Installation Guide

Version 3.1*

Model # MS-SCK-001
*Requires SapCheck BW1.3E-14 software or above

The Bosworth Company

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LIMITED WARRANTY

You should first read all the instructions in this Installation Guide before attempting to use this product.

The SapCheck Controller and sensors are warranted against defective material or workmanship from the date of purchase. The warranty period is one (1) year.

This limited warranty applies to repair or replacement of product found to be defective in material or workmanship. This warranty does not apply to damage resulting from commercial, abusive, unreasonable use or supplemental damage. Defects that are the result of normal wear and tear will not be considered manufacturing defects under this warranty. **THE BOSWORTH COMPANY IS NOT LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE. ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.** Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you also may have other rights which vary from jurisdiction to jurisdiction. This warranty applies only to the original purchaser of this product from the original date of purchase.

At its option, The Bosworth Company will repair or replace this product if it is found to be defective in material or workmanship.

This warranty does not cover damage resulting from any unauthorized attempts to repair or from any use not in accordance with the instruction manual.

> **NOTE: IF YOU EXPERIENCE A PROBLEM, PLEASE FIRST CONTACT INFO@THEBOSWORTHCO.COM OR CALL US TOLL-FREE AT 1-888-438-1110. PLEASE HAVE AVAILABLE THE SAPCHECK MODEL NUMBER PRINTED ON THE BOTTOM OF THE CONTROLLER BOX. DO NOT RETURN THE PRODUCT TO THE ORIGINAL PLACE OF PURCHASE WITHOUT A RETURN MERCHANDISE AUTHORIZATION. DO NOT ATTEMPT TO OPEN THE SAPCHECK CONTROLLER BOX YOURSELF. DOING SO MAY VOID YOUR WARRANTY AND MAY CAUSE PERSONAL INJURY OR DAMAGE TO THE PRODUCT.**

SAFETY

The SapCheck Controller requires protection from the elements. The unit should be deployed in a dry environment and should not be operated in temperatures below 20° F (-6° C) or above 90° F (32° C)

Under no circumstances should the SapCheck Controller be opened or disassembled. Tampering with the SapCheck equipment will void the warranty.

IMPORTANT! READ THIS FIRST !

SAVE THE PACKAGING!

Should you need to return SapCheck for any reason, you will need to send it back in its original carton in order to reduce the risk of possible damage during shipping. Shipping damage may not be covered under the product warranty if SapCheck has not been properly packaged in its original container prior to shipment.

BEFORE YOU BEGIN—CHECK FOR COMMUNICATIONS

Before you begin your installation, check to be sure that there is sufficient cell phone signal strength at your sugarbush for SapCheck to operate.

Each SapCheck unit has an associated phone number that is used for sending text messages to it. If you purchased your SapCheck unit directly from The Bosworth Company, that phone number has already been assigned to your device and your unit is ready to send and receive text messages.

If you purchased your unit through a dealer, you must call The Bosworth Company (1-888-438-1110) or visit the company website at https://theboswothco.com/activate to purchase a support plan that will provide the cell phone communications necessary for SapCheck to operate. When you purchase a support plan, your SapCheck unit will be activated and you will receive your SapCheck's phone number.

To purchase a support plan you will need to provide the SapCheck ID # printed on the bottom of the SapCheck Controller. (Figure 1 shows an example of a SapCheck with ID # "D0000XT003".)
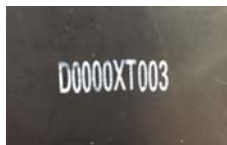

Figure 1
Example of SapCheck ID # printed on bottom of SapCheck controller:.

CHECK FOR COMMUNICATIONS (CONT'D)

Remove the SapCheck Controller from the packaging and attach the antenna to the box as shown in the figures below.

Figure 2a.   Screw the antenna into the antenna port on the side of the SapCheck Controller.

