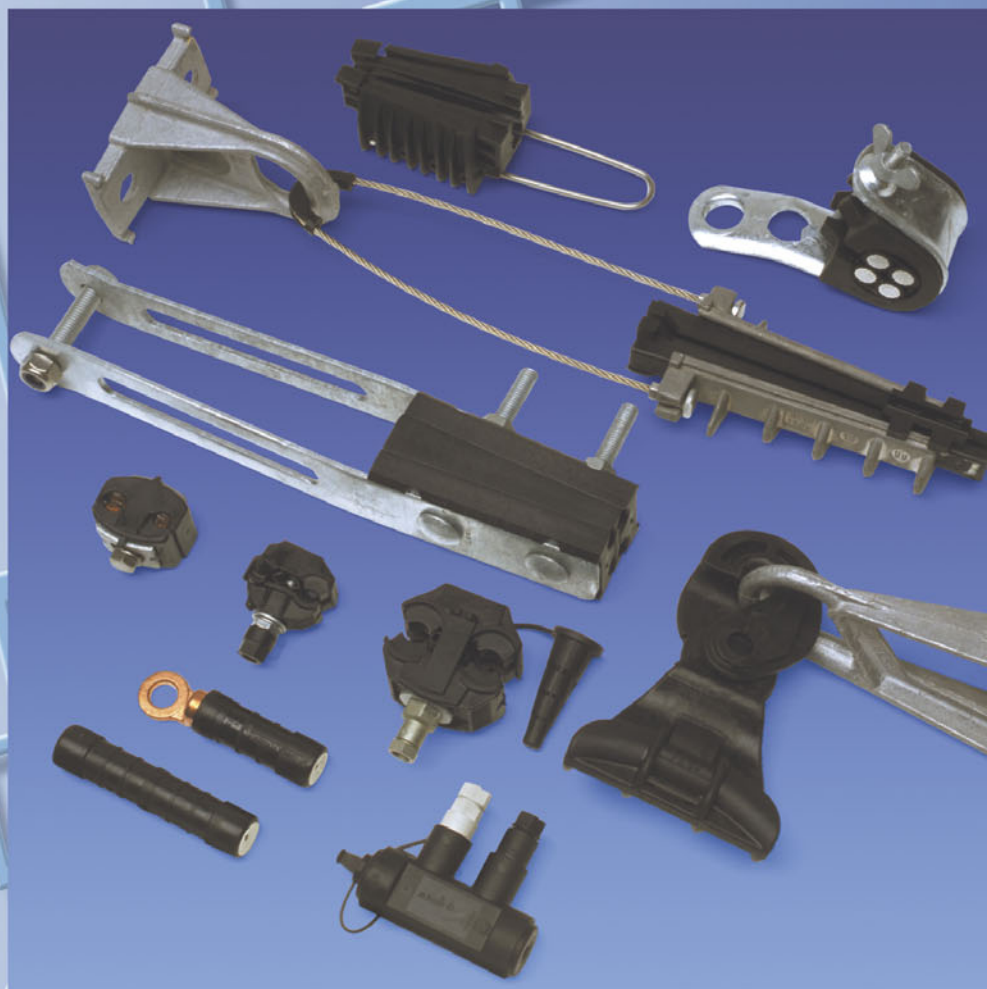


Connectors & Fittings for Low Voltage- Insulated Overhead Lines



Catalogue 2005/2006

Connectors & Fittings for LV - Insulated Overhead Lines (Aerial Bundled Conductor Systems)

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Low Voltage Insulated Overhead Lines (LV - Aerial Bundled Conductor System)



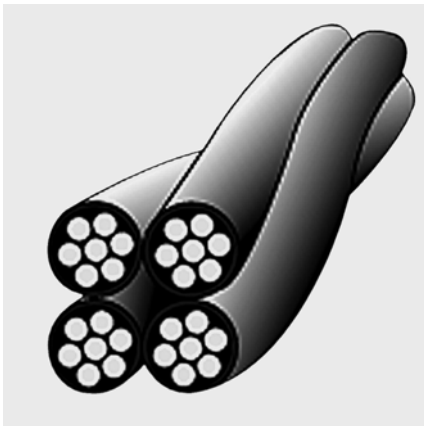
Tyco Electronics Energy Division was one of the first to pioneer the connection, anchoring and suspension of low-voltage insulated overhead systems since its first installations in the mid 1950's. Since then, our continuous efforts in research and development let to state of the art Simel and Hellstern product lines, meeting the demands of modern network design, operation and maintenance. Our products are successfully employed by utilities around the world including arctic, desert and tropical climatic extremes. With both the Simel and the Hellstern piercing connectors service lines can be connected to live lines with maximum safety to linemen.



The 3 main types of LV-ABC according to European Standard HD 626

Our anchor and suspension clamps are designed to fit on all cables according to European Standard HD 626 and most national cable specifications, regardless if cables are insulated with XLPE, PE or PVC. In absence of an European harmonized standard for clamps, all products are tested according to national specifications such as NFC, VDE, BS, ESI.

Self-supporting LV-ABC lines



The self-supporting system is composed of 4 insulated aluminium conductors. Mechanical strength and nominal cross section of all 4 conductors are identical. The system can consist of additional 1 or 2 insulated aluminium conductors with cross sections of 16 mm² or 25 mm² as pilot wire or for street lighting.

When straining the line, all 4 conductors are equally loaded.

The service lines of all 3 LV-ABC systems are usually also of the self-supporting type, composed of 2 to 4 factory bundled insulated aluminium conductors with cross sections of 16 mm², 25 mm² or 35 mm²

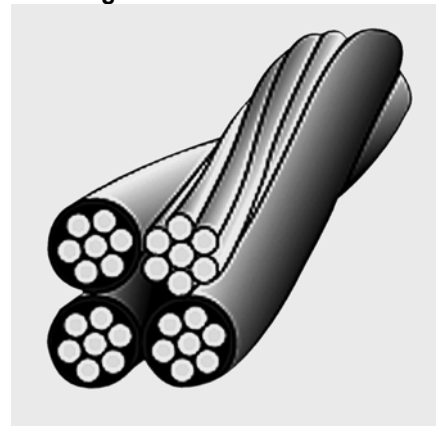
LV-ABC lines with insulated neutral messenger



LV-ABC line with insulated neutral messenger wire, also referred to as 'French System', is composed of 3 insulated aluminium phase conductors and 1 neutral messenger of aluminium alloy (mostly Aldrey) also with insulation. The system can consist of additional 1 or 2 insulated aluminium conductors with cross sections of 16 mm² or 25 mm² as pilot wire or for street lighting.

Mechanical strength and nominal cross section of the 3 phase conductors are identical. The neutral conductor is at the same time the suspension unit having a higher mechanical strength. When straining the line, only the neutral conductor, as suspension unit, is loaded.

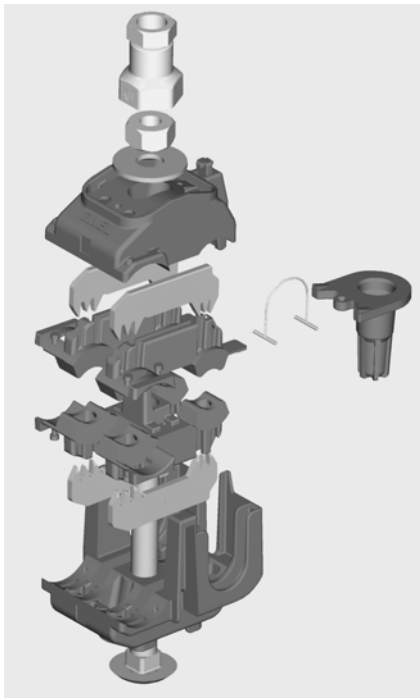
LV-ABC lines with bare neutral messenger



LV-ABC line with bare neutral messenger wire, also referred to as 'Finnish System', is composed of 3 insulated aluminium phase conductors and 1 neutral messenger of aluminium alloy without insulation. The system can consist of additional 1 or 2 insulated aluminium conductors with cross sections of 16 mm² or 25 mm² as pilot wire or for street lighting.

Mechanical strength and nominal cross section of the 3 phase conductors are identical. The neutral conductor is at the same time the suspension unit having a higher mechanical strength. When straining the line, only the neutral conductor, as suspension unit, is loaded.

Piercing Connector Systems



All our connectors are designed and tested to fit to all cables according to European Standard HD 626 and most national cable specifications, regardless if cables are insulated with XLPE, PE or PVC. In absence of an European harmonized standard for insulation piercing connectors, all products are tested according to national specifications such as NFC, VDE, BS, ESI.

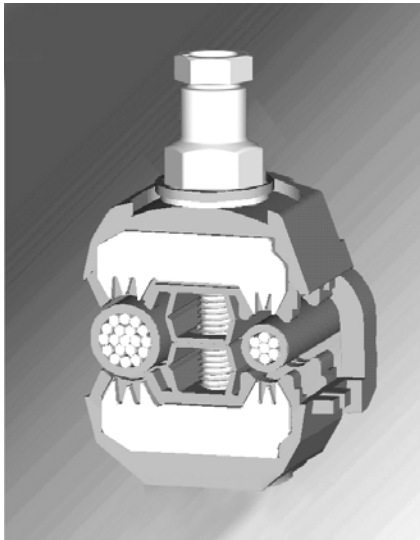
The range of Hellstern piercing connectors is tested according to DIN VDE-0220 and can be classified to withstand 4 kV in air.

Our waterproof range of SIMEL connectors and lugs conforms to the French standards NF C 33 020 (bolted) and NF C 33 021 (crimped) as well as the British standard EATS 43-14. These standards include tests to verify reliable operation even in the harshest environments:

- Designed for Installation from -20°C up to +50°C
- Operation experience with temperatures ranging from -55°C up to +60°C
- No limitation of mechanical loads for main and branch conductors
- Shear head forces are adapted to the required contact forces for each application (main, service, lightning)
- Voltage withstand to 6 kV and no moisture ingress even after immersion in a 30 cm waterbath for 30 min
- No change in contact resistance and temperature after overloads and loadcycling
- Voltage withstand to 6 kV after heavy weathering exposure (UV-light, humidity and temperature cycling)
- Corrosion resistance of metal parts proven in salt fog chamber and wet SO₂ gas chamber

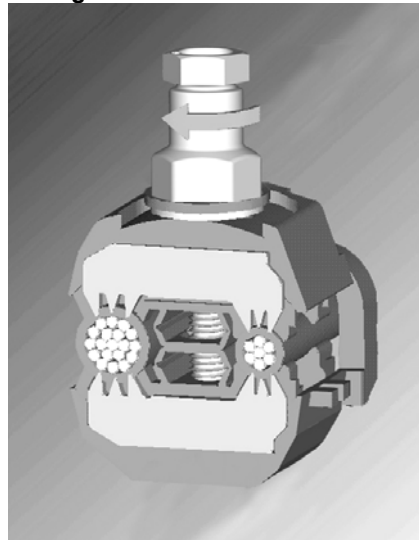
Installation process engineered for long-term reliability

Before installation



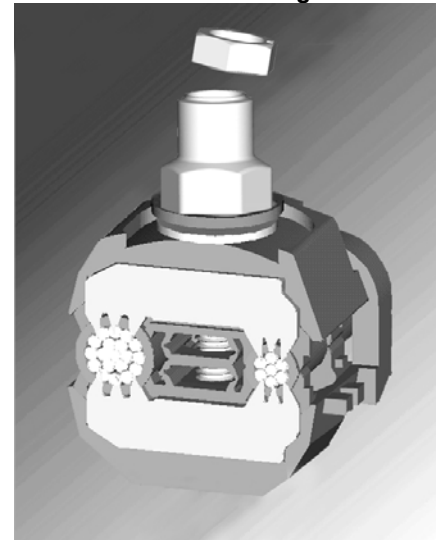
Connector easily positioned over cables, no loose parts can fall to ground. The correct position of the branch conductor can be felt inside the end cap.

During installation



Contact blades pierce the insulation and reliably contact the conductors. The tightening screw is insulated from the contact blades thus providing maximum safety for the installer even during live line installations.

After shear head breaking



The shear head ensures that conductors are not damaged by too large forces; the long neck prevents that the head could shear off too early by naturally applied cantilever loads on the tightening tool. The seals firmly conform to the insulation to prevent any moisture ingress.

Insulation piercing connectors – test voltage 4 kV in air



Type: 1 bolt

These insulation piercing connectors are suitable for all types of LV-ABC conductors as well as connections to service and lighting cable cores. When tightening the bolts, the teeth of the contact plates penetrate the insulation and establish a perfect contact. Stripping of insulation is avoided.



Type: 2 bolts

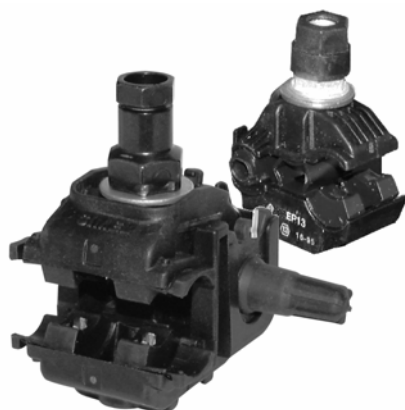
- Suitable for aluminium and copper conductors, including bare conductors
- Potential free tightening bolts allow safe installations on life lines
- Exceeds requirements according to VDE 0220
- Tested for voltage withstand of 4 kV in air
- Connector teeth factory greased to retard water entry and corrosion
- Insulation material made of weather and UV resistant glass fibre reinforced polymer
- Contact blades made of tinned copper, bolts and pressure plates made of hot-dip galvanized steel



Application Range (mm ²)		Product Description	Bolt	Torque (Nm)	Weight (kg/100 pcs)
Main	Tap				
25- 95	1,5- 6	HEL-5022	1xM8	15	6,0
25- 70	6- 35	HEL-5005	1xM8	15	10,9
25- 95	10- 50 or 2x16	HEL-5002	2xM8	15	26,4
25- 95	6- 70	HEL-5020	1xM10	22	19,9
50-150	10- 95 or 2x16	HEL-5008	2xM8	22	26,4

Note: Delivered with both sides of main line open, one side of tap line closed; exception Hel-5020 one main and both tap sides closed. Closed main or tap sides can be opened according to on-site requirements. For double taps, the conductors have to be inserted from either side butting up in the middle.

Waterproof insulation piercing connectors – test voltage 6 kV in water



Type: P2X, EP

These waterproof insulation piercing connectors are suitable for all types of LV-ABC conductors as well as connections to service and lighting cable cores.

When tightening the bolts, the teeth of the contact plates penetrate the insulation and establish a perfect contact. The bolts are tightened until the heads shear off. Stripping of insulation is avoided.



