

PROIECT DE EXECUTIE

17-05-D/2024-AEE-G

Retele exterioare de alimentare cu energie electrica 10-0,4kV; Echipament pentru evidenta si centrala fotovoltaica a solicitantului IS COMBINATUL DE VINURI DE CALITATE MILESTII MICI din r-nul Ialoveni, s. Milestii Mici, Milestii Mici, 9005. NLC:1031420

COMPARTIMENT: Retele electrice exterioare
Echipament electric

Beneficiar: IS COMBINATUL DE VINURI
DE CALITATE MILESTII MICI

CHISINAU 2024

PROIECT DE EXECUTIE

17-05-D/2024-AEE-G

Retele exterioare de alimentare cu energie
electrica 10-0,4kV; Echipament pentru
evidenta si centrala fotovoltaica a
solicitantului IS COMBINATUL DE VINURI DE
CALITATE MILESTII MICI din r-nul Ialoveni, s.
Milestii Mici, Milestii Mici, 9005. NLC:1031420

COMPARTIMENT: Retele electrice exterioare
Echipament electric

CHISINAU 2024

Evidenta desenelor de lucru a setului de baza

Coala	Denumirea	Remarca
1/1-2	Date generale+sarcini de proiectare	
2-3	Planul general LEA 10kV+ Planul general LEC-0.4kV	
4-5	Adresele electrice a panourilor fotovoltaice	
6-8	Schema electrica monofilara DC+ Schema electrica echivalenta	
9	Schema electrica monofilara DC	
10-11	Priza de pamant al pilonului 9TrS10T.MO ST + Traseul liniei pentru egalizarea pontetialelor	
12	Vederea generala a instalatiei	
13-15	Lista de materiale	

Lista materialelor de referinta si anexe

Marcarea	Denumirea	Remarca
	Documente de referinta	
NCM G.01.03.2016	Instalatii electrice Dispozitive electrotehnice	
ПУЭ 7	Правила устройства электроустановок	
NCM A.08.02-2014	Securitatea si sanatatea muncii in constructii	
NCM G.01.01.2015	Proiectarea alimentarii cu energie electrica a intreprinderilor industriale.	
ТП 5.4.07-11	Заземление и зануление электроустановок	
шифр 11.0014	Инструкция по устройству молние- защиты зданий и сооружений	
	Documente anexate	
	Caracteristici tehnice Panouri fotovoltaice Caracteristici tehnice a invertoarelor	

Proiectul este elaborat conform cerintelor si regulilor normativelor in vigoare cu respectarea cerintelor principale catre calitatea constructiilor, reglementate de Legea calitatii in constructie

- A – rezistenta si stabilitate,
- B – siguranta in exploatare,
- C – siguranta la foc,
- D – igiena, sanatatea oamenilor, refacerea si protectia mediului inconjurator;
- E – izolare termica, hidrofuga si economie de energie

Date generale

Datele initiale pentru proiectul "Rețele exterioare de alimentare cu energie electrica 0,4kV; Echipament pentru evidenta si centrala fotovoltaica a solicitantului IS COMBINATUL DE VINURI DE CALITATE MILESTII MICI din r-nul Ialoveni, s. Milestii Mici, Milestii Mici, 9005 NLC:1031420 sunt

- Sarcina de proiectare elaborata de catre beneficiarul Beneficiar IS COMBINATUL DE VINURI DE CALITATE MILESTII MICI.
- Avizul de racordare cu Nr G20502023090004 din 13.09.2023 valabil pana la 13.09.2025 eliberat de I.C.S "Premier Energy Distribution" S.A.
- Documente normative de referinta conform listei de materiale de referinta si anexe
- Proiectia cartografica executat de TOPOPROIECT SRL si masurarile din teren a amplasarii obiectului si desene

Categoria de alimentare cu energie electrica – III.
Sistema de impamintare – TNCS

Puterea centralei fotovoltaice este de Pc=190 000W la tensiunea nominala Un=10-0.4kV.

Conform proiectului dat este necesara consolida pilonului nr.33 cu montarea unei proptele spre derivare pilon de tip 6CtSIOT.MO pilonul 33/1 se va construi de tip 9TrS10T.MO ST si demontarea pilonului rotund din lemn
Pentru posibilitatea debransarii postului de transformare de la rețeaua de medie tensiune s-a proiectat alimentarea acestuia prin intermediul unui aparat de comutatie de tip CUT-OUT si a cablului de tip AC70
In CE-1 BZUM DDE-3 TIP 6.2-06-01 (630A)TT proiectat se va instala intrerupatorul de sarcina, transformatoarele de curent, intrerupatorul automat si echipamentul de evidenta a energiei electrice produse si consumate
Rețeaua de alimentare cu energie electrica existenta se va suplini cu linii si tablouri de distributie necesare corespunzator schemei monofilare din proiect

Parcul fotovoltaic propriuzis se va monta in limitele granitelor proprietati beneficiarului IS COMBINATUL DE VINURI DE CALITATE MILESTII MICI si anume pe terenurile cu Nr Cad 55212030386 pastrand o fasie libera de orice fel de constructii cu latimea de 3m, pe ambele parti ale terenului integral, dea lungul acestuia pentru deservirea periodica si accesul personalului in acest spatiu se vor monta subteran cablurile de legatura intre 10-0.4kV a postui de transformare si invertoarele panourilor fotovoltaice
Panourile fotovoltaice, sunt preconizate a fi instalate in 7 randuri, cu panourile instalate cate doua, vertical
Correspunzator schemelor de amplasare Legatura electrica intre panourile fotovoltaice se va realiza cu cablu solar de model PV1-F 1x6mm2, instalat cu suspendarea pe carcasele metalice de sustinere a panourilor si sau subteran intevi de protectie corugata.

Se recomanda instalarea unei structuri metalice de sustinere a panourilor fotovoltaice din metal zincat, cu insurubarea pilonilor in sol sau prin betonarea acestora, pastrand cativa parametri esentiali pentru volumul de curent preconizat (calculat) a fi produs, dupa cum urmeaza:

1. Unghiul de inclinare al panourilor fotovoltaice va fi de 30°, fata de linia orizontului;
2. Orientarea panourilor va fi spre polul sudic +- 1°;
3. Distanța de la pomant la cea mai jos situata parte a panourilor fotovoltaice va fi de 0.8m;
4. Distanța dintre sirurile de panouri va fi de 6m sau mai mare, pentru a evita umbrirea reciproca;

Proiectul dat nu prevede calcule si marimi ale structurii metalice de sustinere a panourilor fotovoltaice, pentru aceasta este nevoie de elaborat un compartiment separat

Rețeaua proiectata se va conecta cu instalatia electrica existenta
Dimensionarea rețelei s-a facut in baza calculelor pentru caderea de tensiune maxim admisibila, curentul admisibil, pentru transferarea fara abateri a intregului potential de putere de la statia de generare
Efectuarea calculilor a curentilor de scurtcircuit monofazat, pentru aplicarea reglajelor aparatelor electronice de protectie

Pentru garantarea unui grad inalt de fiabilitate din punct de vedere constructiv, se recomanda elaborarea unui compartiment de proiect care va prevedea calculele mecanice referitoare la rezistenta constructiei metalice pe care este preconizata montarea panouri fotovoltaice
Se vor instala 324 de panouri fotovoltaice de model CanadianSolar-CS7N-700TB-AG, conectate la invertoare, corespunzatoare schemelor din proiect

Toate echipamentele electrice trebuie sa fie certificate in republica Moldova sau sa dispuna de certificare Europeana CE.

Autorizatia la proiectare P-2022 Nr.0877

17-05-D/2024-AEE-G

Rețele exterioare de alimentare cu energie electrica 10-0,4kV;
Echipament pentru evidenta si centrala fotovoltaica a solicitantului IS COMBINATUL DE VINURI DE CALITATE MILESTII MICI din r-nul Ialoveni, s. Milestii Mici, Milestii Mici, 9005. NLC 1031420

	Faza	Plansa	Planse
Centrala fotovotaica 190kW	PE	1	15

Nota:

- Proiectul este elaborat in baza conditiilor tehnice pentru proiectare eliberat de I.C.S. "Premier Energy Distribution" S.A. si a sarcini expusa de catre beneficiar.
- La intersectarea cu alte comunicatii ingineresti, cablurile proiectate, de introdus in tevi de protectie mecanica, flexibile, metalice cu izolatia din PVC
- Montarea cablurilor, se va face respectand distantele minime admisibile intre cabluri cu tensiunea mai mica de 1000V si partile constructive ale imobilelor.
- Cablurile pozate constructiv la inaltimei mai mici de 3m, de protejat in furtun de protectie mecanica, metalic.
- Iesirea cablurilor si intrarea acestora in panoul de evidenta, se va efectua in tub de protectie metalic, izolat, prin intermediul mufelor de trecere de tip PG-
- Toate partile metalice ale instalatiei nou construite, care in regim normal nu se afla sub tensiune dar care pot nimeri accidental, sunt supuse impamintarii prin conectarea acestora la clema PE si priza de pamint nou-montata.
- Pentru asigurarea SSM, este necesar ca lucrarile de montare , de construire si de ajustare sa se execute in corespundere cu NCM A.08.02-204, "Securitatea muncii in constructii" si "Legea Securitatii si Sanatatii in Munca. Nr. 86-XVI din 0.07.2008; in temeiul art. 24 din Legea securitatii si sanatatii in munca nr. 86-XVI din 07 iulie 2008".

Protectia mediului ambiant

Obiectul proiectat se construiesc pentru transmiterea si distributia energiei electrice la tensiunea 0,4kV. Procesul tehnologic indicat este fara deseuri si nu este insotit de emisii poluante pentru mediul ambiant iar nivelul de sunet si vibratii care pot fi create de instalatia proiectat, nu depasesc valorile admisibile dupa CHuN II-2-77. Datorita acestui fapt, in proiectul dat nu este prevazut nici un capital predestinat masurilor de protectie a mediului inconjurator de factorii nocivi mentionati.

Securitatea si sanatatea muncii

Securitatea si sanatatea muncii, in continuare SSM, la construirea si exploatarea obiectelor proiectate se asigura prin aprobarea tuturor deciziilor de proiectare in corespundere cu NAIE (NY3) si NCM A.08.02-204, cerintele carora evidentiaza conditiile de SSM, prevenirea traumelor, a bolilor profesionale, a incendiilor si exploziilor.

Pentru asigurarea SSM, este necesar ca lucrarile de montare , de construire si de ajustare sa se execute in corespundere cu NCM A.08.02-204 "Securitatea muncii in constructii" si "Legea Securitatii si Sanatatii in Munca. Nr. 86-XVI din 0.07.2008; In temeiul art. 24 din Legea Securitatii si Sanatatii in Munca nr. 86-XVI din 07 iulie 2008".

Constructia sectoarelor, in apropierea instalatiilor care se afla sub tensiune, trebuie sa fie indeplinite cu respectarea distantelor reglementate de la conductoare pina la mecanisme, cu punerea lor la pamint si intreprinderea altor masuri pentru asigurarea sigurantei desfasurarii lucrarilor.

In caz ca aceste cerinte nu pot fi indeplinite, este necesara deconectarea si punerea la pamint.

Protectia contra incendiilor liniilor electrice se asigura prin imbunatatirea constructiilor ignifuge, deconectarea automata a curentilor de scurtcircuit.

Sarcina pentru proiectare

Rețele exterioare de alimentare cu energie si centrala fotovoltaica

Nr. Ord.	Lista datelor de baza si a cerintelor	Datele de baza si cerintele
1	2	3
1	Baza de proiectare	Avizul de racordare cu Nr. G20502023090004 din 13.09.2023 valabil pana la 13.09.2025eliberat de I.C.S "Premier Energy Distribution" S.A.
2	Conditii speciale privind construirea (regimul economic si juridic)	Construirea prin metoda de antrepriza de catre un antreprenor autorizat, respectand cerintele Legii Nr. 721-XIII din 02.02.1996 cu toate modificarile ulterioare.
3	Tipul constructiei	Constructie noua
4	Faza de proiectare	Proiect de executie
5	Exigente privind solutiile arhitecturale planimetrie si constructive	Conform normelor in vigoare pe teritoriul Rep. Moldova cu utilizarea materialelor si a echipamentelor moderne.
6	Sursa de alimentare cu energie electrica	Punct de racordare LEA-10kV stalpul 33 spre PT340IL, PDC103 MILESTII MICI 35/10/6, fider 2
7	Domeniul de utilizare	Centrala fotovoltaica
8	Volumul de proiectare	1. Panou de evidenta 1 buc. 2. Tablou de distributie 1 buc. 3. Invertoare SolPlanet 3 buc. 4. Panouri fotovoltaice 323 buc. 5. АПВБδWn 4x240mm ² , L=60m 6. АПВБδWn 4x50mm ² , L=195m 7. АВВГнз 4x95mm ² , L=2m 8. АВВГнз 2x(4x150mm ²), L=10m 9. Pilon din beton armat SV 10,5 2 buc.
9	Aplicarea performantelor Tehnico-stiintifice in domeniul tehnologiei de productie, utilajelor si materialelor, obiectelor de constructie.	Aplicarea utilajelor si a materialelor moderne standarde, sau omologate conform prevederilor legale in vigoare pe intreg teritoriul Republicii Moldova
10	Transe si etape de receptie, conditiile de extindere	0 trasa de constructie
11	Masurile luate pentru protectie mediului ambiant	Conform normativelor si legilor in vigoare pe teritoriul Republicii Moldova
12	Cerinte suplimentare	1.Beneficiarul trebuie sa prezinte datele initiale, materialele geodezice, pasapoartele tehnice si certificatele utilajelor propuse pentru instalare. 2.Atat caordonarea, costul expertizei, cat si verificarea proiectului, sunt suportate de catre Beneficiar.

