



Alfa Laval M39L/H module

System modules for membrane filtration

Introduction

Alfa Laval offers a range of system modules which are based on the unique plate-and-frame design.

The Alfa Laval M39L/H module is specially developed for ultrafiltration (UF) and microfiltration (MF) of highly viscous products and fermentation broths.

It is developed to meet the future demands for optimized flow dynamics, low energy consumption, and low pressure operation.

The M39L/H module can be equipped with the entire range of flat sheet membranes from Alfa Laval for UF and MF.

Applications

The Alfa Laval M39L/H module is excellently used within the biotech and pharmaceuticals industry as well as for food, dairy and beverages applications. Some examples are:

Biotech and Pharmaceuticals

- amino acids/organic acids — whole broth clarification
- antibiotics — whole broth clarification
- dextrans — concentration of HMW dextrans
- industrial fermentation — whole broth clarification

Food, Dairy and Beverages

- dairy — cultured milk concentration
- gums — xanthan and pectin concentration
- sugar — clarification of saccharification liquid (HFCS)

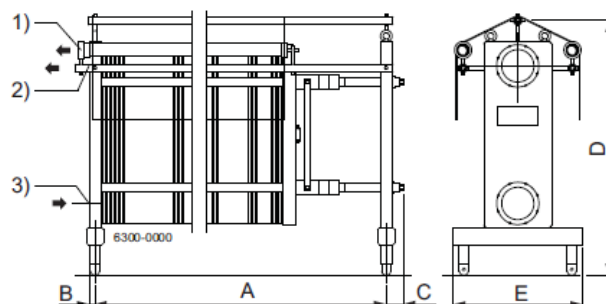
Benefits

- open channel design for the handling of a wide range of viscosities
- accurate production up-scaling by increase of size or number of modules
- easy cleaning by CIP (Cleaning-In-Place)
- standard modules with up to 60 m² membrane area
- easy membrane failure detection and exchange on-site
- rugged yet flexible stainless steel and polymer construction
- sanitary design with all components manufactured in compliance with FDA and EU regulations

Compared to previous module types, the Alfa Laval M39L/H module is superior in respect of:



- up to 6 times bigger section sizes
- approx. 1.5 times bigger module sizes
- up to 15% increase in concentration degree
- up to 30% increase in flux
- up to 30% reduction in energy consumption
- approx. 1.5 times reduction in operating pressure
- all in all reduction in system price by 10–30%



- 1: size 51 clamp
- 2: DN 150 flange (must be ordered separately)
- 3: DN 150 flange (must be ordered separately)
- A: 720 - 2390 mm
- B: 189.5 mm
- C: 78.5 mm
- D: 1180 mm
- E: 600 mm

Standard sizes

The Alfa Laval M39L/H module is available with plates having low (L) or high (H) channels and in the following standard sizes defined by membrane area:

Membrane area, m ²	6	9	18	30	36	40	54	60
Length A, mm	720	815	1065	1540	1615	1740	2130	2390
Shipping weight, kg	500	520	580	650	680	710	790	830
Shipping volume, m ³	0.8	0.9	1.1	1.4	1.5	1.6	1.9	2.2

Module designation

Example: **Alfa Laval M39H-54-1-RC70PP**

Alfa Laval M39	=	Module type
H	=	High channel plates
54	=	Membrane area, m ²
1	=	Number of sections
RC70PP	=	Type of membrane

Module data

Model	Alfa Laval M39L module	Alfa Laval M39H module
Generic design	Plate-and-frame module for cross-flow membrane filtration	Plate-and-frame module for cross-flow membrane filtration
Plate-and-frame design	M39L-PSO / PEEK plates in M39 frame	M39H-PSO / PEEK plates in M39 frame
Membrane area, m ²	6 – 60	6 – 60
Membrane type ¹	All flat sheet membranes for microfiltration and ultrafiltration	All flat sheet membranes for microfiltration and ultrafiltration
Number of sections	1	1
Number of support plates	1 per 0.2 m ² of membrane area installed	1 per 0.2 m ² of membrane area installed
Number of end plates	2	2
Number of flat sheet membranes	2 per support plate installed	2 per support plate installed
Cross-flow configuration within sections	Parallel membrane sheets of 0.1 m ²	Parallel membrane sheets of 0.1 m ²
Liquid capacity	2.15 l/m ² of membrane area installed	2.65 l/m ² of membrane area installed
Dry weight, kg	400 + 5.8 kg/m ² of membrane area installed	400 + 5.5 kg/m ² of membrane area installed

¹ Must be ordered separately

The module is mounted on adjustable legs, the stationary and the support flanges are connected to each other by means of horizontal bolts. The movable flange and the membrane support plates can slide along the bolts.

