

Table: Technical Data for Distribution Transformer 400 kVA, 20/0.4kV

Manufacturer's Name		To be specified	
Type / Model		Oil-immersed With oil conservator outdoor	
Installation		oil, without PCB	
Dielectric		to be specified	
Oil type			
Rated frequency	Hz	50	
Rated power	kVA	400	
Number of phases		3	
Rated voltage:			
- High voltage side	kV	20	
- Low voltage side	kV	0.4	
Taps on HV side	%	±2x2.5%, off load	
Rated currents			
- High voltage side	A	to be specified	
- Low voltage side	A	to be specified	
Impedance voltage	%	4	
Vector group		Dyn5	
Treatment of neutral (LV side)		Solidly earthed	
Losses:			
- No-load	W	To be specified	
- Load	W	To be specified	
Insulation level HV-winding			
Lightning-impulse test voltage	kV	125	
Power-frequency test voltage	kV	50	
Insulation level LV-winding			
Lightning-impulse test voltage	kV	30	
Power-frequency test voltage	kV	10	

علم شماره ۱۰

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Resistance per phase:			
- HV winding	Ω	to be specified	
- LV winding	Ω	to be specified	
Sound pressure level	dB(A)	52	
Max. temperature rise at 45° C ambient temperature and at full load:			
- Winding	°C	to be specified	
- Iron core	°C	to be specified	
- Oil at top level	°C	to be specified	
Max. ambient temperature	°C	45	
Cooling system		ONAN	
Conductor material			
Insulating material of windings		Copper	
Insulation class		to be specified	
Standard bushings		yes	
<b>Accessories:</b>			
- Dial type contactor thermometer transformer	pcs.	1	
- Oil level indicator	pcs.	1	
- Pocket thermometer	pcs.	1	
- Grounding terminals	pcs.	2	
- Filter pipe	pcs.	1	
- Oil drain plug	pcs.	1	
- Rating plate	pcs.	1	
- Towing eye	pcs.	1	
<b>Weights:</b>			
- Total	kg	to be specified	
- Oil	kg	to be specified	
<b>Dimensions:</b>			
- Length	mm	to be specified	
- Width	mm	to be specified	
- Height	mm	to be specified	
- Distance between wheels centers	mm	to be specified	
Standard specifications		IEC 60076-7 IEC 60354	

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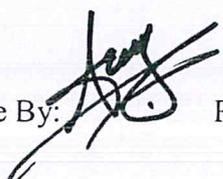
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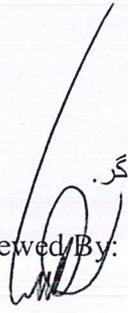
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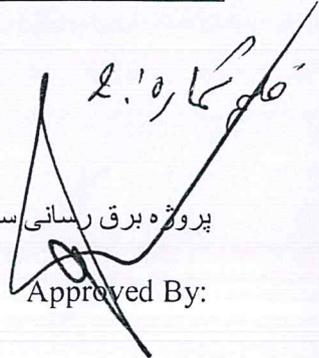
**Table: Technical Data for Distribution Transformer 250 kVA, 20/0.4 kV**

Manufacturer's Name		To be specified	
Type / Model		Oil-immersed With oil conservator	
Installation		outdoor	
Dielectric		oil, without PCB	
Oil type		to be specified	
Rated frequency	Hz	50	
Rated power	kVA	250	
Number of phases		3	
Rated voltage:			
- High voltage side	kV	20	
- Low voltage side	kV	0.4	
Taps on HV side	%	±2x2.5%, off load	
Rated currents			
- High voltage side	A	to be specified	
- Low voltage side	A	to be specified	
Impedance voltage	%	4	
Vector group		Dyn5	
Treatment of neutral (LV side)		Solidly earthed	
Losses:			
- No-load	W	To be specified	
- Load	W	To be specified	
Insulation level HV-winding			
Lightning-impulse test voltage	kV	125	
Power-frequency test voltage	kV	50	
Insulation level LV-winding			
Lightning-impulse test voltage	kV	30	
Power-frequency test voltage	kV	10	

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Resistance per phase:			
- HV winding	Ω	to be specified	
- LV winding	Ω	to be specified	
Sound pressure level	dB(A)	52	
Max. temperature rise at 45° C ambient temperature and at full load:			
- Winding	°C	to be specified	
- Iron core	°C	to be specified	
- Oil at top level	°C	to be specified	
Max. ambient temperature	°C	45	
Cooling system		ONAN	
Conductor material			
Insulating material of windings		Copper	
Insulation class		to be specified	
Standard bushings		yes	
<b>Accessories:</b>			
- Dial type contactor thermometer transformer	pcs.	1	
- Oil level indicator	pcs.	1	
- Pocket thermometer	pcs.	1	
- Grounding terminals	pcs.	2	
- Filter pipe	pcs.	1	
- Oil drain plug	pcs.	1	
- Rating plate	pcs.	1	
- Towing eye	pcs.	1	
<b>Weights:</b>			
- Total	kg	to be specified	
- Oil	kg	to be specified	
<b>Dimensions:</b>			
- Length	mm	to be specified	
- Width	mm	to be specified	
- Height	mm	to be specified	
- Distance between wheels centers	mm	to be specified	
Standard specifications		IEC 60076-7 IEC 60354	

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Table: Technical Data for Distribution Transformer 200 kVA, 20/0.4 kV

