Ranger2™ Terminations

Overview

Elastimold® Ranger2™ Terminations are specifically designed for use on 15 thru 35 kV, XLP or EPR insulated, underground power distribution cable systems. Units allow proper transition and connection of the underground cable system to bare overhead conductors and live front equipment. Applications include indoor, outdoor, riser pole, padmounted and other live front or weather exposed installations. Designs use advanced silicone rubber insulating materials to provide necessary creep, strike, weather sealing and contamination resistance, assuring proper performance in the most severe conditions. The grey color blends in with outdoor environments.

Ranger2 Terminations support a wide application range with only three sizes required to cover #2 AWG through 1250 kcmil cables. The single-piece 15 kV and 25 kV shrink-fit design makes installation effortless, and the two-piece 35 kV design facilitates easier core removal. Simply position the terminator on the prepared cable and remove the center core. Units are compact and lightweight, allowing installation in restricted spaces and free-hanging applications.

Silicone Polymer Housings

The R2T and R2IT terminations are manufactured using an optimized weather-resistant silicone formulation. The housing offers superior cable sealing and voltage withstand characteristics. Elastimold terminations meet or exceed all requirements of IEEE Standard 48 for Class 1 outdoor or Class 2 indoor terminations. Unit tests include voltage withstand wet and dry, before and after load cycling on units installed on maximum conductor sized cable.

Stress Relief

The R2T and R2IT terminations provide electric stress control for the cable by means of a flexible tube with a high permittivity dielectric constant. The stress-relief tube is preassembled on the core under the polymer housing. As the core is removed, the stress-relief tube and housing shrink onto the cable at the same time, in exactly the right position. No secondary operations are required during installation. The electrical fields are refracted through the high dielectric constant tube and housing as shown.

Installation

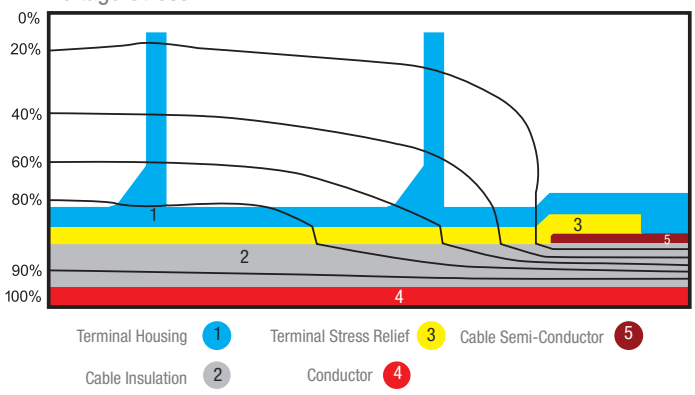
Standard cable preparation techniques are used for all R2T, Elastimold Ranger2 Outdoor Terminations, and R2IT, Elastimold Ranger2 Indoor Terminations. The Elastimold shrink-fit terminations are assembled on a removable core. After the termination is placed onto the prepared cable, the core is removed by pulling on the end. The housing then collapses onto the prepared cable. Memory of the material provides the interface solid dielectric and sealing properties required to meet the electrical ratings and prevent the ingress of moisture.

Kit Contents

Every R2T and R2IT comes complete with housing and stress tube preassembled on the core, ready for installation. Easy-to-read installation instructions will take you from cable preparation through installation. All kits include a tube of silicone grease, two plastic gloves and one strip of self-fusing silicone tape. Outdoor kits also include mastic for sealing. Metallic Tape (M) kits include a grounding adapter for Tape Shield, Wire Shield and UniShield cables. LC Shield (L) kits include a high ampacity grounding adapter for Longitudinally Corrugated Shield, Tape Shield and Wire over Tape Shield cables.