Figure 2b.   Flip the antenna up. Optionally, rotate the antenna so that the flat side faces forward.

Figure 2c.   Antenna installed in optional rotated orientation.

Bring the SapCheck Controller and power cord to your sugarbush. Be sure to have with you the cell phone that is going to function as a SapCheck Command Number.

While at your sugarbush, connect the SapCheck Controller to power.

> *Note: For this initial communications test, you do not need to connect any of the SapCheck sensors to the Controller.)*

If there is sufficient cell phone connectivity at the sugarbush, then within approximately two minutes after powering on, SapCheck will send a text message to your cell phone, indicating the software version that is running, e.g.,

> SapCheck v.BW1.3E-9

You can text the command "**get signal**" to SapCheck and it will return a percent indicator of cell phone signal strength.

> *If you do not receive this text message, or if the percent signal strength is below 10%, then there may be insufficient cell phone signal strength at your sugarbush for SapCheck to operate.*
> *In this case, you may return SapCheck for a full credit if you act within 15 days of date of purchase and if you return SapCheck in its original shipping carton.*

OVERVIEW

SapCheck is used to remotely monitor vacuum pump operation at maple sugarbushes. SapCheck operates by sending and receiving text messages over a cellular network. To operate properly, cell phone communications must be available at the sugarbush, but only to the extent of being able to send and receive text messages.
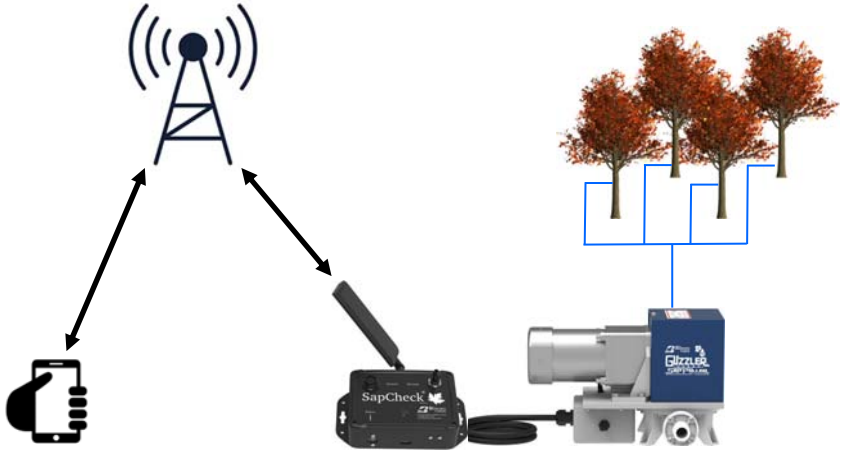

Figure 3

SapCheck consists of a Controller together with three (3) sensors (two external, one internal to the Controller) and associated connecting wires to monitor vacuum and temperature conditions at the sugarbush. SapCheck also sends an alert when the sap in the collection tank has reached a user-specified target level and when vacuum has dropped below a user-specified threshold.

