Martin (Shanghai) Water Technologies Co., Ltd

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Hydro-Flex Reverse Osmosis Membrane

Version 1.0

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Catalogue

Ⅰ. Introduction

Ⅱ. Introduction of Hydro-Flex RO Membrane Elements

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Martin (Shanghai) Water Technology Co., Ltd is a professional manufacture that engaged in process, development, sales and technical service of Hydro-Flex Reverse Osmosis Membrane Element and Nanofiltration Membrane Element.

Advanced membrane technology state of the art web handling production line coupled with well-controlled element rolling allows Martin to produce Hydro-Flex RO Membrane Elements and Nanofiltration Membrane Element with stable performance. Martin has a professional team focusing on research and development, with its own intellectual property right and R&D capability. Hydro-Flex elements are uniquely engineered to have a high level of salt rejection with minimum compromise in water flux.

All Series of Hydro-flex membrane elements are available with dry-type and wet-type.

Hydro-flex dry-type membrane elements have the advantage of easier transportation, installation and long period of preservation compared with wet-type membrane elements.

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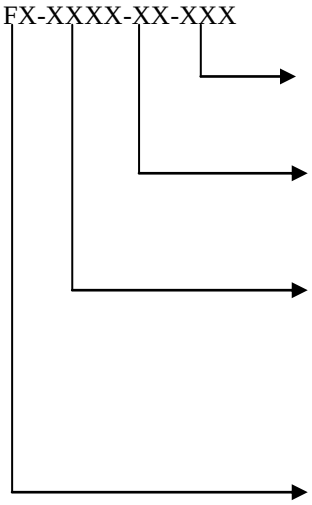
1.2Naming and Code Rules of Membrane Elements

1.2.1 Naming and Code Rules of Membrane Elements of Hydro-Flex Industrial RO Membrane Elements



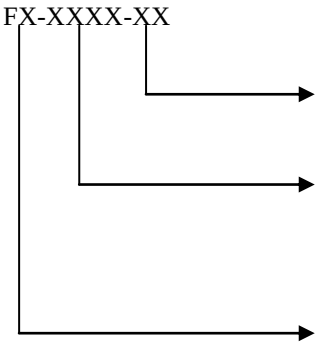
Active Area ft2 (Optional)
365 (Active Area ft2 365); 400 (Active Area ft2 400)

Membrane Series Code
ULP (Ultra-Low Pressure); BW (Low Pressure); XLP (Extreme-Low Pressure)
SW (Sea Water); FR (Fouling Resistance);

Length and diameter of membrane element in inch
8040: 8.0 Inch Diameter; 40 Inch Length
4040: 4.0 Inch Diameter; 40 Inch Length
4021: 4.0 Inch Diameter; 21 Inch Length
2540: 2.5 Inch Diameter; 40 Inch Length
2521: 2.5 Inch Diameter; 21 Inch Length

Abbreviation of Hydro-Flex

1.2.2 Naming and Code Rules of Membrane Elements of Hydro-Flex Industrial Nanofiltration Membrane Elements

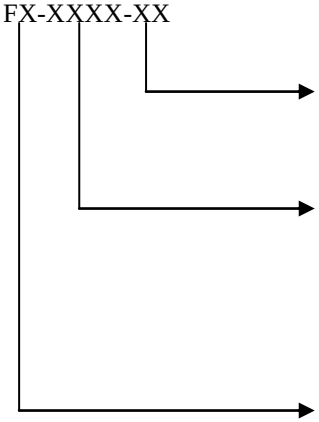


Membrane Series Code
NFL (Nanofiltration L series); NFK (Nanofiltration K series)

Length and diameter of membrane element in inch
8040: 8.0 Inch Diameter; 40 Inch Length
4040: 4.0 Inch Diameter; 40 Inch Length
4021: 4.0 Inch Diameter; 21 Inch Length

Abbreviation of Hydro-Flex

1.2.3 Naming and Code Rules of Membrane Elements of Hydro-Flex Dometic RO Membrane Elements



Produced Water Flow in GPD
50 (50GPD); 75 (75GPD); 100 (100GPD); 150 (150GPD);
200 (200GPD); 300 (300GPD); 400 (400GPD); 600 (600GPD)

Length and diameter of membrane element in inch
1810: 1.8 Inch Diameter; 10 Inch Length
1812: 1.8 Inch Diameter; 12 Inch Length
2012: 2.0 Inch Diameter; 12 Inch Length
2812: 2.8 Inch Diameter; 12 Inch Length
3013: 3.0 Inch Diameter; 13 Inch Length

Abbreviation of Hydro-Flex

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8″ Spiral Wound Elements for Brackish Water

Introduction:

Low Pressure, High Productivity:
8″ Spiral Wound Elements for Brackish Water

Hydro-Flex reverse osmosis (RO) 8″ elements are some of the finest products in the industry. The state of the art coating line, coupled with advanced membrane technology, yields product of the highest quality and most stable performance. Hydro-Flex elements are uniquely engineered to have a high level of salt rejection with minimum compromise in water flux.

Description:

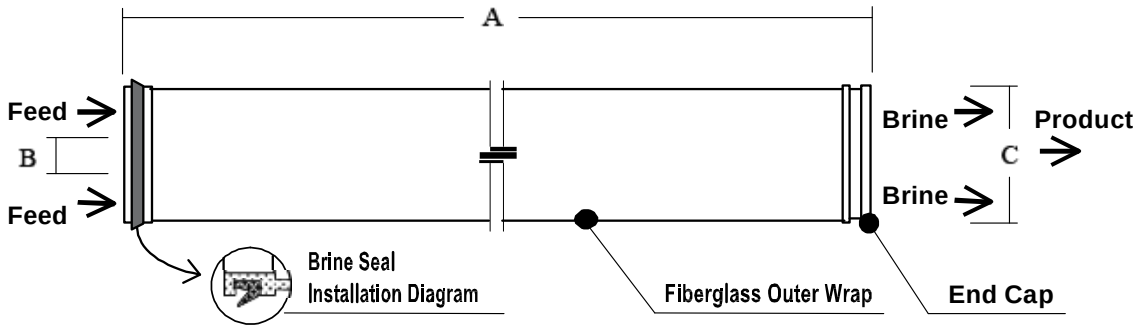
Membrane material: Polyamide thin film composite
Spirally wound element
Epoxy-based FRP overwrap
Low, ultra-low or extreme-low pressure application for brackish water treatment

Specifications:

