



# VITALink® Block Splice

UL Listed 2 Hour Fire-Rated Splice for  
VITALink® MC/RC90 Cables  
UL FHIT 120 USA/ FHIT7 120 Canada

IM-120-1

Rev 0

5/3/2019

## Installation Instructions

These instructions apply to USA System FHIT 120 and Canada System FHIT7 120 for splices and taps installed in areas requiring fire protection. See NFPA 70 Article 728 for a description of Fire-Resistive Cable Systems and their requirements. Compliance and verification is summarized on the last page.

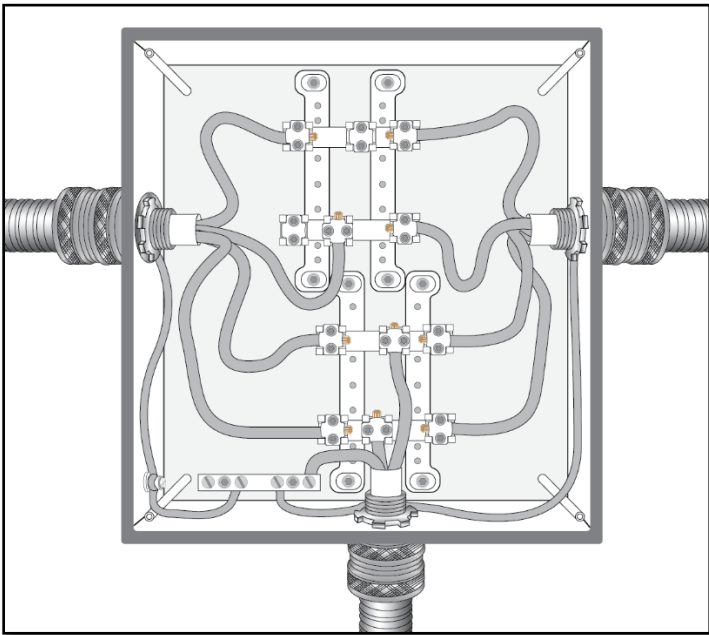
Read all instructions before starting.

### Description

RSCC's VITALink® Block Splice is both UL and cUL listed electrically and fire-rated for 2 hours to UL 2196/ULC S139 for USA and Canada in sizes 14 AWG through 2 AWG. The block splice is compliant with the NEC and CEC requirements.

The VITALink® Block Splice contains components and instructions for assembling a 2 hour fire-rated splice, with optional taps, on VITALink® MC/RC90 Cable. The box comes preassembled with the VITALink® block splice assembly installed inside ready for mounting. The box comes with pre-cut knockouts.

The fire rating of the block splice requires the splice not to exceed 480V.



## Important Guidelines

The VITALink® Block Splice system must be installed by qualified personnel familiar with generally accepted construction techniques and safe electrical practices.

Take all appropriate precautions when installing splices, including following OSHA and other applicable regulations.

Only stainless steel enclosures and stainless steel connectors may be used.

To ensure this kit is installed correctly, read and follow all the safety warnings and instructions contained in this document.

The installation must comply with all national and local electrical codes and all the requirements of the UL Electrical Circuit Integrity System listing (UL Category FHIT/FHIT7, System 120) requirements, and carefully follow the installation instructions.

Ensure the cable is in good condition prior to commencing splice installation. Do not pull cables around corners that have sharp edges, such as corners in cable trays, or other obstructions.

Support the cable in the manner and at the intervals described in the Electrical Circuit Integrity System listing.

### Materials Required

Only the components listed in these instructions and UL FHIT 120/FHIT7 120 shall be used to maintain the fire listing. Further details on the materials beyond the list below are provided inside the document.

- VITALink® Block Splice Assembly and Box - Stainless steel Adalet NEMA 4X enclosure with gasket and VITALink® Block Splice Backplate Assembly pre-installed in box.
- VITALink® MC/RC90 Cable with or without an overall polymeric jacket, and with or without segmented groundwires.
- Bonding wire – bare copper or insulated Firewall® LSZH Type XHHW-2
- American Connector stainless steel MC connector – Type WT
- Steel mounting components. For more information on mounting and securing components please see system FHIT 120/FHIT7 120 published in the UL website.