Type: P3X, P4X

- Tested for watertightness at a voltage of 6 kV for 30 min in a waterbath
- Potential free tightening bolts allow safe installations on life lines
- Suitable for aluminium and copper conductors
- Long neck 13 mm shear head nut ensuring reliable installations
- Exceeds requirements according to NFC 33020 and EATS 43-14



Type: KZ2-150-2B, KZ31

- Components not losable, end cap attached to body
- Insulation material made of weather and UV resistant glass fibre reinforced polymer
- Contact plates made of tinned copper or aluminium, bolt made of dachromatized steel
- Designed that conductor breaking loads exceed cable system requirements:
80% for self-supporting system
95% for insulated neutral conductor

Simultaneous piercing of main and branch conductor

Application Range (mm²)		Product Description	Bolt	Torque (Nm)	Weight (kg/100 pcs)
Main	Tap				
for main to service connections					
2,5- 35	1,5 - 6	EP35-13	1xM6	7	5,0
16 - 95	1,5 - 10	EP95-13	1xM6	7	5,0
16 - 95	4 - 35(50*)	P2X- 95	1xM8	11	12,0
50 - 150	6 - 35(50*)	P2X-150	1xM8	11	12,0
for main to main connections					
16 - 35	16 - 35	P2X- 95	1xM8	11	12,0
25 - 95	25 - 95	P3X- 95	1xM8	18	16,0
25 - 120	25 -120	P4X-120D	2xM8	18	34,0
50 - 150	50 -150	P4X-150D	2xM8	18	34,0

* fits up to this conductor size, but current rating I_{max} of connector (138A according to HD626S1part6E) is lower than possible cable ratings

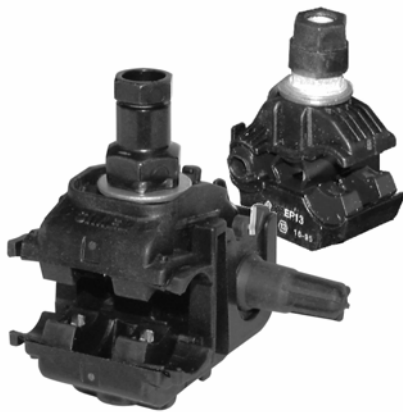
Independent connection of main (piercing) and branch conductor (strippable)

Application Range (mm²)		Product Description	Bolt	Torque (Nm)	Weight (kg/100 pcs)
Main	Tap				
for main to 2 service connections (Bp-piercing tap side, B-strippable tap side)					
25-150	2x 6- 35	KZ2-150 2B	3xM8	11/10	23,0
25-150	2x 6- 35	KZ2-150 2Bp	3xM8	11/10	23,0
for main to main connections (strippable tap side)					
35- 70	35- 70(95*)	KZ31- 70/70	1xM8/1xM10	18/10	24,0
50-150	35- 70(95*)	KZ31-150/70	1xM8/1xM10	18/10	24,0

* fits up to this conductor size, but current rating I_{max} of connector (213A according to HD626S1part6E) is lower than possible cable ratings

Note: Possibility to disconnect and reconnect the tap line (only stripping version) without removal of the main side

Insulation piercing connectors for connections to bare overhead



Type: RDP 25/CN

These connectors allow the transition between bare lines (aluminium or copper) and insulated LV ABC lines.

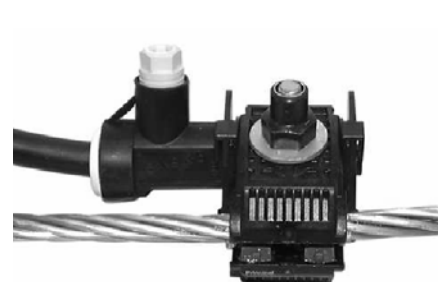
The version with simultaneous connection of bare main and insulated tap conductor includes piercing and a waterproof seal of the tap conductor.

The second version with independent connection requires the tap conductor to be stripped. The bolts (13 mm) are tightened until the heads shear off.



Type: CDR/CN

- Suitable for aluminium and copper conductors
- Groove in contact area for bare conductor fits also for small wires.
- Potential free tightening bolts allow safe installations on life lines
- Exceeds requirements according to NFC 33020
- Components not losable, end cap attached to body
- Insulation material made of weather and UV resistant glass fibre reinforced polymer
- Contact plates made of tinned copper, bolt made of dachromatized steel



Type: KZ31/70

Simultaneous connection of main (bare) and branch (insulated) conductor; piercing of branch conductor

Application Range (mm²)		Product Description	Bolt	Torque (Nm)	Weight (kg/100 pcs)
Bare	Insulated				
for bare main to insulated service connections					
16 - 95 ¹	1,5 - 10	EP95-13	1xM6	7	5,0
16 - 95 ¹	4 - 35	P2X- 95*	1xM8	11	12,0
7 – 100 ²	16 - 35	RDP 25/CN	1xM8	12	13,5
for bare main to insulated main connections					
7 – 100 ²	25 - 95	CDR/CN 1S 95 UK	2xM8	16	26,5

¹ equivalent to a diameter range of 4,5 to 12 mm

² equivalent to a diameter range of 3 to 13,5 mm

* Connector of type P2X can only be used for connections between aluminium conductors

Independent connection of main (bare) and branch conductor (strippable)

Application Range (mm ²)		Product Description	Bolt	Torque (Nm)	Weight (kg/100 pcs)
Bare	Insulated				
22- 75 Al*	35- 70	KZ31/70 CNA	1xM8/1xM10	11/10	24,0
7- 48 Cu	35- 70	KZ31/70 CNU	1xM8/1xM10	11/10	24,0

* equivalent to a diameter range of 6 to 11 mm

Note: Possibility to disconnect and reconnect the tap line without removal of the main side
CNA only for bare main aluminium conductors, CNU only for bare main copper.

Insulation piercing connectors for connections to cables



All piercing connectors type HEL, EP and PX (see pages 4 and 5) can be installed for connections to service and main cables.

The DZ6 connector is designed for connection of cables with large cross sections to insulated LV ABC lines. When tightening the bolts, the teeth of the contact plates penetrate the insulation and establish a perfect contact. The bolts (wrench size 17 mm) are tightened until the heads shear off. Stripping of insulation is avoided and the cable end is sealed with a cap.

- Suitable for aluminium and copper conductors
- Potential free tightening bolts allow safe installations on life lines
- Exceeds requirements according to UL486 and ESI-43-14 , including 4kV voltage withstand test in air
- Connector teeth factory greased and covered with a rubber seal to retard water entry and corrosion
- Components not losable, end cap attached to body
- Insulation material made of weather and UV resistant glass fibre reinforced polymer
- Contact plates made of tinned copper, bolt made of dachromatized steel

For inline connections of LV-ABC to cables see section for bare non-tension mechanical connectors on page 16. For cable terminations and core protection tubing see section insulation accessories page 17 and 18.

Simultaneous piercing of main (insulated LV-ABC) and branch (cable core) conductor

Application Range (mm ²) LV-ABC	Cable conductor	Product Description	Bolt	Torque (Nm)	Weight (kg/100 pcs)
16 - 95	1,5 - 10	EP95-13	1xM6	7	5,0
16 - 95	4 - 35	P2X- 95	1xM8	11	12,0
25 - 95	25 - 95	P3X- 95	1xM8	18	16,0
25 - 120 (150*)	120 - 240	DZ6-UL-F-SLO	1xM10	40	30,0

* fits up to this conductor size, but current rating I_{max} of connector (300A according to HD626S1part6E) is lower than possible cable rating

Parallel groove clamps for bare neutral messenger and grounding



Type: Aluminium - Aluminium

Designed to connect two parallel bare conductors. Conductors can be aluminium alloy or aluminium steel reinforced.

- Exceed requirements according to VDE 0210 and VDE 0212
- Pressure pad ensuring uniform pressure along the clamp
- Cross-grooved clamp channels of universal clamp type improve mechanical pullout strength and electrical contact
- Connector bodies made of corrosion resistant, high strength aluminium alloy AlMgSi1F32
- Bolts and nuts made of hot dip galvanized steel 8.8.



Type: Aluminium - Copper

Designed to connect two parallel bare conductors. Conductors can be aluminium alloy or aluminium steel reinforced for main and copper for tap side.

in addition to aluminium version:

- Hot compressed Cupal plate ensures good electrical contact and prevents corrosion
- Cross-grooved clamp channels improve mechanical pullout strength and electrical contact
- Spring washers maintain pressure even at dilatation caused by temperature changes



Type: Copper - Copper

Designed to connect two parallel bare conductors. Conductors can be copper stranded or rods.

different to aluminium version:

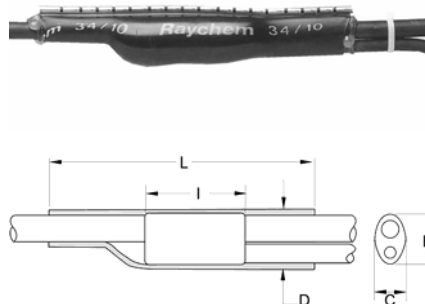
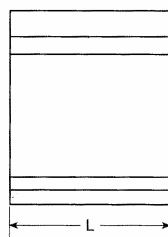
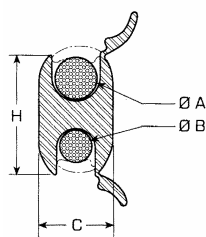
- Connector bodies and bolts made of high strength electrolytic copper F60

Conductor Cross Section mm2			Conductor Diameter mm		Product Description	Bolts	Weight (kg/100 pcs)
Al	Al/St, ACSR	Cu	Al	Cu			
Aluminium - Aluminium							
6- 35	16/2,5-25/4	-	2,5- 7,5	-	HEL-3587	2 x M 8	9,5
10- 50	16/2,5-35/6	-	4,1- 9,0	-	HEL-3588	2 x M 8	9,5
10- 70	16/2,5-50/8	-	4,1-10,5	-	HEL-3589	2 x M 8	11,4
10- 95	16/2,5-70/12	-	4,1-12,5	-	HEL-3590	2 x M 8	14,3
16-120	16/2,5-95/15	-	5,1-14,0	-	HEL-3591	2 x M 8	15,8
25-150	25/4-120/20	-	6,3-15,7	-	HEL-3592	2 x M 10	24,0
35-240	35/6-210/35	-	7,5-20,2	-	HEL-3594	2 x M 10	45,0
Universal type for fixing of dead-ends, tap conductors and auxiliary conductors:							
16- 70	16/2,5-70/12 ¹⁾	-	5,1-11,7	-	HEL-3929	2 x M 8	10,0
25-150	25/4-120/20 ²⁾	-	6,3-15,7	-	HEL-3932	2 x M 10	20,4
Aluminium - Copper							
16- 95	16/2,5-50/8	1,5- 10	5,1-11,7	1,5- 5,1	HEL-3920	1 x M 8	6,0
16- 70	16/2,5-70/12	6- 50	5,1-11,7	2,7- 9,0	HEL-3919	1 x M 8	6,0
16- 95	16/2,5-70/12	6- 50	5,1-12,5	2,7- 9,0	HEL-3910	2 x M 8	11,5
25-150	25/4-120/20	10- 95	6,3-15,7	5,1-12,5	HEL-3911	2 x M 8	15,0
35-300	35/6-265/35	35-240	7,5-22,5	7,5-20,2	HEL-3915	3 x M 10	68,0
Copper - Copper							
-	-	2,5- 16	-	1,8- 5,1	HEL-3005	1 x M 5	2,8
-	-	6- 35	-	2,7- 7,5	HEL-3007	1 x M 7	6,5
-	-	6- 70	-	2,7-10,5	HEL-3009	1 x M 8	11,7
-	-	16-150	-	5,1-15,7	HEL-3032	2 x M 10	43,0

1) use 2 clamps for dead-ends and auxiliary conductors of 50/8 and 70/12

2) use 2 clamps for dead-ends for 70/12 and above and for auxiliary conductors with strain above 90 N/mm²

Compression branch connectors and sealing kits



These compression fittings are designed for branches on bare conductors.

The connector is made of aluminium alloy, inhibitor is filled into the grooves and marks indicate the place for crimping. The connectors are tested to Nema standard CC3.

For installations on insulated conductors, the sealing kits shall be installed to re-establish the insulation and to ensure a good seal.

The conductors are inserted into the grooves and hand closed with the two movable parts.

The connector is crimped at the indicated marks with the appropriate die and the crimping tool Simablock C120 (for tool details see page 42).

The branch joints are designed for sealing branch connections made by bare tap connectors on insulated LV-ABC conductors.

Void filling mastic smooths the edges of the connector. A wraparound heat-shrinkable sleeve insulates and seals the connection area.

Compression branch connectors, type CH

Application Main (mm ²)	Range Tap (mm ²)	Ordering Description	Sealing Joint	Dimensions (mm)			H	L	Crimping Die
				Ø A	Ø B	C			
16- 35	16- 35	CH O 125	on request	8,5	8,5	17	30	40	12SU-O
50- 71,5	16- 35	CH O 200	SMOE-380	12,0	8,5	17	30	40	12SU-O
25- 71,5	25- 70	CH O 250	on request	12,0	11,0	17	30	40	12SU-O
50- 71,5	50- 71,5	CH D 300	SMOE-380	12,4	12,4	23	39	45	12SU-D3
70-120	35- 70	CH D 350	SMOE-380	15,0	11,0	23	37	63	12SU-D3
70-120	70-120	CH D 400	SMOE-380	15,0	15,0	23	35	63	12SU-D3
120-240	120-240	CH N 450	on request	22,0	22,0	30	47	85	12SU-N
120-240	35-120	CH N 500	on request	22,0	18,0	30	48	50	12SU-N

Sealing joint kit, type SMOE

Cross Section*		Ordering Description Connector	Dimensions (mm)		
Main (mm ²)	Tap (mm ²)		C (max.)	H (max.)	I (max.)
16 - 50	1,5 - 16	SMOE 379	24	18	35
35 - 120	6 - 120	SMOE 380	40	40	75

* Cross section ranges are based on cable and typical connector dimensions

Note: The connectors used must not exceed the dimensions given in the table. Branch joints for other cables or connector dimensions are available on request.

Waterproof pre-insulated mechanical connectors for service cables



Type: piercing version

These waterproof insulated mechanical connectors are suitable for all types of LV-ABC conductors as well as connections to service and lighting cable cores. They are used when a customer service line is changed or to reconnect a customer after payment. End cap is included to seal open sides. The bolts (13 mm) are tightened until the heads shear off. Available with a piercing contact and as second version which requires stripping of the insulation.



Type: stripping version

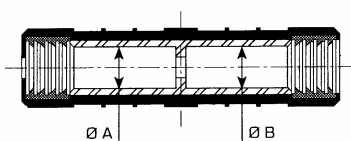
- Suitable for aluminium and copper conductors, solid and stranded
- Stripping version can be installed and removed under load (max 90A)
- Polymeric tightening bolts allow safe installations on life lines
- Tested for watertightness at a voltage of 6 kV for 30 min in a waterbath
- Exceeds requirements according to NFC 33020 and NFC 20-540
- Components not loosable, end cap attached to body
- Stripping version re-openable, piercing version not reopenable
- Insulation material made of weather and UV resistant glass fibre reinforced polymer



Cross Section (mm ²)		Product Description	Type	I max* (A)	Torque (Nm)	Weight (kg/100 pcs)
Min.	Max.					
4	35	BPC 35 - 35	stripping/stripping	90	10	8,5
4	35	BPC 35 - P35	stripping/piercing	90	10	8,5
4	35	BPC P35 - P35	piercing/piercing	-	10	8,5

* max. current I max for connection under load

Waterproof pre-insulated hexagonal compression connectors for service cables

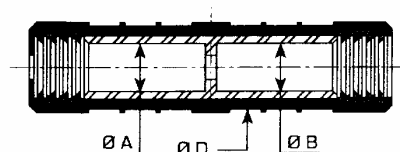


These pre-insulated connectors are suitable for insulated stranded aluminium conductors. Stripped cables are inserted up to the block in the connector. Crimping according to the marks with crimping die size E140 over the insulation. The electrical contact and the sealing by the elastomer ring is achieved during the crimp process. Uniform connector length of 70 mm.

- MJPB suitable for stranded aluminium conductors up to 35 mm² and stranded copper conductors up to 16 mm²
- MJPBAS suitable for stranded aluminium conductors to solid aluminium conductors
- Mechanical strength of 60% of cable breaking load
- Tested for watertightness at a voltage of 6 kV for 30 min in a waterbath
- One die size E140 for all connector sizes (tools and dies see page 42)
- Exceeds requirements according to NFC 33021
- Elastomeric sealing ring colour coded to easier identify the cross sections
- Inner aluminium sleeve filled with contact grease
- Insulation material made of weather and UV resistant polymer

Cross Section (mm²)		Product Description	Colour Code A/B	Dimensions (mm)		Weight (kg/100 pcs)
stranded	solid			Ø A	Ø B	
MJPB for stranded conductors						
6		MJPB 06	brown	3,3	3,3	2,5
6 - 10		MJPB 06-10	brown/green	3,3	4,3	2,5
6 - 16		MJPB 06-16	brown/blue	3,3	5,3	2,5
6 - 25		MJPB 06-25	brown/orange	3,3	6,5	2,5
6 - 35		MJPB 06-35	brown/red	3,3	8,0	2,5
10		MJPB 10	green	4,3	4,3	2,5
10 - 16		MJPB 10-16	green/blue	4,3	5,3	2,5
10 - 25		MJPB 10-25	green/orange	4,3	6,5	2,5
10 - 35		MJPB 10-35	green/red	4,3	8,0	2,5
16		MJPB 16	blue	5,3	5,3	2,5
16 - 25		MJPB 16-25	blue/orange	5,3	6,5	2,5
16 - 35		MJPB 16-35	blue/red	5,3	8,0	2,5
16 - 50		MJPB 16-50	blue/yellow	5,3	9,0	2,5
25		MJPB 25	orange	6,5	6,5	2,5
25 - 35		MJPB 25-35	orange/red	6,5	8,0	2,5
35		MJPB 35	red	8,0	8,0	2,5
MJPBAS for stranded to solid conductors						
10 -	25	MJPBAS 10-25M	green/orange	4,3	5,9	2,5
10 -	35	MJPBAS 10-35M	green/red	4,3	6,9	2,5
16	16	MJPBAS 16-16M	blue/blue	5,3	4,5	2,5
16 -	25	MJPBAS 16-25M	blue/orange	5,3	5,9	2,5
16 -	35	MJPBAS 16-35M	blue/red	5,3	6,9	2,5
25	16	MJPBAS 25-16M	orange/blue	6,5	4,8	2,5
25	25	MJPBAS 25-25M	orange/orange	6,5	5,9	2,5
25 -	35	MJPBAS 25-35M	orange/red	6,5	6,9	2,5
35	35	MJPBAS 35-35M	red/red	8,0	6,9	2,5

Waterproof pre-insulated hexagonal compression connectors



These pre-insulated connectors are suitable for insulated stranded aluminium conductors. Three connector versions are available to meet the mechanical load requirements for self-supporting system and systems with a neutral messenger.

