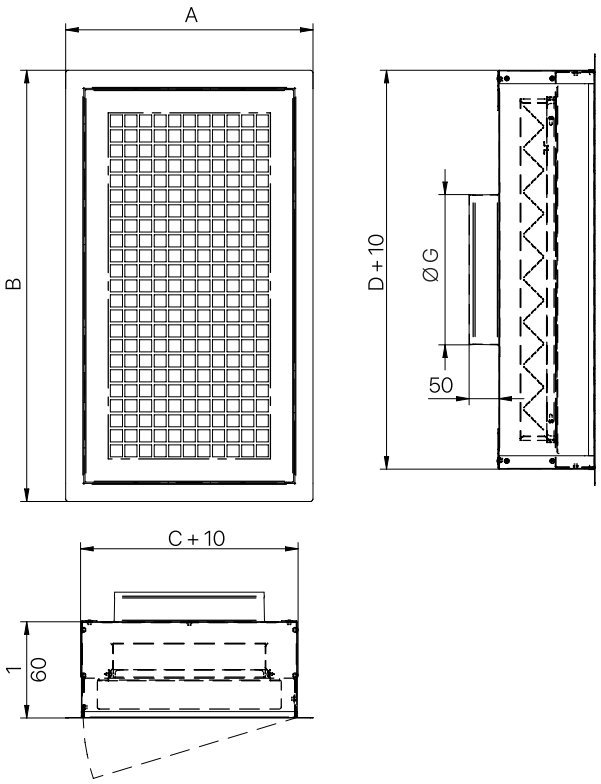
Size	Grid dimensions (mm)				Plenum (mm)		
	A	B	C	D	H2	E	øG
3.1	410	255	350	195	230	150	124
4.1	500	255	440	195	270	170	159
3.3	410	410	350	350	310	190	199
3.4	410	500	350	440	310	190	199
3.5	410	595	350	535	370	220	249
5.3	595	410	535	350	-	-	-
4.4	500	500	440	440	370	220	249
3.6	410	715	350	655	370	220	249
6.3	715	410	655	350	-	-	-
4.5	500	595	440	535	450	265	314
4.6	500	715	440	655	450	265	314
5.5	595	595	535	535	450	265	314
5.6	595	715	535	655	480	280	354
6.6	715	715	655	655	510	285	399
5.9	595	1020	535	960	510	285	399
7.4	867	500	807	440	-	-	-
7.7	867	867	807	807	610	335	499

Note: The connection is by definition at the length C



HL-RB + Axial Plenum

Size	Grid dimensions (mm)				Plenum (mm)
	A	B	C	D	øG
3.1	410	255	350	195	124
4.1	500	255	440	195	159
3.3	410	410	350	350	199
3.4	410	500	350	440	199
3.5	410	595	350	535	249
5.3	595	410	535	350	-
4.4	500	500	440	440	249
3.6	410	715	350	655	249
6.3	715	410	655	350	-
4.5	500	595	440	535	314
4.6	500	715	440	655	314
5.5	595	595	535	535	314
5.6	595	715	535	655	354
6.6	715	715	655	655	399
5.9	595	1020	535	960	399
7.4	867	500	807	440	-
7.7	867	867	807	807	499



HL-RB Air Return grid

Example of a configuration: HL-RB/ 6.6 T1 G M G R

1 2 3 4 5 6

1 - Dimensions	
3.1	305 x 150 mm
4.1	395 x 150 mm
3.3	305 x 305 mm
3.4	305 x 395 mm
3.5	305 x 490 mm
5.3	490 x 305 mm
4.4	395 x 395 mm
3.6	305 x 610 mm
6.3	610 x 305 mm
4.5	395 x 490 mm
4.6	395 x 610 mm
5.5	490 x 490 mm
5.6	490 x 610 mm
6.6	610 x 610 mm
5.9	490 x 915 mm
7.4	762 x 395 mm
7.7	762 x 762 mm

2 - Plenum	
A	Without plenum
T1	Triangular plenum - 1P
T2	Triangular plenum - 2P
S	Lateral plenum
T	Top plenum