Beneficiar: IS COMBINATUL DE VINURI
DE CALITATE MILESTII MICI

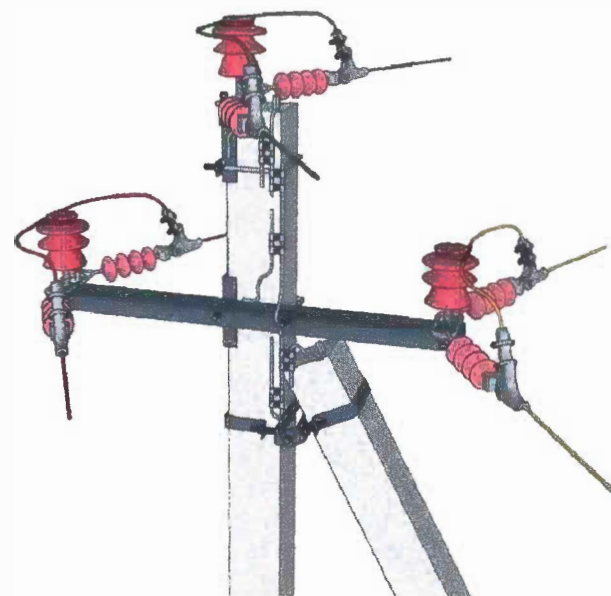
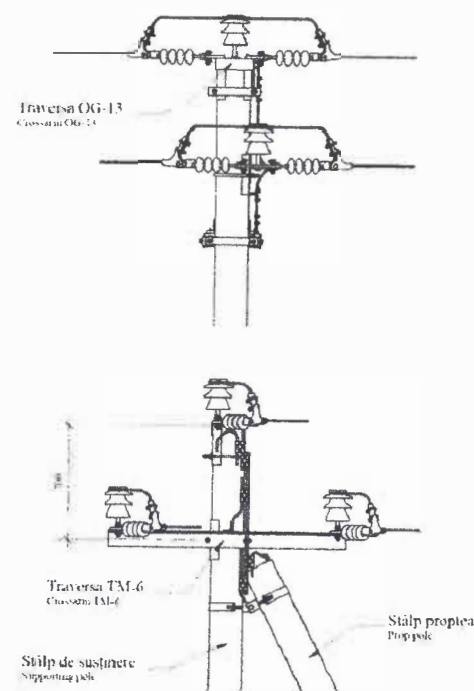
17-05-D/2024-AEE-G

Sarcina de proiectare

Coala

1-2

pilon de tip 6CtSIOT.MO



Limitator de supratensiune
OPH-10 existent

tr. nr. 340

SF CUT-OUT proiectat
Pilon de tip 9TrSIOT.MO ST
proiectat

Post de transformare
existent nr.340
BZUM TF 630 proiectat

Pilonul existent din lemn se
va demonta

Zona de protecție LEA 10kV

AC 3x(1x70mm²)
existent

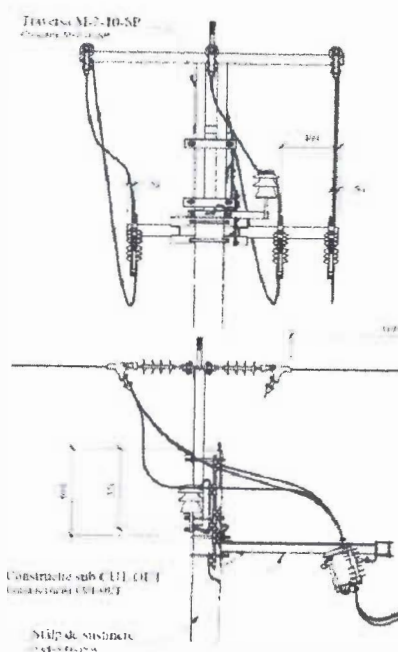
H1/ АПВБДШn 4x240mm², L=60m
traseu de tip T1

10 kv
3 fire

Pilonul nr.33 se va consolida
cu montarea unei proptei spre derivare
pilon de tip 6CtSIOT.MO

Punct de racordare
LEA-10kV stalpul 33 spre PT340IL,
POC103 MILESTII MICI 35/10/6, fider 2

R1 (2x22 buc.)



Scara 1:200

Autorizarea la proiectare P-2022 Nr.0877
17-05-D/2024-AEE-G

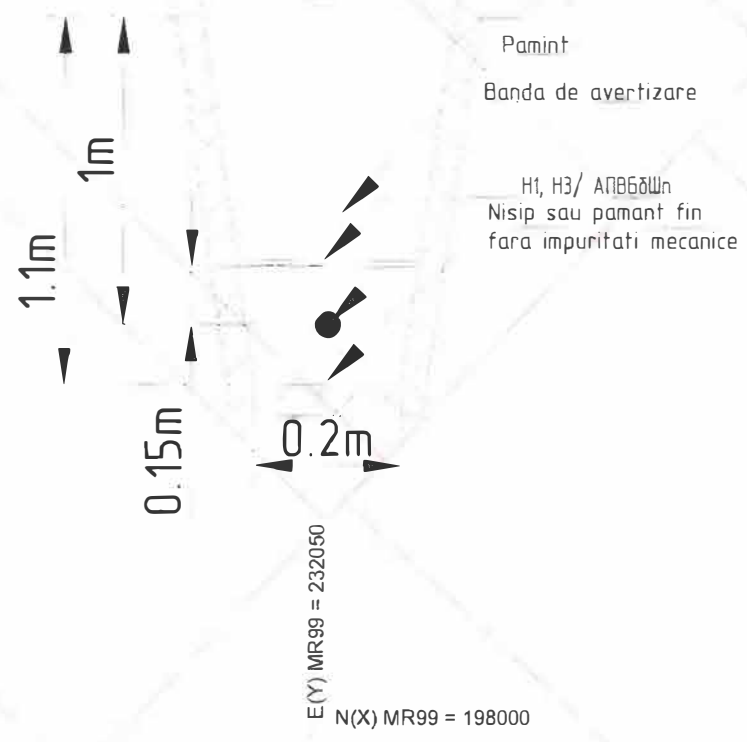
Rețele exterioare de alimentare cu energie electrică 10-0,4kV;
Echipament pentru evidența și centrala fotovoltaică a solicitantului
IS COMBINATUL DE VINURI DE CALITATE MILESTII MICI din r-nul Iași, s. Milestii Mici, Milestii Mici, 9005. NLC1031420

Centrala fotovoltaică 190kW

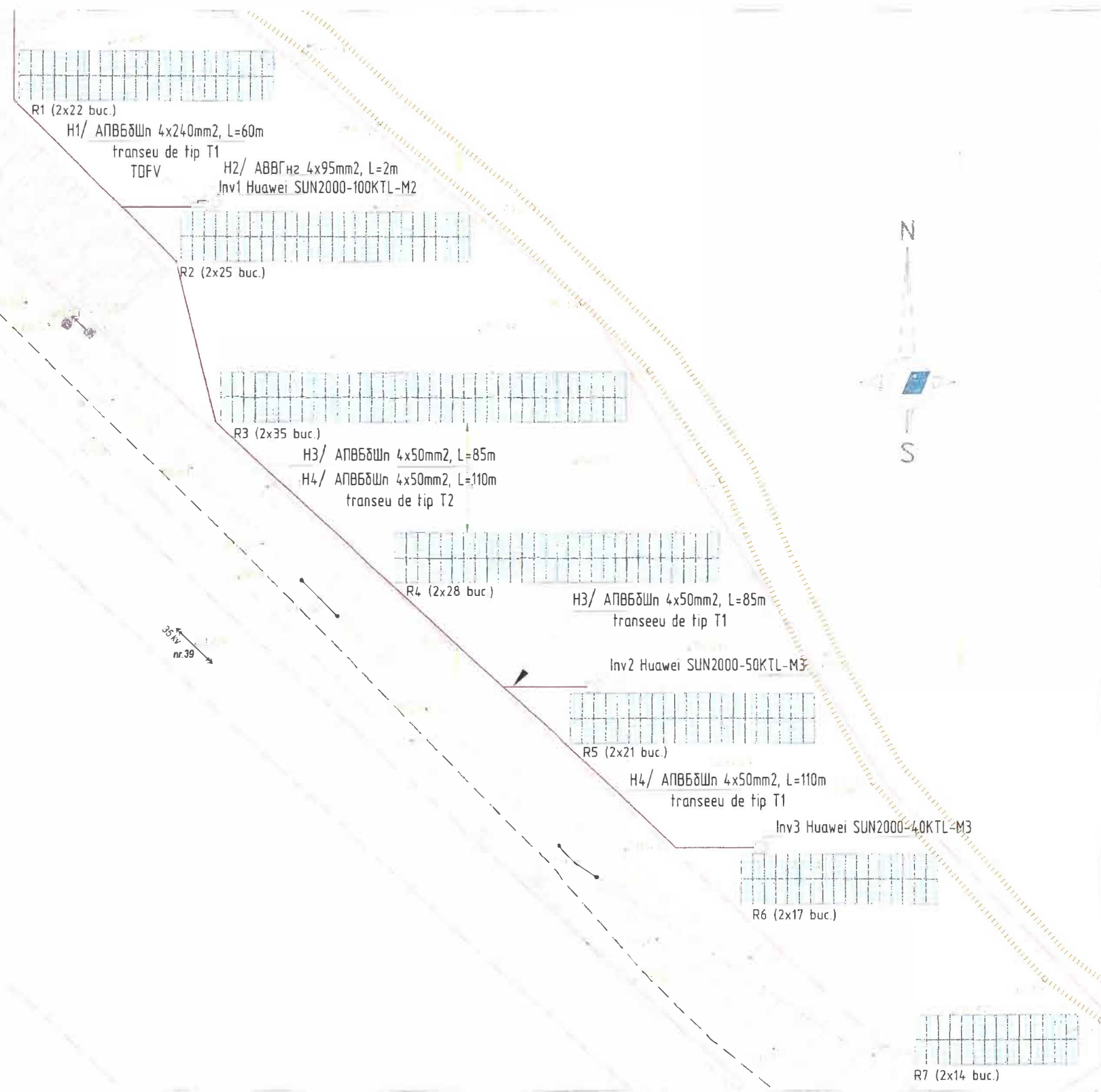
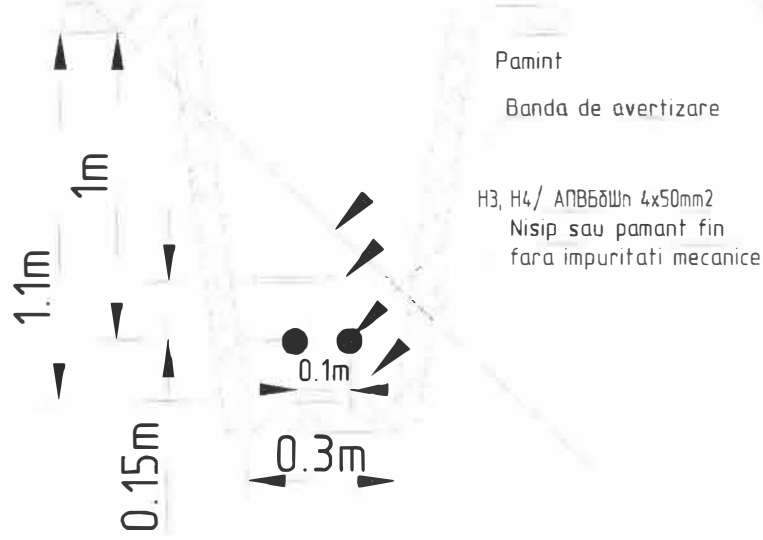
Plan general LEA 10kV

Faza	Plansa	Planse
PE	2	15

Marimele de gabarit ale transeelor de cablu
Transee T1



Transee T2



Scara 1:500

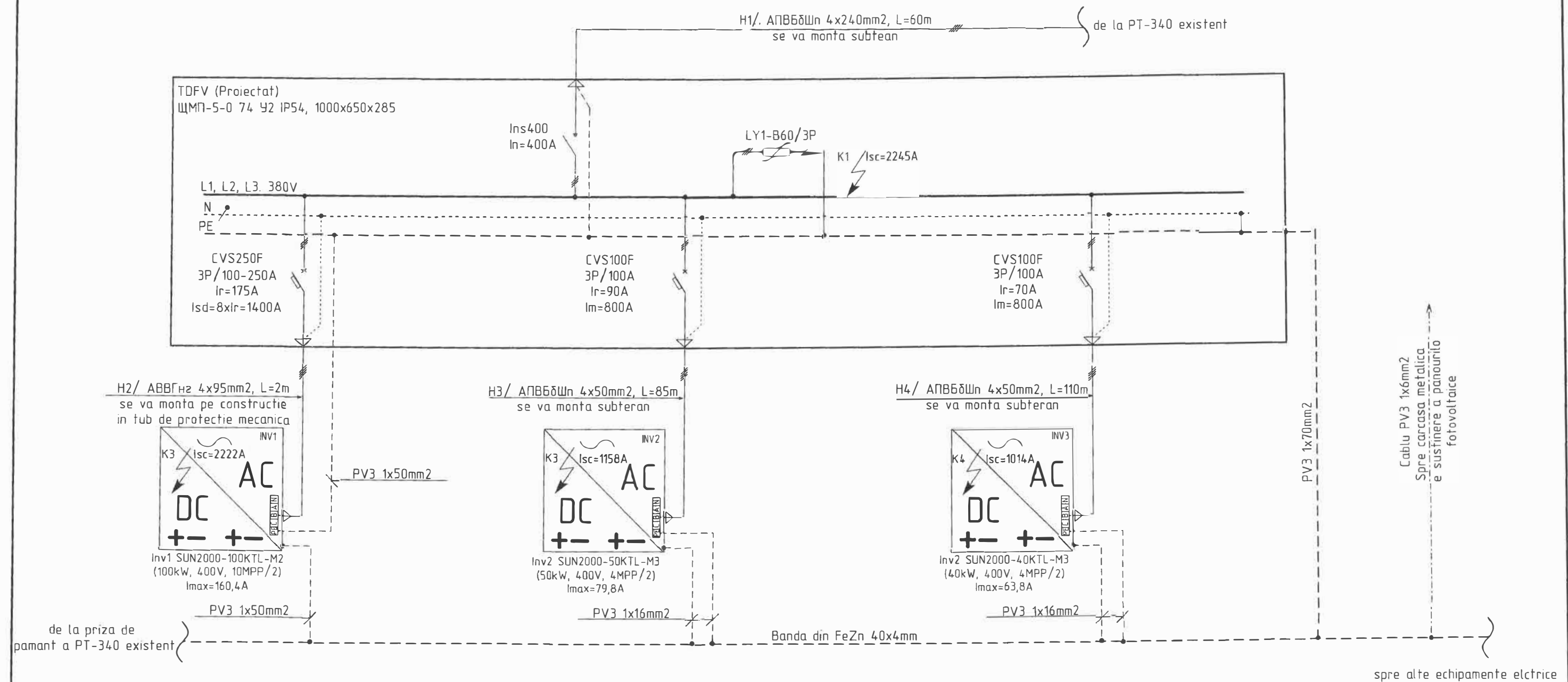
Autorizarea la proiectare P-2022 Nr.0877
17-05-D/2024-AEE-G

