



Installation Guide For 18, 16, 14 & 12 AWG 2 Hour Rated Fire Resistive Applications

VITALink[®]

2 Hour



**Fire Resistive Circuit
Integrity Cable
With Hose Stream**

UL 105°C Listed Type FPLR-CI-LS,
CMR-CI-LS, CL3R-CI-LS, PLTC-CI-LS &
CSA FAS90,

Shielded and Unshielded
For Use in Electrical Circuit Integrity
Systems FHIT.40A & FHIT7.40A

R27557, (72v)

18, 16, 14 & 12 AWG Non-Shielded Construction
18, 16 & 14 AWG Shielded Construction
Installation Guide dated May, 2017



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Scope

VITALink® 2 Hour Fire Resistive Circuit Integrity Cable is a unique cable which offers superior fire endurance capabilities along with the well-established benefits & features associated with NEC Type FPLR-CI-LS, CMR-CI-LS, CL3R-CI-LS & PLTC-CI-LS and CEC CSA Type FAS90 cable designs. This cable is specifically designed to meet the circuit integrity requirements in NFPA 72 National Fire Alarm and Signaling Code, CSA C22.2 No. 208-14 Fire Alarm and Signal Cable as well as other low voltage critical circuits in NFPA 70 National Electrical Code and Canadian Electrical Code.

Introduction

The following instructions are for the **VITALink®** 2 Hour Fire Resistive Circuit Integrity Cables for UL 2196 and ULC S139 **Electrical Circuit Integrity Systems No. FHIT.40A and FHIT7.40A, with Hose Stream Test**. The National Electrical Code, Canadian Electric Code and all applicable rules and regulations, including federal, state or provincial, local, and municipal or territorial laws should be followed.

Electrical Circuit Integrity Systems FHIT.40A & FHIT7.40A

Electrical Circuit Integrity Systems consist of components and materials that are intended to provide protection for specific fire alarm and control wiring systems with respect to the circuit integrity upon exterior fire exposure. The specifications for **Electrical Circuit Integrity Systems No. FHIT. 40A and FHIT7.40A, with Hose Stream Test**, and its assembly are important details in the development of the ratings.

Ratings apply only to the entire integrity system assembly, constructed using the combination of components specified in the system. Individual components and materials are designated for use in a specific system(s) for which corresponding ratings have been developed, and are not intended to be interchanged between systems. Ratings are not assigned to individual system components or materials.

The **Electrical Circuit Integrity Systems No. FHIT. 40A and FHIT7.40A, with Hose Stream Test**, must be fastened to a concrete or masonry wall or a concrete floor-ceiling assembly. The fire rating of wall or floor ceiling assembly must be equal to or greater than the rating of the electrical circuit integrity system. This is to ensure that the complete electrical circuit integrity system will survive during the fire and hose stream exposure.

These **Electrical Circuit Integrity Systems No. FHIT. 40A and FHIT7.40A**, are evaluated by the **fire exposure and water hose stream test** as described in the Standards ANSI/UL 2196 and CAN/ULC-S139. The system contains the construction details of the tested configuration. The conductor size, cable type, and voltage rating, etc. are construction details that are also provided. Cables are listed to a NEC Type and ULC listed to CEC Type and CSA Listed to C22.2 No. 208-14 Type and constructed to:

- UL – Type FPLR-CI-LS to UL 1424, CL3R-CI-LS and PLTC-CI-LS to UL 13, and CMR-CI-LS to UL 444/CSA 22.2 No.214
- CSA – FAS90 to C22.2 No. 208-14

The **Electrical Circuit Integrity Systems No. FHIT. 40A and FHIT7.40A, with Hose Stream Test**, is tested as a complete system and includes the type of raceway, raceway support, couplings, pulling lubricants, etc. Cable or raceway supports needed to hold the cable in place during the fire and hose stream. The hardware, clamps, strut, etc., unless otherwise noted, are to be made of steel so that these components do not melt in fire.

Systems that require a raceway are to be evaluated for use with the type and size of raceway and couplings with the maximum numbers of cables per diameter raceway trade size. Only the type of raceway and number of cables installed in the raceway per the UL/ULC Certification shall be acceptable.

The raceway must be connected together using the coupling type listed in the system, such as steel EMT compression. No other coupling shall be used unless noted in the specific system.

