





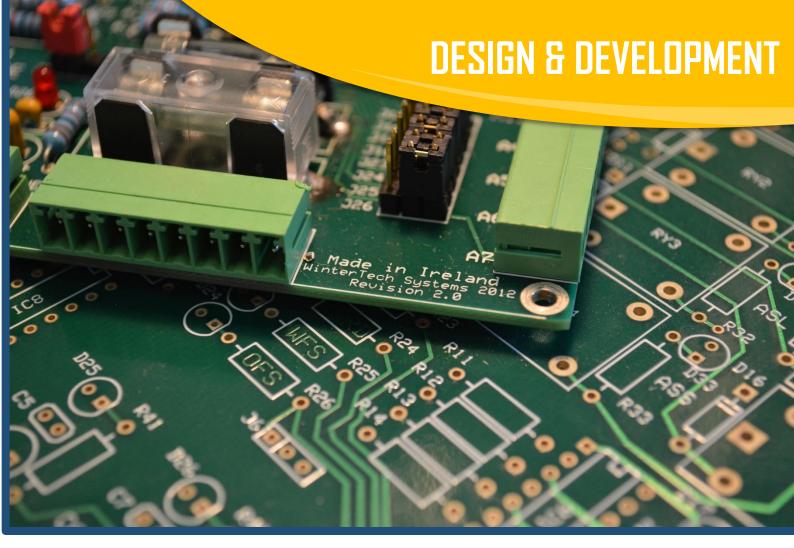
WinterTech Systems

WinterTech Systems Ltd design, develop and manufacture Brine Saturation & Storage Solutions. We manufacture in Tenure Co. Louth, Ireland and in Hull in the UK. Our flagship, the BS Series Brine Saturator product range is currently the market leader in Ireland and due to its ease of use, rich feature set and reliability we have now gained market share in the UK and have commenced exporting to Europe.

We have a combined expertise of over 50 years across a wide range of engineering disciplines including electronics, mechanical, software development and IT. This experience ensures that we can produce the best possible products that always meet or exceed the needs and expectations of our customers.

We place a lot of emphasis on our ability to provide a top class after sales service. Our relationship with the customer doesn't end after installation, we feel it's just the beginning. A close relationship with the end user ensures that our products will constantly evolve to meet ever changing needs.

Our track record with our customers is impeccable. For example, for the entire 2013/14 and 2014/2015 winter seasons we were only required to make three service visits. That kind of reliability is unheard of when machines work in such extreme environments. References are available from all customers with whom we have worked. 100% resilience for us is not a goal – it's a fact!



DESIGN

All of our products have been designed to ensure that end users can operate with minimal intervention, freeing them to get on with the job of winter servicing. The BS Series of brine stations have been designed with this ethos in mind. We have created what we believe to be the most reliable and user friendly brine stations currently available on the market today.

When designing and developing our machines we are passionate in our focus of what CAN go wrong. This is what sets our machines apart from many others. Our design team have considered the environment, possible human error and machine failure and have devised a design that actively informs the user of any problems/issues that can arise. For example, our machines automatically tell you by SMS when they need to be topped up with salt and also if any problem develops in the system. It's not every day you receive a text message from a brine station!

USER RELATIONSHIP

We value the relationship we have with our customers. We encourage our customers to provide us with any feedback they may have about our systems. Any mechanical & software issues can be discussed with our development team who guarantee with each new update any known issues will be resolved. This ensures that the machines are running at maximum efficiency and in turn, you can operate at maximum effectiveness.

FIELD TESTING

WinterTech Systems are also providers of Winter Services to the MI motorway in Ireland. For this contract, we actively use our own products in real world conditions. This means that our machines and their software are thoroughly tested from prototype to finished product. Our engineers work closely with the operatives to ensure every potential issue is rectified before final release ensuring you of a tried, tested, proven product delivered to your depot at all times.



Our manufacturing facility in Ireland is located just 5 minutes from the MI motorway and just 30 minutes from Dublin airport. This is an excellent location as this provides us with easy access to every major town & city across Ireland.

We also manufacture in the UK in HULL which allows us to easily ship and service within the UK and central Europe.

