

INSULATED PRODUCTS Measurement, Indicator and protective devices























のまたでは、人のまたでは、人 CUCTEMA СЕРТИФИКАЦИИ РУССКОГО РЕГИСТРА RUSSIAN REGISTER CERTIFICATION SYSTEM CERTIFICATE This is to certify that the Quality Manag "TERMA-ENERGO" Ltd.
3, Dudko Str., In.C, office 17 N, 192029, Saint-Petershe has been assessed and found to be in accordance with the requirements of ISO 9001:2015 in respect of design, production and realization of electrical Insulating monitoring equipment for cells and elements of compact distribu No: 19.0143.026 of 12th February, 2019 This scrift case is velid critil 12th February, 2022

District Green's Confidence Association Theorem. O-RNSE- (AP 0 000

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Voltage display device IN 3-10-00 UHL3



Certificate of Conformity No. ROCC RU.ME05. H00374 (TU 3414-001-73361303-2006)

DC voltage display device IN 3-10-00 UHL3 relates to integrated equipment (integrated systems as per IEC 61243-5 cl.3.1).

The device is made in the form of three IOEL 10-8 type insulators with integrated carry electrodes, through which regulated voltage enters from primary circuit into indication unit. Carry electrodes are connected with indication unit via cables. Insulators are fixed (to provide electric contact) in switchgear and control gear between the casing and relevant phase.

3 red LEDs and 3 regulating connectors exist on front panel of indication unit. LEDs initiate the presence of operating voltage. LED blinking frequency is proportional to the value of regulated voltage. Regulating connectors are intended to check the accuracy of indication unit using the TIN testing device, that enables to check indicator in operation conditions (under voltage); meanwhile, the whole internal circuit of indication unit and gauge-integrated overvoltage limiter are checked. Regulating connectors can be also used to define right phases sequence (by IFZ device) and for other measurements. Overvoltage limiter on regulating connectors is similar to the limiter integrated into carry electrode.

Signaling cables are connected to carry electrode via FS63 socket and to rear panel of the unit through LS1537 blade connectors. Marling is under bottom surface of indication unit. Contact of protection earthing of indication unit is connected to the casing of electric installation cabinet.

Climatic version UHL, allocation category 3 as per GOST 15150.







Technical data:

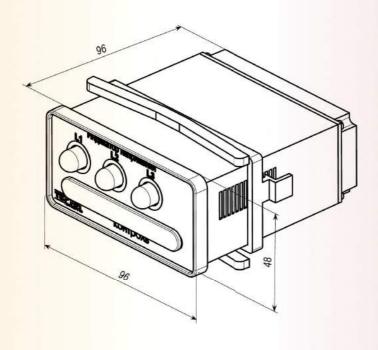
rated frequency, Hz	50-60
Uo < 10 % Un	no voltage signaling
Uo ≥ 20 % Un	voltage signaling
Max.voltage on indication unit	Less than 100
at any testing voltages, V	
Protection	IP 40
Operating temperatures range for indication unit, °C	-25+40
Operating temperatures range for	-60+85
carry electrodes, °C	
mass of one carry electrode, kg	0,8
Set mass, kg	3,7

Completeness:

- carry electrode	3 pcs
- set of connecting wires	1 set
- indication unit	1pc
- assemblina manual	1 pc

- self-testing apparatus to be ordered separately

Overall dimensions





Voltage display device IN 3-10R-00 UHL3



Certificate of Conformity No. POCC RU.ME.05. H00374 (TU 3414-004-73361303-2006)

DC voltage display device IN 3-10R-00 UHL3 relates to integrated equipment (integrated systems as per IEC 61243-5 cl.3.1).

The device is made in the form of three IOEL 10-8 type insulators with integrated carry electrodes, through which regulated voltage enters from primary circuit into indication unit. Carry electrodes are connected with indication unit via cables. Insulators are fixed (to provide electric contact) in switchgear and control gear between the casing and relevant phase.

4LEDs and 3 regulating connectors exist on front panel of indication unit. Small yellow LED initiates the presence of operating voltage. LED blinking frequency is proportional to the value of auxiliary voltage. 3 other LEDs initiate the presence of operating voltage. LED blinking means the presence of operating voltage. Regulating connectors are intended to check the accuracy of indication unit using the TIN testing device, that enables to check indicator in operation conditions (under voltage); meanwhile, the whole internal circuit of indication unit and gauge-integrated overvoltage limiter are checked. Regulating connectors can be also used to define right phases sequence (by IFZ device) and for other measurements. Overvoltage limiter on regulating connectors is similar to the limiter integrated into carry electrode.

Signaling cables are connected to carry electrode via FS63 socket and to rear panel of the unit through LS1537 blade connectors. K1 relay actuates, when all three phases of operating voltage exist. K2 relay actuates at on-load condition.

Contact of protection earthing of indication unit is connected to the chasing of electric installation cabinet. Technical specifications are similar to those for IN 3-10-00 UHL3.

Logic of relay actuation is represented in Table 1.

Completeness:

carry electrode

set of connecting wires

- indication unit

- assembling manual

- self-testing apparatus

3 pcs

1 set

1pc

1 pc

to be ordered separately







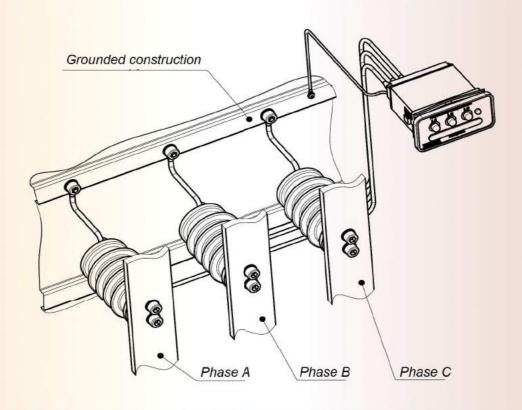
Technical data:

K1	K2	Auxiliary voltage	Phase A	Phase B	Phase C
0	0	0		Any combination	
0	1	1	0	0	0
0	0	1	1	0	0
0	0	1	0	1	0
0	0	1	1	1	0
0	0	1	0	0	1
0	0	1	1	0	1
0	0	1	0	1	1
1	0	1	1	1	1

1 in the table means that voltage is supplied (or relay is active), zero means that there is no voltage (or relay is deactivated).

Indication unit is fed from auxiliary source 60-220V (DC or AC, 50 Hz). As agreed with the client, auxiliary voltage can be replaced by other voltage. The device has 1 kV galvanic between measuring circuits and auxiliary power source.

Overall dimensions





Potential divider 6(10) kV/100 V IDEL 6(10)-1,5-065-04 U3



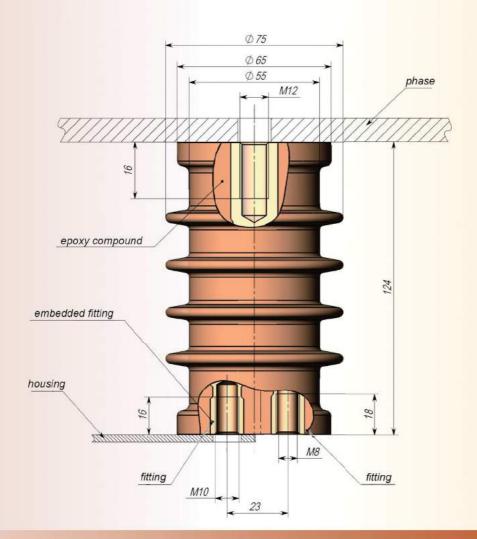
Potential divider 6(10) kV/100 V is intended to be used in security circuits, and to control phase, voltage quality and value in electric installations for nominal voltage 6(10) kV as per IEC 61243-5, cl. 1.4.9.

Potential divider is made in 10-5-065 insulator housing, with resistive divider poured inside. High voltage is supplied to embedded fitting in the form of M12 insulator contact. Output voltage is removed from the opposite edge of insulator and from M10 and M8 embedded fittings. M10 embedded fitting constitutes the earthing contact.