The supports are an important part of the **Electrical Circuit Integrity Systems No. FHIT. 40A and FHIT7.40A, with Hose Stream Test**, and each individual system has specific support requirements. The maximum distance between the supports is listed in the system and should not be exceeded. The type of support and the distance between the steel supports is unique to that specific system and is for all sizes/types of cable and/or conduits/raceways unless otherwise noted in a specific system.

The supports for both the vertical or horizontal configuration are intended to be the support to the cable/conductor. Cables installed in a vertical raceway are not supported by the raceway. The ability of cable to support the equivalent cable weight of the distance specified in Table 300.19 of the NEC or Table 21 of the CEC (or a lesser distance), without breaking the conductor, and compatibility/mechanical considerations of the support mechanism are evaluated in the test by simulating the weight of the vertical cable run. The vertical distance tested and the support mechanisms are detailed in the system.

Compatibility of materials used in **Electrical Circuit Integrity Systems No. FHIT. 40A and FHIT7.40A, with Hose Stream Test**, is also a concern. Some materials can provide carbon residue that is conductive, or conductive gasses that can cause premature failure. A dedicated raceway is required. As an example, other types of fire alarm cables, such as Type FPLP/FAS cables shall not be used with a fire rated system unless specified in the system. The pulling lubricant tested with the system is so noted in the system.

These systems shall be installed in accordance with all provisions of the National Electric Code and/or the Canadian Electric Code, as applicable to location, and as amended by the details of each individual system (such as type of supports and distance between supports).

Authorities having jurisdiction should be consulted in all cases as to the specific requirements covering the installation and use of these classified systems.

The following instructions are for the **VITALink® 2 Hour Electrical Circuit Integrity Systems No. FHIT. 40A and FHIT7.40A, with Hose Stream Test**, These requirements must be followed to maintain the 2 Hour rating in a fire rated area.

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction (AHJ) should be consulted prior to construction and in all cases as to the particular requirements covering the installation and use of UL/ULC Certified products, equipment, system, devices, and materials.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL and ULC for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL/ULC/CSA Marks are considered Certified.

The following cables are approved for use in **Electrical Circuit Integrity Systems No. FHIT. 40A and FHIT7.40A, with Hose Stream Test**.

Part Number	Description
36397	2C18 AWG SBC Shielded FPLR-CI-LS/CMR-CI-LS/PLTC-CI-LS/CSA/FAS90/FT4/ST1
35785	2C16 AWG SBC Shielded FPLR-CI-LS/CMR-CI-LS/PLTC-CI-LS/CSA/FAS90/FT4/ST1
36316	2C14 AWG SBC Shielded FPLR-CI-LS/CMR-CI-LS/PLTC-CI-LS/CSA/FAS90/FT4/ST1
36337	2C18 AWG SBC FPLR-CI-LS/CMR-CI-LS/PLTC-CI-LS/CSA/FAS90
35777	2C16 AWG SBC FPLR-CI-LS/CMR-CI-LS/PLTC-CI-LS/CSA/FAS90
36341	2C16 (7/24) AWG BC FPLR-CI-LS/CMR-CI-LS/PLTC-CI-LS/CSA/FAS90
36338	2C14 AWG SBC FPLR-CI-LS/CMR-CI-LS/PLTC-CI-LS/CSA/FAS90
36340	2C14 (7/.0242) AWG BC FPLR-CI-LS/CMR-CI-LS/PLTC-CI-LS/CSA/FAS90
36342	2C12 AWG SBC FPLR-CI-LS/CMR-CI-LS/PLTC-CI-LS/CSA/FAS90
36339	2C12 (19/.0185) AWG BC FPLR-CI-LS/CMR-CI-LS/PLTC-CI-LS/CSA/FAS90

Installation Details

- 1. Wall or Floor Assembly*** - Minimum 2 hour rated concrete or masonry wall or concrete floor. Opening in wall or floor through which raceway passes is to be sized to closely follow the contour of the raceway. Through opening in wall or floor shall be fire stopped using an approved firestop system. See Through-penetration Firestop Systems (XHEZ) for presently certified firestop systems.
- 2. Raceway*** - Horizontal and Vertical installation. **ALLIED TUBE & CONDUIT CORP & Columbia-MBF - Type EMT E-Z Pull™ Brand or WHEATLAND TUBE CO WH DIV - Type EMT FasTrak Plus Brand**

