Москва
ООО "МЗВА"
Завод высоковольтной арматуры

Moscow®
"MZVA" LLC
Powerline Accessories Plant

AERIAL LINES ACCESSORIES MANUFACTURING SINCE 2000

ФОРЭНЕРГО
ПРОИЗВОДСТВЕННОЕ ОБЪЕДИНЕНИЕ

FORENERGO®
INDUSTRIAL GROUP

CONTENTS

ABOUT COMPANY «MZVA» LLC

«MZVA» was founded in June 2000. This year the production process of several line accessories items for overhead transmission lines and substations was initiated.

The company is constantly working on the development and adaptation of innovative line armature at series production, including line armature for new types of lines.

Today, the whole list of production includes more than 1000 articles.

All the outputs are tested in compliance with the technical requirements of PJSC «ROSSETI» and being successfully used on the power transmission grid facilities in Russia.

«MZVA» LLC today:

- Up-to-date, reliable, time tested line accessories made in Russia;
- Leader in terms of volume and line accessories types diversity. More than 3000 item in batch production;
- Leading Russian company manufacturing line accessories for self-supporting insulated wires (SSIW);
- Company is leading in the area of protective, supporting, connecting, contact associated and pulling accessories for stripped wires;
- Special tools for servicing of 0,4-35 kV lines with SSIW and fibre-optic communication lines;
- There are template solutions and automated design software that include MZVA production.

FABRICATION

Manufacturing space - 12 000 square meters, number of employees is more than 500. Our product line includes more than 1500 items. Our organization uses the most modern technologies and high-performance equipment.




QUALITY

The high quality of products is the top priority for the enterprise. High quality management systems have been certified in accordance with ISO 9001:2015. We are also certified in Occupational Health and Safety Management System.


Certificate ISO 9001:2015


Certificates of Occupational Health and Safety Management System

TEST CENTER

«ChEMZ-MZVA» test center is an integral part of «MZVA» LLC company. It has the accreditation certificate that confirms their technical competence. Various tests in accordance with international standards IEC 61284, IEC 61897, IEC 61854, IEC 60794, BS EN 50483 (CENELEC) etc. are being conducted at «ChEMZ-MZVA» test center.





ФЕДЕРАЛЬНАЯ СЛУЖБА ПО АККРЕДИТАЦИИ № 0012857

АТТЕСТАТ АККРЕДИТАЦИИ

№ РОСС RU.0001.22МН34 выдан 27 июня 2016 г.

Настоящий аттестат выдан Обществу с ограниченной ответственностью «Чкаловский электромеханический завод»

ИНН 5238005429

606540, РОССИЯ, Нижегородская область, Чкаловский район, город Чкаловск, ул. Пушкина, 46

Испытательный центр линейной арматуры и высоковольтных изоляторов «НЭЗ» - «МЗВА» Общества с ограниченной ответственностью «Чкаловский электромеханический Завод»

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соответствует требованиям ГОСТ ИСО/МЭК 17025-2009

аккредитован(а) в качестве Испытательной лаборатории (центра)

Дата внесения сведений в реестр аккредитованных лиц 18 февраля 2016 г.

Руководитель (заместитель Руководителя) Федеральной службы по аккредитации О.И. Мальцев

The center is certified in the national accreditation system.

OVERHEAD LINE HARDWARE AND DEVICES FOR PROTECTION FROM LIGHTNING

FOR LOW VOLTAGE AERIAL BUNDLED CABLES LINES

PRODUCTION MEETS REQUIREMENTS OF EN 50483 (CENELEC) STANDARD AND REQUIREMENTS OF RUSSIAN NATIONAL STANDARDS

INTERMEDIATE SUSPENSION SET ES 1500

PURPOSE:
Set for fixation of insulated neutral messenger LV ABC on intermediate and angle suspension towers. It is fixed on posts made of reinforced concrete, wood or steel with the special SB bolt and MSH stud or with mounting band F 20.

Closed contour of bracket provides 100% protection from clamp failure unlikely to hooks and brackets with open contour.
In suspension bracket structure an element is provided that prevents rolling over of clam; besides, bracket has a special projection for fixation of hook sheave during reeling out of cables. Clamp has element with limited strength.

Name	Nominal cross-section area of messenger, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
ES 1500	16–120	12,0	0,54	30

SUPPORT CLAMP PS 1500

PURPOSE:
Set for fixation of insulated neutral messenger LV ABC on intermediate and angle suspension towers. Is used with brackets and hooks of different types (maximum hook diameter is 22 mm). Clamp has element with limited strength.

Name	Nominal cross-section area of messenger, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
PS 1500	16–120	12,0	0,27	70

INTERMEDIATE SUSPENSION SET EST1500

PURPOSE:
Set for intermediate fixation of LV ABC messenger to wire rope braces during suspension of LV ABC in street lighting system, which has no towers. In this case lighting fixtures are suspended on wire rope braces, stretched across the streets.

Name	Nominal cross-section area of messenger, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
ES T1500	16–120	12,0	0,54	50

INTERMEDIATE SUSPENSION SET ES 1500.1©

PURPOSE:
Set for fixation of insulated neutral messenger LV ABC on intermediate and angle suspension towers. It is fixed on posts made of reinforced concrete, wood or steel with the special SB bolt and MSH stud or with mounting band F 20.

In suspension bracket structure an element is provided that prevents rolling over of clam; besides, bracket has a special projection for fixation of hook sheave during reeling out of cables. Suspension clamp has element with limited strength and movable section.

Name	Nominal cross-section area of messenger, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
ES 1500.1	16–120	12,0	0,46	30

SUPPORT CLAMP PS 1500.1©

PURPOSE:
Set for fixation of insulated neutral messenger LV ABC on intermediate and angle suspension towers. It is used with brackets and hooks of different types (maximum hook diameter is 22 mm). Clamp has element with limited strength and movable section.

Name	Nominal cross-section area of messenger, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
PS 1500.1	16–120	12,0	0,16	70

BRACKET CS 1500.1©

PURPOSE:
Bracket for fixation of support clamp PS 1500.1 as a part of intermediate suspension set ES 1500.1 It is fixed on posts made of reinforced concrete, wood or steel with the special SB bolt and MSH stud or with mounting band F 20.

Name	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
CS 1500.1	12,0	0,3	100

SUPPORT CLAMP PS 2000.1

PURPOSE:
Set for fixation of insulated neutral messenger LV ABC on intermediate and angle suspension towers. Is used with brackets and hooks of different types (maximum hook diameter is 22 mm). Clamp has element with limited strength and movable section.

Name	Nominal cross-section area of messenger, mm2	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
PS 2000.1	25–120	15,0	0,3	70

SUPPORT CLAMP PS 25-95

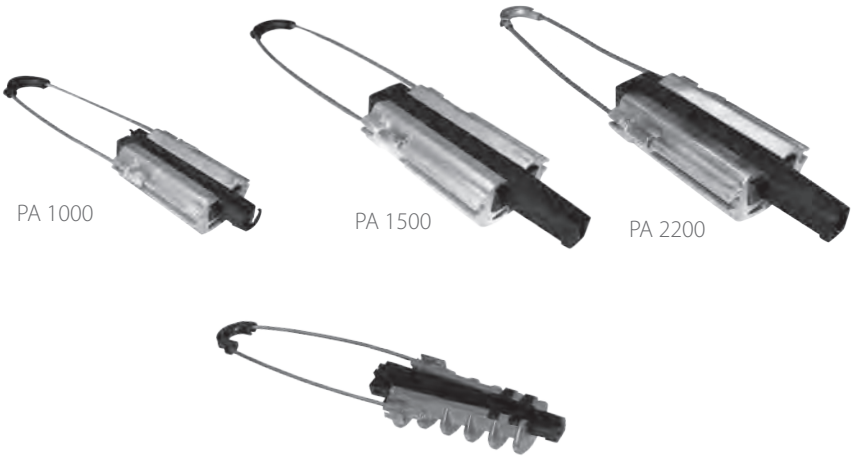
PURPOSE:
Set for fixation of insulated neutral messenger LV ABC on intermediate and angle suspension towers. It is used with brackets and hooks of different types (maximum hook diameter is 22 mm).

Name	Nominal cross-section area of messenger, mm^2	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
PS 25-95	25–95	22,0	0,31	40

ANCHOR CLAMPS PA 1000©, PA 1500©, PA 2200©, PA 1000N©, PA 1500N©, PA 2200N©

PURPOSE:

Clamps for anchorage of insulated LV ABC messenger on dead-end, angle and branch towers. They can be used with any types of anchor hooks and brackets. Clamps may be shipped in versions with cast body or with body made of extruded section. N modification is equipped with stainless steel wire rope.



Version with cast body

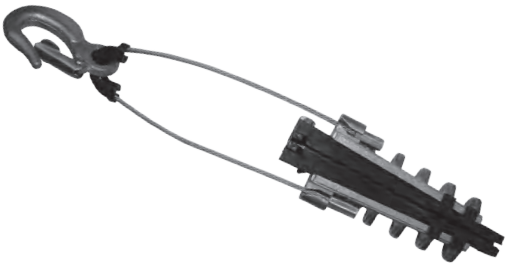
Name	Nominal cross-section area of messenger, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
PA 1000 PA 1000N	25–35	10,0	0,2	50
PA 1500 PA 1500N	35–70	15,0	0,4	20
PA 2200 PA 2200N	70–120	20,0	0,4	20

ANCHOR CLAMPS PAK 1000, PAK 1500, PAK 2200, PAK 1000N, PAK 1500N, PAK 2200N

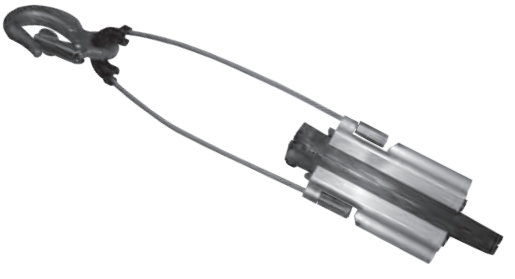
НАЗНАЧЕНИЕ:

Clamps for anchorage of insulated LV ABC messenger on dead-end, angle and branch towers. They can be used with any types of anchor hooks and brackets. Clamps may be shipped in versions with cast body or with body made of extruded section. For convenience of installation with anchor brackets of closed type in constrained conditions they are equipped with safety hooks.

N modification is equipped with stainless steel wire rope.



PAK 1500



PAK 2200

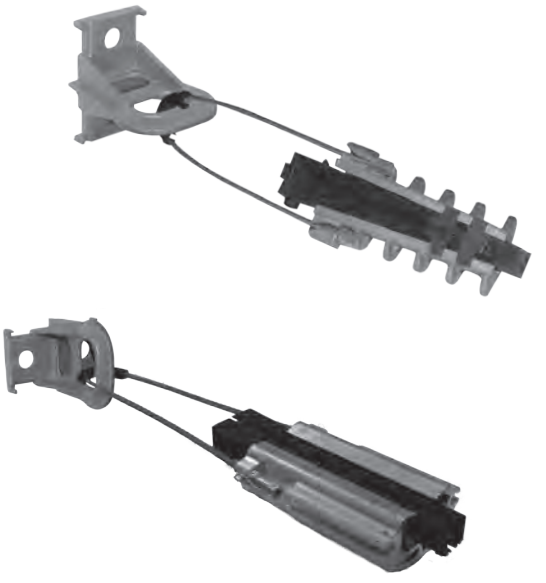
Name	Nominal cross-section area of messenger, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
PAK 1000 PAK 1000N	25–35	10,0	0,3	30
PAK 1500 PAK 1500N	35–70	15,0	0,5	15
PAK 2200 PAK 2200N	70–120	20,0	0,5	15

SETS OF ANCHOR SUSPENSION EA 1000©, EA 1500©, EA 2200©, EA 1000N©, EA 1500N©, EA 2200N©

PURPOSE:

Clamps for anchorage of insulated LV ABC messenger on dead-end, angle and branch towers. Fixation on towers is made with bolts or mounting band F20.

Anchor clamps may be shipped in versions with cast body or with body made of extruded section. N modification is equipped with stainless steel wire rope



Name	Nominal cross-section area of messenger, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
EA 1000 EA 1000N	25–35	10,0	0,36	25
EA 1500 EA 1500N	35–70	15,0	0,56	25
EA 2200 EA 2200N	70–120	20,0	0,56	25

ANCHOR BRACKET CAT1500 (FOR INSTALLATION ON WIRE ROPE)

PURPOSE:

Bracket for fixation of one or two anchor clamps to wire rope braces during suspension of LV ABC in street lighting system, which has no towers. In this case lighting fixtures are suspended on wire rope braces, stretched across the streets.

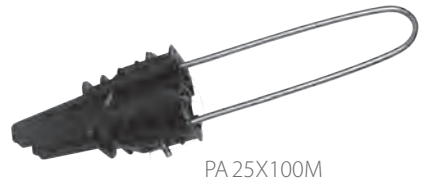
Name	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
CAT1500	15,0	0,35	40

ANCHOR CLAMPS FOR WIRES OF SUBSCRIBERS' BRANCHES PA 25X100, PA 25X100M

PURPOSE:

Clamps for anchoring of 2 or 4 branch wires with 16 or 25 mm² from main line to consumers' connections. PA 25x100M has fixation rod made of galvanized steel. It provides possibility of fixation on hook and ring (fixation rod is dismountable).

PA 25X100



PA 25X100M

Name	Nominal cross-section area of conductors, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
PA 25x100	2x16–4x25	3,5	0,08	50
PA 25x100M	2x16–4x25	3,5	0,15	100

UNIVERSAL ANCHOR SUPPORT CLAMPS PA2X10-50, PA 4X10-50

PURPOSE:

Clamps for anchoring or intermediate fixation of 2 or 4 conductors of LV ABC. Clamps also may be used for intermediate fixation of wires by turning of fixing part through 90°. Clamps of C modification are equipped with shear head bolts, which limit tightening torque, and it eases installation and reduces quantity of mistakes made during installation. Fixation on hook. Hole for suspension: 32x22 mm.

PA 2X10-50

PA 4X10-50

POSITION OF PA 2 FOR INTERMEDIATE FIXATION OF LV ABC

PA 2X10-50C

PA 4X10-50C

Name	Nominal cross-section area of conductors, mm²	Destructive load, kN, not less	Bolt tightening torque, N*m	Weight, kg, not more	Qty in package, pcs.
PA 2x10-50 PA 2x10-50C	2x10-2x50	10,0	24	0,45	30
PA 4x10-50 PA 4x10-50C	2x10–4x50			0,55	

ANCHOR CLAMP OF PA 4X25-70 TYPE

PURPOSE:

Clamp for anchoring of 4 conductors of LV ABC. If LV ABC bundle has additional wires (e. g. lighting wires), they are laid along the clamp. Clamps of C modification are equipped with shear head bolts, which limit tightening torque, and it eases installation and reduces quantity of mistakes made during installation.

PA 4X25-70

PA 4X25-70C

Name	Nominal cross-section area of conductors, mm²	Destructive load, kN, not less	Bolt tightening torque, N*m	Weight, kg, not more	Qty in package, pcs.
PA 4X25-70 PA 4X25-70C	4x25-4x70	25,0	22	0,65	17

ANCHORING LINE CLAMPS PA 4X16-35, PA 4X35-120

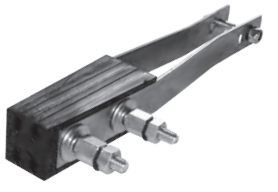
PURPOSE:

Clamps for anchoring of 4 conduits in LV ABC. If LV ABC bundle has additional wires (e. g. lighting wires), they are laid along the clamp. Clamps of C modification are equipped with shear head bolts, which limit tightening torque, and it eases installation and reduces quantity of mistakes made during installation. Fixation on hook or ring is possible.

PA 4X16-35

PA 4X35-120

PA 4X16-35C



PA 4X35-120C

Name	Nominal cross-section area of conductors, mm²	Destructive load, kN, not less	Bolt tightening torque, N*m	Weight, kg, not more	Qty in package, pcs.
PA 4x16-35 PA 4x16-35C	4x16	20,0	24	0,53	25
	4x25				
	4x35				
PA 4x35-120 PA 4x35-120C	4x35	45,0		0,95	20
	4x50				
	4x70				
	4x95				
	4x120				

SUPPORT CLAMP PS 4X16-120

PURPOSE:

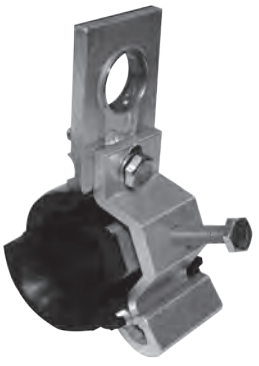
Clamp for intermediate fixation of 4 insulated conduits of LV ABC on hooks at turns of overhead power lines with angles up to 30°. If LV ABC bundle has additional wires (e. g. lighting wires), they are laid along the clamp. Diameter of hole for clamp suspension is 25 mm.

Name	Nominal cross-section area of conductors, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
PS 4X16-120	4x16 - 4x120	10,0	0,18	60

SUPPORT CLAMPS OF PSP 4X25-120 TYPE

PURPOSE:

Clamps for intermediate fixation of 4 insulated conduits of LV ABC on hooks. Overhead power line can have turns with angles up to 90°. If LV ABC bundle has additional wires (e. g. lighting wires), they are laid along the clamp. Diameter of hole for clamp suspension is 22 mm.



Name	Nominal cross-section area of conductors, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
PSP 4X25-120	2x16- 4x120	18,0	0,28	50

SUPPORT CLAMPS OF PS 4X16-120M TYPE

PURPOSE:

Clamps for intermediate fixation of 4 insulated conduits of LV ABC on hooks. Overhead power line can have turns with angles up to 90°. If LV ABC bundle has additional wires (e. g. lighting wires), they are laid along the clamp. Diameter of hole for clamp suspension is 22 mm.

Name	Nominal cross-section area of conductors, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
PS 4X16-120M	2x16 - 4x120	40,0	0,37	50

SUPPORT CLAMPS OF PS 4 TYPE

PURPOSE:

Clamps for intermediate fixation of 2 or 4 insulated conduits of LV ABC on hooks. They can be used at turns of main HVL with angles: up to 30° in tower direction and 50° in direction from tower. Diameter of hole for clamp suspension is 22 mm.

Name	Nominal cross-section area of conductors, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
PS 4x35	4x35(2x50)	12,0	0,4	40
PS 4x50	4x50(2x95)			45
PS 4x70	4x70			40
PS 4x95	4x95			40
PS 4x120	4x120			45

ANCHOR BRACKETS OF CA 25 TYPE

PURPOSE:

Brackets for fixation of anchor clamps of consumers' branches of LV ABC from main line to connections. They are made of weatherproof plastic (CA 25 and CA 25.1) or aluminum alloy (CA 25M and CA 25.1 M). Method of fixation of CA 25 and CA 25.1 – with mounting band or bolts (ø14-16 mm) or with 4 screws (ø5 mm). CA 25M and CA 25.1 M - with mounting band or bolt (ø14-16 mm).

CA 25

CA 25.1

CA 25M

CA 25.1M

Name	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
CA 25	2,0	0,015	250
CA 25.1			
CA 25M	4,0	0,032	500
CA 25.1M			

ANCHOR BRACKETS OF CA 2000© TYPE

PURPOSE:

Brackets for fixation of one or two anchor clamps. They are fixed on posts, made of reinforced concrete, wood or steel as well as on the walls of buildings with such hardware:

- CA 2000 – bolt SB 16.219 or mounting band F20;
- CA 2000.1 – special bolts (when fixed on wall) or mounting band F20;
- CA 2000.2 – special bolts (when fixed on wall) or mounting band F20, or 4 screws.

CA 2000

CA 2000.1

CA 2000.2

CA 2000 bracket has additional projections on surfaces adjacent to tower, which increase angle of approach of mounting band to bracket, which increases strength of its fixation.

Name	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
CA 2000	22,0	0,17	50
CA 2000.1		0,16	
CA 2000.2		0,16	

ANCHOR BRACKETS OF CA 600B, CA 600T TYPES

PURPOSE:

Brackets for fixation of anchor clamps on walls of buildings during placing of LV ABC. CA 600B bracket has fixation in two points and is intended for fixation of the one anchor clamp. CA 600T bracket has fixation in three points and is intended for fixation of two anchor clamps in case of change of LV ABC main line route direction.

Brackets are fixed on walls with bolts through holes of 16 mm diameter.

They are made of aluminum profile.

CA 600B

CA 600T

Name	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs.
CA 600B	3,75	0,1	40
CA 600T	6,25	0,24	25

FACADE FIXTURES BRPF 6, BRPF 6.1

PURPOSE:

Fixtures for intermediate fixation of LV ABC along walls of the buildings. BRPF 6.1 modification is intended for installation only on wooden surfaces.

BRPF-6

BRPF-6.1

Name	Diameter of conductors' bundle, mm	Minimum distance to the wall, mm	Weight, kg, not more	Qty in package, pcs.
BRPF 6	18-62*	60	0,06	100
BRPF 6.1	18-62*			

* - it can be increased up to 100 mm in accordance with customers' desire.

REMOTE RETENTION DEVICES BIC

PURPOSE:

Device for fixation of 2 or 4 conduits of LV ABC wires placed on surfaces of towers and of buildings and structures.