Stripped cables are inserted up to the block in the connector. Crimping according to the marks with appropriate crimping die over the insulation. The electrical contact and the sealing by the elastomer ring is achieved during the crimp process. Uniform connector length of 100 mm, except for neutral messengers 170 mm.

- Suitable for stranded aluminium conductors
- Tested for watertightness at a voltage of 6 kV for 30 min in a waterbath
- Only two crimping die sizes (E173, E215) cover complete connector range (tools and dies see page 42)
- Exceeds requirements according to NFC 33021 and ESI 43-14
- Elastomeric sealing ring colour coded to easier identify the cross sections
- Inner aluminium sleeve filled with contact grease
- Insulation material made of weather and UV resistant polymer

Mechanical load withstand of connectors:

For conductors of self-supporting system:
80% of conductor breaking load

For systems with neutral messenger:
60 % of breaking load of phase conductor
100% of breaking load of insulated neutral conductor

Cross Section (mm²)	Product Description		ColourCode A/B	Dimensions (mm)			Crimp Die size	Weight (kg/100 pcs)
For self supporting LV-ABC systems								
16	MJPT	16	blue	5,5	5,5	20	E173	5,5
25	MJPT	25 Alus	orange	6,5	6,5	20	E173	5,5
35	MJPT	35 Alus	red	-	-	-	E173	5,5
50	MJPT	50 Alus	yellow	9,0	9,0	20	E173	5,0
70	MJPT	70 Alus	white	10,5	10,5	20	E173	4,5
95	MJPT	95 Alus	grey	12,2	12,2	25	E215	7,5
120	MJPT	120 Alus	pink	14,2	14,2	25	E215	7,5
150	MJPT	150 Alus	violet	15,5	15,5	25	E215	7,0
For phase conductors of LV-ABC systems with neutral messenger								
16	MJPT	16	blue	5,5	5,5	20	E173	5,5
25	MJPT	25	orange	6,5	6,5	20	E173	5,0
35	MJPT	35	red	8,0	8,0	20	E173	5,0
50	MJPT	50	yellow	9,0	9,0	20	E173	5,0
50 - 25	MJPT	50- 25	yellow/orange	9,0	6,5	20	E173	5,0
50 - 35	MJPT	50- 35	yellow/red	9,0	8,0	20	E173	5,0
70	MJPT	70	white	10,5	10,5	20	E173	4,5
70 - 35	MJPT	70- 35	white/red	10,5	8,0	20	E173	4,5
70 - 50	MJPT	70- 50	white/yellow	10,5	9,0	20	E173	4,5
95	MJPT	95	grey	12,2	12,2	20	E173	4,0
95 - 35	MJPT	95- 35	grey/red	12,2	8,0	20	E173	4,5
95 - 50	MJPT	95- 50	grey/yellow	12,2	9,0	20	E173	4,0
95 - 70	MJPT	95- 70	grey/white	12,2	10,5	20	E173	4,0
120	MJPT	120 D25	pink	14,2	14,2	25	E215	8,5
150	MJPT	150	violet	15,5	15,5	25	E215	8,0
150 - 70	MJPT	150- 70	violet/white	15,5	10,5	25	E215	9,0
150 - 95	MJPT	150- 95 D25	violet/grey	15,5	12,2	25	E215	9,0
For insulated neutral conductors of LV-ABC systems with neutral messenger								
54,6	MJPT	54	black	10,0	10,0	20	E173	8,0
70	MJPT	70N	white	10,5	10,5	20	E173	8,0
70 - 54,6	MJPT	70N-54	white/black	10,5	10,0	20	E173	8,0

Waterproof pre-insulated hexagonal compression lugs



Type: CPTA

These pre-insulated lugs are suitable for insulated stranded aluminium conductors.

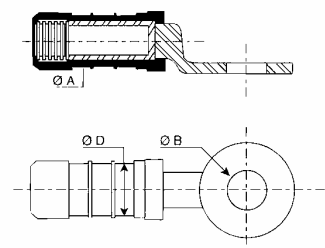
Stripped cables are inserted up to the end. Crimping according to the marks with appropriate crimping die size over the insulation. The electrical contact and the sealing by the elastomer ring is achieved during the crimp process.

Available with aluminium palm (CPTA) and as bimetallic lug with a copper palm (CPTAU).



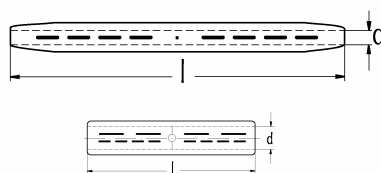
Type: CPTAU

- Suitable for stranded aluminium conductors
- Mechanical strength achieved is 60% of cable breaking load
- Tested for watertightness at a voltage of 6 kV for 30 min in a waterbath
- Three die sizes (E140, E173, E215) for all connector sizes (tools and dies see page 42)
- Exceeds requirements according to NFC 33021 and ESI 43-14
- Elastomeric sealing ring colour coded to easier identify the cross sections
- Inner aluminium sleeve filled with contact grease
- Insulation material made of weather and UV resistant polymer



Cross Section (mm²)	Product Description	Colour Code	Dimensions (mm)			Crimp Die size	Weight (kg/100 pcs)
			Ø A	Ø B	Ø D		
with aluminium palms							
35	CPTA 35	red	8,0	16,0	20	E173	7,0
50	CPTA 50	yellow	9,0	16,0	20	E173	7,0
54	CPTA 54	black	10,0	16,0	20	E173	7,0
70	CPTA 70	white	10,5	16,0	20	E173	7,0
95	CPTA 95 D20	grey	12,2	16,0	20	E173	6,5
150	CPTA 150-21 D20UK	violet	15,5	21,0	20	E173	7,0
with copper palms (bimetallic)							
16	CPTAU 16 D16	blue	5,5	10,5	16	E140	3,5
25	CPTAU 25 D16	orange	6,5	10,5	16	E140	3,0
35	CPTAU 35(trousse)	red	8,0	12,8	20	E173	7,0
50	CPTAU 50	yellow	9,0	12,8	20	E173	7,0
54	CPTAU 54	black	10,0	12,8	20	E173	7,0
70	CPTAU 70	white	10,5	12,8	20	E173	7,0
95	CPTAU 95	grey	12,2	12,8	20	E173	6,5
120	CPTAU 120 D25	pink	14,2	12,8	25	E215	13,0
150	CPTAU 150 D25	violet	15,5	12,8	25	E215	12,5

Bare full-tension and non-tension DIN-compression connectors



Tension and non-tension connector designed to connect LV-ABC aluminium or Aldrey conductors between each other.
Cable insulation has to be stripped before placing in the connector.
Connectors are crimped according to the marks with the appropriate DIN crimping dies and tool (see page 42).

- Suitable for stranded aluminium and aluminium alloy (Aldrey) conductors according to DIN 48201
- Exceeds requirements according to VDE 0220
- Connector dimensions in accordance with DIN 48085 part 2 (tension type) and with DIN 46267 part 2 (non-tension type)
- Additional heat-shrinkable tubing ensures perfect sealing and electrical insulation, to be ordered separately
- Connector bodies made of aluminium and aluminium alloy

Sealing tubing type MWMTM is recommended to insulate and seal over the connectors. The medium-wall tubing MWMTM is resistant to UV-light and weathering and coated with hot-melt adhesive which seals to all common plastics and metals.

Conductor Cross Section (mm ²)	Diameter (mm)	Product Description Crimp Connector	Sealing Sleeve Types	Connector Dimensions Ø d (mm)	l (mm)	Die code number acc. to DIN	Number of compressions mechanical/ hydraulic	Weight (kg/100 pcs)
Full tension connector for stranded aluminium conductors (self supporting system)								
16	5,1	HEL-72205	2	5,6	140	12	8-8/4-4	3,6
25	6,3	HEL-72206	2, 4	6,8	140	12	8-8/4-4	3,3
35	7,5	HEL-72207	4	8	140	14	8-8/4-4	4,5
50	9	HEL-72208	4	10	155	16	8-8/4-4	5,9
70	10,5	HEL-72209	4, 6	11,5	165	18	8-8/4-4	8,1
95	12,5	HEL-72210	6	13,5	165	22	8-8/4-4	12
120	14	HEL-72211	8	15,5	250	25	12-12/6-6	25
150	15,8	HEL-72212	8	17	300	28	7-7/3-3	37,5
Full tension connector for Aldrey (Almelec) conductors (neutral messenger system)								
54,6	9	HEL-73348	4	10	155	16	8-8/4-4	5,9
70,71,5	10,5	HEL-73349	4, 6	11,5	165	18	8-8/4-4	8,1
95	12,5	HEL-73350	6	13,5	165	20	8-8/4-4	12
Non tension connector for stranded aluminium and aluminium alloy (Aldrey) conductors								
16	5,1	HEL-72305	1	6	55	12	4-4/2-2	1,5
25	6,3	HEL-72306	1, 3	7	70	12	4-4/2-2	1,8
35	7,5	HEL-72307	3	8,3	85	14	5-5/2-2	3
50	9	HEL-72308	3	10	85	16	6-6/3-3	3,8
70	10,5	HEL-72309	3, 5	11,3	105	18	6-6/3-3	5,7
95	12,5	HEL-72310	5	13,5	105	22	6-6/3-3	8,9
120	14	HEL-72311	5	14,8	105	22	6-6/3-3	8,6
150	15,8	HEL-72312	7	16,5	125	25	6-6/3-3	11,2

Cross Section (mm ²)	MWMTM - Heat-shrinkable sealing sleeves			Full-tension connectors		
	Non-tension connectors			Full-tension connectors		
	Type	Product Description	Length (mm)	Type	Product description	Length (mm)
16- 25	1	MWMTM-16/ 5-100/S	100	2	MWMTM-16/ 5-200/S	200
25- 70	3	MWMTM-25/ 8-150/S	150	4	MWMTM-25/ 8-250/S	250
70- 95	5	MWMTM-35/12-150/S	150	6	MWMTM-35/12-250/S	250
70-150	7	MWMTM-35/12-200/S	200	8	MWMTM-35/12-400/S	400

MWMTM tubing is also available in lengths of 1000 mm and 1500 mm which can be cut to length at site, for details see page 18.

Bare mechanical lugs with sealing tubing



These mechanical lugs are suitable for stranded or solid and for aluminium or copper conductors. Cable insulation has to be stripped before placing in the lug. Bolts have to be tightened with a regular spanner until the heads shear off. The lugs can't be easily removed.

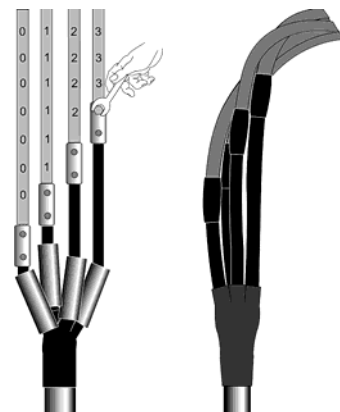
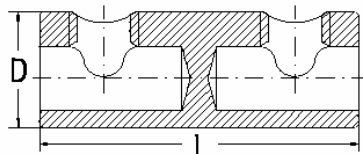
A heat-shrinkable tubing type MWTM ensures a reliable seal between the lug and the insulation. The tinned lug can be fastened to aluminium or copper busbars with M12 bolts.

- Suitable for stranded and solid, round or sector shaped conductors
- Large application ranges
- Exceeds requirements according to VDE 0220
- Transversal ridged grooves and 2 bolts improve mechanical pullout strength and electrical contact
- Heat-shrinkable tubing, supplied with kit, ensures perfect sealing and electrical insulation
- Connector bodies made of corrosion resistant, high strength aluminium alloy AlMgSi
- Bolts made of brass, electro tinned

Complete connection kits consisting of 4 lugs and 4 heat-shrinkable, sealing tubings

Cross Section (mm ²)	Product Description	Sealing tubing length (mm)	Connector bolt width across flats (mm)	Weight (kg/100 pcs)
25- 70	SMOE-81971	80	SW 10	6,8
50-150	SMOE-81972	100	SW 17	9,4
120-240	SMOE-81973	125	SW 22	16,8

Bare non-tension mechanical connectors



Non-tension mechanical connector designed to connect LV-ABC conductors between each other and to underground cable conductors. Cable insulation has to be stripped before placing in the connector. Bolts have to be tightened with an allen key until the heads shear off. The connectors can be easily removed and are reusable.

- Suitable for stranded and solid, round or sector shaped conductors
- Tinned connector for aluminium and copper conductors
- Large application ranges
- Exceeds requirements according to VDE 0220
- Transversal ridged grooves improve mechanical pullout strength and electrical contact
- Additional heat-shrinkable tubing ensures perfect sealing and electrical insulation
- Connector bodies made of corrosion resistant, high strength aluminium alloy AlMgSi
- Bolts made of brass, electro tinned

Sealing tubing type WCSM is recommended to insulate and seal over the connectors. The thick-wall tubing WCSM is specially designed to deliver the necessary shrinking range while providing the required insulation thickness over the connectors. The tubing is resistant to UV-light and weathering and coated with hot-melt adhesive which seals to all common plastics and metals. For cable terminations see Insulation Accessories at page 17 and 18, which include heat-shrinkable breakouts, sealing and protection tubing.

Complete connection kits consisting of 4 connectors and 4 heat-shrinkable, sealing tubings

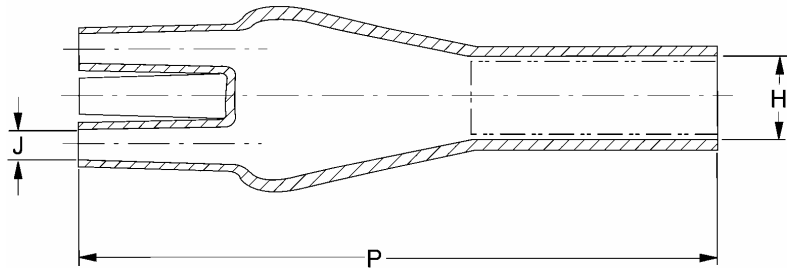
Conductor LV-ABC Cable (mm ²)	Cross Section Underground Cable (mm ²)	Product Description	Sealing tubing length (mm)	Connector bolt width across flats (mm)	Weight (kg/100 pcs)
16- 70	16- 70	SMOE-81974	150	SW 5	6,8
25-150	35-120	SMOE-81975	150	SW 6	9,4
50-185	50-185	SMOE-81976	150	SW 6	16,8

Connection and sealing components

Conductor LV-ABC Cable (mm ²)	Cross Section Underground Cable (mm ²)	Product Description Mechanical Connector	Heat-shrinkable Sealing Tubing* type WCSM	Connector Dimensions Ø D (mm) L (mm)	Width across flats (mm)	Weight (kg/100 pcs)
16- 70	16- 70	HEL-4896 ZAK	WCSM-33/ 8-150/S	25 55	SW 5	6,8
25-150	35-120	HEL-6893 ZAK	WCSM-33/ 8-150/S	28 75	SW 6	9,4
50-185	50-185	HEL-4893 ZAK	WCSM-43/12-150/S	32 80	SW 6	16,8

* WCSM tubing is also available in lengths of 1000 mm and 1500 mm which can be cut to length at site.