With the optional PowerToggle accessory, SapCheck can also be used to remotely control (turn on/off) a vacuum pump and other 120 vac devices. When purchased for use with a remote control-enabled Guzzler® 24 vdc pump, SapCheck can be used to remotely control 24 vdc Guzzler pumps as well.
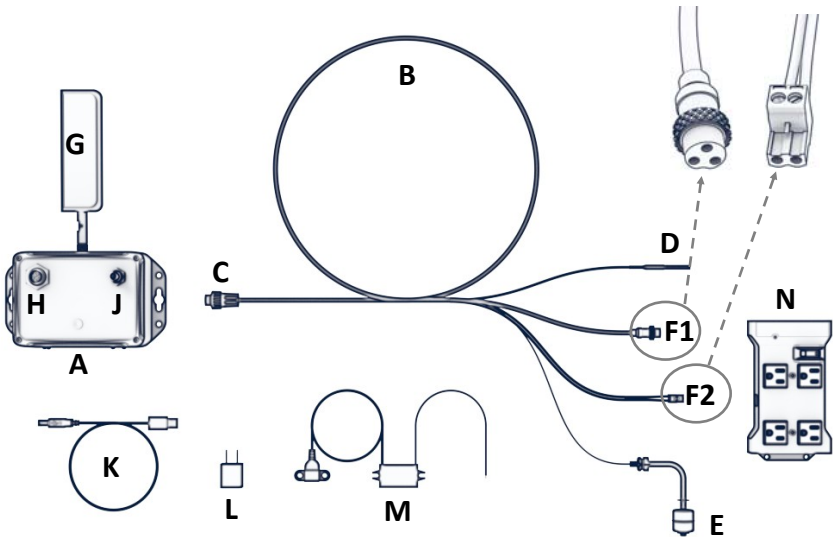
SAPCHECK COMPONENTS

Figure 4

♦ SapCheck Controller (**A**)

♦ Sensor Cable (**B**) —Wire assembly consisting of Male Sensor Connector Plug (**C**) with temperature sensor (**D**), tank float switch (**E**) and *either*

  ◊ Remote Control Interface plug for 24 vdc Guzzler pump (**F1**) *or*

  ◊ PowerToggle interface plug (**F2**)

♦ Antenna (**G**)

♦ Sensor Cable Connector-Female (**H**)

♦ Vacuum Sensor Line Connection—1/4" nipple (**J**)

♦ Input Power Cord (**K**)

♦ 120 vac Power Brick (**L**)

♦ 24 vdc Power Adapter (**M**)

♦ PowerToggle (**N**)

INSTALLATION

TOOLS YOU WILL NEED

Drill bits	Other
9/32" - Pump enclosure hole for temperature sensor	
3/8" - Pump enclosure hole for float switch cables	Teflon tape
13/32" - Float switch hole in sap collection tank (Drill 2-34" above alert level.)	Adjustable wrench (for installing tank float switch)

BEFORE YOU BEGIN

The SapCheck Controller unit must be co-located near your pump. It should be installed in a dry, ventilated enclosure that protects it from the elements. These instructions assume that SapCheck will be installed in the same enclosure that contains your vacuum pump.

Your SapCheck unit has been pre-configured to send text messages to the cell phone number (a "Command Number") you provided. You can send text messages to your SapCheck unit at the SapCheck phone number listed with this installation note. We suggest you add this phone number to your "Contacts" on your cell phone, giving it the name "SapCheck" or, if you have more than one SapCheck unit, a name referencing the sugarbush location where the unit is deployed. That way, you will be receiving and sending text messages either from/to "SapCheck" or from/to the sugarbush location where SapCheck is operating.

SAPCHECK CONTROLLER

Note: While you can add on any length to the cable connecting the Controller to the tank float switch, there is only 24 in of cable connecting the SapCheck Controller to the temperature sensor. Be sure to choose a Controller location that allows you to locate the temperature sensor so that it can measure outside temperature.

Locate the SapCheck controller (**A**) within your pump enclosure. (Make sure that you have previously installed the antenna (**G**) onto the controller.)

INSTALLATION STEPS (CONT'D)

Figure 5a View from above

Figure 5b View from inside tank

Figure 5a pictures tank wall from above, showing the installed float switch with exterior nut holding switch in place. The nylon washer fits between the inside nut (non-rotating) and inside tank wall to ensure secure fit with no leakage.

Figure 3b shows installed float switch, with bottom of switch roughly 3-1/2 in from top of tank. Center of hole drilled to accommodate float switch (13/32 in diameter) was located 5/8 in from top of tank.

TANK FLOAT SWITCH

The tank float switch (**E**) is to be installed in your sap collection tank. Both right angle and striaight-stem float switches are available, depending on what style best suits your tank requirement.

