

16.02 KW SOLAR PHOTOVOLTAIC SYSTEM

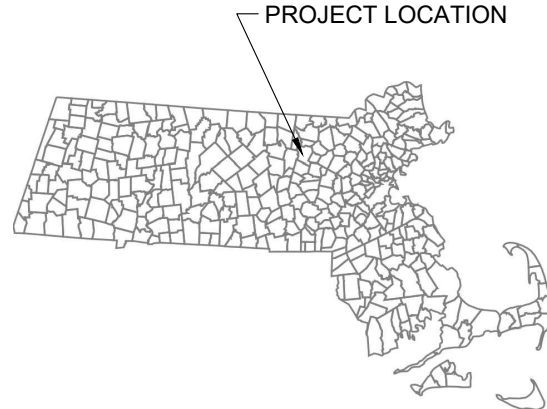
MARK & SUSAN JONES
51 VAUGHN HILL RD
BOLTON, MA 01740



INTELLIGENT SOLAR
917 FLAT HILL RD
LUNENBURG, MA 01462

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SCOPE OF WORK	SYSTEM DESCRIPTION	VICINITY MAP	SHEET INDEX		JONES RESIDENCE 51 VAUGHN HILL RD BOLTON, MA 01740 NOTES: <u>MODULES:</u> QTY (36) -- TALESUN 445 WATT <u>INVERTER:</u> QTY (1) -- SOLARK 15K <u>SYSTEM CAPACITIES:</u> DC CAPACITY -- 16.20 kW DC AC CAPACITY -- 15.00 kW AC <u>ROOF DETAILS:</u> AZIMUTHS = 168° TILT = 30° RACKING TYPE = GROUND MOUNTED														
THE PROJECT SCOPE INCLUDES THE INSTALLATION OF A GRID-TIED SOLAR PHOTOVOLTAIC SYSTEM. THE INSTALLATION CONSISTS OF A GROUND MOUNTED SOLAR ARRAY, INVERTER, AND RELATED ELECTRICAL METERING AND SAFETY EQUIPMENT. ALL EQUIPMENT WILL BE INSTALLED AS REQUIRED BY APPLICABLE CODES AND THE LOCAL UTILITY COMPANY. DURING DAYLIGHT HOURS THIS PHOTOVOLTAIC SYSTEM WILL PROVIDE ELECTRICITY IN PARALLEL WITH THE LOCAL UTILITY SERVICE PROVIDER.	GROUND MOUNTED SOLAR PV SYSTEM (36) TALESUN 445 WATT SOLAR MODULES (1) SOLARK 15.0 KW 240V INVERTERS SOLARK INTEGRATED MONITORING SYSTEM SNAPNRACK RACKING SYSTEM OPERATING VOLTAGE 240VAC 2P OPERATING CURRENT 62.5A		<table><tr><td>G-1.0</td><td>TITLE SHEET</td></tr><tr><td>C-1.0</td><td>SITE PLAN</td></tr><tr><td>C-2.0</td><td>ARRAY LAYOUT</td></tr><tr><td>C-2.1</td><td>RACKING LAYOUT</td></tr><tr><td>E-1.0</td><td>ONE-LINE DIAGRAM</td></tr><tr><td>E-2.0</td><td>STRING DIAGRAM</td></tr><tr><td>E-3.0</td><td>EQUIPMENT SPECS</td></tr></table>			G-1.0	TITLE SHEET	C-1.0	SITE PLAN	C-2.0	ARRAY LAYOUT	C-2.1	RACKING LAYOUT	E-1.0	ONE-LINE DIAGRAM	E-2.0	STRING DIAGRAM	E-3.0	EQUIPMENT SPECS
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GENERAL NOTES	PROJECT DATA		PROJECT TEAM																
ALL ELECTRICAL WORK TO BE PERFORMED BY MA LICENSED ELECTRICIANS. ALL SOLAR MODULES AND INVERTERS SHALL BE UL LISTED. ALL ELECTRICAL COMPONENTS AND MATERIALS SHALL BE LISTED FOR ITS PURPOSE AND INSTALLED IN A WORKMANLIKE MANNER. ALL OUTDOOR EQUIPMENT SHALL MEET APPROPRIATE NEMA STANDARDS. THE SYSTEM IS INTENDED TO BE OPERATED IN PARALLEL WITH THE UTILITY SERVICE PROVIDER. ANTI-ISLANDING PROTECTION IS A REQUIREMENT OF UL 1741 AND IS INTENDED TO PREVENT THE OPERATION OF THE PV SYSTEM WHEN THE UTILITY GRID IS NOT AVAILABLE. PERMISSION TO OPERATE THE SYSTEM IS NOT AUTHORIZED UNTIL FINAL INSPECTIONS AND APPROVALS ARE OBTAINED FROM THE LOCAL AUTHORITY HAVING JURISDICTION AND THE LOCAL UTILITY SERVICE PROVIDER. THE METHOD OF ATTACHMENT CREATES A MECHANICALLY ATTACHED STRUCTURE TO MEET DEAD LOAD, AND WIND LOAD REQUIREMENTS. SOLAR MODULES WILL BE SECURED TO THE MECHANICALLY ATTACHED RACKING AS SPECIFIED IN THE RACKING INSTALLATION MANUAL. ALL FASTENERS TO BE CORROSION RESISTANT CONNECTORS SHALL BE TORQUED PER DEVICE LISTING.	OWNER: MARK & SUSAN JONES OWNER ADDRESS: 51 VAUGHN HILL RD, BOLTON, MA 01740 PROJECT ADDRESS: 51 VAUGHN HILL RD, BOLTON, MA 01740		RENEWABLE ENERGY CONTRACTOR INTELLIGENT SOLAR SERVICES, LLC 917 FLAT HILL RD LUNENBURG, MA 01462 ELECTRICAL CONTRACTOR RICHARD LAMOTHE 26 PINEHAVEN DR NORTHBOROUGH, MA 01532 SITework CONTRACTOR SOLAR FOUNDATIONS USA 7 LAZUR ROAD BALLSTON LAKE, NY 12019																
	BUILDING CODE DATA																		
	JURISDICTION: TOWN OF BOLTON OCCUPANCY CAT: 2 EXPOSURE CATEGORY: B WIND LOAD: 123 MPH GROUND SNOW LOAD: 50 PSF																		
					SHEET NAME														
					TITLE SHEET														
					SHEET NO.														
					G-1.0														
					DRAWN BY: KMG														
					SHEET: 1 OF: 7														
					DATE: 7/12/2022														