Fixation is made to:

- posts made of reinforced concrete or steel with the use of mounting band F20.
- wooden posts with the use of mounting band F20 or screws.
- walls of buildings or structures - with screws.

BIC-15.50

BIC-50.90

Name	Diameter of conductors' bundle, mm	Weight, kg, not more	Qty in package, pcs.
BIC 15.50	10-52	0,02	100
BIC 50.90	25-80	0,03	100

CABLE TIES OF KR TYPE

PURPOSE:

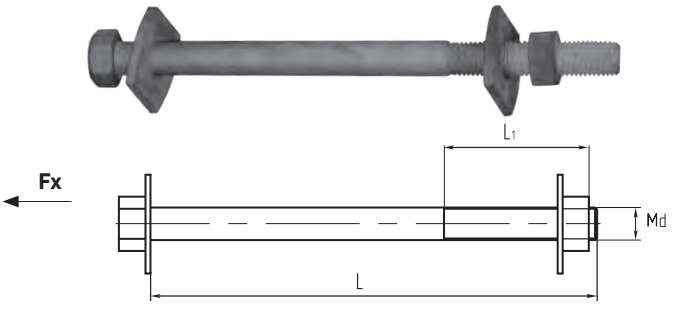
Ties for banding of bundles of LV ABC conduits. Ties are easily installed and provide easy tying of conduits without use of special tools. Tie is fixed with double lock. It is made of weatherproof plastic with melting temperature not less than 260 °C.

Name	Diameter of conductors' bundle, mm	Length, mm	Destructive load, kN, not less	Qty in package, pcs.
KR 1	10-55	250	0,4	1000
KR 2	25-62	265		1000
KR 3	30-92	360		2000

SPECIAL BOLTS OF SB TYPE

PURPOSE:

Bolts for fixation of intermediate suspension set ES on wooden and reinforced concrete towers in case when it is impossible to fix it with mounting band F20. They are installed in technological holes in reinforced concrete poles.

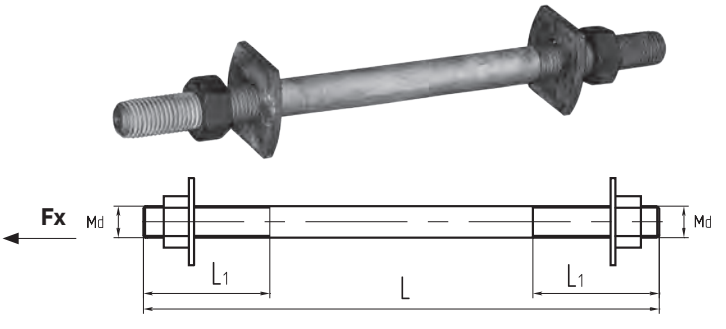


Name	Destructive load, Fx, kN, not less	Dimensions, mm			Weight, kg, not more
		Thread diameter, Md	L	L1	
SB 16.219	50,0	M16	225	75	0,46
SB 16.240			240	150	0,50
SB 16.280			280		0,61
SB 16.360			360		0,69
SB 16.750			755		1,54
SB 20.240	55,0	M20	240		0,60
SB 20.280			280		0,72
SB 20.360			360		0,87

FITTING STUDS OF MSH TYPE

PURPOSE:

Studs for fixation of two intermediate suspension sets of ES type on double-circuit line towers made of wood or reinforced concrete, if there is no possibility to use mounting band F 20 for fixation of suspensions. They are installed in technological holes in reinforced concrete poles. For tightening of nuts flat spanner S24 shall be used.

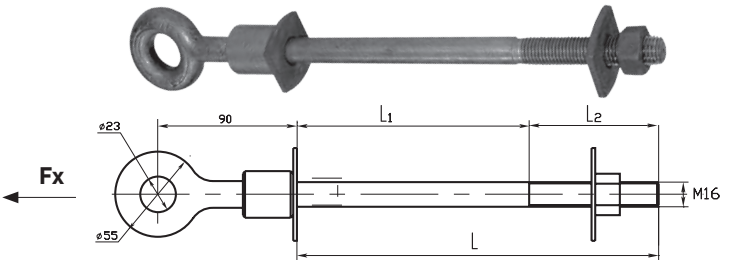


Name	Destructive load, Fx, kN, not less	Dimensions, mm			Weight, kg, not more
		Thread diameter, Md	L	L1	
MSH 16.265	50,0	M16	265	65	0,49
MSH 16.240			240	75	0,50
MSH 16.280			280		0,61
MSH 16.360			360		0,69
MSH 20.240	55,0	M20	240		0,60
MSH 20.280			280		0,72
MSH 20.360			360		0,87
MSH 24.360	60,0	M24		100	1,80

THROUGH ANCHOR EYE-BOLTS OF RAS TYPE

PURPOSE:

Eye-bolts for fixation of anchor clamps on towers made of wood or reinforced concrete, as well as on walls of buildings and structures. They are installed in manufacturing holes near the top of the pole.

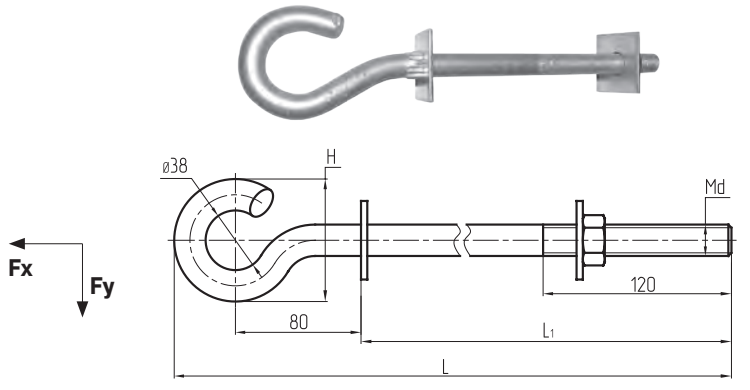


Name	Destructive load, Fx, kN, not less	Dimensions, mm			Weight, kg, not more
		L, mm	L1, mm	L2, mm	
RAS 16.234	50,0	234	150	84	0,95
RAS 16.600		630	480	150	1,3
RAS 16.750		780	580	200	1,7

THROUGH HOOKS OF KP TYPE

PURPOSE:

Eye-bolts for fixation of anchor clamps on towers made of wood or reinforced concrete, as well as on walls of buildings and structures. They are installed in manufacturing holes near the top of the pole.

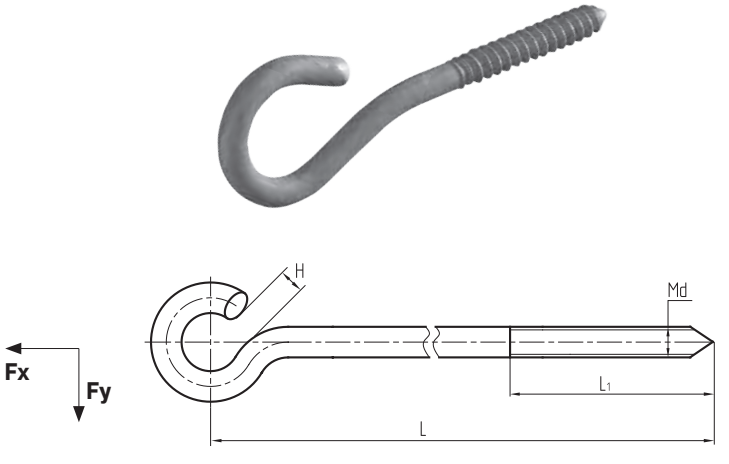


Name	Destructive load, Fx/Fy, kN, not less	Dimensions, mm				Weight, kg, not more
		Thread diameter, Md	H	L	L1	
KP 16.200	12,0/2,4	M16	70	315	200	0,81
KP 16.240				355	240	0,82
KP 16.320				435	320	0,84
KP 20.200	14,5/4,6	M20	74	320	200	1,22
KP 20.240				360	240	1,25
KP 20.320				440	320	1,31
KP 20.350				470	350	1,32

THREADED HOOKS OF KD TYPE

PURPOSE:

Hooks for fixation of anchor clamps on wooden wall of building or on wooden towers.

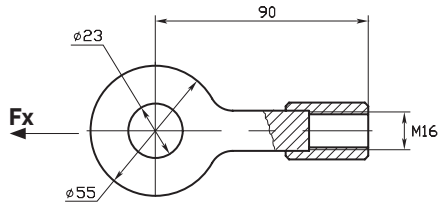


Name	Destructive load, Fx/Fy, kN, not less	Dimensions, mm				Weight, kg, not more
		Diameter	H	L	L1	
KD 8	3,0/2,3	8,0	8	120	65	0,15
KD 12	5,3/4,1	12,0	16	165	85	0,24
KD 16	8,8/6,6	16,0		170	90	0,44
KD 20	16,6/12,9	20,0	18	165	85	0,73

EYE-NUT GR 16

PURPOSE:

Nut for application together with mounting stud MSH 16.265, anchor eye-bolt RAS 16.234 or with through hooks of KP type. It is installed for fixation of anchor clamps, meant for fixation of wires of main line branches or consumers' connections.

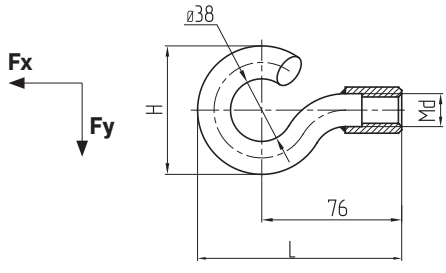


Name	Destructive load, Fx, kN, not less	Weight, kg, not more	Qty in package, pcs
GR 16	50,0	0,36	100

HOOK NUTS GK 16, GK 20

PURPOSE:

Nuts for application together with mounting stud MSH 16.265, anchor eye-bolt RAS 16.234 or with through hooks of KP type. They are installed for fixation of anchor clamps, meant for fixation of wires of main line branches or consumers' connections.



Name	Разрушающая нагрузка, Fx/ Fy, кН, не менее	Dimensions, mm			Weight, kg, not more	Qty in package, pcs.
		Thread diameter	H	L		
GK 16	12/2,4	M16	70	111	0,4	50
GK 20	14,5/4,6	M20	70	115	0,63	30

UNIVERSAL HOOKS SOT 29.10, KU 16, KM 39

PURPOSE:

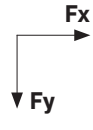
Hooks for fixation of anchor and support clamps. They have additional hole for grounding conduit connection. They are installed with:

- SOT 29,10 and KM 39 with band F 20 on tower of the overhead power line.
- KU 16 with band F 20 on tower or with 6 screws when installed on building wall.

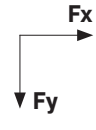
KU 16 modification sets include:

- KU 16.1 – screw 8x160;
- KU 16.2 – screw 6x50, plastic anchor 10x50;
- KU 16.3 – screw 6x50.

SOT 29.10
KM 39



KU 16



Name	Hook diameter, mm	Destructive load, not less		Weight, kg, not more	Qty in package, pcs.
		Fx, кН	Fy, кН		
SOT 29.10	16	17,8	12,5	0,71	25
KU 16		17,4	13,3	0,61	
KU16.1				0,62	
KU16.2					
KU16.3					
KM 39	20	27,7	17,7	0,85	

MOUNTING BAND F 20 AND F 20 PREMIUM

PURPOSE:

Band for fixation of anchor and suspension brackets on towers of telecom lines, overhead power lines of various voltage classes, overhead catenary system at railroad, on the elements of buildings and structures. It is made of stainless steel with machined edge. Band surface has marking. Tearing load not less than 10.0 kN. Band is fixed on tower with bracket C 20 or buckle B 200. Band package: F 20 Premium – plastic magazine, F 20 – cardboard package.

F 20 PREMIUM

F 20

Name	Dimensions, mm	Package	Weight, kg/ package, not more
F 20 Premium	20x0,7(0,8)	1 roll has 50 m of band	6,25
F 20			6,1

BRACKET C 20, BUCKLE B 200 FOR MOUNTING BAND

PURPOSE:

Bracket and bundle for fixation of mounting band F 20. They are made of stainless steel. It is recommended to use buckle B 200 for fixation of mounting band during bracing of anchor brackets and fastening nodes.

C 20

B 200

Name	DESTRUCTIVE LOAD, KN, NOT LESS	Weight, g, not more	Qty in pack, pcs
C 20	8,5	10	100
B 200	10,0	20	

CABLE TIE HF 207, FIXATION SETS HF207+CA25.1, HF207+CA25.1M

НАЗНАЧЕНИЕ:

Products for fixation of anchor brackets at consumers' branches without special tools which are used for mounting of F 20 band.

HF 207

HF 207 + CA25.1

HF 207 + CA25.1M

Name	Destructive load, kN, not less	Weight, kg, not more	Qty in pack, pcs
HF 207	10,0	0,25	50
HF 207+CA25.1	3,5/10,0	0,27	
HF 207+CA25.1M	3,5/10,0	0,28	

BRANCH PIERCING CLAMPS OF OP TYPE

PURPOSE:

Clamps for electrical connection of neutral and power conduits of LV ABC at main line tap points (copper or aluminum). They provide reliable electrical contact. Installation can be implemented under temperature not less than -20 °C. Moment of bolt head shearing corresponds with equivalent force, which is necessary for creation of electrical contact between wires (of main line, customers branch, lighting). Piercing elements are covered with couplant. Clamps can be easily mounted on the wire; it has no falling out elements. Bolt is insulated from contacting parts of clamp. Possibility of fixation of lower part of clamps with the use of key S 15 (OP 6, OP 616), S 19 (OP 645, OP 95) eases tightening of bolts.

Electrical strength and tightness of clamps shall be tested with full submersion into water under 6 kV voltage for the period of 1 min.

Name	Nominal cross-section area of conductors, mm²		Wrench head size	Weight, kg, not more	Qty in package, pcs.
	Main lines	Main lines			
OP 6 (OP 6M)*	6–150	1,5–10	10	0,09	200
OP 616 (OP 616M)*	6–150	1,5–16		0,05	200
OP 645 (OP 645M)*	16–150	4–50	13	0,11	100
OP 95 (OP 95M)*	16–150	16–150		0,14	60

* - Clamps of M modification have metal shear heads.

PIERCING TRANSITION CLAMPS FOR ELECTRICAL CONNECTION OF LV ABC AND UNINSULATED WIRES OF TC TYPE

PURPOSE:

Clamps for creation of electrical connection between LV ABC and uninsulated wires of overhead power lines. Contact with LV ABC conduit is provided through piercing of insulation. Tightening torque for bolts is controlled with shear head.

Name	Nominal cross-section area of uninsulated wire, made of copper or aluminum, mm²	Nominal cross-section area of LV ABC, mm²	Wrench head size	Weight, kg, not more	Qty in package, pcs.
TC 16-120/4-50 (M)*	16-120	4-50	13	0,11	100
TC 16-150/16-150 (M)*	16-120	16-150		0,14	60

* - Clamps of M modification have metal shear heads.

BRANCH PIERCING CLAMPS OF OP 72 AND OP 74 TYPE

PURPOSE:

Clamps for electrical connection of consumers' connections to neutral and electrical conductors of LV ABC 0.4 kV main line. Clamps have separate tightening of bolts on main line wire and on branch wires and it allows to connect and disconnect consumers' wires multiple times without dismantling of clamps from main line wire.

Clamp structure includes hermetically tight piercing branch clamp and one or two tight adapters of AG type with steel die clamps for connection of one, two, three or four wires of consumers' branches. Ends of consumer branches wires shall be stripped of insulation. Possibility of fixation of lower part of clamps with S17 wrench eases tightening of bolts.

Shearing of bolt head, which provides installation of clamp on main line wire, corresponds with equivalent force, required for creation of electrical contact with main line wire. Piercing elements are covered with couplant. Clamp can be easily installed on the wire; it has no falling out elements. Bolt which provide installation of clamp on the main line wire is insulated from clamps contact parts.

Name	Quantity of branch wires	Nominal cross-section area of conductors, mm²		Wrench head size	Weight, kg, not more	Qty in package, pcs.
		Main lines	Branches			
OP 72 (OP 72M)*	1 or 2	16-150	1,5-35	13	0,19	20
OP 74 (OP 74M)*	3 or 4	16-150			0,28	10
AG 2	1 or 2	-			0,08	25
AG 4	3 or 4	-			0,17	20

* - Clamps of M modification have metal shear heads.

MOISTURE-PROOF BRANCH PIERCING CLAMPS OF OP 71B, OP 72B AND OP 74B TYPES

PURPOSE:

Clamps for iterative connection and disconnection of consumers' branches aluminum and copper wires and wires of the lighting fixtures without dismantling of clamp from the main line cable.

Connection of conduits and assurance of reliable electrical contact is provided by piercing of insulation on the wires of main line and stripping of branch.

Clamps have different quantities of branches - clamp OP 71B is designed for one branch, clamp OP 72B for two branches coming from single point, OP 74B for four branches from single point. Contacting parts of clamps are covered with special grease. Clamps are shipped in set with special moisture-proof cover. Tightening torque during piercing of main line wire insulation is controlled by be bolt with S10 shear head.

Name	Number of branch wires	Nominal cross-section area of LV ABC main line conduits, mm²	Nominal cross-section area of LV ABC branch conduits, mm²	Weight, kg, not more	Qty in package, pcs.
OP 71B	1 branch	16-150	1,5-95	0,10	40
OP 72B	2 branches		2x1,5-95	0,13	
OP 74B	4 branches		4x1,5-35	0,14	

MOISTURE-PROOF BRANCH PIERCING CLAMPS OF OCD TYPE

PURPOSE:

Clamps for multiple connections and disconnections of:

- branch LV ABC wires from main line uninsulated wire without dismantling of clamp from main line wire. It requires stripping of branch wire from insulation;
- aluminum and copper uninsulated branch wires from main line uninsulated wire without dismantling of clamp from main line wire.

Clamp OCD 71B may be used for re-grounding of uninsulated messenger of LV ABC. Clamps has different quantities of branches - clamp OCD 71B is designed for one branch, clamp OP 72B for two branches coming from single point. Contacting parts of clamps are covered with special grease. Clamps are made of aluminum alloy. Clamps are shipped in set with special moisture-proof cover. Tightening torque on main line wire s controlled by be bolt with S10 shear head.

Name	Number of branch wires	Nominal cross-section area of main line wire, mm²	Nominal cross-section area of LV ABC branch conduits, mm²	Weight, kg, not more	Qty in package, pcs.
OCD 71B	1 branch	16-150	1,5-95	0,1	40
OCD 72B	2 branches		2x1,5-95	0,13	
OCD 74B	4 branches		4x1,5-35	0,14	

WIRE END CAPS OF CI TYPE

PURPOSE:

Caps for insulation of stripped ends of LV ABC conduits as well as for prevention of moisture penetration into conduits. Made of weatherproof plastic thermoplastic elastomer.

Name	Nominal cross-section area of conduit, mm²	Weight, g, not more	Qty in package, pcs.
CI 6-35	4–50	4	1000
CI 25-150	16–150	8	6000

SEALING SELF-ADHESIVE TAPE LS 20

PURPOSE:

Band for recovering of sealing of LV ABC wires insulation. It can be also used for filling and leveling of surface for heat shrink products. It is made of weatherproof UV-resistant composite material.

Name	Length, m	Width, mm	Thickness, mm	Weight, g, not more	Qty in package, pcs.
LS20	10	22	0,75	320	12

HERMETICALLY SEALED COMPRESSION CONNECTING CLAMPS OF MJPT-N TYPE

PURPOSE:

Clamps for connection in spans of insulated neutral messengers of neutral messenger system and of any self-supporting system conduits. Conduits with stripped off insulation are brought into clamp until partition is reached and then are compressed by dies E173, E215 through clamp insulation in accordance with marking. Electrical contact is ensured through compressing and tightness - through elastomer seal. Cable end sealing strength shall be 95 % of disruptive load of the conduit. It has insulated body. Filled with couplant.

Name	Nominal cross-section area of conduit, mm²	Ring color	Length, mm	Compression die	Weight, g, not more	Qty in package, pcs.
MJPT-25N	25	Orange	170	E173	90	10
MJPT-35N	35	Red	170	E173	85	10
MJPT-50N	50	Yellow	170	E173	80	10
MJPT-54,6N	54,6	Black	170	E173	80	10
MJPT-70N	70	White	170	E173	80	10
MJPT-95N	95	Grey	170	E173	75	10
MJPT-120N	120	Pink	180	E215	70	10
MJPT-150N	150	Violet	180	E215	70	10

HERMETICALLY SEALED COMPRESSION CONNECTING CLAMPS OF MJPT-N TYPE

НАЗНАЧЕНИЕ:

Clamps for connection in spans of insulated neutral messengers of neutral messenger system and of any self-supporting system conduits with unequal cross-section areas. Conduits with stripped off insulation are brought into clamp until partition is reached and then are compressed by dies E173 through clamp insulation in accordance with marking.

Electrical contact is ensured through compressing and tightness - through elastomer seal. Cable end sealing strength shall be 95 % of disruptive load of conduit with the least cross-section area. It has insulated body. Filled with couplant.

