

3M Electrical Markets Division
Low / Medium & Extra High Voltage Cable Accessories



INSULATING • CONNECTING • TERMINATING • SHIELDING • SEALING

Important Notice
Before using these products, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use.

Warranty; Limited Remedy; Limited Liability.
This product will be free from defects in material and manufacture at the time of purchase. **3M MAKES NO OTHER WARRANTIES**

INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. If this product is defective within the warranty period stated above, your exclusive remedy shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product. **Except where prohibited by law, 3M will not be liable for any indirect, special, incidental or consequential loss or damage arising from this 3M product, regardless of the legal theory asserted.**

3M
Electrical Markets Division,
3M Electro and Communicat



3M - Global capability, local back up

3M produces over 70,000 existing products many of which are designed specifically for the electrical, electronics and telecommunications industries.

We invest in over \$1 Billion a year on R & D and employ over 7,000 research engineers dedicated to meeting your needs. By working closely with our customers we are able to apply our vast experience in cutting edge technologies where it counts the most: optimizing your product or system capabilities. Working with 3M you're on the receiving end of the unrivalled support of a global company - with a strong local presence.

Moreover, all our products are independently tested to the major industry standards.

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Cold Shrink Solutions

Discover 3M Cold Shrink Solutions

Your reputation and revenues depend on the quality of your work. When you complete a job you want assurance that every connection you make is correctly sealed and insulated to provide long term protection. 3M makes the products you need for that peace of mind.

Over 40 years ago, 3M pioneered cold shrink technology. Since then, field use and laboratory analysis have repeatedly proven its merits and reliability. Through constant innovation, we have refined cold shrink products making them better than ever. They're easier to apply and built to withstand extreme environmental conditions. Enhanced performance at a lower installed cost continue to make 3M the preferred choice for cold shrink solutions. Cold shrink splicing products are designed using 3M's unique cold shrink delivery system. Products are supplied pre-stretched on a removable core for efficiency and ease of installation. Removal of the core (unwind) after positioning the splice allows the product to shrink into position forming a moisture-tight seal. The live memory action of the specially formulated material ensures a permanent, durable environmental seal and insulation. Discover how quality 3M products can solve your most common sealing and insulating applications.

Low Voltage

EPDM Rubber and Silicone Rubber Cold Shrink Tubes

Features

- Simple, safe installation, requires no tools or special training.
- Accommodates a wide range of cable, wire, conduit and hose diameters.
- No torches or heat required.
- Good thermal stability.
- Seals tight, retains its resiliency and pressure even after prolonged years of aging and exposure.
- Excellent wet electrical properties.
- Improved, tougher rubber formulation provides a highly flexible "living" seal.
- Water-resistant. Meets the water seal requirements of ANSI C119.1.
- Seals without mastic, tape or adhesives.
- Resistant to fungus, ozone, alkalies and acids.
- Easily removed for required disconnects or inspections.



Applications

- Primary electrical insulation for all solid dielectric (rubber and plastic) insulated wire and cable splicing rated to 1000 volts
- Physical protection and moisture sealing for couplings, hoses, connectors, and terminal lugs
- Cable jacket and sheath repairs
- Environmental sealing for communication connectors and other non-electrical applications

- Repair of non-pressurized hoses and conduit
- Corrosion protection for fittings and couplings
- Resists ozone and ultraviolet light*
- Resists fire - will not support flame*
- Resists fluid splashes*
- Operating temperature range -66°F/ -55C to 500°F/260°C*

3M™ Armorcast™ Material

Structural Material for Cable Splice Re-armor and Re-jacketing

The Armorcast products create maintenance free mechanical protection for power cable splices. 3M Armorcast structural material is a flexible fiberglass knit fabric strip that has been saturated with black urethane resin syrup. It is rolled and packed dry in a sealed foil envelope.



Features and Benefits

- Quick and easy installation
- No flame, electricity, or chemicals needed
- Safe for use in all hazardous environments (manholes, vaults, etc.)
- Resists moisture, temp, acid, alkali, ozone, sunlight and gasoline
- No special tools, mechanical ties, rails or clips required
- Forms to any shape or size

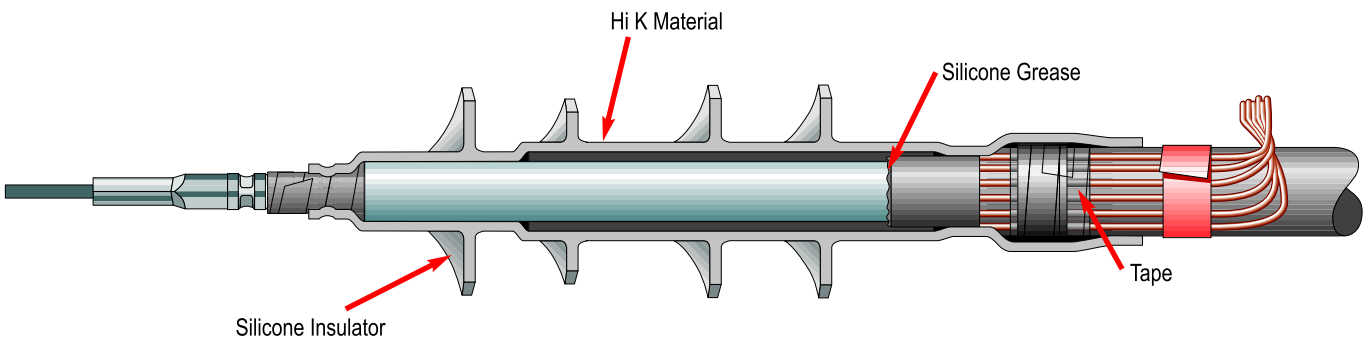
Cold Shrink Solutions

11/22/33 kV Termination

3M™ Cold Shrink Termination QT II

3M termination kits offer you –

- **Fast, easy installation.** Advanced 3M solutions provide terminations and splices installed in a fraction of the time. 3M kits also eliminate the need for soldering or special tools.
- **Reliable, long-lasting materials.** All 3M termination and splice materials have been factory tested and retested before being shipped to you. And all 3M products meet tough IEEE standards for performance and design rated class I
- **Solutions to fit your specs.** Kits are available for virtually any application, cable voltage or cable size.
- **Everything you need to terminate and splice.** With 3M, you can order all the kits and accessories you need from the same source. So you can save time, simplify your ordering and reduce your paperwork. For dependable, easy-to-assemble termination and splice solutions, contact your 3M representative. We'll be happy to provide you with reliable, high-quality 3M materials to meet your special requirements.