Product	Active area ft^2 (m^2)	Feed spacer thickness mil(mm)	Permeate flow rate gpd (m^3/d)	Stabilized salt rejection (%)	Minimum salt rejection (%)	Test Conditions
FX-8040-BW-400	400 (37)	28 (0.7)	10,500 (40)	99.5%	99.0%	225psi/2000ppm
FX-8040-BW-365	365 (33.9)	28 (0.7)	9,600 (36.3)	99.5%	99.0%	225psi/2000ppm
FX-8040-ULP-400	400 (37)	28 (0.7)	10,500 (40)	99.0%	98.0%	150psi/2000ppm
FX-8040-ULP-365	365 (33.9)	28 (0.7)	9,600 (36.3)	99.0%	98.0%	150psi/2000ppm
FX-8040-XLP-400	400 (37)	28 (0.7)	12,500 (40)	98.0%	97.0%	100psi/500ppm

1. All performance data are collected at 25℃ (77℉), NaCl solution, pH7.5 and 15% recovery rate.
2. Permeate flows for single element may vary ±15%.

Element Dimension:



Product	Recovery Rate %	Dimensions – Inches (mm)		
		A	B	C
FX-8040-BW-400	15	40.0 (1016)	1.125 (29)	7.9 (201)
FX-8040-BW-365	15	40.0 (1016)	1.125 (29)	7.9 (201)
FX-8040-ULP-400	15	40.0 (1016)	1.125 (29)	7.9 (201)
FX-8040-ULP-365	15	40.0 (1016)	1.125 (29)	7.9 (201)
FX-8040-XLP-400	15	40.0 (1016)	1.125 (29)	7.9 (201)

* 1 inch= 25.4 mm

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Operating Limits for Design:

Maximum Operating Temperature……45℃(113℉)
Maximum Operating Pressure……600psi(41bar)
Maximum Pressure Drop (single element)……15psi(1.0bar)
pH Range for Continuous Operation……3-11
pH Range for Cleaning……1.5-12
Chlorine tolerance……<0.1ppm
Maximum Feed SDI……5

Important Operation Notes:

- It is critical to follow approved start-up procedure to prevent membrane damage due to overfeeding or hydraulic shock. Before initiating system, loading of the RO elements, instrument calibration, membrane pretreatment and other system checks should be conducted.
- Minimize any pressure shock or cross-flow fluctuation on the spiral elements at all times. During start-up, a gradual, incremental change from a standstill to operating state is recommended.
- Maximum pressure drop across an entire pressure vessel (housing) is 50 psi (3.4 bar).
- No static pressure should ever be built up on permeate side.
- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines are not followed, the Limited Warranty will be void.
- In case of prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution to prevent bacteria growth.
- Permeate collected from first hour of operation should be discarded.
- It is customer's responsibility to make sure that the chemicals and lubricants do not have detrimental effects on RO elements.

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4″ Spiral Wound Elements for Brackish Water

Introduction:

Low Pressure, High Productivity:
4″ Spiral Wound Elements for Brackish Water

Hydro-Flex reverse osmosis (RO) 4″ elements are some of the finest products in the industry. The state of the art coating line, coupled with advanced membrane technology, yields product of the highest quality and most stable performance. Hydro-Flex elements are uniquely engineered to have a high level of salt rejection with minimum compromise in water flux.

Description:

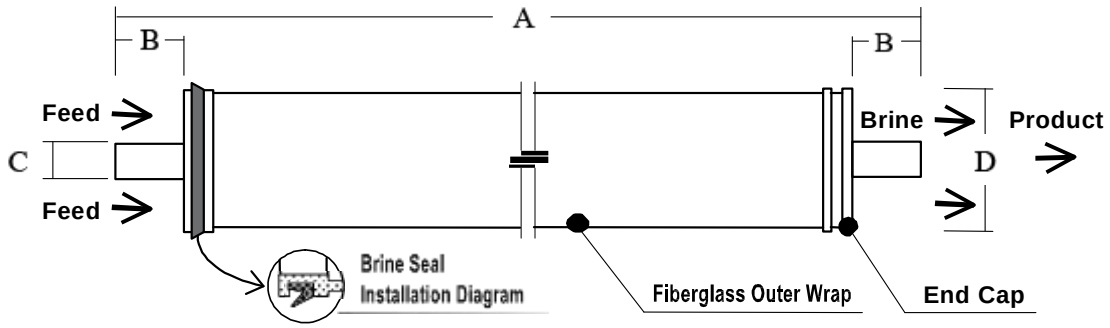
Membrane material: Polyamide thin film composite
Spirally wound element
Epoxy-based FRP overwrap
Low, ultra-low or extreme-low pressure application for brackish water treatment

Specifications:

Product	Active area ft^2 (m^2)	Feed spacer thickness mil(mm)	Permeate flow rate gpd (m^3/d)	Stabilized salt rejection (%)	Minimum salt rejection (%)	Test Conditions
FX-4040-BW	87 (8)	28 (0.7)	2400(9.1)	99.5%	99.0%	225psi/2000ppm
FX-4021-BW	36 (3.3)	28 (0.7)	1000(3.78)	99.5%	99.0%	225psi/2000ppm
FX-4040-ULP	87 (8)	28 (0.7)	2400(9.1)	99.0%	98.0%	150psi/2000ppm
FX-4021-ULP	36 (3.3)	28 (0.7)	1000(3.78)	99.0%	98.0%	150psi/2000ppm
FX-4040-XLP	87 (8)	28 (0.7)	3,200 (12)	98.0%	97.0%	100psi/500ppm

1. All performance data are collected at 25°C (77°F), NaCl solution,pH7.5 and recovery rate FX-4040-15%, FX-4021-8%.
2. Permeate flows for single element may vary ±15%.

Element Dimension:



Product	Recovery Rate	Dimensions – Inches (mm)			
		A	B	C	D
FX-4040	15%	40.0 (1016)	1.05 (26.7)	0.75 (19.1)	3.9 (99)
FX- 4021	8%	21.0 (508)	1.05 (26.7)	0.75 (19.1)	3.9 (99)

* 1 inch= 25.4 mm

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Operating Limits for Design:

Maximum Operating Temperature……45°C(113°F)
Maximum Operating Pressure……600psi(41bar)
Maximum Pressure Drop (single element)……..15psi(1.0bar)
pH Range for Continuous Operation…….....3-11
pH Range for Cleaning……..……1.5-12
Chlorine tolerance……<0.1ppm
Maximum Feed SDI……..……...……5

Important Operation Notes:

- It is critical to follow approved start-up procedure to prevent membrane damage due to overfeeding or hydraulic shock. Before initiating system, loading of the RO elements, instrument calibration, membrane pretreatment and other system checks should be conducted.
- Minimize any pressure shock or cross-flow fluctuation on the spiral elements at all times. During start-up, a gradual, incremental change from a standstill to operating state is recommended.
- Maximum pressure drop across an entire pressure vessel (housing) is 50 psi (3.4 bar).
- No static pressure should ever be built up on permeate side.
- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines are not followed, the Limited Warranty will be void.
- In case of prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution to prevent bacteria growth.
- Permeate collected from first hour of operation should be discarded.
- It is customer's responsibility to make sure that the chemicals and lubricants do not have detrimental effects on RO elements.

