



Membrane Filtration Systems

M39L/H

Specifically designed for ultra- and microfiltration of highly viscous products and fermentation broths the M39 module is excellently used within the industries of Biotech & Pharma as well as Food & Beverage.

The M39 module is developed to meet the future demands for optimised flow dynamics, low energy consumption, and low pressure operation.

Biotech & Pharma

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

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 M39 module is available with membrane area sizes of up to 60 m² per module, and can be equipped with all types of flat sheet UF and MF membranes.

Compared to previous module types, the M39 module is superior in respect of:

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

The modules can operate at temperatures up to 80°C , pressures up to 0.8 MPa, and pH ranges between 1-14. The entire range of flat sheet membranes for ultra- and microfiltration can be used. Please consult our Flat Sheet Membranes Product Specification for specific temperature, pressure, and pH limits set by the membranes.

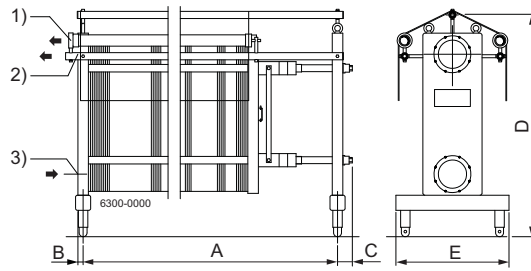
Modules M39L and M39H for ultra- and microfiltration are available in the following standard sizes defined by membrane area:

Membrane area	6 m ²	9 m ²	18 m ²	30 m ²	36 m ²	40 m ²	54 m ²	60 m ²
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



The module M39L/M39H equipment comprises:

- Flanges, pipes, and fittings all made of stainless steel
- Support plates, end plates, and permeate collecting tubes made of PSO (polysulphone)
- Gaskets made of nitril/EPDM
- Permeate hoses made of silicone
- Frame: The module is mounted on adjustable legs, the stationary and the support flanges are connected to each other by means of four horizontal bolts. The movable flange and the membrane support plates can slide along the bolts.
- The hydraulic tool kit, type T39 as well as the flat sheet membranes and lock strips must be ordered separately.



1 =	DN51 Clamp	A =	720-2390 mm
2 =	DN150 Flange	B =	189.5 mm
3 =	DN150 Flange	C =	78.5 mm
		D =	1180 mm
		E =	600 mm

Module Data

Module designation	M39L/H-m ² of membrane area - 1 (number of sections) - type of membrane	
Generic design	Plate-and-frame type cross-flow membrane filtration module	
Plate-and-frame design	M39L/H-PSO plates in M39 frame	
Membrane area	6-60 m ²	
Membrane type	All flat sheet MF and UF membranes	
Number of sections	1	
Number of support plates	1 per 0.2 m ² of membrane area installed	
Number of end plates	2	
Number of membrane sheets	2 per support plate installed	
Cross-flow configuration	Parallel membrane sheets of 0.1 m ²	
Liquid capacity	M39L: 2.15 l/m ² *	M39H: 2.65 l/m ² *
Weight, empty/dry	M39L: 400 kg + 5.8 kg/m ² *	M39H: 400 kg + 5.5 kg/m ² *

