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UNISOL
Membrane Technology

AMS Membrane Series

CATALOGUE

Specialty Spiral Wound Elements

UNISOL MEMBRANE TECHNOLOGY

www.unisol-global.com

Contents

Product Introduction

UNISOL MEMBRANE TECHNOLOGY is a membrane & membrane module supplier, providing a wide portfolio of products and seriousness in business proceedings according to customer needs.

AMS membrane series represent our chemically and thermally stable ultrafiltration (UF) and nanofiltration (NF) membranes and modules.

Today these membranes have become state of the art with significant improvement in the economics of organic and inorganic compounds recovery.

We offer a complete product line of extreme acid, alkaline, solvent, thermal- and pressure-stable membranes. Our core technology adds significant value in various applications and industries; by way of cost savings, improved recovery rates, greater supply reliability and clear environmental benefits.

AMS membrane series primarily are focused on the mineral extraction sector (mining) and industries with harsh operating environments such as: pharma, pulp, rayon, beverages and chemicals.

Product History

2000. Bio Pure Technology Ltd (BPT) is founded to develop novel NF membranes for industrial and agricultural applications.

2012. Former BPT is renamed into AMS Technologies (AMS) and belongs now to a group of investors from the mining industry.

2022. Integration of the AMS Technologies (AMS) products into the UNISOL Membrane Technology products portfolio. Today, UNISOL Membrane Technology markets products and continuously develops novel membranes to address complex tasks in various industries worldwide.

Project Approach

Initial assessment. Knowing the composition of the solution it is possible to carry out a simulation, which gives an approximate result of the separation. Clients are asked to provide details on solution's composition. This information enables UNISOL experts to provide an initial analysis.

Lab testing. After the initial analysis, it is recommended to follow up with laboratory testing. For the purpose of lab testing, UNISOL can provide the adequate testing modules or flat sheet membrane to determine feasibility

Proof of concept. Client together with UNISOL evaluates the preliminary business case of the application by analyzing potential benefits to expected costs.

Pilot plant. In collaboration with an EPC, UNISOL designs and builds a testing system at the client's site.

Full-scale plant. Lastly, an EPC will be engaged to fabricate the full-scale operating plant.

AMS Flat Sheet Membrane Overview

Product Line	Stability	Membrane	Cut-off [Da]	pH Range	Typical Solutions
NanoPro™	Acid	A–3011	100	0 – 12	20% H_2SO_4 20% HCl 4% HNO_3 30% H_3PO_4 15% CH_3COOH
		A–3012	200	0 – 12	
		A–3014	400	0 – 12	
	Base	B–4021	100	3 – 14	20% NaOH 10% KOH
		B–4022	200	3 – 14	
		B–4024	400	3 – 14	
	Solvent	S–3011	100	2 – 12	Methanol, Ethanol, Propanol, Hexane, THF, Acetone, Acetonitrile, Ethyl acetate, DMF
		S–3012	200	2 – 12	
		S–3014	400	2 – 12	
UltraPro™	Acid	A–U301	2,500	0 – 12	20% H_2SO_4 20% HCl 4% HNO_3 30% H_3PO_4 15% CH_3COOH
		A–1801	10,000	0 – 12	
	Solvent	S–U301	2,500	2 – 12	Methanol, Ethanol, Propanol, Hexane, THF, Acetone, Acetonitrile, Ethyl acetate, DMF
		S–1801	10,000	2 – 12	

AMS NanoPro™ Acid Elements

Acid Stable Nanofiltration Spiral Wound Elements

Description

The AMS NanoPro™ membrane is developed for long-term performance with high and stable fluxes in very acidic environment, featuring high pressure and temperature compatibility. AMS NanoPro™ elements are used for acid purification and metals concentration in low pH streams. Typical solutions include:

- 20% H_2SO_4
- 20% HCl
- 30% H_3PO_4
- 10% CH_3COOH

Characteristics

Membrane	Cut-off Rate (Da)	Flux[1]	$MgSO_4$ Rejection[1]	Glucose Rejection [2]
A-3011	100	22 LMH	98%	98%
A-3012	200	25 LMH	96%	96%
A-3014	400	30 LMH	90%	90%