Designation	Unit	Required	Offered
Manufacturer's Name		To be specified	
Type / Model		Oil-immersed With conservator	
Installation		outdoor	
Dielectric		oil, without PCB	
Oil type		to be specified	
Rated frequency	Hz	50	
Rated power	kVA	200	
Number of phases		3	
Rated voltage:			
- High voltage side	kV	20	
- Low voltage side	kV	0.4	
Taps on HV side	%	±2x2.5%, off load	
Rated currents			
- High voltage side	A	to be specified	
- Low voltage side	A	to be specified	
Impedance voltage	%	4	
Vector group		Dyn5	
Treatment of neutral (LV side)		Solidly earthed	
Losses:			
- No-load	W	To be specified	
- Load	W	To be specified	
Insulation level HV-winding:			
Lightning-impulse test voltage	kV	125	
Power-frequency test voltage	kV	50	
Insulation level LV-winding:			
Lightning-impulse test voltage	kV	30	
Power-frequency test voltage	kV	10	

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Resistance per phase:			
- HV winding	$\Omega$	to be specified	
- LV winding	$\Omega$	to be specified	
Sound pressure level	dB(A)	52	
Max. temperature rise at 45° C ambient temperature and at full load:			
- Winding	°C	to be specified	
- Iron core	°C	to be specified	
- Oil at top level	°C	to be specified	
Max. ambient temperature	°C	45	
Cooling system		ONAN	
Conductor material		Copper	
Insulating material of windings		to be specified	
Insulation class		yes	
Standard bushings		yes	
<b>Accessories:</b>			
- Dial type contactor thermometer	pcs.	1	
- Oil level indicator	pcs.	1	
- Pocket thermometer	pcs.	1	
- Grounding terminals	pcs.	2	
- Filter pipe	pcs.	1	
- Oil drain plug	pcs.	1	
- Rating plate	pcs.	1	
- Towing eye	pcs.	1	
<b>Weights:</b>			
- Total	kg	to be specified	
- Oil	kg	to be specified	
<b>Dimensions:</b>			
- Length	mm	to be specified	
- Width	mm	to be specified	
- Height	mm	to be specified	
- Distance between wheels centers	mm	to be specified	
Standard		IEC 60076-7 IEC 60354	

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محمد طارق

**Table: Technical Data for Distribution Transformer 160 kVA, 20/0.4 kV**

Designation	Unit	Required	Offered
Manufacturer's Name		To be specified	
Type / Model		Oil-immersed With oil conservator	
Installation		outdoor	
Dielectric		oil, without PCB	
Oil type		to be specified	
Rated frequency	Hz	50	
Rated power	kVA	160	
Number of phases		3	
Rated voltage:			
- High voltage side	kV	20	
- Low voltage side	kV	0.4	
Taps on HV side	%	±2x2.5%, off load	
Rated currents			
- High voltage side	A	to be specified	
- Low voltage side	A	to be specified	
Impedance voltage	%	4	
Vector group		Dyn5	
Treatment of neutral (LV side)		Solidly earthed	
Losses:			
- No-load	W	To be specified	
- Load	W	To be specified	
Insulation level HV-winding			
Lightning-impulse test voltage	kV	125	
Power-frequency test voltage	kV	50	
Insulation level LV-winding			
Lightning-impulse test voltage	kV	30	
Power-frequency test voltage	kV	10	

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Resistance per phase:			
- HV winding	Ω	to be specified	
- LV winding	Ω	to be specified	
Sound pressure level	dB(A)	52	
Max. temperature rise at 45° C ambient temperature and at full load:			
- Winding	°C	to be specified	
- Iron core	°C	to be specified	
- Oil at top level	°C	to be specified	
Max. ambient temperature	°C	45	
Cooling system		ONAN	
Conductor material		Copper	
Insulating material of windings		to be specified	
Insulation class		yes	
Standard bushings		yes	
<b>Accessories:</b>			
- Dial type contactor thermometer transformer	pcs.	1	
- Oil level indicator	pcs.	1	
- Pocket thermometer	pcs.	1	
- Grounding terminals	pcs.	2	
- Filter pipe	pcs.	1	
- Oil drain plug	pcs.	1	
- Rating plate	pcs.	1	
- Towing eye	pcs.	1	
<b>Weights:</b>			
- Total	kg	to be specified	
- Oil	kg	to be specified	
<b>Dimensions:</b>			
- Length	mm	to be specified	
- Width	mm	to be specified	
- Height	mm	to be specified	
- Distance between wheels centers	mm	to be specified	
Standard specifications		IEC 60076-7 IEC 60354	

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محمد کمالی 4

Table: Technical Data for Distribution Transformer 100 kVA, 20/0.4 kV

Designation	Unit	Required	Offered
Manufacturer's Name		To be specified	
Type / Model		Oil-immersed With conservator	
Installation		Outdoor	
Dielectric		oil, without PCB	
Oil type		to be specified	
Rated frequency	Hz	50	
Rated power	kVA	100	
Number of phases		3	
Rated voltage:			
- High voltage side	kV	20	
- Low voltage side	kV	0.4	
Taps on HV side	%	±2x2.5%, off load	
Rated currents			
- High voltage side	A	to be specified	
- Low voltage side	A	to be specified	
Impedance voltage	%	4	
Vector group		Dyn5	
Treatment of neutral (LV side)		Solidly earthed	
Losses:			
- No-load	W	To be specified	
- Load	W	To be specified	
Insulation level HV-winding:			
Lightning-impulse test voltage	kV	125	
Power-frequency test voltage	kV	50	
Insulation level LV-winding:			
Lightning-impulse test voltage	kV	30	
Power-frequency test voltage	kV	10	

