

49  
Table: Technical Data for Distribution Transformer 630 kVA, 20/0.4 kV

Manufacturer's Name		To be specified	
Type / Model		Oil-immersed	
Installation		With oil conservator	
Dielectric		outdoor	
Oil type		oil, without PCB	
Rated frequency	Hz	to be specified	
Rated power	kVA	50	
Number of phases		630	
Rated voltage:		3	
- 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	%	6	
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			
<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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50

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

Manufacturer's Name		To be specified	
Type / Model		Oil-immersed	
Installation		With oil conservator	
Dielectric		outdoor	
Oil type		oil, without PCB	
Rated frequency	Hz	to be specified	
Rated power	kVA	50	
Number of phases		400	
Rated voltage:		3	
- High voltage side	kV	20	
- Low voltage side	kV	0.4	
Taps on HV side	%	$\pm 2 \times 2.5\%$ , 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			
<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	

تعمیر شماره: 2



پروژه د شبکه برقی سازی موخه وړو قریجات ولسوالی دشت ارچی ولایت کنډز.

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52

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

Manufacturer's Name		To be specified	
Type / Model		Oil-immersed	
Installation		With oil conservator	
Dielectric		outdoor	
Oil type		oil, without PCB	
Rated frequency	Hz	to be specified	
Rated power	kVA	50	
Number of phases		250	
Rated voltage:		3	
- 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	



پروژه شبکه برق قریبیات ولسوالی دشت ارچی ولایت کندز.

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53

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			
<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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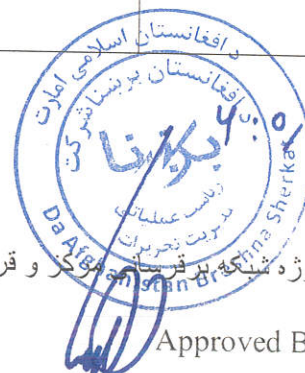
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پروژه شبکه برق رسانی مرکز و فریجات ولسوالی دشت ارچی ولایت کندز.



54  
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	
Installation		With oil conservator	
Dielectric		outdoor	
Oil type		oil, without PCB	
Rated frequency	Hz	to be specified	
Rated power	kVA	50	
Number of phases		160	
Rated voltage:		3	
- High voltage side	kV	20	
- Low voltage side	kV	0.4	
Taps on HV side	%	$\pm 2 \times 2.5\%$ , 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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55

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			
<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	



پروژه شمعه برقی و قریجات ولسوالی دشت ارچی ولایت کندز.

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56

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	%	$\pm 2 \times 2.5\%$ , 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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57

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			
<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	

تعمیم شده

د افغانستان اسلامي امارت  
د افغانستان پر بنسټ کېږي  
بېرته  
د افغانستان برېښنا شرکت  
Da Afghanistan Breshna Sherkat

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59

**Table: Low voltage distribution switchboard MCCB – 1000 A**

Description	Unit	Required	Offered
Manufacturer			
Type		Outdoor	
Materials for enclosure		Black steel sheet with electrostatic powder	
Dimensions of enclosure (width x depth x height)	mm		
Thickness	mm	1.5	
Mechanical shock withstand	J	20	
Weight	kg	To be specified	
Rated maximum voltage	V	600	
Rated lightning impulse withstand voltage phase to earth (1.2/50 $\mu$ s wave)	KV peak	6	
Rated withstand voltage at power frequency between phase and frame	KV rms	2	
MCCB: rated current	A	1000	
Rated continues current	A	1000	
Trip unit	A	1000	
Ultimate breaking capacity	kA	100	
Standard		IEC 60947.2	
Rated operation voltage	V	600	
Frequency	Hz	50	
Pole quantity	pole	3	
Number of incoming feeders		1	
Number of outgoing feeders		To be specified according to BOQ	
The distribution cabinets shall be pre-wire with neutral and earth bus ready for service, complete with cable lugs		yes	



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**Table: LOW VOLTAGE MCCB – 250 A FOR OUTGOING FEEDER**

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60

Table: Low voltage distribution switchboard with MCCB – 630 A

Description	Unit	Required	Offered
Manufacturer		To be specified	
Type		Outdoor	
Materials for enclosure		Black steel with electrostatic powder	
Dimensions of enclosure (width x depth x height)	mm	To be specified	
Thickness	mm	1.5	
Mechanical shock withstand	J	20	
Weight	kg		
Rated maximum voltage	V	600	
Rated lightning impulse withstand voltage phase to earth (1.2/50 $\mu$ s wave)	KV peak	6	
Rated withstand voltage at power frequency between phase and frame	KV rms	2	
Phase barrier		Yes	
Phase puller (one per board)		yes	
MCCB : rated current	A	630	
Rated continues current	A	630	
Trip unit	A	630	
Ultimate breaking capacity	KA	> 50	
Pole quantity	pole	3	
Standard		IEC 60947.2	
Rated operation voltage	V	600	
Frequency	Hz	50	
Number of incoming feeders		1	
Number of outgoing feeders		To be specified according to BOQ	
The distribution cabinets shall be pre-wired with neutral and earth bus ready for service, complete with cable lugs.		yes	



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61

**Table : LOW VOLTAGE MCCB – 200 A FOR OUTGOING FEEDER**

Description	Unit	Required	Offered
Manufacturer	-	To be specified	
MCCB: rated current	A	200	
Rated continues current	A	200	
Trip unit	A	200	
Ultimate breaking capacity	kA	>35	
Short circuit current	kA	4.56	
Rated operation voltage	V	415- 690	
Frequency	Hz	50	
Rated insulating voltage	V	800	
Temperature rang	C <sup>0</sup>	-5 to +40	
Rated impulse voltage	KV	8	
Pole quantity	pole	3	
Standard	-	IEC 60947.2	



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62  
Table: Low voltage distribution switchboard with MCCB – 400 A

Description	Unit	Required	Offered
Manufacturer		To be specified	
Type		Outdoor	
Materials for enclosure		Black steel sheet with electrostatic powder	
Dimensions of enclosure (width x depth x height)	mm	To be specified	
Thickness	mm	1.5	
Mechanical shock withstand	J	20	
Weight	kg		
Rated maximum voltage	V	600	
Rated lightning impulse withstand voltage phase to earth (1.2/50 $\mu$ s wave)	KV peak	6	
Rated withstand voltage at power frequency between phase and frame	KV rms	2	
Phase barrier		Yes	
MCCB: rated current	A	400	
Rated continues current	A	400	
Trip unit	A	400	
Ultimate breaking capacity	kA	>50	
Standard		IEC 60947.2	
Rated operation voltage	V	600	
Frequency	Hz	50	
Pole quantity	pole	3	
Number of incoming feeders		1	
Number of outgoing feeders		To be specified according to BOQ	
The distribution cabinets shall be pre-wire with neutral and earth bus ready for service, complete with glands		yes	

پروژه شبکه برق سانی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

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63

Table : LOW VOLTAGE MCCB – 160 A FOR OUTGOING FEEDER

Description	Unit	Required	Offered
Manufacturer	-	To be specified	
Type		indoor	
MCCB: rated current	A	160	
Rated continues current	A	160	
Trip unit	A	160	
Ultimate breaking capacity	kA	>35	
Short circuit current	kA	3.65	
Rated operation voltage	V	415- 690	
Frequency	Hz	50	
Rated insulating voltage	V	800	
Temperature rang	C <sup>0</sup>	-5 to +40	
Rated impulse voltage	KV	6	
Pole quantity	pole	3	
Standard	-	IEC 60947.2	



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69

Table: Low voltage distribution switchboard transformer with MCCB – 250 A

Description	Unit	Required	Offered
Manufacturer		To be specified	
Type		Outdoor	
Materials for enclosure		Black steel sheet with electrostatic powder	
Dimensions of enclosure (width x depth x height)	mm	To be specified	
Thickness	mm	1.5	
Mechanical shock withstand	J	20	
Weight	kg		
Rated maximum voltage	V	600	
Rated lightning impulse withstand voltage phase to earth (1.2/50 $\mu$ s wave)	KV peak	6	
Rated withstand voltage at power frequency between phase and frame	KV rms	2	
Phase barrier		Yes	
MCCB: rated current	A	250	
Rated continues current	A	250	
Trip unit	A	250	
Ultimate breaking capacity	kA	>35	
Standard		IEC 60947.2	
Rated operation voltage	V	600	
Frequency	Hz	50	
Pole quantity	pole	3	
Number of incoming feeders		1	
Number of outgoing feeders		To be specified according to BOQ	
The distribution cabinets shall be pre-wire with neutral and earth bus ready for service, complete with glands		yes	



پروژہ سمجھوتہ برقی سہولتیں مرکز و قریبات و سولائی دشت ارچی ولایت کندز.