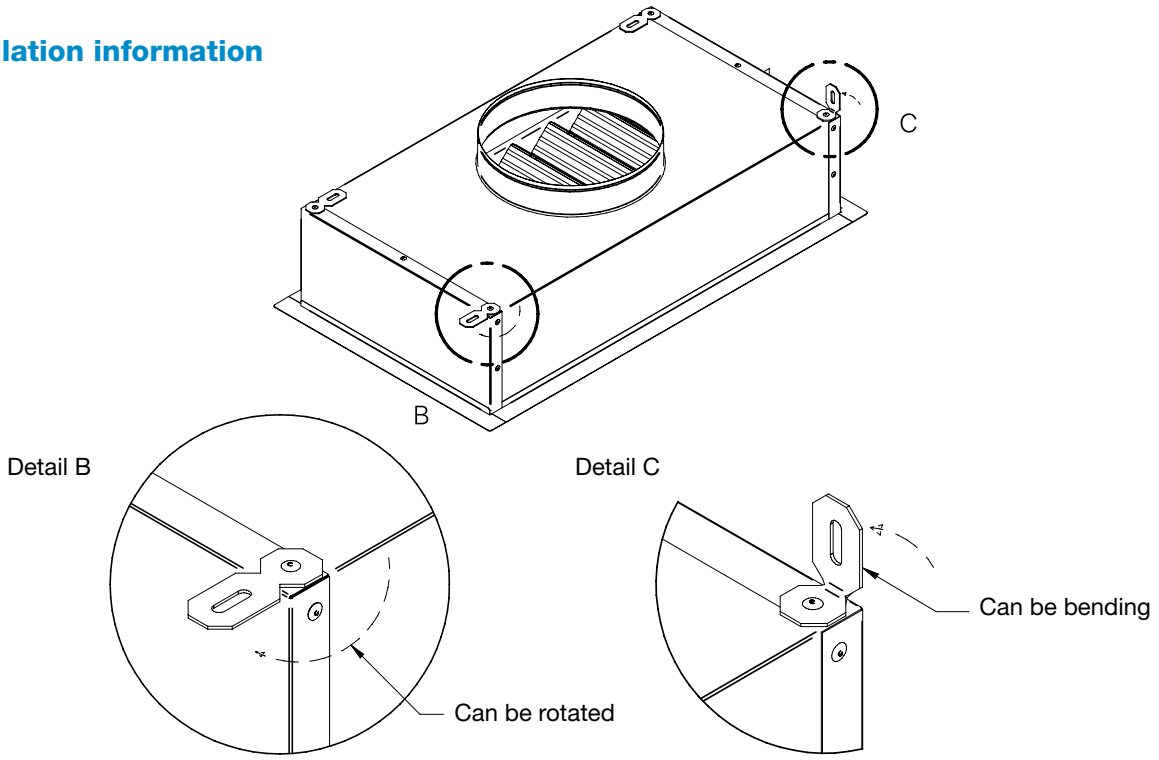
3 - Connector diameter	
A	125 mm
B	160 mm
C	200 mm
D	250 mm
E	315 mm
F	355 mm
G	400 mm
H	500 mm
N	-

4 - Locking system	
M	Magnetic - Hinged grid

5 - Material	
G	Galvanized steel RAL 9010
S	AISI 304L

6 - Register	
R	With register
N	Without register

Installation information

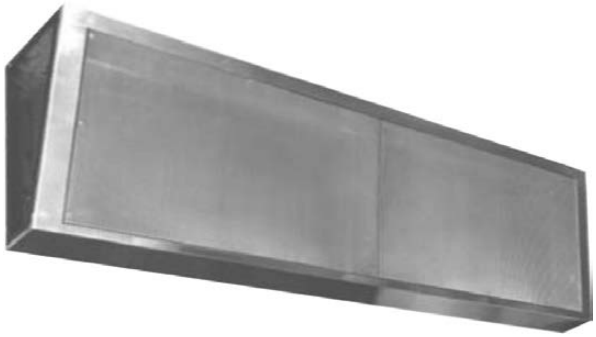


PF Air diffuser

PF

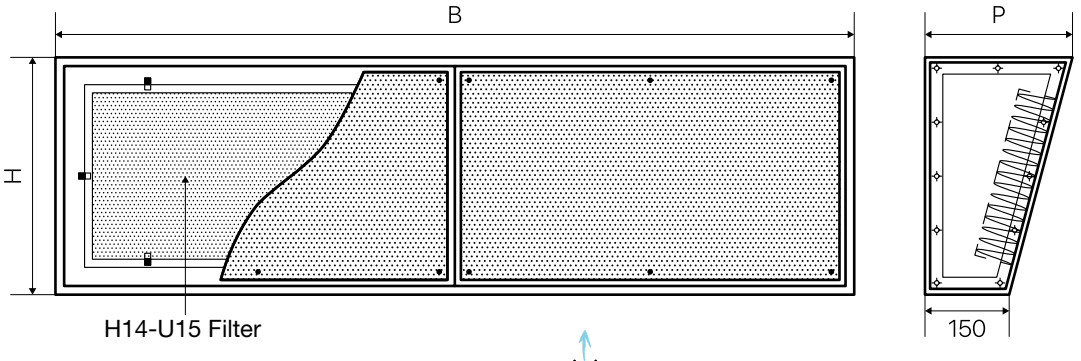
High-efficiency modular corner plenum for risk-3 operating rooms conforming to standard NFS90:351

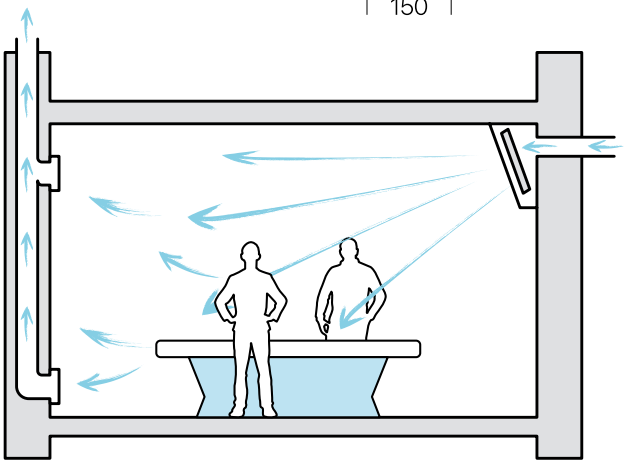
Characteristics



- Airtight construction in 304L stainless steel
- Available in 1 or multiple module versions, depending on airflow and installation constraints
- Rear or top air supply (dimensions and position to be confirmed before starting manufacturing process)
- Pressure ports for differential pressure measurement filters
- 100% pressure ports for the integrity tests filters
- One-piece seals for optimum airtightness
- Clamping system for dry-gasket filters using pivoting brackets
- Air diffusion over the entire surface through perforated grilles equipped with quarter-turn fasteners