1 SITE PLAN
SCALE: 1:40

JONES RESIDENCE

51 VAUGHN HILL RD
BOLTON, MA 01740

NOTES:

MODULES:
QTY (36) -- TALESUN 445 WATT

INVERTER:
QTY (1) -- SOLARK 15K

SYSTEM CAPACITIES:
DC CAPACITY -- 16.20 kW DC
AC CAPACITY -- 15.00 kW AC

ROOF DETAILS:
AZIMUTHS = 168°
TILT = 30°
RACKING TYPE = GROUND MOUNTED

SHEET NAME

SITE PLAN

SHEET NO.

C-1.0

DRAWN BY: KMG

SHEET: 2 OF: 7

DATE: 7/12/2022



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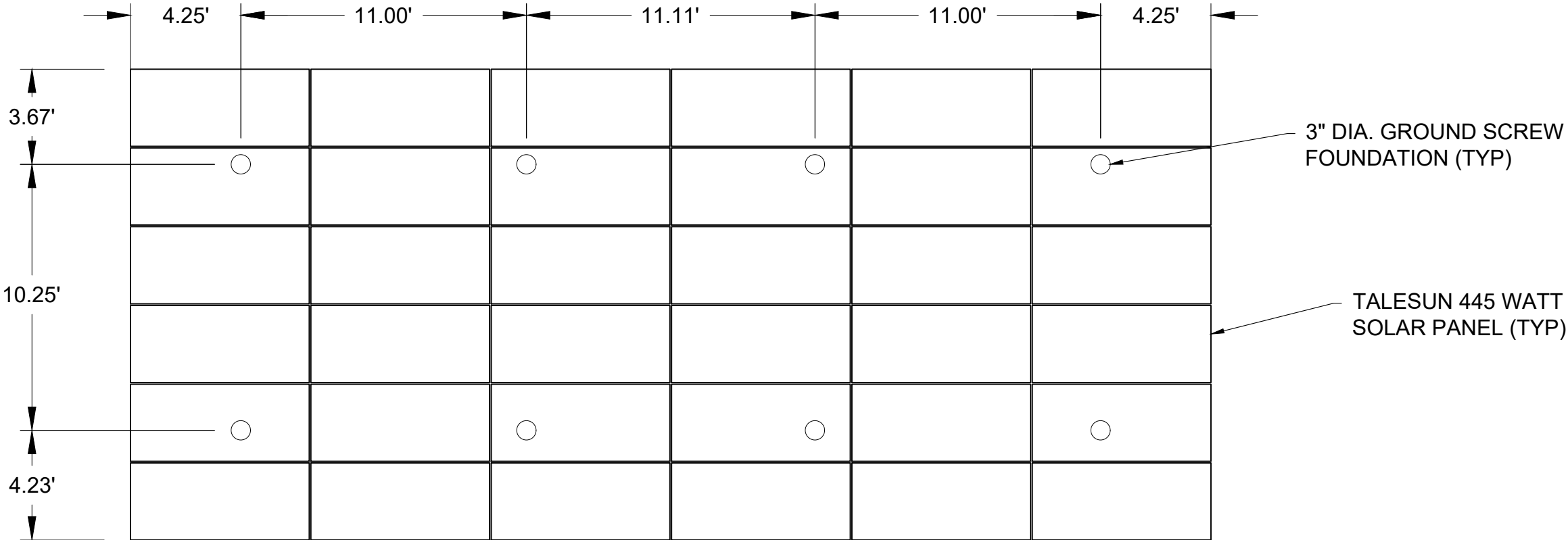
