



Making fluid energy work for **you**™



**Go GREEN
with FEDCO**



Product Summary and References

Fluid Equipment Development Company

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About FEDCO

Since 1997, FEDCO has been a global leader in the design and manufacture of high-pressure pumps and energy recovery devices for fresh, brackish, and sea water reverse osmosis systems. The efficiency and reliability of our pumps and energy recovery turbochargers has been demonstrated in over 5,000 installations, from the smallest facilities and containerized installations, to some of the world's largest desalination plants.

FEDCO partners with our customers to provide them with the best products for their specific needs. Our highly skilled engineers, manufacturing experts and experienced management team are ready to meet the most demanding performance requirements, complex specifications and tight delivery schedules from small to the very largest projects anywhere on land or the ocean.



MSD

High Pressure Pump



- 20 – 1,120 m³/h (88 – 4,931 gpm)
- Pressures to 100 bar (1,450 psi)
- Super Duplex Construction

MSS

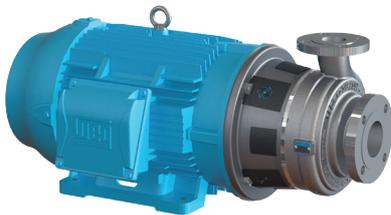
High Pressure Pump



- 7.5 – 295 m³/h (33 – 1,300 gpm)
- Pressures to 83 bar (1,200 psi)
- Duplex/SS-316 Construction

SLP

Low Pressure Pump



- 5.9 – 375 m³/h (26 – 1,650 gpm)
- Pressures to 9 bar (270 psi)
- Super Duplex Construction

HPB & HPB ULTRA

Energy Recovery Device



- 3 – 3,460 m³/h (13.2 – 15,234 gpm)
- Pressures to 124 bar (1,800 psi)
- Super Duplex Construction

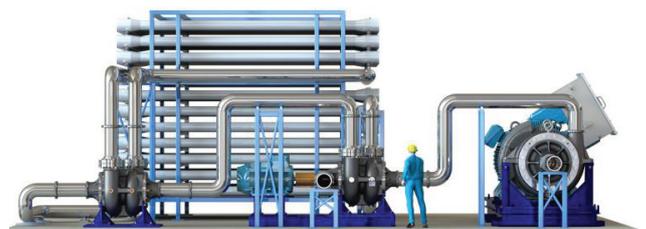
BiTurbo™

High Recovery SWRO



Mega Scale SWRO

Optimized Seawater Desalination



- Reduce Energy Consumption
- Optimize Membrane Conditions
- Improve Plant Reliability



MSD Series Multistage Centrifugal High Pressure Pump

Benefits

- ✓ High Efficiency: Up to 87%
- ✓ High Inlet Pressure Option: < 80 bar
- ✓ Flow Rate: 20–1080 m³/h (88–4755 gpm)
- ✓ Pressure: < 82 bar (1200 psi)
*Higher pressures can be achieved with custom models
- ✓ Low Maintenance Design
- ✓ Easy Installation and Rapid Commissioning
- ✓ Smooth and Quiet Operation
- ✓ 18 Month Warranty as Standard

High Flow Model



Low Flow Model

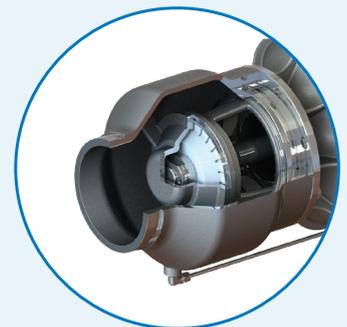


Features

- Patented Water Bearing™ Technology
- All Super Duplex Investment Cast Construction
- Balanced Impellers
- Rotatable Inlet Connection
- Mechanical Seal Cartridge Easily Accessible
- Precision Leveling Feet for Easy Alignment

Exclusive Water Bearing™ Technology

- Handles the entire thrust load generated by the impellers
- Shaft is kept in tension to eliminate buckling
- Product water provides the lubrication, therefore grease or oil maintenance is eliminated



Best Value for High Pressure Pumping

- Large capacity range, energy efficiency and low maintenance design
- Rotatable inlet connection and precision leveling feet for quick alignment
- Baseplates are optional and can be custom manufactured
- Mechanical seal sits in a removable cartridge for easy replacement
- Balance disc can be accessed with minimum disassembly
- Resistant materials
- Large capacity range
- World-leading energy efficiency
- Low maintenance design



Horizontal, Multistage Centrifugal Pump

OPERATING ENVELOPE

Flow Rate: 20-1080 m³/h (88-4755 gpm)

Pressure: < 82 bar (1200 psi)

Liquid: Seawater, Brackish Water, Potable Water (20 microns)

Temperature: < 70 °C (158 °F)

MATERIALS

Shell: Super Duplex SS

Impeller: Super Duplex SS

Shaft: Super Duplex SS

Bearing: Non-metallic

18 Month Warranty

Shaft Coupling: Flexible Disk Type

Motor: Standard 2 Pole NEMA or IE

Shaft Coupling: Flexible Disk Type

OPTIONAL FEATURES

Flanged Connections

High Pressure Seal Carrier

Contact FEDCO for your custom option requirements

REVERSE OSMOSIS APPLICATIONS

Seawater and Brackish Water	Oil & Gas
Industrial/Municipal	Produced Water
Hotels/Islands/Resorts	Water Reuse
Marine	

SYSTEM UPGRADES

Contact FEDCO to upgrade your existing reverse osmosis desalination plant to state-of-the-art pumps and energy recovery devices.

FEDCO has a broad range of feed pumps, booster pumps, and energy recovery devices for seawater and brackish water reverse osmosis applications.



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MSD Maximum Performance Range 2950 rpm