VERTICAL & HORIZONTAL - SHIELDED CONSTRUCTIONS

Raceway/ Conduit Size	Max # of 14 AWG (Solid) in Conduit	Max # of 16 AWG (Solid) in Conduit	Max # of 18 AWG (Solid) in Conduit
1"	3	3	4
1 ¼"	5	6	7
1 ½"	6	8	7
2"	10	10	7

VERTICAL & HORIZONTAL - NON-SHIELDED CONSTRUCTIONS

Raceway/ Conduit Size	Max # of 12AWG (stranded/solid) in Conduit	Max # of 14AWG (stranded) in Conduit	Max # of 14AWG (solid) in Conduit	Max # of 16AWG (stranded) in Conduit	Max # of 16AWG (solid) in Conduit	Max # of 18AWG (solid) in Conduit
1/2"	1	1	1	1	1	1
3/4"	1	1	1	1	2	2
1"	2	2	3	3	3	4
1-1/4"	4	4	5	5	6	7
1-1/2"	6	6	7	7	8	7
2"	10	10	10	10	10	7

Note - **VITALink®** Brand cables may be installed within the same raceway when not exceeding the maximum number of cables associated with any of the cable sizes installed within the common raceway. i.e. 12AWG and 18AWG cables installed in the same 2" raceway are limited to a maximum of 7 cables

2A. Raceway Coupling* - (Not Shown).

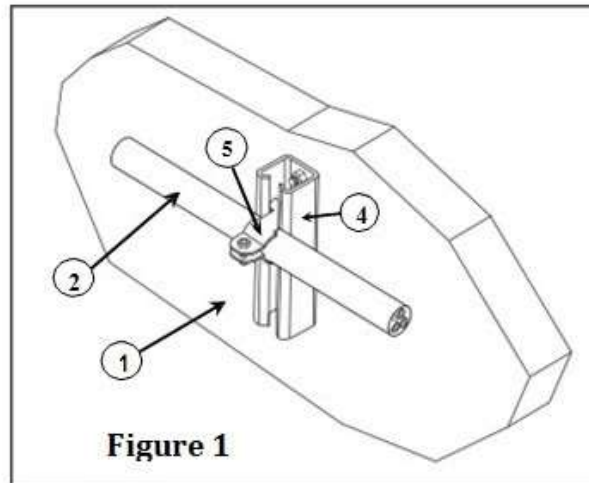
330A Turner Street, Attleboro, MA 02703 • Phone: 508-399-7004 • Fax: 508-399-8839 • www.comtrancorp.com

Thomas & Betts Corp. - Steel (all components) EMT Compression Couplings. Trade size to correspond with the raceway size.

RACO - Steel (all components) EMT Compression Couplings. Trade size to correspond with the raceway size.

3. **Fire-resistive Cable*** - The 2 hour fire rating applies to cable passing completely through a fire zone and terminating a minimum of 12 inches beyond the fire rated wall or floor bounding the fire zone. The cables, as identified below, may be installed in the vertical or horizontal orientation.

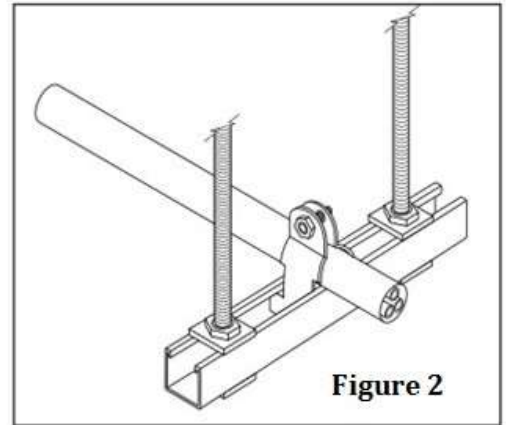
COMTRAN CABLE LLC - VITALink® Brand Type FPLR-CI-LS/CMR-CI-LS/PLTC-CI-LS & FAS 90 shielded and Type FPLR-CI-LS/CMR-CI-LS/PLTC-CI-LS & FAS 90 non-shielded Cables. To be installed as described herein and in accordance with the manufacturer's installation instructions dated May, 2017, R27557.