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2.5” Spiral Wound Elements for Brackish Water

Introduction:

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2.5” Spiral Wound Elements for Brackish Water

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Description:

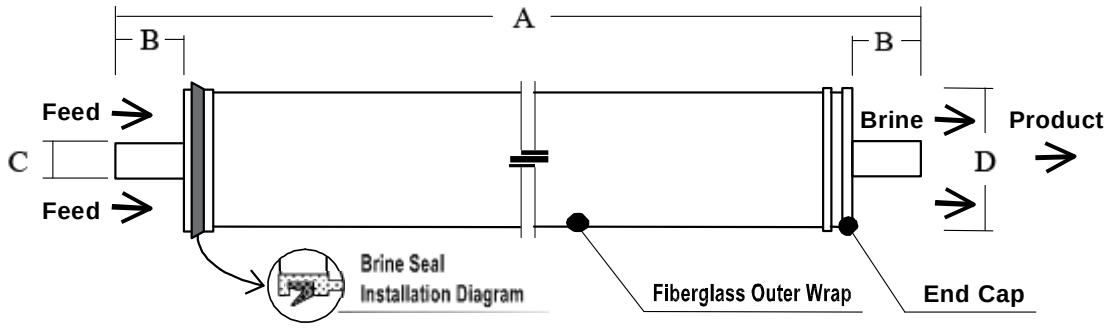
Membrane material: Polyamide thin film composite
Spirally wound element
Tape-Wrapped
Low, ultra-low or extreme-low pressure application for brackish water treatment

Specifications:

Product	Active area ft^2 (m^2)	Feed spacer thickness mil(mm)	Permeate flow rate gpd (m^3/d)	Stabilized salt rejection (%)	Minimum salt rejection (%)	Test Conditions
FX-2540-ULP	30 (2.8)	28 (0.7)	750 (2.84)	99.0%	98.0%	150psi/1500ppm
FX-2521-ULP	14 (1.3)	28 (0.7)	300 (1.13)	99.0%	98.0%	150psi/1500ppm

1. All performance data are collected at 25°C (77°F), NaCl solution, pH7.5 and recovery rate FX-2540-ULP 15%, TX-2521-ULP 8%.
2. Permeate flows for single element may vary ±15%.

Element Dimension:



Product	Recovery Rate	Dimensions – Inches (mm)			
		A	B	C	D
FX- 2540	15%	40.0 (1016)	1.10 (28.6)	0.75 (19.1)	2.4 (61)
FX- 2521	8%	21.0 (508)	1.10 (28.6)	0.75 (19.1)	2.4 (61)

* 1 inch= 25.4 mm

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Operating Limits for Design:

Maximum Operating Temperature……45°C(113°F)
Maximum Operating Pressure……600psi(41bar)
Maximum Pressure Drop (single element)……..15psi(1.0bar)
pH Range for Continuous Operation…….....3-11
pH Range for Cleaning……..……1.5-12
Chlorine tolerance……<0.1ppm
Maximum Feed SDI……..……..……5

Important Operation Notes:

- It is critical to follow approved start-up procedure to prevent membrane damage due to overfeeding or hydraulic shock. Before initiating system, loading of the RO elements, instrument calibration, membrane pretreatment and other system checks should be conducted.
- Minimize any pressure shock or cross-flow fluctuation on the spiral elements at all times. During start-up, a gradual, incremental change from a standstill to operating state is recommended.
- Maximum pressure drop across an entire pressure vessel (housing) is 50 psi (3.4 bar).
- No static pressure should ever be built up on permeate side.
- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines are not followed, the Limited Warranty will be void.
- In case of prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution to prevent bacteria growth.
- Permeate collected from first hour of operation should be discarded.
- It is customer's responsibility to make sure that the chemicals and lubricants do not have detrimental effects on RO elements.

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8″ Spiral Wound Elements for Sea Water

Introduction:

High Rejection, High Productivity:
8″ Spiral Wound Elements for Sea Water

Hydro-Flex reverse osmosis (RO) 8″ elements are some of the finest products in the industry. The state of the art coating line, coupled with advanced membrane technology, yields product of the highest quality and most stable performance. Hydro-Flex elements are uniquely engineered to have a high level of salt rejection with minimum compromise in water flux.

Description:

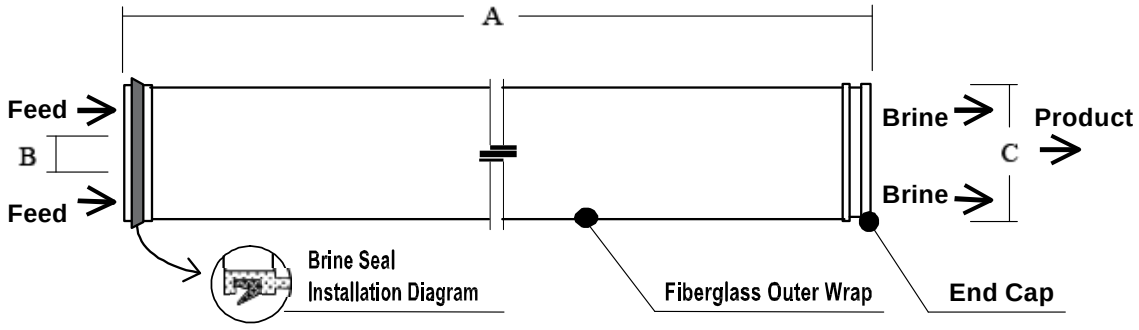
Membrane material: Polyamide thin film composite
Spirally wound element
Epoxy-based FRP overwrap
High pressure application for sea water treatment

Specifications:

Product	Active area ft^2 (m^2)	Feed spacer thickness mil(mm)	Permeate flow rate gpd (m^3/d)	Stabilized salt rejection (%)	Minimum salt rejection (%)	Test Conditions
FX-8040-SW-400	400 (37)	28 (0.7)	6000 (23)	99.7%	99.0%	800psi/32800ppm

1. All performance data are collected at 25°C (77°F), NaCl solution, pH7.5 and 8% recovery rate.
2. Stabilized Boron Rejection 93%
3. Permeate flows for single element may vary ±15%.