Limits

Max Operating Pressure	55 bar (800 psi)
Max Pressure Drop	1 bar (14.5 psi) for individual element
Max. Operating Temperature	40 °C (104 °F)
Max. Cleaning Temperature	40 °C (104 °F)
Operating pH range	0-12
Cleaning pH range	0-13
Recirculation Flow	1812: 4.0 – 8.0 liter/min (1.0 – 2.1 gal/min) 2540: 7.5 – 17 liter/min (2.0 – 4.4 gal/min) 4040: 22 – 42 liter/min (5.8 – 11.1 gal/min) 8040: 90 – 167 liter/min (23 – 42.7 gal/min)
Pressurization/ Depressurization rate	< 0.7 bar/second (10psi/second)
Heating & cool down rate	< 5°C /minute (41 °F/minute)

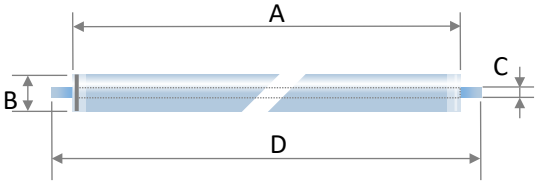
Area m^2 (ft^2)

Size	1812	2540	4040	8040
31mil (B)	0.19 (2)	1.8 (19)	6.2 (67)	29 (312)
46mil (C)	0.17 (1.8)	1.6 (17)	4.9 (53)	24 (260)

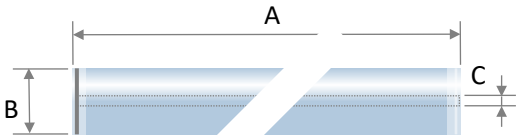
[1] Test condition:
a. 2000ppm $MgSO_4$ solution, 225psi (15.5bar), 86°F (30°C), pH7.0.
b. Permeate flow for individual elements may vary ± 20%.
[2] Test condition: 5% Glucose solution, 225psi (15.5bar), 86°F (30°C), pH7.0.
[3] For the purpose of improvement, specifications may be updated periodically.
[4] Consult UNISOL Membrane Technology when intend to operate at elevated pressure, temperature, concentrations.
[5] Stabilized salt rejection is generally achieved within 24 – 48 hours of continuous use, depending upon feed water characteristics and operating conditions.

Dimensions

Male Configuration



Female Configuration



Size mm(inch)	A[1]	⌀B[2]	⌀C[3]	D	Permeate tube
1812	305 (12)	46 (1.8)	16 (0.629)	/	Female
2540	965 (38)	62 (2.4)	19 (0.748)	1016 (40)	Male
4040	965 (38)	99 (3.9)	19 (0.748)	1016 (40)	Male
8040	1016 (40)	200.5 (7.9)	28.9 (1.138)	/	Female

[1] Tolerance: ±0.5 mm
[2] Tolerance: -2~0 mm
[3] 1812 tolerance: ±0.1 mm. 2540/4040-M tolerance: 0~+0.1mm. 8040 tolerance: -0.2~0mm

Handling

Chemical Exposure. Do not expose the membrane to chlorine or other oxidants. Sodium metabisulfite (without catalysts such as cobalt) is the preferred chemical to eliminate free chlorine or other oxidizers in the feed.
* ***NB:*** *Please do not use tap water while testing or cleaning the module since the residual chlorine contained in the tap water could negatively affect the membrane performance.*

Recommended Cleaning Materials. Depending on the nature of the feed material, a choice can be made among the following cleaning agents:

- Sodium hydroxide at pH 10 – 12, temperature ≤40 °C (104 °F);
- Hydrochloric acid at pH 1 – 2, temperature ≤40 °C (104 °F);
- Nitric acid at pH 1 – 2, temperature ≤40 °C (104 °F);
- Na-EDTA of 0.2 – 1.0 % w/w at pH 10.5 – 11, temperature≤35 °C (91 °F);
- Anionic surfactant (e.g. sodium dodecyl sulfate) of 0.5% at pH 10.5 – 11, temperature ≤35 °C (91°F).