Name	Nominal cross-section area, mm2 conduit 1/ conduit 2	Ring color conduit 1/ conduit 2	Length, mm	Compression die	Weight, g, not more	Qty in package, pcs.
MJPT-50.35N	50/35	Yellow/Red	170	E173	82	10
MJPT-70.50N	70/50	White/Yellow			80	
MJPT-70.54,6N	70/54,6	White/Black				
MJPT-95.70N	95/70	Grey/White			77	

HERMETICALLY SEALED INSULATED COMPRESSION CONNECTING CLAMPS OF MJPT TYPE

PURPOSE:

Clamps for connection in spans of insulated phase conduits of LV ABC. Conduits with stripped off insulation are brought into clamp until partition is reached and then are pressed by dies E140, E173, E215 through clamp insulation in accordance with marking. Electrical contact is ensured through compressing and tightness - through elastomer seal. Cable end sealing strength shall be 60 % of the conduit disruptive load. It has insulated body. Filled with couplant.

Name	Nominal cross-section area of conduit, mm²	Ring color	Length, mm	Compression die	Weight, g, not more	Qty in package, pcs.
MJPT-16	16	Light blue	100	E140	55	10
MJPT-25	25	Orange	100	E140	50	10
MJPT-35	35	Red	100	E173	50	10
MJPT-50	50	Yellow	100	E173	50	10
MJPT-70	70	White	100	E173	45	10
MJPT-95	95	Grey	100	E173	40	10
MJPT-120	120	Pink	100	E215	85	10
MJPT-150	150	Violet	100	E215	80	10

HERMETICALLY SEALED INSULATED COMPRESSION CONNECTING CLAMPS OF MJPT TYPE

PURPOSE:

Clamps for connection in spans of insulated phase conduits of LV ABC with unequal cross-section areas. Conduits with stripped off insulation are brought into clamp until partition is reached and then are compressed by dies E173, E215 through clamp insulation in accordance with marking. Electrical contact is ensured through compressing and tightness - through elastomer seal. Cable end sealing strength shall be 60 % of disruptive load of conduit with the least cross-section area. It has insulated body. Filled with couplant.

Name	Nominal cross-section area, mm2 conduit 1/ conduit 2	Ring color conduit 1/ conduit 2	Length, mm	Compression die	Weight, g, not more	Qty in package, pcs.
MJPT-70.50	70/50	White/Yellow	100	E 173	45	10
MJPT-95.50	95/50	Grey/Yellow			40	
MJPT-95.70	95/70	Grey/White				

HERMETICALLY SEALED INSULATED COMPRESSION CONNECTING CLAMPS OF MJPB TYPE

PURPOSE:

Clamps for connection of insulated copper and aluminum conduits of branch wires. Conduits with stripped off insulation are brought into clamp until partition is reached and then are compressed by dies E140 through clamp insulation in accordance with marking. Electrical contact is ensured through compressing and tightness - through elastomer seal.

It has insulated body. Filled with couplant.

Name	Nominal cross-section area of conduit, mm²	Ring color	Length, mm	Compression die	Weight, g, not more	Qty in package, pcs.
MJPB 06-16	6–16	Brown/Light blue	70	E140	25	10
MJPB 06-25	6–25	Brown/ Orange	70	E140	25	10
MJPB 16	16	Light blue	70	E140	25	10
MJPB 16-25	16–25	Light blue/ Orange	70	E140	25	10
MJPB 25	25	Orange	70	E140	25	10

HERMETICALLY SEALED INSULATED COMPRESSION TERMINALS OF CPTAU TYPE

PURPOSE:

Terminals for connection of LV ABC with copper buses of electrical equipment. Connection is made by crimping of LV ABC conduits. It has insulated body. Filled with couplant.

Name	Nominal cross-section area of conduit, mm²	Ring color	Diameter of the hole in contact end terminal/ outer diameter of end terminal, mm	Compression die	Weight, g, not more	Qty in package, pcs.
CPTAU-16	16	Light blue	13/24	E140	35	10
CPTAU-25	25	Orange	13/24	E140	30	10
CPTAU-35	35	Red	13/24	E173	70	10
CPTAU-50	50	Yellow	13/24	E173	70	10
CPTAU-54,6	54	Black	13/24	E173	70	10
CPTAU-70	70	White	13/24	E173	70	10
CPTAU-95	95	Grey	13/24	E173	65	10
CPTAU-120	120	Pink	17,5/30	E215	130	10
CPTAU-150	150	Violet	17,5/30	E215	125	10

HERMETICALLY SEALED INSULATED COMPRESSION TERMINALS OF CPTAUO TYPE

PURPOSE:

Terminals for connection of LV ABC with copper and aluminum buses of electrical equipment. Connection is made by crimping of LV ABC conduits. It has insulated body. Filled with couplant. Connection dimensions of end terminal are adopted for contacts of domestically-produced equipment.

Name	Nominal cross-section area of conduit, mm²	Ring color	Diameter of the hole in contact end terminal/ outer diameter of end terminal, mm	Compression die	Weight, g, not more	Qty in package, pcs.
CPTAUO-16	16	Light blue	13/24	E140	35	10
CPTAUO-25	25	Orange	13/24	E140	30	10
CPTAUO-35	35	Red	13/24	E140	70	10
CPTAUO-50	50	Yellow	13/24	E173	70	10
CPTAUO-54,6	54	Black	13/24	E173	70	10
CPTAUO-70	70	White	13/24	E173	70	10
CPTAUO-95	95	Grey	13/24	E173	65	10
CPTAUO-120	120	Pink	17,5/30	E215	130	10
CPTAUO-150	150	Violet	17,5/30	E215	125	10

GROUNDING SET CK 200, BRACKET C 200

PURPOSE:

Set for voltage metering, short-circuiting and protective grounding of LV ABC during implementation of works on LV ABC. It includes insulated bracket C 200 and piercing clamp OP 645. C 200 brackets are connected to LV ABC wire with piercing clamps OP 645. It is installed on current-carrying and neutral conduits for the whole lifetime of the line.

C 200 BRACKET

CK 200 SET

Insulated bracket C 200 is made of copper rod, coated with composite UV-resistant material. Working part is covered with protective cap.

Name	Nominal cross-section area of conduit, mm²	Weight, g, not more
C 200	-	0,06
CK 200 (CK 200M)*	16-150	0,8

* - Clamps of M modification have metal shear heads.

INSULATED ADAPTER FOR SHORT-CIRCUIT JUMPERS AND GROUNDINGS OF AIZZ TYPE

PURPOSE:

Adapters for voltage metering, short-circuit and protective grounding of line with the use of short circuit devices of UZK type, grounding devices of UZM type or universal devices UZMK for short circuit creating and grounding during implementation of works on LV ABC. They are installed on current carrying and neutral conduits of LV ABC for the whole lifetime of the line (usually at start and end of the line). Bronze male terminal with retention device can be reached when insulation pug is removed. Male terminal has hole for checking of voltage absence.

It is necessary to use piercing branch clamp OP 645 or OP-645M for installation of AIZZ adapter on the lint.

AIZZ

AIZZ 40

AIZZ adapter has one male plug and is intended for connection of short-circuit devices UZK-5, UZK-6, UZK-7, UZMK-5, UZMK-6, UZMK-7, M5D, M6D, M7D.

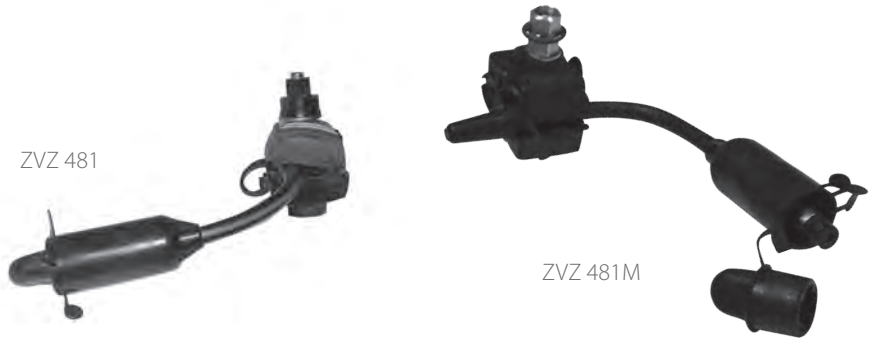
AIZZ 40 adapter has one male plug and is intended for connection of short-circuit devices of SE 41, UZK-5-41, UZK-6-41, UZK-7-41 type, as well as for UZMK-5-41, UZMK-6-41, UZMK-7-41 devices.

Name	Weight, kg, not more	Qty in package, pcs.
AIZZ	0,09	100
AIZZ 40	0,08	100

ZVZ 481 TYPE CLAMPS

PURPOSE:

Clamp for voltage metering, short-circuit and protective grounding of line with the use of short circuit devices of UZK-5, UZK-6, UZK-7, M5D, M6D, M7D type, grounding devices of UZM type and universal devices for short circuit creating and grounding - UZMK-5, UZMK-6, UZMK-7, - during implementation of works on LV ABC. It is installed on current carrying and neutral conduits of LV ABC for the whole lifetime of the line (usually at start and end of the line). Bronze male terminal with retention device can be reached when insulation pug is removed. Male terminal has hole for checking of voltage absence.



Possibility of fixation of lower part of clamps with S17 wrench eases tightening of bolts.

Name	Nominal cross-section area of conduit, mm²	Wrench head size	Weight, kg, not more	Qty in package, pcs.
ZVZ 481 ZVZ 481 M*	16-150	13	0,23	30

* - Clamps of M modification have metal shear heads.

ZVZ 481 TYPE CLAMPS

PURPOSE:

Clamps for connection of short-circuit devices of SE 41, UZK-5-41, UZK-6-41, UZK-7-41 types as well as UZMK-5-41, UZMK-6-41, UZMK-7-41 devices. They are installed similarly to clamps of ZVZ-481 type.

Name	Nominal cross-section area of conduit, mm²	Wrench head size	Weight, kg, not more	Qty in package, pcs.
ZVZ 481-40	16-150	13	0,22	30
ZVZ 481-40M*	16-150	13	0,22	

* - Clamps of M modification have metal shear heads.

SHORT CIRCUIT JUMPER DEVICES UZK

PURPOSE:

Devices for creation of mobile short-circuit and grounding solutions for LV ABC.

After voltage presence check short circuit device UZK is connected to the "ground" with the use of grounding device UZM and plug-in connectors are inserted into adapters ZVZ 481, which ensures compliance with requirements of safety rules for LV ABC grounding during implementation of works on it. Set includes 5-7 plug-in connectors, which are connected with insulated copper wire.

Name	Number of plug-in connectors	Weight, kg, not more
UZK-5	5	1,55
UZK-6	6	1,75
UZK-7	7	1,95

GROUNDING DEVICE UZM

PURPOSE:

Device for connection between short-circuit device UZK and "ground". It consists of plug terminal (intended for connection to plug-in connector of UZK), which in its turn connected with grounding device with 10 meters copper insulated wire with 16 mm^2 cross-section.

Name	Weight, kg, not more
UZM	3,35

DEVICES FOR SHORT-CIRCUIT AND GROUNDING UZMK

PURPOSE:

Devices for creation of mobile short-circuit and grounding solutions for LV ABC. UZMK device represents set, which consists of one UZK device and one UZM device, which are placed in one case.

Name	Number of plug-in connectors	Weight, kg, not more
UZMK-5	5	4,3
UZMK-6	6	4,5
UZMK-7	7	4,7

SHORT-CIRCUIT JUMPERS DEVICES UZK-41

PURPOSE:

Devices for creation of mobile short-circuit and grounding solutions for LV ABC.

After voltage presence check short circuit device UZK is connected to the "ground" with the use of grounding device UZM and plug-in connectors are inserted into adapters ZVZ 481-40 or ZVZ-481-40-2, which ensures compliance with requirements of safety rules for LV ABC grounding during implementation of works on it. Set includes 5-7 plug-in connectors, which are connected with insulated copper wire.

Name	Number of plug-in connectors	Weight, kg, not more
UZK-5-41	5	1,55
UZK-6-41	6	1,75
UZK-7-41	7	1,95

GROUNDING DEVICE UZM-41

PURPOSE:

Device for connection with "ground" of short-circuit jumper devices UZK-41-5, UZK-41-6, UZK-41-7. It consists of plug terminal (intended for connection to plug-in connector of UZK), which in its turn connected with grounding device with 10 meters copper insulated wire with 16 mm^2 cross-section.

Name	Weight, kg, not more
UZM-41	3,35

DEVICES FOR SHORT-CIRCUIT AND GROUNDING UZMK-41

PURPOSE:

Devices for creation of mobile short-circuit and grounding solutions for LV ABC. UZMK-41 device represents set, which consists of one UZK-41 device and one UZM-41 device, which are placed in one case.

Name	Number of plug-in connectors	Weight, kg, not more
UZMK-5-41	5	4,41
UZMK-6-41	6	4,64
UZMK-7-41	7	4,87

GROUNDING DEVICE SSGD

PURPOSE:

Device for creation of permanent grounding of LV ABC at the start and end of each main line, at places of sectioning posts, as well as in places of crossing with overhead lines of more than 1000 V voltage.

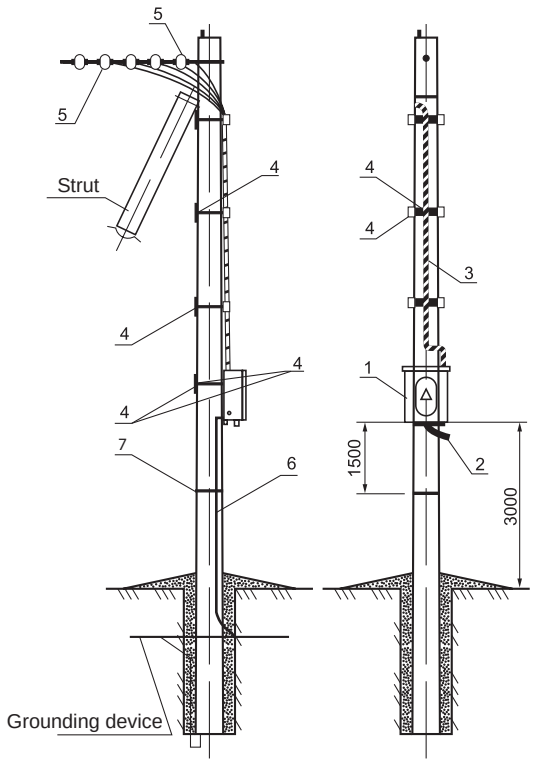
This solution for LV ABC grounding, which ensures safety of works, is the most reliable and convenient solution today.

SSGD grounding device is installed on reinforced concrete poles.

Wires are led through the bottom of device.

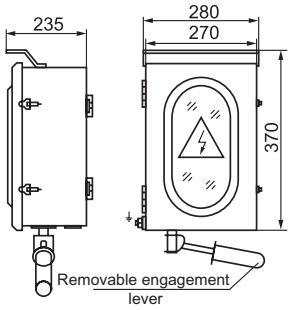
IP index of device - IP43 according to IEC 60529:2013.

Diagram of SSGD installation on the pole

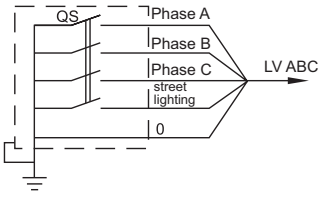


Example of SSGD installation on the pole

Overall dimensions



Electrical diagram



Delivery package

Item	Name	Qty	Note
	SSGD device:		
1	Grounding device	1	
2	Manual drive	1	As a part of SSGD set
3	Shunt of wires for connection to LV ABC	5	As a part of SSGD set
4	Fastener elements (sets)	5	As a part of SSGD set
	Overhead line hardware:		
5	Clamp OP-645	5	Is purchased separately
	Steelworks:		
6	Round bar d=10mm	3.5 m	Is purchased separately
7	Tie X-181 with flat bar	1	Is purchased separately

Technical parameters of SSGD

No.	Parameter name	Value
1	Nominal working voltage, V	380
2	Nominal current, A	100
3	Short-time thermal current (1 sec), kA, not less	3.2
4	Nominal frequency, Hz	50
5	Mechanical wear-resistance, cycles (enabling - spontaneous pause - disabling)	2000
6	Number of poles, pcs.	4 (3 ph.+1 lght. contr.)
7	Number of wires for connection to LV ABC, pcs.	5 (3 ph. + 1 lght. contr. + 0)
8	Connecting wires length, m	6
9	Climatic version and placement category acc. GOST 15150-69	from -60° to +50°
10	Weight, kg, not more	15

BENEFITS

- No need in lifting on the tower or use of hoisting device for installation of mobile groundings and their connection to clamps PC-481 or ZVZ-481.
- Convenience and apparency during voltage absence check (electrician has no need to open protective caps, which are installed on clamps PC-481 or ZVZ-481).
- Process of installation of grounding on LV ABC becomes simpler.
- There is no need in using of expensive self-containing mobile grounding.
- There is no possibility of dismantling of installed grounding or stealing of mobile grounding by unauthorized persons.
- Exception of possibility of spontaneous disconnection of mobile grounding from LV ABC wires.
- Ensuring of normalized grounding contour at place of grounding installation.
- Short pay-back period in operation due to lowering of costs for carrying out of technical measures for taking of LV ABC from service.

SURGE PROTECTORS OF LVA TYPE

PURPOSE:

Devices for protection of consumers, equipment and line insulation of LV ABC from surge voltages. Devices consist of special structure excess-voltage suppressor for connection to LV ABC wires at one side and to grounding drops of towers on the other side.

LVA-260-2, LVA-450-2 or LVA-660-2 with clamp for uninsulated wire with cross-section area of 16–35 mm^2.

LVA-260-3, LVA-450-3 or LVA-660-3 with clamp for uninsulated wire with cross-section of 50–70 mm^2.

LVA-260-4, LVA-450-4 or LVA-660-4 with insulated adapter for connection through piercing branch clamp.

LVA-260-1, LVA-450-1 or LVA-660-1 with aluminum flange and M6 stud.

Designations for order: LVA-260-1 (2, 3, 4) or LVA-450-1 (2, 3, 4) or LVA-660-1(2,3,4)

Parameter name	OF LVA-260 TYPE EXCESS-VOLTAGE SUPPRESSOR 0.22/300/0.26 NF1	OF LVA-450 TYPE EXCESS-VOLTAGE SUPPRESSOR 0.4/300/0.4 NF1	OF LVA-660 TYPE EXCESS-VOLTAGE SUPPRESSOR 0.66/300/0.7 NF1
1. Network voltage class, kV	0.22	0.4	0.66
2. The most long term working voltage of LVA device, V (actual), kV	260	450	710
3. Nominal frequency, Hz	50	50	50
4. Nominal discharge current, kA	10	10	10
5. Maximum discharge current, kA	40	40	40
6. Residual voltage after 8/20 μs lightning current impulses, kV, not more With amplitude:			
5000 A	1.1	1.6	2.7
10000 A	1.2	1.8	3.0
20000 A	1.5	2.2	3.7
7. Number of current impulses which can be carried:			
• Under square-wave impulses with 2000 μs duration and maximum value 300 A, not less	20	20	20
• Under 8/20 μs lightning current impulses with maximum value 20000 A, not less	15	15	15
8. Capacity for dissipation of energy of rated square-wave impulse with duration of 2000 μs, J, not less	600	1000	1850
9. Conduction current, mA, not more	0.9	0.9	0.9
10. Voltage in case of direct current i= 1 mA, V, not less	400	650	1050
11. Weight, not more, kg	0.38	0.4	0.5

STEEL DIE CLAMPS FOR GROUNDING OF SDC TYPE

PURPOSE:
Clamp for connection of grounding conduits.

Name	Diameter of steel grounding conduits, mm	Weight, kg, not more	Qty in package, pcs.
SDC-1-1A	5,5–8,6	0,20	300
SDC-2-1A	9,1–12,0	0,25	100
SDC-3-1A	12,5–14,0	0,37	100

STEEL DIE CLAMP CD-35

НАЗНАЧЕНИЕ:
Clamp for connection of uninsulated conduits. Material: corrosion-resistant aluminum alloy.