4. **Supports** - Supports - (Figure 1) - Min 12 gauge, by 1-1/2 inch wide or 1-5/8 inch wide, painted or unpainted, slotted steel channels with hemmed flange edges. Channel bottom with or without holes. Lengths of slotted steel channels 5 feet and less shall be secured to the wall or floor with a min of two 1/4 inch diameter (or larger) by 2-1/4 inch min long concrete screws, or 1/4 inch diameter (or larger) by 1-3/4 inch long min steel masonry anchors. One screw or anchor to be located at each end of the slotted steel channel. Lengths of slotted steel channel in excess of 5 feet require a min of three screws or anchors, one at each end of the channel and one centrally located within the length of the channel. For vertical and/or horizontal cable installations, the supports shall be spaced a maximum of 5 feet on center.

*Bearing the Certification Mark of UL/ULC/CSA

4A. **Trapeze-type Supports** - (Figure 2) - The raceways shall be installed on/from trapeze-type supports. The trapeze-type supports shall be secured from the surface of the floor. The supports shall be spaced a maximum of 5 feet on center.



5. **Clamps** - Two-piece single-bolt pipe clamps manufactured of min 16 gauge steel, measuring 1-1/4 inch wide and trade size to correspond with the outside diameter of the raceway.

6. **Pulling Lubricant*** - When installing the cable into the EMT, the cables shall be coated with pulling lubricant.

AMERICAN POLYWATER CORP – Polywater Type LZ

7. **Enclosures (Pull Boxes)*** - Wiegmann NEMA-1 Steel Enclosures with steel compression connectors (RACO or Thomas & Betts Corp) can be used in both the horizontal and vertical installations.

Horizontal Installation - (Figure 3) - For long horizontal runs or installations with more than four 90 degree bends in the EMT a pull box is permitted.

The enclosures should have minimum height and depth and maximum width as follows:



EMT Size	Enclosure Size
1/2" - 1"	4" x 4" x 12"
1 1/4" - 1 1/2"	6" x 6" x 12"
2"	6" x 6" x 16"

*Bearing the Certification Mark of UL/ULC/CSA

Vertical Installation – (Figure 4) – Vertical runs require an enclosure (pull box) be installed at the bottom of the EMT.



Figure 5

For 0.5, 0.75 & 1 inch EMT the enclosure should have a minimum dimension of 4 x 4 x 12 inches. For 1.25 & 1.5 inch EMT the enclosure should have a minimum dimension of 6 x 6 x 12 inches. For 2 inch EMT the enclosure should have a minimum dimension of 6 x 6 x 16 inches. The bottom EMT must exit through either the back or side wall of the enclosure not less than six times the diameter of the EMT (See Figure 5).



Figure 4

For Reference:

EMT Size	Enclosure Size (Min)	Exit From Top (Min)
½" - 1"	4" x 4" x 12"	6"
1 ¼" - 1 ½"	6" x 6" x 12"	9"
2"	6" x 6" x 16"	12"

When installing 12 AWG, 14 AWG and 16 AWG cable(s) in vertical runs, the maximum distance of unsupported cable shall not exceed 45 feet between vertical cable supports. 18 AWG Cable shall not exceed 30 feet between vertical cable supports. (See Section 8).

8. **Vertical Cable Supports** – (Figure 6). Vertical runs beyond the maximum distances described in Section 7 require the cables to be supported using an AMTEC stainless steel wire mesh support grip within a vertical enclosure.

The grip must be suspended from a steel bolt or steel hook fastened to the back or side wall of the enclosure (see figure 7). Make sure the head of the fastener does not block the opening of the raceway or interfere with the cables. For 0.5 – 1.5 inch EMT the enclosure should have a minimum dimension of 4 x 4 x 12 inches. For 2 inch EMT the enclosure should have a minimum dimension of 6 x 6 x 16 inches.



Figure 7



Figure 6

9. **Splices** – (Optional, Not Shown) 2 Hour Ratings at 72V Line to Line (42V Line to Ground)

– The cables may be installed with a pig tail crimp taped splice using components specified in the Manufacturer’s VITALink® Taped Splice Pigtail Crimp Instructions dated May 2017. The instructions are a component of the VITALink® Taped Splice Kits available from Comtran Cable LLC. For more information or to order a kit please contact Comtran Cable LLC at 508-399-7004.