

This technical information sheet covers Circuit Defender™ Non-Shielded and Shielded FPLR, FAS, or CMR Cables, which are UL-certified and listed as Two-Hour Fire-Resistant Fire Alarm Power Limited Cables.

APPLICATIONS

Circuit Defender™ CI cables have been qualified and listed to the requirements of UL 2196 and the CAN/ULC-S139 Test for Fire Resistive Cables. They are UL-listed Types FPLR/CMR and CSA Certified FAS.

Circuit Defender™ cables meet various industry code requirements (NFPA 70, NFPA 101, NFPA 130, and NFPA 502) for Fire Resistance according to UL 2196 when selected and installed per applicable codes, including federal, state, local, and municipal rules, laws, and regulations. This is in addition to the Electrical Circuit Integrity System 44 (FHIT44). Please note that authorities having jurisdiction (AHJ) should be consulted for approval before purchasing and installing the system.

DESCRIPTION

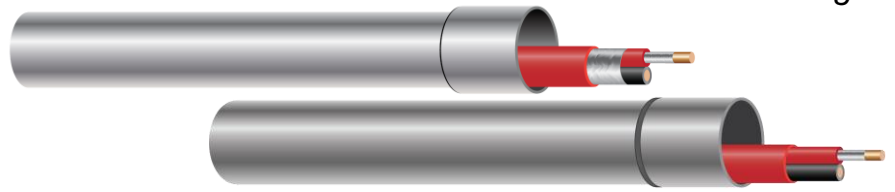
Dual Rated Non-Shielded and Shielded CMR UL/ULC and FPLR.

COMPLIANCE

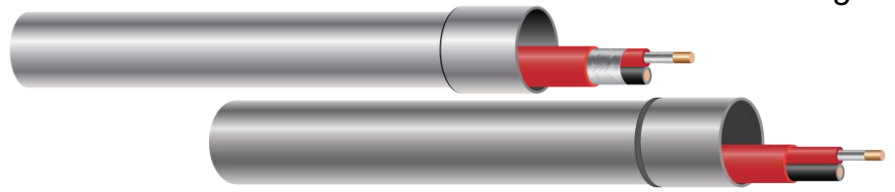
- ✓ UL1424 Listed FPLR
- ✓ UL 444 Listed CMR
- ✓ UL/CAN (ULC) Certified to UL 2196 2-hour Fire Rating in FHIT 44
- ✓ NFPA 70 Articles 517, 700, & 760
- ✓ NFPA 70, 72, 130, & 502 Fire Alarm Survivability circuit requirements
- ✓ UL File #E75610 & #E118871
- ✓ CSA Certified LL90458

REQUIREMENTS (HARDWARE & ACCESSORIES CERTIFIED)

- o EMT Conduit: Wheatland Western Tube, Nucor
- o EMT Compression Couplings: Garvin Industries Southwire
 - Part # CCP-50 for ½" EMT
 - Part # CCP-75 for ¾" EMT
 - Part # CCP-100 for 1" EMT
 - Part # CCP-125 for 1-1/4" EMT
 - Part # CCP-150 for 1-1/2" EMT
 - Part # CCP-200 for 2" EMT
- o EMT Compression Couplings: Raco
 - Part # 2922 for ½" EMT
 - Part # 2923 for ¾" EMT
 - Part # 2924 for 1" EMT
 - Part # 2925 for 1-1/4" EMT
 - Part # 2926 for 1-1/2" EMT
 - Part # 2928 for 2" EMT