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1 ARRAY LAYOUT
SCALE: 1:5

SHEET NAME

ARRAY
LAYOUT

SHEET NO.

C-2.0

DRAWN BY: KMG

SHEET: 3 OF: 7

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-TOTAL PENETRATIONS = 111
-NOTE: THE TWO HORIZONTAL
DIMENSIONS FROM ROOF EDGE TO
THE FIRST PENETRATION MAY VARY
DUE TO LOCATION OF RAFTERS IN
ROOF.

SHEET NAME

RACKING
LAYOUT

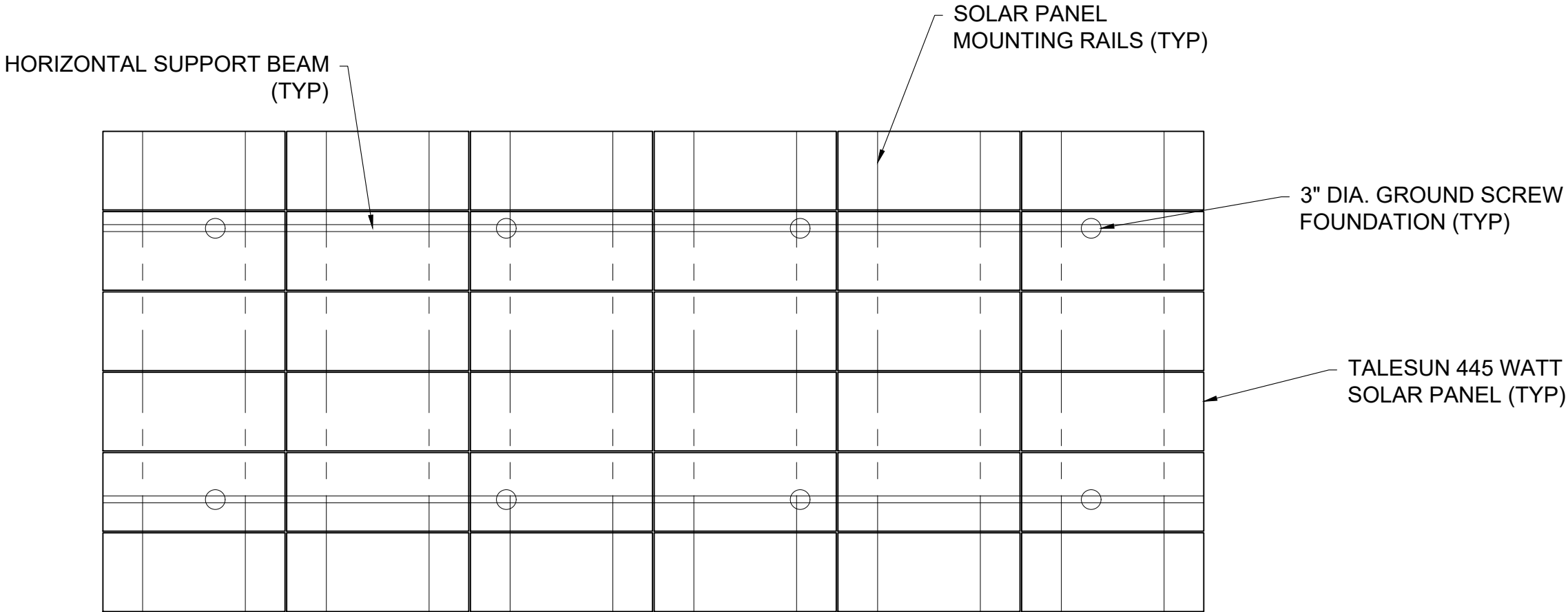
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C-2.1

