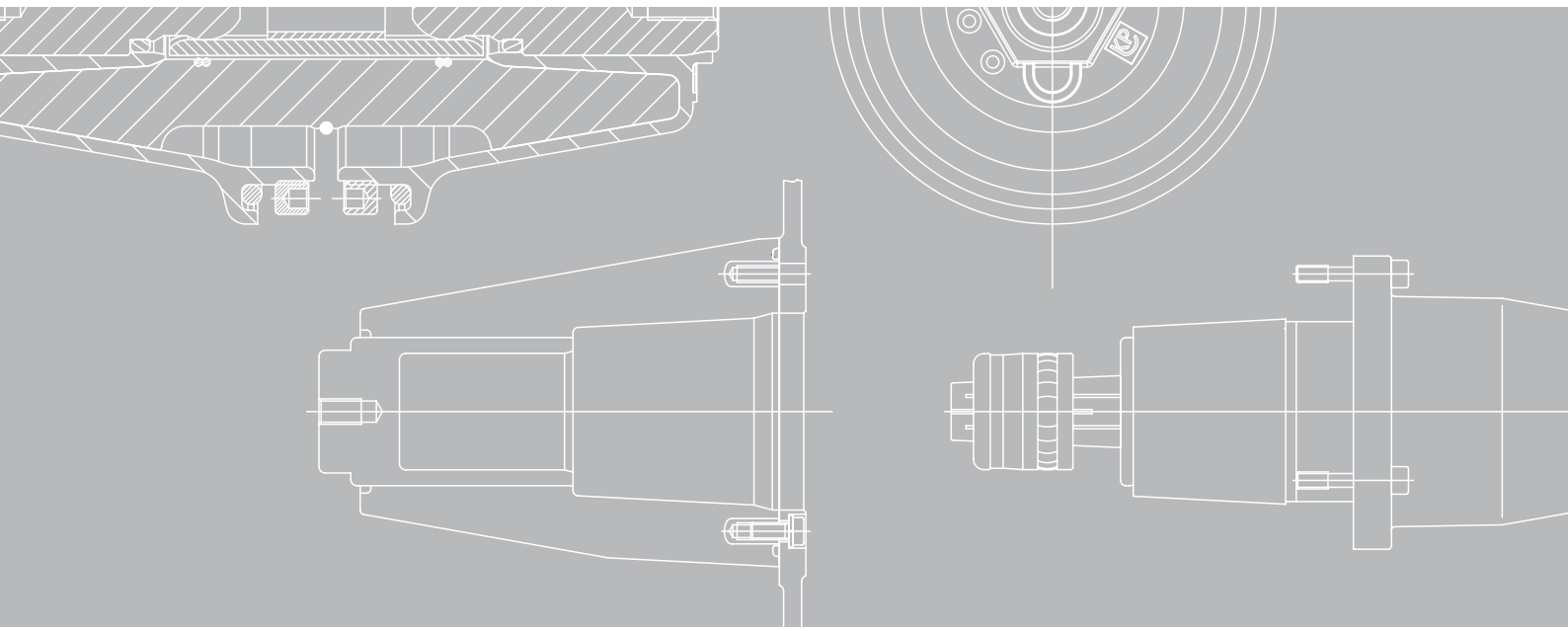
PFISTERER



EDITION 2008

CABLE SYSTEMS

Cable fittings for medium voltage networks

THE POWER CONNECTION

CABLE SYSTEMS | COMPONENTS | OVERHEAD LINES | RAILWAY CATENARY SYSTEMS

Cable Fittings for Medium Voltage Networks.

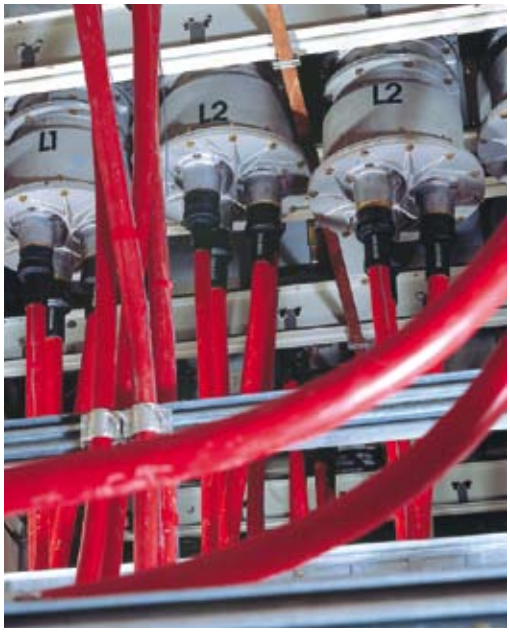
Our range of cable accessories offers solutions for virtually all applications in the area of medium voltage engineering. All accessories use silicone rubber as insulating medium because of its outstanding properties. We offer components and complete systems.

MV-CONNEX. A Dry, Separable Connector System for Medium Voltage Networks.

CONNEX meets all your requirements to an universal system of separable connectors: fully insulated with metal housing and providing touch-proof properties. It is maintenance-free, suitable for outdoor use and waterproof. This means MV-CONNEX can be used even in the most extreme conditions.

MV-CONNEX for medium voltage systems comes in a wide range of variations. It includes traditional plug and socket combinations, multiple sockets, bus-bar connectors, surge arresters and voltage detecting systems.

MV-CONNEX components are factory tested and are surprisingly simple to install. Complex oil and gas work during installation and commissioning of transformers is finally a thing of the past.



Silicone – a Key Material in Medium Voltage Engineering.

Water, dirt, grease and oil-resistant, completely maintenance-free, shock-resistant and unbreakable: silicone rubber is the perfect material for cable terminations and far superior to traditional materials such as porcelain. When used as a stress-relief device in sealed applications, silicone evens out temperature variations and unevenness in the cable surface much better than harder materials such as EPDM do. Dangerous partial discharges caused by air gaps are safely avoided. PFISTERER makes silicone products primarily using advanced LSR (Liquid Silicone Rubber) designs; special variations are designed using RTV (room-temperature vulcanising silicone).

Continuous voltage indicator for enclosed equipment.

With the increasing use of enclosed switchgear, voltage testing systems, that indicate the presence of voltage without directly contacting live parts, are becoming increasingly important. The principle of the DSA continuous voltage indicator that was developed by us has become a standard. In line with the trend towards integrated systems we have incorporated these plug-in display devices in the compact DSA-i3 system.

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MV-CONNEX up to 52 kV

The MV-CONNEX range is ideal for use in ring main units, circuit-breaker switch-gear, high-voltage motors, transformers, capacitors, transducers and sealing boxes. The connectors on the equipment-side are designed to meet EN 50180, 50181, and DIN 47637. The plug is suitable for all kinds of insulated plastic cables. As well as a wide range of standard types there are also customer-specific versions for every cable type. The MV-CONNEX system features numerous variations: in addition to the standard plug and socket combination, there are many other versions for testing purposes and special applications.

Advantages

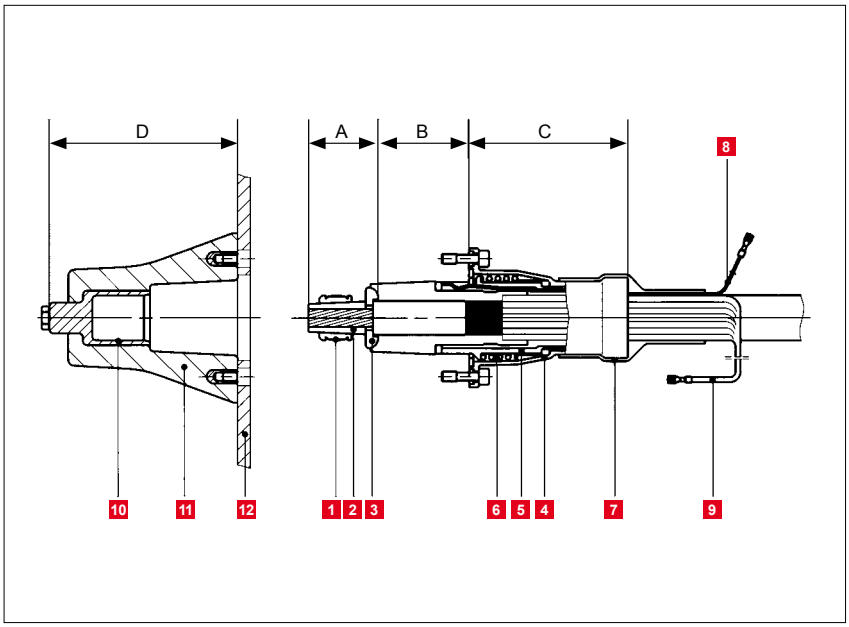
- no liquid insulating medium
- no need to open the cable termination at the installation site
- deckwater-proof
- suitable for outdoor use
- thorough transformer and GIS testing by manufacturer possible
- metal enclosed
- fully insulated
- touch proof
- free from arcing
- high short-circuit protection
- maintenance free
- soil proof
- saltwater proof (off shore)
- protection class IP 68
- up to 11 kV E Exe

A Contact system
1 contact ring
2 tension cone
3 thrust piece

B Insulating and field-control part

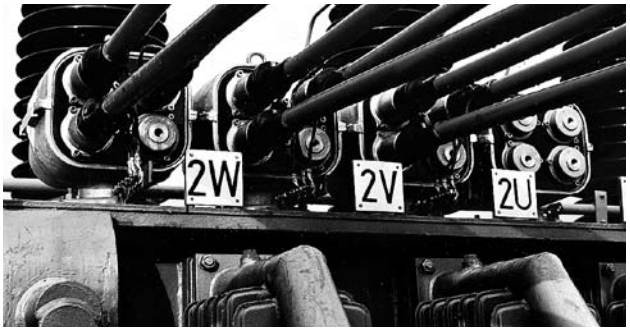
C Housing
4 bell flange
5 pressure sleeve
6 pressure spring
7 heat-shrink
8 test lead (depends on design)
9 cable screen

D Bushing
10 female contact part
11 insulating bushing
12 housing



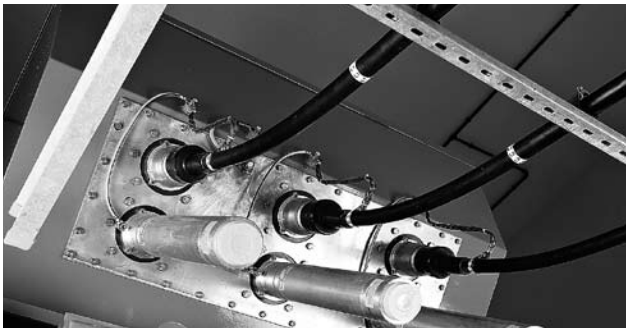
MV-CONNEX Multi-Contact Elbow Bushing 24 kV – 52 kV

Multi-contact elbow bushings are used instead of DIN-standard porcelain versions on the medium-voltage side of power transformers. They distribute the current over two or four cables, thus accommodating higher power loads using more manageable cable cross sections.



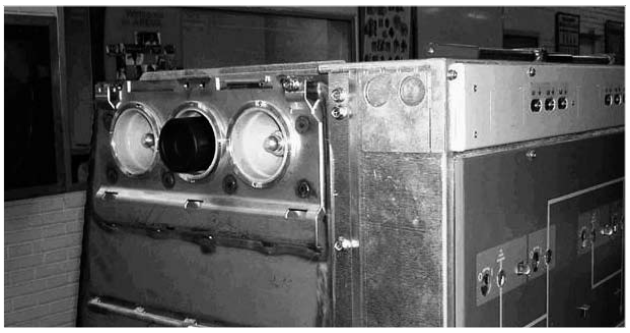
MV-CONNEX Surge Arrester 6 kV – 52 kV

CONNEX surge arresters are used to protect metal-enclosed switchgear fitted with cable terminations in accordance with EN 50180/EN 50181. The surge arresters are connected to the switchgear transformer and prevent the entry of excessively high surges. The surge arresters are particularly effective in limiting surges caused by reflected travelling waves and switching overvoltages.



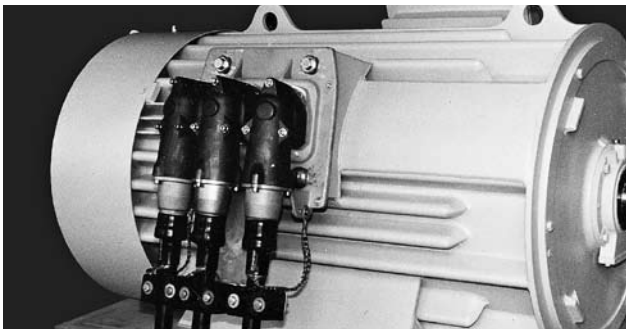
MV-CONNEX Busbar Connectors 24 kV – 42 kV

Busbar connectors facilitate the modular construction and on-site expansion of SF6 insulated switchgear, because the gas compartment does not have to be opened during installation. The range includes 24 kV to 42 kV versions.



CMA-MV-CONNEX Motor Connector

The CMA-MV-CONNEX motor connector allows the quick and easy connection of high-voltage motors, with the connection area being fully metal-enclosed and intrinsically safe. The system is easily installed in place of the motor connection box.



Voltage Detecting Systems

The integrated capacitive potential point makes it easy to check the connection for the absence of voltage. The PFISTERER range includes mobile and stationary continuous voltage indicators, as well as phase comparators and performance testing equipment.

MV-CONNEX Separable Connectors, Size 0 - 3-S
Technical Data and Size Classification List

Technical data:

- Test Specification to HD 629.1 S2 and EN 61442
- High-Current-Proof Design II
- CONNEX Cable Termination System
- DIN VDE 0278 Part 629-1 test series D Tab. 7 20,8 / 36 / 42 kV
- type testaccording on IEC 60 840 / 02.99 26 / 45 / 52 kV

*) Packing Unit = 3 pieces

Size / Voltage tap		0 without voltage tap	1 with voltage tap	1 without voltage tap	2 with voltage tap	2 without voltage tap	3 with voltage tap	3 without voltage tap	3-S with voltage tap	3-S without voltage tap
Max. operating voltage	**U_m (kV)**	24	36	36	42	42	42	42	52	52
Nominal current	**I_N (A)**	250	630	630	800	800	1250	1250	1250	1250
Cross section range	**(mm²)**	25 - 70	25 - 240	25 - 240	25 - 325	25 - 325	50 - 630	50 - 630	50 - 630	400 - 630
Min. conductor diameter	**Ø (mm)**	5.6	4.9	4.9	4.9	4.9	7.2	7.2	7.2	24.6
Max. conductor diameter	**Ø (mm)**	11.9	20.1	20.1	22.3	22.3	34.6	34.6	34.6	34.6
Min. diameter over insulation	**Ø (mm)**	12.7	13.5	13.5	13.5	13.5	15.5	15.5	15.5	46.0
Max. diameter over insulation	**Ø (mm)**	23.5	31.5	36.0	36.0	40.0	46.0	50.0	46.0	50.0
Gross weight per packing unit*)	**(kg)**	2.7	4.0	4.0	4.3	4.3	9.9	9.9	9.4	9.9
Rated power frequency withstand voltage	**1min (kV)**	50	70	70	95	95	95	95	117	117
Partial discharge	**2 x U_0 (pC)**	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10
Rated lightning impulse withstand voltage (BIL)	**(kV)**	125	170	170	200	200	200	200	250	250
DC voltage test	**15 min 6 x U_0 (kV)**	72	108	108	125	125	125	125	156	156
Rated short-time withstand current	**0,5 s (kA)**	-	50	50	50	50	63	63	63	63
Rated short-time withstand current	**1 s (kA)**	16	31.5	31.5	40	40	50	50	50	50
Rated impulse current	**(kA)**	40	125	125	125	125	150	150	150	150

Form to determine MV-Separable Connectors

Company: **Name:**

Telephone: **Date:**

E-mail: **Signature:**

Cable manufacturer: **Cable type:**

Voltages: U_O (phase/earth) _____ kV U_N (phase/phase) _____ kV Max. operating voltage U_M (2 x U_O) _____ kV

Short circuit current: 1 sec. short circuit current screen/sheath _____ kA

Cable design: single core cable ☐ three core cable ☐ single core superflexible cable ☐ three core superflexible cable ☐

Separable Connectors: ground-/salt water stable: yes ☐ no ☐ voltage tap: yes ☐ no ☐

Size of bushing: Size 0 ☐ Size 1 ☐ Size 2 ☐ Size 3 ☐

1 Conductor: Material: Cu ☐ Al ☐ Cross section: _____ mm² Diameter: ø _____ mm

Type: stranded circular RM ☐ sector, stranded SM ☐ solid circular RE ☐

stranded circular, segment RMS ☐ sector solid SE ☐ superflexible stranded RF ☐

2 Insulation: XLPE ☐ PVC ☐ EPR ☐ Diameter over insulation: ø _____ mm

3 Semi-conducting layer: Type: fully bonded ☐ easy strip ☐ graphite ☐ Diameter over semi-conducting layer: ø _____ mm

4 Metallic sheath/screen: yes ☐ no ☐

Type: Copper wire ☐ Copper band ☐ Lead sheath ☐ Lead sheath/Copper wire ☐

Copper-corrugated sheath ☐ Al-corrugated sheath ☐

Cross section: _____ mm² Section thickness: _____ mm Diameter over screen: ø _____ mm

5 Inner sheath: yes ☐ no ☐ Metallic screen: yes ☐ no ☐ Diameter over inner sheath: ø _____ mm

6 Armouring: 1. Armouring: yes ☐ no ☐ Material: Steel ☐ other material ☐

Type: Flat conductors ☐ Circular conductors ☐ Band ☐ Diameter over 1. armouring: ø _____ mm

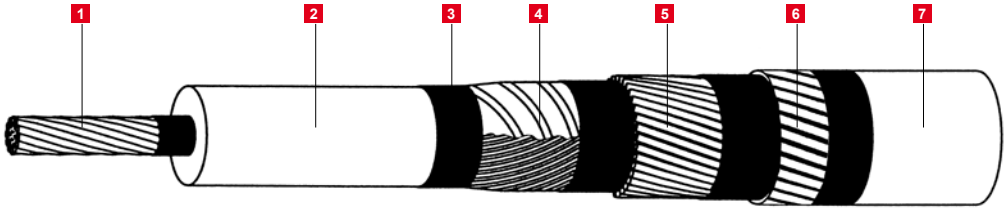
2. Armouring: yes ☐ no ☐ Material: Steel ☐ other material ☐

Type: Flat conductors ☐ Circular conductors ☐ Band ☐ Diameter over 2. armouring: ø _____ mm

7 Outer sheath: Metallic screen: yes ☐ no ☐ Overall diameter: ø _____ mm

Conductibility: yes ☐ no ☐

Outdoor installation vertical from on high: yes ☐ no ☐



MV-CONNEX Separable Connectors, Size 0, U_m = 24 kV, I_N = 250 A

Standard article no.

