

**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	

طرح شماره ۱۰  
پروژه برق رسانی دبل سرکت 20KV سولر استیشن 22.75MW سروبی.  
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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, 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	

مهم شماره: 2

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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	

تعمیم شده : 2

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#### Copper Ground Ear thing Rod

diameter	20mm
Usage/Application	Power Distribution Earthing
Material	Copper
Color	Copper
Length Of Rod	3000mm

مشخصات تخنیکي برای تجهیزات دبل سرکت 20kv سولر استیشن سروبی قلم شماره (3) BOQ

**Table: MV Underground Cable 12/20 kV, N2XS2Y 1 x 240 RM/25**

Designation	Unit	Required	Offered
Manufacturer's name		To be specified	
Type		N2XS2Y	
Conductor material and form		Copper / Circ. Stranded	
Nominal cross section of conductor	mm <sup>2</sup>	240	
Nominal cross section of screen	mm <sup>2</sup>	25	
Insulation material of conductor		XLPE	
Insulation thickness	mm	5.5	
Outer sheath material		PE	
Thickness of outer sheath	mm	2.5	
Overall diameter of cable (D)	mm	41.5	
Weight of cable	Kg/km	3,200	
Minimum bending radius	mm	15 D	
Nominal voltage	kV	12/20	
Service voltage actual (future)	kV	15 (20)	
Maximum operating voltage	kV	24	
Frequency	Hz	50	
Effective a.c. resistance at 90° C	Ω/km	0.102	
Operating capacitance	μF/km	0.304	
Max. admissible short circuit current (1s) of conductor (screen)	kA	34.3	
<u>Installation in ground</u>			
Current carrying capacity	A	534	
Ohmic losses per cable	KW/km	To be specified	
Inductance per conductor	mH/km	0.361	
Standards		IEC 60502 IEC 60228 DIN VDE 0273 HD 620	

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قلم شماره: 4



**Table: Technical data for 12/20kv Cable Termination- Outdoor**

Designation	Unit	Required	Offered
<b>Cable</b>			
Nominal voltage of cable	kV	12/20	
Cable type		N2XS2Y	
Insulation material of conductor		XLPE	
Outer sheath material		PE	
Nominal cross-section	mm <sup>2</sup>	35	
Nominal cross-section	mm <sup>2</sup>	50	
Nominal cross-section	mm <sup>2</sup>	70	
Nominal cross-section	mm <sup>2</sup>	95	
Nominal cross-section	mm <sup>2</sup>	120	
Nominal cross-section	mm <sup>2</sup>	150	
Nominal cross-section	mm <sup>2</sup>	185	
Nominal cross-section	mm <sup>2</sup>	240	
<b>Termination</b>		to be specified	
Manufacturer		to be specified	
Type		track resistant, silicon	
Design		rubber insulator with an detector for controlling the electrical field	
Installation	kV		
Rated lightning – impulse test voltage	kV	>55	
Rated power – frequency withstand voltage		>145	
Direct current withstand	kA	>U <sub>0</sub>	
Short-time current withstand	mm	>75	
Dimension	kg	to be specified	
Weight		to be specified	
Standard specifications		IEC 60, 230, 437, 502 VDE 0278	

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تعمیرکار: 5

**Table: Technical data for 12/20kv Cable Termination- indoor**

Designation	Unit	Required	Offered
<b>Cable</b>			
Nominal voltage of cable	kV	12/20	
Cable type		N2XS2Y	
Insulation material of conductor		XLPE	
Outer sheath material		PE	
Nominal cross-section	mm <sup>2</sup>	35	
Nominal cross-section	mm <sup>2</sup>	50	
Nominal cross-section	mm <sup>2</sup>	70	
Nominal cross-section	mm <sup>2</sup>	95	
Nominal cross-section	mm <sup>2</sup>	120	
Nominal cross-section	mm <sup>2</sup>	150	
Nominal cross-section	mm <sup>2</sup>	185	
Nominal cross-section	mm <sup>2</sup>	240	
<b>Termination</b>			
Manufacturer		to be specified	
Type		to be specified	
Design		track resistant, silicon rubber insulator with an detector for controlling the electrical field	
Installation	kV		
Rated lightning – impulse test voltage	kV	>55	
Rated power – frequency withstand voltage		>145	
Direct current withstand	kA	>U <sub>0</sub>	
Short-time current withstand	mm	>75	
Dimension	kg	to be specified	
Weitht		to be specified	
Standard specifcations		IEC 60, 230, 437, 502 VDE 0278	

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پروژه برق رسانی دبل سرکت 20KV سولر استیشن 22.75MW سروبی.

شماره: 6

Table: Pre-Stressed Steel concrete Poles (15m/600kgf)

Description	Unit	Required	Offered
<b>Concrete Poles</b>			
Manufacturer			
Type / Form		circular	
Pole Length	m	15	
Load			
Nominal	kgf	600	
Breaking	kg		
Safety Factor (minimum)		2.5	
Dimension of Top	mm	250	
Dimension of Base	mm	470	
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	

تصميم كود: 11

پروژه برق رسانی دبل سرکت 20KV سولر استیشن 22.75MW سروبی.

