

Scorpion[®] RF

8294-06, 8294-06 EXT, & 8394-07 Monitors
Installation, Operating, & Maintenance Instructions



98291000 REV. K

1-574-295-8330
www.elkhartbrass.com

ELKHART BRASS
FIRE FIGHTING EQUIPMENT A SAFE FLEET BRAND

TABLE OF CONTENTS

PRODUCT SAFETY INFORMATION.....	3
MONITOR CALLOUT DRAWING.....	4
SYSTEM COMPONENTS.....	5
INSTALLATION INSTRUCTIONS.....	9
Installation Step 1: Mount and Wire all System Components	9
Installation Step 2: Communication Address Setup	12
Installation Step 3: RF Settings Setup	13
Installation Step 4: System Programming	15
OPERATING INSTRUCTIONS.....	18
MAINTENANCE INSTRUCTIONS.....	21
SYSTEM SPECIFICATIONS.....	24
COMPONENT MOUNTING TEMPLATES.....	25

To view the most current parts list and drawings please visit www.elkhartbrass.com

PRODUCT SAFETY INFORMATION

- All personnel who may be expected to use this equipment must be thoroughly trained in its safe and proper use.
- Before flowing water from this device, check that all personnel (fire service and civilian) are out of the stream path. Also, check to make sure stream direction will not cause avoidable property damage.
- Become thoroughly familiar with the hydraulic characteristics of this equipment, and the pumping system used to supply it. To produce effective fire streams, operating personnel must be properly trained.
- Whenever possible, this equipment should be operated from a remote location. Do not needlessly expose personnel to dangerous fire conditions.
- Open water valves supplying this equipment slowly so that piping fills slowly, thus preventing possible water hammer occurrence.
- After each use, and on a scheduled basis, inspect equipment per instructions in the Maintenance section.
- Any modifications to the electrical enclosures will destroy the NEMA 4 rating and void warranty coverage of the enclosure and all components within.



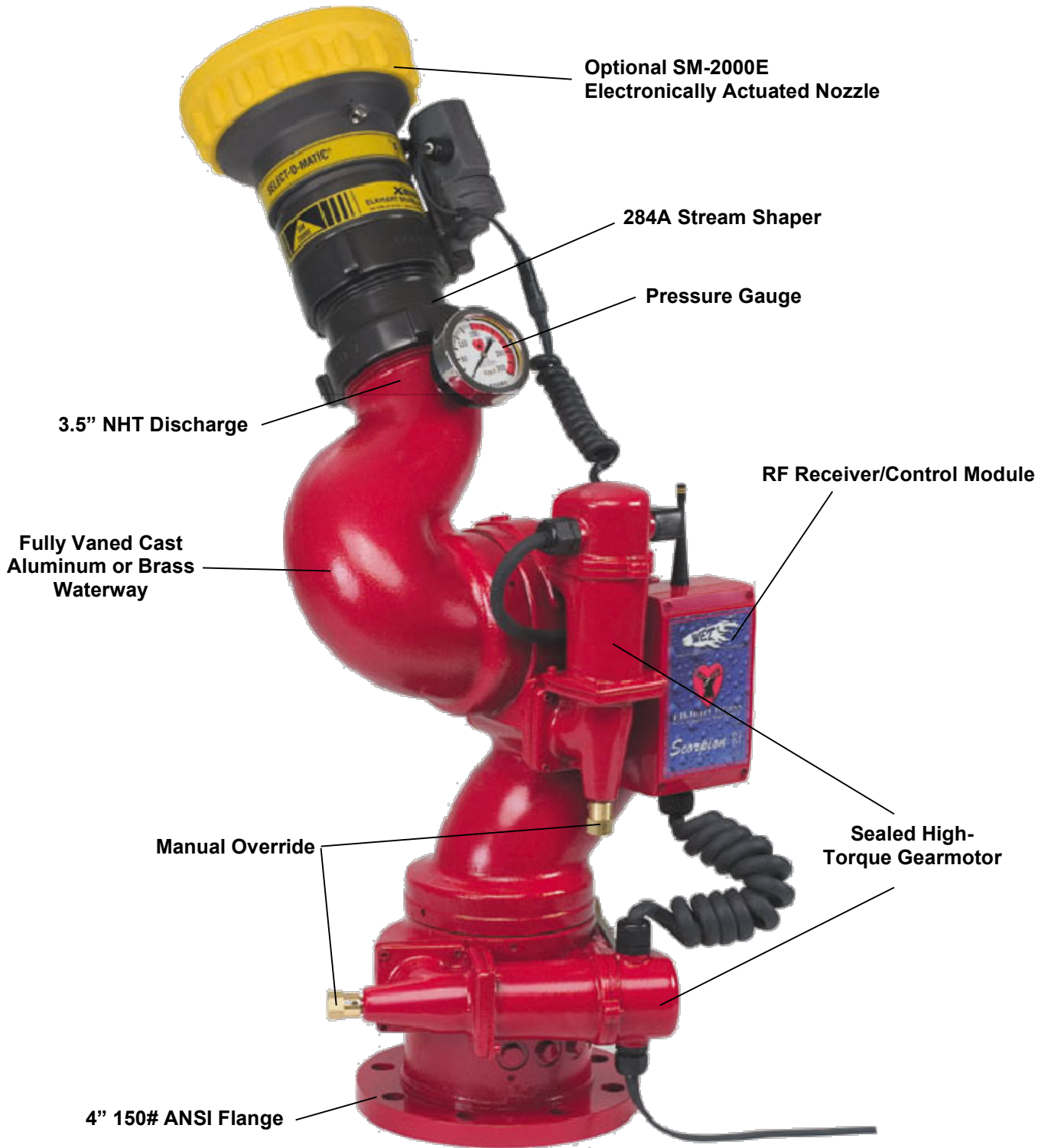
Important: Before installing and operating provided equipment, read this manual thoroughly. Proper installation is essential to safe operation.

SYSTEM INFORMATION:

MONITOR SERIAL NUMBER: _____

MONITOR ACCESSORIES (NOZZLE GALLONAGE AND TYPE, TYPES OF TRANSMITTERS, WATER VALVE, ETC.):

MONITOR CALLOUT DRAWING



8294-06 Scorpion RF Monitor

SYSTEM COMPONENTS

MONITOR

Scorpion RF Monitors – 8294-06 & 8394-07

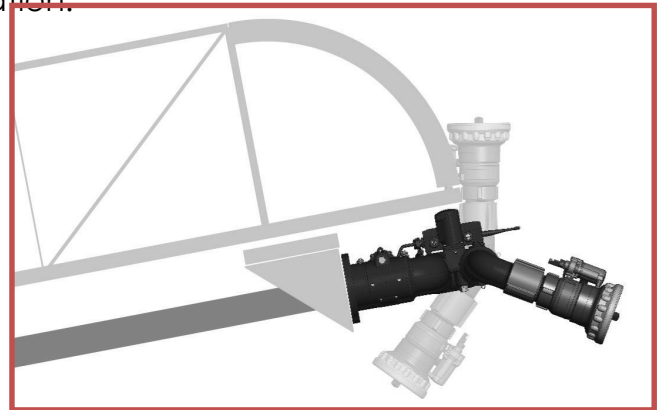
The 8294-06 and 8294-06 EXT is a cast aluminum monitor with 4" waterway while the 8394-07 is cast brass. The waterway contains a central vane to minimize large-scale turbulence and provide superior fire streams. Monitor water supply connection is a 4 inch 150 lb. ANSI pattern flange. The discharge nozzle connection is 3½" National Hose thread. Nozzle stream direction is controlled by two permanent magnet type planetary gear motors, one controlling rotation about the axis of the water inlet, and the other controlling nozzle elevation and depression. Right angle gear cases between the gear motor and the monitor allow for convenient manual override of the electric motors in the event of a power failure during firefighting operations. All gearing is enclosed within the monitor housings.