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65

Table : LOW VOLTAGE MCCB – 100 A FOR OUTGOING FEEDER

Description	Unit	Required	Offered
Manufacturer	-	To be specified	
type		indoor	
MCCB: rated current	A	100	
Rated continues current	A	100	
Trip unit	A	100	
Ultimate breaking capacity	kA	>25	
Short circuit current	kA	2.28	
Rated operation voltage	V	415- 690	
Frequency	Hz	50	
Rated insulating voltage	V	800	
Temperature rang	C <sup>o</sup>	-5 to +40	
Rated impulse voltage	KV	8	
Pole quantity	pole	3	
Standard	-	IEC 60947.2	



شمېره: 9

پروژه شبکه برق رسانی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

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66

Table: Low voltage distribution switchboard with MCCB 160A

Description	Unit	Required	Offered
Manufacturer		To be specified	
Type		Outdoor	
Materials for enclosure		Black steel sheet with electrostatic powder	
Thickness	mm	1.5	
Dimensions of enclosure width x depth x height)	mm		
Mechanical shock withstand	J	20	
Weight	kg		
Rated voltage	V	600	
Rated lightning impulse withstand voltage phase to earth (1.2/50 $\mu$ s wave)	KV peak	6	
Rated withstand voltage at power frequency between phase and frame	KV rms	2	
Phase barrier		Yes	
Phase puller (one per board)		yes	
MCCB: rated current	A	160	
Rated continues current	A	160	
Trip unit	A	160	
Ultimate breaking capacity	KA	>35	
Pole quantity	Pole	3	
Standard		IEC 60947.2	
Rated operation voltage	V	600	
Number of incoming feeders		1	
Number of outgoing feeders		To be specified according to BOQ	
The distribution cabinets shall be pre-wire with neutral and earth bus ready for service, complete with cable lugs		yes	

پروژه شبکه برق فرسای مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

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67

**Table: LOW VOLTAGE MCCB – 63 A FOR OUTGOING FEEDER**

Description	Unit	Required	Offered
Manufacturer	-	To be specified	
MCCB: rated current	A	63	
Rated continues current	A	63	
Trip unit	A	63	
Ultimate breaking capacity	kA	>25	
Short circuit current	kA	1.43	
Rated operation voltage	V	415- 690	
Frequency	Hz	50	
Rated insulating voltage	V	800	
Temperature rang	C°	-5 to +40	
Rated impulse voltage	KV	6	
Pole quantity	pole	3	
Standard	-	IEC 60947.2	

ختم شماره ۱۰



پروژه شبکه برق ساهو مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

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68

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	

اقدام کیا گیا ہے 11-12-13 و 14



پروژہ شبکه برق سانی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

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Checked By:

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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	



پروژه شبکه برق رسانی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

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Approved By:

Table: Surge Arrester

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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, 1/2 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	



پروژه شبکه برق رسانی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

Make By:

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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	

پروژه شبکه برقسانی مرکز و فریجات ولسوالی دشت ارچی ولایت کندز.

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Table: Pre-Stressed Steel concrete Poles (12m/800kfg)

Description	Unit	Required	Offered
<b>Concrete Poles</b>			
Manufacturer			
Type / Form		circular	
Pole Length	m	12	
Load			
Nominal	kgf	800	
Breaking	kg		
Safety Factor (minimum)		2.5	
Dimension of Top	mm	270	
Dimension of Base	mm	450	
Dimension of 1.80m from butt end	mm		
Type of Cement			
Weight of Pole	kg		
Minimum Cement Content	kg/m <sup>3</sup>		
Maximum Water/Cement Ratio			
Maximum Diameter Aggregates	mm		
Concrete Cylinder Strength at 28 days	Mpa		
Concrete Additives		Yes/No	
If yes, add details			
Curing Method			
Reinforcing Steel	Mpa		
Yield Stress			
Electrical grounding	mm <sup>2</sup>	35	
- Ground wire (Stranded soft drawn cooper)			
Standard		As per International	



پروژہ شبکه برقسانی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

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73

Table: Pre-Stressed Steel concrete Poles (12m/400kgf)

Description	Unit	Required	Offered
<b>Concrete Poles</b>			
Manufacturer			
Type / Form		Circular	
Pole Length	m	12	
Load			
Nominal	kgf	400	
Breaking	kg		
Safety Factor (minimum)		2.5	
Dimension of Top	mm	225	
Dimension of Base	mm	405	
Dimension of 1.80m from butt end	mm		
Type of Cement			
Weight of Pole	kg		
Minimum Cement Content	kg/m <sup>3</sup>		
Maximum Water/Cement Ratio			
Maximum Diameter Aggregates	mm		
Concrete Cylinder Strength at 28 days	Mpa		
Concrete Additives		Yes/No	
If yes, add details			
Curing Method			
Reinforcing Steel	Mpa		
Yield Stress			
Electrical grounding	mm <sup>2</sup>	35	
- Ground wire			
(Stranded soft drawn cooper)			
Standard		As per International	



پروژه شبکه برق رسانی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

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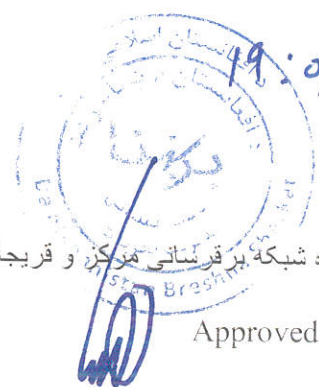
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Approved By:

74

Table: Pre-Stressed Steel concrete Poles (10m/800kgf)

Description	Unit	Required	Offered
Concrete Poles			
Manufacturer			
Type / Form		Circular	
Pole Length	m	10	
Load			
Nominal	kgf	800	
Breaking	kg		
Safety Factor (minimum)		2.5	
Dimension of Top	mm	190	
Dimension of Base	mm	340	
Dimension of 1.5m from butt end	mm		
Type of Cement			
Weight of Pole	kg		
Minimum Cement Content	kg/m <sup>3</sup>		
Maximum Water/Cement Ratio			
Maximum Diameter Aggregates	mm		
Concrete Cylinder Strength at 28 days	Mpa		
Concrete Additives		Yes/No	
If yes, add details			
Curing Method			
Reinforcing Steel	Mpa		
Yield Stress			
Electrical grounding	mm <sup>2</sup>	35	
- Ground wire (Stranded soft drawn cooper)			



پروژه شبکه برق رسانی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

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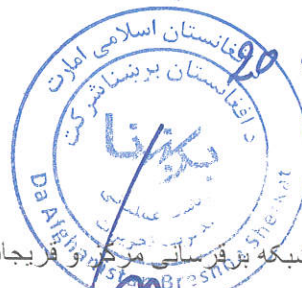
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Checked By:

Approved By:

Table: Pre-Stressed Steel concrete Poles (10m/400kgf)

Description	Unit	Required	Offered
Concrete Poles			
Manufacturer			
Type / Form		Circular	
Pole Length	m	10	
Load			
Nominal	kgf	400	
Breaking	kg		
Safety Factor (minimum)		2.5	
Dimension of Top	mm	190	
Dimension of Base	mm	340	
Dimension of 1.5m from butt end	mm		
Type of Cement			
Weight of Pole	kg		
Minimum Cement Content	kg/m <sup>3</sup>		
Maximum Water/Cement Ratio			
Maximum Diameter Aggregates	mm		
Concrete Cylinder Strength at 28 days	Mpa		
Concrete Additives		Yes/No	
If yes, add details			
Curing Method			
Reinforcing Steel	Mpa		
Yield Stress			
Electrical grounding	mm <sup>2</sup>	35	
- Ground wire			
(Stranded soft drawn cooper)			



پروژه شبکه برق رسانی مرکز و فریجات ولسوالی دشت ارچی ولایت کندز.

Make By:

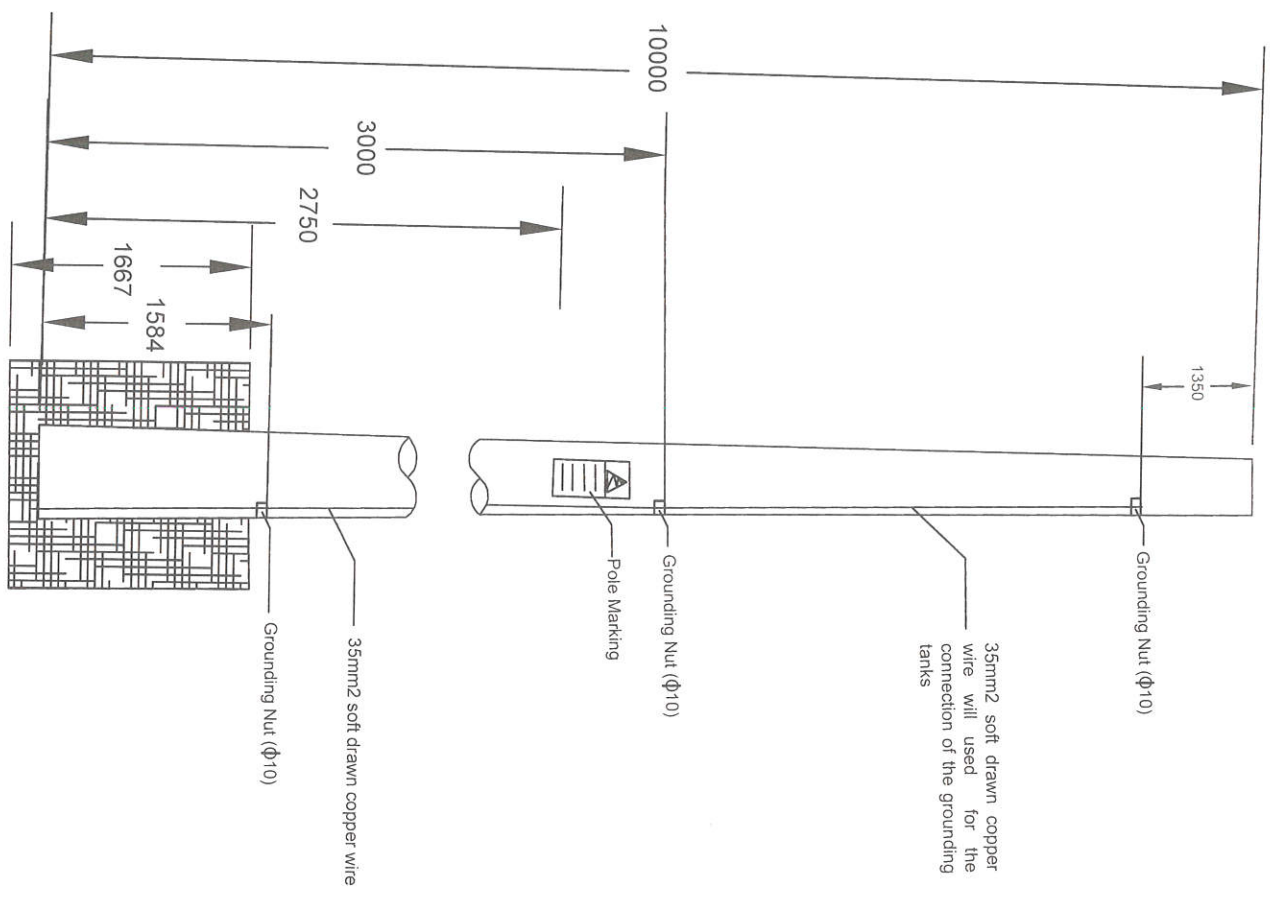
Reviewed By:

Checked By:

Approved By:



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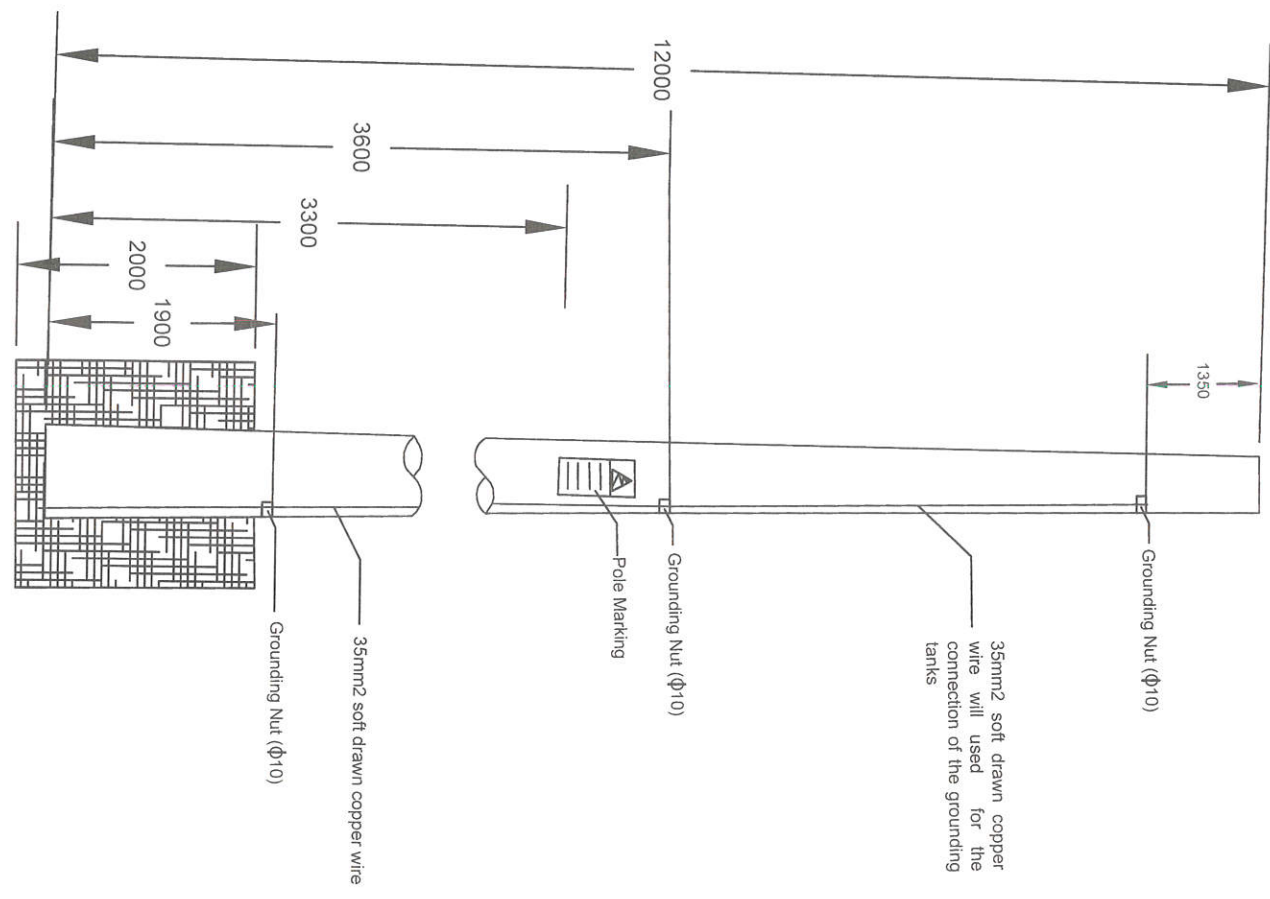
NOTE :  
 1. All dimension are in millimeter.  
 2. The 35mm<sup>2</sup> soft drawn copper wire have to consider 5cm plussage from the bottom.

اقوام کماره : ۱۹ و ۲۰

Handwritten signatures and marks.



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NOTE :  
 1. All dimension are in millimeter.  
 2. The 35mm<sup>2</sup> soft drawn copper wire have to consider 5cm plusage from the bottom.

امداد شماره: 17, 18

*(Handwritten signatures)*



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## پروسیجر انتخاب سیمیل و تست پایه های آهن کانکریتی

قبل از انتخاب نمونه و اجرای تست ، شرکت قراردادی مکلف به اجرای امور ذیل می باشد :

### درج مشخصات بر روی پایه ها (Labeling):

سطر اول : نام شرکت برشنا

سطر دوم : طول پایه به متر و مقاومت نامی پایه بر حسب کیلوگرام قوه

سطر سوم : نام فابریکه تولید کننده پایه

سطر چهارم : تاریخ ساخت روز - ماه - سال

سطر پنجم: سریال نمبر هر پایه

### انتخاب سیمیل (نمونه) برای تست:

در صورتیکه تعداد پایه های قرارداد شده بیشتر از 100 اصله باشد قرارداد مکلف است بعد از تولید یک محموله که 100 اصله پایه می شود لست آن را با درج مشخصات و سریال نمبر آن به شرکت برشنا ارسال نماید که بعدا هیئت موظف برشنا شرکت از هر محموله (100) اصله پایه یک اصله آنرا جهت تست انتخاب می نماید و در صورتیکه تعداد مجموعی پایه های قرارداد شده از 100 اصله کمتر باشد باز هم یک اصله پایه از هر نوع آن برای تست انتخاب می گردد.

همچنان قرارداد باید قبل از رفتن هیئت موظف برشنا شرکت به ساحه تست، تمام امکانات ذیل را آماده سازد:

1. آماده سازی محل تست مطابق هدایت هیئت موظف
2. آماده سازی پایه هاییکه قبلا توسط هیئت موظف در تست محموله تولید شده برای تست انتخاب گردیده است
3. آماده سازی داینامومتر (قوه سنج) با ظرفیت معادل حداقل دو برابر قوه نیایی پایه هاییکه تست میگردند
4. اسناد و سر تیفیکیت عیار سازی داینامومتر (قوه سنج) که توسط یک نهاد معتبر عیار سازی انجام گردیده باشد
5. محموله پایه های تولید شده باید ضوری چابجا گردیده باشد که مشخصات آن قابل دیدن باشد

### پروسیجر تست پایه ها:

تست پایه های آهن کانکریتی به دو گروه تقسیم می شود:

- 1- تست بصری (شکل ظاهری تمام محموله تولید شده چک میگردند).
- 2- تست قوه برداشت نهایی (بالای پایه هاییکه توسط هیئت موظف انتخاب گردیده انجام میگردند).

### تست بصری پایه های آهن کانکریتی:

در تست بصری تمام پایه ها شامل محموله باید از رویت ظاهری تمام ابعاد آن مطابق نقشه تائید شده بررسی گردد، پذیرش ابعادی قرار ذیل می باشد:

- 1- تفاوت طول پایه نظر به نقشه:  $\pm 15$  ملی متر
  - 2- تفاوت قطر پایه نظر به نقشه: کمتر از 2 ملی متر و بیشتر از 4 ملی متر نباشد
  - 3- تفاوت انحنا پایه نظر به نقشه:  $\pm 15$  ملی متر
  - 4- قطر سوراخ ها مطابق به نقشه: 0- ملی متر و  $+2$  ملی متر
  - 5- تفاوت موقعیت نسبی سوراخ ها نظر به نقشه:  $\pm 5$  ملی متر
  - 6- حداقل سطح مقطع تخته چوب های بین قطار پایه: چوب چهار تراش  $8 \times 8$  سانتی متر مربع
- نوت: حداکثر فاصله اولین تخته چوب از سر پایه 2 متر ، حداکثر فاصله آخرین تخته چوب از ته پایه 2 متر و حداکثر فواصل تخته های میانی از یکدیگر 4 متر می باشد.