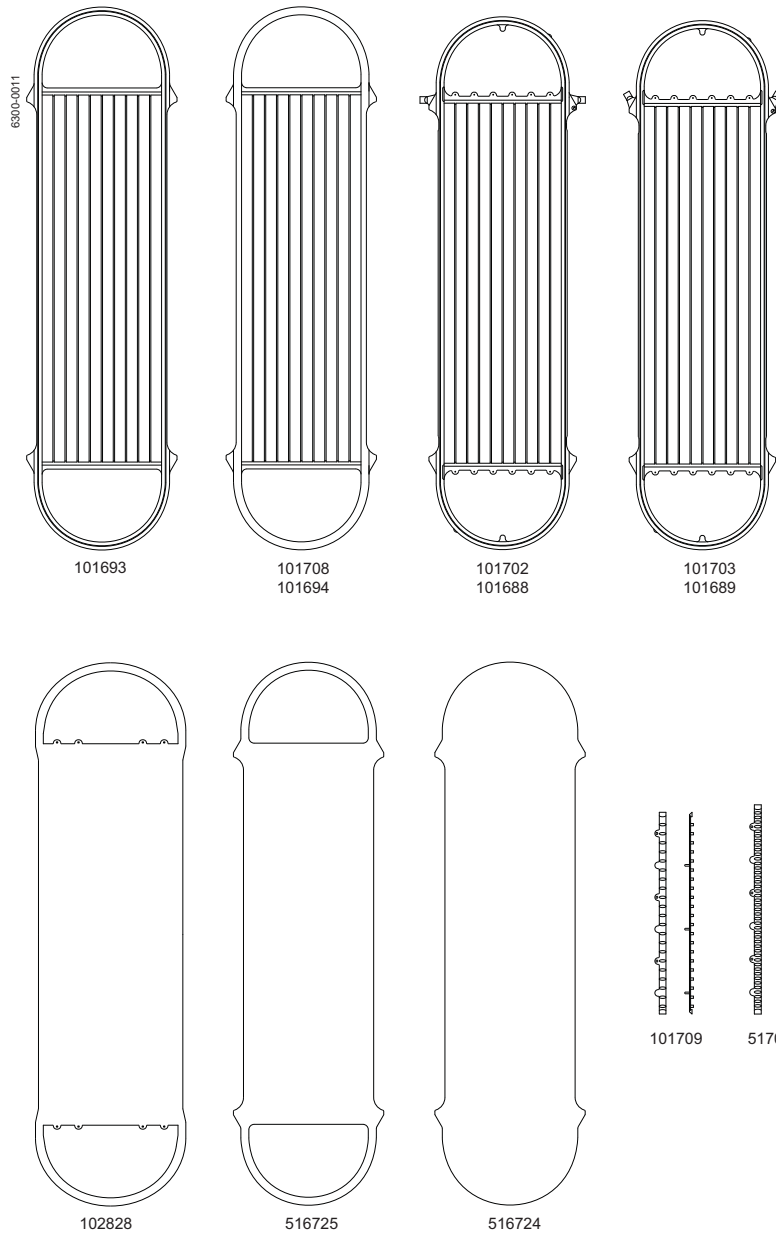
* of membrane area installed

Operating Data

Cross-flow range (per plate in one section)	M39L: 5-20 l/min./plate	M39H: 20-50 l/min./plate
Inlet pressure	Max. 8 bar	
Differential pressure	0.2 - 2 bar	
Viscosity range, apparent	M39L: 1-5 cP	M39H: 1-30 cP
Max. temperature	80°C pH range 1 - 14	
Plate stack pressure / temperature	8 bar at 0 - 40°C sloping to max. 5 bar at 80°C	
Plate stack compression force	Max. 100 kN (tool kit, type T39 to be used)	
Max. back pressure at permeate tube outlet	0.1 bar at static and 0.3 bar at dynamic conditions	

Module Material

External steel	Stainless steel (min. AISI 304 type)
Internal / liquid contact steel	Acid resistant (min. AISI 316 type)
Support and end plates	Polysulphone (PSO)
Permeate tube and connector	Polysulphone (PSO)
Permeate hose	Silicone (Si)
Gasket and o-ring	Nitril (NBR)/EPDM
Membrane lock strip	Polyvinylidene fluoride (PVDF)
Membrane sheet	According to Product Specification sheet
Connections at cross-flow in/outlets	Flange DN 150, Alfa Laval
Connection at permeate outlet tube	DN 51, ISO 2852 clamp flange and ring



Designation	Material	Code No.	
		M39L	M39H
End plate with seal	Polysulphone	101693	101693
End plate without seal	Polysulphone	101708	101694
Membrane support plate (0)	Polysulphone	101702	101688
Membrane support plate (1)	Polysulphone	101703	101689
Paper gasket	Polypropylene	102828	102828
Tightening plate, top/bottom	Polypropylene	516725	516725
Tightening plate, without hole	Polypropylene	516724	516724
Locking strip	Polyvinylidene flouride	101709	101709
Locking strip (blue)	Polyvinylidene flouride	517092	517092

Alfa Laval reserves the right to change specifications without prior notification. ALFA LAVAL is a trademark registered and owned by Alfa Laval Corporate AB.

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