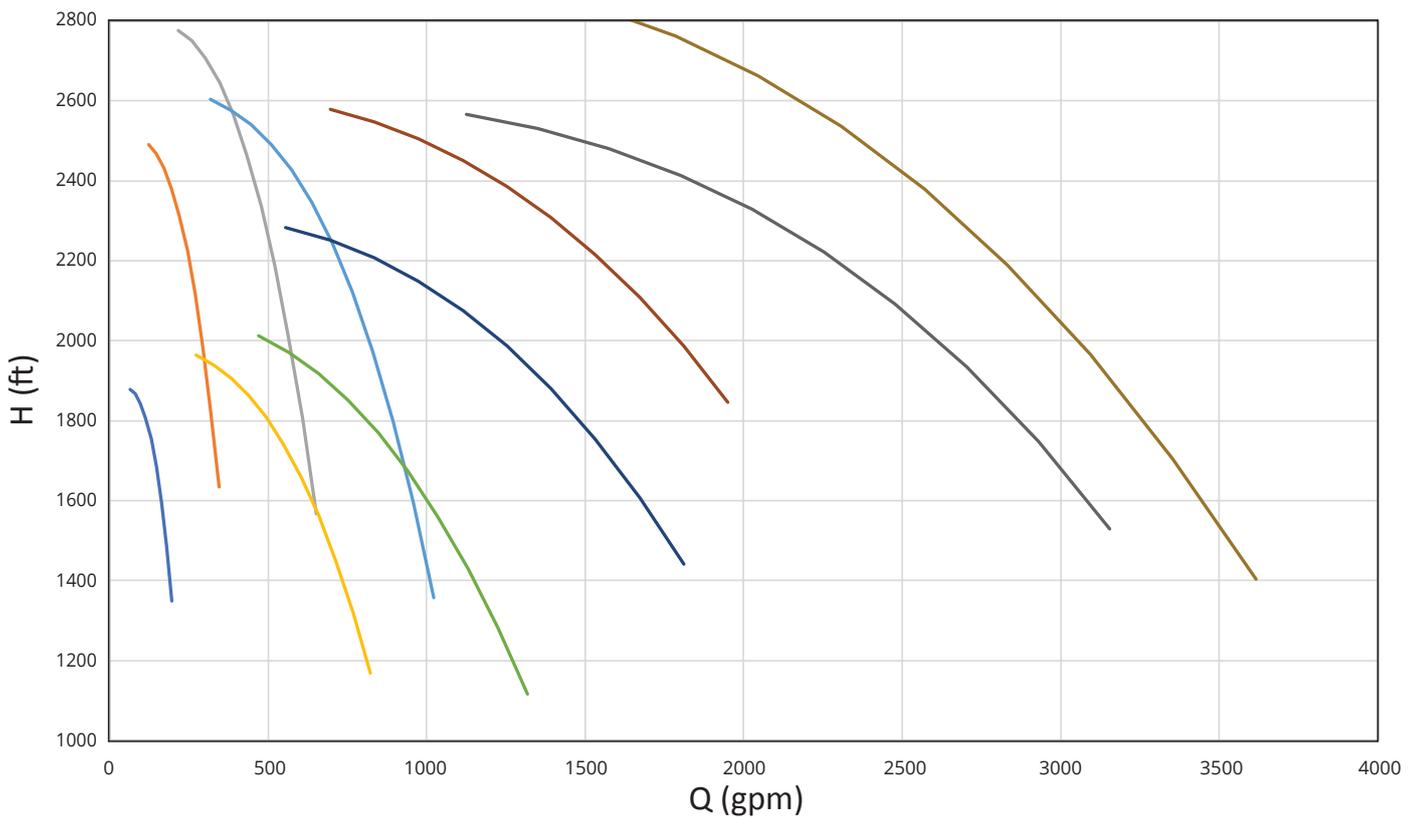
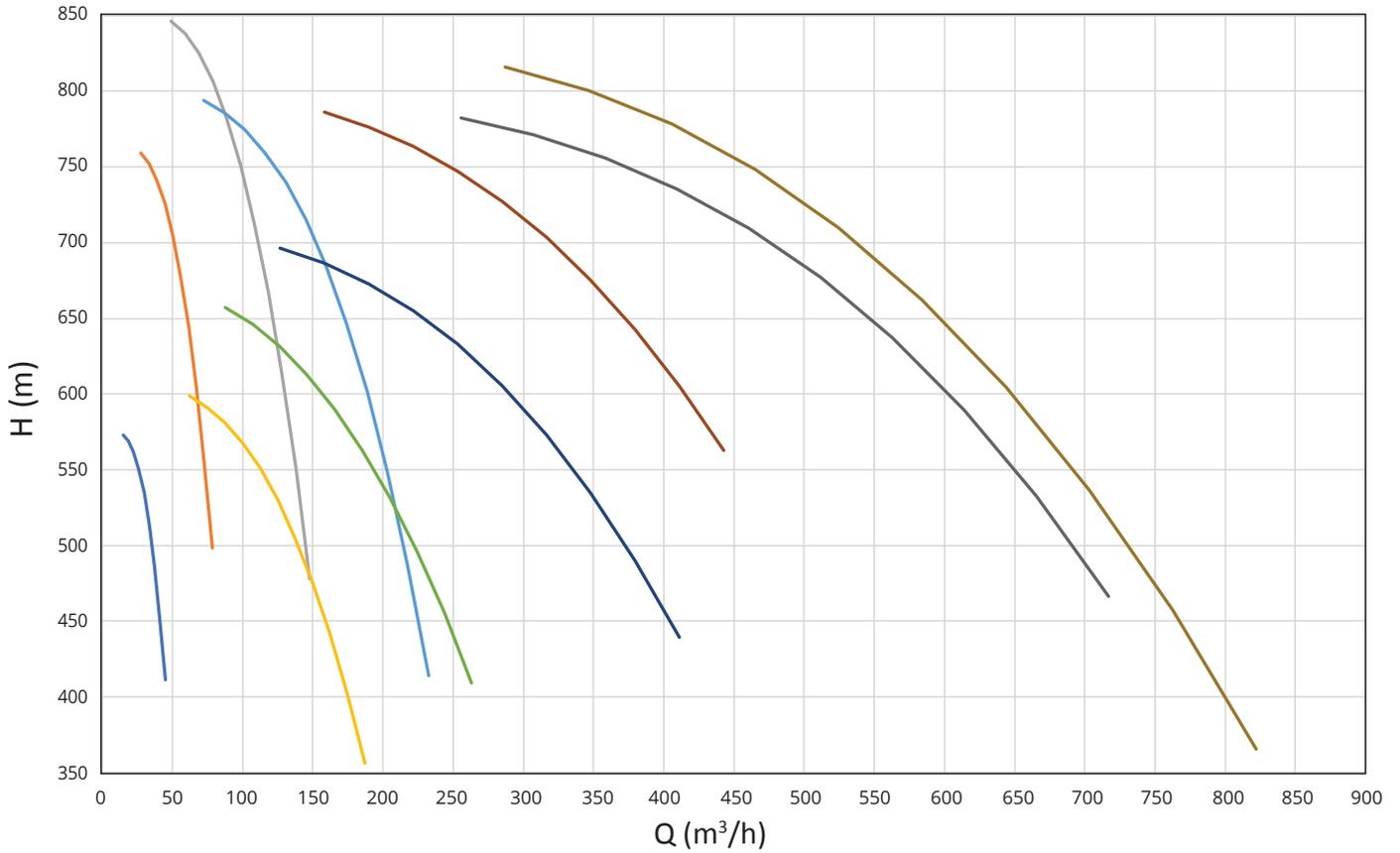
Pressure can be varied using variable frequency drives.

Maximum pressure may be limited by pressure ratings of RO equipment.