Scorpion RF Monitor – 8294-06 EXT

The extended travel Scorpion has the same highly efficient waterway and flow capacity as the Scorpion RF monitor. The monitor waterway is supplied through a 4" 150# flat faced flange base. The 8294-06 EXT monitor has a mechanical stop to allow 180° for added protection in an aerial application.

The extended travel Scorpion RF has special features to optimize performance as an aerial master stream device when used on a straight aerial ladder with pinnable waterway. The pinnable waterway feature allows the waterway to be pinned to the second fly section of the ladder (egress position), thus keeping the monitor and nozzle away from the end fly section when it is necessary to place the ladder tip at a window sill or roof parapet.




The 8294-06 EXT contains a special wiring harness connection at the inlet flange to allow attachment of an OEM provided proximity sensor. The proximity sensor is used to tell the monitor controller which positions the waterway and monitor is. As a result, the monitor discharge Up-Down travel range differs for the two waterway and monitor positions as indicated in Table 1.

Waterway/Monitor	Up-Down Travel Range
Master Stream	+30° to -135°
Egress	+0° to -135°

Table 1: EXT Travel Ranges

The 0° position is when the nozzle is aimed parallel to the ladder.

As a further enhancement, the left-right motor direction of rotation automatically reverses when the monitor discharge is in the range of 0° to +30°. Without this feature, when the discharge travels above 0°, “left” would functionally become “right” and vice versa. If the proximity sensor changes state while the monitor is in the “master stream” position and the monitor discharge is in the 0° to 30° “up” range, the monitor controller will automatically lower the discharge to 0° to prevent possible interference with the ladder, or impingement of stream upon personnel.

 **Caution: All monitor motors are 12VDC. If using a non-Elkhart nozzle, another 12VDC nozzle should be used, or nozzle control may not function properly.**

NOZZLE

Scorpion RF Nozzles –

There are two nozzles available for the Scorpion RF.

SM-1250E & SM-2000E

The maximum monitor flow capacity is 2000 gallons per minute. Monitors can be supplied with the SM-1250E (SM-1250BE for model 8394-07) constant pressure (automatic) type master stream nozzle. This nozzle has a flow range of 300 to 1250 gallons per minute at 75 psi and has an electric drive mechanism for RF control of the spray pattern from a straight stream to wide fog.



**SM-1250E (P/N: 03781211) &
SM-2000E (P/N: 03990201)**

A similar nozzle, the SM-2000E (SM-2000BE for 8394-07), provides a flow range of 500 to 2000 gallons per minute at 80 psi. For optimum straight stream performance, stream shapers are provided as part of the monitor and nozzle system. Solid stream nozzles are also available for use with these monitors.

SM-1250E; 350 GPM @ 50 PSI – 1250 GPM @ 75 PSI

SM-2000E; 500 GPM @ 50 PSI – 2000 GPM @ 80 PSI

CONTROL

Handheld RF Controller – 81282001

A sealed handheld RF transmitter contains all the controls necessary for operation of the monitor. The handheld remote allows the operator to direct the monitor from a significantly improved point of view. With the wireless remote, the operator can view the stream from the side and confirm that the stream is hitting its target. Separate push button switches are provided for up, down, left, right, fog, and stream functions. The handheld remote has user selectable frequency and security codes that allow multiple monitors to operate on the same fire ground at the same time. The remote has an automatic power down



feature that will shut down the power after 5 minutes of no activity. As an additional power saving feature the radio signal is only transmitted while a button is pushed. The handheld remote case has a NEMA 4 rating.

Primary Panel Mount RF Controller – 81327101


The fixed RF transmitter sends signals to the monitor via an encoded radio signal, requiring no wires between the RF transmitter and the monitor. It is powered by the vehicle electrical system. The faceplate is intended for a flush mount onto the pump or aerial ladder control panel. Separate sealed push button switches are provided for up, down, left, right, fog, and stream functions. This fixed RF transmitter provides two-button access to the Stow feature. It will override any low-priority controls, allowing the apparatus operator to retain ultimate control over the monitor. Comes with 10 foot coax antenna cable and (1) 90° antenna and (1) straight antenna.



Secondary Panel Mount RF Controller – 81327201

The fixed RF transmitter sends signals to the monitor via an encoded radio signal, requiring no wires between the RF transmitter and the monitor. It is powered by the vehicle electrical system. The faceplate is intended for a flush mount onto the pump or aerial ladder control panel. Separate sealed push button switches are provided for up, down, left, right, fog, and stream functions. Comes with 10 foot coax antenna cable and (1) 90° antenna and (1) straight antenna.



 **Caution: Any modification of the Handheld Controller or Panel Mount enclosures will destroy the NEMA 4 rating to that piece of equipment and will void the warranty coverage.**

MONITOR ACCESSORY

Primary OEM RF Transmitter – 81353101

The OEM RF transmitter allows the monitor installer to use their switching arrangement while still having the benefit of the W.E.T. It has all of the same features of the Primary Panel Mount RF controller, but has a wiring harness for the installer to connect to the switches. Comes with 10 foot coax antenna cable and (1) 90° antenna and (1) straight antenna.



Secondary OEM RF Transmitter – 81353201

The OEM RF transmitter allows the monitor installer to use their switching arrangement while still having the benefit of the W.E.T. It has all of the same features of the Secondary Panel Mount RF



controller, but has a wiring harness for the installer to connect to the switches. Comes with 10 foot coax antenna cable and (1) 90° antenna and (1) straight antenna.

Secondary Switch Box Control for Aerial Application – 81549001


This component is a surface mount type switch box with controls for operation of the monitor for use with the OEM secondary RF transmitter. Separate sealed toggle switches are furnished for up-down, left-right, and strtfog functions. The box has a NEMA 4 rating, and is generally installed at the tip of the aerial ladder, or in the bucket of the aerial platform. A terminal strip inside the enclosure allows for connection of the control cable, and a watertight strain relief fitting provides for sealing around the cable entry



Auxiliary Battery Pack – 81492001

A 12-volt, 12 amp-hr. sealed lead-acid battery pack is available to allow operation of the monitor in case of vehicle electrical system failure. These battery packs are also used as a means to minimize the required size of conductors routed up aerial ladders and towers. This is accomplished by mounting the battery pack near the monitor, with a small trickle-charge conductor to the battery from the vehicle system



 **Caution: Any modification of the enclosures of any of the transmitters or switch box will destroy the NEMA 4 rating, and will void the warranty coverage. Ensure all O-ring and gaskets are properly installed when closing receiver or controller enclosures.**

DC to DC Converter Function – 24272000

An optional 24 to 12VDC converter board can be added to the RF receiver control module to allow 24 VDC power to the monitor. The converter will supply enough 12VDC power to the monitor to run all motors simultaneously. It is reverse voltage protected and meets SAE J1113-11 (Immunity to Conducted Transients on Power Leads) requirements.

