

Manufacturer's Instructions for Lifeline® Power Cables



Lifeline® RHW-2 Two-Hour Fire Resistive Cables in EMT Conduit
Technical Information Sheet #301K

This Technical Information Sheet (TIS) covers Lifeline® RHW-2 Cables:
UL Certified and Listed Two Hour Fire Resistive Cable for use in EMT Conduit

APPLICATIONS

Lifeline® Power Cables have been qualified and listed to the demanding requirements of UL 2196, Tests for Fire Resistive Cables, and are UL Listed Type RHW-2.

Lifeline® Power Cables meet various industry code requirements (NFPA 70, NFPA 72, NFPA 101, NFPA 130, and NFPA 502) for fire resistance according to UL Standard 2196 when selected and installed per applicable codes including federal, state, local and municipal rules, laws and regulations as well as Electrical Circuit Integrity System 25E (FHIT 25E). Note that Authorities Having Jurisdiction (AHJ) should be consulted for approval prior to cable purchase and installation.

REQUIREMENTS

1) Codes / Laws / Regulations

Selection and installation compliance is dependent on the applicable issue of any codes or addendums which cover the use of Lifeline® RHW-2 Cables, Fire Resistive Cables.

2) UL Electrical Circuit Integrity System #25E (FHIT 25E)

The most current listing details and supporting information applicable to Lifeline® Cables' fire resistive rating classification can be obtained from UL's UL Product IQ website by searching for keyword: "FHIT 25E".

3) Manufacturer's Instructions – TIS #301K

All Lifeline® Cable products are covered by specific datasheets and supporting Technical Information Sheets that provide the user with information to properly select and install Lifeline® Cables in a reliable and trouble-free manner. Do not hesitate to contact your Lifeline® Cable representative should you have any questions.

INSTALLATION PARAMETERS

1) Cable: Lifeline® RHW-2

Code compliant cable certified as two-hours fire resistive with 480 volts utilization per testing according to UL 2196 and listed in FHIT 25E. Appropriate cable selection is required for systems requiring a fire resistive rating.

2) Fire Resistive Cable System

Code compliant conduit system which meets the following requirements:

- a. Installations must use Allied EMT conduit with optional Wiegmann NEMA 3R enclosures as pull boxes with Raco steel conduit connectors and couplers. Conduit fittings for 2 inches and smaller shall be set screw type and fittings for 2½ inch and larger can be either set screw type or compression type. Maximum allowable vertical distance is 59 feet and shall not exceed support spacing in NEC table 300.19(A) where maximum for conductor sizes 400MCM and 500MCM is 50 feet and maximum for conductor sizes 600MCM and 750MCM is 40 feet. For easier installation Polywater LZ pulling lubricant may be used. No substitute components are allowed and Lifeline cables shall be installed in dedicated raceway.
- b. Conduit assemblies shall be secured to a fire rated structure comprised of steel or other fire rated components proven to meet the required fire resistance ratings (i.e. two hours). Conduit shall be secured to structure using steel two-piece single-bolt pipe clamps. Clamps shall be 1-1/4 in. wide with minimum thickness of 14-gauge..

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2) Fire Resistive Cable System (Continued)

- c. Maximum support spacing shall be EMT conduit shall be supported every five feet (60 inches) .
- d. When enclosures are used as pull boxes, two-piece steel clamps shall be used to secure conduit within one foot from enclosure.

3) Conduit Sizing

Minimum allowable conduit sizes for installation of Lifeline® RHW-2 cables classified in FHIT.25E are listed in Table 2, where the conduit sizes listed shall be used lieu of maximum conduit cross-sectional area requirements of National Electrical Code. Conduit bends shall be equal or greater than minimum conduit bend radius listed in Table 3.

4) Pull Boxes

If pull boxes are used, enclosure size shall be at least 8 times the raceway trade size in accordance with National Electric Code article 314.28. Installations in EMT conduit shall use Wiegmann NEMA 3R enclosures. For enclosures 12 inches or less across, Wiegmann series RSC with lift-off screw cover or RHC with hinged cover may be used and enclosures 16 inches or greater across shall use Wiegmann a RHC with hinged cover. Order model number comprised of series number prefix followed by two digit height, width and depth dimensions.

Examples:

An installation with 1-1/4 inch EMT requires an enclosure 10 inches across and Wiegmann RSC101004 enclosure shall be used.

