

CAMSAFE



TECHNICAL GUIDE

The CAMFIL safe change filter housing system is for use wherever containment and operator safety is essential.

Field of application:

- Pharmaceutical Plants
- Chemical Plants
- Laboratories
- Safety Biological Cabinets

Design

CAMSAFE-housings can provide a filter change free of contamination. They are available as single modules or multi-module systems depending on air volume.

The housings consist of a gastight welded robust construction of sheet steel and has removable inspection doors, which are secured by 4 star grip screws in each case.

These housings are complete with a spring loaded locking system, which insures containment at all times through the filter lifetime. Each housing has a separate safe change facility for each filter, a PVC bag is secured onto it by means of a rubber locking ring

A surrounding gasket guarantees the additional sealing between the inspection door and the housing.

The housings are provided with a high quality coating in RAL 9010 but can be delivered alternatively in stainless steel 304.

CAMSAFE filter housing

The CAMSAFE-housing can be fitted with a high efficiency filter of class F7 (EN 779) to H14 (EN 1822) or with special activated carbon filters (Acticarb)

CAMSAFE 2 filters housing

The CAMSAFE-housing can be fitted with a pair of high efficiency filters of class G4 / F5 to F9 (EN 779) and a high efficiency filter of H10 or H14 (EN 1822) or with special activated carbon filters (Acticarb)



Fig. 1 - CAMSAFE - housing



Fig. 2 – CAMSAFE-housing

By means of a spring loaded quick clamping device the gasket of the filter is pressed air tight against the receiving face. To do this the lever must be turned 180 degrees, otherwise the inspection door can not be fitted. This is an additional safety device for the correct mounting of the filter for the upstream sealing of the filter.

Selection: CAMSAFE-housing

Type of housing	Filter dimensions
CAMSAFE-1000	610 x 610 x 292 mm (Main filter)
CAMSAFE-P1/1000	610 x 610 x 48 mm (Pre filter)
CAMSAFE-P2/1000	610 x 610 x 292 mm (Main filter)
CAMSAFE-P2/1000	610 x 610 x 292 mm (Pre filter)
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Data concerning air volume and pressure drop are specified in tables on Page 5.

Combinations of housings

At high airflow's CAMSAFE and CAMSAFE-housings can be duct mounted vertically into duct-systems provided by customers.

Note: Please take care that there is enough space on the service side for filter change.

Example:

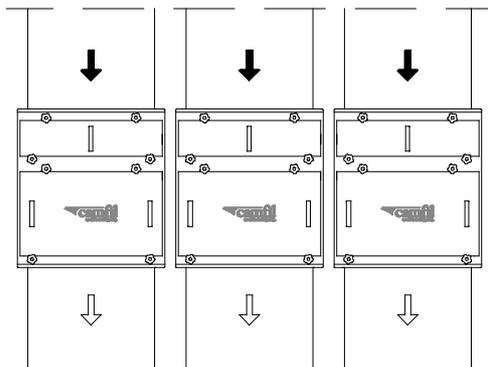


Fig. 4
3 pieces CAMSAFE - housing, parallel,
connection duct provided by customers

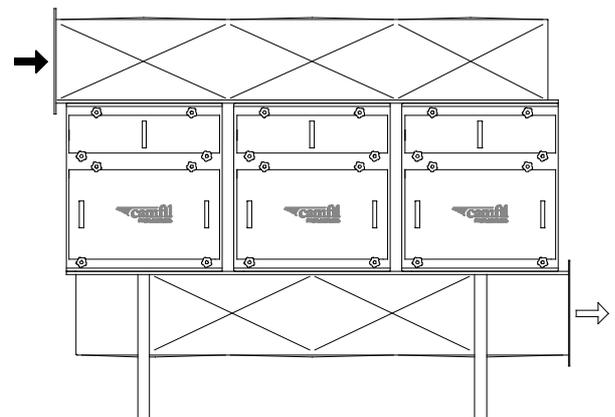
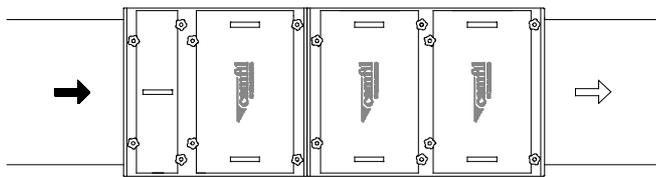