You may choose to install either style of float switch in your tank or you may choose to attach the float switch to a rod that you can clamp to the side of your tank if you wish to avoid drilling any holes into your tank.

If you do choose to install the float switch into the tank, be aware that he maximum tank wall thickness that the float switch can accommodate is 3/8 in.

The switching end of the float switch must be installed pointing down.

> **Note:** If you do not wish to install the Tank Float Switch provided, simply connect together the two Float Switch wires coming from the Male Sensor Connector Plug (**C**)

TANK FLOAT SWITCH (CONT'D)

If you choose to install your tank float switch into the side wall of your collection tank, follow the steps below.

2. Determine the desired sap level height in your collection tank at which you want the SapCheck unit to send you a Sap Alert Level message. Using the 13/32" drill bit, drill a hole 2-3/4" above this height in your tank to mount the float switch. Remove the nut from the Float Switch (**E**) and pass the float switch wires through this hole from inside the tank wall out. (Ensure that the nylon washer sits between the inside tank wall and the interior float switch nut.) Pass the nut over the wires on the outside and secure the nut onto the exposed threads of the tank float switch using an adjustable wrench.

3. Drill a 3/8" hole in the pump enclosure near where the SapCheck Controller is to be located. Pass the end of the 12' float switch cable (**C**) through this hole and connect the cable to the SapCheck Float Switch wires (**G**) using the red insulated male/female disconnects. (Note: If your sap collection tank is further than 12 feet from the SapCheck Controller, you can splice additional wires onto the existing Float Switch wires without affecting the operation of the Float Switch.)

TEMPERATURE SENSOR

Drill a 9/32" hole in the pump enclosure box near where the SapCheck Controller is located and pass the temperature sensor (**D**) from inside the enclosure to the outside. (See Figure 6.) Ensure that the end of the temperature sensor probe is exposed to the outside temperature.

9/32" diameter

| Figure 6a | Figure 6b | Figure 6c |

(6a) shows temperature probe being inserted through 9/32" diameter hole in floor of pump enclosure box. (6b) shows temperature sensor installed through a hole in the floor of the pump enclosure box. (6c) shows the metal end of the temperature probe located outside and below the pump enclosure box. The metal end tip of temperature sensor must be exposed to the outside air to correctly register outside temperature. The probe tip should be located at least 12 inches away from the pump enclosure box so that it does not register heat being radiated in the area immediately near the box by the equipment operating within.

VACUUM SENSOR

The SapCheck Controller has an internal solid state vacuum sensor to measure vacuum. Connect a 1/4" vacuum line to the nipple on the top right hand corner of the the SapCheck Controller. Connect the other end of this vacuum sensor line to the point on your sap lines where you wish to measure vacuum.

SENSOR CABLE

Connect the male plug on the sensor cable (C) to the sensor cable female connector (H) on the Controller. Note that this plug is keyed—rotate it so that the key inserts into the slot on the receptacle, then gently rotate the collar on the plug to lock it into place.
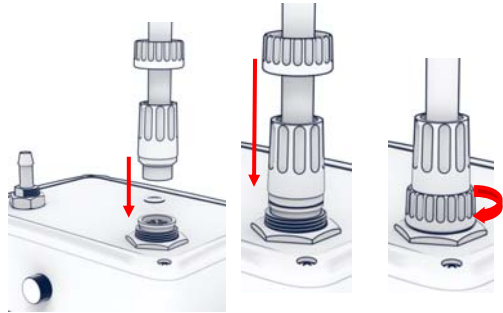
The Bosworth Company

Figure 7

POWER

Plug the input power cord (K) into the power receptacle on the side of the SapCheck Controller.

If you purchased the SapCheck AC power adapter, plug the other end of the input power cord into the 120 vac power brick and plug the brick into a 120 vac power supply. *(Note: Once plugged in, the power brick has about a 2 second delay before power is made available to SapCheck.)*

If you purchased the SapCheck DC power adapter, plug the input power cord (K) into the 24 vdc-5 vdc power converter (L). Connect the red and black leads from (L) to the positive (red) and negative (black) terminals of your 24 vdc power supply.