### Tools Required

- Utility Knife
- 5/32 and 7/64 Hex Wrench
- Torque Wrench (lbf-in)
- Screw Driver
- Pipe Cutter
- Cable Cutter
- Needle Nose Pliers
- Channel Locks

### Listings

The items below are fire resistive cable system components listed to UL 2196/ULC S139 for use with UL system FHIT 120 and FHIT7 120.

#### VITALink® Splice box assembly

- UL 50 (TYPE 4X)/CSA C22.2 No. 94.1
- CSA C22.2 No. 76
- UL 1773
- UL 486A-486B/CSA C22.2 No. 65

#### VITALink® MC/RC90 Cable

- Type MC per UL 1569
- Type RC90 per CSA C22.2 No. 123
- See VITALink® MC/RC90 data sheet for all cable listings

#### Firewall® LSZH Bonding Wire

- Type XHHW-2 UL 44/ CSA C22.2 No. 38
- See Firewall® LSZH data sheet for all cable listings

#### American Connector

- UL 467/CSA C22.2 No. 41
- UL 514B/CSA C22.2 No. 18.3



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## General

Only use RSCC provided stainless steel enclosure. Support the cable within 12 inches from box and every four feet on center thereafter.

RSCC's Firewall® LSZH bonding wire may be used inside the box. Do not introduce any materials into splice box that are not described within this installation guide. Taps and splices in any orientation may be connected to the bus bars (not shown).

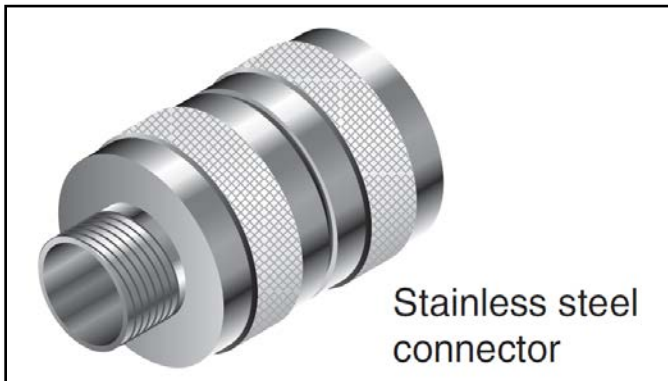
## Box Mounting

Four mounting holes for the box are 5/16" in diameter. Boxes can be mounted in any orientation.

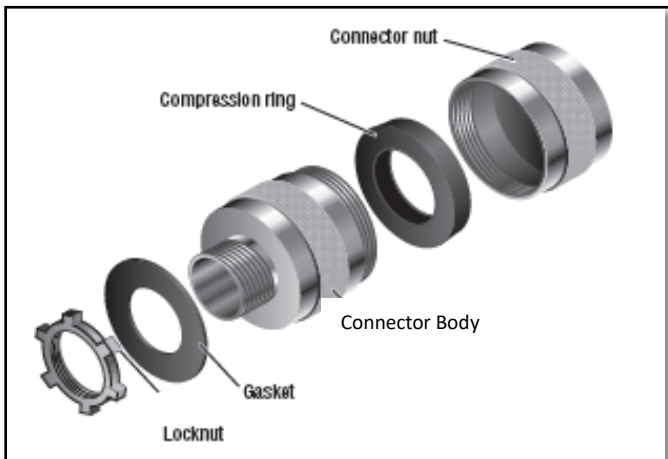
## Connector Attachment to Cable

The MC Connector must be American Connector WT series stainless steel. For detailed instructions on preparation of cable, including removal of armor, see the VITALink® MC/RC90 Installation Manual (IM-120-0).