Name	Nominal cross-section area of main line conduit, mm²	Nominal cross-section area of branch conduit, mm²	Weight, kg, not more
CD-35	10–50	10–50	0,06

CORRESPONDENCE TABLE FOR LV ABC HARDWARE

MZVA	Cross-section area, mm² Diameter, mm	Destructive load, kN	TYCO	Cross-section area, mm² Diameter, mm	Destructive load, kN	НИЛЕД	Cross-section area, mm² Diameter, mm	Destructive load, kN	
ES 1500 **ES 1500.1**	16–120	12,0	ES 35-1500	16–35	4,3	ES 800 ES 1500	16-95 16-95	8,0 12,0	**Intermediate suspension set**
			ES F54/70	50–70	7,0				
			ES 1500	50–70	12,0				
			ES 95-2000	50–95	16,0				
PS 1500 **PS 1500.1** **PS 2000** **PS 25-95**	16–120 16–120 16–120 25-95	12,0 12,0 15,0 22,0	PS 35 PS 54 (PS54+LM) PS 120	16-35 50-70 95-120	4.3 12,0 30,0	PS 54QC PS 1500 PS 2000	16-95 16-95 25-120	8,0 12,0 15,0	**Support clamp without bracket**
EST 1500	16–120	12,0				CS 2	16–95	12,0	**Intermediate suspension set for wire-rope**
CS 1500.1	–	12,0				CS 1500	–	12,0	**Bracket for intermediate suspension**
PS 4x35	4x35(2x50)	12,0	PS435 (250)	4x35(2x50)	7,5	PS16/120	2-4x16-120	10,0	**Support clamp for LV ABC without messenger**
PS 4x50	4x50(2x95)	12,0	PS450	4x50(2x95)	7,5				
PS 4x70	4x70	12,0	PS470	4x70	7,5				
PS 4X95	4x95	12,0	PS495	4x95	7,5				
PS 4x120	4x120	12,0	PS4120	4x120	7,5				
PS 4x16-120	4x16-4x120	10,0							
PSP 4X25-120	2-4x16-120	18,0	USC25-120	2-4x25-120	18,0	PSP 25/120.M	2x16-4x120	18,0	
EA 1000	25–35	10,0	EA-1000	25–35	10,0	–	–	–	**Anchor suspension set**
EA 1500	35–70	15,0	EA-1500 EA-2000	50–70	15,0 20,0	–	–	–	
EA 2200	70–120	20,0	EA-95-2000	95	20,0	–	–	–	
CA 2000.1	–	22,0	CA-1500-2	–	15,0	CS10.3	–	15,0	**Anchor bracket**
			CA1500/2000	–	19,5	CA2000	–	20,0	
CA 600B	–	6,0	–	–	–	CB 600	–	3,75	**Anchor bracket for facades of buildings**
CA 600T	–		–	–	–	CT 600	–	6,25	
CAT 1500	–	15,0	–	–	–	CS1	–	15,0	**Анкерный кронштейн для установки на тросс**
SOT 29.10	–	17,8/12,5	HEL-5661	–	18/28	CF16	–	18,0	**Universal hook**
KM 39	–	27,7 /17,7							
KU 16	–	17,4/13,3	–	–	–	CS 16	–	18,0	
KU 16.1	–		–	–	–	–	–		
KU 16.2	–		–	–	–	–	–		
KU 16.3	–		–	–	–	–	–		
GK 16	–	12,0/2,4	–	–	–	–	–	–	**Nut hook**
GK 20	–	14,5/4,6	–	–	–	–	–	–	
KP 16.200	D16	12,0/2,4	–	–	–	–	–	–	**Through hook**
KP 16.240	D16		MEL-5551	–	5,5	B16/240	D16	12	
KP 16.320	D16		–	–	–	–	–	–	

	SICAME	Cross-section area, mm² Diameter, mm	Destructive load, kN	ENSTO	Cross-section area, mm² Diameter, mm	Destructive load, kN	MZVA	Cross-section area, mm² Diameter, mm	Destructive load, kN
Intermediate suspension set	ES 54-14	25-95	12,0	SO260	25-95	12,0	**ES 1500** **ES 1500.1**	16–120	12,0
	ES 70-14	25-95	16,0						
Support clamp without bracket	PS 54 (T,TR)	25-95	6,0	SO265 SO265.1	16-95	12,0	**PS 1500** **PS 1500.1** **PS 2000**	16–120 16-120 25-120	12,0 12,0 15,0
	PSQ 54(R)	25-95	12,0						
	PSQ 70 R	25-95	16,0	SO 69.95	16-95	22,0	**PS 25-95**	25-95	22,0
	–	–	–	–	–	–			
Intermediate suspension set for wire-rope	–	–	–	–	–	–	**EST 1500**	16–120	12,0
Bracket for intermediate suspension	–	–	–	–	–	–	**CS 1500.1**	–	12,0
Support clamp for LV ABC without messenger	PSP120TRA Z2050(224)	2-4x16-120 4x16-120	7,0 6,5(6,0)	SO 270	4x16-120	7,0	**PS 4x35**	4x35(2x50)	12,0
							PS 4x50	4x50(2x95)	12,0
							PS 4x70	4x70	12,0
							PS 4X95	4x95	12,0
							PS 4x120	4x120	12,0
							PS 4x16-120	4x16-120	10,0
	PSP122TRA	2-4x16-120	18,0	SO130 (130.2)	2-4x25-120	18,0	**PSP 4X25-120**	2-4x16-120	18,0
Anchor suspension set	EAS35-10	25–35	10,0	–	–	–	**EA 1000**	25–35	10,0
	EAS54-10 (54C,C3)	50–70	15,0	–	–	–	**EA 1500**	35–70	15,0
	–	–	–	–	–	–	**EA 2200**	95–120	20,0
Anchor bracket	CS10-3	–	15,0	SO253	–	22,0	**CA 2000.1**	–	22,0
	CS10-2000	–	19,5	–	–	–			
Anchor bracket for facades of buildings	CS10W2	–	8,0	–	–	–	**CA 600B**	–	6,0
	CS10W3	–	8,0	–	–	–	**CA 600T**	–	
Анкерный кронштейн для установки на тросс	–	–	–	–	–	–	**CAT 1500**	–	15,0
Universal hook	GHS016	–	7,3/3,3	SOT29.10	–	17,8/12,5	**SOT 29.10**	–	12,5/17,8
	GHS020	–	13,5/6,0	SOT 39	–	27,7/17,7	**KM 39**	–	17,7/27,7
	–	–	–	SOT 28 SOT76	–	17,4/13,3	**RU 16**	–	17,4/13,3
	–	–	–	SOT 28.1 SOT76.1	–		**RU 16.1**	–	
	–	–	–	SOT 28.2 SOT76.2	–		**RU 16.2**	–	
	–	–	–	SOT 28.3	–		**RU 16.3**	–	
Nut hook	–	–	–	PD2.3	–	15,4/2,0	**GK 16**	–	12,0/2,4
	–	–	–	PD2.2	–	15,5/4,0	**GK 20**	–	14,5/4,6
Through hook	GHW 16/200	–	7,5/3,5	SOT15.82	D16	4,8/1,5	**KP 16.200**	D16	12,0/2,4
				SOT15.8	D16	9,6/2,4			
				SOT21.16	D16	11,9/2,4			
	–	–	–	SOT15.92	D16	4,8/1,5	**KP 16.240**	D16	
				SOT15.9	D16	9,6/2,4			
				SOT21.116	D16	11,9/2,4			
	–	–	–	SOT15.10	D16	9,6/2,4	**KP 16.320**	D16	
				SOT21.216	D16	11,9/2,4			

MZVA	Cross-section area, mm² Diameter, mm	Destructive load, kN	TYCO	Cross-section area, mm² Diameter, mm	Destructive load, kN	НИЛЕД	Cross-section area, mm² Diameter, mm	Destructive load, kN	
KP 20.200	D20	14,5/4,6	–	–	–	–	–	–	**Through hook**
KP 20.240	D20		HEL-5556	–	13	B20/240	D20	46/24	
KP 20.320	D20		–	–	–	–	–	–	
KP 20.350	D20		–	–	–	–	–	–	
KD 8	D8	3,0/2,3	–	–	–	BT 8	D8	2,3	**Threaded hook**
KD 12	D12	5,3/4,1	–	–	–	–	–	–	
KD 16	D16	8,8/6,6	–	–	–	BT 16	D16	6,6	
KD 20	D20	16,6/12,9	–	–	–	–	–	–	
MSH 16.240	D16	50,0	–	–	–	–	–	–	**Mounting stud**
MSH 16.280	D16		–	–	–	–	–	–	
MSH 16.360	D16		–	–	–	–	–	–	
MSH 20.240	D20	55,0	–	–	–	–	–	–	
MSH 20.280	D20		–	–	–	–	–	–	
MSH 20.360	D20		–	–	–	–	–	–	
MSH 24.360	D24	60,0	–	–	–	–	–	–	
RAS 16.234	–	50,0	HEL-5562	–	40,0	–	–	–	**Through anchor eye-bolt**
CA 25 **CA 25M**	– –	2,0 4,0	CAB 25	–	2,0	CA-16	–	4,0	**Anchor bracket for consumers' branches**
PA 1000(N)	25–35	10,0	PA 1000	25–35	10,0	DN-35	25–35	10,0	**Anchor clamp**
PA 1500(N)	35–70	15,0	PA-1500	50–70	15,0	PA-1500	50–70	15,0	
			PA-2000	50–70	20,0				
PAK 1500(N)	35–70	15,0	–	–	–	PAC-1500	50–70	15,0	
PA 2200(N)	70–120	20,0	PA-95-2000	95	20,0	DN80 DN95-120	95-120 95-120	15,0 22,0	
PA 25x100	2x16–4x25	3,5	–	–	–	–	–	–	**Anchor clamp for branches to connections**
PA 25x100M	2x16–4x25	3,5	PA-25x100	2x16–4x25	3,0	DN123	2x6–4x25	3,5	
						DN1	2x16–2x25	2,0	
PA 4x10-35(M)	2x10–4x35	8,0	–	–	–	DN126	2x16–4x35	8.0	
PA 2x10–50(C)	2x10–2x50	10,0	HEL-5505-2	2x10–35	12,0	PAS 216/450	2x16-4x50	10,0	**Anchor clamp for LV ABC without messenger**
PA 4x10-50(C)	4x10–4x50	10,0	HEL-5505	4x10–35	12,0				
PA 4x25-70(C)	4x25-4x70	25,0	HEL-5505(5506)	4x25–35	12,3	RPA 425/70	4x25-4x70	25,0	
PA 4x35-120(C)	4x35–4x120	45,0	HEL-5504(5507)	4x70–95	43,0	RPA 470/120	4x70-4x120	40,0	
						RPA 450/120.S	4x50-4x120		
PA 4x16-35(C)	4x16–35	20,0	HEL-5506 HEL-5503	4x25–50	12,3	-			

	SICAME	Cross-section area, mm² Diameter, mm	Destructive load, kN	ENSTO	Cross-section area, mm² Diameter, mm	Destructive load, kN	MZVA	Cross-section area, mm² Diameter, mm	Destructive load, kN
Through hook	–	–	–	SOT21 SOT21.0	D20	14,5/4,6	**KP 20.200**	D20	14,5/4,6
				SOT8.21	D20	15,2/4,5			
	–	–	–	SOT21.1 SOT21.01	D20	14,5/4,6	**KP 20.240**	D20	
				SOT8.22	D20	15,2/4,5			
	–	–	–	SOT21.2 SOT21.02	D20	14,5/4,6	**KP 20.320**	D20	
				SOT8.23	D20	15,2/4,5			
	–	–	–	SOT21.3 SOT21.03	D20	14,5/4,6	**KP 20.350**	D20	
Threaded hook	–	–	–	–	–	–	**KD 8**	D8	6,0/-
	–	–	–	SOT16.12	D12	5,3/4,1	**KD 12**	D12	5,3/4,1
	–	–	–	SOT16.10	D16	8,8/6,6	**KD 16**	D16	8,8/6,6
	–	–	–	SOT1.1	D20	16,6/12,9	**KD 20**	D20	16,6/12,9
Mounting stud	–	–	–	SOT4.8	D16	Н/Д	**MSH 16.240**	D16	50,0
	–	–	–	SOT4.9	D16		**MSH 16.280**	D16	
	–	–	–	SOT4.10	D16		**MSH 16.360**	D16	
	–	–	–	SOT4.5	D20		**MSH 20.240**	D20	55,0
	–	–	–	SOT4.6	D20		**MSH 20.280**	D20	
	–	–	–	SOT4.7	D20		**MSH 20.360**	D20	
	–	–	–	SOT78	D24		**MSH 24.360**	D24	60,0
Through anchor eye-bolt	–	–	–	–	–	–	**RAS 16.234**	–	50,0
Anchor bracket for consumers' branches	PA69F	–	2	SO279	–	2,0	**CA 25** **CA 25M**	– –	2,0 4,0
Anchor clamp	PA 25-600	16–25	6,0	SO252.01	25–35	12,0	**PA 1000(N)**	25–35	10,0
	PA 35-1000(A) PA 35-1000	25–35	10,0						
	PA 54-1500(C) PA 54-1500	50–70	15,0	SO250.01	50–70	15,0	**PA 1500(N)**	35–70	15,0
	PA 70-2000(A) PA 70-2000	54–70	19,5						
	–	–	–	–	–	–	**PAK 1500(N)**	35–70	15,0
	PA 95-2000(A) PA 95-2000	70–95	19,5	SO251.01	95	15,0	**PA 2200(N)**	95–120	20,0
	PA 120-2000	95–120	20,0						
Anchor clamp for branches to connections	–	–	–	SO243	2x16-4x25	2,0	**PA 25x100**	2x16–4x25	3,5
	PC63F27(TF8)	2x6–4x35	3,5	SO 157.1	2x16-2x35	3,5	**PA 25x100M**	2x16–4x25	3,5
	–	–	–	SO158.1	4x16-35	5,5	**PA 4x10-35(M)**	2x10–4x35	8,0
Anchor clamp for LV ABC without messenger	GUKp2	2x16-35	5,0	SO 80.235S	2x16–35	5,4	**PA 2x10–50(C)**	2x10–50	10,0
	GUKp4	4x16-35	10,0	SO 80(S)	4x16–25(35)	8,75(12)	**PA 4x10-50(C)**	4x10–50	10,0
	GUKo1	4x25-50	25,0	SO 118.425 SO118.1201S	4x25-35 4x50-120	20,0 35,0	**PA 4x25-70(C)**	4x25-70	25,0
	PA-12(A)(F)	4x50-120	50,0	SO117.50952S SO275S SO276 SO118.1202S SO234S	4x50-95 4x50-70 4x70-150 4x50-120 4x50-120	23,0 36,0 50,0 35,0 37,0	**PA 4x35-120(C)**	4x35–120	45,0
	-			SO274S	4x25-50	25,0	**PA 4x16-35(C)**	4x16–35	20,0

MZVA	Cross-section area, mm² Diameter, mm	Destructive load, kN	TYCO	Cross-section area, mm² Diameter, mm	Destructive load, kN	НИЛЕД	Cross-section area, mm² Diameter, mm	Destructive load, kN	
SDC–1–1A	16–35/16–35	–	–	–	–	CD35	10–50/10–50	–	**Steel die clamp for connection of grounding conduits**
CD-35	10-50/10-50								
PC 150	16-150/16-150	–	–	–	–	CD150	16-150/16-150	–	**Steel die branch clamp**
CD-35	10-50/10-50	–	–	–	–	CD35	10–50/10–50	–	
UZK-5(6,7)	–	–	MT-245	–	–	M6(7)D	–	–	**Short-circuit device**
UZM	–	–	MT-205 (206,207)	–	–	MAT	–	–	**Grounding device**
UZMK-5-41	–	–	–	–	–	–	–	–	**Device for organization of short-circuit and grounding**
BRPF-6	D18-62	2,0 0,2	BRF-70-150-6F	D25-60	2,0	SF 50	D18-55	2,0	**Facade fixture for masonry walls**
BRPF-6.1	D18-62	2,0 0,2	–	–	–	SFW 50	D18-55	2,0	**Facade fixture for wooden walls**
BIC 15.50	D15-50 30-80	–	–	–	–	BIC 15.50	D15-50	–	**Remote retention device**
BIC 50.90	D50-90 30-100	–	–	–	–	BIC 50-90	D50-90	–	
OP 6(M)	6–150 / 1,5 –10	–	EP 95-13	16–95/1,5–10	–	P4	6–95 / 1,5–10	–	**Hermetically sealed branch clamps with simultaneous bolt tightening**
OP 616(M)	6–150 / 1,5 –16	–				P616 (R)	6–95 / 1,5–16	–	
OP 645(M)	16–150 / 4-50	–	P2R-95	16–95 / 4–35	–	P635 P645	16-95 / 6-35 16-150 / 6-35	– –	
OP 95(M)	16–150/16–95	–	P3X-95	25–95 / 25–95	–	P70	35-150/35-95	– –	
OP 72	16-150/1(2) x2,5-35	–	–	–	–	P617 P619	35-150/ 2x6-50	–	**Hermetically sealed branch clamps with separate tightening of bolts on main line and branch**
OP 74	16-150 / 3(4) x2,5-35	–	–	–	–	P 14	16-150/4x1,5-35	–	
OP 71B	16-150 / 1,5-95	–	–	–	–	P 71	35-95 / 4-54	–	**Moisture-proof branch clamps with separate tightening of bolts on main line and branch**
OP 72B	16-150 / 1,5-35	–	–	–	–	P 72	35-95 / 2x4-54	–	
OP 74B	16-150 / 1,5-35	–	–	–	–	P 74	16-150 / 4x2,5 / 4-35	–	
OCD 71B	16-150 / 1,5-95	–	–	–	–	CD 71+BI	16-150 / 4-70	–	**Moisture-proof branch clamps for creation of LV ABC branches from HVL with separate tightening of bolts on main line and branch**
OCD 72B	16-150/2x1,5-95	–	–	–	–	CD 72+BI	16-150 / 2x4-54	–	
AG 2	1(2)x1,5-35	–	–	–	–	–	–	–	**Moisture-proof multi-purpose adapter**
AG 4	(4)x1,5-35	–	–	–	–	–	–	–	

	SICAME	Cross-section area, mm² Diameter, mm	Destructive load, kN	ENSTO	Cross-section area, mm² Diameter, mm	Destructive load, kN	MZVA	Cross-section area, mm² Diameter, mm	Destructive load, kN
Steel die clamp for connection of grounding conduits	–	–	–	–	–	–	**SDC–1–1A**	16–35/ 16–35	–
							CD-35	10-50/10-50	
Steel die branch clamp	–	–	–	SL4.21 SL4.25	16-120/16-120	–	**PC 150**	16-150/16-150	–
				SL39.2	16-150/16-150				
				SL2.11	16-50/16-50				
				SL37.1(2)	6-95/6-95				
	–	–	–	–	–	–	**CD-35**	10-50/10-50	
Short-circuit device	EMCC 1105(6) (7)S	–	–	CT202.5(6,7)	–	–	**UZK-5(6,7)**	–	–
Grounding device	EMT 1101S	–	–	CT202.2(3)	–	–	**UZM**	–	–
Device for organization of short-circuit and grounding	–	–	–	SE41	–	–	**UZMK-5-41**	–	–
Facade fixture for masonry walls	SC93-6PC BRPF-6	D20-50	2,0	SO70.13	D12-47	Н/Д	**BRPF-6**	D 18-62 мм	2,0
				SO70.17		Н/Д			
Facade fixture for wooden walls	–	–	–	SO70.11	D12-47	Н/Д	**BRPF-6.1**	D 18-62	2,0
				SO70.16		Н/Д			
				SO76.11		Н/Д			
Remote retention device	BIC 15-30 BIC 30-50	D 15-30 D 30-50	–	SO79.1 SO79.6	D45	–	**BIC 15.50**	D15-50	–
	BIC 50-90	D 50-90	–	SO75.100	D45-100	–	**BIC 50.90**	D50-90	–
Hermetically sealed branch clamps with simultaneous bolt tightening	TTD051FJA(Z)	16–95 / 1,5–10	–	SLIW11.1 SLIW50	16–95 / 1,5–10 10–50/ 1,5–10	–	**OP 6**	6–150 / 1,5 –10	–
							OP 616	6–150 / 1,5 –16	–
	TTD151FJA(Z) TTD171FJA(Z)	16–95 / 6–35 25-120/6-35	–	SLIW52 SLIW56 SLIW54 SLIW58	16–150 / 1,5–60 25–150/ 6–35 16–120 / 6–50 50–150 / 50–150	–	**OP 645**	16–150 / 4-50	–
	TTD271FJA(Z) TTD201FJA(Z) TTD251FJA(Z) TTD211FJA(Z)	35–120 / 35–120 35–95 / 25–95 50–150 / 25–95 35–120 / 16–70	–	SLIW17.1 SLIW57	25–150/25–70 25–150/25–95	–	**OP 95**	16–150 / 16–150	–
Hermetically sealed branch clamps with separate tightening of bolts on main line and branch	TT1D82(86)F TT2D82(86)F	25-95(50-150)/ 2,5-35	–	SLIW54+SLIW65 SLIW57+SLIW66	16–150 / 2,5–35 25–150 / 6–35	–	**OP 72**	16-150/1(2) x2,5-35	–
	TT4D82(86)F	25-95 (50-150)/ 4x2,5-35	–	SLIW57+SLIW67	25–150 / 6–35	–	**OP 74**	16-150/3(4) x2,5-35	–
Moisture-proof branch clamps with separate tightening of bolts on main line and branch	CT70-35HF CT25-25HF	35-95/2,5-35 10-54/2,5-25	–	–	–	–	**OP 71B**	16-150 / 1,5-95	–
	CT70-235HF	35-95/2x2,5-35	–	–	–	–	**OP 72B**	16-150 / 2x1,5-95	–
	–	–	–	–	–	–	**OP 74B**	16-150 / 4x1,5-35	–
Moisture-proof branch clamps for creation of LV ABC branches from HVL with separate tightening of bolts on main line and branch	–	–	–	–	–	–	**OCD 71B**	16-150 / 4-95	–
	–	–	–	–	–	–	**OCD 72B**	16-150 / 2x4-95	–
Moisture-proof multi-purpose adapter	F 35 F 235	1x2,5-35 2x2,5-35	–	SLIW66	2x10-35 6-35	–	**AG 2**	1(2)x1,5-35	–
			–	SLIW77	4x10-35 6-35	–	**AG 4**	3(4)x1,5-35	–