INSTALLATION INSTRUCTIONS

Installation Overview:

Step 1 – Mount and Wire All System

Components

Step 2 – Communication Address Setup

Step 3 – RF Settings Setup

Installation Step 1: Mount and Wire All System Components



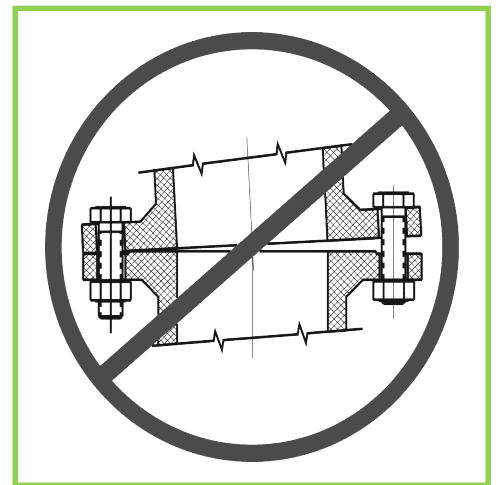
Warning: It is up to the system designer to appropriately handle the open circuit condition of the stow signal. In the open circuit mode there is no source to turn off the stow signal load, which may lead to erroneous signal indications if not handled properly. The stow signal is capable of sinking 250mA maximum. Exceeding this value may blow the internal fuse and the stow output will no longer be able to provide a ground.



Important: Most test lights draw in excess of 1A.

Monitor Mounting –

- **4" NPT Base:** Thread monitor onto male 4" NPT thread using Loctite 592 or equivalent thread sealant. Install the monitor in the straight ahead position.
- **4"-150# Flat Faced Flange:** Attach 4"-150# ANSI pattern companion flange to water supply pipe so that the bolt pattern will allow the monitor to be installed in the straight ahead position. Alignment is correct when the straight ahead position is centered between adjacent flange holes. Attach monitor inlet flange to companion flange on water supply pipe with eight (8) 2½" 5/8-11 UNC grade 5, carbon steel or stainless steel bolts & nuts. Seal flange joint with gasket, or suitable flange sealant. Most wafer type butterfly valves have seats that serve as flange gaskets, and separate gaskets or sealant is not required. Apply Loctite 242 or equivalent to bolt threads before tightening nuts. Torque to 60-70 ft-lbs.



Warning: When installing the monitor on a raised face companion flange, it is critical that the bolts be tightened uniformly to prevent misalignment of the monitor relative to the flange or valve. If the monitor becomes misaligned, the base flange will fracture and fail when the bolts on the "high" side are tightened.

Monitor Wiring –

- Crimp a fused lead from a switched positive power source to the red lead (pin C) of the power harness supplied. Use a 10A fuse for the 8294-06 & 8294-06 EXT, and a 15A fuse for the 8394-07. Crimp a lead from the vehicle ground to the black lead (pin A) of the monitor power harness. Shrink and seal the connectors with a heat gun after crimping.
- The white lead (pin B) is for an optional “Stow Indicator” which could be attached to a relay or LED supplied by the OEM. The circuit switches in a ground when the monitor is in a non-stowed position.
- All control functions are sent to the monitor via an encoded RF signal from the RF controller, and no control wiring is needed.
- The 8294-06 EXT has a proximity sensor. The red wire (pin C) supplies power, the black lead (pin A) is the ground, and the white lead (pin B) is the signal for the proximity sensor to show master stream versus an egress position.

Panel Mount RF Controllers –

- Using the Panel Mount RF Controller template in the Component Mounting Templates section, mark the panel cutout and mounting screw locations.
- Cut a rectangular clearance opening and drill four (4) 7/32” holes.
- Insert fixed RF controller case through the panel cutout. Secure the unit to the panel with four (4) #10-32 screws. The length of the screws should be the panel thickness plus 3/16”. The screws supplied are 1/4” in length. Apply Loctite 242 or equivalent to screw threads before tightening them.
- The controller antenna is to be mounted using the 10’ antenna cable provided. Locate one of the antennas outside the vehicle compartment, and in a position that provides the least obstructed line of sight to the monitor’s antenna.
- Place a 1A fuse between the red lead of the RF controller and a switched positive power lead on the vehicle. Attach the black lead from the monitor base to the vehicle ground.
- All control functions are sent to the monitor via an encoded RF signal from the RF Controller.

OEM RF Transmitter –

- Place a 1A fuse between the red lead of the transmitter and a switched positive power lead on the vehicle. Attach the black lead from the monitor base to the vehicle ground.
- Connect all of the switch commons to the ground (black) connection.
- Connect each function to a corresponding switch (see Table 2 on page 11). To operate the function, close function’s switch to ground. Any combination of pushbuttons or toggle switches can be used.

- Power indication can be created by attaching an LED and proper resistance between the VCC (+3V) and ground connections. Max rating for the VCC connection is 250mA.
- The transmitter's antenna is to be mounted using the 10' antenna cable provided. Locate one of the antennas outside the vehicle compartment, and in a position that provides the least obstructed line of sight to the monitor's antenna.

Function	Wire Color
Ground	Black
VCC (+3V) Output	Red
Right	Brown
Down	Orange
Up	Yellow
Left	Green
Stream	Blue
Fog	Violet
Aux 2	Grey
Oscillate	White
Aux 1	White/Black
Stow	White/Brown

Table 2: OEM RF Transmitter switches

Secondary Switch Box Control for Aerial Applications –

- Using the Secondary Control Switch Box template in the Component Mounting Templates section, mark the mounting holes on panel or bracket.
- Drill two 9/32" diameter holes in panel or bracket.
- Remove ¼-20 screws and lock washers from back of box. Insert screws with lock washers through backside of panel or bracket into mounting holes in box. Tighten screws.

Auxiliary Battery –

- Using the Auxiliary Battery template in the Component Mounting Templates section, mark locations of mounting holes on mounting surface or bracket.
- Drill four (4) 21/64" diameter mounting holes.
- Open hinged cover of battery enclosure by loosening the four screws. Insert one 5/16-18 UNC socket head cap screw from the inside of the enclosure through each of the four (4) mounting holes of the enclosure and into the corresponding holes in the mounting surface or bracket. Assemble nuts and lock washers to each mounting screw, then tighten.


- Plug the female connector of the battery pack into the male connector at the base of the monitor.
- Crimp a fused positive power lead from the vehicle charging system to the red lead (pin C) of the power harness supplied. Use a 10A fuse for the 8294-06 & 8294-06 EXT, and a 15A fuse for the 8394-07. Crimp a lead from the vehicle ground to the black lead (pin A) of the monitor power harness. Shrink and seal the connectors with a heat gun after crimping. Plug the female connector of the finished harness into the male connector of the battery pack.
- The white lead (pin B) is for an optional “Stow Indicator,” which can be attached to a relay or LED supplied by the OEM. The circuit switches in a ground when the monitor is in a non-stowed position.


Installation Step 2: Communication Address Setup

An RF Controller controls one 8294-06, 8294-06 EXT, or 8394-07 monitor. The controller is digitally encoded with a security code ensuring that it does not accidentally control the wrong monitor. The receiver has a matching decoder and security code that instantly decodes and interprets commands. The security code is a 15-bit selectable code that is set on both the remote transmitter and receiver.

The 8294-06, 8294-06 EXT, and 8394-07 monitors are tested and shipped with a security code based upon the monitor serial number, ensuring each monitor leaves the factory with a unique code assigned to it. The security settings will normally not need to be changed. In the case of a lost transmitter or replaced control board, contact Elkhart Brass.

 **Danger:** Using two W.E.T. monitors with the same security code may cause the inadvertent control of the wrong monitor, resulting in possible property damage and injury to personnel. Using the factory specified codes will help prevent this.

 **Caution:** Do NOT pinch wires when attaching back panel to front panel of the handheld enclosure. Ensure all O-rings and gaskets are properly installed when closing the receiver or transmitter enclosures.

 **Important:** The RF Receiver/Control Module and all transmitter communication addresses have been factory set. They should not require any additional address setup.

