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Euromold

a Nexans company

Technical information

Catalogue 2001

Euromold
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TECHNICAL INFORMATION

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PROPERTIES OF EPDM AND SILICONE RUBBERS

The EPDM rubber used in products manufactured by Euromold is a terpolymer of ethylene, propylene and a nonconjugated diene. The resultant hydrocarbon-based elastomer has all advantages of general purpose rubbers but its performance excels in electrical strength and resistance to environmental conditions.

The silicone rubber used by Euromold in the cold-shrinkable terminations has been selected for its excellent tracking resistance as well as its unique hydrophobic properties.

Electrical properties

Typical values	EPDM		Silicone insulation
	Insulation	Conductive	
Dielectric strength (kV/mm)	33	-	24
Dielectric constant	2.7 to 3.1	-	2.6
Dissipation factor (x 10^{-3})	2.5	-	4
Volume resistivity at 20°C (Ohm-cm)	10^{14}	50	10^{15}

Ozone/corona resistance

Both EPDM and silicone rubbers can be considered resistant to ozone attack. As a consequence, the outstanding resistance to corona is due to the ability of the EPDM to withstand ozone and other chemical compounds formed by the discharge as well as its resistance to heat. The excellent fitting due to low hardness of silicone rubber provides excellent corona values.

Radiation resistance

Some utilities use EPDM connectors in nuclear containment areas.

Chemical resistance

Products made from EPDM resist attack by many acids, alkalis, detergents, phosphates, esters, ketones, alcohols and glycols. They give particularly outstanding service in the presence of hot water and high pressure steam. Like all hydrocarbon-based elastomers, EPDM is not resistant to hydrocarbon solvents and oils or chlorinated hydrocarbons.

Resistance to the environment

EPDM rubber has properties comparable with the best speciality elastomers in resistance to weather. Accelerated life and salt spray tests suggested excellent properties which have been proven in practice by more than 35 years experience in widely varied applications all over the world. Silicone rubber has outstanding long-term resistance to weather in aggressive environments (industrial, coastal and desert climates).

Resistance to water

Water has little effect on the properties of EPDM hydrocarbon rubber. Even long immersion in hot water results in minimal loss of tensile strength. Tests also show a very low degree of water absorption. Silicone rubbers retain their surface hydrophobicity which is a considerable advantage for outdoor applications.

Resistance to mechanical abuse

EPDM has good resistance to compression, cutting, impact, tearing and abrasion over a wide temperature range.

Other physical properties

Typical values	EPDM		Silicone insulation
	Insulation	Conductive	
Specific gravity (kg/dm^3)	1.33	1.12	1.15
Tensile strength (N/mm^2)	4.8	11	8.5
Shore hardness (Shore A)	65	80	47
Elongation (%)	400	450	700
Abrasion resistance	good	excellent	poor
Heat ageing	good	good	good
Temperature range (°C)	-60 to +130	-60 to +130	-80 to +200
Resistance to :			
- U.V.	good	good	good
- Ozone	excellent	excellent	excellent
- Sunlight	outstanding	outstanding	outstanding
- Water absorption	very good	very good	excellent
- Solvents	poor	poor	poor
- Hydrocarbon oil	poor	poor	good
- Silicone oil	good	good	poor

For further information on silicone and EPDM rubbers, please contact our local representative.

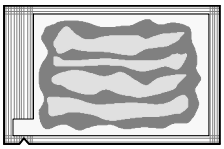
PROPERTIES OF EPDM SEPARABLE CONNECTORS AND ACCESSORIES

The EPDM separable connectors and accessories :

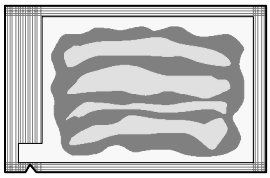
- are fully screened, touchable and provide complete safety for personnel.
- are fully watertight, fully submersible and can be installed outdoors.
- their resistance level to the following conditions is :
  - UV radiation : good
  - Ozone : excellent
  - Sunlight : outstanding
  - Extreme temperatures (–60°C up to +130°C) : good
  - Pollution (salt-fog, nuclear environments, steel- and cement works) : excellent
- have interfaces conform to the international standards :
  - CENELEC EN 50180 and 50181
  - ANSI/IEEE 386
  - C 33-051
- are designed to terminate any type of polymeric cable.
- can be energised immediately after installation on its mating part.

SILICONE LUBRICANT

Grease : SG5, SG15 & SG100



SG5 (5 grams)



SG15 (15 grams)

SG100 (100 grams)

DESCRIPTION

Silicone SG high viscosity grease has been chosen for both its lubrication and dielectric properties.
It is used as a lubricant when installing all premoulded rubber accessories and epoxy bushings as well on the insulation of dry cables.
Its selection is the result of several years' evaluation by ELASTIMOLD of many types of silicone grease. Silicone SG grease displays a high level of long-term lubricating stability avoiding any ageing effects (e.g. the risk of sticking).
It also offers excellent dielectric properties assuring good performance at high voltage interfaces. In addition the grease contributes to making interfaces watertight. It is completely compatible with all premoulded rubber accessories as well as with polymeric insulated cables.

USES

Use of this grease has proved to be of value in the installation of accessories in series and for operations such as greasing interfaces after disconnection. The installation instructions contained in each product package detail clearly the application of silicone SG grease.

CABLE STRESS RELIEF

The design and construction of screened power cable is primarily based on two types of electrical stress – a radial stress which can be represented by lines of flux (Fig. 1) and a longitudinal stress which can be considered as lines of equipotential (Fig. 2).

Fig. 1 **RADIAL STRESS**

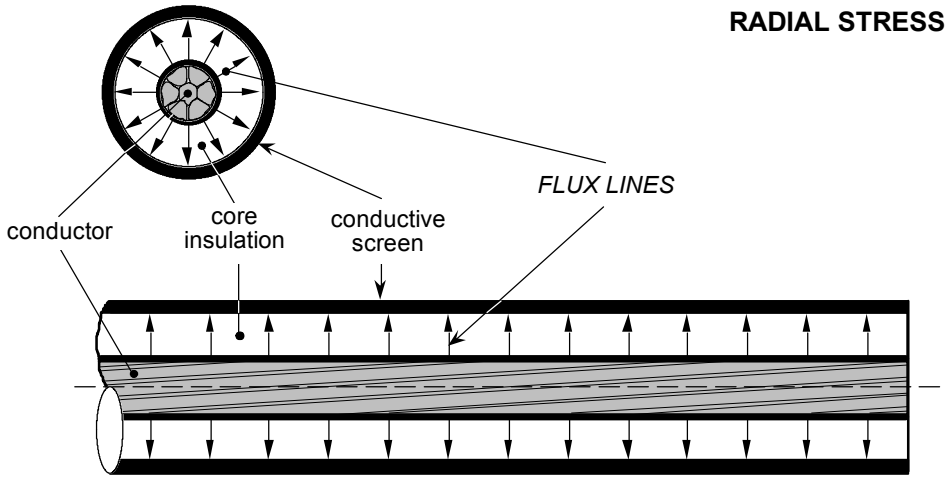
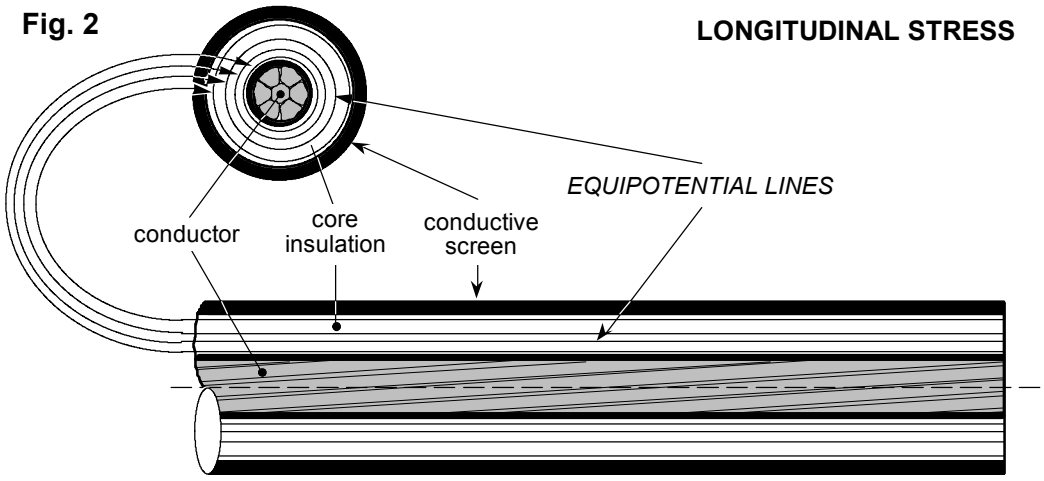


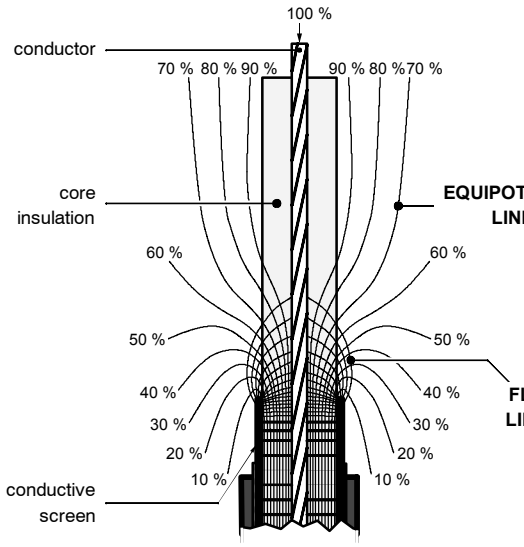
Fig. 2 **LONGITUDINAL STRESS**



When the semi-conducting core screen is cut, the electrical field distribution changes radically. The surrounding air becomes overstressed as does the dielectric material in the cable immediately in the vicinity of the cut screen (Fig. 3). To prevent rapid breakdown of the cable it is necessary to apply a stress cone (Fig. 4) or a linear stress relief tube (Fig. 5) at the end of the screen.
The cone has an insulating portion to reinforce the primary cable insulation and a conductive portion to mate with the semi-conducting core screen. This controls the lines of equipotential so that when they finally emerge into the air they are sufficiently far apart not to cause ionisation.

