

Distribution shrink-fit terminations

Ranger2™ terminations

- Silicone polymer housing provides superior memory and weathering characteristics
- Shrink-fit housing uses common installation procedures and cable preparation dimensions, and 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
- Three sizes cover entire cable range from #2 AWG to 1250 kcmil
- Units accommodate popular XLP and EPR cable types and various shield constructions
- Integral Hi-K voltage stress-control tube provides uniform voltage grading over the length of the termination and 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 – Accommodate CN, JCN, tape, wire or LC shielded cable construction
- Lightweight, compact design installs in restricted spaces and permits application where free hanging is desired
- Dark gray molded silicone insulator uses specially formulated silicone materials with improved UV stability, track, erosion and weather resistance for enhanced performance under the worst environmental conditions
- Optional connectors with copper stem and one-hole or two-hole spade
- Optional cable and support bracket with three sizes ranging from 0.80"–2.40" O.D.

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 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.

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 two strips 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 unshield cables. LC shield (L) kits include a high ampacity grounding adapter for longitudinally corrugated shield, tape shield and wire over tape shield cables.



Distribution shrink-fit terminations

Ranger2 terminations

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.

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.

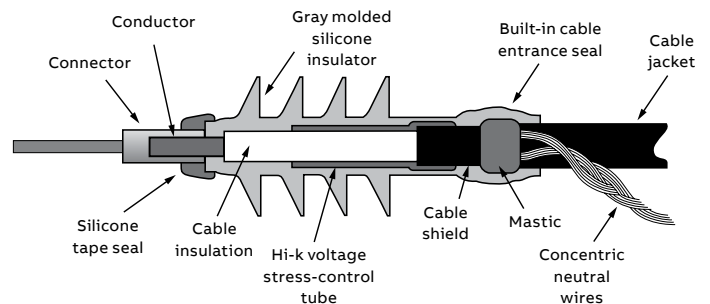
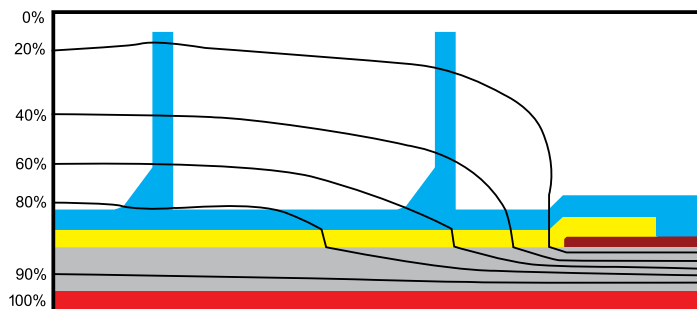
ANSI C119.4

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.

Voltage stress



Distribution shrink-fit terminations

Ranger2 terminations

Ratings

| | R2IT15 indoor | R2T15 outdoor | R2T28 outdoor | R2T35 outdoor |
|--|------------------|------------------|------------------|------------------|
| 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 pC) (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) | 35 | 35 | 55 | 75 |
| DC withstand 15 min. dry (kV) | 75 | 75 | 105 | 140 |

Application information

| | |
|---------------------------|--------------------------------------|
| IEEE 48 classification | Outdoor = Class 1A, indoor = Class 2 |
| Ambient temperature range | -30 °C to 65 °C |
| Power system frequency | 48 to 62 Hz |
| Altitude range | 3,300 feet max. |
| Mounting | Free hanging or optional bracket |

Dimensions

| | R2IT15 indoor | R2T15 outdoor | R2T28 outdoor | R2T35 outdoor |
|----------------------------------|------------------|------------------|------------------|------------------|
| 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) | 8.4 (213) | 15.0 (381) | 22.8 (579) | 30.0 (762) |

* See page A63 for cable insulation diameter ranges.





Distribution shrink-fit terminations

Ranger2 terminations

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" (16 mm) to 2.10" (53 mm) insulation diameter cables (#2 AWG through 1,250 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 ABB sales representative for further information.




