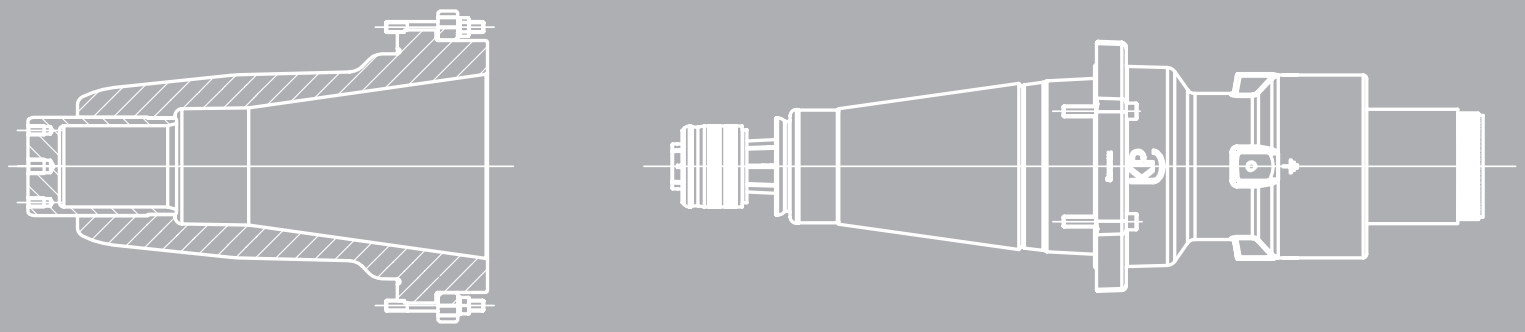
PFISTERER



EDITION 2012

CABLE SYSTEMS

Cable fittings for high voltage networks

THORNE & DERRICK INTERNATIONAL

Thorne & Derrick
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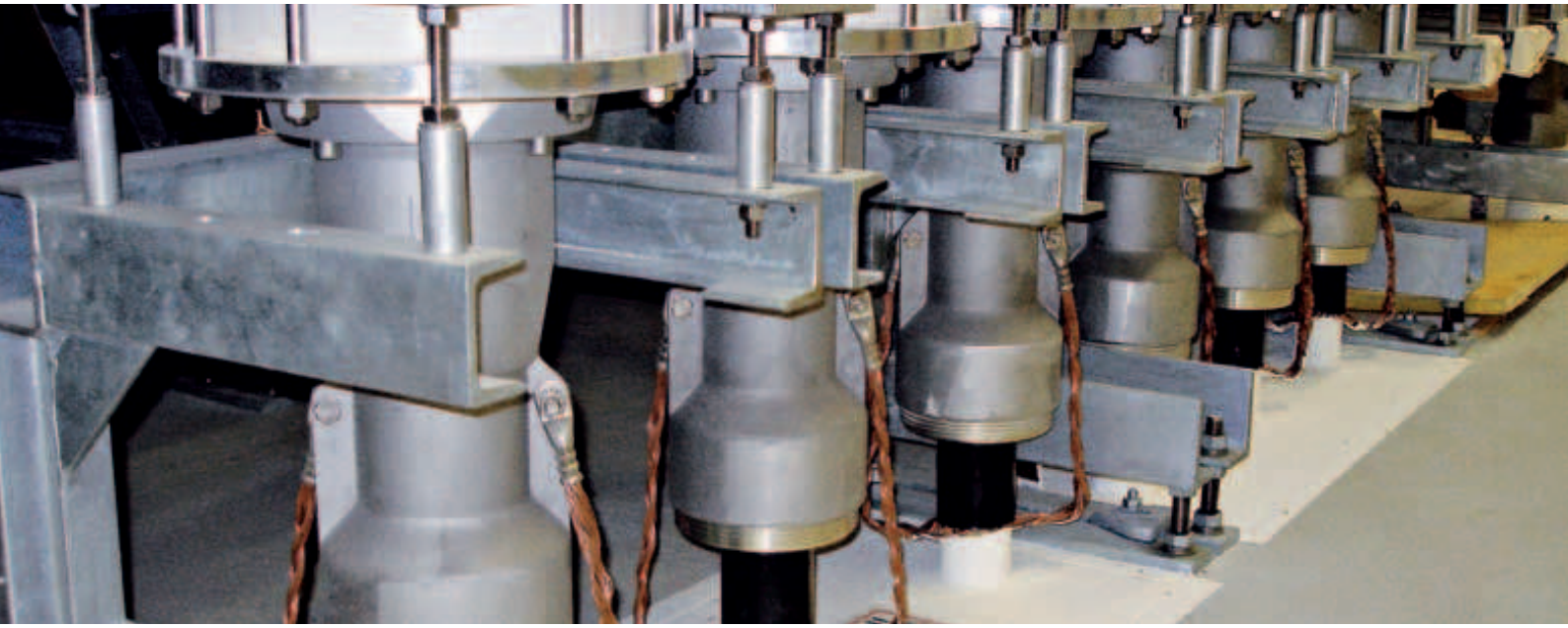
THE POWER CONNECTION

CABLE SYSTEMS | COMPONENTS | OVERHEAD LINES | RAILWAY CATENARY SYSTEMS



Welcome to the CABLE SYSTEMS Centre of Competence.

Our range of cable accessories offers solutions for virtually all applications in the area of high-voltage engineering up to 300 kV. All accessories use silicone rubber as insulating medium because of its outstanding properties. We offer components and complete systems, as well as worldwide installation and advisory services:

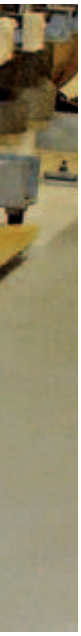
HV-CONNEX. A Dry, Separable Connector System for High-Voltage Networks.

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 CONNEX can be used even in the most extreme conditions.

HV-CONNEX components for high-voltage systems up to 245 kV 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.

IXOSIL. Cable Terminations.

The extensive range of terminations will handle almost all applications. The silicone rubber insulating medium enables IXOSIL products to be ideally suited for outdoor use. Self-supporting oil-filled terminations are available with silicone rubber coated or porcelain housings. Special designs for indoor use complete the product range.



IXOSIL. Slip-on Joints.

IXOSIL silicone rubber joints can be used to join all XLPE and EPR insulated cables within the range of 72.5 – 300 kV. Two designs are available: the compact one piece version, and a three piece version for connecting cables with different shielding and cross sections. Joints can be used on either aluminum or copper cables.

IXOLINE. Factory-Assembled Cables Ready-to-Use.

IXOLINE finished cable sections come with IXOSIL and / or CONNEX terminations. No special tools are required for installation. Result: increased efficiency, reduced installation time, lower costs.

Silicone – a Key Material in High-Voltage Engineering.

Silicone rubber is the perfect material for cable terminations. Water, dirt, grease and oil resistant, completely maintenance free, shock resistant and unbreakable; it is far superior to traditional materials such as porcelain. When used as a stress relief device in sealed applications, silicone performs much better than harder materials such as EPDM because it helps to even out temperature variations and unevenness in the cable surface. Silicone helps to prevent air gaps, and therefore dangerous partial discharges are avoided. PFISTERER takes extensive advantage of using advanced LSR (liquid silicone rubber) designs, and special variations are designed using RTV (room temperature vulcanizing silicone).

Worldwide Installation Services.

The installation of high voltage components requires extensive knowledge and care. We share our know-how with our customers in training courses based on practical applications. If requested by the customer, we can perform installations anywhere in the world.

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IXOSIL Slip-on Joints

IXOSIL slip-on joints mainly consist of pre-fabricated silicone rubber parts. This ensures reliable and efficient connection of two polymer insulated high voltage cables (VPE, EPR). The well proven slip-on system ensures minimum installation time and maximum operational reliability. The tested material conforms to all electrical, mechanical and thermal requirements for rebuilding cable insulation. The IXOSIL slip-on joint is available in a one-piece or a three-piece version and can be used to connect both copper and aluminium cables. Several versions of the two joint designs are available which differ in terms of the combination of screen treatment, water diffusion barrier, mechanical protective enclosure and other features as listed below.

Screen treatment
Type designation DO: Straight through connection of cable screen
Type designation DE: Straight through connection of cable screen with additional earthing
Type designation XL: Screen cross-bonding with 2 single bonding cables
Type designation XK: Screen cross bonding with 1 concentric bonding cable

Water diffusion barrier
Type designation F: Aluminium foil water diffusion barrier
Type designation M: Copper tube water diffusion barrier

Protective enclosure
Type designation S: Heat-shrinkable sleeve
Type designation R: Glass fibre-reinforced, heat-shrinkable sleeve
Type designation G: glass fibre-reinforced protection box

Fibre optics and/or PD sensor
Type designation OP: Integrated fibre optic splice box
Type designation TE: Integrated partial discharge sensor
Type designation TEOP: Integrated fibre optic splice box and partial discharge sensor

Detailed information regarding the type designation is required when placing your order.

One-piece Slip-on Joint

The one-piece MSA slip-on joint is available for voltages from 72.5 kV to 300 kV. Thanks to the one-piece design, the joints are extremely compact in size. The space required in a joint bay is therefore reduced to a minimum. Each size of silicone body covers a wide range of cable insulation diameters.

Materials:
Joint body: Silicone rubber

Conductor connection:
Compressed or screwed

Note:
The weight depends on the diameter over cable insulation and the joint design. The joints are tailored according to customer specifications; detailed technical data and dimensioned drawings are therefore available on request.

Max. operating voltage	Standards	Rated voltage	Rated lightning impulse withstand voltage (BIL)	Partial discharge measurement	Conductor cross-section area	Diameter across cable insulation (prepared)
U_m (kV)		U (kV)	(kV)	(pC)	(mm^2)	(mm)
72.5	IEC60840	60 - 69	325	< 5	150 - 2000	37 - 87
123	IEC60840	110 - 115	550	< 5	240 - 2500	46 - 122
145	IEC60840	132 - 138	650	< 5	240 - 2500	46 - 122
170	IEC60840	150 - 161	750	< 5	240 - 2500	52 - 122
245	IEC62067	220 - 230	1050	< 5	240 - 2500	69 - 122
300	IEC62067	275 - 287	1050	< 5	240 - 2500	72 - 122

Three-piece Slip-on Joint

The three-piece MSA slip-on joint is available for voltages from 72.5 kV to 170 kV. The well known and tested three-piece design of this joint enables cables of different types and dimensions to be connected. For example, a 630 mm^2 EPR cable can be connected to a 500 mm^2 VPE cable.

Materials:
Joint body: Silicone rubber

Conductor connection:
Compressed or screwed

Note:
The joints are tailored according to customer specifications; detailed technical data and dimensioned drawings are therefore available on request.

Max. operating voltage	Standards	Rated voltage	Rated lightning impulse withstand voltage (BIL)	Partial discharge measurement	Conductor cross-section area	Diameter across cable insulation (prepared)
U_m (kV)		U (kV)	(kV)	(pC)	(mm^2)	(mm)
72.5	IEC60840	60 - 69	325	< 5	on request	on request
123	IEC60840	110 - 115	550	< 5	on request	on request
145	IEC60840	132 - 138	650	< 5	on request	on request
170	IEC60840	150 - 161	750	< 5	on request	on request

Outdoor Cable Termination (Composite)

ESS terminations are available for a voltage range from 72.5 kV to 300 kV with various creepage distances. A glass fibre reinforced tube equipped with silicone sheds provides the highest degree of mechanical strength. The ESS is filled with an insulating compound. An easy-to-fit head armature and a high quality stress control unit completes the ESS as a maintenance-free system.

Material:
Insulator: composite hollow insulator (silicone-sheded FRP tube)
Material of the control unit: silicone rubber

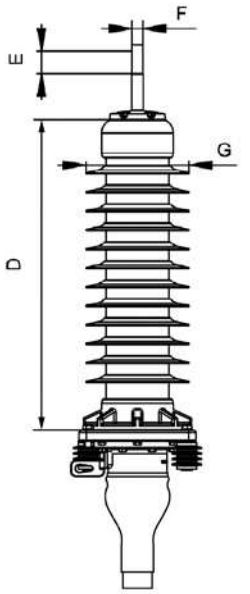
Conductor connection:
compressed or screwed

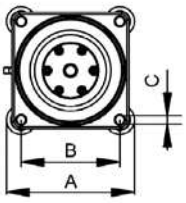
Optional accessories:
Earthing set

Note:
Optional material is not within scope of supply and has to be ordered seperately.
Technical data for conductor cross section 2.500 mm² up on request.
Dimensions in parentheses in the following product tables can be inquired separately.

Max. operating voltage	**U_m (kV)**	72.5	123	145	170	245	300
Standards		IEC60840 IEC60815	IEC60840 IEC60815	IEC60840 IEC60815	IEC60840 IEC60815	IEC62067 IEC60815	IEC62067 IEC60815
Rated voltage	**U (kV)**	60 - 69	110 - 115	132 - 138	150 - 161	220 - 230	275 - 287
Rated lightning impulse withstand voltage (BIL)	**(kV)**	325	550	650	750	1050	1050
Partial discharge measurement	**(pC)**	< 5	< 5	< 5	< 5	< 5	< 5

ESS72

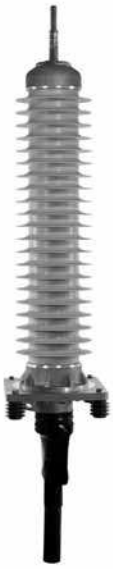


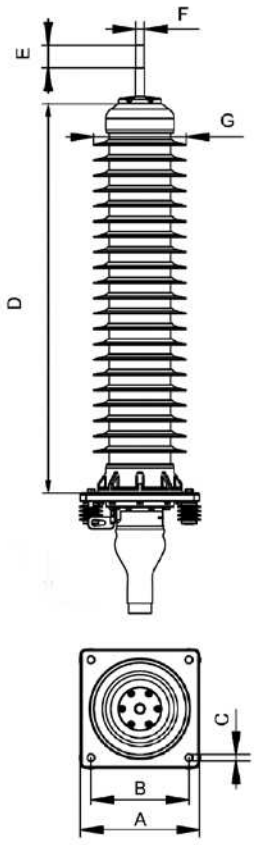


Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Max. diameter across cable outer sheath	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(mm)	(kg)	(mm)		(mm/kV)
ESS72-C19	150 - 2000	37 - 84	120	40.0	1813	3	25
ESS72-C23	150 - 2000	37 - 84	120	42.0	2248	4	31

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
ESS72-C19	320 (420)	270 (345)	19	850	100	30,40,50	282
ESS72-C23	320 (420)	270 (345)	19	850	100	30,40,50	282

ESS123

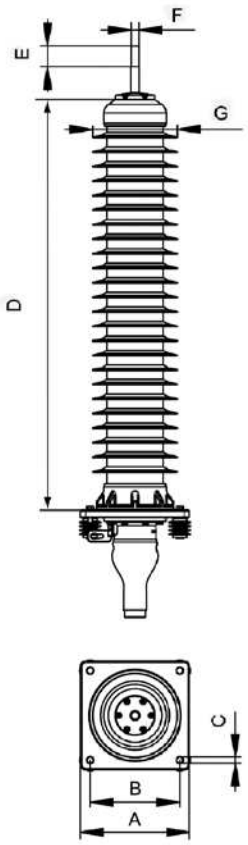




Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Max. diameter across cable outer sheath	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(mm)	(kg)	(mm)		(mm/kV)
ESS123-C31	150-1600	42 - 99	120	95.0	3075	3	25
ESS123-C34	150 - 2500	42 - 118	170	120.0	3383	3	25
ESS123-C39	150-1600	42 - 99	120	100.0	3813	4	31
ESS123-C42	150 - 2500	42 - 118	170	125.0	4194	4	31

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
ESS123-C31	420 (320, 500)	345 (270, 400)	19	1370	100	30,40,50	326
ESS123-C34	420 (500)	345 (400)	19	1380	100	30,40,50	376
ESS123-C39	420 (320, 500)	345 (270, 400)	19	1370	100	30,40,50	326
ESS123-C42	420 (500)	345 (400)	19	1380	100	30,40,50	416

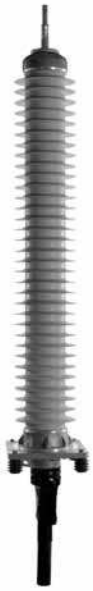
ESS145

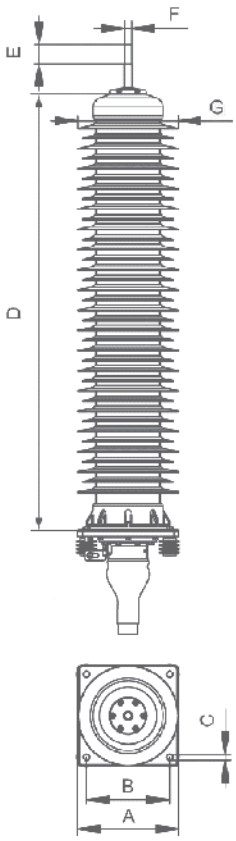


Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Max. diameter across cable outer sheath	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(mm)	(kg)	(mm)		(mm/kV)
ESS145-C37	150-1200	46 - 84	120	111.0	3625	3	25
ESS145-C40	150 - 2500	46 - 118	170	128.0	3989	3	25
ESS145-C45	150-1200	46 - 84	120	118.0	4495	4	31
ESS145-C50	150 - 2500	46 - 118	170	144.0	4945	4	31
ESS145-C72	150 - 2500	46 - 118	170	206.0	7178	-	45
ESS145-C74	150 - 1200	46 - 84	120	125.0	7350	-	50
ESS145-C88	150 - 2500	46 - 118	170	210.0	8773	-	55

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
ESS145-C37	420 (320, 500)	345 (270, 400)	19	1580	100	30,40,50	326
ESS145-C40	420 (500)	345 (400)	19	1590	100	30,40,50	376
ESS145-C45	420 (320, 500)	345 (270, 400)	19	1580	100	30,40,50	326
ESS145-C50	420 (500)	345 (400)	19	1590	100	30,40,50	416
ESS145-C72	500 (420, 600)	400 (320, 500)	19	2200	100	30,40,50	416
ESS145-C74	500 (420)	400 (345)	19	1830	100	30,40,50	326
ESS145-C88	500 (420, 600)	400 (345, 500)	19	2200	100	30,40,50	416

ESS170

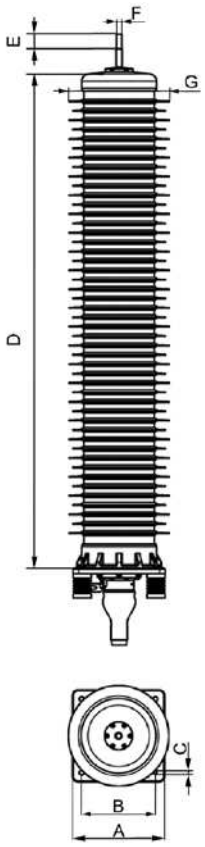


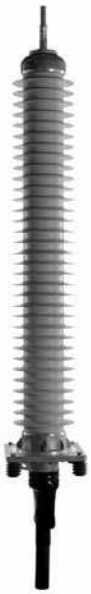


Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Max. diameter across cable outer sheath	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(mm)	(kg)	(mm)		(mm/kV)
ESS170-C47	150 - 2500	52 - 118	170	155.0	4675	3	25
ESS170-C58	150 - 2500	52 - 118	170	175.0	5797	4	31
ESS170-C72	150 - 2500	52 - 118	170	206.0	7106	-	38

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
ESS170-C47	500 (420, 600)	400 (345, 500)	19	1810	100	30,40,50	376
ESS170-C58	500 (420, 600)	400 (345, 500)	19	1810	100	30,40,50	416
ESS170-C72	500 (420, 600)	400 (345, 500)	19	2200	100	30,40,50	416

ESS245

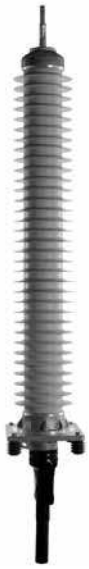


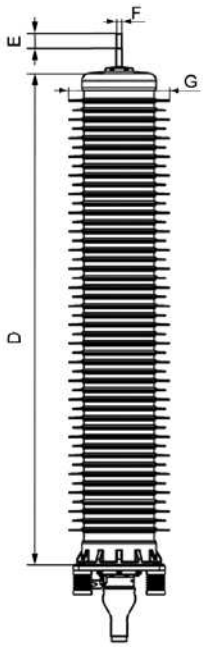


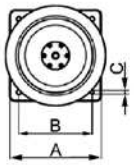
Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Max. diameter across cable outer sheath	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(mm)	(kg)	(mm)		(mm/kV)
ESS245-C84	240 - 2500	68 - 118	170	321.0	8355	4	31
ESS245-C149	240 - 2500	68 - 118	170	525.0	14880	-	55

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
ESS245-C84	600 (500)	400, 500	19	2697	100	30,40,50	547
ESS245-C149	600	500	19	3728	100	30,40,50	547

ESS300



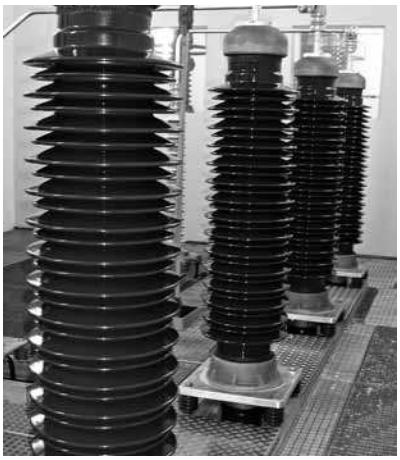




Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Max. diameter across cable outer sheath	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(mm)	(kg)	(mm)		(mm/kV)
ESS300-C83	400 - 2500	72 - 118	170	321.0	8250	3	25

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
ESS300-C83	500, 600	400, 500	19	2697	100	30,40,50	547

Outdoor Cable Termination (Porcelain)



ESP termination can be supplied for voltages from 72.5 kV to 300 kV. The porcelain insulator provides the highest degree of mechanical strength and the highest protection against ultraviolet radiation. The ESP is filled with an insulating compound. An easy-to-fit head armature and an high quality stress control unit completes the ESS as a maintenance-free system.

Material:
Insulator: porcelain
Material of the control unit: silicone rubber

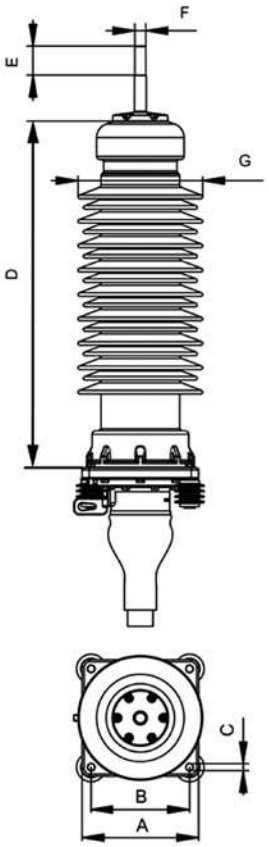
Conductor connection:
compressed or screwed

Optional accessories:
Earthing set, spark conductors

Note:
Optional material is not within scope of supply and has to be ordered seperately.
Technical data for conductor cross section 2.500 mm^2 up on request.
Dimensions in parentheses in the following product can be inquired separately.