*Higher pressures can be achieved with custom models

Model	Min. Flow (m ³ /h)	Max. Flow (m ³ /h)
MSD-40	720	56
MSD-70	35	98
MSD-130	65	182
MSD-160	80	224
MSD-200	100	280

Model	Min. Flow (m ³ /h)	Max. Flow (m ³ /h)
MSD-270	135	378
MSD-350	175	490
MSD-400	200	560
MSD-650	325	877
MSD-800	400	1080



MSD Maximum Performance Range 3550 rpm

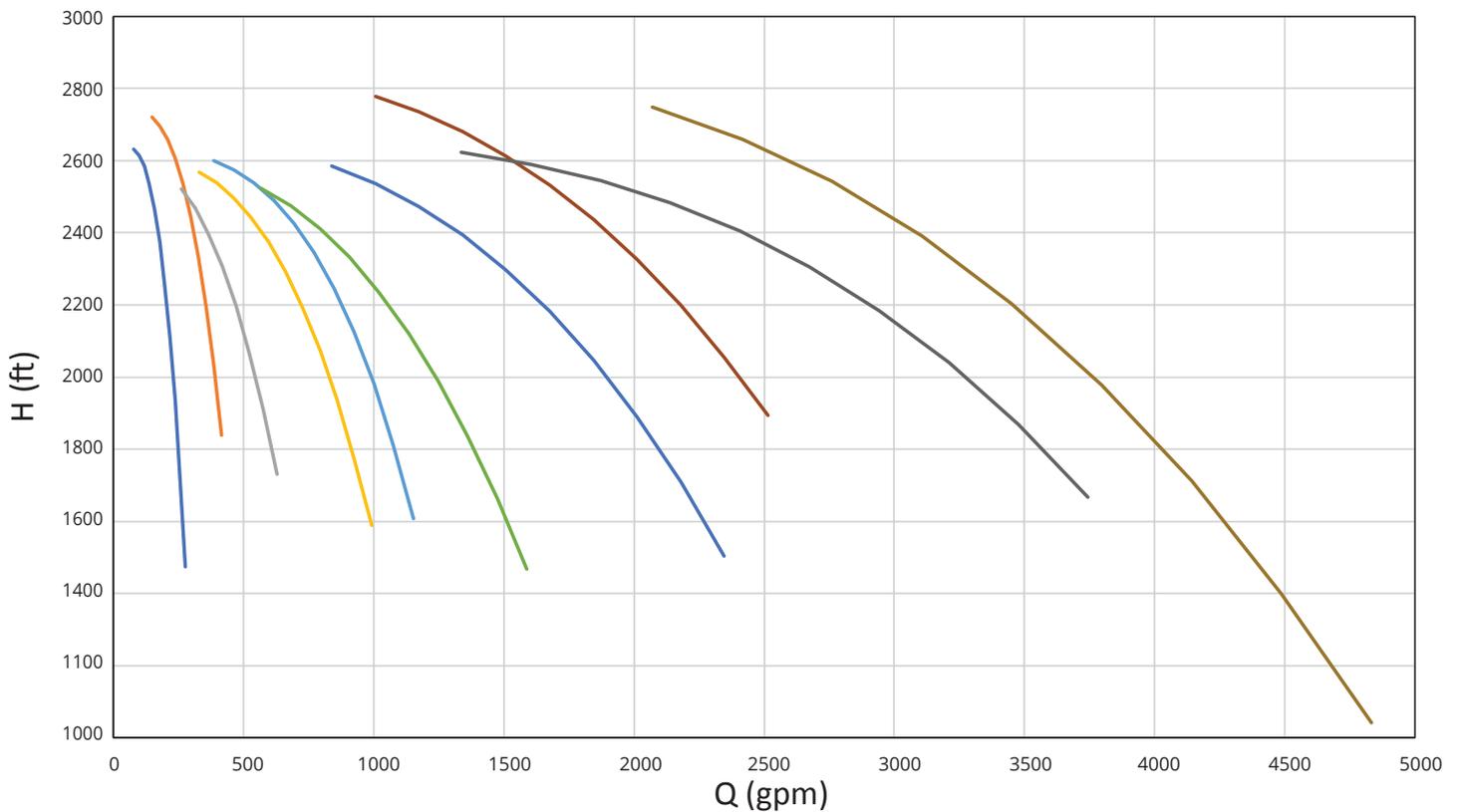
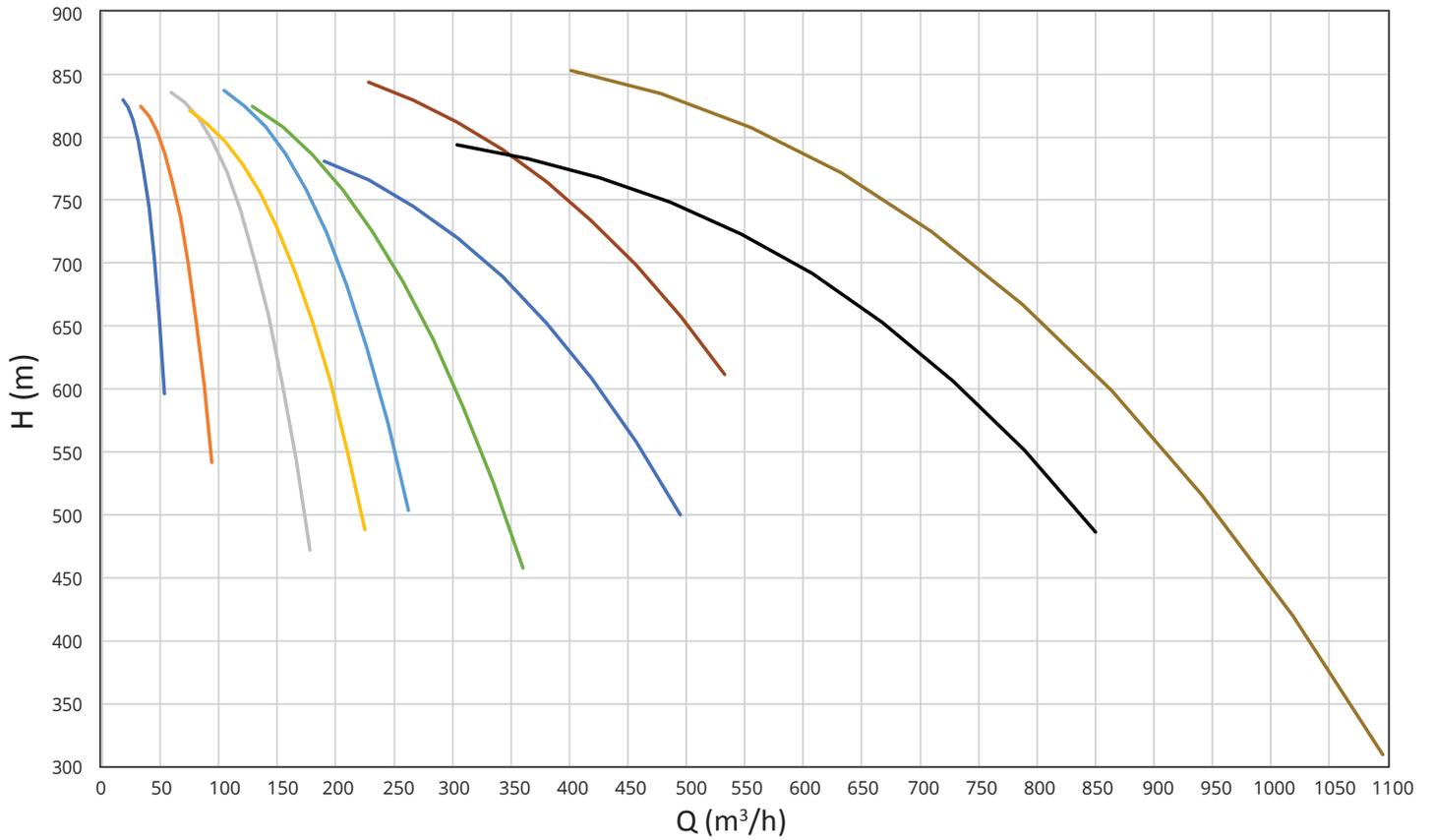
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MSD-40	20	56
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MSD-130	65	182
MSD-160	80	224
MSD-200	100	280