Ranger2 terminations base catalog numbers

| | kV class | Type | Cable range (insulation diameter) | | Concentric neutral and jacketed concentric neutral cable | Tape shield, wire shield and unishield cable | LC shield, wire over tape shield and tape shield cable | Cat. no. |
|---|----------|---------|--------------------------------------|---------------|--|--|---|----------|
| | | | Inches | mm | | | | |
|  | 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 | 20.03 to 35.1 | R2T35J2 | R2T35M2 | R2T35L2 | |
| | | | 1.30 to 2.10 | 33.0 to 53.3 | R2T35J4 | R2T35M4 | R2T35L4 | |

Distribution shrink-fit terminations


Ranger2 terminations

Ranger2 termination connector options

| | Type | Material | Conductor | Conductor size | Connector prefix* |
|---|----------------------------|-----------------|--------------------|---------------------|-------------------|
|  | Stem compression connector | Aluminum | Aluminum or copper | #2-4/0 (34-107) | T0 |
| | | Aluminum | Aluminum only | #2-4/0 (34-107) | T1 |
|  | One-hole spade connector | Tinned aluminum | Aluminum or copper | #2-500 (34-253) | H0 |
|  | Two-hole spade connector | Tinned aluminum | Aluminum or copper | #2-1250 (34-633) | N0 |
| | | Tinned copper | Copper | #2-1250 (34-633) | N2 |



* See page A65 for conductor code.

Optional cable support brackets

| Type | Cable range (overall O.D.) | Cat. no. | Stainless steel | |
|---|----------------------------|------------------------|-----------------|----|
| | | | Suffix number | |
|  | 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 |
| | Double clamp | 1.80"-2.40" (45-61 mm) | JB-4 | B4 |

Add-on grounding kits

Convert a jacketed concentric neutral "J" kit to an "M" or "L" shield kit

| | Cat. no. | Type | Size | Use with series |
|---|----------|-----------------------------------|------|--|
|  | GMA | Tape shield/wire shield/unishield | A | R2IT15J1, R2IT15J2, R2T15J1, R2T15J2, R2T28J2, R2T35J2 |
| | GMB | Tape shield/wire shield/unishield | B | R2IT15J4, R2T15J4, R2T28J4, R2T35J4 |
|  | GLA | LC shield/wire over tape shield | A | R2IT15J1, R2IT15J2, R2T15J1, R2T15J2, R2T28J2, R2T35J2 |
| | GLB | LC shield/wire over tape shield | B | R2IT15J4, R2T15J4, R2T28J4, R2T35J4 |