- for DIN VDE cables
- with sealing system (seal and shrink tubing)
- for indoor and outdoor applications
- not soil and salt-water resistant
- Packaging unit: set with three cable connecting parts

No. without voltage tap	Max. operating voltage U_m (kV)	for cable cross-section (mm²)	for diameters over PE/VPE insulation Ø (mm)
870 010 025	12	25	12,7 - 16,3
870 010 035	12	35	12,7 - 16,3
870 010 050	12	50	15,0 - 19,2
870 010 070	12	70	15,0 - 19,2
870 020 025	24	25	15,0 - 19,2
870 020 035	24	35	18,0 - 21,7
870 020 050	24	50	20,0 - 23,5

MV-CONNEX Separable Connectors, Size 1, U_m = 36 kV, I_N = 630 A

Standard article no.

- for DIN VDE cables
- with sealing system (seal and shrink tubing)
- for indoor and outdoor applications
- not soil and salt-water resistant
- Packaging unit: set with three cable connecting parts

The picture shows an MV-CONNEX cable connecting part without voltage tap

No. with voltage tap	No. without voltage tap	Max. operating voltage U_m (kV)	for cable cross-section (mm²)	for diameters over PE/VPE insulation Ø (mm)
850 110 035	**870 110 035**	12	35	14,8 - 16,3
850 110 050	**870 110 050**	12	50	16,0 - 17,5
850 110 070	**870 110 070**	12	70	17,7 - 19,2
850 110 095	**870 110 095**	12	95	19,3 - 20,8
850 110 120	**870 110 120**	12	120	20,8 - 22,8
850 110 150	**870 110 150**	12	150	22,3 - 24,3
850 110 185	**870 110 185**	12	185	23,9 - 25,9
850 110 240	**870 110 240**	12	240	26,4 - 28,4
850 120 035	**870 120 035**	24	35	19,0 - 20,5
850 120 050	**870 120 050**	24	50	20,2 - 21,7
850 120 070	**870 120 070**	24	70	21,9 - 23,4
850 120 095	**870 120 095**	24	95	23,4 - 25,0
850 120 120	**870 120 120**	24	120	25,0 - 27,0
850 120 150	**870 120 150**	24	150	26,5 - 28,5
850 120 185	**870 120 185**	24	185	28,1 - 30,1
850 120 240	**870 120 240**	24	240	30,6 - 32,6
850 130 050	**870 130 050**	36	50	25,2 - 26,7
850 130 070	**870 130 070**	36	70	26,9 - 28,4
850 130 095	**870 130 095**	36	95	28,5 - 30,0
850 130 150	**870 130 150**	36	150	31,5 - 33,5

MV-CONNEX Separable Connectors, Size 2, U_m = 42 kV, I_N = 800 A

Standard article no.

- for DIN VDE cables
- with sealing system (seal and shrink tubing)
- for indoor and outdoor applications
- not soil and salt-water resistant
- Packaging unit: set with three cable connecting parts

The picture shows an MV-CONNEX cable connecting part with voltage tap.

No. with voltage tap	No. without voltage tap	Max. operating voltage U_m (kV)	for cable cross-section (mm²)	for diameters over PE/VPE insulation Ø (mm)
850 210 050	-	12	50	13,7 - 17,5
850 210 095	**870 210 095**	12	95	19,3 - 20,8
850 210 120	**870 210 120**	12	120	20,8 - 22,8
850 210 150	**870 210 150**	12	150	22,3 - 24,3
850 210 185	**870 210 185**	12	185	23,9 - 25,9
850 210 240	**870 210 240**	12	240	26,4 - 28,4
850 210 300	**870 210 300**	12	300	28,4 - 30,4
850 220 050	**870 220 050**	24	50	20,2 - 21,7
850 220 095	**870 220 095**	24	95	23,5 - 26,0
850 220 120	**870 220 120**	24	120	25,0 - 28,0
850 220 150	**870 220 150**	24	150	26,5 - 29,5
850 220 185	**870 220 185**	24	185	28,1 - 30,1
850 220 240	**870 220 240**	24	240	30,6 - 32,6
850 220 300	**870 220 300**	24	300	32,6 - 34,6
850 230 035	-	36	35	16,0 - 19,2
850 230 050	**870 230 050**	36	50	25,2 - 26,7
850 230 070	**870 230 070**	36	70	26,9 - 28,4
850 230 095	**870 230 095**	36	95	28,5 - 30,0
850 230 120	**870 230 120**	36	120	30,0 - 32,0
850 230 150	**870 230 150**	36	150	31,5 - 33,5
850 230 185	**870 230 185**	36	185	33,1 - 35,1
-	**870 230 240**	36	240	32,5 - 36,0
-	**870 230 300**	36	300	35,0 - 38,0

MV-CONNEX Separable Connectors, Size 3, U_m = 42 kV, I_N = 1250 A

Standard article no.

- for DIN VDE cables
- with sealing system (seal and shrink tubing)
- for indoor and outdoor applications
- not soil and salt-water resistant
- Packaging unit: set with three cable connecting parts

The picture shows an MV-CONNEX cable connecting part without voltage tap

No. with voltage tap	No. without voltage tap	Max. operating voltage U_m (kV)	for cable cross-section (mm²)	for diameters over PE/VPE insulation Ø (mm)
850 310 240	**870 310 240**	12	240	26,5 - 28,4
850 310 300	**870 310 300**	12	300	28,4 - 30,4
850 310 400	**870 310 400**	12	400	31,6 - 33,6
850 310 500	**870 310 500**	12	500	34,4 - 36,4
850 310 630	**870 310 630**	12	630	37,6 - 39,6
850 320 150	**870 320 150**	24	150	26,5 - 28,5
850 320 185	**870 320 185**	24	185	28,1 - 30,1
850 320 240	**870 320 240**	24	240	30,6 - 32,6
850 320 300	**870 320 300**	24	300	32,6 - 34,6
850 320 400	**870 320 400**	24	400	35,8 - 37,8
850 320 500	**870 320 500**	24	500	38,6 - 40,6
850 320 630	**870 320 630**	24	630	43,6 - 45,6
850 330 095	**870 330 095**	36	95	28,5 - 30,0
850 330 120	**870 330 120**	36	120	30,0 - 32,0
850 330 150	**870 330 150**	36	150	31,5 - 33,5
850 330 185	**870 330 185**	36	185	33,1 - 35,1
850 330 240	**870 330 240**	36	240	35,6 - 37,6
850 330 300	**870 330 300**	36	300	37,6 - 39,6
850 330 400	**870 330 400**	36	400	40,8 - 42,8
850 330 500	**870 330 500**	36	500	43,6 - 45,6
-	**870 330 630**	36	630	47,2 - 50,0

MV-CONNEX Separable Connectors, Size 3-S, U_m = 52 kV, I_N = 1250 A

Standard article no.

- with sealing system (seal and shrink tubing)
- for indoor and outdoor applications
- not soil and salt-water resistant
- Packaging unit: set with three cable connecting parts
- Voltage taps that are not connected to a voltage display system, must be earthed for size 3-S.

No. with voltage tap	No. without voltage tap	Max. operating voltage U_m (kV)	for cable cross-section (mm²)	for diameters over PE/VPE insulation Ø (mm)
850 350 120	-	52	120	32,0 - 36,0
850 350 150	-	52	150	37,0 - 39,5
850 350 240	-	52	240	39,0 - 41,5
850 350 300	-	52	300	39,0 - 41,5
850 350 400	-	52	400	41,0 - 43,5
850 350 500	-	52	500	44,5 - 46,0
-	**870 350 630**	52	630	47,5 - 50,0

Order Information

Caution! Important information.

The flange bell is available in bronze for underground and saltwater use. These CONNEX cable connecting parts are available in sizes 1, 2 and 3.

The cable insulation must correspond to the rated voltage of the CONNEX cable connecting part. Example: for a 20 kV insulated cable, even if the cable is powered with 10 kV rated voltage the CONNEX cable connecting part for 24 kV max. operating voltage must be selected, as the standard insulation wall thickness for DIN VDE cables is linked to the max. operating voltage and the appropriate insulator was assigned based on this.

Special tools are required to assemble the contact system of the CONNEX connecting cable parts sizes 1 - 3.
Only qualified personnel who have been authorised and trained by the manufacturer may work on and with the product. The personnel receive a certificate for the training from the manufacturer with a validity of 5 years.

Note the special assembly for CONNEX cable connection parts for cable bundle sizes 1, 2 and 3; an additional special tool is required to press the aluminium sleeve around the finely stranded conductor.

CONNEX cable connecting part with **rotatable** flange available on request.

For vertical outdoor assembly, **from above**, an additional sealing set is required:
This is available with article no. 559 218 001 for size 3 and 559 218 002 for size 2.

ATTENTION:

For cables that have not been produced to comply with DIN VDE, a product configurator is used to determine an individual article number for the required MV-CONNEX cable connecting parts size 0 - 3-S. To do this the form for determining the MV cable connecting part, found in the introductory section of the catalogue, must be fully completed. The individual article number consists of a base number and a variant number and contains all parts for connecting and earthing the individual cable.

890 999 999 variant XXXX
MV-CONNEX cable connecting part, size 0
I_N = 250 A, U_{max} = 24 kV
without voltage tap
with or without sealing system (seal and shrink tubing)

891 999 999 variant XXXX
MV-CONNEX cable connecting part, size 1
I_N = 630 A, U_{max} = 36 kV
with or without voltage tap
with or without sealing system (seal and shrink tubing)

892 999 999 variant XXXX
MV-CONNEX cable connecting part, size 2
I_N = 800 A, U_{max} = 42 kV
with or without voltage tap
with or without sealing system (seal and shrink tubing)

893 999 999 variant XXXX
MV-CONNEX cable connecting part, size 3 / 3-S
I_N = 1250 A, U_{max} = 42 / 52 kV
with or without voltage tap
with or without sealing system (seal and shrink tubing)

The article no. contains 1 piece; the packaging is made in sets, i.e. 3 pieces.

Tools for Round-Pressing Aluminum Sleeves

Aluminum Carrying Case - Empty

for tools for round-pressing aluminum sleeves

No.
305 767 001

Hydraulic tool heads 850 bar

Hydraulic tool heads 850 bar with oil-tight coupling plug for two-stage high-pressure pumps and electro-hydraulic high-pressure pumps EHP with hose coupling (coupling socket).

No.	Type Typ	Power stroke (mm)	Nominal compression force (kN)	Weight (kg)
305 818 001	BIII	30	240	6.5

Round Compression Dies

For round-pressing aluminum sleeves on fine-wire conductors of a flexible cable, the following high-pressure rounding tools are required:

No.	Compression die code No.	External diameter of the aluminium crimping sleeve Ø (mm)	for aluminium crimping sleeve
300 632 632	HR 11	13.0	558003001 558003006 558003015
300 632 635	HR 16	18.5	558003007 558003010 558003017 558003008 558003005
300 632 637	HR 20	22.5	558003018 558003012 558003020 558003009
300 632 639	HR 22	25.0	558003021 558003022
300 632 640	HR 25	28.5	558003014 558003016
300 642 001	HR 28	32.0	558003011 558003019

Two stage high pressure pump

The high-pressure unit is mounted horizontally on a galvanised U-frame. The valve body is made of aluminium alloy. Therefore the pump is very light. The high-pressure hose is fitted with an oil-tight coupling socket for connecting the compression head. The pump operates with rapid thrust until the compression starts, thus requiring fewer power strokes.
An excess pressure valve protects the compression tool against overload.

No.	Hose length (mm)	Operating pressure (bar)	Hydraulic oil volume (cm^3)
305 799 002	3000	850	600

Assembly Accessories

Carrying Case - empty -

To accommodate tools for the assembly of CONNEX separable connectors

No.
305 768 001

Hydraulic Hand-Operated Compression Tool

Basic Tool for sizes 1, 2 and 3 without compression head

No.
827 017 002

Compression Head

including pull-off die for hand-operated compression tool

No.	Size
305 675 001	1
305 675 002	2
305 675 003	3

Impact Device

made of plastic. For the pre-assembly of the connector contact

No.	Size
559 214 001	1
559 214 002	2
559 214 003	3

Measuring Template

for an economical cut-back of the cable sheath during connector assembly

No.	Size
559 224 001	0
559 215 001	1, 2
559 223 001	3

Hexagon Wrench SW 6

for tightening the screws of separable connectors sizes 0 - 3

No.
546 004 009

Chain

for suspending the assembly lever and hole bar (only for Size 3)

No.
827 165 001

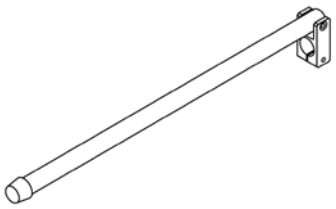
Assembly Lever

for pressing and releasing the bell flange of the CONNEX separable connector size 3

No.
827 167 001

Unplug Rod for Assembly Lever

No.
827 226 001



Hole Bar

for suspending the assembly lever (only for Size 3)

No.
827 166 001

Assembly Clamp

Assembly clamp for holding the cable during heat-shrinking and for releasing the CONNEX separable connector.

No.
827 153 001

Cable Stripper

for PE/XLPE insulation. Longitudinal and radial cutting with adjustable depth stop

No.
305 051 051

Spare Blade for Cable Stripper

No.
305 063 063

Open hand-operated compression tool

Gripper for CONNEX cable connecting part size 0

Hexagon pressing tool for hand-held jointing clamp PRIMAT O6 T, classification number 18 Al for Al and Cu conductors 25 - 70 mm²
No. 300 455 458

Important!
The crimp sleeve for the CONNEX cable connecting part size 0 should generally be pressed for Al and Cu cables of 25 - 70 mm² using the pressing tool KZ 18 Al.

No.	Weight (kg)
303 871 002	3.2

Hexagonal compression dies

for threaded pin and Cu strand for CONNEX transformer and appliance elbow connecting parts

No.	Code number	Width (mm)
300 438 441	8	32
300 438 443	10	32
300 438 445	12	32
300 438 447	14	32
300 438 448	16	32
300 438 449	18	32
300 438 451	20	32
300 438 452	22	32
300 438 453	25	32

MV - cable peeling tool

For removal of the outer sheath, stripping of the semi-conductive layer and chamfering of the conductor insulation.