Heat-shrinkable breakouts and tubing for plastic insulated conductors and cables



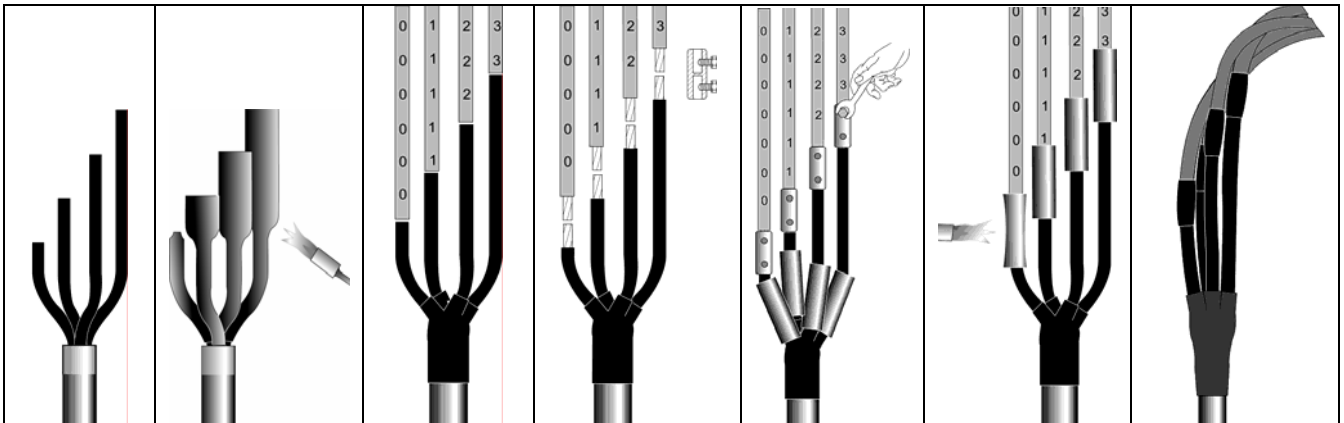
For sealing crutches of multi-core cables and LV-ABC cable entries into ducts. To seal onto all common plastics and metals, all outlets are coated with hot-melt adhesive. The breakouts are resistant to UV-light and weathering. Breakouts are available for 2,3,4 and 5-core cables, in a variety of sizes. Dimensional Details see table below.

H: Diameter of large outlet
J: Diameter of small outlets
P: Length of breakout
a: as delivered
b: after free recovery

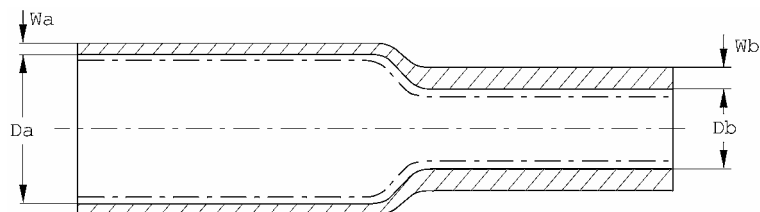
Recommended Cross Section (mm ²)	Ordering Description	Dimensions (mm)				
		H		J		P
		a (min.)	b (max.)	a (min.)	b (max.)	b (+/-10%)
for 2-core cables						
4 - 25	302K333/S	28	9	15	4,1	90
35 - 150	302K224/S	48	32	22	7	172
150 - 400	302K466/S	86	42	40	16	200
for 3-core cables						
4 - 35	402W533/S	38	13	16	4,2	103
50 - 150	402W516/S	63	22	26	9	180
95 - 500	402W526/S	95	28	44	13	205
for 4-core cables						
1,5- 10	502S012/S	23	9,5	7	2	60
4 - 35	502K033/S	36	16,5	14	3,4	96
25 - 95	502K046/S	45	19	20	7	165
50 - 150	502K016/S	60	25	25	9	217
120 - 400	502K026/S	100	31	40	13,5	223
-	502R810/S	170	60	46	21	255
for 5-core cables						
25 – 120*	603W035/S	68	26	20	7	182
* for smaller cross sections use 502K033 with 2 cores inside an outlet.						

* for smaller cross sections use 502K033 with 2 cores inside an outlet.

Installation steps with typical components for transition terminations of cables to LV-ABC lines.



Heat-shrinkable tubing for plastic insulated conductors and cables



Protection and insulation tubing

In case of terminating cables with core insulation which is not resistant to UV-light it is recommended to install over the cores the CGPT insulating tubing. The thin-wall CGPT tubing is uncoated and resistant to UV-light and weathering. As marking and protection tubing for grounding wires, cables and busbars the dual colour (yellow-green) DCPT tubing is recommended.

Sealing and insulation tubing

The sealing tubing MWTM is recommended to insulate and seal over crimp connectors and lugs and onto the cable insulation. The tubing is resistant to UV-light and weathering and coated with hot-melt adhesive which seals to all common plastics and metals. For bare connectors see pages 14 and 15.

Dimensions:

D: Diameter
Da: Diameter as delivered
Db: Diameter after free recovery
L: Length
W: Wallthickness
Wa: Wall thickness as delivered
Wb: Wall thickness after free recovery

Recommended Cross Section (mm²)		Ordering Description	Dimensions (mm)				
min.	max.		L (nom.)	D a (min.)	b (max.)	W a (min.)	b (min.)
CGPT – thin wall, black, insulation and protection tubing							
1,5	10	EN-CGPT 9/ 3-0	on spool	9	3		0,75
4	35	EN-CGPT 12/ 4-0	on spool	12	4		0,75
16	95	EN-CGPT 18/ 6-0	on spool	18	6		0,85
35	150	EN-CGPT 24/ 8-0	on spool	24	8		1,00
120	400	EN-CGPT 39/13-0	on spool	39	13		1,15
DCPT – thin wall, green-yellow, marking and protection tubing for grounding wires, cables and busbars							
1,5	10	EN-DCPT 6/ 3-45	on spool	6	3		0,58
4	16	EN-DCPT 8/ 4-45	on spool	8	4		0,64
10	25	EN-DCPT 10/ 5-45	on spool	10	5		0,64
16	35	EN-DCPT 12/ 6-45	on spool	12	6		0,64
50	120	EN-DCPT 19/ 9-45	on spool	19	9		0,76
120	185	EN-DCPT 26/13-45	on spool	26	13		0,89
185	400	EN-DCPT 38/19-45	on spool	38	19		1,00
MWTM – medium wall insulation and sealing tubing							
1,5	10	MWTM 10/ 3-1000/S	1000	10	3	0,3	1,0
4	35	MWTM 16/ 5-1000/S	1000	16	5	0,3	1,4
25	70	MWTM 25/ 8-1000/S	1000	25	8	0,4	2,0
70	150	MWTM 35/12-1000/S	1000	35	12	0,4	2,0
150	400	MWTM 50/16-1000/S	1000	50	16	0,5	2,0

CGPT tubing is delivered on spools and can be cut to length at site. MWTM tubing is also available as short pieces (see page 14) and in lengths of 1500 mm which can be cut to length at site

Other heat-shrinkable tubing, with and without adhesive coating, are available on request.

End caps



Type: CECT

Elastomeric end caps – CECT

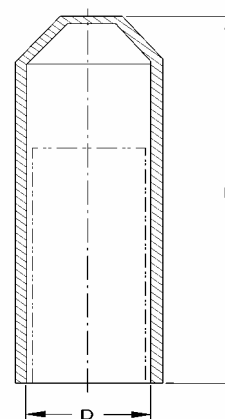
The elastomeric end caps are premoulded and simply pushed over the conductors. The CECT end caps are made of thermoplastic, UV-resistant material and fullfill voltage tests of 6 kV under water according to NFC 33020.



Type: 102L

Heat-shrinkable end caps – 102L

Inside coated with hot-melt adhesive, the heat-shrinkable end caps are used to seal and protect the ends of insulated LV-ABC and cable conductors. Larger sizes are available to seal plastic, paper and rubber insulated cables during storage, transport and cable laying. The end caps are resistant to UV-light and weathering



Da: Diameter as delivered

Db: Diameter after free recovery

Lb: Length after free recovery

Wb: Wall thickness after free recovery

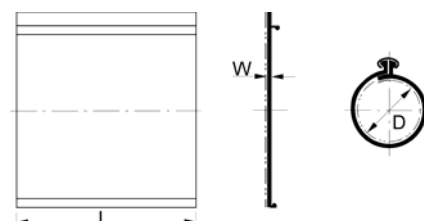
Elastomeric end caps - CECT

Recommended Cross Section (mm ²)	Application Diameter (mm)	Ordering Description	Weight (kg/100 pcs)
6- 35	4,5-11,5	CECT 6- 35	0,6
16-150	6,5-19,0	CECT 16-150	0,7

Heat-shrinkable end caps – 102L

Recommended application Cross Section (mm ²)	Diameter (mm)	Ordering Description	Dimensions (mm)			
			D		L	W
			a (min.)	b (max)	b (+/-10%)	b (+/-20%)
4- 25	4- 8	102L011-R05/S	10	4	38	2,0
16-120	8- 17	102L022-R05/S	20	7,5	55	2,8
120-300	17- 30	102L033-R05/S	35	15	90	3,2
-	30- 45	102L044-R05/S	55	25	143	3,9
-	45- 65	102L048-R05/S	75	32	150	3,3
-	65- 95	102L055-R05/S	100	45	162	3,8
-	95-115	102L066-R05/S	120	70	145	3,8

Heat-shrinkable Repair sleeve



The general purpose wraparound CRSM is used for a fast and reliable repair of polymeric insulated conductors and cable sheaths to re-establish the electrical and mechanical integrity of the cable. The wraparound is supplied with an adhesive coating and is resistant to UV-light and weathering

Dimensions:

D: Diameter

Da: Diameter as delivered

Db: Diameter after free recovery

L: Length

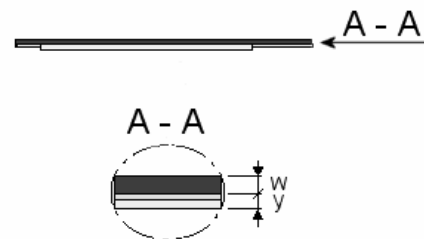
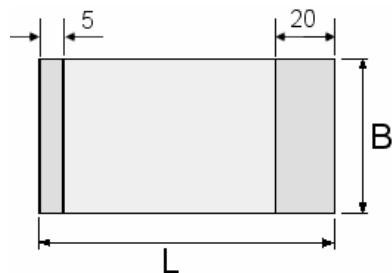
W: Wallthickness

Wa: Wall thickness as delivered

Wb: Wall thickness after free recovery

Recommended conductor Cross section (mm ²) min.-max.	Diameter (mm) min.-max.	Ordering Description	Dimensions (mm)				
			D		W		L
			a (min.)	b (max)	a (min)	b (min)	a (+/-15mm)
35-150	11-21	CRSM 34/10- 250/239	35	9	0,3	2,4	250
		CRSM 34/10- 500/239					500
		CRSM 34/10-1000/239					1000
		CRSM 34/10-1500/239					1500
70-400	17-32	CRSM 53/13- 250/239	54	15	0,3	2,0	250
		CRSM 53/13- 500/239					500
		CRSM 53/13- 750/239					750
		CRSM 53/13-1000/239					1000
		CRSM 53/13-1500/239					1500

Heat-shrinkable repair tape - SSRK



The heat-shrinkable repair tape SSRK is designed to repair small damages to insulated conductors and cable sheaths. The smaller size 60 is ideal for re-establishing the insulation and to seal an insulated conductor after removal of a piercing connector. The tape length is selected according to the diameter of the conductor or cable.

The SSRK repair tape is made of an UV-light and weathering resistant polymer. The ends of the tape are coated with pressure sensitive adhesive which allows easy positioning and keeps the tape in place before shrinking. Upon heating, the tape shrinks by min. 10% and the hot-melt adhesive in the middle part of the tape flows and seals to all common plastics and metals.

Dimensions:

Ba: Width as delivered

Bb: Width after free recovery

La: Length as delivered

Lb: Length after free recovery

Wa: Wall thickness of tape as delivered

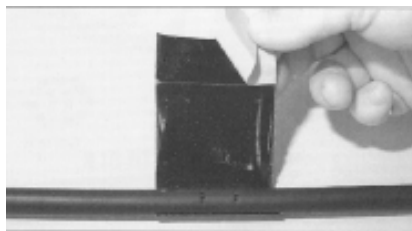
Ya: Wall thickness of hot melt adhesive as delivered

Recommended conductor Cross Section (mm ²)	Diameter (mm)	Ordering Description	Dimensions (mm)					
			B		L		W	Y
			a (min.)	b (max)	a (min)	b (min)	a (nom.)	a (nom.)
10- 95	5-15	SSRK- 60-100	60	62	100	90	0,5	0,7
35-240	10-35	SSRK- 60-200	60	62	200	180	0,5	0,7
-	15-55	SSRK- 60-300	60	62	300	270	0,5	0,7
-	20-75	SSRK- 60-400	60	62	400	360	0,5	0,7
10- 95	5-15	SSRK-100-100	100	102	100	90	0,5	0,7
35-240	10-35	SSRK-100-200	100	102	200	180	0,5	0,7
-	15-55	SSRK-100-300	100	102	300	270	0,5	0,7

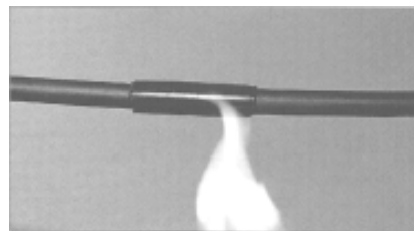
Application



Cable with damaged insulation, e.g. after removal of insulation piercing connector.

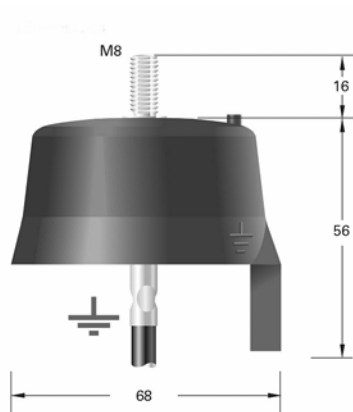


Small side with pressure sensitive adhesive positioned on cable. The rest of the SSRK tape is wrapped around the conductor. The end is kept in place by the wide side with pressure sensitive adhesive.



While heated, the tape shrinks and the hot-melt adhesive flows and seals.

Metal oxide surge arresters and accessories



Low voltage surge arresters are installed at transitions of LV-ABC lines to underground or service cables and to substations.

The metal-oxide varistors incorporated in the surge arrester reliably protects the insulation of the network and the connected equipment from all kind of surges.

A bundle of installation accessories like insulated line leads and mounting brackets are available to meet the individual requirements.