### روش نگهداری پایه ها:

حداکثر قطار برای دبیو پایه های 200 کیلوگرام ، 5-6 قطار ، حداکثر قطار برای دبیو پایه های 400 و 600 کیلوگرام 4-5 قطار و حداکثر قطار برای دبیو پایه های 800 و 1200 کیلوگرام ، 3-4 قطار می باشد.

تاریخ: ۱۹، ۱۸، ۱۷، ۱۶، ۱۵، ۱۴، ۱۳، ۱۲، ۱۱، ۱۰، ۹، ۸، ۷، ۶، ۵، ۴، ۳، ۲، ۱، ۰



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## معیارات قبولی پایه هنگام تست:

اگر پایه های تست شده معیارات مندرج ذیل را دارا باشد ، محموله 100 اصله پایه ها مورد تایید هیئت موظف قرار میگیرد .  
 الف) پس از حذف قوه در مرحله 40% از بار نهایی در پایه هیچ گونه درزی ایجاد نگردد .  
 ب) انحراف دائمی پایه مورد نظر بعد از دور ساختن 60% قوه نهایی اعمال شده ، کمتر از 10% انحراف 60% قوه نهایی باشد .  
 ج) زمانی که 60% قوه به پایه وارد گردید و در پایه درز ایجاد شد ، بعد از حذف قوه ها ، درزها باید بشکل کامل بسته گردند .  
 د) قوه اعمال شده تست در هنگام شکست پایه باید بیشتر از قوه نهایی آن باشد .  
 ر) قطر سیخ ها ، طول ، محل گزدمک ها ، فاصله بین سیخ ها پایه که تحت تست شکست نموده مطابق به نقشه تایید شده باشد .  
 علاوه بر تست های بالا ، کلیه پایه های کانکریتی باید از لحاظ شکل ظاهری ، مورد بررسی بصری قرار گیرند .

**نوت :** انجام کلیه تست ها بر روی هر محموله از سفارشات الزامی میباشد و نیز تمام هزینه آن باید قرار دانی متحمل شود .

## محل تست:

در هر فابریکه باید جایگاه مشخص جهت تست پایه موجود باشد

1. استفاده از تخته های صاف در محل تست ، استفاده از تکیه گاه چوبی نیم دایره برای انجام تست پایه الزامیست ، همچنان در صورت موجود نبودن تکیه گاه نیم دایره در فابریکه ، مسئولیت کم شدن قوه مقاومت نهایی در پایه به عهده فابریکه تولید کننده می باشد .
2. عملیات محکم نمودن پایه در محل تست بگونه ای انجام شود که درز و شکستگی در پایه بوجود نیاید .
3. در صورت بروز شکستگی در مرحله فوق الذکر ، باید پایه سالم توسط هیئت موظف با سرپال نمبر متفاوت جایگزین آن گردد .
4. استفاده از وسیله چرخدار که حرکت رفت و برگشت پایه را تسهیل نماید از راس پایه الزامیست .
5. موجودیت خط کش درجه دار جهت اندازه گیری انحراف پایه در پروسه تست الزامیست .
6. میله نصب شده در راس پایه جهت اندازه گیری انحراف آن باید به اندازه سر پایه بوده و در مطابقت با استاندارد باشد .
7. جهت کشش پایه استفاده از تسمه نخی و یا کیبل استندرد مورد استفاده پایه الزامیست .
8. دستگاه تست باید مطابق به استاندارد بوده و دارای مترتفکیکیت کالیبریشن و مشخصات آن باشد .

## مراحل تست:

- 1- تست بر روی نمونه انتخاب شده توسط هیئت ، از محموله 100 اصله ای پایه های یک نوع که دارای مشخصات و سرپال نمبر قبلاً انتخاب شده انجام داده میشود .
- 2- حداقل عمر پایه جهت تست 28 روز و حداکثر عمر آن 40 روز از تاریخ تولید می باشد . قبل از قراردادن پایه در محل تست از سلامت ظاهری پایه اطمینان حاصل شود ، همچنان پایه باید حالت مستقیم خود را هنگام بلند کردن با کرن حفظ نماید و حالت انحناء در آن مشاهده نگردد .
- 3- جهت قوه وارده کاملاً عمود بر محور طولی پایه ( با حداکثر  $\pm 5^\circ$  درجه انحراف ) اعمال می گردد . سرعت وارد کردن قوه باید در تمامی مراحل یکنواخت باشد به نحوی که از وارد آمدن هرگونه قوه های لرزه ای به پایه جلوگیری صورت گیرد .
- 4- اعمال قوه باید به شکل تدریجی صورت گیرد قسمی که در هر مرحله ، 10% قوه نهایی اعمال گردد .
- 5- در مرحله 40% از قوه نهایی هیچ گونه درزی در پایه ایجاد نگردد و بعد از دور ساختن قوه پایه به حالت اولیه ( صفر ) باز گردد .
- 6- بعد از حداقل دو دقیقه زمان استراحت ، اعمال قوه به شکل تدریجی از سر گرفته شود و الی 60% قوه نهایی ادامه یابد .
- 7- در تست مرحله 60% قوه نهایی ، تعداد درزها با مارکر بطور شماره وار علامت گذاری شوند و بعد از رها سازی قوه ، درزها به حالت اولیه باز گردند .
- 8- در تست مرحله 100% قوه نهایی ، مراحل افزایش قوه از 60% تا 100% با زمان انتظار 2 دقیقه برای هر مرحله انجام شود و تا زمان شکست پایه ادامه یابد .

## یادداشت :

- الف- در صورت قبول شدن تست های فوق و شرایط ظاهری ، محموله 100 اصله پایه مورد تایید می باشد .
- ب- در صورت رد شدن نمونه انتخاب شده ، تست بر روی یک نمونه دیگر از همان محموله توسط هیئت تکرار گردد . شرط پذیرش و یا عدم پذیرش محموله وابسته به نتیجه تست پایه دومی می باشد .

افراد شماره: 77/19/20





## Concrete Pole Test Report

Form Number	CFO/QC:CPTR023
Project Code	
Location	
Date of Testing	
Type of Pole	
Pole Serial Number	
Working Load (kgf)	
Safety Factor	
Maximum Test Load	

### Observation of Load Test

Sr.	Load Applied (kgf)	% Ultimate load	Deflection (mm)	No of Cracks	Remarks
1		10%			
2		20%			
3		30%			
4		40%			
5		0			
6		10%			
7		20%			
8		30%			
9		40%			
10		50%			
11		60%			
12		0			
13		10%			
14		20%			
15		30%			
16		40%			
17		50%			
18		60%			
19		70%			
20		80%			
21		90%			
22		100%			
23		0			

انوار شماره: 17, 18, 19 و 20

Rep. of QC/Dept.

Rep. of DABS

Rep. of Contractor

Verified by:

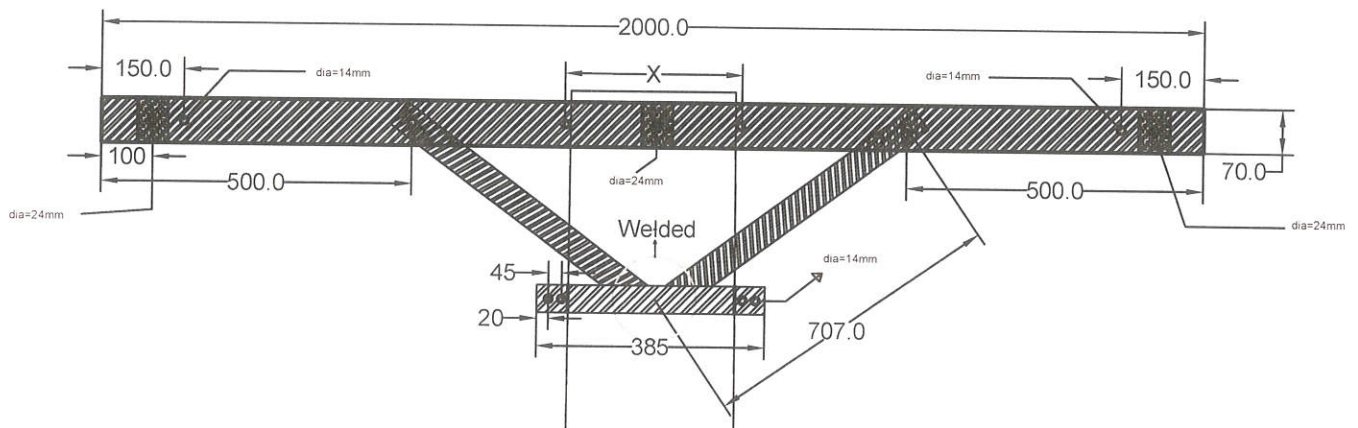
Head of QC Dept.