No.
827 951 001

Plug-In Type Assembly Bushings

for the pre-assembly of CONNEX separable connectors (e.g. in the workshop)

No.	Size
827 174 003	0
827 174 001	1
827 174 002	2
827 174 004	3

Blind Cap

protection against electric-shock hazard for live CONNEX separable connector

No.	Size	Rated power frequency withstand voltage 1 min (kV)	Rated lightning impulse withstand voltage (BIL) (kV)
827 131 001	1	81	170
827 132 001	2	81	170
827 133 001	3	94	200

Dummy Cable Connector

for sealing and voltage-proof closing of CONNEX bushings

No.	Size	Max. operating voltage U_m (kV)
827 150 005	0	24
827 150 002	1	36
827 150 003	2	42
827 150 004	3	52

Protecting Cap

•not voltage proof

For protecting withdrawn CONNEX separable connectors against damage and dirt

No.	Size	Material
546 133 001	0, 1	Plastic
827 134 004	0	Metal
827 134 001	1	Metal
827 134 002	2	Metal
827 134 003	3	Metal

Roll Springs

Earthing accessories for cables with metallic band shield and / or armour. These are assigned using the cable data from the product configurator.

No.	Diameter roll springs Ø (mm)	Width (mm)
546 078 009	14 - 22	16
546 078 002	25 - 40	13
546 078 003	30 - 39	25
546 078 004	40 - 60	25
546 078 007	50 - 75	30
546 078 010	75 - 100	30

Clamping Collar acc. DIN 3017, Material V2A

Earthing accessories for cables with metallic band shield and / or armour. These are assigned using the cable data from the product configurator.

No.	Clamping Range (mm)	Width (mm)
620 866 001	20 - 32	10
617 825 007	32 - 50	10
617 825 001	40 - 60	10
617 825 002	50 - 70	10
617 825 003	60 - 80	10
617 825 005	80 - 100	10
617 825 006	100 - 120	10

MV-CONNEX Silicone Grease

Is included for use when first fitting the cable connecting part. If the cable connecting part needs to be re-fitted, the MV-CONNEX special grease must be ordered separately.

No.	Type	Weight (g)
558 228 008	Bag	10
558 228 007	Can	200

Heat-Shrink Tubing

Included in delivery for cable connecting parts with a sealing system.

No.	Heat shrink area d	Length (mm)	Size
619 528 528	68 / 22	125	0 + 1
619 528 003	85 / 25	150	2
619 528 001	130 / 36	225	3

Sealing Tape

Included in delivery for cable connecting parts with a sealing system.

No.	Width (mm)	Thickness d (mm)	Length (mm)
545 036 002	25.4	1.6	300

Copper Mesh Hose

Material sold by the metre

Is classified as cables with tape shielding by the product configurator; used for metallic combining of the insulator and the field control part.

No.	Width (mm)
001 743 007	100

Cotton-Insulating Tape

for bundling energy cables

No.
001 743 016

Dry graphit (5 ml)

for adding an additional conductive layer, e.g. for removable or thin conductive layers.

No.
003 010 011

Cable Breakout

is classified under three-core cables by the product configurator.

No.	Heat shrink area d	Heat shrink area D
020 839 025	31 / 16	80 / 36
020 839 026	41 / 20	110 / 48
020 839 027	53 / 27	140 / 62
020 839 023	60 / 30	170 / 60

Heat Shrink Tubing

is classified under three-core cables by the product configurator.

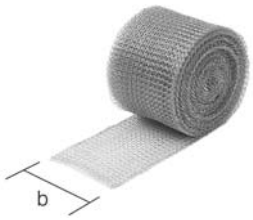
*) Length 5000 mm for 3 cores

No.	Heat shrink area d	Length (mm)	
023 998 010	51 / 16	5000	*)
023 998 011	68 / 22	5000	*)

Copper Braiding

In the product configurator is classified as three-core cables with common shielding, used for metallic shielding on the single cores.

No.	Width (mm)	Length (mm)
001 743 005	75	10000



Conductive Crepe Paper

is classified by the product configurator as a buffer between the extruded cable shielding and the copper weave if common shielding.

No.	Length (mm)	Width (mm)
002 756 011	15000	50

Copper Mesh Tape

is classified by the product configurator using the cable data if cables with tape shield and / or band armour.

No.	Width (mm)	Thickness d (mm)	Length (mm)	Cross section (mm^2)
001 743 009	22	2.5	1000	25
001 743 008	30	2.5	1000	35

CONNEX Test and Adapter Connectors

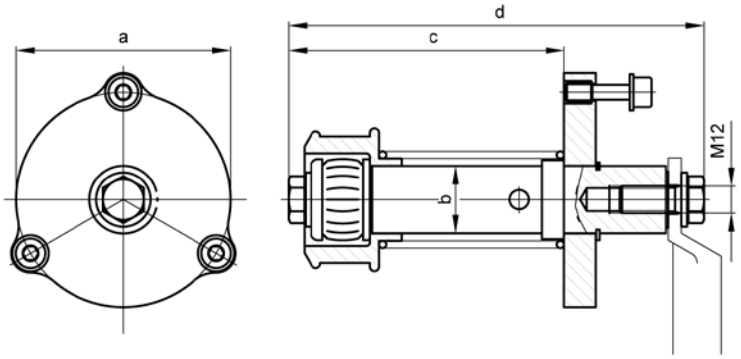
To fulfill multiple usage requirements, the component is designed with 45° angle.
They are used as transitional connecting parts when transformers that are equipped with CONNEX appliance connecting parts are connected to blank (overhead) lines.
They are used as CONNEX test connecting parts for electrical testing of equipment that is equipped with CONNEX appliance connecting parts.

No.	Size	Thread	Max. operating voltage	Nominal current	Rated power frequency withstand voltage	Rated lightning impulse withstand voltage (BIL)
		G	U_m (kV)	I_N (A)	1 min (kV)	(kV)
827 186 210	0	M12	24	250	54	125
827 186 211	1	M12	36	630	81	170
827 186 212	2	M12	42	800	95	200
827 186 213	3	M12	42	800	95	200

Current-Testing Connectors

This connector permits to carry out current tests on switchgear, transformers, transducers etc. fitted with CONNEX bushings.

For the electrical and mechanical connection, the connector is inserted into a CONNEX bushing of equal size and bolted. The test lead is connected to the terminal stud with a screw.



No.	Size	Nominal current	Test current	Rated short-time withstand current	Rated short-time withstand current	Max. testing voltage	a	b	c	d
		I_N (A)	max.	1 s (kA)	3 s (kA)	U_m (kV)	(mm)	(mm)	(mm)	(mm)
827 181 003	0	250	-	16,0	-	2	88	30	122	184
827 181 001	1	630	2000	31,5	18,0	2	95	30	122	184
827 181 002	2	800	2500	40,0	25,0	2	102	30	122	184
827 193 001	3	1250	3150	50,0	40,0	2	130	35	170	238

Cable-Testing Socket

To be used when carrying out start-up tests on cables.

Caution:

The cable test socket is not touchproof. After testing, the test socket must be earthed and short-circuited. The cable test socket is not suitable for partial discharge measuring.

No.	Size	Rated power frequency withstand voltage	DC voltage test	Weight
		1min (kV)	1 min. (kV)	(kg)
827 125 001	1	54	54	4.1
827 125 002	2	54	54	4.0
827 125 003	3	72	72	9.3

CONNEX Test Cable

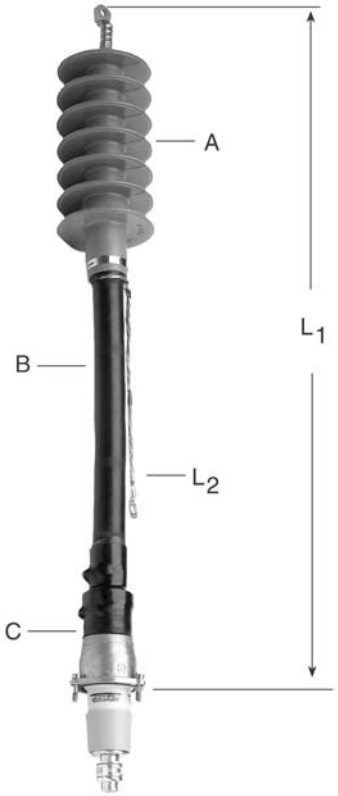
The flexible test leads are used for electric tests of equipment with installed CONNEX bushings.

Especially suitable for voltage tests and partial discharge tests on transformers and gas-insulated switchgears.

Test lead

A = outdoor termination
B = flexible cable
C = CONNEX separable connector
L1 = Length of the test cable
L2 = Length of the screen wires

Other lengths and connecting cables with two separable connectors on request.



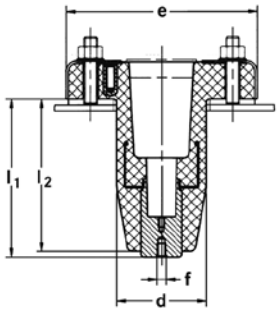
No.	Size	Max. operating voltage	Rated power frequency withstand voltage	Rated lightning impulse withstand voltage (BIL)	Cable cross section	Rated current in air at 30° C	L_1	L_2
		U_m (kV)	1 min (kV)	(kV)	(mm^2)	(A)	(m)	(mm)
810 105 110	1	36	70	170	95	440	1	300
810 105 210	2	42	80	200	95	440	1	300
810 105 222	2	42	80	200	95	440	1.5	300
810 105 310	3	42	80	200	95	440	1	300
810 105 319	3	42	80	200	95	440	1.6	300
810 105 352	3-S	52	95	250	95	440	1.5	300
810 105 391	3-S	52	95	250	400	980	1.6	300

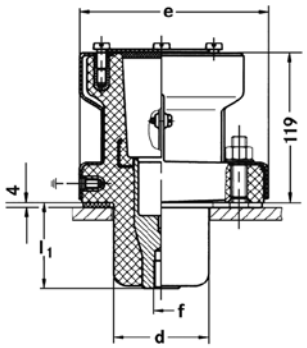
1 MV-CONNEX Transformer Bushings, straight, up to 24 kV

For local grid transformers, the transformer connecting pieces are fitted instead of the DIN porcelain bushings on the medium voltage side.
The insulation piece that extends into the transformer (dimensions l_1 and l_2) is available in different lengths in order to accommodate the type of transformer. The cables are connected using metal-encapsulated CONNEX cable connecting parts.
On the 0.4 kV side there are corresponding insulating caps which provide total protection against contact.

Note:
For an example of application, see picture overview of local grid transformers

2





No.	Size	Max. operating voltage	Nominal current	Threaded connection	Weight	l_1	l_2	d	e	
		U_m (kV)	I_N (A)	f	(kg)	(mm)	(mm)	(mm)	(mm)	
827 115 004	0	24	250	M8	2.1	133	128	74	127	1
827 158 001	0	24	250	M12	3.4	68	-	75	130	2
827 159 001	1	24	630	M12	3.3	68	-	75	130	2

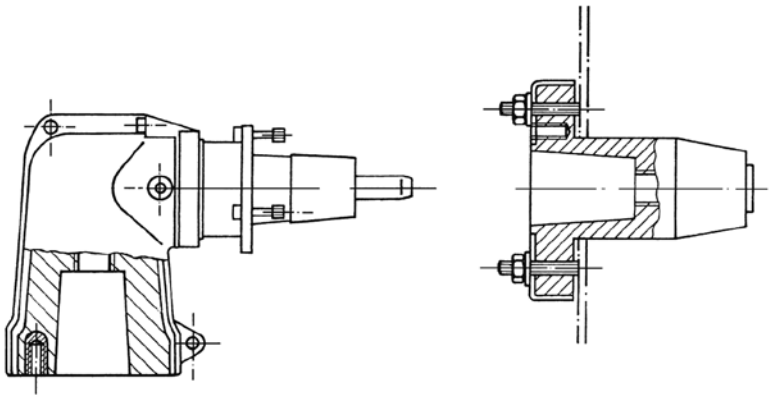
MV-CONNEX Elbow Adapters, up to 24 kV

The metal-encapsulated CONNEX elbow adapter is a component which can be used to convert straight CONNEX appliance connecting parts into CONNEX elbow appliance connecting parts. The system offers a connection that is rotated by 90°. One side is designed as a CONNEX cable connecting part size 0 or 1, the other side as a CONNEX appliance connecting part of the same size. The grounded metal housing provides total protection against contact.

Note:
For an example of application, see picture overview of local grid transformers

1

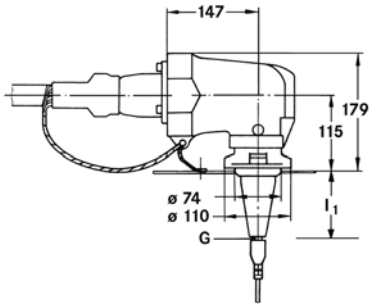
2



No.	Size	Max. operating voltage	Nominal current	Weight	
		U_m (kV)	I_N (A)	(kg)	
827 176 001	0	24	250	4.3	1
827 180 001	1	24	630	5.4	2

MV-CONNEX Transformer Elbow Bushings

When installed, elbow bushings can be swiveled by 260°. After fixing the CONNEX separable connector, the elbow bushing can be locked. The grounded metal housing provides absolute protection against electric-shock hazard. A compression sleeve and a copper strand wire serve to establish a flexible connection between the 260° swivel-type elbow bushing and the transformer winding.

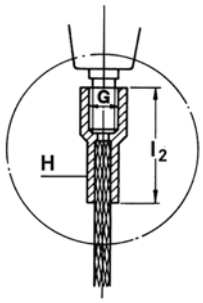


No.	Size	Max. operating voltage	Nominal current	Thread	Weight	l_1
		U_m (kV)	I_N (A)	G	(kg)	(mm)
827 107 064	0	24	250	M10	4.4	64
827 107 107	0	24	250	M10	4.5	107
827 107 168	0	24	250	M10	4.8	168
827 117 064	1	36	630	M16	4.8	64
827 117 107	1	36	630	M16	5.0	107
827 117 168	1	36	630	M16	5.2	168

1 2

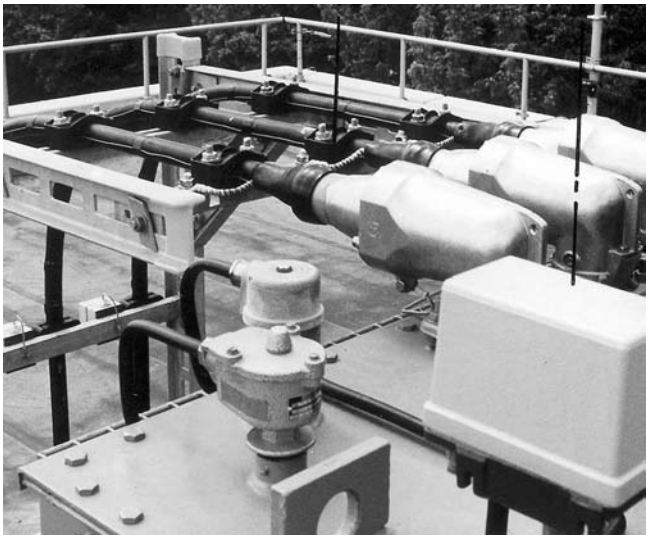
Compression Sleeves

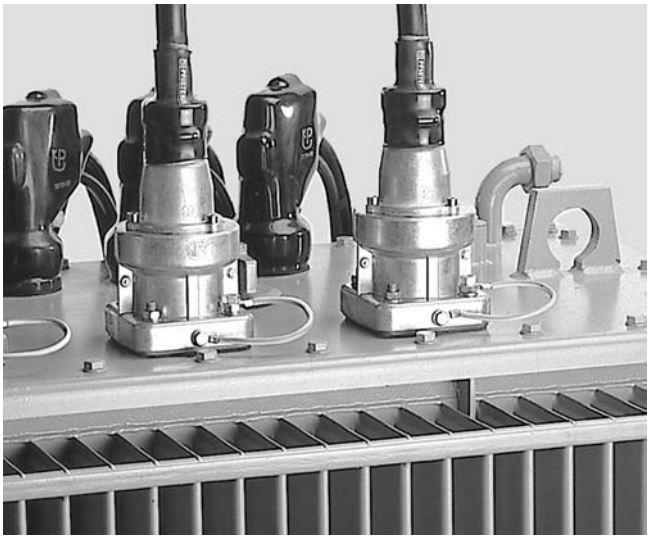
for use with hexagonal compression dies

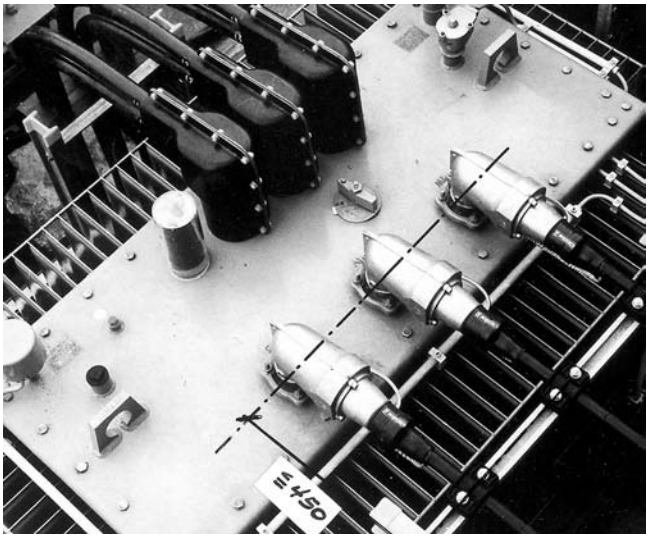


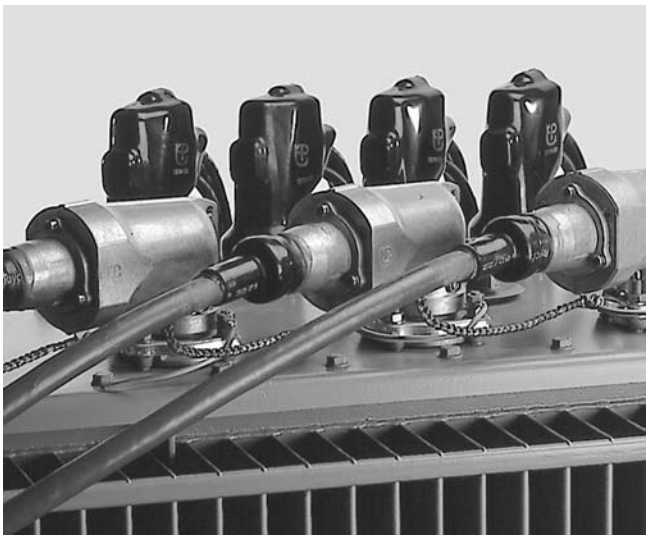
No.	for size	Cross section Cu strand wire according to DIN 46438	Diameter Cu strand wire	Pressing tool for thread	Pressing tool for Cu strand	l_2	
		(mm^2)	Ø (mm)	G	H	(mm)	
560 320 001	0	10	5.0	KZ 14	KZ 8	35	1
560 320 007	0	35	10.0	KZ 16	KZ 14	42	1
560 320 005	0	70	14.2	KZ 16	KZ 18	70	1
560 320 002	1	10	5.0	KZ 20	KZ 8	38	2
560 320 003	1	35	10.0	KZ 20	KZ 14	42	2
560 320 004	1	50	12.0	KZ 20	KZ 16	42	2
560 320 006	1	120	19.5	KZ 22	KZ 25	70	2