MZVA	Cross-section area, mm² Diameter, mm	Destructive load, kN	TYCO	Cross-section area, mm² Diameter, mm	Destructive load, kN	НИЛЕД	Cross-section area, mm² Diameter, mm	Destructive load, kN	
TC 16-120/4-50 (M)*	6–120 / 4-50	–	RDP 25/CN	7–100 / 16–35	–	N616	6–95 / 4-16	–	**Hermetically sealed branch clamps for creation of LV ABC branches from HVL**
						N640	6–120 / 6–25	–	
TC 16-150/16-150 (M)*	16-120 / 16-150	–	CDR/ CN1S95UK	7–100 / 25–95	–	N70	22–150 / 16–95	–	
AIZZ	–	–	PMCC	–	–	–	–	–	**Adapter for temporary grounding of LV ABC**
AIZZ 40	–	–	–	–	–	–	–	–	
ZVZ 481(M)	16–150	–	–	–	–	PC 481	16–150	–	**Clamp for temporary grounding equipped with adapter**
C 200	–	–	–	–	–	–	–	–	**Insulated grounding bracket for grounding of LV ABC**
CK 200	16–150	–	–	–	–	–	–	–	**Grounding set**
MJPT 25, 35,50,70	25, 35, 50, 70	–	MJPT 25,35,50,70	25, 35, 50, 70	–	MJPT 25,35,50,70	35, 50, 70	–	**Connecting clamp**
MJPT 95	95	–	MJPT 95	95	–	MJPT 95	95	–	
MJPT 120, 150	120, 150	–	MJPT 120, 150	120, 150	–	MJPT 120, 150	120, 150	–	
MJPB 06-16	6–16	–	MJPB 6-16	6–16	–	MJPB 6-16	6–16	–	**Connecting clamp for input wires**
MJPB 16	16	–	MJPB 16	16	–	MJPB 16	16	–	
MJPB 25	25	–	MJPB 25	25	–	MJPB 25	25	–	
MJPB 16-25	16–25	–	MJPB 16-25	16–25	–	MJPB 16-25	16–25	–	
MJPT 25N	25	–	–	–	–	MJPT 25N	25	–	**Connecting clamp for neutral conduit**
MJPT 35N	35	–	–	–	–	MJPT 35N	35	–	
MJPT 50N	50	–	–	–	–	MJPT 50N	50	–	
MJPT 54,6 N	54,6	–	MJPT 54	54,6	–	MJPT 54,6 N	54,6	–	
MJPT 70N	70	–	MJPT 70N	70	–	MJPT 70N	70	–	
MJPT 95N	95	–	–	–	–	MJPT 95N	95	–	
MJPT 120N	120	–	–	–	–	MJPT 120N	–	–	
MJPT 150N	150	–	–	–	–	–	–	–	
CPTAU 16, 25, 35, 50, 54,6, 70	16–70	–	CPTAU 16D, 25D, 35, 50, 54,6, 70	16–70	–	CPTAU 16, 25, 35, 50, 54,6, 70	16–70	–	**Insulated end terminal for copper buses**
CPTAU 95	95	–	CPTAU 95	95	–	CPTAU 95	95	–	
CPTAU 120, 150	120, 150	–	CPTAU 120D, 150D	120, 150	–	CPTAU 120, 150	120, 150	–	
CPTAUO 16, 25, 35, 50, 54,6, 70	16–70	–	–	–	–	CPTA R 16, 25, 35, 50, 54,6, 70	16–70	–	**Insulated end terminal for copper and aluminum buses**
CPTAUO 95	95	–	–	–	–	CPTA R 95	95	–	
CPTAUO 120, 150	120, 150	–	–	–	–	CPTA R 120, 150	120, 150	–	
KR 1	D 15–30	–	CSB	D 10–45	–	E778	D 10–45 мм	–	**Cable tie**
KR 2	D 30–80	–	CSL 260	D 26–66	–	E260	D 25–62 мм	–	
KR 3	D 30–100	–	CSL 350	D 55–93	–	E350	D 55–92 мм	–	
F 20(Premium)	упак. 50 м.	–	F 2007	упак. 50 м.	–	F 207	упак. 50 м.	–	**Mounting band**
C20	20 мм	–	A200	20 мм	–	NC 20	20 мм	–	**Band bracket**
B20	20 мм	–	–	–	–	NB 20	20 мм	–	
CI 6-35	6–35	–	CECT 6-35	6–35	–	CE 6.35	6–35	–	**Insulating cap**
CI 25-150	16–150	–	CECT 16-150	16–150	–	CE 25.95	25–150	–	
LS 20	–	–	–	–	–	SCT 20	–	–	**Sealing tape**
HF 207	–	10,0	–	–	–	BF 207	–	10,0	**Cable tie**
LVA 260*	–	–	LVA 280B-F*	–	–	OP600/28*	–	–	**Surge protector**
LVA 450*	–	–	LVA 440B-F*	–	–	OP600/50*	–	–	
LVA 660*						OP600/66*	–	–	

*** - it is necessary to specify particular modification and decide whether it should be equipped with clamp or not**

	SICAME	Cross-section area, mm² Diameter, mm	Destructive load, kN	ENSTO	Cross-section area, mm² Diameter, mm	Destructive load, kN	MZVA	Cross-section area, mm² Diameter, mm	Destructive load, kN
Hermetically sealed branch clamps for creation of LV ABC branches from HVL	NTD151AF(Z)	35–95/2,5–35	–	SLIP12.127	10–70 / 1,5–50	–	**TC 16-120/4-50 (M)***	16–120 / 4-50	–
	NTD201AF(Z)	7–95/25–95		SLIP22.127 SLIP22.12	25–95 / 2,5–95	–	**TC 16-150/16-150 (M)***	16-120 / 16-150	–
	NTD401AF(Z)	50–150/25–95							
Adapter for temporary grounding of LV ABC	–	–	–	ST202	–	–	**AIZZ**	–	–
	–	–	–	SE40	–	–	**AIZZ 40**	–	–
Clamp for temporary grounding equipped with adapter	TTD1-CC TTD2-CC TTD3-CC	16-35 35–95 50-150	–	ST202.54	16-120	–	**ZVZ 481(M)**	16–150	–
Insulated grounding bracket for grounding of LV ABC	–	–	–	ST 208.1	–	–	**C 200**	–	–
Grounding set	–	–	–	ST208.57	25–150	–	**CK 200**	16–150	–
Connecting clamp	MJPT 25, 35,50,70	25, 35, 50, 70	–	–	–	–	**MJPT 25, 35,50,70**	25, 35, 50, 70	–
	MJPT 95	95	–	–	–	–	**MJPT 95**	95	–
	MJPT 120,150	120, 150	–	–	–	–	**MJPT 120, 150**	120, 150	–
Connecting clamp for input wires	MJPB 16-6(CG)	16–25	–	–			**MJPB 06-16**	6–16	–
	MJPB 16(CG)	16	–	–	–	–	**MJPB 16**	16	–
	MJPB 25(CG)	25	–	–	–	–	**MJPB 25**	25	–
	MJPB 25-16(CG)	16–25	–	–	–	–	**MJPB 16-25**	16–25	–
Connecting clamp for neutral conduit	MJPT 25N	25	–	CIL166	25–50	–	**MJPT 25N**	25	–
	MJPT 35N	35	–	CIL166	25–50	–	**MJPT 35N**	35	–
	MJPT 50N	50	–	CIL166	25–50	–	**MJPT 50N**	50	–
	MJPT 54	54,6	–			–	**MJPT 54,6 N**	54,6	–
	MJPT 70N	70	–	CIL7	70-95	–	**MJPT 70N**	70	–
	MJPT 95N	95	–	CIL7	70-95	–	**MJPT 95N**	95	–
	MJPT 120N	120	–	CIL8(68)	120-150	–	**MJPT 120N**	120	–
	MJPT 150N	150	–	CIL8(68)	120-150	–	**MJPT 150N**	150	–
Insulated end terminal for copper buses	CPTAU 16, 25, 35, 50, 54,6, 70	16–70	–	SAL 1.27(272)	10–50	–	**CPTAU 16, 25, 35, 50, 54,6, 70**	16–70	–
	CPTAU 95	95	–	SAL 2.27 (272)	50–95	–	**CPTAU 95**	95	–
	CPTAU 120, 150	120, 150	–	SAL 3.27 (272)	95–185	–	**CPTAU 120, 150**	120, 150	–
Insulated end terminal for copper and aluminum buses	CPTA 16, 25, 35, 50, 54,6, 70	16–70	–	–	–	–	**CPTAUO 16, 25, 35, 50, 54,6, 70**	16–70	–
	CPTA 95	95	–	–	–	–	**CPTAUO 95**	95	–
	CPTA 120, 150	120, 150	–	–	–	–	**CPTAUO 120, 150**	120, 150	–
Cable tie	CCI 9-180	D 8–22	–	PER26.200	10–50	–	**KR 1**	D 15–60	–
	CCI 9-265	D 20–62	–	PER-15	10–80	–	**KR 2**	D 30–80	–
	CCI 9-360	D 20–92	–	PER26.375	10–105	–	**KR 3**	D 30–100	–
Mounting band	IF 207	упак. 50 м.	–	COT 37	упак. 25 м.	–	**F 20 (Premium)**	упак. 50 м.	–
Band bracket	CF 20	20 мм	–	COT 36	20 мм	–	**C20**	20 мм	–
	–	–	–	–	–	–	**B20**	20 мм	–
Insulating cap	GPE 3	10–35	–	PK99.025	10–25	–	**CI 6-35**	6–35	–
	GPE 5	50–95	–	PK99.2595	25–95	–	**CI 25-150**	25–150	–
Sealing tape	–	–	–	–	–	–	**LS 20**	–	–
Cable tie	–	–	–	–	–	–	**HF 207**	–	10,0
Surge protector	BOP-R 0,28/5*			SE 45 (46). 328-10*	–	–	**LVA 260***	–	–
	BOP-R 0,44/5*			SE 45 (46). 344-10*	–	–	**LVA 450***	–	–
	BOP-R 0,66/5*			SE 45(46)366-10*			**LVA 660***		
	*** - it is necessary to specify particular modification and decide whether it should be equipped with clamp or not**								

SPECIAL OVERHEAD LINE HARDWARE AND LIGHTNING PROTECTION DEVICES

FOR MEDIUM VOLTAGE WITH COVERED CONDUCTORS LINES (6-36 KV)

PRODUCTION MEETS REQUIREMENTS OF EN 50397 STANDARD (CENELEC) AND REQUIREMENTS OF RUSSIAN NATIONAL STANDARDS

SPIRAL CLAMPS OF SCNM, SC-S, SCNM-S TYPES

PURPOSE:

Production is intended for fixation on pin and supporting line insulators MV CC. Spiral clamps are made of metal wireline and have durable composite coating, which provides sufficient strength of cable end sealing. Goods are handy in installation and have color marking

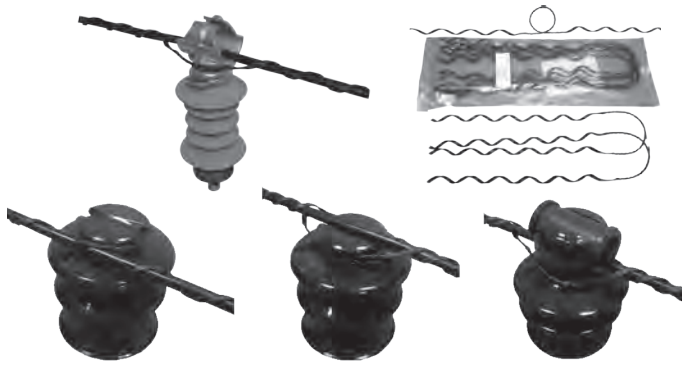


PHOTO 1 PHOTO 2 PHOTO 3

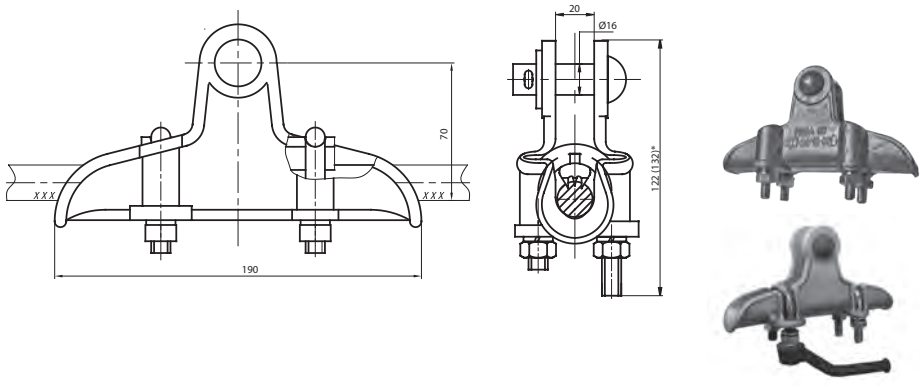
Modification SC(nm)--/--.1 is intended for single fixation on insulators (photo 1).
Modification SC(nm)--/--.2 is intended for double fixation on insulators (photo 2, 3).
Modification SCnm is made of non-magnetic materials and eliminates losses due to magnetic reverse.
Modification "S" is less in length and is intended for fixation of wires to insulators in stubs of anchor towers.

Name	Diameter of insulator groove, mm	Nominal cross-section area of the wire, mm²	Color marking	Qty in pack, pcs	Quantity in box, pcs
SC 35/50.1 SCnm 35/50.1 SC 35/50.1S SCnm 35/50.1S	75-85	35–50	yellow	12	120
SC 35/50.1-35 SCnm 35/50.1-35	100				
SC 35/50.1-P SCnm 35/50.1-P SC 35/50.1-PS SCnm 35/50.1-PS	50-60				
SC 35/50.2 SCnm 35/50.2	70-85				
SC 35/50.2-35 SCnm 35/50.2-35	100			6	240
SC 35/50.2-P SCnm 35/50.2-P	50-60				
SC 70/95.1 SCnm 70/95.1 SC 70/95.1S SCnm 70/95.1S	75-85	70–95	green	12	120
SC 70/95.1-35 SCnm 70/95.1-35	100				
SC 70/95.1-P SCnm 70/95.1-P SC 70/95.1-PS SCnm 70/95.1-PS	50-60				
SC 70/95.2 SCnm 70/95.2 SC 70/95.2P SCnm 70/95.2P	70-85				
SC 70/95.2-35 SCnm 70/95.2-35	100			6	240
SC 70/95.2-P SCnm 70/95.2-P	50-60				
SC 120/150.1 SCnm 120/150.1 SC 120/150.1У SCnm 120/150.1S	75-85	120–150	black	12	120
SC 120/150.1-35 SCnm 120/150.1-35	100				
SC 120/150.1-P SCnm 120/150.1-P SC 120/150.1-PS SCnm 120/150.1-PS	50-60				
SC 120/150.2 SCnm 120/150.2	70-85				
SC 120/150.2-35 SCnm 120/150.2-35	100			6	240
SC 120/150.2-P SCnm 120/150.2-P	50-60				

SUPPORT CLAMPS OF CS-30/12-20 TYPE

PURPOSE:

Clamps for fixation of MV CC to support insulating suspensions of intermediate and angle suspension towers. They have pressing bar with piercing parts. Don't require stripping of insulation off the wire in the point of installation. Don't cause losses due to magnetic reverse as they have no closed magnetic contour in their structure. Modification A (see scheme) are equipped with U-bolt, intended for connection of shunt APD-4.



Clamp CS-30/12-20 MV CC-K differs from CS-30/12-20 MV CC clamp in that its structure has special connector, intended for installation of service short-circuiting and grounding bar on it during implementation of repair works on overhead power lines. It eliminates necessity of additional equipping of overhead power lines with special products for this purpose.

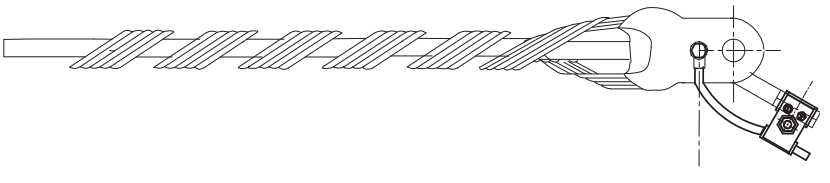
Name	Nominal cross-section area of the wire, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs
CS-30/12-20 MV CC	35, 50, 70, 95, 120, 150	30	0,75	30
CS-30/12-20 MV CC-A			0,76	
CS-30/12-20 MV CC-K			0,93	

* - there are dimensions for clamps of A and self-supporting LV ABC system modifications in brackets

TENSION CLAMPS OF TSC TYPE

PURPOSE:

Clamps for anchorage of MV CC. They are equipped with piercing clamps and shunt for connection of wire with dead eye. Spiral clamps are made of high tensile aluminum alloy wireline, dead eyes are made of aluminum alloy and provide connection to standard coupling accessories and insulators. Don't require stripping of insulation off the wire in the point of installation. Don't cause losses due to magnetic reverse.



Наименование	Номинальное сечение провода, мм²	Разрушающая нагрузка, кН, не менее	Масса, кг, не более
TSC-70	70	70	1,7
TSC-95	95		1,8
TSC-120	120		1,9
TSC-150	150		2,0
TSC-185	185		2,2
TSC-240	240		2,3

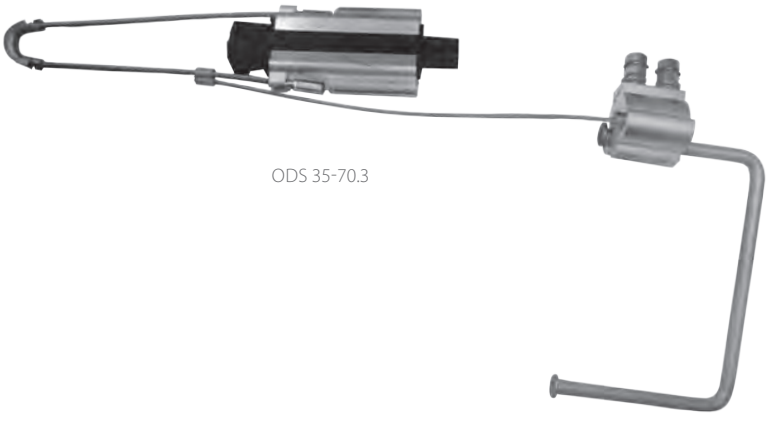
TENSION CLAMPS OF ODS 35-70 TYPE

PURPOSE:

Clamps for fixation of MV CC to tensioning insulation suspensions of anchor, angle anchor and dead-end towers.

Don't cause losses due to magnetic reverse. Don't require stripping of insulation off the wire in the point of installation. Clamp of ODS 35-70.3 is equipped with electrode for possibility of connection of service grounding bars during repairs.

ODS 35-70



ODS 35-70.3

Name	Nominal cross-section area of the wire, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs
ODS 35-70	35, 50, 70	20	0,5	10
ODS 35-70.3	35, 50, 70	20	0,9	5

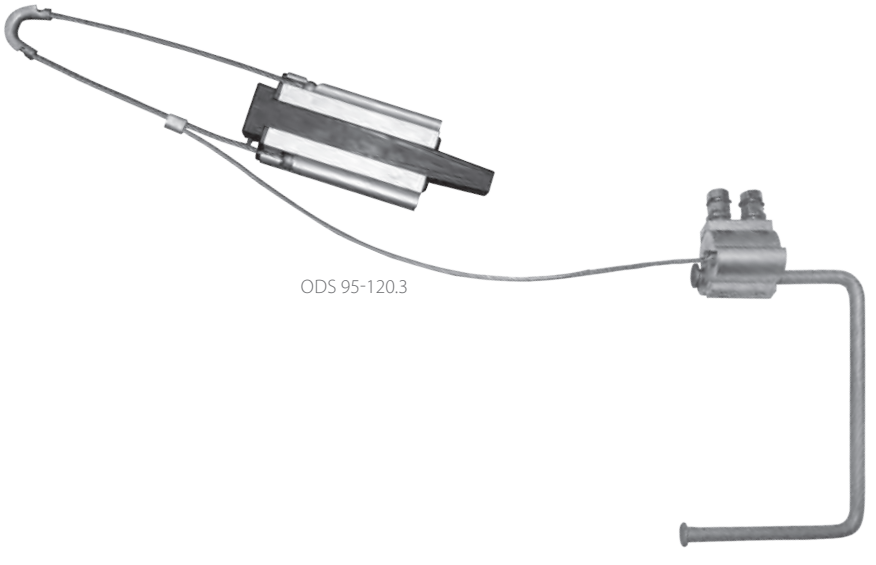
TENSION CLAMPS OF ODS 95-120 TYPE

PURPOSE:

Clamps for fixation of MV CC to tensioning insulation suspensions of anchor, angle anchor and dead-end towers.

Don't cause losses due to magnetic reverse. Don't require stripping of insulation off the wire in the point of installation. Clamp of ODS 95-120.3 is equipped with electrode for possibility of connection of service grounding bars during repairs.