Installation Step 3: RF Settings Setup

RF Receiver/Control Module Settings –

Remove the cover from the RF Receiver/Control Module. SW4 (see Figure 1) allows this board to be used in different product applications. In order for it to properly operate the Scorpion RF monitor, it must be set to one of the following positions:

1	8294-06 & 8394-07 Scorpion RF – Blinking Stow Indicator for Dash Panel Indicator Application
2	8294-06 & 8394-07 Scorpion RF – Non-blinking Stow Indicator for Interlock Application
A	8294-06 EXT Scorpion RF

If it is set to a value that is not yet programmed, the status indicator LED, DS5 (see Figure 1), will blink rapidly until a valid setting is selected **AND** power is cycled. If SW4 is set to a valid setting but not one of the above positions, unpredictable results will occur.

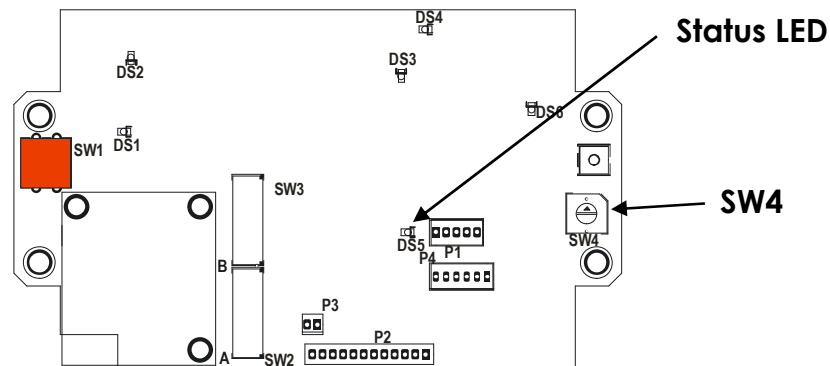


Figure 1: RF Receiver/Control Module Circuit Board

Handheld RF Controller Settings –

- Remove the battery cover from the handheld RF controller. Remove the four (4) screws holding the two halves of the cover together using a #1 size Pozidriv® screwdriver (use caution with a standard Philips screwdriver as it may strip the screw heads).
- Locate the security code switches on the circuit board (see Figure 2 on page 14).
- Change the switches to match the settings of the RF Receiver/Control Module **except** switch A position 1. **One incorrect setting will prevent the system from working properly.**
- Ensure the battery lead connector is securely fastened to the transmitter circuit board.
- When reassembling the handheld controller, ensure that no wires will be pinched, close the cover halves, and replace the screws. Do not exceed 6 in-lbs. of torque. The screws should be just snug. Do not over tighten the screws or the plastic enclosure could strip.
- With the monitor power on, turn on the handheld controller. The PWR/XMIT light will flash. Once the flashing light stops (light will be off), turn the handheld on once again.

This can take 3-5 minutes and is required to sync the handheld to the monitor. The handheld is now ready for use.

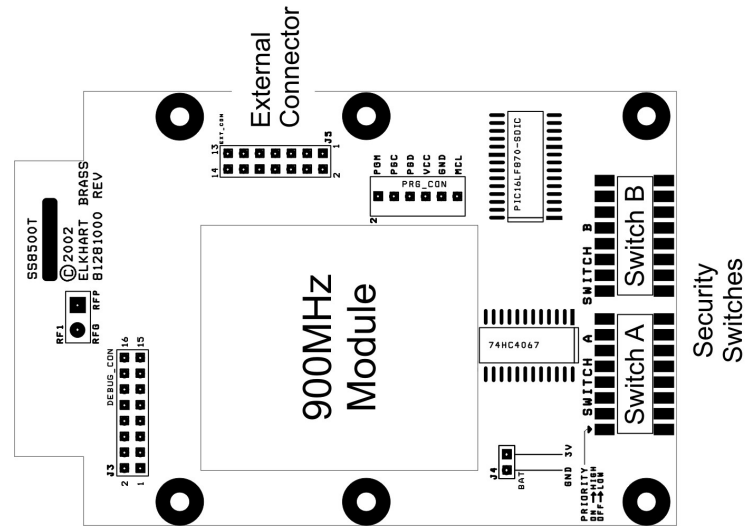


Figure 2: Handheld RF Controller Circuit Board

 **Caution: Do NOT change switch A position 1 on any transmitter. This switch is used to set the priority setting of the transmitter and changing this switch may remove override capabilities.**

Panel Mount RF Controller and OEM RF Transmitter –

- Disconnect the power connector to the panel mount controller at the back of the panel.
- Open the back cover of the controller after loosening the screws.
- Remove the red and black power leads from the power conversion board and place the cover to the side.
- Locate the security code switches on the circuit board (see Figure 2).
- Change the switches to the settings of the RF Receiver/Control Module **except** switch A position 1. **One incorrect setting will prevent the system from working.**
- Reconnect the power leads. The red lead is attached to the Positive (+) terminal, and the black lead is attached to the Negative (-) terminal.
- Close the cover and replace the screws.
- Reconnect the power connector.

 **Important: While reassembling the controller or transmitter, ensure wires and antenna leads do not become pinched.**

Installation Step 4: System Programming

Programming Stow Position

8294-06 & 8394-07

- On the monitor receiver board switch A position 1 “ON” is stow up, while switch A position 1 “OFF” is stow down. If any selections are changed, power must be cycled.
- Move the monitor to the left or right position that will be used for stowing the monitor.
- Press and hold the red programming switch, SW1 (see Figure 3), for approximately 5 seconds, then release.
- The monitor will move up or down (depending on the location of switch A position 1 on monitor receiver board), and rotate to the left until the stop is located.
- When the monitor stops, the programming will be complete.
- **If the programming is interrupted by inadvertently pressing the SW1 (red) button or any button on the primary or secondary controller, a programmed stop is set, and will not allow movement past this point. The programmed stops can be cleared by holding the red SW1 button for 3 seconds and allowing the monitor rotate to the left stop. After this is complete, repeat the above procedure.**
- On the primary controller, press and hold the Stow and Fog buttons for 5 seconds to activate and check the stow positioning.

8294-06 EXT

- The 8294-06 EXT monitor does NOT allow for user selectable stow position.
- Press and hold the red programming switch, SW1, for a minimum of 5 seconds. After the red programming button is released, the monitor will travel to both the left and right travel limits in order to calibrate the horizontal stow position at ZERO (straight ahead).
- Activating the stow function will cause the monitor to rotate to the straight-ahead position with the discharge at 0 degree elevation.

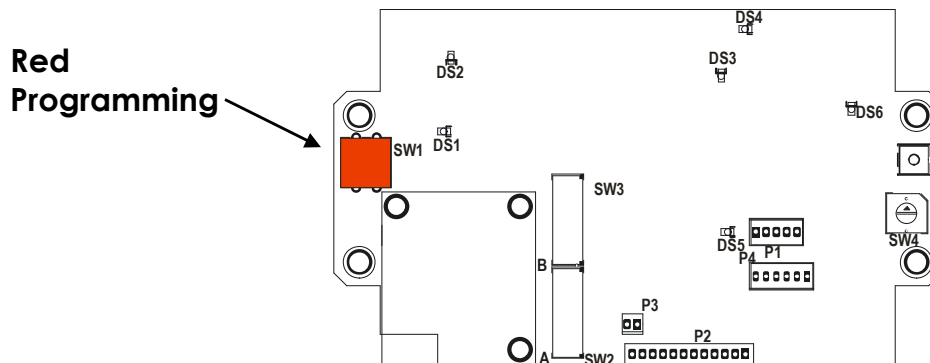


Figure 3: SW1 Switch



Caution: To prevent damage to the monitor controller, keep all metallic objects away from the receiver circuit board while it is energized. Ensure all O-rings and gaskets are properly installed when closing receiver enclosure.