No external power source is needed for operation of potential divider.

Technical data:

Frequencies range for operation voltage, Hz	17 to 60
Nominal output current of divider, mA	2
Nominal output voltage,V	100+/-10
Operational range	-25+45)
of ambient air temperatures, °C	







Arc fault detection-device AFDD 00 "Raduga-PCM" UHL3.1

Arc fault detection-device AFDD 00 "Raduga-PCM" UHL3.1 with polymer optic-fiber sensor is designed for selective protection of cabinets of switchgears 6-35 kV from short-circuit accompanied by open electric arc



Features of a device:

- 1) number of cells under protection up to 99 pcs;
- polymer optic-fiber is much more reliable than quartz cable used in the similar imported and domestic devices due to elasticity;
- 3) reliability (durability) of the device due to decentralized structure. In each cell the universal arc fault detection unit that can operate irrespective of the state of other components of the device. Failure in operation of separate components of the device does cause loss of function of the arc fault detection as a whole;
- 4) variability of parameters (overcurrent protection, circuit-breaker failure protection, unit numbering) during operation;
 - 5) digital interface RS-485;
- 6) behavior of the device is defined by a connection diagram that is simpler, more understandable for personnel at installation and during operation;
- 7) application of the universal arc fault detection unit allows to unify significantly the electrical, wiring diagrams, design solutions;
- 8) cost is lower than the cost of other optical arc fault detection devices of the similar class.



Electronic current transformer (ECT) ETT-1 Class 0.5S

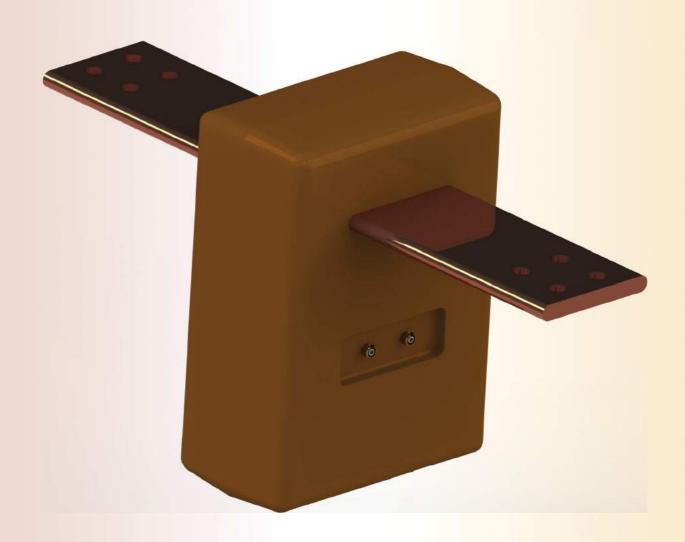


Electronic current transformer ETT-1 is designed for conversion of primary instantaneous values of variable and pulse currents into proportional values of low secondary current or into the digital signal.

Electronic current transformer ETT-1 consists of high-voltage, measuring and low-voltage parts normalized to standard signals.

High-voltage insulation and transfer of signal is provided through fiber-optic cable.

For operation of electronic current transformer the operational power supply voltage is necessary.







Voltage converter (VC) IPN-05 UHL3.1

Voltage converter IPN-05 UHL3.1 is designed to replace the voltage transformer (VT), class 6-35 kV, used in measuring circuits for electric power metering with accuracy class 0,5.

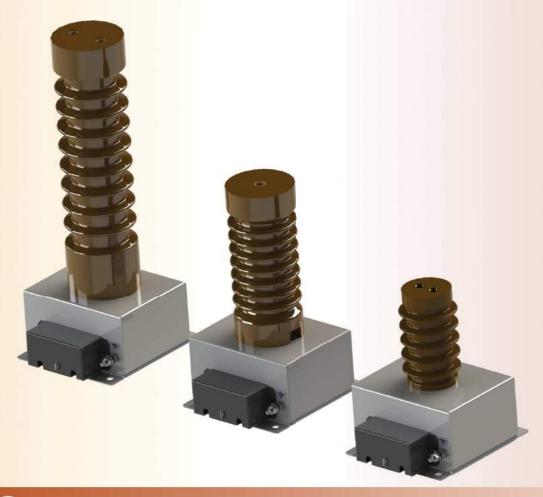
The converter includes a converter unit in a metal house with resistive carry electrode (as a supporting insulator). The house contains a power supply source and amplifier.

The converter is made as a linear amplifier of weak signal from resistive carry electrode in relation to a house. Output signal is also picked up in relation to a house. The amplifier has current limiting.

The converter has a galvanic separation unit 1,5 kV between measuring circuits and auxiliary power supply.

Advantages of this device:

- The converter has lower cost, weight and dimensions than the voltage transformer;
- There is no resonance and saturation which can occur in the voltage transformer;
- It operates reliably in networks with high voltage surges, high harmonic percent.

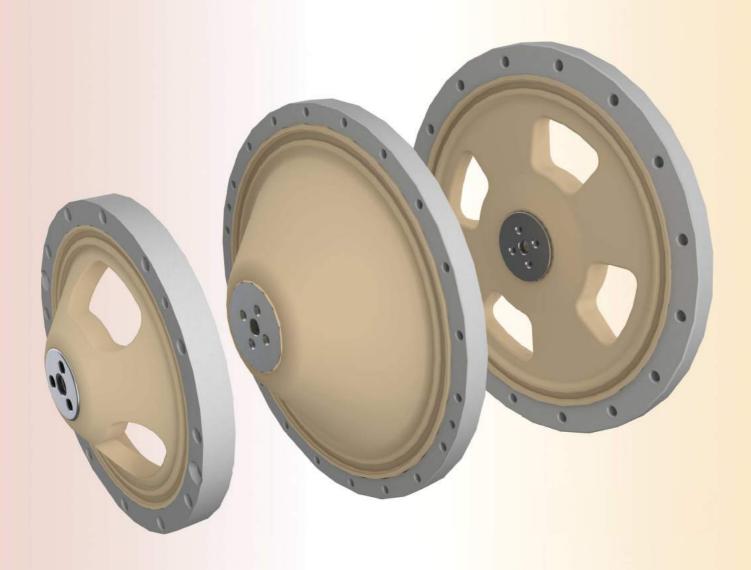




Insulation products for operation in SF6 gas



In 2017 in TERMA-ENERGO LLC the innovation process of insulation product manufacture for operation in SF6-gas, i.e. APG pressure casting in a vacuum chamber. Insulators are installed in a gas-insulated core switch and gas-insulated switchgear for class of voltage 110-220 kV. Until recently the similar insulation at the Russian market was only imported. Due to application of filled compositions of new generation and the newest procedures of monitoring the process of preparation and filling of a product, process automation the customers receive the product with high level of quality and reliability.





Particulars of OJSC «TERMA-ENERGO»

Epoxy insulators of OJSC «TERMA-ENERGO» are produced using pressure casting in heated molds of machines (APG Process). Molds construction enables to reach high precision of fitting arrangement and observe product dimensions. Compound is prepared in process vacuum conditions, therefore, moisture and gaseous substances content in material is minimized. At this expense the following is reached: high uniformity, low level of partial discharges, maximal strength and smooth facture of the surface of finished insulator.

Advantages of OJSC "TERMA-ENERGO" epoxy insulators

- -High short-term and long-term strength at bending and twist;
- -High impact resistance;
- -High electric strength;
- -High hydrophobic nature and dirt-resistance;
- -Low mass;
- -High mechanical strength;
- -High stability and minimal dimensional allowance.

