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Air Filtration and Air Ventilation

... we go further
... to absolutely clean air!

Grada UK has become a well known name in the world of ventilation and air distribution. Having over 20,000 air distribution products within our range, we are sure we can accommodate most air distribution enquiries. We are a manufacturer with a difference and do not employ sales people, all our personnel are fully qualified air distribution engineers.

We are proud of the service we provide from selection, manufacture to delivery. All our products are manufactured under one roof and in our control. We have a test laboratory and Thermal Imaging service available for anyone to use for proof of selection. Therefore if you have a Design and Build project or an Architect or Consultant, we have the air distribution know how.

To complete the service, once the order is placed, your order will be given a contracts manager to process the order and keep you informed right through until delivery.

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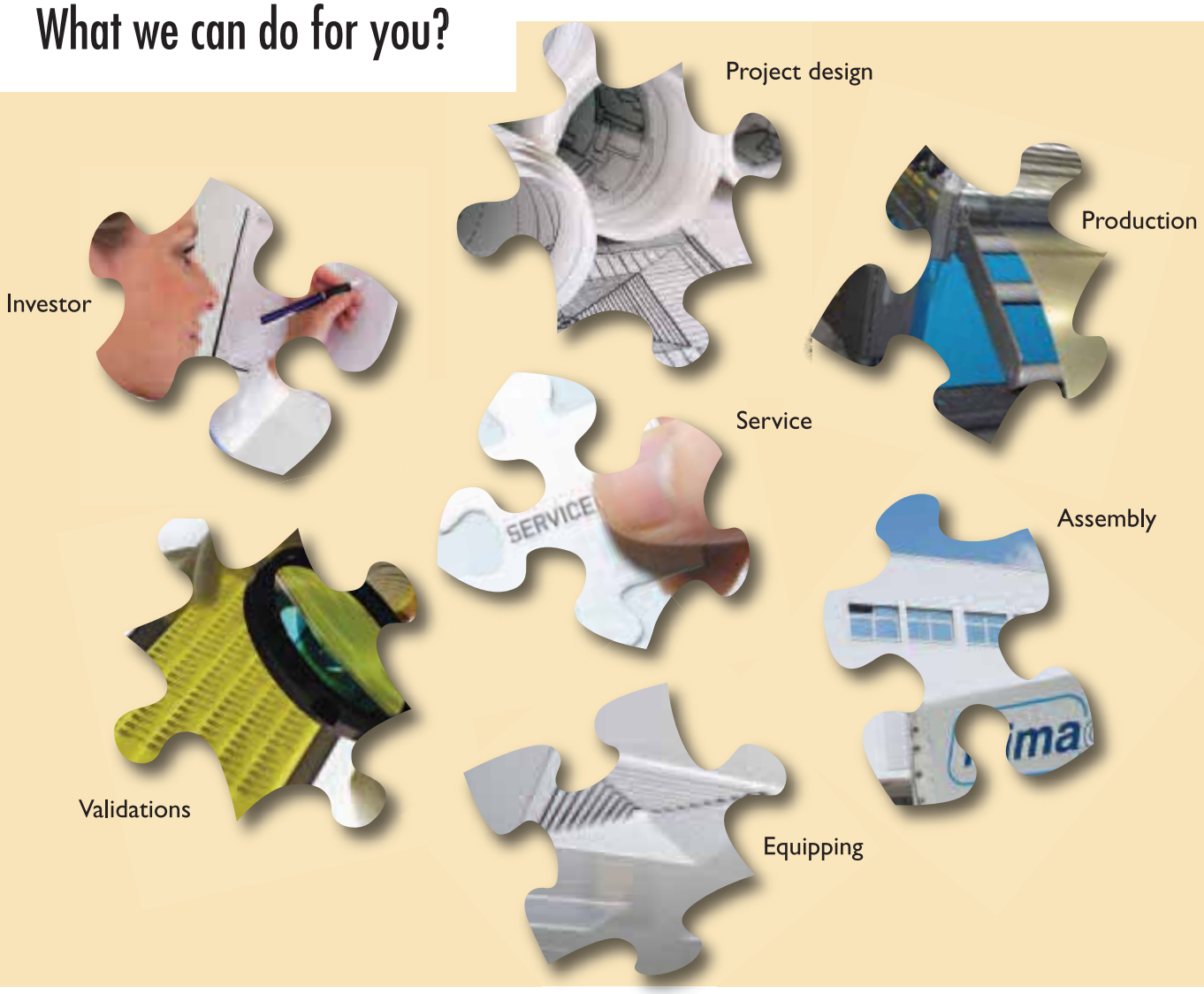
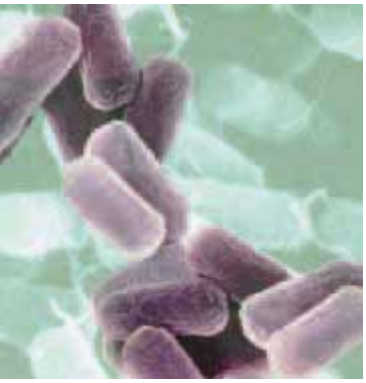
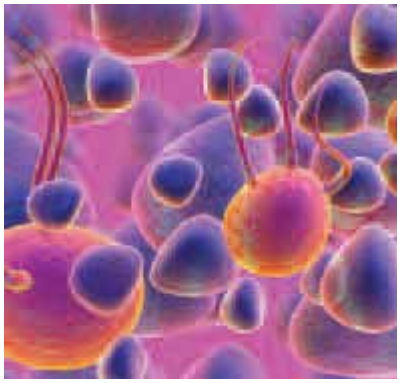
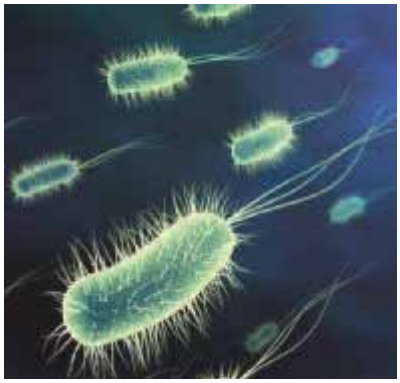
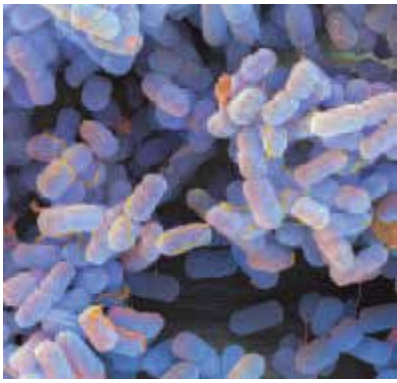
What we can do for you?



Content

About Air filtration

Ambient air, both outdoor and indoor, is subject to contamination with solid or liquid particles of mineral or organic origin that are called aerosols. Size of these particles is from 0,0001-100 μm. Particles larger than 10 μm regularly leave their sediments on the ground, while particles under 1 μm, and especially those under 0,3 μm in size, remain floating in the air. The average concentration of these particles in the atmosphere over the European continent is measured in millions per liter of air. The particles are divided into the categories below:

- Dust - tiny particles
- Smoke - tiny solid particles
- Fog - small droplets
- Haze - very small droplets
- Steam - gaseous substance

The reasons of their appearance:

- Natural processes that occur on Earth's surface
- Vegetation on Earth
- Organisms that inhabit the Earth, including human beings
- Technological processes created by mankind

Using the absolute filters[1], this concentration can be reduced to 3,5 particles per liter of air, and even less. Besides dust, environmental and ambient air also contains live micro-organisms, microbes, ferments, fungi, bacteria, viruses, etc. The air which is completely free and purified of living organisms is called sterile. Such air may be obtained only by using absolute filters.
Experience of some researchers suggest that there is a relationship between the number of living and the number of inert particles (organic and non-organic) and that this ratio ranges from 1:500 to 1:12000, and usually is 1:1000.
After purification in an absolute filter, the air is clean and almost sterile. If even greater safety in terms of sterility is required, then behind the absolute filter UV lamps are mounted. UV lamps kill any remaining micro-organisms that absolute filter failed to stop.