Only demineralized (RO) water must be used for cleaning. **Please flush the module by permeate after processing**. Consult UNISOL Membrane Technology regarding the use of other cleaning materials.

Lubricants. During installation, use only water or glycerin to lubricate seals. The use of petroleum or vegetable-based oils or solvents may damage the element and void any warranty.

Preservation and Storage. Plan ahead to use new membranes. The element should not be allowed to dry: store it in a sealed bag, at 4 – 30°C (39 – 86°F). Storage solutions should be made with: 1.5% w/w sodium metabisulfite. Please refer to "UNISOL Membrane Element Storage and Handling Instructions."

AMS NanoPro™ Base Elements

Base Stable Nanofiltration Spiral Wound Elements

Description

The AMS NanoPro™ B-series membranes are developed for long-term performance with high and stable fluxes in a very base environment, featuring high pressure and temperature compatibility. AMS NanoPro™ B-series elements are used for alkali purification and components concentration in high-pH streams. Typical solutions include:

- 20% NaOH
- 10% KOH

Characteristics

Membrane	Cut-off Rate (Da)	Water Flux[1]	$MgSO_4$ Rejection[1]	Glucose Rejection [2]
B-4021	100	21 LMH	98%	98%
B-4022	200	30 LMH	96%	96%
B-4024	400	50 LMH	92%	90%

Limits

Max Operating Pressure	40 bar (580psi)
Max Pressure Drop	1 bar (14.5 psi) for individual element
Max. Operating Temperature	50 °C (104 °F)
Max. Cleaning Temperature	50 °C (104 °F)
Operating pH range	3-14
Cleaning pH range	2-14
Recirculation Flow	1812: 4.0 – 8.0 liter/min (1.0 – 2.1 gal/min) 2540: 7.5 – 17 liter/min (2.0 – 4.4 gal/min) 4040: 22 – 42 liter/min (5.8 – 11.1 gal/min) 8040: 90 – 167 liter/min (23 – 42.7 gal/min)
Pressurization/ Depressurization rate	< 0.7 bar/second (10psi/second)
Heating & cool down rate	< 5°C /minute (41 °F/minute)

Area m^2 (ft^2)

Size	1812	2540	4040	8040
31mil (B)	0.19 (2)	1.6 (17)	6.1 (66)	28 (300)
46mil (C)	/	/	4.7 (51)	23 (250)

[1] Test condition:
a. 2000ppm $MgSO_4$ solution, 225psi (15.5bar), 86°F (30°C), pH7.0;
b. Permeate flow for individual elements may vary ± 20%;

[2] Test condition: 5% Glucose solution, 225psi (15.5bar), 86°F (30°C), pH7.0;

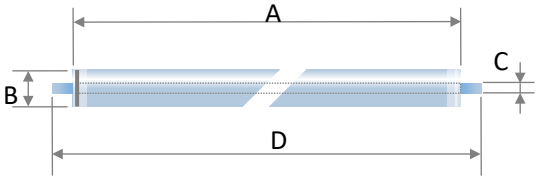
[3] For the purpose of improvement, specifications may be updated periodically

[4] Consult UNISOL Membrane Technology when intend to operate at elevated pressure, temperature, concentrations.

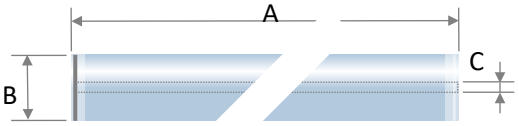
[5] Stabilized salt rejection is generally achieved within 24 – 48 hours of continuous use, depending upon feed water characteristics and operating conditions.

