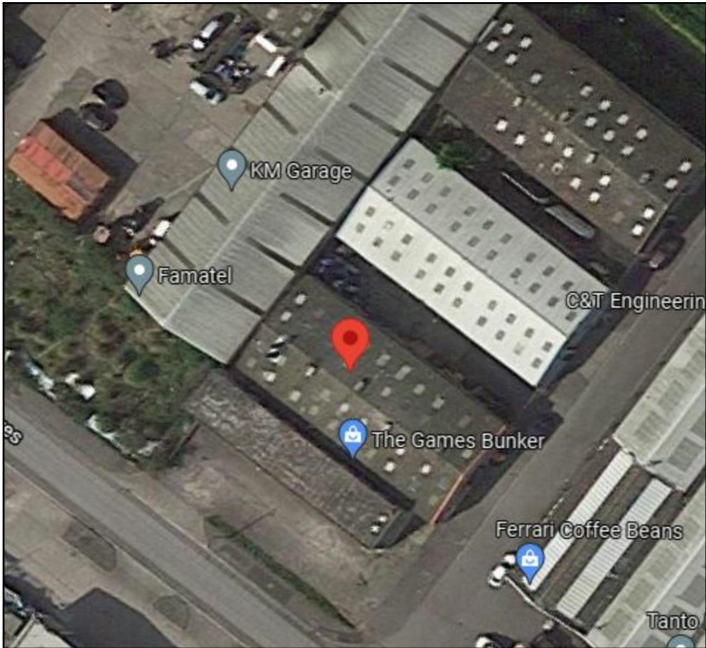


ROOF MOUNT SOLAR PERMIT PACKAGE

29.920KW DC GRID TIED PHOTOVOLTAIC SYSTEM
OLDMIXON CRES, WESTON
SUPER MARE BS24 9AX

PV SYSTEM SUMMARY:

SYSTEM SIZE (DC)	: STC: 340 x 88 = 29.920kW DC
	: PTC: 315.4 x 88 = 27.7552kW DC
SYSTEM SIZE (AC)	: 25.0kW AC @ 240V
MODULES	: (88) JA SOLAR JAM60S10-340/MR
	: 27.394kW AC @ 240V CEC-AC RATING
DC ISOLATORS	: (2) TWO STRING DC SWITCH DISCONNECTORS
INVERTER	: GROWATT MID 25KTL3-X
TILT	: 18°
AZIMUTH	: 217°
ROOF	: METAL ROOF
RAFTER/TRUSS SIZE	: 2" X 4" RAFTER @ 24"" O.C.
ATTACHMENT TYPE	: RENUSOL MS+ PV MOUNTING SYSTEM
MAIN SERVICE PANEL	: NEW 225 AMPS MSP WITH NEW 200 AMPS BREAKER
INTERCONNECTION	: LOAD BREAKER
OCPD RATING	: 60 AMPS
UTILITY	: STONECRAFT UTILITY SOLUTIONS LTD.



1 AERIAL VIEW



2 VICINITY MAP

BRITISH STANDARD CODES:

THE INSTALLATION OF SOLAR ARRAYS AND PHOTOVOLTAIC
POWER SYSTEMS SHALL COMPLY WITH THE FOLLOWING CODES:

BS9991 RESIDENTIAL CODE
BS8110 STRUCTURAL CONCRETE
BS999 FIRE CODE 2017
BS7671 ELECTRICAL CODE 18TH EDITION 2019

BUILDING INFORMATION

1 STORY HOUSE
CONSTRUCTION TYPE: V-B
ROOF: METAL ROOF

GENERAL NOTES:

- INSPECTION REQUESTS**
- CONTRACTOR SHALL REQUEST AN INSPECTION OF THE ATTIC, TO VERIFY MOUNTING BRACKET LAG BOLT PENETRATION AND LABELING OF CONDUIT AND JUNCTION BOXES.
- CONDUIT**
- ALL EXTERIOR CONDUITS ARE REQUIRED TO BE PAINTED A COLOR TO MATCH THE SUBSTRATE MATERIAL THEY ATTACHED TO.
- GROUNDING**
- ALL PV SYSTEMS MUST BE GROUNDED TO THE BUILDING GROUNDING SYSTEM.
- LABELING**
- LABELING OF ALL CONDUITS, JUNCTION BOXES AND ELECTRICAL PANELS SHALL COMPLY WITH ARTICLE 690, 2016 CEC.
 - LABEL THE MSP WITH THE LOCATION OF THE SOLAR EQUIPMENT, THE LABEL SHALL BE REFLECTIVE WITH WHITE LETTERS ON A RED BACKGROUND.

