Ion exchange filters of type IEF, CF, IEF-CF

Ion exchange filters of type IEF, CF, IEF-CF are used for cleaning air of toxic gaseous and aerosol contaminants (sulphur dioxide, hydrogen fluoride, hydrogen chloride, aerosols of sulphuric, nitric, phosphoric acids, ammonia, organic acids and bases, chromic anhydride, etc.) in chemical, engineering, electronic, and metallurgic industry, as well as in building materials manufacturing and in other industries.

Due to the universality and simplicity, filters of type IEF are built in, supply, extract ventilation and recirculation systems, or in the systems of final cleaning of technological gases.

Cleaning of air and gases in filters occurs as a result of chemical reactions of gas and aerosol molecules with functional groups of ion exchange fibrous medium, forming filter elements.

Gases with toxic impurity content from 0,1 to 500 mg/m^3 at temperature +1єC to +40ºC are purified. The water-insoluble dust content should not exceed 5 mg/m3 for filters of type IEF and IEF-CF.

Ion exchange filters in the single module have air flow from 500 to 30000 m^3/h and are made of a rectangular body with flanges for inlet and outlet of a air flow. The body of the filter is made of corrosion-proof materials. Inside the body of the filter there are vertical filtering elements with ion exchange fibrous material, forming inlet and outlet slits for gas. At the top part of the filter there is a device for distribution of regenerating solution, at the bottom-there is regenerator collector.

Filters include the device for regeneration. Filtering elements of the filter are regenerated in periodic or continuous modes by water or by solution of a corresponding reagent. Regeneration solutions circulate in the unit up to their saturation with extracted component, after that they can be returned to manufacture or go to recycling as neutral salts.

Ion exchange filters work in automatic or manual modes of regeneration. The service life of ion exchange filter media is up to 3 years.

CONDITIONS OF USE OFION EXCHANGE FILTERS

Filter type	Trapped components	Average efficiency, not less than, %	Pressure drop, Pa	Regeneration management	Conditions of use
Frame ion exchange filter **IEF**	NH_3, HF, HCl, SO_2 CrO_3 Acids and bases aerosols	90	500-700	Automatic or manual	Dust content not greater than 5 mg/m^3; Air temperature not higher than 40ºC.
Contact filter **CF**	NH_3 HF, SO_2	95	50-100	Automatic	Dust content over 5 mg/m^3; Low air humidity; Does not require conditions for uniform movement of air across the filter section; The use of low pressure fans is possible.
Combined filter **IEF - CF**	NO_x, NH_3, HF, HCl, SO_2, CrO_3 Acids and bases aerosols	95	700-800	Automatic	Low air humidity; Does not require conditions for uniform movement of air across the filter section.

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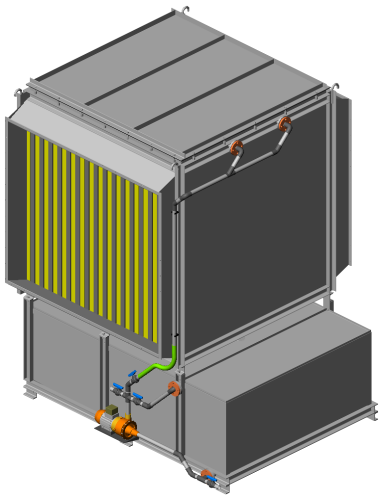
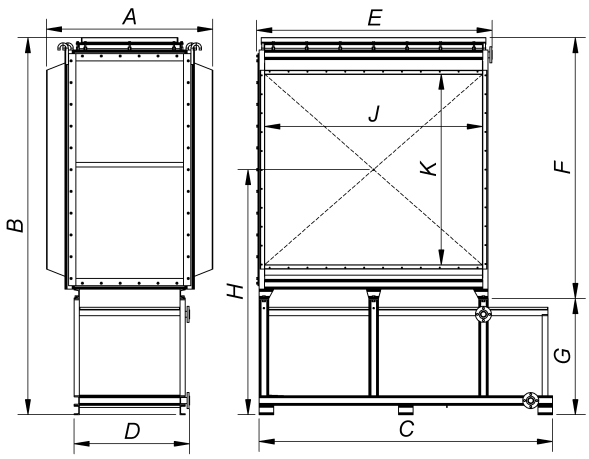
FRAME ION EXCHANGE FILTER OF TYPE IEF





Dimensions of filters of type IEF.