Transeul					Conectarea cablului/conectorului		
Marca	Inceput	Sfirsit	Mod pozare, m	Traseie	Marca	L, rezervei	L, totala
H1	PT	TDFV	0	55	АПВБДШн 4x240	5	60
H2	TDFV	Inv1	2	0	ВВГГн2 4x95mm2	0	2
H3	TDFV	Inv2	0	80	АПВБДШн 4x50	5	85
H4	TDFV	Inv3	0	105	АПВБДШн 4x50	5	110

Rețele exterioare de alimentare cu energie electrica 10-0,4kV;
Echipament pentru evidenta si centrala fotovoltaica a solicitantului
IS COMBINATUL DE VINURI DE CALITATE MILESTII MICI din r-nul Ialoveni,
s. Milestii Mici, Milestii Mici, 9005. NLC:1031420

Centrala fotovoltaica 190kW	Faza	Plansa	Planse
	PE	3	15

Plan general LEC-0,4kV



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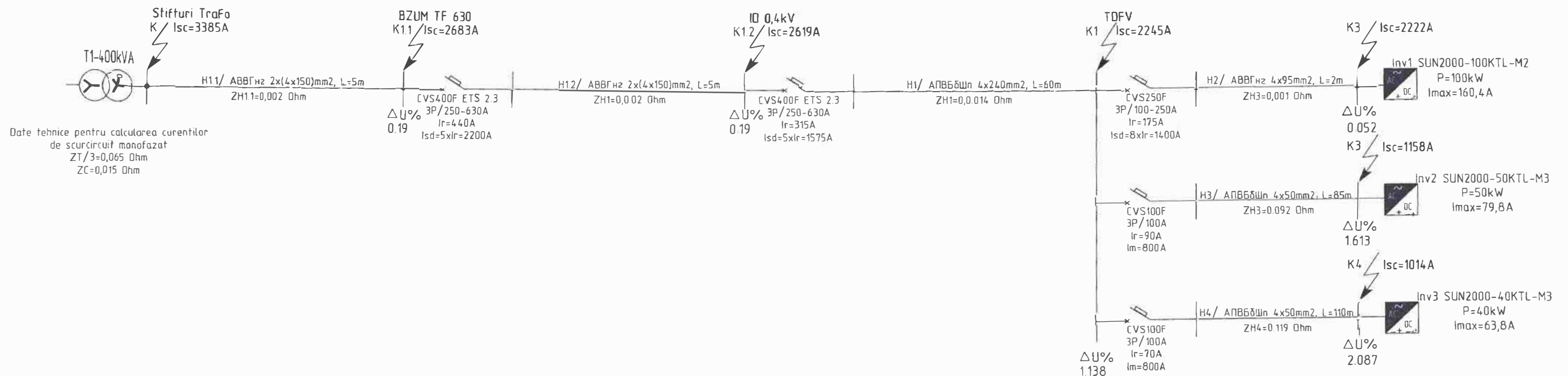
Centrala fotovoltaica 190kW

Schema electrica monofilara AC

Faza	Plansa	Planse
PE	7	15

Tabelul de date

Punct Scirc.	Marca, sectiunea si numarul de fire a conductorului	Lungimea sectorului de cablu	Iadm Icalc		$\Delta U\%$	Z bucla faza zero Ohm	Curent de scut circuit A	Aparat de protectie				
			Iadm A	Icalc A				Model	Intrerupator automat Siguranta fuzibila		Timp de reactie sec.	Timp admis sec.
									In automat A	In siguranta A		
K	Stifturi TraFo	-	-	-	-	0.065 0.015	-	-	-	-	-	
K1.1	ABBГHz 2x(4x150)mm2	5m	2x242	413.23	0,19	0,002	2683	-	-	-	-	
K1.2	ABBГHz 2x(4x150)mm2	5m	2x242	413.23	0,19	0,002	2619	CVS400F 3P/250-630A	Ir=315A Isd=2200A	0.01	<5	
K1	АПВБЩШn 4x240mm2	60m	369	308,1	1.138	0,014	2245	CVS400F 3P/250-630A	Ir=315A Isd=1575A	0.01	<5	
K2	ABBГHz 4x95mm2	2m	183	174,7	0.052	0,001	2222	CVS250F 3P/100-250A	Ir=175A Isd=1400A	0.01	<0,4	
K3	АПВБЩШn 4x50mm2	85m	146	66,7	1.613	0,092	1158	CVS100F 3P/100A	Ir=90A Isd=800A	0.01	<0,4	
K4	АПВБЩШn 4x50mm2	110m	146	66,7	2.087	0,119	1014	CVS100F 3P/100A	Ir=70A Isd=800A	0.01	<0,4	



Marcajul cablului	Traseul		porțiune de cablu							Cabluri					
	Început	Sfârșit	Sina de aluminiu	În tranșee	În tub de protecție mecanică	Aerian	în tranșee în tevi			după proiect			pază		
							din azbest	din metal	din PVC	marca	numărul de spire și secțiunea în mm ²	lungimea totală în m. + a rezervei	marca	numărul de spire și secțiunea în mm ²	lungimea în m.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
H1	Stifțuri TraFo	BZUM TF 630	-	-	5	-	-	-	5	ABBГH2	2x(4x150)	5			
H2	BZUM TF 630	ID-0,4kV	-	-	5	-	-	-	5	ABBГH2	2x(4x150)	5			
H3	ID-0,4kV	TDFV	-	-	-	-	-	-	-	АПББЩH	4x240	60			
H4	TDFV	Inv1	-	-	-	-	-	-	-	ABBГH2	4x95	2			
H3	TDFV	Inv2	-	-	-	-	-	-	-	АПББЩH	4x50	85			
H4	TDFV	Inv3	-	-	-	-	-	-	-	АПББЩH	4x50	110			

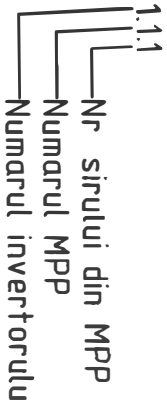
					Autorizatia la proiectare P-2022 Nr.0877			
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					Centrala fotovoltaica 190kW	Faza	Plansa	Planse
						PE	8	15
					Schema electrica echivalenta			

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16.1	16.1

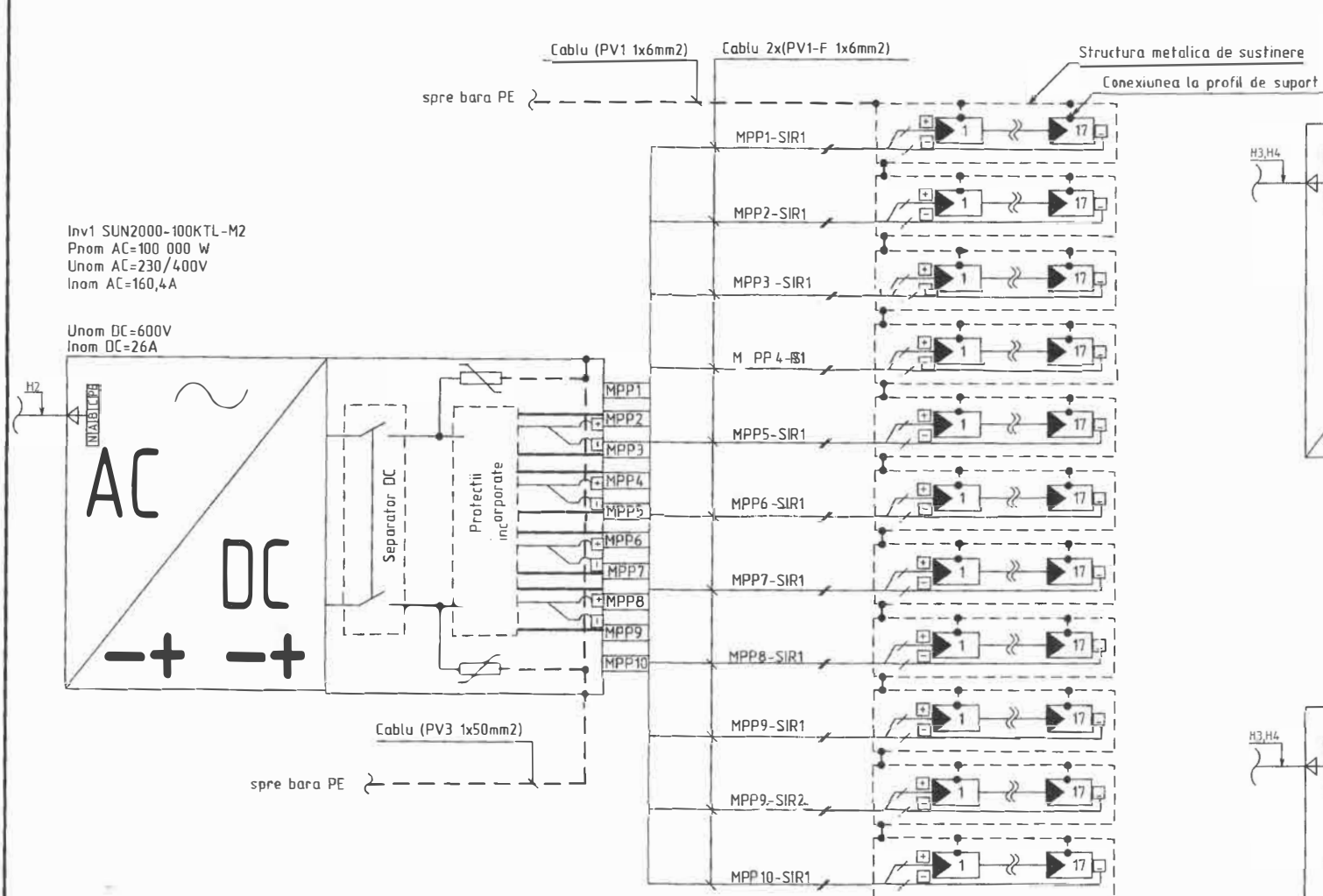
Adrese electrice ale panour lor fotovoltaice



Autorizarea la proiectare P-2022 Nr 0877
17-05-D/2024-AEE-G

Rețele exterioare de alimentare cu energie electrică 10-0,4kV,
Echipament pentru evidență și centrală fotovoltaică a solicitantului
S COMBINATUL DE VÂNĂRI DE CALITATE MILESTII MICI din r-nul de
s. Milestii Mici, Milestii Mici, 9005, NLC-1031420

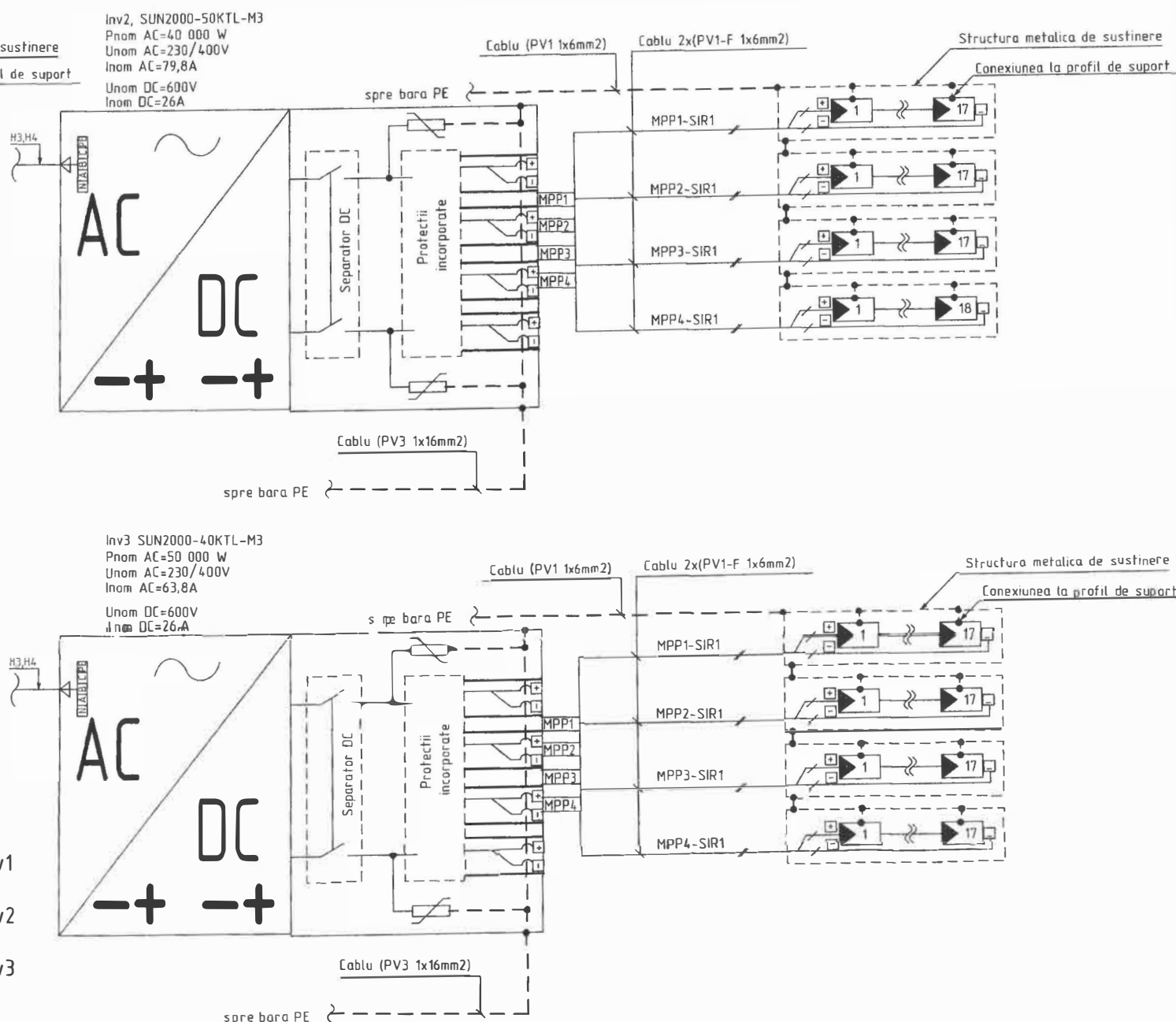
Centră fotovoltaică 90kW PE 15



Panouri fotovoltaice (17 buc.)
CanadianSolar-CS7N-700TB-AG
P_{si}=17x700W=11 900W
U_{MPP} (Voc)=17x47,9V=814,3V<1100V
U_{MPP} (Vm)=17x40V=680V<1000V
I_{si}=(17x700)/680V=18,49A<26A