Type	Air flow (m^3/u)	B x H x P (mm)	Filters
1248	600	1440 x 430 x 265	2 x 305x610x68
1260	750	1744 x 430 x 265	2 x 305x762x68
1272	900	2050 x 430 x 265	2 x 305x915x68
2448	1200	1400 x 725 x 340	1 x 610x1220x68
2460	1500	1744 x 725 x 340	2 x 610x762x68
2472	1800	2050 x 725 x 340	2 x 610x915x68
2496	2400	2660 x 725 x 340	2 x 610x1220x68
2430	2250	2546 x 725 x 340	3 x 610x762x68
2436	2700	3005 x 725 x 340	3 x 610x915x68





TERTIARY SECTOR

About ISO 16890

In order to guarantee the quality of a service or product, most companies work according to ISO standards. An ISO standard means that a service or product meets general expectations regarding safety, durability and effectiveness.

The classification of air filters based on the minimum efficiency of a filter is currently determined by the ISO 16890 standard. This means that our products are tested for particles that vary in size between 0.3 and 10 m (microns or micrometers). The new standard replaces the old standard EN779, which only tested for particles down to 0.4 m. Thanks to the ISO 16890 standard, we can provide insight into which filters offer protection against solid particles.

How are the filters tested?

To determine what a filter does and does not block, we place the filter in a test bench. In this test bench we determine the efficiency (E_i) of the filter with the standardized test substance.

We measure efficiency with:

ePM1 0,3 - 1 micron

ePM2.5 0,3 - 2,5 micron

ePM10 0,3 - 10 micron

The filter is then placed in a special cabinet for 24 hours where IPA (isopropyl alcohol) is nebulized. In this way we eliminate the effect of any electrostatic charge. We put the filter back in the test bench and measure the efficiency again ($E_{D,i}$).

The average efficiency then becomes:

$E_{A,i} = 0{,}5 \bullet (E_i + E_{D,i})$

Classification according to ISO 16890

ISO 16890 classifies air filters into four groups. To fall into a certain group, a filter must capture at least 50% of the relevant particle size. If a filter captures more than 50% of PM1 particles, it is an ISO ePM1 filter. If a filter captures less than 50% of PM10 particles, it falls under the ISO Coarse filters.

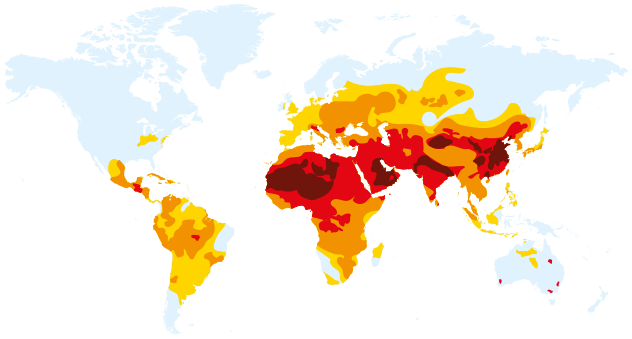
ISO ePM1	ePM1, min ≥ 50%
ISO ePM2,5	ePM2,5, min ≥ 50%
ISO ePM10	ePM10 ≥ 50%
ISO Coarse	ePM10 ≤ 50%, classification based on initial gravimetric yield

Within the various groups, a distinction is made on the basis of the percentage efficiency. We round this percentage down to 5%. If you are looking for a filter that captures 60% of all particles smaller than 1 micron, then choose an ePM1 60% filter. If 80% of those particles have to be stopped, then an ePM1 80% filter is the right option.

How do I choose the right filter?

Based on ISO 16890, Eurovent has drawn up a guideline for selecting air filters; the directive 4/23-2020. The table below shows how the different filter classes relate to the quality of the outdoor air and the desired classification of the supply air. For every public space or workplace there is a filter that meets the specific needs.

ISO ePM1	ISO ePM2.5	ISO ePM10
ISO ePM1 50%	ISO ePM2.5 50%	ISO ePM10 50%
ISO ePM1 55%	ISO ePM2.5 55%	ISO ePM10 55%
ISO ePM1 60%	ISO ePM2.5 60%	ISO ePM10 60%
ISO ePM1 65%	ISO ePM2.5 65%	ISO ePM10 65%
ISO ePM1 70%	ISO ePM2.5 70%	ISO ePM10 70%
ISO ePM1 75%	ISO ePM2.5 75%	ISO ePM10 75%
ISO ePM1 80%	ISO ePM2.5 80%	ISO ePM10 80%
ISO ePM1 85%	ISO ePM2.5 85%	ISO ePM10 85%
ISO ePM1 90%	ISO ePM2.5 90%	ISO ePM10 90%
ISO ePM1 95%	ISO ePM2.5 95%	ISO ePM10 95%



Annual average (µm/m³)