ODS 95-120



ODS 95-120.3

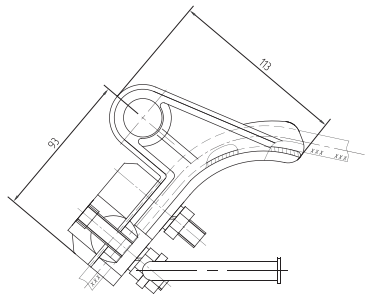
Name	Nominal cross-section area of the wire, mm²	Destructive load, kN, not less	Weight, kg, not more	Qty in package, pcs
ODS 95-120	95, 120	30	0,9	15
ODS 95-120.3	95, 120	30	1,3	10

TENSION BOLT CLAMPS OF TBC-60/5.6-16 TYPE

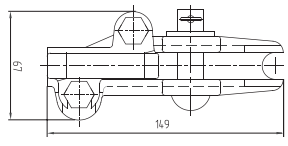
PURPOSE:

Clamps for fixation of MV CC to tensioning insulation suspensions of anchor, angle anchor and dead-end towers. It has body and pressing bar made of aluminum alloy, which eliminates losses due to magnetic reverse. Clamps are installed with more ease due to optimal design of pressing bar. They require stripping of insulation off wires in point of clamps installation.

TBC-60/5,6-16 K



TBC-60/5,6-16



TBC-60/5.6-16 K clamp is equipped with special connector, which allows to ensure installation of service grounding bar on it during repair works on overhead power lines - it eliminates necessity of additional equipping of overhead power lines with special products for this purpose.

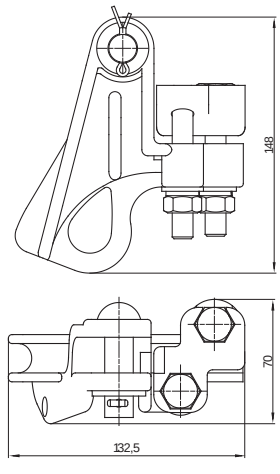
Name	Nominal cross-section area of the wire, mm²	Destructive load, kN, not less	Weight, kg, not more
TBC-60/5,6-16	35, 50, 70, 95, 120, 150	46,0	0,7
TBC-60/5,6-16 K			1,0

TENSION BOLT CLAMPS OF TBC-44/5.6-16 И TBC-44/5.6-16 K TYPE

PURPOSE:

Clamps for fixation of MV CC to tensioning insulation suspensions of anchor, angle anchor and dead-end towers. It has body and pressing bar made of aluminum alloy, which eliminates losses due to magnetic reverse. Clamps are installed with more ease due to optimal design of pressing bar. There is additional advantage of TBC-44/5.6-16 clamp, which consists in body with open contour, which also eases installation of clamp.

It requires stripping of insulation off wires in point of clamps installation.



There is additional advantage of TBC-44/5.6-16 clamp, which consists in body with open contour - it also eases installation of clamp on the wire.

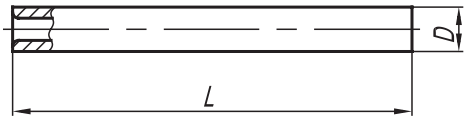
TBC-44/5.6-16 K clamp is equipped with special connector, which allows to ensure installation of quick grounding bar on it during repair works on overhead power lines - it eliminates necessity of additional equipping of overhead power lines with special products for this purpose. It has lug for attachment of winch during mounting of wire.

Name	Nominal cross-section area of the wire, mm²	Destructive load, kN, not less	Weight, kg, not more
TBC-44/5,6-16	35, 50, 70, 95, 120, 150	44,0	0,79
TBC-44/5,6-16 K			1,1

COMPRESSION CONNECTING CLAMPS OF CCC TYPE

PURPOSE:

Clamps for connection in spans of MV CC. Cable end sealing strength shall be 95 % of disruptive load of the conduit.



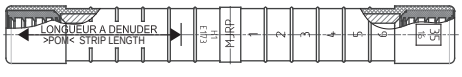
Wires with stripped off insulation are brought into clamp until partition is reached and then are compressed by dies, stated in table. Is shipped as set with heat shrink tube for recovering of the wire insulation (modification A).

Name	MV CC wire		Clamp dimensions, mm		Dies for compression	Weight, kg, not more
	Nominal cross-section area, mm²	Diameter, mm	Outer diameter, D	Length, L		
CCC-35-3(A)	35	6,7-7,1	16	150	E 140	0,07
CCC-50-3(A)	50	7,9-8,4		180		0,08
CCC-70-3(A)	70	9,5-10,0	20	195	E 173	0,12
CCC-95-3(A)	95	11,1-11,7	25	215	E 215	0,22
CCC-120-3(A)	95	12,2-12,9		235		0,22
	120	12,5-13,1				
CCC-150-3(A)	150	13,9-14,5	26	292	МШ 22,5	0,28

HERMETICALLY SEALED COMPRESSION CONNECTING CLAMPS OF MJRP-N TYPE

PURPOSE:

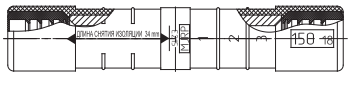
Clamps for connection in spans of MV CC. Cable end sealing strength shall be 95 % of disruptive load of the conduit.



Wires with stripped off insulation are brought into clamp until partition is reached and then clamp is compressed. Electrical contact is ensured through compressing and tightness - through elastomer seal.

Name	MV CC wire		Clamp dimensions, mm		Dies for compression	Weight, kg, not more
	Nominal cross-section area, mm²	Diameter, mm	Outer diameter, D	Length, L		
MJRP-35N	35	6,7-7,1	22	170	E 173	0,100
MJRP-50N	50	7,9-8,4				0,099
MJRP-70N	70	9,5-10,0				0,085
MJRP-95N	95	11,1-12,9	25	180	E 215	0,160
MJRP-120N	120	12,5-13,1				0,134
MJRP-150N	150	13,9-14,5				0,128

HERMETICALLY SEALED COMPRESSION CONNECTING CLAMPS OF MJRP TYPE



НАЗНАЧЕНИЕ:

Clamps for connection of MV CC in stubs of anchor towers. Cable end sealing strength shall be 30 % of disruptive load of the conduit.

Wires with stripped off insulation are brought into clamp until partition is reached and then clamp is compressed. Electrical contact is ensured through compressing and tightness - through elastomer seal.

Name	MV CC wire		Clamp dimensions, mm		Dies for compression	Weight, kg, not more
	Nominal cross-section area, mm²	Diameter, mm	Outer diameter, D	Length, L		
MJRP-35	35	6,7-7,1	22	105	E 173	0,070
MJRP-50	50	7,9-8,4				0,060
MJRP-70	70	9,5-10,0				0,055
MJRP-95	95	11,1-12,9	25	110	E 215	0,092
MJRP-120	120	12,5-13,1				0,082
MJRP-150	150	13,9-14,5				0,078

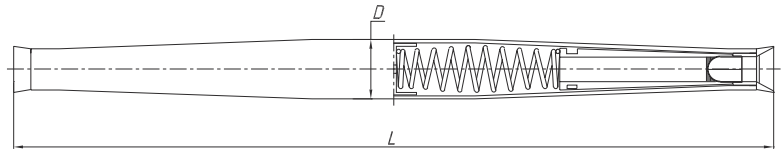
AUTOMATIC COLLET-TYPE CONNECTING CLAMPS OF CTCC TYPE

PURPOSE:

Clamps for connecting of MV CC in span. Connected conduits' ends shall be stripped off of insulation prior to installation.

For recovery of the wire insulation clamps are equipped with sealing insulating heat shrink tubes for 20 or 35 kV voltage in place of the installation.

Clamps are intended for installation at temperatures from -20 to +40 °C and operation at temperatures from -60 to +50 °C.



Преимущества:

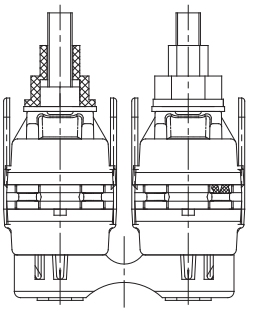
- Installation without tools as well as possibility of two-three types of wires with similar cross-sections areas, which is especially important during implementation of the emergency recovery works;
- Convenience and speed of installation are significantly higher than for spiral connection clamps. Installation, unlikely to spiral clamps, doesn't require special training of installation crew personnel;
- Made of high-tensile aluminum alloy and ensure cable end sealing strength equal to 95 % of disruptive load of the conduit;
- Don't cause losses due to magnetic reverse and don't cause heating of wires in place of its installation;
- Have high corrosive resistance;
- Have color marking for assistance in identification of clamp unit size.

Name	Plug color	Nominal cross-section area of the wire, mm²	Diameter, D, mm	Length, L, mm
CTCC 66-20	Red	35-50	25	325
CTCC 66-35				
CTCC 67-20	Yellow	70-95	33	390
CTCC 67-35				
CTCC 68-20	Pink	(95*) 120-150	44	535
CTCC 68-35				
CTCC 69-20	Green	185-240		
CTCC 69-35				

HERMETICALLY SEALED BRANCH PIERCING CLAMPS ORP 150

PURPOSE:

Clamps for electrical connection of MV CC in branches going from the main line as well as in stubs of anchor towers.



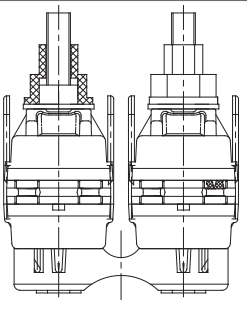
Clamps are equipped with shear heads (metal or plastic) which limits tightening torque on bolts. Modification (M) is equipped with metal shear head. Clamp body has grey colored e;ements for visual differentiation from LV ABC clamps.

Name	MV CC		Weight, kg, not more	Quantity in box, pcs
	Nominal cross-section area of main line, mm²	Nominal cross-section area of branch, mm²		
ORP 150 ORP 150M	25–150	25-150	0,48	30

BRANCH PIERCING CLAMPS ORPN 150

PURPOSE:

Clamps for electrical connection of MC CC with uninsulated wires.



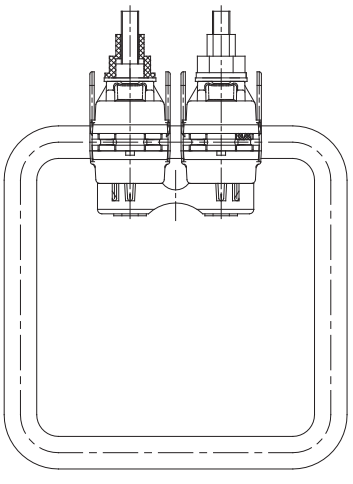
Clamps are equipped with shear heads (metal or plastic) which limits tightening torque on bolts. Modification (M) is equipped with metal shear head. Clamp body has grey colored elements for visual differentiation from LV ABC clamps.

Name	Cross-section area		Weight, kg, not more	Quantity in box, pcs
	Nominal cross-section area of LV CC wire, mm²	Nominal cross-section area of bare wire, mm²		
ORPN 150 ORPN 150M	25-150	25-150	0,48	30

SERVICE GROUNDING CLAMPS ORPN-D

PURPOSE:

Clamps for application of mobile service grounding during implementation of repair works on overhead power lines. Structure comprises clamp ORPN 150(M) and brackets D. Clamps are equipped with shear heads (metal or plastic) which limit tightening torque on bolts. Modification (M) is equipped with metal shear head.

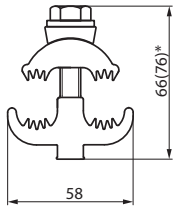


Name	Nominal cross-section area of MV CC wire, mm²	Weight, kg, not more	Quantity in box, pcs
ORPN-D ORPN-DM	25-150	0,69	20

BRANCH PIERCING CLAMP
BPC-1

PURPOSE:

Clamp for electrical connection of MV CC in branches going from the main line as well as in stubs of anchor towers.




BPC-1


BPC-1C


PIC-02

Has both contact groups of piercing type. Body is made of corrosion resistant aluminum alloy. Clamp is preliminary filled with grease. It can be equipped with protective cover PIC-02. Clamps of C modification are equipped with shear head bolts which limit tightening torque on bolts. Possibility of fixation of back part of the clamp with ST 34, D3 wrenches (or similar) eases tightening of bolts.

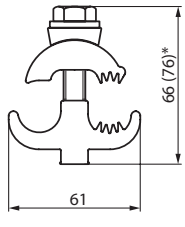
Name	Wire MV CC		Bolt tightening torque, Nm	Weight, kg, not more	Quantity in box, pcs
	Nominal cross-section area of main line, mm²	Nominal cross-section area of branch, mm²			
BPC-1 BPC-1C	35–150	35–150	50	0,27	40

* - there is a dimension for clamps of C modification in brackets.

BRANCH PIERCING CLAMP
BPC-2

PURPOSE:

Clamp for electrical connection of MV CC with uninsulated wires. Clamp has contact group of piercing type for applying to MV CC. For uninsulated wire there is a contact group of steel die clamp type.




BPC-2


BPC-2C


PIC-02

Body is made of corrosion resistant aluminum alloy.

Clamp is preliminary filled with grease.

It can be equipped with protective cover PIC-02.

Clamps of C modification are equipped with shear head bolts which limit tightening torque on bolts. Possibility of fixation of back part of the clamp with ST 34, D3 wrenches (or similar) eases tightening of bolts.

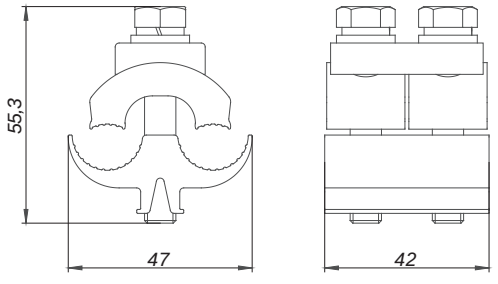
Name	Cross-section area		Bolt tightening torque, Nm	Weight, kg, not more	Quantity in box, pcs
	Nominal cross-section area of MV CC wire, mm²	Nominal cross-section area of bare wire, mm²			
BPC-2 BPC-2C	35–150	35–150	50	0,27	40

* - there is a dimension for clamps of C modification in brackets.

STEEL DIE CLAMP PC 150

PURPOSE:

Clamp for electrical connection of wires in MV CC main line when they are connected in stubs of anchor towers. In this case it will be necessary to strip off wire insulation at the place of clamp application and also using of steel covers of PIC-02 type will be required.



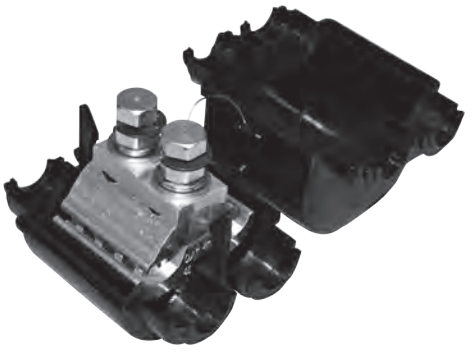
Besides, it may be used for connection of uninsulated aluminum or steel conduits of 6-36 kV overhead power lines. It is made of corrosion resistant aluminum alloy and equipped with two M8 bolts. Possibility of fixation of back part of the clamp with ST 34, D3 wrenches (or similar) eases tightening of bolts.

Name	Nominal cross-section area of main line, mm²	Nominal cross-section area of branch, mm²	Bolt tightening torque, Nm	Weight, kg
PC 150	16-150	16-150	22	0,13

PROTECTIVE COVER PIC-02

PURPOSE:

Cover is used with clamps of BPC and PC 150 and protects birds from direct contact with BPC or PC 150 clamps.



Name	Weight, kg	Quantity in box, pcs
PIC-02	0,07	80

SERVICE BRANCH CLAMPS SBC 30 AND SBC 30.1

3B3 30

3B3 30.1

PURPOSE:

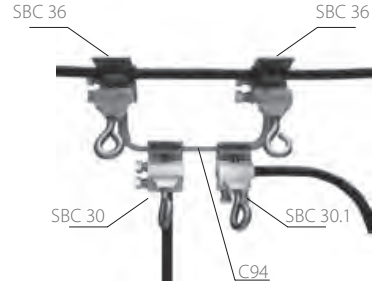
Clamps for creation of service MV CC branches, and it is used for this purpose together with brackets C93, C94 and clamps SBC 36.

Body made of corrosion resistant aluminum alloy. Bolts with eye are made of galvanized steel. Bolts for fixation of branch wires are made of corrosion-resistant aluminum.

Installation of clamp under voltage can be made with CT48 bar or similar.

Name	Nominal cross-section area of main line, mm²	Nominal cross-section area of tee-off, mm²	Tightening torque, N*m	Weight, kg, not more
SBC 30	25-150	25-150	40	0, 48
SBC 30.1	25-150	25-150	40	0, 45

SERVICE BRANCH CLAMP SBC 36



PURPOSE:

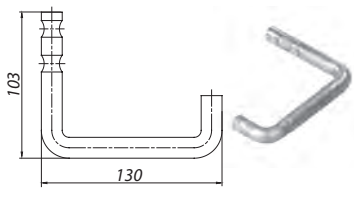
Clamp for creation of service branch from MV CC or for service grounding of MV CC.

It is equipped with piercing elements and doesn't require stripping of insulation off wires in point of clamps installation. Body made of corrosion resistant aluminum alloy. Bolt with eye are made of galvanized steel. Bolts for fixation of brackets C93 or C94 are made of corrosive-resistant aluminum.

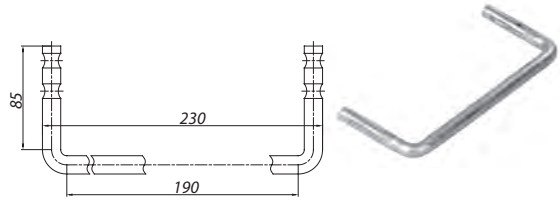
Remote installation of clamp under voltage can be made with CT48 bar or similar.

Name	Nominal cross-section area of MV CC main line, mm²	Nominal cross-section area of tee-off, mm2	Tightening torque, N*m	Weight, kg, not mo
SBC 36	35-185	35-157	40	0, 44

SERVICE BRANCH CLAMP BRACKETS C93 AND C94



C93



C94

PURPOSE:

Brackets for application together with clamps SBC 36 and SBC 30 (SBC 30.1) for creation of service branch from MV CC or service grounding of MV CC.

Bracket is installed into SBC 36 clamp and fixed there with bolts of clamp. Then the clamp SBC 30 or clamp SBC 30.1 is connected to bracket, and, in its turn, service branch from MV CC is connected to the above mentioned clamp.

If it is necessary to create service grounding for MV CC, service grounding bar shall be attached to the bracket.

Name	Weight, kg, not more
C93	0,1
C94	0,17

IMPORTANCE OF LIGHTNING PROTECTION FOR 6-35 KV OVERHEAD POWER LINES AND MV CC

LIGHTNING PROTECTION FOR 6-36 KV OVERHEAD POWER LINES WITH SURGE PROTECTORS OF APD-EVS-SG-10 TYPE MANUFACTURED BY "MZVA" LLC.

One of the most frequent causes of accidents and power failures at overhead power lines with 6-10 kV voltage are lightning impacts, which account for up to 40% from total number of their disconnections. They cause damage of insulators, towers, wires, lead to ground faults, arc power surges and automatic disconnections. Due to low level of impulse strength of linear insulation, 6-10 kV overhead power lines are highly susceptible to disconnections during thunderstorms, cause almost all surges from direct lightning strikes and significant part of induced surges lead to insulator flashovers turning with high possibility into power arc with voltage of industrial frequency.

Problem of protection of MV CC with insulated wire from lightning has such particularity that, in case of unavailability of special measures, at flashover of line insulators due to lightning, appearing with high possibility power arc of industrial frequency has no possibility to move along the wire and remains at the place of insulation failure till the moment of line disconnection. It frequently leads to damage of insulators, burns on wire insulation and, in case of high short circuit currents - to burning out of wires.

For protection of the overhead power lines of alternate current with voltage of 6, 10, 15, 20 and 36 kV from atmospheric (lightning) surges, "MZVA" LLC in cooperation with R&D company "Polymer-Apparat" has developed protection devices of APD-EVS-SG type, which represent linear surge protector with outer spark gap.

They ensure decrease in number of lightning-caused overhead line disconnections and prevent burning outs of insulated MV CC wires caused by arc of the current, which associates lightning impulse and has industrial frequency.

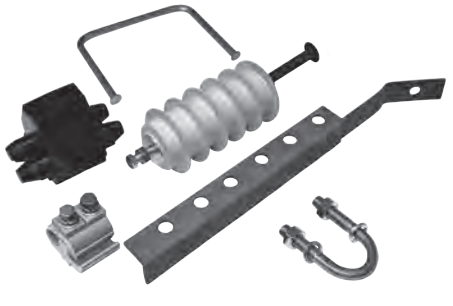
Device consists of:

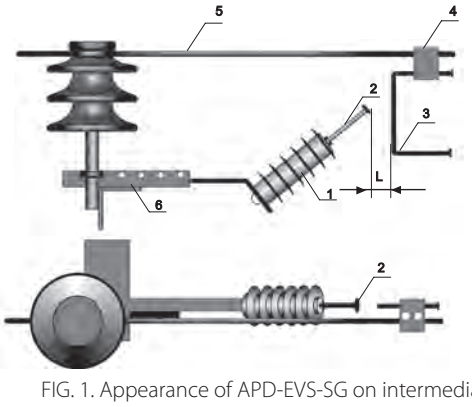
- surge protector non-linear of special construction;
- spark gap between phase wire and surge protector non-linear.

