NANCREDE ENGINEERING CO
EST. 1932

Distributors of equipment manufactured by
MARLO INCORPORATED ®

MR Series

A07

PACKAGED WATER SOFTENERS

Triple System - Skid Mounted, Prepiped and Prewired (Option Shown)

Quality Products for Quality Water

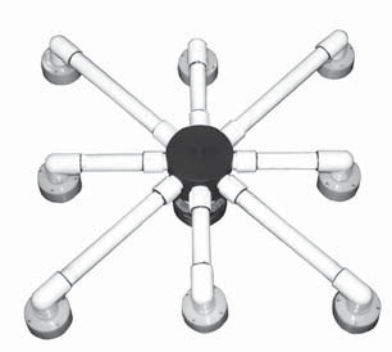
MARLO INCORPORATED®

MR SERIES . . .

SYSTEM DESIGN

MARLO "MR" water softeners utilize a system of integrated components selected for optimum performance and reliability. Ease of field service and availability of parts are also important criteria in the selection of components.

- **High Capacity Resin**
  MARLO high capacity resin is of uniform bead size possessing high exchange capacity and low pressure loss combined with excellent stability over a wide range of operating conditions.
- **Regeneration Module**
  Individually sized cast iron diaphragm valves arranged in a galvanized steel piping module according to the flow pattern of each mode of regeneration to ensure reliable and efficient operation. Flexibility of design is possible without the use of auxiliary service valves associated with multiport control valves. Automatic by-pass during regeneration is provided on single units.
- **Regeneration Control**
  The regeneration modes are automatically controlled by a staging pilot coupled to a time clock. The staging pilot can be supplied with hydraulic or pneumatic pressure for flexibility of operation. Pushbutton start and means for manual operation are provided as standard.



APPLICATION DATA

- **Pressure Range**
  30 psi minimum pressure required to ensure proper brining. 100 psi maximum pressure with standard units. Equipment available for higher pressures.
- **Temperature**
  Standard equipment is suitable for water up to 120° F. Custom fitted equipment is available for higher temperatures and special applications.
- **Electrical**
  110 volt, 60 hertz, 1 phase AC power is standard. MARLO controls are available for other electric requirements. Electrical enclosures are NEMA 12 rated as standard. Other NEMA ratings are available on request.

RESIN TANK

Standard Construction

The resin tank is fabricated of heavy gauge carbon steel and electrically welded. Tank supports are fabricated of structural steel with anchor pads. A 4" x 6" handhole access opening is provided in the upper tank head for tank 20" to 30" diameter and a 11" x 15" manway is provided for tank 36" to 42" diameter. All tanks are equipped with a 4" x 6" handhole in the lower tank sideshell.

Linings/Exterior Finish Coatings

The standard tank interior lining is an NSF approved, cold-set epoxy coating applied at a 10-12 mil DFT to a sandblasted surface. The standard tank exterior finish is a self-priming epoxy based paint in Safety Blue color and applied at a 4-6 mil DFT to a sandblasted surface. Alternative tank lining and finish paint systems are available upon request.

ASME Code Option

The resin tank is available fabricated in accordance with ASME code, certified, and stamped with standard pressure rating 100 psi working pressure - 150 psi test, with other pressure ratings available.

UNDERDRAIN

The MARLO hub-radial distribution system ensures utilization of the entire bed area during all flow rates and also minimizes channeling during periods of low flow.

The hub-radial design features non-clogging stainers arranged in a radial network. The strainers are molded from polypropylene and the radial pipes are fabricated from heavy duty PVC pipe. This construction provides the ultimate in corrosion resistance and long trouble-free service. The system uses a single layer of fine washed gravel to avoid intrusion of resin fines and eliminate wasted capacity in the bottom area of the resin bed.

Upper Distributor

An inlet baffle type distributor is provided to properly distribute the inlet water and collect the backwash water.

. . . DESIGNED FOR PERFORMANCE

OPTIONS

◆ Water Meters

A water meter increases the efficiency of operation where demand is variable. Often times capital costs can be reduced by installing smaller multiple tank meter controlled softeners capable of regenerating several times daily.

MF Series

- Electromechanical meter with dial volume indicator.
- Operates 1 to 3 softeners in single, alternating or parallel configurations.
- Utilizes full diameter brass turbine meter from 1" to 3". The 2" meter is also available in a more economical thermoplastic material.
- E. T. electronic digital display register is also available as an option.

MX Series

- Electronic programmable controller with digital volume remaining, flow rate, totalizer and regeneration cycle indicators.
- Operates 1 to 3 softeners in single, alternating, parallel or additive flow configurations.
- Utilizes insertion type paddlewheel flow sensors from 1" through 3".