Element Dimension:



Product	Recovery Rate %	Dimensions – Inches (mm)		
		A	B	C
FX-8040-SW-400	15	40.0 (1016)	1.125 (29)	7.9 (201)

* 1 inch= 25.4 mm

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Operating Limits for Design:

Maximum Operating Temperature……45°C(113°F)
Maximum Operating Pressure……...1000psi(69bar)
Maximum Pressure Drop (single element)……15psi(1.0bar)
pH Range for Continuous Operation…….....3-11
pH Range for Cleaning……..……1.5-12
Chlorine tolerance……..……<0.1ppm
Maximum Feed SDI……..…….5

Important Operation Notes:

- It is critical to follow approved start-up procedure to prevent membrane damage due to overfeeding or hydraulic shock. Before initiating system, loading of the RO elements, instrument calibration, membrane pretreatment and other system checks should be conducted.
- Minimize any pressure shock or cross-flow fluctuation on the spiral elements at all times. During start-up, a gradual, incremental change from a standstill to operating state is recommended.
- Maximum pressure drop across an entire pressure vessel (housing) is 50 psi (3.4 bar).
- No static pressure should ever be built up on permeate side.
- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines are not followed, the Limited Warranty will be void.
- In case of prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution to prevent bacteria growth.
- Permeate collected from first hour of operation should be discarded.
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4″ Spiral Wound Elements for Sea Water

Introduction:

High Rejection, High Productivity:
4″ Spiral Wound Elements for Sea Water

Hydro-Flex reverse osmosis (RO) 4″ elements are some of the finest products in the industry. The state of the art coating line, coupled with advanced membrane technology, yields product of the highest quality and most stable performance. Hydro-Flex elements are uniquely engineered to have a high level of salt rejection with minimum compromise in water flux.

Description:

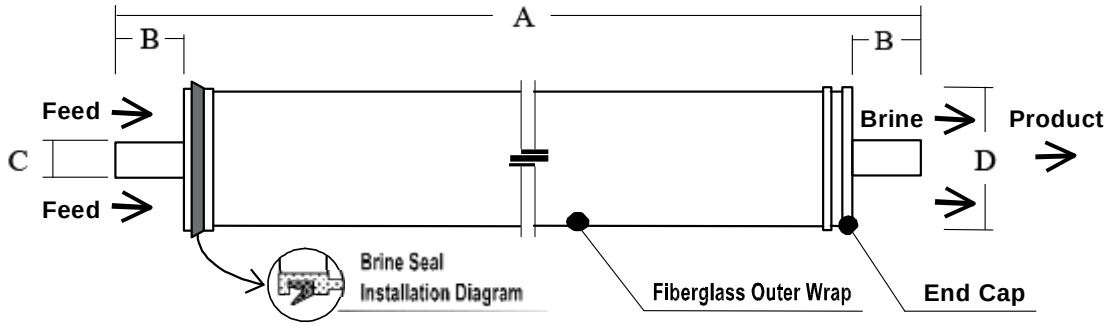
Membrane material: Polyamide thin film composite
Spirally wound element
Epoxy-based FRP overwrap
High pressure application for sea water treatment

Specifications:

Product	Active area ft^2 (m^2)	Feed spacer thickness mil(mm)	Permeate flow rate gpd (m^3/d)	Stabilized salt rejection (%)	Minimum salt rejection (%)	Test Conditions
FX-4021-SW	33 (3.1)	28 (0.7)	800 (3.0)	99.4%	99.0%	800psi/32800ppm
FX-4040-SW	80 (7.4)	28 (0.7)	1950 (7.4)	99.4%	99.0%	800psi/32800ppm

1. All performance data are collected at 25℃ (77℉), NaCl solution, pH7.5 and recovery rate FX-4040-SW 8%, FX-4021-SW 4%.
2. Permeate flows for single element may vary ± 20%.

Element Dimension:



Product	Recovery Rate	Dimensions – Inches (mm)			
		A	B	C	D
FX-4021-SW	4%	40.0 (1016)	1.05 (26.7)	0.75 (19)	3.9 (99)
FX-4040-SW	8%	40.0 (1016)	1.05 (26.7)	0.75 (19)	3.9 (99)

* 1 inch= 25.4 mm

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Operating Limits for Design:

Maximum Operating Temperature……45°C(113°F)
Maximum Operating Pressure……1000psi(69bar)
Maximum Pressure Drop (single element)……15psi(1.0bar)
pH Range for Continuous Operation……3-11
pH Range for Cleaning……1.5-12
Chlorine tolerance……<0.1ppm
Maximum Feed SDI……5

Important Operation Notes:

- It is critical to follow approved start-up procedure to prevent membrane damage due to overfeeding or hydraulic shock. Before initiating system, loading of the RO elements, instrument calibration, membrane pretreatment and other system checks should be conducted.
- Minimize any pressure shock or cross-flow fluctuation on the spiral elements at all times. During start-up, a gradual, incremental change from a standstill to operating state is recommended.
- Maximum pressure drop across an entire pressure vessel (housing) is 50 psi (3.4 bar).
- No static pressure should ever be built up on permeate side.
- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines are not followed, the Limited Warranty will be void.
- In case of prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution to prevent bacteria growth.
- Permeate collected from first hour of operation should be discarded.
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2.5″ Spiral Wound Elements for Sea Water

Introduction:

High Rejection, High Productivity:
2.5″ Spiral Wound Elements for Sea Water

Hydro-Flex reverse osmosis (RO) 2.5″ elements are some of the finest products in the industry. The state of the art coating line, coupled with advanced membrane technology, yields product of the highest quality and most stable performance. Hydro-Flex elements are uniquely engineered to have a high level of salt rejection with minimum compromise in water flux.