STAFF

Our staff are highly qualified and are knowledgeable in every aspect of our products. As machine designers and builders all the intellectual property of our systems resides in-house. All of our technical staff are involved in the design & development process which allows us to design products drawing from a large knowledge base. Taking feedback from the customer experiences in the field ensures that our products are always designed with the end user in mind.

MATERIALS

Our products are built with some of the most reliable components currently on the market. From the PVC pipes to the control systems each individual component that makes up our machines has been proven time and time again across a huge range of industries.

We have established a strong relationship with our suppliers to ensure that we receive the best products on the market. The quality of the materials fitted is reflected in the end product. All materials and components are selected to reduce lead time should fast replacement be required.

SERVICE & SUPPORT

DEDICATED SUPPORT 24/7

WinterTech Systems have a dedicated support team who are on call 24/7 all year round. We can uniquely guarantee to diagnose every possible problem that can occur after just one single phone call.

Our Brine Saturators come equipped with the latest technology that allow our technicians to remotely access each machine. Therefore, we can diagnose any problem quickly and efficiently. If a problem cannot be resolved over the internet and a site visit is required, we are there to FIX the problem and not to DIAGNOSE it saving many days potential downtime.

NEXT DAY SERVICE VISIT

If our service team has diagnosed a problem that requires a site visit, a technician can be on location at your site within 24 hours. This will mean that your machine will never be non-functional for any longer than one day. Depending on the nature of your business (Winter Services, Food Production etc.), this can be an important factor in choosing your brine technology provider. We carry a large stock of spare parts which ensures that our Service Technicians are always equipped with the parts needed to complete the job when they arrive on your site.

SERVICE CONTRACTS & TRAINING

We offer excellent service contracts with annual preventative maintenance schedules that will ensure your machine remains functional and efficient for as long as you require.







SALT BRINE

Standard brine is a simple mixture of water and Sodium Chloride (NaCl) salt. A pure or eutectic NaCl salt brine contains 23.3% salt concentration by mass. A eutectic NaCl brine is capable of protecting the road surface against freezing to temperatures as low as -21°C. For protection at lower temperatures other chlorides such as Calcium Chloride (CaCl) brine can be used. CaCl brine is capable of protecting the road surface to temperatures as low -51°C.

WHY USE SALT BRINE?

- It has been proven to slash annual salt consumption by as much as 78% providing huge savings.
- Applications with brine will last up to 6 times longer. This will provide additional time to respond to freezing precipitation.
- Brine can be applied at much higher speeds of up to 80km/h improving treatment times as it does not bounce or blow off the road.
- On marginal nights, using brine will significantly reduce the number of second interventions due to hoar frost. This will result in significant savings in salt usage, labour, diesel and vehicle wear and tear.
- It's a simple and safe anti-icing treatment that helps prevent the bonding of ice to road surfaces.
- Brine melts frozen precipitation faster than dry rock salt. It can be used to pre-wet salt (reducing application scatter) or as a full-wet where dry salt is not needed.
- Unlike dry salt, brine can be applied a number of days before it snows.
- Brine will stop snow compacting on roadways.
- Overall, the increased efficiency results in the use of much less salt, minimizing environmental impact.

WHAT IS BRINE?

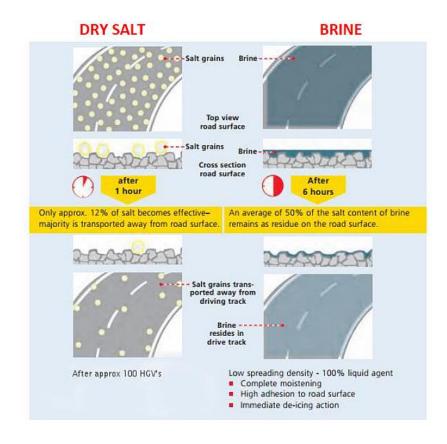
HOW DOES BRINE COMPARE TO DRY SALT?

Brine has many major advantages over dry salt. The first advantage is that Brine can be applied up to two days before snow arrives. This is obviously ideal as the ploughs don't need to be driving as often on the dangerous roadways once it starts to snow. This also lessens the service company's payroll costs.