Max. operating voltage	**U_m (kV)**	72.5	123	145	170	245	300
Standards		IEC60840 IEC60815	IEC60840 IEC60815	IEC60840 IEC60815	IEC60840 IEC60815	IEC62067 IEC60815	IEC62067 IEC60815
Rated voltage	**U (kV)**	60 - 69	110 - 115	132 - 138	150 - 161	220 - 230	275 - 287
Rated lightning impulse withstand voltage (BIL)	**(kV)**	325	550	650	750	1050	1050
Partial discharge measurement	**(pC)**	< 5	< 5	< 5	< 5	< 5	< 5

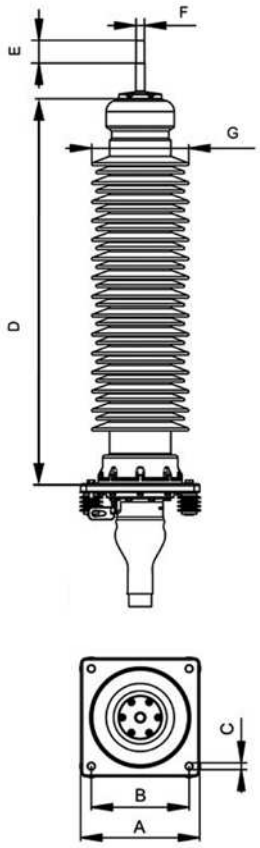
ESP72



Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Max. diameter across cable outer sheath	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(mm)	(kg)	(mm)		(mm/kV)
ESP72-C23	95-2000	37 - 84	120	120.0	2248	4	31
ESP72-C39	95-2000	37 - 84	120	170.0	3852	-	53

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
ESP72-C23	320 (420)	270 (345)	19	950	100	30,40,50	342
ESP72-C39	420 (320)	345 (270)	19	1360	100	30,40,50	170

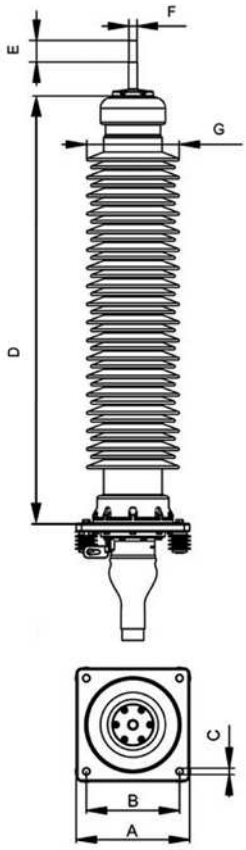
ESP123



Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Max. diameter across cable outer sheath	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(mm)	(kg)	(mm)		(mm/kV)
ESP123-C39	150-1600	42 - 84	120	170.0	3813	4	31
ESP123-C45	150-1600	42 - 84	120	195.0	4540	-	36

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
ESP123-C39	420 (320)	345 (270)	19	1360	100	30,40,50	170
ESP123-C45	420 (500)	345 (400)	19	1580	100	30,40,50	195

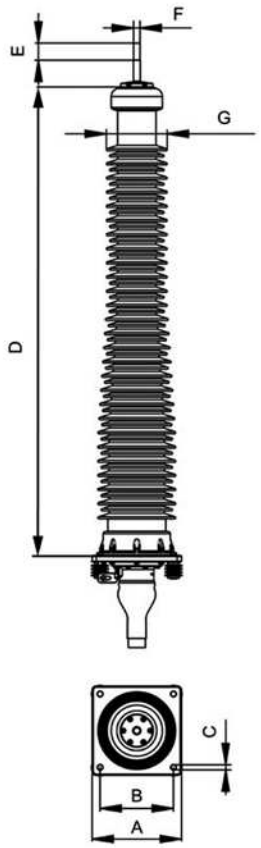
ESP145



Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Max. diameter across cable outer sheath	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(mm)	(kg)	(mm)		(mm/kV)
ESP145-C45	150-1200	46 - 84	120	195.0	4540	4	31
ESP145-C50	150-2000	46 - 99	120	220.0	4994	4	31
ESP145-C58	150-2000	46 - 99	120	235.0	5800	-	36
ESP145-C73	150 - 2500	46 - 118	170	330.0	7250	-	45

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
ESP145-C45	420 (500)	345 (400)	19	1580	100	30,40,50	342
ESP145-C50	420 (500)	345 (400)	19	1599	100	30,40,50	390/310
ESP145-C58	500 (420)	400 (345)	19	2200	100	30,40,50	365/285
ESP145-C73	500 (600, 420)	400 (500, 345)	19	2200	100	30,40,50	450/370

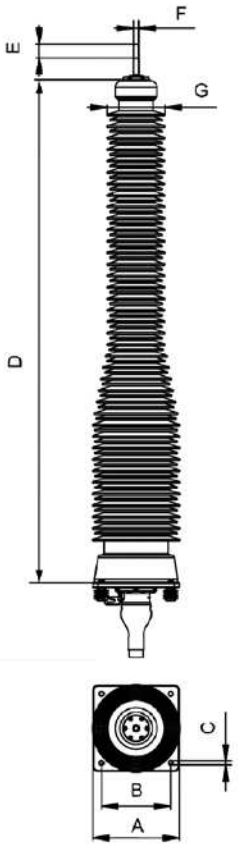
ESP170



Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Max. diameter across cable outer sheath	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(mm)	(kg)	(mm)		(mm/kV)
ESP170-C58	150-2000	52 - 99	120	235.0	5800	4	31
ESP170-C73	150 - 2500	52 - 118	170	330.0	7250	-	38

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
ESP170-C58	500 (420)	400 (345)	19	2200	100	30,40,50	365/285
ESP170-C73	500 (600, 420)	400 (500, 345)	19	2200	100	30,40,50	450/370

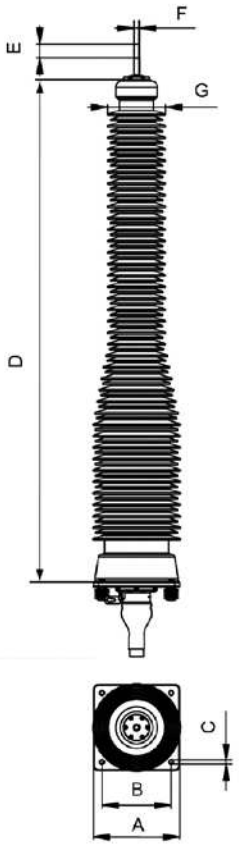
ESP245



Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Max. diameter across cable outer sheath	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(mm)	(kg)	(mm)		(mm/kV)
ESP245-C103	240 - 2500	68 - 118	170	530.0	10339	-	38

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
ESP245-C103	500, 600	400, 500	19	2909	100	30,40,50	334/506

ESP300



Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Max. diameter across cable outer sheath	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(mm)	(kg)	(mm)		(mm/kV)
ESP300-C103	240 - 2500	72 - 118	170	530.0	10339	4	31

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
ESP300-C103	500, 600	400, 500	19	2909	100	30,40,50	334/506

Flexible Outdoor Cable Termination

ESF flexible terminations are dry, slip-on terminations for modular assembly. The use of silicone sheds makes them ideally suited for applications in outdoor installations and are available for a voltage range from 52 kV to 170 kV.

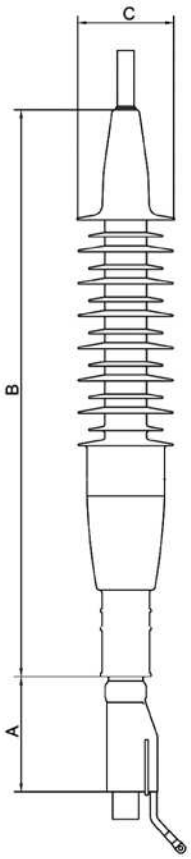
Material:
Insulator: silicone rubber
Material of the control unit: silicone rubber

Conductor connection:
compressed or screwed

Note:
Various connection options.

Max. operating voltage	**U_m (kV)**	52	72.5	123	145	170
Standards		IEC60840 IEC60815	IEC60840 IEC60815	IEC60840 IEC60815	IEC60840 IEC60815	IEC60840 IEC60815
Rated voltage	**U (kV)**	45 - 47	60 - 69	110 - 115	132 - 138	150 - 161
Rated lightning impulse withstand voltage (BIL)	**(kV)**	250	325	550	650	750
Partial discharge measurement	**(pC)**	< 5	< 5	< 5	< 5	< 5

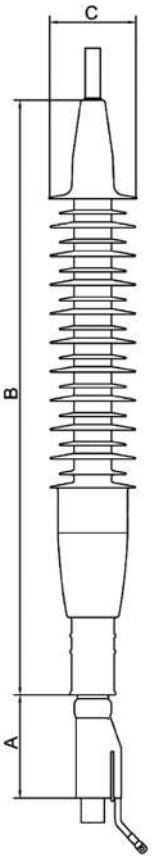
ESF52



Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Net weight approx.	Minimal creepage distance	Pollution class
	(mm^2)	(mm)	(kg)	(mm)	(mm/kV)
ESF52-C15	95 - 1200	32.5 - 64.4	11.0	1500	28
ESF52-C19	95 - 1200	32.5 - 64.4	12.0	1813	34

Product designation	A (mm)	B (mm)	C (mm)
ESF52-C15	~250	909 - 1021	175
ESF52-C19	~250	1019 - 1137	175

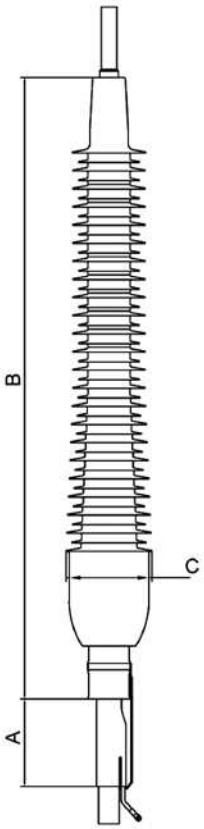
ESF72



Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(kg)	(mm)		(mm/kV)
ESF72-C15	95 - 1200	32.5 - 64.4	11.0	1450	2	20
ESF72-C19	95 - 1200	32.5 - 64.4	12.0	1813	3	25
ESF72-C23	95 - 2000	32.5 - 82	13.5 - 22.0	2248	4	31

Product designation	A (mm)	B (mm)	C (mm)
ESF72-C15	~250	909 - 1021	175
ESF72-C19	~250	1019 - 1137	175
ESF72-C23	~250	1120 - 1330	175 - 190

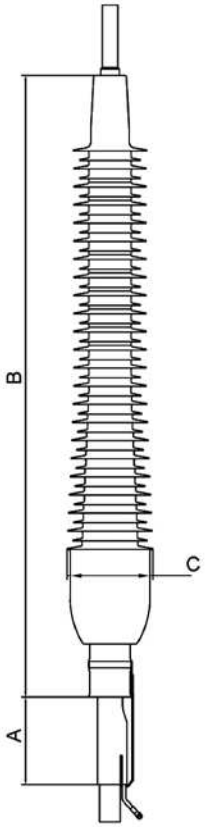
ESF123



Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(kg)	(mm)		(mm/kV)
ESF123-C25	95 - 2000	46 - 76.2	19.0	2460	2	20
ESF123-C31	150 - 2000	46 - 115	28.0 - 37.0	3075	3	25
ESF123-C39	150 - 2000	46 - 115	31.0 - 50.0	3813	4	31

Product designation	A (mm)	B (mm)	C (mm)
ESF123-C25	~250	~1300 - 1360	180
ESF123-C31	~250	~1450 - 1560	227 - 274
ESF123-C39	~250	~1670 - 1790	227 - 274

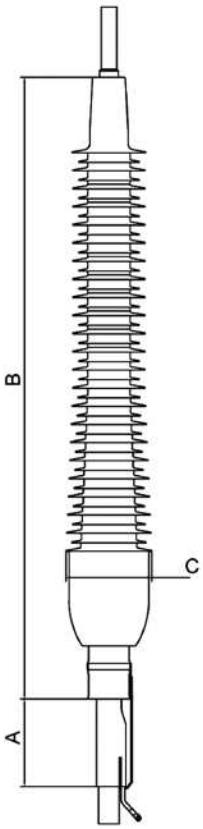
ESF145



Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(kg)	(mm)		(mm/kV)
ESF145-C37	240 - 2000	46 - 115	31.0 - 45.0	3625	3	25
ESF145-C45	240 - 2000	46 - 115	36.0 - 54.0	4495	4	31

Product designation	A (mm)	B (mm)	C (mm)
ESF145-C37	~250	~1670 - 1790	227 - 274
ESF145-C45	~250	~1890 - 2025	227 - 274

ESF170



Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(kg)	(mm)		(mm/kV)
ESF170-C43	240 - 2000	52 - 115	54.0	4250	3	25
ESF170-C53	240 - 2000	52 - 115	58.0	5270	4	31

Product designation	A (mm)	B (mm)	C (mm)
ESF170-C43	~250	~1968 - 2022	274
ESF170-C53	~250	~2200 - 2254	274

Dry-insulated Outdoor Cable Termination

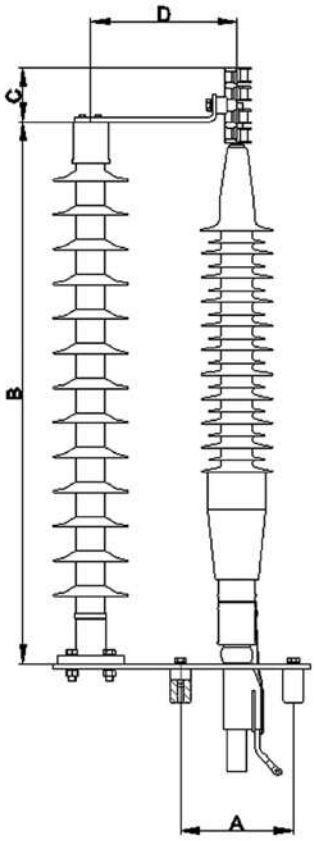
EST termination is ideally suited for outdoor and indoor use. It is available for voltages from 72.5 kV to 170 kV and consists of one flexible ESF termination and one supporting insulator. It contains no liquid insulating materials and is self-supporting. The EST is of modular construction for rapid, easy installation. The base plate design allows installations on existing units.

Material:
Insulator: silicone shielded fibre glass reinforced rod
Stress relief cone: silicone rubber
Shed material: silicone rubber

Conductor connection:
compressed or screwed

Max. operating voltage	**U_m (kV)**	72.5	123	145	170
Standards		IEC60840 IEC60815	IEC60840 IEC60815	IEC60840 IEC60815	IEC60815 IEC60840
Rated voltage	**U (kV)**	60 - 69	110 - 115	132 - 138	150 - 161
Rated lightning impulse withstand voltage (BIL)	**(kV)**	325	550	650	750
Partial discharge measurement	**(pC)**	< 5	< 5	< 5	< 5

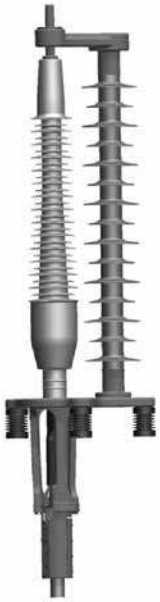
EST72

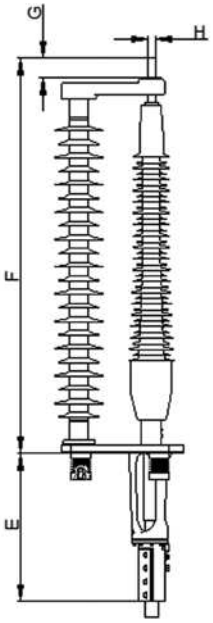


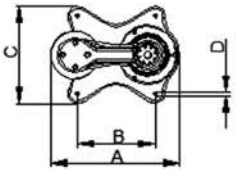
Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(kg)	(mm)		(mm/kV)
EST72-C19	95 - 1200	32.5 - 64.4	65.0	1813	3	25
EST72-C23	95 - 1200	32.5 - 64.4	68.0	2248	4	31

Product designation	A (mm)	B (mm)	C (mm)	D (mm)
EST72-C19	270	1300	130	350
EST72-C23	270	1300	130	350

EST123



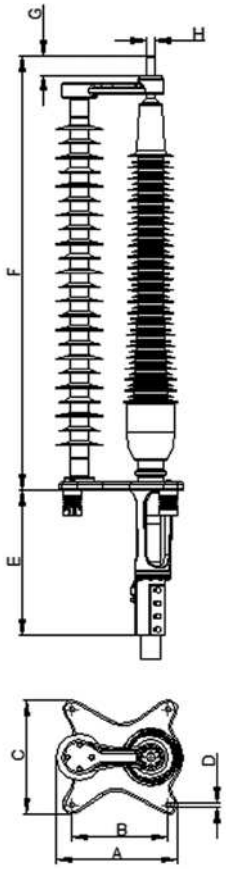




Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(kg)	(mm)		(mm/kV)
EST123-C31	150 - 2000	46 - 115	100.0	3075	3	25
EST123-C39	150 - 2000	46 - 115	120.0	3813	4	31

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)
EST123-C31	690 (661)	500 (400)	600 (500)	18	~760	1800	100	30,40,50
EST123-C39	690 (661)	500 (400)	600 (500)	18	~760	2030	100	30,40,50

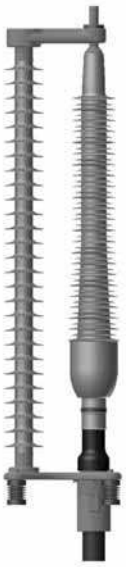
EST145

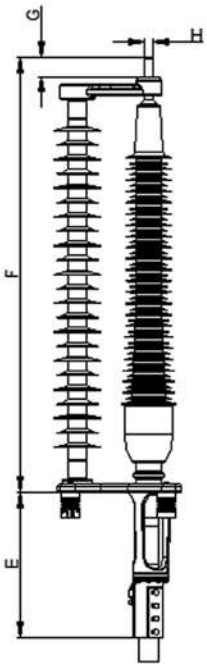


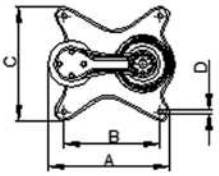
Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(kg)	(mm)		(mm/kV)
EST145-C37	240 - 2000	46 - 115	120.0	3625	3	25
EST145-C45	240 - 2000	46 - 115	130.0	4495	4	31

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)
EST145-C37	690 (661)	500 (400)	600 (500)	18	~760	2030	100	30,40,50
EST145-C45	690 (661)	500 (400)	600 (500)	18	~760	2260	100	30,40,50

EST170



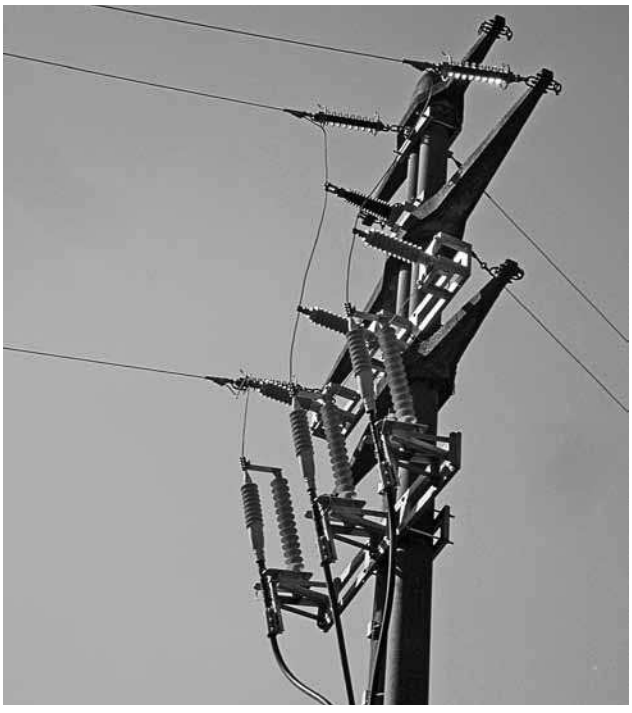


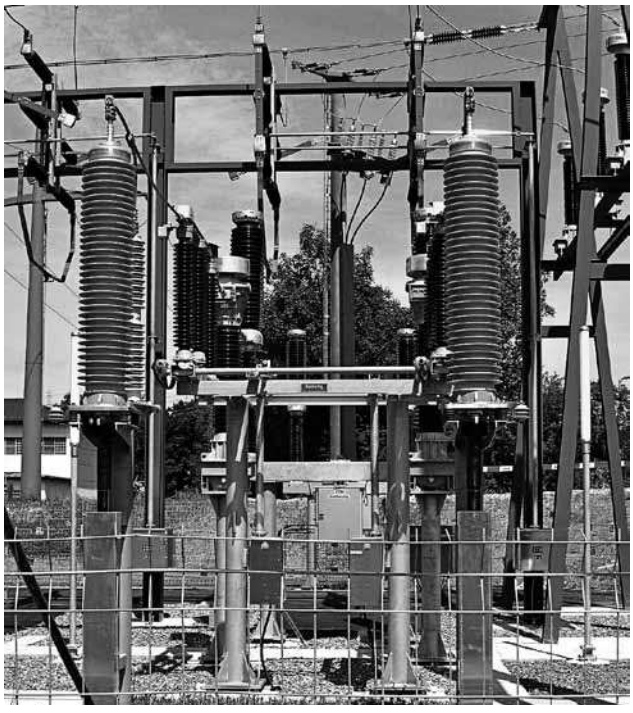


Product designation	Conductor cross-section area	Diameter across cable insulation (prepared)	Net weight approx.	Minimal creepage distance	Pollution class	Pollution class
	(mm^2)	(mm)	(kg)	(mm)		(mm/kV)
EST170-C43	240 - 2000	52 - 115	150.0	4250	3	25
EST170-C53	240 - 2000	52 - 115	160.0	5270	4	31

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)
EST170-C43	690 (661)	500 (400)	600 (500)	18	~760	2260	100	30,40,50
EST170-C53	690 (661)	500 (400)	600 (500)	18	~760	2480	100	30,40,50

Applications





HV-CONNEX 72,5 kV – 245 kV

The advantages of the CONNEX system come to the fore in particular in the area of highvoltage systems: simple on-site installation and factory-tested components save money and provide additional safety. Plug-in HV-CONNEX systems make costly oil and gas work during the installation and commissioning of transformers and gas-insulated switchgear a thing of the past. Thanks to their plug-in connectors, cable joints from the HV-CONNEX range are much more flexible than traditional solutions when it comes to building and converting electrical systems. Needless to say, the range includes all the connection components needed to test the system and the attached equipment.

Advantages

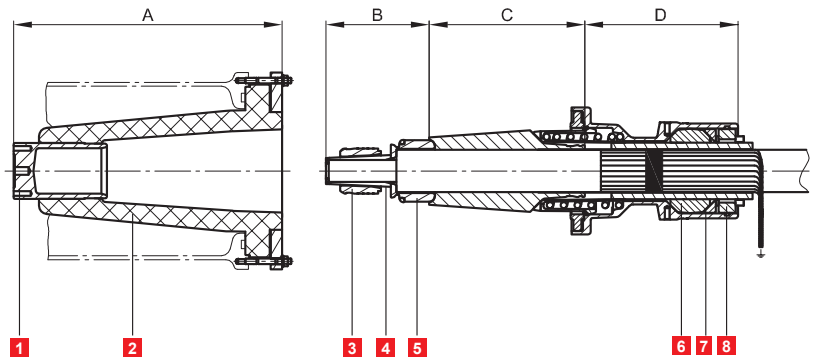
- approx. 50 % shorter mounting length compared with conventional systems in accordance with IEC62271-209 (former IEC60859)
- no opening of the cable termination and associated costly gas or oil work
- horizontal, vertical and angled versions for connection to GIS and transformers
- considerably reduced installation times
- the use of pre-assembled and tested components means maximum safety and efficiency
- installation errors are minimised
- if a fault does arise, rapid separation of cable and equipment
- cable sheath test possible without unplugging

A Socket
1 contact element
2 epoxy socket

B Contact System
3 contact ring
4 tension cone
5 thrust piece

C Insulating part

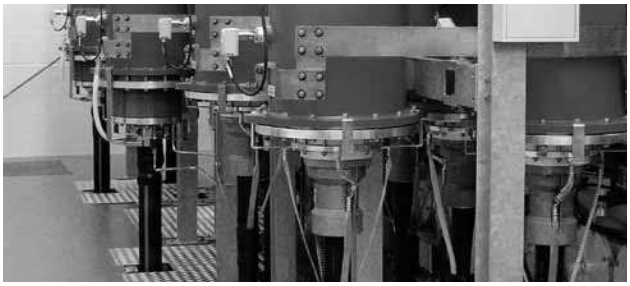
D Bell flange
6 gasket ring
7 thrust ring
8 counter ring



Sample Drawing: Cable connecting system CONNEX Size 5
(cable with wire screen, application switch gear)

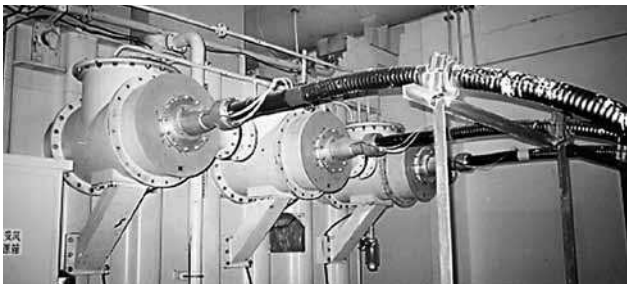
GIS Equipment

Using HV-CONNEX sockets in switchgears allows for maximum flexibility. The interface provides the socket, which is ideally pre-assembled at the factory. This allows all relevant parameters to be tested at the factory and eliminates the need to open up the plant on site during commissioning. However, assembly on site is possible as well. The connection geometry meets all relevant standards.