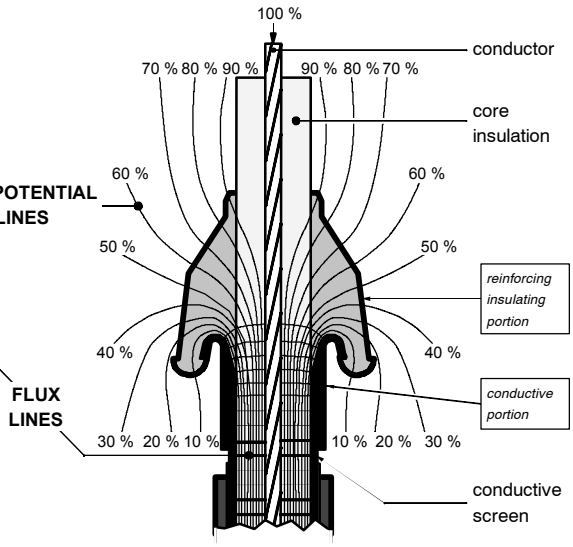
Stress cones manufactured by EUROMOLD are designed to carry out this function specifically but stress relief is automatically built into all the accessories by the precision moulding of conductive and insulating rubber (Fig. 6).

Fig. 3



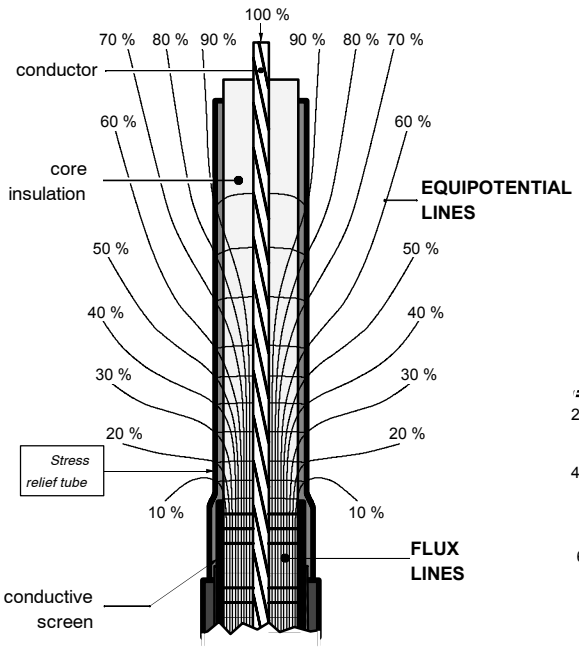
Without stress relief

Fig. 4



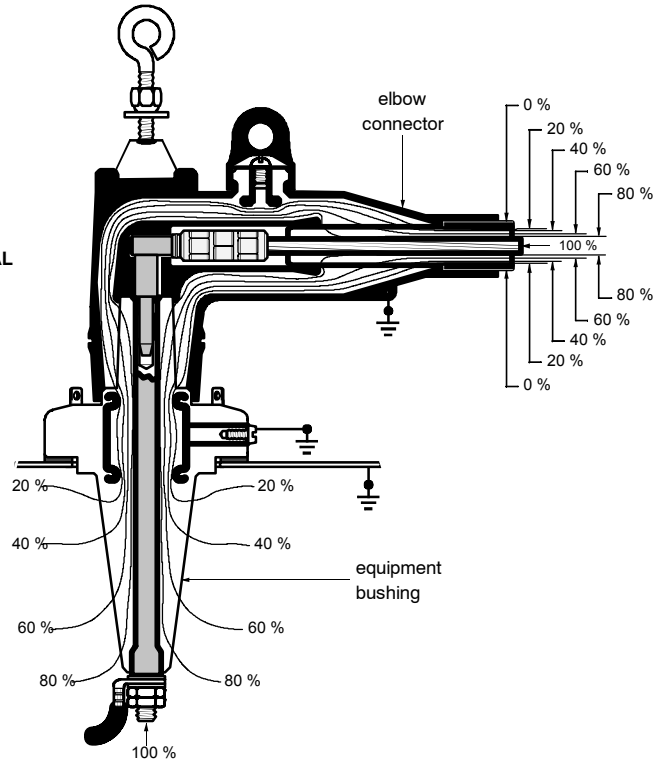
Stress relief with a premoulded stress cone

Fig. 5



Stress relief with a linear stress relief tube

Fig. 6



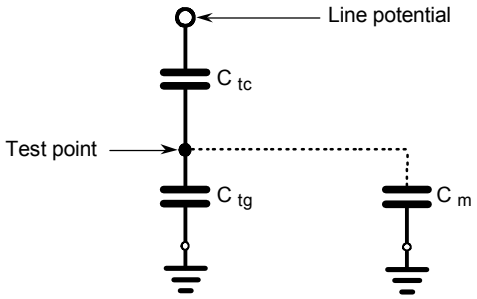
Stress distribution in a typical combination

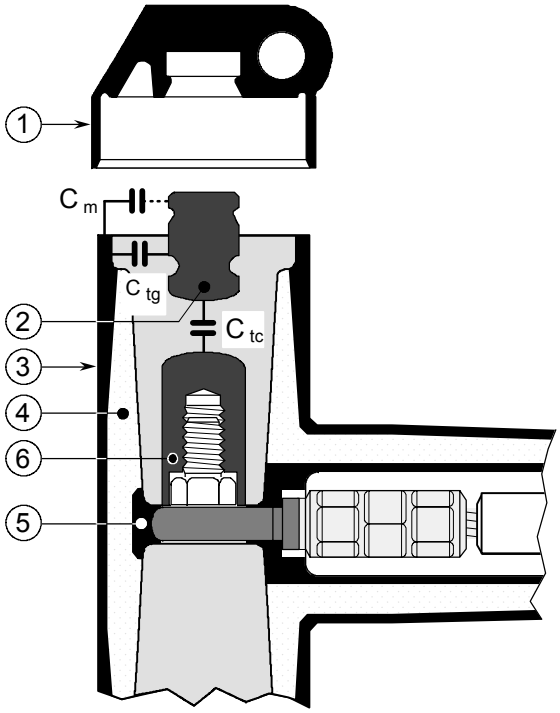
THE CAPACITIVE TEST POINT

The connectors manufactured by EUROMOLD are provided with a capacitive test point. This enables a local check to be made to confirm that the product is de-energised prior to disconnection.

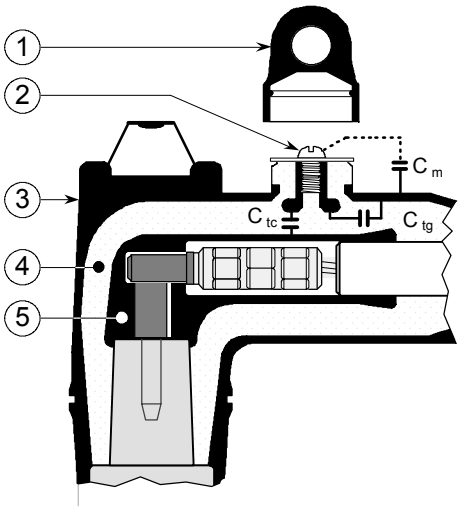
KEY

1. Conductive rubber cap
2. Metallic insert (capacitive test point)
3. Conductive EPDM screen (earth potential)
4. EPDM insulation
5. Internal EPDM screen (line potential)
6. Metallic insert (line potential)





SEPARABLE CONNECTORS
- (K)(M)400TE
- (K)(M)400TB
- (K)(M)440TB
- (K)676LRA
- 750LR
- 775LR



SEPARABLE CONNECTORS
- (K)152SR
- (K)158LR
- (K)(M)400LR

The capacitive test point consists of a metallic insert moulded into the insulation and electrically connected to a convenient external terminal.

Under normal operating circumstances this terminal is earthed by its conductive rubber cap. The cap must be removed prior to testing. When applying the test device you are effectively establishing a capacitive potential divider, the components of which are :

C_{tc} : 1,5 to 3 picofarads between test point and line connections.
C_{tg} : 5 to 8 picofarads between test point and earthed conductive screen.
C_{m} : 15 picofarads representing the approximate capacity of the detection apparatus.

The voltage available at the test point is directly proportional to the line voltage depending on the capacitance ratio.

The following ratio is typical :

$$\frac{V_{mesure}}{V_{phase/earth}} = \frac{C_{tc}}{\left(C_{tc} + C_{tg} + C_{m}\right)} = \frac{1}{14}$$

Although relatively high voltages can be present on the test point after removing the conductive cap, the overall available energy is minimal and any potential would disappear instantaneously if touched by an operator or other personnel. The current transfer would be a fraction of a micro ampere and imperceptible to human touch.

POLLUTION RESISTANCE REFERENCES

Type of pollution	Installed products	Date & location of installation
Potassium mine	K650S Joints	1975 - Mulhouse (France)
Hydrocarbons	Separable connectors - Type D	1975 - Brent oil drilling platform (North Sea)
Salt fog	Separable connectors - Type A Separable connectors and equipment bushings - Type A and B	1974 - Antwerp region (Belgium) 1989 - Stavanger (Norway)
Steel works	Terminations and separable connectors	1974 - USINOR Dunkirk (France)
Seawater - total submersion at each high tide	K650S Joints	1975 - Long Island - East coast (USA)
Radioactive zone - nuclear plant	Separable connectors - Type A	1977 - Eurodif-Tricastin (France)
Extreme temperatures	Separable connectors - Type A	1973 - Val Thorens (French Alps)
Copper oxide and vibration	Separable connectors - Type E	1975 - French railways locomotive
Cement works	Separable connectors - Type C and D	1975 - Obourg (Belgium)

VARIED APPLICATION REFERENCES

Type of application	Installed products	Reference
Railway locomotives	750S1 equipment bushings and 750LR separable connectors - cable 25/43 kV	ALSTHOM Locomotive (China)
	750S1 equipment bushings and 750LR separable connectors - cable 25/43 kV - 240 mm^2 Cu	AMTRAK Locomotive (USA)
	750L2 separable connector arrangement and 36MT outdoor terminations- cable 25/43 kV	Q.R. (Australia)
Tunnels	152SR and 151SP disconnectable joints - cable 3,5/6 kV	St. Moritz (Switzerland)
Motor/generator connections	600S1 equipment bushings and 650LR separable connectors - cable 3,5/6 kV	AEG Generator (Germany)
	600S1 equipment bushings and 650LR separable connectors - cable 3,5/6 kV	SIEMENS Generator (Germany)
Heating of railway track switches	400T1 equipment bushings and 400LR separable connectors	Deutsche Bundesbahn (Germany)
Forest overhead lines	250S joints, 152SR and 151SP disconnectable joints and 1501J3-U three-way junctions	UNERG (Belgium) and EDF Charleville (France)