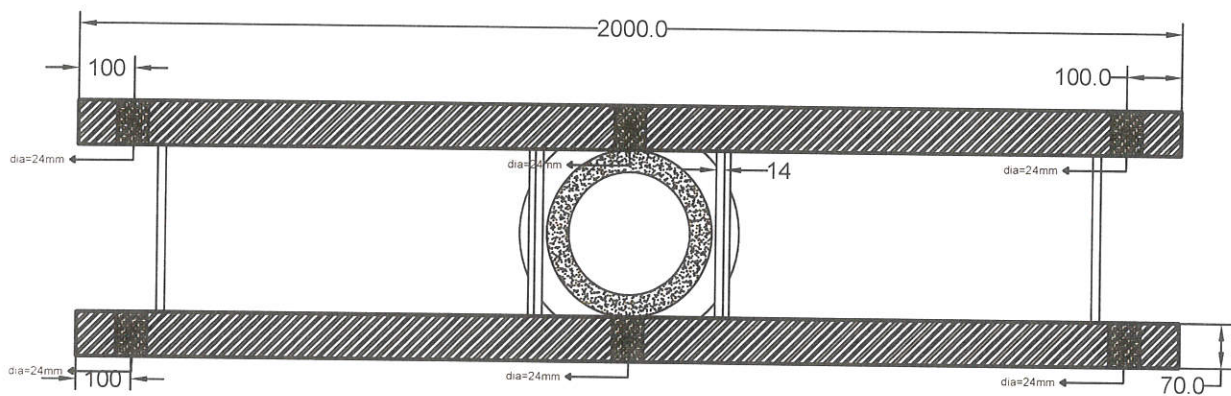



81

## 20KV Single Circuit Tension Cross Arm Front Veiw



## 20KV Single Circuit Tension Cross Arm Top Veiw



Drawn by: Survey and Engineering Unit of DABS

### Note:

- All dimensions are in mm, unless otherwise specified.
- X dimensions must be taken from pole diameter.
- Cross arm thickness 7mm.
- Cross arm must be hot dip galvanized.
- (70x70x7)mm

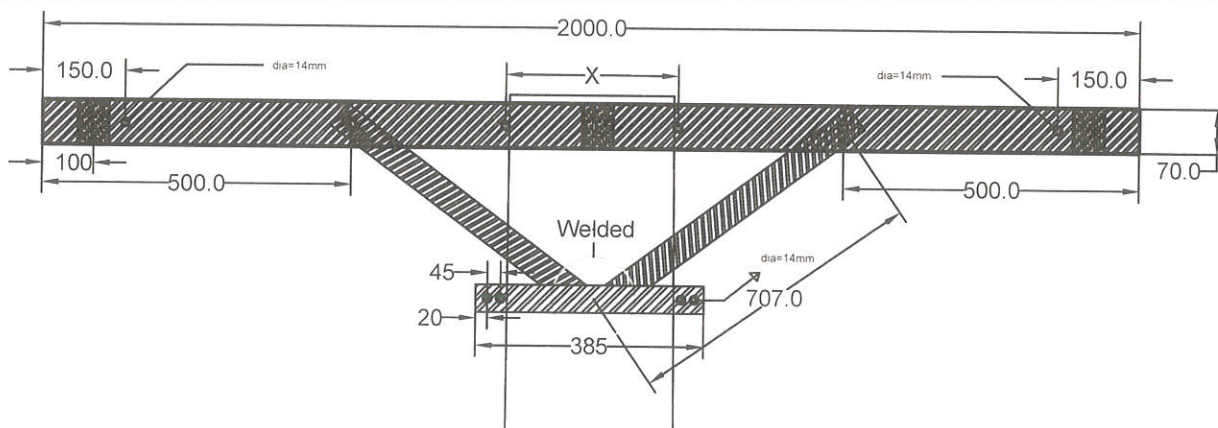
*[Handwritten signature]*

*[Handwritten signature]*

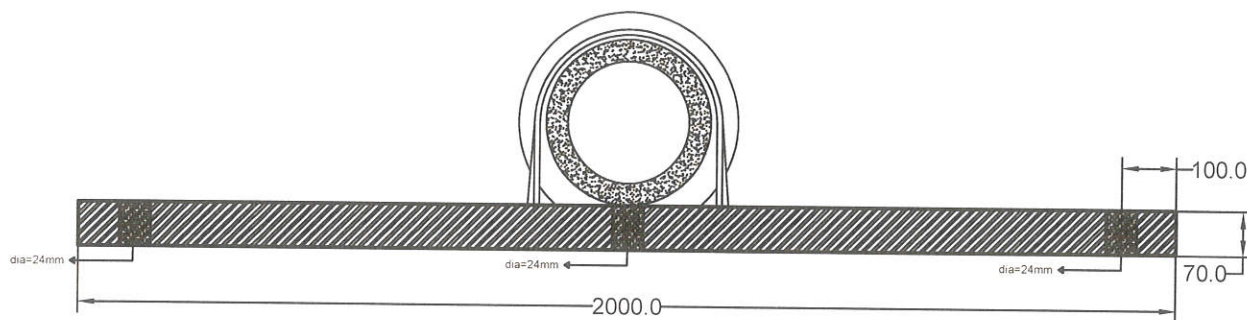


تم کار: ۲۱

92



### 20KV Single Circuit Suspension Cross Arm Top Veiw




تعلیم کا راز : 22

Drawn by: Survey and Engineering Unit of DABS

Note:

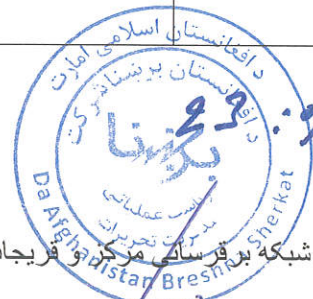
- All dimensions are in mm, unless otherwise specified.
- X dimensions must be taken from pole diameter.
- Cross arm thickness 7mm.
- Cross arm must be hot-dip galvanized.
- (70x70x7)mm



83

Table: Technical Data for 20 kV Fiber Tension Insulator:

Description	Unit	Required	Offered
Manufacturer's Name:		to be specified	
Type:		tension insulator	
Material:		silicon rubber	
Rated voltage:	kV	24	
Min. SML (Specified Mechanical Load):	kV	70	
Min. Arc distance:	mm	265	
Min. nominal creepage distance:	mm	635	
Min. 1 Minute power frequency wet withstand voltage not less than:	kV	42	
Min. Full wave lighting impulse voltage (Peak Value):	kV	150	
Min. Puncture voltage in oil:	kV/mm	20	
Nominal diameter "D":	mm	to be specified	
Maximum height "H":	mm	to be specified	
Number of the Sheds:	Number	to be specified	
Unit weight:	Kg	to be specified	
Standard:		IEC 61109	
With all necessary accessories for installation incl. metal thimbles threaded for screwing on to steel spindles:			



پروژه شبکه برق سالی مرکز و فریجات ولسوالی دشت ارچی ولایت کندز.

Make By:

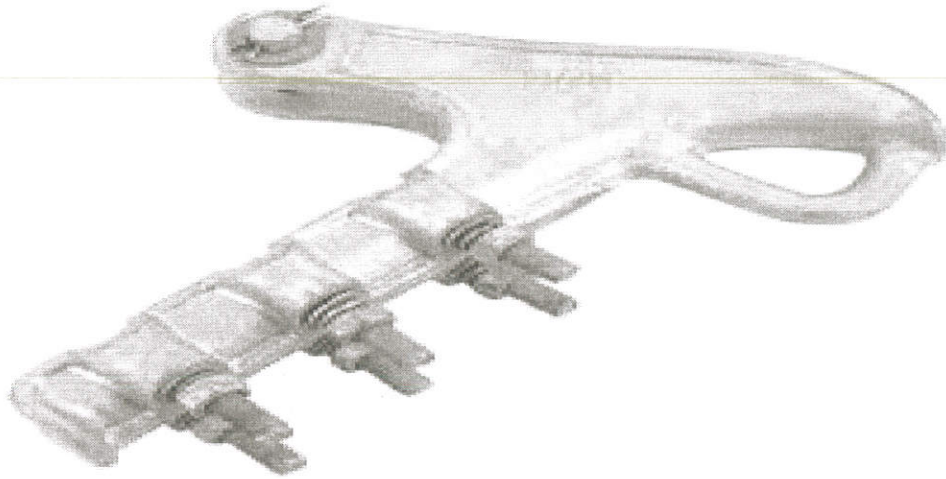
Reviewed By:

Checked By:

Approved By:



85



### A L- ACSR - Tension Clamp

Standard	GB
Usage	Line Fittings
Type	Tension Clamp
Conductor Range	1x(50-185 )mm <sup>2</sup>
Application	M- Voltage 20-24 kv
Materials	Cast iron

تصویر شماره: 23



پروژه شبکه برق در مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

Make By:

Reviewed By:

Checked By:

Approved By:

85

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	
Min. nominal creepage distance:	mm	610	
Min. Arc distance:	mm	215	
Section length:	mm	305	
SCL (Specified Cantilever Load):	KN	5	
RTL (Routine Test Load):	KN	6.5	
Min. STL (Specified Tensile Load):	KN	13	
Nominal diameter "D":	mm	to be specified	
Maximum height "H":	mm	to be specified	
Number of the Sheds:	Number	to be specified	
Unit weight:	Kg	to be specified	
Standard:		IEC 61109	
With all necessary accessories for installation incl. metal thimbles threaded for screwing on to steel spindles:			



صم: 24

پروژه شبکه برق سلسلی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

Make By:

Reviewed By:

Checked By:

Approved By:

86

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	
Cross-section ratio AL/St approx.		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	



پروژہ شبکه برق سیاتی مرکز و فریجیات ولسوالی دشت ارچی ولایت کندز.