Transformers

Assembly at the factory and pre-testing the entire transformer lead to the best possible outcome. The actual plugging portion is then performed at the plant when it is commissioned on site, thus ensuring surge-proof sealing. The sockets can be installed in any position. Meeting all relevant standards ensures a proper connection geometry.



Plug-in Joint Boxes

The HV-CONNEX cable connection system means plug-in joint boxes for various geometric configurations can be assembled using fewer components. The advantage of these joint boxes is that the joint body is a single unit which is completely manu-factured and tested at the factory. Solutions of this kind bring enormous benefits if, for example, cables need to be bent back multiple times during the installation and conversion phase.

HV-CONNEX Pluggable Bushing

The HV-CONNEX pluggable bushing for sizes 5 and 6 can be used wherever overhead lines need to be connected to high-voltage equipment. The interface provides a HV-CONNEX socket. Commissioning involves a simple plugging procedure in every position.

HV-CONNEX Surge Arrester

HV-CONNEX Surge Arresters size 4 are used to protect metal clad switchgear (GIS) and transformers equipped with HV-CONNEX sockets size 4 (with or without a voltage tap). The surge arrester is directly connected to the switchgear or the transformer and prevents inadmissibly high, incoming surges. It is particularly effective in limiting surges caused by reflected traveling waves.

HV-CONNEX Separable Connectors Size 4 - 6-S
Technical Data and Size Classification List

Size		4	5	6	6-S
Max. operating voltage	**U_m (kV)**	72.5	145	170	245
Nominal voltage	**U_n (kV)**	60 - 69	132 - 138	150 - 161	220 - 230
Conductor Earth Voltage	**U_0 (kV)**	36	76	87	127
Max. current rating for cable accessory [1]	**I_N (A)**	2500	2500	2500	2500
Max. current rating for transformer application [1]	**I_R (A)**	2000	2000	2000	2000
Cross section range [2] [3]	**(mm²)**	95 - 1600	95 - 1600	240 - 2500	240 - 2500
Min. conductor diameter [3] [4]	**Ø (mm)**	9.3	9.3	15.3	15.3
Max. conductor diameter [3] [4]	**Ø (mm)**	50.4	50.4	64.9	64.9
Min. diameter over insulation [4]	**Ø (mm)**	33.0	36.0	53.0	53.0
Max. diameter over insulation [4]	**Ø (mm)**	75.0	76.0	110.5	110.5
Gross weight per packing unit [5]	**(kg)**	12.0	18.0	27.0	27.0
Rated power frequency withstand voltage	**1 min (kV)**	140	275	325	460
Partial discharge at 2 x U_0	**(pC)**	≤ 2	≤ 2	≤ 2	≤ 2
Rated lightning impulse withstand voltage (BIL)	**(kV)**	325	650	750	1050
DC voltage test	**15 min 6 x U_0 (kV)**	144	304	348	508
Rated short-time withstand current	**3 s (kA)**	50	50	50	50
Rated peak withstand current	**(kA)**	125	125	125	125

[1] depending on the cable that is used
[2] Cross section is for reference only.
Actual value is limited by min. / max. diameter over conductor and min. / max. diameter over insulation.
(1 inch = 25.4 mm; 1 square inch = 645.16 mm²)
[3] Values are vor RM (round circular).
RE (round solid) and RF (round superflexible stranded) upon request.
[4] The total range is covered by different components.
[5] Packaging unit PU = 1 piece;
Weight is just a guide value, depends on version

Form to determine HV-CONNEX Separable Connectors

Company: _____ **Name:** _____

Telephone: _____ **Date:** _____

E-Mail: _____ **Signature:** _____

Cable manufacturer: _____ **Cable type:** _____

Size of socket: Size 4 ☐ Size 5 ☐ Size 6 ☐ Size 6-S ☐

Application: Indoor ☐ Outdoor ☐ Offshore (saltwater-proof/soil-resistant) ☐

Installation position: vertical installation from above ☐ others ☐

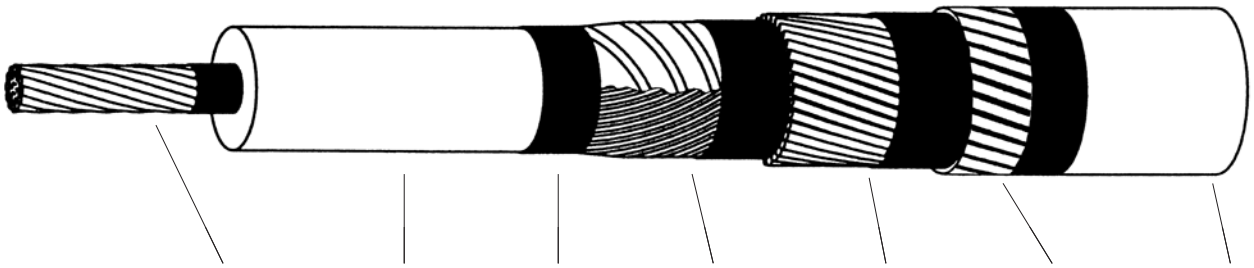
Environmental conditions at assembly site: Lowest temperature: down to - 25°C ☐ - 25°C down to - 50°C ☐
Altitude (above NN): up to 2500 m ☐ over 2500 m ☐

Voltages: U_0 _____ kV U_N _____ kV U_M _____ kV

Grounding/Earthing: solid (standard) ☐ insulated (for Linkbox) ☐

Cable sheath test: _____ kV

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



Diameter (mm)	_____	_____	_____	_____	_____	_____	_____
Cross section (mm²)	_____			_____	_____	_____	
Section thickness (mm)		_____	_____	_____	_____	_____	_____

stranded circular RM ☐	XLPE ☐	fully bonded ☐	Al-/Cu-wire ☐	Al-/Cu-wire ☐	Al-/Cu-wire ☐	PE ☐
stranded circular, segment RMS ☐	EPR ☐	easy strip ☐	Al-/Cu-band ☐	Al-/Cu-band ☐	Al-/Cu-band ☐	PVC ☐
solid circular RE ☐			Lead sheath ☐	Steel wire ☐	Steel wire ☐	
superflexible stranded RF ☐			Al-corr sheath ☐	Steel band ☐	Steel band ☐	
			Cu-corr sheath ☐	Lead sheath ☐	Lead sheath ☐	
			_____	Al-corr sheath ☐	Al-corr sheath ☐	
			Fibre optic cable ☐	Cu-corr sheath ☐	Cu-corr sheath ☐	
			_____	Inner sheath. ☐	Inner sheath ☐	
				Al-foil ☐	Al-foil ☐	
				Cu-foil ☐	Cu-foil ☐	
				_____		
				Fibre optic cable ☐		
				_____		

Form to determine HV test lead and connecting cable

Company: _____ **Name:** _____

Telephone: _____ **Date:** _____

E-Mail: _____ **Signature:** _____

Application: Indoor / Outdoor ☐ Offshore (saltwater-proof/soil-resistant) ☐

Max. operating voltage (BIL): 72,5 kV (325 kV) ☐ 145 kV (650 kV) ☐ 170 kV (750 kV) ☐ 245 kV (1050 kV) ☐

_____ kV (_____ kV) ☐

Cable cross section: 300 mm² RM/110 kV ☐ 240 mm² RF/132 kV ☐ _____ ☐

Length of test and connecting cable: L = _____ m (0,1 m Stufung)

Dielectric routine test according to IEC 60137 (Transformer) ☐ according to IEC 60840 alt. IEC 62067 (Cable System) ☐

*** Phase description:** L1 ☐ L2 ☐ L3 ☐ N-Conductor ☐ None ☐

Side A:

CONNEX Size 4 (up to 72,5 kV) ☐
CONNEX Size 5 (up to 145 kV) ☐
CONNEX Size 6 (up to 170 kV) ☐
CONNEX Size 6-S (up to 245 kV) ☐
Outdoor termination ESF (up to 72,5 kV) ☐
Outdoor termination ESF (up to 145 kV) ☐
Outdoor termination ESF (up to 170 kV) ☐
end-cap (not voltage proof) ☐

Side B:

CONNEX Size 4 (up to 72,5 kV) ☐
CONNEX Size 5 (up to 145 kV) ☐
CONNEX Size 6 (up to 170 kV) ☐
CONNEX Size 6-S (up to 245 kV) ☐
Outdoor termination ESF (up to 72,5 kV) ☐
Outdoor termination ESF (up to 145 kV) ☐
Outdoor termination ESF (up to 170 kV) ☐
end-cap (not voltage proof) ☐

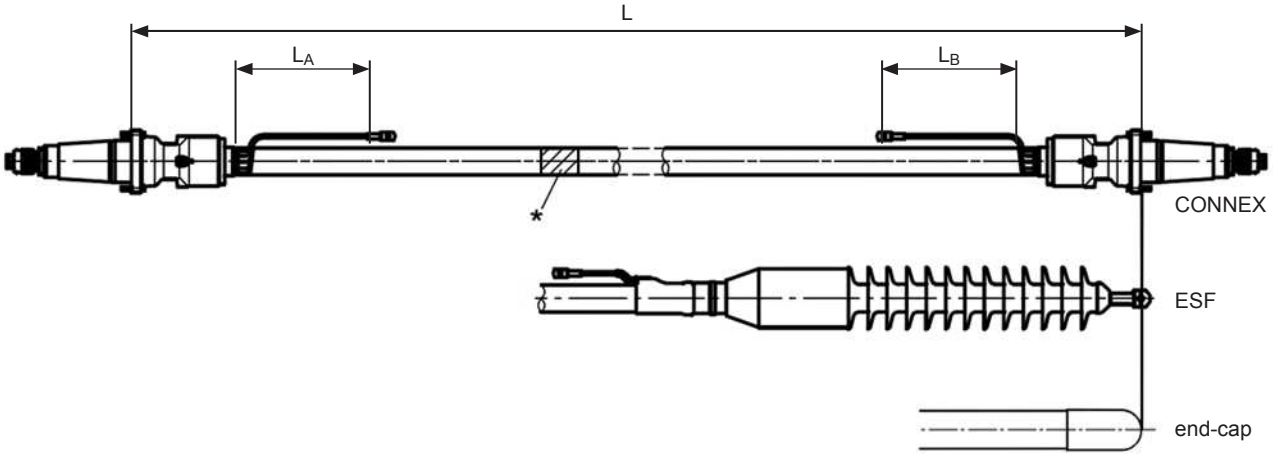
Cable shield A:

Length cable shield L_A = _____ m ☐

Cable shield B:

Length cable shield L_B = _____ m ☐

Side A **Side B**



HV-CONNEX Separable Connectors, Size 4, up to 72,5 kV

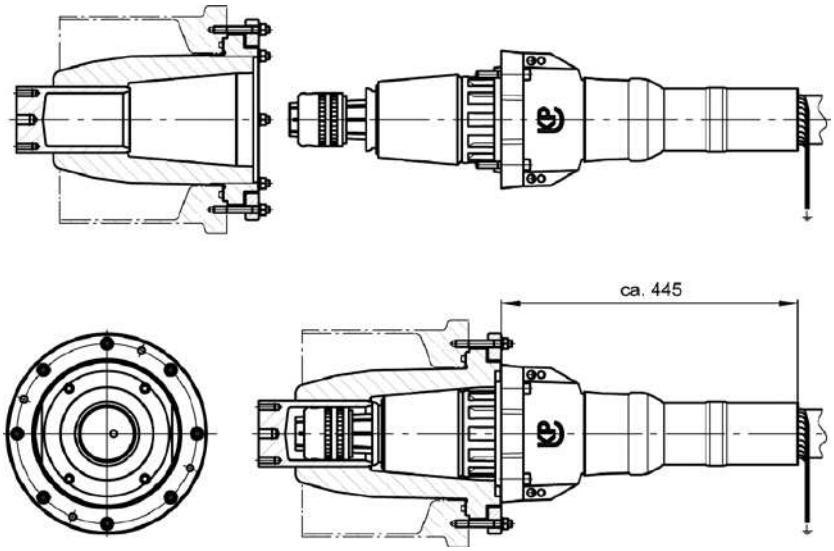
The following options are available but must be specified when ordering:

Low temperature
The standard components are designed for a temperature down to -25°C. A special low temperature grease is used for ambient conditions involving temperatures below -25°C.

Offshore
Components with corresponding material properties are used for offshore applications.

Insulated cable shield
For insulated networks and usage of a Link Box. A touch proof system and flexibility were the main approach.

Important:
Special tools are required for the assembly of HV-CONNEX separable connectors size 4 (see assembly accessories).



No.	Version [1]	Nominal voltage [2]	Cross section range [3] [4]	Conductor diameter [4] [5]	Diameter over insulation
		U_N (A)	(mm²)	Ø (mm)	Ø (mm)
849 999 999	XXXX	2500	95 - 1600	9.3 - 50.4	33.0 - 75.0

[1] Individual article number determined according to actual cable dimensions (see page 39: Form to determine HV-CONNEX Separable Connectors).
[2] depending on the cable that is used
[3] Cross section is for reference only.
Actual value is limited by min. / max. diameter over conductor and min. / max. diameter over insulation.
(1 inch = 25.4 mm; 1 square inch = 645.16 mm²)
[4] Values are vor RM (round circular).
RE (round solid) and RF (round superflexible stranded) upon request.
[5] The total range is covered by different components.

HV-CONNEX Sockets for GIS, Size 4, up to 72.5 kV

For installation in gas-insulated switchgears, switchgears, joint boxes and other devices.

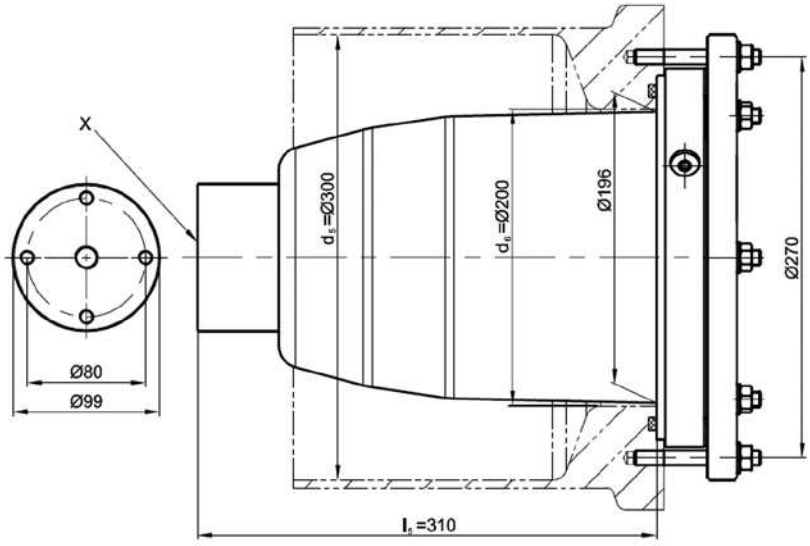
HV-CONNEX socket
with or without voltage tap, each including fastenings.

Extension adapter
for adjusting the length of terminations to relevant standards.

For dimensions according to IEC 62271-209, for dry terminations, Size 4

These versions allow for very small cable connection spaces and therefore also a significant reduction in the amount of SF_6 gas needed.

Scope of delivery:
- Socket (with or without voltage tap)
- Fastenings

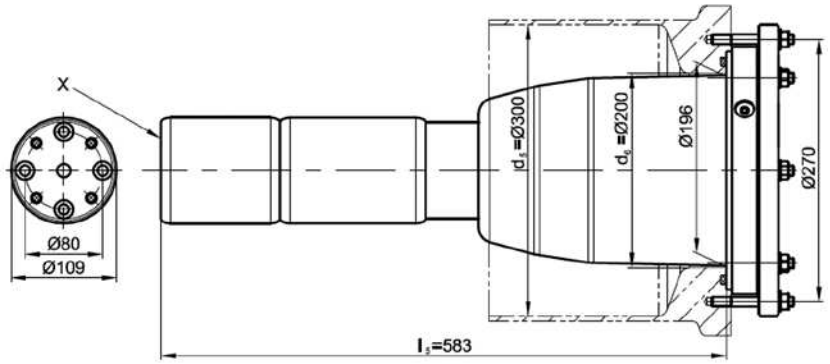


No.	Version [1]	Capacitive voltage tap [2]	IEC dimensions l_5	Weight
		(pF)	(mm)	(kg)
828 040 999	0001	—	310	17.8
828 040 999	0002	approx. 5	310	16.0

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

For dimensions according to IEC 62271-209, for fluid-filled terminations, Size 4

Scope of delivery:
- Socket (with or without voltage tap)
- Extension adapter (pre-assembled)
- Fastenings



No.	Version [1]	Capacitive voltage tap [2]	IEC dimensions l_5	Weight
		(pF)	(mm)	(kg)
828 040 999	0003	—	583	24.5
828 040 999	0004	approx. 5	583	22.1

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

HV-CONNEX Sockets for transformers, Size 4, up to 72.5 kV

For installation in transformers, E-coils, joint boxes and other oil-insulated devices.

HV-CONNEX socket
with or without voltage tap, each including fastenings.

Extension adapter
for adjusting the length of terminations to relevant standards.

Corona shield
Protects against sharp-edged areas of the connection system.

Take-off bolt
optional; must be ordered separately. Included in scope of delivery of transformer manufacturer as specified in standard. Individual designs can be delivered upon request.

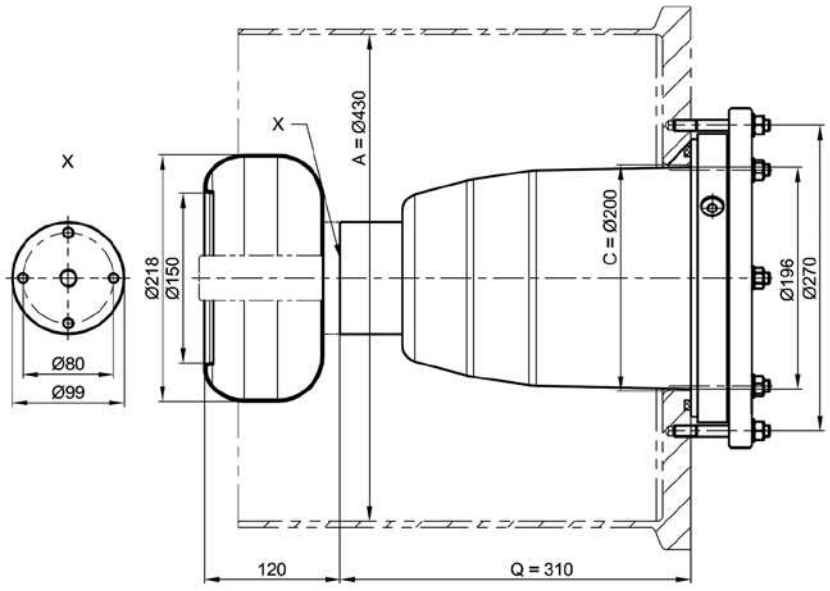
Please note: When using a HV-CONNEX separable connector, the maximum temperature of the surrounding insulating fluid must not exceed the maximum temperature admissible for cable insulation.

For dimensions according to DIN VDE 0532, Size 4

These versions allow for very small cable connection spaces and therefore also a significant reduction in the amount of insulating fluid needed.

Scope of delivery:
- Socket (with or without voltage tap)
- corona shield (included)
- Fastenings

Optional: take-off bolt (must be ordered separately)



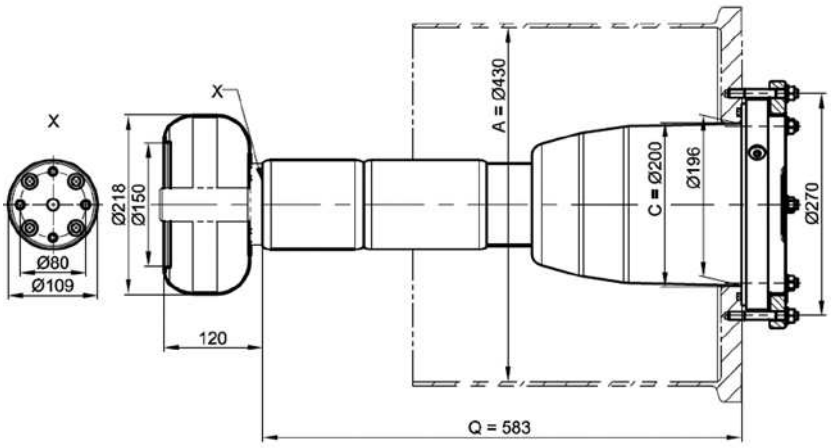
No.	Version [1]	Capacitive voltage tap [2] (pF)	Installation depth (mm)	Weight (kg)
828 041 999	0001	—	310	18.3
828 041 999	0002	approx. 5	310	16.5

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

For dimensions according to EN 50299, for conventional terminations, Size 4

Scope of delivery:
- Socket (with or without voltage tap)
- Extension adapter (pre-assembled)
- corona shield (included)
- Fastenings

Optional: take-off bolt (must be ordered separately)



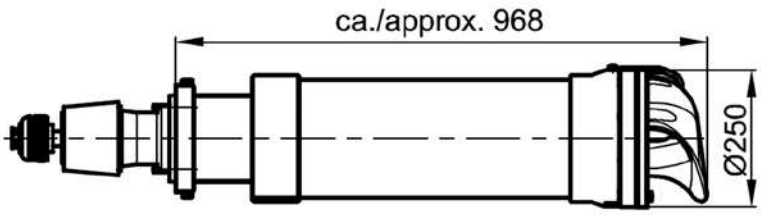
No.	Version [1]	Capacitive voltage tap [2] (pF)	Installation depth (mm)	Weight (kg)
828 041 999	0003	—	583	24.9
828 041 999	0004	approx. 5	583	23.1

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

HV-CONNEX Surge Arrester, Size 4

HV-CONNEX Surge Arresters size 4 are used to protect metal clad switchgears (GIS) and transformers equipped with HV-CONNEX sockets size 4 (with or without a voltage tap). The surge arrester is directly connected to the switchgear or the transformer and prevents inadmissibly high incoming surges. It is particularly effective in limiting surges caused by reflected traveling waves.

Technical data:
Rated discharge surge current 10 kA, 8/20µs
Higher short-circuit current 40 kA, 0.2s
High surge current = 100 kA, 4/10µs
Long-wave peak current = 420 A, 2000µs
Line discharge class 2
Energy absorption capacity: 4.28 kJ / kV_{Ur}
Weight: approx. 40 kg



Surge Arrester, Size 4 for GIS

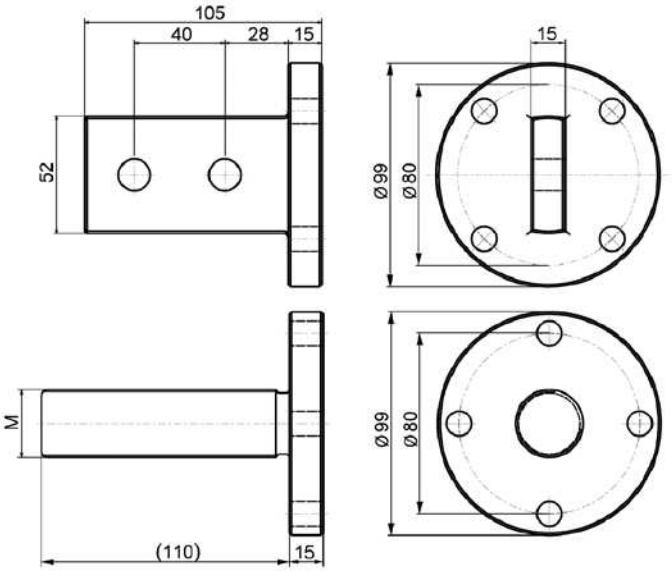
No.	Max. rated voltage	Max. continuous rating	Temporary surge		Max. residual voltage U_{res} at					
	U_r (kV)	U_c (kV)	$U_{TOV(1s)}$ (kV)	$U_{TOV(10s)}$ (kV)	1/2 µs 10 kA (kV)	8/20 µs 5 kA (kV)	8/20 µs 10 kA (kV)	8/20 µs 20 kA (kV)	30/60 µs 125 A (kV)	30/60 µs 500 A (kV)
827 542 450	45.0	36	48.2	46.4	132	112	119.9	136	88	94
827 542 525	52.5	42	56.2	54.1	154	131	139.9	159	103	109
827 542 613	61.3	49	65.6	63.1	179	152	163.2	185	120	127
827 542 650	65.0	52	69.6	67,0	190	162	173.2	196	127	135
827 542 725	72.5	58	77.6	74.7	212	180	193.2	219	142	151

Surge Arrester, Size 4 for Transformator

No.	Max. rated voltage	Max. continuous rating	Temporary surge		Max. residual voltage U_{res} at					
	U_r (kV)	U_c (kV)	$U_{TOV(1s)}$ (kV)	$U_{TOV(10s)}$ (kV)	1/2 µs 10 kA (kV)	8/20 µs 5 kA (kV)	8/20 µs 10 kA (kV)	8/20 µs 20 kA (kV)	30/60 µs 125 A (kV)	30/60 µs 500 A (kV)
827 541 450	45.0	36	48.2	46.4	132	112	119.9	136	88	94
827 541 525	52.5	42	56.2	54.1	154	131	139.9	159	103	109
827 541 613	61.3	49	65.6	63.1	179	152	163.2	185	120	127
827 541 650	65.0	52	69.6	67,0	190	162	173.2	196	127	135
827 541 725	72.5	58	77.6	74.7	212	180	193.2	219	142	151

Take-off-bolt

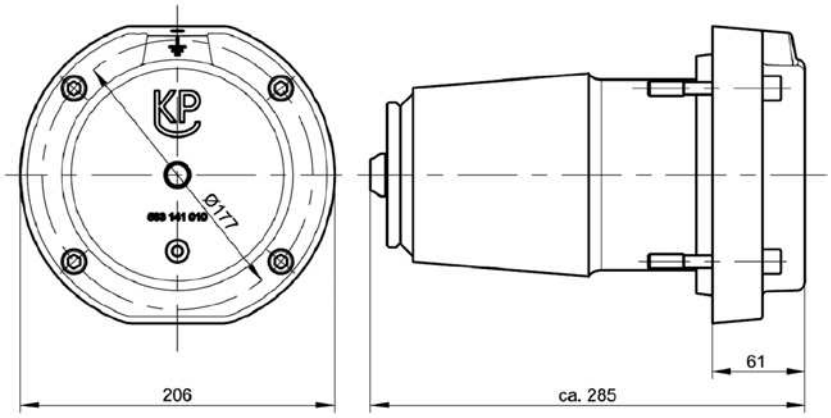
Optional. Conforming to EN 50299 included in scope of delivery of transformer manufacturer.
Material: Aluminium, silver-plated



No.	Bolt size (mm)	Cross sectional range (mm²)
880 266 147	M30 x 1,5	240 - 630
880 265 988	M42 x 1,5	800 - 1200
880 265 986	M52 x 2	≤ 2000
880 266 779	52 x 15	240 - 630

Dummy Plug, Size 4

For sealing and voltage-proof closing of HV-CONNEX sockets.



