DFH
Snow and Droplet Separator



EQUIPMENT

DFH

- Effective elimination of snow particles
- Prevents filters being plugged by snow and ice
- Efficient anti-icing function
- Very low pressure drop leading to lower operating costs
- Corrosion resistant
- Simple installation
- Low maintenance cost due to simple operating principle and long lifetime
- Tailor made sizes and designs
- In house ISO 9001 certified manufacturing

DFH is a ready-to-install snow and droplet separator for use as an air intake in cold climates. The unit provides protection against all sorts of snow particles and rain, hence it prevents the intake from getting plugged with ice. DFH is typically used in cold climates, with snowfall, hail, drifting snow particles and high relative humidity.

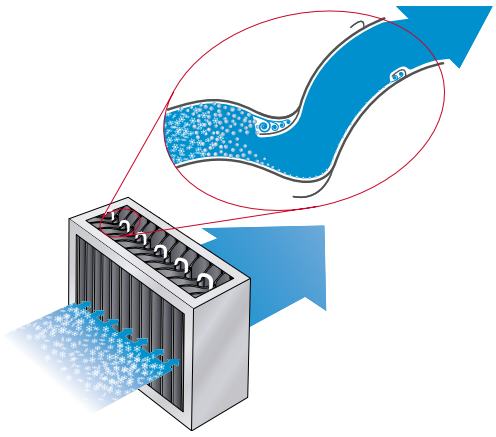
DFH separator is available in aluminium and stainless steel alloys and thus fits a wide range of applications.

It can be configured to various individual performance and installation situations, providing a cost effective solution. The choice of sensor options allows for the best adaptation to the weather conditions in order to reduce the electrical consumption.

Design

DFH consists of a separator and a control unit. The separator unit accommodates vertical profiles with heating devices. Captured snow and hail particles are either sublimated or melted, once they have coalesced on the heated surface. Melted particles gravitate down and drain the eliminator through a heated exit.

Depending on the application, the control unit can incorporate an integrated FI switch, sensors and additional electrical components. The control unit comes as a separate part and is installed in close proximity to separator. A single unit can control several separators, provided that they are installed in the same location.



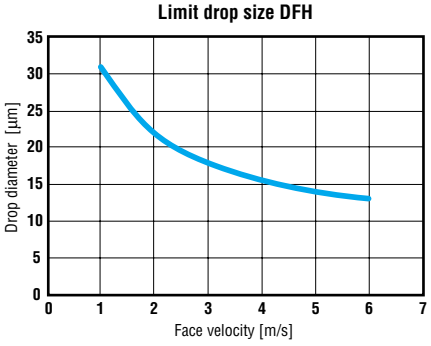
Principle illustration.

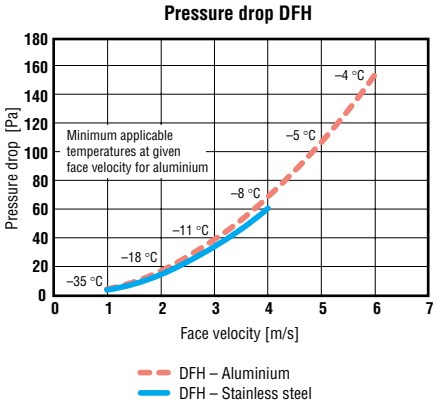
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Performance

The limit drop size represents a performance characteristic of the profile, at the relevant velocity and operating conditions it is the size of the smallest droplet that is completely separated. The diagram showing limit drop size has been calculated for an air/water system at 20 °C and 1 bar.

The pressure drop is measured at ambient conditions (20 °C and 1 bar) through a number of assembled profiles and under ideal conditions.





The figure shows the maximum applicable air velocity at a given ambient temperature. The convection of heat strongly increases with increasing air velocity and cools down the surface temperature of the profiles.

Liquid load

Maximum liquid load is specified for each project individually.

Electrical data and control options

Power supply

The unit requires 400V 3 phase or 230V AC or DC. For larger units, it is recommended to use 400V 3 phase.

