



GUAM POWER
AUTHORITY

SPECIFICATION No. E-048

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April 11, 2022

PREPARED BY THE ENGINEERING DEPARTMENT

REV. 2

GUAM POWER AUTHORITY
P.O. BOX 2977
HAGATNA, GUAM 96932

TRANSMISSION & DISTRIBUTION SPECIFICATION
Specification No. E-048
For

**600 AMP DEAD BREAK SEPARABLE
INSULATED CONNECTORS**

EFFECTIVE DATE: 5/17/22

ISSUED: 

APPROVED: 



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EFFECTIVE DATE: 5/12/22

ISSUED: [Signature]

APPROVED: [Signature]



1.0 SCOPE

- 1.1 This specification covers GPA's requirements for premolded 600 Amp deadbreak separable 15kV and 35kV insulated connectors and other cable accessories for use on dead front equipment.

2.0 CONFORMANCE TO STANDARDS AND SPECIFICATIONS

- 2.1 The connectors shall be constructed and tested in accordance with all applicable sections of the latest listed revisions of the following standards, unless otherwise specified in this specification.

2.1.1 American National Standards Institute, Inc. (ANSI) Standards:

IEEE386	Standard for Separable Insulated Connectors for Power Distribution Systems above 600V
IEEE404	Standard for Cable Joints and Splices
IEEE48	Standard for Cable Terminations
IEEE592	Standard for Exposed Semiconducting Shields
C119.4	Standard for Copper and Aluminum Conductor Connectors

2.1.2 The Association of Edison Illuminating Companies (AEIC)

CS8	Standard for XLP and EPR Insulated Cables
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2.1.3 Insulated Cable Engineers Association (ICEA)

S-97-682-2007 Utility Shielded Power Cables Rated 5 through 46 kV

2.1.4 All other applicable industry standards.

2.1.5 Deviations and Non-Conformance Requirements

- 2.1.6 Deviations from this specification or changes in materials or design after the Purchase Order has been placed must be approved by the GPA Engineering Department and acknowledged by a Purchase Order Amendment.

- 2.1.7 Units received with deviations or non-conformances which are not acknowledged as specified in Sub-Paragraph 2.2.1 are subject to rejection. The Supplier is responsible for any corrective action including but not limited to materials, labor and transportation necessary to dispose of, or make the units conform to the specification.

- 2.1.8 Notification of defects discovered before or after installation that are believed to be inherent to manufacturing problems or workmanship shall be made and forwarded to the Supplier. The description of the item, documentation of the problem and the described information, disposition and/or follow-up (as appropriate) that GPA expects from the Supplier will be specified. The Supplier's response shall be made within thirty (30) days unless an extension is acknowledged and approved in writing by the GPA Manager of Engineering.

- 2.2 Warranty- the Supplier shall warrant the products to be free from defects in material and workmanship under normal use and service conditions. The term of the Warranty shall be the



lesser of twelve (12) months from the date of initial installation or eighteen (18) months from date of manufacture.

- 2.3 Statement of Compliance - The Supplier shall provide a signed statement verifying that the products being supplied fully comply with the specifications and drawings. Items not in full compliance with the specification and drawings will be identified with a description of the deficiency and any proposed substitutions. Items not in full compliance with the specifications and drawings must be approved by the GPA Engineering Department.

3.0 SUBMITTALS

- 3.1 The bidder shall provide with their bid the following data:
- Complete set of catalog cuts
 - Manufacturer's information brochures
 - Physical dimension drawings
 - Detailed installation instructions with diagrams and dimensions

4.0 PRODUCTS

- 4.1 15kV Deadbreak, 600 Ampere Cable Accessories
- 4.1.1 15kV Class Elbows /"T-Bodies": Deadbreak cable terminators shall be Elbow / "T-Body" type -units with 600 ampere continuous current rating, with capacitance test points, coordinated and sized with insulation diameter, conductor size, and material of cable being terminated. All 600A Elbow /"T -Body" connector must be packaged with an Insulating Plug with Cap, and Stud Lug and Cable Adapter.
 - 4.1.2 15kV Class Connecting Plugs: deadbreak connecting plug for use with deadbreak elbows/"T -Bodies", fully rated 600 Ampere interface. Assembled with Elastimold 600ATM Assembly Tool.
 - 4.1.3 15kV Class Elbows /"T-Bodies" 600 Ampere: Housing only.
 - 4.1.4 15kV Connector 600 Ampere: Threaded Stud only.
 - 4.1.5 15kV Connector 600 Ampere: Cable Adapter.
 - 4.1.6 15kV Connector 600 Ampere: Crimp Connector.
 - 4.1.7 15kV Connector 600 Ampere: Cold Shrinkable Jacket Seal.
 - 4.1.8 15kV Insulating Plug with cap: The Insulating Plug attaches and insulates 600 Ampere Deadbreak Connectors. It is equipped with a capacitive test point.
 - 4.1.9 15kV Class Reducing Tap Well: permits 200 Ampere tap off of 600 Ampere Connectors. The well will accept either 200 Ampere Loadbreak or Deadbreak Inserts.
 - 4.1.10 15kV Class Reducing Tap Plug: permits a 200 Ampere Deadbreak Tap off of a 600 Ampere Connector.