No.	Weight (kg)
827 700 004	5.0

Gas-insulated Blind Cover, Size 4

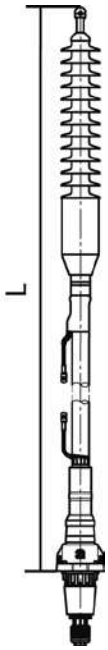
For voltage-proof sealing of HV-CONNEX sockes with SF_6 gas.

No.	Manometer
827 714 001	with
827 714 002	without

Cover Disk, Size 4

Not voltage-proof!
For protecting open HV-CONNEX sockets (e.g. transportation).
Dust-proof and water-tight.

No.	Diameter Ø (mm)	Weight (kg)
827 220 104	200	1.1



Test lead, Size 4

The cable with flexible outdoor termination can be used for electrical tests on equipment fitted with HV-CONNEX sockets.

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

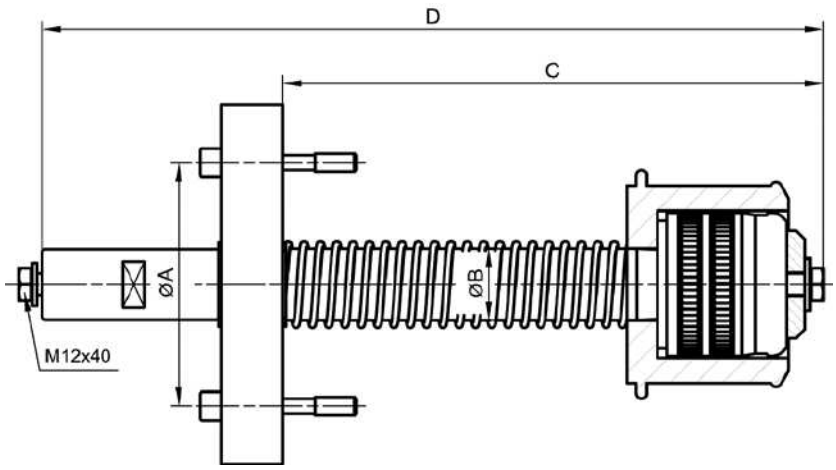
The specified values are maximum testing values that will result in increased wear when used as a testing cable, thus decreasing the expected service life.

No.	Version [1)]	Rated power frequency-withstand voltage 1 min (kV)	Rated lightning impulse withstand voltage (BIL) (kV)	Partial discharge (pC)	Length (m)	Standards
815 999 999	XXXX	140	325	84 kV ≤ 5 pC	min. 2,5	IEC60137
815 999 999	XXXX	90 (30 min)	—	54 kV ≤ 5 pC	min. 2,5	IEC60840

[1)] Individual article number determined with a product configurator based on customer requests (see page 40: Form to determine HV test lead and connecting cable).

Current Testing Plug, Size 4

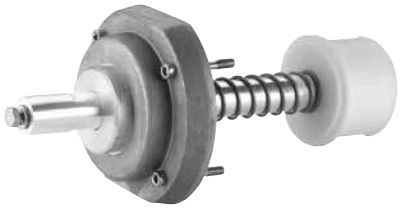
This plug is used to carry out current tests on switchgear, transformers, transducers etc. fitted with HV-CONNEX sockets.

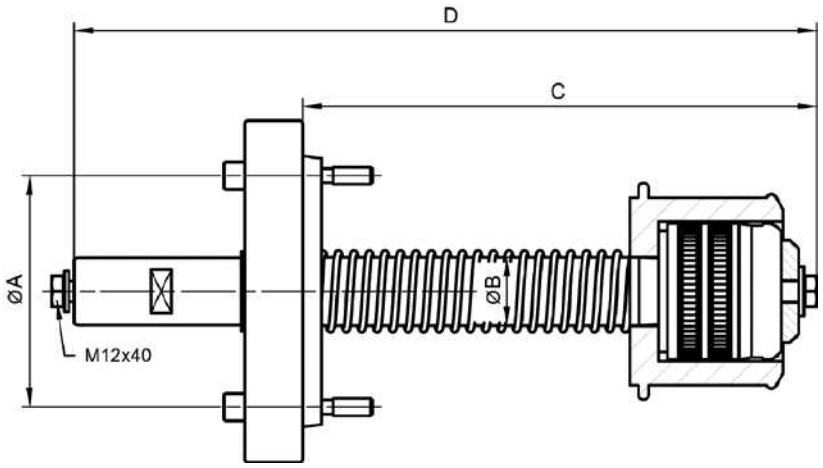


No.	Nominal voltage I_N (A)	Max. testing voltage U_m (kV)	A (mm)	B (mm)	C (mm)	D (mm)
827 093 004	1600	5	177	40	301	435

Earthing and Short-circuit Devices for HV-CONNEX sockets, Size 4

These devices are used to earth and short circuit equipment fitted with HV-CONNEX sockets (e. g. switchgear, transformers etc.).



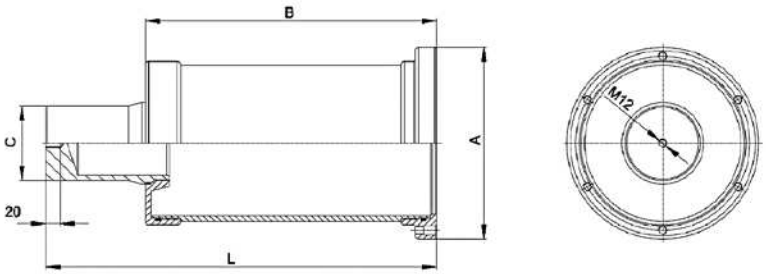


No.	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
827 086 004	177	40	301	435	10.5

Earthing Cap, Size 4

This device is used to earth and short circuit unplugged HV-CONNEX separable connectors.
- waterproof

For protection of unplugged HV-CONNEX separable connectors against damage and dirt.



No.	A (mm)	B (mm)	C (mm)	L (mm)	Weight (kg)
827 708 002	210	240	97	375	5.7

Protective cap, Size 4

For protecting the insulating part and contact system of bushing, test lead and mounted HV-CONNEX separable connector.
- not surge-proof
- made of plastic
- with o-ring seal, therefore dust-proof and water-tight

No.	Weight (kg)
827 708 011	3.4

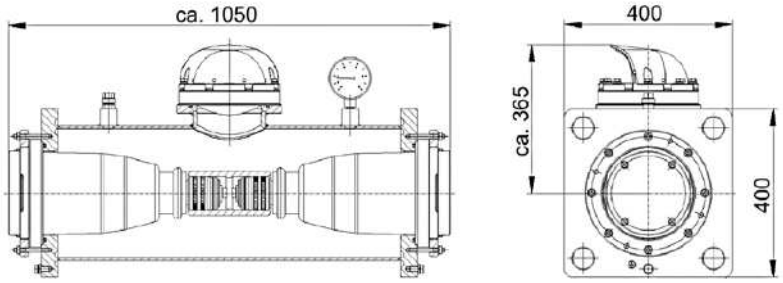
HV-CONNEX Joint, Size 4

HV-CONNEX joint for testing and connecting cables terminated with HV-CONNEX separable connectors.

Insulation medium: SF_6 gas

The joint features a turnable anti-burst device and a SF_6 gas density monitor with signal generator for remote display. The sockets are sealed with plastic covers. Voltage-proof dummy plugs to be ordered separately.

Low temperature:
The standard components are designed for a temperature up to -25 °C. A special gas mixture for low temperatures is used for ambient conditions below -25 °C.



No.	Max. operating voltage	Rated power frequency-withstand voltage	Rated lightning impulse withstand voltage (BIL)	Width	Length	Weight
	U_m (kV)	1 min (kV)	(kV)	(mm)	(mm)	(kg)
827 049 010	72.5	140	325	400	1050	173.0

HV-CONNEX T-Joint, Size 4

HV-CONNEX T-Joint for branching cables terminated with HV-CONNEX separable connectors.

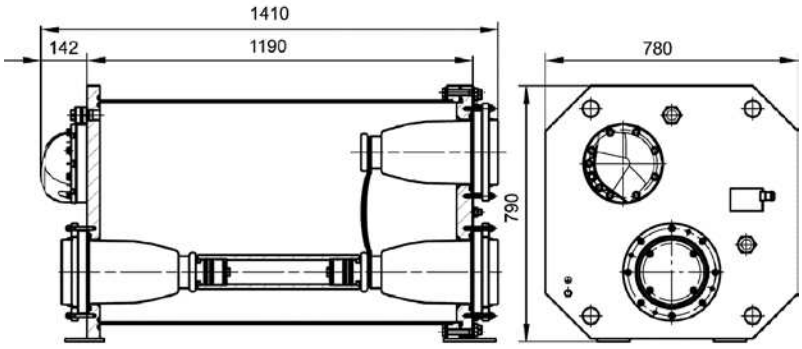
Insulation medium: SF_6 gas

The T-joint features a turnable anti-burst device and a SF_6 gas density monitor with signal generator for remote display. The sockets are sealed with plastic covers; voltage-proof dummy plugs to be ordered separately.

Low temperature:
The standard components are designed for a temperature up to -25 °C. A special gas mixture for low temperatures is used for ambient conditions below -25 °C.

Possible applications:
- Pluggable branching joint for HV cables
- Universal application options:
  T-branching of one plastic-insulated cable to two plastic-insulated cables or a overhead line to two plastic-insulated cables

Properties:
- Metal clad
- Fully insulated
- High short-circuit strength
- Maintenance-free
- For outdoor use
- IP66
- Maintenance-free gas density monitor (manometer) with remote monitoring option
- Bursting disc
- Insulation medium SF_6
- TÜV-tested joint-housing (TÜV is german Technical Inspection Association)
- Different sizes can be combined on request



No.	Max. operating voltage	Rated power frequency-withstand voltage	Rated lightning impulse withstand voltage (BIL)	Width	Length	Weight
	U_m (kV)	1 min (kV)	(kV)	(mm)	(mm)	(kg)
827 062 001	72.5	140	325	780	1410	600.0

HV-CONNEX Separable Connectors, Size 5, up to 145 kV

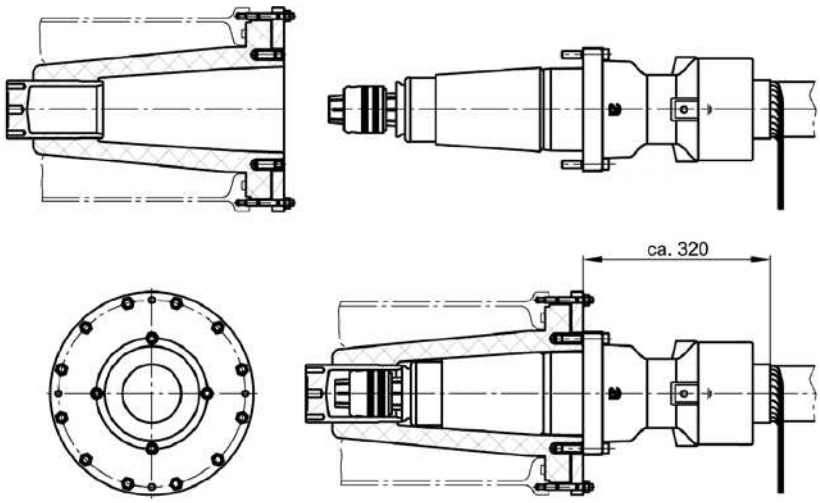
The following options are available but must be specified when ordering:

Low temperature
The standard components are designed for a temperature down to -25°C. A special low temperature grease is used for ambient conditions involving temperatures below -25°C.

Offshore
Components with corresponding material properties are used for offshore applications.

Insulated cable shield
For insulated networks and usage of a Link Box. A touch proof system and flexibility were the main approach.

Important:
Special tools are required for the assembly of HV-CONNEX separable connectors size 5 (see assembly accessories).



No.	Version [1]	Nominal voltage [2]	Cross section range [3] [4]	Conductor diameter [4] [5]	Diameter over insulation
		I_N (A)	(mm²)	Ø (mm)	Ø (mm)
859 999 999	XXXX	2500	95 - 1600	9.3 - 50.4	33.0 - 76.0

[1] Individual article number determined according to actual cable dimensions (see page 39: Form to determine HV-CONNEX Separable Connectors).
[2] depending on the cable that is used
[3] Cross section is for reference only.
Actual value is limited by min. / max. diameter over conductor and min. / max. diameter over insulation.
(1 inch = 25.4 mm; 1 square inch = 645.16 mm²)
[4] Values are vor RM (round circular).
RE (round solid) and RF (round superflexible stranded) upon request.
[5] The total range is covered by different components.

HV-CONNEX Sockets for GIS, Size 5, up to 145 kV

For installation in gas-insulated switchgears, switchgears, joint boxes and other devices.

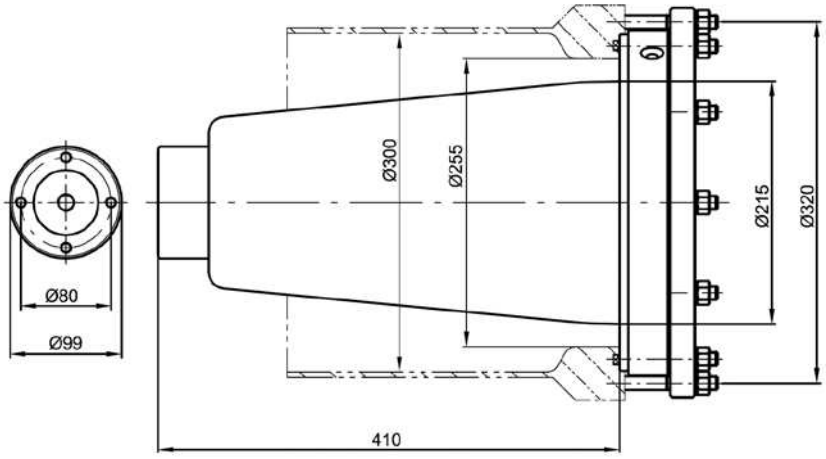
HV-CONNEX socket
with or without voltage tap, each including fastenings.

Extension adapter
for adjusting the length of terminations to relevant standards.

Dimensions for compact design, Size 5

These versions allow for very small cable connection spaces and therefore also a significant reduction in the amount of SF_6 gas needed.

Scope of delivery:
- Socket (with or without voltage tap)
- Fastenings

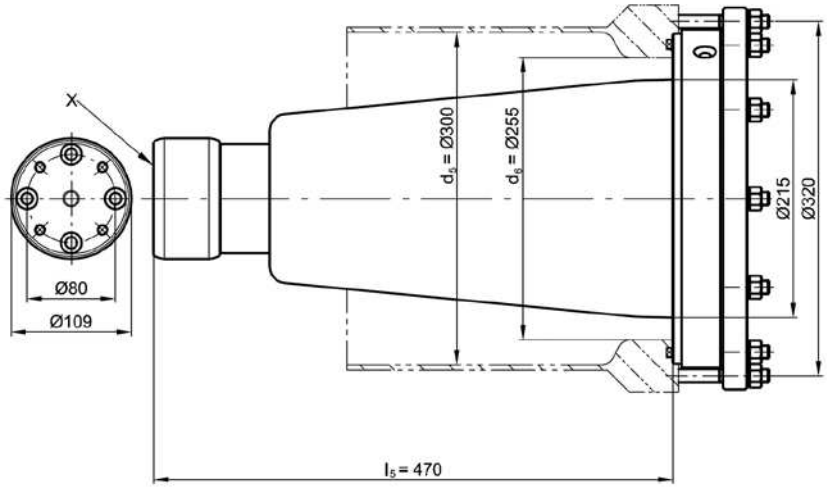


No.	Version [1]	Capacitive voltage tap [2] (pF)	Installation depth (mm)	Weight (kg)
828 050 999	0001	—	410	24.2
828 050 999	0002	approx. 3	410	24.2

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

For dimensions according to IEC 62271-209, for dry-type termination, Size 5

Scope of delivery:
- Socket (with or without voltage tap)
- Extension adapter (pre-assembled)
- Fastenings



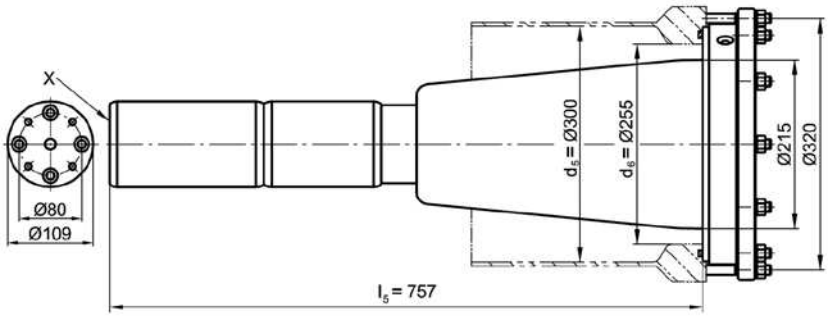
No.	Version [1]	Capacitive voltage tap [2]	IEC dimensions l_5	Weight
		(pF)	(mm)	(kg)
828 050 999	0003	—	470	25.7
828 050 999	0004	approx. 3	470	25.8

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

For dimensions according to IEC 62271-209, for fluid-filled termination, Size 5

Scope of delivery:

- Socket (with or without voltage tap)
- Extension adapter (pre-assembled)
- Fastenings



No.	Version [1]	Capacitive voltage tap [2]	IEC dimensions l_5	Weight
		(pF)	(mm)	(kg)
828 050 999	0005	—	757	32.5
828 050 999	0006	approx. 3	757	32.6

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

HV-CONNEX Sockets for transformers, Size 5, up to 145 kV

For installation in transformers, E-coils, joint boxes and other oil-insulated devices.

HV-CONNEX socket
with or without voltage tap, each including fastenings.

Extension adapter
for adjusting the length of terminations to relevant standards.

Corona shield
Protects against sharp-edged areas of the connection system.

Take-off bolt
optional; must be ordered separately. Included in scope of delivery of transformer manufacturer as specified in standard. Individual designs can be delivered upon request.

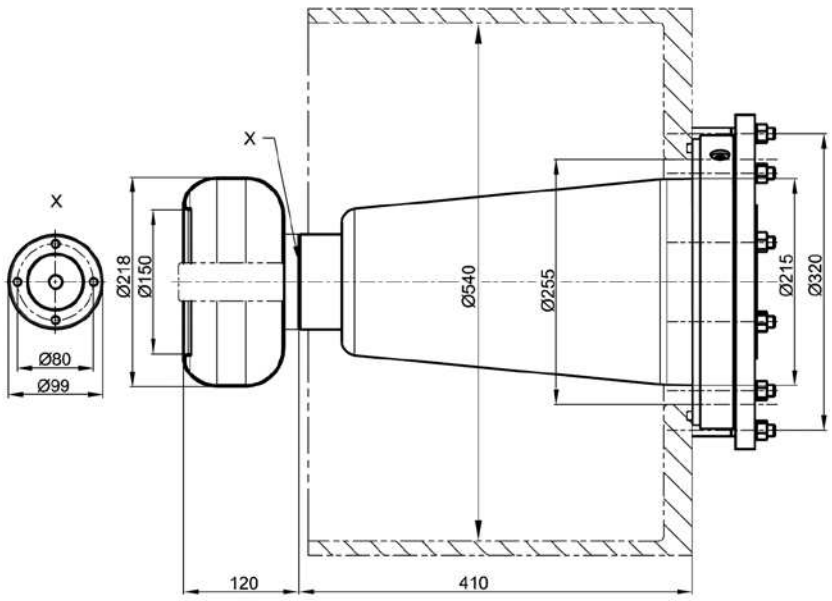
Please note: When using a HV-CONNEX separable connector, the maximum temperature of the surrounding insulating fluid must not exceed the maximum temperature admissible for cable insulation.

Dimensions for compact design, Size 5

These versions allow for very small cable connection spaces and therefore also a significant reduction in the amount of insulating fluid needed.