Termination Kits and Accessories

The right technology for utility applications

Fast and effective, 3M Cold Shrink™ termination kits with integral Hi-K stress control help provide you with easy-to assemble terminations for a broad spectrum of indoor and outdoor applications. 3M terminations are based on specially formulated, track-resistant, silicone rubber insulators with “built-in” Hi-K stress relief. These insulators are prestretched around a coiled, plastic core. When the terminator is slipped over a properly prepared cable and the core is pulled out, the terminator immediately shrinks to fit the cable's dimensions. The result is a tight, durable, void-free, constant-pressure seal for a variety of cable types and sizes. 3M “built-in” Hi-K provides a dielectric constant of approximately 25, distributing the electric field well beyond the shield cutoff. This greatly reduces the stress gradient at the end of the shield, thus helping to ensure long-lasting performance in high-voltage applications. Cold Shrink silicone rubber insulators are well suited for both indoor and outdoor applications. 3M silicone rubber insulators will not harden or crack, even under demanding conditions, and all 3M terminations are highly resistant to severe weathering, temperature extremes, heavy moisture and prolonged industrial contamination.



Cold Shrink Solutions

11/22/33 kV Splice

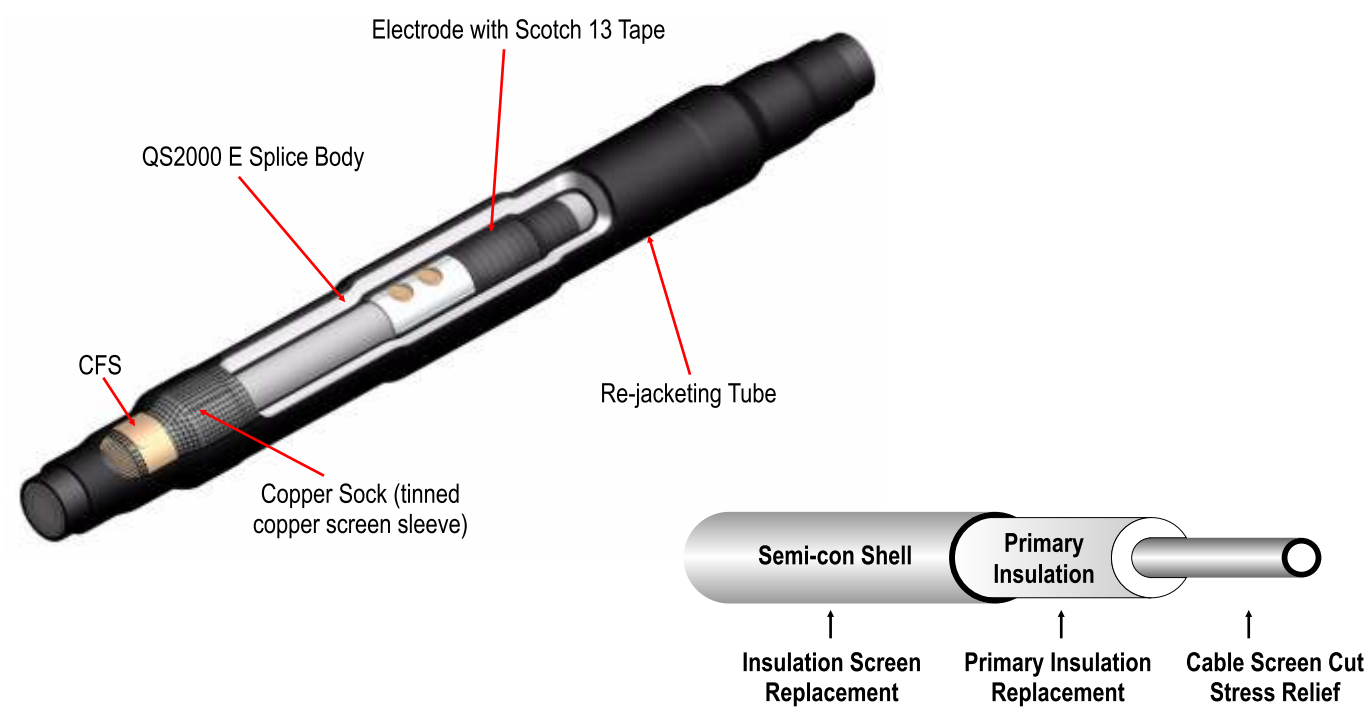
3M Cold Shrink QS 2000E

3M splice solutions can help you reduce the time, labor and cost involved in both above and below splice applications. What's more, every 3M splice has been 100% factory tested on power cable, so you can be assured of dependable performance, stability and long life with every splice you make.



Product Description

The 3M QS2000 E is a cold shrink, one-piece multilayer silicone splice body with integrated stress control device, insulation and outer semi-conductive layer. The 3M QS2000 E silicone splice body is delivered on a removeable plastic supporting core. During the installation the ribbon core is unwound counter clockwise, allowing the splice body to shrink onto the cable joint. The applied permanent radial pressure guarantees a reliable function over the entire lifetime.



- The outer semi-conductive layer re-establishes the cable screen.
- The insulation of the splice body replaces the cable insulation across the entire splice.
- The integrated refractive stress control provides the proper electric field distribution.
- 3M Scotch® Tape 13 is applied over the connector and forms the inner conductive electrode.

Cold Shrink Solutions

66kV / 69kV / 72kV Termination

3M™ Cold Shrink QT III



The same 3M cold shrink technology that the utility industry has relied on for years has been expanded to 69/72, 5kV for standard and reduced-wall (thinner insulation) cable.

Advantages

- Simpler installation makes possible lower total installed cost and helps reduce craft errors that may threaten reliability
- Applies quickly and easily
- Lightweight
- Proven cold shrink reliability
- Can be used on a wide range of cable insulations in a wide range of applications
- Backed and supported by 3M's renowned technical expertise
- Installs without heat, reducing worker safety risk
- Class I Termination



Cold shrink delivery system allows quick easy installation without flame, special tools or extensive training.



Hi-K stress control system minimizes surface stress.



The 3M™ Cold Shrink Termination QT-III for 69kV is designed for indoor and outdoor installations.

Cold Shrink Solutions

66kV / 69kV / 72kV Splice

3M™ Cold Shrink QS III

3M revolutionizes power cable splicing with the Cold Shrink QS-III. The QS-III silicone rubber splice meets customer demands for easy, consistent installations by eliminating the pushing, pulling or heating required by traditional splices. The Cold Shrink QS-III splice features a silicone rubber body which provides excellent electrical properties and superior low temperature handling. Plus the QS-III meets the requirements of most world wide standards including IEC 60840

3M Cold Shrink products bring tested reliability to splicing.