Symbol legend structure for insulators:

Supporting epoxy cast insulator
Nominal voltage, kV
Bending strength, kN
Insulator index
Version No
Climatic version and allocation category

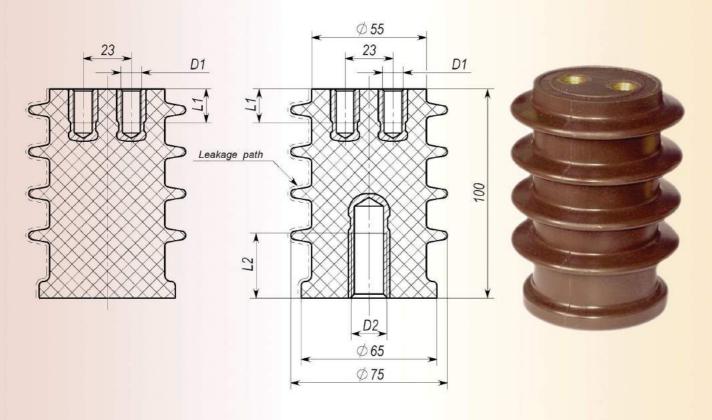


Supporting insulator IOEL 6-8-065-00 UHL2 and U3



IOEL 6-8-065-00 UHL2 and U3 supporting insulator (TU 3494-001-73361303-2006) Meets the requirements of GOST R 1516.3-96 and IEC 273

nominal operating voltage, kV	6
max. operating voltage, kV	7,2
5-minutes resting voltage of industrial frequency, kV	32
FR intensity in insulator at 4.6 kV, pC	<2,0
leakage path, mm	160
max. mass, kg	0,62



Туре	Bending strength, kN	D1	D2	L1, mm	L2, mm
IOEL 6-8-065-00	8	M10	M16	16	36
IOEL 6-8-065-01	8	2xM10	M16	16	36
IOEL 6-5-065-02	5	2xM10	M10	16	16
IOEL 6-5-065-03	5	2xM10	2xM10	16	16
IOEL 6-5-065-04	5	2xM10	2xM8	16	12
IOEL 6-8-065-05	8	2xM10	M12	16	24
IOEL 6-8-065-06	8	M16	M16	19	36
IOEL 6-8-065-07	8	M10	M12	16	24
IOEL 6-8-065-08	8	2xM6	-	12	-
IOEL 6-5-065-09	5	M10	M8	16	12



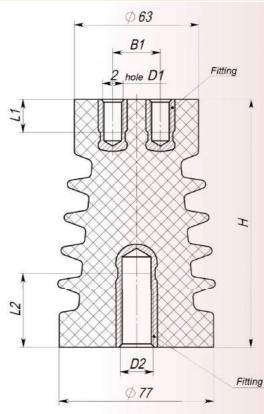


Supporting insulator IOEL 10-8-098-00 UHL2 and U3

IOEL 10-8-098-00 UHL2 and U3 supporting insulator Meets the requirements of GOST R 1516.3-96 and IEC 273 Certificate of Conformity No. ROSS RU.ME.05.H00324 (TU 3494-001-73361303-2006)

nominal operating voltage, kV	10
max. operating voltage, kV	12
5-minutes resting voltage of industrial frequency, kV	42
FR intensity in insulator at 7.7 kV, pC	<2,5
max. mass, kg	0,76





Туре	H, mm	Bending strength, kN	Leakage path, mm	D1	D2	L1, mm	L2, mm	B1, mm
IOEL 10-8-098-00	120	8	194	2xM10	M16	16	36	23
IOEL 10-5-098-01	120	5	194	2xM10	M10	16	16	23
IOEL 10-8-098-03	120	8	194	M16	M16	36	36	-
IOEL 10-8-098-04	130	8	204	2xM10	M16	16	36	23
IOEL 10-5-098-05	130	5	204	2xM10	M10	16	16	23
IOEL 10-8-098-07	124	8	198	2xM10	M16	16	36	23
IOEL 10-8-098-08	130	8	204	M16	M16	36	36	-
IOEL 10-8-098-10	130	8	204	M12	M16	24	36	-
IOEL 10-8-098-13	120	8	194	2xM8	M16	12	36	23
IOEL 10-8-098-15	130	8	204	2xM10	M12	16	24	23
IOEL 10-5-098-16	124	5	198	2xM8	M12	12	24	23
IOEL 10-5-098-18	120	5	194	2xM8	M12	12	24	23



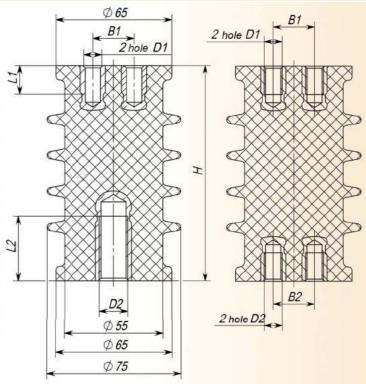
Supporting insulator IOEL 10-8-065-00 UHL2 and U3



IOEL 10-8-065-00 UHL2 and U3 supporting insulator Meets the requirements of GOST R 1516.3-96 and IEC 273 Certificate of Conformity No. ROSS RU.ME.05.HO5164 (TU 3494-001-73361303-2006)

nominal operating voltage, kV	10
max. operating voltage, kV	12
5-minutes resting voltage of industrial frequency, kV	42
FR intensity in insulator at 7.7 kV, pC	<2,5
max. mass, kg	0,82





Туре	H, mm	Bending strength, kN	Leakage path, mm	D1	D2	L1, mm	L2, mm	B1, mm	B2, mm
IOEL 10-5-065-02	120	5	183	2xM10	2xM10	16	16	23	23
IOEL 10-5-065-06	130	5	193	2xM10	2xM10	16	16	23	23
IOEL 10-8-065-09	124	8	187	2xM8	M16	12	36	30	-
IOEL 10-5-065-11	120	5	183	2xM8	M12	12	24	18	-
IOEL 10-5-065-12*	120	5	183	2xM8	2xM8	12	12	18	18
IOEL 10-8-065-14	130	8	193	2xM10	M16	16	36	30	-
IOEL 10-5-065-17	130	5	193	2xM8	2xM10	12	16	26	30
IOEL 10-5-065-19	120	5	183	M8	M10	12	16	-	-
IOEL 10-5-065-20	120	5	183	M8	M12	12	24	-	-
IOEL 10-8-065-22	130	8	193	M12	M12	24	24	-	-
IOEL 10-5-065-47	120	5	183	M12	M16	16	20	-	-
IOEL 10-5-065-52	130	5	193	2M8	2M10	12	16	18	23

^{*-} holes D1 and D2 lay in perpendicular surfaces



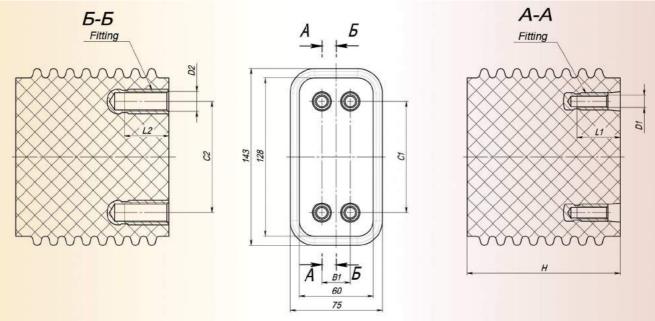


Supporting insulator IOEL 10-20-035-00 UHL2 and U3

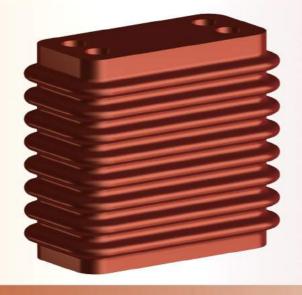
IOEL 10-20-035-00 UHL2 and U3 supporting insulator (TU 3494-001-73361303-2006)

Meets the requirements of GOST R 1516.3-96 and IEC 273

nominal operating voltage, kV	10
max. operating voltage, kV	12
5-minutes resting voltage of industrial frequency, kV	42
FR intensity in insulator at 7.7 kV, pC	< 2,5
Bending strength, kN	20
max. mass, kg	2,2