Dimensions

Male Configuration



Female Configuration



Size mm(inch)	A[1]	⌀B[2]	⌀C[3]	D	Permeate tube
1812	305 (12)	46 (1.8)	16 (0.629)	/	Female
2540	965 (38)	62 (2.4)	19 (0.748)	1016 (40)	Male
4040	965 (38)	99 (3.9)	19 (0.748)	1016 (40)	Male
8040	1016 (40)	200.5 (7.9)	28.9 (1.138)	/	Female

[1] Tolerance: ±0.5 mm
[2] Tolerance: -2~0 mm
[3] 1812 tolerance: ±0.1 mm. 2540/4040-M tolerance: 0~+0.1mm. 8040 tolerance: -0.2~0mm

Handling

Chemical Exposure. Do not expose the membrane to chlorine or other oxidants. Sodium metabisulfite (without catalysts such as cobalt) is the preferred chemical to eliminate free chlorine or other oxidizers in the feed.
* ***NB:*** *Please do not use tap water while testing or cleaning the module since the residule chlorine contained in the tap water could negatively affect the membrane performance.*

Recommended Cleaning Materials. Depending on the nature of the feed material, a choice can be made among the following cleaning agents:

- Sodium hydroxide at pH 10 – 12, temperature ≤40 °C (104°F);
- Hydrochloric acid at pH 1 – 2, temperature ≤40 °C (104°F);
- Nitric acid at pH 1 – 2, temperature ≤40 °C (104°F);
- Na-EDTA of 0.2 – 1.0 % w/w at pH 10.5 – 11, temperature ≤35°C (91°F);
- Anionic surfactant (e.g. sodium dodecyl sulfate) of 0.5 % at pH10.5 – 11, temperature ≤35 °C (91 °F).

Only demineralized (RO) water must be used for cleaning. **Please flush the module by permeate after processing.** Consult UNISOL Membrane Technology regarding the use of other cleaning materials.

Lubricants. During installation, use only water or glycerin to lubricate seals. The use of petroleum or vegetable-based oils or solvents may damage the element and void any warranty.

Preservation and Storage. Plan ahead to use new membranes. The element should not be allowed to dry: store it in a sealed bag, at 4 – 30°C (39 – 86°F). Storage solutions should be made with: 1.5 % w/w sodium metabisulfite. Please refer to “UNISOL Membrane Element Storage and Handling Instructions.”

AMS NanoPro™ Solvent Elements

Solvent Stable Nanofiltration Spiral Wound Elements

Description

The AMS NanoPro™ membrane is developed for long-term performance with high and stable fluxes in presence of solvents, featuring high pressure and temperature compatibility. AMS NanoPro™ elements are used for solvent purification and component concentration. Typical solvents include:

- Methanol, Ethanol, Propanol
- Hexane
- THF
- Acetone, Acetonitrile
- Ethyl acetate
- DMF

Characteristics

Membrane	Cut-off Rate (Da)	Water Flux	$MgSO_4$ Rejection[1]	Glucose Rejection [2]
S-3011	100	22 LMH	98%	98%
S-3012	200	25 LMH	96%	96%
S-3014	400	30 LMH	90%	90%

Limits

Max Operating Pressure	40 bar (580 psi)
Max Pressure Drop	1 bar (14.5 psi) for individual element
Max. Operating Temperature	40 °C (104 °F)
Max. Cleaning Temperature	40 °C (104 °F)
Operating pH range	2 – 12
Cleaning pH range	1 – 13
Recirculation Flow	1812: 4.0 – 8.0 liter/min (1.0 – 2.1 gal/min) 2540: 7.5 – 17 liter/min (2.0 – 4.4 gal/min) 4040: 22 – 42 liter/min (5.8 – 11.1 gal/min) 8040: 90 – 167 liter/min (23 – 42.7 gal/min)
Pressurization/ Depressurization rate	< 0.7 bar/second (10psi/second)
Heating & cool down rate	< 5°C /minute (41 °F/minute)

Area m^2 (ft^2)

Size	1812	2540	4040	8040
31mil (B)	0.19 (2)	1.8 (19)	6.2 (67)	29 (312)
46mil (C)	0.17 (1.8)	1.6 (17)	4.9 (53)	24 (260)

[1] Test condition:
a. 2000ppm $MgSO_4$ solution, 225psi (15.5bar), 86°F (30°C), pH 7.0.
b. Permeate flow for individual elements may vary ± 20%.