3M invented Cold Shrink technology over 35 years ago, so no one knows more about it than we do. Thanks to the successful history of Cold Shrink QT-II terminations, the merits and reliability of Cold Shrink products have been proven consistently by field-use and laboratory testing. 3M™ Cold Shrink QS-III splices eliminate heat applied and force fit methods, resulting in safer, more reliable, and lower cost installations.

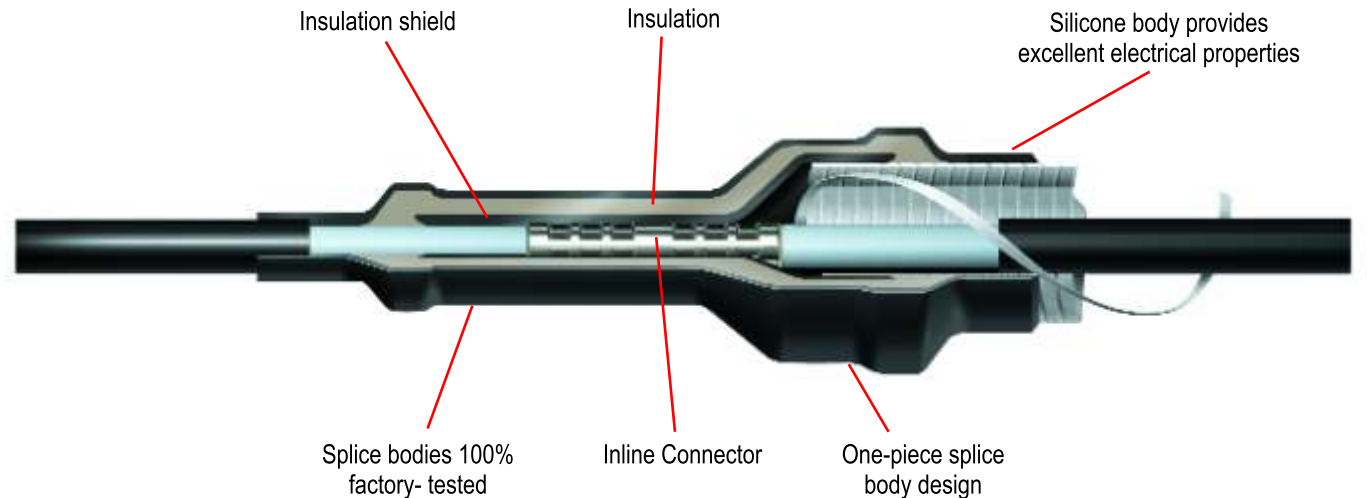
Cold Shrink Benefits

- No heat, flames or special installation tools required
- Minimal training required
- Easy, fast and safe installation
- Symmetrical cable cutback dimensions
- Allows transitioning of different size cables

QS-III Splice Features

- Silicone body provides excellent electrical performance and superior low temperature handling
- Splice bodies are 100% factory tested
- One piece splice body design
- Field proven technology
- Wide cable range for individual splice bodies
- Allows easy size transitions within a splice range

3M™ QS-III Splices come with all components required to make a complete splice for all types of cable of 69 / 72 kV.



EHV Cable Accessories

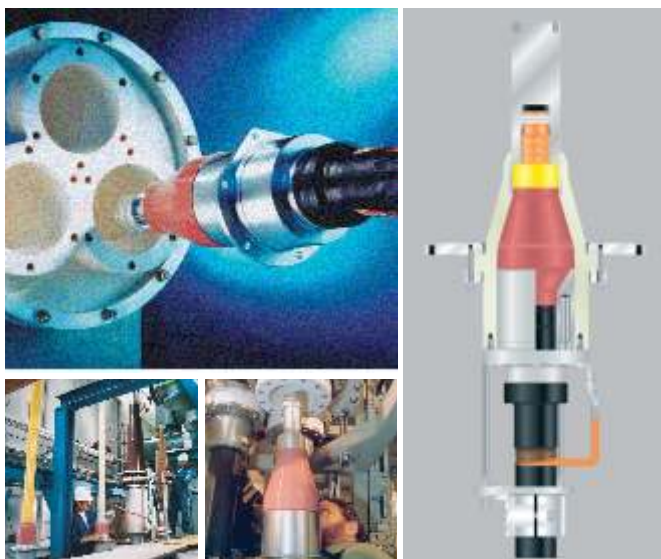
110kV upto 550kV

Outdoor Termination



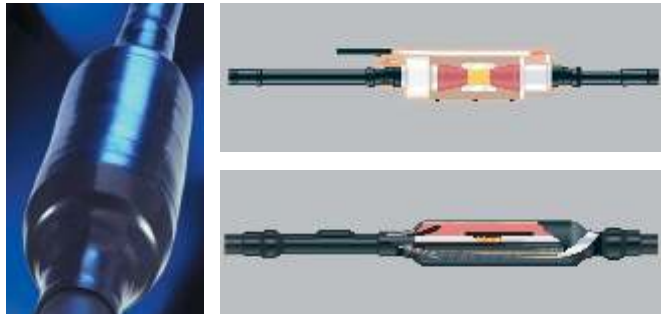
- Available upto 550kV
- Available in both porcelain and composite Insulator
- Prefabricated silicone stress cone
- Covers cable sizes upto 2500 SQMM
- Available for all pollution level as per IEC standard
- Type tested as per IEC 60840 & DIN VDE 0276-632
- Product is supported by experienced installation team
- Product in use for more then 15 years

GIS Plug In Type Termination



- Available upto 550kV
- Designed for GIS Switch gear as per IEC 60859 and ABB Switch gear type EXK
- Prefabricated silicone stress Cone
- Both Fluid and Dry type are available
- Dry type processes faster, cleaner, maintenance free and eco friendly terminations
- Covers cable sizes upto 2500 SQMM
- Plug in for 3 phase metal enclosures available
- Type tested as per IEC 60840
- Product is supported by experienced installation team
- Product in use for more then 15 years

Splice



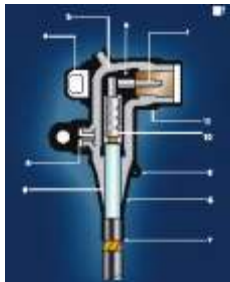
- Available upto 550kV
- Covers sizes upto 2500 SQMM
- Prefabricated body easy to install
- The sectionalised joints are suitable for cross bonding the screen or for single sided screen earthings of the individual laying sections
- Type tested as per IEC 60840
- Product is supported by experienced installation team
- Product in use for more then 15 years