As brine is a liquid, it doesn't get bounced around or blown off the roadway while being spread, meaning it can be applied much faster than dry salt.

After a short period, the dry salt will begin to dissipate from the road surface mainly due to wind and also being removed by vehicles from the main driving track. Brine effectively coats the road and will not dissipate meaning that far more of the treatment stays on the road. Therefore it remains effective for much longer.

Dry salt needs moisture to activate but brine is effective immediately especially when the roads are dry. It is instantly active and there is no delay in its effectiveness











Winter Tech Systems

SYSTEM DESCRIPTION

The BS Series of Brine Mixing Stations consisting of the BS6000 and BS7000 are all fully featured state of the art machines. Sharing the same control system, each machine is designed to produce brine for the purpose of Road Surface Condition Management during the winter season, specifically to treat the roads for frost, ice and snow. They are capable of producing brine from calcium chloride, magnesium chloride, sodium chloride and potassium chloride.

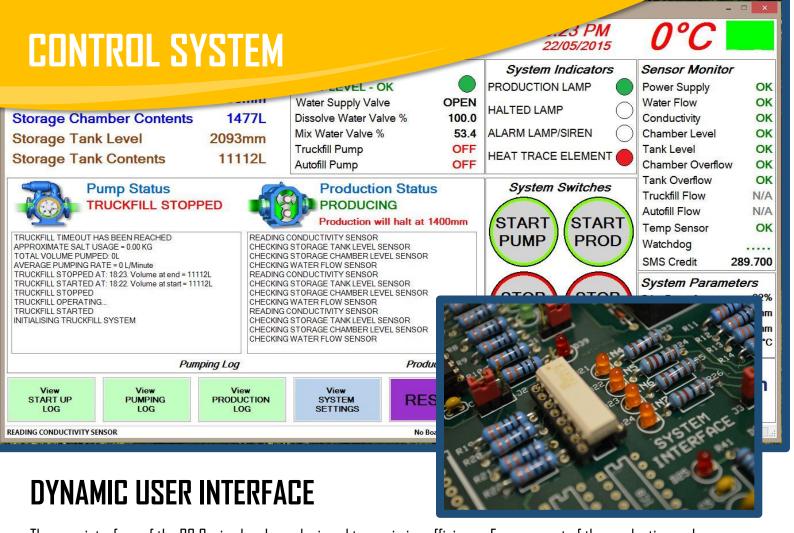
Salt brine is a liquid solution made up of salt and fresh water. The ideal concentration of salt brine for road treatment applications is typically 22-23%. This concentration has been shown to be the most effective in both treating the road surface and also in maintaining the stability of the solution for long term storage.

The control system of the BS Series of Brine Mixing Stations is designed to produce salt brine at this concentration with no user intervention. It does this by using a closed loop control system where the custom designed electronics and software uses Pulse Width Modulation (PWM) to control the valves that supply water to dissolve the dry salt.

FEATURES:

- Fully Automatic Brine Production
- Automatic Storage Tank Filling and Replenishment
- Production Rate of between 1,500 & 5,000L/hr (dependent on mains flow rate)
- Pumping Rate of up to 350L/min
- Intelligent Frost Protected Pipework
- Microsoft Windows based Operating System
- Dynamic User Interface
- SMS Messaging of Salt Status and System Errors
- Pumping & Production Logs (remote viewing)
- Remote Support & Diagnostics
- Modular Design (additional storage tanks)





The user interface of the BS Series has been designed to maximise efficiency. Every aspect of the production and pumping processes can be viewed on the 11" display. System information is displayed in real time and also logged continually. All logs can then be viewed locally on the machine or if you prefer can be viewed remotely from any internet

enabled device.

Emphasis was placed on designing a control system that needed very little formal training to operate. The layout of the BS Series software is easy to read and everything is explained through on-site training and in our comprehensive user manuals. BS Series machines ensure that everything is easy to use, both from an operator's perspective and also from a service/maintenance perspective. Therefore the entire production and pumping system can be controlled by six buttons located on the front of the unit.

The system software reads data from various sensors on the machine via the proprietary System Interface circuit board. The board reads inputs from various sensors on the saturator, all of which are optically isolated providing protection from any short circuits or power surges.