- o EMT Compression Termination fittings: Garvin Industries Southwire
 - Part # CCN-50 for ½" EMT
 - Part # CCN-75 for ¾" EMT
 - Part # CCN-100 for 1" EMT
 - Part # CCN-125 for 1-1/4" EMT
 - Part # CCN-150 for 1-1/2" EMT
 - Part # CCN-200 for 2" EMT
- o EMT Compression Termination fittings: Raco
 - Part # 2902 for ½" EMT
 - Part # 2903 for ¾" EMT
 - Part # 2904 for 1" EMT
 - Part # 2905 for 1-1/4" EMT
 - Part # 2906 for 1-1/2" EMT
 - Part # 2908 for 2" EMT
- o EMT Set Screw Connector: Garvin Industries Southwire
 - Part # SSCN-50 for ½" EMT
 - Part # SSCN-75 for ¾" EMT
 - Part # SSCN-100 for 1" EMT
 - Part # SSCN-125 for 1-1/4" EMT
 - Part # SSCN-150 for 1-1/2" EMT
 - Part # SSCN-200 for 2" EMT
- o EMT Set Screw Connector: Raco
 - Part # 2002 for ½" EMT
 - Part # 2003 for ¾" EMT
 - Part # 2124 for 1" EMT
 - Part # 2125 for 1-1/4" EMT
 - Part # 2006 for 1-1/2" EMT
 - Part # 2008 for 2" EMT
- o EMT Set Screw Couplings: Garvin Industries Southwire
 - Part # SSCP-50 for ½" EMT
 - Part # SSCP-75 for ¾" EMT
 - Part # SSCP-100 for 1" EMT
 - Part # SSCP-125 for 1-1/4" EMT
 - Part # SSCP-150 for 1-1/2" EMT
 - Part # SSCP-200 for 2" EMT
- o EMT Set Screw Couplings: Raco
 - Part # 2022 for ½" EMT
 - Part # 2023 for ¾" EMT
 - Part # 2024 for 1" EMT
 - Part # 2025 for 1-1/4" EMT
 - Part # 2026 for 1-1/2" EMT
 - Part # 2028 for 2" EMT



- o Pull Through Box: Garvin Industries Southwire
 - Part # 52151-S 4 sq. X 1-1/2" DP Vertical only for 1/2" & 3/4" EMT
 - Part # 52181-S 4 sq. X 3-1/2" DP for 1/2" & 3/4" EMT Horizontal runs
 - Part 3 6350-1-1/2 6" Sq. Box with 1-1/2" KO's for EMT >3/4"
- o Conduit Clamps: Garvin Industries/Southwire 2-piece bolted
- o Pulling Lubricant: Klein Clear Gel

CABLE CONSTRUCTION

Non-Shielded

- o Conductor: Oxygen Free Copper (OFC)
- o Mica Tape
- o Insulation: Silicone Rubber
- o Assembly: Color-coded Black & Red conductors cabled with a 3" LL
- o Jacket: Red Thermoplastic Jacket

Shielded

- o Conductor: Oxygen Free Copper (OFC)
- o Mica Tape
- o Insulation: Silicone Rubber
- o Assembly: Color-coded Black & Red conductors cabled with a 3" LL
- o Assembly: Overall Shield
- o Tinned Copper Drain Wire
- o Jacket: Red Thermoplastic Jacket

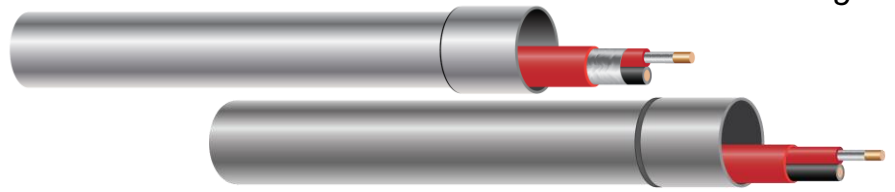
CABLE MARKING

Non-Shielded

SOUTHWIRE Circuit Defender™ E75610 2/C # AWG FPLR/CMR/ 90C/ R26267 FRR 2-HR (FHIT/7 44) <UL logo> 2196 & <ULC logo> S139 MAX 72V /CSA LL90458 FAS/300V

Shielded

SOUTHWIRE Circuit Defender™ E75610 2/C # AWG OAS/FPLR/CMR/ 90C/ R26267 FRR 2-HR (FHIT/7 44) <UL logo> 2196 & <ULC logo> S139 MAX 72V /CSA LL90458 FAS/300V



INSTALLATION PARAMETERS

1.) Conduit system, fill, and spacing.