OVERALL DIMENSIONS OF SEPARABLE CONNECTORS - TYPE A AND B -

Fig. 1

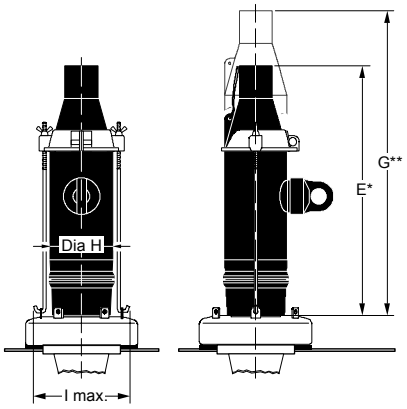


Fig. 2

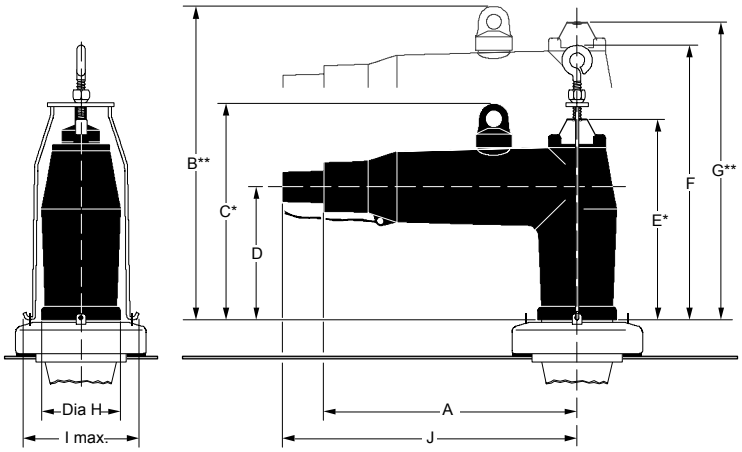
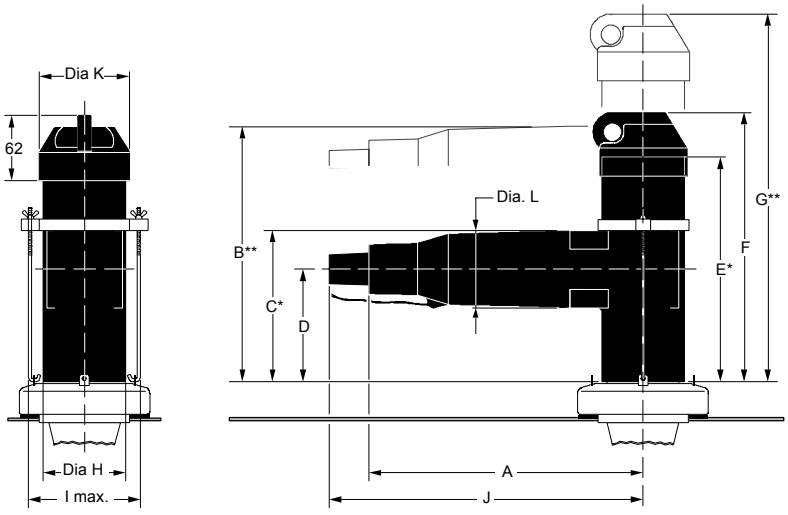


Fig. 3



* Dimensions of connector in assembled position.
** Minimum dimensions necessary to disconnect.

Connector type	Fig.	Interface type	Dimensions in mm											
			A	B**	C*	D	E*	F	G**	I max	J±10	Dia. H	Dia. K	Dia. L
(K)158LR	2	A	190	215	160	85	140	210	195	100	-	62	-	-
(K)(M)400LR	2	B	250	300	210	130	193	270	290	115	285	77	-	-
(K)152SR	1	A	-	-	-	-	255	-	310	100	-	62	-	-
(K)(M)400TE	3	B	270	250	150	110	220	255	355	110	310	80	86	75

OVERALL DIMENSIONS OF SEPARABLE CONNECTORS - TYPE C, D AND E -

Fig. 4

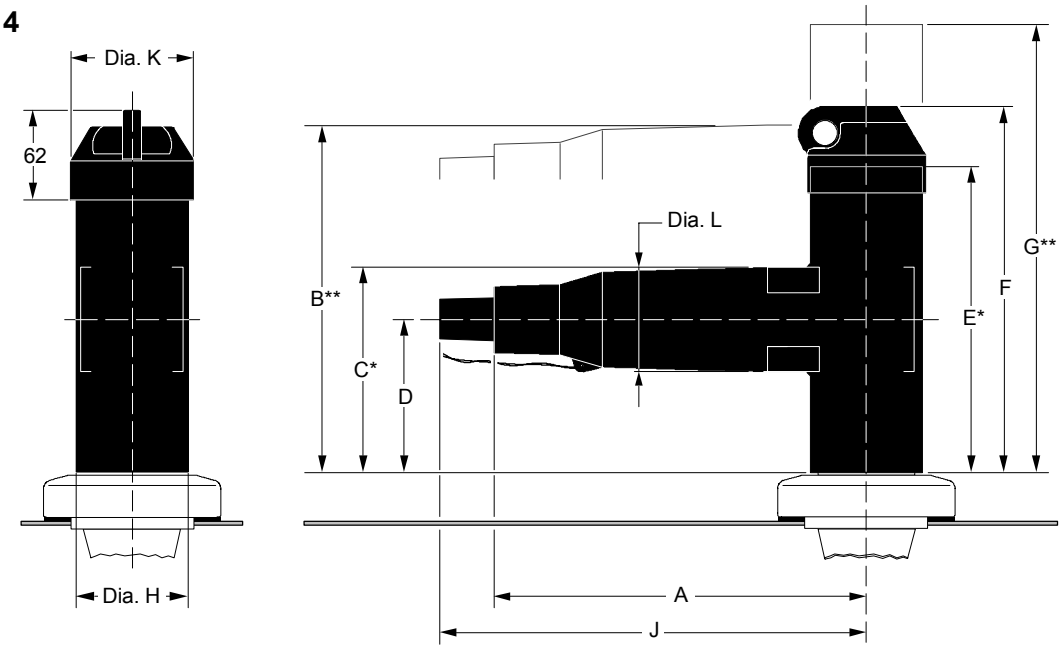
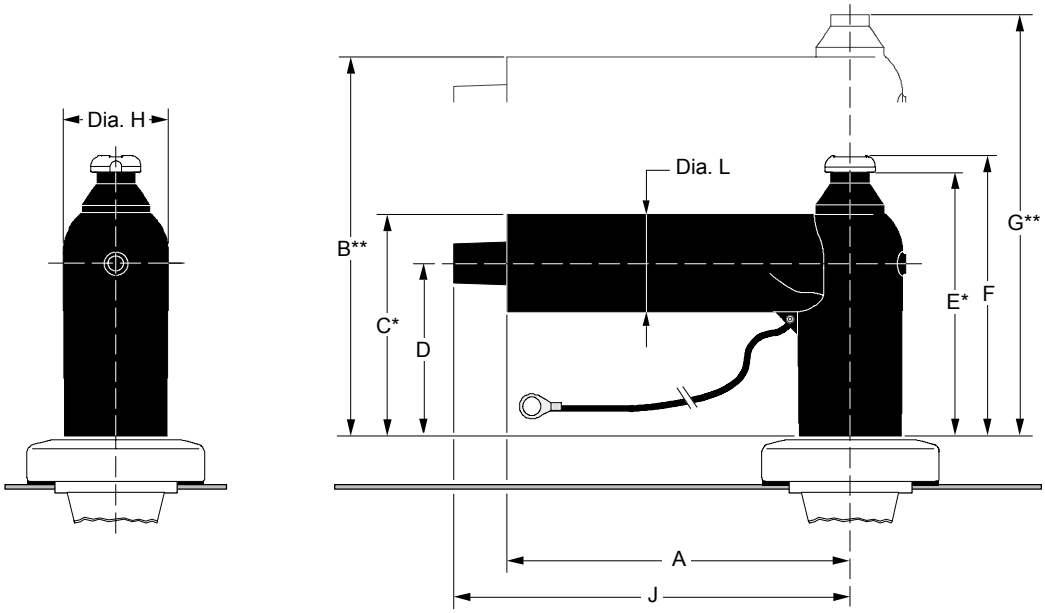


Fig. 5



* Dimensions of connector in assembled position.
** Minimum dimensions necessary to disconnect.

Connector type	Fig.	Interface type	Dimensions in mm										
			A	B**	C*	D	E*	F	G**	J±10	Dia. H	Dia. K	Dia. L
(K)(M)400TB	4	C	270	250	150	110	220	255	320	310	80	86	75
(K)(M)440TB	4	C	275	266	156	110	220	260	330	315	80	86	92
(K)676LRA	4	D	275	280	150	106	212	250	340	315	80	86	92
750LR & 775LR	4	E	305	310	180	130	260	295	390	355	80	86	100
(K)400LB	5	C	245	274	159	124	190	202	305	285	76	-	70