Model	Min. Flow (m ³ /h)	Max. Flow (m ³ /h)
MSD-270	135	378
MSD-350	175	490
MSD-400	200	560
MSD-650	325	877
MSD-800	400	1080





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Multistage Centrifugal High Pressure Pump

Benefits

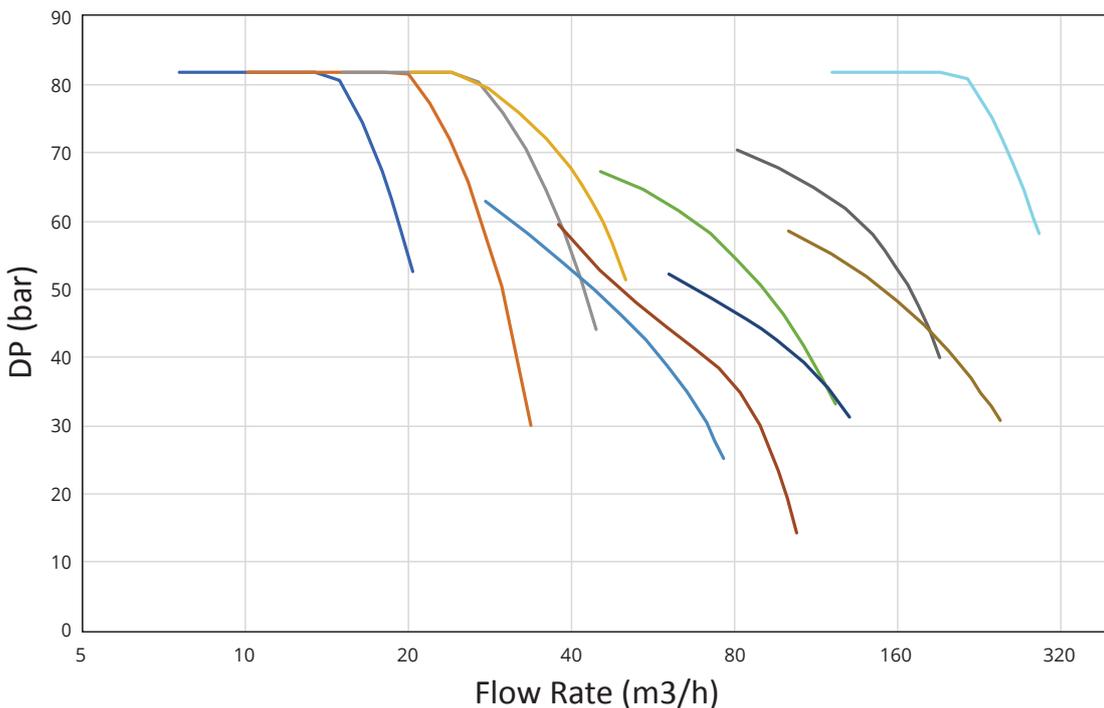
- ✓ Flow Rate: 7.5–295 m³/h (33—1299 gpm)
- ✓ Pressure: < 82 bar (1200 psi)
- ✓ High Inlet Pressure Option: < 80 bar
- ✓ Low Maintenance Design
- ✓ Easy Installation and Rapid Commissioning
- ✓ Smooth and Quiet Operation
- ✓ 18 Month Warranty as Standard
- ✓ Compact Footprint



MSS Maximum Performance Range 3600 rpm*

Pressure can be varied using variable frequency drives.

Maximum pressure may be limited by pressure ratings of RO equipment.



Model	Min. Flow (m ³ /h)	Max. Flow (m ³ /h)
MSS-15	7.5	20.5
MSS-20	10	34
MSS-30	15	45
MSS-40	20	51
MSS-55	27.5	77
MSS-75	37.5	105
MSS-90	45	124
MSS-120	60	132
MSS-16	80	193
MSS-200	100	250
MSS-240	120	295

*Maximum pressure rating using standard couplings. Pressure can be varied using variable frequency drives.

Features

Patented Water Bearing™ Technology	Balanced Impellers
Super Duplex Investment Cast Construction	Rotatable Inlet Connection
Mechanical Seal Cartridge Easily Accessible	Precision Leveling Feet for Easy Alignment
	Low Maintenance Design



High Pressure, High Efficiency

- Horizontal multistage centrifugal pumps specifically designed for seawater and brackish water reverse osmosis (RO)
- Each MSS pump is custom built to customer flow and pressure requirements
- Designed for long life and to be maintenance-free
- Long product life and low maintenance design lowers the total cost of water for your RO system

Exclusive Water Bearing™ Technology

- Handles the entire thrust load generated by the impellers
- Shaft is kept in tension eliminating any problems that can stem from buckling
- Product water provides the lubrication, therefore grease or oil maintenance is eliminated



Horizontal Multistage Centrifugal Pump

OPERATING ENVELOPE

Flow Rate: 6–290 m³/h (26–1276 gpm)

Pressure: < 82 bar (1200 psi)

Liquid: Seawater, Brackish Water, Potable Water (20 microns)

Temperature: < 40 °C (104 °F)

MATERIALS

Shell: Super Duplex SS

Shaft: Super Duplex SS

Impeller: 316L

Stage Housing: Duplex SS

18 Month Warranty

Bearing: Non-metallic

Motor: Standard 2 Pole NEMA or IEC

Shaft Coupling: Flexible Disk Type

OPTIONAL FEATURES

Flanged Connections

High Pressure Seal Carrier

Variable Frequency Drive (VFD)

*Contact FEDCO for your custom option requirements

REVERSE OSMOSIS APPLICATIONS

Seawater and Brackish Water	Oil & Gas
Industrial/Municipal	Produced Water
Hotels/Islands/Resorts	Water Reuse
Marine	