Туре	H, mm	Leakage path, mm	D1	D2	L1, mm	L2, mm	B1, mm	B2, mm	C1, mm	C2, mm
IOEL 10-20-035-00	120	190	2xM12	2xM12	30	30	-	-	80	80
IOEL 10-20-035-01	130	200	2xM12	2xM12	30	30	-	-	80	80
IOEL 10-20-035-11	124	194	4xM10	2xM16	35	36	23	-	90	80





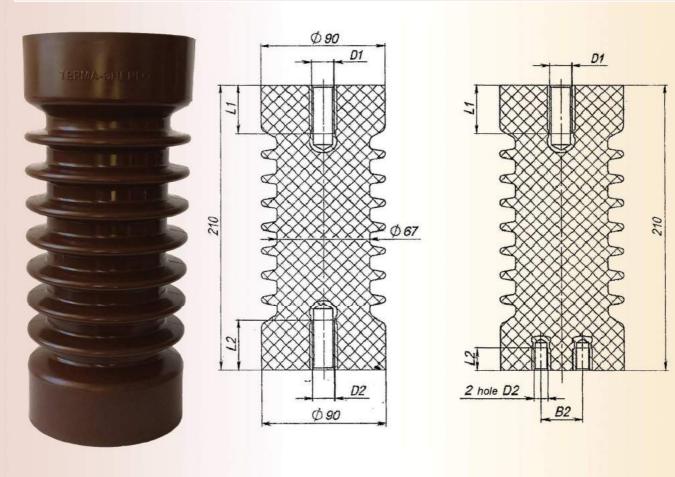
Supporting insulator IOEL 20-5-025-00 UHL2 and U3



IOEL 20-5-025-00 UHL2 and U3 supporting insulator (TU 3494-001-73361303-2006)

Meets the requirements of GOST R 1516.3-96 and IEC 273

nominal operating voltage, kV	20
max. operating voltage, kV	24
5-minutes resting voltage of industrial frequency, kV	65
Bending strength, kN	5
leakage path, mm	325
max. mass, kg	2,0



Туре	D1	D2	L1,	L2,	B2,
Турс	Di	DZ	mm	mm	mm
IOEL 20-5-127-00	M12	M16	30	36	-
IOEL 20-5-127-01	M16	M16	36	36	-
IOEL 20-5-127-03	M16	2xM10	36	16	30
IOEL 20-5-127-04	M12	M12	30	30	-
IOEL 20-5-127-05	M20	2xM10	36	16	46

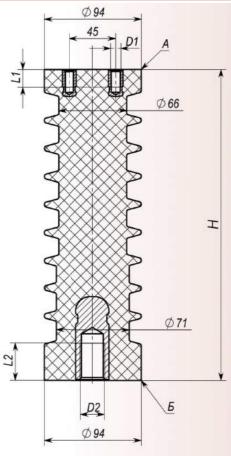




IOEL 27/35, 35 kV UHL2 and U3 supporting insulator (TU 3494-001-73361303-2006) Meets the requirements of GOST R 1516.3-96 and IEC 273

nominal operating voltage, kV	27/35	35	
max. operating voltage, kV	40,5	40,5	
5-minutes resting voltage of industrial frequency, kV	95	120	
Bending strength, kN	5	5	
leakage path, mm	464	514	
max. mass, kg	3,1	3,5	



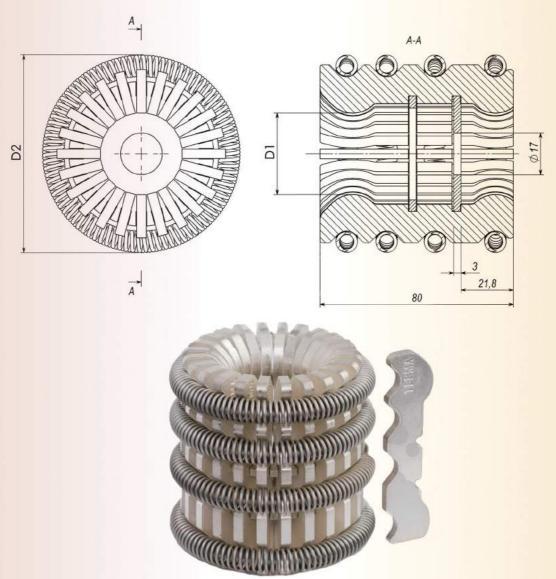


Type	Type D1 D2	L1,	L2,	B2,	
1,00	Di)	mm	mm	mm
IOEL 27-5-025-00	2xM10	M16	16	36	300
IOEL 27-5-025-01	2xM10	M24	16	36	300
IOEL 27-5-025-02	M16	M24	36	36	300
IOEL 27-5-025-03	M16	M16	36	36	300
IOEL 35-5-025-00	2xM10	M16	16	36	350
IOEL 35-5-025-01	2xM10	M24	16	36	350
IOEL 35-5-025-02	M16	M24	36	36	350
IOEL 35-5-025-03	M16	M16	36	36	350
IOEL 35-5-025-04	2xM10	M12	16	24	350



Lamellated contact





Туре	Nominal current, A	Rod D, mm	D1, mm	D1, mm	Mass, kg
Lamellated contact 630A KP 630-36-01	630	36	33	81	0,65
Lamellated contact 1000A KP 1000-36-01	1000	36	33	81	0,9
Lamellated contact 1600A KP 1600-36-01	1600	36	33	81	1,1
Lamellated contact 1600A KP 1000-55-01	1600	55	52	102	1,0
Lamellated contact 2000A KP 2000-55-01	2000	55	52	102	1,4
Lamellated contact 2500A KP 2500-73-01	2500	73	70	118	2,0
Lamellated contact 3150A KP 3150-90-01	3150	90	87	135	2,4

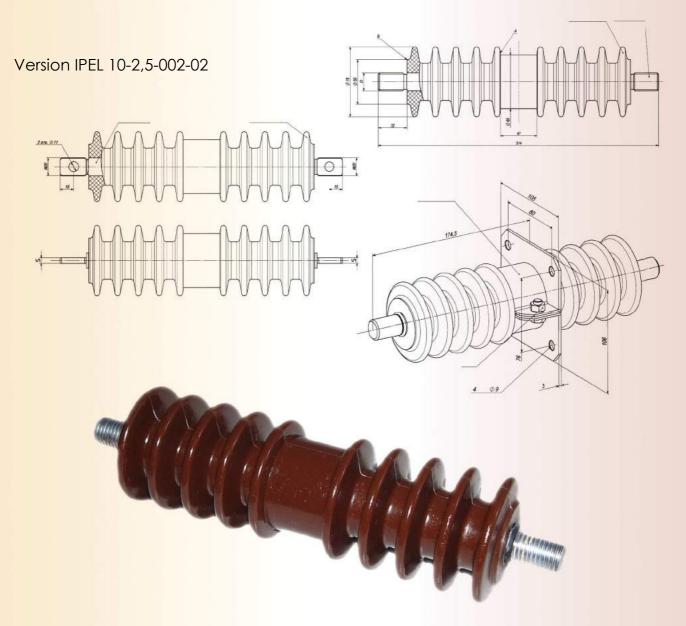




Straight-through insulator IPEL 10-2,5-002-00 UHL2

nominal operating voltage, kV	10
max. operating voltage, kV	12
5-minutes resting voltage of industrial frequency, kV	42
nominal current, A	630
leakage path A to B, mm	230
bending strength, kN	2,5
mass, kg	2