Scope of delivery:
- Socket (with or without voltage tap)
- corona shield (included)
- Fastenings

Optional: take-off bolt (must be ordered separately)



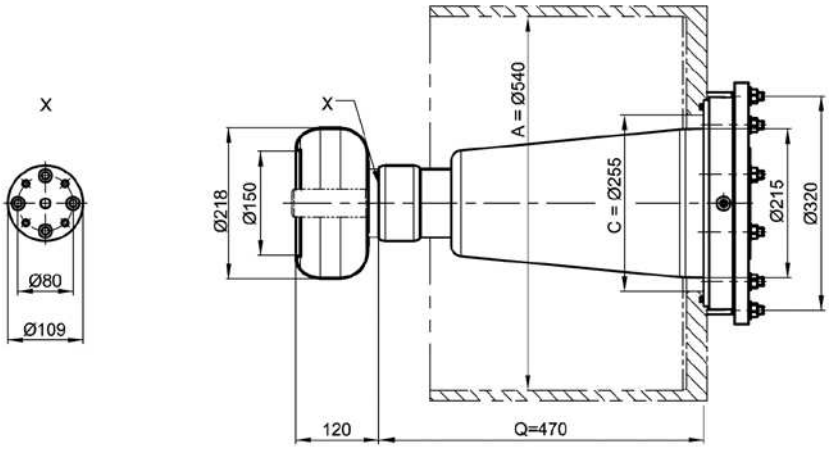
No.	Version [1]	Capacitive voltage tap [2]	Installation depth	Weight
		(pF)	(mm)	(kg)
828 051 999	0001	—	410	24.6
828 051 999	0002	approx. 3	410	24.7

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

For dimensions according to DIN VDE 0532

Scope of delivery:
- Socket (with or without voltage tap)
- Extension adapter (pre-assembled)
- corona shield (included)
- Fastenings

Optional: take-off bolt (must be ordered separately)



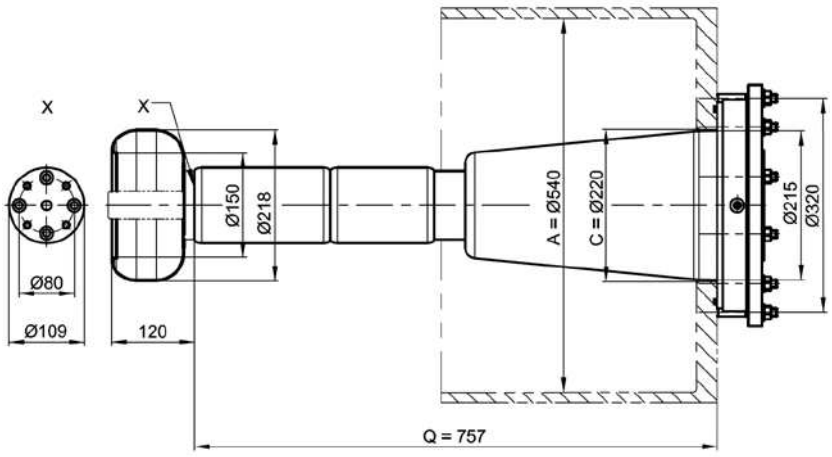
No.	Version [1]	Capacitive voltage tap [2] (pF)	Installation depth (mm)	Weight (kg)
828 051 999	0003	—	470	26.2
828 051 999	0004	approx. 3	470	26.2

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

For dimensions according to EN 50299 for conventional terminations

Scope of delivery:
- Socket (with or without voltage tap)
- Extension adapter (pre-assembled)
- corona shield (included)
- Fastenings

Optional: take-off bolt (must be ordered separately)

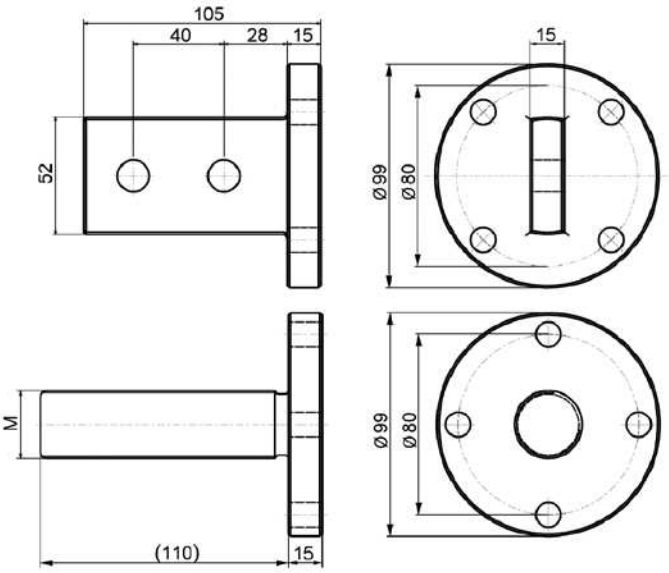


No.	Version [1]	Capacitive voltage tap [2] (pF)	Installation depth (mm)	Weight (kg)
828 051 999	0005	—	757	33.0
828 051 999	0006	approx. 3	757	33.0

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

Take-off-bolt

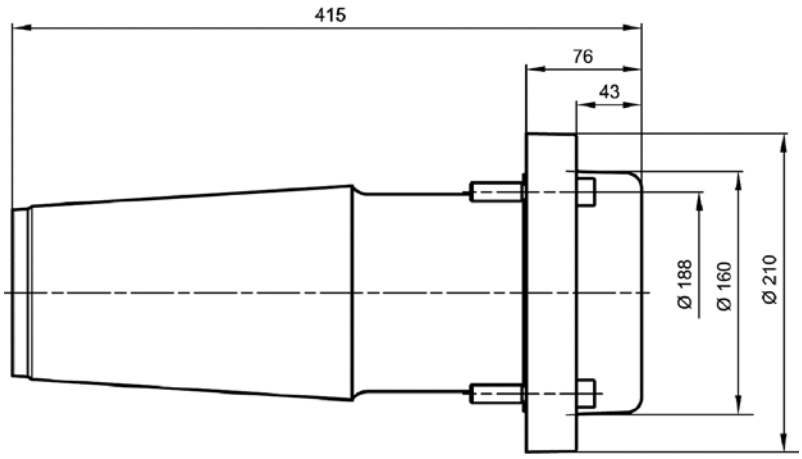
Optional.
Conforming to EN 50299 included in scope of delivery of transformer manufacturer.
Material: Aluminium, silver-plated



No.	Bolt size (mm)	Cross sectional range (mm²)
880 266 147	M30 x 1,5	240 - 630
880 265 988	M42 x 1,5	800 - 1200
880 265 986	M52 x 2	≤ 2000
880 266 779	52 x 15	240 - 630

Dummy Plug, Size 5

For voltage-proof sealing of HV-CONNEX sockets.



No.	Weight (kg)
827 701 002	7.7

Gas-insulated Blind Cover, Size 5

For voltage-proof sealing of HV-CONNEX sockets with SF_6 gas.

No.	Manometer
827 711 001	with
827 711 002	without

Cover Disk, Size 5

Not voltage-proof!
For protecting open HV-CONNEX sockets (e.g. transportation).
Dust-proof and water-tight.

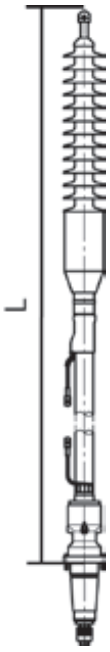
No.	Diameter Ø (mm)	Weight (kg)
827 220 105	230	2.9

Test lead, Size 5

The cable with flexible outdoor termination can be used for electrical tests on equipment fitted with HV-CONNEX sockets.

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

The specified values are maximum testing values that will result in increased wear when used as a testing cable, thus decreasing the expected service life.



No.	Version [1]	Rated power frequency-withstand voltage 1 min (kV)	Rated lightning impulse withstand voltage (BIL) (kV)	Partial discharge (pC)	Length (m)	Standards
815 999 999	XXXX	275	650	167 kV ≤ 5 pC	min. 3	IEC60137
815 999 999	XXXX	190 (30 min)	—	114 kV ≤ 5 pC	min. 3	IEC60840

[1]) Individual article number determined with a product configurator based on customer requests (see page 40: Form to determine HV test lead and connecting cable).

1

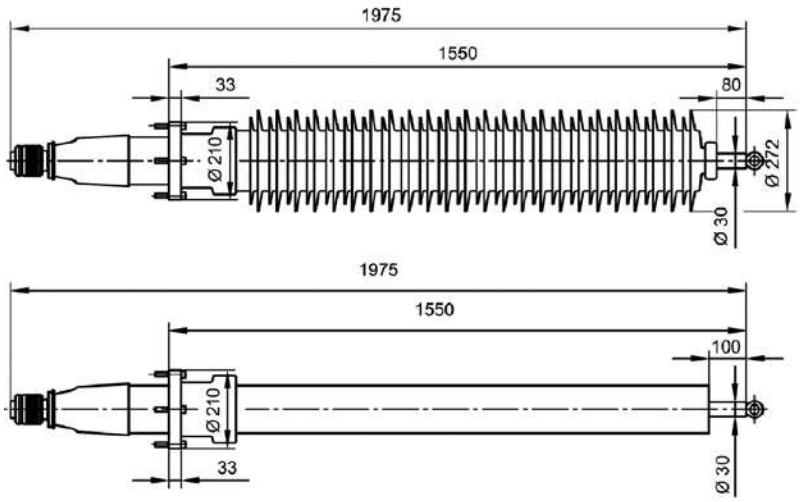
HV-CONNEX Pluggable Bushing, Size 5

HV-CONNEX pluggable bushings are used for permanent operation or for carrying out voltage tests on equipment fitted with HV-CONNEX sockets.

The pluggable bushings are equipped with a capacitive voltage tap.

Use as a test bushing will result in increased wear, thus decreasing the expected service life.

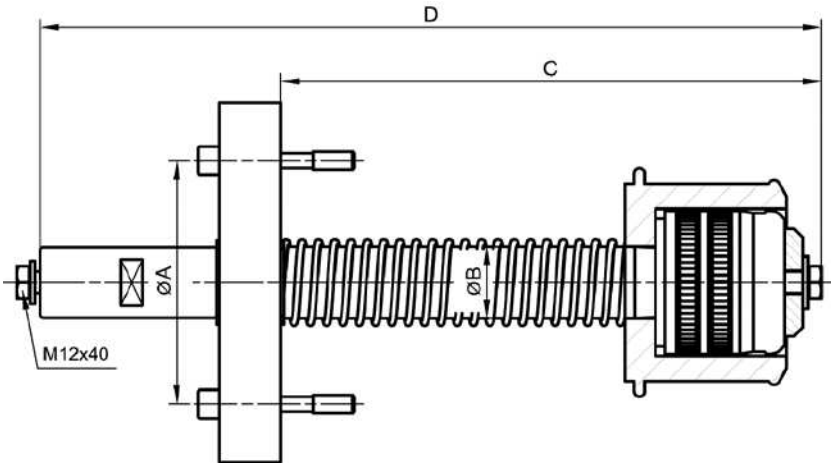
2



No.	Rated Current	Rated power frequency-withstand voltage	Rated lightning impulse withstand voltage (BIL)	Partial discharge at 1.5 x U_0	Creepage distance	Weight
	I_r (A)	1 min (kV)	(kV)	(pC)	(mm)	(kg)
828 186 012	1250	275	650	160 kV ≤ 10 pC	4495	85.0
828 186 014	1250	275	650	160 kV ≤ 10 pC	1300	75.0

Current Testing Plug, Size 5

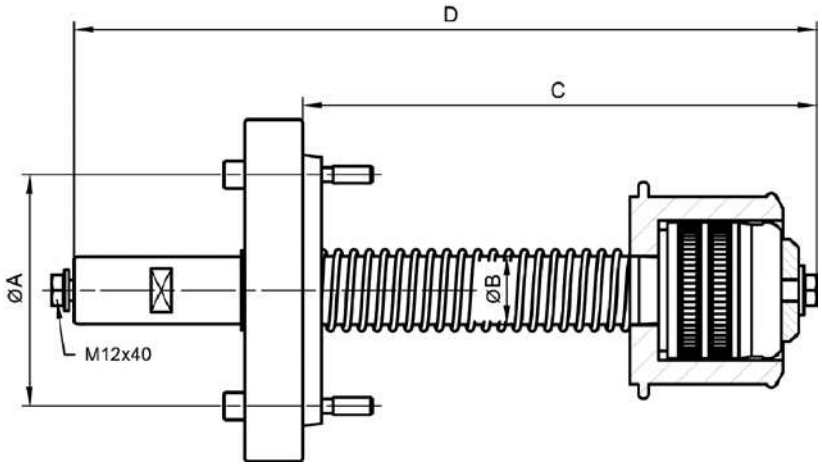
This plug is used to carry out current tests on switchgear, transformers, transducers etc. fitted with HV-CONNEX sockets.



No.	Nominal voltage	Max. testing voltage	A	B	C	D
	I_N (A)	U_m (kV)	(mm)	(mm)	(mm)	(mm)
827 093 005	1600	5	188	40	416	550

Earthing and Short-circuit Devices for HV-CONNEX Sockets, Size 5

These devices are used to earth and short circuit equipment fitted with HV-CONNEX sockets (e. g. switchgear, transformers etc.).

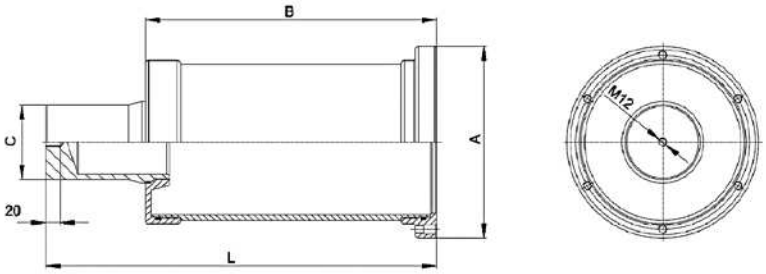


No.	A	B	C	D
	(mm)	(mm)	(mm)	(mm)
827 086 005	188	40	416	550

Earthing Cap, Size 5

This device is used to earth and short circuit unplugged HV-CONNEX separable connectors.
- not voltage proof

For protection of unplugged HV-CONNEX separable connectors against damage and dirt.



No.	Weight (kg)	A (mm)	B (mm)	C (mm)	L (mm)
827 708 001	6.5	220	355	97	490

Protective cap, Size 5

For protecting the insulating part and contact system of bushing, test lead and mounted HV-CONNEX separable connector.
- not surge-proof
- made of plastic
- with o-ring seal, therefore dust-proof and water-tight

No.	Weight (kg)
827 708 012	7.9

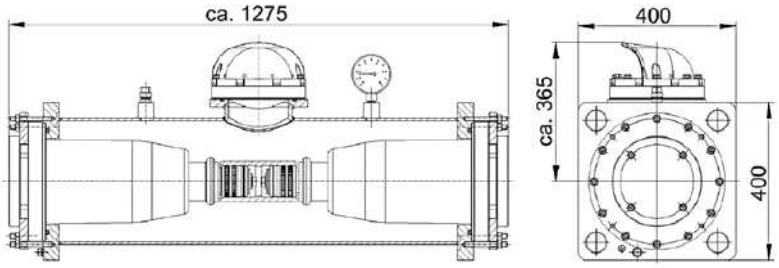
HV-CONNEX Joint, Size 5

HV-CONNEX joint for testing and connecting cables terminated with HV-CONNEX separable connectors.

Insulation medium: SF_6 gas

The joint features a turnable anti-burst device and a SF_6 gas density monitor with signal generator for remote display. The sockets are sealed with plastic covers. Voltage-proof dummy plugs to be ordered separately.

Low temperature:
The standard components are designed for a temperature up to -25 °C. A special gas mixture for low temperatures is used for ambient conditions below -25 °C.



No.	Max. operating voltage	Rated power frequency-withstand voltage	Rated lightning impulse withstand voltage (BIL)	Width	Length	Weight
	U_m (kV)	1 min (kV)	(kV)	(mm)	(mm)	(kg)
827 052 010	145	275	550	400	1275	193.0

HV-CONNEX T-joint, Size 5

HV-CONNEX T-joint for branching cables terminated with HV-CONNEX separable connectors.

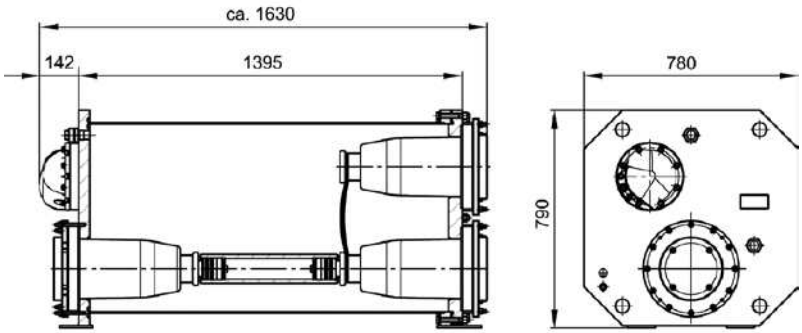
Insulation medium: SF_6 gas

The T-joint features a turnable anti-burst device and a SF_6 gas density monitor with signal generator for remote display. The sockets are sealed with plastic covers; voltage-proof dummy plugs to be ordered separately.

Low temperature:
The standard components are designed for a temperature up to -25 °C. A special gas mixture for low temperatures is used for ambient conditions below -25 °C.

Possible applications:
- Pluggable branching joint for HV cables
- Universal application options:
  T-branching of one plastic-insulated cable to two plastic-insulated cables or a overhead line to two plastic-insulated cables

Properties:
- Metal clad
- Fully insulated
- High short-circuit strength
- Maintenance-free
- For outdoor use
- IP66
- Maintenance-free gas density monitor (manometer) with remote monitoring option
- Bursting disc
- Insulation medium SF_6
- TÜV-tested joint-housing (TÜV is german Technical Inspection Association)
- Different sizes can be combined on request



No.	Max. operating voltage	Rated power frequency-withstand voltage	Rated lightning impulse withstand voltage (BIL)	Width	Length	Weight
	U_m (kV)	1 min (kV)	(kV)	(mm)	(mm)	(kg)
827 047 101	145	275	650	780	1630	665.0

HV-CONNEX Separable Connectors, Size 6, up to 170 kV

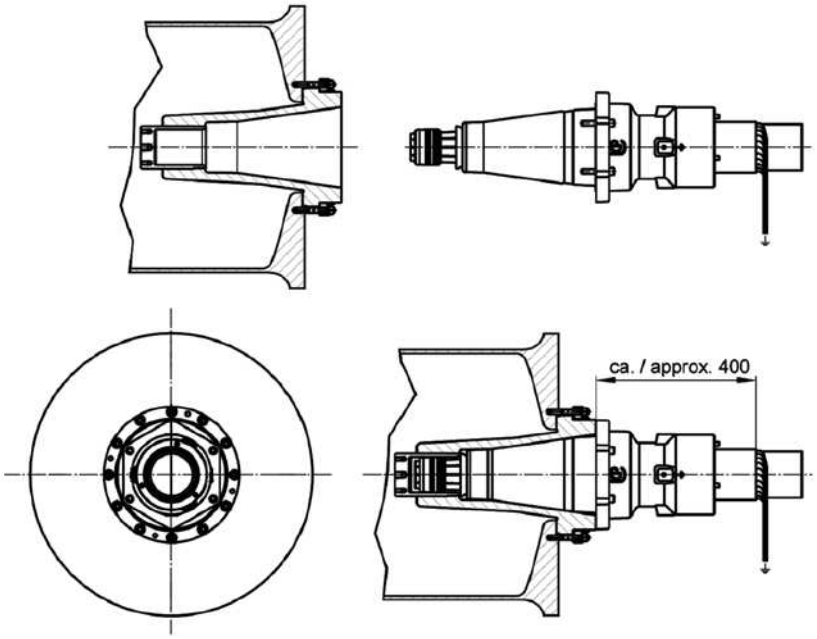
The following options are available but must be specified when ordering:

Low temperature
The standard components are designed for a temperature down to -25°C. A special low temperature grease is used for ambient conditions involving temperatures below -25°C.

Offshore
Components with corresponding material properties are used for offshore applications.

Insulated cable shield
For insulated networks and usage of a Link Box. A touch proof system and flexibility were the main approach.

Important:
Special tools are required for the assembly of HV-CONNEX separable connectors size 6 (see assembly accessories).



No.	Version [1]	Nominal voltage [2]	Cross section range [3] [4]	Conductor diameter [4] [5]	Diameter over insulation
		I_N (A)	(mm²)	Ø (mm)	Ø (mm)
869 999 999	XXXX	2500	240 - 2500	15.3 - 64.9	53.0 - 110.5

[1] Individual article number determined according to actual cable dimensions (see page 39: Form to determine HV-CONNEX Separable Connectors)
[2] depending on the cable that is used
[3] Cross section is for reference only.
Actual value is limited by min. / max. diameter over conductor and min. / max. diameter over insulation.
(1 inch = 25.4 mm; 1 square inch = 645.16 mm²)
[4] Values are vor RM (round circular).
RE (round solid) and RF (round superflexible stranded) upon request.
[5] The total range is covered by different components.

HV-CONNEX Sockets for GIS, Size 6, up to 170 kV

For installation in gas-insulated switchgears, switchgears, joint boxes and other devices.

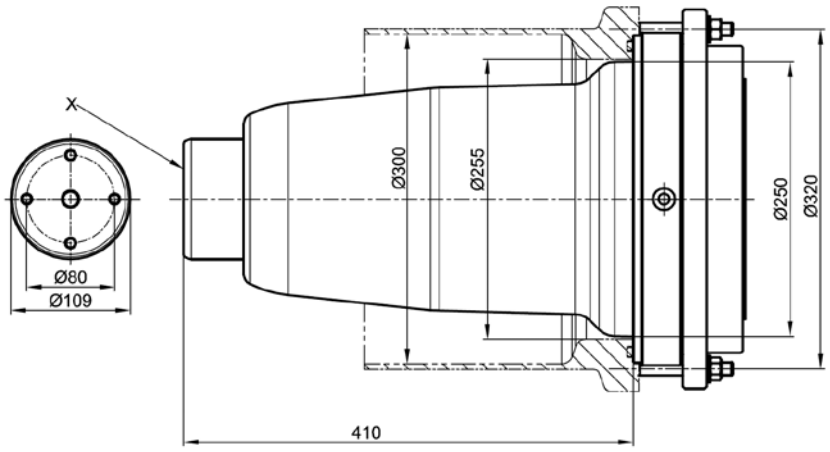
HV-CONNEX socket
with or without voltage tap, each including fastenings.

Extension adapter
for adjusting the length of terminations to relevant standards.

Dimensions for compact design, Size 6

These versions allow for very small cable connection spaces and therefore also a significant reduction in the amount of SF_6 gas needed.

Scope of delivery:
- Socket (with or without voltage tap)
- Fastenings

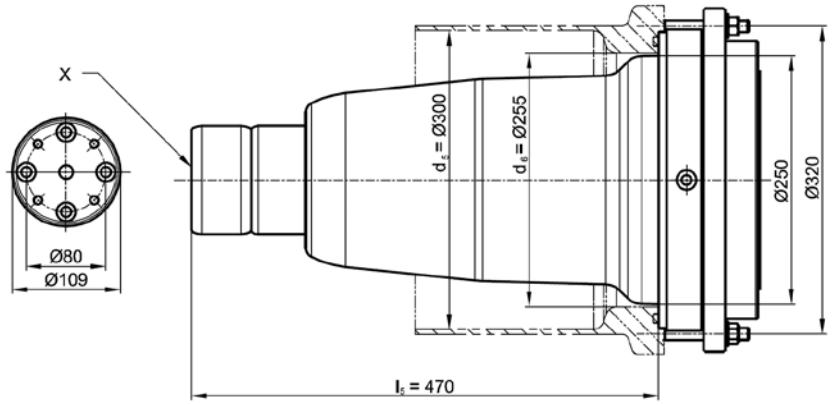


No.	Version [1]	Capacitive voltage tap [2]	Installation depth	d_6	Weight
		(pF)	(mm)	(mm)	(kg)
828 060 999	0001	—	410	255	24.3
828 060 999	0002	approx. 3	410	255	24.5

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

For dimensions according to IEC 62271-209, for dry terminations, Size 6

Scope of delivery:
- Socket (with or without voltage tap)
- Extension adapter (pre-assembled)
- Fastenings

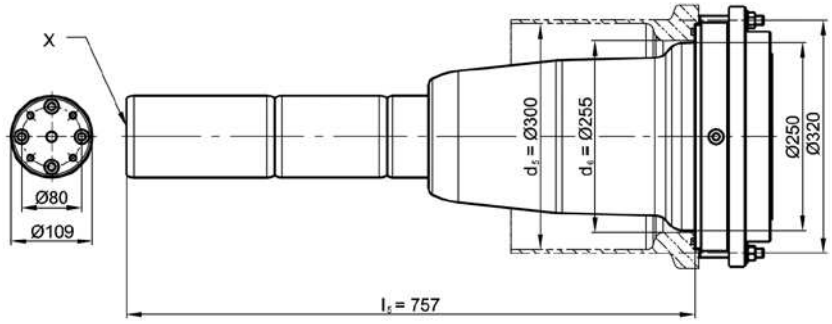


No.	Version [1]	Capacitive voltage tap [2]	IEC dimensions l_5	d_6	Weight
		(pF)	(mm)	(mm)	(kg)
828 060 999	0003	—	470	255	25.814
828 060 999	0004	approx. 3	470	255	25.961

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

For dimensions according to IEC 62271-209, for fluid-filled terminations, Size 6

Scope of delivery:
- Socket (with or without voltage tap)
- Extension adapter (pre-assembled)
- Fastenings



No.	Version [1]	Capacitive voltage tap [2]	IEC dimensions l_5	d_6	Weight
		(pF)	(mm)	(mm)	(kg)
828 060 999	0005	—	757	255	32.6
828 060 999	0006	approx. 3	757	255	32.8

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

HV-CONNEX Sockets for transformers, Size 6, up to 170 kV

For installation in transformers, E-coils, joint boxes and other oil-insulated devices.

HV-CONNEX socket
with or without voltage tap, each including fastenings.

Extension adapter
for adjusting the length of terminations to relevant standards.

Corona shield
Protects against sharp-edged areas of the connection system.

Take-off bolt
optional; must be ordered separately. Included in scope of delivery of transformer manufacturer as specified in standard. Individual designs can be delivered upon request.