[1] Free expression for filters for impending particles, due to their very high efficiency.

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Classification of filters according to norms

The main factor in air filtration are filter materials, that is, filter inserts, or shorter, filters: rough, fine and absolute (filters for impending particles).
Rough, fine and absolute filters built into the final product (frame or casing) normally get group names, such as:

- Panel filters
- Duct filters
- Absolute filters with diffuser plate

Filter as a final product consists of one, two or three filter inserts, the last built in a series is called the filter and the priors are pre-filters.

In year 1993 The European Committee for Standardization, Technical Committee 195, Working Group 1 (CEN/TC195-WG1) issued a new standard for rough and fine filters for general ventilation. By the introduction of this standard, known as EN 779, EU member countries are obliged to publish their own national versions of these standards within a set framework (exe. BS EN 779 in the United Kingdom, DIN EN 779 in Germany). Standard EN 779 is based on existing documents such as EUROVENT 4/5 and ASHRAE 52.1:1992, but is in fact much more stringent than them. It also includes a new classification system for rough and fine filters, based on the average efficiency of dust separation in a finite pressure drop. Filters with an initial dust spot efficiency Eo < 20% are classified as rough filters and have an identification range G1-G4. Final pressure drop for certification is ≤ 250 Pa. Filters with an initial dust spot efficiency Eo ≥ 20% are classified as fine filters and have an identification range F5-F9. The final pressure drop for certification is determined with ≤ 450 Pa.

Classification of filters according to different norms:

	StF	DIN 24185, part 100	DIN 24185, part 2			EN 779
ROUGH	A	A	EU 1	Am < 65	-	G1
	B	B_1	EU 2	65 ≤ Am ≤ 80	-	G2
		B_2	EU 3	80 ≤ Am ≤ 90	-	G3
			EU 4	90 ≤ Am	-	G4
FINE	C	C_1	EU 5	-	40 ≤ Em ≤ 60	F5
			EU 6	-	60 ≤ Em ≤ 80	F6
		C_2	EU 7	-	80 ≤ Em ≤ 90	F7
		C_3	EU 8	-	90 ≤ Em ≤ 95	F8
			EU 9	-	95 ≤ Em	F9

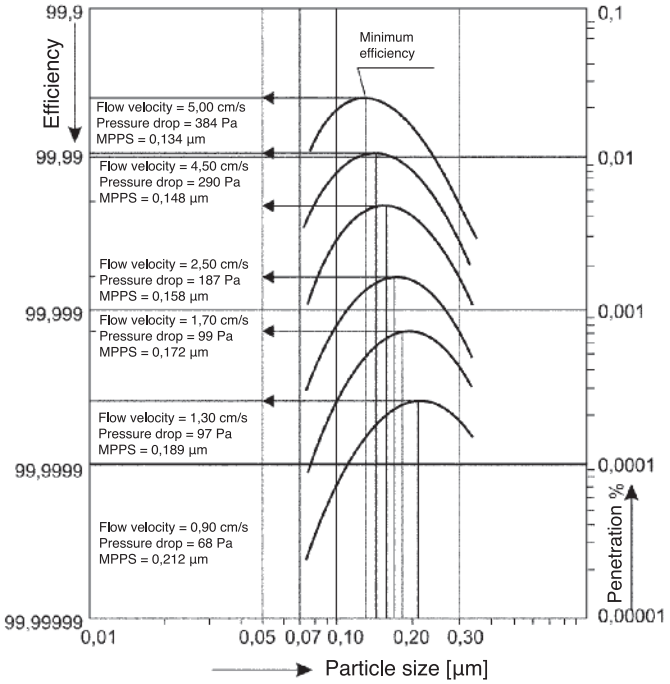
	StF	DIN 24185, part 100	DIN 24185, T1, E, addition A		E % 0,3 µm	E % MPPS	EN 1822	
HEPA	Filters for impending particles	Q	EU 10	1	> 95	-	H10	3
		R	EU 11		> 98	-	H11	
		S	EU 12		> 99,99	-	H12	
			EU 13		> 99,997	-	H13	
			EU 14		> 99,999	-	H14	
ULPA					-	**E % 0,12 µm**		
			EU 15	2	-	> 99,9995	U15	4
			EU 16		-	> 99,99995	U16	
			EU 17		-	> 99,999995	U17	

Key:

Mark	Explanation
1	General absolute filters
2	High efficiency absolute filters
3	High Efficiency Particulate Air filters (HEPA)
4	Ultra Low Penetration Air filters (ULPA)
StF	Staubforschungs-Institut (Dust Research Institute) in Bonn, Germany
DIN 24185, part 100 **DIN 24185, part 2**	German standard corresponding to European classification EUROVENT
EUROVENT	European Committee of Air-Handling, Air-Conditioning and Refrigeration Eguipment Manufacturers
EN 779 **EN 1822**	European standards
Am	Average synthetic dust weight arrestance for **ROUGH** filters (compared to artificial dust)
Em	Average atmospheric dust spot efficiency for **FINE** filters (compared to artificial dust)
E %	Middle (minimum) efficiency for **HEPA** and **ULPA** filters
MPPS	Most Penetrating Particle Size
HEPA	High Efficiency Particulate Air filter
ULPA	Ultra Low Penetration Air filters. This group includes absolute filters with commercial names VHSI, MEGA, SUPER MEGA, etc.

Filter performances

- Roll-filters with glass fibre filter media
- Roll-filters with synthetic fibre filter media
- Filters with synthetic fibre filter media, resistant to temperatures up to 200°C
- Synthetic fibre filters for paint booths
- Paper filters
- Synthetic fibre bag filters
- Synthetic and glass fibre bag filters
- Burnt bag filters
- Washable metal filters
- Compact high-capacity filters
- Absolute HEPA and ULPA filters
- Absolute filters for cleanrooms and operating rooms
- Filters resistant to high temperatures, up to 480°C
- Filters with active coal
- Automatic roll filters
- Dust removing filters
- Electrostatic filters



Penetration of particles of a certain size (acc. to CEN TC/WG2 NO22 Draft)

Besides the efficiency of absolute filters, which is defined by class in the range H10-U17, the important information for the user is particle size that passes (penetrates) through the filter media at a certain velocity of air flow. For this purpose, tests described below are done.

The size of particles that penetrate through filtration media (MPPS) is determined for the given air velocity (airflow direction is vertical to the filter surface).

MPPS and aerosol particles circulate through the filter. Local and overall efficiency is defined by particle counter (Condensing Nuclei Counter-CNC) or by laser spectrometer.

In line with the test results, filters are classified in classes H10-H14 for HEPA or U15-U17 for ULPA filters.

Penetration is defined as the maximum allowed locally (overall) penetration of MPPS, which, expressed in percentages, must not exceed five times the integral value of penetration.