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Table: Pre-Stressed Steel concrete Poles (15m/1200kgf)

Description	Unit	Required	Offered
<b>Concrete Poles</b>			
Manufacturer			
Type / Form		circular	
Pole Length	m	15	
Load			
Nominal	kgf	1200	
Breaking	kg		
Safety Factor (minimum)		2.5	
Dimension of Top	mm	270	
Dimension of Base	mm	495	
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	

تصميم کار ۱۰:۵

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پروژه برق رسانی دبل سرکت 20KV سولر استیشن 22.75MW سروبی.

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	

قسم کا ۹:۰۰

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پروژہ برق رسانی دہل سرکت 20KV سولر اسٹیشن 22.75MW سروبہ.

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	

صم شماره: 8

Make By:

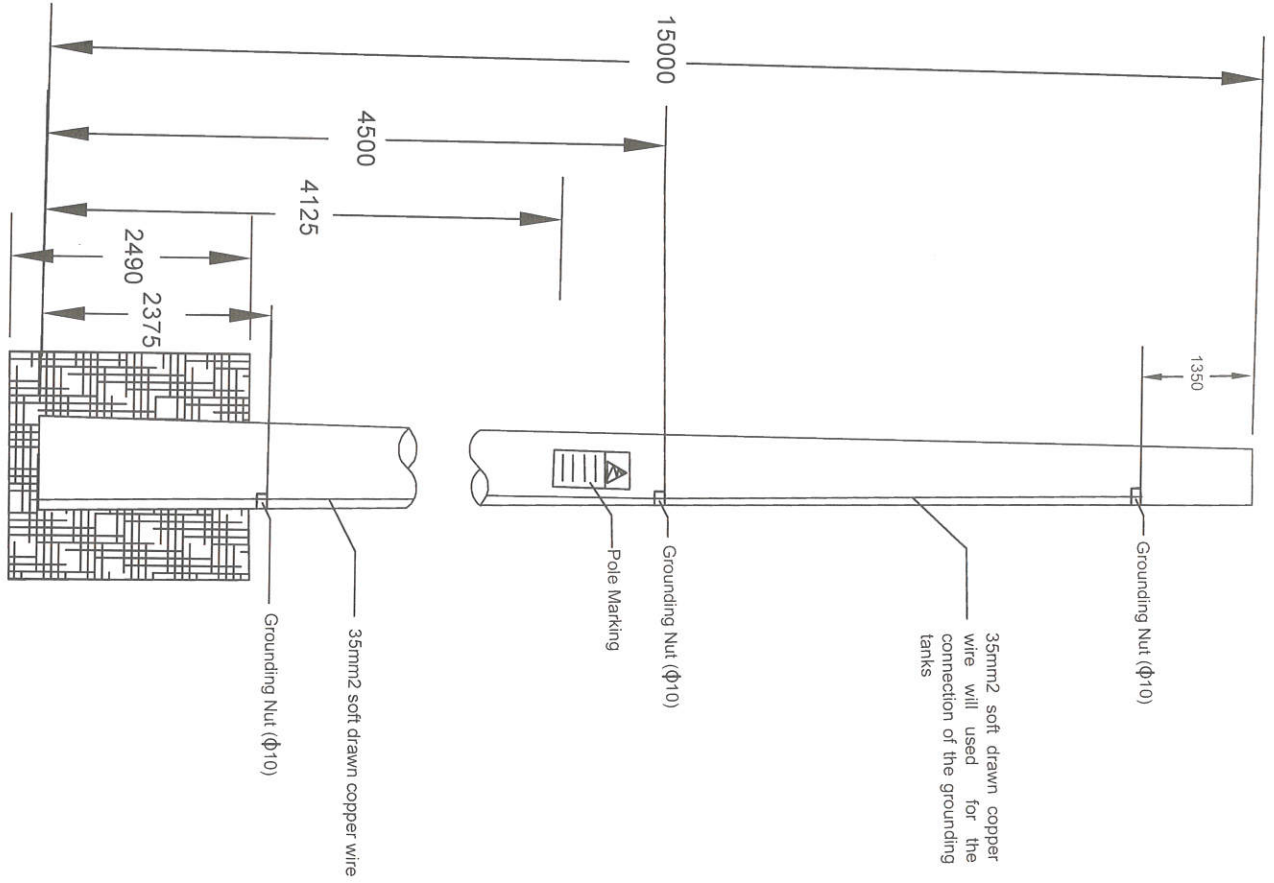
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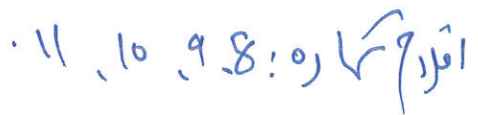
- NOTE :
1. All dimension are in millimeter.
  2. The 35mm<sup>2</sup> soft drawn copper wire have to consider 5cm plussage from the bottom.



امداد کا، 8، 9، 10، 11

*[Handwritten signatures]*





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