Rotational Limit Settings

8294-06

- The rotational stop screws (see Figure 4) set the monitor rotational limits (left-right and up-down) to satisfy the application requirements, as well as NFPA* requirements. The monitor is shipped from the factory with the horizontal travel limits set at 90 degrees left and 90 degrees right of the zero (straight ahead) position. The vertical travel limits are factory set at 90 degrees above, and 45 degrees below horizontal. If the application requires the rotation limits to be changed, relocate threaded stop screws to required positions per chart below. Apply Loctite 242 or equivalent to stop screws and hex head plugs prior to reinstalling (stop screw holes are identified on the monitor by a stamped letter adjacent to each hole). All empty stop screw holes should be filled with a hex head plug.

8394-07

- The rotational stop screws (see Figure 4) set the monitor rotational limits (left-right and up-down) to satisfy the application requirements, as well as NFPA* requirements. The monitor is shipped from the factory with the horizontal travel limits set at 90 degrees left and 90 degrees right of the zero (straight ahead) position. The vertical travel limits are factory set at 90 degrees above, and 45 degrees below horizontal. If the application requires the rotation limits to be changed, relocate threaded stop screws to required positions per chart below. Apply Loctite 242 or equivalent to stop screws and hex head plugs prior to reinstalling (stop screw holes are identified on drawing 98031050). All empty stop screw holes should be filled with a hex head plug

8294-06 EXT

- Monitor can be rotated 90° left or 90° right of the zero (straight ahead) position. The vertical travel is either Master Stream (+30 to -135°) or Egress (+0° to -135°). Horizontal travel limits can NOT be changed.
- Monitor can be rotated 90° left or 90° right of straight ahead. Stops are mechanically fixed by a stop screw and milled slot in base. Stop screw must remain in place in monitor base.

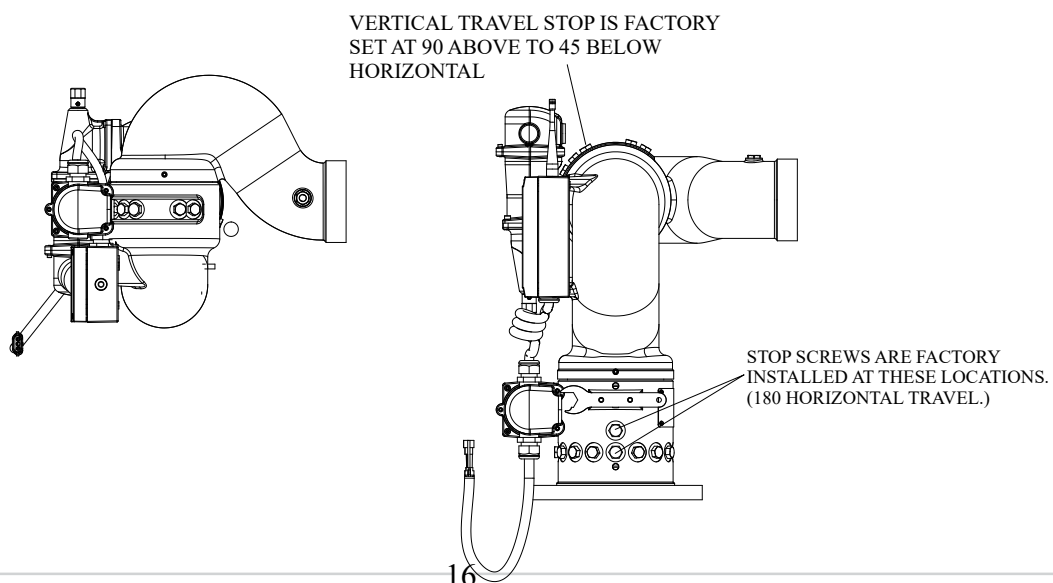


Figure 4: Scorpion RF Rotational Stops


	<p>Caution: At least one stop screw is required to prevent damage to the monitor. If the monitor is set with the horizontal setting at 174 degrees left or right of the zero (straight ahead) position, the vertical setting will need to be set to 30 degrees below horizontal as the maximum lowest position.</p>
--	--

Table 3: Horizontal Settings (8294-06 only)

Application	Rotation Limits	Stop Screw Locations
Aerial Ladder, Elevating Platform, Water Tower	45° Left or Right of Straight Ahead	D & H
	67½° Left or Right of Straight Ahead	E & G
	90° Left or Right of Straight Ahead	F
Deck Gun	174° Left or Right of Straight Ahead	A

Table 4: Vertical Settings (8294-06 only)

Application	Rotation Limits	Stop Screw Locations
Aerial Ladder, Deck Gun	90° above horizontal to 45° below horizontal	T
Elevating Platform	45° above horizontal to 45° below horizontal	T & U

To view a complete list of stops, please download the Scorpion Monitor Position Chart (98031010 for 8294-06, and 98031050 for 8394-07) from www.elkhartbrass.com.

Table 5: NFPA 1901, 2003 Ed. minimum rotation angles for aerial device monitors.

20.6	Aerial Ladder Water Delivery System
20.6.1.3.1	The monitor shall be capable of swiveling at least 135° from a line parallel to the ladder and down.
20.6.1.3.2	The monitor shall be capable of horizontal traverse at least 45° from each side of center.
20.12	Elevating Platform Water Delivery System

20.12.3.2	The monitor(s) shall allow the operator to control the aimed direction of the nozzle through a rotation of at least 45° on either side of center and at least 45° above and below horizontal.
20.12.3.3	The horizontal and vertical traverse of the monitors shall not exceed the elevating platform manufacturer's recommendation.

OPERATING INSTRUCTIONS

Normal Operation

The Scorpion monitors use the standard Left/Right, Up/Down, and Fog/Stream commands to provide stream direction and pattern adjustments.

- To move the monitor left or right, press and hold the LEFT or RIGHT button until the monitor discharge is in the correct position, or a mechanical stop is reached.
- To move the monitor up or down, press and hold the UP or DOWN button until the monitor discharge is in the correct position, or a mechanical stop is reached.
- To adjust the stream pattern, press and hold the FOG or STREAM button until the desired stream pattern is reached.

Any combination of left or right, fog or stream, and up or down can be used to achieve motion horizontal, vertical, or nozzle commands simultaneously. If the LEFT and RIGHT buttons are pressed at the same time, the monitor will stop all motion. To continue motion, release both buttons and repress the desired direction button. This is also true for the up/down and fog/stream commands.

The handheld remote transmitter has a power saving feature that turns the transmitter power off if no signal is sent for 5 minutes. Press and hold the "ON/OFF" button until the Power LED illuminates to reactivate the transmitter. The "Low Battery" LED will flash slowly when the battery voltage drops below a predetermined level. When the low battery LED flashes rapidly, the batteries are nearly discharged and should be replaced immediately.

NOTE: The SM-1250E, SM-1250BE, SM-2000E and SM-2000BE nozzles have a unique ball screw drive that allows motor to "free wheel" at the end of pattern travel in either the straight stream or wide fog positions. No slip clutch or current limiting feature is used with these nozzle drives.

Oscillation Function

The 8294-06, 8294-06 EXT, and 8394-07 monitors have an automatic left/right oscillation function, which can be used to provide continuous exposure protection with no operator input. The oscillation limits are set using the handheld or truck mount RF transmitters.


- Position the monitor at either the left or the right limit of oscillation.
- Press and hold the OSCILLATE button.
- Move the monitor to the other limit of oscillation.
- Release the OSCILLATE button.

- Press and release the OSCILLATE button to engage the oscillation function.
- The monitor will oscillate between the limits until the oscillation button is pressed again. Pressing the left or right button on one of the controllers will also stop the oscillation.