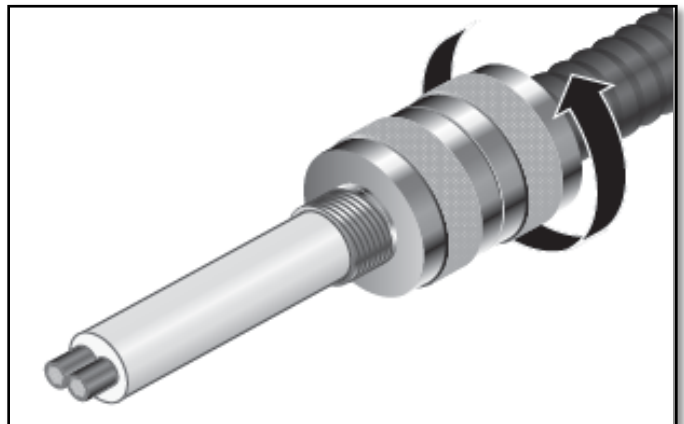
Connector



1. Check to ensure you have all connector components. This can be done visually without disassembling connector.



2. Using a pipe cutter, remove enough armor so the conductors can be easily spliced inside the enclosure. To avoid damaging the insulation on the conductors it is advisable to leave the white inner jacket until you insert the cable into the enclosure.
3. If the cable has an outer jacket over the copper armor, then strip the outer jacket to the length specified in the connector instructions.
4. Inspect the edge of the armor for any burrs or sharp edges. Flatten or remove as necessary with needle nose pliers. Be careful not to have scrap pieces fall into cable.
5. Loosen the *Connector Nut*, but do not remove it.
6. Slide the *Connector* over the cable until the threads inside of the *Connector Body* make contact with the copper armor.
7. Gripping only the *Connector Body*, screw connector onto copper armor and continue until hand tight.
8. Finish tightening the *Connector Body* onto the armor using channel locks gripped to the *Connector Body*. The connector is tightened when the copper armor reaches the end of the threading on the male end of the *Connector Body*. The connector will not be able to be screwed on further. Do not force. Once the connector is tight, further tightening will only cause the armor to twist and break. The connector should not be loose on the cable after tightened. A loose connector is not sized properly.
9. Tighten the *Connector Nut* using two channel locks. One channel lock is needed on the connector body to prevent unscrewing it while the *Connector Nut* is being tightened, and one channel lock is gripped on the *Connector Nut* to tighten it.





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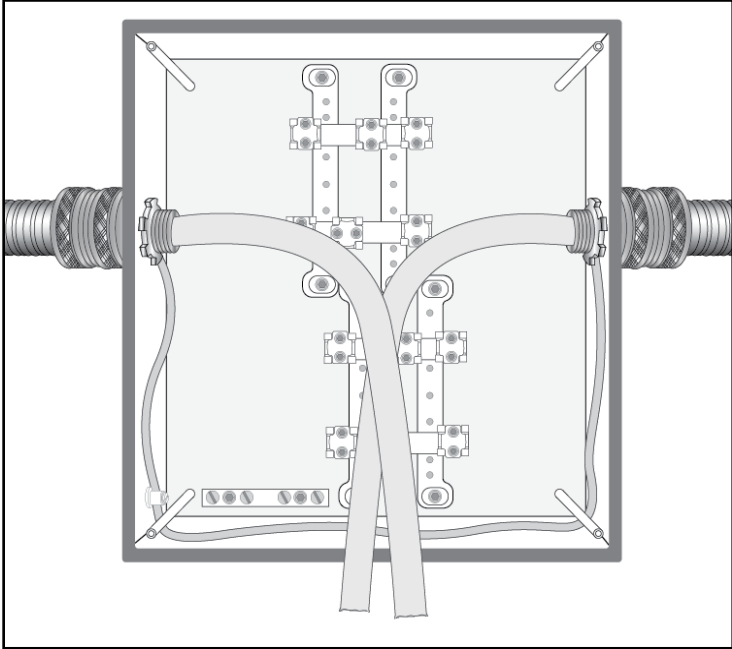
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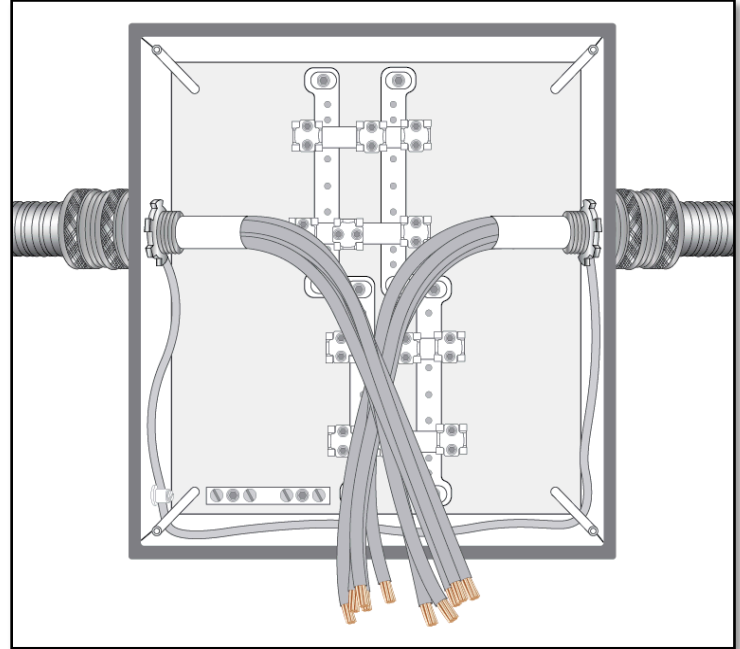
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## Secure Cable and Grounds