DRAWN BY: KMG

SHEET: 4 OF: 7

DATE: 7/12/2022



1 RACKING LAYOUT
SCALE: 1:5

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BILLING CUSTOMER AND SYSTEM
OWNER

SUSAN
JONES

SHEET NAME

ONE LINE
DIAGRAM

SHEET NO.

E-1.0

DRAWN BY: KMG

SHEET: 5 OF: 7

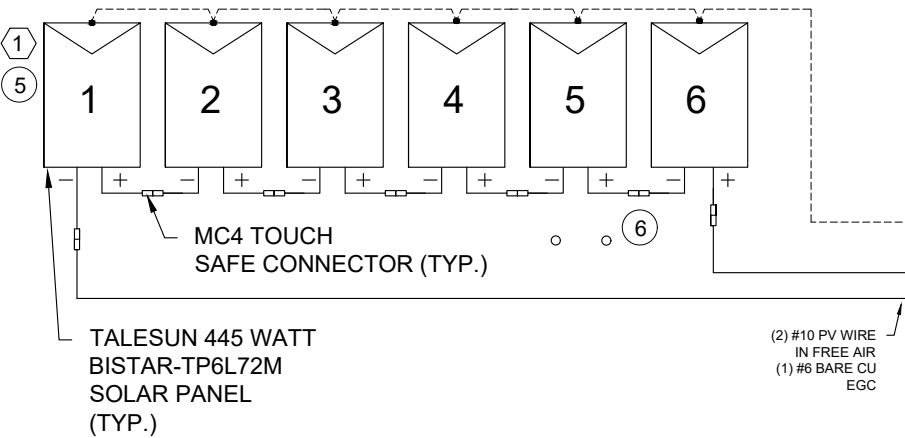
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EXTERIOR/INTERIOR
WALLS

INTERIOR (BASEMENT)

EXTERIOR

INVERTER 1 - 15KW - STRINGS 1-6 (6 PANELS IN SERIES - 6 STRINGS)



NEMA 3R
JUNCTION BOX

SOLARK
15K
STRING
INVERTER

AC ISOLATION
DEVICE
(LOCKABLE)
100A 2P
GANG-OPERATED
VISIBLE
DISCONNECT
EXTERIOR
MOUNTED
READILY
ACCESSIBLE

CUSTOMER OWNED
PRODUCTION METER

UTILITY AC
DISCONNECT

SOLAR SUB
PANEL

MAIN PANEL 1 OF 2 (EXISTING)

200A
2P

CUSTOMER
LOADS

POLE MOUNTED TRANSFORMER

POINT OF COMMON
COUPLING (PCC)

UTILITY
SERVICE

UTILITY METER

CUSTOMER
COMPANY

MAIN PANEL 2 OF 2 (EXISTING)