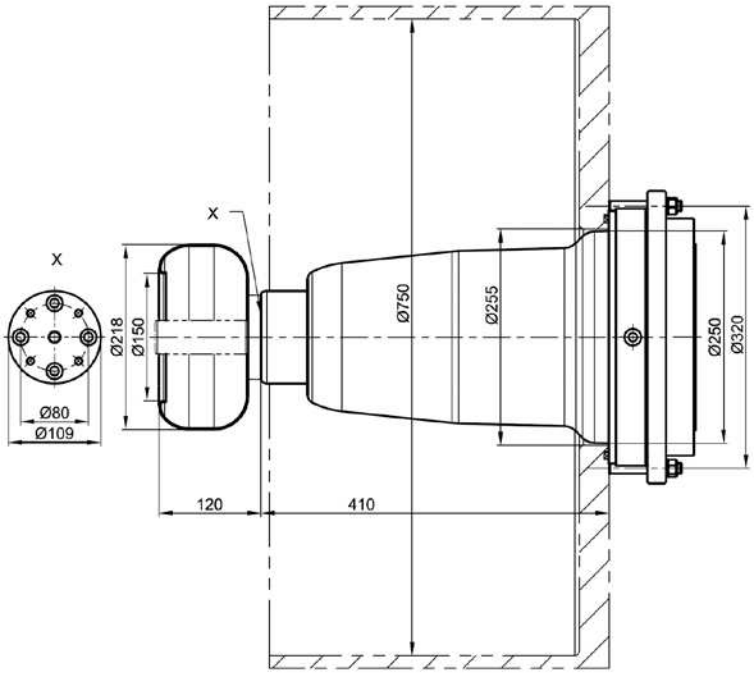
Please note: When using a HV-CONNEX separable connector, the maximum temperature of the surrounding insulating fluid must not exceed the maximum temperature admissible for cable insulation.

Dimensions for compact design, Size 6

These versions allow for very small cable connection spaces and therefore also a significant reduction in the amount of insulating fluid needed.

Scope of delivery:
- Socket (with or without voltage tap)
- corona shield (included)
- Fastenings

Optional: take-off bolt (must be ordered separately)



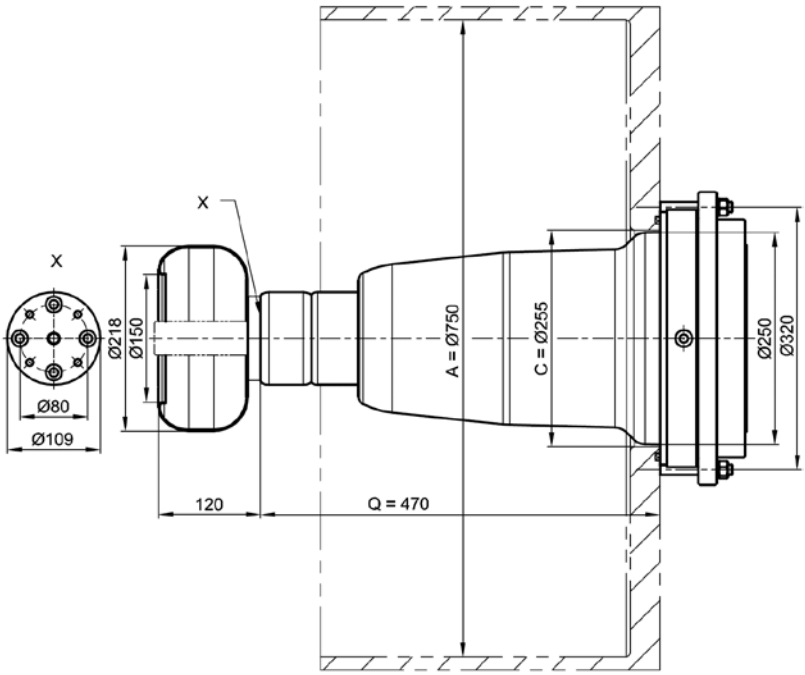
No.	Version [1]	Capacitive voltage tap [2]	Installation depth	C	Weight
		(pF)	(mm)	(mm)	(kg)
828 061 999	0001	—	410	255	25.9
828 061 999	0002	approx. 3	410	255	26.0

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

Dimensions for compact design according to DIN VDE 0532, Size 6

Scope of delivery:
- Socket (with or without voltage tap)
- Extension adapter (pre-assembled)
- corona shield (included)
- Fastenings

Optional: take-off bolt (must be ordered separately)



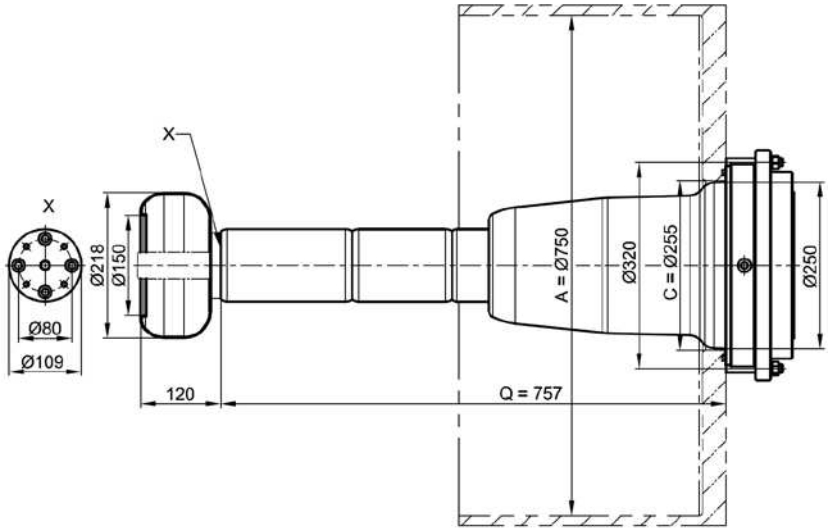
No.	Version [1]	Capacitive voltage tap [2]	Installation depth	C	Weight
		(pF)	(mm)	(mm)	(kg)
828 061 999	0003	—	470	255	27.4
828 061 999	0004	approx. 3	470	255	27.5

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

For dimensions according to EN 50299, for conventional terminations, Size 6

Scope of delivery:
- Socket (with or without voltage tap)
- Extension adapter (pre-assembled)
- corona shield (included)
- Fastenings

Optional: take-off bolt (must be ordered separately)

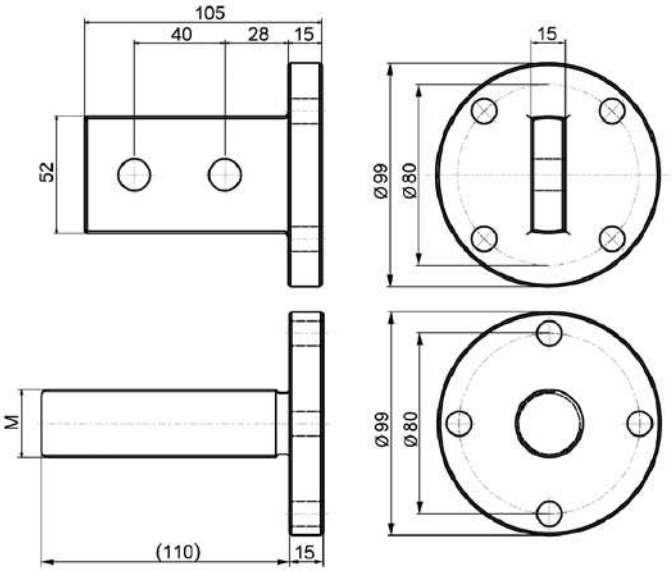


No.	Version [1]	Capacitive voltage tap [2]	Installation depth	C	Weight
		(pF)	(mm)	(mm)	(kg)
828 061 999	0005	—	757	220	33.4

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

Take-off-bolt

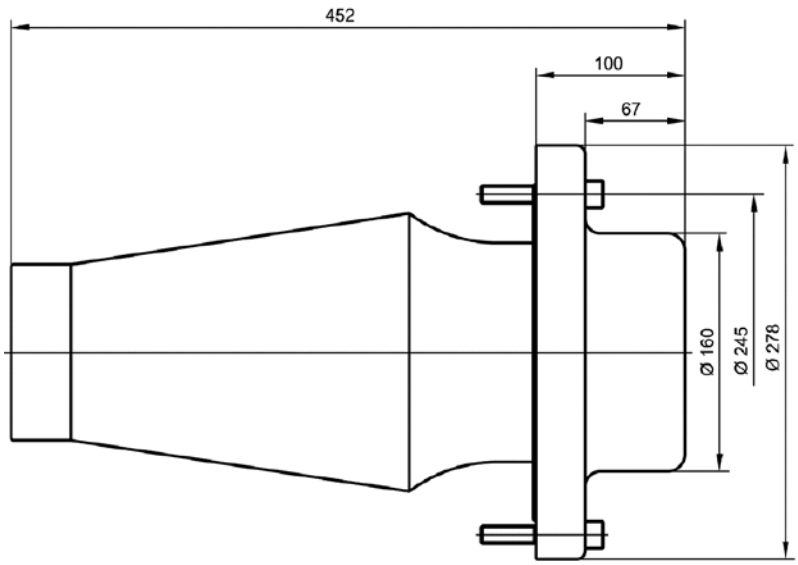
Optional.
Conforming to EN 50299 included in scope of delivery of transformer manufacturer.
Material: Aluminium, silver-plated



No.	Bolt size (mm)	Cross sectional range (mm^2)
880 266 147	M30 x 1,5	240 - 630
880 265 988	M42 x 1,5	800 - 1200
880 265 986	M52 x 2	≤ 2000
880 266 779	52 x 15	240 - 630

Dummy Plug, Size 6

For voltage-proof sealing of HV-CONNEX sockets.



No.	Weight (kg)
827 706 002	13.2

Gas-insulated Blind Cover, Size 6

For voltage-proof sealing of HV-CONNEX sockets with SF_6 gas.

No.	Manometer
827 716 001	with
827 716 002	without

Cover Disk, Size 6

Not voltage-proof!
For protecting open HV-CONNEX socket (e.g. transportation).
Dust-proof and water-tight.

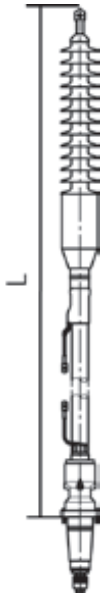
No.	Diameter Ø (mm)	Weight (kg)
827 220 106	280	3.2

Test lead, Size 6

The cable with flexible outdoor termination can be used for electrical tests on equipment fitted with HV-CONNEX sockets.

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

The specified values are maximum testing values that will result in increased wear when used as a testing cable, thus decreasing the expected service life.



No.	Version [1]	Rated power frequency-withstand voltage	Rated lightning impulse withstand voltage (BIL)	Partial discharge	Length	Standards
		1 min (kV)	(kV)	(pC)	(m)	
815 999 999	XXXX	325	750	197 kV ≤ 5 pC	min. 3	IEC60137
815 999 999	XXXX	218 (30 min)	—	131 kV ≤ 5 pC	min. 3	IEC60840

[1]) Individual article number determined with a product configurator based on customer requests (see page 40: Form to determine HV test lead and connecting cable).

HV-CONNEX Pluggable Bushing, Size 6

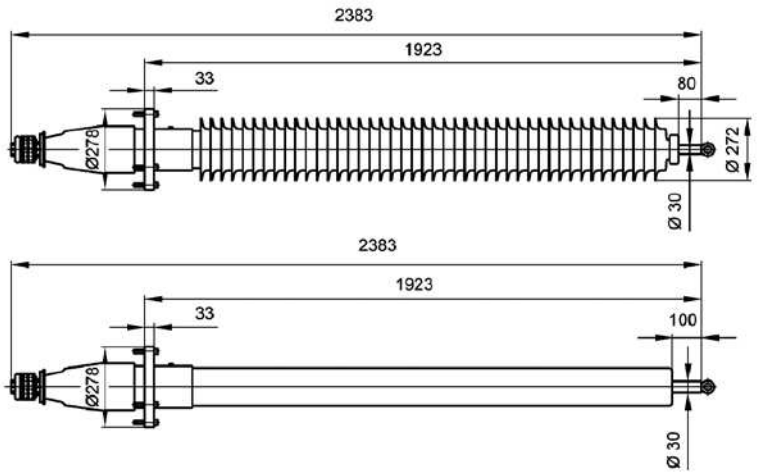
HV-CONNEX pluggable bushings are used for permanent operation or for carrying out voltage tests on equipment fitted with HV-CONNEX sockets.

The pluggable bushings are equipped with a capacitive voltage tap.

Use as a test bushing will result in increased wear, thus decreasing the expected service life.

2

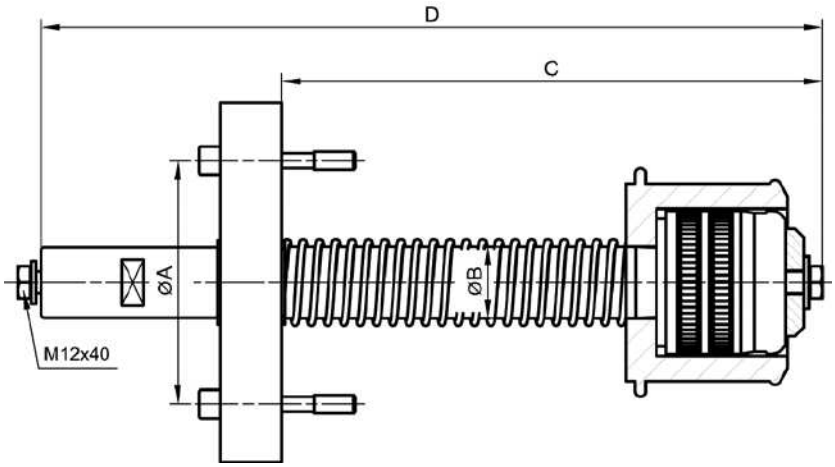
1



No.	Rated Current	Rated power frequency-withstand voltage	Rated lightning impulse withstand voltage (BIL)	Partial discharge at 1.5 x U_0	Creepage distance	Weight
	I_r (A)	1 min (kV)	(kV)	(pC)	(mm)	(kg)
828 187 019	1250	325	750	170 kV ≤ 10 pC	5270	98.0
828 187 018	1250	325	750	170 kV ≤ 10 pC	1500	86.0

Current Testing Plug, Size 6

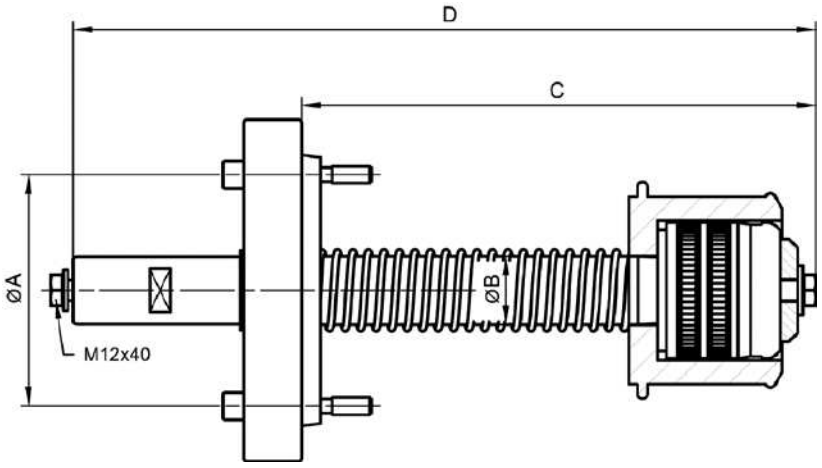
This plug is used to carry out current tests on switchgear, transformers, transducers etc. fitted with HV-CONNEX sockets.



No.	Nominal voltage	Max. testing voltage	A	B	C	D
	I_N (A)	U_m (kV)	(mm)	(mm)	(mm)	(mm)
827 093 006	1600	5	245	40	451	585

Earthing and Short-circuit Devices for HV-CONNEX Socket, Size 6

These devices are used to earth and short circuit equipment fitted with HV-CONNEX sockets (e. g. switchgear, transformers etc.).

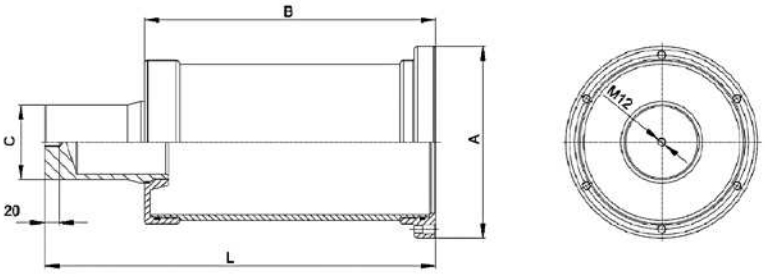


No.	A	B	C	D
	(mm)	(mm)	(mm)	(mm)
827 086 006	245	40	451	585

Earthing Cap, Size 6

This device is used to earth and short circuit unplugged HV-CONNEX separable connectors.
- not voltage proof

For protection of unplugged HV-CONNEX separable connectors against damage and dirt.



No.	A (mm)	B (mm)	C (mm)	L (mm)
827 708 003	270	410	105	550

Protective cap, Size 6

For protecting the insulating part and contact system of bushing, test lead and mounted HV-CONNEX separable connector.
- not surge-proof
- made of plastic
- with o-ring seal, therefore dust-proof and water-tight

No.	Weight (kg)
827 708 013	5.8

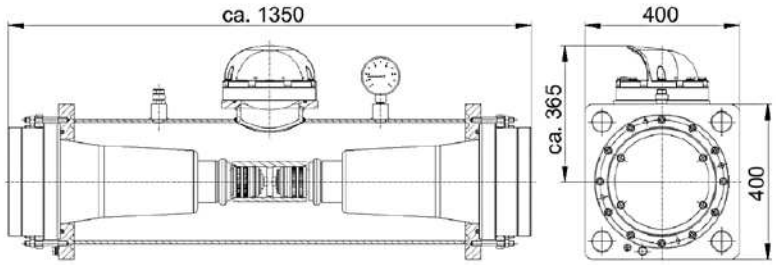
HV-CONNEX Joint, Size 6

HV-CONNEX joint for testing and connecting cables terminated with HV-CONNEX separable connectors.

Insulation medium: SF_6 gas

The joint features a turnable anti-burst device and a SF_6 gas density monitor with signal generator for remote display. The sockets are sealed with plastic covers. Voltage-proof dummy plugs to be ordered separately.

Low temperature:
The standard components are designed for a temperature up to -25 °C. A special gas mixture for low temperatures is used for ambient conditions below -25 °C.



No.	Max. operating voltage	Rated power frequency-withstand voltage	Rated lightning impulse withstand voltage BIL)	Width	Length	Weight
	U_m (kV)	1 min (kV)	(kV)	(mm)	(mm)	(kg)
827 053 010	170	325	750	400	1350	196.0

III
Size 6

HV-CONNEX T-Joint, Size 6

HV-CONNEX T-joint for branching cables terminated with HV-CONNEX cable connectors.

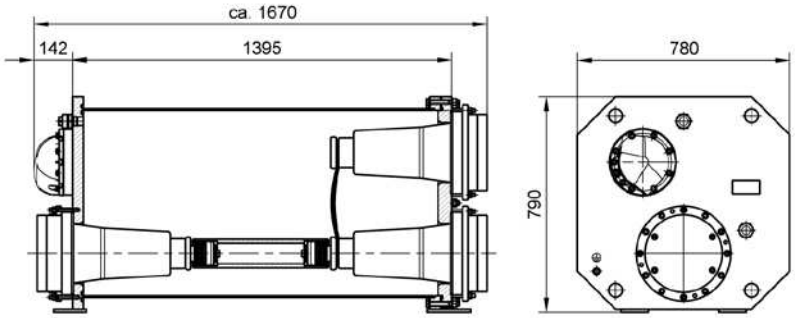
Insulation medium: SF_6 gas

The T-joint features a turnable anti-burst device and a SF_6 gas density monitor with signal generator for remote display. The sockets are sealed with plastic covers; voltage-proof dummy plugs to be ordered separately.

Low temperature:
The standard components are designed for a temperature up to -25 °C. A special gas mixture for low temperatures is used for ambient conditions below -25 °C.

Possible applications:
- Pluggable branching joint for HV cables
- Universal application options:
  T-branching of one plastic-insulated cable to two plastic-insulated cables or a overhead line to two plastic-insulated cables

Properties:
- Metal clad
- Fully insulated
- High short-circuit strength
- Maintenance-free
- For outdoor use
- IP66
- Maintenance-free gas density monitor (manometer) with remote monitoring option
- Bursting disc
- Insulation medium SF_6
- TÜV-tested joint-housing (TÜV is german Technical Inspection Association)
- Different sizes can be combined on request



No.	Max. operating voltage	Rated power frequency-withstand voltage	Rated lightning impulse withstand voltage (BIL)	Width	Length	Weight
	U_m (kV)	1 min (kV)	(kV)	(mm)	(mm)	(kg)
827 057 001	170	325	750	780	1670	650.0

HV-CONNEX Separable Connectors, Size 6-S, up to 245 kV

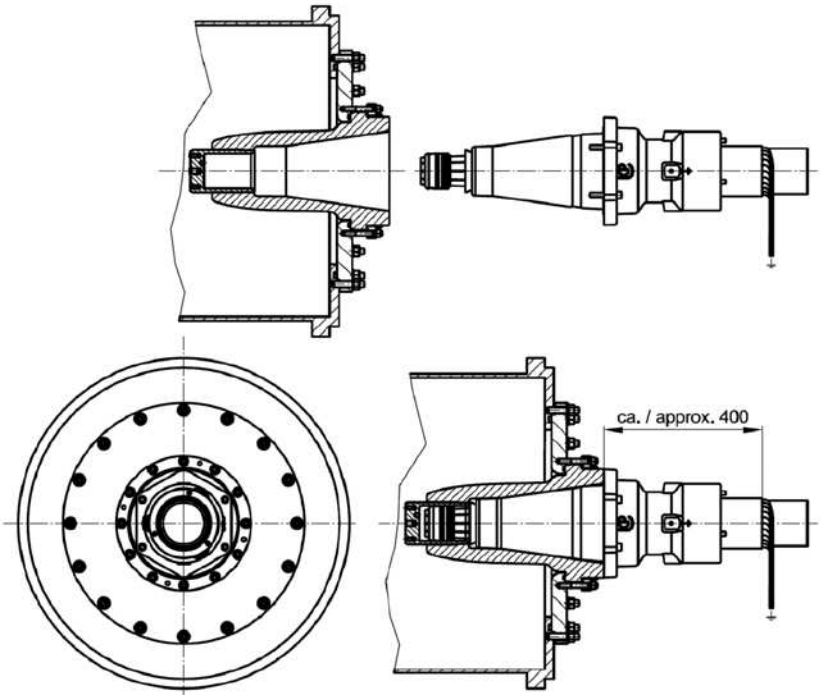
The following options are available but must be specified when ordering:

Low temperature
The standard components are designed for a temperature down to -25°C. A special low temperature grease is used for ambient conditions involving temperatures below -25°C.

Offshore
Components with corresponding material properties are used for offshore applications.

Insulated cable shield
For insulated networks and usage of a Link Box. A touch proof system and flexibility were the main approach.

Important:
Special tools are required for the assembly of HV-CONNEX separable connectors size 6-S (see assembly accessories).



No.	Version[1)]	Nominal voltage [2)] U_N (A)	Cross section range [3) 4)] (mm²)	Conductor diameter [4) 5)] Ø (mm)	Diameter over insulation Ø (mm)
869 999 999	XXXX	2500	240 - 2500	15.3 - 64.9	54.5 - 110.5

[1)] Individual article number determined according to actual cable dimensions (see page 39: Form to determine HV-CONNEX Separable Connectors).
[2)] depending on the cable that is used
[3)] Cross section is for reference only.
Actual value is limited by min. / max. diameter over conductor and min. / max. diameter over insulation.
(1 inch = 25.4 mm; 1 square inch = 645.16 mm²)
[4)] Values are vor RM (round circular).
RE (round solid) and RF (round superflexible stranded) upon request.
[5)] The total range is covered by different components.

HV-CONNEX Sockets for GIS, Size 6-S, up to 245 kV

For installation in gas-insulated switchgears, switchgears, joint boxes and other devices.

HV-CONNEX socket
with or without voltage tap, each including fastenings.