For safety reasons, once oscillation has stopped the oscillation limits need to be reprogrammed before it can be re-engaged. The nozzle fog, stream, and discharge elevation functions can be operated while the monitor is oscillating.

Manual Override

In the event of power failure to the monitor, the motors may be actuated manually. To operate a function manually, simply apply a 3/4" ratcheting type wrench (either socket type or ratcheting box end type) to the hex fitting on the motor shaft.



Important: Using the horizontal override nut when the power to the receiver is off or the horizontal motor is disconnected will move stow position from its original programmed position. See section titled *Programming Stow Position* to realign stow position even if stow feature is not utilized.



Warning: Do NOT use impact drivers to operate the manual override nuts. Serious damage to motor gear heads will occur.

Storing the Monitor

Elkhart Brass recommends that a stow position be set and the stow routine be utilized to place the monitor in its stowed position after each use.

- **8294-06 & 8394-07**
 These monitors have a user selectable stow position (see **Programming Stow Position** section for instructions). After the water supply to the monitor has been turned off, simultaneously press the STOW and FOG buttons on the primary panel mount RF transmitter (**buttons must be held down for a minimum of 3 seconds**). The monitor will automatically rotate horizontally to the stow position previously programmed, and either lower or raise the discharge to its mechanical stop (depending on the position of switch A position 1 on the receiver board). Prior to stowing the monitor, the stow signal output provides a ground signal. There are two settings for stow signal output.

Switch 4 Position 1 (Signal Mode)

Once the monitor starts to move to the stow position, the stow signal output will alternately supply and remove the ground, at approximately a 1 second rate, while the monitor is moving to the stow position. Once the monitor has completed the stow sequence, the stow signal output will be an open circuit.

Switch 4 Position 2 (Interlock Mode)

Once the monitor starts to move to the stow position, the stow signal output will continue to supply a ground while the monitor is moving to the stow position. The ground will be removed after the monitor reaches the stow position and the stow signal output will be an open circuit.

NOTE: If the stow indicator does not turn off, see the **Programming Stow Position** section to realign the stow position. Provided the necessary switches are wired, the OEM primary transmitter will operate using the same inputs as listed for the primary panel mount transmitter.

Any directional command (left, right, up, down, fog or straight stream) will cancel the stow command, and the stow output signal will continue to provide a ground. To stow the monitor, the stow command must be reactivated.

- **8294-06 EXT**

The 8294-06 EXT aerial monitor does not allow for a user selectable stow position, switch SW4 should be set to position A for this application. After the water supply to the monitor has been turned off, simultaneously press the STOW and FOG buttons on the primary panel mount RF transmitter (buttons must be held down for a minimum of 3 seconds). Activating the stow function causes the monitor to rotate horizontally to the center of the allowed travel and move the discharge to 0° elevation. As the monitor starts to move to the stow position, the stow signal output will continue to supply a ground while the monitor is moving to the stow position. The ground will be removed after the monitor reaches the stow position and the stow signal output will be an open circuit.

Any directional command (left, right, up, down, fog or straight stream) will cancel the stow command, and the stow output signal will continue to provide a ground. To stow the monitor, the stow command must be reactivated.



Warning: Never activate the stow feature while water is flowing. Serious injury to personnel and damage to apparatus could result.



Warning: It is up to the system designer to appropriately handle the open circuit condition of the stow signal. In the open circuit mode there is no source to turn off the stow signal load, which may lead to erroneous signal indications if not handled properly. The stow signal is capable of sinking 250mA maximum. Exceeding this value may blow the internal fuse and the stow output will no longer be able to provide a ground.



Important: Most test lights draw in excess of 1A.

Monitor

Preventive Maintenance

The complete monitor and control system should be inspected during each apparatus check. Careful inspection for damage to the monitor or nozzle is especially important after use of the Scorpion RF monitor in emergency operations.

- Operate all possible functions to ensure that each works normally.
- Flow water to check the nozzle pattern.
 - If the pattern is disrupted, remove the nozzle and check for debris lodged between the nozzle stem and body, or in the stream shaper inlet. Remove debris.
- During nozzle flow test, inspect monitor swivel joints for leaks.
- With the water off, operate the stow function, looking for any possible obstructions and check the final stow position.
- Inspect all exposed wiring for signs of damage.

Note: Grease fittings are provided for the up-down and left-right rotation joints, routine greasing should be performed to expel water & other contaminants that can get into the rotation joints. If the monitor is exposed to a high level of radiant heat for a prolonged period, it may be possible for the factory grease to thin and run out of the rotation joints. In such an event, fresh grease should be applied. Use Mobilux EP2 or equivalent. Start at one end of travel range and apply grease through the fitting of each joint until fresh grease comes out the joint. Repeat every 30 degrees throughout the full range of travel on each rotation joint. Wipe off any expelled grease when done.



Caution: DO NOT use high pressure spray to clean the monitor system. Using high pressure spray can damage seals and lead to serious damage of electrical components.



Caution: Always check the stow position after any repairs to the monitor. It is possible that during repair work the stow position could be moved or lost, and will need to be reprogrammed. If necessary, reprogram the stow position by following the instructions in the *Programming Stow Position* section.

Understanding System LEDs

- **LED Notations**

- DS1 – Lights when either nozzle direction is engaged.
- DS2 – Lights when either of the AUX buttons are pushed.
- DS3 – Comes on when the UP or DOWN button is pressed.
- DS4 – Comes on with any horizontal movement.
- DS5 – See DS5 Status Indicator Table below.
- DS6 – Lights when power is applied.

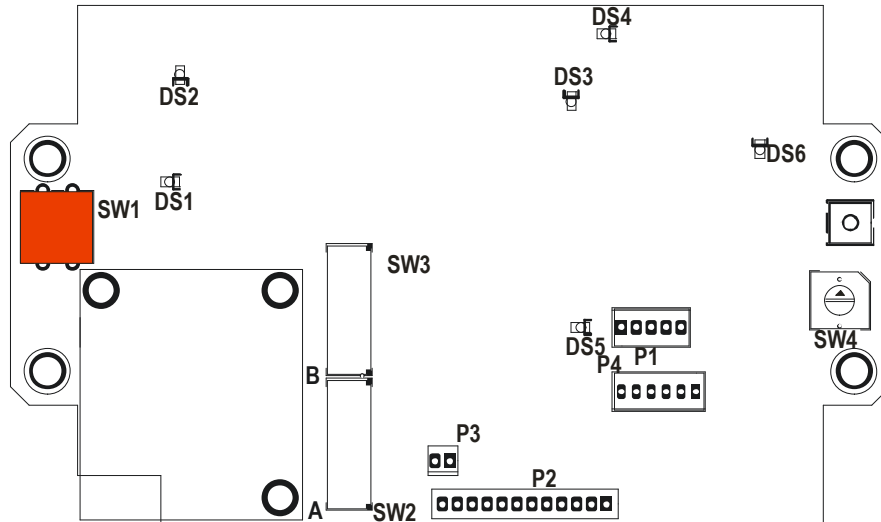


Figure 5: System LED Notations

Table 6: DS5 Status Indicator LED Table

Reference	Indication	Meaning
1	Blinks 6 times rapidly during startup	Visual indication that the controller is initializing – normal operation.
2	Blinks 6 times rapidly during startup, then blinks at ¼ second rate continuously	SW4 in wrong position – must be in position 1 or 2 for proper 8294-06 or 8394-07, or position 3 for 8294-06 EXT operation.
3	Blinks at ½ second rate	Truck battery voltage <8 volts – light will blink until power is lost or restored.

Handheld Controller

Battery Type

The Scorpion handheld controller uses two AA Lithium batteries. The low battery light will illuminate with approximately two hours of transmission time remaining before the batteries are completely discharged. Due to the time-voltage characteristics of rechargeable batteries, this time could be drastically reduced if rechargeable batteries are used.