Make By:

Reviewed By:

Checked By:

Approved By:

97

**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	
<b>Cross-section ratio AL/St approx.</b>		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	



پروژه شبکه برق رسانی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

Make By:

*[Signature]*

Reviewed By:

*[Signature]*

Checked By:

*[Signature]*

Approved By:



89

**Table: Technical Data for ABC Low Voltage Cables LV ABC 4 x 95 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>	95	
Class		2	
Cross section shape		circular	
		compacted	
Number of wires		≥15	
Diameter of wires	mm	To be specified	
Diameter of conductor	mm	11.4	
Maximum conductor DC resistance at 20 °C	ohm/km	0.320	
Insulation Material		Black XLPE	
Insulation thickness	Mm	1.7	
Breaking load of single core, min.	KN	15	
Breaking load of complete cable, min.	KN	53.2	
<b><u>Technical Characteristics</u></b>			
Outer diameter of bundle (D)	mm	35.3	
Weight of conductor	kg/km	1350	
Minimum bending radius	mm	15 D	
Maximum lay of cores			
Current rating /ambient 40 °C	A	250	
Maximum conductor temperature/normal operation	°C	90	
Maximum conductor temperature/short circuit	°C	250	
Rated short circuit /phase	kA	6.8	
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	



27 کالونه

پروژه شبکه برقسانی مرکز و قریجات ولسوالی د شیت ارجی ولایت کندز.

Make By:

Reviewed By:

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Approved By:

90

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	

شمېره: 28



پروژه شبکه برقسانی مرکز و قریجات ولسوالۍ دشتیار چی ولایت کنډز.

Make By:

Reviewed By:

Checked By:

Approved By:

91  
Table: LV Underground Cable 0.6/1 kV, NYY 1 x 240 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>	240	
Insulation material of conductor		PVC	
Insulation thickness	mm	2.2	
Outer sheath material		PVC	
Thickness of outer sheath	mm	1.8	
Overall diameter of cable(D)	mm	27	
Weight of cable	kg/km	2650	
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	0.0912	
Max. admissible short circuit current (1s)	kA	27.6	
Current carrying capacity (in air)	A	483	
Inductance per conductor	mH/km	To be specified	
Standards		IEC 60502 DIN VDE 0271 VDE 0295 (IEC60228) VDE0293	



تعمیم ۹: ۲۹

پروژه شبکه برق رسانی مرکز و قریجات و لیسوالی کشت ارچی ولایت کندز.

Make By:

Reviewed By:

Checked By:

Approved By:

92

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)		NYY	
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	



پروژه شبکه برق رسانی مرکز و فریجات ولسوالی دشت ارچی ولایت کندز.

Make By:

Reviewed By:

Checked By:

Approved By:



93

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)		NYY	
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	



پروژہ شیعہ برقیاتی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

Make By:

Reviewed By:

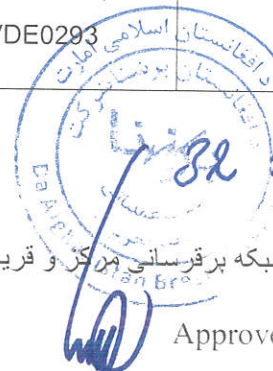
Checked By:

Approved By:

99

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	



پروژه شبکه برق رسانی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

Make By:

Reviewed By:

Checked By:

Approved By:

95

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)		NYY	
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	



پروژه شبکه برق رسانی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

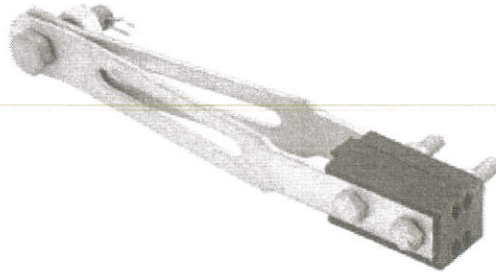
Make By:

Reviewed By:

Checked By:

Approved By:

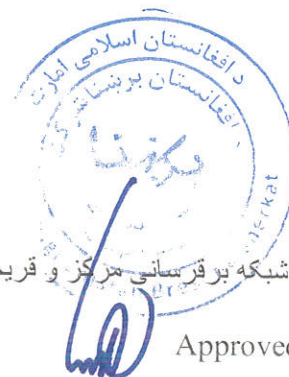
96



### AL-ABC - Tension Clamp

Usage	Line Fittings
Type	Tension Clamp
Conductor Range	4X(50-120 )mm2
Application	Low Voltage 1kv
Materials	AL- Robber

34 : 0/0/0



پروژه شبکه برق رسانی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

Make By:

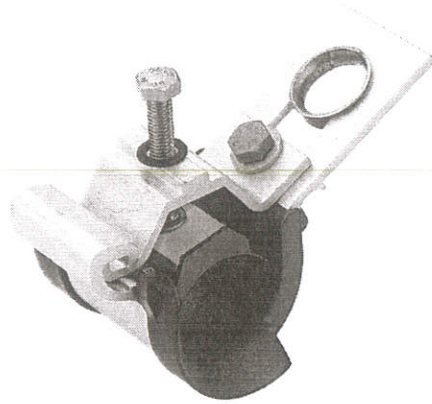
Reviewed By:

Checked By:

Approved By:



97



### LV ABC Cable Suspension Clamp

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

تعمیم ۱۵/۸۵



پروژه شبکه برق رسانی مرکز و قریجات ولسوالی دشت ارچی ولایت کندز.

Make By:

Reviewed By:

Checked By:

Approved By:

GENERAL:

PANEL NAME: METER BOX 6 METERS  
LOCATION: INDOOR  
MOUNTING: SURFACE PAD

POLE MOUNTED

CABLE ENTRY & ACCESS  
TOP ENTRY  
BOTTOM ENTRY  
FRONT ACCESS  
REAR ACCESS

ELECTRICAL:

RATED SERVICE VOLTAGE : 380V  
RATED CURRENT : 100A  
SHORT CIRCUIT CURRENT : ---KA  
RATED FREQUENCY : 50 Hz AC  
PHASE : 3φ 1φ

SUPPLY OF AUXILIARIES:

AUXILIARY CIRCUITS VOLTAGE  
CONTROL 230V AC  
SIGNALING 230V AC  
HEATERS 230V AC  
24V DC SUPPLY 24V DC  
(\*) 24V DC SUPPLY FROM EXTERNAL

NOTE : Supply Of Auxiliaries Are Not Necessary.

ENCLOSURE:

ENCLOSURE SIZE (mm) 850(h) X 555(w) X 180(d)  
GEAR PLATE (mm) 800(h) X 550(w)  
ENCLOSURE SYSTEM FIXED  
DEGREE OF PROTECTION IP43

NEMA 12/IP52

NEMA 3R/IP54

EXTENDABLE YES NO  
ACCESS CLOSING PLAIN DOOR REAR COVER  
PARTIAL DOOR REAR DOOR  
FRONT COVER WITH DOOR

INTERNAL PAINT FINISH RAL 7032

EXTERNAL PAINT FINISH RAL 7032

THICKNESS SHEET 1.5 mm STEEL SHEET/PRE-GALVANIZE SHEET

APPARATUS:

TYPE OF DEVICES  
FIXED  
PLUG-IN  
DRAW-OUT  
INCOMING OUTGOING

BUSBARS:

NEUTRAL BUSBAR SIZE: (15 x 03)mm<sup>2</sup>

IDENTIFICATION A, B, C, N : RED, YELLOW, BLUE, BLACK  
EARTH : YELLOW / GREEN

CONNECTIONS:

INTER CONNECTION

COPPER FLAT BARS

FLEXIBLE COPPER WIRES

LABELS:

LABELS ARE GRAY & BLACK  
GRAY BACKGROUND  
BLACK LETTERS IN ENGLISH  
TRAFFOLYTE  
FIXATION BY RIVET  
ALUMINIUM  
ADHESIVE  
FIXATION BY SCREWS & UNITS

INCOMING

QTY 01 RATING 100A MCB TYPE C PHASE 3 Icu(kA) 6

OUTGOING

QTY 06 RATING 32A MCB TYPE C PHASE 1 Icu(kA) 6



PROJECT

Meter Box with 6 Meters Shop Drawing

NS-02

DESIGNED BY  
DRAWING BY  
CHECKED BY

DATE  
SUBMITTED BY  
CUSTOMER

Submittal  
Description

Date APPR

LOUVERS FOR NATURAL VENTILATION

NOTE  
(4x50mm)