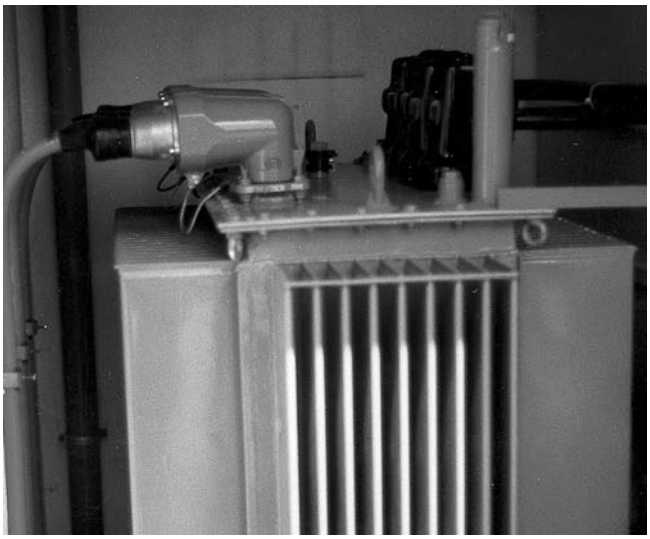
Picture overview of local grid transformers











MV-CONNEX Multi-Contact Elbow Bushings

The multiple elbow connecting pieces are fitted instead of the DIN porcelain bushings on the medium voltage side of the power transformer.

The multiple elbow connecting pieces consist of an insulation body that is integrated in a metal housing or in the new compact design, aluminium flame sprayed and is connected with a maximum of 2 or 4 cables using CONNEX cable connecting parts sizes 2 or 3. The earthed metal housing and the earthed layer of aluminium provide total protection against contact.
Unnassigned connecting parts must be closed using dummy plugs such that they are voltage-proof.

External environmental influences, such as small animals and birds, cannot cause short circuits. Plug-in enclosed overvoltage conductors can be fitted instead of a CONNEX cable connecting part. The electrical connections in the transformer can be in the form of either clamps or plugs.

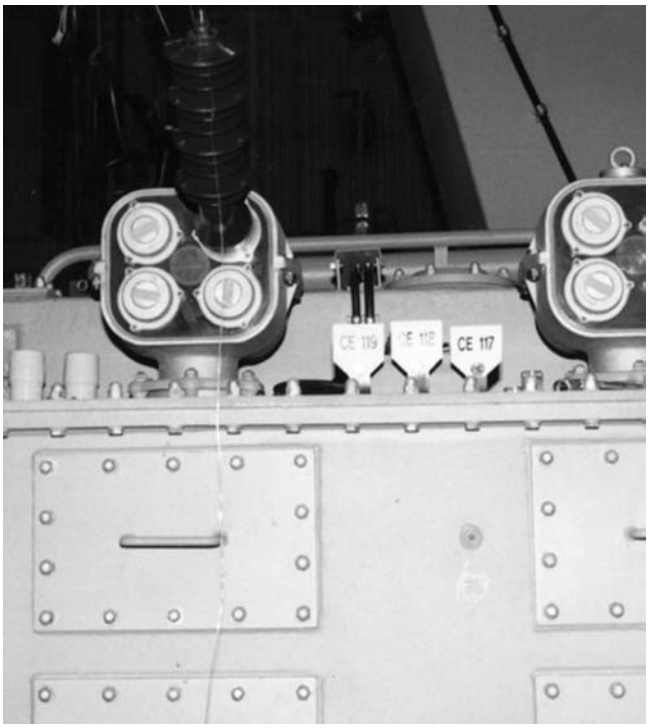
For power transformers suitable for fastening in accordance with DIN 42538, resistant to outside air.

Order connecting part separately.

Cold shock tests in accordance with VDE 0441.

Caution:
The CONNEX cable dummy plugs are not provided and must be ordered separately.

MV-CONNEX Multi-Contact Elbow Bushings

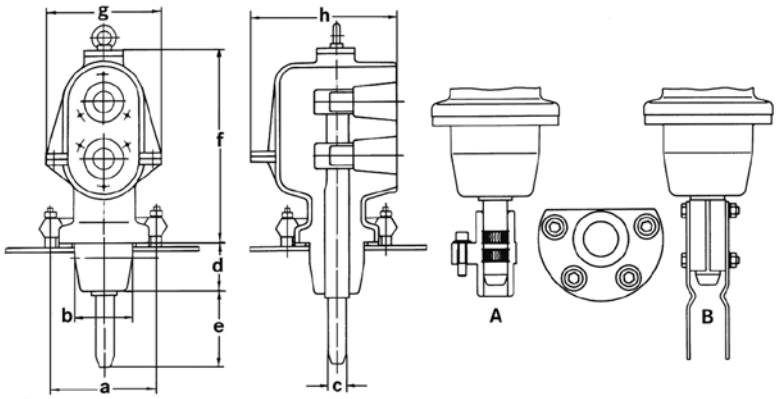


MV-CONNEX Double-Contact Elbow Bushings, up to 52 kV

For plug-in and clamping type construction, respectively.

A Plug-in type connecting part

B Clamping type connecting part(supplied by the transformer manufacturer)



No.	Size	Max. operating voltage	max. rated current with plugged connection in trans-former - type A	max. rated current with clamped connection in trans-former - type B	a	b	c	d	e	f	g
		U_m (kV)	max. I_N (A)	max. I_N (A)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
827 661 002	2	42	1250	1250	180	110	30	125	90	388	215
827 661 001	2	42	1600	1600	200	135	35	125	125	388	215
827 660 001	3	42	2200	2500	200	135	35	125	125	451	246
827 660 003	3	42	2200	2500	200	135	35	300	125	451	246
827 660 004	3	52	2200	2500	200	135	35	125	125	451	246
827 660 006	3	52	2200	2500	200	135	35	300	125	451	246

Plug-in Type Connecting Part (A)

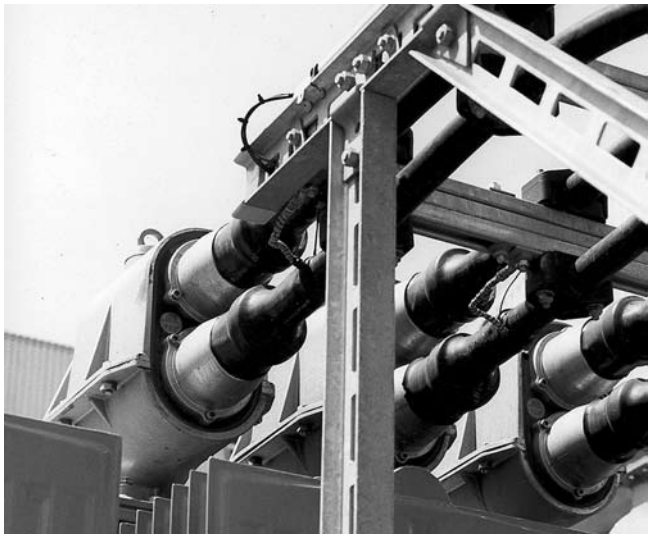
No.	for CONNEX twin elbow connecting parts	for CONNEX 4-elbow connecting parts	Weight (kg)
827 128 710	827661002	827124716	2.5
827 128 730	827661001 827660001 827660003 827660004 827660006	827124727 827146336 827146337 827146836 827146837 827672001 827672003 827673001 827673003	2.8

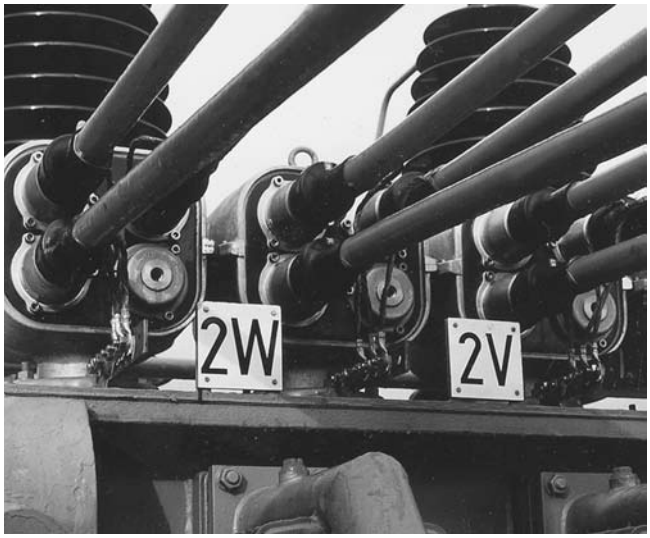
Fixing set

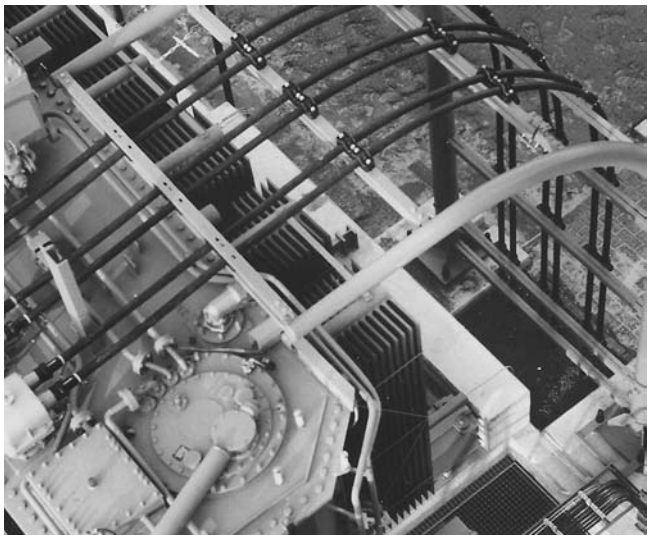
comprises a flange ring, flat gasket, spring washers and hexagon nuts

No.	for CONNEX twin elbow connecting parts	for CONNEX 4-elbow connecting parts
827 190 016	827661002	827124716
827 190 015	827661001 827660001 827660003 827660004 827660006	827124727 827146336 827146337 827146836 827146837 827672001 827672003 827673001 827673003

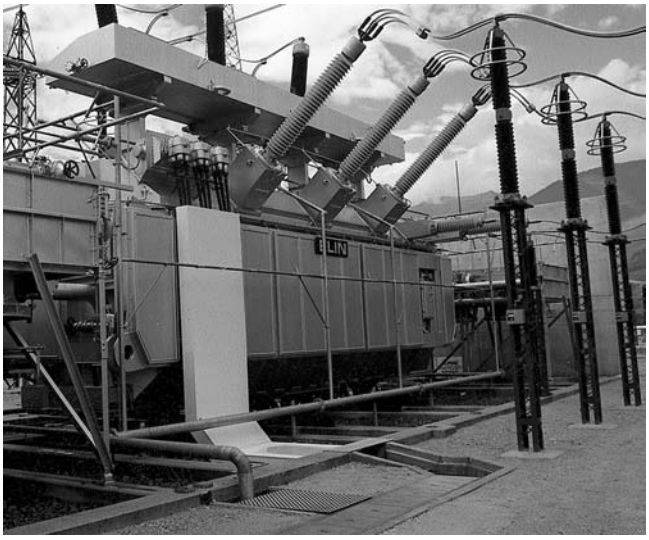
Power Transformers, on the low-voltage side with multi-contact elbow bushings up to 52 kV

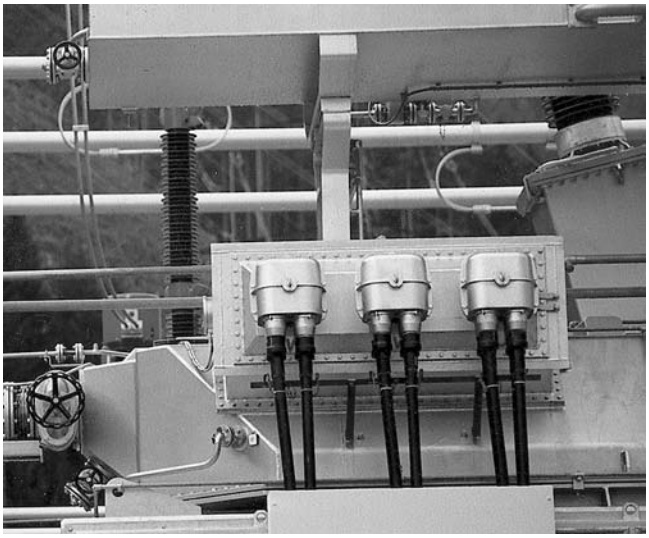


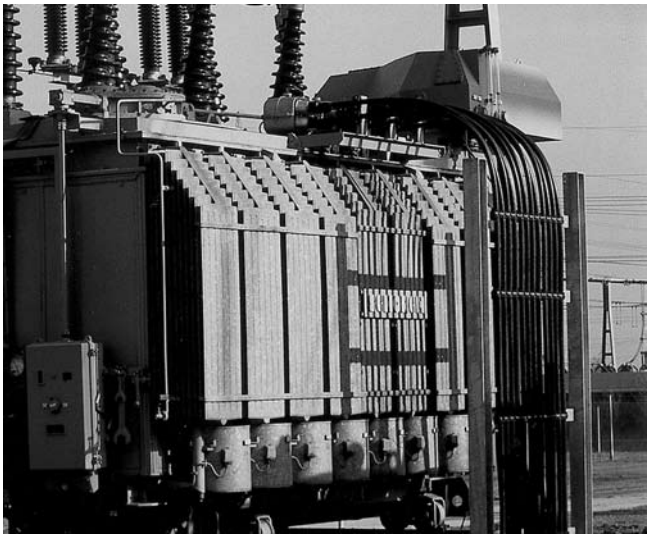


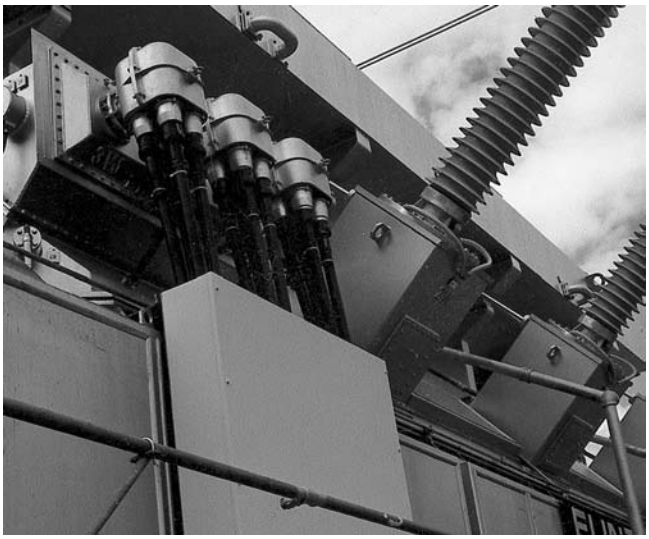


Power Transformers, on the low-voltage side with multi-contact elbow bushings up to 52 kV







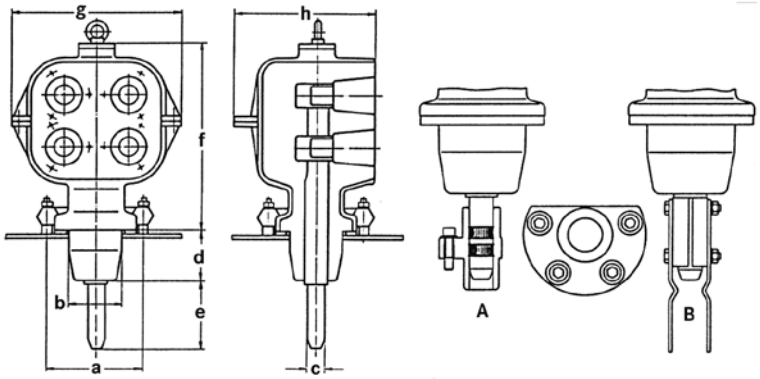


MV-CONNEX Quadruple-Contact Elbow Bushings, up to 52 kV

For plug-in and clamping type construction, respectively.