Operating data

Model	Alfa Laval M39L module	Alfa Laval M39H module
Max. inlet pressure, bar ¹	8	8
pH range	1 – 14	1 – 14
Max. temperature, °C ¹	80	80
Cross-flow range, l/min./plate	5 – 20 / plate in one section	20 – 50 / plate in one section
Differential pressure, bar	0.2 – 2	0.2 – 2
Viscosity range, apparent, cP	1 – 5	1 – 30
Max. plate stack pressure, bar	8 at 0 – 40°C / 5 at 80°C	8 at 0 – 40°C / 5 at 80°C
Max. plate stack compression force, kN ²	100	100
Max. back pressure at permeate tube outlet, bar	0.1 at static conditions / 0.3 at dynamic conditions	0.1 at static conditions / 0.3 at dynamic conditions

¹ For detailed information about operating conditions, please see the specifications for the membrane type applied

² Hydraulic tool kit, type T39, code No. 108495 to be used. Must be ordered separately

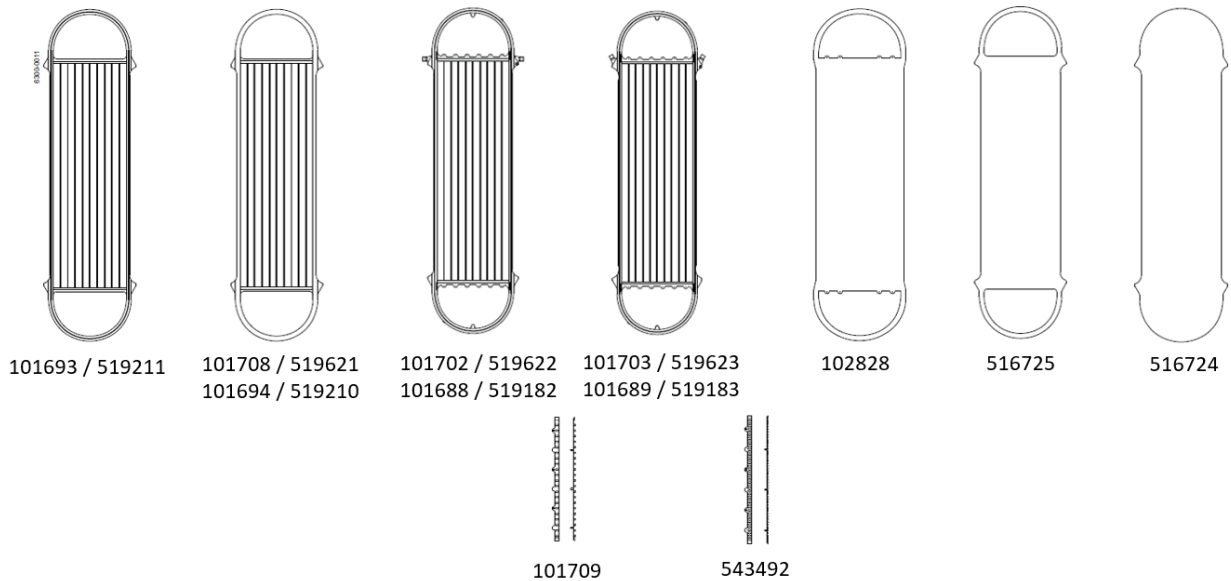
Module material

Support and end plates	Polysulphone (PSO) or polyetheretherketone (PEEK)
Membrane locking strip	Polyvinylidene fluoride (PVDF)
Permeate hose	Silicone rubber (Si)
Gasket	Ethylene propylene diene monomer (EPDM) rubber
Internal/product wetted steel parts	Acid resistant steel, min. AISI 316
External steel parts	Stainless steel, min. AISI 304
Cross-flow in/outlet connections ¹	Flange DN 150, Alfa Laval, code No. 521227
O-ring for cross-flow in/outlet connections ¹	DN 150, code No. 520498
Permeate outlet tube connection	Size 51 clamp ferrule ISO 2852
Permeate tube and hose connector	Polysulphone (PSO)
Membrane sheet	Polymer ²

¹ Must be ordered separately

² For detailed information about the membrane material, please see the specifications for the membrane type applied

Plates and accessories



Designation	Material	Code No.	
		Alfa Laval M39L module	Alfa Laval M39H module
End plate with seal	Polysulphone / PEEK	101693 / 519211	101693 / 519211
End plate without seal	Polysulphone / PEEK	101708 / 519621	101694 / 519210
Membrane support plate, type 0	Polysulphone / PEEK	101702 / 519622	101688 / 519182
Membrane support plate, type 1	Polysulphone / PEEK	101703 / 519623	101689 / 519183
Paper gasket	Polysulphone	102828	102828
Tightening plate, top/bottom	Polypropylene	516725	516725
Tightening plate, without hole	Polypropylene	516724	516724
Locking strip (coarse serrations) ¹	Polyvinylidene fluoride	101709	101709
Locking strip (fine serrations) ¹	Polyvinylidene fluoride	543492	543492

¹ Must be ordered separately

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