Panouri fotovoltaice (18 buc.)
CanadianSolar-CS7N-700TB-AG
P_{si}=18x700W=12 600W
U_{MPP} (Voc)=18x47,9V=862,2V<1100V
U_{MPP} (Vm)=18x40V=720V<1000V
I_{si}=(18x700)/720V=18,49A<26A

Putere sumara a panourilor pe Inv1
P_{INV1}=17x700x11=130 900W
Putere sumara a panourilor pe Inv2
P_{INV2}=(17x2+18x2)x700=49 000W
Putere sumara a panourilor pe Inv3
P_{INV3}=17x700x4=47 600W
Putere sumara a panourilor
P_{tot}=130 900W+49 000W+47 600W=227 500W



Protectii incorporate in invertor de la producator

Protectie de inversare a polaritatii pe DC	Oa
Separator de sarcina DC	Oa
Protectie de supratensiune de impuls AC/DC	clasall/clasall
Monitorizarea rezistentei izolatiei	Oa
Protectie de scurtcircuit AC	Oa
monitorizare defectiunilor de punere la pamant	Oa
monitorizare tensiune din retea	Oa
protectie antiinsulare	Oa
protectie impotriva curentilor de scurgere	Oa

Autorizatia la proiectare P-2022 Nr.0877

17-05-D/2024-AEE-G

Rețele exterioare de alimentare cu energie electrica 10-0,4kV;
Echipament pentru evidenta si centrala fotovoltaica a solicitantului
IS COMBINATUL DE VINURI DE CALITATE MILESTII MICI din r-nul Ialoveni,
s. Milestii Mici, Milestii Mici, 9005. NLC 1031420

	Faza	Plansa	Planse
Centrala fotovoltaica 190kW	PE	9	15

Schema electrica monofilara DC

600
3000

Nodul A

Electrozi de împământare d=16mm²

Modulul PV

Profil
Orizontal

Profil
Orizontal

Conductor de coborire Cu 6mm²

Conductor de coborire Cu 6mm²

Conexiune prin bulon

Conductor de coborire Cu 6mm²

Piloni montați în sol

Banda FeZn 40x4mm

De la prize de pământ a
postului de transformare

Banda FeZn 80x4mm

R1 (2x22 buc.)

Zona de protecție
LEA 10 kV

Cablu PV3 1x50mm²

Inv1 Huawei
SUN2000-100KTL-M1

R2 (2x25 buc.)

Nodul A

Conexiune prin bulon

R3 (2x35 buc.)

Bara PE
Conexiune prin bulon
ГОСТ 10434-82
pentru conductori din cupru
Papuc de cabluri AG

Banda oțel 40x4mm

Îmbinare prin bulon

Electrozi de împământare d=16mm²

R4 (2x28 buc.)

Banda FeZn 40x4mm

Inv2 Huawei SUN2000-40KTL-M3

Cablu PV3 1x16mm²

R5 (2x21 buc.)

Inv3 Huawei SUN2000-40KTL-M3

Cablu PV3 1x16mm²

R6 (2x17 buc.)

R7 (2x14 buc.)

Nodul A
Îmbinare prin sudură
ГОСТ 15264-80-42

Banda oțel 40x4mm

Sudură

Electrod orizontal
din oțel d=16mm

Autorizarea la proiectare P-2022 Nr.0877
17-05-D/2024-AEE-G

Nota:

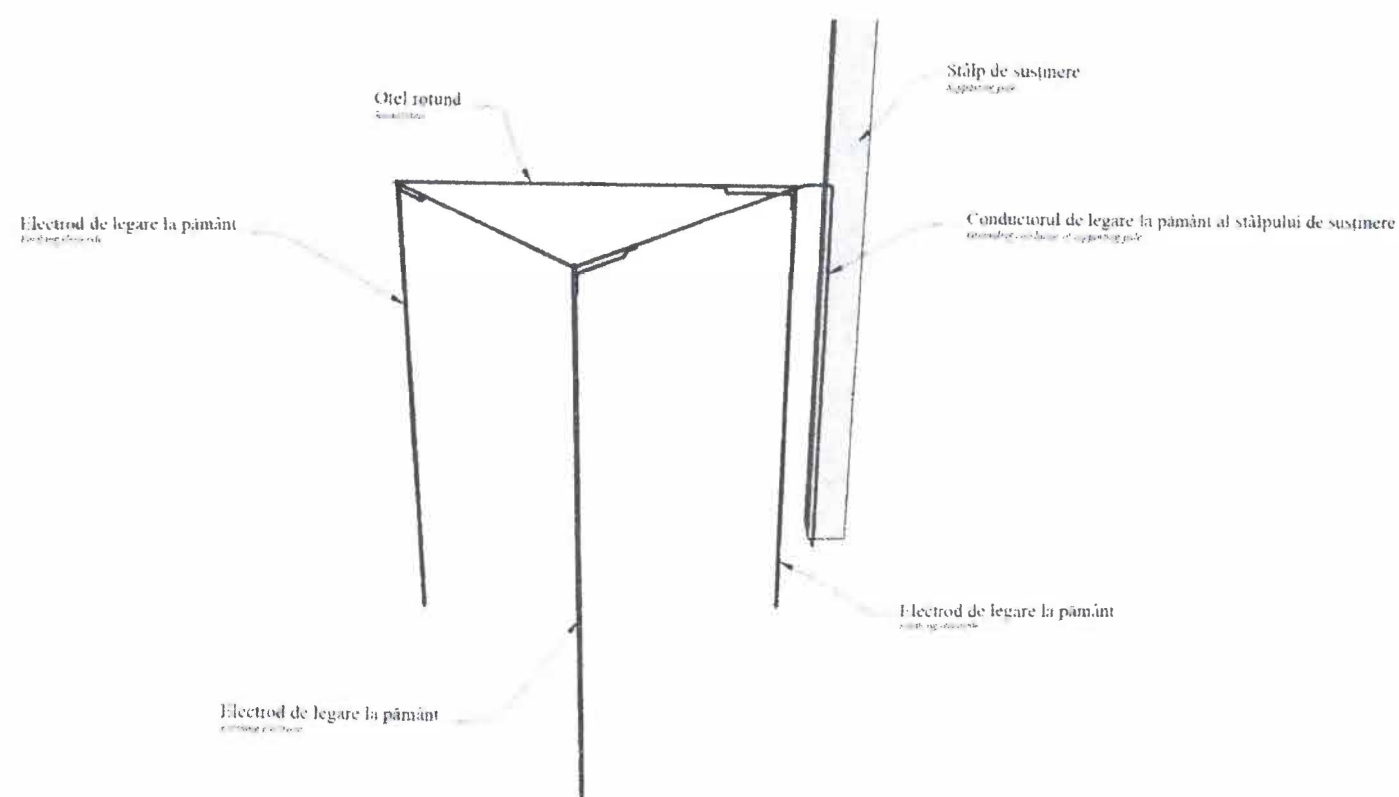
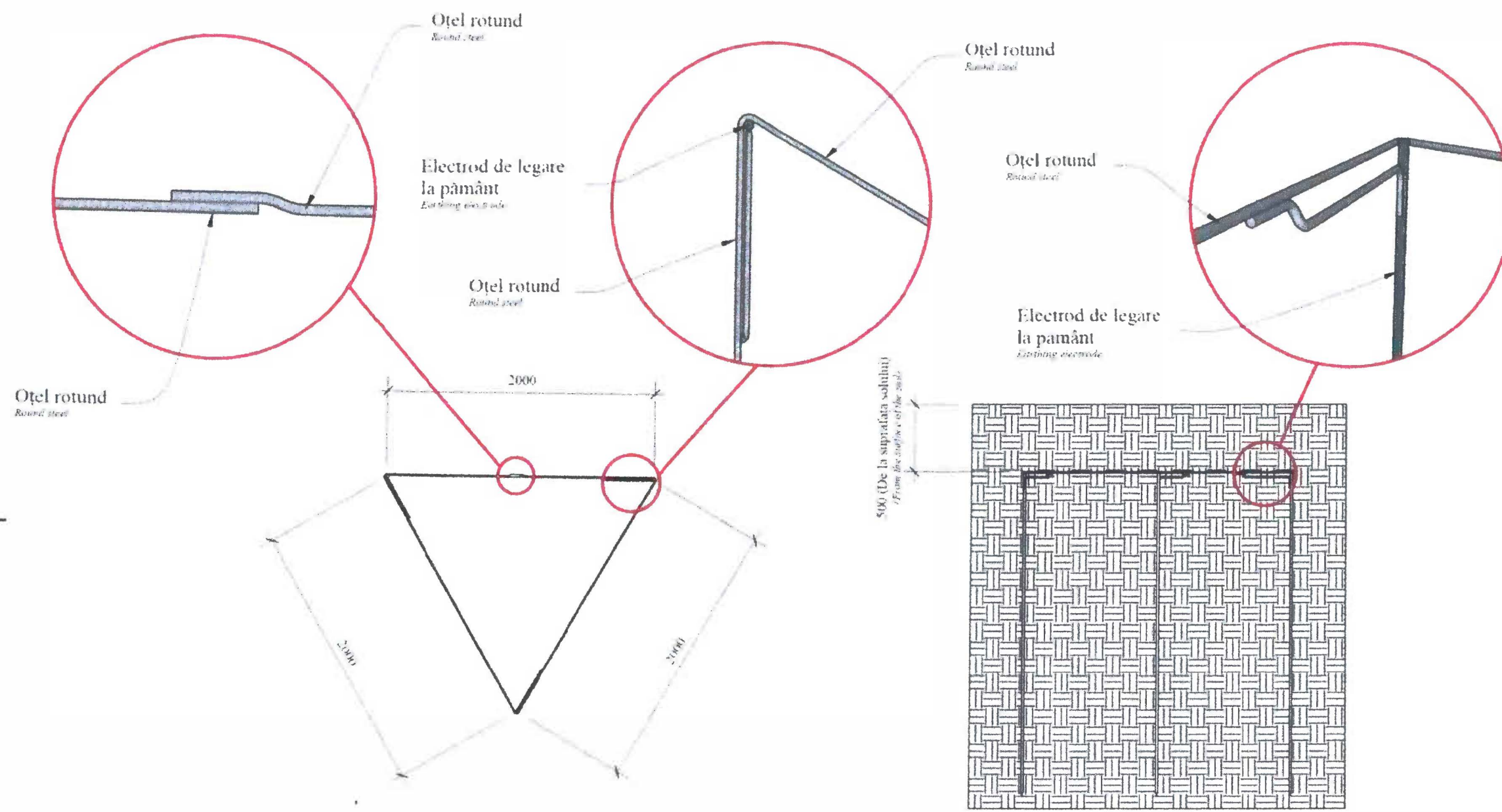
1. Structurile de susținere a panourilor fotovoltaice se montează pe piloni montați în sol.
2. Electrozii orizontali ai prizei de pământ sunt pozate în tranșee.
3. Electrozii verticali de îngropat în pământ prin presare, iar extremitatea superioară a acestora trebuie să fie cu 0,7m mai jos ca nivelul solului și îmbinarea electrozilor verticali și orizontali trebuie realizată prin sudare, iar lungimea părții sudate nu trebuie să fie mai mică ca două latimi a conductorului de împământare. Locurile de conexiune prin sudură trebuie să fie acoperite cu lac de bitum.

