



SwitchBlade® Rail Heater Installation, Operation and Maintenance Manual

A. GENERAL

Fastrax® Switchblade® heaters are engineered for state-of-the-art heat transfer and endurance.



CAUTION. Disconnect electrical feeder prior to terminating heaters.



CAUTION. The National Electrical Code and Canadian Electrical Code require ground-fault protection be provided for electric heaters

NOTE: Do not operate heaters at voltages in excess of that stamped on the heater. Excess voltage will shorten heater life.



Figure 1 - Typical Packaging

Prior to Installation



WARNING. Hazard of electrical shock. When electric heaters are applied to track switches where track circuits are used in conjunction with signal or switch operation and it is necessary that power system be maintained free from grounds, suitable ground fault detection and interrupting systems must be in use at all times to reduce shock hazard and protect signal system.

1. Using the 500 volt DC scale on a standard meg ohm meter perform a dielectric test on the heater.
 - a. Connect one lead of the meg ohm meter to the metal jacket of the heater and the second lead to either the black or white heater conductor. The insulation resistance should read at least 20 meg ohms from conductor to outer meter jacket (refer to Figure 2).



CAUTION. Do not come into contact with heater while performing the meg ohm test.



Figure 2 - Meg Ohms Reading

- b. If the heater does not reach 20 meg ohms, contact Fastrax® and do not install the heater.
2. Using a standard ohm meter perform a heater resistance test.
 - a. Connect one lead of the ohm meter to the black heater conductor and the other lead to the white heater conductor. (refer to Figure 2). Confirm the reading is consistent with the value listed in document 100021. Alternatively the resistance of the heater can be calculated by using the nameplate data stamped on the heater near the terminal end. The formula for calculating resistance is $VOLT^2/WATTS$. Record the ohm reading on the "System Checkout" sheet located at the back of this instruction.



Figure 3 - Standard Ohms Reading

B. LAYOUT GUIDELINES

1. Locate equipment for each switch.
2. Place the equipment near the location but out of the way of planned cable or conduit trenching and general construction.

Note: Always size conductors and electrical equipment based on load and configuration conditions. Follow Railroad and Local Electrical Code standards. Use only copper conductors.

Note: Electric wiring to heating elements must be installed in accordance with local Electrical Code and any applicable third party standards.



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CAUTION. Disconnect electrical feeder to control panel prior to terminating rail heaters.

C. INSTALLATION

1. Preparing the heater
 - a. Remove shipping ties and uncoil the heater on a reasonably flat surface being careful not to cause bends or kinks. It's helpful to have a second person.



- b. Walk the length of the heater to remove as much memory as possible.



- c. Rotate the heater 180 degrees and from one end flex the heater to remove as much memory as possible.



- d. Re-walk the length of the heater to remove as much memory as possible. It's not practical to remove all the memory from the heater.



2. SWITCHBLADE® Heaters (Field Side of Running Rail), Heaters Up To 26 Feet Long

- a. Refer to site plans to determine the required orientation of the heaters and cable end. For switches with rail braces, the braces must have notches to allow the elements to pass through. The heaters should be installed with bow away from the rail and the heater

ends contacting the rail. Once positioned, fasten in place with one clip at each end and every 24 inches along the length of the heater. Use only Fastrax SwitchBlade clips or clamps.



Figure 4 - Heater Installed with FRB clamp.(example only, clamp type varies depending on application)

3. SWITCHBLADE® Heaters (Field Side Running Rail) Greater Than 26 Feet Long

SWITCHBLADE heaters have a maximum length of 26 feet. To provide heating for points up to 52 feet, two heaters can be installed end to end.

Install one heater as previously described. Use the following instructions for the second heater:

- a. Orient the second heater with the cable end toward the heel and the loop end toward the point. Slide the heater in place, loop end first from the heel block location. Place the loop end about 2" from the loop end of the front heater.
- b. If necessary, adjust both heater placements to allow loop ends to meet between rail braces.
- c. Follow the same clamping instructions as on the front heater.
- d. Install one stainless steel wire tie between the two loop ends as shown below.



Figure 5 - Install clamps on rear heater every 2".



Figure 6 - Install the second heater from the rear of the switch so that the point of the rear heater meets the point of the front heater.

4. Heater Power Wire to Junction Box

Note: Electric wiring to heating elements must be installed in accordance with local Electrical Code and any applicable third party standards.

- a. Standard power lead wires are 26 ft long. Uncoil the power wire on each heater and route them in a crib below the rail, when crossing tracks, or directly to a junction box or control panel, as indicated on site plans.
- b. Follow site plans or railway authority guidelines for routing and installation of cable in ballast. Route and connect to junction box, or directly to control panel.
- c. Install cable with appropriate cable or conduit fittings.
- d. Leave wires long inside the box until final connections are made.