Temperature sensor (TS)

The temperature sensor measures the ambient air temperature. The sensor shall be installed in close proximity to the separator. TS cables can be up to 3,000 mm long.

Heating capacity

Electrical capacities vary between 2.3 and 5.8 kW/m^2, depending on ambient temperature and requested anti icing features. The snow melting capacity of DFH is a multiple of what typically occurs under heavy snowfall.

Control units

Control units "communicate" in such way that the electricity is "on" only when required. For given ambient air temperatures, the maximum air velocities are given in the graph for pressure drop.

The unit comes with various control options such as:

Option 1 (code): *TS.*

- (e.g. actuated +5 °C) Actuating temperature adjustable

Option 2: *TS, Humidity sensor (HS) and snow-detector.*

- actuated from -5 °C to +5 °C and RH>70% at no snowfall
- actuated at any temperature during snowfall

Option 3: *TS, HS, snow-detector and rain sensor.*

- actuated at +5 °C and rain, RH may be lower than 65%
- actuated from -5 °C to +5 °C and RH>70% at no snowfall
- actuated at any temperature during snowfall

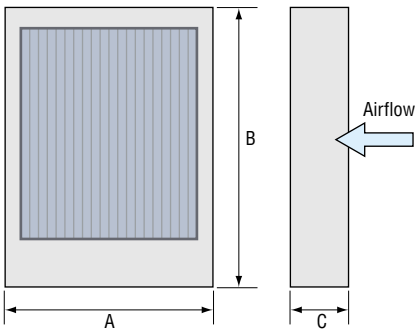
Type, material, dimension and cable output specifications

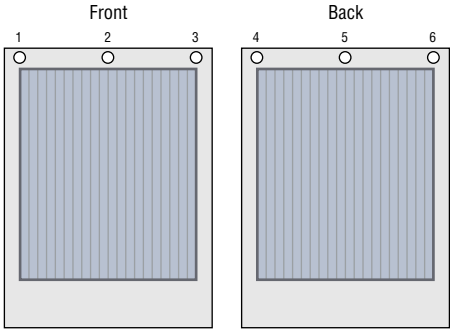
Type code	Material		Width** (A) mm min–max	Height** (B) mm min–max	Depth (C) mm
	Frame*	Profile*			
8a	AlMg3	AlMgSi0.5	300–2,500	500–1,800	>165
9l	316L	316L	300–2,500	500–1,800	>135

316L = Stainless steel (AISI 316L, DIN 1.4404)
AlMg3 = Aluminium alloy
AlMgSi0.5 = Aluminium alloy

* *All frames and profiles can be painted on request (specify RAL code).*

** *Standard tolerance on width and height: +0, –5 mm. If higher than 800 mm, the height of the separator unit will be split in two or more sections.*



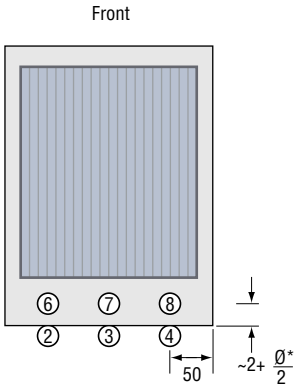


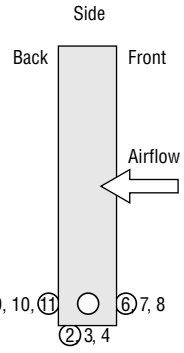
Code for cable output position, put CO before the position number (1-6) e.g., CO1.

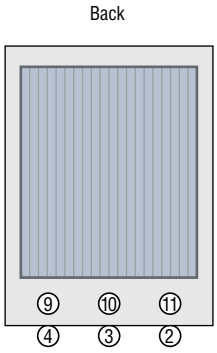
Only one position is possible!

Drainage positions

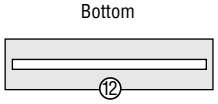
Code for drainage position, put P before the position number, e.g., P9 or P6,8,9,10 if more outlets are to be used.