Separable Connector



- Installation**
- No special tool or heat required
 - Immediately operational after installation
- Usage**
- Can be used for both single core and three core cable termination to SF6 switchgears.
 - Can be used on transformers, motors and other equipment.
 - Suitable for both indoor and outdoor application
 - Rated up to 24kV
 - Rated Permanent Current - Straight Connector: 250A; Tee Connector 630A
 - Peak Current Withstand (Max 8 Hours) - Straight Connector: 300A ; Tee Connector 900A
- Standards Met**
- VDE0278 • IEC60502-4 • EDF HN52-5-61 • BS7215

250A Dead Break Elbow Connector



- 1 Pin Connector - Secures to cable connector via supplied key.
- 2 Inner Conductive Screen Insulation - EPDM rubber screen (electrode) controls the electrical stress around connecting components.
- 3 Insulation – High quality peroxide-cured EPDM rubber formulated.
- 4 "D" Ring Pulling Eye - For elbow installation, removal and securing to equipment bushing.
- 5 Test Point - Circuit status confirmation before disconnection. Protected by conductive EPDM rubber cap.
- 6 Stress Cone
- 7 Cable Entrance
- 8 Outer Conductive Shield (Screen)
- 9 Grounding Tab - Connects conductive outer shell to grounded cablemetallic shield.
- 10 Bi-Metal Connector - Compatible for Cu & Al Connectors
- 11 Locking Groove

250A Dead Break Straight Connector



- 1 Pin Connector - Secures to cable connector via supplied key.
- 2 Inner Conductive Screen Insulation - EPDM rubber screen (electrode) controls the electrical stress around connecting components.
- 3 Test Point - Circuit status confirmation before disconnection. Protected by conductive EPDM rubber cap.
- 4 Stress Cone
- 5 Cable Entrance
- 6 Outer Conductive Shield (Screen)
- 7 Grounding Tab - Connects conductive outer shell to grounded cablemetallic shield.
- 8 Insulation – High quality peroxide-cured EPDM rubber formulated.
- 9 Locking Groove

400A/630A Dead Break Tee Connector



- 1 Bushing Connecting Stud
- 2 Insulation – High quality peroxide-cured EPDM rubber formulated.
- 3 Connecting Plug
- 4 Test Point - Circuit status confirmation before disconnection. Protected by conductive EPDM rubber cap.
- 5 Conductive Rubber End Cap - Grounds capacitive test point, seals connecting plug and provides outer shell ground continuity.
- 6 Inner Conductive Screen Insulation - EPDM rubber screen (electrode) controls the electrical stress around connecting components.
- 7 Stress Cone
- 8 Insulation Adapter - Adapts Tee-body of connector to a variety of cable sizes.
- 9 Grounding Tab - Connects conductive outer shell to grounded cable metallic shield.
- 10 Outer Conductive Shield (Screen)
- 11 Bi-Metal Connector - Compatible for Cu & Al Connectors

Medium Voltage Splice & Termination



Heat Shrink Technology



Heat Shrink Technology offers complete range of cable jointing & termination kits for XLPE, PILC, PVC & EPR Cables from 1.1kV to 36kV voltage grades. The kits consist of heat shrinkable tubing, moulded parts, mastics & other accessories for making a complete joint/ termination. The product range also includes various heat shrinkable components viz. Rain sheds, Breakouts (two way, three way, four way), Right angle & Straight boots, Cable end caps, Wrap around sleeves, Bus bar tubing, Medium wall & Dual wall tubes. Heat Shrink components have excellent stress control properties, exceptional insulation characteristics offer ease of installations & unsurpassed performance in polluted environments.

- Covers all types of conductors and connection shapes
- Environmental sealing by specially developed sealants
- Effective and reliable stress control
- Flexible kits sizes, reduces inventory
- Compact, hence multiple terminations possible
- Unlimited shelf life
- Immediate energisation of cable on completion
- Designed to meet International specifications IDE, IEC, IS & IEEE



PushOn Technology



PUSH ON System comprises of intricately engineered and moulded EPDM (Ethylene Propylene Diene Monomer) Rubber Components. The stress cone of terminations consist of a highly track resistant insulating section vulcanized to a semi-conducting section. The built in stress cone is designed using computer calculations of the electric field in the cone and the surrounding air. The system can be used up to 1000 sq mm for cables from 3.3kV to 36kV.

- Stress Grading is done by premoulded stress cone designed on a CAD Station
- Void free System as connecting pad has cold flow properties
- Flexibility of EPDM rubber guarantees active pressure thus eliminating development of voids during load cycling.
- Reusable termination.
- Flame Retardant Termination.
- Indefinite shelf life.
- Can be used on Aerial Bunched Cables.
- Enables an error free installation as the components are premoulded & thus eliminates chances of human error.



Kastex Joints & Terminations



Kastex Cable Accessories for Low Voltage PVC / PILC / XLPE Cables have been designed for simplicity in installation and a prolonged service life. Kastex joints and terminations for LV Cables are based on a cast resin system. The casting resin is polyurethane based which has complete compatibility with the cable components. M-Seal Kastex Joints are available in the following types.

- Straight Through Joints
- Pot Ends
- Tee Off Joints
- Breach Joints
- Indoor / Outdoor Terminations.
- Very simple & easy to install
- Provide proper mechanical protection
- Provide proper moisture imperviousness
- Can be provided with crimping ferrules or mechanical connectors
- Tee Joints also available with Soldering/ Crimping & mechanical connector

Medium Voltage Splice & Termination



Tapex Joints



Tapex System of cable jointing follows the time tested technique of rebuilding the cable construction. The system is simple and is based on three components:

- Self Amalgamating Insulating Tapes
- Self Amalgamating Semi-Conducting Tapes
- Non Linear Stress Grading Pads
 - Few Components and no mastics
 - Easy to install as it requires no heating
 - No tapering of XLPE Insulation
 - Cold Flow property
 - Thermally compatible with XLPE Insulation
 - Provides complete mechanical & moisture protection



Terminal Protector



The Terminal Protector is an insulating barrier system, which can be used in conjunction with any indoor termination.

The Terminal Protector is a unique insulating system for providing Phase to Phase and Phase to Earth insulation to power cable terminals where these terminations need to be installed in very compact areas like motor terminal boxes, ring main units, distribution transformers etc.

The Terminal Protector comprises of an insulating bellow and grommets. All these components are injection moulded from EPDM rubber, which is highly insulating and track resistant.

The Terminal Protector is available for insulating right angle connections as well as in-line connections.