Distribution shrink-fit terminations

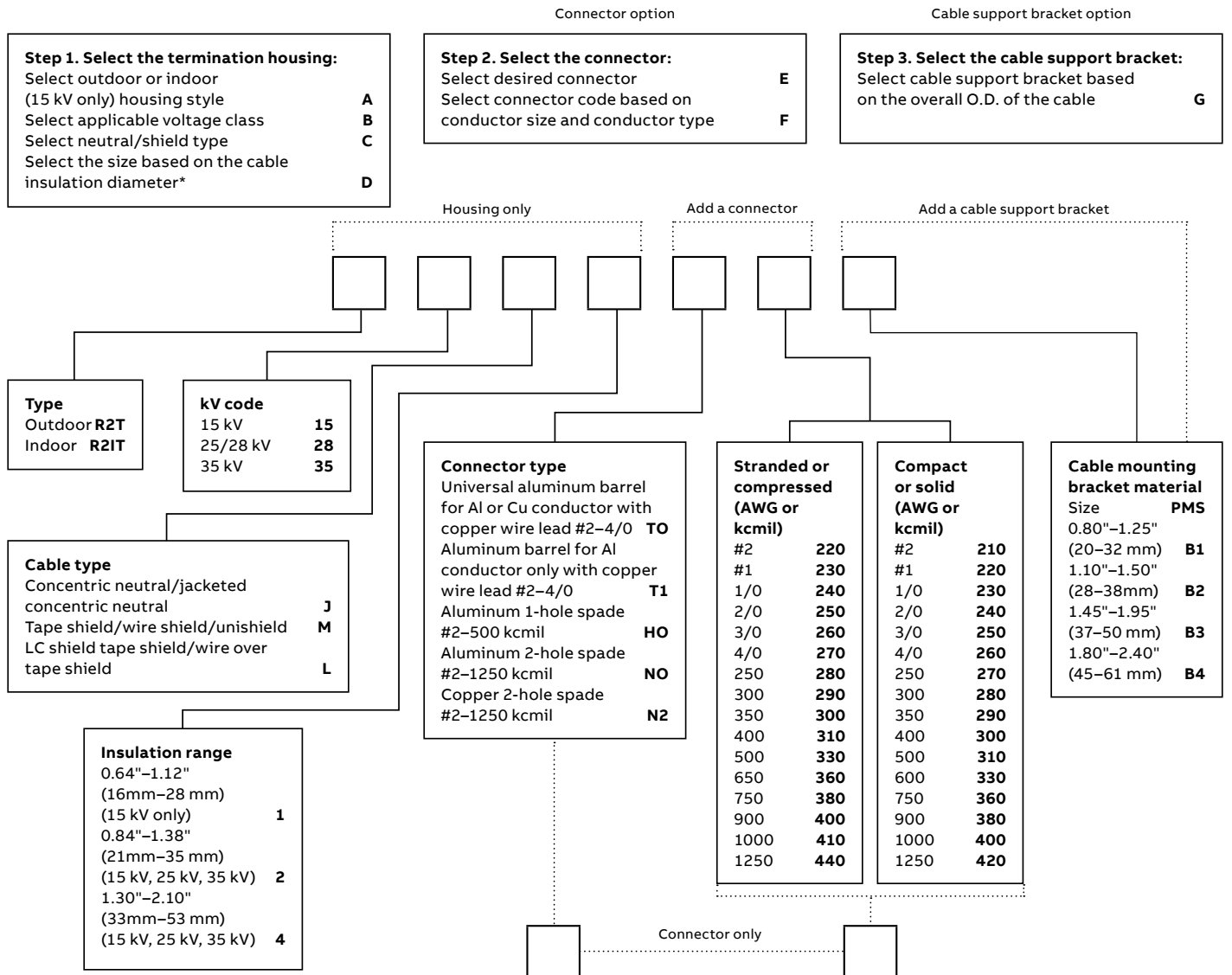
Ranger2 terminations

Ordering information for Ranger2 terminations

Ranger2 terminations may be ordered in components or as complete kits by following the steps outlined and using the model below to develop the catalog number for your application. Contact your local ABB sales representative for special requirements.

Indicates field that must be filled in to complete order. Note: Availability of selected configuration will be verified at quotation time.

The following diagram shows how to construct a catalog number for a Ranger2 termination.



* To help in selecting the proper terminator, ICEA and AEIC standard dimensions for XLP and EPR cables are on pages A50 to A52.
 ** In 28 kV, the connector type "NO" is only for insulation range 2 and 4.

Distribution shrink-fit terminations

Ranger2 terminations

01 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.

02 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, unshield or LC shield cables: install the ground braid using the constant force spring and seal with mastic strips and vinyl tape.

03 Clean the exposed conductor, install and crimp the connector.

04 Use mastic and vinyl tape to fill any gap or step between the connector and the cable insulation. Clean the cable.

05 Apply a liberal bead of silicone lubricant to the semi-con shield step.

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

07 Position the terminator onto the cable.

08 Shrink into place by unwinding the removable core.

09 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.

Typical installation of Elastimold Ranger2 shrink-fit terminations (R2T – Outdoor and R2IT – Indoor)

Warning: Refer to local code for required PPE.



01, 02, 03, 04



05



06



07



08



09



10



11



12