The System Interface has also been designed with spare inputs and outputs to allow for potential expansion of your system. Expansion could include extra pumps, valves, truck fill sensors and storage tanks, all of which can be provided by WinterTech Systems.





production begins with the control system dissolving the salt crystals. The brine at this stage is in an unprocessed state and is at about 26-27%

concentration. The control system detects the brine percentage by means of a conductivity sensor located in the production pipework. When the control system detects brine at 26-27% it will open up a proportional valve that adds fresh water to the brine. The fresh water will dilute the concentrated brine until it detects a concentration of 22-23% for winter services use. (The BS series can be configured to produce any concentration of brine you may require from 0-26%).

Production will continue with the control system automatically adjusting the brine percentage until it detects that the storage chamber is full. Production will then automatically halt. In the halted state the BS Series control system will trigger an Amber Strobe to physically display that the Storage Chamber is full. If an operator pumps brine out of the Storage Chamber, the system will leave the halted state and production will automatically re-commence without any user input.



CONTROL SYSTEM

ERROR HANDLING

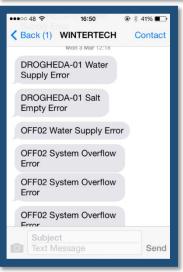
Most saturators currently on the market give very little feedback during the production and pumping processes. In most cases it is down to the operator to determine any errors that may have occurred. Considering how many components make up a saturator it could take a long period of time before issues are located and fixed.

The WinterTech Systems BS Series supersedes our competitors. Our system continually checks each sensor during the production process. If it finds any issue it will automatically stop production. When production is stopped it will then display any active problems with the system. This will include a flashing Red Strobe, an Error Message on the screen, a Warning Siren, and a message sent by SMS to any assigned numbers.

Once an error has been rectified the operator can press "Start Production". The control system will run diagnostics and the production process will begin once the system detects that the error has been fixed.

Production Status SALT EMPTY ERROR







PUMPING BRINE

Pumping Brine from the saturator is simple. All pumping actions are controlled by the buttons on the front of the unit. All pumping choices are relayed back to the user via the software to ensure that they have correctly attached the hose and also to ensure that the valves are in the correct position.

The pump is one of the more expensive components of the system. Pump failure can have a catastrophic effect. To protect the pump, we have put in a number of safety features to protect against human error and system failure.

1. Pump Flow Sensor

Detects if there is brine flowing through the pipes. The pump is stopped automatically if no flow is detected.

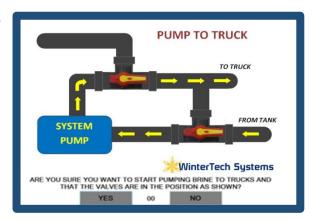
2. Pump Timeout

The pump will only run for a safe period of time and then shut off.

3. Valve Position Reminder

On screen reminder that the valves are in the correct position.

If the BS saturator is configured with storage tanks it will have an additional pump. This pump will automatically fill each storage tank during the production process without any user intervention.





REMOTE SUPPORT, DIAGNOSTICS & OPERATION

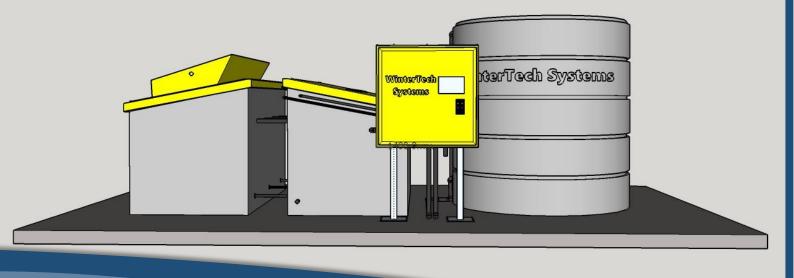
One of the most significant features of the BS Series is the remote support capability. Each BS Series saturator has the ability to be remotely accessed. This provides huge advantages to both WinterTech Systems personnel and to the end user. From the end user's perspective, the saturator can be operated with the peace of mind that if something goes wrong they can have a WinterTech Systems technician investigate the problem remotely. Most issues are resolved remotely but if the problem requires it, a site visit can be made with the technician arriving on site already knowing exactly what is wrong with the machine. With other brine saturators it could potentially require more than one site visit in order to diagnose and then to fix a problem. If your brine saturator provider is located in a different country to your brine saturator installation it could potentially become a very costly process, even for the smallest of repairs.