- Accommodates a large cable cross section - 25 to 300 sq mm and 400 to 630 sq mm
- Also fits sector shaped cables
- Facilitates direct voltage testing
- Easy to fit
- Cost Effective
- Re-openable
- Re-usable
- Can be installed on any termination i.e. Premoulded Heat Shrink etc.
- Can be installed on XLPE, PVC or PILC cable

Electrical MRO Tapes



PRODUCT NAME		PRODUCT DESCRIPTION	TAPE THICKNESS	SIZES AVAILABLE	TEMPERATURE RATING	TYPICAL APPLICATIONS
Vinyl Electrical Tapes						
Scotch® Super 33+ Professional Use Premium Vinyl Electrical Tape		Highly conformable, super stretchy in all weather applications; resists UV rays, abrasion, corrosion, alkalis and acids. Flame retardant.	7 mil	3/4" x 20' 3/4" x 44' 3/4" x 36 yd.	3/4" x 66' 1" x 36 yd. 1 1/2" x 36 yd.	220°F 105°C Primary insulation for splices up to 600V. Protective jacketing.
Scotch 35 Professional Use Vinyl Electrical Tape for Color Coding		Nine fade resistant colors, super stretchy and conformable, excellent insulating properties. Resist UV rays, abrasion, corrosion, alkalis and acid.	7 mil		1/2" x 20' 3/4" x 66'	220°F 105°C Phase identification and marking. Harnessing.
Scotch Super 88 Professional Use Premium Vinyl Electrical Tape		All weather; heavy duty, professional use, abrasion resistant, fast build up.	8.5 mil	3/4" x 44' 3/4" x 66' 3/4" x 36 yd. 1" x 36 yd.	1 1/2" x 44' 1 1/2" x 36 yd. 2" x 36 yd.	220°F 105°C Primary insulation for splices up to 600V. Protective jacketing.
Scotch 22 Heavy Duty Vinyl Electrical Tape		Thicker for increased mechanical strength and abrasion resistance. Electrical insulating.	10 mil	1/2" x 36 yd. 3/4" x 36 yd. 1" x 36 yd.	1 1/2" x 36 yd. 2" x 36 yd.	176°F 80°C Bus bar insulation. Cable jacket repair.
Temflex 1500 Vinyl Electrical Tape		Resistant to abrasion, moisture, alkalis, acid and varying weather conditions.	5 mil		3/4" x 10 yd.	176°F 80°C General use. Vinyl insulation tape.
Tartan 1710 Vinyl Electrical Tape		Excellent resistance to: abrasion, moisture, alkalies, acid and varying weather conditions, flame retardant	7 mil		3/4" x 20'	176°F 80°C General use. Vinyl insulation tape.

Insulating & Splicing Tapes						
Scotch® 13 Semiconducting Tape		Rubber tape, semi conductive. Compatible with cable semi-conducting jackets.	30 mil	3/4" x 15'		continuous: 194°F / 90°C short term: 266°F / 130°C Electrically round high voltage connections. Provide cable shield continuation.
Scotch 23 Rubber Tape		High and low voltage insulating, self-fusing rubber tape.	30 mil	3/4" x 30' 1" x 20' 1" x 30'	1 1/2" x 30' 2" x 30'	continuous: 194°F / 90°C short term: 266°F / 130°C Primary electrical insulation for splicing all solid dielectric cables through 69kV.
Scotch 24 Shielding Tape		All metal open weave shielding braid, conformable, temperature stable.		1" x 15' 1" x 100'		Continue electrostatic shielding across splice.
Scotch 25 Grounding Braid		All metal woven braid; high current carrying capacity of 6 AWG wire; solderable.		1/2" x 15'		Conformable ground braid for splices and terminations.
Scotch 27 and 69 Glass Cloth Tapes		Woven insulating glass cloth; high temperature resistance; high mechanical strength.	7 mil	27 1/2" x 66' 3/4" x 66' 3/4" x 60 yd. 1" x 60 yd. 1 1/2" x 60 yd.	69 1/2" x 66' 1/2" x 36 yd. 3/4" x 66' 3/4" x 36 yd. 1" x 36 yd.	27 is Class B temp (266°F / 130°C) 69 is class H temp (356°F / 180°C) Heat-stable insulation for furnace and oven controls, motor leads, and switches.
Scotch 70 Self-Fusing Silicone Rubber Tape		Arc and track resistant; self fusing, long lasting silicon rubber.	12 mil	1" x 30'		Protective overwrap for terminating high voltage cables.

PRODUCT NAME		PRODUCT DESCRIPTION	TAPE THICKNESS	SIZES AVAILABLE	TEMPERATURE RATING	TYPICAL APPLICATIONS
Insulating & Splicing Tapes						
Scotch 77 Electric Arc Proofing Tape		Protects cable until limiting devices can interrupt faulted current.	30 mil	1 1/2" x 20' 3" x 20'		Use on high-energy cables that are within 18" of other high energy cables.
Scotch 130C Linerless Rubber Splicing Tape		High voltage insulating; thermally conductive; self-bonding.	30 mil	3/4" x 30' 1" x 10' 1" x 15'	1" x 30' 1 1/2" x 30' 2" x 30'	continuous: 194°F / 90°C short-term: 266°F / 130°C Primary electrical insulation for splicing all solid dielectric cables through 69kV.
3M™ 2242 Linerless Splicing Compound		General purpose rubber insulating tape.	30 mil	3/4" x 15' 1 1/2" x 15' 2" x 15'	continuous: 194°F / 90°C short-term: 266°F / 130°C	All-voltage splicing, jacketing, and general insulating.
Temflex™ 2155 Rubber Splicing Tape		Economical low voltage rubber insulating tape; self-fusing.	30 mil	3/4" x 22' 1 1/2" x 22'	176°F 80°C	Insulating wire splices, split bolt connections and leads up to 600V.
Scotchfil™ Electrical Insulation Putty		Black, self-fusing, insulating putty in tape form.	125 mil	1 1/2" x 60"		176°F 80°C Insulate connections up to 600V. Smooth bus bar irregularities
Scotch 2510 motor		Yellow, varnish coated and 2520 Varnished cotton cloth 2510: no adhesive; 2520 is 8 mil3/4" x 36 yd.	2510 is 7 mil	3/4" x 60' 1/2" x 36 yd.	220°F	Insulate bus bars 2" x 36 yd.