Description:

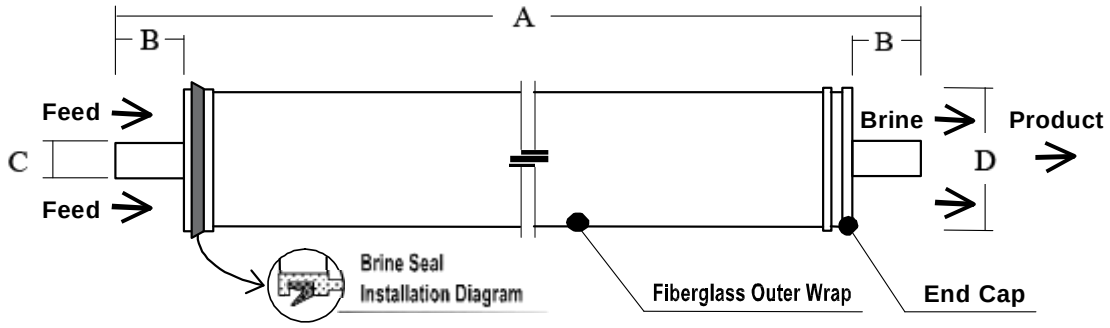
Membrane material: Polyamide thin film composite
Spirally wound element
Tape-Wrapped
High pressure application for sea water treatment

Specifications:

Product	Active area ft^2 (m^2)	Feed spacer thickness mil(mm)	Permeate flow rate gpd (m^3/d)	Stabilized salt rejection (%)	Minimum salt rejection (%)	Test Conditions
FX-2514-SW	6.5 (0.6)	28 (0.7)	150 (0.6)	99.4%	99.0%	800psi/32800ppm
FX-2521-SW	13 (1.2)	28 (0.7)	300 (1.1)	99.4%	99.0%	800psi/32800ppm
FX-2540-SW	29 (2.8)	28 (0.7)	700 (2.6)	99.4%	99.0%	800psi/32800ppm

1. All performance data are collected at 25℃ (77℉), NaCl solution, pH7.5 and recovery rate FX-2514-2%, FX-2521-4%, FX-2540-8%.
2. Permeate flows for single element may vary ± 20%.

Element Dimension:



Product	Recovery Rate	Dimensions – Inches (mm)			
		A	B	C	D
FX-2514-SW	2%	14.0 (356)	1.19 (30.2)	0.75 (19)	2.4 (61)
FX-2521-SW	4%	21.0 (533)	1.19 (30.2)	0.75 (19)	2.4 (61)
FX-2540-SW	8%	40.0 (1016)	1.19 (30.2)	0.75 (19)	2.4 (61)

* 1 inch= 25.4 mm

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Operating Limits for Design:

Maximum Operating Temperature……..……..……45°C(113°F)
Maximum Operating Pressure……..……...1000psi(69bar)
Maximum Pressure Drop (single element)……..……15psi(1.0bar)
pH Range for Continuous Operation…….....3-11
pH Range for Cleaning……..……1.5-12
Chlorine tolerance……<0.1ppm
Maximum Feed SDI…….....……5

Important Operation Notes:

- It is critical to follow approved start-up procedure to prevent membrane damage due to overfeeding or hydraulic shock. Before initiating system, loading of the RO elements, instrument calibration, membrane pretreatment and other system checks should be conducted.
- Minimize any pressure shock or cross-flow fluctuation on the spiral elements at all times. During start-up, a gradual, incremental change from a standstill to operating state is recommended.
- Maximum pressure drop across an entire pressure vessel (housing) is 50 psi (3.4 bar).
- No static pressure should ever be built up on permeate side.
- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines are not followed, the Limited Warranty will be void.
- In case of prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution to prevent bacteria growth.
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8″ Spiral Wound Elements Fouling Resistance

Introduction:

High Rejection, High Productivity:
8″ Spiral Wound Elements Fouling Resistance

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Description:

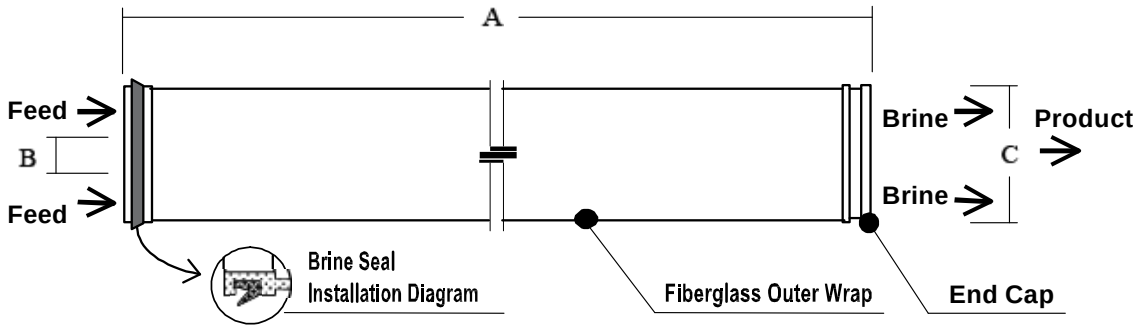
Membrane material: Polyamide thin film composite
Spirally wound element
Epoxy-based FRP overwrap
High pressure application for sea water treatment

Specifications:

Product	Active area ft^2 (m^2)	Feed spacer thickness mil(mm)	Permeate flow rate gpd (m^3/d)	Stabilized salt rejection (%)	Minimum salt rejection (%)	Test Conditions
FX-8040-FR-400	400 (37)	34 (0.85)	10500 (40)	99.5%	99.0%	225psi/2000ppm
FX-8040-FR-365	365 (33.9)	34 (0.85)	9600 (36)	99.5%	99.0%	225psi/2000ppm
FX-8040-FR-365-X	365 (33.9)	48 (1.20)	9600 (36)	99.5%	99.0%	225psi/2000ppm
FX-8040-FR-365-E	365 (33.9)	48 (1.20)	9600 (36)	99.5%	99.0%	225psi/2000ppm
FX-8040-FR-365-T	365 (33.9)	48 (1.20)	9600 (36)	99.5%	99.0%	225psi/2000ppm

1. All performance data are collected at 25℃ (77℉), NaCl solution, pH7.5 and 15% recovery rate.
2. Permeate flows for single element may vary ±15%.
3. FX-8040-FR-365-X for the textile industry, FX-8040-FR-365-E for the electroplating industry, FX-8040-FR-365-T for the tea processing industry.