Rețele exterioare de alimentare cu energie electrică 10-0,4kV;
Echipament pentru evidență și centrală fotovoltaică a solicitantului
IS COMBINATUL DE VINURI DE CALITATE MILEȘTII MICI din r-nul Iași, s. Mileștii Mici, 9005. NLC:1031420

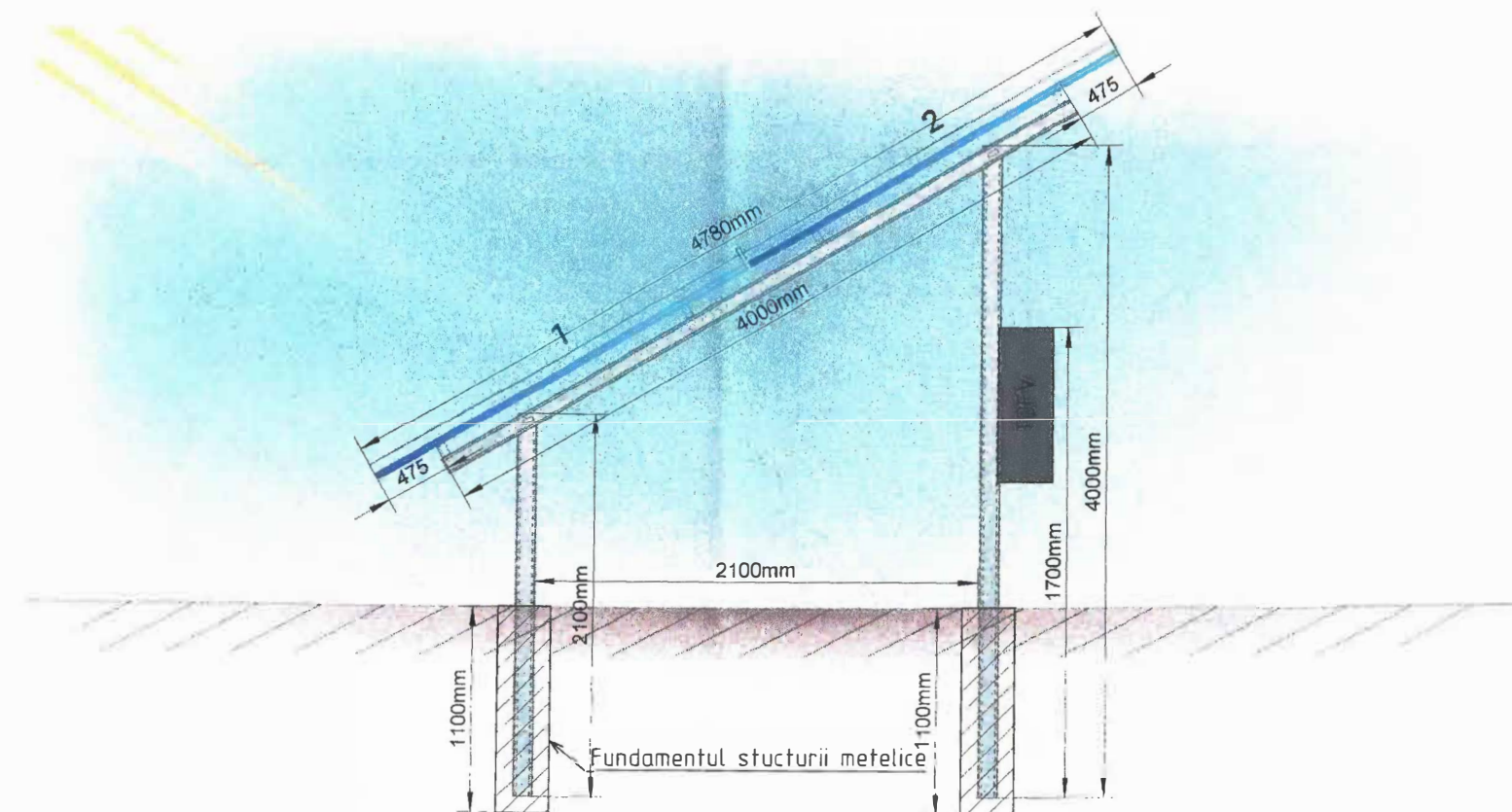
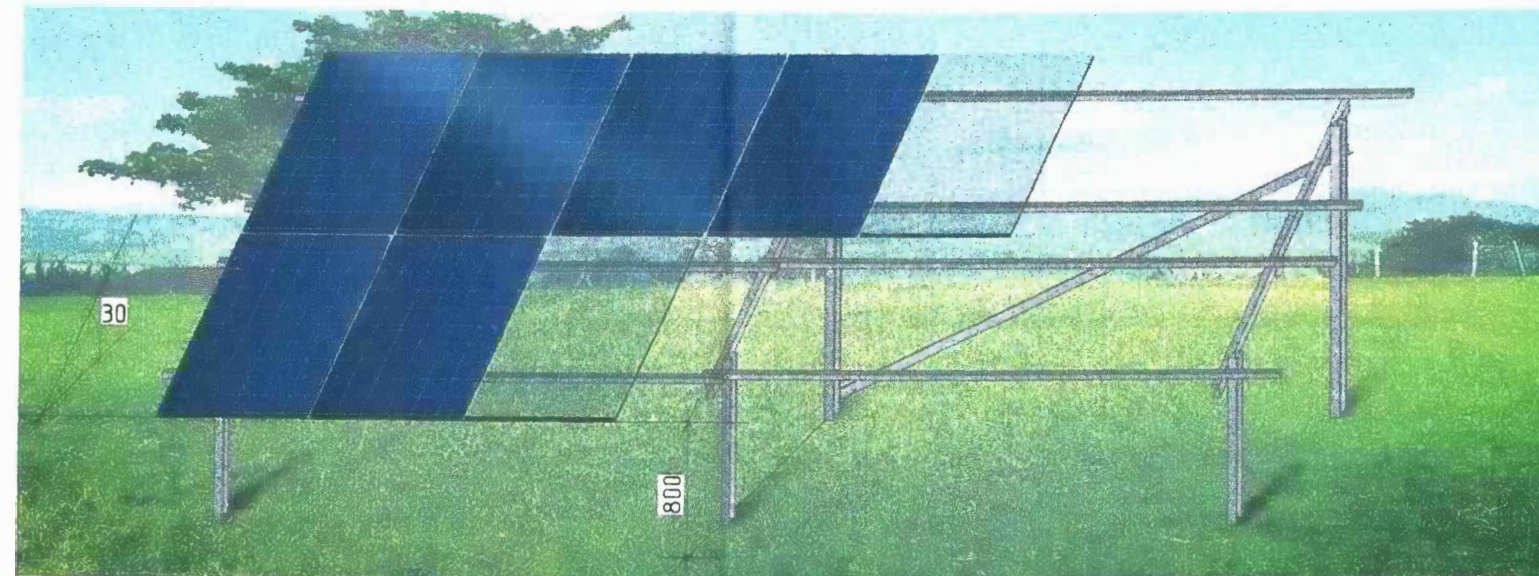
Centrala fotovoltaică 190kW

Traseul liniei pentru
egalizarea potențialelor

Faza	Planșa	Planșe
PE	10	15



Autorizația la proiectare P-2022 Nr.0877			
17-05-D/2024-AEE-G			
Retele exterioare de alimentare cu energie electrică 10-0,4kV; Echipament pentru evidența și centrala fotovoltaică a solicitantului IS COMBINATUL DE VINURI DE CALITATE MILESTII MICI din r-nul Iași, s. Milestii Mici, Milestii Mici, 9005. NLC:1031420			
Centrala fotovoltaică 190kW	Faza	Planșa	Planșe
	PE	11	15
Priza de pământ al pilonului 9TrS10T.M0 ST			



Pentru a obtine eficienta maxima din instalatia fotovoltaica proiectata, se vor respecta urmatoarele prevederi:

- Structura metalica se va construi din profile din otel zincat 41x41x1.5mm (STRUT) ce va permite exploatarea instalatiei fotovoltaice timp indelungat si nu se va oxida sau deteriora inainte de expirarea termenului de exploatare a panourilor fotovoltaice.
- Se va realiza in asa fel incat unghiul de inclinare al planului panourilor fotovoltaice se va incadra intre 25- 30 grade fata de linia orizontala, dat fiind faptul ca proiectul nu prevede instalarea carcasi cu unghi de inclinare reglabil, structura metalica se va instala paralel cu planul inclinat al acoperisului respectand integritatea acestuia.
- Orientarea sirurilor de panouri se va realiza in dependenta de configuratia planului acoperisului.
- Se va curata periodic suprafata panourilor fotovoltaice, de praful din atmosfera pe timp de vara si de zapada pe timp de iarna.
- Panourile se vor spala periodic cu jet de apa, de depunerile de praf din atmosfera.

Autorizatia la proiectare P-2022 Nr.0877

17-05-D/2024-AEE-G

Rețele exterioare de alimentare cu energie electrică 10-0,4kV;
Echipament pentru evidență și centrală fotovoltaică a solicitantului
IS COMBINATUL DE VINURI DE CALITATE MILEȘTII MICI din r-nul Iași, s. Mileștii Mici, Mileștii Mici, 9005. NLC:1031420

Centrala fotovoltaică 190kW

Vederea generală
a construcției metalice

Faza	Plansa	Planse
PE	12	15

Pozitia	Denumirea si caracteristici tehnice	Tipul, Marca	Codul utilajului, materialul	Companie producatoare	Unitate de masura	Cantitate	Masa unitati	Nota
	Intrerupator automat de joasa tensiune	CVS400F ETS 2.3		Schneider Electric	buc.	2		
	Intrerupator automat de joasa tensiune	CVS250F		Schneider Electric	buc.	1		
	Intrerupator automat de joasa tensiune	CVS100F		Schneider Electric	buc.	2		
	Intrerupator de sarcina de joasa tensiune	Ins400		Schneider Electric	buc.	1		
	Limitator de supratensiune	LY1-B60	LY1-B60/3P		buc.	1		
	Contor electronic digital	ZMG 405 CT	ZMG 405 CT	Landis&Gyr	buc.	1		
	Panou de evidenta	DDE-3 TIP 6.2-06-01	DDE-3 TIP 6.2-06-01		buc.	1		
	Tablou de distributie	ЩМП-5-0 74	ЩМП-5-0 74 Y2 IP54, 1000x650x285		buc.	1		
	Cablu de putere 1kV, rotund, in izolatie PVC si mata PVC	ABBГнз 4x150mm2		Фжкатель	m	20		
	Cablu de putere 1kV, rotund, in izolatie PVC si mata PVC	ABBГнз 4x95mm2		Фжкатель	m	2		
	Cabluri de alimentare cu TPG din aluminiu, cu izolatie din polietilena reticulata, blindate cu benzi de otel galvanizat, cu furtun de protectie din polietilena	АПВБЩн 4x240mm2		Фжкатель	m	60		
	Cabluri de alimentare cu TPG din aluminiu, cu izolatie din polietilena reticulata, blindate cu benzi de otel galvanizat, cu furtun de protectie din polietilena	АПВБЩн 4x50mm2		Фжкатель	m	195		

					Autorizatia la proiectare P-2022 Nr.0877			
					17-05-D/2024-AEE-G			
					Rețele exterioare de alimentare cu energie electrica 10-0,4kV; Echipament pentru evidenta si centrala fotovoltaica a solicitantului IS COMBINATUL DE VINURI DE CALITATE MILESTII MICI din r-nul Ialoveni, s. Milestii Mici, Milestii Mici, 9005 NIC 1031420			
					Centrala fotovotaica 190kW	Faza	Plansa	Planse
						PE	13	15
					Lista de materiale			

Pozitia	Denumirea si caracteristici tehnice	Tipul,Marca	Codul utilajului, materialul	Companie producatoare	Unitate de masura	Cantitate	Masa unitati	Nota
	Cablu de putere 1kV,rotund, in izolatie PVC	PV3 1x50mm2			m	6		
	Cablu de putere 1kV,rotund, in izolatie PVC	PV3 1x16mm2			m	12		
	Cablu de putere 1kV,rotund, in izolatie PVC	PV3 1x6mm2			m	50		
	Banda zincata	FeZn 40x4mm			m	260		
	Banda de avertizare		Banda de avertizare 250 mm		m	240		
	Nisip				m3	14,4		
	Manusa termoretractabila	ΠΤκ 4x35 - 50 mm2		IEK	buc.	4		
	Manusa termoretractabila	ΠΤκ 4 x 70 - 120 mm2		IEK	buc.	2		
	Manusa termoretractabila	ΠΤκ 4x150 - 240 mm2		IEK	buc.	1		
	Panouri fotovoltaice monocristaline	CS7N-700TB-AG		CanadiaSolar	buc.	324		
	Invertor SUN2000-100KTL-M2	SUN2000-100KTL-M2		Huawei	buc.	1		
	Invertor SUN2000-50KTL-M3	SUN2000-50KTL-M3		Huawei	buc.	1		
	Invertor SUN2000-40KTL-M3	SUN2000-40KTL-M3		Huawei	buc.	1		
	Profil zincat 40x40x1,5	Profil zincat			Kg	3 610		

					Autorizatia la proiectare P-2022 Nr.0877		
					17-05-0/2024-AEE-G		
					Rețele exterioare de alimentare cu energie electrica 10-0,4kV; Echipament pentru evidenta si centrala fotovoltaica a solicitantului IS COMBINATUL DE VINURI DE CALITATE MILESTII MICI din r-nul Ialoveni, s. Milestii Mici, Milestii Mici, 9005. NLC:1031420		
					Centrala fotovoltaica 190kW	Faza	Plansa
						PE	14
					Lista de materiale	Planse	15

Pozitia	Denumirea si caracteristici tehnice	Tipul,Marca	Codul utilajului, materialul	Companie producatoare	Unitate de masura	Cantitate	Masa unitati	Nota
	Pilon din beton armat SV 10,5	SV 10,5			buc.	2		
	Traversa metalica	Traversa metalica M-2-10-SP			buc.	2		
	Consola metalica	Consola metalica RA4			buc.	1		
	Constructie sub CUT-OUT	Constructie sub CUT-OUT			buc.	1		
	Set de intindere conductor				buc.	3		
	Separator CUT-OUT polimeric	Separator CUT-OUT			buc.	3		
	Sigurante fusibile	Sigurante fusibile CUT-OUT (40A)			buc.	3		
	Cleme pentru conexiunea conductorului AC70	Cleme PA 2-2			buc.	3		
	Cleme pentru conexiunea conductorului de inamintare	Cleme NC 2-1			buc.	6		
	Papuc de aluminiu	Papuc de aluminiu AC70			buc.	9		
	Conductor pentru inamantare	otel rotund d=10mm			m	9		
	Conductor pentru inamantare	otel rotund d=16mm			m	30		
	Conductor AC70	Conductor AC70			m	36,5		

