

Distributors of equipment
manufactured by
MARLO
INCORPORATED®

MSB Series



INDUSTRIAL PACKAGED SEPARATE BED DEMINERALIZER



(Twin System With Optional Recirculation Pump)

Quality Products for Quality Water



(Single System With Optional Recirculation Pump)

PRODUCT OVERVIEW

The Marlo MSB Series Industrial Separate Bed Systems are engineered to economically produce high purity water by removal of dissolved minerals. Each MSB machine is constructed using the highest quality components and materials for reliable operation and exceptional performance. Our standard machines are available with product water outputs from 5-600 GPM. Contact the factory for larger flow rate requirements.

Marlo also offers a wide variety of machine options, pre/post treatment equipment, distribution pumps, and integrated controls for a complete water treatment system. Our specialty is skid mounted, pre-piped, and pre-wired equipment allowing for quick installation and start-up time. Marlo engineers are ready to work with you to design a system meeting your water treatment requirements.

The following are just a few of the industrial applications benefitting from the use of Demineralized water:

- Boiler Feedwater
- Electronics Manufacturing
- Ink / Dye Production
- Food / Beverage Production
- Reverse Osmosis System Post-Treatment
- Chemical Manufacturing
- Metal Plating / Finishing
- Ice-Making
- Bottled Water

... DESIGNED FOR PERFORMANCE

SYSTEM FEATURES

Skid Assemblies

All systems are manufactured skid mounted and prepped providing for ease of installation with minimum floor space requirements. Constructed of welded structural carbon steel, finished with acid and caustic resistant epoxy paint. Stainless steel fastener hardware is standard for corrosion resistance.

Resin Tanks

Resin tanks are fabricated of heavy gauge carbon steel, electrically welded and internally coated with a 40-45 mil thick vinyl ester coating over a sandblasted surface to ensure proper adhesion and complete coverage of all surfaces. All exterior surfaces are sandblasted and coated with acid and caustic resistant epoxy paint. All connections are 150 lb. flanged. All tanks have flanged resin clean-out connections.

Underdrain

The Marlo hub-radial design features non-clogging pipe based wedge wire laterals fabricated from heavy duty PVC. This construction provides the ultimate in corrosion resistance and long trouble free service. The Marlo underdrain design uses a flat false bottom eliminating the requirement for support beds such as anthracite or quartz.

Upper Distributor

An inlet baffle type distributor is provided to properly distribute the inlet water/regenerate water and collect backwash water. All upper distributors are manufactured of heavy duty PVC.

Regenerant Distributors

On tanks 42" - 96" dia. a hub-radial regenerate distributor is provided 6" above the upper resin bed to evenly distribute the regeneration water.

Resin

Cation resin is provided which is a strong acid high capacity, bead-form, conventional gel polystyrene sulfonated exchange resin which is shipped in the hydrogen form ready for immediate use. Resin capacity information is based on 6 lbs. of hydrochloric acid per cu. ft. of exchange resin.

Anion resin is provided which is a strong base, high capacity, type 2, bead form, conventional gel exchange resin which is shipped in the chloride form for maximum storage life. Resin capacity information is based on 6 lbs. of sodium hydroxide per cu. ft. of exchange resin.

System Piping and Valves

All systems are completely pre-piped to the fullest extent possible and installation ready. Schedule 80 PVC pipe and fittings is standard. Individually sized all plastic diaphragm or butterfly valves arranged in a piping module according to the flow pattern of each mode of regeneration ensure reliable and efficient operation. The following valves are provided as standard for flow and convenient operation:

- Air operated automatic regeneration control valves
- Inlet water pressure regulator for accurate regeneration
- Inlet, outlet, dilute acid, dilute caustic sample valves
- Manual air vent valves
- Manual tank drain valves
- Skid and tank isolation valves
- Pressure gauge isolation valves
- Inlet air pressure regulator with isolation valve

Instrumentation

All systems feature a complete instrumentation package for optimal performance and monitoring. Each of the following instruments are pre-piped and wired:

- Inlet/outlet cation vessel pressure gauges
- Inlet/outlet anion vessel pressure gauges
- Air inlet pressure gauge
- In-line inlet flow meter
- Air inlet low pressure switch with alarm
- Outlet conductivity meter