Fig. 5
Typ CAMSAFE-31-14
connection duct provided by Camfil

Multistage filter system

In many cases it is necessary to filter dust particles and toxic gases by several filter-stages. For this purpose two or three CAMSAFE-housings can be mounted in series.

For example: a multistage filter-system consisting of pre-filter, high efficiency filter, activated carbon filter and an additional high efficiency filter as attrition-filter.



CAMSAFE CAMSAFE
Pre filter HEPA-Filter Activated carbon-Filter HEPA-Filter
as attrition-filter

Fig. 6

Mounting information

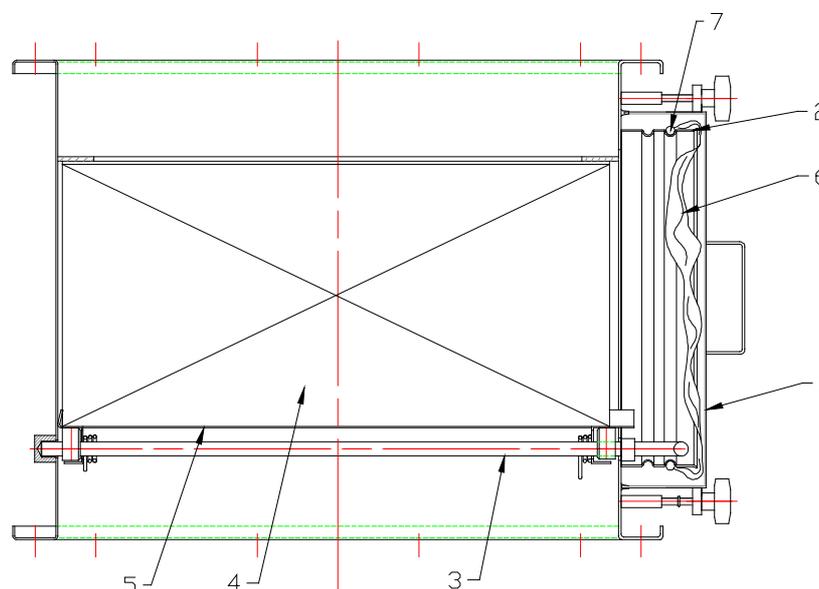
For reasons of transportation housings and ducts will be delivered separately. Customer carries out assembly on site. All fixings are supplied by Camfil. Due to the gasket properties these screw connections should be tightened again after 24 hours.

After cleaning and disinfections of housings and ducts proceed as follows:

1. Remove maintenance cover plate (1).
2. Turn to right clamping lever (3). So clamping frame (5) is pressed downward.
3. Put filter (4) on the clamping frame and slide it into the housing till end position.
4. Turn to left clamping lever (3) cautiously and press upward the clamping frame.
5. Draw PVC-bag (6) over the bag-board (2) and fix it with locking ring (7) at the outer groove.
6. Unroll the PVC-bag (6), Press it into the opening of the housing.
7. Attach maintenance cover-plate (1) and fix it with star-grip screws.

Attention: Please avoid a defect of the PVC-bag.