4.2 35kV Deadbreak, 600 Ampere Cable Accessories

4.2.1 35 kV Class Separable Splices: Deadbreak Cable Splice for joining two cables. Fully shielded, submersible and meet the requirements of IEEE Std 386™ standard - Separable Insulated Connector Systems. Includes two (2) Elbows / "T-Bodies", two (2) Insulating Plugs with Caps, one (1) Connecting Plug and one (1) Stud. Elbows / "T-Bodies" shall be provided without capacitive test points.

4.2.2 35 kV Class Insulating Plug with Cap: Deadbreak Plug with Cap to be inserted into Elbow/ "T-Body".

4.2.3 35 kV Class Connecting Plugs: Deadbreak Connecting Plug for use with Elbows/ "T-Bodies" fully rated 600 amp interface.

5.0 RATINGS

5.1 15kV Class Cable Accessories

System nominal voltage	13.8 kV phase to phase, grounded wye
Withstand Impulse Voltage (BIL)	95 kV 1.2x50 microsecond wave
AC Withstand Voltage	34 kV 60 Hz, 1 minute
DC Withstand Voltage	53 kV 15 minutes
Corona Extinction Level	11 kV, @ 3 picocoulombs sensitivity
Continuous Current	600 Amperes
Eight hour over load current	1,000 Amperes
Short-time current (duration, cycles = 10)	25,000 symmetrical, rms, Amperes

5.2 35kV Class Cable Accessories

System nominal voltage	34.5 kV phase to phase, grounded wye
Withstand Impulse Voltage (BIL)	150 kV 1.2x50 microsecond wave
AC Withstand Voltage	50 kV 60 Hz, 1 minute
DC Withstand Voltage	103 kV 15 minutes
Corona Extinction Level	26 kV, @ 3 picocoulombs sensitivity
Continuous Current	600 Amperes
Eight hour over load current	1,000 Amperes
Short-time current (duration, cycles = 10)	25,000 symmetrical, rms, Amperes

6.0 CONSTRUCTION

Terminations for dead front equipment shall be separable insulated connectors consisting of a 600 Amp dead break cable terminator system complying with IEEE 386. Disconnecting, single pole



terminators and matching 600 Amp bushing insert. Elbow Cable Terminator, Bushing Insert, and all other related components, must use the IEEE 386 Figure 5 Operating and Figure 3 Installation interface. All components shall be designed for sealing against moisture. Dead front terminations and elbow connections shall be fully shielded and meet all provisions of IEEE 592 and shall be suitable for submerged operation

6.1 Ethylene Propylene Diene Monomer Rubber (EPDM) insulation and shielding compounds shall be 100% peroxide-cured.

6.2 Maximum conductor temperatures:
90 degrees C Normal Operations
130 degrees C Emergency Operation
250 degrees C Short Circuit Operation
150 degrees C Transformer Interface

6.3 Connectors shall be compatible for use with one of the following cable designs:

15KV CONDUCTOR			INSULATION		CABLE DIAMETERS	
Size AWG/ kcmil	#of Wires	Material	Material	Thickness Mils	Conductor (mils)	Over Insulation (mils)
#2	7	Aluminum	XLPE	220	292	770
#2/0	19	Aluminum	XLPE	220	418	900
#4/0	19	Aluminum	XLPE	220	528	1010
500	37	Copper	XLPE	220	813	1290
750	61	Copper	XLPE	220	998	1480
1000	61	Copper	XLPE	220	1152	1640

35KV CONDUCTOR			INSULATION		CABLE DIAMETERS	
Size AWG	#of Wires	Material	Material	Thickness Mils	Conductor (mils)	Over Insulation (mils)
1/0	19	Aluminum or Copper	XLPE	420	362	1298
500	37	Copper	XLPE	420	813	1700
600	61	Aluminum	XLPE	420	866	1761
750	61	Aluminum or Copper	XLPE	420	998	1900
1000	61	Aluminum or Copper	XLPE	420	1152	2050

6.4 Elbow parts shall be interchangeable with existing (list available upon request) GPA elbow parts, including torque wrench and silicone lubricant.

6.5 Connectors shall have readily verifiable, permanent identification of vintage, no greater than by quarter and year of manufacture.



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7.0 TESTING

- 7.1 Connectors shall have passed tests in accordance with ANSI/IEEE 386, latest proposed revisions and IEEE Standard for Testing Shielding for Molded Cable Accessories.
- 7.2 Capacitive test point voltage shall be checked with high impedance volt meter.
- 7.3 Parts shall be examined visually and by X-ray periodically for porosity by taking the first piece molded on each shifts plus enough additional pieces during the shift as required insuring continued porosity free production.
- 7.4 A certified report shall be submitted to GPA Manager of Engineering proving compliance with all the test requirements of this specification.

8.0 SHIPMENT

- 8.1 Each connector shall be shipped in an individual protective container which will prevent damage and deformation to components.
- 8.2 Protective end plugs, caps and/or sealed plastic bags shall be provided to prevent open storage contamination.
- 8.3 Kit shall contain necessary installation items such as wrench, silicone grease, installation instructions, strip back guide, etc.

EFFECTIVE DATE: 5/17/22

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