Non-Shielded

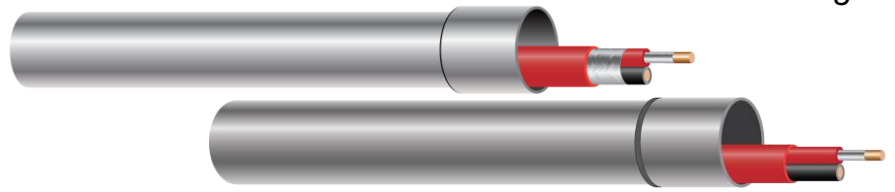
- 5' Support spacing on all Vertical run applications
 - 5' Support spacing on 2" EMT Horizontal runs
 - 4' Support spacing on 1/2" EMT Horizontal runs
 - 3' Support spacing on horizontal runs and all 3/4" to 1-1/2" EMT Horizontal runs
1. Raceway - **Wheatland/Western/Zekelman** – EMT Conduit 1/2"-2".
 2. Raceway - **NUCOR** – EMT Conduit 1/2"-1-1/2"

Shielded

- 5' Support spacing on all EMT 3/4" to 2" Vertical run applications
 - 4' Support spacing on 2" EMT horizontal #16 AWG. Horizontal runs
 - 5' Support spacing on all other Horizontal runs
3. Raceway - **Wheatland/Western/Zekelman** – EMT Conduit 3/4"-2".
 4. Raceway - **NUCOR** – EMT Conduit 3/4"-2"

Table 1 provides the maximum cable conduit fill and spacing requirements in conjunction with the National Electrical Code® requirements.

Table -1 System Fill Allowances for Installations (# of Cables / Horizontal Support Spacing (feet) / Vertical Spacing (feet))							
Maximum spacing on all verticals 5 ft.							
Unshielded	EMT	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
	Sizes	No. of Cables Max Fill					
	#18/2	1 / 4 / 5	2 / 3 / 5	3 / 3 / 5	6 / 3 / 5	7 / 3 / 5	11 / 5 / 5
	#16/2	-	1 / 3 / 5	2 / 3 / 5	5 / 3 / 5	7 / 3 / 5	11 / 5 / 5
	#14/2	-	1 / 3 / 5	2 / 3 / 5	4 / 3 / 5	5 / 3 / 5	9 / 5 / 5
Shielded	#18/2	0	1 / 5 / 5	2 / 5 / 5	3 / 5 / 5	4 / 5 / 5	7 / 5 / 5
	#16/2	0	1 / 5 / 5	1 / 5 / 5	3 / 5 / 5	4 / 5 / 5	7 / 4 / 5
	#14/2	0	0	1 / 5 / 5	2 / 5 / 5	3 / 5 / 5	5 / 5 / 5



2.) Raceway Coupling – (Not Shown)

Garvin Industries, INC — Steel (all components) EMT Compression and Set Screw Couplings. Trade size to correspond with the raceway size.

Raco (Hubbel/Raco) — Steel (all components) EMT Compression and Set Screw Couplings. Trade size to correspond with the raceway size.

3.) Fire Resistive Cables*

The hourly fire rating applies to cables 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 horizontal or vertical orientation.

Southwire Company — Circuit Defender™ Type FPLR/CMR non-shielded and shielded to be installed as described herein and in accordance with the manufacturer's installation instructions PDS-102-44 Dated 10-2024.