					Autorizatia la proiectare P-2022 Nr.0877			
					17-05-D/2024-AEE-G			
					Rețele exterioare de alimentare cu energie electrica 10-0,4kV; Echipament pentru evidenta si centrala fotovoltaiica a solicitantului IS COMBINATUL DE VINURI DE CALITATE MILESTII MICI din r-nul Ialoveni, s. Milestii Mici, Milestii Mici, 9005. NLC:1031420			
					Centrala fotovoltaiica 190kW	Faza	Plansa	Planse
						PE	15	15
					Lista de materiale			

SUN2000-100KTL-M2 Smart PV Controller



10
MPP Trackers



98.8% (@480V)
Max. Efficiency



String-level
Management



Smart I-V Curve Diagnosis
Supported



MBUS
Supported



Support AFCI &
Smart String Level
Disconnect

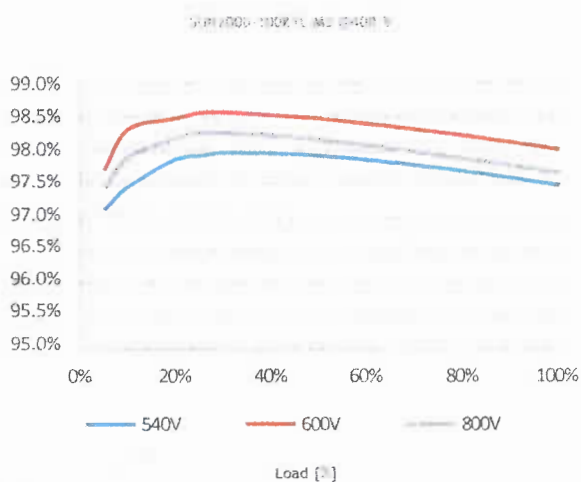


Surge Arresters for
DC & AC

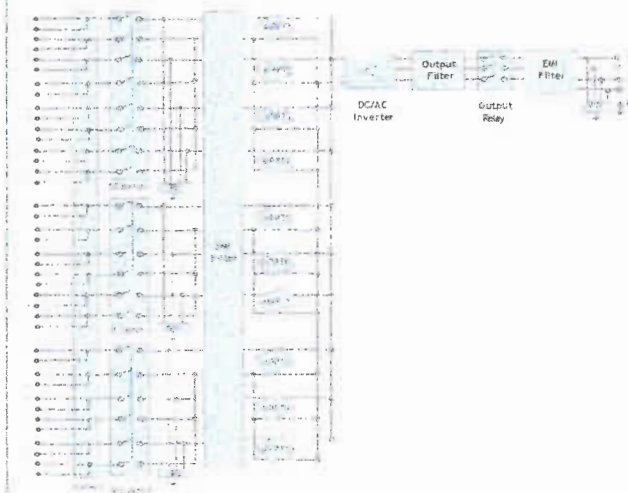


IP66
Protection

Efficiency Curve



Circuit Diagram



SUN2000-100KTL-M2

Technical Specification

Technical Specification

SUN2000-100KTL-M2

Efficiency

Max. efficiency	98.6% @ 400 V, 98.8% @ 480 V
European efficiency	98.4% @ 400 V, 98.6% @ 480 V

Input

Max. Input Voltage ¹	1,100 V
Max. Current per MPPT	30 A
Max. Current per Input ³	20 A
Max. Short Circuit Current per MPPT	40 A
Start Voltage	200 V
MPPT Operating Voltage Range ²	200 V ~ 1,000 V
Nominal Input Voltage	600 V @ 400 Vac, 720 V @ 480 Vac
Number of MPP trackers	10
Max. input number per MPP tracker	2

Output

Nominal AC Active Power	100,000 W
Max. AC Apparent Power	110,000 VA
Max. AC Active Power (cosφ=1)	110,000 W
Nominal Output Voltage	380 V / 400 V / 480 V, 3W+(N)+PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Nominal Output Current	144.4 A @ 400 V, 120.3 A @ 480 V
Max. Output Current	160.4 A @ 400 V, 133.7 A @ 480 V
Adjustable Power Factor Range	0.8 leading... 0.8 lagging
Max. Total Harmonic Distortion	< 3%

Protection

Input-side Disconnection Device	Yes
Anti-islanding Protection	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Monitoring	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
Residual Current Monitoring Unit	Yes
Arc Fault Protection	Yes
Smart String Level Disconnect	Yes

Communication

Display	LED indicators; WLAN adaptor + FusionSolar APP
RS485	Yes
USB	Yes
Smart Dongle-4G	Smart Dongle - 4G / WLAN (Optional)
Monitoring BUS (MBUS)	Yes (isolation transformer required)

General Data

Dimensions (W x H x D)	1,035 x 700 x 365 mm
Weight (with mounting plate)	93 kg
Operating Temperature Range	-25°C - 60°C
Cooling Method	Smart Air Cooling
Max. Operating Altitude	4,000 m (13,123 ft.)
Relative Humidity	0 ~ 100%
DC Connector	Amphenol Helios H4
AC Connector	Waterproof Connector + OT/DT Terminal
Protection Degree	IP66
Topology	Transformerless
Nighttime Power Consumption	< 3.5 W

Standard Compliance (more available upon request)

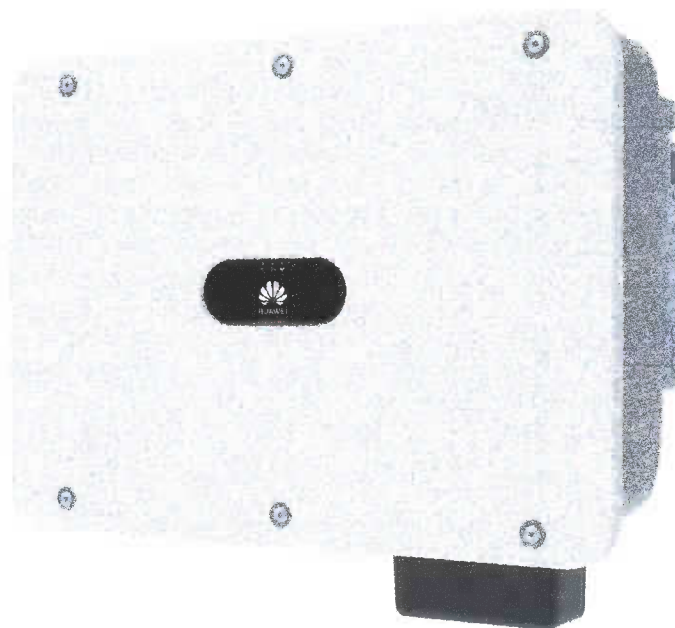
Certificate	EN 62109-1/-2, IEC 62109-1/-2, EN 50530, IEC 62116, IEC 61727, IEC 60068, IEC 61683
Grid Connection Standards	VDE-AR-N4105, EN 50549-1, EN 50549-2, RD 661, RD 1699, C10/11

¹ The maximum input voltage is 1,100 V. The input voltage should be lower than the maximum input voltage. The input voltage should be lower than the maximum input voltage. The input voltage should be lower than the maximum input voltage.

² The MPPT operating voltage range is 200 V ~ 1,000 V. The MPPT operating voltage range is 200 V ~ 1,000 V. The MPPT operating voltage range is 200 V ~ 1,000 V. The MPPT operating voltage range is 200 V ~ 1,000 V.

³ The maximum input current is 20 A. The maximum input current is 20 A. The maximum input current is 20 A. The maximum input current is 20 A.

SUN2000-30/36/40KTL-M3 Smart PV Controller



Smart

8 strings intelligent monitoring



Efficient

Max. efficiency 98.7%



Safe

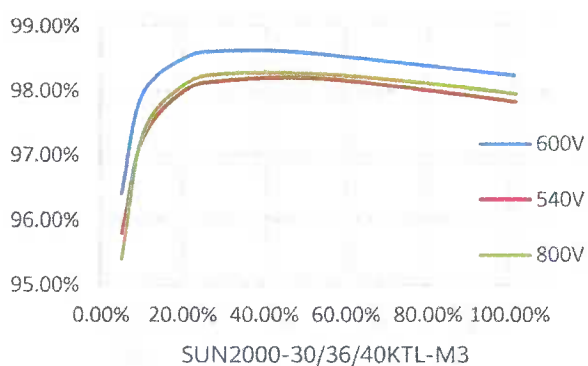
Fuse free design



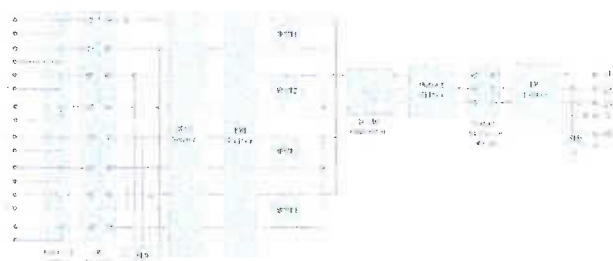
Reliable

Type II surge arresters for DC & AC

Efficiency Curve



Circuit Diagram



SUN2000-30/36/40KTL-M3

Technical Specification

Technical Specification	SUN2000-30KTL-M3	SUN2000-36KTL-M3	SUN2000-40KTL-M3
Efficiency			
Max. Efficiency	98.7%		
European Efficiency	98.4%		
Input			
Max. Input Voltage ¹	1,100 V		
Max. Current per MPPT	26 A		
Max. Short Circuit Current per MPPT	40 A		
Start Voltage	200 V		
MPPT Operating Voltage Range ²	200 V ~ 1000 V		
Rated Input Voltage	600 V		
Number of Inputs	8		
Number of MPP Trackers	4		
Output			
Rated AC Active Power	30,000 W	36,000 W	40,000 W
Max. AC Apparent Power	33,000 VA ³	40,000 VA	44,000 VA
Rated Output Voltage	230 Vac / 400 Vac / 480 Vac, 3W/N+PE		
Rated AC Grid Frequency	50 Hz / 60 Hz		
Rated Output Current	43.3 A	52.0 A	57.8 A
Max. Output Current	47.9 A	58.0 A	63.8 A
Adjustable Power Factor Range	0.8 LG ... 0.8 LD		
Max. Total Harmonic Distortion	< 3%		
Protection			
Input-side Disconnection Device	Yes		
Anti-islanding Protection	Yes		
AC Overcurrent Protection	Yes		
DC Reverse-polarity Protection	Yes		
PV-array String Fault Monitoring	Yes		
DC Surge Arrester	Yes		
AC Surge Arrester	Yes		
DC Insulation Resistance Detection	Yes		
Residual Current Monitoring Unit	Yes		
Arc Fault Protection	Yes		
Ripple Receiver Control	Yes		
Integrated PID Recovery ⁴	Yes		
Communication			
Display	LED Indicators, Integrated WLAN + FusionSolar APP		
RS485	Yes		
Smart Dongle	WLAN/Ethernet via Smart Dongle-WLAN-FE (Optional)		
Monitoring BUS (MBUS)	4G / 3G / 2G via Smart Dongle-4G (Optional) Yes (Isolation Transformer required)		
General Data			
Dimensions (W x H x D)	640 x 530 x 270 mm (25.2 x 20.9 x 10.6 inch)		
Weight (with mounting plate)	43 kg (94.8 lb)		
Operating Temperature Range	-25 ~ + 60 °C (-13 °F ~ 140 °F)		
Cooling Method	Natural Convection		
Max. Operating Altitude	4,000 m (13,123 ft.) (Derating above 2000 m)		
Relative Humidity	0% RH ~ 100% RH		
DC Connector	Staubli MC4		
AC Connector	Waterproof Connector + OT/DT Terminal		
Protection Degree	IP 66		
Topology	Transformerless		
Nighttime Power Consumption	≤ 5.5W		
Optimizer Compatibility			
DC MBUS Compatible Optimizer	SUN2000-450W-P		
Standard Compliance (more available upon request)			
Safety	EN 62109-1/-2, IEC 62109-1/-2, EN 50530, IEC 62116, IEC 60068, IEC 61683		
Grid Connection Standards	IEC 61727, VDE-AR-N4105, VDE 0126-1-1, BDEW, G59/3, UTE C 15-712-1, CEI 0-16, CEI 0-21, RD 661, RD 1699, P.O. 12.3,RD 413, EN-50438-Turkey, EN-50438-Ireland, C10/11, MEA, Resolution No.7, NRS 097-2-1, AS/NZS 4777.2, DEWA		

¹ The maximum input voltage is the upper limit of the DC voltage and higher input DC voltage may be possible for longer periods.

² At the DC input voltage beyond the operating voltage range, the inverter may be damaged, therefore, please do not exceed.

³ For America, Germany, England, N. America, France, AC Connector: 3-core with 10A earth wire. For other countries, please refer to the local standard.

⁴ The DC 0-100% MPPT voltage range potential will be tested after approval by the power grid company. The inverter will not be able to work normally if the power grid company does not allow the MPPT voltage range to be 0-100%.