A Plug-in type connecting part.

B Clamping type connecting part(supplied by the transformer manufacturer).



No.	Size	Max. operating voltage	max. rated current with plugged connection in trans-former - type A	max. rated current with clamped connection in trans-former - type B	a	b	c	d	e	f	g
		U_m (kV)	max. I_N (A)	max. I_N (A)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
827 124 716	2	42	1250	1250	180	110	30	125	90	387	345
827 124 727	2	42	2200	3150	200	135	35	125	125	387	345
827 146 336	3	42	2200	3150	200	135	35	125	125	449	390
827 146 337	3	52	2200	3150	200	135	35	125	125	449	390
827 146 836	3	42	2200	3150	200	135	35	300	125	449	390
827 146 837	3	52	2200	3150	200	135	35	300	125	449	390

Plug-in Type Connecting Part (A)

No.	for CONNEX twin elbow connecting parts	for CONNEX 4-elbow connecting parts	Weight (kg)
827 128 710	827661002	827124716	2.5
827 128 730	827661001 827660001 827660003 827660004 827660006	827124727 827146336 827146337 827146836 827146837 827672001 827672003 827673001 827673003	2.8

Fixing set

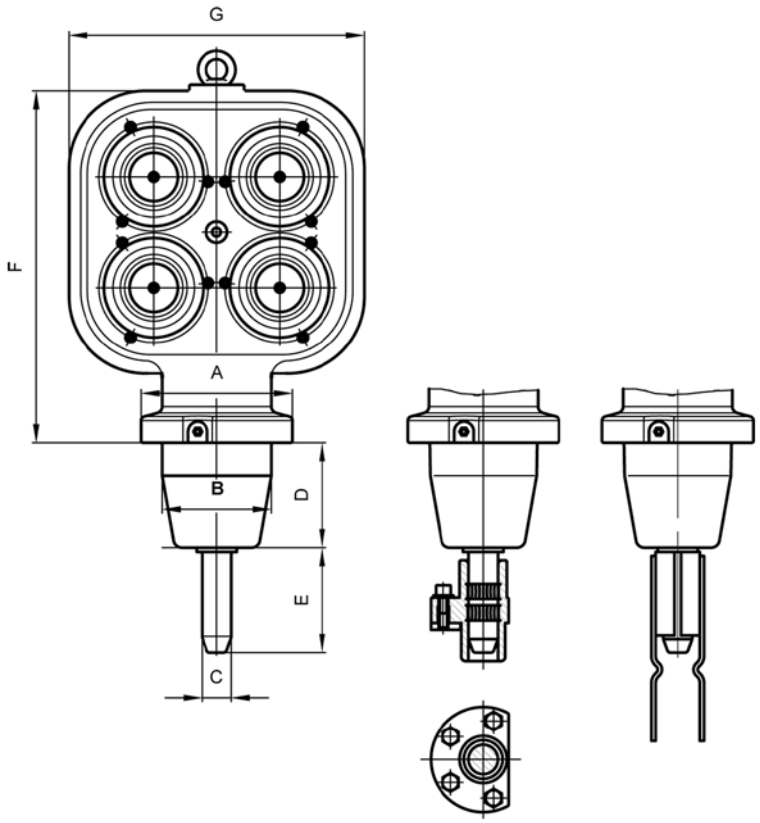
comprises a flange ring, flat gasket, spring washers and hexagon nuts

No.	for CONNEX twin elbow connecting parts	for CONNEX 4-elbow connecting parts
827 190 016	827661002	827124716
827 190 015	827661001 827660001 827660003 827660004 827660006	827124727 827146336 827146337 827146836 827146837 827672001 827672003 827673001 827673003

MV-CONNEX Quadruple-Contact Elbow Bushings, up to 52 kV

- with aluminium flame sprayed surface and integrated voltage tap
- for both plug and clamp versions

A Plug-in type connecting part.
B Clamping type connecting part(supplied by the transformer manufacturer).



No.	Size	Max. operating voltage	max. rated current with plugged connection in trans-former - type A	max. rated current with clamped connection in trans-former - type B	a	b	c	d	e	f	g
		U_m (kV)	max. I_N (A)	max. I_N (A)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
827 672 001	3	42	2200	3150	200	135	35	125	125	403	332
827 672 003	3	42	2200	3150	200	135	35	300	125	403	332
827 673 001	3	52	2200	3150	200	135	35	125	125	403	332
827 673 003	3	52	2200	3150	200	135	35	300	125	403	332

Plug-in Type Connecting Part (A)

No.	for CONNEX twin elbow connecting parts	for CONNEX 4-elbow connecting parts	Weight (kg)
827 128 710	827661002	827124716	2.5
827 128 730	827661001 827660001 827660003 827660004 827660006	827124727 827146336 827146337 827146836 827146837 827672001 827672003 827673001 827673003	2.8

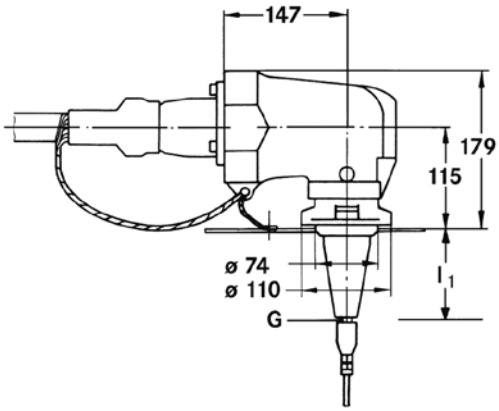
Fixing set

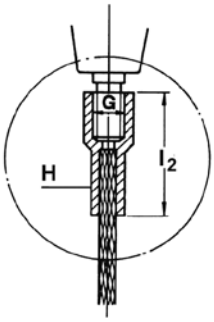
comprises a flange ring, flat gasket, spring washers and hexagon nuts

No.	for CONNEX twin elbow connecting parts	for CONNEX 4-elbow connecting parts
827 190 015	827661001 827660001 827660003 827660004 827660006	827124727 827146336 827146337 827146836 827146837 827672001 827672003 827673001 827673003

MV-CONNEX Switchgear Elbow Bushings

For switchgears and motors.



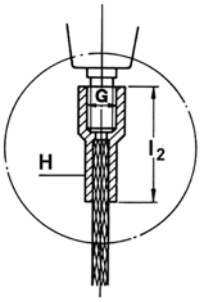


No.	Size	Nominal current	Max. operating voltage air	Max. operating voltage SF_6-gas	Max. operating voltage oil	Thread	Weight	l_1
		I_N (A)	U_m (kV)	U_m (kV)	U_m (kV)	G	(kg)	(mm)
827 109 107	0	250	6	24	24	M10	6.5	107
827 119 107	1	630	6	36	36	M16	4.9	107

1 **Compression Sleeves**

for use with hexagonal compression dies

2



No.	for size	Cross section Cu strand wire according to DIN 46438	Diameter Cu strand wire	Pressing tool for thread	Pressing tool for Cu strand	l_2	
		(mm^2)	Ø (mm)	G	H	(mm)	
560 320 001	0	10	5.0	KZ 14	KZ 8	35	1
560 320 007	0	35	10.0	KZ 16	KZ 14	42	1
560 320 005	0	70	14.2	KZ 16	KZ 18	70	1
560 320 002	1	10	5.0	KZ 20	KZ 8	38	2
560 320 003	1	35	10.0	KZ 20	KZ 14	42	2
560 320 004	1	50	12.0	KZ 20	KZ 16	42	2
560 320 006	1	120	19.5	KZ 22	KZ 25	70	2

MV-CONNEX appliance connecting parts, up to 42 kV, hexagon version

For fitting in:
switching stations, circuit breaker units, high-voltage motors, condensers, and other appliances.
Insulating medium: SF_6-Gas
max. operating temperature 90°C

No.	No. with sealing and fixing set	Sealing Form	Size	Max. operating voltage U_m (kV)	Capacitive voltage tap (pF)	Weight (kg)
827 106 001	**827 106 201**	hexagonal	1	36	-	2.0
827 106 011	**827 106 211**	hexagonal	1	36	6 ± 1,5	2.0
827 106 002	**827 106 202**	hexagonal	2	42	-	2.1
827 106 012	**827 106 212**	hexagonal	2	42	6 ± 1,5	2.1

MV-CONNEX appliance connecting parts, up to 42 kV, round version

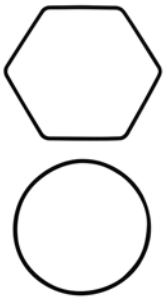
For fitting in:
switching stations , circuit breaker units, high-voltage motors, transformers, condensers, connecting sleeves and other appliances.
Insulating medium: SF_6-Gas or oil.
max. operating temperature 110°C
*) suitable for use in transformers

No.	No. with sealing and fixing set	Sealing Form	Size	Max. operating voltage U_m (kV)	Weight (kg)	
827 104 005	**827 104 205**	round	2	42	2.8	*)

MV-CONNEX appliance connecting parts, up to 52 kV, hexagon version

For fitting in:
switching stations , circuit breaker units, high-voltage motors, transformers, condensers, connecting sleeves and other appliances.
Insulating medium: SF_6-Gas or oil.
max. operating temperature 110°C
*) suitable for use in transformers

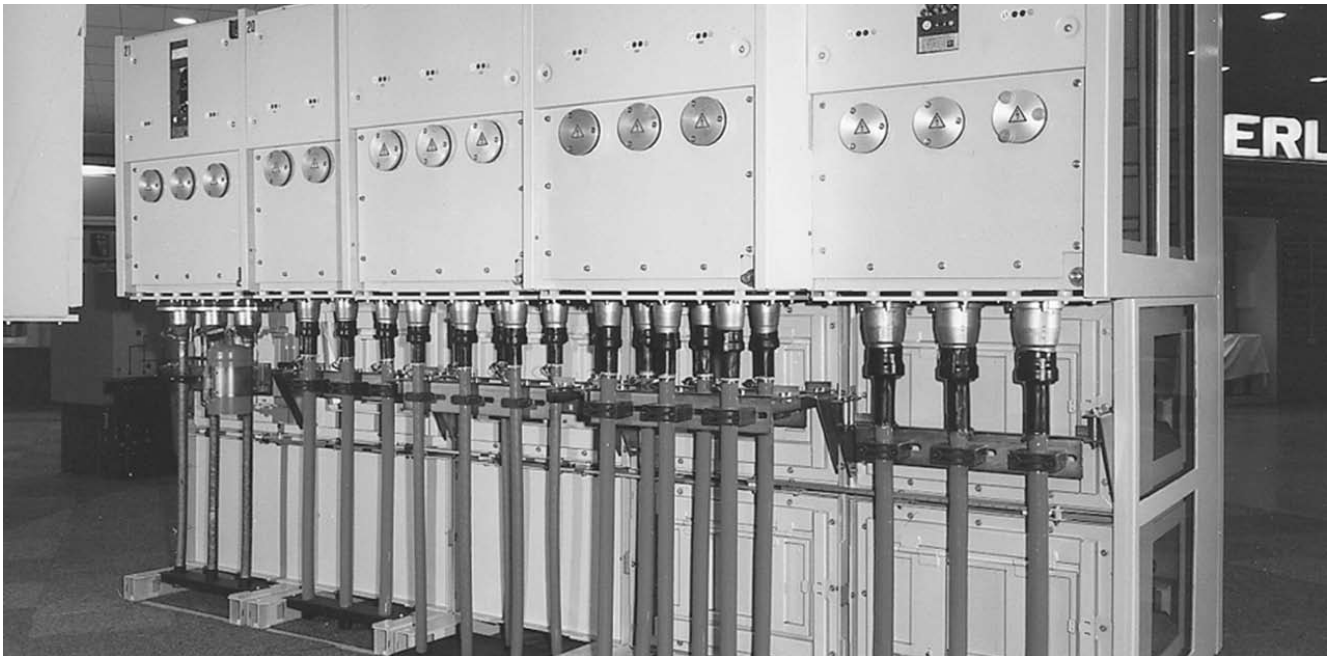
No.	No. with sealing and fixing set	Sealing Form	Size	Max. operating voltage U_m (kV)	Capacitive voltage tap (pF)	Weight (kg)	
827 110 001	**827 110 201**	hexagonal	3	52	-	5.4	*)
827 110 008	**827 110 208**	hexagonal	3	52	-	5.2	-
827 110 009	**827 110 209**	hexagonal	3	52	13.8 ± 1.5	5.8	-



O-Ring Sealings

No.	Suitable for	Dimensions (mm)	Form	Material
021 937 067	827106001 827106011 827106002 827106012	112 x 4	hexagonal	FKM (Viton)
021 937 069	827110001 827110008 827110009	137 x 4	hexagonal	FKM (Viton)
021 937 070	827104005	118 x 4	round	FKM (Viton)

MV-CONNEX Bushings up to 52 kV

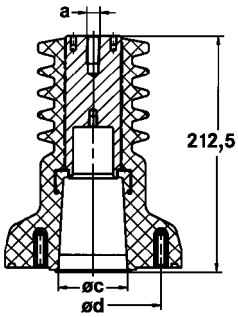


MV-CONNEX Insulator, up to 24 kV

For indoor equipment
(insulating capacity: list 2).

By using appliance connecting isolators air-insulated switching stations can be equipped with shock-proof cable connections. Switching and cable connection areas can thus be easily sheltered.
The size 1 and 2 appliance connecting isolators are suitable to be fitted to sheets that are 2 - 2.5 mm thick.