8. Housing is now ready for use.



TECHNICAL DATA –FILTERCELLS

1. High efficiency-filter ABSOLUTE^Ø and MICRETAIN^Ø 3)

1.1. Absolute high efficiency-filter H13/H14,

acc. EN 1822, MPPS efficiency

Filtertyp	Dimensions B x H x T	Nominal airflow at 250 Pa [m ³ /h] ²⁾	Recomended final pressure drop [Pa]	Humidity resist up to	Weight [kg]
SOFILAIR H13	610 x 610 x 292	4000	500 – 600	100 % r. h. ¹⁾	16,3
SOFILAIR H14	610 x 610 x 292	3000	500 – 600	100 % r. h. ¹⁾	16,3

1.2. Micretain high efficiency-filter H10, acc. EN 1822, MPPS efficiency 95%

Filtertyp	Dimensions B x H x T	Nominal airflow at 125 Pa [m ³ /h] ²⁾	Recomended final pressure drop [Pa]	Humidity resist up to	Weight [kg]
SOFILAIR H10	610 x 610 x 292	5000	500 – 600	100 % r. h. ¹⁾	16,3

2. Activated carbon filtercells 3)

Filtertyp	Dimensions B x H x T	Construction typ	Carbon Volume [l]	Recomended temperatur [°C]	Recommended rel. humidity	Weight [kg]
Acticarb 4000	610 x 610 x 292	4 V version	65	0 – 40	30 - 70 % r. h.	80

Activated carbon filter cells are available with non or special impregnated activated carbon. In each case data have to be specified separately in dependence on substances to adsorb and concentrations.

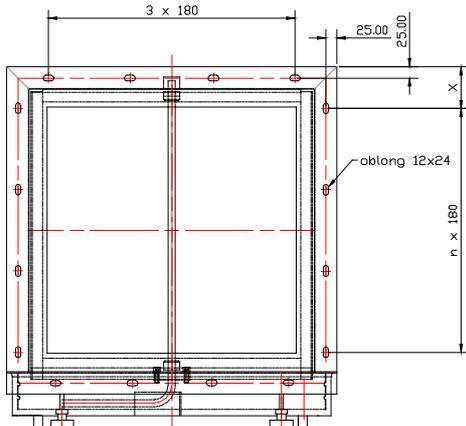
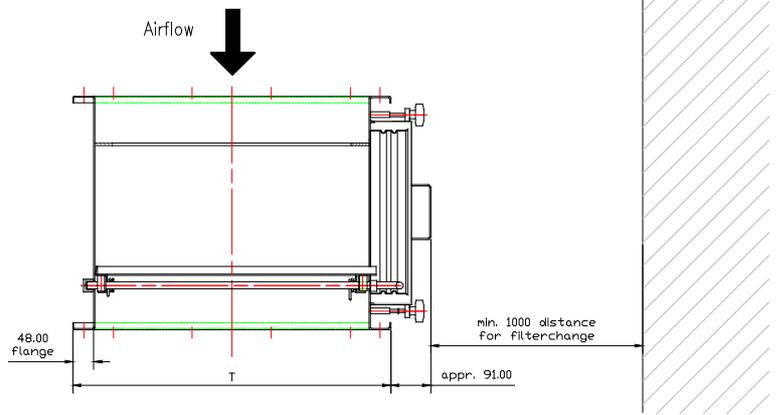
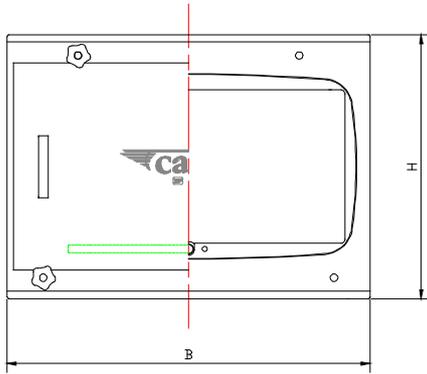
On request your Camfil sales office will specify a filter layout according requirements and available data.