Version IPEL 10-2,5-002-00 and 01



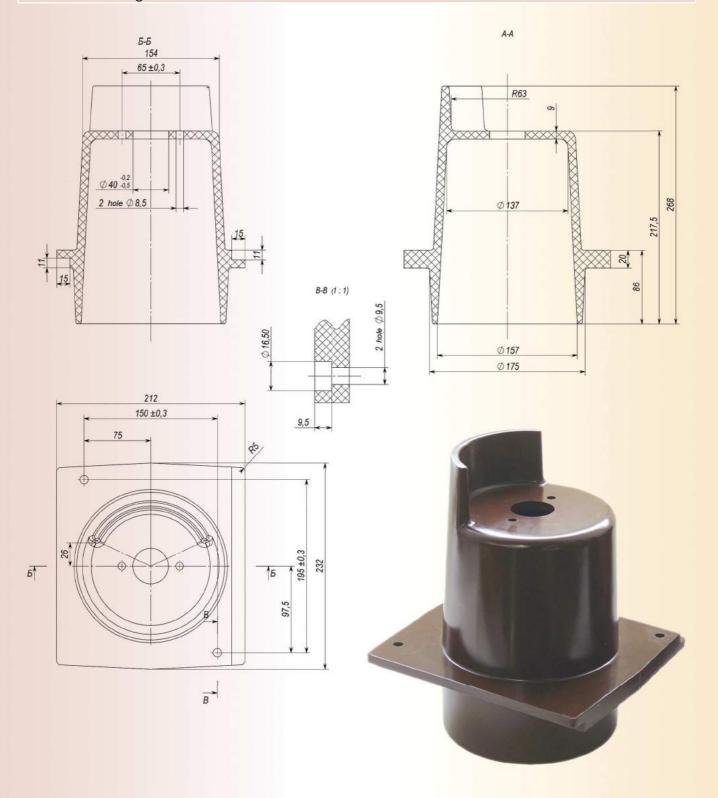
Туре	D	S, mm
IPEL 10-2,5-002-00	M20	-
IPEL 10-2,5-002-01	M12	-
IPEL 10-2,5-002-02	-	6



Straight-through insulator IPEL 10-024-00 UHL2



nominal operating voltage, kV	10
max. operating voltage, kV	12
5-minutes resting voltage of industrial frequency, kV	42
max. mass, kg	2.9

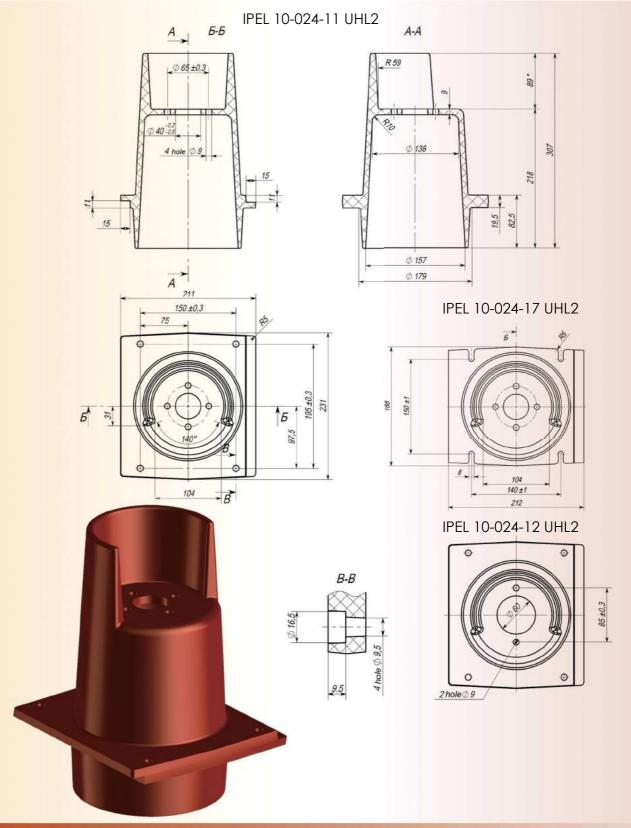






Straight-through insulator IPEL 10-024-11(12)(17) UHL2

nominal operating voltage, kV	10
max. operating voltage, kV	12
5-minutes resting voltage of industrial frequency, kV	42
max. mass, kg	2.9

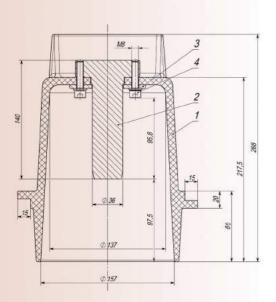


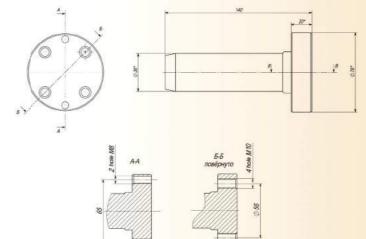


Straight-through insulator IPELS 10-024-00 UHL2



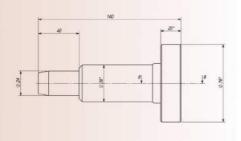
Pivod contact KC-36





- 1-insulator
- 2-pivod
- 3-washer cutting
- 4-fixture

Pivod contact KC-24



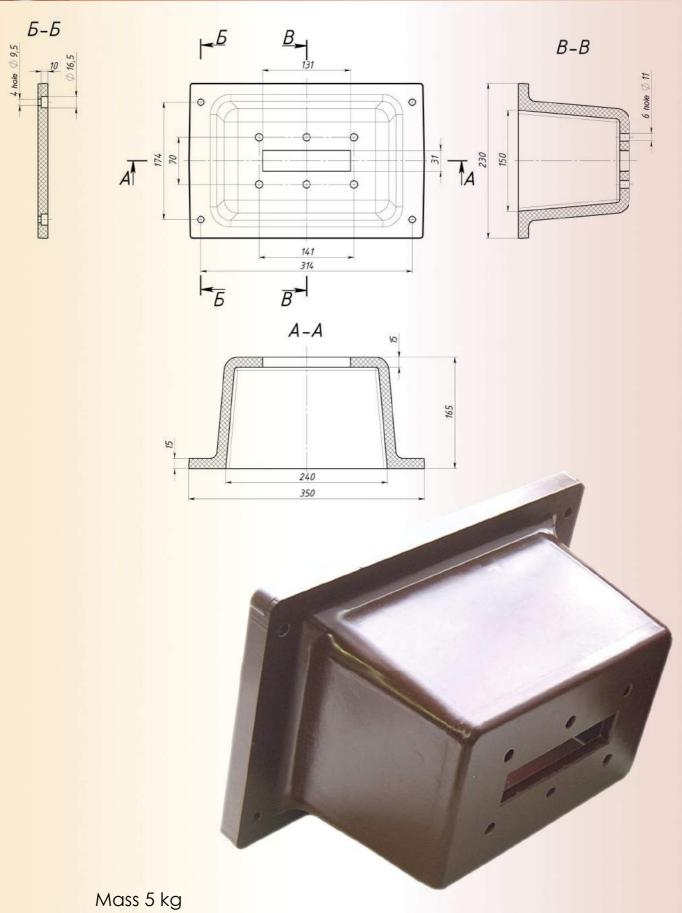


Type	Type	Operating	Mass, kg
1,000	pivod	current	741033, Kg
IPELS 10-024-00	KC-24	1000	5,48
IPELS 10-024-01	KC-36	1600	5,68