System Control

Operations of the systems are automatically controlled through a comprehensive programmable controller [PLC] package housed in a NEMA-4X Fiberglass industrial electrical enclosure. All automatic valves are operated through heavy duty 3-way solenoids with manual over-ride for maximum flexibility. The control system also includes pre-wired operator switches/pushbuttons, and status/alarm indicator lights. Standard systems include the following:

- Regeneration and service status lights
- Low air pressure alarm
- High conductivity alarm
- Pre-service rinse failure
- Post-regeneration rinse failure
- Regeneration required alarm
- System operation selector switches

SYSTEM OPTIONS

Machine Hardware

- Automatic low/no flow recirculation pump
- Pumped chemical regeneration
- ASME code stamped pressure vessels
- Rubber lining
- Automatic alternating systems for continuous service
- Warm caustic regeneration
- Sulfuric acid regenerated cation systems
- Fiberglass skids and tanks on smaller sizes
- Stainless Steel internal distributors

Instrumentation

- Digital flow totalization
- Digital acid/caustic percent meters
- Digital inlet/outlet pH meter
- Digital inlet ORP meter
- Current output for all digital instruments
- Touch screen operator control monitor

Resin Options

- Layered weak/strong acid systems
- Layered weak/strong base systems
- Macroporous resins

Tanks and Distribution Systems

- FRP and HDPE storage tanks and level controls
- Repressurization pumps

Neutralization Systems

- FRP and HDPE tanks and level controls
- pH controls
- Automatic recirculation
- Air sparge/motor driven mixers

Degasifiers

- Forced and induced draft designs
- FRP tanks and level controls
- Polypropylene tower packing
- Repressurization pumps and controls

Pre-Treatment Systems

- Multi-media filters
- Activated carbon filters
- Reverse Osmosis systems

Post-Treatment Systems

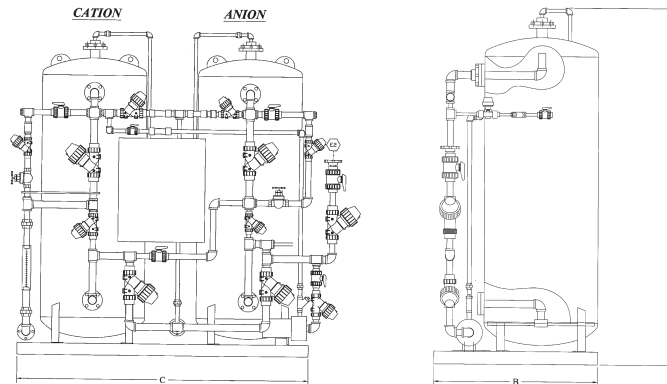
- Mixed bed deionization
- UV sterilization
- Activated carbon filters