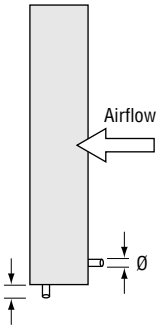


**Diameter of bushing, nipple or tube. Dimensions in mm.*



⑫ *Slot throughout the entire bottom for use with separate housing/tray.*

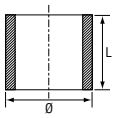
Drawing for fittings (see below).



Fittings specifications

For aluminium frames
Tubes

Fitting code	Ø mm	L mm
A1	16	50
A2	20	50
A3	30	50
A4	42	50
A5	54	75
A6	65	75
A7	76	75

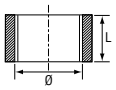




Fitting material AlMgSi0.5 aluminium alloy.

Half bushing Inside threads, both sides.

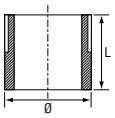
Fitting code	Ø inch	L mm
C1	1/2	15
C2	3/4	17
C3	1	19
C4	1 1/2	22
C5	2	26





Weld-on nipple External threads, one side.

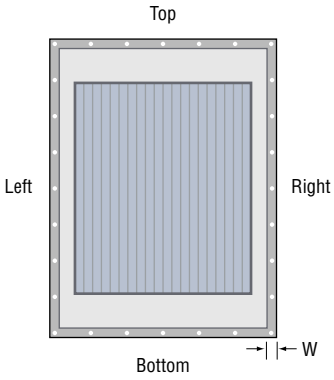
Fitting code	Ø inch	L mm
D1	1/2	35
D2	3/4	40
D3	1	40
D4	1 1/2	50
D5	2	50
D6	2 1/2	60
D7	3	65



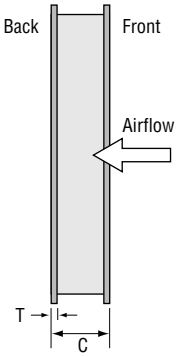


Bushing according to DIN 2986, nipples DIN 2982, material 316Ti (AISI 316Ti, DIN 1.4571), witworth – thread according to DIN 259.

N.B. The required cross-section of the water outflow depends on both application and liquid load. Most frequently used fitting sizes are 3/4" and 1" and corresponding tube sizes.



Hole configurations in flanges are delivered according to Eurovent, DIN 24193, Norsok or other trade, national or international standards (specify standard). Hole configuration according to individual requirements are also delivered (specify drill pattern and hole diameter, provide a drawing).



N.B. Depths [C] is the same with or without flanges.

Flanges specifications

Flange code		Position
Continous welded	Spot welded	
F1	F11	Top & bottom front
F2	F12	Left & right front
F3	F13	All sides front
F4	F14	Top & bottom back
F5	F15	Left & right back
F6	F16	All sides back
F7	F17	Top & bottom, front & back
F8	F18	Left & right, front & back
F9	F19	All sides front & back

Thickness*, T	
code	mm
T2	2
T3	3
T4	4

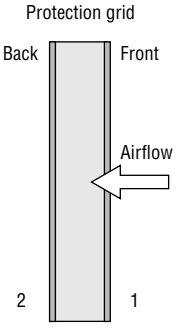
Width*, W	
code	mm
W30	30
W50	50
W60	60

Material: Aluminium and stainless steel in accordance with the frame material selected.
** Other thickness or width on request.*

Code	[mm] min–max
R	50–500

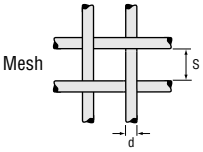


Code for radius, put R before the dimension, e.g. R150



Protection grid and mesh type specifications

Protection grid code	Position
G1	Front
G2	Back



Mesh width, S		Mesh type, wire diameter, d Ø [mm]			
inch	mm	1.0	1.2	1.5	2.0
1/2 × 1/2	10 × 10	Q4	X4		
1/2 × 1/2	12 × 12	Q5		Y5	
3/4 × 3/4	16 × 16	Q6	X6	Y6	
3/4 × 3/4	20 × 20	Q7		Y7	Z7
1 × 1	25 × 25			Y8	Z8