Frame ion exchange filters (IEF) are intended for cleaning air of NH3, HF, HCl, SO_2, CrO_3, organic acids and amines, aerosols of acids, alkalis, and toxic salts ($NiCl_2$, Ni_2SO_4, $CdSO_4$).

Air purification is carried out during filtration of dirty air through the ion exchange filter material whose functional groups bind toxic components. Temperature of cleaned air is not higher than 40°C. Water-insoluble dust content in cleaned air is not greater than 5 mg/m^3.

CHARACTERISTICS OF FILTERS OF TYPE IEF

Table 1

	IEF-0,5	IEF-1	IEF-5	IEF-10	IEF-20
Air flow, m^3/h	500	1000	5 000	10 000	20 000
Filtration area, m^2	3,0	6,0	22	42	108
Pressure drop, not greater than, Pa: • Periodic regeneration mode	300	300	300	350	400
Regeneration time, no more than, hr	1	1	1,5	2	2
Linear speed of filtration, m/s	0,046	0,046	0,06	0,07	0,05
A, mm	865	750	968	940	1694
B, mm	1200	1200	1825	2482	2476
C, mm	875	1340	1655	1950	2250
D, mm	550	550	810	815	1560
E, mm	585	1100	1360	1664	1965
F, mm	-	750	1318	1832	1827
G, mm	-	510	570	745	743
H, mm	850	835	1226	1638	1626
JxK, mm	415x427	1004x385	1196x905	1496 x1397	1800x1401
Dry filter weight, not greater than, kg	125	270	525	735	1325
Container volume, m^3	0,12	0,3	0,45	0,55	1,35

CONTACTOR FILTER OF TYPE CF

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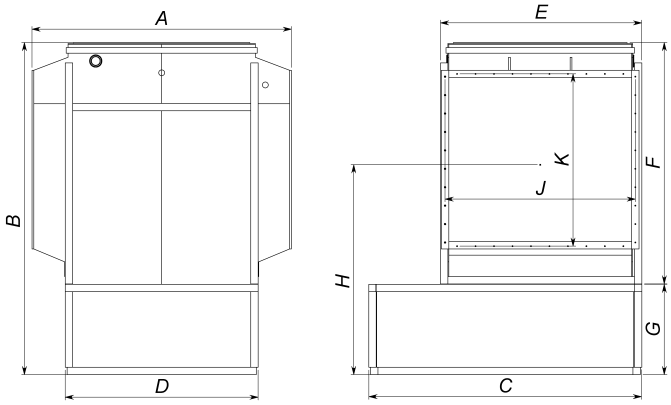

Dimensions of filters CF

Contactor filters (CF) are intended for cleaning air of ammonia, sulphurous gas, hydrogen chloride, hydrogen fluoride.

Filters CF are characterised by:

- High efficiency (90-95 %);
- Full automation of process of cleaning;
- Efficiency of cleaning practically does not depend on fluctuations of contaminant content and speed of air flux;
- Low sensitivity to a dust content of air;
- Capability of cleaning air with low and high humidity (10-100 relate. %).

Air cleaning is carried out due to diffusion of molecules of contaminating gases and fumes to the surface of plates of the contactor block and their subsequent chemical binding by functional groups of ion exchange filter material.