◆ Alternative Piping & Valve Material

Softener piping and control valves are available in several alternative materials of construction such as Sch 80 PVC, copper, and stainless steel for more corrosion resistance and compatibility with the users existing piping system.

◆ Skid Mount Option

Resin tanks mounted on a common structural steel base. Prewired with single power connections. Prepiped interconnecting piping supplied with inlet, outlet and drain single point customer connections.

◆ Alternator

To provide one or more units in service with one or more units in a standby mode. This assures a constant supply of soft water without interruption.

◆ Alternative Exchange Resin

The standard cation resin can be substituted for a variety of different types including 10% cross-linked resin for high chlorine and higher temperature applications and higher efficiency resins for increased flow rates or lower hardness leakage.

DIAPHRAGM VALVES

The diaphragm valves used are of the "Y" pattern design allowing for higher flow rates at lower pressure drops. The valves use a guided stem design and are operated hydraulically with the system water pressure, or pneumatically with plant air pressure.

Backwash Controller

An automatic flow controller maintains the proper backwash flow rate over wide variations in operating pressure, utilizing a variable orifice concept requiring no field adjustments.

Timer/Stager

The timer uses a calendar clock for flexibility in regeneration scheduling, with a means for manual initiation as standard.

A motor driven multiport stager is coupled with the timer to automatically control each step of the regeneration cycle. The stager can be manually operated in the event of electrical power failure. The sequence timer is adjustable to allow for variations in operation conditions.

BRINE MAKER

MARLO's dry salt storage system allows maximum salt storage using a high salt platform for minimum water contact minimizing salt bridging. The system in essence effects two tanks in one with the lower compartment for saturated brine storage and the upper for dry salt storage. Brine maker tanks are constructed of rigid polyethylene with cover of the same material, and contain a separate well for housing the brine valve. The brine maker allows salt to be added at any time without brine overflow and waste.

Injector

A PVC pressure compensating hydraulic injector is used to convey brine to the softener at the correct brine rate and concentration.

BRINE VALVE

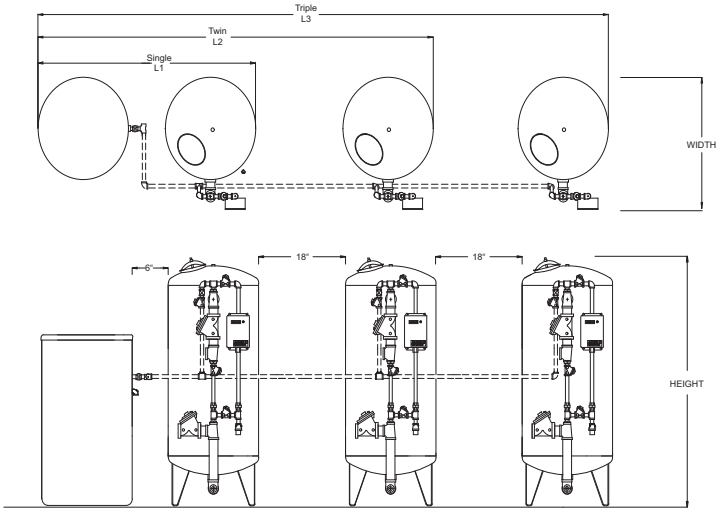
Precise volumetric control of both refill and brine draw is provided by a single float operated brine valve. An integral air check assures positive brine shutoff. On site adjustment of salt dosage without disassembly of the brine maker is easily accomplished by adding or deleting brine valve riser pipe segments.