3. Pre-filters 3)

Filtertyp	Dimensions B x H x T	Nominal airflow [m ³ /h]	Filterclass Acc. EN 779	Initial pressure drop [Pa] ²⁾	Weight [kg]
CAMPLIS	610 x 610 x 48	3400	G4	90	2,3
CAMPLIS	610 x 610 x 48	3500	F5	130	2,5
ECOPLEAT	610 x 610 x 48	3400	F6	110	3
ECOPLEAT	610 x 610 x 48	3400	F7	175	3
OPAKAIR	610 x 610 x 292	4500	F7	110	15
OPAKAIR	610 x 610 x 292	4500	F8	130	15
OPAKAIR	610 x 610 x 292	4500	F9	140	15

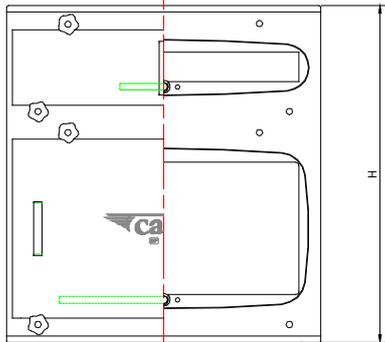
Recommended final pressure drop = initial pressure drop + 100 to 150 Pa

- Footnote:
- 1) Due to the aerosol-arrestance within the high efficiency filter during operating in the range of the dew point an increase of the filter pressure drop is possible.
 - 2) Pressure drop values are only based on filters. Additional pressure loss due to the ducts and air channels must be considered.
 - 3) For additional filter information's technical data sheets are available.



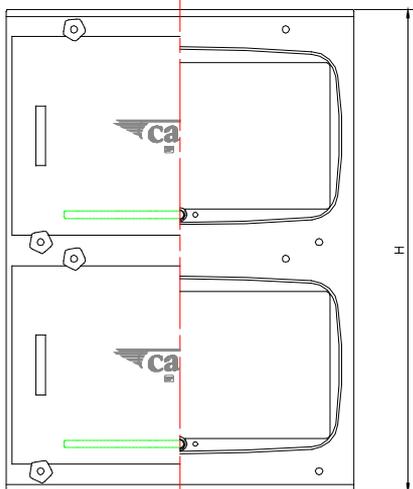
Type CAMSAFE

Typ	Dimensions [mm]	Dimensions [mm]				n	Weight [kg]
		B	H	T	X		
CAMSAFE	1000	730	535	725	92.5	3	44



Type CAMSAFE-P1

Typ	Dimensions [mm]	Dimensions [mm]				n	Weight [kg]
		B	H	T	X		
CAMSAFE	1000	730	790	725	92.5	3	69



Type CAMSAFE-P2

Typ	Dimensions [mm]	Dimensions [mm]				n	Weight [kg]
		B	H	T	X		
CAMSAFE	1000	730	1020	725	92,5	3	89

Filter change

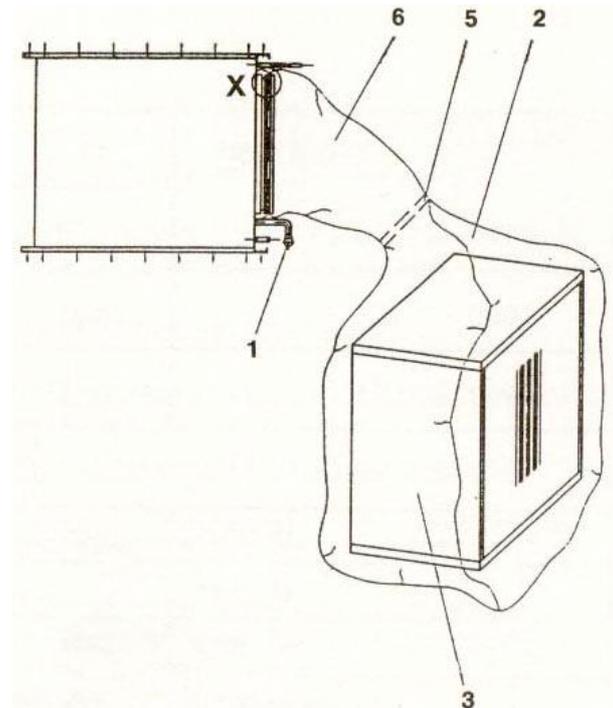
Filters should be changed no later than the specified final filter pressure drop.