[2] Test condition: 5% Glucose solution, 225psi (15.5bar), 86°F (30°C), pH 7.0.

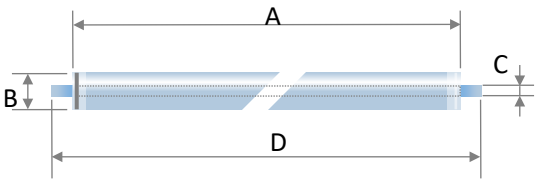
[3] For the purpose of improvement, specifications may be updated periodically.

[4] Consult UNISOL Membrane Technology when intend to operate at elevated pressure, temperature, concentrations.

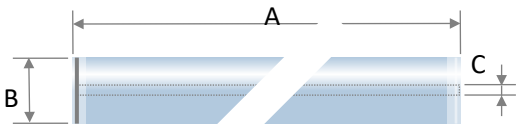
[5] Stabilized salt rejection is generally achieved within 24 – 48 hours of continuous use, depending upon feed water characteristics and operating conditions.

Dimensions

Male Configuration



Female Configuration



Size mm(inch)	A[1]	⌀B[2]	⌀C[3]	D	Permeate tube
1812	305 (12)	46 (1.8)	16 (0.629)	/	Female
2540	956 (37.6)	62 (2.4)	19 (0.748)	1016 (40)	Male
4040	965 (38)	99 (3.9)	19 (0.748)	1016 (40)	Male
8040	1016 (40)	200.5 (7.9)	28.9 (1.138)	/	Female

[1] Tolerance: ±0.5 mm
[2] Tolerance: -2~0 mm
[3] 1812 tolerance: ±0.1 mm. 2540/4040-M tolerance: 0~+0.1mm. 8040 tolerance: -0.2~0mm

Handling

Chemical Exposure. Do not expose the membrane to chlorine or other oxidants. Sodium metabisulfite (without catalysts such as cobalt) is the preferred chemical to eliminate free chlorine or other oxidizers in the feed.
* ***NB:*** *Please do not use tap water while testing or cleaning the module since the residual chlorine contained in the tap water could negatively affect the membrane performance.*

Recommended Cleaning Materials. Depending on the nature of the feed material, a choice can be made among the following cleaning agents:

- Sodium hydroxide at pH 10 – 12, temperature ⩽ 40 °C (104 °F);
- Hydrochloric acid at pH 1 – 2, temperature ⩽ 40 °C (104 °F);
- Nitric acid at pH 1 – 2, temperature ⩽ 40 °C (104 °F);
- Na-EDTA of 0.2 – 1.0 % w/w at pH 10.5 – 11, temperature ⩽ 35 °C (91 °F);
- Anionic surfactant (e.g. sodium dodecyl sulfate) of 0.5 % at pH 10.5 – 11, temperature ⩽ 35 °C (91 °F).

Only demineralized (RO) water must be used for cleaning. **Please flush the module by permeate after processing.** Consult UNISOL Membrane Technology regarding the use of other cleaning materials.

Lubricants. During installation, use only water or glycerin to lubricate seals. The use of petroleum or vegetable-based oils or solvents may damage the element and void any warranty.

Preservation and Storage. Plan ahead to use new membranes. The element should not be allowed to dry: store it in a sealed bag, at 4 – 30 °C (39 – 86 °F). Storage solutions should be made with: 1.5 % w/w sodium metabisulfite. Please refer to “UNISOL Membrane Element Storage and Handling Instructions.”