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حاجہ سجادہ! 5

Resistance per phase:			
- HV winding	$\Omega$	to be specified	
- LV winding	$\Omega$	to be specified	
Sound pressure level	dB(A)	52	
Max. temperature rise at 45° C ambient temperature and at full load:			
- Winding	°C	to be specified	
- Iron core	°C	to be specified	
- Oil at top level	°C	to be specified	
Max. ambient temperature	°C	45	
Cooling system		ONAN	
Conductor material			
Insulating material of windings		Copper	
Insulation class		to be specified	
Standard bushings		yes	
<b>Accessories:</b>			
- Dial type contactor thermometer	pcs.	1	
- Oil level indicator	pcs.	1	
- Pocket thermometer	pcs.	1	
- Grounding terminals	pcs.	2	
- Filter pipe	pcs.	1	
- Oil drain plug	pcs.	1	
- Rating plate	pcs.	1	
- Towing eye	pcs.	1	
<b>Weights:</b>			
- Total	kg	to be specified	
- Oil	kg	to be specified	
<b>Dimensions:</b>			
- Length	mm	to be specified	
- Width	mm	to be specified	
- Height	mm	to be specified	
- Distance between wheels centers	mm	to be specified	
Standard		IEC 60076-7 IEC 60354	

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محمد کاظم

**Table: Technical Data Disconnecting Switch 20kV, 630 A**

Description	Unit	Required	Offered
Manufacturer's Name		to be specified	
Type / Model		to be specified	
Installation		pole mounted	
Nominal Voltage	kV	20	
Rated Voltage	kV	24	
Rated Frequency	Hz	50	
Rated Normal Current	A	630	
Rated Breaking current			
Rated lightning-impulse withstand voltage	kV	125	
Power frequency test voltage	kV	50	
Rated short-time current	kA	25	
Rated short-circuit making current	kA	63	
Creepage distance for insulators	mm/kV	25	
Distance between phase centers (min)	mm	350	
Operation mechanism		Manual	
All necessary accessories		to be confirmed	
Standard specifications		IEC 60129 VDE 0670	

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6:07

Table: Technical Data Disconnecting Switch Combination fuse 20kV, 630 A

Description	Unit	Required	Offered
Manufacturer's Name		to be specified	
Type / Model		to be specified	
Installation		pole mounted	
Nominal Voltage	kV	20	
Rated Voltage	kV	24	
Rated Frequency	Hz	50	
Rated Normal Current	A	630	
Rated Breaking current			
Rated lightning-impulse withstand voltage	kV	125	
Power frequency test voltage	kV	50	
Rated short-time current	kA	25	
Rated short-circuit making current	kA	63	
Creepage distance for insulators	mm/kV	25	
Distance between phase centers (min)	mm	350	
Link Fuse	A	To be specified according to BOQ	
Operation mechanism		Manual	
All necessary accessories		to be confirmed	
Standard specifications		IEC 60129	
		VDE 0670	

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Table: Surge Arrester

Designation	Unit	Required	Offered
Manufacturer	-	-	
Country of origin	-		
Type	-	station metal oxide gapless	
Housing	-	silicon rubber	
Color	-	grey	
<b>Nominal characteristics</b>	-		
Rated max. network operating voltage	kV	24	
Rated operating voltage (Ur)	kV	24	
Rated continuous operating voltage (Uc)	kV	20	
Rated discharge current (peak)	kA	10	
Switching impulse current (peak)	kA	2	
Line discharge class (IEC 99-4)	-		
Rated frequency	Hz	50	
<b>Protection characteristics</b>			
Max. residual voltages			
- For a steep impulse current, ½ µs front, 10 kA.	kV	71	
- For lightning impulse current, 8/20 µs, 10 kA.	kV	67	
- For a switching impulse current 30/60 µs, 0.5 kA	kV	52	
Energy absorbing capacity	kJ/kV	4.3	
<b>Operating performances</b>			
High current impulse withstand (4/10 µs)	kA	100	
Temporary over voltage withstand (for 10s)	kV	24	

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10/10/10

Table: Surge Arrester

Designation	Unit	Required	Offered
<b>Insulation levels</b>			
- Lightning impulse withstand voltage	kV	125	
- Power frequency withstand voltage (1 m wet)	kV	50	
- Creepage distance	mm/kV	25	
- Cantilever strength	kN	-	
- Torsion strength	N-m	-	
<b>Pressure relief capacity</b>			
- Current amplitude (rms)	KA	17.5	
- X/R, asymmetry factor	-	17	
- Current duration	s	0.2	
<b>Weights and dimensions:</b>			
- Arrester height	mm	-	
- Arrester diameter	mm	-	
- Weight	kg	-	
<b>Accessories</b>			
Mounting hardware	-	Yes	
Ground Connector	-	Yes	
Insulating bases	-	Yes	
Discharge counter	-	-	
HV terminals connectors	-	Yes	
<b>Standards</b>			
	-	IEC 60099-4	
<b>Quality control</b>			
	-	ISO 9001	
<b>Installation</b>			
	-	Outdoor	

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تاریخ کار: ۱۰/۱۰/۱۰

**Table: LV Underground Cable 0.6/1 kV, NYY 1 x 300 RM**

Designation	Unit	Required	Offered
Manufacturer's name		To be specified	
Cable type (one – core)		NYY	
Conductor material		Copper	
Conductor shape		Circular stranded	
Nominal cross-sectional area of conductor	mm <sup>2</sup>	300	
Insulation material of conductor	mm	PVC	
Insulation thickness		2.2	
Outer sheath material		PVC	
Thickness of outer sheath	mm	1.8	
Overall diameter of cable(D)	mm	30	
Weight of cable	kg/km	3219	
Minimum bending radius	mm	15 D	
Nominal voltage	kV	0.6/1.0	
Max. Permissible operating voltage	kV	1.2	
Service voltage	kV	0.4/0.230	
Frequency	Hz	50	
Effective a.c. resistance at 70° C	Ω/km	0.075	
Max. admissible short circuit current (1s)	kA	34.5	
Current carrying capacity (in air)	A	557	
Inductance per conductor	mH/km	To be specified	
Standards		IEC 60502	
		DIN VDE 0271	
		VDE 0295	
		(IEC60228)	
		VDE0293-	