CHARACTERISTICS OF FILTERS CF

Table 2

	CF-5	**CF-10**	**CF-20**	**CF-30**
Air flow, m^3/h	5 000	10 000	20 000	30 000
Contact area, m^2	88	176	350	460
Pressure drop, not greater than, Pa:	100	100	100	100
Period between regenerations, min	20	20	20	20
Regeneration time, no more than, hr	1	1	1	1
Linear speed of filtration, m/s	3	3	3	3
A, mm	1266	1266	1270	1510
B, mm	1858	1880	1942	2130
C, mm	1000	1500	2500	3080
D, mm	1025	1020	1025	1510
E, mm	730	1230	2250	3080
F, mm	1338	1370	1417	1460
G, mm	648	640	653	667
H, mm	1266	1233	1300	1382
JxK, mm	550x940	1050x940	20500x940	3000x885
Dry filter weight, not greater than, kg	470	600	850	1300
Container volume, m^3	0,2	0,5	0,84	2,3

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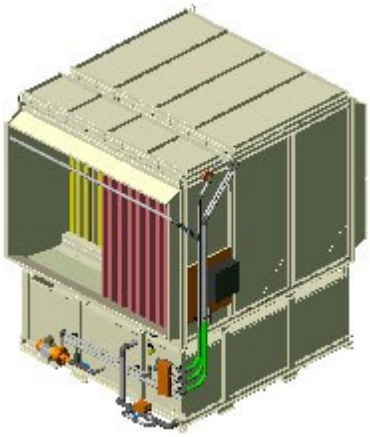
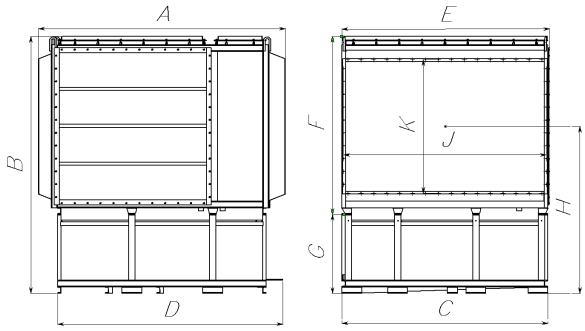
COMBINED FILTERS OF TYPE IEF-CF





Dimensions of filters of type IEF-CF.

Combined filters (IEF-CF) are intended for cleaning air of NO_x, NH_3, HF, HCl, SO_2, CrO_3, organic acids, aerosols of acids, alkalis, toxic salts ($NiCl_2$, $NiSO_4$, $CdSO_4$, etc).

Filters IEF-CF are characterised by:

- High efficiency (90-95 %);
- Efficiency of cleaning practically does not depend on fluctuations of ccontaminant content and speed of air flux;
- Capability of cleaning air with low and high humidity (10-100 relat. %).

Air cleaning is carried out in two steps:

1 - due to diffusion of molecules of contaminating gases and fumes to the surface of plates of the contactor block and their subsequent chemical binding by functional groups of ion exchange filter material.

2 - during filtration of cleaning air through ion exchange material, toxic components are chemically bound by functional groups of ion exchange filter media.

Characteristics of filters of type IEF-CF

Table 3

	IEF-CF-0,5	IEF-CF-5	IEF-CF-10	IEF-CF-20	IEF-CF-25
Air flow, m^3/h	500	5000	10 000	20000	25 000
Filtration area, m^2	2,0	18	37	60	75
Pressure drop, not greater than, Pa: • Periodic regeneration mode • Continuous regeneration mode	 450 700	 450 700	 450 700	 800 900	 800 900
Regeneration time of filtration block, no more than, hr	2	2	2	2	2
A, мм	1420	1540	1630	2410	2380
B, мм	1200	1810	2723	2660	2589
C, мм	850	1660	1930	2560	2550
D, мм	1050	1340	1496	2240	2205
E, мм	465	1420	1784	2320	2496
F, мм	650	1310	1898	1840	1910
G, мм	550	520	1039	960	838
H, мм	850	1220	1875	1800	1739
JxK, мм	415x427	1196x892	1540 x1437	2000x1412	2236x1437
Dry filter weight, not greater than, kg	800	1200	1250	1800	2000
Container volume, m^3	0,5	1,0	0,9	2,0	2,1

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