200A
2P

CUSTOMER
LOADS

INSULATION PIERCING
TAP CONNECTORS

ELECTRICAL NOTES

- 1 RUN CONDUIT THROUGH SPARE UNUSED CHASE. LABEL CONDUITS EVERY 10 FEET.
- 2 LOAD BREAKERS ARE GENERALLY NOT SHOWN IN ELECTRICAL PANELS ON THIS SHEET.
- 3 TRANSITION FROM #10 PV WIRE TO #10 THWN-2 INSIDE JUNCTION BOX USING APPROVED TERMINAL BLOCKS. ROUTE CONDUCTORS INTO JBOX USING CABLE GLANDS.
- 5 PROVIDE WARNING SIGN . LABEL AS FOLLOWS: "UTILITY SOLAR AC DISCONNECT".
- 6 BOND ALL METALLIC COMPONENTS WITH CU E.G.C. USE #6 BARE CU GROUNDING CONDUCTOR WHERE SUBJECT TO PHYSICAL DAMAGE. TRANSITION TO #8 THWN-2 WHEN RUN IN CONDUIT.
- 7 NEW SERVICE DISCONNECT FOR PV SYSTEM MUST BE LOCATED WITHIN 10 FEET OF TAP LOCATION. CONDUCTOR LENGTH MUST BE LESS THAN OR EQUAL TO 10 FEET.
- 8 ROUTE ALL DC SOURCE CIRCUITS IN CLOSE PROXIMITY TO MINIMIZE CIRCUIT TIME CONSTANT.
- 9 INVERTER OUTPUT WIRING SHALL BE 90C RATED.
- 10 BOND GROUND AND NEUTRAL

1 ONE-LINE DIAGRAM
SCALE: NTS

EQUIPMENT SCHEDULE

TAG	EQUIPMENT MANUFACTURE	EQUIPMENT DESCRIPTION	MODEL
1	TALESUN	SOLAR MODULE	BISTAR-TP6L72M
2			
3	MULTI CONTACT	TOUCH SAFE CONNECTOR	MC4 / H4
4		PASS-THROUGH JUNCTION BOX	TYP.
5	SOLARK	15kW AC SINGLE PHASE 240V STRING INVERTER	15K
6	MILBANK	METER SOCKET	U5934-XL-BLG
7		KILOWATT HOUR METER	
8	SIEMENS	100A 240V 2 POLE NON-FUSIBLE SWITCH NEMA3R	
9	SQUARE D	2 x 200A MAIN PANEL 240V	EXISTING
10			
11			
12			
13			
14			



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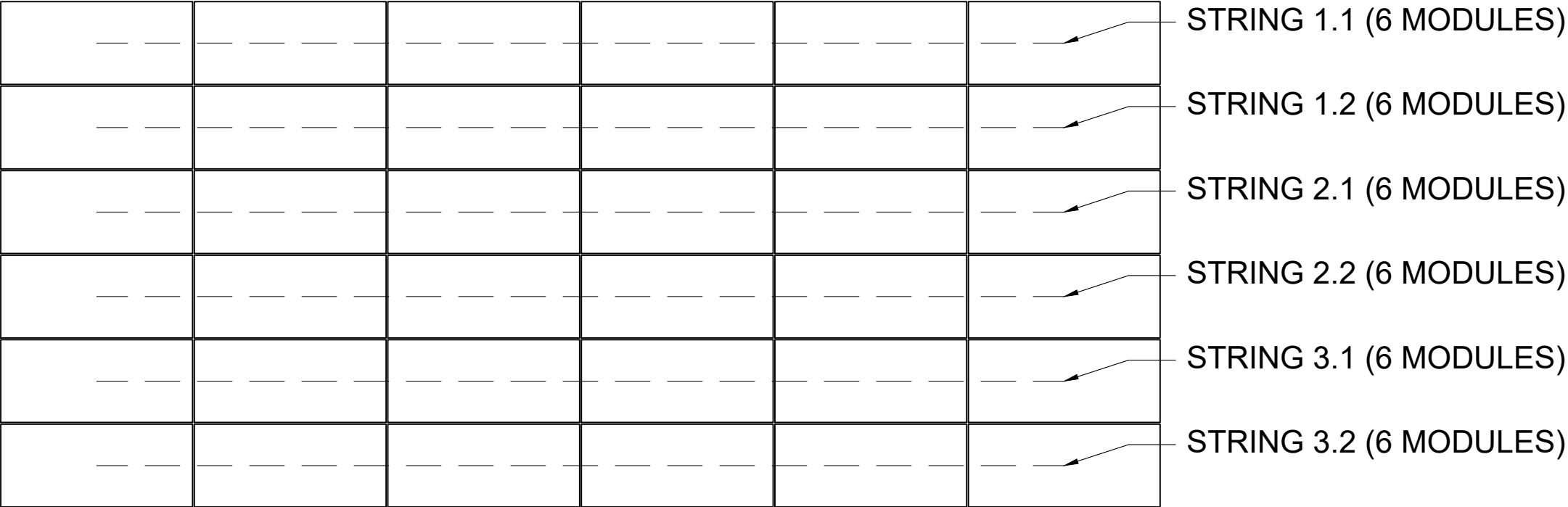
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SHEET NAME