Breaking force P_n = 5kN
Creepage distance 340 mm
Suitable for outdoor use up to U_m = 6 kV

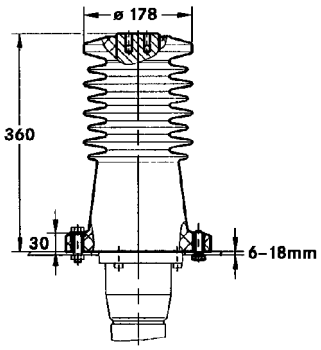


No.	Size	Max. operating voltage	Nominal current	Diameter c	Diameter d	Terminal pin	Weight	
		U_m (kV)	I_N (A)	Ø (mm)	Ø (mm)	a	(kg)	
827 113 011	1	24	630	62	95	M12	3.9	Silicone-free production process
827 113 001	1	24	630	62	95	M12	3.9	-
827 113 003	2	24	800	68	102	M12	4.4	-

MV-CONNEX Insulator, up to 36 kV

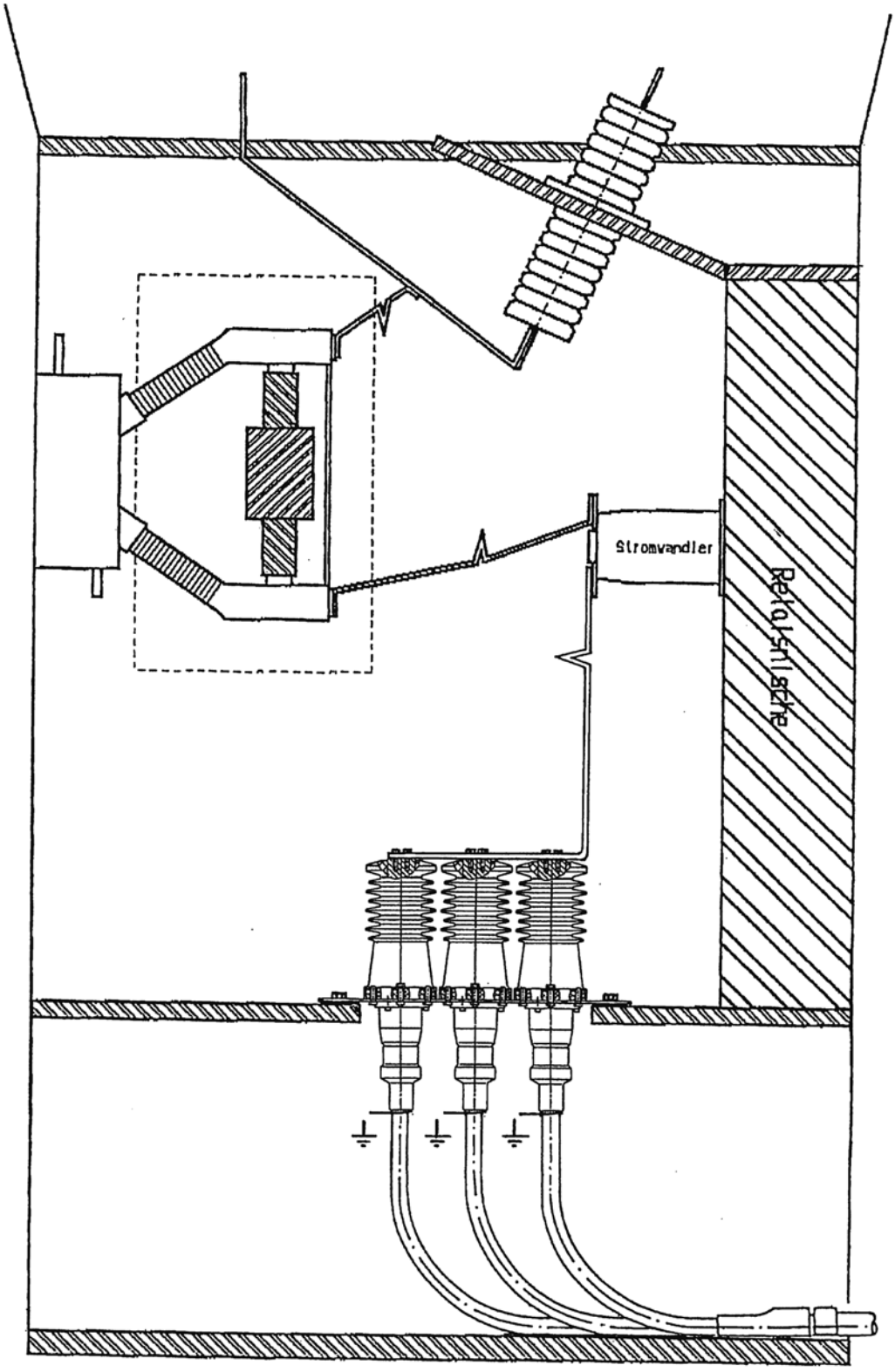
The size 3 appliance connecting isolators are suitable to be fitted to sheets that are 6 - 18 mm thick.

For indoor equipment
breaking force P_n = 10 kN
Creepage distance 740 mm
Suitable for outdoor use up to U_m = 24 kV



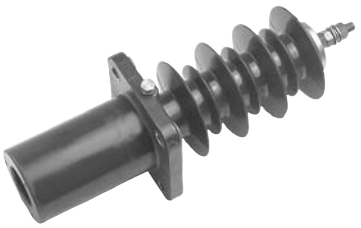
No.	Size	Max. operating voltage	Nominal current	Weight
		U_m (kV)	I_N (A)	(kg)
827 177 001	3	36	1250	17.6

MV-CONNEX Insulator up to 36 kV



MV-CONNEX Outdoor Insulators

For tower substations.



The outdoor insulator permits the transition from the overhead line to the metal-enclosed touchproof cable termination inside tower substations. This insulator is designed as a bushing insulator with integrated female contact part for CONNEX separable connectors. Linked to other metal-enclosed equipment such as

- CONNEX elbow adapters
- CONNEX separable connectors
- CONNEX transformer bushings
- transformer terminal clamps with covers
- metal-enclosed ring main units

the outdoor insulator offers the possibility of an absolutely intrinsically safe construction of tower substations. Cantilever strength Pn = 5 kN.

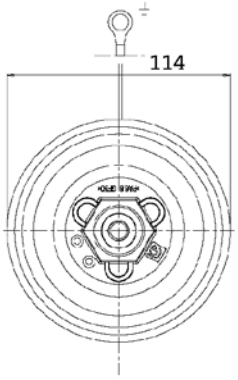
No.	Size	Max. operating voltage	Nominal current	Terminal pin	Weight	a	c	d	e
		U_m (kV)	I_N (A)		(kg)	(mm)	(mm)	(mm)	(mm)
827 173 002	2	24	800	M24	13.0	124	92	298	193

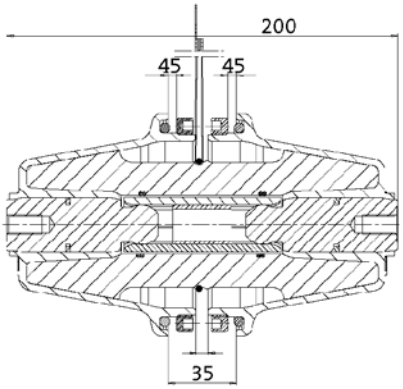
1 FLINK bus-bar Couple System

To connect (coupling) the bus-bar of SF_6-insulated switchgears.

2

3

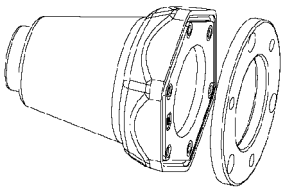


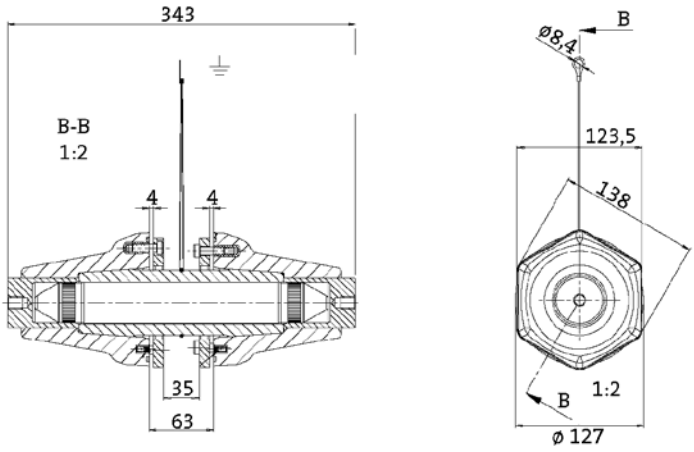


No.		Max. operating voltage U_m (kV)	Nominal current I_N (A)	Weight (kg)	Packing unit	
819 001 024	Coupling plug	24	630	0.8	1	1
839 001 024	Coupling plug	24	630	2.4	3	1
819 002 002	Bushing including sealing and securing ring	24	630	0.6	1	2
839 002 002	Bushing including sealing and securing ring	24	630	1.9	3	2
819 003 001	Dummy Plug	24	630	0.4	1	3
839 003 001	Dummy Plug	24	630	1.2	3	3

Bus-bar Couple System, Size 2 compatible

To connect (coupling) the bus-bar of SF_6-insulated switchgears.
Application only with CONNEX-bushings size 2 with voltage tap which must always be earthed!





No.		Size	Max. operating voltage U_m (kV)	Nominal current I_N (A)	Weight (kg)	Packing unit
839 005 001	CONNEX appliance connecting parts, with voltage tap, incl. fastening flange	2	42	800	6.4	3
839 004 003	Coupling plug, incl. ground wire	2	42	800	10.2	3

Dummy Cable Connector

for sealing and voltage-proof closing of CONNEX bushings

No.	Size	Max. operating voltage U_m (kV)		Weight (kg)	Packing unit
827 150 003	2	42	Dummy Plug	0.6	1

MV-CONNEX Branching System

Given the diminishing financial framework within which electricity companies are now forced to operate, the most important present-day requirements for any change or new investment in everyday operations are cost effectiveness and competitiveness.

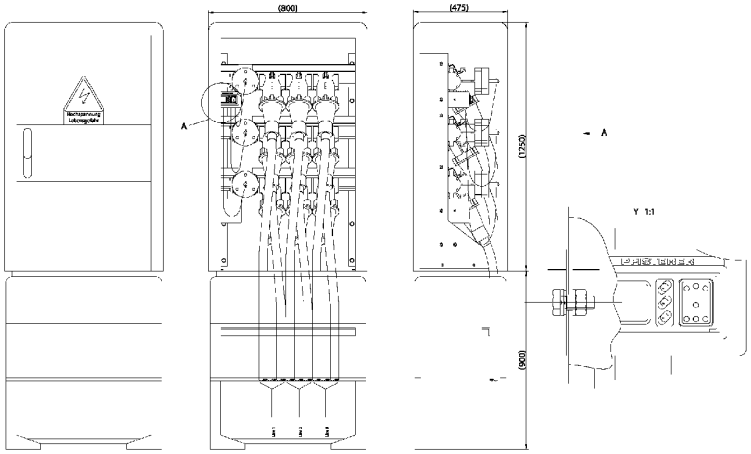
Instead of conventional shrink-fit or push- on sealing ends, pluggable, metal-clad cable connectors of the internal cone type have proved their worth in practice. Rather than expensive switching installations that require maintenance at specific intervals, an alternative is available in the form of branch joints of a size appropriate to the space available, e.g. from secondary substations with adequate space to connect and disconnect cables, to compact plastic housings for the retrospective connection of a tap line. The capacitive voltage tap at the cable connector provides for a reliable, continuous voltage indication at the site. Branch joints can be configured in a variety of ways, permitting adaption and expansion at any time. The use of silicone for insulating purposes and diecast aluminium for housings mean that they can be manufactured at low cost. Aluminium diecast housings are suitable for use outdoors and in cable shafts.

Here again, the comprehensive CONNEX product range, with test fittings, grounding and short-circuiting devices, and a voltage testing system, offers all the advantages of a pluggable, maintenance-free, shockproof, medium-voltage cable connection.

MV-CONNEX Branching System, Size 1, U_m = 24 kV, I_N = 630 A

Consisting

1 Unit	Metal frame
1 Unit	DSA-i3
3 Unit	Dummy-plug with voltage tap
3 Unit	4-way joints
1 Unit	KVS Polyester housing
1 Unit	Polyester base



No.	Size	Max. operating voltage U_m (kV)	Nominal current I_N (A)	Width (mm)	Height (mm)	Depth (mm)	Weight (kg)
827 219 002	1	24	630	800	1250	475	140.0

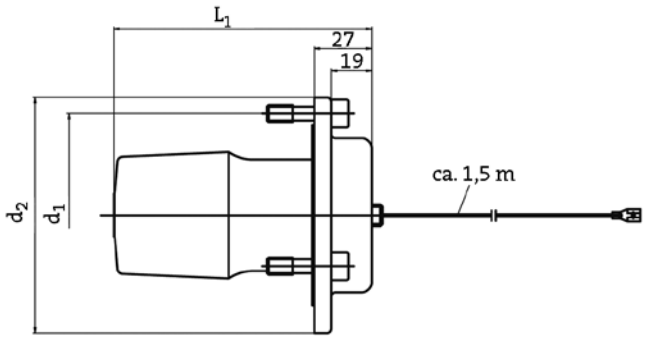
MV-CONNEX Branching System

Housing
Corrosion-resistant aluminium casting
Insulation:
Silicone rubber
Inner cone appliance connecting parts in accordance with EN 50180/50181(DIN 47637)

Possible applications and locations
Above ground:
in cable ducts,
in cable pits,
in plastic cabinets
Fastening:
on the wall,
on the ground,
on metal frames

Dummy Plug with Voltage Tap

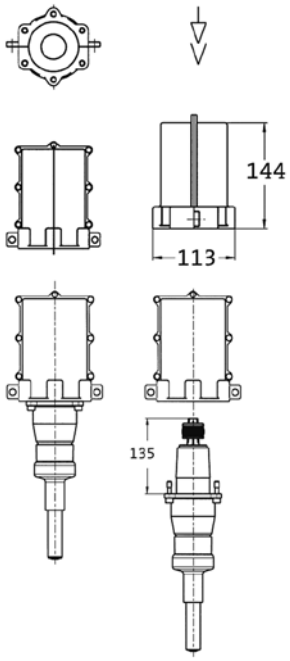
Flange
Corrosion resistant diecast aluminium
Insulation:
Silicone rubber acc.
EN 50180/50181 (DIN 47637)



No.	Size	Max. operating voltage U_m (kV)	l_1 (mm)	Dimension D1 d_1 (mm)	Dimension D2 d_2 (mm)	Weight (kg)
827 213 011	1	24	121	95	112	1.0
827 213 013	3	36	170	130	147	1.6

Blind Cap, Size 1

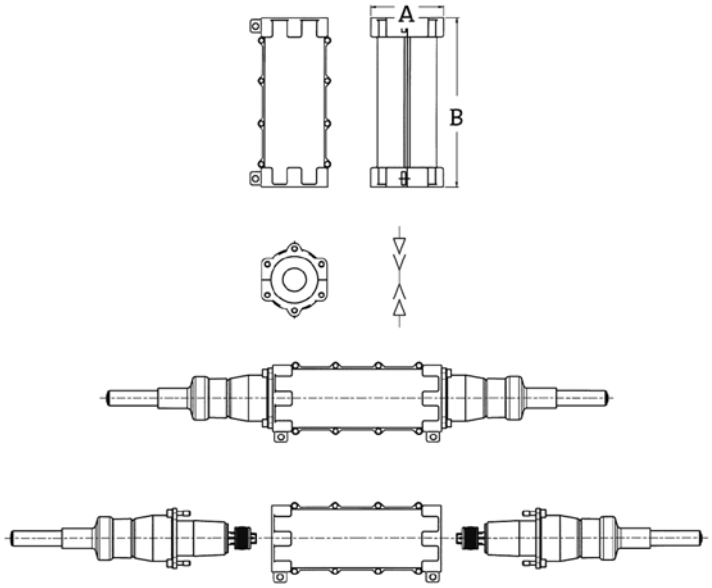
Housing
Corrosion-resistant diecast aluminium
Insulation:
Silicone rubber
Internal cone-type bushings acc.EN 50180/50181
(DIN 47637)



No.	Size	Max. operating voltage U_m (kV)	Nominal current I_N (A)	Weight (kg)
827 213 001	1	24	630	1.5

Cable Joint, Size 1

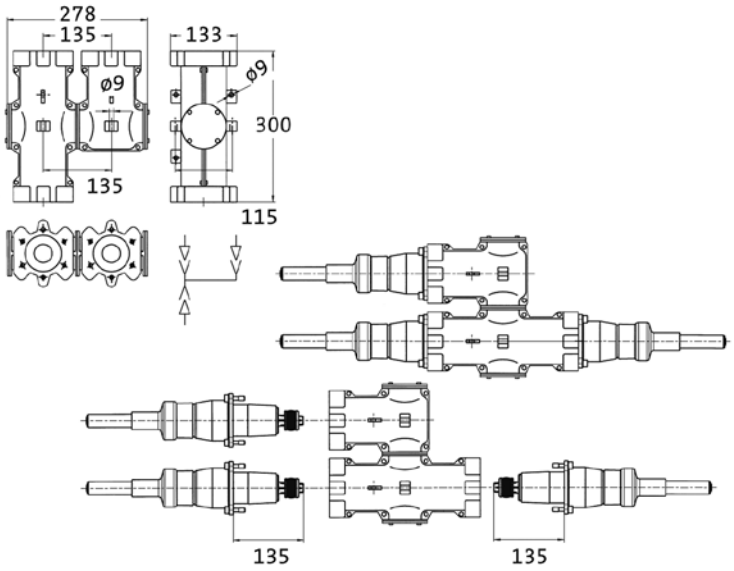
Housing
Corrosion-resistant diecast aluminium
Insulation:
Silicone rubber
Internal cone-type bushings acc. EN 50180/50181 (DIN 47637)



No.	Size	Max. operating voltage	Nominal current	a	b	Weight
		U_m (kV)	I_N (A)	(mm)	(mm)	(kg)
827 213 002	1	24	630	113	260	3.0

h-Joint, Size 1

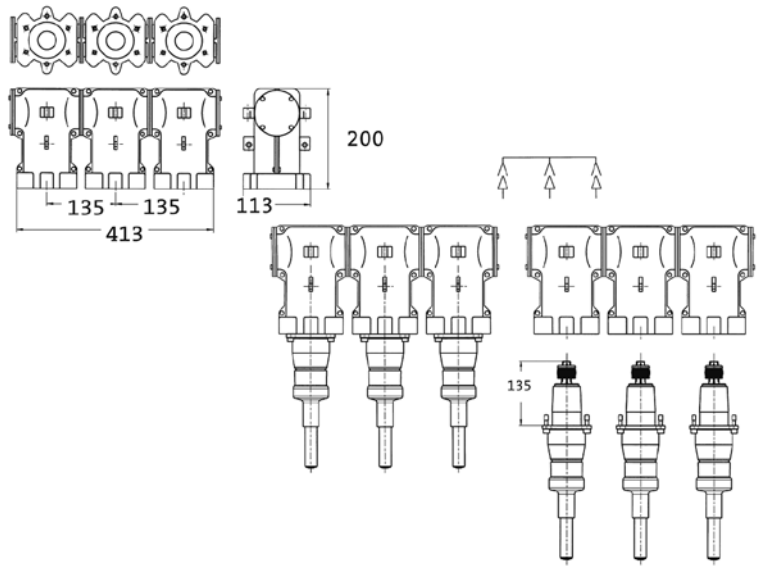
Housing
Corrosion-resistant diecast aluminium
Insulation:
Silicone rubber
Internal cone-type bushings acc. EN 50180/50181 (DIN 47637)



No.	Size	Max. operating voltage	Nominal current	a	b	c	d	Weight
		U_m (kV)	I_N (A)	(mm)	(mm)	(mm)	(mm)	(kg)
827 213 003	1	24	630	133	300	278	135	7.0

M-Joint, Size 1

Housing
Corrosion resistant diecast aluminium
Insulation:
Silicone rubber
Internal cone-type bushings acc. EN 50180/50181 (DIN 47637)



No.	Size	Max. operating voltage U_m (kV)	Nominal current I_N (A)	Weight (kg)
827 213 004	1	24	630	5.5

MV-CONNEX Cable Joints, up to 42kV

For above and below ground use.