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11/01/11

**Table: LV Underground Cable 0.6/1 kV, NYY 4 x 185 Sm**

Designation	Unit	Required	Offered
Manufacturer's name		To be specified	
Cable type (four – core)		NYN	
Conductor material		Copper	
Conductor shape		Sector Stranded	
Nominal cross-sectional area of conductor	mm <sup>2</sup>	185	
Insulation material of conductor		PVC	
Insulation thickness	mm	2.0	
Outer sheath material		PVC	
Thickness of outer sheath	mm	2.8	
Overall diameter of cable (D)	mm	54	
Weight of cable	kg/km	8596	
Minimum bending radius	mm	15 D	
Nominal voltage	kV	0.6/1.0	
Max. Permissible operating voltage	kV	1.2	
Service voltage	kV	0.4/0.230	
Frequency	Hz	50	
Effective d.c. resistance at 20° C	Ω/km	0.0991	
Max. admissible short circuit current (1s)	kA	21.3	
Current carrying capacity (in ground)	A	396	
Inductance per conductor	mH/km	To be specified	
Standards		IEC 60502 DIN VDE 0271 VDE 0295 (IEC60228) VDE0293	

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12:01

**Table: LV Underground Cable 0.6/1 kV, NYY 4 x 120 SM**

Designation	Unit	Required	Offered
Manufacturer's name		To be specified	
Cable type (four – core)		NYN	
Conductor material		Copper	
Conductor shape		Sector Stranded	
Nominal cross-sectional area of conductor	mm <sup>2</sup>	120	
Insulation material of conductor		PVC	
Insulation thickness	mm	1.6	
Outer sheath material		PVC	
Thickness of outer sheath	mm	2.4	
Overall diameter of cable (D)	mm	43	
Weight of cable	kg/km	5676	
Minimum bending radius	mm	15 D	
Nominal voltage	kV	0.6/1.0	
Max. Permissible operating voltage	kV	1.2	
Service voltage	kV	0.4/0.230	
Frequency	Hz	50	
Effective a.c. resistance at 70° C	Ω/km	0.187	
Max. admissible short circuit current (1s)	kA	13.8	
Current carrying capacity (in ground)	A	285	
Inductance per conductor	mH/km	To be specified	
Standards		IEC 60502 DIN VDE 0271 VDE 0295 (IEC60228) VDE0293	

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تعمیر کیا، 13.10.13

**Table: LV Underground Cable 0.6/1 kV, NYY 4 x 70SM**

Designation	Unit	Required	Offered
Manufacturer's name		To be specified	
Cable type (four – core)		NYY	
Conductor material		Copper	
Conductor shape		Sector Stranded	
Nominal cross-sectional area of conductor	mm <sup>2</sup>	70	
Insulation material of conductor		PVC	
Insulation thickness	mm	1.4	
Outer sheath material		PVC	
Thickness of outer sheath	mm	2.1	
Overall diameter of cable(D)	mm	36	
Weight of cable	kg/km	3375	
Weight of copper	kg/km	3243	
Minimum bending radius	mm	15 D	
Nominal voltage	kV	0.6/1.0	
Max. Permissible operating voltage	kV	1.2	
Service voltage	kV	0.4/0.230	
Frequency	Hz	50	
Effective d.c. resistance at 20° C	Ω/km	0.268	
Max. admissible short circuit current (1s)	kA	8.05	
Current carrying capacity (in ground)	A	200	
Inductance per conductor	mH/km	To be specified	
Standards		IEC 60502 DIN VDE 0271 VDE 0295 (IEC60228) VDE0293	

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14:01

**Table: LV Underground Cable 0.6/1 kV, NYY- 4x 10 RM**

Designation	Unit	Required	Offered
Manufacturer's name		To be specified	
Cable type (four – core)		NYN	
Conductor material		Copper	
Conductor shape		Circular stranded	
Nominal cross-sectional area of conductor	mm <sup>2</sup>	10	
Insulation material of conductor		PVC	
Insulation thickness	mm	1.0	
Outer sheath material		PVC	
Thickness of outer sheath	mm	1.8	
Overall diameter of cable(D)	mm	21	
Weight of cable	kg/km	743	
Minimum bending radius	mm	12 D	
Nominal voltage	kV	0.6/1.0	
Max. Permissible operating voltage	kV	1.2	
Service voltage	kV	0.4/0.230	
Frequency	Hz	50	
Effective a.c. resistance at 20° C	Ω/km	1.83	
Max. admissible short circuit current (1s)	kA	1.15	
Current carrying capacity (in ground)	A	60	
Inductance per conductor	mH/km	To be specified	
Standards		IEC 60502 DIN VDE 0271 VDE 0295 (IEC60228) VDE0293	