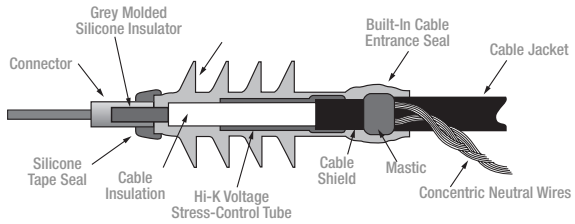
Stress Relief

Voltage Stress



Ranger2™ Terminations

Overview



Typical Installation on Jacketed Concentric Neutral (JCN) Cable

Features	Benefits/Descriptions
Silicone Polymer Housing	Superior memory and weathering characteristics
Shrink-Fit Housing	Uses common installation procedures and cable preparation dimensions. Field-removable center core allows for easy installation.
Three Different Shed Designs for Superior Weathering	• Four sheds for 15 kV outdoor model • Six sheds for 25/28 kV outdoor model • Eight sheds for 35 kV outdoor model
Wide Range	Three sizes cover entire cable range from #2 AWG to 1250 kcmil. Units accommodate popular XLP and EPR cable types and shield constructions.
Integral Hi-K Voltage Stress-Control Tube	Provides uniform voltage grading over the length of the termination. Eliminates damaging voltage stress concentrations at the cable insulation shield edge. Thick wall construction securely maintains critical interface pressure for consistent long term reliability and performance.
Pull-Down Tabs for Easy Installation of Built-In Jacket Seal	Accommodates CN, JCN, Tape, Wire or LC shielded cable construction
Lightweight, Compact Design	Installs in restricted spaces. Permits application where free hanging is desired.
Dark Grey Molded Silicone Insulator	Blends well into outdoor environments. Utilizes specially formulated silicone materials with improved UV stability, track, erosion and weather resistance. Outdoor styles feature large diameter, multi-shed profile with extra creep and strike for enhanced performance under the worst environmental conditions.
Optional Connectors	Connector with copper stem, one-hole and two-hole spade connector
Optional Cable and Support Bracket	Three sizes, ranging from 0.80 in. – 1.95 in. O.D.

Certified

Elastimold Ranger2 Terminations have been designed and tested per applicable portions of ANSI, IEEE, AEIC, ICEA and other industry standards.

IEEE 48	Standard for indoor and outdoor cable terminations
ANSI C119.4	Standard for cable connectors for aluminum and copper conductors
AEIC CS8-06 and ANSI/ICEA S-94-649-2004 and S-97-682-2000	Standards for XLP and EPR insulated cables

Application Information

IEEE 48 Classification	Outdoor = Class 1A, Indoor = Class 2
Ambient Temperature Range	-30ºC to 65ºC
Power System Frequency	48 to 62 Hz
Altitude Range	3 300 ft. max.
Mounting	Free hanging or optional bracket

Ratings

Ratings	Indoor	Outdoor	Outdoor	Outdoor
Termination Catalogue Series	R2IT15	R2T15	R2T28	R2T35
Sizes Available*	1, 2, 4	1, 2, 4	2, 4	2, 4
Voltage Rating (kV)	15	15	25/28	35
Max. Design Voltage to Ground (kV)	9.5	9.5	16	22
Corona Extinction Voltage (kV) (≤3 p.c.) (Partial Discharge)	13	13	22	30
Insulation Withstand Voltage:				
Lightning Impulse (BIL Dry 110 Withstand) (kV Crest)	110	110	150	200
10 Sec. Wet (60 Hz) (kV)	—	45	60	80
1 Minute Dry (60 Hz) (kV)	50	50	65	90
5 Hour Dry (60 Hz) (kV)	36	35	55	75
DC Withstand 15 Min. Dry (kV)	75	75	105	140

* See page A46 for cable insulation diameter ranges.

Dimensions

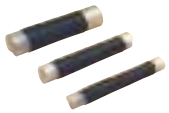
Dimensions	Indoor	Outdoor	Outdoor	Outdoor
Termination Catalogue Series	R2IT15	R2T15	R2T28	R2T35
Sizes Available*	1, 2, 4	1, 2, 4	2, 4	2, 4
Voltage Rating (kV)	15	15	25/28	35
Number of Sheds	0	4	6	8
Minimum Strike Distance in. (mm)	8.4 (213)	11.6 (295)	14.5 (368)	16.8 (427)
Creepage Distance in. (mm)		15.0 (381)	22.8 (579)	30.0 (762)

* See page A46 for cable insulation diameter ranges.