10. Boxes come with pre-cut knockouts. Additional knockouts can be prepared in field using a punch set. Prepare box knockouts and file sharp edges as needed. Clean up any metal shavings or oil.
11. Ensure rubber gasket is on connector and insert cables into enclosure taking care not to nick or cut the cable core.
12. Attach and secure the MC connector to the steel box using provided locknut. Once firm even contact is made between the locknut and box, an additional quarter turn is required.
13. Attach the earth tag, orient the bonding screw towards the bottom of the box, and secure second locknut to the MC connector similar to Step 12.
14. Attach bare ground or RSCC Firewall® LSZH green ground to the earth tag, copper ground bar, and any other grounding locations to bond the connector, cable, and box to ground. Train the ground/bond wires toward the bottom of the box as shown in the illustration. Train the ground wire from the ground copper bar to the back of the SS box.

## Remove Inner Jacket



15. Taking care not to nick or cut the black insulation, carefully remove the white inner jacket leaving a minimum of ½ inch where the cable exits the threaded part of the MC connector. One method to accomplish this is to cut through the end of the inner jacket ½ inch inward and use your hands to peel the jacket back. This is preferred over scoring the jacket lengthwise down the cable because it eliminates the risk of cutting the insulation accidentally. Damage to the insulation will require a new piece of cable.



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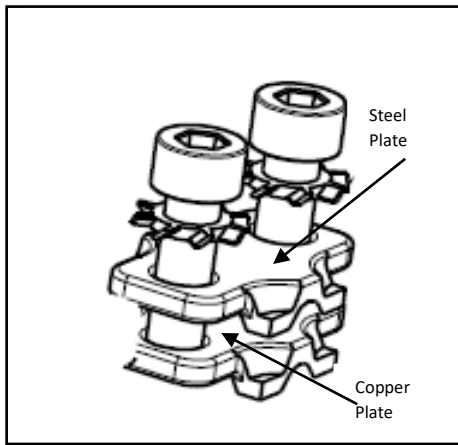
## Splice/Tap Layout and Termination

Multiple splices and taps are allowed in each box. Some splice kits come with large bus bars (Approximately 4-3/8" long), and some with small bus bars (Approximately 2-3/4" long).

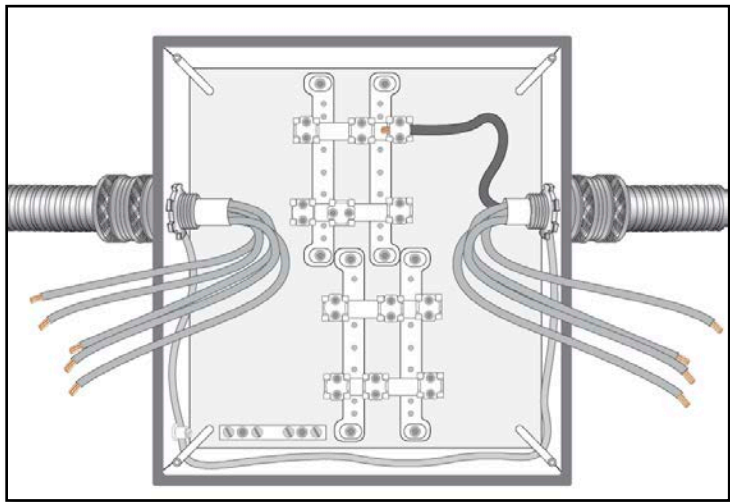
Each termination point on the large bus bars has two compression plates. The top plate is steel and the bottom plate is copper.