SHEET INDEX

PV-1.0	COVER PAGE
PV-2.0	SITE PLAN
PV-3.0	STRUCTURAL
PV-4.0	STRING LAYOUT
PV-5.0	ATTACHMENT DETAIL
PV-6.0	EARTHING DIAGRAM
PV-7.0	ELECTRICAL SLD
PV-8.0	SIGNAGE
PV-9.0	STRING CHART
PV-10.0	SAFETY PLAN
PV-11.0+	SPEC. SHEETS

CONTRACTOR INFO



COMPANY NAME
COMPANY CONTACT
ADDRESS
PHONE NO: (XXX) XXX-XXXX
LIC #: XXXXXXXX

REVISIONS

DESCRIPTION	Date	REV

Signature With Seal

PROJECT NAME AND ADDRESS

OLDMIXON CRES, WESTON
SUPER MARE BS24 9AX

DESIGNER

DESIGNER NAME
DESIGN PRESENTATION
DATE: XX/XX/XXXX
PHONE NO: (XXX)-XXX-XXXX

SHEET NAME

COVER PAGE

SHEET SIZE

ANSI FULL BLEED B
11"X17"

SHEET NUMBER

PV-1.0

R324.6.1 PATHWAYS:
NOT LESS THAN TWO MINIMUM 36-INCH WIDE PATHWAYS ON SEPARATE ROOF PLANES,
FROM LOWEST ROOF EDGE TO RIDGE, SHALL BE PROVIDED ON ALL BUILDINGS.
AT LEAST ONE PATHWAY SHALL BE PROVIDED ON THE STREET OR DRIVEWAY SIDE OF THE ROOF.
FOR EACH ROOF PLANE WITH A PHOTOVOLTAIC ARRAY,A MINIMUM 36 INCH-WIDE PATHWAY FROM THE LOWEST ROOF EDGE TO RIDGE SHALL BE PROVIDED ON THE SAME ROOF PLANE OR STRADDLING THE SAME AND ADJACENT ROOF PLANES.PATHWAYS SHALL BE OVER AREAS CAPABLE OF SUPPORTING FIRE FIGHTERS ACCESSING THE ROOF.PATHWAYS SHALL BE LOCATED IN AREAS WITH MINIMAL OBSTRUCTIONS SUCH AS VENT PIPES,CONDUIT , OR MECHANICAL EQUIPMENT.

R324.6.2 SETBACK AT RIDGE:
FOR PHOTOVOLTAIC ARRAYS OCCUPYING NOT MORE THAN 33 PERCENT OF THE PLAN VIEW TOTAL ROOF AREA,NOT LESS THAN AN 18 INCH CLEAR SET BACK IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE.
FOR PHOTOVOLTAIC ARRAYS OCCUPYING MORE THAN 33 PERCENT OF THE PLAN VIEW TOTAL ROOF AREA,NOT LESS THAN A 36-INCH CLEAR SET BACK IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE.

R324.6.4 EMERGENCY ESCAPE AND RESCUE OPENING: PANELS AND MODULES INSTALLED ON DWELLINGS SHALL NOT BE PLACED THE PORTION OF A ROOF THAT IS BELOW AN EMERGENCY ESCAPE AND RESCUE OPENING. A 36-INCH-WIDE PATHWAY SHALL BE PROVIDED TO THE EMERGENCY ESCAPE AND RESCUE OPENING.