Less than 10 | 10-12 ODA1 | 12-14 ODA2 | 14-16 ODA3 | More than 16

Outdoor air quality	ePM2.5	ePM10	ePM1 AS1*
ODA1	≤ 5µg/m³	≤ 15µg/m³	70%
ODA2	≤ 7,5µg/m³	≤ 22,5µg/m³	80%
ODA3	> 7,5µg/m³	> 22,5µg/m³	90%

Air Supply (AS)
= The flow of air entering the treated room or air entering the system after treatment
** MIN minimum filtration requirement ISO PM1 50%*
*** MIN minimum filtration requirement ISO PM2.5 50%*

Industrial applications that meet the maximum sanitary requirements
- *Hospital*
- *Pharmaceutical industry*
- *Electronics*
- *Clean room*

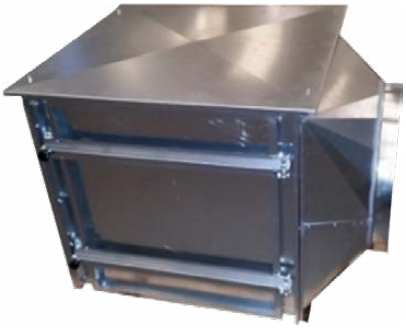
HL-DA Filter box

Characteristics

- Application: Unit with 1 or more filter levels for installation in a duct network
- Monobloc galvanized steel
- Pre-drilled 30 mm flanges upstream/downstream the housing
- Lateral access door for maintenance, closed airtight by means of a seal star knobs
- Adapted clamping system: U-profile for pre-filters, eccentric cams for the HEPA filters, fully welded construction for the activated carbon cylinders
- Mounted pressure ports
- Class C according to standard EN 1751, class L1 according to standard EN 1886
- Mechanical resistance +/- 1500 Pa

Configuration

- Installation of 1 to 3 filter levels: prefilter, high-efficiency filter, activated carbon filter and HEPA filter
- Possibility to mount 1 or more filters per filter level at higher flow rates



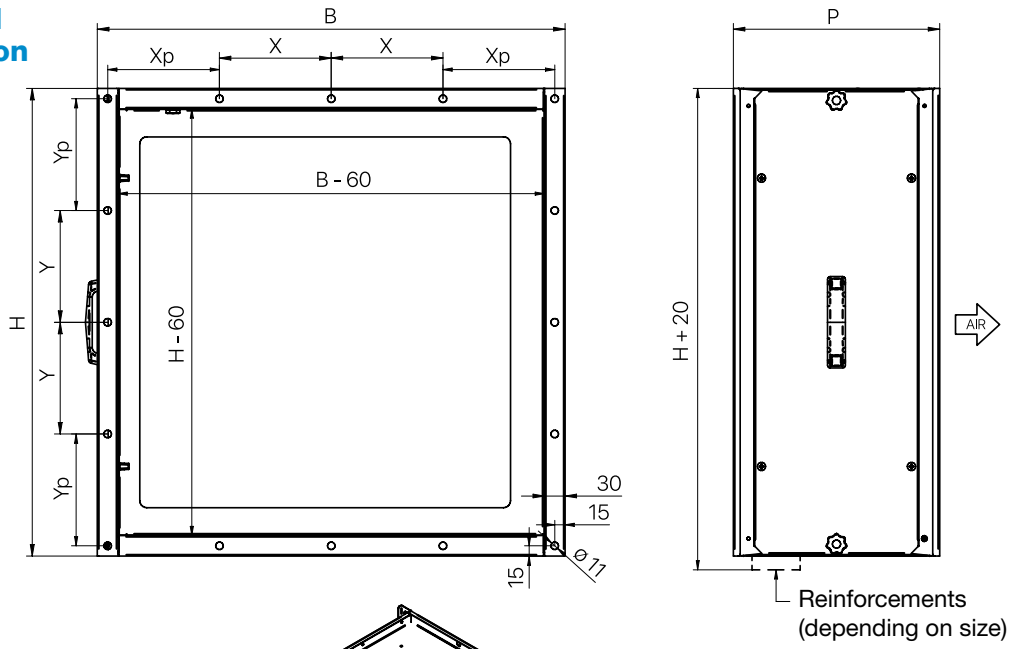
Type	Number of filters	Filters size (mm)	Width (mm)	Height (mm)	H (mm)	W (mm)	Y (mm)	Yp (mm)	X (mm)	Xp (mm)
H0.5L0.5	1	287×287	315	315	375	375	-	172.5	-	172.5
H0.5L1	1	287×592	620	315	375	680	-	172.5	162.5	162.5
H1L0.5	1	287×592	315	620	680	375	162.5	162.5	-	172.5
H1L1	1	592x592	620	620	680	680	162.5	162.5	162.5	162.5
H1L1.5	1 1	592x592 287x592	930	620	680	995	162.5	162.5	170	142.5
H1L2	2	592x592	1240	620	680	1300	162.5	162.5	170	125
H1.5L1	1 1	592x592 287x592	620	930	995	680	170	142.5	162.5	162.5
H1.5L2	2 2	592x592 287x592	1240	930	995	1300	170	142.5	170	125
H2L1	2	592x592	620	1240	1300	680	170	125	162.5	162.5
H2L1.5	2 2	592x592 287x592	930	1240	1300	995	170	125	170	142.5
H2L2	4	592x592	1240	1240	1300	1300	170	125	170	125
H2L3	6	592x592	1855	1240	1300	1920	170	125	170	95
H3L2	6	592x592	1240	1855	1920	1300	170	95	170	125
H3L3	9	592x592	1855	1855	1920	1920	170	95	170	95