SPECIFICATIONS MSB SERIES

| Model No. | Capacity | Service Flow Min. | Service Flow Max. | Tank Size | Resin Volume | Resin Volume | Pipe Size | Waste Volume | Acid Per Regeneration | Caustic Per Regeneration |
|-----------|----------|-------------------|-------------------|-----------|---------------------|--------------------|-----------|--------------|-----------------------|--------------------------|
| | | | | | CATION (Cu. Ft.) | ANION (Cu. Ft.) | | | | |
| | | (GPM) | (GPM) | Inches | | | (ips) | (GALS) | (GALS) | (GALS) |
| MSB-1684 | 100 KGR | 5 | 17 | 16 x 84 | 5 | 5 1/2 | 1 | 726 | 10 1/2 | 5 1/4 |
| MSB-2084 | 140 KGR | 7 | 26 | 20 x 84 | 7 | 8 | 1 | 1046 | 14 1/2 | 7 1/2 |
| MSB-2484 | 220 KGR | 11 | 37 | 24 x 84 | 11 | 12 | 1 1/2 | 1597 | 23 | 11 1/3 |
| MSB-3084 | 340 KGR | 17 | 60 | 30 x 84 | 17 | 19 | 2 | 2482 | 35 1/2 | 18 |
| MSB-3684 | 500 KGR | 25 | 85 | 36 x 84 | 25 | 27 | 2 1/2 | 3579 | 52 1/3 | 25 1/2 |
| MSB-4284 | 680 KGR | 34 | 115 | 42 x 84 | 34 | 37 | 2 1/2 | 4873 | 71 | 35 |
| MSB-4884 | 860 KGR | 43 | 150 | 48 x 84 | 43 | 48 | 2 1/2 | 6274 | 90 | 45 1/4 |
| MSB-5484 | 1100 KGR | 55 | 190 | 54 x 84 | 55 | 60 | 3 | 7924 | 115 | 56 1/2 |
| MSB-6084 | 1320 KGR | 66 | 235 | 60 x 84 | 66 | 72 | 3 | 9574 | 138 | 68 |
| MSB-6684 | 1640 KGR | 82 | 288 | 66 x 84 | 82 | 90 | 3 | 11854 | 171 | 85 |
| MSB-7284 | 1900 KGR | 95 | 336 | 72 x 84 | 95 | 104 | 4 | 13738 | 198 | 98 |
| MSB-7884 | 2260 KGR | 113 | 396 | 78 x 84 | 113 | 124 | 4 | 16337 | 236 | 117 |
| MSB-8484 | 2640 KGR | 132 | 456 | 84 x 84 | 132 | 144 | 6 | 18986 | 276 | 136 |
| MSB-9084 | 3040 KGR | 152 | 528 | 90 x 84 | 152 | 167 | 6 | 21990 | 318 | 157 |
| MSB-9684 | 3440 KGR | 173 | 600 | 96 x 84 | 173 | 190 | 6 | 24962 | 362 | 180 |

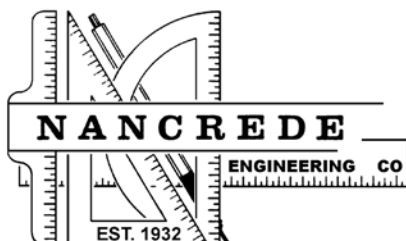
OVERALL SYSTEM DIMENSIONS

| Model No. | Height A | Width B | Length C | Shipping Weight (LBS) | Operating Weight (LBS) |
|-----------|----------|---------|----------|-----------------------|------------------------|
| MSB-1684 | 98" | 34" | 80" | 2265 | 3265 |
| MSB-2084 | 106" | 38" | 88" | 2605 | 3905 |
| MSB-2484 | 108" | 42" | 96" | 3054 | 4854 |
| MSB-3084 | 111" | 48" | 108" | 4187 | 7087 |
| MSB-3684 | 114" | 54" | 120" | 5665 | 8465 |
| MSB-4284 | 117" | 60" | 132" | 7452 | 12852 |
| MSB-4884 | 122" | 66" | 144" | 9185 | 16485 |
| MSB-5484 | 125" | 72" | 156" | 11162 | 20162 |
| MSB-6084 | 128" | 78" | 168" | 13888 | 25088 |
| MSB-6684 | 133" | 90" | 186" | 17055 | 30555 |
| MSB-7284 | 136" | 96" | 198" | 19163 | 36700 |
| MSB-7884 | 139" | 102" | 210" | 23157 | 46614 |
| MSB-8484 | 142" | 108" | 222" | 26614 | 49825 |
| MSB-9084 | 145" | 114" | 234" | 32128 | 59128 |
| MSB-9684 | 148" | 120" | 246" | 36416 | 66750 |



NOTES

1. Capacities are based on raw water not having more than 10 GPG total dissolved solids as CaCO₃ consisting of 25% sodium, 50% alkalinity and free of color, oil, turbidity and organics.
2. Cation resin uses 30% hydrochloric acid for regeneration, anion resin uses 50% sodium hydroxide for regeneration.
3. Operating pressures 60-100 PSI
4. Maximum water temperature 100° F.
5. All piping connections are 150# flanged except air and strong chemical which are 150# threaded.
6. All automatic valves are air operated requiring an 80-100 PSIG clean air supply.
7. Standard electrical power; 115 VAC, 1-Phase, 60 Hz.
8. Regeneration waste may require neutralization.



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