SYSTEM UPGRADES

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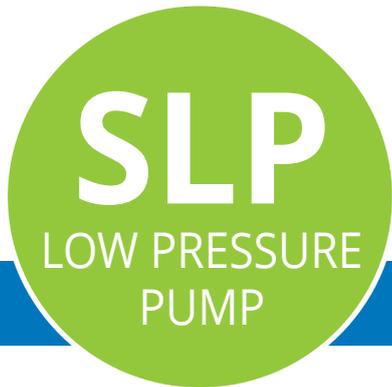
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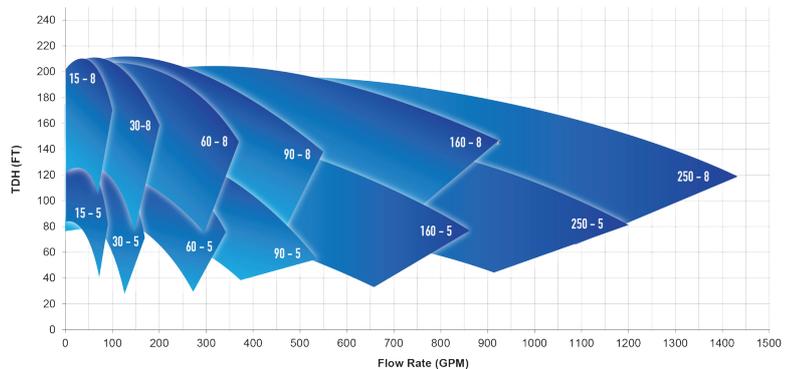
End Suction Single Stage Centrifugal Pump

Benefits

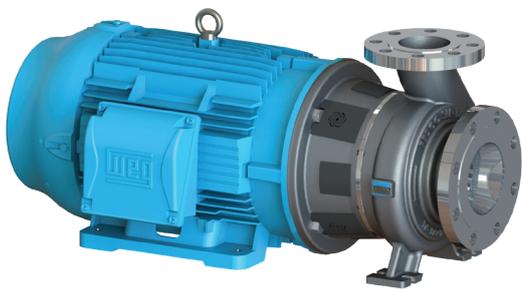
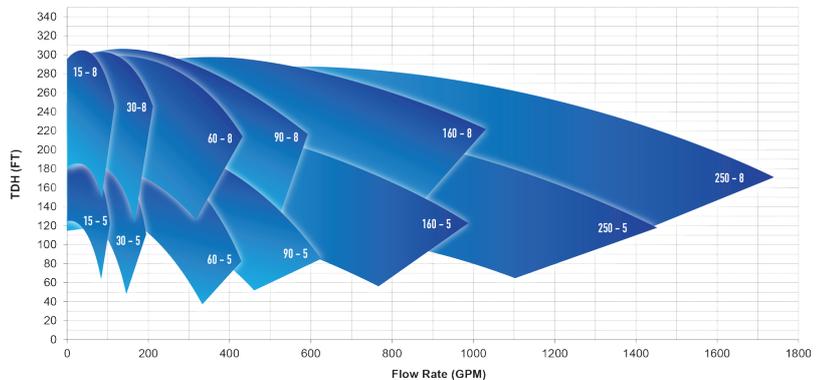
- ✓ High Efficiency
- ✓ Super Duplex Construction
- ✓ Flow Rate: 6.8 to 375 m3/h (30 to 165 gpm)
- ✓ Pressure: 2.4-9 bar (35-130.5 psi)
- ✓ Single stage, Close Coupled
- ✓ Premium Features for Long Life

Performance Range

SLP Pump Operating Range (2900 RPM/50Hz)



SLP Pump Operating Range (3500 RPM/60Hz)

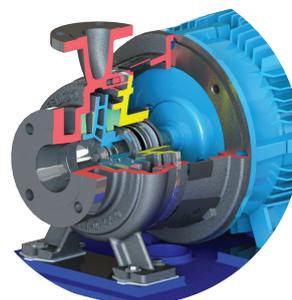


Features

- Multiple impeller trims available
- No oil or grease lubrication for reduced maintenance
- NEMA standard JM frame, TEFC motor for easy repair
- Compact footprint for saving space
- Centerline discharge for easy piping and self venting design

Applications

Seawater and Brackish Water	Oil & Gas
Industrial/Municipal	Produced Water
Hotels/Islands/Resorts	Water Reuse
Marine	



Cutaway View

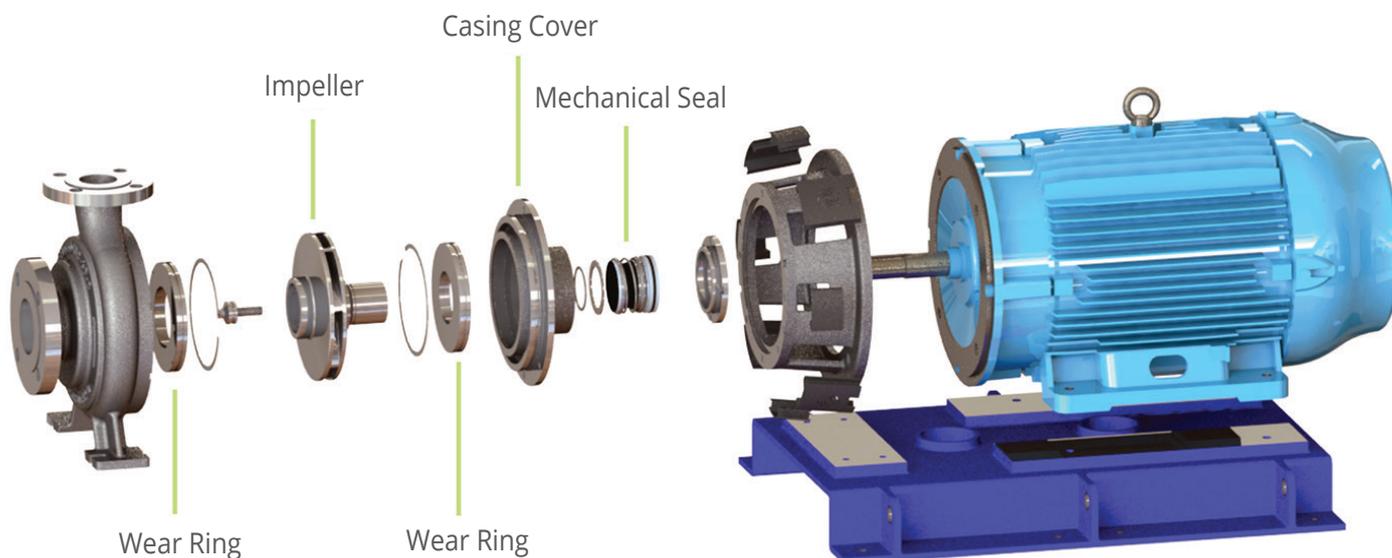
About

The SLP pump series is a low pressure end suction, close-coupled horizontal pump for general water process applications. It was designed with high efficiency and Super Duplex stainless steel construction for reliability and longevity in harsh environments. This pump series features a standard mechanical seal with seal flush to ensure long life, centerline discharge, self-venting design and no oil or grease lubrication for simple installation and maintenance.

The SLP is offered in five ANSI 150lb flanged models with a set of customizable impellers, coupled with a NEMA standard TEFC, JM or JP motor frame mounted on a common baseplate. The compact footprint and robust construction gives the SLP series an advantage over similar pumps.