Corrosion Protection Tapes						
Scotchrap™ 50 and 51 All-weather Corrosion Protection Tapes		All-weather performance and corrosion resistance. Resistant to impact and abrasions.	50 is 10 mil 51 is 20 mil	1" x 100' 2" x 100' 3" x 100'	4" x 100' 6" x 100'	176°F 80°C Corrosion protection on pipes, conduits and fittings, etc.
Temflex™ 1100 Tape		General purpose corrosion resistant tape. Good abrasion resistance.	10 mil	2" x 100'		176°F 80°C Corrosion protection on conduits, fittings and joints, etc.
Scotchrap Pipe Primer		Quick-dry, non-sag rubber base primer that prepares metal surfaces for tape application.		1 gallon can		176°F 80°C For use with Scotchrap 50 and 51 tapes and Temflex 1100 Tape.

Special Use Tapes						
Scotch 2000 Electrician's Duct Tape		General purpose easy tear vinyl duct tape	6 mil	1.9" x 50 yd.		General holding and bundling.
Scotch 300 Series Barricade Tape*		Durable polyethylene plastic, attractive price, bold 2" letters, long roll length, will not tear easily, attracts attention	3 mil	3" x 300' 3" x 1000'		Barricade applicable in both large and small areas

Sealing & Insulating Tapes						
Scotch 2200 and 2210 Vinyl Mastic / Scotch 06147 and 06149 Moisture Sealant		Excellent moisture sealant; tough vinyl backing; electrical insulating.	2200 is 125 mil 2210 is 90 mil 6147 is 45 mil 6149 is 45 mil	3 1/4" x 4 1/2" pads 6 1/2" x 4 1/2" pads 4" x 10' roll 2 1/2" x 10' 2 1/2" x 2 1/2"	176°F 80°C	Insulate moisture-seal and pad connections up to 600V.
Scotch 2228 Rubber Mastic Tape		Self-fusing rubber based compound bonded to a moisture sealing mastic; all weather.	65 mil	1" x 10' 2" x 3' 2" x 10'	194°F / 90°C emergency overload of 266°F / 130°C	Insulate, pad and seal bus bar and splice connections.
Scotch-Seal™ 2229 Mastic Tape Compound		Conformable and durable mastic. Excellent moisture and environmental seal.	125 mil	3 3/4" x 10' 1" x 10' 2 1/2" x 3 3/4" pads 3 3/4" x 3 3/4" pads 3 3/4" x 6 1/2" pads	176°F 80°C	Sealing high voltage cables and accessories.

HVDS Insulation Enhancement System

The High Voltage Distribution System (HVDS) in an utility consists of a step- down transformer, a lightening arrester (LA), Jumper(s) and a drop out (DO) fuse assembly installed very close to the consumer premises. The DO fuse assembly provides protection to the transformer from over load and short circuit. However, the close proximity of these high voltage fittings with the habitation around them has become a safety concern, particularly in densely populated areas, where these assemblies come very close to the buildings and can be accidentally accessed by people standing in their windows, balconies and roof tops. Hence the need to insulate the live transformer bushings, LA bushings, DO fuse assembly and jumper tapping. 3M HVDS Insulation System provide electrical insulation to the live and exposed parts of a 11 kV Drop Out Fuse Assembly on a high voltage distribution system. The molded covers are made of arc resistant, flame retardant insulating material having excellent weathering and UV resistance properties similar to our Heat shrink cable jointing products.



- The product has a robust design for absolute fitment on the HVDS fittings
- Fast, efficient & easy to use product - Can be installed without disturbing the HVDS fittings/ bare conductors
- The product is re-usable, which can be entered by opening few buttons which can be refitted after the maintenance/ repair work.
- Excellent Di-electric and wet electrical properties- Resists electrical arc and tracking in outdoor service conditions
- Flame retardant and good thermal stability.
- Excellent weathering, ozone and ultraviolet light resistance
- Resists fungus, acids and alkalis
- Does not require heat or any specific tools- requires only workman's hands for error free installation
- Built in buttons provide unique latching mechanism which ensures lasting stability of the products on HVDS fittings

3M can customize the insulation system to meet the customers HVDS network requirements.

Aluminum Conductor Composite Reinforced (ACCR)

The next generation of reliable and affordable transmission solutions

Higher capacity, lower costs, less installation time and fewer environmental impacts compared to conventional upgrade options

Benefits

- Two to three times the ampacity, using existing towers and clearances
- Reduced total project costs
- Proven performance in numerous field installations, 5 years field experience and thorough testing
- Avoid the environmental impact of new towers and ROW
- Shorter permitting and installation times
- Fully-documented installation procedures, design and implementation support, and a complete range of accessories optimized for 3M ACCR
- Peace of mind from using a technology backed by the technical, financial and manufacturing resources of 3M

Technology

Advanced aluminum and ceramic fiber composite core wrapped in high-temperature, hardened aluminum outer strands results in:

- Core strength comparable to steel and eight times that of aluminum
- Core weight less than half that of steel
- Core conductivity approximately four times that of steel and half that of aluminum
- Thermal expansion of the core approximately one-fourth that of aluminum and half that of steel
- Rated for 210°C/240°C emergency
- Creep lower than steel
- Core stiffness three times aluminum
- Excellent fatigue resistance
- No degradation through corrosion and other environmental factors
- Standard sizes, round or compact constructions

Applications

- Thermal upgrades, such as transmission bottlenecks or high load growth areas
- Difficult or environmentally sensitive areas, such as mountains, wetlands, parks and wildlife refuges, or densely populated areas
- Long span, high strength applications, such as river, canyon or lake crossings
- Corrosive or challenging environments, such as coastal, desert or cold regions