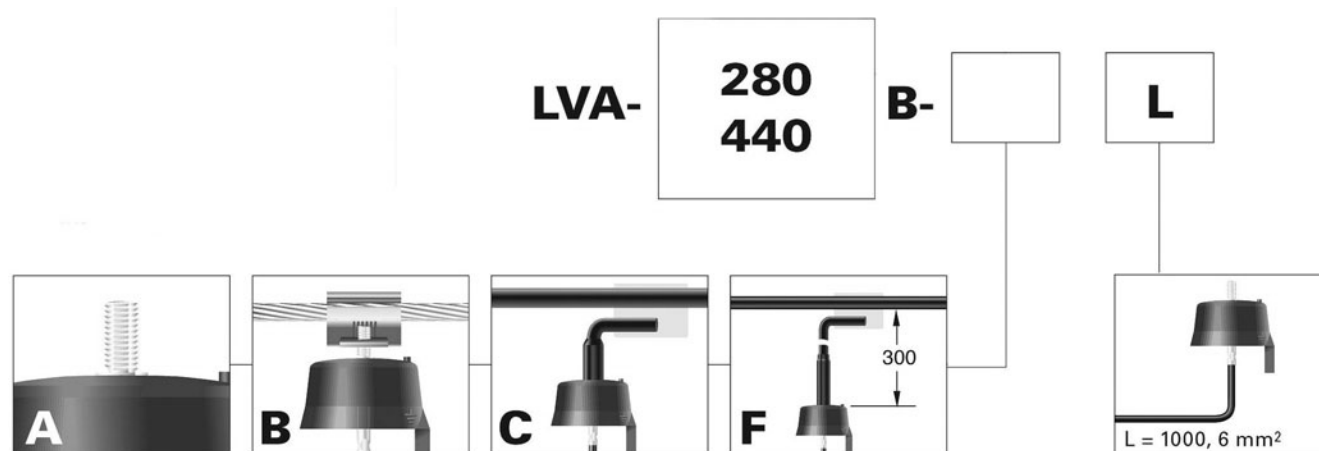
- Gapless metal-oxide surge arrester for continuous voltages of 280V or 440V
- Tested according to Class II of IEC 61643-1 + Amd.1 / EN 61643-11
- Nominal discharge current I_n of 10kA, max. discharge current I_{max} of 40kA.
- Extremely fast response to steep impulses, high current impulse of 100kA, 4/10 μ s (IEC 99-4) is safely handled
- Energy absorption capability of 4,1 J/V U_c
- Tested to exceed ambient temperatures of -40°C up to +70°C
- Watertightness at a voltage of 6 kV for 30 min tested in a waterbath
- In case of overload, e.g. by lightning strike in vicinity of arrester, an integrated disconnecter disconnects the arrester from the network while the ground lead remains in position and an easy to spot coloured plate hangs down from the arrester
- Insulated adapters suitable for all piercing connectors designed for tap conductors of 25 mm² (insulated conductor diameter of 9 mm)
- Sturdy, weatherproof polymer housing ensuring durability even at extreme temperature fluctuations and contamination
- All metal parts made of corrosion resistant aluminium or stainless steel

Technical data of arresters

Rated voltage U_r (V)	Ordering Description with standard accessories*	Residual Voltages (kV) *				
		Lightning current impulse 8/20 μ s				
		1kA	2kA	5kA	10kA	20kA
280	LVA-280B-AL	0,76	0,82	0,96	1,20	1,58
440	LVA-440B-AL	1,29	1,38	1,55	1,80	2,21

* Residual Voltages measured with 150 mm ground lead

Ordering descriptions for surge arresters and accessories



Line Leads

Threaded bolt
M8x16

Clamp for bare
conductors
16 mm² – 120 mm²

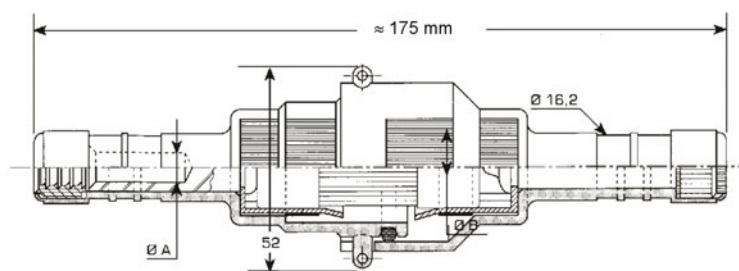
Insulated right angle
adapter to fit to
piercing connectors

Insulated, flexible
line lead to fit to
piercing
connectors

Ground lead

Insulated earth
lead 6 mm², Cu,
1000 mm long

Fuse cutout for service lines



These removable circuit breakers are installed on service lines as a fuse with 4 to 125A and allow disconnection under load up to 60A. Attached sealing cap allows to temporary protect access to the network side.

The connection to the service line of 16 or 25 mm² is performed by crimping, see page 10 for crimping details.

- Suitable for 22x58 AD fuse cartridges from 4 to 125 A
- Allows connection and disconnection under load up to 60 A
- Tested for watertightness at a voltage of 6 kV for 30 min in a waterbath
- Two part body with integrated seals easily interlock during closing
- Die size E140 for both sizes (tools and dies see page 42)
- Insulation material made of weather and UV resistant polymer

Fuse cutouts

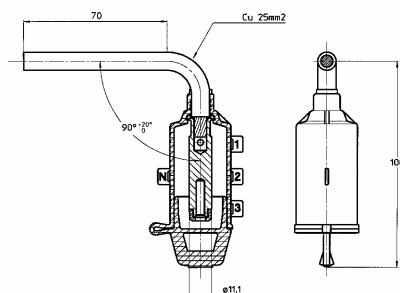
Cross Section (mm ²)	Ordering Description	Fuse Dimension and Size (mm) (A)		Weight (kg/100 pcs)
16	CCFBD 16-16	22 x 58	4 - 125	12,5
25	CCFBD 25-25	22 x 58	4 - 125	12,5

Fuse cartridges

Size (mm x mm)	Ordering Description	Rated In Current (A)	Rated Voltage (V)	Interrupting rating (A)	Weight (kg/100 pcs)
22 x 58	AD 16-22X58	16	500	80 000	12,5
22 x 58	AD 32-22X58	32	500	80 000	12,5
22 x 58	AD 63-22X58	63	500	80 000	12,5

fuses according to IEC 269-2 and NFC 63 210, other sizes available on request

Insulated short-circuiting and earthing adapter for piercing connectors



These adapters are installed on the tap-off side of an insulation piercing connector (type HEL or P2X, see page 4), usually close to the end of a line or at intersections.

The insulating cover is removed for access to the inside brass stud fitted with a bayonet lock. A hole drilled into the stud provides a reliable point of contact for voltage testing.

The connection to earth is done by an insulated earthing equipment.

- Suitable for all piercing connectors designed for tap conductors of 25 mm² (insulated conductor diameter of 9 mm)
- Designed for short circuit currents up to 4 kA/1s, permanent currents up to 200A
- Phases are easily identified by phase neutral indexes (breakable flags)
- Tested for watertightness at a voltage of 6 kV for 30 min in a waterbath

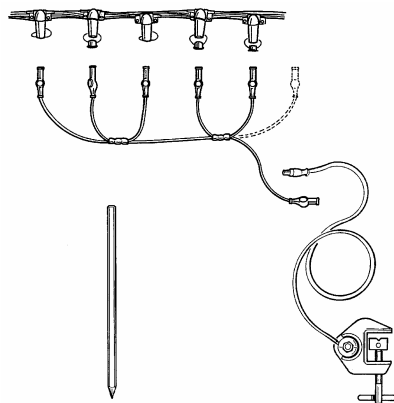
- Exceeds requirements according to NFC 33020
- Components not loosable, cover attached to body
- Insulation material made of weather and UV resistant polymer
- Contact stud made of brass; dimensions Ø 11,1 mm, length 35 mm, hole 4 mm

Insulated Conductor		Product Description	Stud dimension		I max (kA/1s)	Weight (kg/100 pcs)
Cross Section (mm ²)	Diameter (mm)		Ø (mm)	length (mm)		
25	9,0	PMCC	11,1	35	4	8,4

Short-circuiting and earthing equipment



After checking for absence of voltage, the earthing and short circuiting equipment is connected to ground and then the studs inserted in PMCC adapters, thus following the common safety rules.



Shortcircuiting equipment consisting of 6 or 7 stud pins with bayonett locking connected by highly flexible insulated copper cable, delivered in transport box. Conforms with EN 61230 and IEC 1230.

Designed for short circuit currents up to 4 kA/1s, permanent currents up to 200A. Contact stud dimensions Ø 11,1 mm, length 35 mm (according to NFC 33020-HT33 S69).



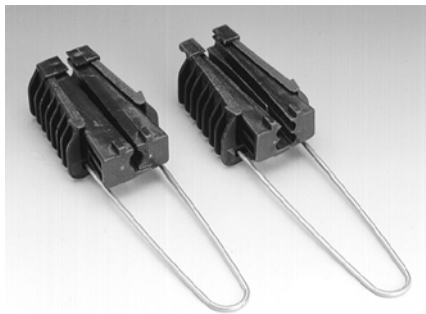
Earthing equipment consisting of an insulated splicing bayonett to connect on a stud pin, highly flexible insulated copper cable and an earth clamp for connection to an earth rod, delivered in a transport box. Designed for short circuit currents up to 4 kA/1s.

Earthing rods are made of stainless steel with diameter of 16 mm and length of 1 m.

Application	Product Description	Cross section (mm ²)	I _{max} (kA/1s)	Box dimensions (mm)	Weight (kg/kit)
Short circuiting equipment					
6 stud pins	MT-206	16	4	234x215x75	1,5
Earthing equipment					
10 m cable	MT-245	16	4	310x280x105	3,0

Earthing rod	Product Description	Material	Length (mm)	Diameter (mm)	Weight (kg/rod)
	PT-INOX-160/AA-1M	Stainless steel	1000	16,0	1,5

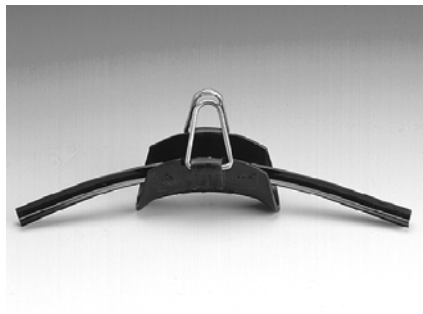
Anchor and angle clamps for service cables



Type: PA, PAS

The clamps are designed to anchor insulated service lines with 2 or 4 conductors.

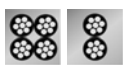
- Toolfree installation with wedges sliding inside the body
- Easy to open bail permits fixing to brackets and pigtails
- Length of bail adjustable, max total length 220 mm
- Exceeds requirements according to NF C 33 042
- Clamp made of weather and UV resistant polymer



Type: RA 25

The clamps are designed for suspension applications of insulated service lines with 2 or 4 conductors.

- For angles of up to 90° of the line
- Toolfree installation with core separator
- Easy to open bail permits fixing to brackets and pigtails
- Exceeds requirements according to NF C 33 042
- Clamp made of weather and UV resistant polymer



Anchor clamps for insulated overhead conductors (self-supporting)

Cross Section (mm ²)		Product Description	Breaking Load	Max. Continuous Operating Load	Weight (kg/10 pcs)
Min.	Max.				
2 x 16	4 x 25	PA 25x100	3,0 kN	-	1,3

* B version with open eye of 18 mm opening



Anchor clamps with rigid bail for round cables

Cable Diameter (mm)		Product Description	Breaking Load	Max. Continuous Operating Load	Weight (kg/10 pcs)
Min.	Max.				
Ø 9	Ø 17	PA 9-17	3,0 kN	-	1,4
Ø 18	Ø 25	PAS 35/10	3,0 kN	-	1,3

Angle clamp for insulated overhead conductors and cables

Cross Section (mm ²)		Product Description	Breaking Load	Max. Continuous Operating Load	Weight (kg/10 pcs)
Min.	Max.				
2 x 16	4 x 25	RA 25	3,0 kN	-	0,9

For brackets and hooks see page 36

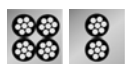
Anchor and suspension clamps for service cables



Type: HEL

The clamp is designed to anchor or suspend insulated service lines with 2 or 4 conductors.

- Clamp can be used as suspension clamp by simply rotating blocks.
- Strap with closed eye (32,5 x 22,5 mm) or open eye (opening 18 mm)
- Simple single bolt installation with 17 mm spanner
- Clamp with short length of 165 mm
- Exceeds slipping requirements of 4 kN according to AS 3766
- Exceeds requirements according to VDE 0211
- Clamp made of weather and UV resistant glass fibre reinforced polymer and hot dip galvanized steel



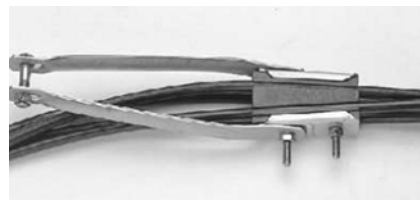
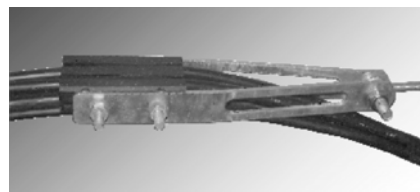
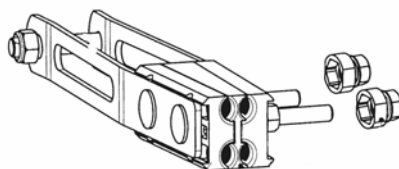
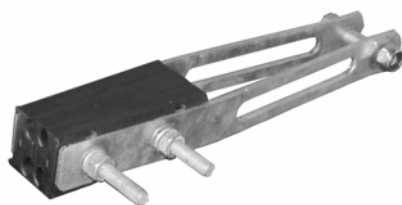
Anchor and suspension clamps for insulated overhead conductors (self-supporting)

Cross Section (mm ²)		Product Description	Support strap type		Max. Continuous Operating Load	Weight (kg/10 pcs)
Min.	Max.		Closed eye	Open eye		
2 x 10	2 x 35	HEL-5505-2	X		40 N/mm ²	4,3
2 x 10	2 x 35	HEL-5505-2B*		X	40 N/mm ²	4,3
2 x 10	4 x 35	HEL-5505	X		40 N/mm ²	5,2
2 x 10	4 x 35	HEL-5505-B*		X	40 N/mm ²	5,2

For brackets and hooks see page 36



Anchoring clamps for self supporting LV-ABC lines



The clamps are designed to anchor self supporting LV-ABC lines from 2 to 4 cores. The wedge type clamp is self-adjusting. Pilot wires or street lighting conductors are led alongside the clamp.

The self opening feature by an integrated spring facilitates the insertion of conductors. The version with movable arms further simplifies the installation.

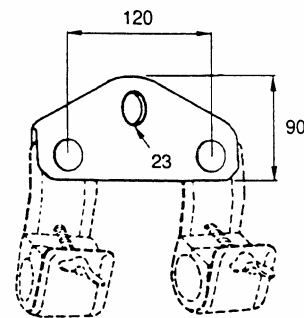
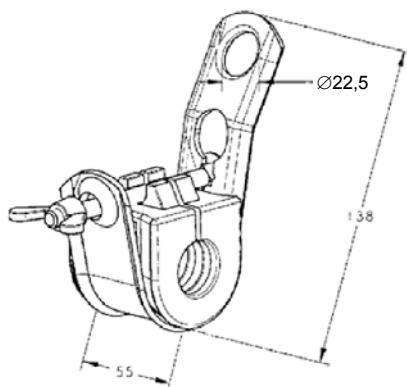
- Single M12 bolt and selflocking nut allows clamp also to be fixed to closed eye screws or brackets
- Short length of approx. 320 mm
- Exceeds requirements according to ESI 43-14 and VDE 0211
- Clamp made of weather and UV resistant glass fibre reinforced polymer and hot dip galvanized steel

Cross Section (mm ²)	Product Description	Breaking Load	Max. Continuous Operating Load	Weight (kg/ 10 pcs)
with movable arm				
4 x 25 - 50	HEL-5503	12,3 kN	40 N/mm ²	10,0
4 x 70 - 95	HEL-5504	43,0 kN	40 N/mm ²	11,0
with fixed arm				
4 x 10 - 35	HEL-5505		40 N/mm ²	5,2
4 x 25 - 50	HEL-5506	12,3 kN	40 N/mm ²	10,0
4 x 70 - 95	HEL-5507	43,0 kN	40 N/mm ²	11,0
4 x 120	PA 4120	60,0 kN	7,0 kN	20,0

For brackets and hooks see page 36



Suspension clamps for self supporting LV-ABC lines



The clamps are designed to hang self supporting LV-ABC lines. These clamps can also be used to hang LV-ABC lines with bare and insulated neutral messenger.

The lines can be in straight direction and in line deviation angles up to 30°.



- Toolfree installation, equipped with wing nut
- No loosable parts
- Exceeds requirements according to ESI 43-14 and VDE 0211
- Clamp made of weather and UV resistant elastomer and hot dip galvanized steel

The hot dip galvanized steel suspension plate PSY is available for suspensions with deviation angles up to 60°. Two standard suspension clamps must be installed on this plate. The suspension plate can be ordered with the description **PSY**. For larger line deviation angles 2 anchor clamps shall be used.