Filter class	Efficiency in relation to MPPS		Penetration in relation to MPPS	
	Integral value	Local value	Integral value	Local value
H10	≥ 85	-	15	-
H11	≥ 95	-	5	-
H12	≥ 99,5	97,5	0,5	2,5
H13	≥ 99,95	99,75	0,05	0,25
H14	≥ 99,995	99,975	0,005	0,025
U15	≥ 99,9995	99,9975	0,0005	0,0025
U16	≥ 99,99995	99,99975	0,00005	0,00025
U17	≥ 99,999995	99,999975	0,000005	0,0001

Note:

- Certificate on local penetration value is not required for class H10 and H11 filters
- Filters in class H12, H13 and H14 may be tested using the test with oil mist, in accordance with standard EN 1822 which is generally accepted and more well-known than local penetration value
- Filters in class U17 represent an exception to the rule; in this case local value of penetration, expressed in percentages, must not exceed twenty times the integral value of penetration

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Orientation data for rough and fine filters

Rough filters are used in air-conditioning of production halls, compressor stations, to protect electrical devices or as pre-filters in a demanding air-handling units (paint shops, commercial buildings, etc.).

Fine filters are used in hospitals, laboratories, power plants, paint shops and other places.

Absolute filters are used in operating rooms, medical and pharmaceutical industry, sterile bottling plants, microtechnology and microelectronics, food industry and other plants that need to meet the highest demand for clean air.

Rough filters:

Class	G1*	G2*	G3*	G4*
Recommended value of flow velocity m/s	2,5	2,0	2,0	2,0
Unit capacity m^3/h m^2	9000	7200	7200	7200
Initial pressure drop Pa	40	40	45	60
Recommended value of final pressure drop Pa	100-200	150-200	160-200	160-200
Average arrestance Am %	do 100	75-80	80-85	87-92
Allowed working temperature °C	-30 do 120	do 100	do 100	do 100
Thickness mm	10÷20	13÷25	15÷20	20

* Straight filter insert, in roll or made in the form of bag

Fine filters:

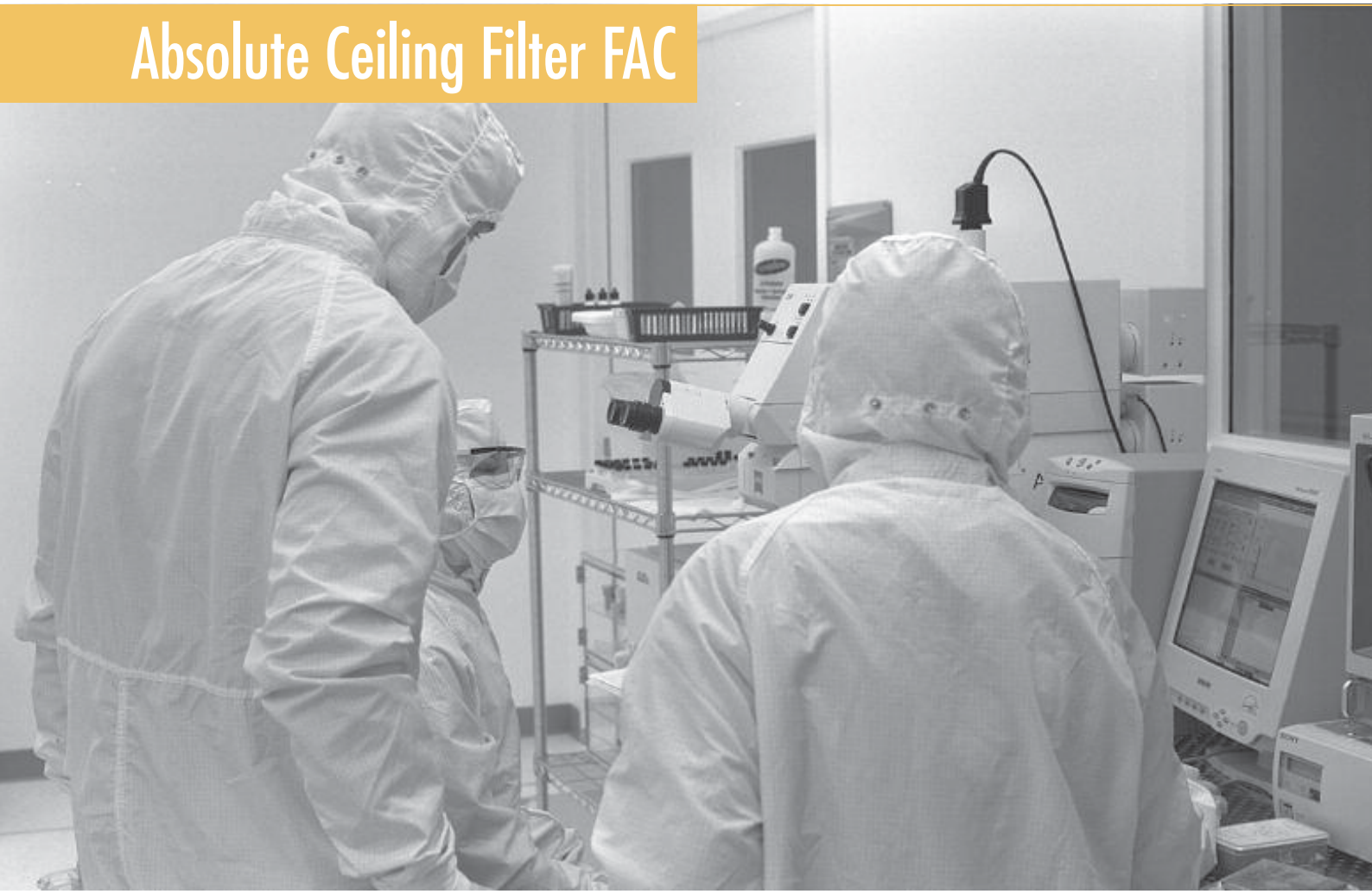
Class	F5**	F6**	F7**	F8**	F9**
Recommended value of flow velocity m/s	0,9	2,5	2,0	2,5	3,5
Unit capacity m^3/h m^2	3240	9000	7200	7200	12600
Initial pressure drop Pa	90	80	100	120	120-140
Recommended value of final pressure drop Pa	200-400	250	350	350	450
Average efficiency Em %	40÷50	60÷80	80÷90	90÷95	više od 95
Allowed working temperature °C	do 100	-30 do +90	-30 do +90	-30 do +90	-30 do +90
Thickness mm	20	100	78	100	292

** Pleated filter insert, installed in different frameworks

Classification of various cleanroom classes according to ISO 14644-1, U.S.F.S. 209 E and EU GMP standards:

Purity class by ISO 14644-1 standard		8	7	6	5	4	3
Purity class by U.S.Federal Standard 209 E		100 000	10 000	1 000	100	10	1
Purity class by EU GMP standard		D	C	B	A		
Maximum permitted number of particles (particle/m^3) equal to or greater than	5.0 µm	29 300	2 930	293	29	-	-
	1.0 µm	832 000	83 200	8 320	832	83	8
	0.5 µm	3 520 000	352 000	35 200	3 520	352	35
	0.3 µm	-	-	102 000	10 200	1 020	102
	0.2 µm	-	-	237 000	23 700	2 370	237
	0.1 µm	-	-	1 000 000	100 000	10 000	1 000
Type of flow		Turbulent	Turbulent	Transition	Unidirectional	Unidirectional	Unidirectional
Maximum number of air changes i/h		36-90	60-100	180-300	300-480	420-600	500-640
Minimum velocity m/s		0.08-0.10	0.10-0.15	0.15-0.25	0.26-0.36	0.36-0.41	0.38-0.46
Minimum ceiling coverage by filters %		15	30	40	75	100	100
Filter type		H12	H12	H13	H14	U16	U16
Air diffusers		Ceiling swirl diffuser	Ceiling swirl diffuser	Ceiling filter diffuser	Ceiling filter diffuser	Ceiling filter diffuser	Ceiling filter diffuser
Exhaust air openings		Side wall	Low wall-mounted sideway	Low mounted sideway	Floor or low mounted sideway	Floor mounted	Floor mounted
Positive pressure in cleanroom Pa		10-15	10-15	10-15	10-15	15	15
Temperature °C		22°C±1°C, Not more than 2°C variations during 4 hours	22°C±1°C, Not more than 2°C variations during 4 hours	22°C±1°C, Not more than 2°C variations during 4 hours	22°C±0.5°C, Not more than 1°C variations during 4 hours	22°C±0.25°C, Not more than 0.5°C variations during 4 hours	22°C±0.25°C, Not more than 0.5°C variations during 4 hours
Humidity %		45%RH±5% Not more than 5% variations during 4 hours	45%RH±5% Not more than 5% variations during 4 hours	45%RH±5% Not more than 5% variations during 4 hours	45%RH±5% Not more than 3% variations during 4	45%RH±5% Not more than 3% variations during 4	45%RH±5% Not more than 3% variations during 4
Particles counting		12 months	12 months	12 months	6 months	6 months	6 months
Air flow volume or velocity airstream		12 months	12 months	12 months	12 months	12 months	12 months
Integrity of filters and casings		24 months	24 months	24 months	24 months	24 months	24 months
Flow visualization		24 months	24 months	24 months	24 months	24 months	24 months

Absolute Ceiling Filter FAC



Technical features:

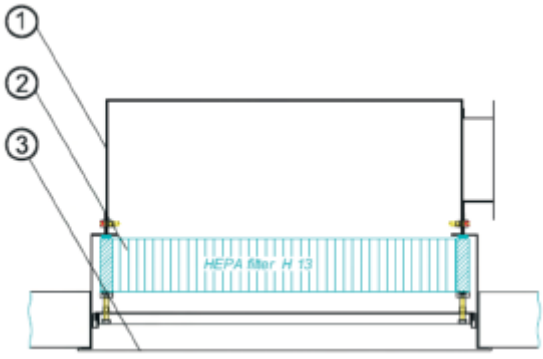
- Absolute ceiling filter with diffuser plate is intended for supply of „absolutely“ clean, filtrated air into operating rooms, intensive care sections, laboratories and cleanrooms that are in class 7 and 8 according to ISO 14644 standard
- Filter casing is made from inox, plastic coated in white color RAL 9010
- Filter casing is made as an air-tight construction
- Absolute filter according to EN 1822 is installed in casing
- Casing is fitted with differential pressure gauge connections for pressure drop measurements and filter saturation control
- Diffuser plate is made of steel sheet, plastic coated in white color RAL 9010. Other colors or performance out of inox are available on request
- Size of diffuser plate is adapted to dimensions of the casing
- Filter change is performed from the lower, clean side, after removal of diffuser plate

Filter casing air-connection options:

- Horizontal circular connection
- Vertical circular connection
- Horizontal rectangular connection
- Horizontal rectangular connection with air-tight damper. Air-tight damper with motor is an option

Components:

1. Housing/Casing
2. HEPA filter
3. Diffuser plate



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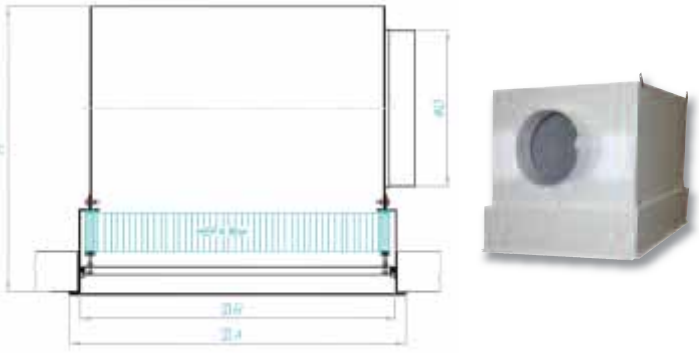
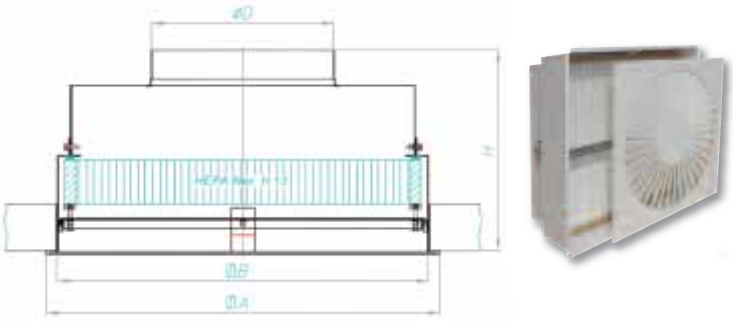
Technical data:

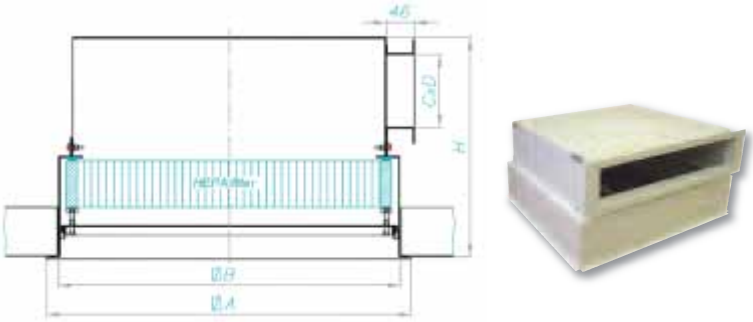
HORIZONTAL CIRCULAR CONNECTION, TYPE FAC-HO								
	Nominal size				Filter dimensions			Air flow
	B	H	ØD	A	b	h	t	Q
	mm	mm	mm	mm	mm	mm	mm	m³/h
FAC-HO	331	380	158	370	305	305	78	250
	483	420	198	522	457	457	78	570
	561	470	248	598	535	535	78	770
	601	470	248	625	575	575	78	890
	636	520	298	675	610	610	78	1000
	636	784	348	675	610	610	292	2000
	636	834	398	675	610	610	292	3400



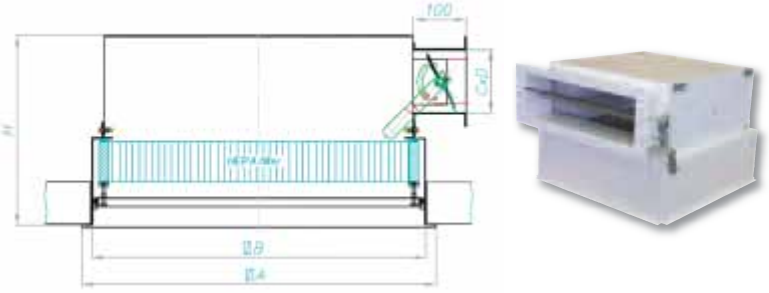
VERTICAL CIRCULAR CONNECTION, TYPE FAC-V								
	Nominal size				Filter dimensions			Air flow
	B	H	ØD	A	b	h	t	Q
	mm	mm	mm	mm	mm	mm	mm	m³/h
FAC-V	331	328	158	370	305	305	78	250
	483	328	198	522	457	457	78	570
	561	328	248	598	535	535	78	770
	601	328	248	625	575	575	78	890
	636	328	298	675	610	610	78	1000
	636	542	348	675	610	610	292	2000
	636	542	398	675	610	610	292	3400