STRING
DIAGRAM

SHEET NO.

E-2.0

DRAWN BY: KMG

SHEET: 6 OF: 7

DATE: 7/12/2022



LIMITLESS
15K-LV
Spec Sheet



Solar Input Power 17000W	
Max Allowed PV Power	17000W
Max PV Power Delivered to Battery & AC Outputs	15000W
Max DC Voltage (Voc)	500V @ 26A
MPPT Voltage Range	150-425V
Starting Voltage	125V
Number of MPPT	3
Max Solar Strings Per MPPT	2
Max DC Current per MPPT (Self Limiting)	26A
Max AC Coupled Input (Micro/String Inverters)	19200W

AC Output Power 15kW On-Grid & Off-Grid	
Connections	120/240/208V Split Phase
Continuous AC Power with PV	15000W 62.5A-L (240V)
Continuous AC Power from Batteries	12000W 50A-L (240V)
Surge AC Power 10sec	24,000VA L-L (240V)
Surge AC Power 100ms	30,000VA L-L (240V)
Parallel Stacking	Yes - Up to 12
Frequency	60/50Hz
Continuous AC Power with Grid or Generator	48000W 200A L-L (240V) 24000W 200A L-N (120V)
CEC Efficiency	96.5% (Peak 97.5%)
Idle Consumption Typical—No Load	90W
Sell Back Power Modes	Limited to Household/Fully Grid-Tied
Design (DC to AC)	Transformerless DC
Response Time (Grid-Tied to Off-Grid)	5ms
Power Factor	+/- 0.9 - 1.0

Battery (optional) Output Power 12000W	
Type	Lead-Acid or Li-Ion
Nominal DC Input	48V
Capacity	50 — 9900Ah
Voltage Range	43.0 — 63.0V
Continuous Battery Charging Output	275A
Charging Curve	3-Stage w/ Equalization
Grid to Batt Charging Efficiency	96.0%
External Temperature Sensor	Included
Current Shunt for Accurate % SOC	Integrated
External Gen Start Based on Voltage or %SOC	Integrated
Communication to Lithium Battery	CanBus & RS485

General	
Dimensions (H x W x D)	31.8" x 18.3" x 10.9"
Weight	135 lbs
Enclosure	IP65 / NEMA 3R
Ambient Temperature	-40~60°C, >45°C Derating
Installation Style	Wall-Mounted
Wi-Fi & LAN Communication	Included
Standard Warranty (verified by HALT Testing)	10 Years

Protections & Certifications		
Electronics Certified Safety by SGS Labs to NEC & UL Specs - NEC 690.4B & NEC 705.4/6	Yes	
Grid Sell Back — UL1741-2010/2018, IEE-E1547a-2003/2014, FCC 15 Class B, UL1741SA, CA Rule 21, HECO Rule 14H	Yes	
PV DC Disconnect Switch — NEC 240.15	Integrated	
Ground Fault Detection — NEC 690.5	Integrated	
PV Rapid Shutdown Control — NEC 690.12	Integrated	
PV Arc Fault Detection — NEC 690.11	Integrated	
PV Input Lightning Protection	Integrated	
PV String Input Reverse Polarity Protection	Integrated	
AC Output Breakers - 200A	Integrated	
2 x 200A Battery Breaker / Disconnect	Integrated	
Surge Protection	DC Type II / AC Type II	

ELECTRICAL PARAMETERS

Performance at STC (Power Tolerance 0 ~ +3%)