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15/10/2015

**Table: Technical Data for ABC Low Voltage Cables LV ABC 4 x 70 mm<sup>2</sup>**

Description	Unit	Required	Offered
Manufacturer			
Rated Voltage	kV	0.6/1	
<b><u>Phases and Neutral</u></b>			
Material		Aluminum	
Cross section	mm <sup>2</sup>	70	
Class		2	
Cross section shape		Circular compacted	
Number of wires		≥12	
Diameter of wires	mm	To be specified	
Diameter of conductor	mm	9.7	
Maximum conductor DC resistance at 20 °C	ohm/km	0.443	
Insulation Material		Black XLPE	
Insulation thickness	Mm	1.5	
Breaking load of single core, min.	KN	11	
Breaking load of complete cable, min.	KN	39.2	
<b><u>Technical Characteristics</u></b>			
Outer diameter of bundle (D)	mm	31.3	
Weight of conductor	kg/km	960	
Minimum bending radius	mm	12 D	
Maximum lay of cores			
Current rating /ambient 40 °C	A	205	
Maximum conductor temperature/normal operation	°C	90	
Maximum conductor temperature/short circuit	°C	250	
Rated short circuit /phase	kA	5.0	
Length of conductor drum	m	To be specified	
Gross weight of loaded drum	kg	To be specified	
Standard		IEC 60502 NFA2X (VDE 0276 - 626 4F-1), AsXS (n) (PL WT92/K396), 1-AES (CSN 34761-4F) AS/NZS 3560.1	

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تصدیق شماره: 16

Table: Technical Data for ABC Low Voltage Cables LV ABC 4 x 50 mm<sup>2</sup>

Description	Unit	Required	Offered
Manufacturer			
Rated Voltage	kV	0.6/1	
<b>Phases and Neutral</b>			
Material		Aluminum	
Cross section	mm <sup>2</sup>	50	
Class		2	
Cross section shape		circular compacted	
Number of wires		≥6	
Diameter of wires	mm	To be specified	
Diameter of conductor	mm	8.1	
Maximum conductor DC resistance at 20 °C	ohm/km	0.641	
Insulation Material		Black XLPE	
Insulation thickness	Mm	1.5	
Breaking load of single core, min.	KN	8.4	
Breaking load of complete cable, min.	KN	28	
<b>Technical Characteristics</b>			
Outer diameter of bundle (D)	mm	27.3	
Weight of conductor	kg/km	715	
Minimum bending radius	mm	12 D	
Maximum lay of cores			
Current rating /ambient 40 °C	A	165	
Maximum conductor temperature/normal operation	°C	90	
Maximum conductor temperature/short circuit	°C	250	
Rated short circuit /phase	kA	3.6	
Length of conductor drum	m	To be specified	
Gross weight of loaded drum	kg	To be specified	
Standard		IEC 60502 NFA2X (VDE 0276 - 626 4F-1), AsXS (n) (PL WT92/K396), 1-AES (GSN 34761-4F) AS/NZS 3560.1	

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Table: Technical Data for 20 kV Fiber pin Insulator

Description	Unit	Required	Offered
Manufacturer's Name		to be specified	
Type		pin insulator	
Material		silicon rubber	
Rated voltage	kV	24	
Power frequency withstand voltage:	KV	65	
Dry Lightning impulse withstand voltage:	KV	145	
Leakage distance	mm	610	
Min Arc distance	mm	215	
Section length	mm	305	
Specified mechanical load	KN	11	
Nominal diameter "D"	mm	to be specified	
Maximum height "H"	mm	to be specified	
Min. nominal creepage distance	mm	to be specified	
Number of the fiber	number	to be specified	
Unit weight	kg	to be specified	
With all necessary accessories for Installation incl. metal thimbles threaded for screwing on to steel spindles			
Reference standard		IEC 61109	

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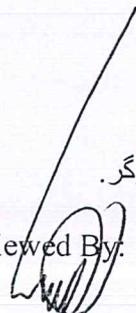
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Table: Technical Data for 20 kV Fiber Tension Insulator

Designation	Unit	Required	Offered
Manufacturer's Name		to be specified	
Type		tension insulator	
Material		silicon rubber	
Rated voltage	kV	24	
Minimum mechanical failing load	kN	70	
Height	MM	450	
Insulating distance Li.	MM	235	
Min.nominal creepage distance	MM	635	
Diameter of shed	MM	148/118	
1 min power frequency wet withstand voltage not less than	KV	42	
Full wave lightning impulse voltage (peak value)	KV	150	
Dry impulse withstand voltage:	KV	to be specified	
Minimum puncture voltage in oil	kV	to be specified	
Number of elements	number	to be specified	
Weight	kg	to be specified	
With all necessary accessories for installation standard		IEC 61109	

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**Table: Technical Data for Overhead Line Conductor ACSR 185/30 mm<sup>2</sup>**

Designation	Unit	Required	Offered
Manufacturer's name		To be specified	
Type		Aluminum conductor Steel – reinforced (ACSR)	
Nominal cross-section	mm <sup>2</sup>	185/30	
<b>Cross-section ratio AL/St approx.</b>		To be specified	
<b>Steel</b>			
- construction	N/mm	7/2.33	
- diameter	mm	6.99	
- cross-section	mm <sup>2</sup>	29.8	
<b>Aluminium</b>			
- construction	N/mm	26/3.0	
- cross-section	mm <sup>2</sup>	183.8	
Total cross-section	mm <sup>2</sup>	213.6	
Conductor diameter approx.	mm	19	
<b>Conductor weight</b>			
- steel	kg/km	234	
- aluminium	kg/km	507	
- grease	kg/km	4.3	
- with grease total approx.	kg/km	745	
Current carrying capacity	A	535	
Nominal conductor breaking load	KN	65.27	
Calculated conductor resistance at 20° C	Ω/km	0.1571	
Standard length per reel approx.	m	to be specified	
Dispatch reel nominal size	m	to be specified	
Standard specifications		IEC 209 DIN 48204 BS EN 50182	