VERTICAL RECTANGULAR CONNECTION, TYPE FAC-H									
	Nominal size					Filter dimensions			Air flow
	B	H	A	C	D	b	h	t	Q
	mm	mm	mm	mm	mm	mm	mm	mm	m³/h
FAC-H	331	360	370	250	120	305	305	78	250
	483	360	522	400	120	457	457	78	570
	561	360	598	475	120	535	535	78	770
	601	360	625	520	120	575	575	78	890
	636	360	675	550	120	610	610	78	1000
	636	634	675	550	180	610	610	292	2000
	636	704	675	550	250	610	610	292	3400



HORIZONTAL RECTANGULAR CONNECTION WITH AIR-TIGHT DAMPER, TYPE FAC-HZ									
	Nominal size					Filter dimensions			Air flow
	B	H	A	C	D	b	h	t	Q
	mm	mm	mm	mm	mm	mm	mm	mm	m³/h
FAC-HZ	331	360	370	250	120	305	305	78	250
	483	360	522	400	120	457	457	78	570
	561	360	598	475	120	535	535	78	770
	601	360	625	520	120	575	575	78	890
	636	360	675	550	120	610	610	78	1000
	636	634	675	550	180	610	610	292	2000
	636	704	675	550	250	610	610	292	3400



Key:

Mark	Explanation
B	Width
H	Height
øD	Connection
A	Width of diffuser plate
b	Width
h	Height
t	Thickness
Q	Air flow
C, D	Rectangular connection

Types of diffuser plate:

DVS

Swirl ceiling diffuser whose radial jet is mixing with room air, achieving key contaminant „diluation“ effect.

ANP-P

Ceiling diffuser with perforated front plate whose directed jet secures absolutely clean air in target area.

ANK

Ceiling diffuser for air supply in up to 4 m high rooms. Due to high induction they are very convenient for cooling rooms that have high temperature differences.

DEU

DEK

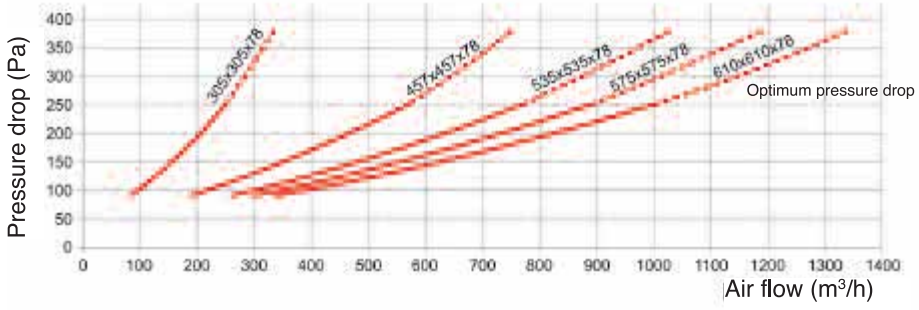
DEV

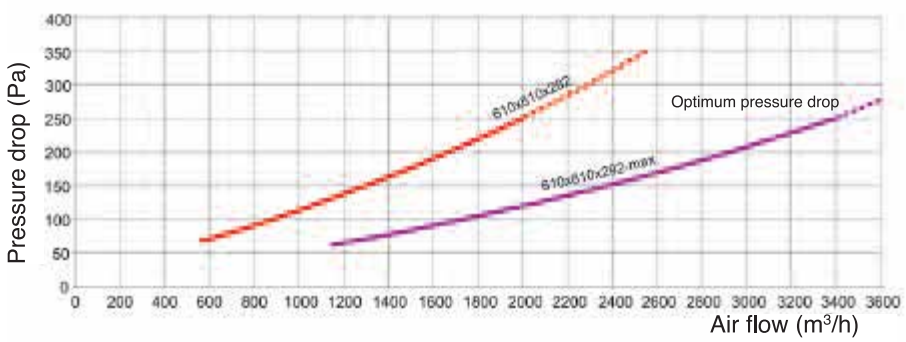
Diffusers that are suitable for areas with a large number of air changes in rooms up to 4 m high. Large effective velocity discharge of air flow provides a steady flow.

DIMENSIONS OF DIFFUSER PLATE					
Filter size mm	305 x 305	457 x 457	535 x 535	575 x 575	610 x 610
Diffuser					
DVS	400	522	598	625	675
ANP	370	522	598	625	675
ANK	370	522	598	625	675
DEK	370	522	598	625	675
DEU	370	522	598	625	675
DEV	370	522	598	625	675

Other dimensions and performances according to customer request

Pressure drop diagrams for filter H13





Note: - Pressure drop of H14 filter is 10÷12% higher
- Final pressure drop of filled filter is 500 Pa

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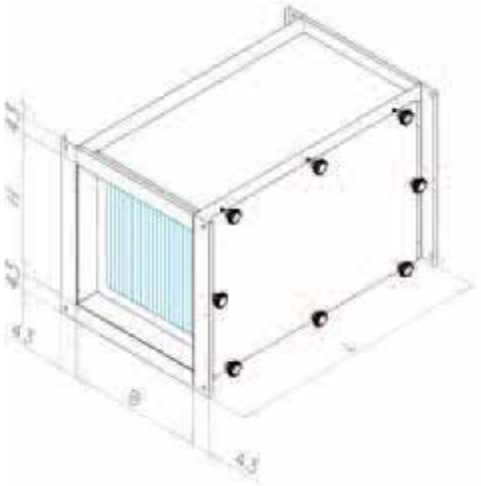
Absolute Duct Filter FAK

Technical features:

- Absolute duct filter is designed for absolute air filtration in spaces prior to the premises where high class of air cleanliness is required (hospitals, pharmaceutical, food, electronic industry)
- Filter insert is absolute HEPA filter, class H13 or H14 for airborne particles 0.3 µm, efficiency 99,95÷99,995% according to EN 1822
- Replacement of filter insert is done from the side, after cover removal
- Casing contains connections for filter saturation control
- Casing is made from galvanized steel sheet, plastic coated in white color RAL 9010

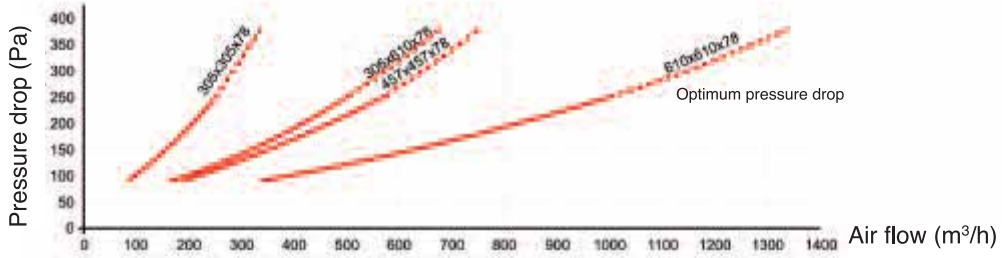
Technical data:

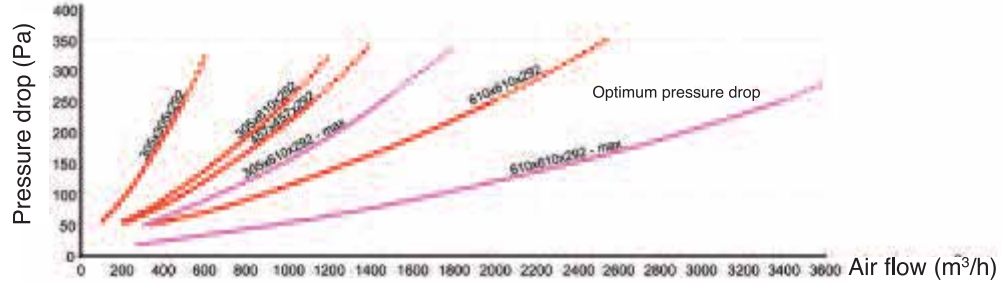
	Nominal size width x height x length (mm)	Filter dimensions width x height x length (mm)	Air flow Q (m³/h)
FAK	309 x 309 x 450	305 x 305 x 78	250
	461 x 461 x 450	457 x 457 x 78	570
	309 x 614 x 450	305 x 610 x 78	500
	614 x 614 x 450	610 x 610 x 78	1000
	309 x 309 x 600	305 x 305 x 292	500
	461 x 461 x 600	457 x 457 x 292	1140
	309 x 614 x 600	305 x 610 x 292	1000
	614 x 614 x 600	610 x 610 x 292	2000
	309 x 614 x 600 - max.	305 x 610 x 292 - max.	1500
	614 x 614 x 600 - max.	610 x 610 x 292 - max.	3400



Other dimensions and performances according to customer request

Pressure drop diagrams for filter H13





Note: - Pressure drop of H14 filter is 10÷12% higher
- Final pressure drop of filled filter is 500 Pa

Absolute Duct Filter with Grille FAR

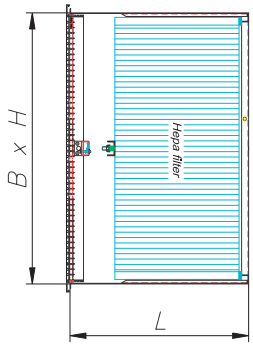
Technical features:

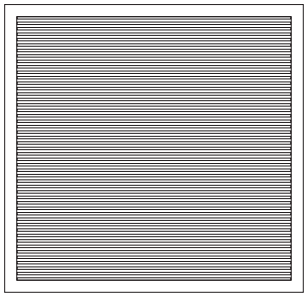
- Absolute duct filter with grille is intended for supply of absolutely clean, filtrated air into operating rooms, intensive care sections, laboratories, food industry and other cleanroom spaces
- Filter insert is absolute HEPA filter, class H13 or H14 for airborne particles 0.3 µm, efficiency 99,95÷99,995% according to EN 1822
- Replacement of filter insert is done from the clean side, from the grille side
- Aluminium grille is made of extruded Al-profiles and protected by anodic oxidation (anodization) in natural aluminium color
- Filter casing is made from steel sheet, plastic coated in white color RAL 9010
- Installation at the end of the ventilation duct

Technical data:

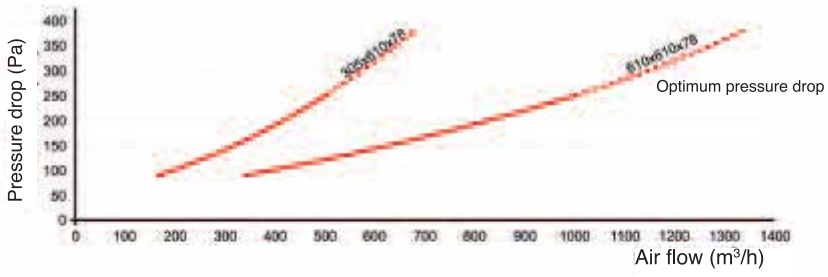
	Nominal size width x height x length (mm)	Filter dimensions width x height x length (mm)	Air flow Q (m³/h)
FAR	665 x 330 x 200	610 x 305 x 78	500
	665 x 330 x 420	610 x 305 x 292	1000
	665 x 630 x 200	610 x 610 x 78	1000
	665 x 630 x 420	610 x 610 x 292	2000

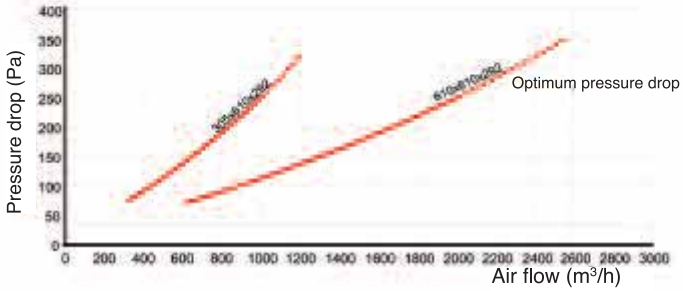
Other dimensions and performances according to customer request





Pressure drop diagrams for filter H13





Note: - Pressure drop of H14 filter is 10÷12% higher
- Final pressure drop of filled filter is 500 Pa

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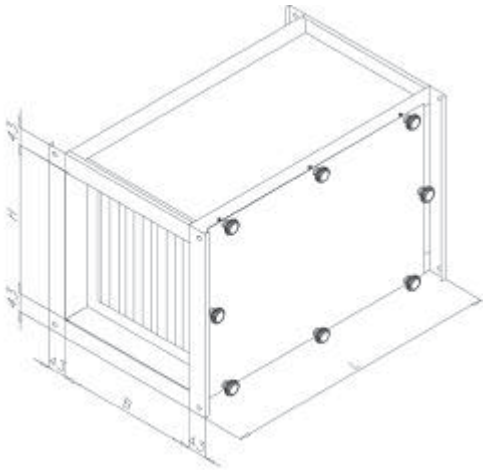
Duct Bag Filter FKV

Technical features:

- Duct bag filter is intended for air filtration in ventilation and air-conditioning systems where higher air cleanliness is required (laboratories, operating rooms, pharmaceutical and food industry, microelectronics)
- Installation of bag filter extends the life of HEPA filter, larger particles are removed by bag filter which is installed before HEPA filter
- Filter casing is made from galvanized steel, on request, performance of steel sheet, plastic coated in RAL color or made out of inox is possible
- Bag filter class F5 to F7 according to EN 779, is installed in casing
- Replacement of filter insert is done from the side of casing, after removing the cover. When dimensions are larger (B > 918 mm), cover is fitted on two sides, for easy replacement of filter insert



Technical data:

	Nominal size width x height x length (mm)	Air flow Q (m³/h)	Bag filter (pcs.)		
			592 x 592	287 x 592	287 x 287
FKV	613 x 613 x 750	3400	1	1	-
	918 x 613 x 750	5100	1	1	-
	1223 x 613 x 750	6800	2	-	-
	1528 x 613 x 750	8500	2	1	-
	1833 x 613 x 750	10200	3	-	-
	613 x 918 x 750	5100	1	1	-
	918 x 918 x 750	7650	1	2	1
	1223 x 918 x 750	10200	2	2	-
	1528 x 918 x 750	12750	2	2	1
	1833 x 918 x 750	15300	3	3	-
	613 x 1223 x 750	6800	2	-	-
	918 x 1223 x 750	10200	2	-	-
	1223 x 1223 x 750	13600	4	-	-
	1528 x 1223 x 750	17000	4	2	-
	1833 x 1223 x 750	20400	6	-	-