SLP Pump Components



Any Project

Any Location

Rapid Delivery

Over 200+ Installations in 3 Years



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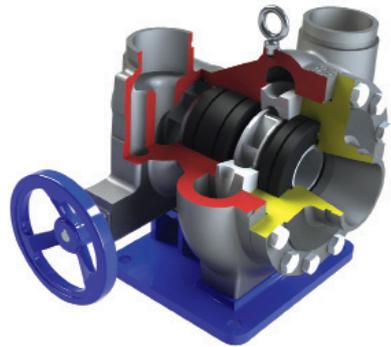




Turbocharger Energy Recovery Device

Benefits

- ✓ Fully Custom Engineered
- ✓ Self Regulating Energy Recovery
- ✓ Compact Footprint
- ✓ Resilient Design
- ✓ Reduces Total Cost of Water



Model	Flow Rate	Pressure Rating
HPB™	10–3460 m³/h	< 83 bar
HPB Boosted™	20–3460 m³/h	< 83 bar
HPB Ultra™	20–250 m³/h 250–350 m³/h	< 124 bar < 104 bar

Turbocharge your RO

- Efficient, Reliable Energy Recovery up to 124 bar
- Reduce Footprint, Energy, and Capex Requirements
- Reduce Pump and Motor Size Requirements

Unlock Optimal Designs

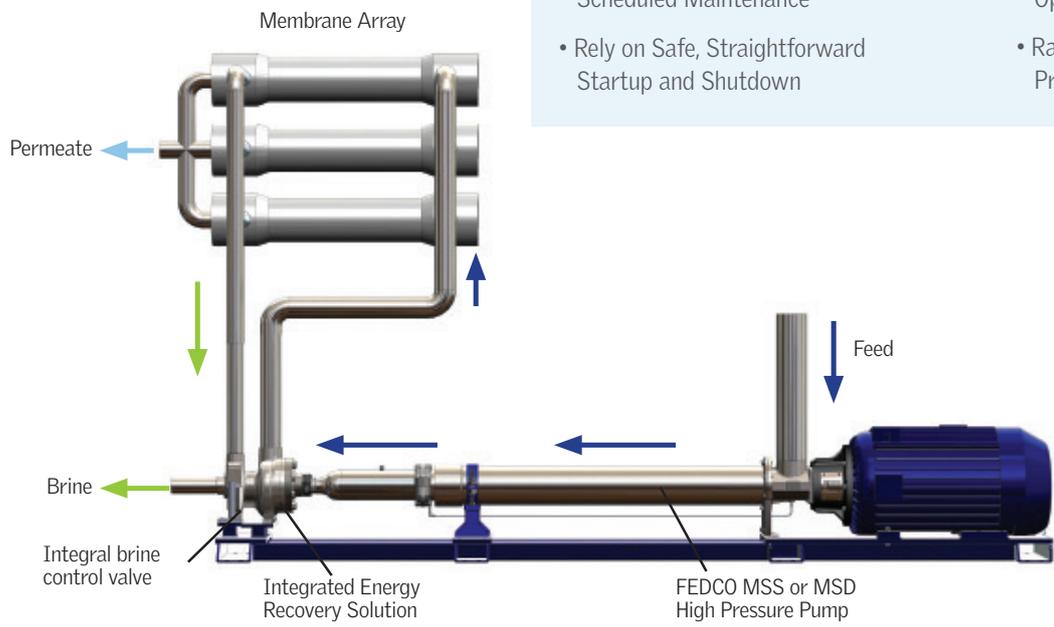
- Custom Engineered for Better RO System Performance
- Enables Simple RO Configurations with No Feed Splitting
- Increase Duty Points with Self Regulating Energy Recovery

Built for Resilience

- Zero Brine Mixing, Better Permeate Quality
- Reduced Downtime with Minimal Scheduled Maintenance
- Rely on Safe, Straightforward Startup and Shutdown

Get Up and Running—Fast

- Short Lead Times for the Most Demanding Project Schedule
- Simple Installation and Minimal Operator Training
- Rapid Commissioning to Start Water Production Quickly



Complete Pump and ERD Packages Available

Global Service and Support

- Spare Parts Delivered Fast
- Installation and Commissioning
- Operator Training
- Technical Assistance
- On-site or Off-site Service
- Loaner Rotor Program

Innovative Technology

- Fully Custom Engineered Products
- One Piece Rotor
- CFD-optimized Multi-vane Diffuser
- Rotor Flo™ Patented Lubrication
- No External Tubing or Auxiliary Equipment
- Super Duplex Construction

Superior Proven Efficiency

FEDCO's HPB leads the industry as the only turbocharger in the industry tested to exceed 80% transfer efficiency

Our turbochargers benefit from custom engineering, in-house test equipment, and continuous efficiency improvements



83+% EFFICIENCY

FEDCO Energy Recovery Devices can handle flows of 1600+ m³/h with 83%+ efficiency



Whether it is field operating log sheet data or precision test stand data, the HPB displays the highest average efficiency of any turbocharger ERD. Fully machined rotors and CFD-optimized hydraulic design make the difference.

HPB Turbocharger Energy Recovery Device

OPERATING ENVELOPE

Flow Rate: 5—3460 m³/hr (22—15,234 gpm)

Pressure: < 124 bar (1800 psi)

Liquid: Seawater, Brackish Water, Potable Water, Concentrate (20 microns)

Temperature: < 40 °C (104 °F)

MATERIALS

Casing: Duplex SS, Super Duplex SS

Rotor: Duplex SS, Super Duplex SS

Bearings: Non-metallic

Pipe Connections: Grooved End

3 Year Warranty

OPTIONAL FEATURES

Flanged Connections

High Pressure Option

Automated Brine Control

*Contact FEDCO for your custom option requirements

REVERSE OSMOSIS

Seawater and Brackish Water	Marine
Industrial/Municipal	Oil & Gas
Interstage Pressure Boosting	Produced Water
Hotels/Islands/Resorts	Water Reuse

SYSTEM UPGRADES

Contact FEDCO to upgrade your existing reverse osmosis desalination plant to state-of-the-art pumps and energy recovery devices.

FEDCO has a broad range of feed pumps, booster pumps, and energy recovery devices for seawater and brackish water reverse osmosis applications.



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High Recovery: The Future of RO



BiTurbo High Recovery SWRO Configuration



High recovery SWRO up to 60%

Reduced pretreatment and intake size

Lowest total water cost (CAPEX+OPEX)

Applications from small to mega-scale projects

Proven Performance

- 5 BiTurbo™ units are currently in operation, with a further 20 under development
- The world's first BiTurbo™, installed in Los Cabos, won distinction at the 2019 Global Water Awards' Desalination Plant of the Year category
- Self-regulating properties of turbochargers mean that the BiTurbo™ design easily handles fluctuations in feed quality and temperature