- A** - PATHWAY ON STREET
OR DRIVEWAY SIDE OF ROOF
- B** - FIRE ACCESS POINT

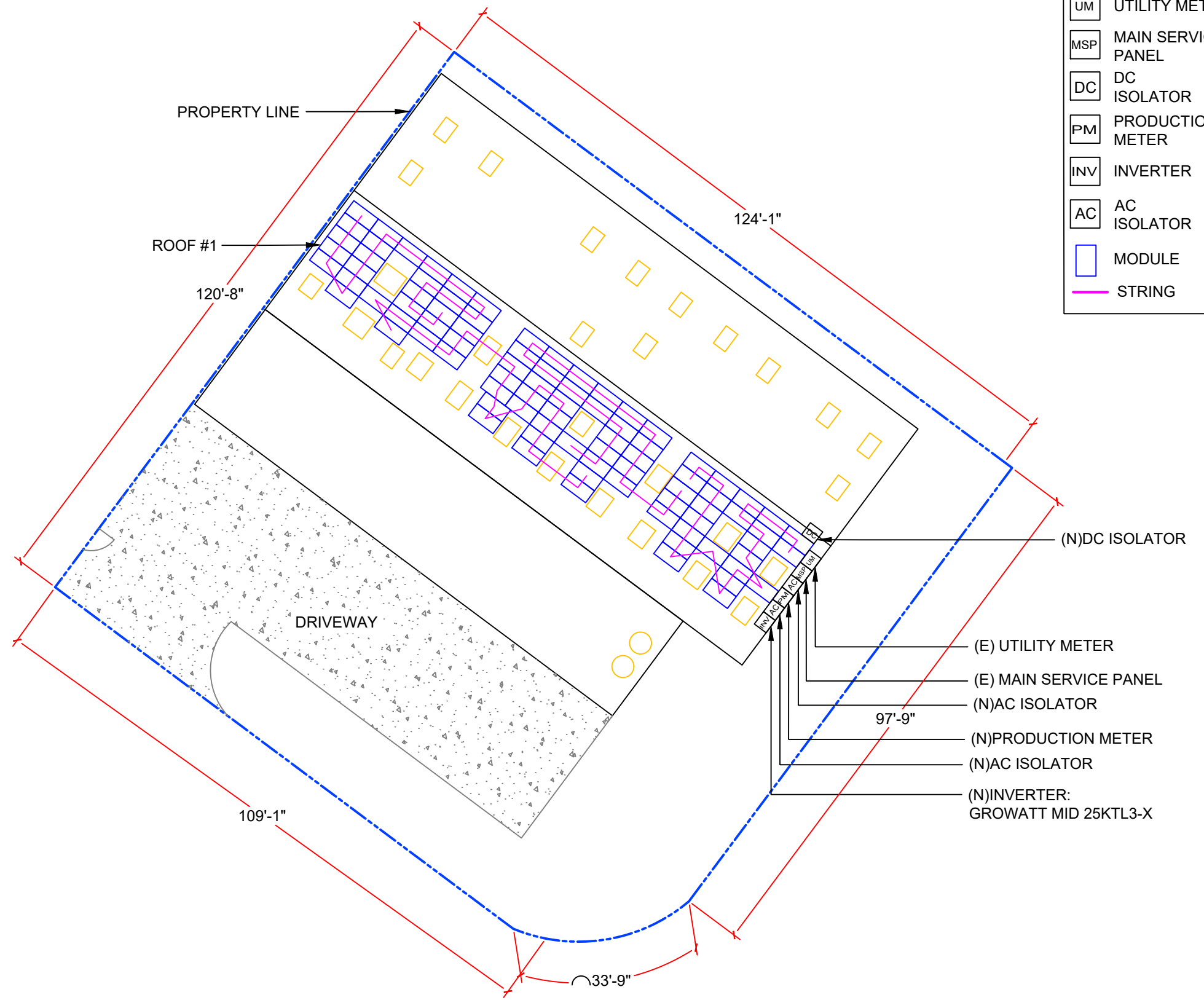


- NOTES:**
- MINOR FIELD ADJUSTMENTS ALLOWED BASED ON ACTUAL SITE CONDITION AND MEASUREMENTS.
 - CONDUIT SHALL BE PAINTED TO MACH EXTERIOR WALL.

1

SITE PLAN

SCALE: 3/64" = 1'-0"



LEGEND

UM

UTILITY METER

MSP

MAIN SERVICE PANEL

DC

DC ISOLATOR

PM

PRODUCTION METER

INV

INVERTER

AC

AC ISOLATOR

MODULE

MODULE

STRING

STRING

CONTRACTOR INFO

COMPANY LOGO

COMPANY NAME
COMPANY CONTACT
ADDRESS
PHONE NO: (XXX) XXX-XXXX
LIC #: XXXXXXXX

REVISIONS

DESCRIPTION	Date	REV

Signature With Seal

PROJECT NAME AND ADDRESS

OLDMIXON CRES, WESTON
SUPER MARE BS24 9AX

DESIGNER

DESIGNER NAME
DESIGN PRESENTATION
DATE: XX/XX/XXXX
PHONE NO: (XXX)-XXX-XXXX

SHEET NAME

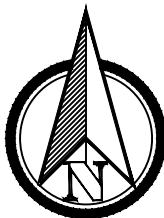
SITE PLAN

SHEET SIZE

ANSI FULL BLEED B
11"X17"