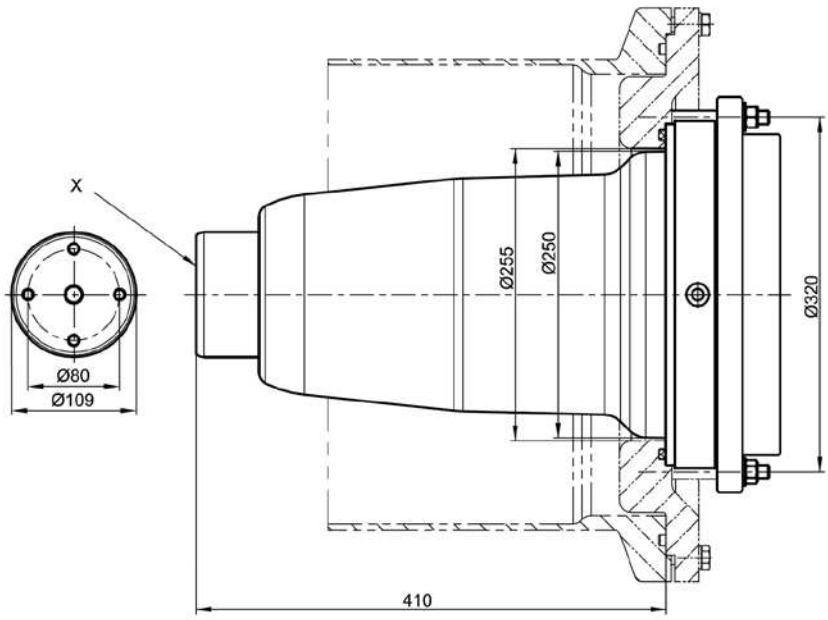
Adapter flange
for adjusting the diameter to relevant standards.

Extension adapter
or adjusting the length of terminations to relevant standards.

Dimensions for compact design, Size 6-S

These versions allow for very small cable connection spaces and therefore also a significant reduction in the amount of SF_6 gas needed.

Scope of delivery:
- Socket (with or without voltage tap)
- Fastenings



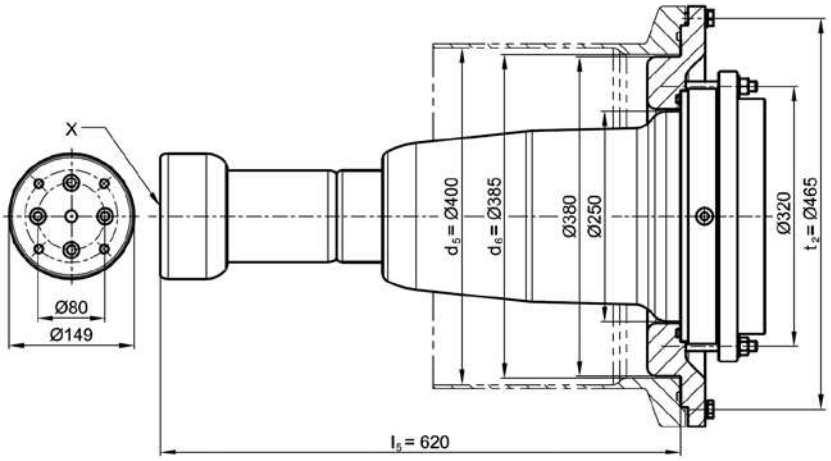
No.	Version[1]	Capacitive voltage tap [2] (pF)	Installation depth (mm)	Weight (kg)
828 065 999	0001	—	410	25.4
828 065 999	0002	approx. 3	410	25.6

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

For dimensions according to IEC 62271-209, for dry terminations, Size 6-S

Scope of delivery:

- Socket (with or without voltage tap)
- Adapter flange (included)
- Extension adapter (pre-assembled)
- Fastenings

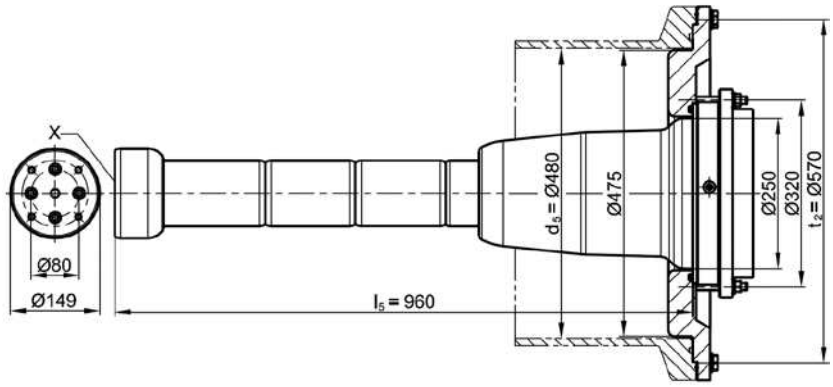


No.	Version [1]	Capacitive voltage tap [2]	IEC dimensions l_5	t_2	Weight
		(pF)	(mm)	(mm)	(kg)
828 065 999	0003	—	620	475	45.9
828 065 999	0004	approx. 3	620	475	46.1

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

For dimensions according to IEC 62271-209, for fluid-filled terminations, Size 6-S

Scope of delivery:
- Socket (with or without voltage tap)
- Adapter flange (included)
- Extension adapter (pre-assembled)
- Fastenings



No.	Version [1]	Capacitive voltage tap [2]	IEC dimensions l_5	t_2	Weight
		(pF)	(mm)	(mm)	(kg)
828 065 999	0005	—	960	582	65.3
828 065 999	0006	approx. 3	960	582	65.5

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

HV-CONNEX Sockets for transformers, Size 6-S, up to 245 kV

For installation in transformers, E-coils, joint boxes and other oil-insulated devices.

HV-CONNEX socket
with or without voltage tap, each including fastenings.

Adapter flange
for adjusting the diameter to relevant standards.

Extension adapter
for adjusting the length of terminations to relevant standards.

Corona shield
Protects against sharp-edged areas of the connection system.

Take-off bolt
optional; must be ordered separately. Included in scope of delivery of transformer manufacturer as specified in standard. Individual designs can be delivered upon request.

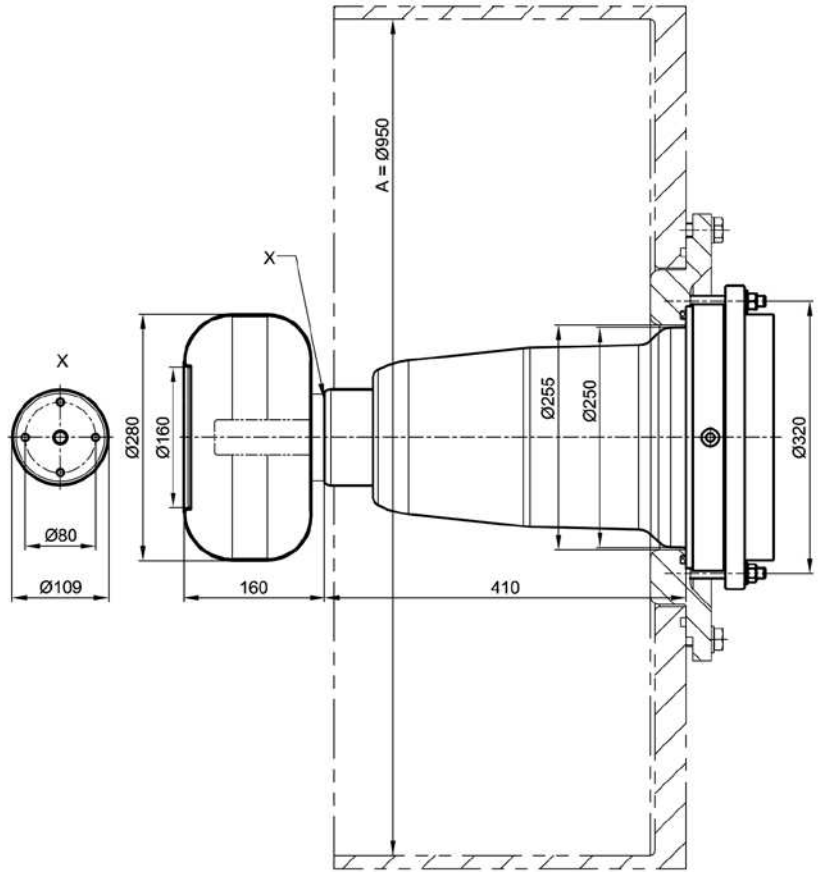
Please note: When using a HV-CONNEX separable connector, the maximum temperature of the surrounding insulating fluid must not exceed the maximum temperature admissible for cable insulation.

Dimensions for compact design, Size 6-S

These versions allow for very small cable connection spaces and therefore also a significant reduction in the amount of insulating fluid needed.

Scope of delivery:
- Socket (with or without voltage tap)
- Corona shield (included)
- Fastenings

Optional: take-off bolt (must be ordered separately)



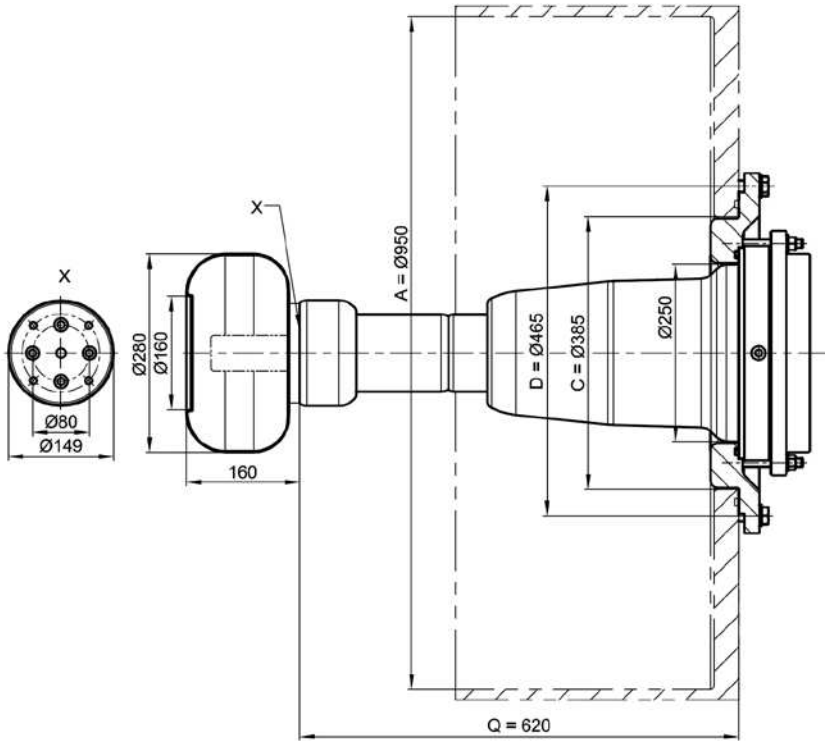
No.	Version [1]	Capacitive voltage tap [2] (pF)	Installation depth (mm)	Weight (kg)
828 066 999	0001	—	410	26.2
828 066 999	0002	approx. 3	410	26.4

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

For dimensions according to DIN VDE 0532, Size 6-S

Scope of delivery:
- Socket (with or without voltage tap)
- Adapter flange (included)
- Extension adapter (pre-assembled)
- Corona shield (included)
- Fastenings

Optional: take-off bolt (must be ordered separately)



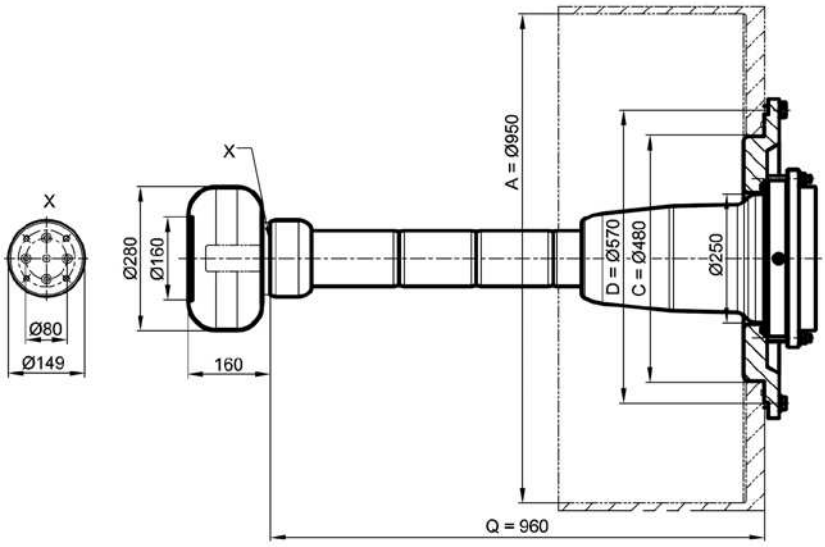
No.	Version [1]	Capacitive voltage tap [2]	Installation depth	D	Weight
		(pF)	(mm)	(mm)	(kg)
828 065 999	0003	—	620	475	46.5
828 066 999	0004	approx. 3	620	475	46.6

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

for dimensions according to EN 50299 for conventional terminations, Size 6-S

Scope of delivery:
- Socket (with or without voltage tap)
- Adapter flange (included)
- Extension adapter (pre-assembled)
- Corona shield (included)
- Fastenings

Optional: take-off bolt (must be ordered separately)

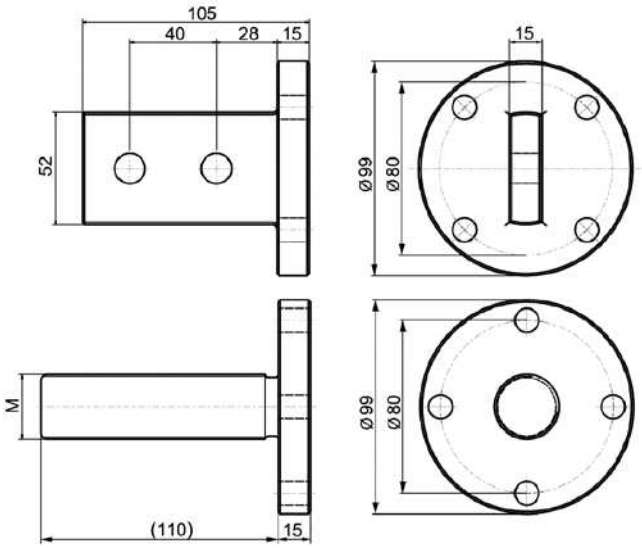


No.	Version [1]	Capacitive voltage tap [2]	Installation depth	D	Weight
		(pF)	(mm)	(mm)	(kg)
828 066 999	0005	—	960	582	66.1
828 066 999	0006	approx. 3	960	582	66.3

[1] Further versions upon request.
[2] capacity with cable plugged in; tolerance ±3 %

Take-off-bolt

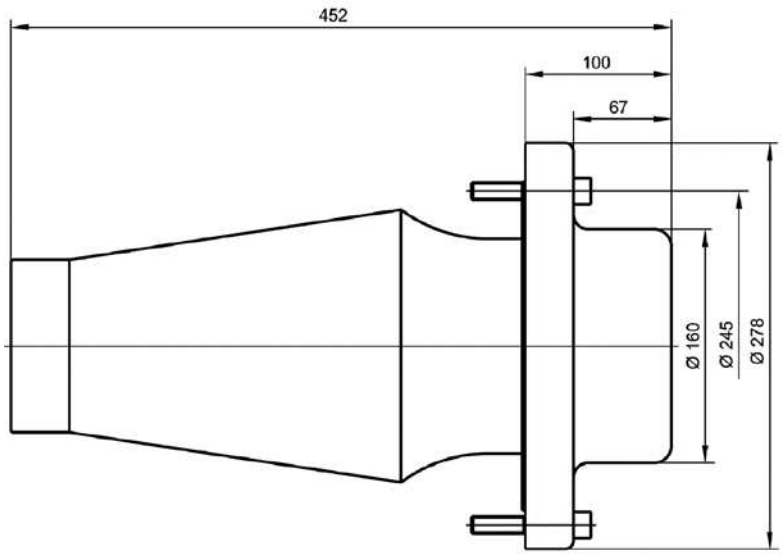
Optional.
Conforming to EN 50299 included in scope of delivery of transformer manufacturer.
Material: Aluminium, silver-plated



No.	Bolt size (mm)	Cross sectional range (mm²)
880 266 147	M30 x 1,5	240 - 630
880 265 988	M42 x 1,5	800 - 1200
880 265 986	M52 x 2	≤ 2000
880 266 779	52 x 15	240 - 630

Dummy Plug, Size 6-S

For surge-proof sealing of HV-CONNEX sockets.



No.	Weight (kg)
827 706 001	13.2

Gas-insulated Blind Cover, Size 6-S

For voltage-proof sealing of HV-CONNEX sockets with SF_6 gas.

No.	Manometer
827 716 001	with
827 716 002	without

Cover Disk, Size 6-S

Not voltage-proof!
For protecting open HV-CONNEX socket (e.g. transportation).
Dust-proof and water-tight.

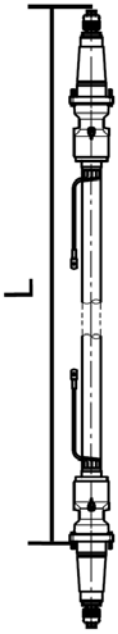
No.	Diameter Ø (mm)	Weight (kg)
827 220 106	280	3.2

Test lead, Size 6-S

The cable with flexible outdoor termination can be used for electrical tests on equipment fitted with HV-CONNEX sockets.

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

The specified values are maximum testing values that will result in increased wear when used as a testing cable, thus decreasing the expected service life.

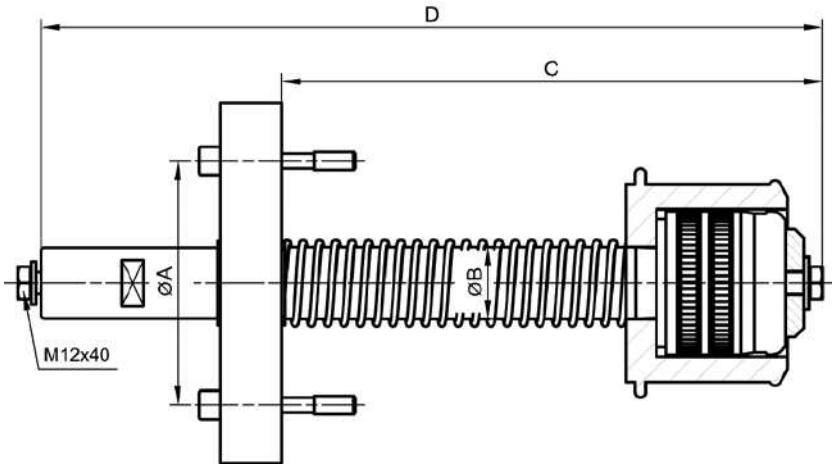


No.	Version [1]	Rated power frequency-withstand voltage 1 min (kV)	Rated lightning impulse withstand voltage (BIL) (kV)	Partial discharge (pC)	Length (m)	Standards
815 999 999	XXXX	460	1050	238 kV ≤ 5 pC	min. 3	IEC60137
815 999 999	XXXX	318 (30 min)	—	190 kV ≤ 5 pC	min. 3	IEC60840

[1]) Individual article number determined with a product configurator based on customer requests (see page 40: Form to determine HV test lead and connecting cable).

Current Testing Plug, Size 6-S

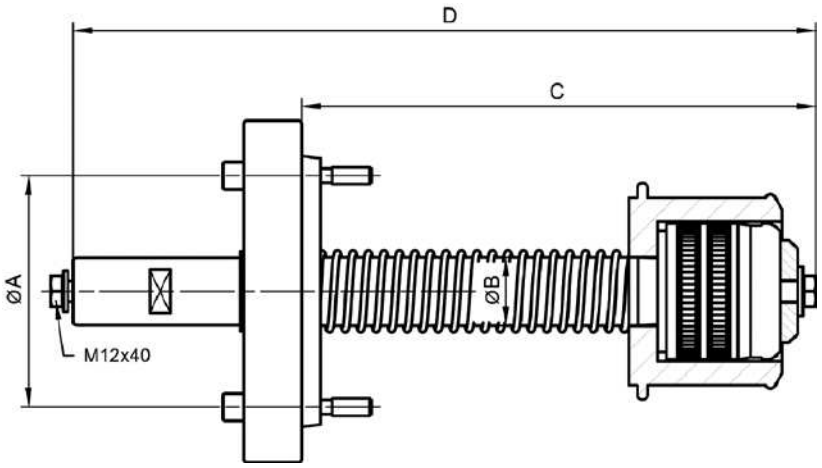
This plug is used to carry out current tests on switchgear, transformers, transducers etc. fitted with HV-CONNEX sockets.



No.	Nominal voltage	Max. testing voltage	A	B	C	D
	I_N (A)	U_m (kV)	(mm)	(mm)	(mm)	(mm)
827 093 006	1600	5	245	40	451	585

Earthing and Short-circuit Devices for HV-CONNEX Socket, Size 6-S

These devices are used to earth and short circuit equipment fitted with HV-CONNEX sockets (e. g. switchgear, transformers etc.).

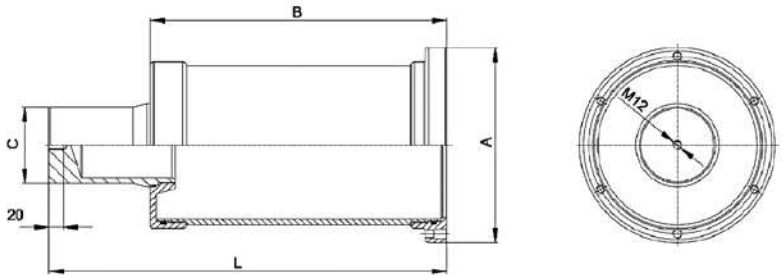


No.	A	B	C	D
	(mm)	(mm)	(mm)	(mm)
827 086 006	245	40	451	585

Earthing Cap, Size 6-S

This device is used to earth and short circuit unplugged HV-CONNEX separable connectors.
- not voltage proof

For protection of unplugged HV-CONNEX separable connectors against damage and dirt.



No.	A (mm)	B (mm)	C (mm)	L (mm)
827 708 003	270	410	105	550

Protective cap, Size 6-S

For protecting the insulating part and contact system of bushing, test lead and mounted HV-CONNEX separable connector.
- not surge-proof
- made of plastic
- with o-ring seal, therefore dust-proof and water-tight

No.	Weight (kg)
827 708 013	5.8

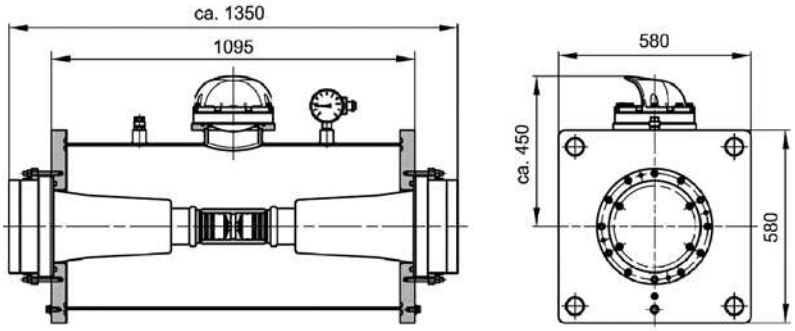
HV-CONNEX Joint, Size 6-S

HV-CONNEX joint for testing and connecting cables terminated with HV-CONNEX separable connectors.

Insulation medium: SF_6 gas

The joint features a turnable anti-burst device and a SF_6 gas density monitor with signal generator for remote display. The sockets are sealed with plastic covers. Voltage-proof dummy plugs to be ordered separately.

Low temperature:
The standard components are designed for a temperature up to -25 °C. A special gas mixture for low temperatures is used for ambient conditions below -25 °C.



No.	Max. operating voltage	Rated power frequency-withstand voltage	Rated lightning impulse withstand voltage (BIL)	Weight
	U_m (kV)	1 min (kV)	(kV)	(kg)
827 059 010	245	460	1050	338.0

HV-CONNEX T-Joint, Size 6-S

HV-CONNEX T-joint for branching cables terminated with HV-CONNEX separable connectors.

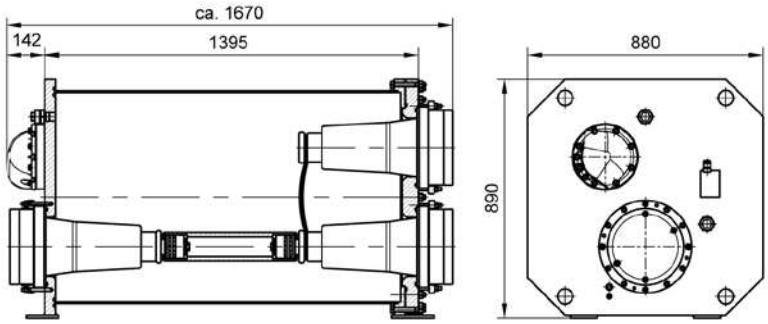
Insulation medium: SF_6 gas

The T-joint features a turnable anti-burst device and a SF_6 gas density monitor with signal generator for remote display. The sockets are sealed with plastic covers; voltage-proof dummy plugs to be ordered separately.