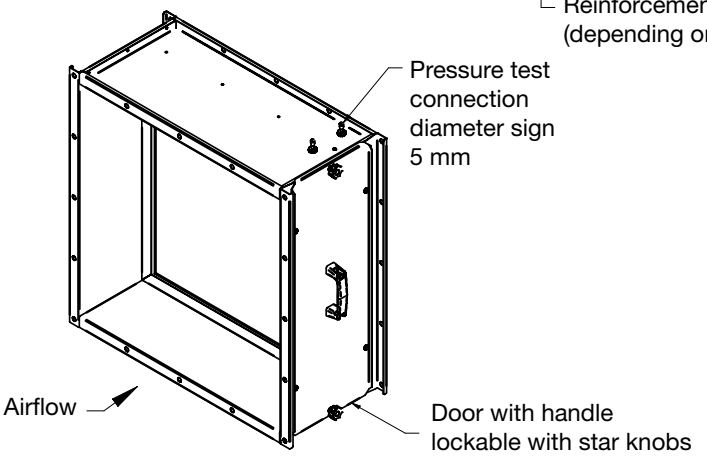
Configuration	Description	Depth (mm)
A	Pre-filter with thickness 48 mm	300
B	Pre-filter with thickness 98 mm	300
C	Pre-filter 48 mm + Bag filter max 535 mm or compact filter (HPQ) 292 mm	700
D[1]	Pre-filter 48 mm + HEPA Filter : 610x610x292 and 305x610x292	700[2] / 800[3]
E	Pre-filter 48 mm + Activated Carbon cylinder 450 mm	800
F	Type C+D	1100[4] / 1200[5]
G	Type C+E	1100[4] / 1200[5]

1. For configuration D, HEPA filter dimensions: 305x305, 305x610, 610x610
2. Depth of 700 mm for hood & units smaller than H2L1
3. Depth of 800 mm for hood & units greater than or equal to H2L1
4. Depth of 1100 mm for hood & units smaller than H2L1
5. Depth of 1200 mm for hood & units greater than or equal to H2L1