Battery Replacement

The batteries can be replaced with any standard fresh AA Lithium batteries.

- Turn the controller power off.
- Remove the battery cover.
- Remove both of the old AA batteries.
- Wait 5 minutes, and then install new AA Lithium batteries.
- Replace the battery cover.

SYSTEM SPECIFICATIONS

Panel Mount Controller

- Input power 12/24 VDC (11 VDC to 30 VDC)
- RF power output Meets FCC part 15 requirements for license free operation
- Transmitter dimensions 7 5/8" x 3 7/8" x 2 3/8"
- Operating temperature range -40°C to +65°C, -40°F to +150°F
- Environmental Rating NEMA 4
- FCC ID QT8PTSS2003

Handheld Controller

- Input power 2 AA Batteries (Lithium Recommended)
- RF power output Meets FCC part 15 requirements for license free operation
- Transmitter dimensions 6" x 3 1/4" x 1 3/8"
- Transmitter weight 10 1/2 oz.
- Operating temperature range -40°C to +65°C, -40°F to +150°F
- Environmental Rating NEMA 4
- FCC ID QT8PTSS2003

Receiver

- Power requirements Without Converter Assembly 12VDC (11-14VDC)
- Electrical Load See Table 7 Below
- Control current 0.07 A (12V)
- Operating temperature range -40°C to +65°C, -40°F to +150°F
- Environmental Rating NEMA 4

Monitor	Left/Right	Up/Down	Nozzle
Run Current*	5 A	6 A	0.5 A
Stall Current*	26 A	26 A	NA
Current Trip Point*	13 A	10 A	4 A

Table 7: Motor Current Specifications

*All current ratings are at 12V

Shock

- 30 G's (55 Hz. @ .2" double amplitude)

Vibration

- 15.5 G's (55 Hz. @ .05" double amplitude) continuous operation

Drop Test

- The handheld controller must meet operating specifications after drop from 1m height onto concrete surface.

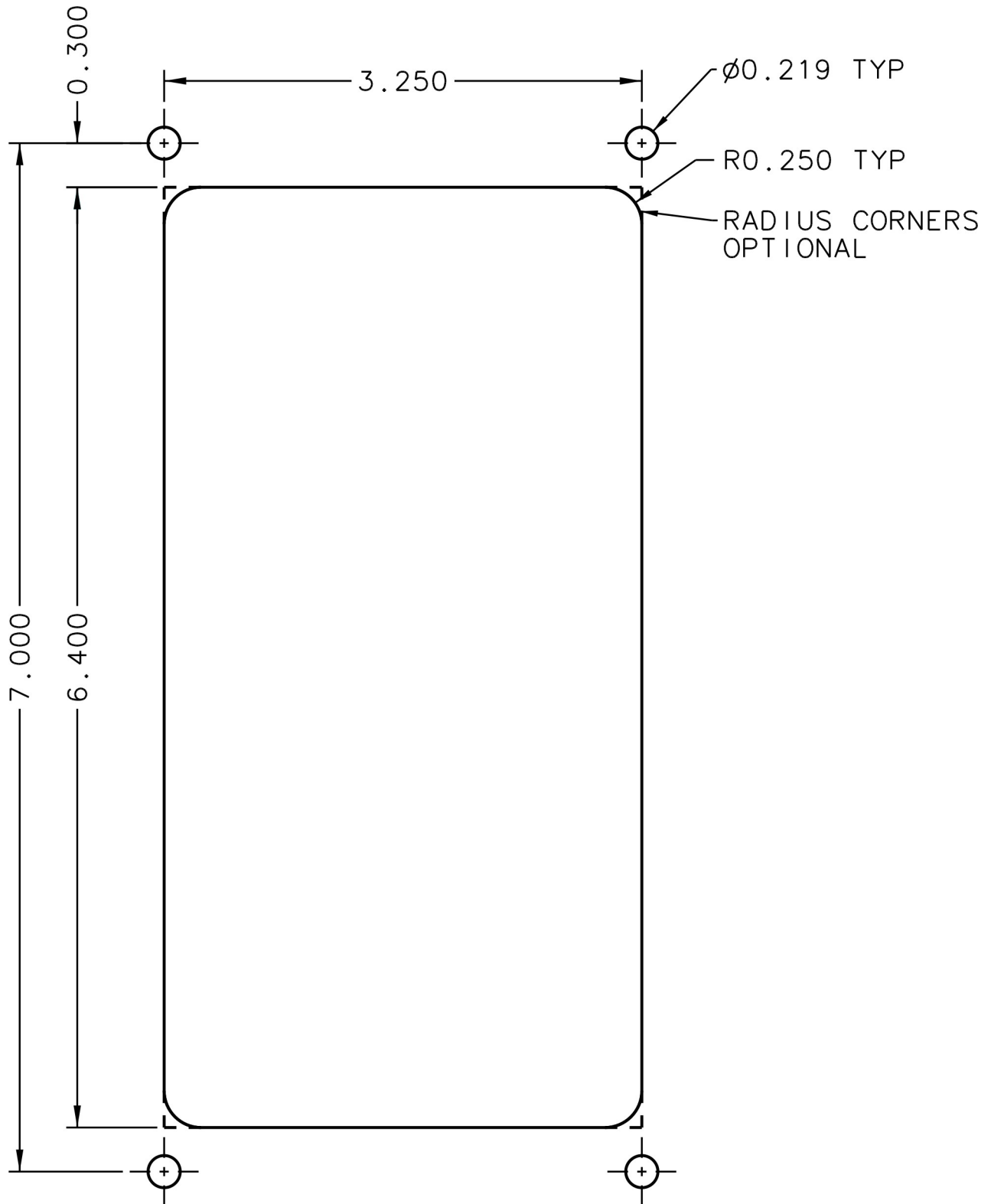
Environmental

- All enclosures have a NEMA 4 rating (must withstand a 1" stream of water at 65 GPM from a distance to 10ft. for five minutes with no water entering the enclosure).

COMPONENT MOUNTING TEMPLATES

NOTE: Pages must NOT be scaled during printing or template size will be scaled incorrectly.