OVERALL DIMENSIONS OF EQUIPMENT BUSHINGS - TYPE A AND B -

Fig. 1

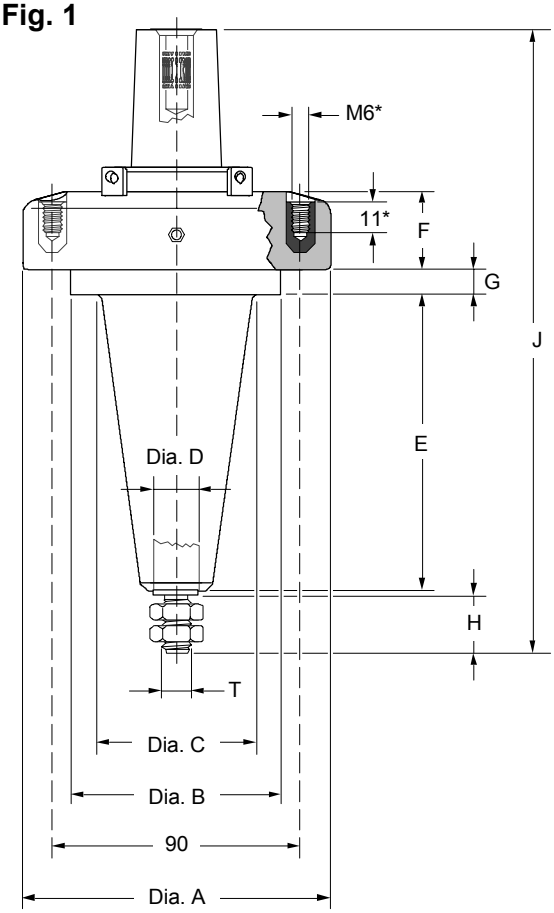
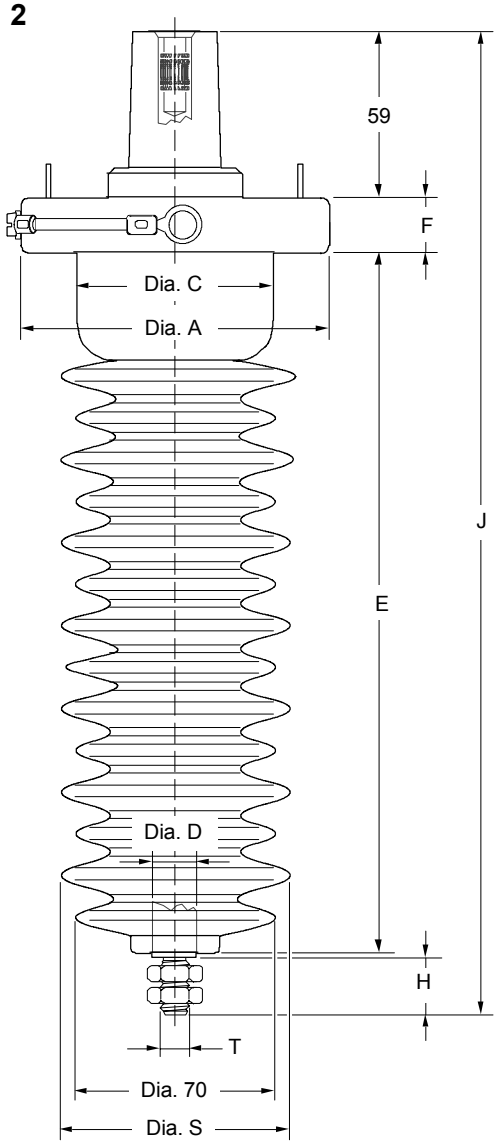


Fig. 2



Bushing type	Fig.	Interface type	Dimensions in mm											Number of fixing....	
			Dia. A	Dia. B	Dia. C	Dia. D	Dia. S	E	F	G	H	J	T	tabs	inserts
(K)180AR-1	1	A	110	75	54	16	-	106	28	8	19	222	M10	6	-
(K)180AR-1-G*	1	A	110	75	54	16	-	106	28	8	19	222	M10	4	2
(K)180AR-2	1	A	110	75	54	16	-	168	28	8	19	284	M10	6	-
(K)180AR-3	1	A	110	75	60	16	-	55	28	8	19	171	M10	6	-
(K)180AR-3-G*	1	A	110	75	60	16	-	55	28	8	19	171	M10	4	2
180A-24P-O	2	A	110	-	70	16	80	250	20	-	20	351	M10	2	-
(K)(M)400T1	1	B	128	88	70	16	-	144	30	10	22	310	M12	4	-
(K)(M)400AR-1	1	B	128	74	70	16	-	213	30	10	22	380	M12	4	-
(K)(M)400AR-2	1	B	150	100	70	30	-	138	36	10	40	329	M16	4	-

OVERALL DIMENSIONS OF EQUIPMENT BUSHINGS
- TYPE C, D AND E -

Fig. 3

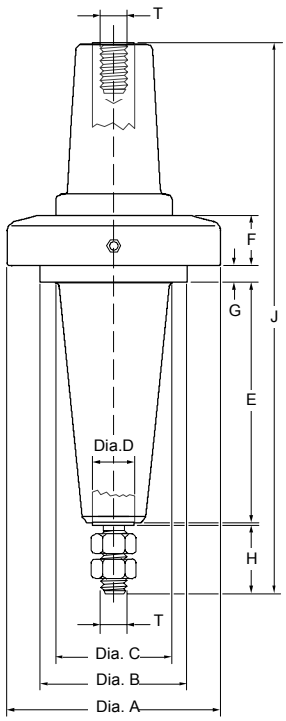


Fig. 4

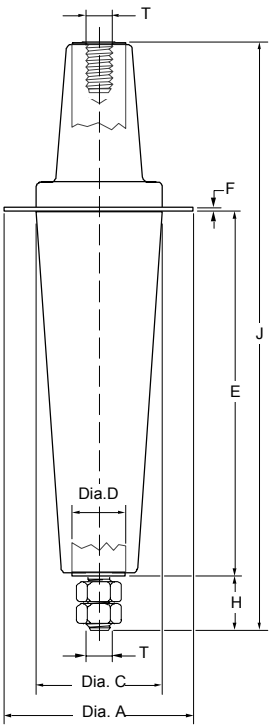


Fig. 5

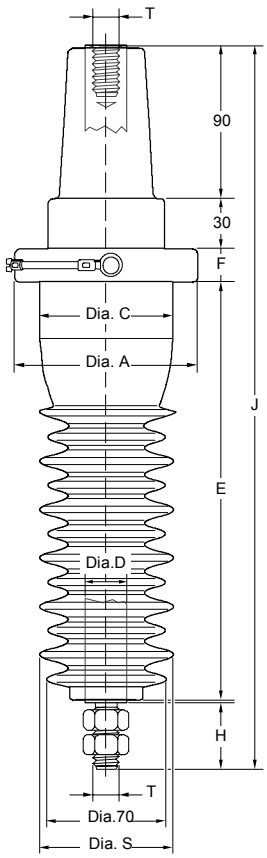
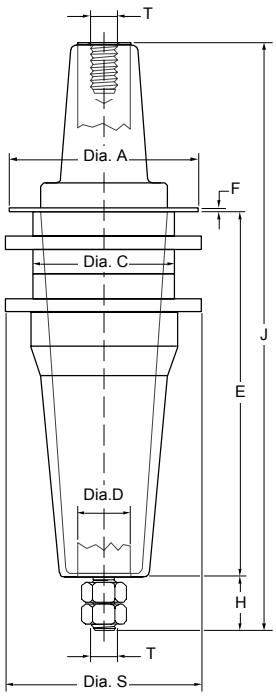


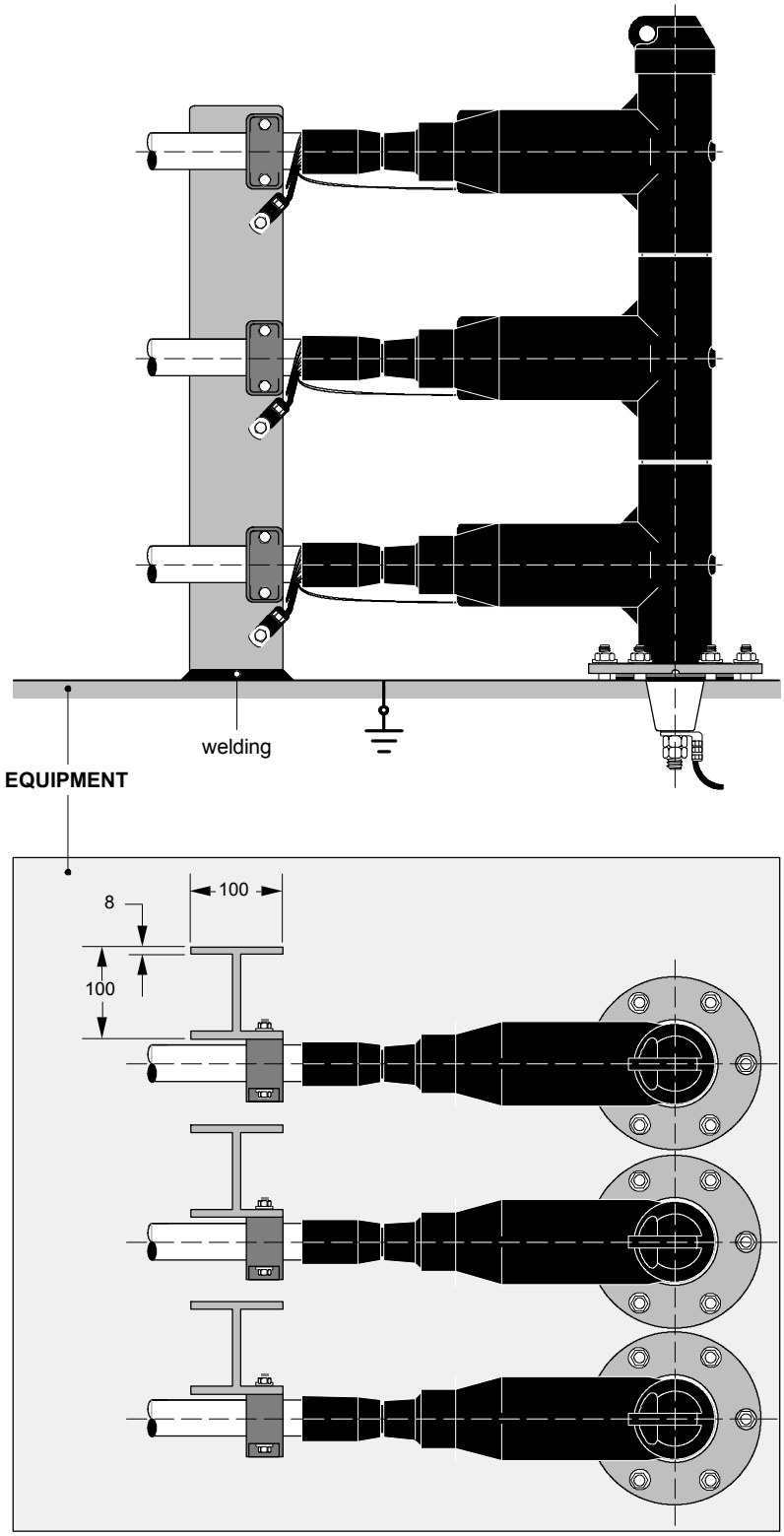
Fig. 6



Bushing type	Fig.	Interface type	Dimensions in mm										
			Dia. A	Dia. B	Dia. C	Dia. D	Dia. S	E	F	G	H	J	T
(K)(M)400AR-3	3	C	128	88	70	25	-	144	30	10	40	330	M16
400A-24B	5	C	110	-	80	25	80	250	20	-	40	434	M16
(K)670AR-2	3	D	150	100	70	32	-	140	36	10	40	325	M16
(K)672T1	4	D	114	-	76	32	-	221	1.5	-	31	349	M16
(K)672TBC	6	D	114	-	85	32	120	221	1.5	-	31	349	M16
750S1 & 775S1	4	E	114	-	76	32	-	75	1.5	-	31	235	5/8”
775T1	4	E	114	-	76	32	-	221	1.5	-	31	378	5/8”