An installation with 3 inch EMT requires an enclosure 24 inches across and Wiegmann RHC242408 enclosure shall be used.

5) Connector Insulation Bushing

When NEMA 3R pull boxes are used insulating bushings shall be installed in EMT connectors on all horizontal installations and in vertical installations with 250MCM and larger conductors. Insulation bushings are flexible silica fabric and shall be installed after cable has been pulled into conduit. For horizontal installations bushing dimensions shall be 3 inches by at least half the connector nipple internal circumference and for vertical installation of cables 250MCM and larger bushing dimensions 3 inches by at least full internal nipple circumference. The installed cables shall be lifted or moved away from nipple internal surface and insulating bushing shall be inserted 2 inches into connector nipple with excess folded over connector nipple threads. Bushings shall be secured in connector nipple by circumferentially wrapping exposed bushing and connector threads with at least three tight layers 3M 69 Glass Cloth tape for horizontal installations and at least five tight layers of 3M 69 Glass Cloth tape for vertical installations. Insulating bushings are available from Prysmian. For horizontal installations order part number CUSEMT-DDD. For vertical installation of conductor sizes 250MCM and larger order part number CUSEMT-DDDV, where DDD is conduit trade size and V is for vertical installation.

Examples:

A horizontal installation with 1-1/4 inch EMT requires one kit of CUSEMT-125.

A vertical installation with 3 inch EMT requires one kit of CUSEMT-300V.

Lifeline® Power Cables: RHW-2 Two-Hour Fire Resistive Cables in EMT Conduit UL 2196 Certified Fire Resistive Cable for Survivability in a Fire



SPECIFICATIONS & RATINGS

- Listed to UL 44, Thermoset Insulated Wires and Cables, as the following type:
 - RHW-2, 600 Volt, Rated 90°C Dry/90°C Wet
- Classified to UL 2196, Standard for Tests for Fire Resistive Cables, for two-hours.
- Electrical Circuit Integrity System (FHIT) No. 25E of the UL Fire Resistance Directory.
- FT4-ST1 12AWG and larger
- NFPA 70, NFPA 72, NFPA 101, NFPA 130 and NFPA 502

DESIGN PARAMETERS

CONDUCTORS: Bare stranded copper, 14 AWG through 750kcmil

FIRE BARRIER: High Temperature Mica Tapes

INNER INSULATION: Ceramifiable silicone, Low Smoke Zero Halogen (LSZH)

OUTER INSULATION: Cross-linked polyolefin (XLPO), Low Smoke Zero Halogen

IDENTIFICATION:

ORIGIN USA PRYSMIAN GROUP MA P/N [#####] [X]AWG ([Y] mm²) LIFELINE® (UL) RHW-2 600V FT4 ST1 VW1 (UL) 2196 FHIT25E FRR 2 HR 480V UTILIZATION ([mm]/[yr]) [2ft]

- Notes:**
- [#] is cable part number
 - [X] is cable size in AWG or kcmil
 - [Y] is cable size in mm²
 - [1] FT4 ST1 12AWG and larger



**RoHS
COMPLIANT**

Lifeline® Power Cables:

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UL 2196 Certified Fire Resistive Cable for Survivability in a Fire



Table 1 – Cable Description

LIFELINE® Part Number	Conductor Size AWG /MCM	Number of Strands	Insulation Thickness in (mm)	Overall Diameter in (mm)	Approximate Weight lbs/Mft (kg/km)	Ampacity* 75°C Amps	Ampacity* 90°C Amps
H30061	14	7	0.045 (1.1)	0.20 (5.0)	30 (45)	20**	25**
H30062	12	7	0.045 (1.1)	0.22 (5.5)	37 (55)	25**	30**
H30063	10	7	0.045 (1.1)	0.24 (6.1)	52 (77)	35**	40**
H30064	8	7	0.060 (1.5)	0.31 (7.7)	84 (125)	50	55
H30065	6	7	0.075 (1.9)	0.38 (9.5)	129 (192)	65	75
H30066	4	7	0.075 (1.9)	0.42 (10.7)	185 (275)	85	95
H30067	3	7	0.075 (1.9)	0.45 (11.4)	224 (333)	100	115
H30068	2	7	0.075 (1.9)	0.48 (12.2)	269 (400)	115	130
H30069	1	19	0.100 (2.5)	0.57 (14.5)	364 (542)	130	145
H30070	1/0	19	0.100 (2.5)	0.61 (15.5)	441 (656)	150	170
H30071	2/0	19	0.100 (2.5)	0.65 (16.6)	535 (796)	175	195
H30072	3/0	19	0.100 (2.5)	0.70 (17.9)	656 (976)	200	225
H30073	4/0	19	0.100 (2.5)	0.76 (19.3)	803 (1195)	230	260
H30074	250	37	0.130 (3.3)	0.87 (22.0)	987 (1469)	255	290
H31501	300	37	0.130 (3.3)	0.92 (23.3)	1160 (1726)	285	320
H30075	350	37	0.130 (3.3)	0.97 (24.6)	1306 (1943)	310	350
H31496	400	37	0.130 (3.3)	1.01 (25.7)	1500 (2232)	335	380
H30076	500	37	0.130 (3.3)	1.10 (27.8)	1820 (2708)	380	430
H30077	600	61	0.145 (3.7)	1.21 (30.6)	2199 (3272)	420	475
H30078	750	61	0.145 (3.7)	1.31 (33.1)	2699 (4016)	475	535