After connecting SapCheck to power, the green light on the SapCheck Controller will illuminate. Within 2 minutes, you will receive a text indicating that SapCheck is running.

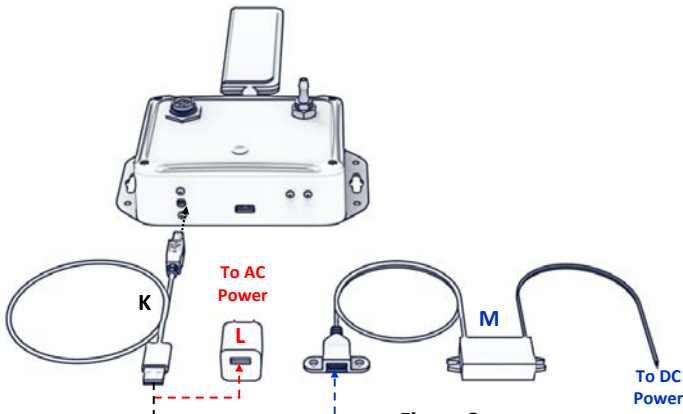*(Ensure that your cell phone is powered on and has reception.)*

To AC Power

K

L

M

To DC Power

Figure 8

Remote Control of 120 vac Pump: PowerToggle

If you wish to use SapCheck to remotely control a 120 vac pump or device, you will need the optional PowerToggle accessory.

To install SapCheck with the PowerToggle, follow the steps below:

1. Plug your vacuum pump into the "Power-out-to-pump" receptacle on the PowerToggle. (See Figure 9.)

2. Plug the SapCheck 120 vac power cord with power brick into the "Power-out-to-Sapcheck" receptacle on the PowerToggle.

3. Plug the end of the PowerToggle control wire (the wire coming from the SapCheck sensor plug that is terminated with small green con-nector **F2**) into the control receptacle on the side of the PowerToggle.

4. Optionally, plug any electrical device (e.g., heat lamp) whose on/off state you want to "toggle" with your pump (i.e., pump on/device off OR pump off/device ON) into the "Power-out-to-heat-source" recep-tacle on the PowerToggle.

5. Plug the PowerToggle power cord into the "AC-power-in" receptacle on the PowerToggle and plug the other end into 120 VAC power.
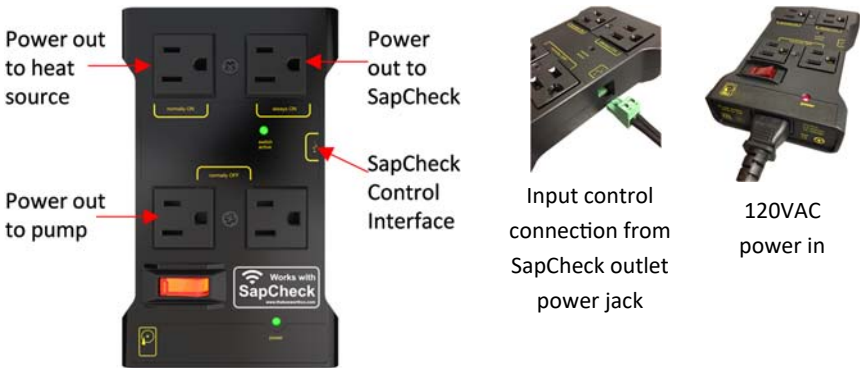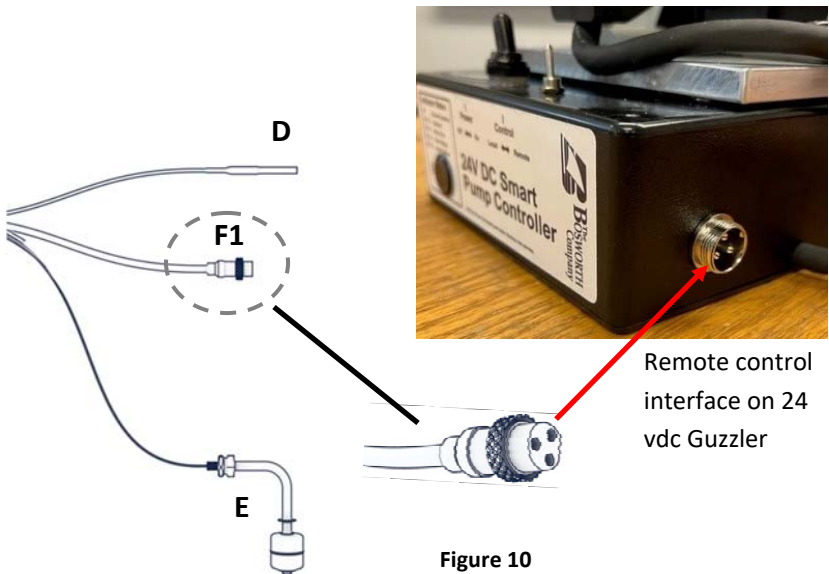