Cutting Edge Technology

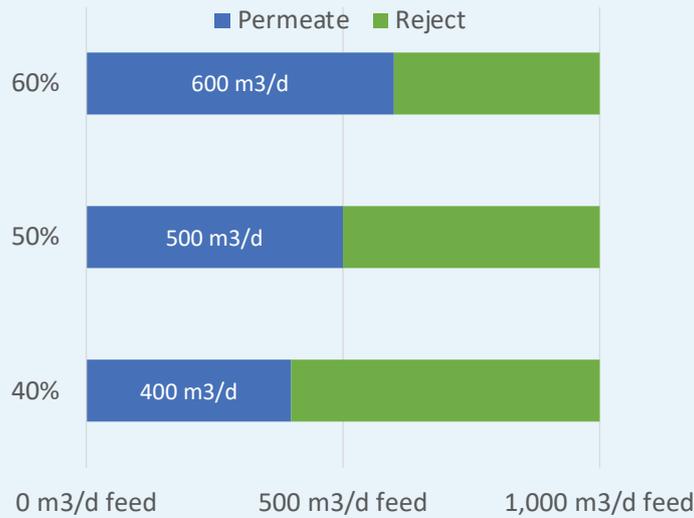
The BiTurbo™ has been tried, tested and proven at pressures up to 100 bar at Saudi Arabia's Desalination Technology & Research Institute (DTRI), in partnership with the Saline Water Conversion Corporation (SWCC)



High Recovery: Making SWRO Affordable

- The BiTurbo™ SWRO system delivers the lowest total cost of water
- Increasing recovery reduces intake, out-fall and pretreatment requirements
- Boosting recovery to 60% unlocks the full potential of SWRO technology

Doing More With Less: Permeate Production at Varying Recovery Rates



BiTurbo™
HIGH RECOVERY
SWRO

50%

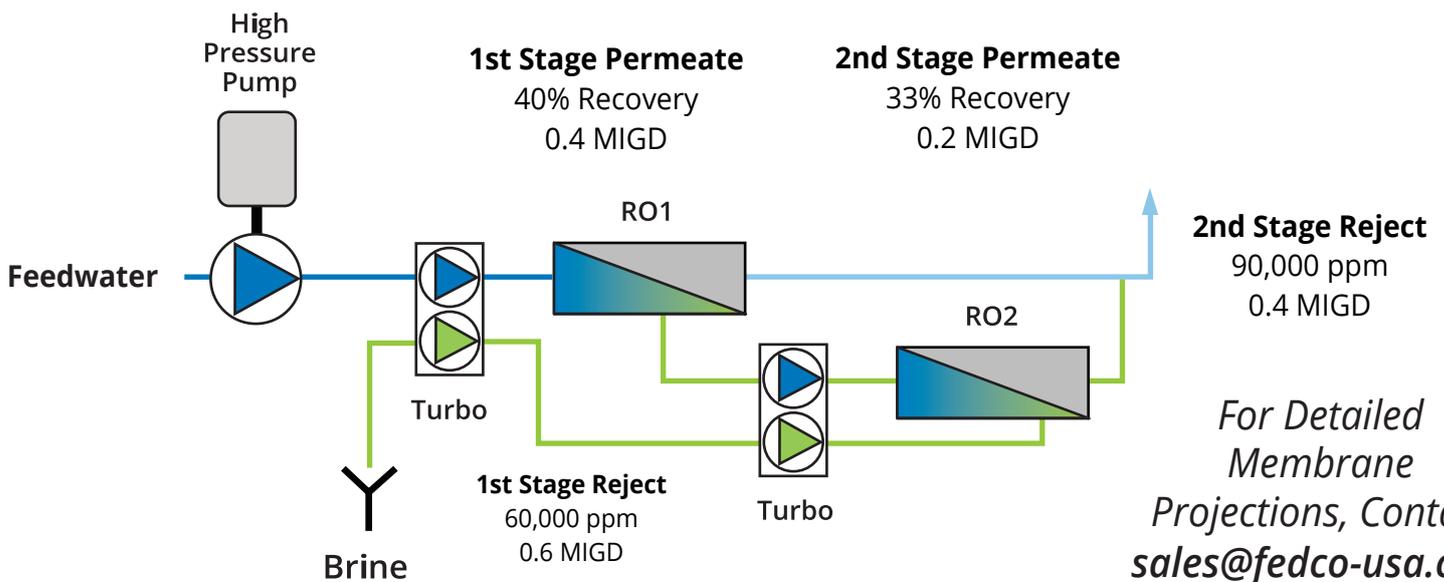
Increase in Water
Production Compared to
Conventional SWRO

Next-Generation Desalination

- The BiTurbo™ configuration operates at up to 60% recovery - **50% more water** than conventional SWRO
- This approach to high recovery SWRO uses standard pumps, membranes and pressure vessels, with **competitive energy consumption**
- Turbochargers provide feed and interstage boosting, and flux balance the system to ensure **outstanding membrane performance**

Maximise System Performance

- Straightforward design allows for rapid installation and commissioning for **greenfield and retrofit projects**
- Standard SWRO membranes are capable of handling brine discharge of **up to 90,000 ppm** - operating below this threshold wastes valuable fresh water
- Self-regulating properties of turbochargers make the BiTurbo™ inherently **stable, reliable and safe**



For Detailed
Membrane
Projections, Contact
sales@fedco-usa.com

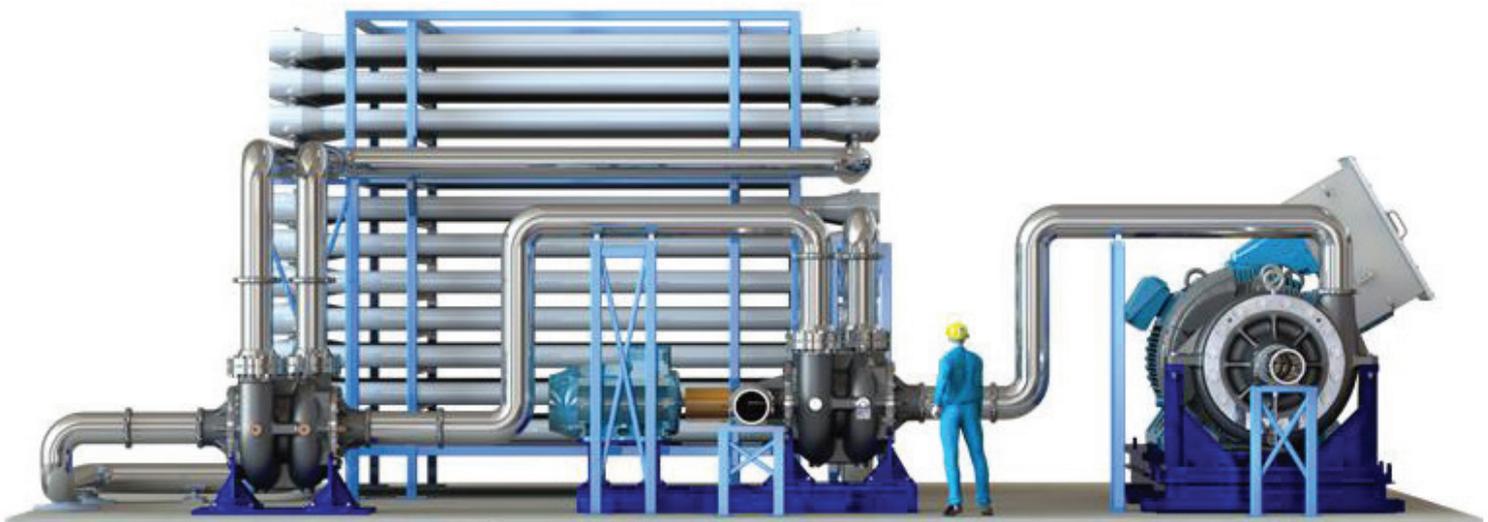
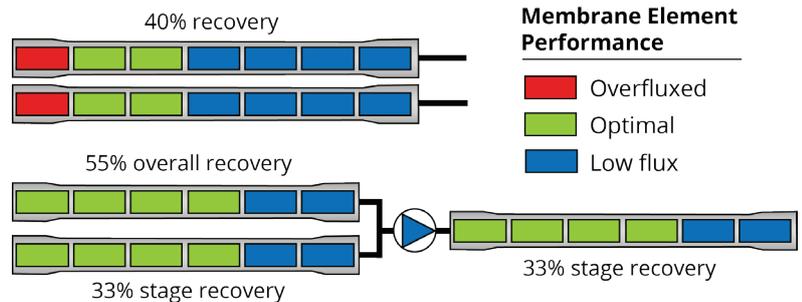
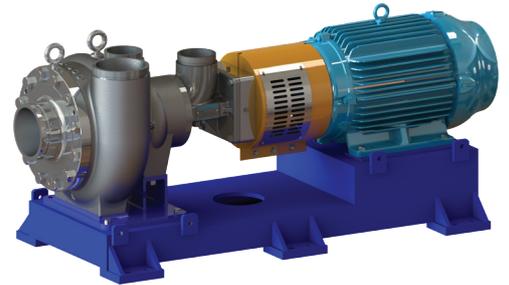
The next generation of mega-scale SWRO