Element Dimension:



Product	Recovery Rate %	Dimensions – Inches (mm)		
		A	B	C
FX-8040-FR-400	15	40.0 (1016)	1.125 (29)	7.9 (201)
FX-8040-FR-365	15	40.0 (1016)	1.125 (29)	7.9 (201)

* 1 inch= 25.4 mm

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Operating Limits for Design:

Maximum Operating Temperature……45°C(113°F)
Maximum Operating Pressure……...600psi(41bar)
Maximum Pressure Drop (single element)……15psi(1.0bar)
pH Range for Continuous Operation…….....3-11
pH Range for Cleaning……..……1.5-12
Chlorine tolerance……..……<0.1ppm
Maximum Feed SDI……..…….5

Important Operation Notes:

- It is critical to follow approved start-up procedure to prevent membrane damage due to overfeeding or hydraulic shock. Before initiating system, loading of the RO elements, instrument calibration, membrane pretreatment and other system checks should be conducted.
- Minimize any pressure shock or cross-flow fluctuation on the spiral elements at all times. During start-up, a gradual, incremental change from a standstill to operating state is recommended.
- Maximum pressure drop across an entire pressure vessel (housing) is 50 psi (3.4 bar).
- No static pressure should ever be built up on permeate side.
- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines are not followed, the Limited Warranty will be void.
- In case of prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution to prevent bacteria growth.
- Permeate collected from first hour of operation should be discarded.
- It is customer's responsibility to make sure that the chemicals and lubricants do not have detrimental effects on RO elements.

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4″ Spiral Wound Elements Fouling Resistance

Introduction:

High Rejection, High Productivity:
4″ Spiral Wound Elements Fouling Resistance

Hydro-Flex reverse osmosis (RO) 4″ elements are some of the finest products in the industry. The state of the art coating line, coupled with advanced membrane technology, yields product of the highest quality and most stable performance. Hydro-Flex elements are uniquely engineered to have a high level of salt rejection with minimum compromise in water flux.

Description:

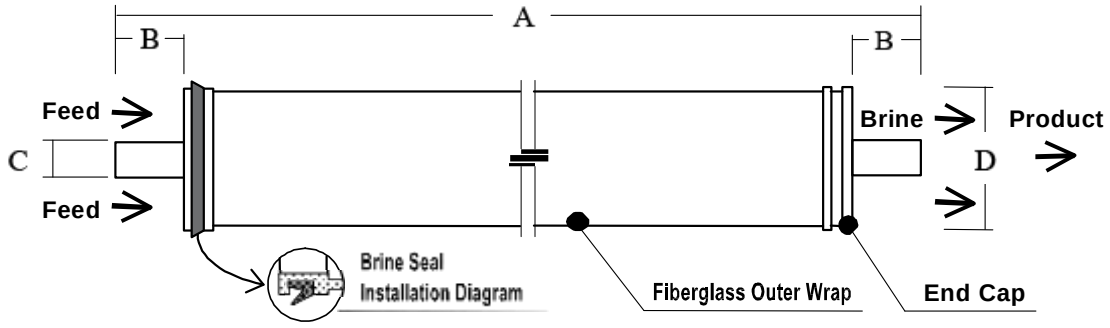
Membrane material: Polyamide thin film composite
Spirally wound element
Epoxy-based FRP overwrap
High pressure application for sea water treatment

Specifications:

Product	Active area ft^2 (m^2)	Feed spacer thickness mil(mm)	Permeate flow rate gpd (m^3/d)	Stabilized salt rejection (%)	Minimum salt rejection (%)	Test Conditions
FX-4040-FR	76.1 (7)	34 (0.85)	2200 (8.3)	99.5%	99.0%	225psi/2000ppm

1. All performance data are collected at 25°C (77°F), NaCl solution, pH7.5 and 8% recovery rate.
2. Permeate flows for single element may vary ±15%.

Element Dimension:



Product	Recovery Rate	Dimensions – Inches (mm)			
		A	B	C	D
FX-4040-FR	8%	40.0 (1016)	1.05 (26.7)	0.75 (19)	3.9 (99)

* 1 inch= 25.4 mm

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Operating Limits for Design:

Maximum Operating Temperature……..……..……45°C(113°F)
Maximum Operating Pressure……..……....600psi(41bar)
Maximum Pressure Drop (single element)……..……15psi(1.0bar)
pH Range for Continuous Operation…….....3-11
pH Range for Cleaning……..……1.5-12
Chlorine tolerance……<0.1ppm
Maximum Feed SDI…….....…….5

Important Operation Notes:

- It is critical to follow approved start-up procedure to prevent membrane damage due to overfeeding or hydraulic shock. Before initiating system, loading of the RO elements, instrument calibration, membrane pretreatment and other system checks should be conducted.
- Minimize any pressure shock or cross-flow fluctuation on the spiral elements at all times. During start-up, a gradual, incremental change from a standstill to operating state is recommended.
- Maximum pressure drop across an entire pressure vessel (housing) is 50 psi (3.4 bar).
- No static pressure should ever be built up on permeate side.
- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines are not followed, the Limited Warranty will be void.
- In case of prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution to prevent bacteria growth.
- Permeate collected from first hour of operation should be discarded.
- It is customer's responsibility to make sure that the chemicals and lubricants do not have detrimental effects on RO elements.

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Residential RO Membrane Elements A

Introduction:

Hydro-Flex reverse osmosis (RO) membrane elements for household drinking water are some of the most reliable and consistent products in the industry. Advanced membrane technology coupled with well-controlled element rolling allows Hydro-Flex to produce RO Membrane Elements with stable performance. Hydro-Flex's first class RO Membrane Element quality helps customers develop and maintain brand recognition along with a reputation for building systems that reliably provide low impurity drinking water. Hydro-Flex elements are uniquely engineered for their high level of salt rejection with minimum compromise in water flux.

Specifications:

Specification / Item	Specification						
	FX-1812-50	FX-1812-75	FX-1812-100	FX-1810-50	FX-1810-75	FX-1810-100	FX-2012-150
Water Yield (GPD)	50	75	100	50	75	100	150
Ratio of Desalinization (%)	96	96	93	96	96	93	92

* Test Condition: 25℃, 250PPM NaCl solution, 60PSI

Dimension:

Model No.	Dimension- Inches (mm)				
	A	B	C	D	E
FX-1812	11.75 (298)	0.87 (22)	0.68 (17)	1.75 (44.5)	10.00 (254)
FX-1810	10.07 (256)	0.87 (22)	0.68 (17)	1.75 (44.5)	9.05 (230)
FX-2012	11.75 (298)	0.87 (22)	0.68 (17)	1.95 (49.5)	10.00 (254)

* Home Drinking Water elements seal at a standard 2.0 inch I.D. within pressure vessels

1 inch=25.4 mm

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Operating Limits for Design:

Membrane Type ..... Polyamide Thin-Film Composite
Maximum Operating Temperature ..... 113℉/45℃
Maximum Operating Pressure ..... 300psi(21bar)
pH range, Continuous Operation 2-11
pH range, Short-Term Cleaning (30 min) 1-12
Maximum Feed Silt Density Index(SDI) 5
Free Chlorine Tolerance ..... <0.1ppm

Important Operation Notes:

- This product is used for the first time. Permeate water obtained from the first hour of use should be discarded.
- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
- To prevent biological growth during prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution. Rinse out the preservative before use.
- The OEM is fully responsible for the effects of incompatible chemicals and lubricants on elements. Use of any such chemicals or lubricants will void the Limited Warranty.