COPPER CABLE Bdgmm

ENCLOSURE GROUNDING 10m

ALUMINUM FLEXIBLE EARTH CONNECTION BETWEEN THE BOX FRAME AND THE DOOR

OUTGOING TERMINAL BLOCK  
SUITABLE FOR 60mm

03 INTERNAL VIEW  
REF. SCALE: NS

02 SIDE VIEW  
REF. SCALE: NS

01 3D VIEW  
REF. SCALE: NS



05 BASE VIEW  
REF. SCALE: NS

NOTE

- 1) All Dimensions are in mm unless otherwise specified
- 2) All Dimensions are approximate with tolerance +/-10%
- 3) For more information please refer to sheet # (NS-01)

PROJECT:  
Meter Box with 6 Meters Shop Drawing

DESIGNED BY:  
DRAWING BY:  
CHECKED BY:

DATE  
SUBMITTED BY:  
CUSTOMER

Submittal  
Description  
Date  
APR

SHEET  
NUMBER  
NS-03

NS-04

36 : 9/10

GENERAL:

PANEL NAME: METER BOX 3 METERS  
LOCATION: INDOOR  
MOUNTING: SURFACE  
POLE MOUNTED

ENCLOSURE:

ENCLOSURE SIZE (mm) 550(h) X 550(w) X 180(d)  
GEAR PLATE (mm) 500(h) X 500(w)  
ENCLOSURE SYSTEM FIXED  
DEGREE OF PROTECTION IP43

CONNECTIONS:

INTER CONNECTION  
COPPER FLAT BARS  
FLEXIBLE COPPER WIRES

LABELS:

LABELS ARE GRAY & BLACK  
GRAY BACKGROUND  
BLACK LETTERS IN ENGLISH  
TRAFFOLYTE  
FIXATION BY RIVET  
ALUMINIUM  
ADHESIVE  
FIXATION BY SCREWS & UNITS

ELECTRICAL:

RATED SERVICE VOLTAGE 380V  
RATED CURRENT 63A  
SHORT CIRCUIT CURRENT  
RATED FREQUENCY 50 Hz AC  
PHASE 3φ

THICKNESS SHEET 1.5 mm STEEL SHEET/PRE-GALVANIZE SHEET

INCOMING  
QTY 01  
RATING 63A MCB  
TYPE C  
PHASE 3  
1000(Icu)(kA)

APPARATUS:

TYPE OF DEVICES  
FIXED  
PLUG-IN  
DRAW-OUT  
INCOMING  
OUTGOING

OUTGOING  
QTY 01  
RATING 32A MCB  
TYPE C  
PHASE 3  
6(Icu)(kA)

SUPPLY OF AUXILIARIES:

AUXILIARY CIRCUITS VOLTAGE  
CONTROL 230V AC  
SIGNALING 230V AC  
HEATERS 230V AC  
24V DC SUPPLY 24V DC  
(\*) 24V DC SUPPLY FROM EXTERNAL

BUSBARS:

NEUTRAL BUSBAR SIZE: (15 x 03)mm²  
IDENTIFICATION A, B, C, N : RED, YELLOW, BLUE, BLACK  
EARTH : YELLOW / GREEN

NOTE : Supply Of Auxiliaries Are Not Necessary.

NOTE: Where this page offers a choice, only those options marked "X" shall be valid.



37:05:27

NS-02

PROJECT  
Meter Box 4 Meters Shop Drawing

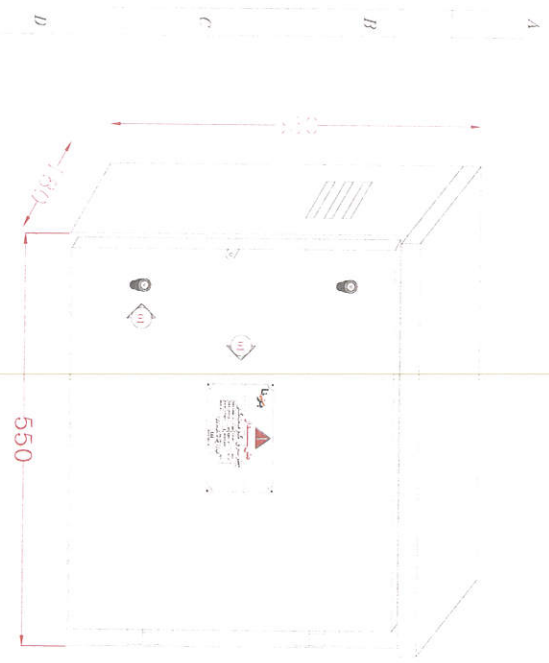
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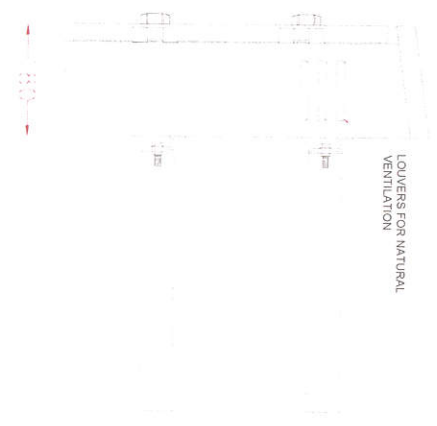
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Description

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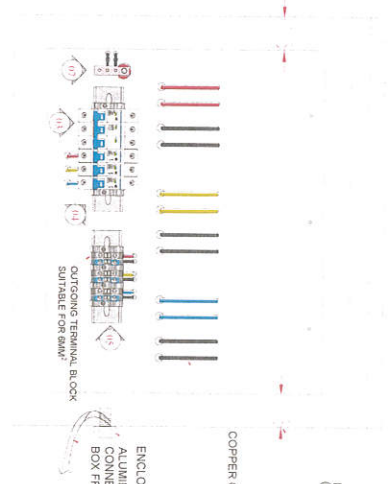




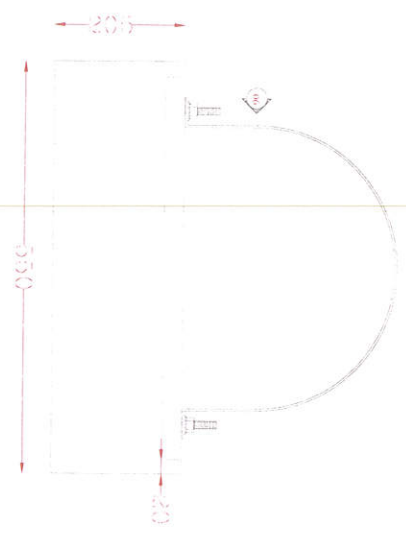
01 3D VIEW  
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SCALE: NS



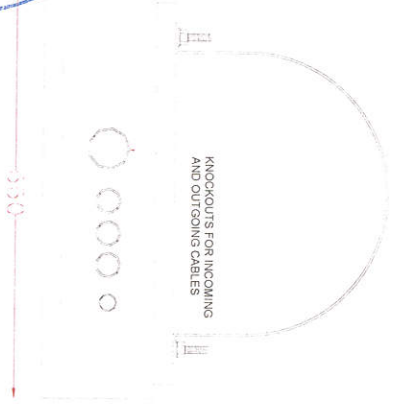
02 SIDE VIEW  
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SCALE: NS



03 INTERNAL VIEW  
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SCALE: NS



04 TOP VIEW  
REF.  
SCALE: NS



05 BASE VIEW  
REF.  
SCALE: NS



NS-04

*[Signature]*

**NOTE**  
1) All Dimensions are in mm unless otherwise specified  
2) All Dimensions are approximate with tolerance +/-10%  
3) For more information please refer to sheet # (NS-01)

*3710/18*

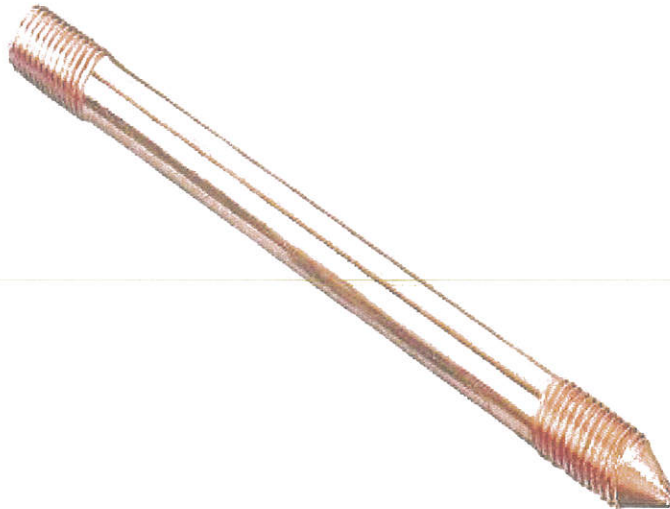
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CUSTOMER

Rev No	Description	Date	APR
1	Submittal		

NS-03

PROJECT  
Meter Box 4 Meters Shop Drawing



#### Copper Ground Ear thing Rod

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

شمېره: 38



پروژه شبکه برق سانی مرکز و قریحات ولسوالی دشت ارچی ولایت کندز.

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103

## Insulation piercing connectors for connections to cables

### Application

All piercing connectors of EP and PX type (see page 9) can be used as a connection between LV-ABC and service or main cables.