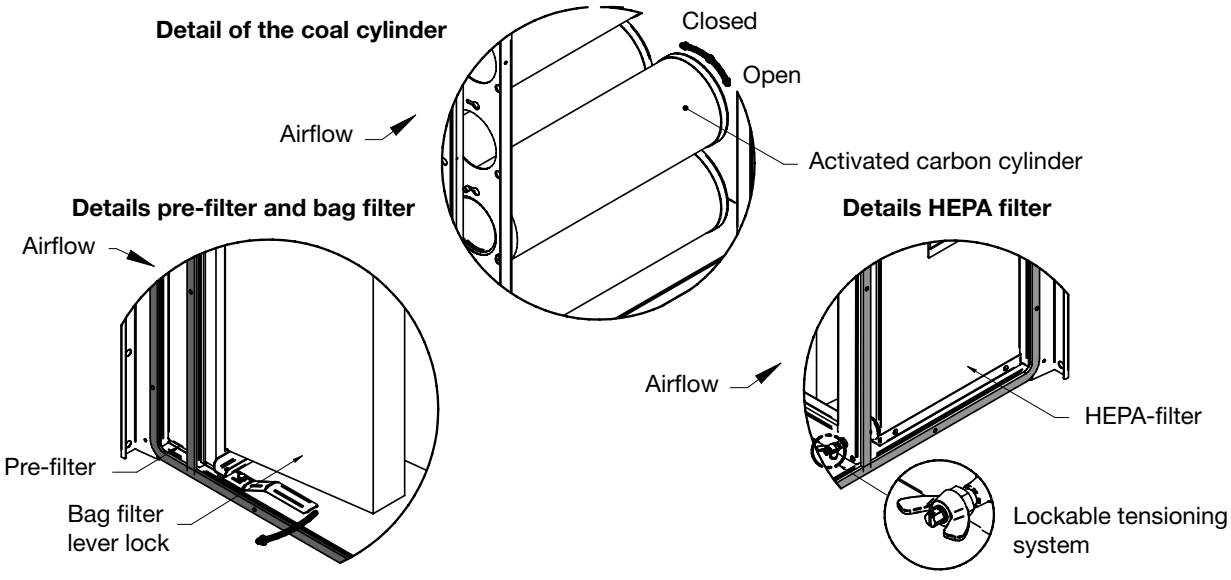
HL-DA Filter box

Technical description



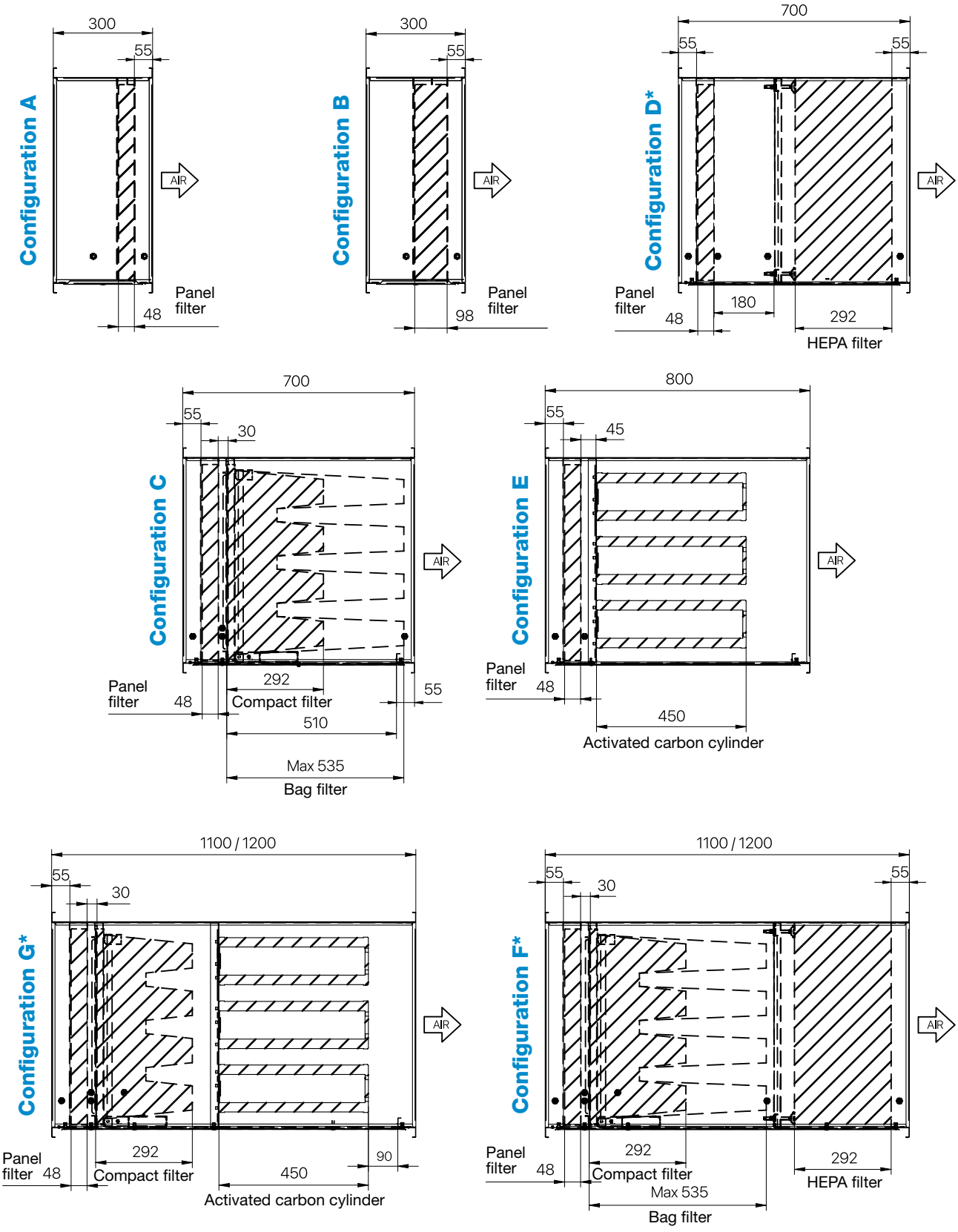


Fixing system for pre-filters, bag filters, HEPA filter, activated carbon filter



HL-DA Filter box