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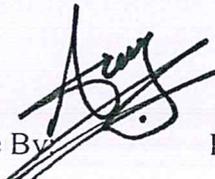
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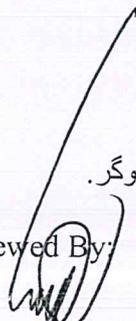
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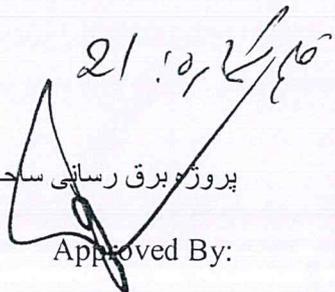
**Table: Technical Data for Overhead Line Conductor ACSR 120/20 mm<sup>2</sup>**

Designation	Unit	Required	Offered
Manufacturer's name		To be specified	
Type		Aluminum conductor Steel – reinforced (ACSR)	
Nominal cross-section	mm <sup>2</sup>	120/20	
<b>Cross-section ratio AL/St approx.</b>		To be specified	
<b>Steel</b>			
- construction	N/mm	7/1.9	
- diameter	mm	5.7	
- cross-section	mm <sup>2</sup>	19.8	
<b>Aluminum</b>			
- construction	N/mm	26/2.44	
- cross-section	mm <sup>2</sup>	121.6	
Total cross-section	mm <sup>2</sup>	141.4	
Conductor diameter approx.	mm	15.5	
<b>Conductor weight</b>			
- steel	kg/km	156	
- aluminum	kg/km	335	
- grease	kg/km	2.9	
- with grease total approx.	kg/km	493.9	
Current carrying capacity	A	410	
Nominal conductor breaking load	KN	44.5	
Calculated conductor resistance at 20° C	Ω/km	0.2376	
Standard length per reel approx.	m	to be specified	
Dispatch reel nominal size	m	to be specified	
Standard specifications		IEC 209 DIN 48204 BS EN 50182	

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**Table: Technical Data for Overhead Line Conductor ACSR 70/12 mm<sup>2</sup>**

Designation	Unit	Required	Offered
Manufacturer's name		To be specified	
Type		Aluminum conductor Steel – reinforced (ACSR)	
Nominal cross-section	mm <sup>2</sup>	70/12	
Cross-section ratio AL/St approx.		To be specified	
<b>Steel</b>			
- construction	N/mm	7/1,44	
- diameter	mm	4.32	
- cross-section	mm <sup>2</sup>	11.4	
<b>Aluminum</b>			
- construction	mm	26/1.85	
- cross-section	mm <sup>2</sup>	69.9	
Total cross-section	mm <sup>2</sup>	81.3	
Conductor diameter approx.	mm	11.7	
<b>Conductor weight</b>			
- steel	kg/km	89	
- aluminum	kg/km	193	
- grease	kg/km	1.7	
- with grease total approx.	kg/km	283	
Current carrying capacity	A	290	
Nominal conductor breaking load	KN	26.27	
Calculated conductor resistance at 20° C	Ω/km	0.1432	
Standard length per reel approx.	m	to be specified	
Dispatch reel nominal size	m	to be specified	
Standard specifications		IEC 209 DIN 48204 BS EN 50182	

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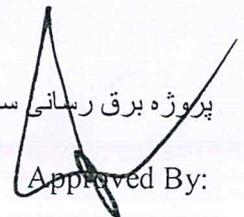


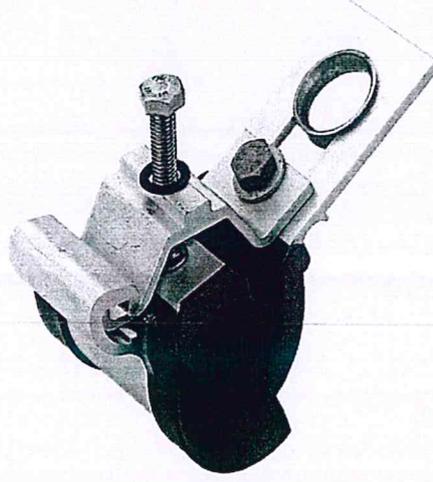
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22/01/20



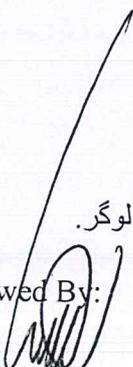


### LV ABC Cable Suspension Clamp

MODEL	CROSS-SECTION( mm2)
SM140	4 X (35-120)

27

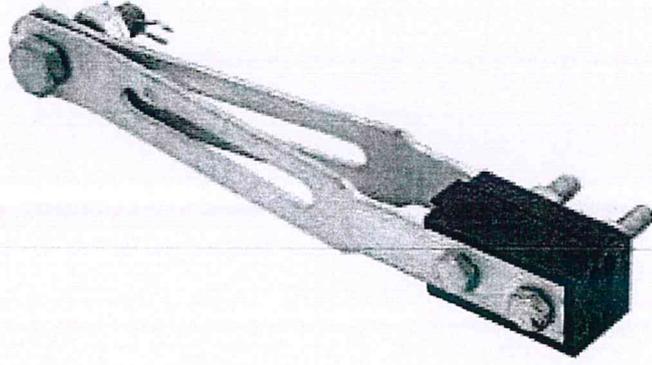
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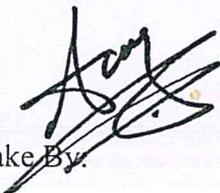
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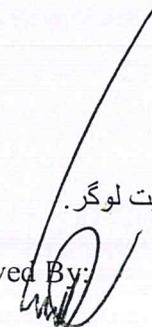