SUN2000-50KTL-M3 Smart PV Controller



Higher Yields

Up to 30% More Energy
with Optimizer



Active Safety

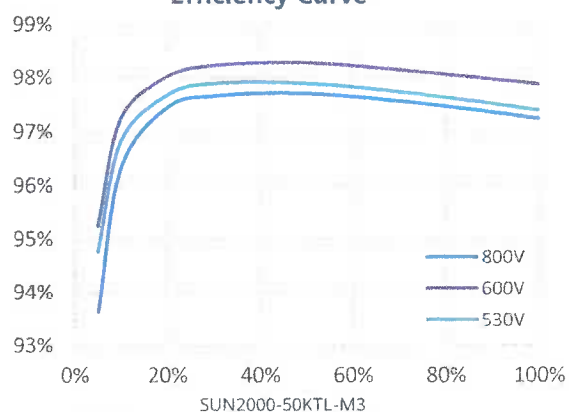
AI Powered
Active Arcing Protection



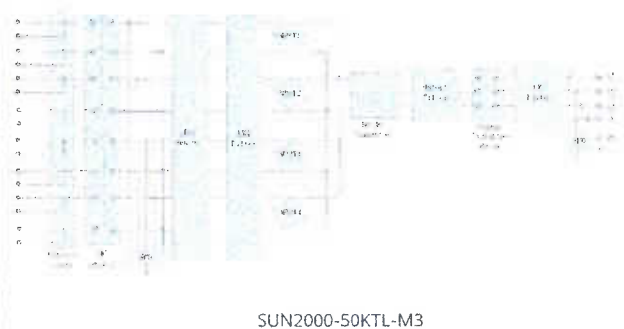
Flexible Communication

WLAN, Fast Ethernet, 4G
Communication Supported

Efficiency Curve



Circuit Diagram



Technical Specification

SUN2000-50KTL-M3

Efficiency

Max. Efficiency	98.5%
European Efficiency	98.0%

Input

Max. Input Voltage ¹	1,100 V
Max. Current per MPPT	30 A
Max. Current per Input	20 A
Max. Short Circuit Current per MPPT	40 A
Start Voltage	200 V
MPPT Operating Voltage Range ²	200 V ~ 1,000 V
Rated Input Voltage	600 V
Number of Inputs	8
Number of MPP Trackers	4

Output

Rated AC Active Power	50,000 W
Max. AC Apparent Power	55,000 VA
Max. AC Active Power (cosφ=1)	55,000 W
Rated Output Voltage	400 Vac / 480 Vac, 3W+{N} + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Rated Output Current	72.2 A @ 400Vac, 60.1 A @ 480Vac
Max. Output Current	79.8 A @ 400Vac, 66.5 A @ 480Vac
Adjustable Power Factor Range	0.8 LG ... 0.8 LD
Max. Total Harmonic Distortion	<3%

Protection

Input-side Disconnection Device	Yes
Anti-islanding Protection	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Monitoring	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
Residual Current Monitoring Unit	Yes
Arc Fault Protection	Yes
Ripple Receiver Control	Yes
Integrated PID Recovery	Yes

Communication

Display	LED Indicators, Bluetooth + APP
RS485	Yes
Smart Dongle	WLAN/Ethernet via Smart Dongle-WLAN-FE (Optional) 4G / 3G / 2G via Smart Dongle-4G (Optional)
Monitoring BUS (MBUS)	Yes (Isolation Transformer required)

Optimizer Compatibility

DC MBUS Compatible Optimizer

General Data

Dimensions (W x H x D)	640 x 530 x 270 mm (25.2 x 20.9 x 10.6 inch)
Weight (with mounting plate)	49 kg (108.1 lb)
Operating Temperature Range	-25°C ~ 60°C (-13°F ~ 140°F)
Cooling Method	Smart Air Cooling
Max. Operating Altitude	4,000 m (13,123 ft.)
Relative Humidity	0% RH ~ 100% RH
DC Connector	Amphenol HH4
AC Connector	Waterproof Connector + OT/DT Terminal
Protection Degree	IP 66
Topology	Transformerless
Nighttime Power Consumption	≤ 5.5W

Standard Compliance (more available upon request)

Safety	EN 62109-1/-2, IEC 62109-1/-2, EN 50530, IEC 62116, IEC 60068, IEC 61683 IEC 61727, VDE-AR-N4105, VDE 0126-1-1, BDEW, G59/3, UTE C 15-712-1, CEI 0-16, CEI 0-21, RD 661, RD 1699.
Grid Connection Standards	P.O. 12.3, RD 413, EN-50438-Turkey, EN-50438-Ireland, C10/11, MEA, Resolution No.7. NRS 097-2-1, DEWA

1. The maximum value of ΔG is the upper limit of the GC content. Any higher value of GC content will result in a higher value of ΔG than the upper limit of GC content, which is not possible for any sequence.

2. Similarly, the minimum value of ΔG is the lower limit of the GC content. Any lower value of GC content will result in a lower value of ΔG than the lower limit of GC content, which is not possible for any sequence.

3. The GC content of a sequence is always between 0% and 100%. The GC content of a sequence is always between 0% and 100%.

4. The GC content of a sequence is always between 0% and 100%. The GC content of a sequence is always between 0% and 100%.

5. The GC content of a sequence is always between 0% and 100%. The GC content of a sequence is always between 0% and 100%.

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7. The GC content of a sequence is always between 0% and 100%. The GC content of a sequence is always between 0% and 100%.

8. The GC content of a sequence is always between 0% and 100%. The GC content of a sequence is always between 0% and 100%.

9. The GC content of a sequence is always between 0% and 100%. The GC content of a sequence is always between 0% and 100%.

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Preliminary Technical
Information Sheet



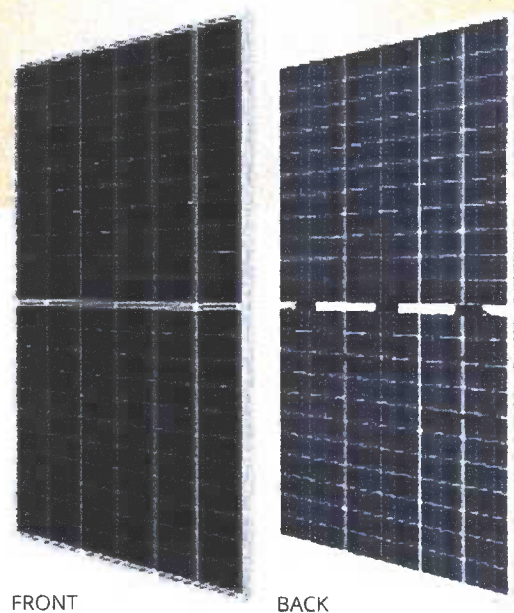
TOPBiHiKu7

BIFACIAL TOPCON

650 W ~ 720 W

CS7N-650 | 655 | 660 | 665 | 670 | 675 | 680 | 685 | 690 |
695 | 700 | 705 | 710 | 715 | 720TB-AG (IEC1000 V)

CS7N-650 | 655 | 660 | 665 | 670 | 675 | 680 | 685 | 690 |
695 | 700 | 705 | 710 | 715 | 720TB-AG (IEC1500 V)



MORE POWER



Module power up to 720 W
Module efficiency up to 23.2 %



Up to 85% Power Bifaciality,
more power from the back side



Excellent anti-LeTID & anti-PID performance.
Low power degradation, high energy yield



Lower temperature coefficient (Pmax): -0.30%/°C,
increases energy yield in hot climate



Lower LCOE & system cost

MORE RELIABLE



Minimizes micro-crack impacts



Heavy snow load up to 5400 Pa,
wind load up to 2400 Pa*

12
Years

Enhanced Product Warranty on Materials
and Workmanship*

30
Years

Linear Power Performance Warranty*

1st year power degradation no more than 1%
Subsequent annual power degradation no more than 0.4%

*According to the applicable Canadian Solar Limited Warranty Statement.

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001:2015 / Quality management system
ISO 14001:2015 / Standards for environmental management system
ISO 45001: 2018 / International standards for occupational health & safety

PRODUCT CERTIFICATES*

* The specific certificates applicable to different module types and markets will vary, and therefore not all of the certifications listed herein will simultaneously apply to the products you order or use. Please contact your local Canadian Solar sales representative to confirm the specific certificates available for your Product and applicable in the regions in which the products will be used.

CSI Solar Co., Ltd. is committed to providing high quality solar photovoltaic modules, solar energy and battery storage solutions to customers. The company was recognized as the No. 1 module supplier for quality and performance/price ratio in the IHS Module Customer Insight Survey. Over the past 20 years, it has successfully delivered over 70 GW of premium-quality solar modules across the world.

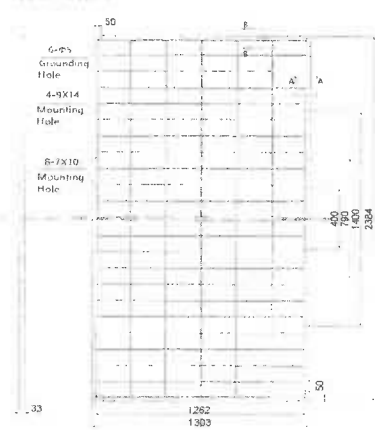
* For detailed information, please refer to the Installation Manual.

Canadian Solar MSS (Australia) Pty Ltd.

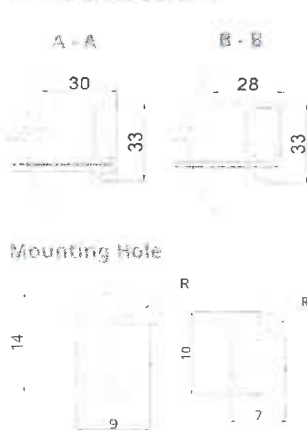
333 Drummond Street, Carlton VIC 3053, Australia, sales.au@csisolar.com, www.csisolar.com/au

ENGINEERING DRAWING (mm)

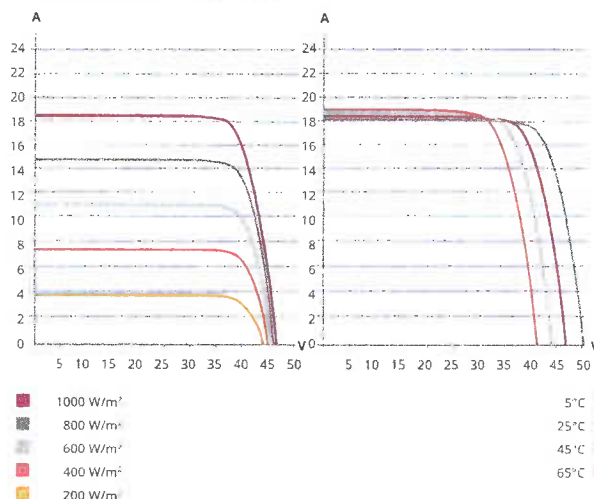
Rear View



Frame Cross Section



CS7N-680TB-AG / I-V CURVES



ELECTRICAL DATA | STC*

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)	Module Efficiency
CS7N-650TB-AG	650 W	38.0 V	17.11 A	45.9 V	17.99 A	20.9%
Bifacial Gain**	5%	683 W	38.0 V	17.97 A	45.9 V	22.0%
	10%	715 W	38.0 V	19.76 A	45.9 V	23.0%
	20%	780 W	38.0 V	20.53 A	45.9 V	25.1%
CS7N-655TB-AG	655 W	38.2 V	17.15 A	46.1 V	18.04 A	21.1%
Bifacial Gain**	5%	688 W	38.2 V	18.01 A	46.1 V	22.1%
	10%	721 W	38.2 V	19.81 A	46.1 V	23.2%
	20%	786 W	38.2 V	20.58 A	46.1 V	25.3%
CS7N-660TB-AG	660 W	38.4 V	17.19 A	46.3 V	18.09 A	21.2%
Bifacial Gain**	5%	693 W	38.4 V	18.05 A	46.3 V	22.3%
	10%	726 W	38.4 V	19.85 A	46.3 V	23.4%
	20%	792 W	38.4 V	20.63 A	46.3 V	25.5%

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C. Measurement uncertainty: ±3 % (Pmax).

** Bifacial Gain: The additional gain from the back side compared to the power of the front side at the standard test condition. It depends on mounting (structure, height, tilt angle etc.) and albedo of the ground.

ELECTRICAL DATA

Operating Temperature	-40°C ~ +85°C
Max. System Voltage	1500 V (IEC/UL) or 1000 V (IEC/UL)
Module Fire Performance	TYPE 29 (UL 61730) or CLASS C (IEC61730)
Max. Series Fuse Rating	35 A
Application Classification	Class A
Power Tolerance	0 ~ + 5 W
Power Bifaciality*	80 %

* Power Bifaciality = $P_{max, rear} / P_{max, front}$, both $P_{max, rear}$ and $P_{max, front}$ are tested under STC, Bifaciality Tolerance: ± 5 %

ELECTRICAL DATA | NMOT*

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)
CS7N-650TB-AG	491 W	35.9 V	13.68 A	43.4 V	14.51 A
CS7N-655TB-AG	494 W	36.1 V	13.72 A	43.6 V	14.55 A
CS7N-660TB-AG	498 W	36.2 V	13.75 A	43.8 V	14.59 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

MECHANICAL DATA

Specification	Data
Cell Type	TOPCon cells
Cell Arrangement	132 [2 x (11 x 6)]
Dimensions	2384 × 1303 × 33 mm (93.9 × 51.3 × 1.30 in)
Weight	37.8 kg (83.3 lbs)
Front Glass	2.0 mm heat strengthened glass with anti-reflective coating
Back Glass	2.0 mm heat strengthened glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	4.0 mm² (IEC), 10 AWG (UL)
Cable Length (Including Connector)	460 mm (18.1 in) (+) / 340 mm (13.4 in) (-) or customized length*
Connector	T6 (IEC 1500V) or PV-KST4-EVO2/XY, PV-KBT4-EVO2/XY (IEC 1500V) or PV-KST4-EVO2A/xy, PV-KBT4-EVO2A/xy (IEC 1500V)
Per Pallet	33 pieces
Per Container (40' HQ)	561 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.30 % / °C
Temperature Coefficient (Voc)	-0.26 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	41 ± 3°C

PARTNER SECTION



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Canadian Solar MSS (Australia) Pty Ltd.