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Residential RO Membrane Elements B

Introduction:

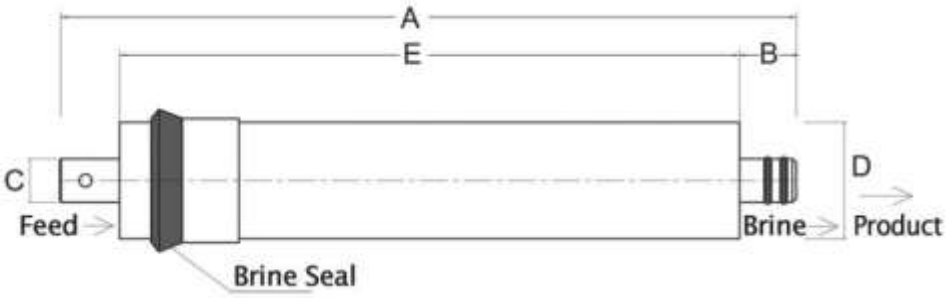
Hydro-Flex reverse osmosis (RO) membrane elements for household drinking water are some of the most reliable and consistent products in the industry. Advanced membrane technology coupled with well-controlled element rolling allows Hydro-Flex to produce RO Membrane Elements with stable performance. Hydro-Flex's first class RO Membrane Element quality helps customers develop and maintain brand recognition along with a reputation for building systems that reliably provide low impurity drinking water. Hydro-Flex elements are uniquely engineered for their high level of salt rejection with minimum compromise in water flux. We offer various models.

Specifications:

Specification / Item	Specification				
	FX-2812-200	**FX-2812-300**	**FX-2812-400**	**FX-3013-400**	**FX-3013-600**
Water Yield (GPD)	200	300	400	400	600
Ratio of Desalinization (%)	92	92	92	92	92

* Test Condition: 25℃ , 500PPM NaCl solution, 100PSI

Dimension:



Model No.	Dimension- Inches (mm)				
	A	**B**	**C**	**D**	**E**
FX-2812-200	11.75 (298)	0.87 (22)	0.68 (17)	2.70 (68.5)	10.00 (254)
FX-2812-300	11.75 (298)	0.87 (22)	0.68 (17)	2.70 (68.5)	10.00 (254)
FX-2812-400	11.75 (298)	0.87 (22)	0.68 (17)	2.70 (68.5)	10.00 (254)
FX-3013-400	12.99 (330)	0.98 (25)	0.68 (17)	2.89 (73.5)	11.02 (280)
FX-3013-600	12.99 (330)	0.98 (25)	0.68 (17)	2.89 (73.5)	11.02 (280)

* Home Drinking Water elements seal at a standard 3.0 inch I.D. within pressure vessels 1 inch=25.4 mm

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Operating Limits for Design:

Membrane Type	Polyamide Thin-Film Composite
Maximum Operating Temperature	113℉/45℃
Maximum Operating Pressure	300psi(21bar)
pH range, Continuous Operation	2-11
pH range, Short-Term Cleaning (30 min)	1-12
Maximum Feed Silt Density Index(SDI)	5
Free Chlorine Tolerance	<0.1ppm

Important Operation Notes:

- This product is used for the first time. Permeate water obtained from the first hour of use should be discarded.
- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
- To prevent biological growth during prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution. Rinse out the preservative before use.
- The OEM is fully responsible for the effects of incompatible chemicals and lubricants on elements. Use of any such chemicals or lubricants will void the Limited Warranty.

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8” & 4″ Spiral Wound Elements for Nano-Filtration (L Series)

Introduction:

High Rejection, High Productivity:
8” & 4″ Spiral Wound Elements for Nano-Filtration (L Series)

Hydro-Flex Nano-Filtration 8” & 4″ elements are some of the finest products in the industry. The state of the art coating line, coupled with advanced membrane technology, yields product of the highest quality and most stable performance. Hydro-Flex elements are uniquely engineered to have a high level of salt rejection with minimum compromise in water flux.

Description:

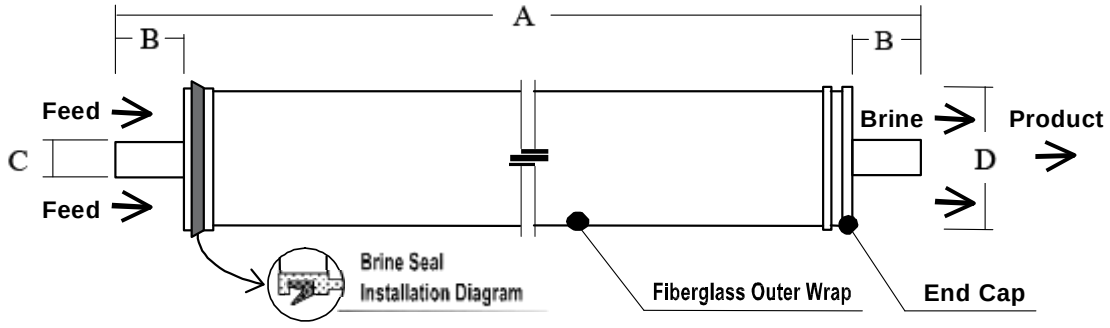
Membrane material: Polyamide thin film composite
Spirally wound element
Epoxy-based FRP overwrap
High pressure application for sea water treatment

Specifications:

Product	Active area ft^2 (m^2)	Feed spacer thickness mil(mm)	Permeate flow rate gpd (m^3/d)	Stabilized NaCl rejection (%)	Stabilized MgSO4 rejection (%)	Test Conditions
FX-8040-365-NFL	365 (33.9)	48 (1.2)	10500 (39.7)	85-95%	>97.0%	150psi/2000ppm
FX-4040-NFL	76.1 (7)	48 (1.2)	2400 (9.1)	85-95%	>97.0%	150psi/2000ppm
FX-4021-NFL	36 (3.3)	48 (1.2)	1000 (3.78)	85-95%	>97.0%	150psi/2000ppm

1. All performance data are collected at 25°C (77°F), MgSO4 Solution, pH7.5 and recovery rate FX-8040/4040-15%, FX-4021-8%.
2. MWCO Dalton: 600-1000
3. Permeate flows for single element may vary ±15%.