* Ampacities are based on Table 310.16 of the National Electrical Code (NFPA 70) for 3 current carrying conductors at 30°C ambient.

** Small overcurrent protection limitations per NEC Article 240.4(D): (4) 14AWG – 15 amps, (6) 12AWG – 20 amps, (30) 10AWG – 30 amps.

The above dimensions are approximate and subject to normal manufacturing tolerances. Information subject to change without notice.

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UL 2196 Certified Fire Resistive Cable for Survivability in a Fire



Table 2 – Minimum Allowable Conduit Size

Conductor Size	Minimum Allowable Conduit Size									
	Horizontal Installation					Vertical Installation				
	Number of Conductors					Number of Conductors				
	1	2	3	4	5	1	2	3	4	5
14	½	¾	¾	¾	1	½	½	¾	¾	1-¼
12	½	¾	1	1	1-¼	½	¾	¾	1	1-¼
10	½	¾	1	1-¼	1-¼	½	¾	1	1	1-½
8	½	1	1-¼	1-¼	1-¼	½	1	1-¼	1-¼	1-¼
6	¾	1-¼	1-¼	1-½	2	¾	1-¼	1-¼	1-½	2
4	1	1-¼	1-½	2	2	1	1-¼	1-½	2	2
3	1	1-¼	1-½	2	2	1	1-¼	1-½	2	2
2	1	1-½	2	2	2-½ (2 ¹)	1	1-½	1-½	2	2
1	1-¼	2	2	2-½	2-½	1-¼	2	2	2-½	2-½
1/0	1-¼	2	2-½	2-½	3	1-¼	2	2-½	2-½	3
2/0	1-¼	2	2-½	2-½	3	1-¼	2	2-½	2-½	3
3/0	1-½	2	2-½	3	3	1-½	2-½	2-½	3	3-½
4/0	1-½	2-½	2-½	3	3-½	1-½	2-½	3	3	3-½
250	2	2-½	3	3	3-½	2	2-½	3	3	4 (3-½ ²)
300	2	2-½	3	3-½	4	2	2-½	3	3-½	(4 ³)
350	2	2-½	3	3-½	4	2	2-½	3	3-½	(4 ³)
400	2	3	3-½	4	N/A	2	3	3-½	4	N/A
500	2-½	3	3-½	4	N/A	2-½	3	3-½	4	N/A
600	2-½	3-½	4	N/A	N/A	2-½	3-½	4	N/A	N/A
750	2-½	3-½	N/A	N/A	N/A	2-½	3-½	N/A	N/A	N/A

For questions regarding installation and conduit size, including the use of ECG, contact the Lifeline team at Prysmian Cables & Systems USA, LLC (800) 333-4248 x2600.

- ¹ 2 inch conduit may be used when ground conductor is 8AWG or smaller
- ² 3½ inch conduit may be used when ground conductor is 2AWG or smaller
- ³ 4 inch conduit may be used when ground conductor is 1AWG or smaller

Table 3 – Minimum Allowable Conduit Bend Radius

Trade Size	Bend Radius
½	4"
¾	4-½"
1	5-¾"
1-¼	7-¼"
1-½	8-¼"
2	9-½"
2-½	10-½"
3	13"
3-½	15"
4	16"



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