Non-linear surge protector represents protective device, which consists of one column of connected in series voltage-variable resistors, enclosed in sealed composite casing. Excess-voltage suppressor is fixed on towers of overhead power lines (both anchor and intermediate) with special fixtures. Fig. 1 shows example of APD-EVS-SG structure for the most common intermediate towers of 10 kV overhead power lines with pin insulators. In this case spark gap is made by electrodes, one of which is fixed on the upper flange of excess-voltage suppressor and the second - on the wire with clamp (piercing clamp for MV CC). Design of electrodes and way of fixation of device allow to maintain value of spark gap L constant in any weather conditions. In cases of impacts on wires, induced by surges due to lightning discharges near overhead power lines or in cases of direct strikes of lightnings to MV CC wires, spark gap of APD-EVS-SG is pierced and non-linear surge protector is connected, which, because of lowering of its own resistance, in this moment effectively transfer surge through electrodes to grounded parts of towers, bypassing insulators and it prevents them from flashover and damages as well as wire from burning out. After removal of surge occurred from an impact of voltage of industrial frequency, current through surge protector non-linear due to recover of resistance in surge protector non-linear up to initial values is restricted to value, which makes existence of arc in spark gap impossible and arc fades out. Devices can be installed at quantities of one for each tower with alternating phases (fig. 2). Also APD-EVS-SG can be installed at quantities of three for each tower, i. e. one device for each phase with following skipping of two towers (fig. 3, photo 4).

Application of APD-EVS-SG-10-P (SL) devices in accordance with stated above installation scheme allows:

- fully put aside installation of additional devices on overhead power lines, ensuring of service grounding bars connection, cause one of APD-EVS-SG-P(SL) electrodes is adapted for this purpose (and it unambiguously has economic feasibility);
- provide guaranteed connection points for bars at every 120-180 m depending on span length;
- eases and accelerates installation of overhead power lines due to no need for ascending on every tower of overhead power lines for installation of devices, i. e. three devices are installed at each ascend.





1. Special excess-voltage suppressor.
2. Electrode 1.
3. Electrode 2.
4. Piercing clamp.
5. Wire.
6. Bracket.

L - Spark gap.

FIG. 1. Appearance of APD-EVS-SG on intermediate tower with pin insulators

SCHEMES OF INSTALLATION OF APD-EVS-SG-10 ON THE LINE

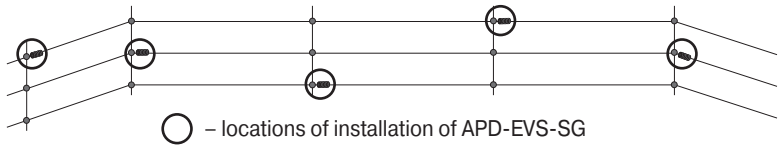


FIG. 2. Scheme of installation APD-EVS-SG in "checkered" pattern

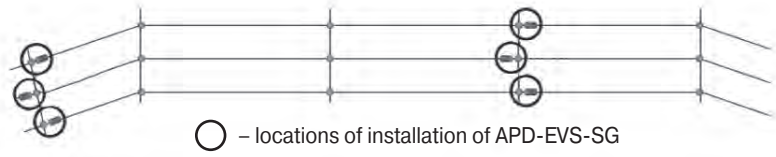


FIG. 3. Scheme of installation of APD-EVS-SG on 6-10 kV MV CC for ensuring of possibility of mobile grounding bars connection without installation of additional clamps on wires.

If it is necessary, APD-EVS-SG may be installed in quantity of three devices on each tower (one for each phase) without skipping of towers. Such scheme is recommended for protection: 6-36 kV MV CC with spans more than 80 meters, local objects at overhead power lines, overhead power lines with unusually high resistance at towers grounding, critical overhead power lines, etc.

PHOTO. 4. Scheme of installation of APD-EVS-SG on 6-20 kV MV CC for ensuring of possibility of mobile grounding bars connection without installation of additional clamps on wires.

Parameter name	APD-EVS-SG-6	APD-EVS-SG-10	APD-EVS-SG-15	APD-EVS-SG-20	APD-EVS-SG-35
Network voltage class, kV	6	10	15	20	35
Maximum continuous working voltage, (UMCW), kV	7.6	12.7	17.5	24	40.5
Residual voltage (kV) during thunder current impulses of 8/20 μs with amplitude:					
2500 A	22.6	31.2	38.0	53.5	–
5000 A	24.3	33.6	41.0	57.6	81.9
10000 A	27.2	37.6	45.8	64.1	89.6
20000 A	–	–	–	–	101.0
Capacity for dissipation of energy of rated square-wave impulse with duration of 2000 μs, kJ, not less	14.2	20.6	25.1	35.3	112
Length of spark gap, L, mm	40	60	70	80	120
50% spark voltage of lightning impulse at spark gap, kV, not more	75	92	98	107	140

Main benefit of APD-EVS-SG devices is an ability of protection of wires from burning out without MV CC disconnection.
Additional benefits of APD-EVS-SG devices are:

- working capacity of device, which doesn't depend on rate of its pollution;
- working capacity in case of full short circuit of spark gap under the influence of ambient factors (for example, tree fallen onto line, atmospheric ice, etc.);
- device is specially adapted for connection of mobile grounding bars for assurance of compliance to requirements of safety regulations during works on overhead power lines, which until now represented significant technical difficulties on lines with insulated wires of 6-36 kV voltage class.

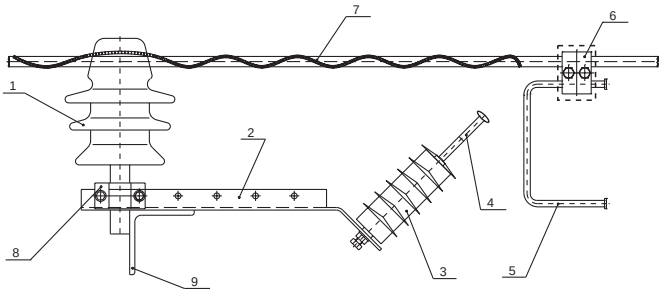
During operation damage of excess-voltage suppressor, which is a part of APD-EVS-SG, is unlikely, but, even if such accident happens, availability of external spark gap in the structure of APD-EVS-SG doesn't allow stable short circuit in case of damage of excess-voltage suppressor. Damaged device can easily be identified visually and may be superseded with new on a scheduled basis.

TYPICAL INSTALLATION SCHEMES

INSTALLATION SCHEMES APD-EVS-SG-6-P, APD-EVS-SG-10-P, APD-EVS-SG-15-P, APD-EVS-SG-20-P, APD-EVS-SG-35-P ON INTERMEDIATE TOWERS OF MV CC WITH 6, 10, 20, 36 KV VOLTAGE WITH PIN INSULATORS OF ALL MODIFICATIONS.

APD-EVS-SG set has only elements No. 2, 3, 4, 5, 6, 8.
Photo 1.

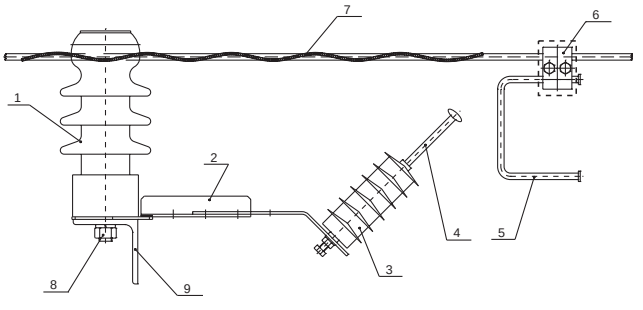
1 - insulator;
2 - bracket;
3 - surge protector non-linear;
4 - electrode No 1;
5 - electrode No 2;
6 - piercing clamp with cover;
7 - spiral binding;
8 - tie;
9 - cross arm.



INSTALLATION SCHEMES APD-EVS-SG-10-SL, APD-EVS-SG-15-SL, APD-EVS-SG-20-SL, APD-EVS-SG-35-SL ON INTERMEDIATE TOWERS OF MV CC WITH 10, 20, 36 KV VOLTAGE WITH SUPPORTING LINE INSULATORS OF ALL MODIFICATIONS.

APD-EVS-SG set has only elements No. 2, 3,
4, 5, 6.
Photo 2

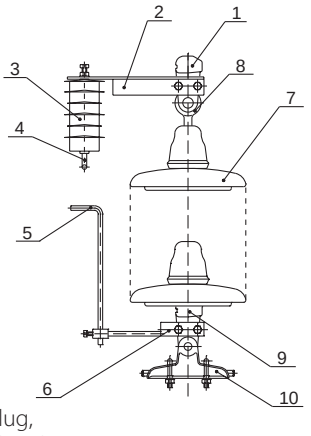
1 - insulator;
2 - bracket;
3 - surge protector non linear;
4 - electrode No 1;
5 - electrode No 2;
6 - piercing clamp with cover;
7 - spiral binding;
8 - M20 nut;
9 - cross arm.



INSTALLATION SCHEMES APD-EVS-SG-6-SG, APD-EVS-SG-10-SG, APD-EVS-SG-15-SG, APD-EVS-SG-20-SG, APD-EVS-SG-35-SG ON INTERMEDIATE OR ANCHOR TOWERS OF MV CC 6, 10, 20, 36 KV ON GLASS INSULATORS.

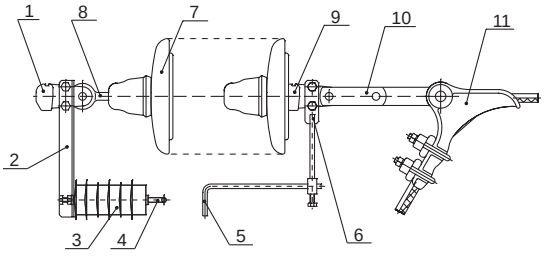
APD-EVS-SG set has only elements No. 2, 3, 4, 5, 6.

SUPPORT SUSPENSION



1 - lug,
2 - bracket,
3 - surge suppressor non-linear,
4 - electrode No 1,
5 - electrode No 2,
6 - bracket,
7 - insulator,
8 - clevis,
9 - lug,
10 - support clamp

TENSION SUSPENSION

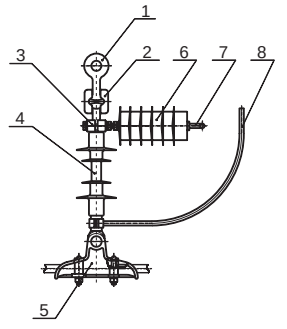


1 - lug,
2 - bracket,
3 - surge suppressor non-linear,
4 - electrode No 1,
5 - electrode No 2,
6 - bracket,
7 - insulator,
8 - clevis,
9 - lug,
10 - intermediate adjusted section,
11 - tension clamp

INSTALLATION SCHEMES APD-EVS-SG-6-CS, APD-EVS-SG-10-CS ON INTERMEDIATE OR ANCHOR TOWERS OF MV CC 6, 10 KV WITH COMPOSITE SUSPENSION INSULATORS.

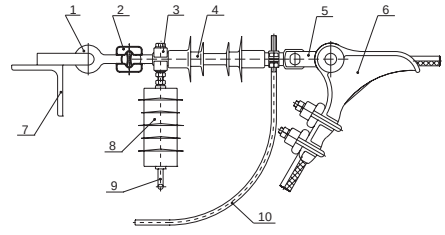
APD-EVS-SG set has:
A) for tension suspension only elements No 3, 8, 9, 10.
B) for support suspension only elements No 3, 6, 7, 8.

SUPPORT SUSPENSION



1 - clevis,
2 - double lug,
3 - attachment node of surge protector non-linear on end terminal of insulator,
4 - insulator,
5 - support clamp*,
6 - surge protector non-linear,
7 - electrode No 1,
8 - electrode No 2.

TENSION SUSPENSION

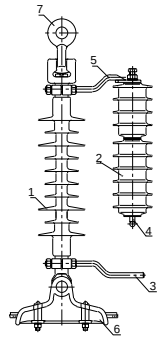


1 - clevis,
2 - double lug,
3 - attachment node of surge protector non-linear on end terminal of insulator,
4 - insulator,
5 - intermediate section,
6 - tension clamp**,
7 - cross arm,
8 - surge protector non-linear,
9 - electrode No 1,
10 - electrode No 2.

INSTALLATION SCHEME APD-EVS-SG-15-CS, APD-EVS-SG-20-CS ON INTERMEDIATE OR ANCHOR TOWERS OF MV CC 15, 20 KV WITH COMPOSITE SUSPENSION INSULATORS

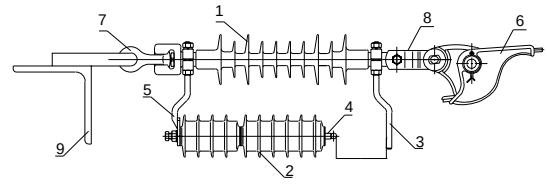
APD-EVS-SG set has only elements No. 2, 3, 4, 5.

SUPPORT SUSPENSION



1 - insulator,
2 - surge protector non-linear,
3 - electrode No 1,
4 - electrode No 2,
5 - bracket,
6 - support clamp,
7 - clevis.

TENSION SUSPENSION

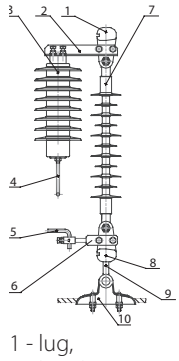


1 - insulator,
2 - surge protector non-linear,
3 - electrode No 1,
4 - electrode No 2,
5 - bracket,
6 - tension clamp,
7 - clevis,
8 - intermediate clevis-tenon section,
9 - cross arm

INSTALLATION SCHEMES APD-EVS-SG-35-CS ON INTERMEDIATE OR ANCHOR TOWERS OF MV CC 36 KV WITH COMPOSITE INSULATORS.

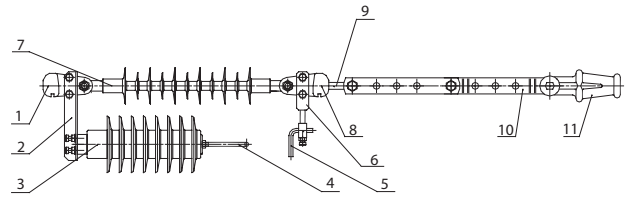
APD-EVS-SG set has only elements No. 2, 3, 4, 5, 6.

SUPPORT SUSPENSION



1 - lug,
2 - bracket,
3 - surge protector non-linear,
4 - electrode No 1,
5 - electrode No 2,
6 - bracket,
7 - insulator,
8 - lug,
9 - clevis,
10 - support clamp.

TENSION SUSPENSION



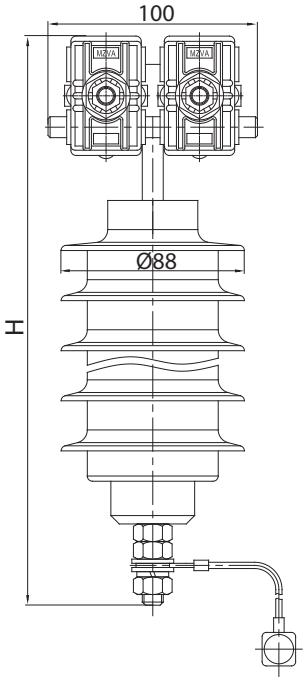
1 - lug,
2 - bracket,
3 - surge protector non-linear,
4 - electrode No 1,
5 - electrode No 2,
6 - bracket,
7 - insulator,
8 - lug,
9 - clevis,
10 - intermediate adjusted section,
11 - tension clamp.

SURGE PROTECTORS (IMPULSE) OF APD-EVS-S-6 AND APD-EVS-S-10 TYPES

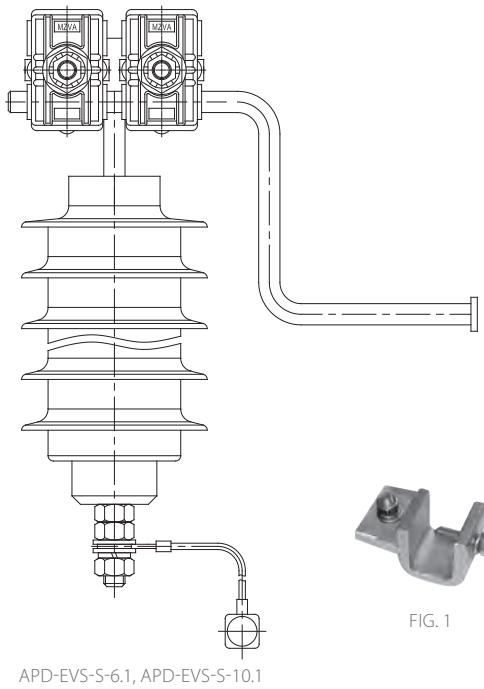
PURPOSE:

Devices for protection of overhead power lines of 6-10 kV from atmospheric (lightning) induced surges. Devices ensure lowering of number of lightning disconnections of overhead power lines and prevent insulated wires burning out of the overhead power lines from an arc, which goes together with lightning impulse of current with industrial frequency. Device consists of: surge protector non-linear of special design, clamp for connection of device to protected wire and grounding conduit, which is connected by one end to isolator of surge protector non-linear and by another to grounded part of overhead power lines tower steelworks (cross arm).

Modifications of APD- EVS-S-6.1 и APD-EVS-S-10.1 devices have in their design connector for connection of mobile grounding bars and screw clamp (fig. 1) for simplification of connection of grounding conduit to vertical or horizontal wing of cross arm angle.



APD-EVS-S-6, APD-EVS-S-10



APD-EVS-S-6.1, APD-EVS-S-10.1

FIG. 1

Parameter name	APD-EVS-S-6 APD-EVS-S-6.1	APD-EVS-S-10 APD-EVS-S-10.1
Network voltage class, kV	6	10
The most long term working voltage, (UMCW), kV	7,6	12,7
Nominal voltage, kV	9,5	15,9
Nominal discharge current, A	10000	
Residual voltage during thunder current impulses of 8/20 μs, kV with amplitude:	22,2	37,1
5000 A	24,3	40,6
10000 A	27,3	45,6
20000 A	30,4	50,8
Capacity for dissipation of energy of rated square-wave impulse with duration of 2000 μs, kJ, not less	280	330
N, mm.		

SCHEME OF INSTALLATION OF APD-EVS-S ON LINE

Devices can be installed on overhead power lines in checkered order with alternating phases (fig.2)

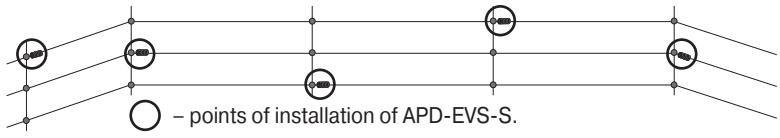


FIG. 2. Scheme of APD-EVS-S installation in checkered order

Products also can be installed in quantity of three for each tower with skipping of following two tower (fig. 3).

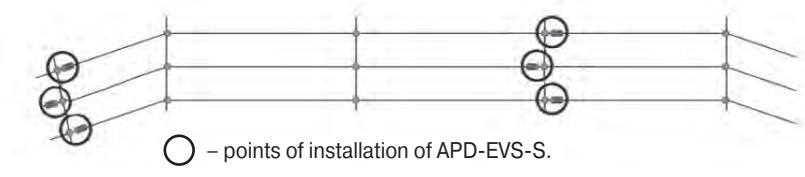


FIG. 3. Scheme of installation of APD-EVS-S on MV CC 6-10 kV for possibility of connection of mobile grounding bars without installation of additional clamps on wires.

Application of APD-EVS-S-6.1 and APD-EVS-S-10.1 accordingly with above stated scheme, shown on fig. 3 of installation allows:

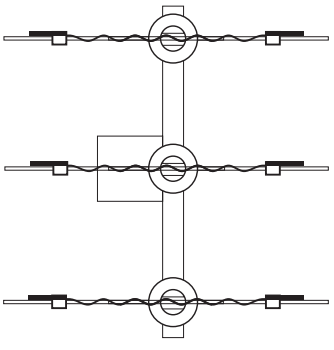
- to reduce quantity of installed on overhead power lines additional devices, providing connection of service grounding bars, which unambiguously has economic feasibility;
- to reduce quantity of uninsulated products under voltage, which are installed on wires, protected with insulation, which reduces possibility of MV CC disconnection due to interphase short circuits caused by falling of foreign bodies, for example, branches of woods, onto MV CC;
- to provide guaranteed points for connection of service grounding bars at every 120-180 m depending on span length. This will allow to implement repair in the shortest terms with compliance to necessary requirements of safety rules without spending time for preparation of points for grounding bars connection on MV CC, which usually requires installation of additional expensive products. Besides, these products shell be kept in emergency backup and their safe installation from the ground requires use of insulated tools, which cost several scores of thousand rubles;
- to reduce time of overhead power lines construction, with triple reduction of number of required ascends on towers for devices installation.

For elimination of possibility of long-term single-phase short-circuits, caused by possible damage of surge protector non-linear, which is a part of device (for example, due to direct lightning strike with current amplitude more than 65 kA), isolator of surge protector non-linear will perform shoot-off of grounding conduit of damaged device.

Arc protection horns (devices for protection from arc (APD).

Structure and placement of arc protection horns is chosen in such way as to any long-term single-phase short-circuit would transform into multi-phase and then automatic protection would disconnect the whole overhead line. At the next automatic switch-on the line is brought into initial condition. As for short-term single-phase short-circuit, it is, thanks to spiral shunts, protecting wire in near insulators, doesn't represent danger for insulated wire and doesn't lead to interphase short-circuit and, consequently, to disconnection of the line by automatic protection, and it is proved by experience of operation of common overhead power lines with uninsulated wires.