AMS UltraPro™ Acid Elements

Acid Stable Ultrafiltration Spiral Wound Elements

Description

The AMS UltraPro™ membrane is developed for long-term performance with high and stable fluxes in very acidic environment, featuring high pressure and temperature compatibility. AMS UltraPro™ elements are used for either pre-filtration before nanofiltration or as stand-alone membranes in acid purification and metals concentration. Typical solutions include:

- 20% H_2SO_4
- 20% HCl
- 30% H_3PO_4
- 10% CH_3COOH

Characteristics

Membrane	Cut-off Rate (Da)	Water Flux
A-1801[1]	10000	18LMH/bar [1]
A-U301[2]	2500	60LMH [2]

Limits

Max Operating Pressure	25 bar (360 psi)
Max Pressure Drop	1 bar (14.5 psi) for individual element
Max. Operating Temperature	40 °C (122 °F)
Max. Cleaning Temperature	40 °C (122 °F)
Operating pH range	0-12
Cleaning pH range	0-13
Recirculation Flow	1812: 4.0 – 8.0 liter/min (1.0 – 2.1 gal/min) 2540: 7.5 – 17 liter/min (2.0 – 4.4 gal/min) 4040: 22 – 42 liter/min (5.8 – 11.1 gal/min) 8040: 90 – 167 liter/min (23 – 42.7 gal/min)
Pressurization/ Depressurization rate	< 0.7 bar/second (10psi/second)
Heating & cool down rate	< 5°C /minute (41 °F/minute)

Area m^2 (ft^2)

Size	1812	2540	4040	8040
31mil (B)	0.19 (2)	1.8 (19)	6.2 (67)	29 (312)
46mil (C)	0.17 (1.8)	1.6 (17)	4.9 (53)	24 (260)

[1] Test condition: RO water, 27psi (2bar), 86°F (30°C), pH 7.0.
Permeate flow for individual elements may vary ± 20%

[2] Test condition: RO water, 225psi (15.5bar), 86°F (30°C), pH 7.0.

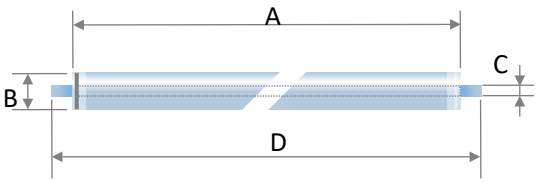
[3] For the purpose of improvement, specifications may be updated periodically.

[4] Consult UNISOL Membrane Technology when intend to operate at elevated pressure, temperature, concentrations.

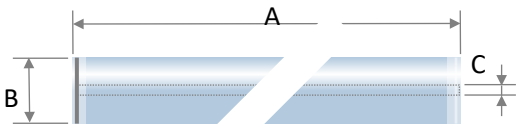
[5] Stabilized salt rejection is generally achieved within 24 – 48 hours of continuous use, depending upon feed water characteristics and operating conditions.

Dimensions

Male Configuration



Female Configuration



Size mm(inch)	A[1]	⌀B[2]	⌀C[3]	D	Permeate tube
1812	305 (12)	46 (1.8)	16 (0.629)	/	Female
2540	965 (38)	62 (2.4)	19 (0.748)	1016 (40)	Male
4040	965 (38)	99 (3.9)	19 (0.748)	1016 (40)	Male
8040	1016 (40)	200.5 (7.9)	28.9 (1.138)	/	Female

[1] Tolerance: ±0.5 mm
[2] Tolerance: -2~0 mm
[3] 1812 tolerance: ±0.1 mm. 2540/4040-M tolerance: 0~+0.1mm. 8040 tolerance: -0.2~0mm

Handling

Chemical Exposure. Do not expose the membrane to chlorine or other oxidants. Sodium metabisulfite (without catalysts such as cobalt) is the preferred chemical to eliminate free chlorine or other oxidizers in the feed.
* ***NB:*** *Please do not use tap water while testing or cleaning the module since the residual chlorine contained in the tap water could negatively affect the membrane performance.*

Recommended Cleaning Materials. Depending on the nature of the feed material, a choice can be made among the following cleaning agents:

- Sodium hydroxide at pH 10 – 12, temperature ≤40 °C (104 °F);
- Hydrochloric acid at pH 1 – 2, temperature ≤40 °C (104 °F);
- Nitric acid at pH 1 – 2, temperature ≤40 °C (104 °F);
- Na-EDTA of 0.2 – 1.0 % w/w at pH 10.5 – 11, temperature ≤35 °C (91 °F);
- Anionic surfactant (e.g. sodium dodecyl sulfate) of 0.5 % at pH 10.5 – 11, temperature ≤35 °C (91 °F).