WinterTech Systems can also allow the customer to have remote access to the saturator. This is incredibly useful if you have a number of saturators in various locations. Combined with the SMS messaging module you will know exactly what the status of each saturator is at any stage. This avoids the necessity of having to physically check each saturator in person in order to ensure they are operating correctly. In the depths of winter this kind of feature can be absolutely

invaluable, especially if you are running a full wet brine operation.

Periodic system software updates are necessary for any system and our brine saturator is no different. With competitors saturators that have no remote support, updating can be an extremely time consuming process, requiring the technician to note down every parameter and then manually re-enter them after the update. The BS series however does not require a site visit for a system update. Instead we can log-in remotely and update the software package. The new software version can be installed in a matter of seconds. The entire update process can be completed in about 2-3 minutes. At worst case, brine production will be stopped for no longer than 5 minutes! This feature also ensures that your machine is always up to date with the latest features and developments.





BS 6000

FEATURES:

- BS Series Control System
- Automated Brine Production
- Production Rate of 1500 to 5000L/hour
- Pumping Rate of up to 350L/min
- Remote Support Capability
- Intelligent Frost Protected Pipework
- SMS messaging for Salt Levels, Error and Temperature Monitoring
- Automatic External Storage Tank Replenishment
- Production Chamber Volume: 5000L Gross
- Storage Chamber Volume: 5000L Gross
- Material: GRP
- Loading Options: Teleporter, JCB, Silo, Auger, Hand

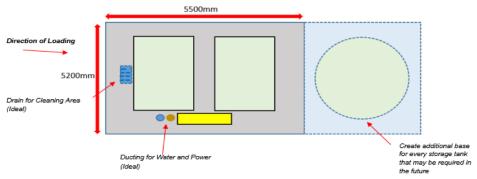


BENEFITS OF THE BS6000

- Low Cost
- Easy to Load
- Easy to Maintain & Inspect
- Modular System

The BS6000 is our entry level brine low cost saturator. It still, however, contains the same proven BS Series Control System. The internal production and storage chambers are smaller in comparison to the BS7000.

Due to the smaller storage chamber it is generally necessary to have external storage tank(s) attached to the saturator. This increases the foot print of the installation, however it means that you can have any size storage capacity you may require.



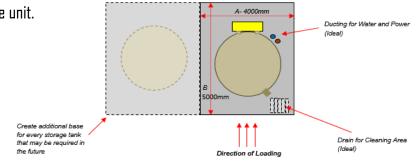




FEATURES:

- BS Series Control System
- MINI or MAXI option
- Automated Brine Production
- Production Rate of 1500 to 5000L/hour
- Pumping Rate of up to 350L/min
- Remote Support Capability
- Intelligent Frost Protected Pipework
- SMS messaging for Salt Levels, Error and Temperature Monitoring
- Automatic External Storage Tank replenishment
- MINI Production Chamber Volume: 3,200L Gross
- MINI Storage Chamber Volume: 10,000L Gross
- MAXI Production Chamber Volume: 5.750L Gross
- MAXI Storage Chamber Volume: 22,000L Gross
- Material: GRP
- Loading Options: Teleporter, Silo, Auger