Recommendation:

For simplification of maintenance works we recommend a table with adjustable height, on which filter cells can be deposited for welding purpose of the PVC-bag.

Operations:

1. Unit shut down
2. Close shut-off damper (when existing)
3. Open pressure compensation device (when existing)
4. Take off maintenance cover
5. Turn clamping lever (1) rightwards
6. Unroll Plastic bag (2)



All further operations must now be carried out from the outside through the plastic bag cautiously and carefully!

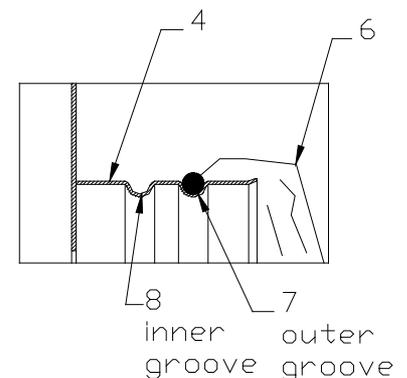
7. Pull out half the used filter cell (3) and push the plastic bag (2) over the cell.
8. The filter cell (3) is located now at the end of the plastic bag (2) and can now be entirely pulled out from the housing.
9. Weld the plastic bag (2) as near as possible to the bag-board (4) twice (approx. 20 mm apart) (5).
10. Cut off the plastic bags between the welded joints.
11. The used filter is now safe inside the plastic bag and can be shipped.

Attention: Do not remove the remained (6) of the plastic bag (2) from the bag-board (4)!

12. Put new filter into a new plastic bag.

Attention: Do not touch the filter media!

13. Secure the plastic bag with new filter in rear groove (8) with new rubber ring.
14. Loosen the old rubber ring and the remainder (6) of old plastic bag and push it behind the new filter.
15. Push the new filter into the housing until it stops.
16. Roll up the new plastic bag and push it into the opening of the housing behind filter.
17. Another rubber ring has to be pressed into the forward groove (7). The rubber ring in the rear groove (8) has to be removed.
18. Turn clamping lever (1) carefully to left and it will move the centring frame up.
19. Connect leak test point (9) with leak test device and perform leak test, if required.
20. Shut the maintenance cover.
21. When finished, close the pressure compensation device and open the shut-off damper.
22. The housing is ready for operation.



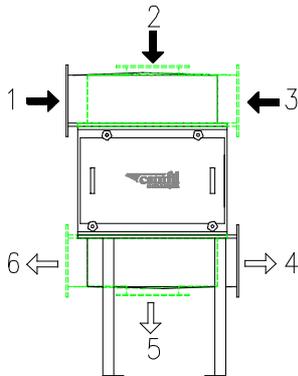
Combinations of housings with ducts

TYPE		1	2	3	4	5	6
		Nominal airflow [m ³ /h] (1)					
1000		4000	8000	12000	16000	20000	24000
Technical data: ducts							
Bh mm		801	1625	2410	3195	4017	4802
B mm		730	1515	2300	3085	3870	4655
h mm		250	320	390	490	590	695
a mm		300	370	440	540	640	740
Type 1000	T mm	730					
	b mm	625					
	c mm	157	96	113,5	138,5	109	126,5
	m	2	4	4	4	6	6
	d mm	115	115	115	115	115	115
	n	6	6	6	6	6	6
	Weight (2)	70	100	165	230	315	410

- Footnote:
- 1) At a higher airflow the air velocity in the duct system will increase which will cause increased noise and system pressure loss.
 - 2) Values are including weight for inlet- and outlet duct pieces, (not housings). For total filter system weights housing weights must be added (see page 6)