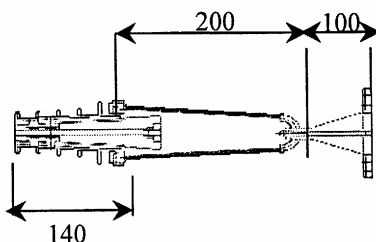
Cross Section (mm ²)	Bundle Diameter (mm)	Product Description	Breaking Load	Weight (kg/ 10 pcs)
4 x 35, 2x50	21 - 25	PS 435(250)	7,5 kN	4,1
4 x 50, 2x95	26 - 30	PS 450	7,5 kN	3,8
4 x 70	31 - 35	PS 470	7,5 kN	3,6
4 x 95	36 - 40	PS 495	7,5 kN	3,5
4 x120	40 - 43	PS 4120	7,5 kN	4,4

Recommended working load of 2,5 kN

For brackets and hooks see page 36



Anchoring clamps for LV-ABC lines with insulated neutral messenger

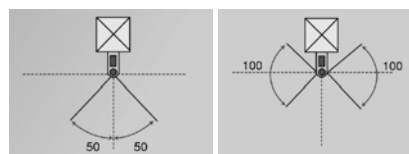


The clamps are designed to anchor LV-ABC lines with insulated neutral messenger. The clamp consists of an aluminium alloy casted body and self adjusting plastic wedges which clamp the neutral messenger without damaging the insulation.

The flexible bail with an insulation wear-resistant saddle allows installations of up to 3 clamps on a bracket. The clamp and the bracket are available separately and together as assembly.

- Toolfree installation
- No loosable parts
- Exceeds requirements according to NF C 33 041 and 042
- Clamp body made of corrosion resistant aluminium alloy, bail of stainless steel, wedges of weather and UV resistant polymer
- Universal fixing of bracket by 2 bolts M14 or stainless steel straps of 20x0,7 mm.
- Bracket made of corrosion resistant aluminium alloy

Maximum line deviation angles of 50° for single and 100° for double anchoring:



Neutral messenger Cross Section (mm ²)	Diameter (mm)	Product Description	Breaking Load	Recommended Working Load	Weight (kg/ 10 pcs)
anchor clamp without bracket					
25 - 35	8 - 11	PA 1000	10,0 kN	3,0 kN	3,2
50 - 70	12 - 14	PA 1500	15,0 kN	5,0 kN	3,4
50 - 70	12 - 14	PA 2000	20,0 kN	7,0 kN	4,1
95	14 - 16	PA 95-2000	20,0 kN	7,0 kN	4,1
anchor clamp with bracket					
25 - 35	8 - 11	EA 1000	10,0 kN	3,0 kN	5,7
50 - 70	12 - 14	EA 1500	15,0 kN	5,0 kN	5,9
50 - 70	12 - 14	EA 2000	20,0 kN	7,0 kN	6,4
95	14 - 16	EA 95-2000	20,0 kN	7,0 kN	6,4
bracket					
-	-	CA 1500-2	15,0 kN	5,0 kN	2,0
-	-	CA 1500/2000	20,0 kN	7,0 kN	2,3

For brackets and hooks see also page 36



Suspension clamps for LV-ABC lines with insulated neutral messenger

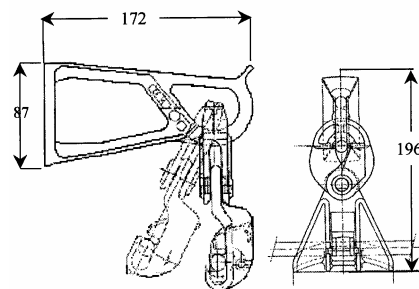


The clamps are designed to hang LV-ABC lines with insulated neutral messengers. The neutral messenger is fixed by an adjustable grip device. A movable link allows longitudinal and transversal movement of the clamp body.

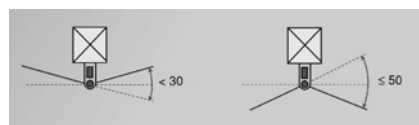
Standard clamp version ES is supplied with preinstalled bracket. The upper bulge of the bracket prevents the clamp from turning over the bracket.

Clamps are also available without bracket (PS) and with a fuse link (ESF). These clamps (PS) are fixed to a pole with a pig tail hook or bracket.

- Toolfree installation
- No loosable parts
- Clamp and link made of polymer giving an additional insulation between the cable and the pole.
- Exceeds requirements according to NF C 33 040
- Clamp and movable link made of weather and UV resistant glass fibre reinforced polymer
- Universal fixing of bracket by 1 bolt M16 or stainless steel strap of 20x0,7 mm.
- Bracket made of corrosion resistant aluminium alloy



The lines can be in straight direction and in line deviation angles up to 30° towards the pole and up to 50° pulling away from the pole.



For larger line deviation angles 2 anchor clamps shall be used.

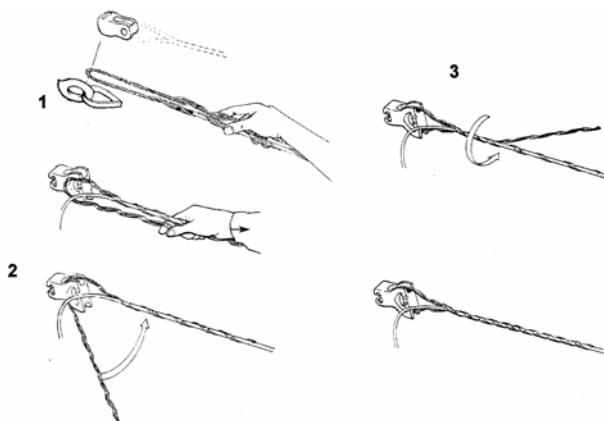
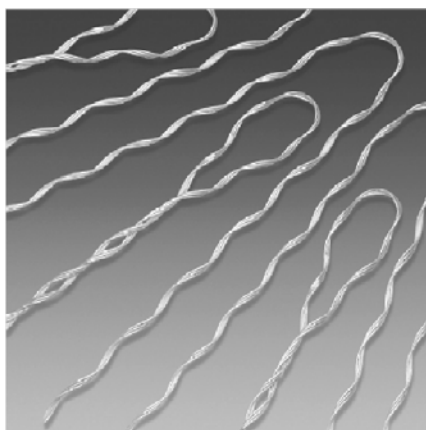
Neutral messenger Cross Section (mm ²)	Diameter (mm)	Product Description	Breaking Load	Hole Diameter max. (mm)	Weight (kg/ 10 pcs)
clamp without bracket					
16 - 35	8 - 11	PS 35	4,3 kN	25,0	0,8
50 - 70	10 - 13,5	PS 54	12,0 kN	25,0	1,2
95 - 120	15 - 17,5	PS 120	30,0 kN	25,0	2,5
clamp with preinstalled bracket					
16 - 35	8 - 11	ES 35-1500	4,3 kN	-	2,8
50 - 70	10 - 13,5	ES 1500	12,0 kN	-	3,2
50 - 70	11 - 15,5	ES 2000	16,0 kN	-	3,4
clamp without bracket with fuse link					
50 - 70	10 - 13,5	ESF 54/70	7,0 kN	-	3,2

For other cable dimensions see also suspension clamps for self supporting LV-ABC lines at page 29.

For brackets and hooks see also page 36



Heliformed anchoring clamps for LV-ABC lines with bare neutral messenger



Heliformed dead ends type ASDE are designed for bare aluminium conductors to provide high mechanical strength (within 90% of conductor breaking strength) and short length while offering advantages over conventional anchoring techniques:

- Even distribution of pressure over a wide area, eliminating concentrated forces
- Fast, simple and uniform installation
- Positive grip upon the conductor that cannot be displaced by bending or vibration
- Compatibility with the conductor to which the fitting is applied
- Material made of aluminium covered steel
- Colour code and label to assist in identification of correct conductor size
- Cross over marks indicate starting point of application

Installation steps:

1 Align the loop of the ASDE dead end with the eye of the thimble. Begin the application procedure by applying the first leg of the ASDE dead end onto the neutral messenger at the cross over mark.

2 Insert the second leg of the ASDE Dead End through the eye of the thimble, and pull through parallel with the conductor for the next application procedure.

3 Match up the cross over mark on the second leg, making sure the gaps are equal between the legs, and commence wrapping the second leg. Complete the application of the dead end.

Heliformed Dead Ends are designed to be applied over smoothly contoured hardware with diameters and groove widths which will adequately support the loop of the fitting. If thimbles are used, a large pin is recommended to fill the loop of the thimble to prevent distortion. ASDE dead ends may be applied three times on new installations, if sag adjustment is necessary. They should not be re-used after final installation.

Neutral messenger Cross Section(mm ²) HD626 ¹ DIN 48201 ²			Product Description	Colour Code	Length applied (mm)	Weight (kg/ 100 pc)
		Diameter (mm)				
25	16	4,62 - 5,17	DUL-ASDE-0465	Blue	406	6,0
		5,18 - 5,81	DUL-ASDE-0520	Brown	457	8,0
		5,82 - 6,54	DUL-ASDE-0585	Orange	457	8,0
35	35	6,55 - 7,36	DUL-ASDE-0655	Purple	559	12,0
50		7,37 - 8,27	DUL-ASDE-0740	Red	635	14,0
		8,28 - 9,26	DUL-ASDE-0830	Green	686	24,0
70	70	9,27 - 10,40	DUL-ASDE-0930	Yellow	686	26,0
95		10,41 - 11,70	DUL-ASDE-1045	Blue	737	26,0
		11,71 - 13,12	DUL-ASDE-1175	Orange	838	37,0

Product selection has to be done according to conductor diameter, given cross sections can be of help:

1) Cross sections according to cables to Cenelec HD626 part 5 section D (applies to cables made to Finnish standards)

2) Cross sections according to AAC conductors defined in DIN 48201 part 5 (applies to cables made to Hungarian standard)

For brackets, hooks see page 36



Anchoring clamps for LV-ABC lines with bare neutral messenger



The clamps are designed to anchor LV-ABC lines with bare neutral messenger. Available with straight and with curved clamp grooves.

- Exceed requirements according to VDE 0210 and VDE 0212
- Cross grooved clamp channels improve mechanical pullout strength and contact
- Connector bodies made of corrosion resistant, high strength aluminium alloy AlMgSi1F32
- Bolts and nuts made of hot dip galvanized steel 8.8.



The clamps are designed as universal clamps including dead-end applications for bare conductors.

- Allows insertion of conductors without dismantling connector
- No loosable parts, nuts fixed to body
- Exceed requirements according to VDE 0210 and VDE 0212
- Cross grooved clamp channels improve mechanical pullout strength and contact
- Connector bodies made of corrosion resistant, high strength aluminium alloy AlMgSi1F32
- Bolts and nuts made of hot dip galvanized steel 8.8.

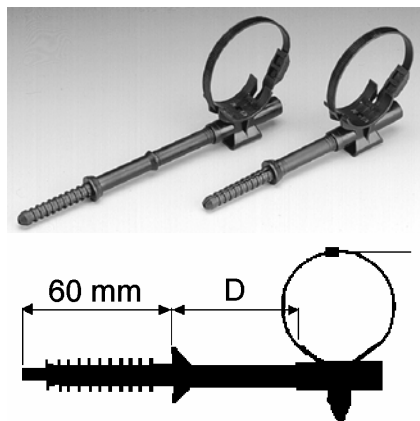
Neutral messenger		Product Description	Weight
Cross Section	Diameter		(kg/ 10 pcs)
(mm²)	(mm)		
Dead end clamp with parallel grooves			
10 - 16	4,1 - 5,1	HEL-3825	0,8
25 - 35	6,3 - 7,5	HEL-3827	1,3
50 - 70	9,0 -10,5	HEL-3829	2,2
95 -120	12,5 -14,0	HEL-3831	4,0
Dead end clamp with curved grooves			
25 - 35	6,3 - 7,5	HEL-38027	1,1
50 - 70	9,0 -10,5	HEL-38029	2,0
95 -120	12,5 -14,0	HEL-38031	3,3
Universal clamps			
16 - 70	5,1 -11,7	HEL-3929	1,0
95 -120	6,3 -15,7	HEL-3932	2,0



Suspension clamps for LV-ABC lines with bare neutral messenger

See suspension clamps for self supporting LV-ABC lines at page 29.

Wall mounted saddles and cable ties for LV-ABC lines

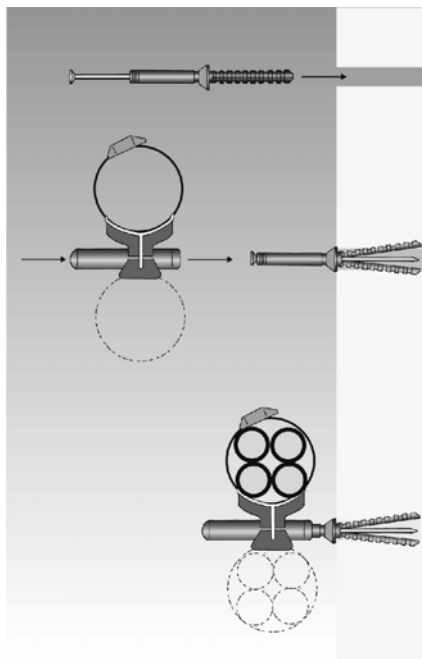


The wall mounted saddles are designed to install LV-ABC lines (self-supporting or insulated neutral messenger type) alongside walls and poles.

The LV-ABC cable is fixed to the saddle by a cable tie. A second cable can be installed on the same support by hanging it to the bottom side with an additional cable tie (to be ordered separately). The body and the cable tie are made of weather and UV resistant polymer material.

Cable ties are made of weather and UV resistant polyamide material:

- width 9 mm, colour black
- halogenfree and flame retarded
- temperature ranges:
operating -50°C to +80°C
installation -15°C to +60°C
max. allowed peak 120°C



The expansion plug part is inserted in a drilled hole $\varnothing 12$ mm and by hitting a nail inside fixed to the wall. The wall saddle part is pushed over the expansion plug part until the self-locking ring snaps in. The cable tie fixes a variety of cables to the saddle. Usually, every 0,7 m a saddle is installed on a wall.

For applications on walls or poles with soft material like wood, the expansion plug is simply cut off and the nail directly hammered into the wood.

Wall mounted saddles

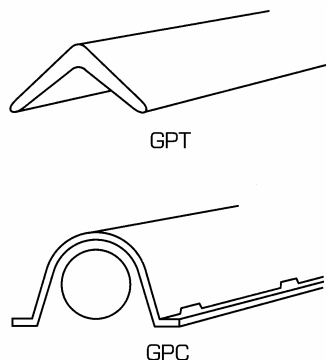
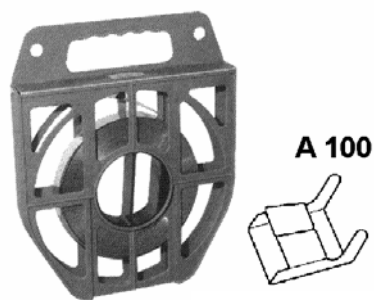
Cable Diameter (mm) min. - max.	Product Description	Spacing to wall (mm)	Breaking Load (kN)	Weight (kg/100 pcs)
25 - 60	BRPF 70-150-1F	10	2,0	4,8
25 - 60	BRPF 70-150-6F	60	2,0	8,2

Cable ties

Cable Diameter (mm) min. - max.	Product Description	Length (mm)	Breaking Load (kN)	Weight (kg/1000 pcs)
8 - 27	CS 922	132	0,35	1,8
10 - 45	CSB	180	0,35	2,6
26 - 66	CSL 260	265	0,51	3,6
55 - 93	CSL 350	360	0,51	5,0

Tool for plastic tie installation see page 40

Mechanical fixing and protection devices for LV-ABC lines



Stainless steel straps are used to attach cable protection, anchoring and suspension assemblies and other devices mainly to poles.

Extruded PVC profiles are used to protect cables and conductors against damages alongside poles or walls.

The steel straps are cut from the roll to the required length. The strap is fixed with the appropriate buckle and a binding tool.