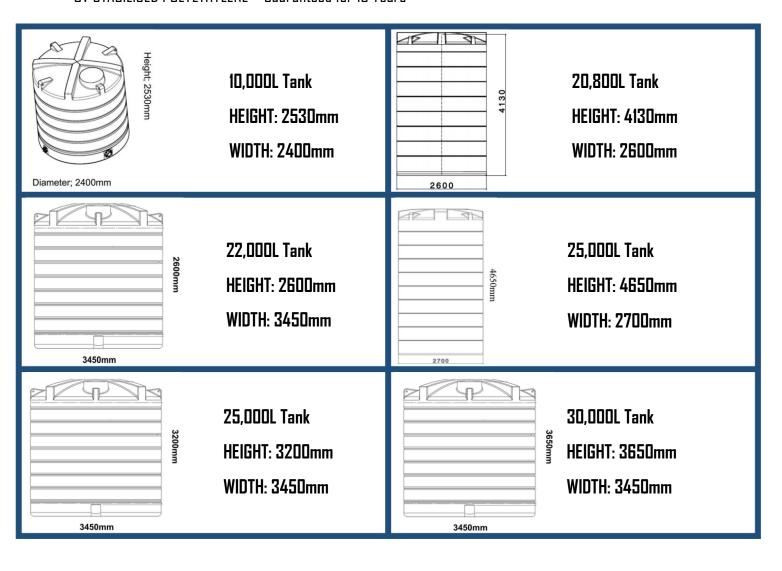
The BS7000 is our flagship saturator. It contains the proven BS Series control system. The height of this saturator provides extra storage and production capacity. The MINI station provides 10,000L of storage and the MAXI station provides a large 22,000L of internal storage. Additional external storage tanks can be added to create an installation of whatever capacity is required. The vertical cylinder shape means there is less of a footprint compared to the BS6000. A teleporter, auger or silo will be required to fill the unit.





Storage tanks are available in either single wall or double wall (bunged) in two materials:

- GLASS REINFORCED POLYESTER (GRP) Guaranteed for 30 Years
- UV STABILISED POLYETHYLENE Guaranteed for 10 Years



ROOFING OPTIONS

We provide three different roofing solutions.

The recommended option is the roof with the self-contained hopper. This roof practically removes the potential for spillages and significantly allows for up to 4m³ of additional salt to be loaded increasing the time between salt refills.

Part No: BS7000-RF-SIM-2500

Part No: BS7000-RF-SIM-3000

GRP - Lift On / Lift off Roof

Supplied in same GRP material as the Saturator Tank. Roof provided with Eye Hook for removal by Teleporter.

Roof Specification

One piece polyester body type

Diameter :2500mm / 3000 mm

Material :Glass fibre reinforced polyester on a

base of orthophthalic acid resin.

Topcoat : RAL 7036 Yellow

GRP - Roof with Self Contained Hopper

Supplied in same GRP Material as the Saturator Tank.

Provides an in-built hopper that allow simple salt filling by a Teleporter. Can be filled to the height of hopper which will reduce fill frequencies.

Allows for up to 4m³ of extra salt to le loaded.

Practically eliminates all spillages of brine when filling.

Keeps area around Brine Station clean.

Roof Specification

Three piece polyester body type

Diameter :2500 mm / 3000 mm

Material :Glass fibre reinforced polyester on a

base of orthophthalic acid resin.

Topcoat : RAL 7036 Yellow



Part No: BS7000-RF-HOP-2500

Part No: BS7000-RF-HOP-3000

Part No: BS7000-RF-ELC-2500

Part No: BS7000-RF-ELC-3000

GRP – Roof with Electrical Control

Supplied in same GRP material as the Saturator Tank. Roof provided with Electrical RAM for opening and closing.

Roof Specification

One piece polvester body type

Diameter :2500mm / 3000 mm

Material :Glass fibre reinforced polyester on a

base of orthophthalic acid resin.

Topcoat : RAL 7036 Yellow

ACCESSORIES

DRY SALT LOADING OPTIONS

The **BS Series** Brine Saturator provides various options for how dry salt can be loaded. The options range from manual loading by teleporter to fully automatic loading from a salt silo placed above or below the unit. Please contact us for a full explanation of the options available if you wish to use anything other than standard loading by teleporter.



Part No: BS7000- SS-GRP-2400

GRP Salt Silo - Various Capacities

Supplied by WinterTech Systems.

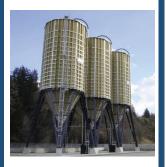
Gravity feeds dry salt into top of saturator.

No mechanical or electronic control is required.

Allows for dry white salt to be stored separately to brown salt to reduce cross contamination.

Can only be used with ultra-dry vacuum White Marine Salt

Diameter: 2400mm Height (max): 7940mm



Part No: BS7000- SS-WDN-2800

Wooden Salt Silo – Various Capacities

Supplied by WinterTech Systems.