Caution:

For use underground the flange bells for the cable connecting parts must be made of bronze.

Single-pole, resistant to outside air, soil-resistant, plug-in type.
The single-pole connection sleeve is supplied as factory-built; the contact bushings are integrated into the soil-resistant insulating body. The connection is established by inserting the CONNEX cable connecting part.
Cast shieldings guarantee short-circuit-resistant cable shielding.
*) The degree of soil sensitivity is reduced by the use of the shrink tubing for the CONNEX cable connecting parts. The shrink tubing is provided. 2

1 2

No.	Size	Max. operating voltage U_m (kV)	Type	Length (mm)	Diameter Ø (mm)	Weight (kg)	
827 222 001	2	42	not insulated against the soil	264	124	5.8	1
827 222 002	2	42	Not soil sensitive *	264	124	6.4	2

MV-CONNEX-T-joint

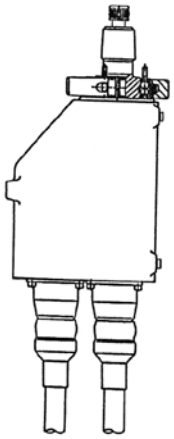
Single-pole, metal-encapsulated, resistant to outside air, soil-resistant.
The connection is established by inserting the CONNEX cable connecting part.
Cast shieldings additionally guarantee a short-circuit-resistant cable shielding connection.
In the event of network modifications, the underground T-sleeves can be replaced by CONNEX connecting sleeves.

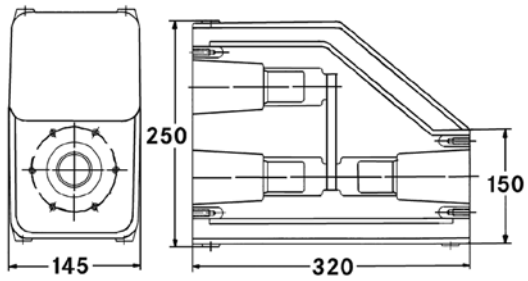
Using this T-sleeve and the CONNEX coupling connecting part, switching stations that are equipped with CONNEX appliance connecting parts can later be expanded to become twin connections. In addition, a plug-in cable branch wire can also be realised.

The single-pole T-sleeve is provided wired ready for connection. The CONNEX contact bushings are integrated in the soil-resistant insulating bodies.

1

2



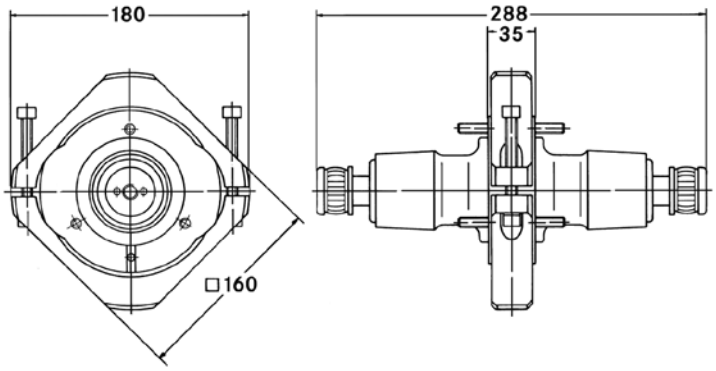


No.	Size	Max. operating voltage U_m (kV)	Nominal current I_N (A)	Type	Weight (kg)	
827 147 002	2	42	800	with metal housing, not soilproof	21.0	1
827 221 002	2	42	800	soilproof	17.6	2

MV-CONNEX Coupling Connector, up to 42 kV

For the coupling of equipment and switchgear. This coupling connector permits easy electric coupling of different components fitted with CONNEX bushings.

The metal flange assures that the mechanical connection of the two components is coupled at minimum distance.



No.	Size	Max. operating voltage U_m (kV)	Nominal current I_N (A)	Weight (kg)
827 138 002	2	42	800	4.2

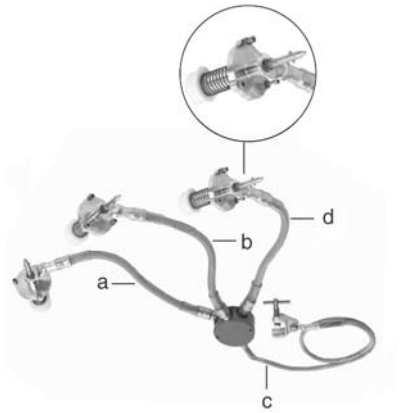
Earthing and Short-Circuiting Devices

These devices permit the grounding and short-circuitting of equipment fitted with CONNEX Bushings (e.g. switchgear, transformers) and cable, fittend with CONNEX Separable Connectors.

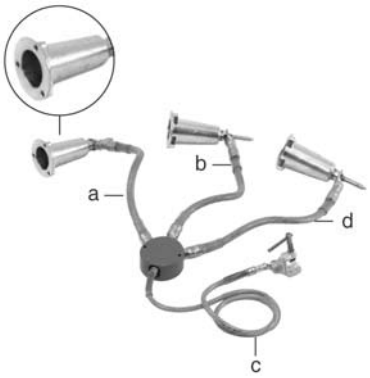
Earthing and Short-circuit device for CONNEX bushings

Earthing and Short-Circuiting Devices, three-pole, matching CONNEX separable connectors to EN 50180, EN 50181, DIN 47 637

Application:
Indoor and outdoor use



No.	Version	Size	Max. short-circuiting current I_k1s/kA	Cable cross section (mm²)	Cable length a/b/d/c (mm)	Conductor screw clamp	Earthing clamp
369 203 001	0164	1	29.5	150 / 50	600/600/600/1500	Connection for CONNEX-Bushing Size 1	E2
369 203 001	0180	2	29.5	150 / 50	600/600/600/1500	Connection for CONNEX-Bushing Size 2	E2
369 203 001	0146	3	29.5	150 / 50	600/600/600/1500	Connection for CONNEX-Bushing Size 3	E2



Earthing and Short-circuit device for CONNEX bushings

Earthing and Short-Circuiting Devices, three-pole, matching CONNEX Bushings to EN 50180, EN 50181, DIN 47 637
Application:
Indoor and outdoor use

No.	Version	Size	Max. short-circuiting current I_k1s/kA	Cable cross section (mm²)	Cable length a/b/d/c (mm)	Conductor screw clamp	Earthing clamp
369 203 001	0182	1	29.5	150 / 50	600/600/600/1500	Connection for CONNEX-Plug Size 1	E2
369 203 001	0221	2	29.5	150 / 50	600/600/600/1500	Connection for CONNEX-Plug Size 2	E2
369 203 001	0181	3	29.5	150 / 50	600/600/600/1500	Connection for CONNEX-Plug Size 3	E2

Tilting Operating Pole

Tilting Operating Pole for CONNEX earthing and short-circuiting devices (to be ordered separately).

No.	Length (mm)
827 137 001	513
827 148 001	1006

MV-CONNEX Surge Arrester

Scope of Application

CONNEX surge arresters are used for the protection of metal-enclosed switchgears and transformers equipped with plug-in type bushings acc.EN 50180 / 50181. The separable surge arrester is installed on the switchgear/transformer to prevent the intake of unduely high overvoltages. The surge arrester limits particularly those overvoltages that are produced by the reflection of traveling waves. **When using these surge arresters for switchgears/transformers connected to the transmission line via a cable route, it is necessary to protect the transition between the cable and the transmission line with suitable arresters. The capacity of protection is specially coordinated with the switchgear's resistance to surge voltages, considering at the same time the space arrangement and the level of electrical protection.**

Specifications

The Standards for surge arresters (DIN VDE 0675, Part 4/05.94 and IEC 99-4) are applicable to these devices. The dimensions of the plug-in termination system comply with EN 50180/EN 50181.

Design

The live part consists of metal oxide resistors without spark gap. The resistors possess a high thermal stability ensured by suitable dimensioning. These live parts are enclosed by a silicone rubber jacket that provides insulation against the metal housing.The corrosion-resistant aluminium housing renders the surge arrester intrinsically safe and thus assures optimal safety for operating personnel. The metal housing provides a hermetic sealing of the live parts against environmental influences, such as moisture or pollution. The plug-in connector is designed to fit the inside cone plug-in termination system acc. EN 50180/EN 50181. It is available in sizes 1, 2 and 3. The arrester is equipped with a corrosion-resistant fracture membrane that opens the arrester in case of an internal fault and allows a defined axial pressure relief on the bottom of the arrester without damaging the plug-in system.

Selection parameters

Selection of the Rated Voltage

The selection of the rated voltage depends on the maximum operating voltage of the system as well as on the type of neutral point. The selection is done in accordance with the following table, for example:

- U_m = 24 kV maximum permissible operating voltage of the installation
- Type of neutral point: insulated. According to the table below, the rated voltage of the arrester to be selected is U_r = 30 kV.

Note

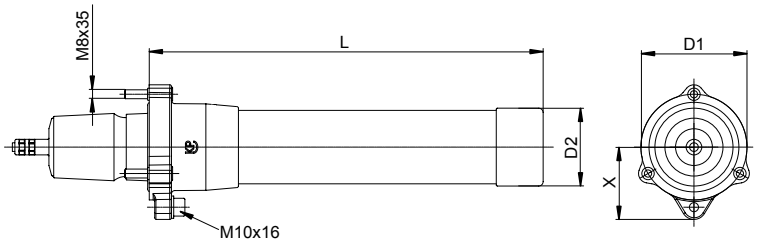
With compensated or insulated systems, the continuous voltage U_c of the arrester must be equal to the maximum operating voltage U_m. If the selected continuous voltage is too low, this can lead to a failure of the surge arrester.

Highest permitted rated voltage of the equipment (GIS/TRANSFORMER)	Rated voltage, insulated or compensated	Rated voltage, solidly earthed system (earth fault factor up to 1.7)
U_m (kV)	U_r (kV) / U_c (kV)	U_r (kV) / U_c (kV)
7.2	9 / 7,2	7,2 / 6
12	15 / 12	12 / 9,5
14.5	19 / 15	15 / 12
17.5	22 / 17,5	18 / 14
24	30 / 24	24 / 19
36	45 / 36	36 / 29
42	52 / 42	42 / 33

CONNEX Surge Arrester, 5 kA

Technical data:
Protection values for CONNEX overvoltage conductors
Rating U_r: 7.5 kV ... 52.5 kV
Continuous rating U_c: 6.0 kV ... 42 kV
Max. residual voltage U_{res} at 10 kA, 8/20µs: 21 kV ... 152 kV
Energy absorption capacity 2 kJ/kV_{Note}
Rated discharge surge current (peak value in kA, wave form) i_{sN}: 5 kA, 8/20µs
High peak current i_{sh}: 65 kA, 4/10µs
Long-wave peak current (peak value in A, square wave) i_{sl}: 150 A; 2000µs
Short-circuit withstand current (root mean square value in kA) 16 kA; 0,2s

The conductor contact takes place via the contact part (line contact) that is linked to the conductor stack via a crimped sleeve and a strand.

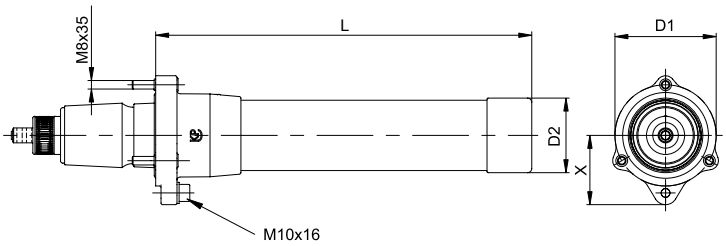


No.	Size	Max. rated voltage	Max. continuous rating	Weight	Surge arrester length when fitted	Surge arrester diameter
		U_r (kV)	U_c (kV)	(kg)	L (mm)	X (mm)
827 511 075	1	7.5	6	3.5	350	65
827 511 090	1	9	7	3.5	350	65
827 511 125	1	12.5	10	3.5	350	65
827 511 150	1	15	12	3.5	350	65
827 511 175	1	17.5	14	3.5	350	65
827 511 190	1	19	15	3.5	350	65
827 511 215	1	21.5	17	3.5	350	65
827 511 240	1	24	19	3.5	350	65
827 511 300	1	30	24	3.5	350	65
827 511 360	1	36	29	3.5	350	65
827 521 075	2	7.5	6	3.7	350	65
827 521 090	2	9	7	3.7	350	65
827 521 125	2	12.5	10	3.7	350	65
827 521 150	2	15	12	3.7	350	65
827 521 175	2	17.5	14	3.7	350	65
827 521 190	2	19	15	3.7	350	65
827 521 215	2	21.5	17	3.7	350	65
827 521 240	2	24	19	3.7	350	65
827 521 300	2	30	24	3.7	350	65
827 521 360	2	36	29	3.7	350	65
827 525 450	2	45	36	4.4	500	65.5
827 525 525	2	52.5	42	4.4	500	65.5
827 535 150	3	15	12	4.4	490	79.5
827 535 240	3	24	19	4.4	490	79.5
827 535 300	3	30	24	4.4	490	79.5
827 535 360	3	36	29	4.4	490	79.5
827 538 450	3	45	36	4.4	490	79.5
827 538 525	3	52.5	42	4.4	490	79.5

CONNEX Surge Arrester, 10 kA

Technical data:
Protection values for CONNEX overvoltage conductors
Rating U_r: 7.5 kV ... 52.5 kV
Continuous rating U_c: 6.0 kV ... 42 kV
Max. residual voltage U_{res} at 10 kA, 8/20µs: 21 kV ... 152 kV
Energy absorption capacity 2 kJ/kV_{Note}
Rated discharge surge current (peak value in kA, wave form) i_{sN}: 10 kA, 8/20µs
High peak current i_{sh}: 65 kA, 4/10µs
Long-wave peak current (peak value in A, square wave) i_{si}: 250 A; 2000µs
Short-circuit withstand current (root mean square value in kA) 16 kA; 0,2s

The conductor contact takes place via the contact part (line contact) that is linked to the conductor stack via a crimped sleeve and a strand.