Low temperature:
The standard components are designed for a temperature up to -25 °C. A special gas mixture for low temperatures is used for ambient conditions below -25 °C.

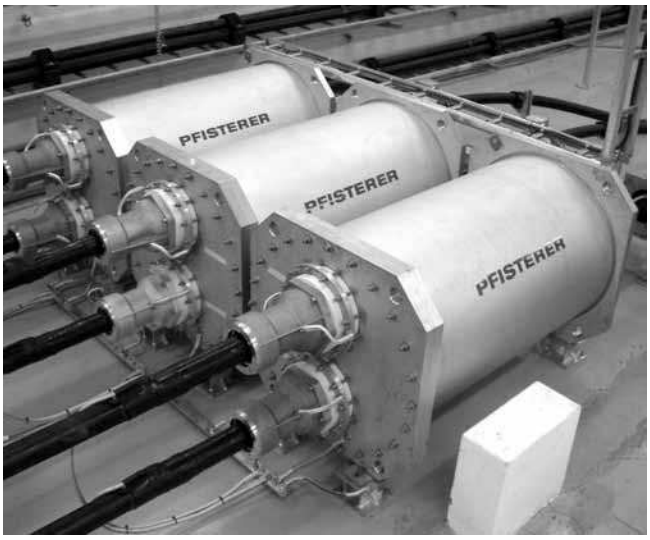
Possible applications:
- Pluggable branching joint for HV cables
- Universal application options:
  T-branching of one plastic-insulated cable to two plastic-insulated cables or a overhead line to two plastic-insulated cables

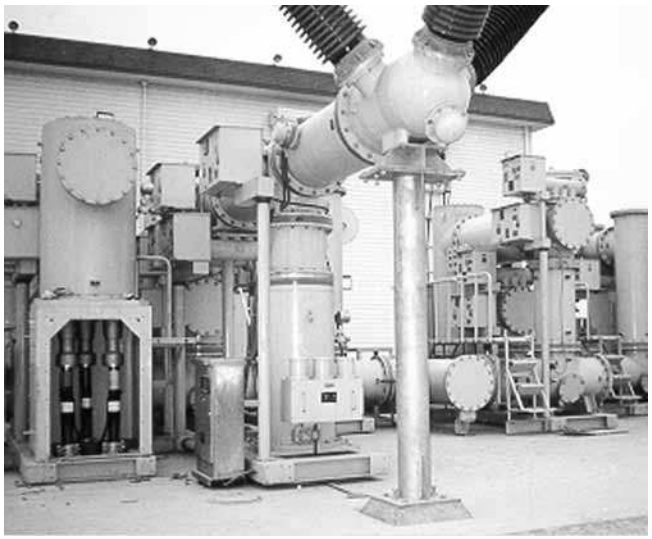
Properties:
- Metal clad
- Fully insulated
- High short-circuit strength
- Maintenance-free
- For outdoor use
- IP66
- Maintenance-free gas density monitor (manometer) with remote monitoring option
- Bursting disc
- Insulation medium SF_6
- TÜV-tested joint-housing (TÜV is german Technical Inspection Association)
- Different sizes can be combined on request

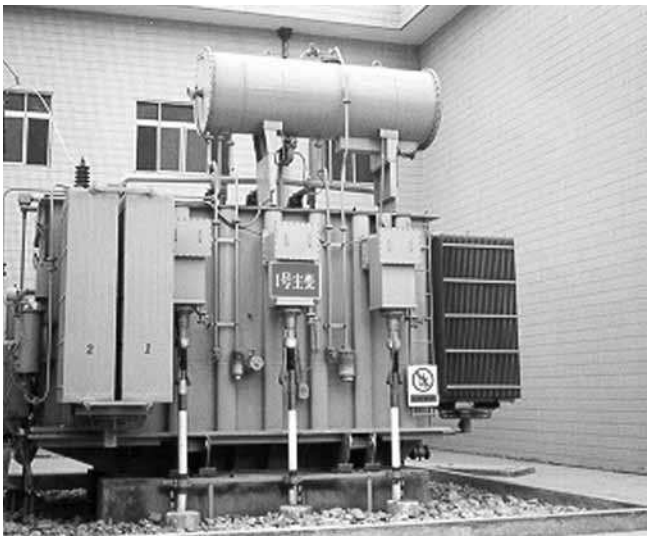


No.	Max. operating voltage	Rated power frequency-withstand voltage	Rated lightning impulse withstand voltage (BIL)	Width	Length	Weight
	U_m (kV)	1 min (kV)	(kV)	(mm)	(mm)	(kg)
827 063 001	245	460	1050	880	1670	865.0

Applications







Assembly Accessories

Tools for HV-CONNEX, Sizes 4, 5, 6 and 6-S.

Required PFISTERER special tools

These special PFISTERER products are needed for assembly:

Hydraulic Hand-Operated Compression Tool

with compression head for axial compression of the contact ring for HV-CONNEX separable connectors.

No.	Size	Weight (kg)
827 017 003	4, 5	6.5
827 017 004	6, 6-S	6.5

Impact Device

for pre-assembly of contact part.

No.	Size	Weight (kg)
559 214 004	4, 5	0.4
559 214 006	6, 6-S	0.6

Optional PFISTERER tools

The following tools may useful as they are designed especially for PFISTERER cable systems:

Push-on Device

for assembly of insulating part.

No.	Size	Weight (kg)
827 103 002	4, 5, 6, 6-S	8.5

Distance Pin with Eyebolt

for mounting of the block and tackle.

No.	Size	Weight (kg)
564 471 001	4, 5, 6, 6-S	0.5

Block and Tackle

insulated, used for plug-in of HV-CONNEX separable connector into socket.

No.	Size	Weight (kg)
619 891 001	4, 5, 6, 6-S	3.2

Heating mat

for heating before straightening.

No.	Length (m)	Weight (kg)
880 265 564	1	4
880 165 181	2	7

HV Cable Stripper

for cable preparation (peeling, removing and bevelling the insulation).
Stop rings for various stripping lengths available on request.

No.	Range Ø (mm)	Weight (kg)
827 976 001	35 - 90	5.3

Outer Jacket Cutter

for lengthwise cut of the outer jacket.

No.	Weight (kg)
827 973 001	0.345

Fitting Clamp

for fixing block and tackles and to protect the bell flange during assembly.

No.	Cable diameter Ø (mm)	Weight (kg)
827 153 010	50 - 100	1.3
827 153 011	75 - 150	5.8

POM-bar

for greasing of the insulating part's inner surface.

No.	Weight (kg)
620 018 019	0.4

Alignment Rails

for straightening of the cable (2 items). Two screw clamps needed for assembly.

No.	Length (m)	Weight (kg)
880 164 185	1	5.9
880 165 185	2	10.1

Pipe Cutter

for cutting of Al-corrugated sheath

No.	Cable diameter Ø (mm)	Weight (kg)
827 972 001	50 - 110	1.5

Chain Cutter

for cut around the outer jacket.

No.	Weight (kg)
827 980 001	2

Grinding Machine, elect.

for insulation preparation.

No.	Weight (kg)
827 960 001	5.2

Hexagonal Screwdriver

for screwing on the bell flange.

No.	Size	Key width	Weight (kg)
546 004 018	4	SW 8	0.2
546 004 010	5, 6, 6-S	SW 10	0.2

Unicut

for cable preparation (peeling, removing and bevelling the insulation).

No.		Diameter over insulation Ø (mm)	Weight (kg)
880 265 214	Unicut 30	30 - 85	3.0
880 265 215	Unicut 40	70 - 125	5.0

Feed Jaws

for Unicut.

No.		Length (mm)	Weight (kg)
880 265 415	for Unicut 30	90	0.2
880 265 416	for Unicut 30	60	0.2
880 265 721	for Unicut 40	90	0.2
880 265 722	for Unicut 40	60	0.2

HV-Carrying Case for Tools (without tools)

for transporting and storing tools.

No.	Size
305 768 002	4, 5, 6, 6-S

Material

Additional assembly material:

HV Special Grease

greasing of insulating part, socket etc.

No.	Size	Temperature range (° C)	Weight (g)
002 854 002	4, 5, 6, 6-S	-25 – +90	8.0
002 854 003	4, 5, 6, 6-S	-45 – +90	8.0

HV-CONNEX Sealing Set for Outdoor Vertical Installation from above

e.g. on transformers for sizes 5-S, 6 and 6-S.

No.	Size	Weight (kg)
545 051 001	5, 6, 6-S	0.6

Dilo SF_6 gas re-filling device

for filling of HV Test- and T-Joints.

No.	Weight (kg)
827 017 100	5.4

GIS Cable Termination

The terminations are used for the direct insertion of polymer insulated high voltage cables in gas insulated switchgears. They are availabe in nearly identical versions as vertical, horizontal or upside-down designs for voltage ranges from 72.5 kV to 245 kV. The slide-on silicone control unit is surrounded by a cast resin insulator, which safely separates the gas insulated switchgear from the cable system. The insulator is aadditionally filled with an insulating compound.

Material:
Insulator material: cast resin
Material of the control unit: silicone rubber

Conductor connection:
compressed or screwed

Optional accessories:
adapter plate

Note:
The horizontal version is equipped with an expansion vessel.
Upside-down version on request.
Optional material is not within scope of supply and has to be ordered seperately.

Max. operating voltage	**U_m (kV)**	72.5	123	145	170	245
Standards		IEC60840 IEC60859 IEC62271-209	IEC60840 IEC60859 IEC62271-209	IEC60840 IEC60859 IEC62271-209	IEC60840 IEC60859 IEC62271-209	IEC62067 IEC60859 IEC62271-209
Rated voltage	**U (kV)**	60 - 69	110 - 115	132 - 138	150 - 161	220 - 230
Rated lightning impulse withstand voltage (BIL)	**(kV)**	325	550	650	750	1050
Partial discharge measurement	**(pC)**	< 5	< 5	< 5	< 5	< 5

ESG72

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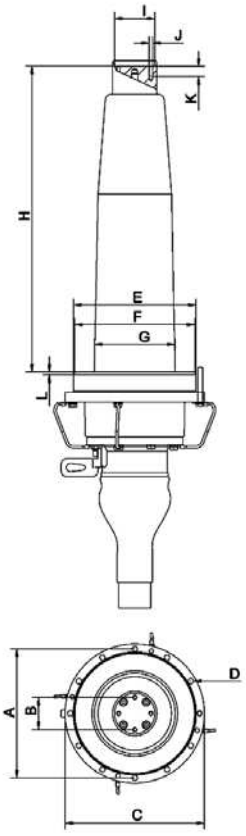

Product designation	Conductor cross-section area (mm²)	Diameter across cable insulation (prepared) (mm)	Max. diameter across cable outer sheath (mm)	Net weight approx. (kg)	
ESG72-H	95-2000	37 - 84	120	58.0	1
ESG72-V	95-2000	37 - 84	120	52.0	2

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)
ESG72-H	270	80 ± 0,3	295	8 x Ø11	255	245 ± 0,3	184	583 ± 1	100	4 x M10	24	7
ESG72-V	270	80 ± 0,3	295	8 x Ø11	255	245 ± 0,3	184	583 ± 1	100	4 x M10	24	7

1 **ESG123**

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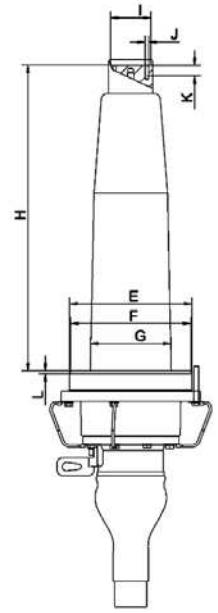

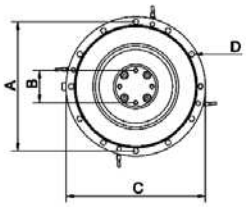

Product designation	Conductor cross-section area (mm²)	Diameter across cable insulation (prepared) (mm)	Max. diameter across cable outer sheath (mm)	Net weight approx. (kg)	
ESG123-H	150-2000	42 - 99	120	78.0	1
ESG123-H	150 - 2500	84 - 110	170	86.0	1
ESG123-V	150-2000	42 - 99	120	72.0	2
ESG123-V	150 - 2500	84 - 110	170	80.0	2

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)
ESG123-H	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	200	757 ± 1	100	4 x M10	24	7
ESG123-H	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	215	757 ± 1	100	4 x M10	24	7
ESG123-V	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	200	757 ± 1	100	4 x M10	24	7
ESG123-V	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	215	757 ± 1	100	4 x M10	24	7

ESG145

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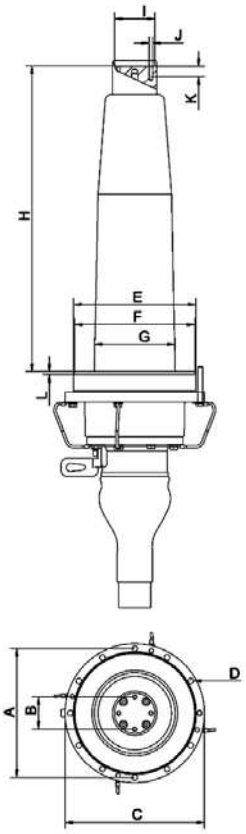

Product designation	Conductor cross-section area (mm²)	Diameter across cable insulation (prepared) (mm)	Max. diameter across cable outer sheath (mm)	Net weight approx. (kg)	
ESG145-H	150-2000	46 - 99	120	78.0	1
ESG145-H	150 - 2500	84 - 110	170	86.0	1
ESG145-V	150-2000	46 - 99	120	72.0	2
ESG145-V	150 - 2500	84 - 110	170	80.0	2

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)
ESG145-H	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	200	757 ± 1	100	4 x M10	24	7
ESG145-H	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	215	757 ± 1	100	4 x M10	24	7
ESG145-V	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	200	757 ± 1	100	4 x M10	24	7
ESG145-V	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	215	757 ± 1	100	4 x M10	24	7

1 ESG170

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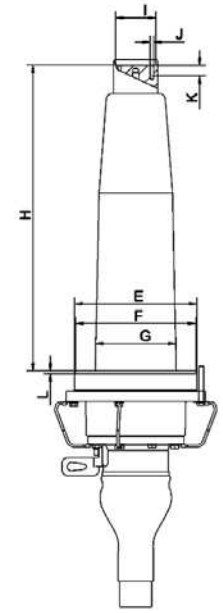
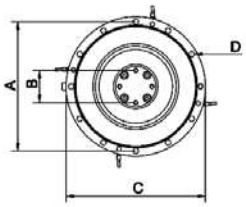
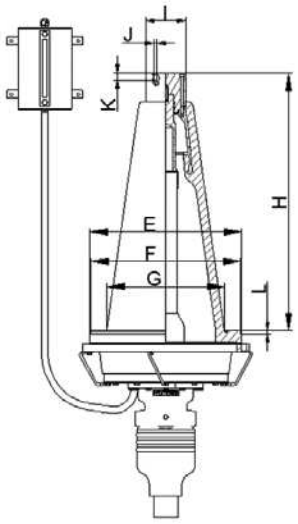


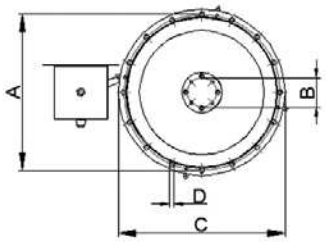


Product designation	Conductor cross-section area (mm²)	Diameter across cable insulation (prepared) (mm)	Max. diameter across cable outer sheath (mm)	Net weight approx. (kg)	
ESG170-H	150-2000	52 - 99	120	78.0	1
ESG170-H	150 - 2500	84 - 110	170	86.0	1
ESG170-V	150-2000	52 - 99	120	72.0	2
ESG170-V	150 - 2500	84 - 110	170	80.0	2

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)
ESG170-H	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	200	757 ± 1	100	4 x M10	24	7
ESG170-H	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	215	757 ± 1	100	4 x M10	24	7
ESG170-V	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	200	757 ± 1	100	4 x M10	24	7
ESG170-V	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	215	757 ± 1	100	4 x M10	24	7

ESG245





Product designation	Conductor cross-section area (mm²)	Diameter across cable insulation (prepared) (mm)	Max. diameter across cable outer sheath (mm)	Net weight approx. (kg)
ESG245	240 - 2500	69 - 118	170	170.0

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)
ESG245	585 ± 0,5	110 ± 0,3	620	16 x Ø17,5	565	559 ± 0,3	439	960 ± 2	150	4 x M12	24	10

Transformer Cable Termination

The terminations are used for the direct insertion of polymer insulated high voltage cables in oil-filled transformers. They are availabe in nearly identical versions as vertical, horizontal or upside-down designs for voltage ranges from 72.5 kV to 245 kV. The slide-on silicone control unit is surrounded by a cast resin insulator, which safely separates the oil-filled equipment from the cable system. The insulator is aaditionally filled with an insulating compound.

Material:
Insulator material: cast resin
Material of the control unit: silicone rubber

Conductor connection:
compressed or screwed

Optional accessories:
adapter plate, corona shield

Note:
The horizontal version is equipped with an expansion vessel.
Upside-down version on request.
Optional material is not within scope of supply and has to be ordered seperately.

Max. operating voltage	U_m (kV)	72.5	123	145	170	245
Standards		IEC60840 EN50299	IEC60840 EN50299	IEC60840 EN50299	IEC60840 EN50299	IEC62067 EN50299
Rated voltage	U (kV)	60 - 69	110 - 115	132 - 138	150 - 161	220 - 230
Rated lightning impulse withstand voltage (BIL)	(kV)	325	550	650	750	1050
Partial discharge measurment	(pC)	< 5	< 5	< 5	< 5	< 5

ESU72

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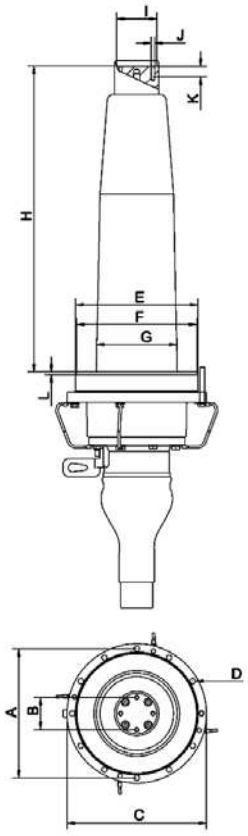

Product designation	Conductor cross-section area (mm²)	Diameter across cable insulation (prepared) (mm)	Max. diameter across cable outer sheath (mm)	Net weight approx. (kg)	
ESU72-H	95-2000	37 - 84	120	58.0	1
ESU72-V	95-2000	37 - 84	120	52.0	2

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)
ESU72-H	270	80 ± 0,3	295	8 x Ø11	255	245 ± 0,3	184	583 ± 1	100	4 x M10	24	7
ESU72-V	270	80 ± 0,3	295	8 x Ø11	255	245 ± 0,3	184	583 ± 1	100	4 x M10	24	7

1 **ESU123**

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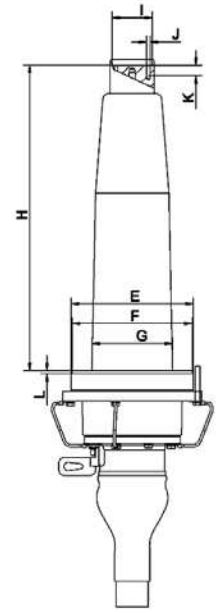

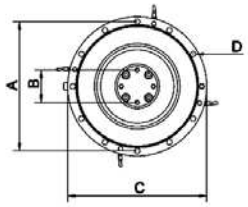

Product designation	Conductor cross-section area (mm²)	Diameter across cable insulation (prepared) (mm)	Max. diameter across cable outer sheath (mm)	Net weight approx. (kg)	
ESU123-H	150-2000	42 - 99	120	78.0	1
ESU123-H	150 - 2500	84 - 110	170	86.0	1
ESU123-V	150-2000	42 - 99	120	72.0	2
ESU123-V	150 - 2500	84 - 110	170	80.0	2

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)
ESU123-H	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	200	757 ± 1	100	4 x M10	24	7
ESU123-H	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	215	757 ± 1	100	4 x M10	24	7
ESU123-V	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	200	757 ± 1	100	4 x M10	24	7
ESU123-V	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	215	757 ± 1	100	4 x M10	24	7

ESU145

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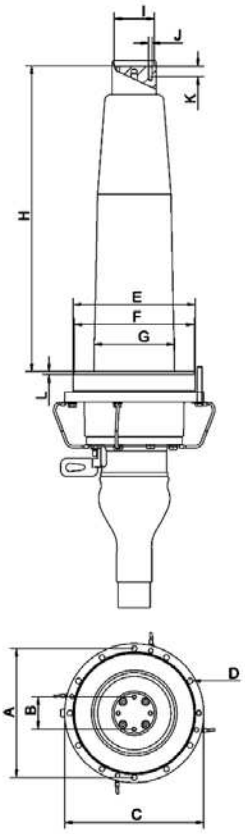

Product designation	Conductor cross-section area (mm²)	Diameter across cable insulation (prepared) (mm)	Max. diameter across cable outer sheath (mm)	Net weight approx. (kg)	
ESU145-H	150-2000	46 - 99	120	78.0	1
ESU145-H	150 - 2500	84 - 110	170	86.0	1
ESU145-V	150-2000	46 - 99	120	72.0	2
ESU145-V	150 - 2500	84 - 110	170	80.0	2

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)
ESU145-H	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	200	757 ± 1	100	4 x M10	24	7
ESU145-H	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	215	757 ± 1	100	4 x M10	24	7
ESU145-V	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	200	757 ± 1	100	4 x M10	24	7
ESU145-V	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	215	757 ± 1	100	4 x M10	24	7

1 ESU170

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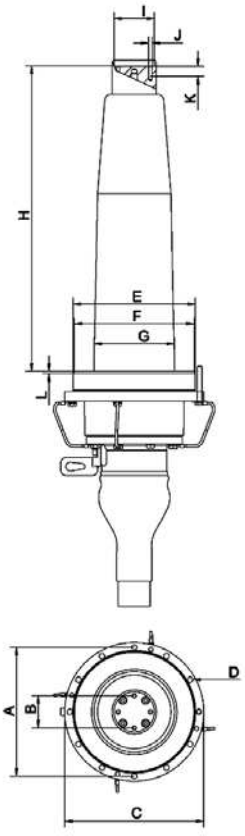
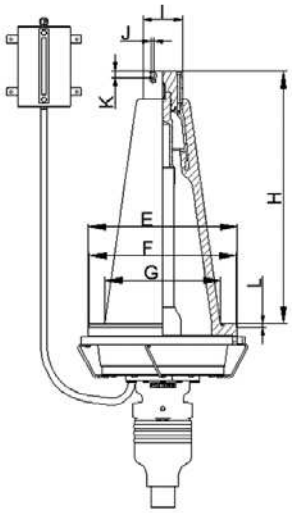
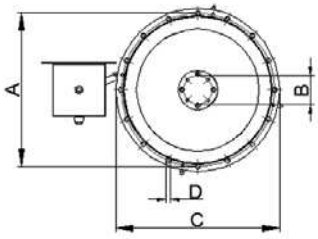


Product designation	Conductor cross-section area (mm²)	Diameter across cable insulation (prepared) (mm)	Max. diameter across cable outer sheath (mm)	Net weight approx. (kg)	
ESU170-H	150-2000	52 - 99	120	78.0	1
ESU170-H	150 - 2500	84 - 110	170	86.0	1
ESU170-V	150-2000	52 - 99	120	72.0	2
ESU170-V	150 - 2500	84 - 110	170	80.0	2

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)
ESU170-H	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	200	757 ± 1	100	4 x M10	24	7
ESU170-H	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	215	757 ± 1	100	4 x M10	24	7
ESU170-V	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	200	757 ± 1	100	4 x M10	24	7
ESU170-V	320	80 ± 0,3	345	12 x Ø13,5	303	298 ± 0,3	215	757 ± 1	100	4 x M10	24	7

ESU245





Product designation	Conductor cross-section area (mm²)	Diameter across cable insulation (prepared) (mm)	Max. diameter across cable outer sheath (mm)	Net weight approx. (kg)
ESU245-H/V	240 - 2500	69 - 118	170	170.0

Product designation	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	K (mm)	L (mm)
ESU245-H/V	585 ± 0,5	110 ± 0,3	620	16 x Ø17,5	565	559 ± 0,3	439	960 ± 2	150	4 x M12	24	10

PFISTERER worldwide

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