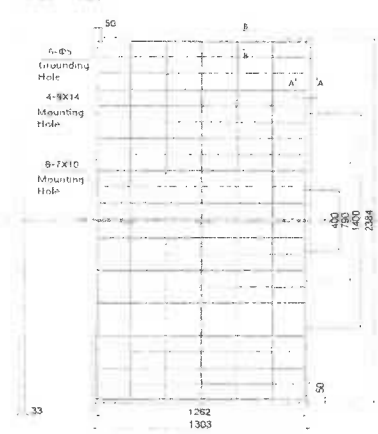
333 Drummond Street, Carlton VIC 3053, Australia, sales.au@csisolar.com, www.csisolar.com/au

October 2022. All rights reserved. PV Module Product Datasheet V1.1C1_AU

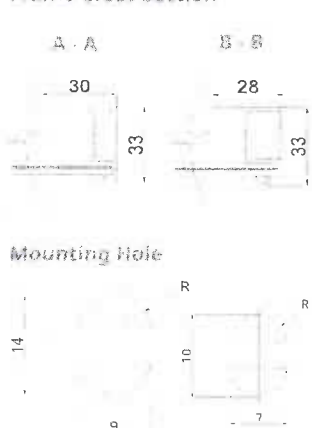
* Manufactured and assembled in China, Thailand and Vietnam.

ENGINEERING DRAWING (mm)

Rear View



Frame Cross Section



ELECTRICAL DATA | STC*

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)	Module Efficiency
CS7N-665TB-AG	665 W	38.6 V	17.23 A	46.5 V	18.14 A	21.4%
Bifacial Gain**	5%	698 W	38.6 V	18.09 A	46.5 V	22.5%
	10%	732 W	38.6 V	18.97 A	46.5 V	23.6%
	20%	798 W	38.6 V	20.68 A	46.5 V	25.7%
CS7N-670TB-AG	670 W	38.8 V	17.27 A	46.7 V	18.19 A	21.6%
Bifacial Gain**	5%	704 W	38.8 V	18.15 A	46.7 V	22.7%
	10%	737 W	38.8 V	19.00 A	46.7 V	23.7%
	20%	804 W	38.8 V	20.72 A	46.7 V	25.9%
CS7N-675TB-AG	675 W	39.0 V	17.31 A	46.9 V	18.24 A	21.7%
Bifacial Gain**	5%	709 W	39.0 V	18.19 A	46.9 V	22.8%
	10%	743 W	39.0 V	19.04 A	46.9 V	23.9%
	20%	810 W	39.0 V	20.77 A	46.9 V	26.1%
CS7N-680TB-AG	680 W	39.2 V	17.35 A	47.1 V	18.29 A	21.9%
Bifacial Gain**	5%	714 W	39.2 V	18.22 A	47.1 V	23.0%
	10%	748 W	39.2 V	19.09 A	47.1 V	24.1%
	20%	816 W	39.2 V	20.82 A	47.1 V	26.3%
CS7N-685TB-AG	685 W	39.4 V	17.39 A	47.3 V	18.34 A	22.1%
Bifacial Gain**	5%	719 W	39.4 V	18.26 A	47.3 V	23.1%
	10%	754 W	39.4 V	19.14 A	47.3 V	24.3%
	20%	822 W	39.4 V	20.87 A	47.3 V	26.5%
CS7N-690TB-AG	690 W	39.6 V	17.43 A	47.5 V	18.39 A	22.2%
Bifacial Gain**	5%	725 W	39.6 V	18.31 A	47.5 V	23.3%
	10%	759 W	39.6 V	19.17 A	47.5 V	24.4%
	20%	828 W	39.6 V	20.92 A	47.5 V	26.7%

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C. Measurement uncertainty: ±3 % (Pmax).

** Bifacial Gain: The additional gain from the back side compared to the power of the front side at the standard test condition. It depends on mounting (structure, height, tilt angle etc.) and albedo of the ground.

ELECTRICAL DATA

Operating Temperature	-40°C ~ +85°C
Max. System Voltage	1500 V (IEC/UL) or 1000 V (IEC/UL)
Module Fire Performance	TYPE 29 (UL 61730) or CLASS C (IEC61730)
Max. Series Fuse Rating	35 A
Application Classification	Class A
Power Tolerance	0 ~ + 5 W
Power Bifaciality*	80 %

* Power Bifaciality = $P_{max, rear} / P_{max, front}$, both $P_{max, rear}$ and $P_{max, front}$ are tested under STC, Bifaciality Tolerance: ± 5 %

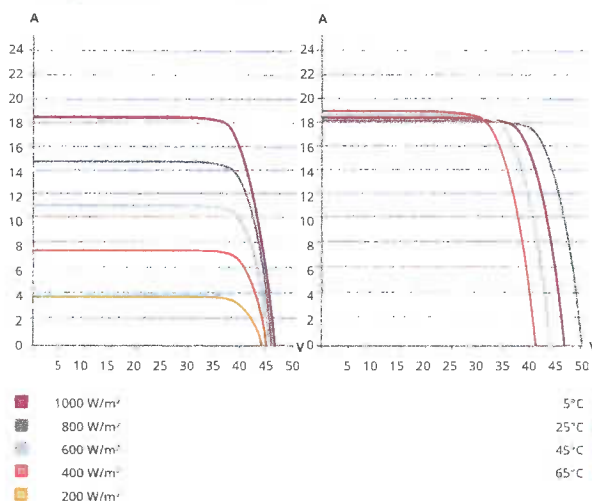
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Canadian Solar MSS (Australia) Pty Ltd.

333 Drummond Street, Carlton VIC 3053, Australia, sales.au@csisolar.com, www.csisolar.com/au

CS7N-680TB-AG / I-V CURVES



ELECTRICAL DATA | NMOT*

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)
CS7N-665TB-AG	502 W	36.4 V	13.78 A	44.0 V	14.63 A
CS7N-670TB-AG	506 W	36.6 V	13.81 A	44.1 V	14.67 A
CS7N-675TB-AG	510 W	36.8 V	13.84 A	44.3 V	14.71 A
CS7N-680TB-AG	513 W	37.0 V	13.88 A	44.5 V	14.75 A
CS7N-685TB-AG	517 W	37.2 V	13.91 A	44.7 V	14.79 A
CS7N-690TB-AG	521 W	37.4 V	13.94 A	44.9 V	14.83 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m² spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

MECHANICAL DATA

Specification	Data
Cell Type	TOPCon cells
Cell Arrangement	132 [2 x (11 x 6)]
Dimensions	2384 x 1303 x 33 mm (93.9 x 51.3 x 1.30 in)
Weight	37.8 kg (83.3 lbs)
Front Glass	2.0 mm heat strengthened glass with anti-reflective coating
Back Glass	2.0 mm heat strengthened glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	4.0 mm ² (IEC), 10 AWG (UL)
Cable Length (Including Connector)	460 mm (18.1 in) (+) / 340 mm (13.4 in) (-) or customized length*
Connector	T6 (IEC 1500V) or PV-KST4-EVO2/XY, PV-KBT4-EVO2/XY (IEC 1500V) or PV-KST4-EVO2A/xy, PV-KBT4-EVO2A/xy (IEC 1500V)

Per Pallet 33 pieces

Per Container (40' HQ) 561 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

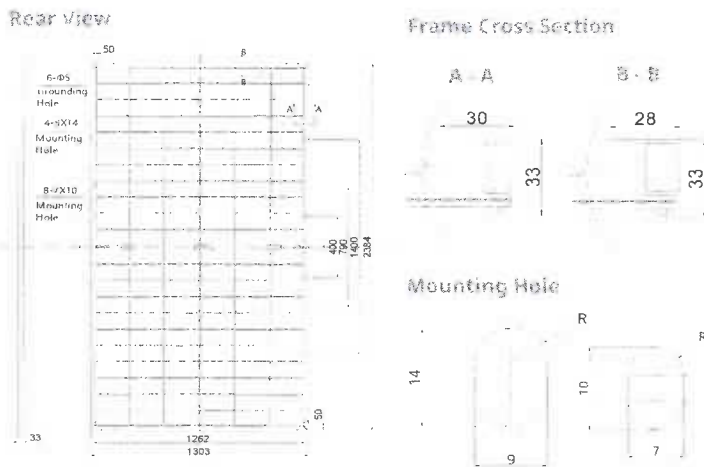
TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.30 % / °C
Temperature Coefficient (Voc)	-0.26 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	41 ± 3°C

PARTNER SECTION



ENGINEERING DRAWING (mm)



ELECTRICAL DATA | STC*

		Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)	Module Efficiency
CS7N-695TB-AG		695 W	39.8 V	17.47 A	47.7 V	18.44 A	22.4%
	Bifacial Gain**	5%	730 W	39.8 V	18.34 A	47.7 V	23.5%
		10%	765 W	39.8 V	20.18 A	47.7 V	24.6%
		20%	834 W	39.8 V	20.96 A	47.7 V	26.8%
CS7N-700TB-AG		700 W	40.0 V	17.51 A	47.9 V	18.49 A	22.5%
	Bifacial Gain**	5%	735 W	40.0 V	18.39 A	47.9 V	23.7%
		10%	770 W	40.0 V	20.22 A	47.9 V	24.8%
		20%	840 W	40.0 V	21.01 A	47.9 V	27.0%
CS7N-705TB-AG		705 W	40.2 V	17.55 A	48.1 V	18.54 A	22.7%
	Bifacial Gain**	5%	740 W	40.2 V	18.43 A	48.1 V	23.8%
		10%	776 W	40.2 V	20.27 A	48.1 V	25.0%
		20%	846 W	40.2 V	21.06 A	48.1 V	27.2%
CS7N-710TB-AG		710 W	40.4 V	17.59 A	48.3 V	18.59 A	22.9%
	Bifacial Gain**	5%	746 W	40.4 V	18.47 A	48.3 V	24.0%
		10%	781 W	40.4 V	20.32 A	48.3 V	25.1%
		20%	852 W	40.4 V	21.11 A	48.3 V	27.4%
CS7N-715TB-AG		715 W	40.6 V	17.63 A	48.5 V	18.64 A	23.0%
	Bifacial Gain**	5%	751 W	40.6 V	18.51 A	48.5 V	24.2%
		10%	787 W	40.6 V	20.36 A	48.5 V	25.3%
		20%	858 W	40.6 V	21.16 A	48.5 V	27.6%
CS7N-720TB-AG		720 W	40.8 V	17.67 A	48.7 V	18.69 A	23.2%
	Bifacial Gain**	5%	756 W	40.8 V	18.55 A	48.7 V	24.3%
		10%	792 W	40.8 V	20.41 A	48.7 V	25.5%
		20%	864 W	40.8 V	21.20 A	48.7 V	27.8%

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C. Measurement uncertainty: ±3 % (Pmax).

** Bifacial Gain: The additional gain from the back side compared to the power of the front side at the standard test condition. It depends on mounting (structure, height, tilt angle etc.) and albedo of the ground.

ELECTRICAL DATA

Operating Temperature	-40°C ~ +85°C
Max. System Voltage	1500 V (IEC/UL) or 1000 V (IEC/UL)
Module Fire Performance	TYPE 29 (UL 61730) or CLASS C (IEC61730)
Max. Series Fuse Rating	35 A
Application Classification	Class A
Power Tolerance	0 ~ + 5 W
Power Bifaciality*	80 %

* Power Bifaciality = $P_{max, rear} / P_{max, front}$, both $P_{max, rear}$ and $P_{max, front}$ are tested under STC, Bifaciality Tolerance: ± 5 %

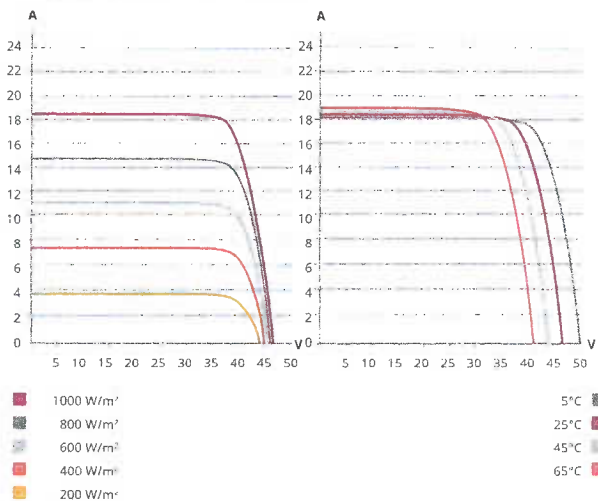
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CS7N-680TB-AG / I-V CURVES



ELECTRICAL DATA | NMOT*

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)
CS7N-695TB-AG	525 W	37.6 V	13.97 A	45.1 V	14.87 A
CS7N-700TB-AG	528 W	37.8 V	14.00 A	45.3 V	14.91 A
CS7N-705TB-AG	532 W	37.9 V	14.03 A	45.5 V	14.95 A
CS7N-710TB-AG	536 W	38.1 V	14.06 A	45.7 V	14.99 A
CS7N-715TB-AG	540 W	38.3 V	14.09 A	45.8 V	15.03 A
CS7N-720TB-AG	544 W	38.5 V	14.12 A	46.0 V	15.07 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

MECHANICAL DATA

Specification	Data
Cell Type	TOPCon cells
Cell Arrangement	132 [2 x (11 x 6)]
Dimensions	2384 x 1303 x 33 mm (93.9 x 51.3 x 1.30 in)
Weight	37.8 kg (83.3 lbs)
Front Glass	2.0 mm heat strengthened glass with anti-reflective coating
Back Glass	2.0 mm heat strengthened glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	4.0 mm ² (IEC), 10 AWG (UL)
Cable Length (Including Connector)	460 mm (18.1 in) (+) / 340 mm (13.4 in) (-) or customized length*
Connector	T6 (IEC 1500V) or PV-KST4-EVO2/XY, PV-KBT4-EVO2/XY (IEC 1500V) or PV-KST4-EVO2A/xy, PV-KBT4-EVO2A/xy (IEC 1500V)
Per Pallet	33 pieces
Per Container (40' HQ)	561 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.30 % / °C
Temperature Coefficient (Voc)	-0.26 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	41 ± 3°C

PARTNER SECTION