Power out to heat source

Power out to SapCheck

SapCheck Control Interface

Power out to pump

Input control connection from SapCheck outlet power jack

120VAC power in

Figure 9

Remote Control of 24 vdc Guzzler Pump

If you wish to use SapCheck to remotely control a 24 vdc Guzzler pump, you will need to have purchased the sensor cable with Remote Control Interface plug for 24 vdc Guzzler pump (**F1**).

1. Plug the (F1) male connector into the corresponding 3-pin female connector on the side of the 24 vdc Guzzler Motor Controller box. (See Figure 10.)

    Note: Guzzler 24 vdc pumps purchased after February 1, 2023 feature the remote control interface connector. If you have a 24 vdc Guzzler pump purchased prior to that date, contact factory to determine your upgrade options.

Remote control interface on 24 vdc Guzzler

Figure 10

The Bosworth Company

DEFINITIONS

SapCheck Controller	That portion of the SapCheck product that contains the active electronics of the product. The product ID # is printed on the bottom of the Controller unit.
Command Number	SapCheck will only receive text commands from cell phone numbers that it recognizes. Each of these numbers is referred to as a Command Number. The "**set user**" text command can be used to add or delete cell phone numbers from this list.
SapCheck Phone Number	This is the phone # to which you will send text messages to your SapCheck device. You can add this phone # to your "Contacts" on your cell phone under the name "SapCheck". (Note: if you have more than one SapCheck device, you may want to list each in your Contacts giving it a unique name, such as "SapCheck—Marshfield Rd".)
Service mode	When service mode is turned on, SapCheck will respond to text commands sent from The Bosworth Company's service support line. This mode is allows Bosworth to send and receive diagnostic text messages to the unit for trouble-shooting purposes.
Activated	A SapCheck unit is "Activated" when its wireless communications components have been configured to send/receive text messages on a cell phone network. To be activated, a SapCheck unit must be covered by a Support Plan. An activated SapCheck has an assigned SapCheck phone #.
Inactive	A SapCheck unit is "Inactive" if its wireless communications components have not been configured to send/receive text messages. An inactive SapCheck unit has not been assigned a SapCheck phone #.
Deactivated	Unless a customer purchases additional support plan coverage, a SapCheck unit with an assigned phone # is Deactivated once the term of the Support Plan ends. When a SapCheck unit is deactivated, it can no longer send/receive text messages and it no longer retains its originally assigned SapCheck phone #. If a new Support Plan is purchased, a new phone # is assigned to the unit and communications are restored for the length of the new Support Plan.

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YOUR NOTES

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