TYPICAL EXAMPLE OF CABLE FIXINGS

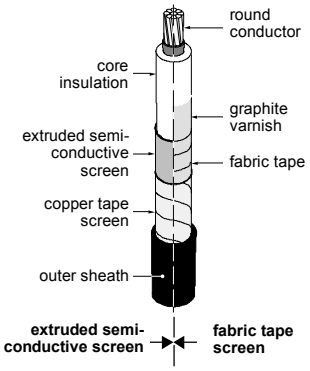
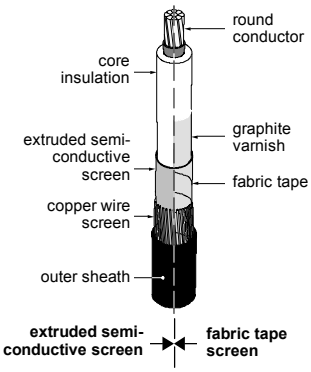
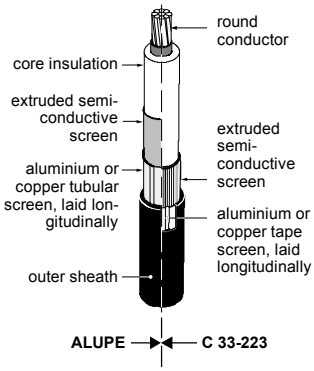
TRIPLE CABLE ARRANGEMENT OF SEPARABLE CONNECTORS - Type C, D and E



SCREEN EARTHING DEVICE AND SCREEN CONTINUITY SELECTION GUIDE

FOR TERMINATIONS (Slip-on EPDM and cold-shrinkable silicone)

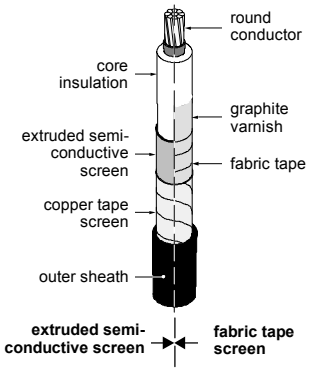
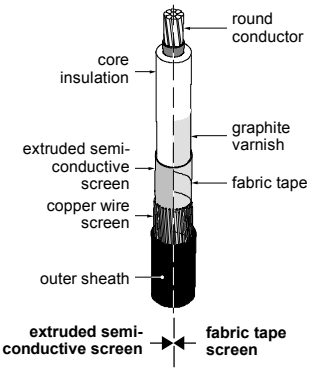
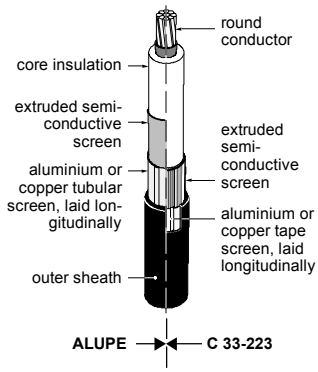
- Indoor and outdoor 24 kV applications* -

Cable type	**Copper tape screen and extruded semi-conductive screen or fabric tape screen (C 33-220)** 		**Copper wire screen and extruded semi-conductive screen or fabric tape screen** 		**Aluminium or copper tubular (ALUPE) or tape (C 33-223) screen and extruded semi-conductive screen** 
Conductor size (mm^2)	Extruded semi-conductive or fabric tape screen	Extruded semi-conductive screen	Fabric tape screen	ALUPE	C 33-223
TERMINATIONS (SLIP-ON EPDM)					
16-35	KIT MT	MWS		KIT 025	KIT 420 TH
50-240	KIT MT	MWS		KIT 025	KIT 425 TH
300-500	KIT MT	MWS		KIT 025	KIT 625 TH
630	KIT MT	MWS		KIT 050	KIT 650 TH
TERMINATIONS (COLD-SHRINKABLE SILICONE)					
25-35	KIT MT + TSC	-	TSC	KIT 025	KIT 420
50-240	KIT MT + TSC	-	TSC	KIT 025	KIT 425
300-500	KIT MT + TSC	-	TSC	KIT 025	KIT 625
630	KIT MT + TSC	-	TSC	KIT 050	KIT 650
800-1200	KIT MT + TSC	-	TSC	KIT 050	KIT 650

* Refer to our local representative for other cable voltages.

SCREEN EARTHING DEVICE SELECTION GUIDE

FOR SEPARABLE CONNECTORS (Slip-on EPDM)
- Type A, B, C, D & E interface -
- Indoor and outdoor applications -

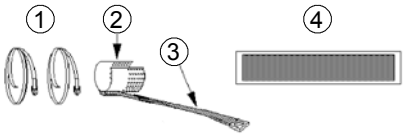
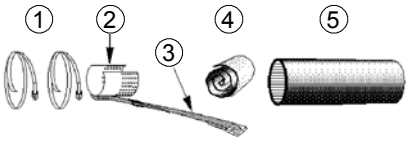
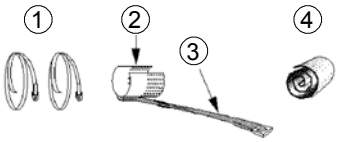
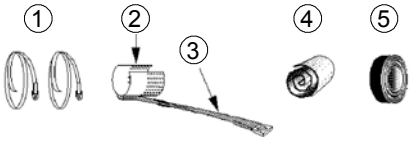
Cable type	Copper tape screen and extruded semi-conductive screen or fabric tape screen (C 33-220)	Copper wire screen and extruded semi-conductive screen or fabric tape screen	Aluminium or copper tubular (ALUPE) or tape (C 33-223) screen and extruded semi-conductive screen	
				
Conductor size (mm^2)			**ALUPE**	**C 33-223**
Type A interface - 24 kV*				
16-35	KIT MT	MWS	KIT 025	KIT 220 TH (A) or 220 G (B)
50-95	KIT MT	MWS	KIT 025	KIT 225 TH (A) or 225 G (B)
Type B interface - 24 kV*				
25-35	KIT MT	MWS	KIT 025	KIT 420 TH (A) or 420 G (B)
50-240	KIT MT	MWS	KIT 025	KIT 425 TH (A) or 425 G (B)
Type C interface - 24 kV*				
25-35	KIT MT	MWS	KIT 025	KIT 420 TH (A) or 420 G (B)
50-240	KIT MT	MWS	KIT 025	KIT 425 TH (A) or 425 G (B)
300-500**	KIT MT	MWS	KIT 025	KIT 625 TH (A) or 625 G (B)
630**	KIT MT	MWS	KIT 050	KIT 650 TH (A) or 650 G (B)
Type D interface - 24 kV*				
50-240	KIT MT	MWS	KIT 025	-
300-500	KIT MT	MWS	KIT 025	KIT 625 TH (A) or 625 G (B)
630	KIT MT	MWS	KIT 050	KIT 650 TH (A) or 650 G (B)
Type E interface - 36 kV				
35-400	KIT MT	MWS	KIT 025	KIT 625 TH
500-630	KIT MT	MWS	KIT 050	KIT 650 TH

* Refer to our local representative for other cable voltages.
** For 440TB separable connectors only.

(A) = for standard application
(B) = for screen break application

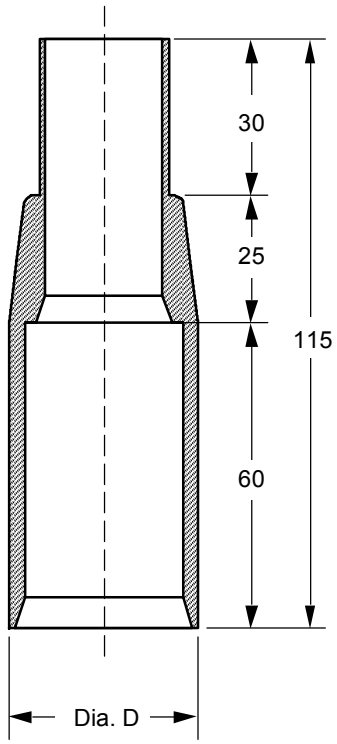
SCREEN EARTHING DEVICE AND SCREEN CONTINUITY KIT CONTENTS

- FOR SEPARABLE CONNECTORS (Slip-on EPDM)
  Type A, B, C, D & E interface
- FOR TERMINATIONS (Slip-on EPDM and cold-shrinkable silicone)

KIT MT  	**1.** 1 TINNED BRAID WITH SOLDER BLOCK : braid section = 25 mm^2, L = 500 mm **2.** 1 TINNED COPPER WIRE FOR EARTH BRAID CLEATING : Dia. 1 mm; L = 1,5 m **3.** 1 ROLL OF SEALING MASTIC
MWS 	1 STRIP OF SEALING MASTIC
TSC 	1 ROLL OF SEMI-CONDUCTIVE TAPE
KIT 025 & KIT 050  	**1.** 2 CLEATING COLLARS **2.** 1 TINNED COPPER PLATE (KIT 025 : Dia. 25 mm / KIT 050 : Dia. 50 mm) **3.** 1 TINNED BRAID WITH SOLDER BLOCK AND LUG : Welded to the copper plate + tinned copper wire; braid section = 25 mm^2, L = 500 mm **4.** 1 STRIP OF SEALING MASTIC
KIT 220 TH, KIT 225 TH, KIT 420 TH, KIT 425 TH, KIT 625 TH & KIT 650 TH  	**1.** 2 CLEATING COLLARS **2.** 1 TINNED COPPER PLATE (KIT 220 TH & KIT 420 TH : Dia. 20 mm / KIT 225 TH, KIT 425 TH & KIT 625 TH : Dia. 25 mm / KIT 650 TH : Dia. 50 mm) **3.** 1 TINNED BRAID WITH SOLDER BLOCK AND LUG : Welded to the copper plate + tinned copper wire; braid section = 25 mm^2, L = 500 mm **4.** 1 ROLL OF SEALING MASTIC **5.** 1 HEAT-SHRINKABLE TUBE
KIT 220 G, KIT 225 G, KIT 420 G, KIT 425 G, KIT 625 G & KIT 650 G  	**1.** 2 CLEATING COLLARS **2.** 1 TINNED COPPER PLATE (KIT 220 G & KIT 420 G : Dia. 20 mm / KIT 225 G, KIT 425 G & KIT 625 G : Dia. 25 mm / KIT 650 G : Dia. 50 mm) **3.** 1 TINNED BRAID WITH SOLDER BLOCK AND LUG : welded to the copper plate + tinned copper wire; braid section = 25 mm^2, L = 500 mm **4.** 1 ROLL OF SEALING MASTIC
KIT 420, KIT 425, KIT 625 & KIT 650  	**1.** 2 CLEATING COLLARS **2.** 1 TINNED COPPER PLATE (KIT 420 : Dia. 20 mm / KIT 425 & KIT 625 : Dia. 25 mm / KIT 650 : Dia. 50 mm) **3.** 1 TINNED BRAID WITH SOLDER BLOCK AND LUG : welded to the copper plate + tinned copper wire; braid section = 25 mm^2, L = 500 mm **4.** 1 ROLL OF SEALING MASTIC **5.** 1 ROLL OF SEMI-CONDUCTIVE TAPE

CABLE SCREEN ADAPTOR

11TL



APPLICATION

Terminates graphite tape or extruded screens with either flat metallic tape or wire current drain.