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

### Features

- Suitable for aluminium and copper conductors
- Potential free tightening bolts allow safe installations on life lines
- Connectors type DZ6 exceed requirements according to UL486 and EATS 43-14, including 4 kV voltage withstand test in air
- Connector teeth are factory greased and covered with a rubber seal to retard water entry and corrosion
- Components not losable, end cap attached to body

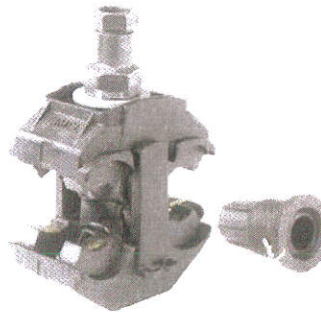
- Insulation material made of weather and UV resistant glass fibre reinforced polymer
- Contact plates made of tinned copper, bolt made of steel with Geomet (Chromium free) protection

For inline connections of LV-ABC to cables see section "Complete connection kits" on 35.

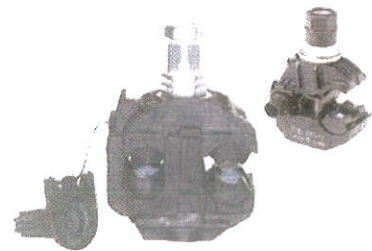
For cable terminations and core protection tubing see pages 25 and 26.



Type: DZ6 UL-F



Type: P3X 95



Type: P2X 95 Mk2, EP95-13

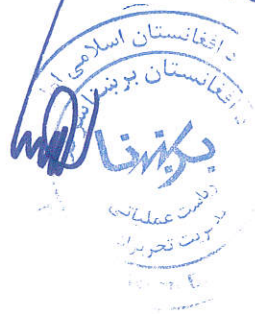
### Simultaneous piercing of main (insulated LV-ABC) and branch (cable core) conductor

Ordering description	Application range (mm <sup>2</sup> )		Bolt	Torque (Nm)	Weight (kg/100 pcs)
	LV-ABC	Cable conductor			
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
P3X 95	25 - 95	25 - 95	1 x M8	18	16.0
DZ6 UL-F-CHINA-N	25 - 120 (150*)	120 - 240	1 x M10	40	30.0

Fits up to this conductor size, but current rating I<sub>max</sub> of connector (300 A according to HD 626S1 part 6E) is lower than possible cable rating.

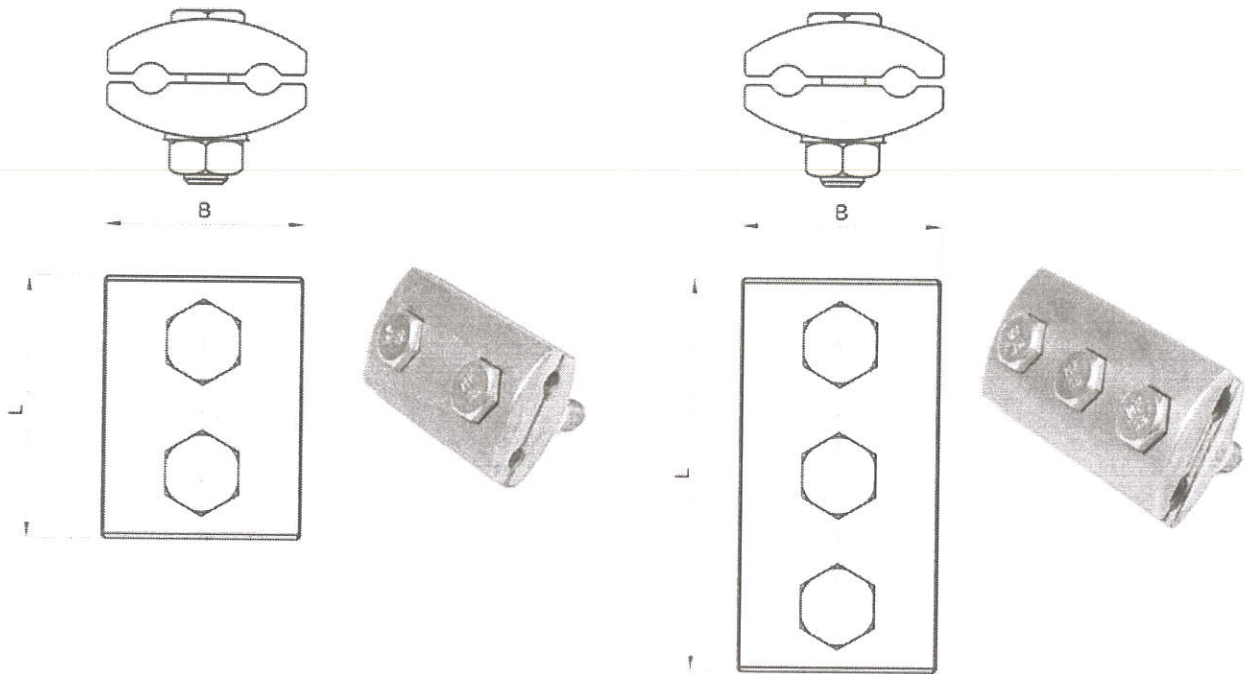
انوار کاره: 44.43

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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.

قیمت کاره: 45



پروژې او ترميمونه پر وختي وزارت د قريجات ولسوالۍ دشت ارجي ولايت کنډز.

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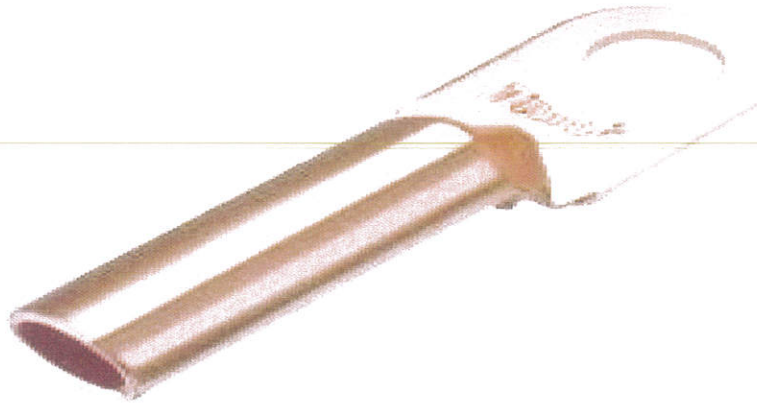
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**Compression Cable Lugs**

Color	Golden
Material	Copper
Size:	10-240 mm <sup>2</sup>
Application	Power Distribution

اقدام شماره: 46، 47، 48، 49 و 50.



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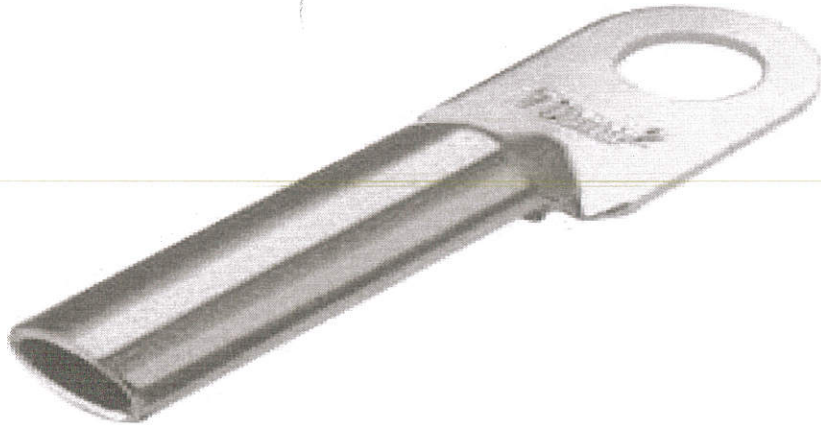
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Reviewed By:

Checked By:

Approved By:

106



#### Compression Cable Lugs

Color	Silver
Material	Aluminium
Size:	25-120 mm <sup>2</sup>
Application	Power Distribution

اقرار نمايد: 51 و 52 -

Make By:

Reviewed By:

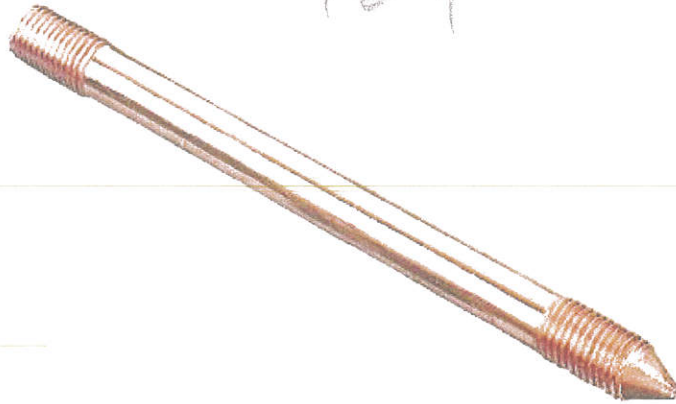
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Approved By:

پروژه شبکه برق و پياوړتيا وزارت برق و پياوړتيا د افغانستان اسلامي امارت د قريجات ولسوالۍ دشت ارچي ولايت کنډز.

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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

قلم کاره : 55

پروژه شبکه برق سانی مراکز و قریجات ولسوالی دشت ارچی ولایت کندز.

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