Material: Stainless steel 304 (AISI 304, DIN 1.4301).
N.B. Protection grid is mainly used as trash screen on air inlets. Pressure drop over wire mesh is negligible.
Aluminium grids can be delivered on request

DFH

DFH droplet separator has been developed to suit a wide range of applications. The various options shown cover the most typical occurring installation variations. However, tailor made separators are frequently delivered based on customers' individual specifications. The separator can be complemented with two-stage or three-stage solutions (such as DCF and DFF).

Material certificates can be delivered for most materials upon request. Fractional efficiency curves for given face velocities are delivered on special request.

All separator units undergo inspection before shipping.

DFH is developed and produced by Munters Euroform GmbH, Germany.

Order information

DFH-X-X-X-X-X-X-X-X-X-X-X-X-X

- Type code
- Cable output code
- Width, mm
- Height, mm

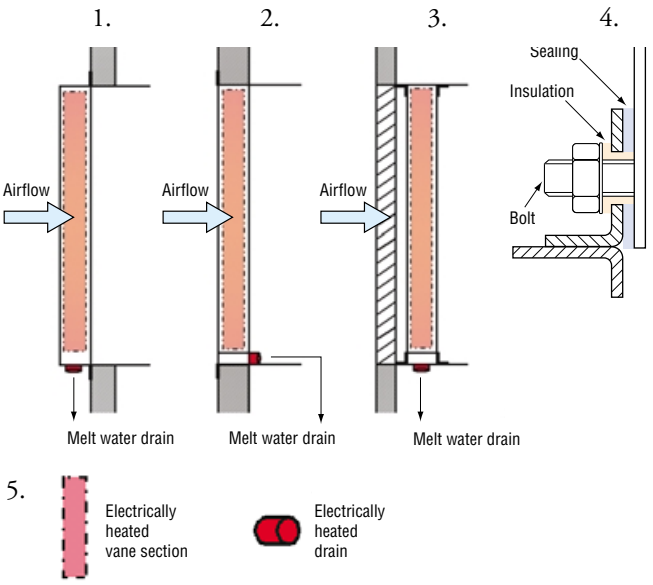
Options:

- Drainage position(s) code
- Fitting code
- Flange position code
- Flange thickness code
- Flange width code
- Protection grid position(s) code
- Mesh type code
- Radius code
- Control option code

e.g., DFH-8a-CO1-1920-1600-P3-A4-F2-T3-W30-G2-Q6-R150-3

Examples of installation

1. The droplet separator is flanged onto a wall opening and the water drains vertically outside of the wall.
2. The droplet separator is flanged into a wall opening and the water drains controlled into an internal tray (not shown in the drawing).
3. The droplet separator is installed behind a weather louver in an air duct and stands in between angled profiles that are connected to the air duct. The water drains through the bottom into a tray that is below the air duct. Typical retrofit installation.
4. Galvanic separation of carbon steel structure from the mist eliminator (made of stainless steel or aluminium for installation on other metals).
5. Munters recommends all drainage prolongations to be heated in order to prevent ice build up and related plugging in the non-heated part.



5.

Design criteria

Air volume ..... m³/h

If existing:

Height ..... mm

Width ..... mm

Winter design conditions:

I. Snowremoval
- Lowest design temperature ..... °C
- Air volume at that temperature ..... m³/h

II. Icing prevention
- Lowest design temperature ..... °C
- Air volume at that temperature ..... m³/h

Available power supply:

110V	DC	.....
220/240V	DC	.....
220/240V	AC	.....
400V	3 phase	.....

Sensor options:

I. TS .....

II. TS .....
- HS .....
- Snow-detector .....

III. TS .....
- HS .....
- Snow-detector .....
- Rain sensor .....

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