- type GPT 30x30 to be fixed by straps
- type GPC to be fixed either by screws \varnothing 6mm (hole \varnothing 7mm) or straps (slit approx. 3 x 30 mm)

- stainless steel 18/8
- breaking strength 0,7 kN/mm²
- width of 10 and 20 mm
- thickness of 0,4 and 0,7 mm
- rolls of 50 m in carrier case

Product Description	Application	Dimensions (mm)	Packaging Unit	Weight (kg/unit)
Stainless steel straps				
F 1004		10 x 0,4	1 roll of 50 m	1,5
F 1007		10 x 0,7	1 roll of 50 m	2,7
F 2004		20 x 0,4	1 roll of 50 m	3,0
F 2007		20 x 0,7	1 roll of 50 m	5,3
Buckles for straps				
A 100	for F1000 series	11	1 bag of 100 buckles	0,5
A 200	for F2000 series	21	1 bag of 100 buckles	1,1
Extruded PVC cable protection				
GPT 30x30 L2600	grounding conductors	30 x 30 x 2600		0,6
GPC 35x35 L2750	low voltage cables	35 x 35 x 2750		1,2
GPC 60x60 L2750	low voltage cables	60 x 60 x 2750		1,9
GPC 90x90 L2750	low/medium voltage cables	90 x 90 x 2750		2,6

Tools for steel straps see page 40

Hooks, brackets and bolts for LV-ABC lines

CA 1500, CA 2000



Anchor bracket CA 1500, CA 2000: Anchor bracket made of aluminium alloy designed for main cables. To be attached by 2 steel straps (20 mm) or up to 2 bolts (\varnothing 14 or 16 mm).

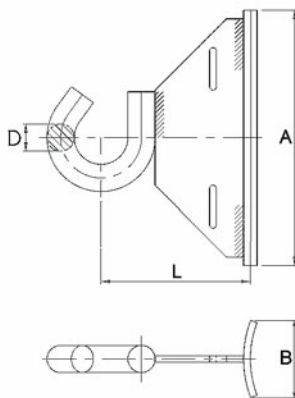
CAB 25



Anchor bracket CAB 25: Anchor bracket made of stainless steel designed for service cables. To be attached by a steel strap (20 mm), a bolt (\varnothing 14 or 16 mm) or 4 screws (\varnothing 5 mm).

Product Description	Breaking load (kN)	Operating load (kN)	Weight (kg/10 pcs)
CA 1500-2	15,0	5,0	1,8
CA 1500/2000	19,5	5,0	2,3
CAB 25	2,0	0,8	0,2

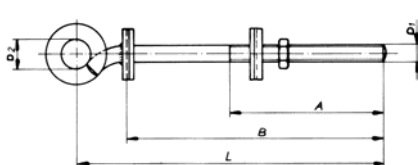
HEL-5661



HEL 5661: Hook plate made of galvanized steel designed for main cables. To be attached to poles by 2 steel straps (20mm). Breaking loads of min. 28 kN horizontal and 18 kN vertical.

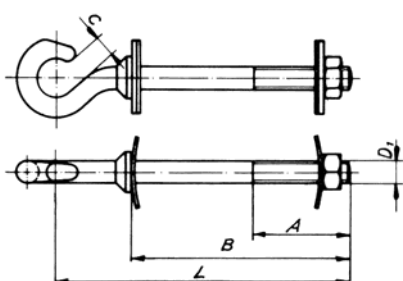
Product Description	A (mm)	B (mm)	L (mm)	D (mm)	Weight (kg/ pc)
HEL-5661	150	54	91	16	0,8

HEL-553x



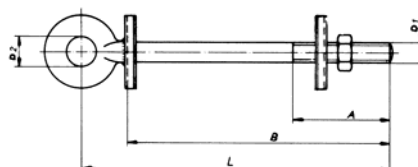
Spiral hook, hook bolts, strain eye bolts HEL: Fixed length by welded, flat or bended washers, made of hot-dip galvanized steel. Designed for main and service clamps. Max. loads of spiral and hook versions for M16 (M20) bolt size of 5,5 (13) kN horizontal and vertical. Max. loads for strain eye versions for M16 (M20) bolt size of 40 (40) kN horizontal and 7 (15) kN vertical.

HEL-555x



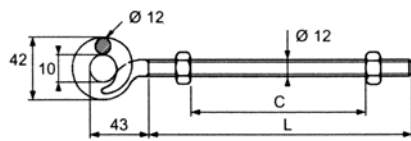
Product Description	A (mm)	B (mm)	L (mm)	D1 (mm)	D2/C (mm)	Weight (kg/ pc)
HEL-5531	80	240	295	M16	30	0,9
HEL-5532	80	240	340	M16	30	1,0
HEL-5534	80	300	400	M16	30	1,2
HEL-5541	100	240	295	M20	30	1,3
HEL-5543	100	300	355	M20	30	1,5
HEL-5551	80	240	300	M16	17/21	0,7
HEL-5552	80	300	360	M16	17/21	0,8
HEL-5556	80	240	300	M20	17/21	1,1
HEL-5561	80	240	290	M16	22	0,9
HEL-5562	80	240	340	M16	22	1,0
HEL-5574	100	300	400	M20	22	1,7

HEL-556x/7x



Hooks, brackets and bolts for LV-ABC lines

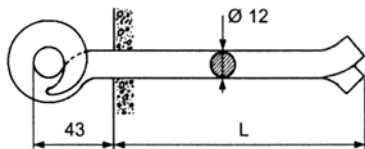
BQC



Spiral hook BQC: Freely adjustable fixing length by 2 nuts, made of hot-dip galvanized steel. Designed for service clamps and max. operating loads of 2 kN horizontal and 0,4 kN vertical.

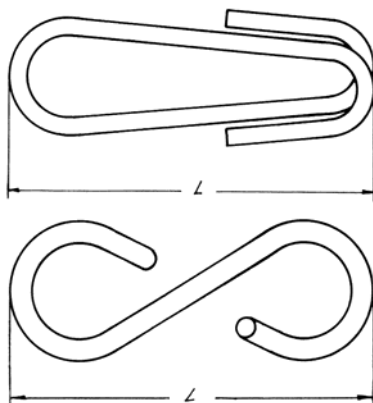
Product Description	L (mm)	C max (mm)	Weight (kg/10 pcs)
BQC 12- 55	55	45	1,8
BQC 12-250	250	220	3,2
BQC 12-300	300	270	3,6

TQC



Spiral hook type TQC 12-150: Designed to anchor dead end and angle clamps to walls, made of hot-dip galvanized steel. Designed for service clamps and max. operating loads of 2 kN horizontal and 0,4 kN vertical, weight of 0,25 kg/pc.

HEL-564x



Weak link hooks HEL-564x: Hooks are used as hangers between the pole support fitting and the anchor or suspension clamp in areas where damage to the LV-ABC line could be expected from falling trees. Weak links withstand normal working loads but the controlled failure mechanism releases the cable in the event of overloads, enabling the cable to drop to the ground.

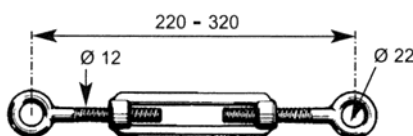
Product Description	Breaking load (kN)	Length L (mm)	Weight (kg/10 pcs)
HEL-5641	4,0 ±10%	90	0,8
HEL-5642	8,0 ±10%	90	1,2

CPA 25



Anchoring clamp hook CPA 25: Hook with 28 mm opening is used as hanger between the fixed support fitting and the anchor clamp for service cables, made of weather and UV-resistant polymer material. It has a breaking load of 2 kN and recommended operating load of 0,8 kN, the weight is approx. 0,05 kg/pc. The hook allows remote operation in areas not allowed for live line working.

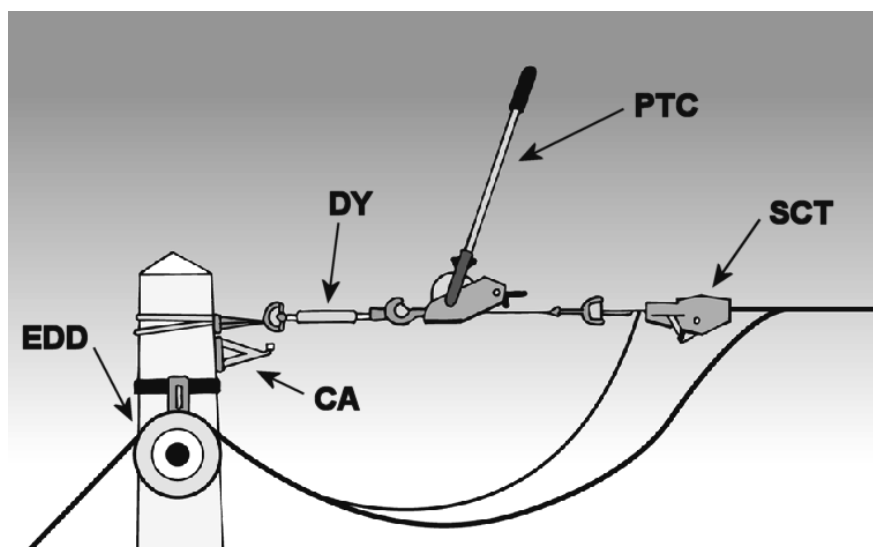
TC



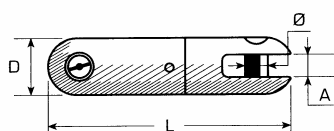
Turnbuckle TC: Turnbuckle with closed eyes (22 mm) and an adjustable length of 220 mm to 320 mm. Made of hot-dip galvanized steel with an eye thickness of 12 mm, breaking load of 8 kN and a weight of 0,6 kg/pc.

Tools and equipment for setting up LV-ABC lines

Typical set-up for tensioning the line



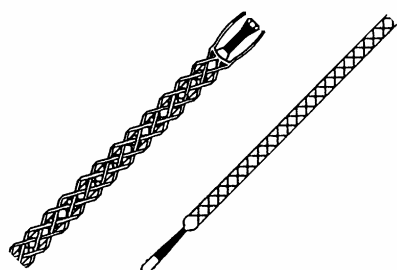
Cable grip components and assemblies



EMD15: Swivel for use with pulling socks to eliminate twist, max load 15 kN

Dimensions (mm): D = 16, L = 122, Ø = 12, A = 16

TCSB, DUL-NLV: Pulling socks



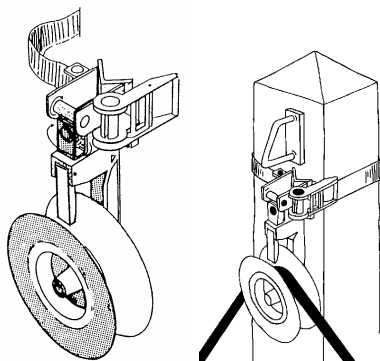
Ordering Description	Cross Section (mm ²)	Diameter (mm)	Length (mm)	Load max. (kN)
for neutral messenger and ropes, made of galv. steel, single eyed				
TCSB15	54- 70	10-15	500	5
TCSB20	95-120	15-18	500	5
for protection of cables with neutral messenger, made of rilsan, single eyed				
TCSB38	3x 70+54	30-38	750	5
TCSB50	3x150+70	40-50	900	5
for self supporting cables, made of nylon strands, double soft eyes with alloy ferrules				
DUL-NLV435	4x 35	25±1	550	15
DUL-NLV470	4x 70	32±1	600	15
DUL-NLV495	4x 95	39±1	600	15
DUL-NLV4150	4x150	44±1	600	15



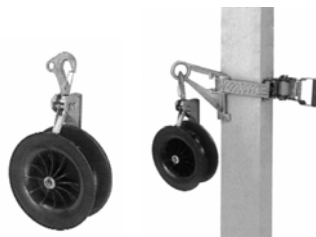
ETC: Complete cable grip assemblies for cables with insulated neutral messenger

Ordering Description	Cross Section (mm ²)	Components
ETC 70	up to 3x70+54	2xTCSB15 + TCSB 38 + EMD15
ETC150	3x 70+54 to 3x150+70	2xTCSB15 + TCSB 50 + EMD15
ETC185	3x150+95 to 3x185+120	2xTCSB20 + TCSB 50 + EMD15

Stringing blocks and accessories



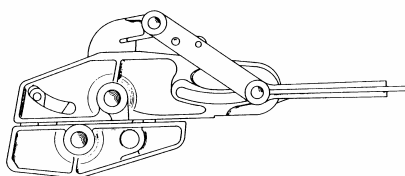
EDD 1000, EDD 1700: Stringing block consisting of plastic coated roll, suspension assembly and a strap with clamping device, max. acceptable cable diameter of 50 mm; max. load of 10 kN for EDD 1000 and 17 kN for EDD 1700, weight of 5,2 kg for EDD 1000 and 10,7 kg for EDD 1700



PO 1000: Stringing block consisting of plastic coated roll and a suspension hook, max. acceptable cable diameter of 50 mm; max. load of 10 kN, weight of 2,3 kg

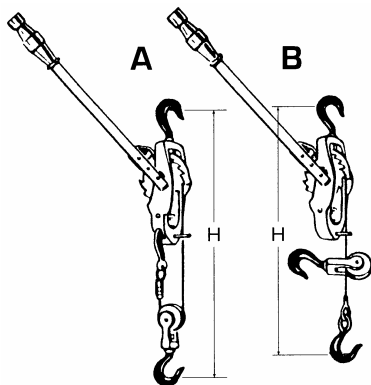
PO 1000 + SPC12: Suspension assembly with strap (length of 1,2 m) and hook stringing block PO1000.

Pulling equipment



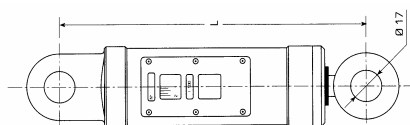
SCT: Come along for LV-ABC cables with insulated neutral messenger, the lever actuated come along automatically converts the pulling force into a clamping force, the long jaws and the use of aluminium prevents damage to the aluminium or aluminium alloy cables

Ordering Description	Cross Section (mm ²)	Diameter (mm)	Clamp Length (mm)	Load max. (kN)	Weight (kg/pc)
SCT13	up to 54	6-13,5	160	8	1,6
SCT20	70-120	10-20	175	17	4,1



PTC: Lightweight cable hoist and pulling tool with hook pulley for block or return, userfriendly handling by reversible lever with limited manual force (approx. 0,4 kN) and supporting reversible action

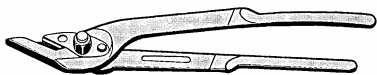
Ordering Description	Hook Setup A			Hook Setup B			Weight (kg/pc)
	Load max. (kN)	Length H min. (mm)	Length H max. (mm)	Load max. (kN)	Length H min. (mm)	Length H max. (mm)	
PTC 750	7,5	0,56	2,86	3,8	0,43	5,03	4,3
PTC1000	10,0	0,55	2,55	5,0	0,42	4,42	4,2
PTC1600	16,0	0,66	3,96	8,0	0,47	7,07	6,2



DY: Lightweight and small dynamometer with high accuracy (0,6%) due to a spring washer system, no torsion or bending stresses permitted, use of swivel recommended

Ordering Description	Load max. (kN)	Scale (kN)	Scale (mm)	Travel max. (mm)	Length L (mm)	Weight (kg/pc)
DY 50	5	0,10	2,0	10	230	1,8
DY100	10	0,20	2,0	9	230	1,8
DY200	20	0,25	2,3	-	327	7,8

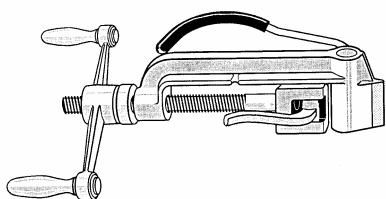
Tools for installing stainless steel straps and cable ties



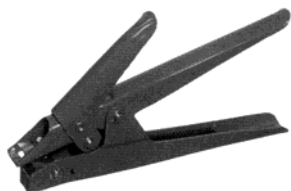
OPC: Strap cutter



OPL: Ratchet type strap binding tool



OPV: Wheel type strap binding tool



CABLE TY TOOL: Hand tool for bundling of heavy duty ties, user controlled tension and cut-off device, for cable ties with a width from 6,0 to 9,0 mm

Tools for connecting LV-ABC lines



EXRM 0607: Cable knife with fixed blade, length: 175 mm



DCS BT: Insulation stripping tool for LV-ABC cables according to HD 626 from 16 mm² up to 150 mm²



IT-1000-22: Fully insulated hexagon head socket T-wrench for allen screws:

IT-1000-22-4 for allen screw with 4 mm width across flats

IT-1000-22-5 for allen screw with 5 mm width across flats

IT-1000-22-6 for allen screw with 6 mm width across flats

IT-1000-22-8 for allen screw with 8 mm width across flats



CLESIM 2: Fully insulated hexagon head socket wrench with ratchet:

CLESIM 2 + RT5: ratchet with socket for allen screw with 5 mm width across flats (SW5)

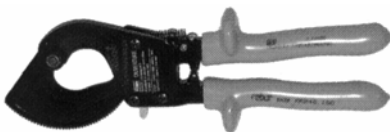
CLESIM 2 + R10: ratchet with socket for hexagon bolt with 10 mm width across flats

CLESIM 2 + R13: ratchet with socket for hexagon bolt with 13 mm width across flats

CLESIM 2 + R17: ratchet with socket for hexagon bolt with 17 mm width across flats



SERSIM 2: Carrying case including one CLESIM 2 ratchet and sockets RT5, R10 and R13



KR240: Ratchet type cable cutter for aluminium and copper conductors:

stranded conductors: diameter from 6 mm to 32 mm

solid conductors: diameter from 6 mm to 26 mm

KR240-ISO: Fully insulated version of cable cutter KR240



FH 1630-S-TS1: Torch assembly for heat-shrinkable products, consisting of a torch handle with holder and shut-off valve, a nozzle (38 mm) optimized for heat-shrink applications and a 5 m long pressure hose with DIN connection thread R 3/8" LH.