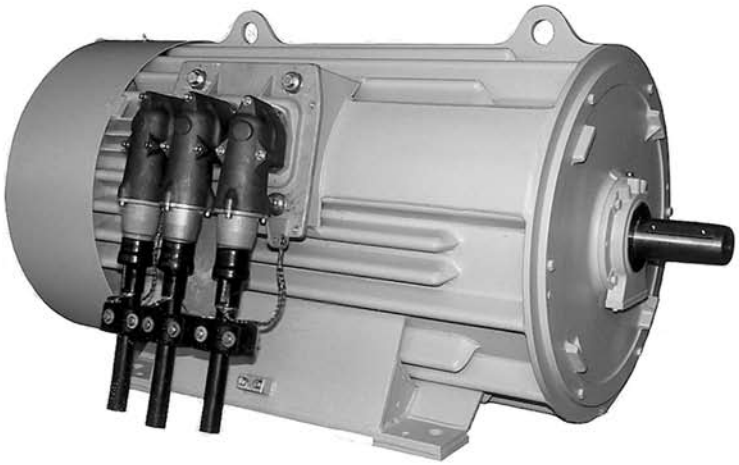


No.	Size	Max. rated voltage	Max. continuous rating	Weight	Surge arrester length when fitted	Surge arrester diameter
		U_r (kV)	U_c (kV)	(kg)	L (mm)	X (mm)
827 513 075	1	7.5	6	3.5	350	65
827 513 090	1	9	7	3.5	350	65
827 513 125	1	12.5	10	3.5	350	65
827 513 150	1	15	12	3.5	350	65
827 513 175	1	17.5	14	3.5	350	65
827 513 190	1	19	15	3.5	350	65
827 513 215	1	21.5	17	3.5	350	65
827 513 240	1	24	19	3.5	350	65
827 513 300	1	30	24	3.5	350	65
827 513 360	1	36	29	3.5	350	65
827 523 075	2	7.5	6	3.7	350	65
827 523 090	2	9	7	3.7	350	65
827 523 125	2	12.5	10	3.7	350	65
827 523 150	2	15	12	3.7	350	65
827 523 175	2	17.5	14	3.7	350	65
827 523 190	2	19	15	3.7	350	65
827 523 215	2	21.5	17	3.7	350	65
827 523 240	2	24	19	3.7	350	65
827 523 300	2	30	24	3.7	350	65
827 523 360	2	36	29	3.7	350	65
827 527 450	2	45	36	4.4	500	65.5
827 527 525	2	52.5	42	4.4	500	65.5
827 537 150	3	15	12	4.4	490	79.5
827 537 240	3	24	19	4.4	490	79.5
827 537 300	3	30	24	4.4	490	79.5
827 537 360	3	36	29	4.4	490	79.5
827 539 450	3	45	36	4.4	490	79.5
827 539 525	3	52.5	42	4.4	490	79.5

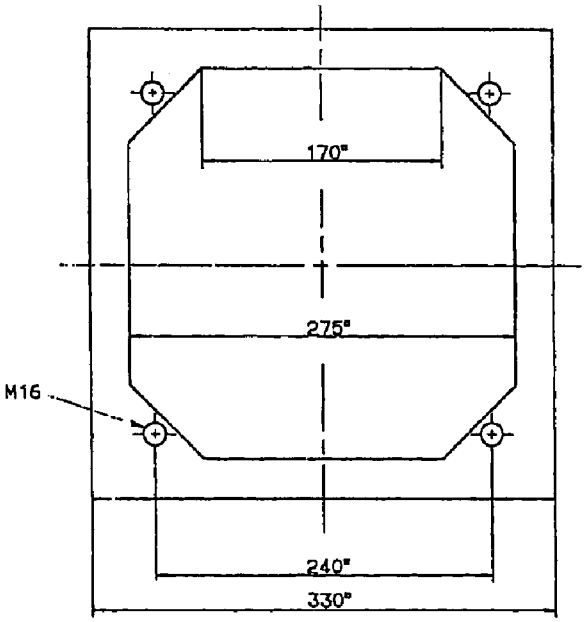
CMA/CMS-System for High Voltage Motors

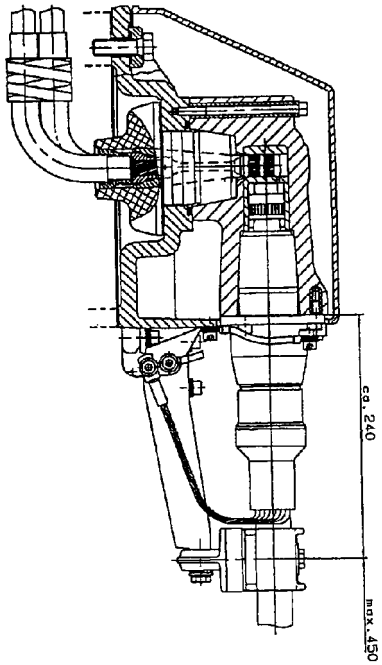
Special features

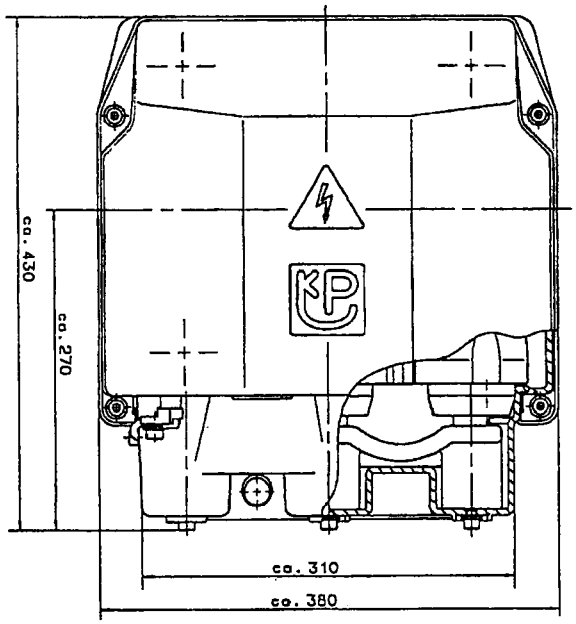
- metal-enclosed
- fully-insulated
- touchproof
- high short-circuit protection
- suitable for outdoor use
- separable into two parts
- degree of protection IP 66
- up to 11 kV E Exe

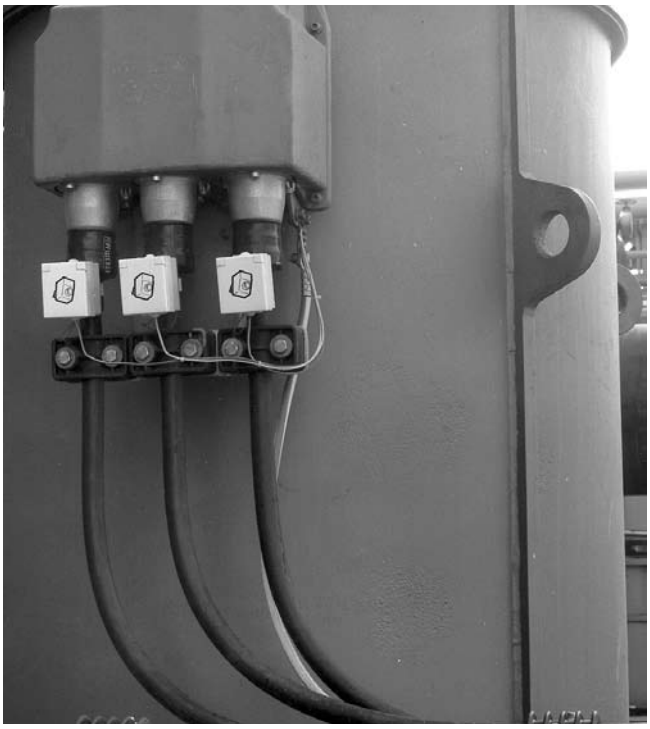


CMA/CMS-System for High Voltage Motors









CMA CONNEX Motor Connector

The CMA CONNEX Motor Connector permits the simple and quick connection of high-voltage motors, providing at the same time a completely metal-enclosed and intrinsically safe connector area.
The system is easily connected instead of the motor terminal box. It permits quick start-up and quick motor change in operation.

No.	Nominal voltage (kV)	Rated short-time withstand current 1 s (kA)		Weight (kg)
827 670 003	11	40	EExe	32.6
827 670 002	13.8	40	-	33.5

CMS CONNEX Motor Star Point Connector

The CMS-CONNEX Star Point Connector allows a simple and quick metal-enclosed and dead front safe star point connection. Thereby, the on-site change from the connecting side to the star-point side of the motor can occur easily. Interchangeability of cable connection and star point (outlet) on the HV motor.

No.	Nominal voltage (kV)		Weight (kg)
827 671 001	11	EExe	35.2

Assembly Accessories

Assembly Tools for Motor Connector

consisting of:
assembly jig; drawing device; soldering device; assembly rods

No.
827 154 001

Disassembly Bridge and Assembly Lever

for Motor Connector and Star Point Bridge

No.
827 154 002

Voltage Detecting Systems

The absence of voltage on metal-enclosed switchgears and transformers equipped with plug-in type touch-proof cable terminations is verified by a test with a capacitive voltage divider and a continuous voltage indicator.The HR-and LR-systems have been defined in Specification DIN VDE 0682 Part 415. The HR-system (high-resistance system) has a specified load capacitance of 88 pF (X_{Cmin} =2 MΩ), a threshold voltage of 90 V and a threshold current of 2.5 µA. The LR- system (low-resistance system) has a specified load capacitance of 1592pF (X_{Cmin} =2 MΩ), a threshold voltage of 5 V, and a threshold current of 2.5 µA.

The capacitive coupling electrodes can be integrated into all sorts of medium voltage components: post-type insulators, transducers, bushings, Duresca busbars, outside cone and inside cone cable terminations. Even gas-insulated switchgear installations for ratings of 110 kV are already provided with the integrated continuous voltage indicating system (DSA). The size of the coupling electrode and the use of 12/20 kV cables in 10 kV networks show the physical limits of the capacitive coupling out inside the cable connector, i.e.coupling capacity as a function of voltage and cross section of approx. 1 to 5 pF.The integration of the coupling capacitance inside the CONNEX bushing allows coupling capacitances of up to approx. 16 pF. These ensure a reliable voltage indication not depending on the cross section and, to a large extent, also not depending on the voltage.

Voltage Detecting Systems HR

When determining the measuring circuit the connection of the measuring line to the coupling electrode must also be taken into account. Due to the high required insulating strength, mechanically sealed screw connections and shrink-fit blade terminal systems have become widely used. The modular design of the measuring point module, in which the measuring line and the interface have been combined to form one unit, guarantees a high level of insulation. This makes assembly cost-efficient, easy to handle and safe.

As capacitive dividers for the HR system, PFISTERER supplies CONNEX cable connecting parts and CONNEX appliance connecting parts with an integrated voltage tap. Divider supports and coated converters are used together with these as coupling parts. PFISTERER supplies the right solution for every application concerning for connecting to capacitive dividers. The measuring point module is the most advanced and assembly-friendly alternative. A measuring and testing strip and dynamometer complete the range and, since the introduction of the continuous rating indicator, they have proven their worth more than one hundred thousand times in practice.

HR-Test Point Module

Integration of measuring circuit components, overvoltage protection and timesaving installation are characteristic features of the test point modules.

No.	Capacity (nF)	Length (mm)	Surge arrester in all modules
827 022 012	450	4500	-
827 022 011	660	6600	-

Interfaces and Connecting Leads
Three-Pole Interface with HR-System Accessories

Measuring and testing block with safety socket and earth socket

Note
In accordance with the latest standards, interfaces with measuring and testing block or with test sockets require a pre-determined voltage safety limit, e.g. a surge arrester No. 961 011 002

The interfaces and terminals on the coupling element as well as the predetermined voltage safety limit must be protected against humidity.

No.
560 915 001

HR-Test socket

Single-Pole Interface
The test socket allows for an additional voltage indication in the cable terminal compartment of a switchgear or in the cable termination area of a transformer.

Note
In accordance with the latest standards, interfaces with measuring and testing block or with test sockets require a pre-determined voltage safety limit, e.g. a surge arrester No. 961 011 002

The interfaces and terminals on the coupling element as well as the predetermined voltage safety limit must be protected against humidity.

No.
827 668 001

Continuous Voltage Indicator DSA-2

The DSA-2 voltage indicator permits detection of the absence of voltage on capacitively coupled-out voltages. The indicator can either be built permanently into the switchgear or used.

Special Features

- No external power supply required
- Voltage indication by flashing LED
- Fully-insulated system (IP66) of impactresistant plastic with cast-on CEE plug connector
- Function test on 230 V AC mains power outlet
- In-service test to VBG4 with EURO-Test HR
- Suitable for all climatic zones
- Certified safety („GS“-tested)

No.
827 161 005

EURO-Test HR

The EURO-Test HR permits a function test of the continuous voltage indicator DSA-2 for capacitively coupled out voltages in accordance with DIN VDE 0682, Part 415, on a mains power outlet. The check of the continuous voltage indicator is effected by simulation of the minimum thresholds of 2.5 µA and 90 V, as specified in the standard. The EURO-Test HR is used for in-service tests in accordance with VBG4. The proper functioning of the LED must be ensured by testing the device on a mains power outlet.

No.	Min. threshold voltage U_{tmin} (V)	Min. threshold current I_{tmin} (µA)	Operation temperature (°C)	Standby indication
827 160 001	90	2.5	-25 ... +55	LED

Test Point Modules LRM

Integration of measuring circuit components, overvoltage protection and time-saving installation are characteristic features of the test point modules.
Special variants of LRM test point modules as per customer's request.

No.	Capacity (nF)	Length (mm)	Surge arrester in all modules
827 027 008	3.6	3000	3,3nF
827 027 009	10.3	3000	10nF
827 027 018	0.67	6600	-
827 027 038	0.67	6600	-
827 027 036	3.9	6600	3,3nF
827 027 005	3.97	6600	3,3nF
827 027 040	3.97	6600	3,3nF
827 027 042	3.97	6600	3,3nF
827 027 006	10.7	6600	10nF
827 027 016	10.7	6600	10nF
827 027 026	10.7	6600	10nF
827 027 041	10.7	6600	10nF

Continuous Voltage Indicator DSA-LRM

The DSA-LRM permits detection of the absence of voltage on capacitively coupled out voltages. The indicator can either be built permanently into the switchgear or used as mobile device.

Special Features

- No external power supply required
- Voltage indication by flashing LED
- Fully insulated system (IP 66) of impact-resistant plastic
- Integrated connector pins, sealed on the interface side
- In-service test to VBG4 with EURO-Test LRM
- Suitable for all climatic zones

No.
827 020 001

EURO-Test LRM

The EURO-Test LRM permits a function test of the continuous voltage indicator DSA-LRM for capacitively coupled out voltages acc. DIN VDE 0682, Part 415, on a mains power outlet.
The check of the continuous voltage indicator is effected by simulation of the specified minimum thresholds of 2.5 µA and 5 V. The EURO-Test LRM is used for in-service tests in accordance with VBG4.

No.	Min. threshold voltage U_{tmin} (V)	Min. threshold current I_{tmin} (µA)	Operation temperature (°C)	Standby indication
827 160 003	5	2.5	-25 ... +55	LED

DSA-i3 Integrated Voltage Detecting System

The DSA-i3 integrated voltage testing system fulfills present day requirements for maintenance-free, cost-effective and reliable voltage indicating system, and meets the requirements specified in DIN VDE 0682, part 415, respectively IEC 61243-5.

It features a clear voltage display DSA-i3 (red LCD). It is also equipped with test sockets for phase comparison. A third socket permits the display itself to be easily checked for reliability.

Special Features

- No external power supply required
- Integrated voltage limiting device
- Easy installation
- No in-service test required

No.	Nominal frequency f_N (Hz)	Threshold voltage (V)	Type of protection	Input impedance (MΩ)	Operation temperature (°C)
827 216 003	50...60	4...5 V	IP 66	2	-25 ... +55

Additional Capacity for DSA-i3

No.	Version	Circuit board	Additional capacity (pF)
827 216 003	2	980 026 001	470 pF
827 216 003	3	980 026 002	2200 pF
827 216 003	4	980 026 003	3300 pF
827 216 003	5	980 026 004	10000 pF

Installation Bracket

No.
993 008 002

Electronic Phase Comparer EPV

The universal phase comparer with integrated test leads permits phase comparison and voltage detection on capacitively tapped test voltages.
The electronic phase comparer EPV is used for HR and LRM systems.

Special Features

- Touchproof testing
- Function test and battery check with integrated self-test
- Voltage detection
- Active phase indication by two LEDs: (green=phase balance; red=phase unbalance)
- Interface control

No.	Scope of application	With 2 HR-adapter	Nominal frequency	Phase indication (phase balance)	Phase indication (phase unbalance)	Duration of standby state	Operation temperature	Batteries	Current consumption during operation	Current consumption after switching off	Dimensions of carrying case (length/ width/ height)
			f_N (Hz)			(min)	(°C)		(mA)	(µA)	(mm)
827 189 007	LRM system	HR system	50...60	< 15°;	> 60°;	3	-25 ... +55	4 x IEC LR6 1,5 V	< 60	< 5	300 x 110 x 70

HR-System Testers

Testing kit for the repeated inspection of indicators and interfaces in accordance with DIN VDE 0682 T 415 (VBG 4)

A qualitative check of the interfaces is carried out by means of the MP test and a multimeter. Due to the high output impedance of the interfaces it is not possible to directly measure the voltage. A reliable check of the interfaces is carried out by means of the MP test.

During the check the short-circuit current and the load current are measured under rated operating conditions. This testing kit can be put together in a number of ways. With the full set of equipment, all systems supplied by PFISTERER can be tested for HR and LRM.

Complete testing kit comprising
case, multimeter, MP test, HR EURO test, LRM EURO test
No. 827 092 002

Index

9

CABLE JOINTS, CABLE TERMINATIONS, CABLE GLANDS, CABLE CLEATS
FEEDER PILLARS, FUSE LINKS, ARC FLASH, CABLE ROLLERS, CUT-OUTS

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