The small bus bar has only one compression plate.

Below – Large bus bar compression plates



The termination of a conductor on the bus bar, for a splice or tap, can be done at any plate location. The conductor should extend slightly past compression plate(s) when inserted into termination. There are different instructions based on conductor sizes and bus bar size. Use appropriate instructions below based on the conductor size.



16. For all splices, cut the ends of the conductor square and carefully remove the black insulation. Strip off insulation 7/8". Ensure conductor trimmings do not fall into the box.

17. Conductor sizes 6 AWG through 2 AWG (Large Bus Bar)

### Large Bus Bar

Approximately 4-3/8" long

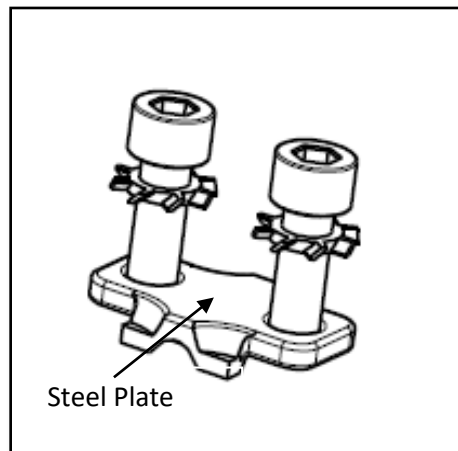
6 AWG through 2 AWG can only be installed on the large bus bar.

The copper plate shall be removed before installing the conductors. If there is only one single steel plate installed, then the copper plate has already been removed. If the bus bar does not have a steel plate available for installation, then contact RSCC.

If the copper compression plate is installed, remove the underlying copper compression plate by unscrewing two hex head machine screws and washers.

Re-install the steel compression plate only and screw the steel compression plate back onto bus bar with the two stainless steel screws and washers.

Insert stripped copper conductor under the single steel plate and torque 31.2 in-lbf Minimum to 36 in-lbf Maximum.





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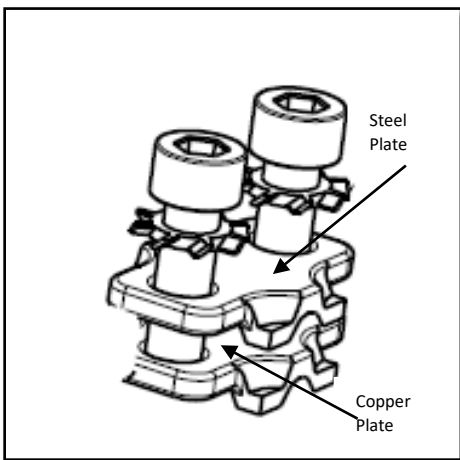
18. Conductor sizes 14 AWG through 8 AWG or two 12 AWG conductors.

### Large Bus Bar

Approximately 4-3/8" long

For large bus bars the conductor(s), shall be inserted between two compression plates. The steel plate must be on the top, and the copper plate must be on the bottom. Large bus bars can accept two 12 AWG conductors between compression plates.

Below – Large bus bar compression plates



If the orientation of the plates is incorrect for the large bus bar, remove plates, and switch them to the proper configuration with the copper plate on the bottom and the steel plate on top.

For the large bus bar, conductor sizes 14 AWG through 8 AWG or two 12 AWG conductors must be installed between the two compression plates. Do not secure the copper conductor(s) under the two compression plates attached to termination point.

For the large bus bar insert the copper conductor(s) between the steel plate and copper plate and torque.

Large Bus Bar: 31.2 in-lbf Minimum to 36 in-lbf Maximum.

### Small Bus Bar

Approximately 2-3/4" long

For small bus bars the conductor can be installed under the single steel compression plate. Small bus bars can accept only one conductor under the termination point. Do not install two conductors under the compression plate for the small bus bar.

For the small bus bar insert the copper conductor between the steel plate and copper plate and torque.

Small Bus Bar: 13.2 in-lbf Minimum to 18 in-lbf Maximum.