Compression tools and dies for connecting LV-ABC lines



SIMPI: Manual compression tool with die E140, for cross sections up to 35 mm²

HOLSTER SIMPI: Holster for tool, to be ordered separately



SIMABLOC 55: Manual operated, hydraulic compression tool for removable dies (type 4E and 5E) for cross sections up to 95 mm²; max. pressure force of 50 kN

SIMABLOC 55 + CR: Compression tool together with carrying case



AUTOPRESS 55 + BAT + CH + CR: Battery operated, hydraulic compression tool for removable dies (type 4E and 5E) for cross sections up to 95 mm², max. pressure force of 50 kN, supplied together with carrying case, battery and charger

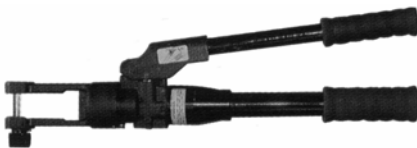


SIMECA: Manual compression tool for removable dies (French type 7E) for cross sections up to 150 mm², max. pressure force of 70 kN

CR/SIMECA: Carrying case for tool, to be ordered separately

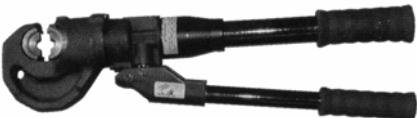
HEL-67600: Manual compression tool for removable dies for (DIN type HEL-676xx) for cross sections up to 300 mm², max. pressure force of 100 kN

HEL-67600K: Carrying case for tool, to be ordered separately



SIMABLOC 80: Manual operated, hydraulic compression tool for removable dies (type 7E, HEL-676xx) for cross sections up to 150 mm², max. pressure force of 80 kN

SIMABLOC 80 + CR: Compression tool together with carrying case



SIMABLOC C120: Manual operated, hydraulic compression tool for removable dies (type 12SE) for cross sections up to 240 mm², max. pressure force of 120 kN

SIMABLOC C120 + CR: Compression tool together with carrying case



SIMABLOC U120: Manual operated, hydraulic compression tool for removable dies (type 13UE) for cross sections up to 240 mm², max. pressure force of 120 kN

SIMABLOC U120 + CR: Compression tool together with carrying case



V120C+CM+coffret: Compression tool head for hydraulic pumps for removable dies (type 12SE, 12R) for cross sections up to 240 mm², max. pressure force of 130 kN, supplied with quick ball coupler in a carrying case, pump SOLHYFLEX or AUTOPUMP to be ordered separately



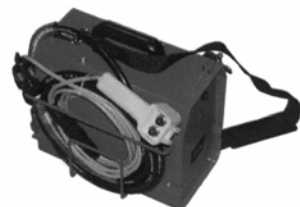
V13UNG+CM: Compression tool head for hydraulic pumps for removable dies (type 13UE, 13P, 13M, 17P, 17M, 18P, 18M) for cross sections up to 240 mm², max. pressure force of 130 kN, supplied with quick ball coupler, pump SOLHYFLEX or AUTOPUMP to be ordered separately



SOLHYFLEXplus+HP3M+CF: Foot pump with pressure hose of 3 m length and quick ball coupler, max. pressure of 700 bar, carrying case to be ordered separately

CR/SOLHYFLEX: Carrying case for pump

FLEX HP12M CM+CF: Pressure hose of 12 m length with quick ball couplers, can be used with pumps SOLHYFLEX and AUTOPUMP







AUTOPUMP 700/0,3 complet+CF: Battery operated pump with pressure hose of 3 m length and quick ball coupler, battery and charger included, max. pressure of 700 bar, carrying case to be ordered separately

AUTOPUMP battery: Battery for pump





AUTOPUMP charger: Charger for battery

Hexagonal compression dies according to NFC 33021, for aluminium and copper conductors

Die Code*	Diameter/ Cross sections (mm)/(mm ²)	Type of Compression Tool SIMPI	Type of Compression Tool			
			SIMABLOC 55 AUTOPRESS 55	SIMABLOC 80 SIMECA	SIMABLOC C120 V120C	SIMABLOC U120 V13UNG
						
E140	16 / 4- 35	included	4E140-E83	7E173-E140	12SE140-9	13UE140-9
E173	20 / 16- 95	-	4E173	7E173-E140	12SE173-9	13UE173-9
E215	25 / 120-150	-	5E215	7E215	12SE215-9	13UE215-9

* Die code E140 typical for application on connectors type for MJPB., E173 and E215 for MJPT

Hexagonal compression dies according to DIN 48083, for aluminium and copper conductors

Die Code	Cross section*		Type of Compression Tool			
	AL (mm ²)	Cu (mm ²)	SIMABLOC 55 AUTOPRESS 55	HEL-67600	SIMABLOC C120 V120C	SIMABLOC U120 V13UNG
						
DIN- 6	-	10	4E 6DIN-16DIN	-	HEL-68451	13UE- 6DIN
DIN- 8	-	16	4E 8DIN-12DIN	-	HEL-68461	13UE- 8DIN
DIN-10	-	25	4E10DIN-14DIN	-	HEL-68471	13UE-10DIN
DIN-12	16,25	35	4E 8DIN-12DIN	-	HEL-68481	13UE-12DIN
DIN-14	35	50	4E10DIN-14DIN	HEL-67610	HEL-68491	13UE-14DIN
DIN-16	50	70	4E 6DIN-16DIN	HEL-67620	HEL-68501	13UE-16DIN
DIN-18	70	95	4E 18 DIN	HEL-67630	HEL-68511	13UE-18DIN
DIN-20	-	120	4E 20 DIN	HEL-67640	HEL-68521	13UE-20DIN
DIN-22	95,120	150	5E 22 DIN	HEL-67650	HEL-68531	13UE-22DIN
DIN-25	-	185	-	HEL-67655	HEL-68541	13UE-25DIN
DIN-25	150	-	-	HEL-67660	HEL-68541	13UE-25DIN
DIN-28	-	240	-	HEL-67665	HEL-68551	13UE-28DIN
DIN-28	185	-	-	HEL-67670	HEL-68551	13UE-28DIN
DIN-32	-	300	-	HEL-67680	HEL-68571	13UE-32DIN
DIN-32	240	-	-	HEL-67690	HEL-68571	13UE-32DIN
DIN-34	300	-	-	HEL-67700	HEL-68581	-

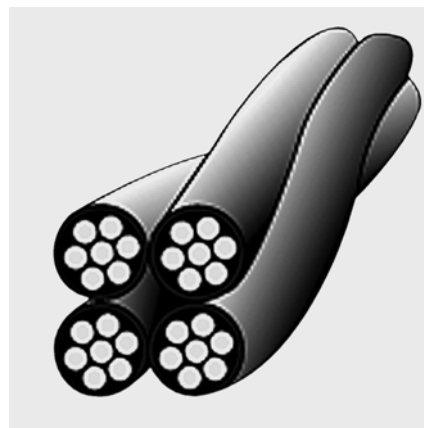
* Die code relevant for proper application selection; cross sections only for information, mostly for round stranded conductors and tension free applications

Dimensions of LV-ABC lines according to HD 626

Self-supporting LV-ABC lines

according to
HD 626 S1: 1996
Part 4-Section F

Aluminium conductors with XLPE
insulation, included in national
products/standards:
NFA2X (VDE 0276 - 626 4F-1),
AsXS(n) (PL WT92/K396)
1-AES (CSN 34761-4F)



Dimensions of conductors

Cross section (mm ²)	Conductor diameter min. max. (mm) (mm)		Thickness of insulation nom. min. (mm) (mm)		Core diameter max. (mm)	Current carrying capacity (A)*	Breaking load (kN)
16	4,6	5,1	1,2	1,00	7,8	-	2,60
25	5,6	6,5	1,3	1,07	10,0	107	4,17
35	6,6	7,5	1,3	1,07	11,0	132	5,78
50	7,7	8,6	1,5	1,25	12,5	165	8,45
70	9,3	10,2	1,5	1,25	14,0	205	11,32
95	11,0	12,0	1,7	1,50	16,1	-	15,30
120	12,5	13,5	1,8	1,60	17,6	-	20,00
150	13,9	15,0	1,8	1,60	18,8	-	25,00

* defined for ambient temperature of 35°C and max. conductor temperature of 80°C

Dimensions of Cable Bundle

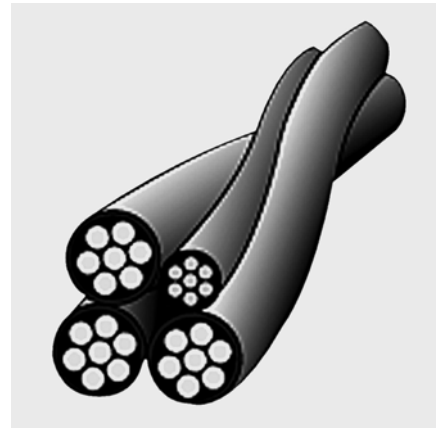
Number of cores x cross section + public lighting conductors (mm ²)	Bundle diameter approx. (mm)
2 x 16	15
2 x 25	18
2 x 35	20
4 x 16	18
4 x 25	22
4 x 35	25
4 x 50	28
4 x 70	32
4 x 70 + 1 x 35	36
4 x 70 + 2 x 35	40
4 x 95	37
4 x 120	40
4 x 120 + 2 x 35	43
4 x 150	44

Dimensions of LV-ABC lines according to HD 626

LV-ABC lines with insulated neutral messenger

according to
HD 626 S1: 1996
Part 6-Section E

Aluminium conductors with XLPE insulation, included in national products/standards:
NF C 33029



Dimensions of phase conductors

Cross section (mm ²)	Conductor diameter		Thickness of insulation		Core diameter		Current carrying capacity (A)*	Breaking load (kN)
	min. (mm)	max. (mm)	nom. (mm)	min. (mm)	min. (mm)	max. (mm)		
16	4,6	5,1	1,2		7,0	7,8	-	-
25	5,8	6,3	1,4		8,6	9,4	112	-
35	6,8	7,3	1,6		10,0	10,9	138	-
50	7,9	8,4	1,6		11,1	12,0	168	-
70	9,7	10,2	1,8		13,3	14,2	213	-
95	11,0	12,0	1,8		14,6	15,7	258	-
120	12,0	13,1	1,8		15,6	16,7	306	-
150	13,9	15,0	1,7		17,3	18,6	344	-

* defined for ambient temperature of 30°C and max. conductor temperature of 90°C

Dimensions of neutral messenger conductors

Cross section (mm ²)	Conductor diameter		Thickness of insulation		Core diameter		Current carrying capacity (A)	Breaking load (kN)
	min. (mm)	max. (mm)	nom. (mm)	min. (mm)	min. (mm)	max. (mm)		
54,6	9,2	9,6	1,6		12,3	13,0	-	16,6
70	10,0	10,2	1,5		12,9	13,6	-	20,5
95	12,2	12,9	1,6		15,3	16,3	-	27,5

Dimensions of Cable Bundle

Number of phase cores x cross section + public lighting conductors + neutral cross section (mm ²)	Bundle diameter approx. (mm)
3 x 25 + 54,6	30,0
3 x 35 + K x 16 + 54,6	33,0
3 x 50 + K x 16 + 54,6	36,0
3 x 70 + K x 16 + 54,6	37,5
3 x 70 + K x 25 + 54,6	40,0
3 x 70 + K x 16 + 70	41,0
3 x 95 + K x 16 + 70	44,0
3 x 120 + K x 16 + 70	46,0
3 x 120 + K x 16 + 95	47,0
3 x 150 + K x 16 + 70	48,0
3 x 150 + K x 16 + 95	49,0

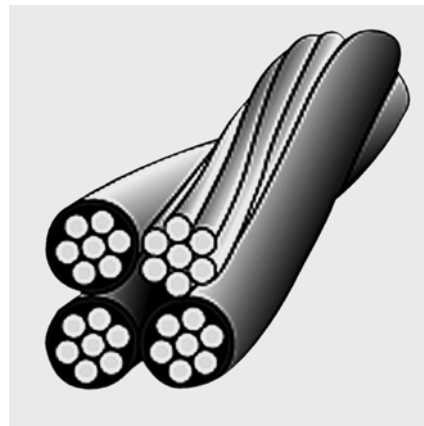
K number of public lighting conductors (K can be equal to 0,1,2,or3)

Dimensions of LV-ABC lines according to HD 626

LV-ABC lines with bare neutral messenger

according to
HD 626 S1: 1996
Part 5-Section D

Phase conductors with XLPE insulation, included in national products/standards:
AMKA (SFS 2200)



Dimensions of phase conductors

Cross section (mm ²)	Conductor diameter		Thickness of insulation		Core diameter		Current carrying capacity (A)*	Breaking load (kN)
	min. (mm)	tolerance (mm)	nom. (mm)	min. (mm)	min. (mm)	max.		
16	4,4	±0,05	1,4		7,1	7,3	70	-
25	5,9	±0,20	1,4		8,3	9,1	95	-
35	6,9	±0,20	1,6		9,7	10,5	115	-
50	8,1	±0,25	1,6		10,8	11,8	140	-
70	9,7	±0,25	1,8		12,8	13,8	180	-
120	12,8	±0,30	2,0		16,2	17,4	250	-

* defined for ambient temperature of 25°C and max. conductor temperature of 70°C

Dimensions of neutral messenger conductors

Cross section (mm ²)	Conductor diameter		Thickness of insulation		Core diameter		Current carrying capacity (A)	Breaking load (kN)
	min. (mm)	max. (mm)	nom. (mm)	min. (mm)	min. (mm)	max.		
25	5,9	±0,20	-		5,5	6,3	-	7,4
35	6,9	±0,20	-		6,5	7,3	-	10,3
50	8,1	±0,25	-		7,6	8,6	-	14,2
70	9,7	±0,25	-		9,2	10,2	-	20,6
95	11,4	±0,30	-		10,8	12,0	-	27,9

Dimensions of Cable Bundle

Number of phase cores x cross section + neutral cross section (mm ²)	Bundle diameter approx. (mm)
1 x 16 + 25	15
3 x 16 + 25	22
4 x 16 + 25	22
3 x 25 + 35	26
4 x 25 + 35	26
3 x 35 + 50	30
3 x 50 + 70	35
3 x 70 + 95	41
3 x 120 + 95	47

All of the above information, including drawings, illustrations and graphic designs, reflects our present understanding and is to the best of our knowledge and belief correct and reliable. Users, however, should independently evaluate the suitability of each product for the desired application. Under no circumstances does this constitute an assurance of any particular quality or performance. Such an assurance is only provided in the context of our product specifications or explicit contractual arrangements. Our liability for these products is set forth in our standard terms and conditions of sale.
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