



Membrane Filtration Systems

Alfa Laval Flat Sheet Membrane Modules M38L/H

The Module M38L/H is specifically designed for ultrafiltration and microfiltration of low to medium viscous products and fermentation broths. The module is ideal for various uses in industries such as pulp and paper, biotechnology and pharmaceuticals, as well as food and beverages.

The Module M38L/H module is developed to meet the future demands for optimized flow dynamics, low energy consumption and low-pressure operation. All materials are in compliance with FDA regulations. This membrane module particularly suited for:

Pulp & Paper

- Spent sulphite liquor
- Black liquor
- Lignin concentration
- Kraft bleach effluents
- Colour removal
- Lignosulphonate concentration

Biotech & Pharma

- Antibiotics - whole broth clarification
- Amino acids/organic acids - whole broth clarification
- Dextranes - concentration of HMW dextrans

Food & Beverage

- Dairy - cultured milk concentration
- Gums - xanthan and pectin concentration
- Protein - concentration of soya, whole egg, gelatine etc.
- Beer - beer yeast concentration
- Sugar - clarification of saccharification liquid (HFCS)
- Juice - clarification of orange juice, apple juice etc.



The Module M38L/H is available with membrane areas of up to 60 m² per module. It can be equipped with all types of flat sheet UF and MF membranes.

The Module M38L/H for ultrafiltration and microfiltration comes in the following standard sizes defined by membrane area:

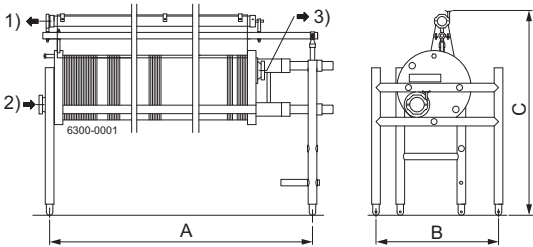
Membrane area	9 m ²	18 m ²	27 m ²	35 m ²	42 m ²	60 m ²
Length A, mm	755	1111	1450	1730	2010	2760
Shipping weight, kg	220	270	320	370	405	505
Shipping volume, m ³	0.7	0.9	1.1	1.5	1.5	1.5

Operating principles

The module can operate at temperatures up to 80°C, pressures up to 10 bar and pH between 1 and 14. The entire range of flat sheet membranes for ultrafiltration and microfiltration can be used. Please consult the Alfa Laval product descriptions for flat sheet membranes for details of temperature, pressure and pH limits set by the membranes.

The Module M38L/H comprises:

- End flanges, frame and fittings all made of stainless steel
- Support plates, end plates, and permeate collecting tubes made of polysulphone (PSO)
- Gaskets made of nitril rubber
- Permeate hoses made of silicone rubber
- Frame: The module is mounted on adjustable legs and the inlet/outlet flanges are connected to each other by means of horizontal bolts. One end flange and the membrane support plates can slide along the bolts.
- The hydraulic tool kit type T38, Flat sheet membranes and lock rings must be ordered separately.



- 1 = \varnothing 51cl.
2 = \varnothing 76cl.
3 = \varnothing 76cl.

A = 755-2760 mm
B = 720 mm
C = 1025 mm

Module data

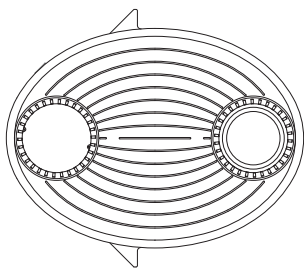
Module designation	M38L/H - (m ² of membrane area) - (number of sections) - (type of membrane)
Generic design	Plate-and-frame type cross-flow membrane filtration module
Plate-and-frame design	M38L/H-Polysulphone (PSO) plates in M38 frame
Membrane area	M38L: 9-60 m ² , M38H: 9-42 m ²
Membrane type	All flat sheet MF and UF membranes
Number of sections	1 or 2-3-4-5 etc. uniform sections connected in series
Number of section plates	1 less than the actual number of sections
Number of support plates	1 per 0.15 m ² of membrane area installed
Number of end plates	2 per module
Number of membrane sheets	2 per support/section plate installed
Cross-flow configuration within sections	Parallel membrane sheets of 0.075 m ²
Liquid capacity	M38L: 1.3 l/m ² of membrane, M38H: 1.55 l/m ² of membrane

Operating data

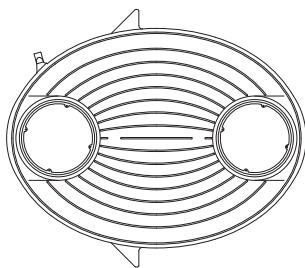
Cross-flow range (per plate in one section)	M38L: 5-15 l/min., M38H: 10-35 l/min.
Inlet pressure	Max. 10 bar
Differential pressure	0.2-2 bar per section
Viscosity range, apparent	M38L: 1-10 cP, M38H: 1-25 cP
Max. temperature	80°C
pH range	1-14
Plate stack pressure/temperature	10 bar at 0-40°C sloping to max. 5 bar at 80°C
Plate stack compression force	M38L: 150 kN, M38H: 240 kN
Max. back pressure at permeate tube outlet	0.1 bar at static and 0.3 bar at dynamic conditions

Materials data

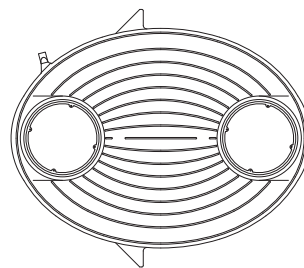
External steel	Stainless steel (min. AISI 304 type)
Internal/product wetted steel	Acid resistant steel (min. AISI 316 type)
Support, section, and end plates	Polysulphone (PSO)
Permeate tube and hose connector	Polysulphone (PSO)
Permeate hose Silicone rubber (Si)	Silicone rubber (Si)
Gasket and o-ring	Nitril rubber (NBR)
Membrane lock ring	Polypropylene (PP)
Membrane sheet	According to product descriptions
Connections at cross-flow in/outlets	DN 76.1, ISO 2852 clamp flange and ring
Connection at permeate outlet tube	DN 51, ISO 2852 clamp flange and ring



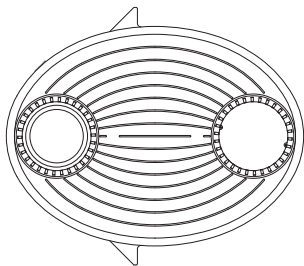
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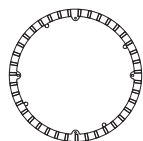
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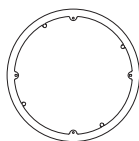
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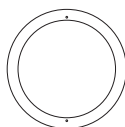
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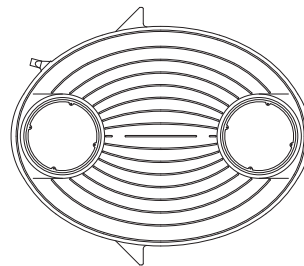
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Designation	Material	Code no.	
		M38L	M38H
End plate, top	Polysulphone	101607	101698
End plate, bottom	Polysulphone	101608	101699
Membrane support plate, type 0	Polysulphone	101730	101660
Membrane support plate, type 1	Polysulphone	101731	101661
Section plate, blue outlet	Polysulphone	101758	101788
Section plate, grey outlet	Polysulphone	101759	101789
Lock ring	Polypropylene	101719	101715 (blue)
Passage ring	Polypropylene	101729	101725 (blue)
Stop disc	Stainless steel	101733	101733

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