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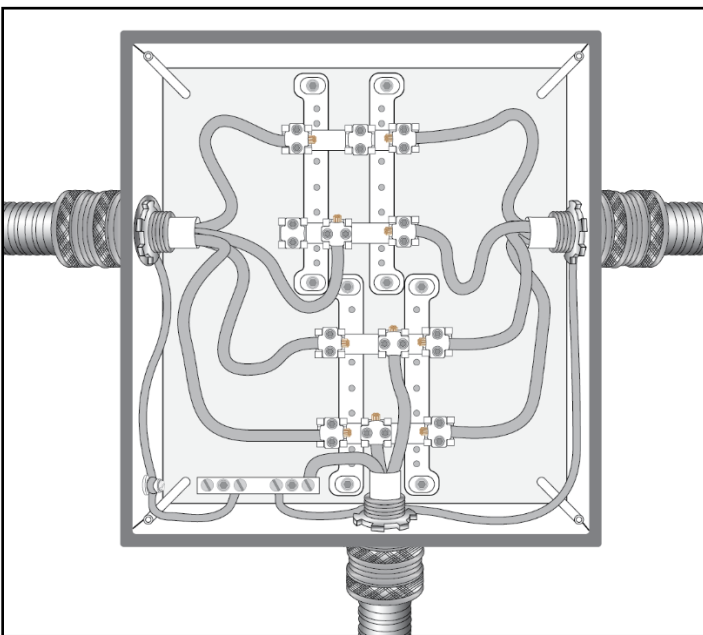
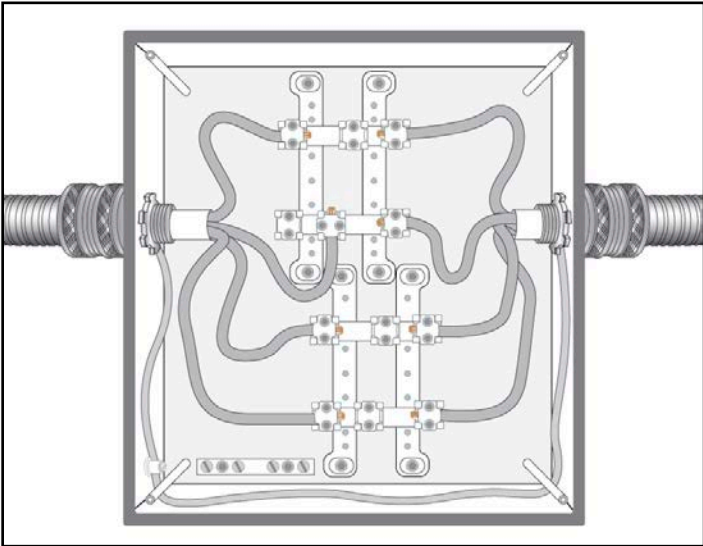
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## Splice/Tap Conductor Training

19. Train conductors to minimize crisscrossing and not exceeding minimum bend radius. Space conductors to maximize space between phase to phase and phase to ground. Phase Conductors should not touch box.

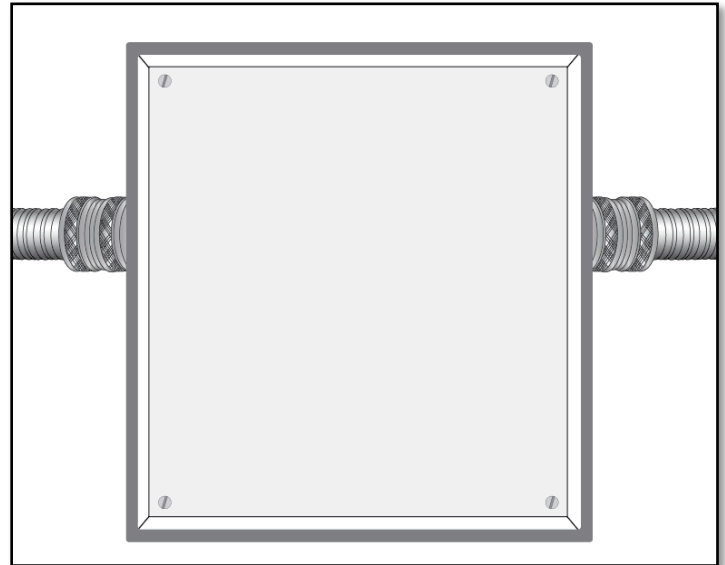
Ground and neutral conductors should be neatly trained towards the bottom and back of the box away from phase conductors as much as reasonably possible.