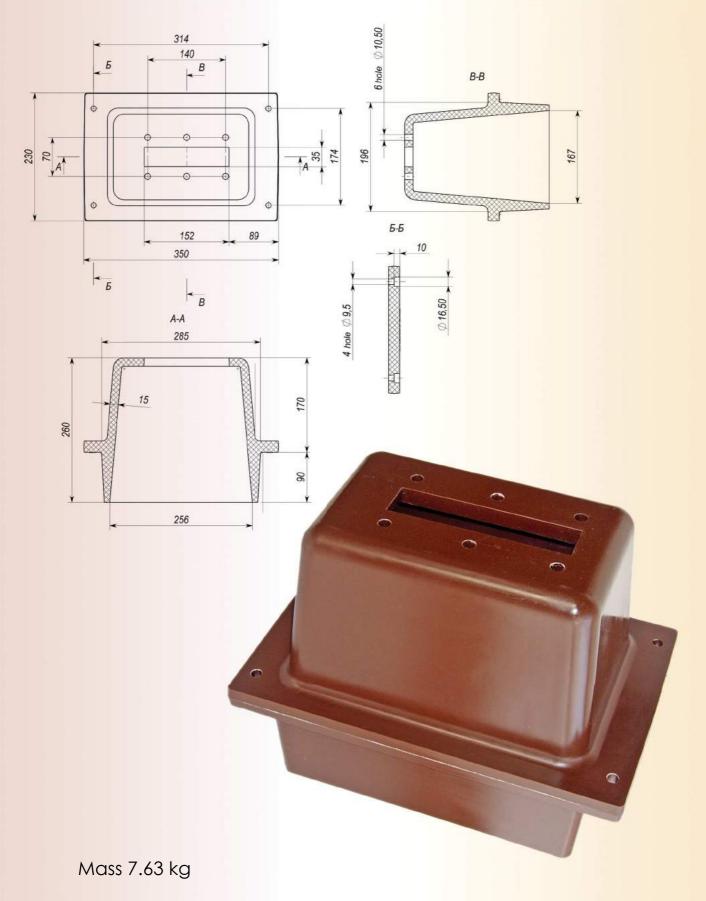
Straight-through insulator IPEL 3-030-00 UHL2





Straight-through insulator IPEL 10-005-00 UHL2

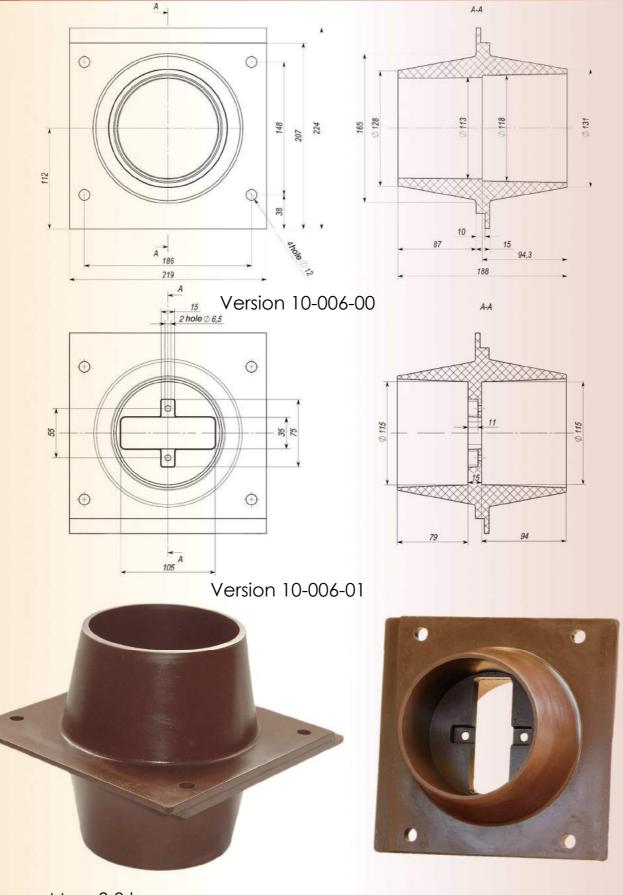


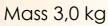






Straight-through insulator IPEL 10-006-00 UHL2







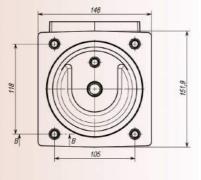
Straight-through insulator IPEL 10-062-00 UHL2

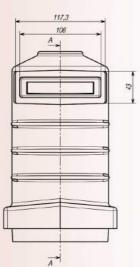


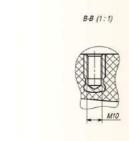
IPEL 10-062-00 UHL2 straight-through insulator (TU 3494-001-73361303-2006)

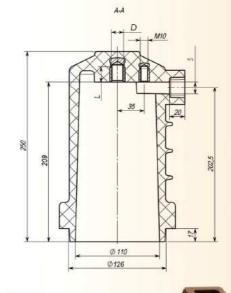
Meets the requirements of GOST R 1516.3-96 and IEC 273

nominal operating voltage, kV	10
max. operating voltage, kV	12
5-minutes resting voltage of industrial frequency, kV	42
max. mass, kg	2,9











Туре	D	L, mm	S, mm
IPEL 10-062-00	M16	20	16,7
IPEL 10-062-01	M12	16	16,7
IPEL 10-062-04	M12	16	18,3



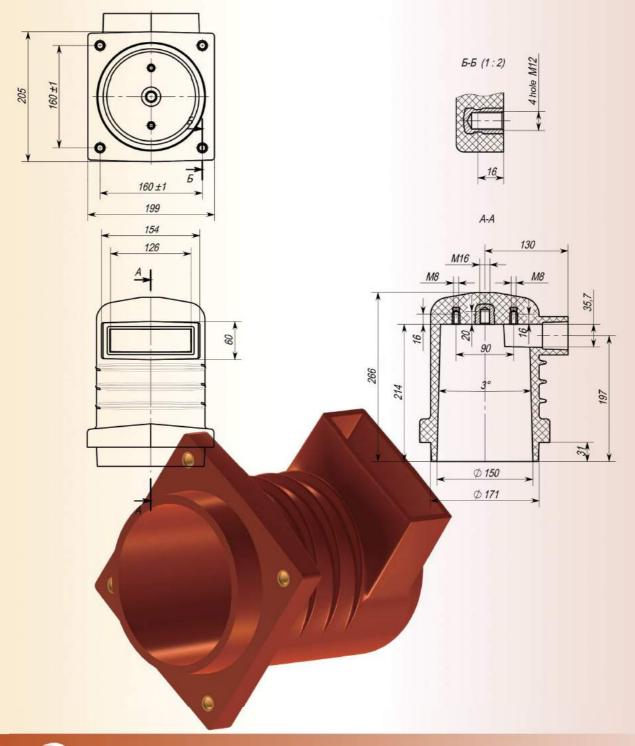


Straight-through insulator IPEL 10-071-00 UHL2

IPEL 10-071-00 UHL2 straight-through insulator (TU 3494-001-73361303-2006)

Meets the requirements of GOST R 1516.3-96 and IEC 273

nominal operating voltage, kV	10
max. operating voltage, kV	12
5-minutes resting voltage of industrial frequency, kV	42
max. mass, kg	5,7





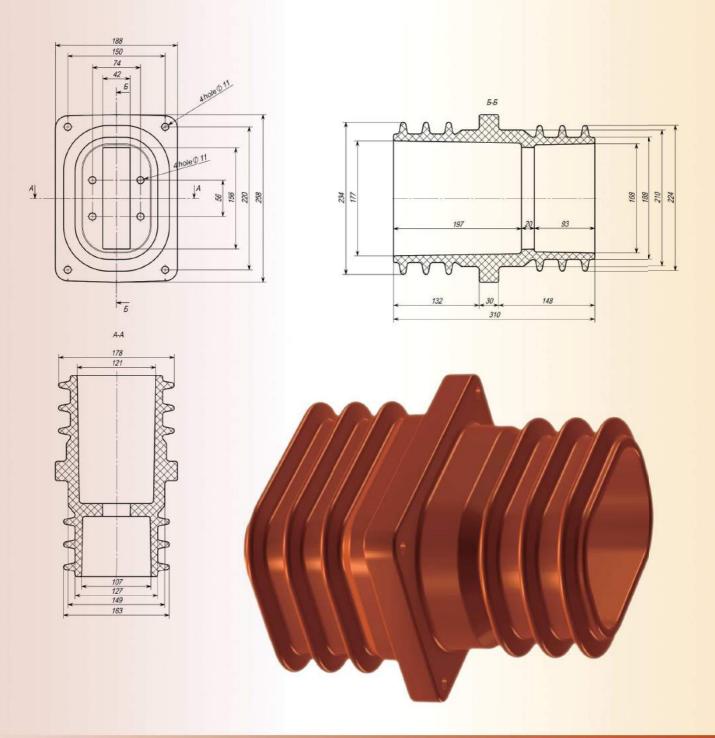
Straight-through insulator IPEL 10-075-00 UHL2