TECHNICAL DETAIL

This unit

- secures the tape and reinforces the graphite varnish
- provides an interface similar to an extruded screened cable which readily accepts all accessoires
- is moulded from conductive EPDM rubber.

INSTALLATION

After cable preparation and with the aid of the silicone grease provided, the adaptor simply slides over the conductive screen and seats on the cable outer sheath.

NOTE :
If it is required to earth a metallic tape screen within completely watertight conditions, use a Kit MT.

ORDERING FORMULA : 11TL-W

To order the 11TL adaptor select the symbol for W that corresponds with the range best centring the core insulation diameter and substitute in the ordering formula.

Example :
The cable has a diameter over core insulation of 23.8 mm.
Order an 11TL-GB/GH adaptor.

Symbol **W**	Cable core insulation dia. (mm)		Dia. D (mm)
	min.	max.	
EB/EF	12.6	16.1	27.0
FA/FAB	14.6	18.7	27.0
FB/FG	17.2	21.2	32.0
GA/GAB	19.7	23.8	32.0
GB/GH	22.2	26.4	37.0
HA/HAB	24.9	29.9	37.0
HB/HJ	27.8	33.2	45.0
JA/JAB	31.0	35.4	45.0
JB/KA	34.4	40.5	52.0
KB/PA	40.0	45.3	56.0

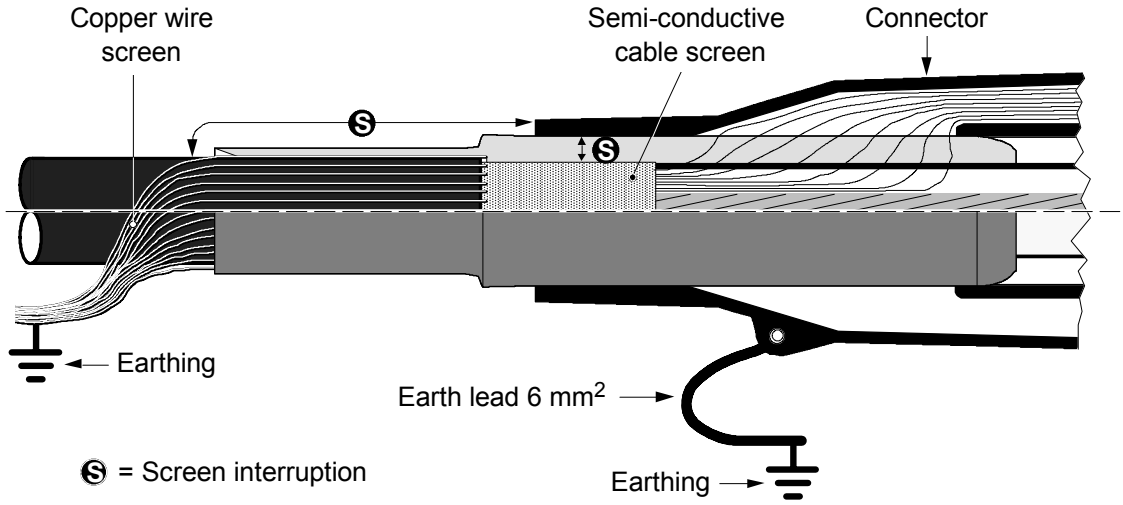
HI-K CABLE REDUCERS

Technology / principle

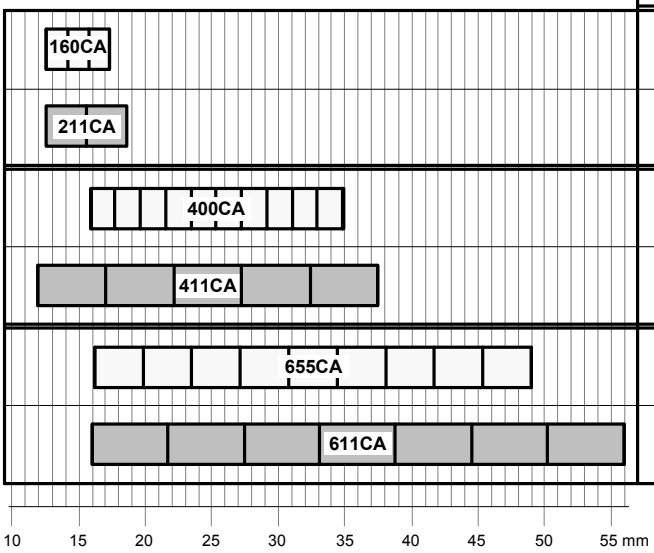
The high permittivity as well as the high dielectric constant material refracts the equipotential lines and thus decreases the stress concentration.

Advantages

- Large increase of size sensitivity compared to the well known EPDM cable reducers



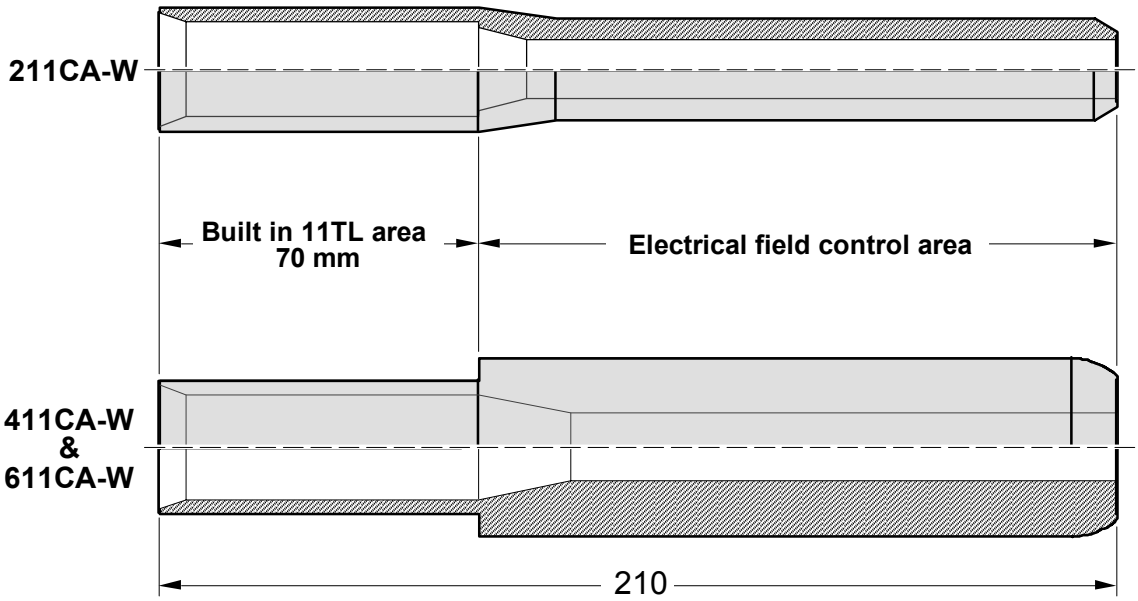
RANGE COVERING EPDM vs. High dielectric constant cable reducers



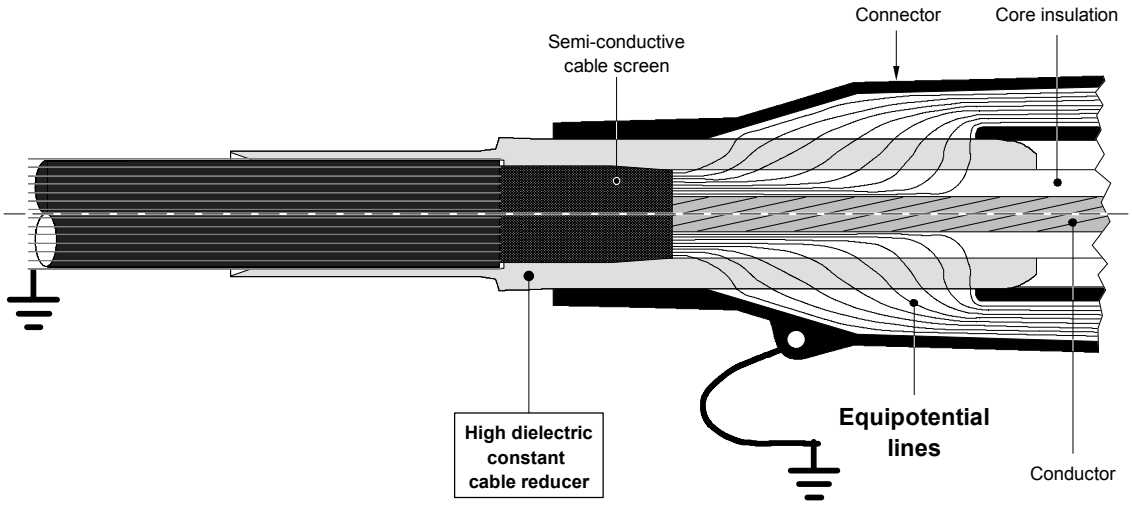
Number of sizes per type of CA	Covered cable insulation range (mm)		Total covered cable insulation range (mm)
	min.	max.	
3	12.6	17.4	4.8
2	12.6	18.7	6.1
10	15.9	34.9	19.0
5	12.0	37.5	25.5
9	16.3	49.1	32.8
7	16.0	56.0	40.0

HI-K CABLE REDUCERS

- Comprise an integrated 11TL cable screen adaptor.