20. Inspect insulation to verify it was not damaged or cut during installation. Two examples showing a pass through splice and a splice with a tap are shown below.



## Clean Up, Final Inspection, Close Box

21. Remove any loose debris from inside the box.
22. Attach stainless steel cover plate on top of standoffs as shown below. Tighten all four screws securely.
23. Inspect box cover gasket for any damage and ensure it is clean.
24. Secure the gasketed box cover to the box using the clips and tighten screws (not shown).





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## Parts and Configurations

### Cables

All cables listed in FHJR 15365 for the USA and FHJR7 15365 for Canada sizes 14 AWG through 2 AWG with or without and overall polymeric jacket, and with or without segmented groundwires. Standard PN's are per VITALink® MC/RC90 Cutsheet. Some cables may require custom PN.

### Connectors

PNs and Sizes per VITALink® MC/RC90 data sheet.

### Box Size

Typical Box Size is 14" x 16" x 4" (Width x Height x Depth). Smaller sizes available. Other sizes available complying with NEC or CEC.

### Splice/Tap Configurations

Typical box comes pre-installed with two block splice sub-assemblies attached to a backplate. Typical sub-assembly has two bus bars attached each with three termination points to allow for lighting taps, totaling 12 termination locations. Note: In The USA, four bus bars can be attached to each sub-assembly doubling the amount of splices/taps.

Other configurations are available allowing many more terminations points and/or smaller boxes.

Sub-assembly configurations are limited to RSCC's UL/cUL electrical listing requirements. See below for all configurations for USA and Canada.

### Backplate Part Numbers

The typical backplate part number is shown because it is most common. PN for the backplate: Typical USA and Canada **VX99002-522**.

### Box Part Numbers

Boxes are ordered by specifying the backplate PN. RSCC will assign a completed box part number prior to order.

The box provided with the assembled back plate will comply with the UL/cUL/CSA electrical and fire listings as appropriate to the application.

## AHJ Inspection and Compliance

When inspecting the splice and components for compliance to UL 2196/ULC S139, verify the following:

1. Match the backplate part number described in this document against the part number printed on UL label applied to the backplate inside the box. This ensures compliance of the splice terminals to the electrical listings, and to FHIT 120/FHIT7 120 listings per UL 2196/ULC S139. (example: VX99002-522)
2. The box is Adalet Series TRN4XHSS or TRN4XHSS6 Series. This is printed on the label attached to the box. This ensures the box is the correct listed type and is stainless steel. Type 304 or 316 stainless steel is acceptable.
3. The cable connectors are Type WT from American Connectors.
4. The bonding/groundwires are bare copper or RSCC Firewall® LSZH type with bare copper conductor if insulated.
5. The fire-rated cable is VITALink® Type MC and/or Type RC90 printed on the cable.
6. The fire rated system is installed per FHIT 120/FHIT7 120, RSCC's VITALink® MC/RC90 Installation Manual (IM-120-0), This document (IM-120-1) as applicable, and the NEC/CEC or other governing code.

## UL Inspection

This section is required for UL inspection. Contact RSCC for design and PN will be assigned complying with listings.

Part Number Nomenclature for the Backplate (11 digits – VX99000-522)

PN digit	<b>VX9900</b>	<b>2</b>	<b>-</b>	<b>5</b>	<b>2</b>	<b>2</b>
Below Reference	I	II	III	IV	V	VI

Backplates can have up to nine sub-assemblies installed.

### USA.

- I. VX9900 – General Vitalink Components Prefix
- II. (1 – 9), Number of bus bar sub-assemblies attached to backplate. (Typically 1 to 2)
- III. (-), Dash Placeholder
- IV. (2-5) – Style (Typically 5)
- V. (1-2) – Bus Bar Size (Typically 2)
- VI. (1-4) – Number of Bus Bars attached to the ceramic base (Typically 2 to 4)

### Canada

- I. VX9900 – General Vitalink Components Prefix
- II. (1 – 9), Number of bus bar sub-assemblies attached to backplate. (Typically 2)
- III. (-), Dash Placeholder
- IV. (3-5) – Style (Typically 5)
- V. (1-2) – Bus Bar Size (Typically 2)
- VI. (1-2) – Number of Bus Bars attached to the ceramic base (Typically 2)