### AL-ABC - Tension Clamp

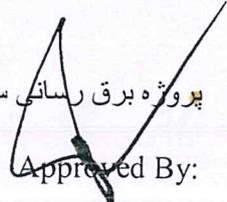
Usage	Line Fittings
Type	Tension Clamp
Conductor Range	4X(50-120 )mm <sup>2</sup>
Application	Low Voltage 1kv
Materials	AL- Robber

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# Insulation piercing connectors for connections to bare overhead

## Application

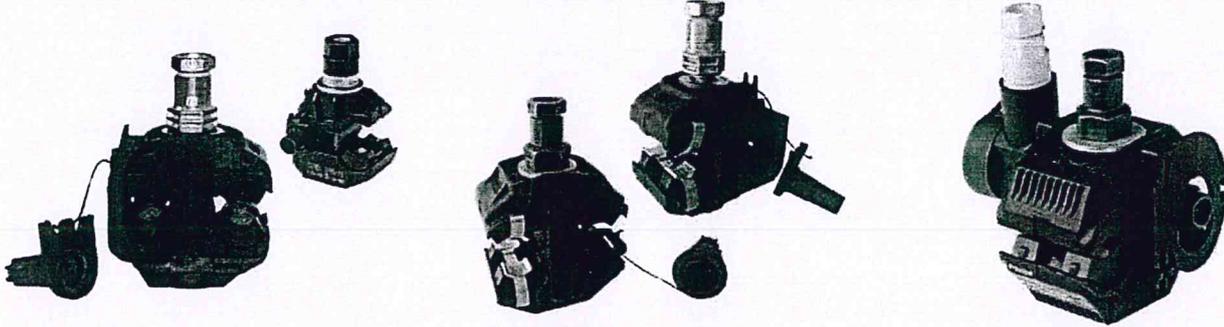
The connectors allow the transition between bare lines (aluminium or copper) and insulated LV ABC lines.

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

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

## Features

- Suitable for aluminium and copper conductors
- Groove in contact area for bare conductor fits also for small wires
- Potential free tightening bolts allow safe installations on live lines
- Exceeds requirements according to NFC 33020 and EN 50483-4
- Components not losable, end cap attached to body
- Insulation material made of weather and UV resistant glass fibre reinforced polymer
- Contact plates made of tinned copper, bolt made of steel with Geomet (Chromium free) protection



Type: P2X 95 Mk2, EP95-13

Type: P3B120, P2B100 U Mk 2

Type: KZ31-70 CNA

## For bare main (Al/Cu) to insulated service connections

Ordering description	Application range (mm <sup>2</sup> )		Bolt	Torque (Nm)	Weight (kg/100 pcs)
	Bare	Insulated			
<b>For bare main (Al/Cu) to insulated service connections</b>					
EP95 - 13	16 - 95	1.5 - 10	1 x M6	7	5.0
P2X 95 Mk2*	16 - 95	4 - 35	1 x M8	11	10.8
P2B100 U Mk2	7 - 100	4 - 35(50)	1 x M8	11	13.5
<b>For bare main (Al/Cu) to insulated main connections</b>					
P3B120	7 - 120 (150) mm <sup>2</sup>	25 - 95	1 x M8	18	17.0

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

NOTE Equivalent to a diameter range of 4.5 to 12 mm.

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

Application range (mm <sup>2</sup> )		Ordering description	Bolt	Torque (Nm)	Weight (kg/100 pcs)
Bare	Insulated				
22 - 75 Al*	35 - 70	KZ31-70 CNA	1 x M8/1 x M10	11/10	24.0
7 - 48 Cu	35 - 70	KZ31-70 CNU	1 x M8/1 x M10	11/10	24.0

\* Equivalent to a diameter range of 6 to 11 mm.

30 و 29:0, ٤٤٩ ١٢١



### Compression Cable Lugs

Color	Golden
Material	Copper
Size:	10-300 mm <sup>2</sup>
Application	Power Distribution

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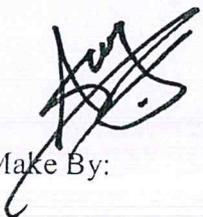
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#### Compression Cable Lugs

Color	Silver
Material	Aluminium
Size:	50-70 mm <sup>2</sup>
Application	Power Distribution

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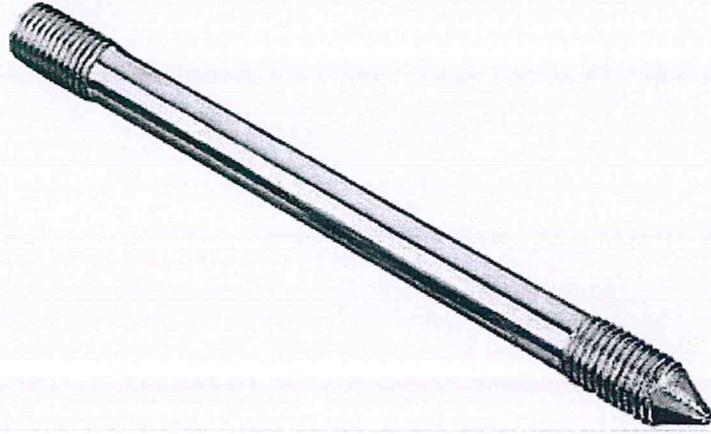
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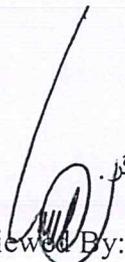