SPECIFICATIONS MR SERIES

CATALOG NUMBER	EXCHANGE CAPACITY/(Grains) SALT DOSAGE/(Pounds) SALT USAGE/(Pounds)❶ MAX.	MIN.	FLOW RATES SERVICE CONT. GPM❷	PEAK GPM❸	BACKWASH GPM	PIPE SIZE SERVICE IN.	DRAIN IN.	RESIN CU. FT.	TANK SIZES SOFTENER IN.	BRINE❹ IN.	SALT STORAGE LBS	REG'N Per Salt Refill @ 5 Max.	Min.
MR-150-1	150,000/ 75/ 75	100,000/ 30/ 30	32	42	10	1	1	5	20 x 54	24 x 50	700	9	23
MR-150-1-1/4			43	57		1-1/4	1						
MR-150-1-1/2			55	78		1-1/2	1						
MR-150-2			69	97		2	1						
MR-210-1-1/4	210,000/ 105/ 105	140,000/ 42/ 42	41	57	15	1-1/4	1	7	24 x 54	24 x 50	600	5	14
MR-210-1-1/2			64	86		1-1/2	1						
MR-210-2			80	110		2	1						
MR-210-2-1/2			115	160		2-1/2	1						
MR-300-1-1/2	300,000/ 150/ 150	200,000/ 60/ 60	68	92	20	1-1/2	1	10	30 x 54	24 x 60	600	4	10
MR-300-2			92	125		2	1						
MR-300-2-1/2			140	190		2-1/2	1						
MR-300-3			165	230		3	1						
MR-450-1-1/2	450,000/ 225/ 225	300,000/ 90/ 90	63	90	20	1-1/2	1	15	30 x 60	30 x 60	1000	4	11
MR-450-2			82	115		2	1						
MR-450-2-1/2			120	170		2-1/2	1						
MR-450-3			140	190		3	1						
MR-600-1-1/2	600,000/ 300/ 300	400,000/ 120/ 120	72	94	30	1-1/2	1-1/2	20	36 x 60	39 x 60	1900	6	15
MR-600-2			110	125		2	1-1/2						
MR-600-2-1/2			140	190		2-1/2	1-1/2						
MR-600-3			175	250		3	1-1/2						
MR-750-2	750,000 375/ 375	500,000/ 150/ 150	90	116	30	2	1-1/2	25	36 x 72	39 x 60	1700	4	11
MR-750-2-1/2			140	190		2-1/2	1-1/2						
MR-750-3			160	230		3	1-1/2						
MR-900-2	900,000 450/ 375	600,000/ 180/ 180	105	133	45	2	2	30	42 x 60	42 x 60	1900	4	10
MR-900-2-1/2			150	218		2-1/2	2						
MR-900-3			188	279		3	2						
MR-1050-2	1,050,000/ 525/ 525	700,000/ 210/ 210	95	124	45	2	2	35	42 x 72	50 x 60	2300	4	10
MR-1050-2-1/2			145	210		2-1/2	2						
MR-1050-3			173	259		3	2						

DIMENSIONS

CATALOG NUMBER	HEIGHT❻	WIDTH	LENGTH❹ SINGLE/L1	TWIN/L2	TRIPLE/L3
MR-150-1	6'-0"	2'-5"	4'-2"	7'-4"	10'-6"
MR-150-1-1/4		2'-6"			
MR-150-1-1/2		2'-6"			
MR-150-2		2'-10"			
MR-210-1-1/4	6'-1"	2'-8"	4'-6"	8'-0"	11'-6"
MR-210-1-1/2		2'-8"			
MR-210-2		3'-0"			
MR-210-2-1/2		3'-1"			
MR-300-1-1/2	6'-4"	3'-2"	5'-0"	9'-0"	13'-0"
MR-300-2		3'-6"			
MR-300-2-1/2		3'-7"			
MR-300-3		3'-8"			
MR-450-1-1/2	6'-10"	3'-2"	5'-6"	9'-6"	13'-6"
MR-450-2		3'-6"			
MR-450-2-1/2		3'-7"			
MR-450-3		3'-8"			
MR-600-1-1/2	7'-5"	3'-8"	6'-9"	11'-3"	15'-9"
MR-600-2		4'-0"			
MR-600-2-1/2		4'-1"			
MR-600-3		4'-2"			
MR-750-2	8'-5"	4'-0"	6'-9"	11'-3"	15'-9"
MR-750-2-1/2		4'-1"			
MR-750-3		4'-2"			
MR-900-2	7'-10"	4'-6"	7'-6"	12'-6"	18'-2"
MR-900-2-1/2		4'-7"			
MR-900-3		4'-8"			
MR-1050-2	8'-10"	4'-6"	8'-2"	13'-2"	18'-2"
MR-1050-2-1/2		4'-7"			
MR-1050-3		4'-8"			



❶ **Salt Dosage** – the total quantity of salt required per regeneration to achieve the published Exchange Capacity.
Salt Usage – the quantity of new salt required to obtain the published Salt Dosage.
@ Max. – provides 2,000 Grains removal per pound of salt used.
@ Min. – provides 3,330 Grains removal per pound of salt used.
Both Salt Dosage and Salt Usage values are equal for MHC series softeners not equipped with Salt Recycler System. Adding the SRS option will reduce the salt usage amount by 25%.

❷ At pressure loss not exceeding 15 psi.

❸ At pressure loss not exceeding 25 psi.

❹ When less than 4 hours is expected between regenerations of a twin softener, two brine tanks are required. Overall length to increase by brine tank diameter.

❺ Includes one Salt Dosage as liquid brine.

❻ Allow a minimum of 24 inches above softener tank for loading. ASME tanks will add 10" to height.

NANCREDE ENGINEERING CO
EST. 1932

5356 Hillside Avenue
Indianapolis, IN 46220
P: +1 888-56-Water (569-2837)
F: +1 317-255-4727
info@nancrede.com
www.nancrede.com