Specifications
VariTech **BRINE BOSS™**
Automatic Salt Brine Production System

**1.0 Scope:**

This specification covers requirements for an Automated Salt Brine Production System intended for use as a generator of quality salt brine that is used as a prewetting, anti-icing, and/or a de-icing agent on pavement or roadways. The system shall be fully automated eliminating the need for manual salinity testing, monitoring, and adjustment.

The system must use an upflow brine production process to insure single pass saturation of fresh water being introduced into the salt bed for increased production. In addition, the upflow process will provide a sediment free brine solution that can be stored in standard flat bottom storage vessels. The need for cone bottom storage vessels is unacceptable.

The system shall include a secondary pump and plumbing arrangement allowing for manual brine production in the event of a primary pump, valve, or other electrical component failure. The secondary plumbing must include a means of automatic shutdown when the onboard storage tank is full. The secondary pump and all plumbing components shall be pre-installed and wired to provide immediate operation.

**2.0 Dimensions:**

Model # BB600 - 62" W X 62" H X 119" Long

**3.0 Storage/Holding Capacity (U.S. Gallons):**

<table>
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<th>Model BB600</th>
<th>Main Tank (Full)</th>
<th>Main Tank (Working)</th>
<th>Hopper Tank</th>
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<td></td>
<td>500</td>
<td>400</td>
<td>600</td>
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Rock Salt Holding Capacity (Cubic Yards)

Model BB600............................3.00

**4.0 Production Rate:**

Model BB600………………5000 Gallons Per Hour (Based on Customers Water Supply)

**5.0 Tank Materials:**

The salt brine production systems shall be comprised of rotationally molded, one-piece tanks. Rotationally molded polyethylene SBPS tanks shall be manufactured from a polyethylene compound that conforms to the following properties........

- Density- ASTM D-1505 .942 g/cm³
- Melt Index- ASTM D-1238 2.0 g/10min.
- Tensile Strength- ASTM D-638 2,700 PSI
- Flexural Modulus- ASTM D-790 103,000 PSI
- Low Temp Impact- ARM-Low Impact (1/4") 175 ft. lbs.
Specifications for Model BB600 continued......

Main Salt Brine Tank:
Rotationally molded one piece (no welds, joints, or seams) polyethylene plastic tank-UV stabilized to provide protection from sunlight- 5/8" nominal thickness- 3" schedule 80 PVC drain pipe with threaded plug end

Hopper/Rock Salt Tank:
Rotationally molded one - piece (no welds, joints, or seams) polyethylene plastic tank-UV stabilized to provide protection from sunlight- 5/8" nominal thickness-Open floor (No interior floor ribs to hinder cleaning, except infeed manifold supports)- 6" schedule 80 PVC drain pipe with threaded cap end- Full length 2" PVC water in-feed manifold provides even filling and salt saturation through an up flow process

Secondary Containment Tank:
Rotationally molded one piece (no welds, joints, or seams) polyethylene plastic tank- UV stabilized to provide protection from sunlight- 5/8" nominal thickness- Self supporting, molded in vertical support ribs and 3” high skid bottoms provide easy forklift entry- Requires no complex saddling or support structures- 2-1” PVC threaded plug drain fittings- Minimum 110% containment capacity

6.0 Plumbing and Plumbing Components:

All plumbing fittings shall be constructed of corrosion resistant materials such as PVC, glass reinforced polypropylene, or stainless steel. All electric valves shall be constructed of glass reinforced polypropylene with stainless steel balls and stems. Wherever possible, the use of manifold flange fittings with EPDM gaskets and stainless steel clamps shall be used for ease of maintenance. All metal fasteners shall be a minimum of 316 grade stainless steel.

The primary pump shall be a 2” x 1 ½” stainless steel centrifugal pump that is close coupled to a 3 HP, 230V, single phase, TEFC motor. Based on water, the pump shall produce 165 GPM at 30’ TDH. A dual volute casing and mechanical shaft seal shall prevent the intrusion of liquid to the electric motor.

The secondary pump shall be an epoxy coated cast iron effluent ejector pump which includes a ½ HP, 115V oil filled motor with thermal overload protection. Based on water, the 1 ½” pump discharge shall be capable of pumping 100 GPM at 10’ TDH.

7.0 Control Package:

The control system shall allow for either continuous brine production to fill a single or multiple vertical storage tanks, or batch production to fill a truck mounted applicator tank. In addition, the control system shall allow for truck loading and offloading from a single or multiple vertical storage tanks. All of these functions shall be accomplished with a single pump and control package.
Specifications for Model BB600 continued.......  

The system controls shall come standard with the option of multiple users tracking for filling and offloading of storage tanks in a shared environment. Each user shall have their password to access the truck fill operation. The system will track the time and date, gallons ordered, gallons produced, and truck identification number for viewing and/or downloading by the system administrator.

All operation and calibration features shall be password protected to prevent unauthorized use or inadvertent start-up. During production, the system shall utilize a dual toroidal sensor application to insure that the brine that is transferred to storage or truck tanks is within the acceptable range of 23.3% plus or minus .3%. If the brine is oversaturated it shall be looped back through the system while fresh water is incorporated to provide an acceptable solution. Once the brine is within range it would be diverted to a storage or truck tank. Should the brine concentration fall below the target range the system will shut down and the user will be prompted to add more salt.

The controller shall include a 12.1” TFT, 32000 color touch screen. The controller shall include USB ports and also be capable of integrating optional networking and Ethernet support for remote access and data transfer.

The operation screen of the controller shall be capable of showing the following: target brine concentration, real-time brine concentration, mode, gallons ordered, gallons produced or transferred, and storage tank volume in gallons for up to 8 storage tanks. In addition, the liquid flow throughout the system shall be displayed in real-time.

The controller shall be capable of logging the following information per production event: time and date, brine concentration produced, salt used, water used, gallons ordered, gallons completed, truck ID, user group if multiple users are selected, and any errors. Any transfer event shall track: time and date, gallons ordered, gallons completed, truck ID, user group if multiple users are selected, and any errors.

In the event of a component malfunction or failure, the system shall shut down and perform a self-diagnosis to inform the user of the fault.

8.0 Installation:  

The controller shall come prewired and ready to accept a customer supplied 220V, single phase power service. The brine system will be plumbed into customer supplied 2” female threaded water service. The seller must provide a minimum of 8 hours of on-site support for installation and training.

9.0 Warranty:  

The unit shall be warranted for a period of 1 year from the date of purchase.