- Enables the cable screen test



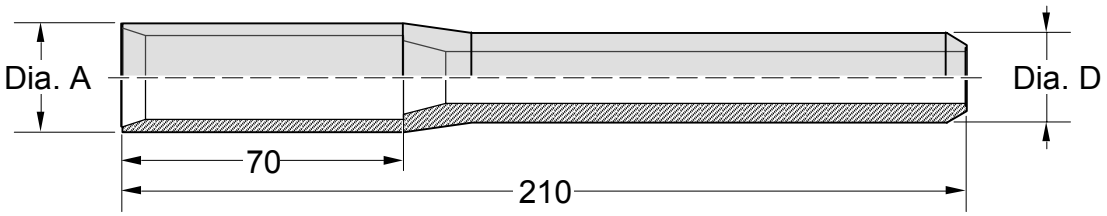
HI-K CABLE REDUCERS

Selection guide

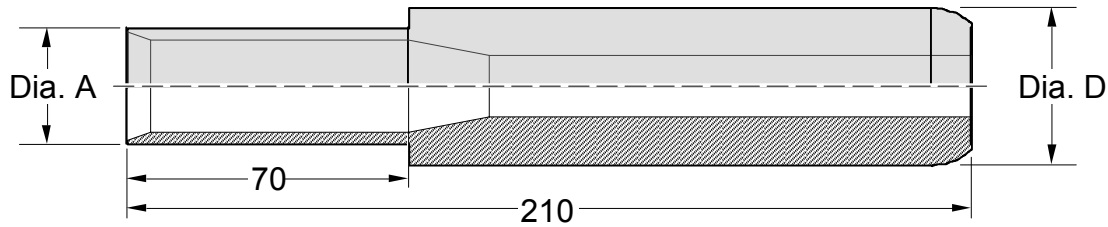
Hi-K cable reducer type	Separable connector type
211CA	(K)152SR, (K)158LR
411CA	(K)(M)400LR, (K)(M)400TE, (K)(M)400TB, (K)400LB
611CA	(K)(M)440TB, (K)676LRA

Cable insulation range / dimensions

211CA-W



411CA-W & 611CA-W



Cable reducer type	Symbol **W**	Dia. A (mm)	Dia. D (mm)	Cable insulation diameter range (mm)	
				min.	max.
211CA-W	11	22.4	27.0	12.6	16.1
	13	22.4	27.0	14.6	18.7
411CA-W	11	29.0	39.0	12.0	17.5
	15	29.0	39.0	16.0	22.0
	19	36.0	39.0	20.0	26.5
	22	39.0	39.0	23.5	31.0
	25	39.0	39.0	26.5	32.5
	27	39.0	39.0	28.5	37.5
611CA-W	15	29.0	54.5	16.0	22.0
	19	36.0	54.5	20.0	26.5
	22	39.0	54.5	23.5	31.0
	27	39.0	54.5	28.5	37.5
	32	48.0	54.5	34.0	42.5
	37	52.0	54.5	39.0	48.5
	43	54.5	54.5	45.5	56.0

ELECTRICAL RATINGS

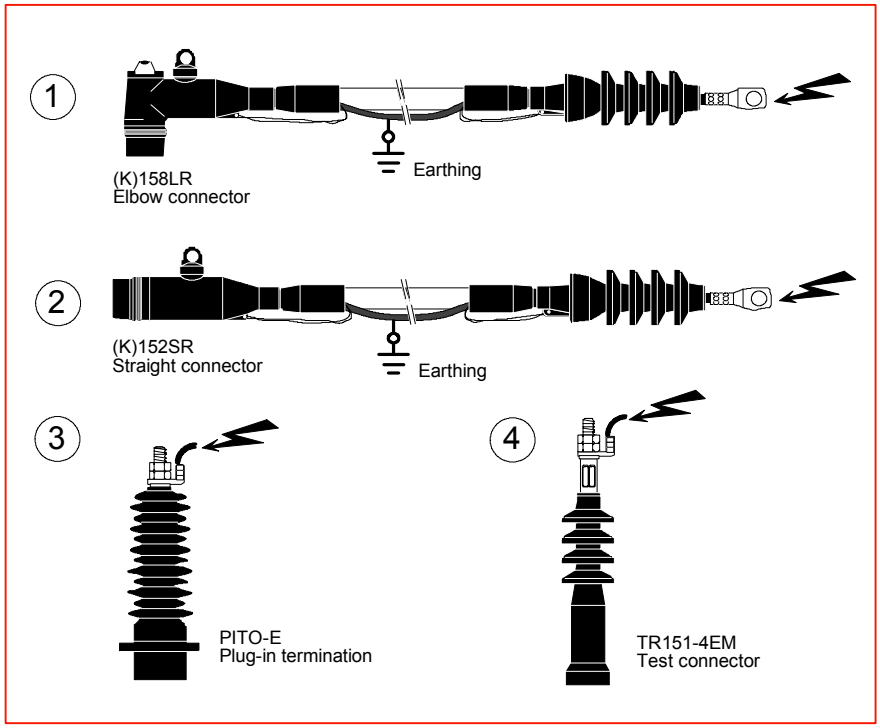
	Separable connectors - Interface type												Stress cones			Joints		
	A (Ac, Bu, Co)*		B (Ac, Bu, Co)*			C (Ac, Bu, Co)*			D (Ac, Bu, Co)*		E (Ac, Bu, Co)*							
Voltage (kV)																		
System U_m or U_r	12	24	12	24	36	12	24	36	12	24	36	36	12	24	36	12	24	36
Partial discharge extinction (@ 5 pC)	11	21	11	21	31	11	21	31	11	21	31	31	11	21	31	11	21	31
Impulse (1.2 x 50 µs)	75	125	75	125	170	75	125	170	75	125	170	170	75	125	170	75	125	170
Industrial power frequency (50 Hz - 1 min.)	35	55	35	55	75	35	55	75	35	55	75	75	35	55	75	35	55	75
Current (A)																		
Continuous I_r	250(1)	250(1)	400	400	400	630	630	630	1250	1250	800	1250	-	-	-	Same as cables		
Overload (8 hrs in 24 hr period)	300	300	600	600	600	800	800	800	1800	1800	900	1800	-	-	-	Same as cables		
Routine tests (kV)																		
Partial discharge extinction (@ 5 pC)	11	21	11	21	31	11	21	31	11	21	31	31	11	21	31	11	21	31
Industrial power frequency (50 Hz - 1 min.)	35	55	35	55	75	35	55	75	35	55	75	75	-	-	-	35	55	75

These ratings meet at least the CENELEC standards and do not reflect maximum withstand levels.
For compliance with other standards, refer to our local representative.

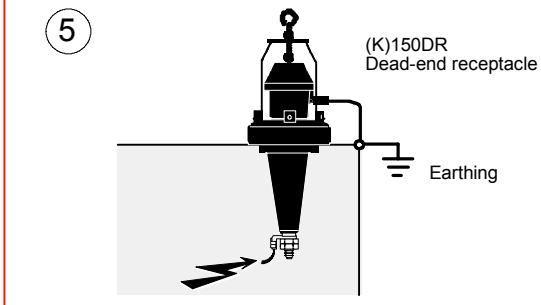
(Ac, Bu, Co)* Ac = accessories like DR, DP, SOP...
Bu = equipment bushings
Co = separable connectors

250(1) some arrangements involving (K)151SP, (K)1501J3-U-8... products can only carry 200 A, refer to our local representative for more details

TEST ARRANGEMENTS FOR SEPARABLE CONNECTORS, BUSHINGS AND ACCESSORIES
- TYPE A -



Test voltage feeding the M.V.-side

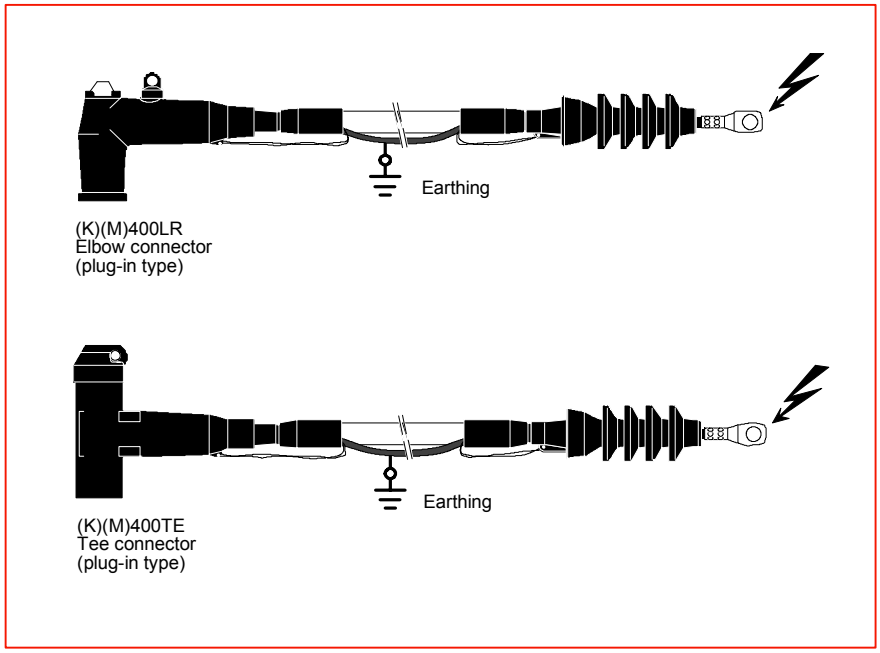


Test voltage feeding the L.V.-side (Equipment dead-ended at the M.V.-side)

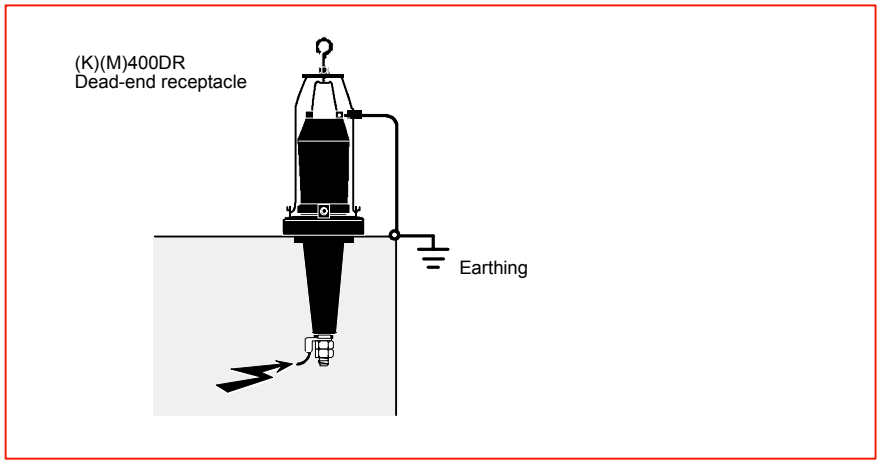
TEST RATINGS

VOLTAGES						CURRENTS			
System voltage U_r or U_m	Partial discharge	Full-wave lightning impulse voltage 1.2 x 50 µs 10 shots pos. / 10 shots neg.	Chopped wave impulse voltage 1.2 x 2 - 6 µs 2 shots neg.	Industrial power frequency 50 Hz - 1 min.	D.C. voltage 8 x U_o 30 min.	Conti-nuous (max.)	Overload current rating 8 hrs max. in 24 hr period	Thermal short circuit current 1 sec.	Dynamic short circuit current
12 kV	> 11 kV @ 5 pC	75 kV	85 kV	35 kV	48 kV	250 A	300 A	12.5 kA	22 kA
24 kV	> 21 kV @ 5 pC	125 kV	145 kV	55 kV	96 kV	250 A	300 A	12.5 kA	22 kA
①	①	①	①	①	①	①	①	①	①
②	②	②	②	②	②	②	②	②	②
③		③	③			③	③	③	③
④				④	④				
⑤	⑤	⑤	⑤	⑤	⑤				