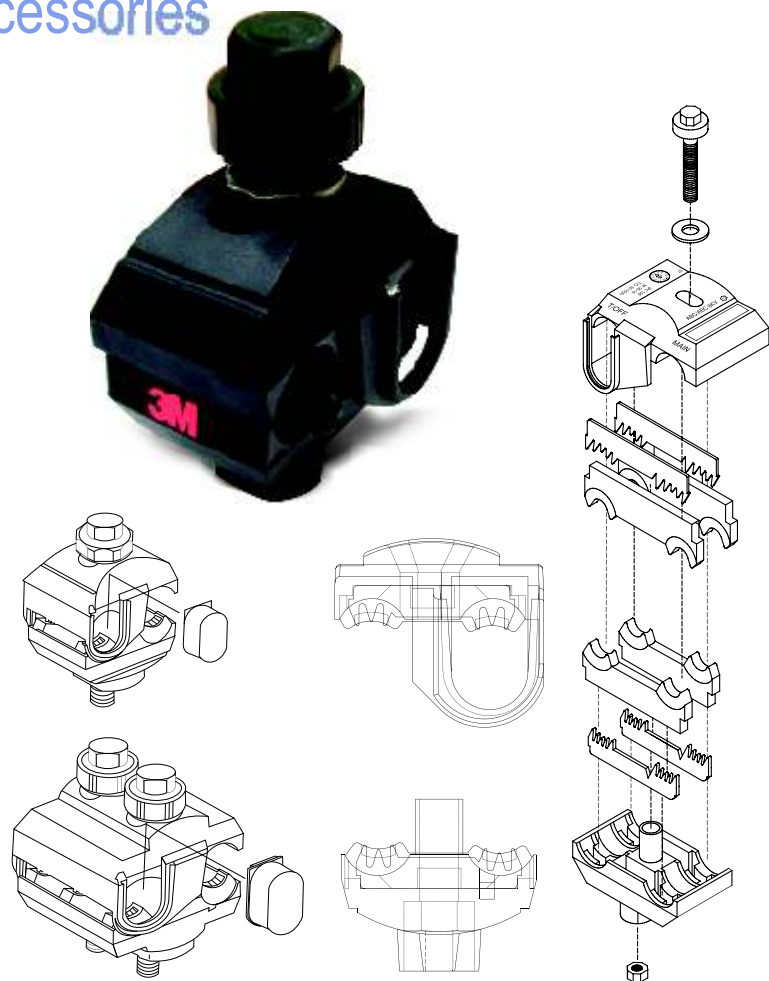


Aerial Bunched Cable Accessories

Insulation Piercing Connector (IPC):

The Insulation Piercing Connector (IPC) is used for connecting an insulated conductor with a branch conductor without removing the insulation of the conductor. The application is mainly for insulated Aerial bunched cables. Each connector is in two halves, interconnected with a bolt having a shear head top. The shear head of the bolt shears off at predetermined torque. IPC of this design is when both the main & tap conductors are tightened simultaneously whereby the teeth of the contact plates penetrate the insulation and establish a contact.

3M Description	Main to tap Conductor size mm2
ABCC 01	95 - 70 to 25 - 16
ABCC 02	95 - 70 to 95 - 70
ABCC 03	185 - 120 to 25 - 16
ABCC 04	185 - 120 to 185 - 70
ABCC 05	95 - 16 to 95 - 16
ABCC 06	185 - 70 (35) to 35 - 6 (50 - 6)
ABCC 07	120 - 16 to 16 - 1.5
ABCC 08	95 - 16 to 50 - 10 (6)
ABCC 09	120 - 6 to 6 - 1.5



Fuse Switch Disconnectors

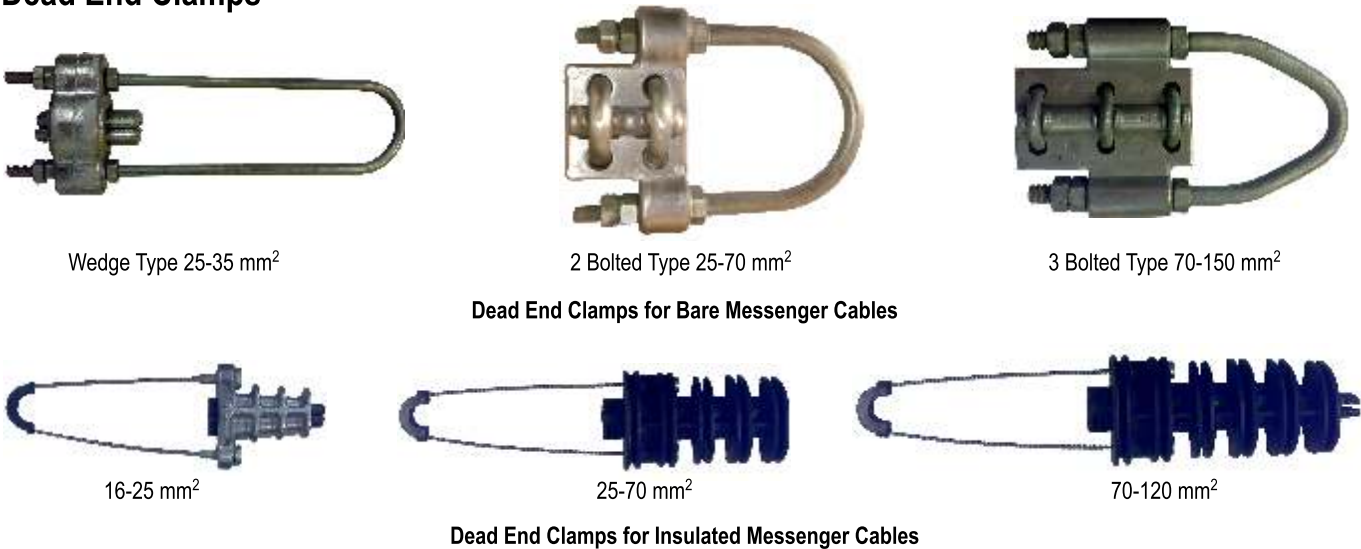
The Fuse Switch Disconnecter together with the DIN fuse is intended for use with ABC cabling systems as an overload protection device. It may also be used (while open) as a circuit isolation device with the facility to complete the circuit if required. The device has a housing comprising terminal cover, lower body, upper body and fuse shroud made of mechanical, climatic, UV resistant glass reinforced poly-amide material. The other parts are the terminals, fuse clip, hook type operation of lower body and an optional LED indicator.

Application Range
FSD 1P 100 - 1Pole 100A
FSD 1P 160 - 1Pole 160A
FSD 1P 400 - 1Pole 400A
FSD 3P 400 - 3Pole 400A



- 1. Hot dip galvanized bracket
- 2. Hot dip galvanized mounting bolt
- 3. Weather resistant housing
- 4. Al alloy terminals (various options)
- 5. DIN type fuse link
- 6. Spring loaded fuse clip
- 7. Hook type operation of lower body
- 8. Optional LED to indicate fuse blown