Ranger2™ Terminations
Base Catalogue Numbers

The R2T and R2IT termination design couples shrink-fit technology and Elastimold's pull-down jacket seal feature to provide a termination line that covers the widest range of applications with the fewest number of models. Three sizes cover 0.64 in. (16 mm) to 2.10 in. (53 mm) insulation diameter cables (#2 AWG through 1250 kcmil).

The R2T housings are designed for maximum performance in all field conditions with superior creepage and strike distances for long-term service. Insulating silicone sleeves are also available when more creepage is required or when wildlife protection is needed to insulate the connectors. Contact your Thomas & Betts Sales Representative for further information.

	kV Class	Type	Cable Range (Insulation Diameter)		Cat. No.		
			(in.)	mm	Concentric Neutral and Jacketed Concentric Neutral Cable	Tape Shield, Wire Shield and UniShield Cable	LC Shield, Wire over Tape Shield and Tape Shield Cable
	15	Indoor	0.64 to 1.12	16.3 to 28.4	R2IT15J1	R2IT15M1	R2IT15L1
			0.84 to 1.38	21.3 to 35.1	R2IT15J2	R2IT15M2	R2IT15L2
			1.30 to 2.10	33.0 to 53.3	R2IT15J4	R2IT15M4	R2IT15L4
	15	Outdoor	0.64 to 1.12	16.3 to 28.4	R2T15J1	R2T15M1	R2T15L1
			0.84 to 1.38	21.3 to 35.1	R2T15J2	R2T15M2	R2T15L2
			1.30 to 2.10	33.0 to 53.3	R2T15J4	R2T15M4	R2T15L4
	25/28	Outdoor	0.84 to 1.38	20.3 to 35.1	R2T28J2	R2T28M2	R2T28L2
			1.30 to 2.10	33.0 to 53.3	R2T28J4	R2T28M4	R2T28L4
	35	Outdoor	0.84 to 1.38	20.3 to 35.1	R2T35J2	R2T35M2	R2T35L2
			1.30 to 2.10	33.0 to 53.3	R2T35J4	R2T35M4	R2T35L4

Ranger2™ Terminations
Accessories Connector Options

	Type	Material	Conductor	Conductor Size	Connector Prefix*
	Stem Compression Connector	Aluminum	Aluminum or Copper	#2 through 4/0 (34–107 mm²)	T0
			Aluminum Only		T1
	One-Hole Spade Connector	Tinned Aluminum	Aluminum or Copper	#2 through 500 kcmil (34–253 mm²)	H0
	Two-Hole Spade Connector	Tinned Aluminum	Aluminum or Copper	#2 through 1250 kcmil (34–633 mm²)	N0

* See page A48 for conductor code.