4.) Supports

(Figure 1) - Min 12 gauge, by 1-1/2 in. wide or 1-5/8 in wide, painted or unpainted, slotted steel channels with hemmed flange edges. Channel bottom with or without holes. Lengths of slotted steel channels 5 ft. and less shall be secured to the wall or floor with a min of two 1/4 in. diameter (or larger) by 2-1/4 in. min long concrete screws, or 1/4 in. diameter (or larger) by 1-3/4 in. 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 ft. 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 unshielded horizontal cable installations, the supports shall be spaced a maximum of 4 ft. OC for 1/2" in. EMT and 3 ft. OC 3/4" in. to 1-1/2" in. EMT. For 2 in. EMT the supports shall be spaced a maximum of 5 ft. OC. For vertical cable installations, the supports shall be spaced a maximum 5 ft. OC for all sizes EMT. When installing cable(s) in vertical runs, the maximum distance between cable terminating points for 18 AWG unshielded shall be 35 ft. within EMT; and for 16 & 14 AWG unshielded shall be 50 ft. within EMT. For shielded horizontal cable installations, the supports shall be spaced a maximum 5 ft. OC for 3/4 in. – 2 in. EMT for 18 and 14AWG cables. For 16AWG cables 5 ft. OC for 3/4 in. – 1-1/2 in. EMT and 4 ft. OC for 2 in. EMT. For vertical cable installations, the supports shall be spaced a maximum 5 ft. OC for all sizes EMT and all AWG's of cable. When installing cable(s) in vertical runs, the maximum distance between cable terminating points shall be 49 ft. within EMT.

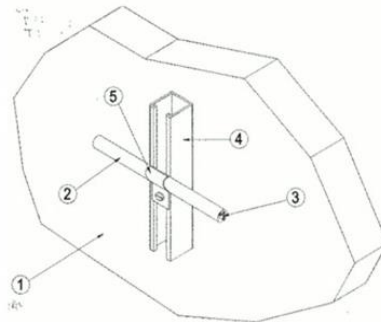
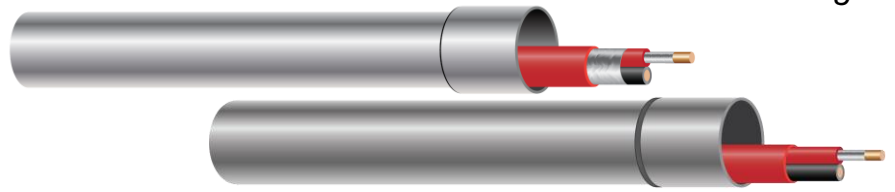


Figure 1



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 ft. OC.

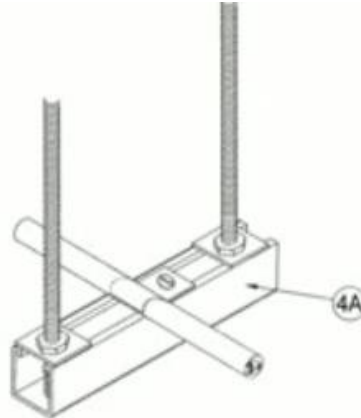


Figure 2

5.) Clamps

For EMT two-piece single-bolt pipe clamps. Min 16 gauge steel, 1-1/4 in. wide. Trade size to correspond with the outside diameter of the raceway. For phenolic, Erico, one piece bolt close conduit/pipe clamp.

6.) Splice

Up to 3 splices per Instructions below using Southwire Splicing Kit (Patent Pending) Part # SW# 66534701. Weigman (Hubbell/Weigman) #HS441NK-N1 or larger wireway is to be used with the SW Splicing kit.

7.) Pull Box – (Not Shown)

Cables installed in the horizontal or vertical orientation may utilize a Garvin or Raco pull box. Refer to the manufacturer's installation instructions.

8.) Pulling Lubricant – (Not Shown)

When installing multiple cables within a single conduit, the cables may be coated with pulling lubricant. Klein Tools — Klein Clear Gel Cat. No. 51028.