IPEL 10-075-00 UHL2 straight-through insulator (TU 3494-006-73361303-2007)

Meets the requirements of GOST R 1516.3-96 and IEC 273

nominal operating voltage, kV	10
max. operating voltage, kV	12
5-minutes resting voltage of industrial frequency, kV	42
max. mass, kg	6,9





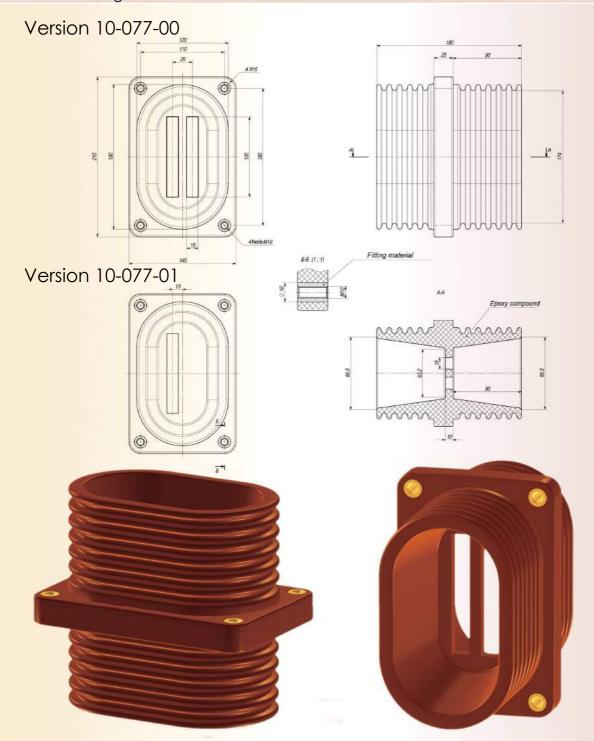


Straight-through insulator IPEL 10-077-00 UHL2

IPEL 10-077-00 UHL2 straight-through insulator (TU 3494-001-73361303-2006)

Meets the requirements of GOST R 1516.3-96 and IEC 273

nominal operating voltage, kV	10
max. operating voltage, kV	12
5-minutes resting voltage of industrial frequency, kV	42
max. mass, kg	3,4



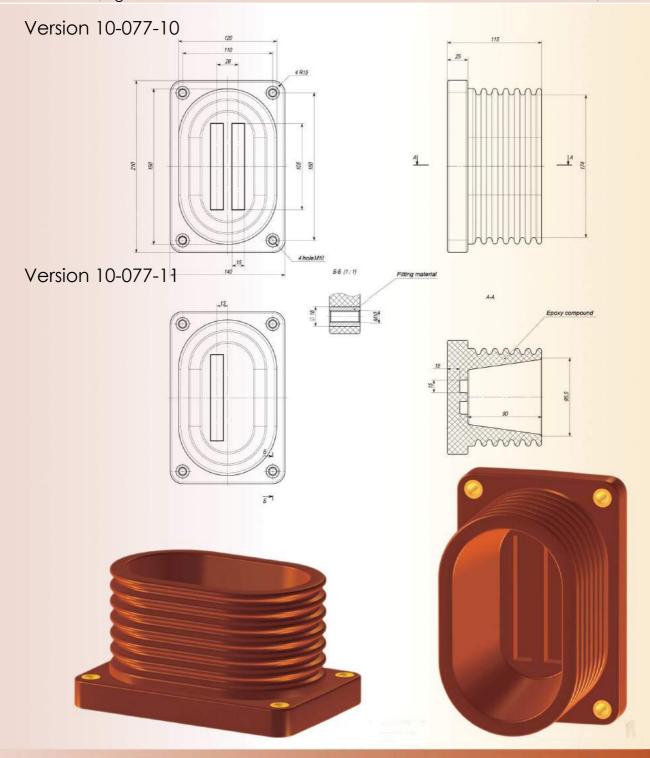


Straight-through insulator IPELT 10-077-10 UHL2



IPELT 10-077-10 UHL2 straight-through insulator (TU 3494-006-73361303-2007)
Meets the requirements of GOST R 1516.3-96 and IEC 273

nominal operating voltage, kV	10
max. operating voltage, kV	12
5-minutes resting voltage of industrial frequency, kV	42
max. mass, kg	2,6





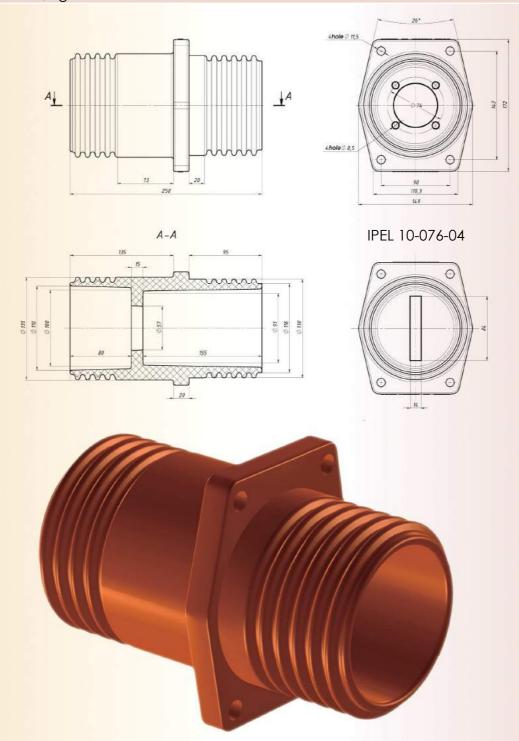


Straight-through insulator IPEL 10-076-00 UHL2

IPEL 10-076-00 UHL2 straight-through insulator (TU 3494-001-73361303-2006)

Meets the requirements of GOST R 1516.3-96 and IEC 273

nominal operating voltage, kV	10
max. operating voltage, kV	12
5-minutes resting voltage of industrial frequency, kV	42
max. mass, kg	2,7





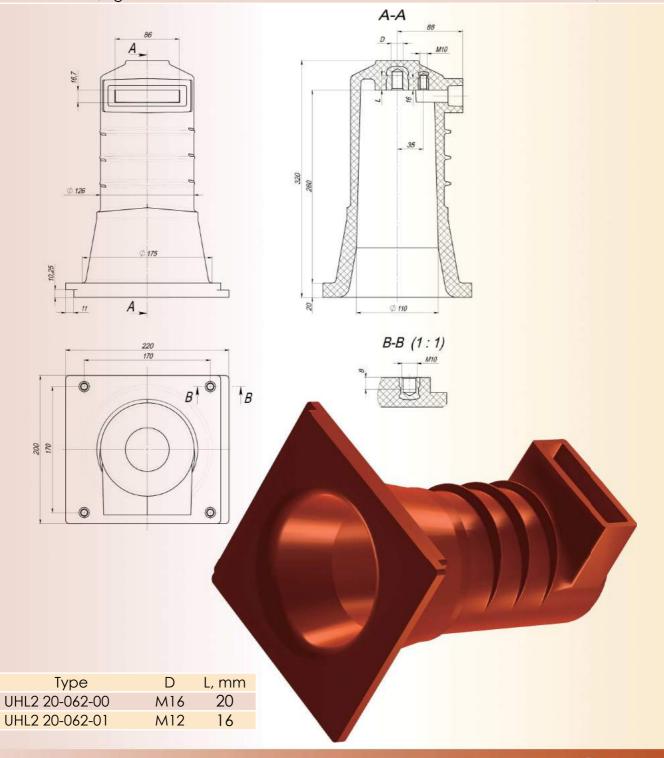
Straight-through insulator IPEL 20-062-00 UHL2