Other dimensions and performances according to customer request

Pressure drop:

Initial pressure drop:

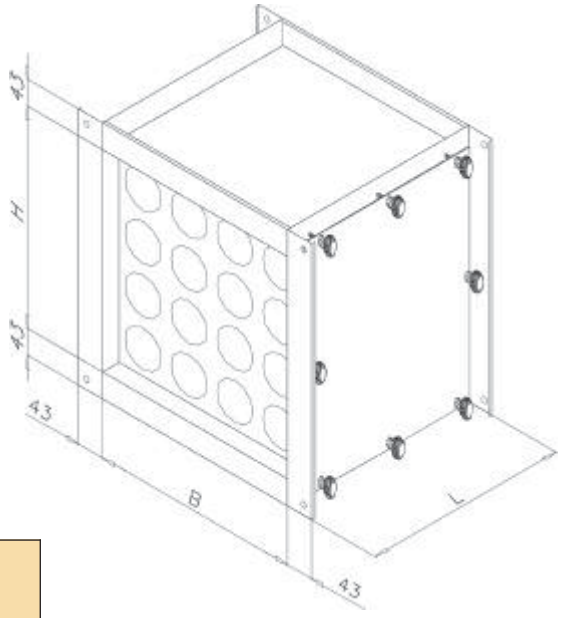
- for filter F5 is 50 Pa
- for filter F6 is 60 Pa
- for filter F7 is 85 Pa

Final pressure drop is 450 Pa

Duct Filter with Active Coal FKU

Technical features:

- Duct filter with active coal is intended for air filtration and removal of unpleasant smells from kitchens, public buildings and industrial plants
- Possible to supply filter with active coal to absorb gases (chemicals) in rafineries, pharmaceutical and chemical industries
- Filter casing is made from galvanized steel, on request, performance of steel sheet, plastic coated in RAL color or made out of inox is possible
- In the casing is seal to which filter with active coal is attached
- Replacement of filter insert is done from the side of casing, after removing the cover
- Designed exclusively for installation in duct with horizontal air flow



Technical data:

	Nominal size width x height x length (mm)	Filter dimensions width x height x length (mm)	Air flow Q (m³/h)
FKU	309 x 309 x 600	305 x 305 x 292	850
	309 x 614 x 600	305 x 610 x 292	1600
	614 x 614 x 600	610 x 610 x 292	3200

Other dimensions and performances according to customer request

Note:
For filtration of gases, the order is necessary to specify the types of gases that are filtered

Pressure drop:

- Initial pressure drop is 100 Pa
- Final pressure drop is 450 Pa

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GRADAUK™

Operating Ceiling SIP

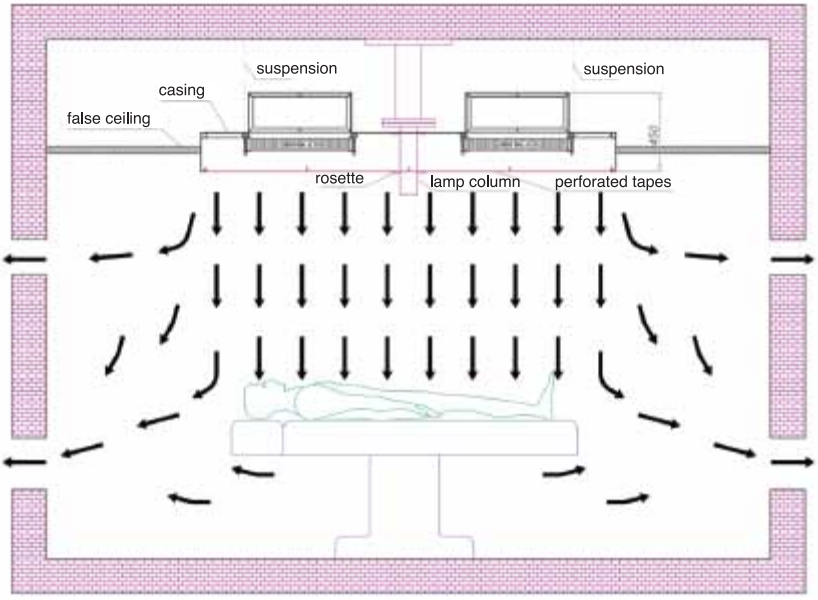
Technical features:

- Operating ceiling is intended for supply of filtrated air into operating rooms
- Optimal aseptic conditions are being achieved due to laminar air flow which is gradually directed toward exhaust openings
- Recommended air flow velocity, above operation table is between 0,15-0,30 m/s
- Absolute filtration is done by high quality HEPA filter class H14 (H13) according to EN 1822
- Casing and air flow surface are made from inox
- Air flow surface can be made of poliethilene fiber with lamps installed within
- Easy to clean and disinfect

Technical data:

OPERATING CEILING DIMENSIONS					
SIP	Dimensions length x width x height	Air connection (mm)	HEPA H14 filter (mm)	Air flow velocity (m/s)	Air flow (m^3/h)
SIP-2014	2000 x 1400 x 450	540 x 180 2 kom.	1220 x 610 x 69 2 kom.	0,15 0,25 0,25 0,30	1500 2000 2500 3000
SIP-2418	2400 x 1800 x 450	540 x 180 2 kom.	1525 x 610 x 69 2 kom.	0,15 0,25 0,25 0,30	2300 3000 3800 4600
SIP-2720	2700 x 2000 x 450	690 x 180 2 kom.	1830 x 762 x 69 2 kom.	0,15 0,25 0,25 0,30	2900 3880 4860 5800

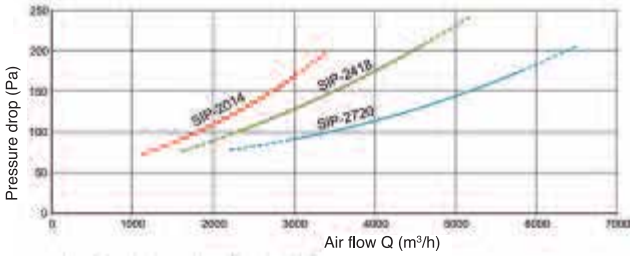
Other dimensions and performances according to customer request



Assembly:

- Mounting in false ceiling

Pressure drop diagram for filter H13



- Final pressure drop of filled filter is 500 Pa

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Inclined Outflow Box KIK

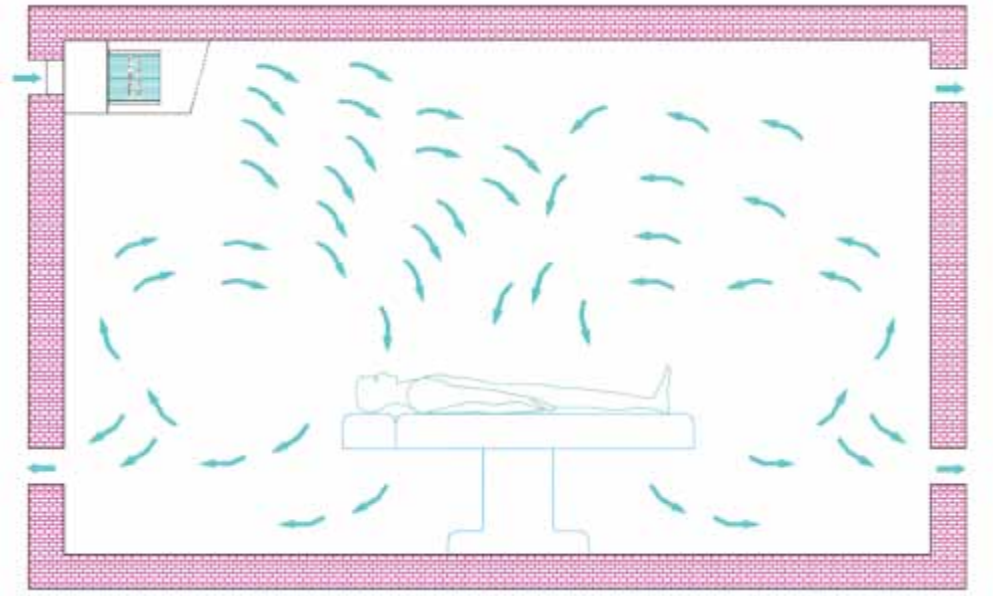
Technical features:

- Inclined outflow box is intended for supply of filtrated air into operating rooms and intensive care sections that have limited ceiling height so operating ceiling SIP can not be installed
- Casing and air flow surface are made from inox
- Duct connections can be located at the back or upper side
- In casing is installed high quality HEPA filter class H13 or H14 for particulates 0,3 µm efficiency 99,95÷99,995% according to EN 1822

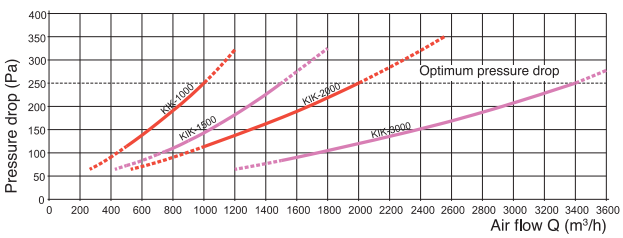
Technical data:

INCLINED OUTFLOW BOX DIMENSIONS					
KIK	Unit	KIK 1000	KIK 1500	KIK 2000	KIK 3000
Casing dimensions width x height x length	mm	490 x 410 x 1000	490 x 410 x 1000	720 x 410 x 2000	720 x 410 x 2000
Duct connection height x length	mm	200 x 600	200 x 600	200 x 800	200 x 800
Filter dimensions	mm	305 x 610 x 292	305 x 610 x 292	305 x 610 x 292	305 x 610 x 292
No. of filters	pcs.	1	1	2	2
Air flow	m³/h	1000	1500	2000	3000
Pressure drop	Pa	250	250	250	250

Other dimensions and performances according to customer request



Pressure drop diagram for filter H13



- Pressure drop of H14 filter is 10÷12% higher
- Final pressure drop of filled filter is 500 Pa

Exhaust Surgical Grille OPR

Technical features:

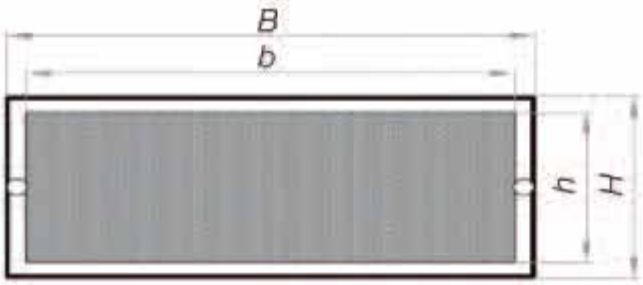
- Exhaust surgical grille is designed for wall mounting in areas with specific requirements of purity (operating rooms)
- Made from inox
- Possible option with filter class G4 or with regulation damper

Technical data:

	Nominal size width x height (mm)	Diffuser plate width x height (mm)	Air flow Q (m³/h)
OPR	325 x 225	285 x 185	450
	425 x 225	385 x 185	650
	525 x 225	485 x 185	800
	425 x 325	385 x 285	1000
	525 x 325	485 x 285	1200
	625 x 325	585 x 285	1500

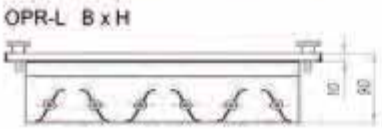
Other dimensions and performances according to customer request

Assembly:



OPR B x H

OPR-F B x H - with filter class G4



OPR-L B x H - with regulation damper

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Interspace Filter Device MFU

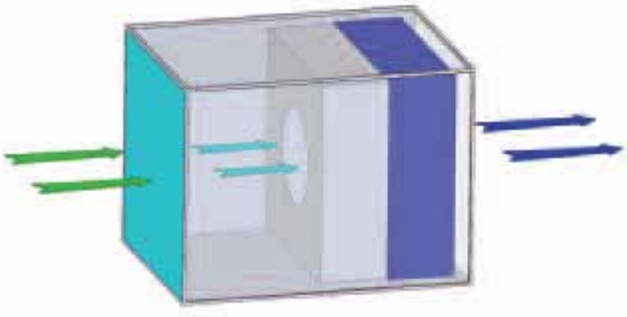
Technical features:

- Purpose: Purification of air in rooms, increasing the purity of air in the room where laminar flow booths/hoods/cabinets are installed, when the item of work is put next to the device
- Mounting: in a wall or partition-walls between two rooms. Installation is air-tight and elastically performed in order to reduce vibrations and avoid air streaming
- Operating: microprocessor controlled parameters from the control panel
- Construction: plastic coated steel sheet, on the front side perforated discharge grille is mounted
- Main filter: Absolute filtration through HEPA H14 filter, efficiency 99,999%MPPS, according to EN 1822
- Room pressure: regulation by air grille and potentiometer on the control box
- Max. air flow: 2500 m^3/h
- Max. overpressure: 60 Pa
- Built-in differential pressure gauge to control the overpressure in the room 0-60 Pa
- Built-in differential pressure gauge to control fulfillment of HEPA filter 0-500 Pa
- Built-in connector for DOP test

Operation principle:

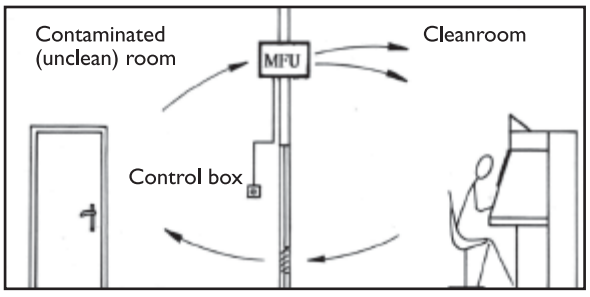
Contaminated air from an unclean room is drawn through a pre filter and using the fan it is pushed through the absolute filter of MFU's. Thus purified, absolutely clean air goes out in the form of divergent jets on the pure side of MFU's and is intensively mixed with air in clean room, increasing the purity. This cycle is continuous while the MFU is in use, while clean room is being used.

Speed adjustment of MFU's is achieved through built-it speed regulator on the wall in the non clean room.



KEY:

- HEPA filtered air
- Recirculating air
- Ambient air



Technical data:

Depending on the size of the room various dimensions and performances according to customer request.

Reference

Traumatology Clinic

Clinical hospital

Special hospital

Clinical hospital

Pharmaceutical factory

PLIVA Biotechnology

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PLIVA

Clinical hospital

Clinical hospital

PLIVA Biotechnology

Reference

Municipial Pharmacy

Municipial Pharmacy

Pharmaceutical factory

Jadran Galenic Laboratory

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Polyclinic

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