Gravity feeds salt into top of saturator.

No machinery or electronic control is required.

Allows for white salt to be stored separately to brown salt to reduce cross contamination.

Can only be used with ultra-dry vacuum White Marine Salt.

Diameter: 2800mm Height: 8100mm



Flatbed GRP Salt Silo with Dispensing Auger

Supplied by WinterTech Systems.

Salt is fed to saturator on demand by an electro-mechanical auger.

Automatically controlled by the BS7000 Brine Saturator Software & Electronics. Reduced height requirements for indoor deployment.

Allows for white salt to be stored separately to brown salt to reduce cross contamination.

SYSTEM ACCESSORIES

The **BS Series** Brine Station comes with many optional software modules and other accessories which can enhance the operation of your brine manufacturing operation. Although none of these accessories are essential, each has their own significant merit and it is worth reviewing each option in detail. Please contact us for a full explanation of any of these accessories and to discuss prices.



Part No: BS7000- SA-HSE-01

Replacement Truck Connection Hose

- > 10M tough non-collapsible hose.
- > Truck connection to customer truck type.
- ➤ Manual on/off valve.



Part No: BS7000- SA-TSB-01

Truck Safe Breakaway

- Connects between Brine Station or External Storage Tanks and the spreading vehicle.
- Protects against serious damage that could be caused by the truck driving off while still connected to Brine Station / Pumping Station.



Part No: BS7000- SA-HTC-10

Additional Mains Water Heat Trace & Insulation

- Station comes with 5M of heat trace for customer pipes.
- If customer pipes are longer, additional heat trace is required.
- Heat Trace runs from the electronics cabinet to where customer water supply comes up from the ground.
- > Intelligent Thermostat Control via BS Series Software.



Part No: BS7000- SA-PTB-01

Professional TakeBack Option

- > Allows the takeback operation to be controlled by automatic tri-port valves.
- > Also allows for regular mixing with no user intervention.



Part No: BS7000- SA-AFV-24

WinterTech Systems Auto Truck Fill Valve

- For use with Auto Truck Fill option.
- This control valve is added to the system to stop any potential truck overfill by gravity feed when the pump stops.
- It would be recommended that one of these items would be fitted to the brine station if the auto fill option for each truck was being purchased

ACCESSORIES



Part No: BS7000- SA-GPS-01

GPS HMI + Mobile Internet Connection

- > GPS Modem for connecting the Brine Station to the Internet.
- Required if customer depot does not have a wireless connection.
- Comes fitted, installed and tested by WinterTech Technicians.
- Needed for remote support, remote viewing, SMS messaging and Back Office modules.

*Customer will be responsible for monthly rental from telecoms provider on Installation, Typical running cost €15 per month.



Part No: BS7000- SA-AFK-01

WinterTech Systems Auto Truck Fill Kit

- > Spreading Vehicle recognised by the Brine Station.
- Vehicle is filled and pump will stop automatically when the spreading vehicle is full.
- > Contains wireless sensors to be fitted to spreading vehicle.
- Additional software module



Part No: BS7000- SA-BO-01

WinterTech Systems Back Office Annual Software User License per Station

- Remote Management of your Brine Station network in the cloud.
- Live update of Brine Concentrations, Quantities on Hand, Production Rates, Truck fills
- > Historical salt usage and costing reporting.

BRINE MEASUREMENT



WinterTech Custom Hydrometer

Specially commissioned hydrometer calibrated on a 0-26% scale for measurement of output brine solution. WinterTech Systems recommend regular checking of output brine concentration percentages for quality control of your brine manufacturing operation.



Part No: BS7000- SA-REF-01

Digital Refractometer

This is a very accurate digital handheld device that allows precise measurement of output brine concentration with resolution down one decimal place.

CUSTOMERS

Below are some of the prestigious private companies and local authorities that WinterTech Systems currently deal with. If you require references from any of our customer base please contact us. All of our customers will be very pleased to recommend us.













Louth County Council











Comhairle Contae an Chláir Clare County Council

















CONTACT US

For any further information regarding our company or our products please don't hesitate to contact us. A full price list of our product range can be provided by our sales team who are more than happy to help you with any aspect of our products and services.

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