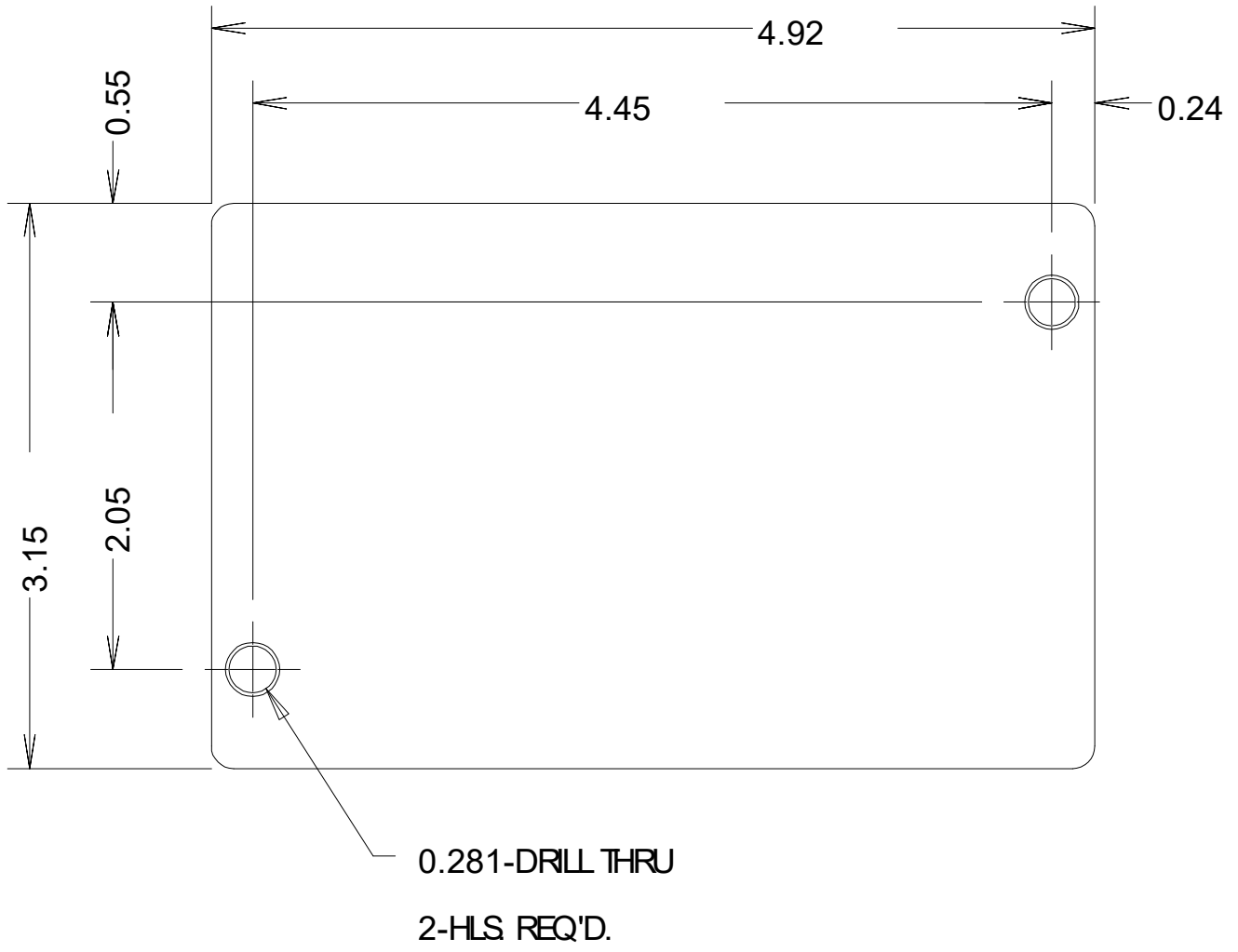
Panel Mount Controller Mounting Template



IF YOU CAN SEE THIS TEXT, PLEASE REPRINT THIS PAGE AT 100% (NOT SCALED) FROM THE DIGITAL PDF. DOUBLE CHECK BEFORE DRILLING.

IF YOU CAN SEE THIS TEXT, PLEASE REPRINT THIS PAGE AT 100% (NOT SCALED) FROM THE DIGITAL PDF. DOUBLE CHECK BEFORE DRILLING.

Secondary Control Switch Box Mounting Template

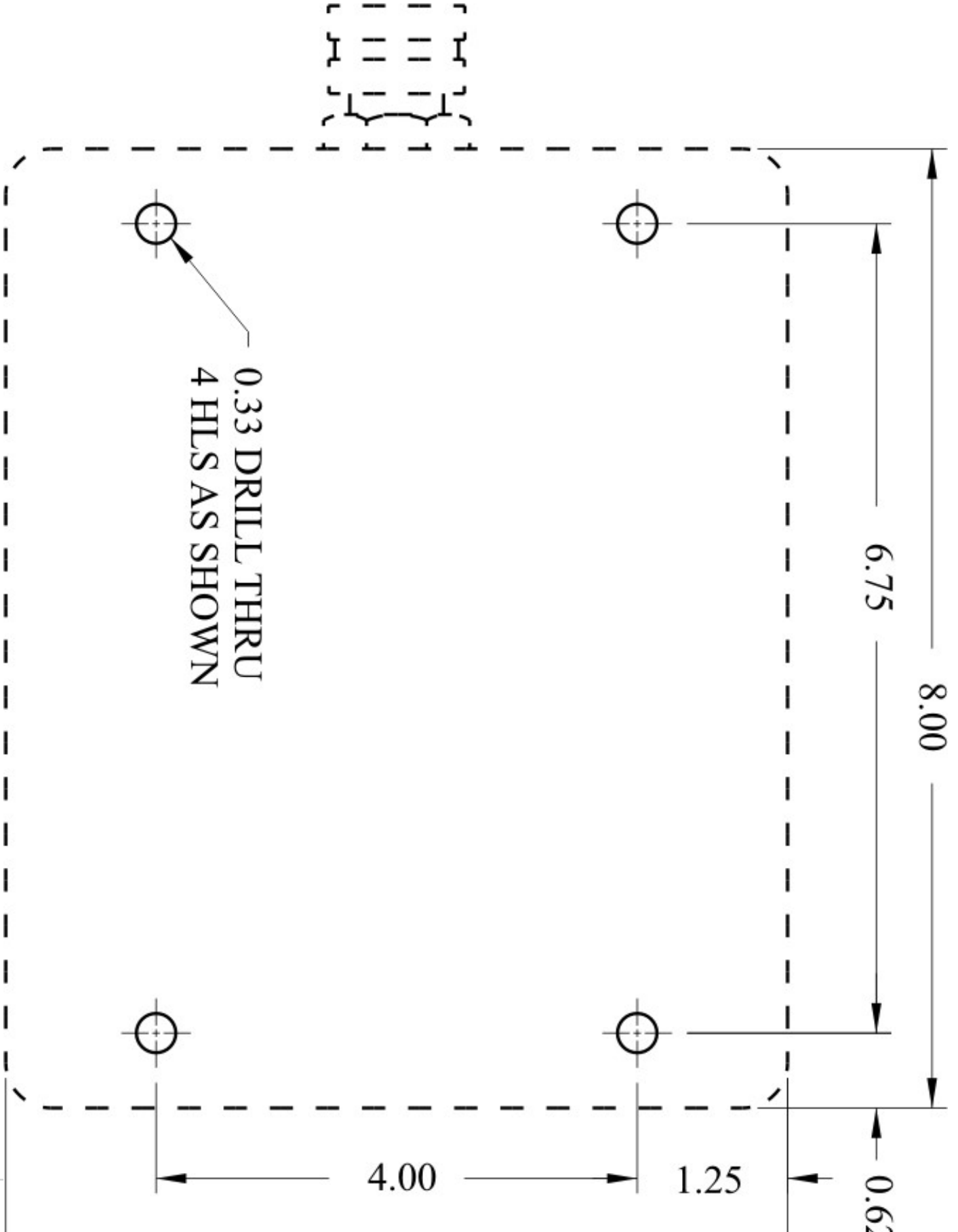


0.281-DRILL THRU
2-HLS REQ'D.

IF YOU CAN SEE THIS TEXT, PLEASE REPRINT THIS PAGE AT 100% (NOT SCALED) FROM THE DIGITAL PDF. DOUBLE CHECK BEFORE DRILLING.

IF YOU CAN SEE THIS TEXT, PLEASE REPRINT THIS PAGE AT 100% (NOT SCALED) FROM THE DIGITAL PDF. DOUBLE CHECK BEFORE DRILLING.

Auxiliary Battery Mounting Template





ELKHART BRASS
1302 WEST BEARDSLEY AVE
P.O. BOX 1127
ELKHART, IN 46514
PHONE: 1-574-295-8330 • 1-800-346-0250
FAX: 1-574-293-9914
WWW.ELKHARTBRASS.COM

© ELKHART BRASS MFG. CO., INC. 2014

8294-06, 8294-06 EXT, 8394-07 MONITORS
INSTALLATION, OPERATION, AND MAINTENANCE INSTRUCTIONS
98291000 REV. K