Cable Support Bracket Options

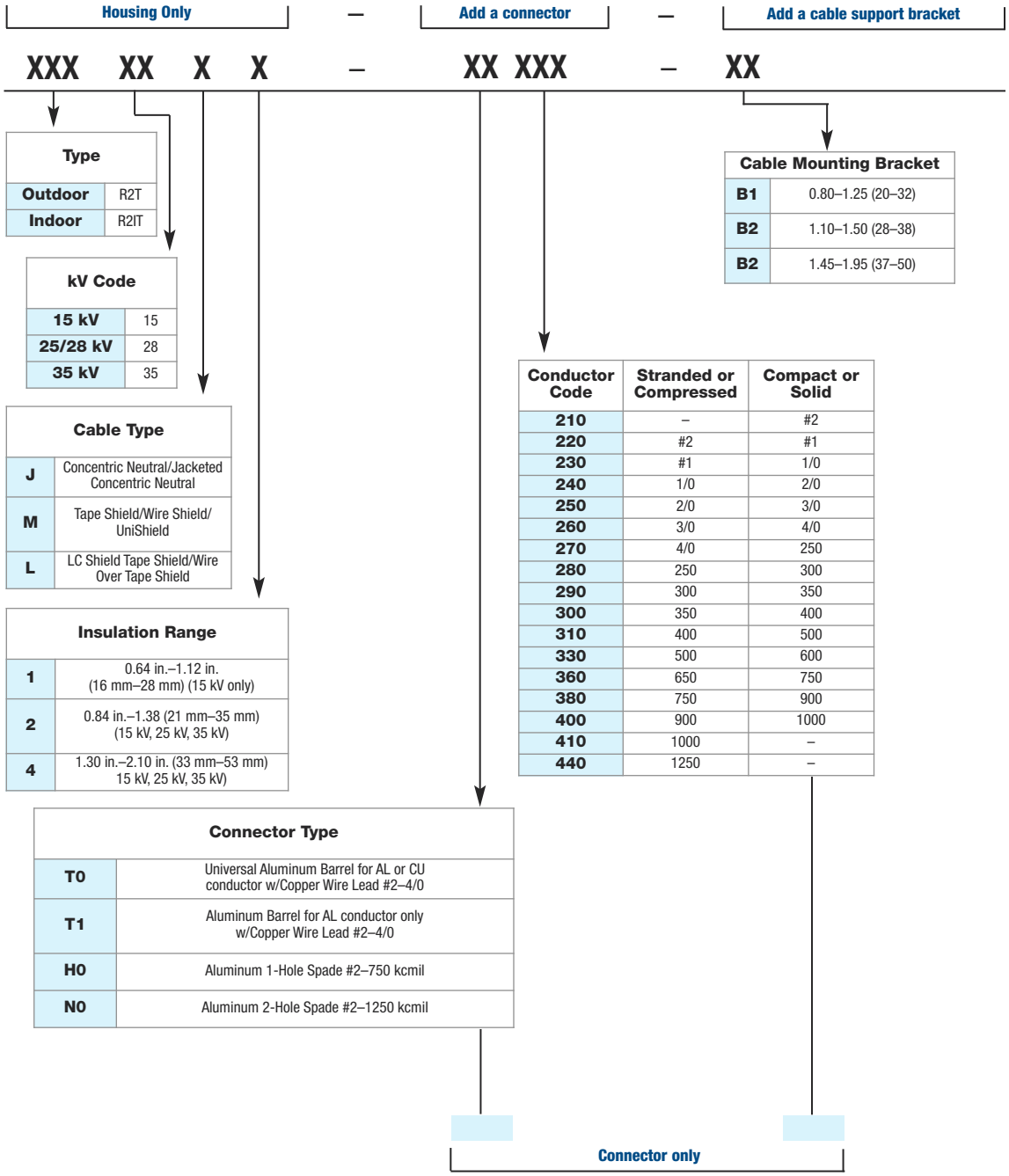
Ranger2 Terminations are compact, lightweight and frequently allow use of free-hanging mounting methods. Optional cable support brackets are available if required.

Optional Cable Support Brackets

	Type	Cable Range (in.) (Overall O.D.)	Cat. No.	Suffix No.
	Single Clamp	0.80–1.25 (20–32 mm)	JB-1	B1
	Single Clamp	1.10–1.50 (28–38 mm)	JB-2	B2
	Double Clamp	1.45–1.95 (37–50 mm)	JB-3	B3

Ranger2™ Terminations Ordering Information

How to construct a catalogue number for Ranger2 Terminations:



Step 1. Select the Termination Housing:

A. Select Outdoor or Indoor housing style
B. Select applicable voltage class
C. Select neutral/ shield type
D. Select the size based on the cable insulation diameter*

Type	
Outdoor	R2T
Indoor	R2IT

kV Code	
15 kV	15
25/28 kV	28
35 kV	35

Cable Type	
J	Concentric Neutral/Jacketed Concentric Neutral
M	Tape Shield/Wire Shield/ UniShield
L	LC Shield Tape Shield/Wire Over Tape Shield