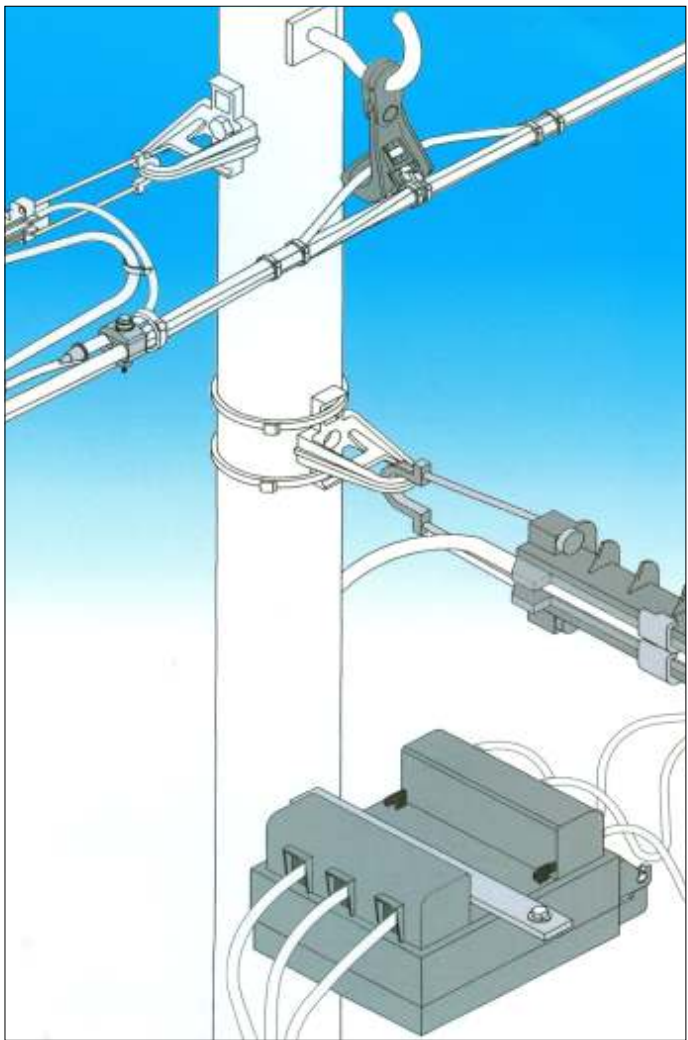
Dead End Clamps



Suspension Clamps



Eye Hooks



Preinsulated Bimetal Lugs



Model No	Conductor (mm²)	Colour	Die	Packing
PBCL 101	16	Blue	E140	20
PBCL 102	25	Orange	E140	20
PBCL 103	35	Red	E173	20
PBCL 104	50	Yellow	E173	20
PBCL 105	54.6	Black	E173	20
PBCL 106	70	White	E173	20
PBCL 107	95	Grey	E173	20
PBCL 108	120	Pink	E173	20
PBCL 109	150	Violet	E215	20
PBCL 110	185	Brown	E215	20

Preinsulated Aluminum Sleeve

RANGE - Type 1

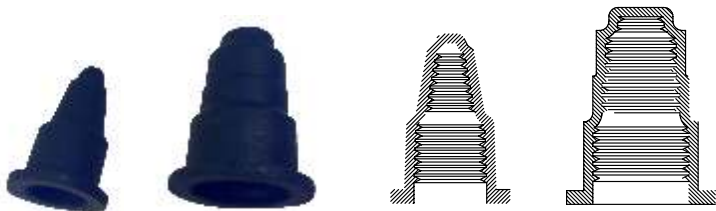
Model No	Conductor (mm²)	Colour	Die	Packing
PIAS 101	16 - 16	Blue - Blue	E140	50
PIAS 102	25 - 25	Orange - Orange	E140	50
PIAS 103	35 - 35	Red - Red	E173	50
PIAS 104	50 - 50	Yellow - Yellow	E173	50
PIAS 105	70 - 70	White - White	E173	50
PIAS 106	95 - 95	Grey - Grey	E173	50
PIAS 107	120 - 120	Pink - Pink	E173	50
PIAS 108	150 - 150	Violet - Violet	E215	50
PIAS 109	185 - 185	Brown - Brown	E215	50
PIAS 110	16 - 25	Blue - Orange	E140	50
PIAS 111	25 - 35	Orange - Red	E140	50



RANGE - Type 2

Model No	Conductor (mm²)	Colour	Die	Packing
PIAS 101 T	16 - 16	Blue - Blue	E140	50
PIAS 102 T	25 - 25	Orange - Orange	E140	50
PIAS 103 T	35 - 35	Red - Red	E173	50
PIAS 104 T	50 - 50	Yellow - Yellow	E173	50
PIAS 105 T	54.6 - 54.6	Black - Black	E173	50
PIAS 106 T	70 - 70	White - White	E173	50
PIAS 107 T	95 - 95	Grey - Grey	E173	50
PIAS 108 T	120 - 120	Pink - Pink	E 173	50

End Caps



Model No	Conductor Range (mm2)	Weight (gm)	Packing
CEC 101	6 - 95	22	200
CEC 102	70 - 185	40	200

Distribution Box

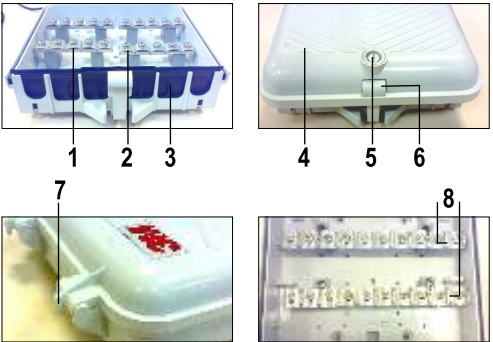
Type DB 140 Series for LV Distribution Systems



Product Description:
The 3M Distribution Box type DB ABC Series for multiple power supply tapping in low voltage distribution systems consists of IP-44 rated enclosure and unique screw contact system. The unique design ensures easy and quick tapping and distribution of energy from the pole mounting position. All components are weather and corrosion resistant.

Application Range:
DB 140 2x10, Single phase 10 way, 140A.
DB 140 4x5, Three phase 5 way, 140 A.

- Construction & Features:**
- 1. 140A rated 6mmx12mm Tin plated Copper busbars
 - 2. Unique screw type Contacts
 - 3. UV Resistant Elastomer seal
 - 4. Flame retardant, UV Resistant Enclosure
 - 5. Inbuilt Lock
 - 6. Snap fit closing mechanism.
 - 7. Stopper
 - 8. Busbar configuration for single phase 10 way box



You're in a demanding industry. To be successful, you need a wide range of reliable products designed to effectively manage your daily processes. You need a supplier with a solid understanding of your industry and the technology that drives it. Quite simply, you need 3M. Our Electrical Products Division designs and manufactures a comprehensive line of products that can address your diverse applications. Widely recognized for our innovation, reliability and global corporate strength, 3M has the products and services you need and the name you trust.

In your business, power, technology and reliability are essential. 3M delivers that and more. We have the power of a diversified, global manufacturer with more than 70,000 products in our line; a reputation for technical excellence and innovation; and employees committed to delivering quality products and service to you, our valued customer.

Our commitment and capability doesn't stop with electrical products, it starts there.