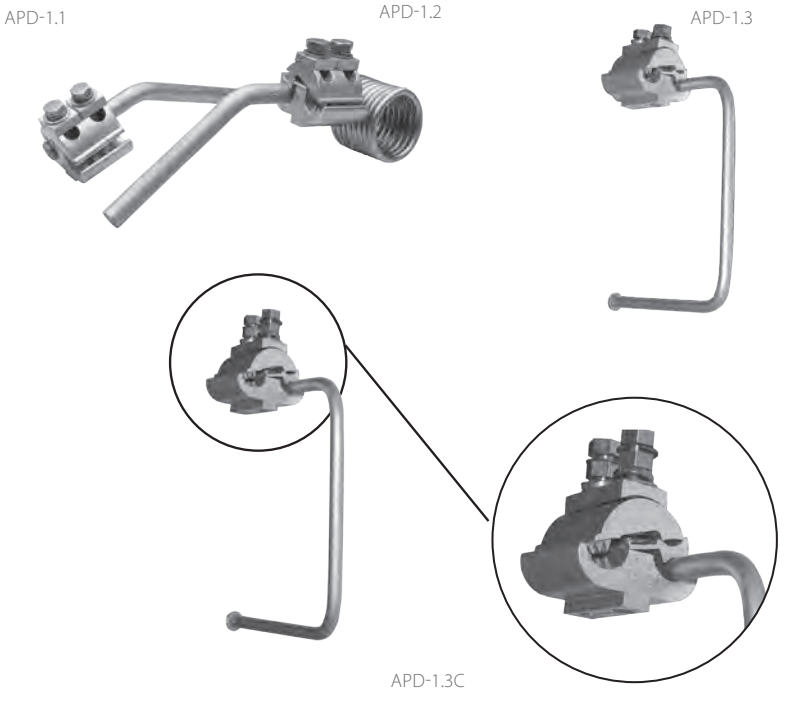
Simply stated, arc protection horns, installed on all three wires together with spiral shunts, winding around wire, near insulators imitate section with "bare" wires near the tower (about 1.5 meters at each phase). Since arc on the line with uninsulated wires under the influence of electrodynamic forces can move one of its ends along the wire, it is unlikely that the latter can be damaged due to thermal impact of the arc, and it is proved by operation experience of common overhead power lines 6-35 kV with uninsulated wires.



ARC PROTECTION DEVICES APD-1.1, APD-1.2, APD-1.3

PURPOSE:

Devices for protection of MV CC with cross-section area of 35-150 mm^2 from lightning surges. Devices consist of the clamp, horn and aluminum shunt (for APD-1.2), rolled in shape of helical spring for easy installation and shipping. There is no need in stripping off of insulation at installation. APD-1.3 is adopted for connection of mobile grounding bars and has a horn for this purpose, which is bended twice under angle of 90°, with thickening at the end, excluding possibility of sliding away of mobile grounding bar.



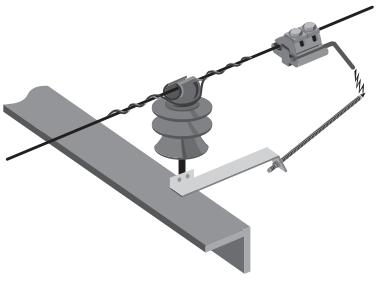
Devices of C modification are equipped with shear head bolts. This excludes necessity of torque wrench using at installation of device, which makes installation method easier and ensures reliability of electrical contact.

Name	Bolts tightening torque, N*m	Weight, kg	Quantity of pcs. in package
APD-1.1	40	0,5	18
APD-1.2		0,6	12
APD-1.3		0,6	12
APD-1.1C		0,5	18
APD-1.2C		0,6	12
APD-1.3C		0,6	12

ARC PROTECTION DEVICES APD-2, APD-2.1

PURPOSE:

Devices for protection of MV CC with cross-section area of 35-150 mm2 and pin insulators from lightning surges through the creation of protective spark gap on intermediate towers of overhead power lines. APD-2 is used on towers with pin insulators. APD-2.1 is used on towers with supporting line insulators.



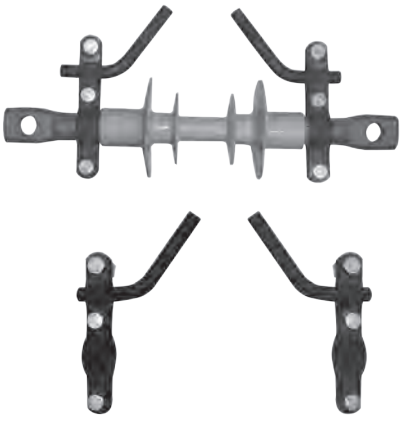
Devices of C modification are equipped with shear head bolts.

Name	Bolts tightening torque, N*m	Weight, kg
APD-2 APD-2.1 APD-2C APD-2.1C	40	1,6

ARC PROTECTION DEVICE APD-3

PURPOSE:

Device for protection of MV CC and composite suspension insulators of CS type from lightning surges. Includes two aluminum clamps with horns, which are installed on end terminals of composite insulator in such way as horn ends would be directed against each other for creation of protective spark gap.



APD-3

Name	Bolts tightening torque, N*m	Weight, kg
APD-3	40	0,91

ARC PROTECTION DEVICE APD-4

PURPOSE:

Device for protection of MV CC and composite suspension insulators of CS type from lightning surges. Set consists of two arc-protective horns, cable end, piercing clamp and stub of 0.5 m length.

APD-4

APD-4.1

piercing clamp of the device of C modification is equipped with shear head bolts.

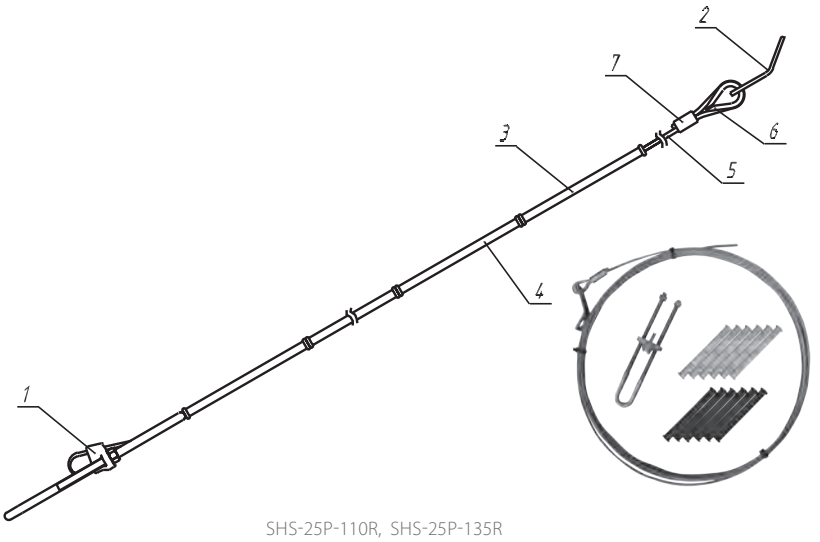
Name	Bolts tightening torque, N*m	Weight, kg
APD-4 APD-4C	40	1,3
APD-4.1		1,0

SETS OF WIRE ROPES FOR GUYS AND INSULATED WIRE ROPES FOR GUYS OF SHS TYPE

PURPOSE:

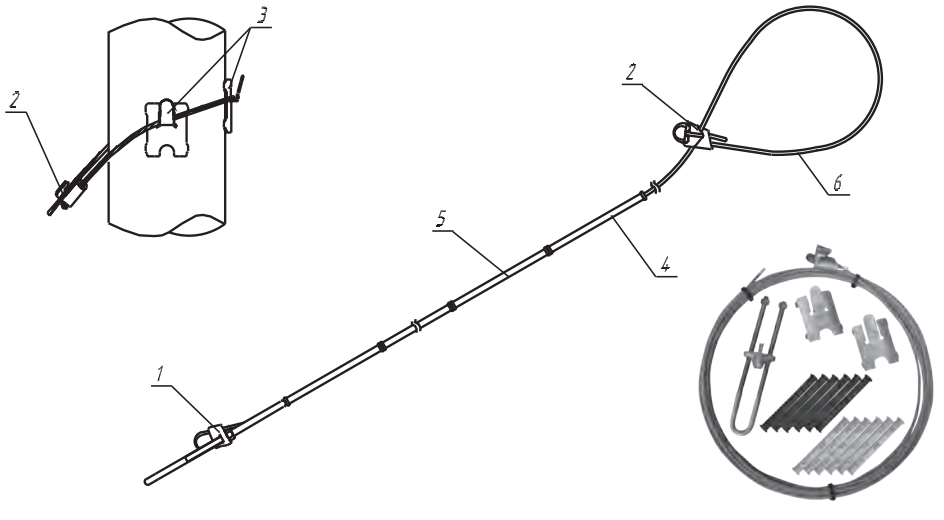
Sets for ensuring of additional stability of wooden towers LVA ABC and MV CC.

1 - Cone-type tension clamp,
2 - Plate with holes of Ø 20 mm (for bolt),
3 - Guy rope marker "Black",
4 - Guy rope marker "Yellow",
5 - Wire rope (steel wire rope),
6 - Dead eye,
7 - Wire rope clamp.



SHS-25P-110R, SHS-25P-135R

1 - Cone-type tension clamp
2 - Cone-type lock for guy rope,
3 - Guy rope bracket CH 187,
4 - Guy rope marker "Black",
5 - Guy rope marker "Yellow",
6 - Wire rope (steel wire rope).

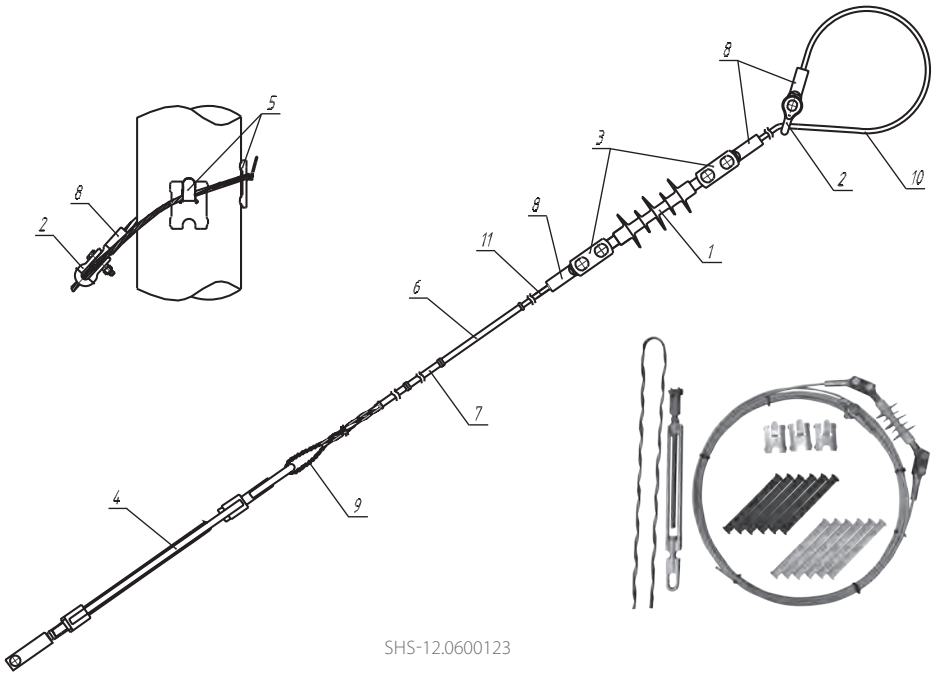


SHS-25P-110L, SHS-25P-135L

Depending on scope of supply set includes wire ropes for guys with various end terminals, brackets, guy rope clamp or guy rope anchor. Metal details of sets are made of galvanized steel, aluminum alloy and cast iron, markers are made of weather-proof plastic. Sets of wire ropes for guys with L and SHS-12.0600123 marking are attached to tower with special brackets, sets of wire ropes for guys with R marking - through the hole in the tower. Sets of wire ropes for guys of overhead power lines 6-20 kV include composite insulators. MZVA manufactures special anchor bolts for fixation of guy wire ropes to the ground. Lifespan of sets of ropes for guy ropes - 40 years.

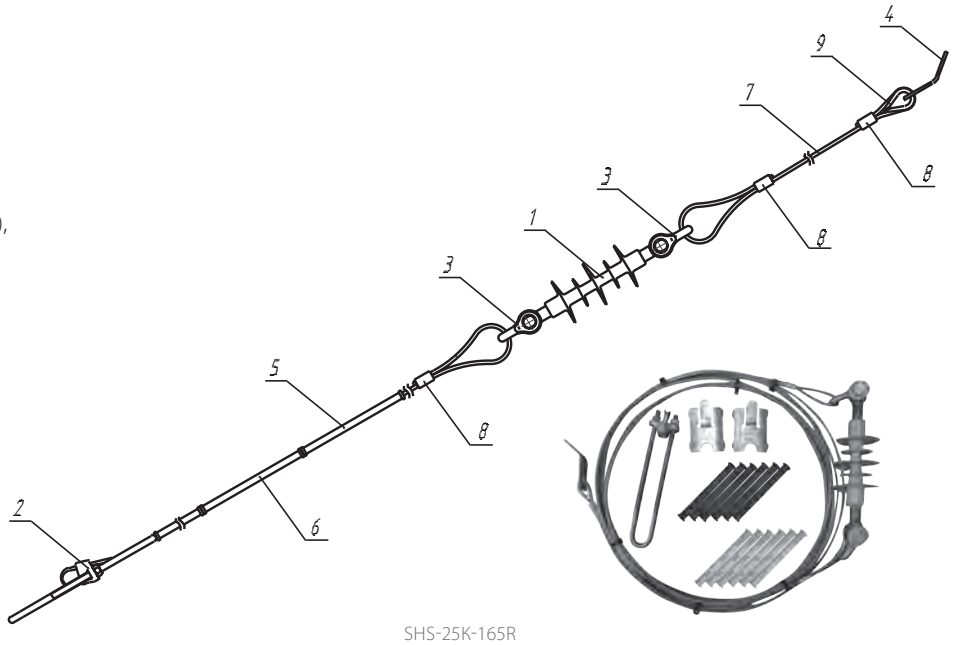
Name	Nominal voltage of HVL, kV	Wire rope diameter, mm	Length, m	Availability of insulator	Destructive load, kN, not less
SHS-25P-110L	0,4	6,1	11,0	-	17,5
SHS-25P-110R	0,4	6,1	11,0	-	17,5
SHS-25P-135L	0,4	6,1	13,5	-	17,5
SHS-25P-135R	0,4	6,1	13,5	-	17,5
SHS-25K-165L	6-20	6,1	16,5	+	17,5
SHS-25K-165R	6-20	6,1	16,5	+	17,5
SHS-12.0600123	6-20	9,1	18,0	+	34,0

1 - CS insulator,
2 - Bracket,
3 - Double intermediate element,
4 - Adjustable intermediate element,
5 - Bracket of guy rope CH 187,
6 - Guy rope marker "Black",
7 - Guy rope marker "Yellow",
8 - Clevis,
9 - Spiral tension clamp,
10, 11 - Wire rope (steel wire rope).



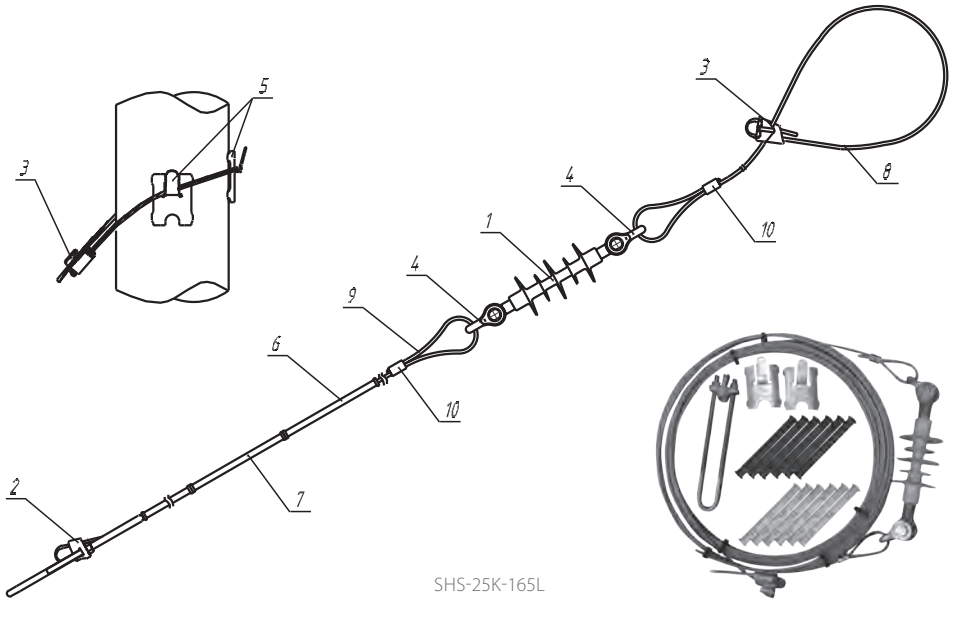
SHS-12.0600123

1 - CS insulator,
2 - Cone-type tension clamp,
3 - Bracket,
4 - Plate with holes of Ø 20 mm (for bolt),
5 - Guy rope marker "Black",
6 - Guy rope marker "Yellow",
7 - Rope,
8 - Wire rope clamp,
9 - Rope (steel wire rope).



SHS-25K-165R

1 - CS insulator,
2 - Cone-type tension clamp,
3 - Cone-type lock for guy rope,
4 - Bracket,
5 - Bracket for guy rope CH 187
6 - Guy rope marker "Black",
7 - Guy rope marker "Yellow",
7 - Clevis,
8 - Wire rope (steel wire rope),
9 - Wire rope (steel wire rope),
10 - Wire rope clamp.



SHS-25K-165L

CORRESPONDENCE TABLE FOR HARDWARE AND INSULATORS OF MV CC

	MZVA INSTA UMEK	**Note**	**ENSTO**	**NILED**
Support clamps	CS-30/12-20 MV CC(K)		SO181 SO181.6 SO241	-
Tension clamps	ODS 35-50(.3)		SO255 (SO255.3)	DN-35Rpi DN-70Rpi
	ODS 95-120(.3)		SO256 (SO256.3)	DN-120Rpi
	TSC-70(95,120, 150)* TBC-60/5,6-16(K)* TBC-44/5,6-16(K)*	* - Type of clamp is chosen depending on cross-section area of the wire and destructive load of replaced clamp.	SO256 (SO256.3) SO85 SO146 SO105	PAZ1 PAZ2 PAZ3
Branch piercing clamps	BPC-1(C)	For replacement of clamps RP150 and RPN150 it is recommended to use them with covers PIC-02	SL(W)25.2	RP150
	ORP150(M)		SLW25.22	
	BPC-2(C) ORPN150(M)		SE(W)20 SEW20.7	RPN150
Steel die branch clamps	PC 150		SL 4.21 SL 4.25 SL 39.2	CD 150
Protective covers for branch piercing clamps	PIC-02		SP 15 SP 16	-

	MZVA INSTA UMEK	Note	ENSTO	NILED
Service branch clamps	SBC 30		SL 30	-
	SBC 30.1		SL 30.1	-
	SBC 36		SL(W) 36	-
Brackets for service branch clamps	C 93		PSS 923	-
	C 94		PSS 924	-
Compression connecting clamps	MJRP35N		CIL6, CIL66	MJRP35N
	CCC-35-3A			
	MJRP50N			MJRP50N
	ССИП-50-3А			
	MJRP70N		CIL7, CIL67	MJRP70N
	CCC-70-3A			
	CCC-95-3A			MJRP95N
	CCC-120-3A		CIL8, CIL68	MJRP120N
	CCC-150-3A			MJRP150N
Spiral bindings	SC 35/50.2		CO 35 SO 115.5073 S0 115.5083	-
	SC 70/95.2		C0 70 SO 115.9573 SO 115.9583	-
	SC 120/150.2		CO 120 SO 115.150	-
Devices for protection from atmospheric (lightning) surges	APD-1.1(C)		SE(W) 20.1	-
	APD-1.2 (C)		SE(W) 20.2	-
	APD-1.3 (C)		SE(W) 20.3	-
	APD-2 (C)		SDI 20.2	-
	APD-2.1 (C)		SDI 20.3	-
	APD-3		SDI 10.2	-
	APD-4 (C)		SDI 27	-
	APD-EVS-SG-10-P		SDI46.710	-
	APD-EVS-SG-10-SL		SDI46.510	-
	APD-EVS-SG-20-P		SDI46.7	-
	APD-EVS-SG-20-SL		SDI46.5	-
	APD-EVS-SG-35-SL		SDI46.535	-
	APD-EVS-SG-10-P		SDI97.1	-
			SDI97.2	-
			SDI97.12	-
	APD-EVS-SG-10**	** - Modification of device is chosen depending on insulator type	SDI97	-
			SDI97.4	
			SDI97.E	

CONTACTOS DE LAS COMPAÑÍAS DE SERVICIOS Y SUMINISTROS

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