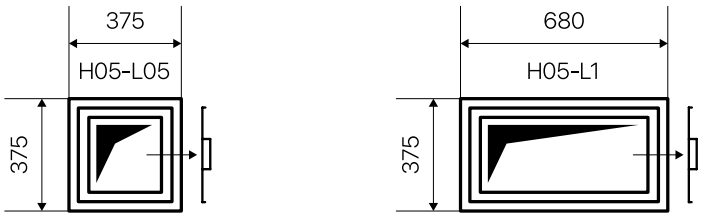
Types of configuration



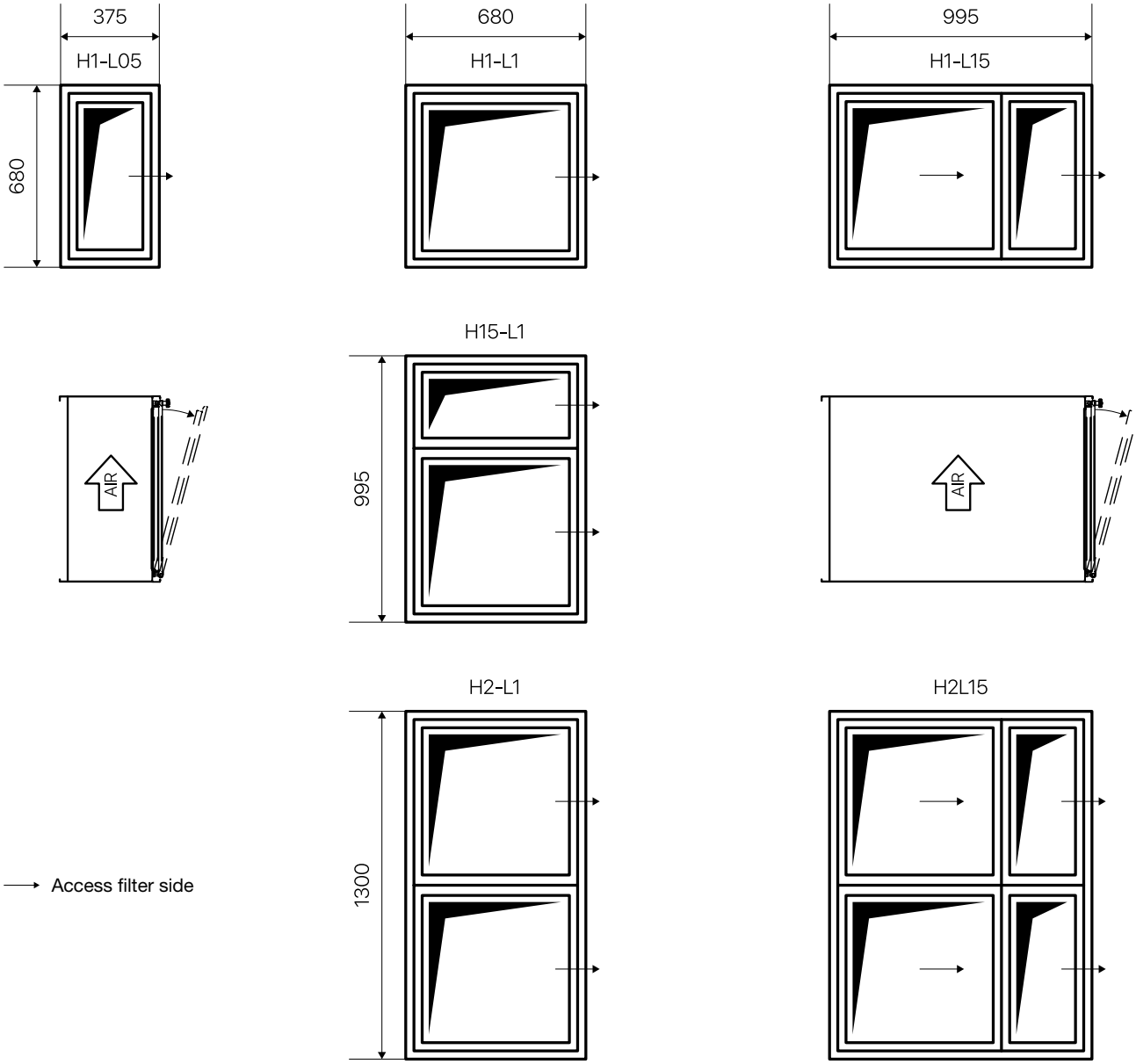
(*) The depth of the boxes with D, G and F configuration varies according to the size of the box (see page 39)