TEST ARRANGEMENTS FOR SEPARABLE CONNECTORS, BUSHINGS AND ACCESSORIES
- TYPE B -



Test voltage feeding the M.V. -side



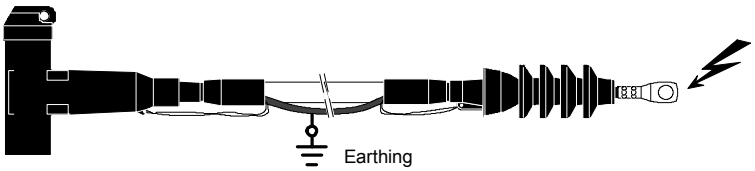
Test voltage feeding the L.V.-side (Equipment dead-ended at the M.V.-side)

TEST RATINGS

VOLTAGES						CURRENTS			
System voltage U_r or U_m	Partial discharge	Full wave lightning impulse voltage 1.2 x 50 μs 10 shots pos./ 10 shots neg.	Chopped wave impulse voltage 1.2 x 2-6 μs 2 shots neg.	Industrial power frequency 50 Hz - 1 min.	D.C. voltage 8 x U_o 30 min.	Conti-nuous (max.)	Overload current rating 8 hrs max. in 24 hr period	Thermal short circuit current 1 sec.	Dynamic short circuit current
12 kV	> 11 kV @ 5 pC	75 kV	85 kV	35 kV	48 kV	400 A	600 A	15 kA	40 kA
24 kV	> 21 kV @ 5 pC	125 kV	145 kV	55 kV	96 kV	400 A	600 A	15 kA	40 kA
36 kV	> 31 kV @ 5 pC	170 kV	195 kV	75 kV	144 kV	400 A	600 A	15 kA	40 kA

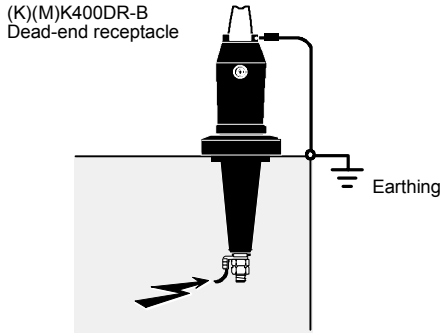
TEST ARRANGEMENTS FOR SEPARABLE CONNECTORS, BUSHINGS AND ACCESSORIES
- TYPE C -

Test voltage feeding the M.V.-side



(K)(M)400TB
or (K)(M)440TB
Tee connector

Test voltage feeding the L.V.-side (Equipment dead-ended at the M.V.-side)

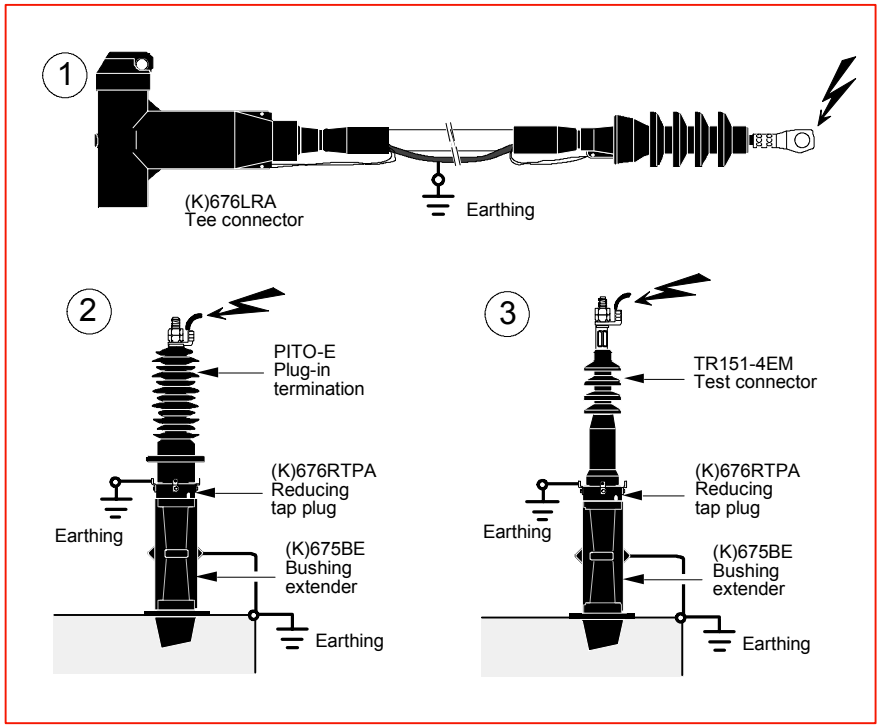


TEST RATINGS

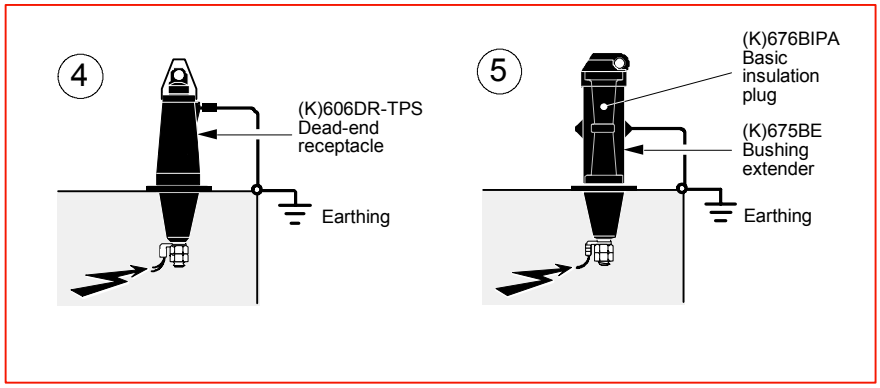
VOLTAGES						CURRENTS			
System voltage U_r or U_m	Partial discharge	Full wave lightning impulse voltage 1.2 x 50 μs 10 shots pos./ 10 shots neg.	Chopped wave impulse voltage 1.2 x 2-6 μs 2 shots neg.	Industrial power frequency 50 Hz - 1 min.	D.C. voltage 8 x U_o 30 min.	Continuous (max.)	Overload current rating 8 hrs max. in 24 hr period	Thermal short circuit current 1 sec.	Dynamic short circuit current
12 kV	> 11 kV @ 5 pC	75 kV	85 kV	35 kV	48 kV	630 A 400 A	900 A 600 A	> 28 kA > 20 kA	> 70 kA > 50 kA
24 kV	> 21 kV @ 5 pC	125 kV	145 kV	55 kV	96 kV	630 A 400 A	900 A 600 A	> 28 kA > 20 kA	> 70 kA > 50 kA
36 kV	> 31 kV @ 5 pC	170 kV	195 kV	75 kV	144 kV	630 A	900 A	> 28 kA	> 70 kA

TEST ARRANGEMENTS FOR SEPARABLE CONNECTORS, BUSHINGS AND ACCESSORIES
- TYPE D -

Test voltage feeding the M.V.-side



Test voltage feeding the L.V.-side (Equipment dead-ended at the M.V.-side)

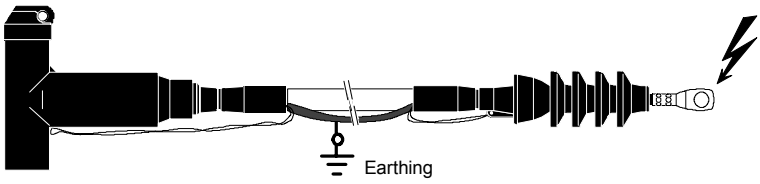


TEST RATINGS

VOLTAGES						CURRENTS			
System voltage U_r or U_m	Partial discharge	Full-wave lightning impulse voltage 1.2 x 50 μs 10 shots pos. / 10 shots neg.	Chopped wave impulse voltage 1.2 x 2 - 6μs 2 shots neg.	Industrial power frequency 50 Hz - 1 min.	D.C. voltage 8 x U_o 30 min.	Conti-nuous (max.)	Overload current rating 8 hrs max. in 24 hr period	Thermal short circuit current 1 sec.	Dynamic short circuit current
12 kV	> 11 kV @ 5 pC	75 kV	85 kV	35 kV	48 kV	1250 A	1500 A	> 75 kA	> 150 kA
24 kV	> 21 kV @ 5 pC	125 kV	145 kV	55 kV	96 kV	1250 A	1500 A	> 75 kA	> 150 kA
①	①	①	①	①	①	①	①	①	①
②		②	②	②	②				
③				③	③				
④	④	④	④	④	④				
⑤	⑤	⑤	⑤	⑤	⑤				

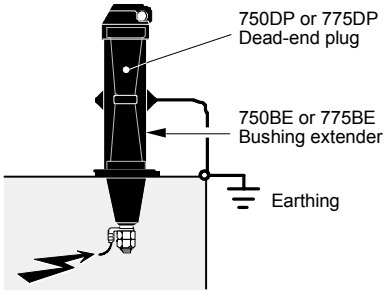
TEST ARRANGEMENTS FOR SEPARABLE CONNECTORS, BUSHINGS AND ACCESSORIES
- TYPE E -

Test voltage feeding the M.V.-side



750LR or 775LR
Tee connector

Test voltage feeding the L.V.-side (Equipment dead-ended at the M.V.-side)



TEST RATINGS

VOLTAGES						CURRENTS			
System voltage U_r or U_m	Partial discharge	Full wave lightning impulse voltage 1.2 x 50 μs 10 shots pos./ 10 shots neg.	Chopped wave impulse voltage 1.2 x 2-6 μs 2 shots neg.	Industrial power frequency 50 Hz - 1 min.	D.C. voltage 8 x U_o 30 min.	Continuous (max.)	Overload current rating 8 hrs max. in 24 hr period	Thermal short circuit current 1 sec.	Dynamic short circuit current
36 kV	> 31 kV @ 5 pC	170 kV	195 kV	75 kV	144 kV	1250 A	1500 A	> 75 kA	> 150 kA

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