Only demineralized (RO) water must be used for cleaning. **Please flush the module by permeate after processing.** Consult UNISOL Membrane Technology regarding the use of other cleaning materials.

Lubricants. During installation, use only water or glycerin to lubricate seals. The use of petroleum or vegetable-based oils or solvents may damage the element and void any warranty.

Preservation and Storage. Plan ahead to use new membranes. The element should not be allowed to dry: store it in a sealed bag, at 4 – 30 °C (39 – 86 °F). Storage solutions should be made with: 1.5 % w/w sodium metabisulfite. Please refer to “UNISOL Membrane Element Storage and Handling Instructions.”

AMS UltraPro™ Solvent Elements

Solvent Stable Ultrafiltration Spiral Wound Elements

Description

The AMS UltraPro™ membrane is developed for long-term performance with high and stable fluxes in presence of solvents, featuring high pressure and temperature compatibility. AMS UltraPro™ elements are used for either pre-filtration before nanofiltration or as stand-alone membranes in solvent purification and component concentration. Typical solvents include*:

- Methanol, Ethanol, Propanol
- Hexane
- THF
- Acetone, Acetonitrile
- Ethyl acetate
- DMF

Characteristics

Membrane	Cut-off Rate (Da)	Water Flux
S-1801[1]	10000	18LMH/bar [1]
S-U301[2]	2500	60LMH [2]

Limits

Max Operating Pressure	25 bar (360 psi)
Max Pressure Drop	1 bar (14.5 psi) for individual element
Max. Operating Temperature	40 °C (122 °F)
Max. Cleaning Temperature	40 °C (122 °F)
Operating pH range	2-12
Cleaning pH range	1-13
Recirculation Flow	1812: 4.0 – 8.0 liter/min (1.0 – 2.1 gal/min) 2540: 7.5 – 17 liter/min (2.0 – 4.4 gal/min) 4040: 22 – 42 liter/min (5.8 – 11.1 gal/min) 8040: 90 – 167 liter/min (23 – 42.7 gal/min)
Pressurization/ Depressurization rate	< 0.7 bar/second (10psi/second)
Heating & cool down rate	< 5°C /minute (41 °F/minute)

Area m^2 (ft^2)

Size	1812	2540	4040	8040
31mil (B)	0.19 (2)	1.8 (19)	6.2 (67)	29 (312)
46mil (C)	0.17 (1.8)	1.6 (17)	4.9 (53)	24 (260)

[1] Test condition: RO water, 27psi (2bar), 86°F (30°C), pH 7.0.
Permeate flow for individual elements may vary ± 20%.

[2] Test condition: RO water, 225psi (15.5bar), 86°F (30°C), pH 7.0.

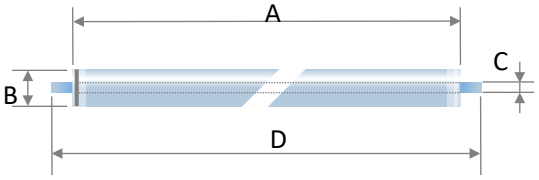
[3] For the purpose of improvement, specifications may be updated periodically.

[4] Consult UNISOL Membrane Technology when intend to operate at elevated pressure, temperature, concentrations.