HL-DA Filter box

Standard door with star knobs



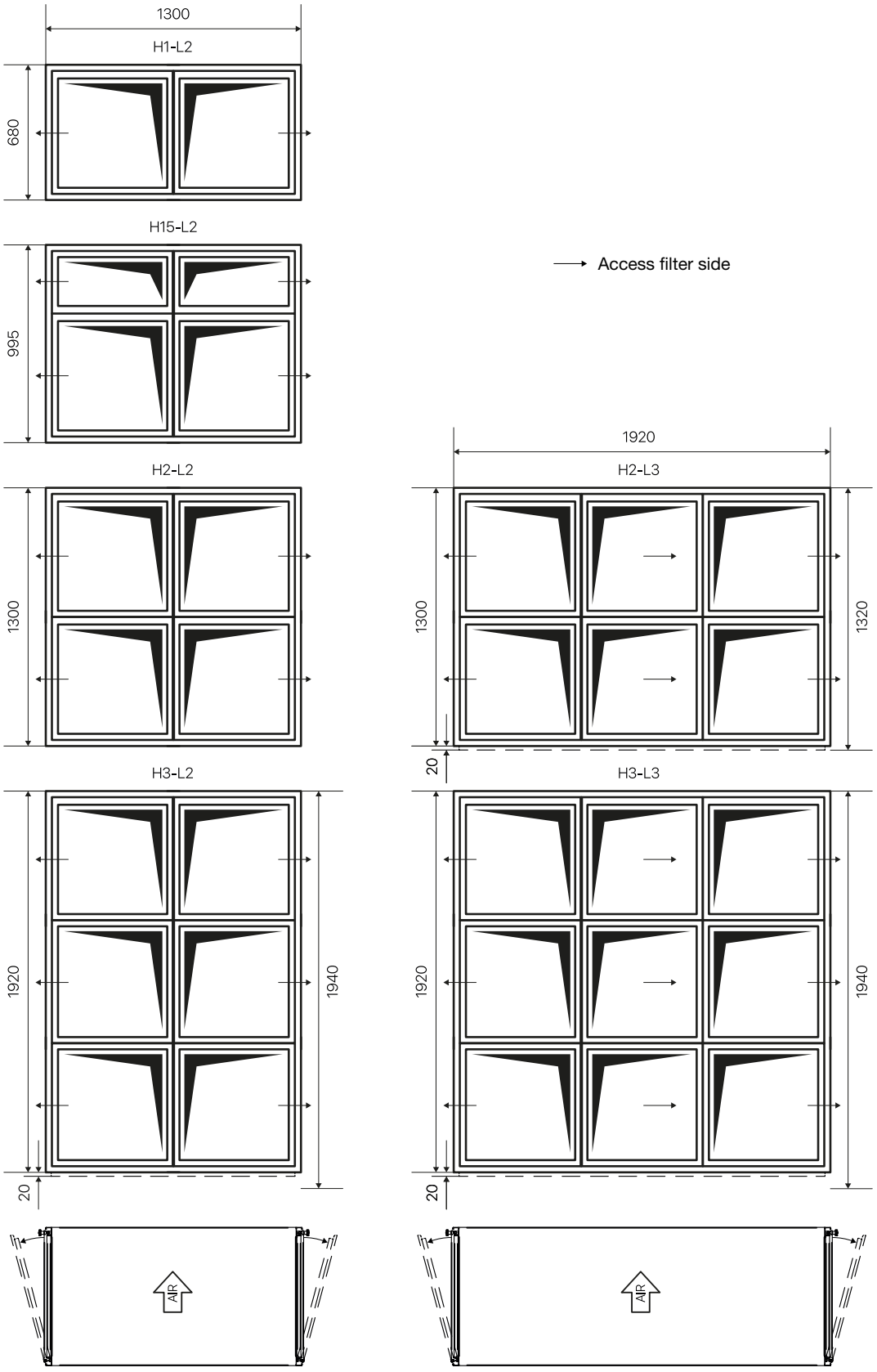
Hinged door with star knobs



→ Access filter side

HL-DA Filter box

Double hinged door with star knobs



HL-DA Filter box

Construction variations and options

Diamond-tipped roof
for outdoor installation

Rain cover with
anti-bird screen

Conical reducer
round/square

Flat plate with standard
connection diameter

Support legs

Outer grid with slats

HL-DA Filter box

HL-DA Filter box
Configuration with pre-filter and bag filters

HL-DA Filter box
Special reinforced version for activated carbon cylinder H4L4

Construction variants and options

- Made of stainless steel 304L or 316L
- Epoxy coating, RAL color of your choice
- Flange drilling as per drawing
- Round duct connection with flat plate up to size H2L2
- Conical reducers round/square
- Control or shut-off register (class 3 or class 4 according to EN 1751)
- Rain cover with anti-bird screen
- Diamond-tipped roof for outdoor installation
- Support legs
- Equipotential connections for ATEX applications
- Larger size than H3L3
- Specific construction according to the customer's request
- Door on the left (service access)
- Filter box for vertical airflow

HL-DA Filter box

Example of a configuration: HL-DA/ 1212 C W W GS S

1 2 3 4 5 6

1 - Dimensions			
Type		**W x H**	**Standard options**
H05L05	1212	375 x 375 mm	Removable door (without hinge)
H05L1	1224	680 x 375 mm	Removable door (without hinge)
H1L05	2412	375 x 680 mm	Hinged door
H1L1	2424	680 x 680 mm	Hinged door
H1L1,5	2436	995 x 680 mm	Hinged door
H1L2	2448	1300 x 680 mm	2 hinged doors
H1,5L1	3624	680 x 995 mm	Hinged door
H1,5L2	3648	1300 x 995 mm	2 hinged doors
H2L1	4824	680 x 1300 mm	Hinged door
H2L1,5	4836	995 x 1300 mm	Hinged door
H2L2	4848	1300 x 1300 mm	2 hinged doors
H2L3	4872	1920 x 1300 mm	2 hinged doors
H3L2	7248	1300 x 1920 mm	2 hinged doors
H3L3	7272	1920 x 1920 mm	2 hinged door

2 - Configuration		
Type		**Depth housing**
A	48 mm thick pre-filter mounted on a slide	300 mm
B	98 mm thick pre-filter mounted on a slide	300 mm
C	Pre-filter + bag filter max 535 mm or compact filter 292 mm Cam-operated clamping on a 25 mm flange	700 mm
D	Pre-filter + HEPA filter - thickness 292 mm Tightening in corners	700/800 mm
E	Pre-filter + Activated carbon filter 450 mm Bayonet mounting	800 mm
F	Type C+D	1100/1200 mm
G	Type C+E	1100/1200 mm

3 - Connection - options - inlet	
O	Connection round 100 mm
A	Connection round 160 mm
B	Connection round 200 mm
C	Connection round 250 mm
D	Connection round 315 mm
E	Connection round 355 mm
F	Connection round 400 mm
S	Connection round special
CC	Connection conical
W	Without connection
GV	Rain cover with anti-bird screen
G	Slats outer grid

4 - Connection - options - outlet	
O	Connection round 100 mm
A	Connection round 160 mm
B	Connection round 200 mm
C	Connection round 250 mm
D	Connection round 315 mm
E	Connection round 355 mm
F	Connection round 400 mm
S	Connection round special
CC	Connection conical
W	Without connection
GV	Rain cover with anti-bird screen
G	Slats outer grid

5 - Material	
GS	Galvanized steel
GC	Painted galvanized steel
S	AISI 304L
SS	AISI 316L

6 - Options	
S	Door with handles / without hinges
H	Hinged door
DS	Double doors standard (two sides)
DH	Double doors hinged (two sides)
E	External construction
HE	Standard hinged door + External construction
SE	Standard door + External construction
DSE	Double doors standard + External construction
DHE	Double doors hinged + External construction

** Hinged door not available on H05L05 and H05L1*

7 - Extra options	
EXP	ATEX construction
HT	High temperature max 200°C
G	Door on the left

Notes

Notes

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