Insulation Range	
1	0.64 in.–1.12 in. (16 mm–28 mm) (15 kV only)
2	0.84 in.–1.38 (21 mm–35 mm) (15 kV, 25 kV, 35 kV)
4	1.30 in.–2.10 in. (33 mm–53 mm) 15 kV, 25 kV, 35 kV)

Cable Mounting Bracket	
B1	0.80–1.25 (20–32)
B2	1.10–1.50 (28–38)
B2	1.45–1.95 (37–50)

Conductor Code	Stranded or Compressed	Compact or Solid
210	–	#2
220	#2	#1
230	#1	1/0
240	1/0	2/0
250	2/0	3/0
260	3/0	4/0
270	4/0	250
280	250	300
290	300	350
300	350	400
310	400	500
330	500	600
360	650	750
380	750	900
400	900	1000
410	1000	–
440	1250	–

Connector Option

Step 2. Select the Connector:

E. Select desired connector
F. Select connector code based on conductor size and conductor type

Connector Type	
T0	Universal Aluminum Barrel for AL or CU conductor w/Copper Wire Lead #2–4/0
T1	Aluminum Barrel for AL conductor only w/Copper Wire Lead #2–4/0
H0	Aluminum 1-Hole Spade #2–750 kcmil
N0	Aluminum 2-Hole Spade #2–1250 kcmil

Cable Support Bracket Option

Step 3. Select the Cable Support Bracket:

G. Select cable support bracket based on the overall O.D. of the cable

Connector only

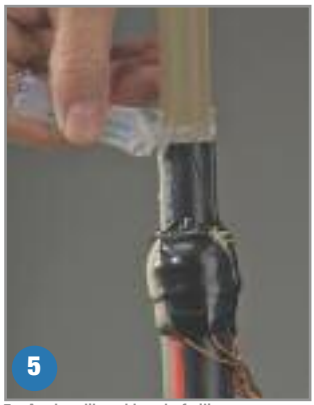
* To help in selecting the proper terminator, ICEA and AEIC standard dimensions for XLP and EPR cables are shown in pages A35 to A37.

Ranger2™ Terminations Installation

Typical Installation of Elastimold Shrink-Fit Terminations (R2T — Outdoor and R2IT — Indoor)

1. Train the cable into position and cut to length. Using standard practices, cut back the cable jacket, metallic shield, semi-conductive shield and cable insulation, exposing the conductor.
2. Finish preparing the metallic shield. For concentric neutral or jacketed concentric neutral cables, bend back the neutral wires and seal with mastic strips and vinyl tape.

   For metallic tape, drain wire, UniShield or LC Shield cables: install the ground braid using the constant force spring and seal with mastic strips and vinyl tape.
3. Clean the exposed conductor, install and crimp the connector.
4. Use mastic and vinyl tape to fill any gap or step between the connector and the cable insulation. Clean the cable.

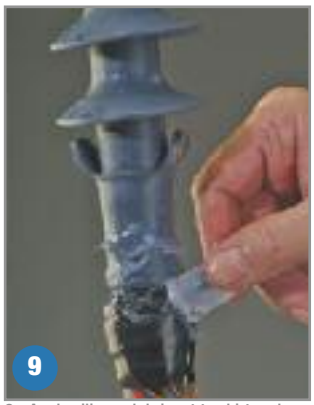


5. Apply a liberal bead of silicone lubricant to the semi-conshield step.

6. Pull the loose end of the core cord until the core is even with the end of the termination housing.

7. Position the terminator onto the cable.

8. Shrink into place by unwinding the removable core.



9. Apply silicone lubricant to skirt and mastic area.

10. Fold down the skirt over the mastic to seal the cable entrance.

11. Seal the top of the terminator at the connector area with silicone tape.

12. Attach the neutral wires or optional ground braid to the system ground per local code. Install the optional cable support bracket if required.