Element Dimension:



Product	Recovery Rate	Dimensions – Inches (mm)			
		A	B	C	D
FX-8040-NFL	15%	40.0 (1016)	1.05 (26.7)	0.75 (19)	7.9 (201)
FX-4040-NFL	15%	40.0 (1016)	1.05 (26.7)	0.75 (19)	3.9 (99)
FX-4021-NFL	8%	21.0 (508)	1.05 (26.7)	0.75 (19)	3.9 (99)

* 1 inch= 25.4 mm

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Operating Limits for Design:

Maximum Operating Temperature……..……..……45°C(113°F)
Maximum Operating Pressure……..……600psi(41bar)
Maximum Pressure Drop (single element)……..……15psi(1.0bar)
pH Range for Continuous Operation…….....3-11
pH Range for Cleaning……..……1.5-12
Chlorine tolerance……<0.1ppm
Maximum Feed SDI…….....……5

Important Operation Notes:

- It is critical to follow approved start-up procedure to prevent membrane damage due to overfeeding or hydraulic shock. Before initiating system, loading of the NF elements, instrument calibration, membrane pretreatment and other system checks should be conducted.
- Minimize any pressure shock or cross-flow fluctuation on the spiral elements at all times. During start-up, a gradual, incremental change from a standstill to operating state is recommended.
- Maximum pressure drop across an entire pressure vessel (housing) is 50 psi (3.4 bar).
- No static pressure should ever be built up on permeate side.
- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines are not followed, the Limited Warranty will be void.
- In case of prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution to prevent bacteria growth.
- Permeate collected from first hour of operation should be discarded.
- It is customer's responsibility to make sure that the chemicals and lubricants do not have detrimental effects on NF elements.

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8” & 4″ Spiral Wound Elements for Nano-Filtration (K Series)

Introduction:

High Rejection, High Productivity:
8” & 4″ Spiral Wound Elements for Nano-Filtration (K Series)

Hydro-Flex Nano-Filtration 8” & 4″ elements are some of the finest products in the industry. The state of the art coating line, coupled with advanced membrane technology, yields product of the highest quality and most stable performance. Hydro-Flex elements are uniquely engineered to have a high level of salt rejection with minimum compromise in water flux.

Description:

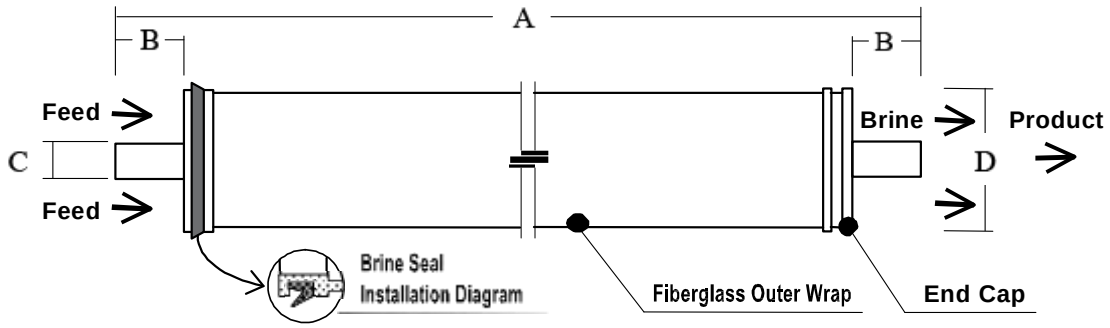
Membrane material: Polyamide thin film composite
Spirally wound element
Epoxy-based FRP overwrap
High pressure application for sea water treatment

Specifications:

Product	Active area ft^2 (m^2)	Feed spacer thickness mil(mm)	Permeate flow rate gpd (m^3/d)	Stabilized NaCl rejection (%)	Stabilized MgSO4 rejection (%)	Test Conditions
FX-8040-365-NFK	365 (33.9)	48 (1.2)	10500 (39.7)	85-95%	>97.0%	150psi/2000ppm
FX-4040-NFK	76.1 (7)	48 (1.2)	2400 (9.1)	85-95%	>97.0%	150psi/2000ppm
FX-4021-NFK	36 (3.3)	48 (1.2)	1000 (3.78)	85-95%	>97.0%	150psi/2000ppm

1. All performance data are collected at 25°C (77°F), MgSO4 Solution, pH7.5 and recovery rate FX-8040/4040-15%, FX-4021-8%.
2. MWCO Dalton: 200-600
3. Permeate flows for single element may vary ±15%.

Element Dimension:



Product	Recovery Rate	Dimensions – Inches (mm)			
		A	B	C	D
FX-8040-NFK	15%	40.0 (1016)	1.05 (26.7)	0.75 (19)	7.9 (201)
FX-4040-NFK	15%	40.0 (1016)	1.05 (26.7)	0.75 (19)	3.9 (99)
FX-4021-NFK	8%	21.0 (508)	1.05 (26.7)	0.75 (19)	3.9 (99)

* 1 inch= 25.4 mm

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Operating Limits for Design:

Maximum Operating Temperature……45°C(113°F)
Maximum Operating Pressure……600psi(41bar)
Maximum Pressure Drop (single element)……15psi(1.0bar)
pH Range for Continuous Operation……3-11
pH Range for Cleaning……1.5-12
Chlorine tolerance……<0.1ppm
Maximum Feed SDI……5

Important Operation Notes:

- It is critical to follow approved start-up procedure to prevent membrane damage due to overfeeding or hydraulic shock. Before initiating system, loading of the NF elements, instrument calibration, membrane pretreatment and other system checks should be conducted.
- Minimize any pressure shock or cross-flow fluctuation on the spiral elements at all times. During start-up, a gradual, incremental change from a standstill to operating state is recommended.
- Maximum pressure drop across an entire pressure vessel (housing) is 50 psi (3.4 bar).
- No static pressure should ever be built up on permeate side.
- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines are not followed, the Limited Warranty will be void.
- In case of prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution to prevent bacteria growth.
- Permeate collected from first hour of operation should be discarded.
- It is customer's responsibility to make sure that the chemicals and lubricants do not have detrimental effects on NF elements.

® Martin (Shanghai) Water
Technologies Co., Ltd

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