Maximum Power (Pmax/W)	435	440	445	450	455
Operating Voltage (Vmpp/W)	40.3	40.5	40.7	40.9	41.1
Operating Current (Impp/A)	10.8	10.87	10.94	11.01	11.08
Open-Circuit Voltage (Voc/V)	49	49.2	49.4	49.6	49.8
Short-Circuit Current (Isc/A)	11.33	11.4	11.47	11.54	11.61
Module Efficiency η (%)	19.8	20.1	20.3	20.5	20.8

Performance at NMOT

Maximum Power (Pmax/W)	324	328	332	335	339
Operating Voltage (Vmpp/W)	37.6	37.8	38.0	38.2	38.4
Operating Current (Impp/A)	8.62	8.67	8.73	8.78	8.84
Open-Circuit Voltage (Voc/V)	45.6	45.8	46.0	46.2	46.4
Short-Circuit Current (Isc/A)	9.15	9.2	9.26	9.32	9.37

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5 NMOT: Irradiance at 800W/m², Ambient Temperature 20°C, Air Mass AM1.5, Wind Speed 1m/s

MECHANICAL SPECIFICATION

Cell Type	mono-Crystalline Silicon (9Busbar)
Cell Dimensions	166*166mm (6inches)
Cell Arrangement	144 (6*24)
Weight	25.5kg (56.2lbs)
Module Dimensions	2098*1046*35 (82.60*41.18*1.38inches)
Cable Length	300mm (11.81inches)
Cable Cross Section Size	4mm² (0.006inches²)
Front Glass	3.2mm High Transmission, Tempered Glass
No. of Bypass Diodes	3/6
Packing Configuration	30pcs/carton, 660pcs/40hq
Frame	Anodized Aluminium Alloy
Junction Box	IP68

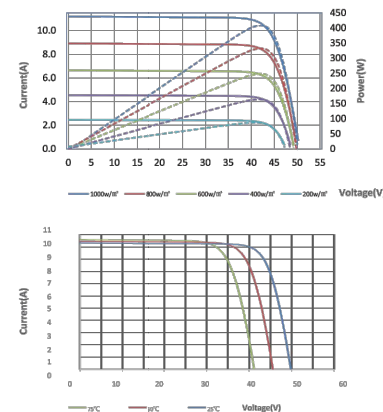
OPERATING CONDITIONS

Maximum System Voltage	1500V/DC
Operating Temperature	-40°C ~ +85°C
Maximum Series Fuse	20A
Static Loading	5400pa
Conductivity at Ground	≤0.1 Ω
Safety Class	II
Resistance	≥100M Ω
Connector	MC4 Compatible

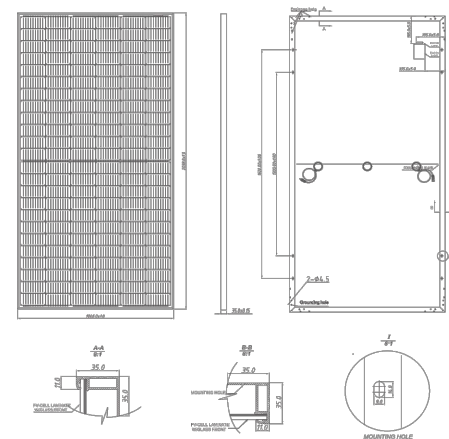
TEMPERATURE COEFFICIENT

Temperature Coefficient Pmax	-0.36%/°C
Temperature Coefficient Voc	-0.26%/°C
Temperature Coefficient Isc	+0.043%/°C
NMOT	43±2°C

I-V CURVE



TECHNICAL DRAWINGS



20200419EN The specification and key features described in this datasheet may deviate slightly and are not guaranteed. Due to ongoing innovation, R&D enhancement, Suzhou Talesun Solar Technologies Co., Ltd. reserves the right to make any adjustment to the information described herein at any time without notice. Please always obtain the most recent version of the datasheet which shall be duly incorporated into the binding contract made by the parties governing all transactions related to the purchase and sale of the products described herein.



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EQUIPMENT
SPECS

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E-3.0

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SHEET: 7 OF: 7

DATE: 7/12/2022

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SCALE: NTS