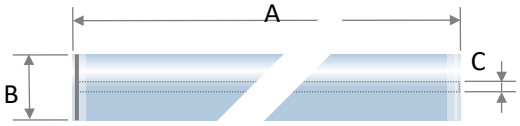
[5] Stabilized salt rejection is generally achieved within 24 – 48 hours of continuous use, depending upon feed water characteristics and operating conditions.

Dimensions

Male Configuration



Female Configuration



Size mm(inch)	A[1]	⌀B[2]	⌀C[3]	D	Permeate tube
1812	305 (12)	46 (1.8)	16 (0.629)	/	Female
2540	956 (37.6)	62 (2.4)	19 (0.748)	1016 (40)	Male
4040	965 (38)	99 (3.9)	19 (0.748)	1016 (40)	Male
8040	1016 (40)	200.5 (7.9)	28.9 (1.138)	/	Female

[1] Tolerance: ±0.5 mm
[2] Tolerance: -2~0 mm
[3] 1812 tolerance: ±0.1 mm. 2540/4040-M tolerance: 0~+0.1mm. 8040 tolerance: -0.2~0mm

Handling

Chemical Exposure. Do not expose the membrane to chlorine or other oxidants. Sodium metabisulfite (without catalysts such as cobalt) is the preferred chemical to eliminate free chlorine or other oxidizers in the feed.
* ***NB:*** *Please do not use tap water while testing or cleaning the module since the residule chlorine contained in the tap water could negatively affect the membrane performance.*

Recommended Cleaning Materials. Depending on the nature of the feed material, a choice can be made among the following cleaning agents:

- Sodium hydroxide at pH 10 – 12, temperature ≤40 °C (104 °F);
- Hydrochloric acid at pH 1 – 2, temperature ≤40 °C (104 °F);
- Nitric acid at pH 1 – 2, temperature ≤40 °C (104 °F);
- Na-EDTA of 0.2 – 1.0 % w/w at pH 10.5 – 11, temperature ≤35 °C (91 °F);
- Anionic surfactant (e.g. sodium dodecyl sulfate) of 0.5 % at pH 10.5 – 11, temperature ≤35 °C (91 °F).

Only demineralized (RO) water must be used for cleaning. **Please flush the module by permeate after processing.** Consult UNISOL Membrane Technology regarding the use of other cleaning materials.

Lubricants. During installation, use only water or glycerin to lubricate seals. The use of petroleum or vegetable-based oils or solvents may damage the element and void any warranty.

Preservation and Storage. Plan ahead to use new membranes. The element should not be allowed to dry: store it in a sealed bag, at 4 – 30 °C (39 – 86 °F). Storage solutions should be made with: 1.5 % w/w sodium metabisulfite. Please refer to “UNISOL Membrane Element Storage and Handling Instructions.”

Annex

Nomenclature: AMS–S-U301–8040–B

AMS	S-U301	8040	B
Design/Application	Membrane	Diameter & Length	Feed spacer
AMS AMS Membrane series	**S-U301** S-1801	1812 2540 4040 **8040**	**B: 31mil /0.78mm (diamond)** C: 46mil /1.1mm (diamond) M: 34mil /0.86mm (diamond)

UNISOL
Membrane Technology

China

UNISOL Membrane Technology (Xiamen) Co., Ltd.
#1670, Butang Mid Rd, Tong'an District, Xiamen
361112, China
+86 592 6301318
infochina@unisol-global.com

Germany

WTA UNISOL GmbH
Fritz-Bothmann-Str. 1, 99867 Gotha, Germany
+49 (0) 3621 73 77 920
info@wta-unisol.com
www.wta-unisol.com

USA

UNISOL LLC
108 W.13th street suite 100,
WILMINGTON, Delaware 19801, USA
+1 786 716 3204
infousa@unisol-global.com

India

+91 98330 90670
Mumbai, India
infoindia@unisol-global.com

Singapore

+65 91822555
Singapore
infosg@unisol-global.com

Vietnam

+84 983 537 155
198 N7 Street, Dong Tang Long, Truong
Thanh ward, Thu Duc, Ho Chi Minh City,
Vietnam
infovn@unisol-global.com

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