IPEL 20-062-00 UHL2 straight-through insulator (TU 3494-006-73361303-2007)

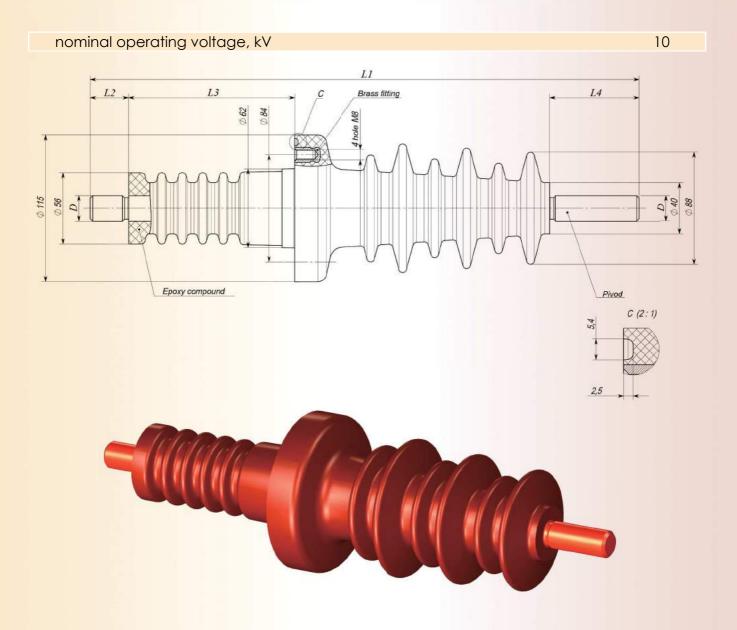
Meets the requirements of GOST R 1516.3-96 and IEC 273

nominal operating voltage, kV	20
max. operating voltage, kV	24
5-minutes resting voltage of industrial frequency, kV	65
max. mass, kg	4,6





Straight-through insulator IPEL 10-5-045-00 UHL2



Type	L1,	L2,	L3,	L4,	D	Nominal	Pivod	Mass,
турс	mm	mm	mm	mm	D	current, A	material	Kg
IPEL 10-5-045-00M	415	35	130	50	M20	630	Cu	3,1
IPEL 10-5-045-25M	440	35	155	50	M12	250	Cu	2,6
IPEL 10-5-045-50M	405	35	130	40	M12	250	Cu	2,4
IPEL 10-5-045-80M	510	70	170	70	M30	1000	Cu	5,0

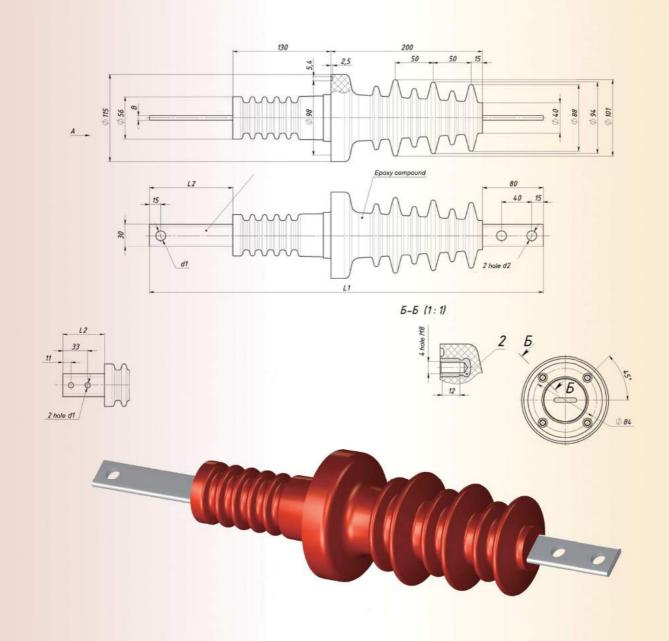


Straight-through insulator IPEL 10-0,8-045-71 UHL2



nominal operating voltage, kV

10

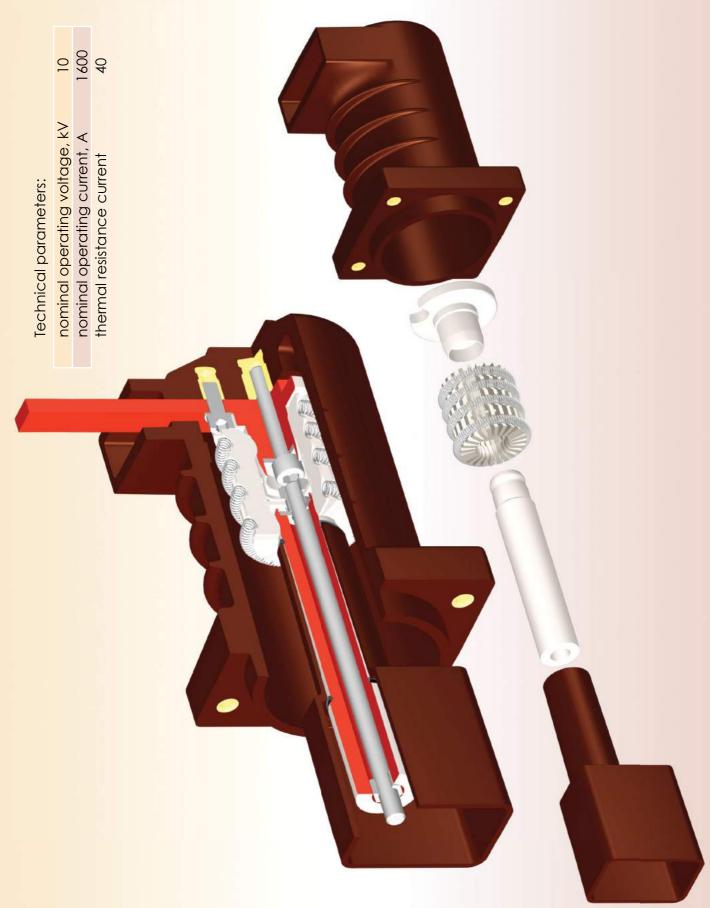


Туре	B, mm	d1, mm	d2, mm	L1, mm	L2, mm	Nominal current, A	Bar material	Mass, Ka
IPEL 10-0,8-045-71M UHL2	8	13	13	520	110	800	Cu	3.0
IPEL 10-0,9-045-73M UHL2	8	7	13	465	55	800	Cu	2.9





Contact system IZI089



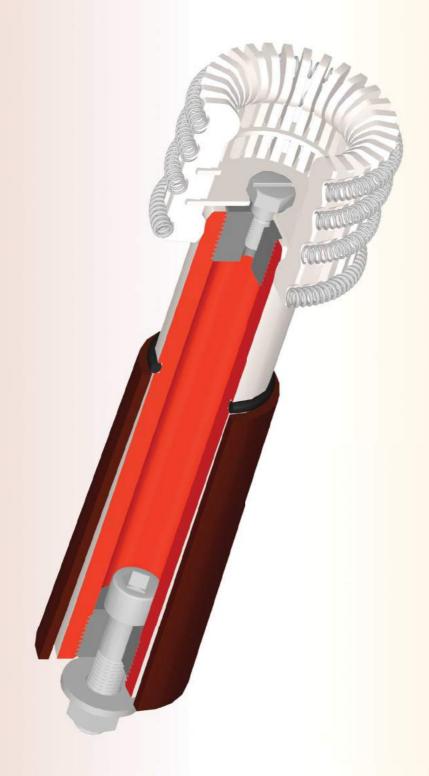




Technical parameters:

nominal operating voltage, kV nominal operating current, A

10 2000





Current conductor with air and solid insulation

Meets the requirements of GOST R 1516.3-96 and IEC 273

nominal operating voltage, kV	6 to 35
nominal operating current, A	630 to 4000
current electrodynamic firmness, kA	<125









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