### Copper Ground Ear thing Rod

Diameter	20mm2
Usage/Application	Power Distribution Earthing
Material	Copper
Color	Copper
Length Of Rod	2.5m

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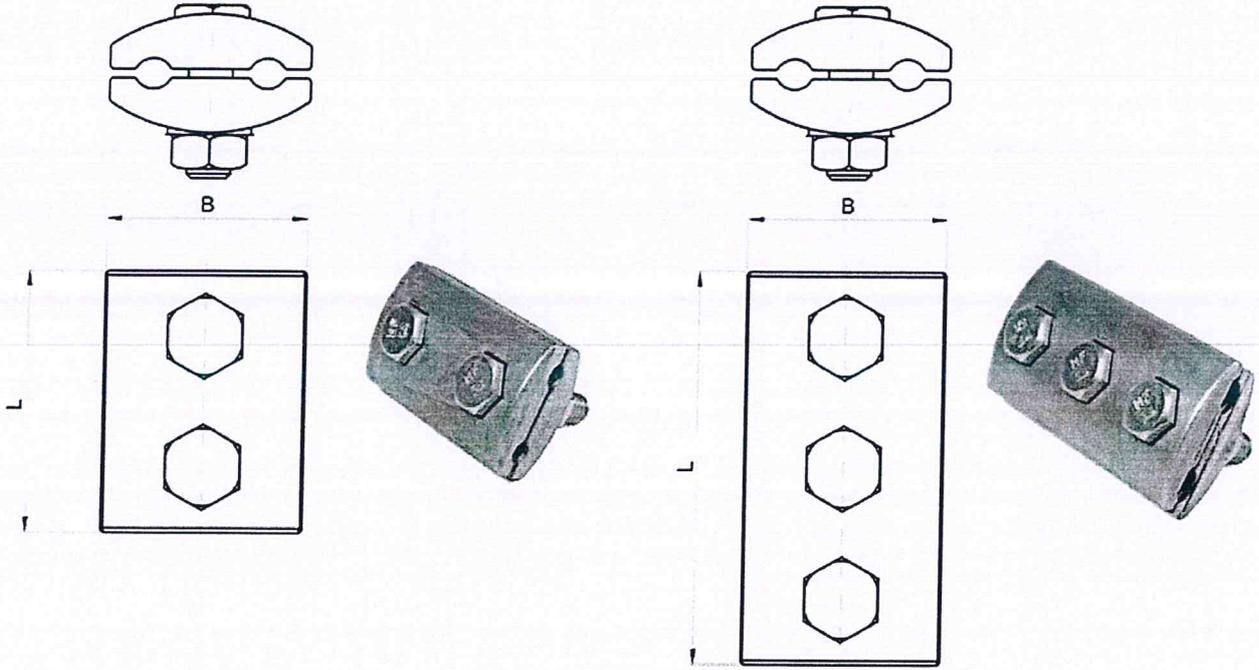
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Materijal: Al legura DIN 226  
Standard: DIN 48 075



AlAl Groove Clamps are used to joint two parallel aluminum alloy conductors (AAAC), aluminum conductors steel reinforced (ACSR) or ends of ABC of the same or similar cross sections from which the insulation has been removed. Their technical characteristics enable jointing of phase conductors at the places where high tensile strength and stiffness is required (joint done in accordance with Standard DIN 48 075). AlAl Groove Clamps are made using die casting process and the inside grooves are cogged, which increases safety regarding pulling out and provides high-quality electrical contact (the grooves are made in such a way that aluminum oxide from the conductor surface is broken, which reduces transitional resistance between the clamp and the conductor). The body of the clamp is made of aluminum alloy of high tensile strength and is corrosion resistant. Their technical characteristics provide fast, easy and reliable installation and long-life and safe usage with minor losses on the network due to very low transitional resistance. Bolts and nuts are Zinc plated. Inside grooves are protected with electrical contact grease. with electrical contact grease.

NOTE: On Customer's request the clamps can be delivered with hot-dip galvanized or stainless steel X 5 CrNi 18-10 bolt parts.

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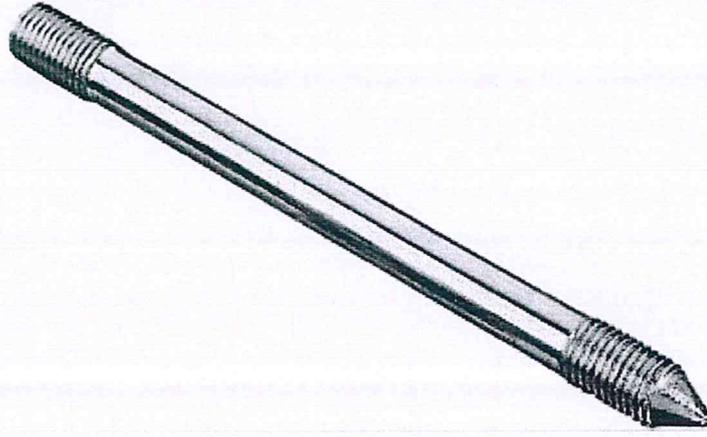
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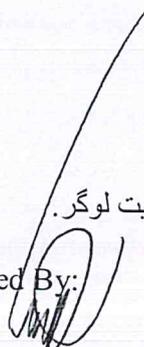


### Copper Ground Ear thing Rod

Diameter	20mm2
Usage/Application	Power Distribution Earthing
Material	Copper
Color	Copper
Length Of Rod	1m

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