Figure 7 - Lead Wire shown installed with conduit.



Figure 8 - Install as required with conduit or cable fitting

D. MAINTENANCE



WARNING. Hazard of severe shock. Disconnect all power to heaters before servicing or replacing heaters. Only qualified personnel trained in electrical equipment service should perform maintenance on switch heating and control equipment.

1. Periodically (minimum annual) check connection of the electrical terminals and tighten if necessary to torque specification guides.
2. It is recommended that switch heaters be tested annually for proper insulation resistance. Turn off the breakers feeding the heaters and test insulation resistance at the incoming terminal blocks with a 500 Volt DC Meg Ohm Meter. A minimum value of 20 Meg Ohms should be obtained between heater metal sheath and electrical conductors. If this insulation level is not achieved, leave heaters disconnected and contact Thermon.
3. Periodically check heater-mounting hardware for loose or missing clamps - tighten or replace as needed. It is important that heating element surface maintains close contact with rail to insure long life and maximum efficiency.
4. Inspect heater and ensure that heater is secured and flat on the rail web.
5. Visually check heaters regularly to keep debris, combustible materials, and other objects from lying against or lodging between the heater and the rail.
6. Visually check heaters regularly for signs of physical damage from abnormal circumstances. If physical damage is apparent, disconnect and perform insulation test immediately before placing the heater back in service.



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HEATER CIRCUIT READINGS

FORM 0004ET

PROJECT: _____ PAGE: _____

LOCATION: _____ DATE: _____

TECH:

[illegible]

NOTES:

***1. Position:** Facing switch point - left or right hand heater

*2. Complete "REF OHM" column immediately before installation

This image shows a full page of blank graph paper. The grid consists of small, equal-sized squares formed by thin black lines. There are no margins, text, or other markings on the page.



PLEASE ADHERE TO INSTRUCTIONS IN THIS MANUAL

Failure to do so may be dangerous and may void certain provisions of your warranty.

For further assistance, please call 1.855.244.3128

WARRANTY: Under normal use the Company warrants to the purchaser that defects in material or workmanship will be repaired or replaced without charge (from date of shipment) for a period of:

- 84 months - SwitchBlade® Heaters
- 60 months - DC Heaters
- 36 months - DC Control Panels
- 36 months - HELLFIRE Heaters, FEB Heaters
- 12 months - All other Fastrax® Products

Any claim for warranty must be reported to the sales office where the product was purchased for authorized repair or replacement within the contract terms.

Subject to State or Provincial law to the contrary, the Company will not be responsible for any expense for installation, removal from service, transportation, or damages of any type whatsoever, including damages arising from lack of use, business interruptions, or incidental or consequential damages.

The Company cannot anticipate or control the conditions of product usage and therefore accepts no responsibility for the safe application and suitability of its products when used alone or in combination with other products. Tests for the safe application and suitability of the products are the sole responsibility of the user.

This warranty will be void if, in the judgment of the Company, the damage, failure or defect is the result of:

- Vibration, radiation, erosion, corrosion, process contamination, abnormal process conditions, temperature and pressures, unusual surges or pulsation, fouling, ordinary wear and tear, lack of maintenance, incorrectly applied utilities such as voltage, air, gas, water, and others or any combination of the aforementioned causes not specifically allowed for in the design conditions
- Or, any act or omission by the Purchaser, its agents, servants or independent contractors which for greater certainty, but not so as to limit the generality of the foregoing, includes physical, chemical or mechanical abuse, accident, improper installation of the product, improper storage and handling of the product, improper application or the misalignment of parts.

No warranty applies to paint finishes except for manufacturing defects apparent within 30 days from the date of installation.

The Company neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with the product(s).

The Purchaser agrees that all warranty work required after the initial commissioning of the product will be provided only if the Company has been paid by the Purchaser in full accordance with the terms and conditions of the contract.

The Purchaser agrees that the Company makes no warranty or guarantee, express, implied or statutory, (including any warranty of merchantability or warranty of fitness for a particular purpose) written or oral, of the Article or incidental labour, except as is expressed or contained in the agreement herein.

LIABILITY: Technical data contained in the catalog or on the website is subject to change without notice. The Company reserves the right to make dimensional and other design changes as required. The Purchaser acknowledges the Company shall not be obligated to modify those articles manufactured before the formulation of the changes in design or improvements of the products by the Company.

The Company shall not be liable to compensate or indemnify the Purchaser, end user or any other party against any actions, claims, liabilities, injury, loss, loss of use, loss of business, damages, indirect or consequential damages, demands, penalties, fines, expenses (including legal expenses), costs, obligations and causes of action of any kind arising wholly or partly from negligence or omission of the user or the misuse, incorrect application, unsafe application, incorrect storage and handling, incorrect installation, lack of maintenance, improper maintenance or improper operation of products furnished by the Company.