By optimizing seawater desalination membrane performance, hydraulic efficiency and electrical configuration, we can deliver the next generation of mega-scale SWRO.

Reverse osmosis. Redefined.

- ✓ **Reduce Energy Consumption**
- ✓ **Optimize Membrane Conditions**
- ✓ **Improve Plant Reliability**

- Lower variation in Net Driving Pressure (NDP)
- Better flux balancing than single stage RO systems, even at higher recovery rates
- Up to 30% long membrane life
- Reduced biofouling potential due to higher average cross-flow velocity



Optimize Membrane Conditions

- Up to 30% longer membrane life
- Lower fouling risk: up to 40% lower membrane beta
- Up to 30% improvement in permeate quality, reducing or removing second-pass RO requirements

Reduce Energy Consumption

- Eliminates up to 80% of the VFDs used to drive the high pressure pumps
- Up to 5% lower energy consumption compared with isobaric chambers by reduced VFD losses and improved membrane efficiency

Improve Plant Reliability

- Reduced VFD downtime
- Reduced CIP
- Longer membrane life
- Higher ERD reliability



Selected References: Turbocharger ERD

Model numbers (HPB500- etc) express nominal flow rate in m³/hr
 Best efficiencies are achieved within c.%20 of nominal flow.

Year	Country	Customer	Qty.	ERD
2023	Confidential Location	Pact Engineering FZC	32	HPB-500
2022	Saudi Arabia	Saline Water Conversion Company	2	HPB-1400
2022	United Arab Emirates	United Arab Emirates	2	HPB-500
2021	Saudi Arabia	Saline Water Conversion Company	1	HPB-1400
2021	Australia	Roy Hill Mine	3	HPB-700
2021	India	Confidential Client	3	HPB-700
2021	United Arab Emirates	Confidential Client	6	HPB-500
2021	Egypt	Confidential Client	1	HPB-700
2020	Saudi Arabia	Saline Water Conversion Company	2	HPB-2800
2020	Chile	Confidential Client	1	HPB-1400
2019	India	Adani Power (Mundra) Ltd	1	HPB-700
2019	UAE	Aqualine General Trading LLC	3	HPB-1400
2017	Spain	Valoriza Agua S.L.	1	HPB-500
2017	Australia	Clough Suez Water Partner	4	HPB-500
2012	Saudi Arabia	KSB Group	3	HPB-700
2012	UAE	Aqualine General Trading LLC	4	HPB-700
2011	Saudi Arabia	Doosan Heavy Industries	17	HPB-2800
2010	India	VA Tech Wabag Ltd.	1	HPB-700
2010	Saudi Arabia	Doosan Heavy Industries	16	HPB-1400
2009	South Korea	Doosan Heavy Industries	1	HPB-1000



Selected References: High Pressure Pumps

Model numbers (MSD400- etc) express nominal flow rate in m³/hr
 Best efficiencies are achieved within c.%20 of nominal flow.

Year	Country	Customer/Project Name	Qty.	Pump
2024	USA	Motor Controls Inc.	1	MSD-400
2023	United Arab Emirates	Corodex Industries	3	MSD-400
2023	United Arab Emirates	Corodex Industries	2	MSD-400
2023	USA	SUEZ WTS Solutions USA, Inc.	1	MSD-400
2022	United Arab Emirates	Pact Engineering FZC	30	MSD-400
2022	Turkey	ESLI End. Ur. Paz. San Ve Tic. Ltd. Sti.	3	MSD-400
2022	USA	Marlo Inc	1	MSD-400
2022	USA	AEREX Industries	2	MSD-400
2022	USA	AEREX Industries	2	MSD-400
2022	Turkey	ESLI End. Ur. Paz. San Ve Tic. Ltd. Sti.	2	MSD-350
2022	USA	Shook/AECOM	6	MSD-35
2020	United Arab Emirates	Super Quality Trading Est.	2	MSD-650
2020	USA	Desalitech Inc.	1	MSD-400
2020	India	Shakunth Aqua Products	1	MSD-400
2021	Mexico	World Water, Inc.	1	MSD-400
2021	Australia	Osmoflo	3	MSD-800
2021	Mexico	World Water, Inc.	1	MSD-400
2021	Egypt	Motor Controls Inc.	1	MSD-800
2020	China	Beijing Onway New Tech. Co., Ltd.	3	MSD-400

Reference List: BiTurbo Multi-stage Reverse Osmosis

Online Date	PO	Application	Capacity (m ³ /d)	Feed TDS (ppm)	Recovery
2023	Chileno Bay	Resort	5,400	36,000	57%
Scheduled 2023	Fluid Technologies	-	3,785	45,000	45%
2019		Resort	3,000	27,000	50%
2023		Resort	3,000	27,000	50%
Sched. 2023	Twin Dolphin	Resort	2,800	36,000	60%
2022	San Quintín	Agriculture	2,300	36,000	58%
Sched. 2023		Resort	2,000	40,000	50%
Sched. 2023	WTM	Resort	1,300	36,000	60%
Sched. 2023	WTM	Resort	1,300	36,000	60%
Sched. 2023	Fluid Technologies	-	1,300	45,000	45%
2022	Cancún	Resort	700	36,000	60%
2022	Jubail	Brine Mining (Ultra high pressure)	672	48,000	68%
2019	Cabo San Lucas	Resort	360	28,000	60%



Making fluid energy work for **you**™

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