Arrangement with connection ducts

Arrangement with connection ducts

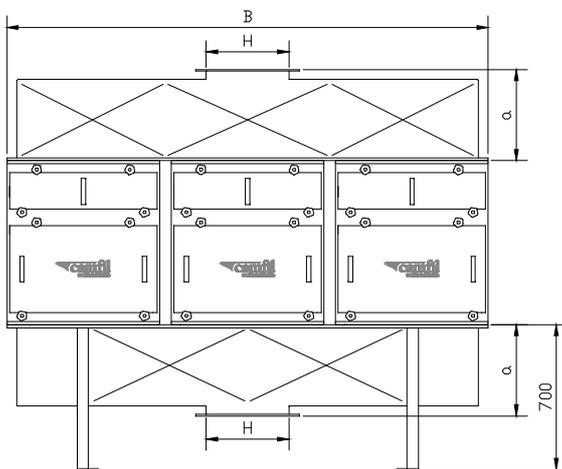


Specify when ordering:

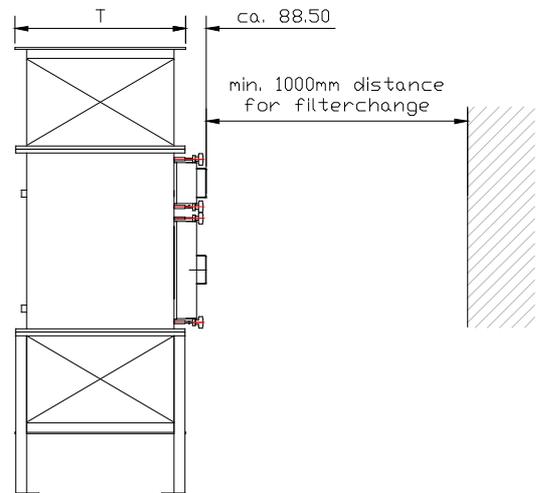
Example: Arrangement 1 4

Upstream position 1
Downstream position 4

Arrangement with vertical inlet and outlet air direction:

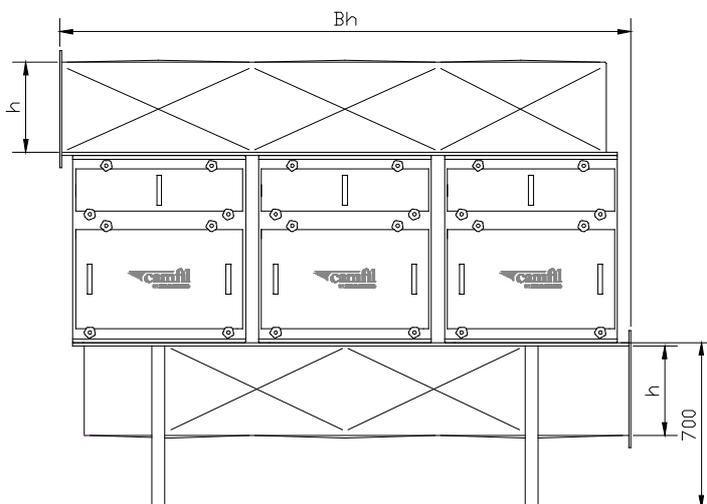


Boring distance on request

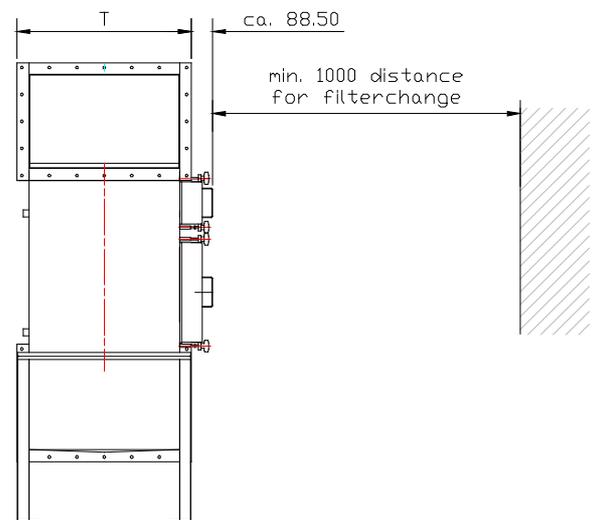


Boring distance on request

Arrangement with horizontal inlet and outlet air direction:

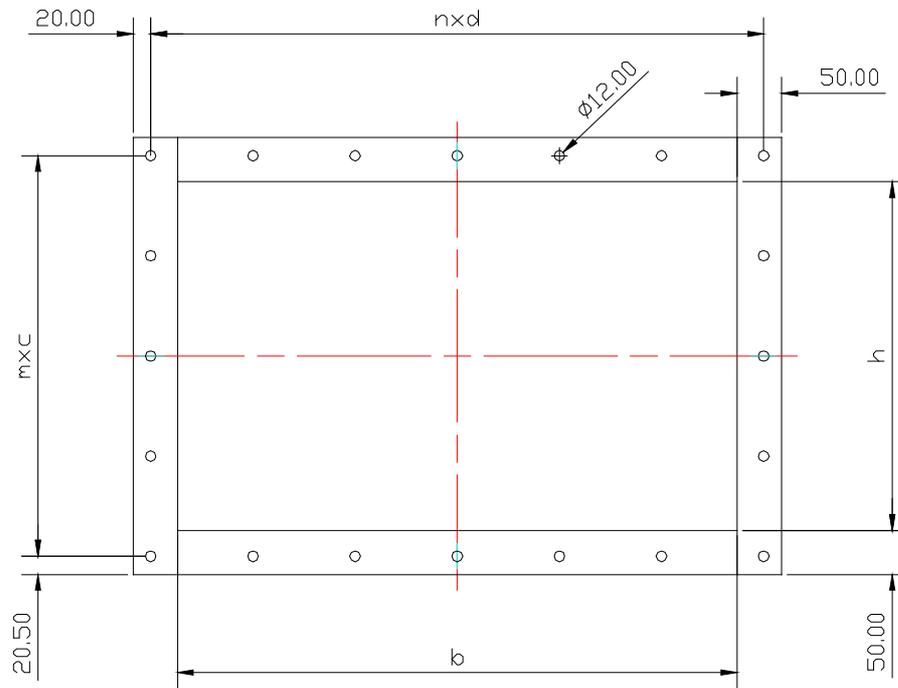


Boring distance on request



Boring distance on request

Duct-connection flange suitable for all sizes



Example : Filter system requirements:

3-staged filter system for 6800 m³/h with upstream and downstream ducts and pedestal.

Arrangement: 1. Stage: pre filter F8 according EN 779
 2. Stage: high efficiency filter, H13 according EN 1822

Connection to the filter system : upstream = horizontal from right, downstream = vertical

Ø 2 x CAMSAFE P1/1000 painted + DUCT 2 1000/ 3 painted + DUCT 2 1000/5 painted

Invitation to bid

Instructions:

Please arrange your individual text of invitation to bid regarding the following notes.

Conventional construction:

CAMFIL high-efficiency duct-housing CAMSAFE 1000.

If pre-filter is necessary:

With CAMFIL pre-filter housing CAMSAFE P1 or P2

Duct-housing or housing-combination?

For combination of housings: with duct-connection pieces and pedestal.

Housing-construction:

In robust, welded sheet steel construction with bored flange ready for connection.

Surface-Protection:

All housings are provided with a high-grade coating in RAL 9010 (white). Alternatively: Stainless steel construction.

Is it necessary to regard protection-devices by changing of filters ?

With maintenance bag-board for a filter-change free of contact and appertaining PVC-bags with locking ring.