SHEET NUMBER

PV-2.0

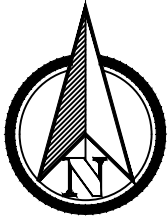
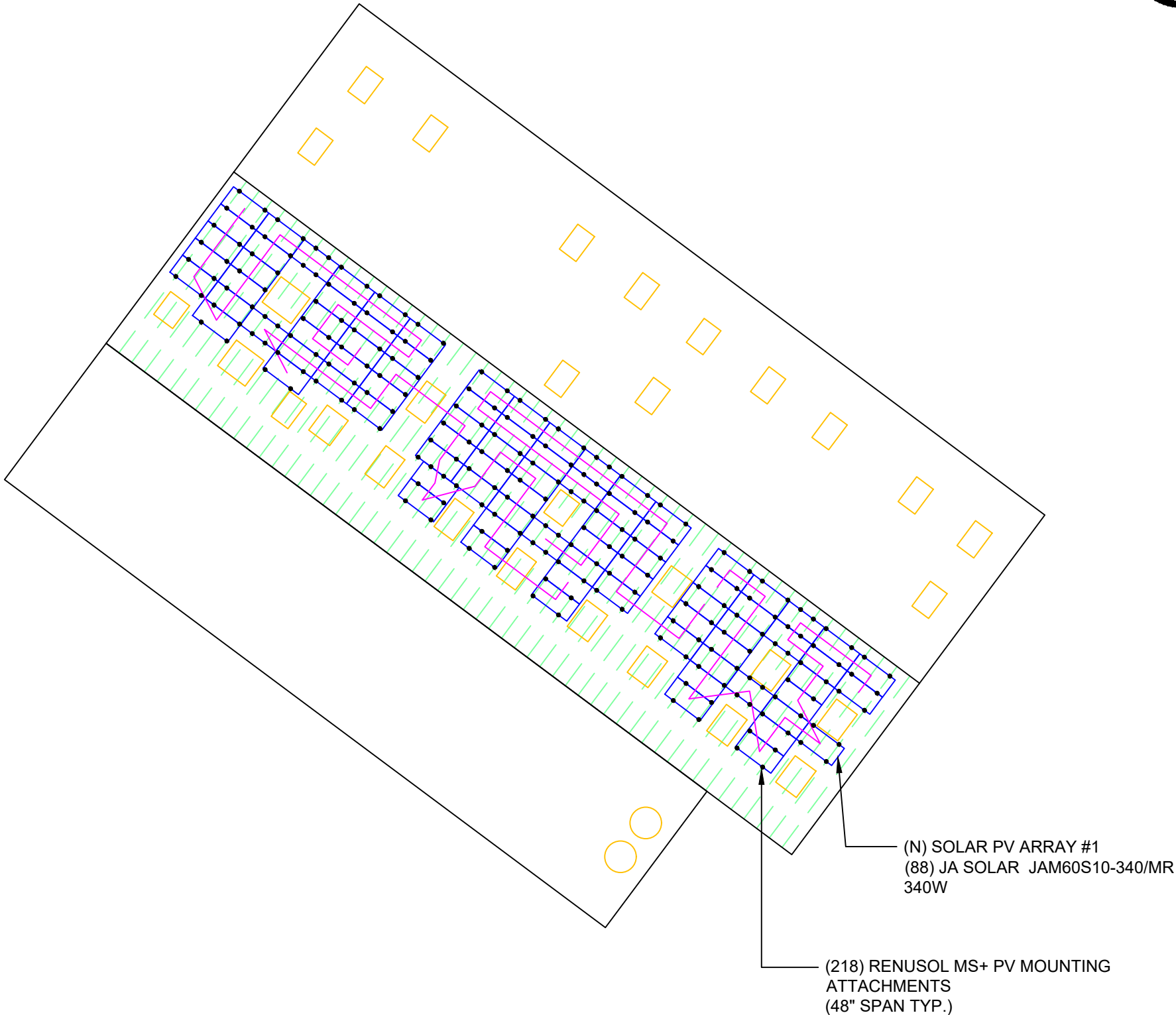


MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 88 MODULES
MODULE TYPE = JA SOLAR JAM60S10-340/MR 340W
MODULE WEIGHT = 41.89 LBS / 19.0 KG.
MODULE DIMENSIONS = 66.49"x 39.21" = 18.19 SF

ARRAY AREA				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	88	1593.46	5668	28.11

ROOF DESCRIPTION				
ROOF TYPE			METAL ROOF	
ROOF	ARRAY PITCH	AZIMUTH	RAFTERS SIZE	RAFTERS SPACING
#1	18°	217°	2"x4"	24" O.C.



CONTRACTOR INFO



COMPANY NAME
COMPANY CONTACT
ADDRESS
PHONE NO: (XXX) XXX-XXXX
LIC #: XXXXXXXX

REVISIONS		
DESCRIPTION	Date	REV

Signature With Seal

PROJECT NAME AND ADDRESS

OLDMIXON CRES, WESTON
SUPER MARE BS24 9AX

DESIGNER

DESIGNER NAME
DESIGN PRESENTATION
DATE: XX/XX/XXXX
PHONE NO: (XXX)-XXX-XXXX

SHEET NAME
STRUCTURAL

SHEET SIZE
ANSI FULL BLEED B
11"X17"

SHEET NUMBER
PV-3.0

1

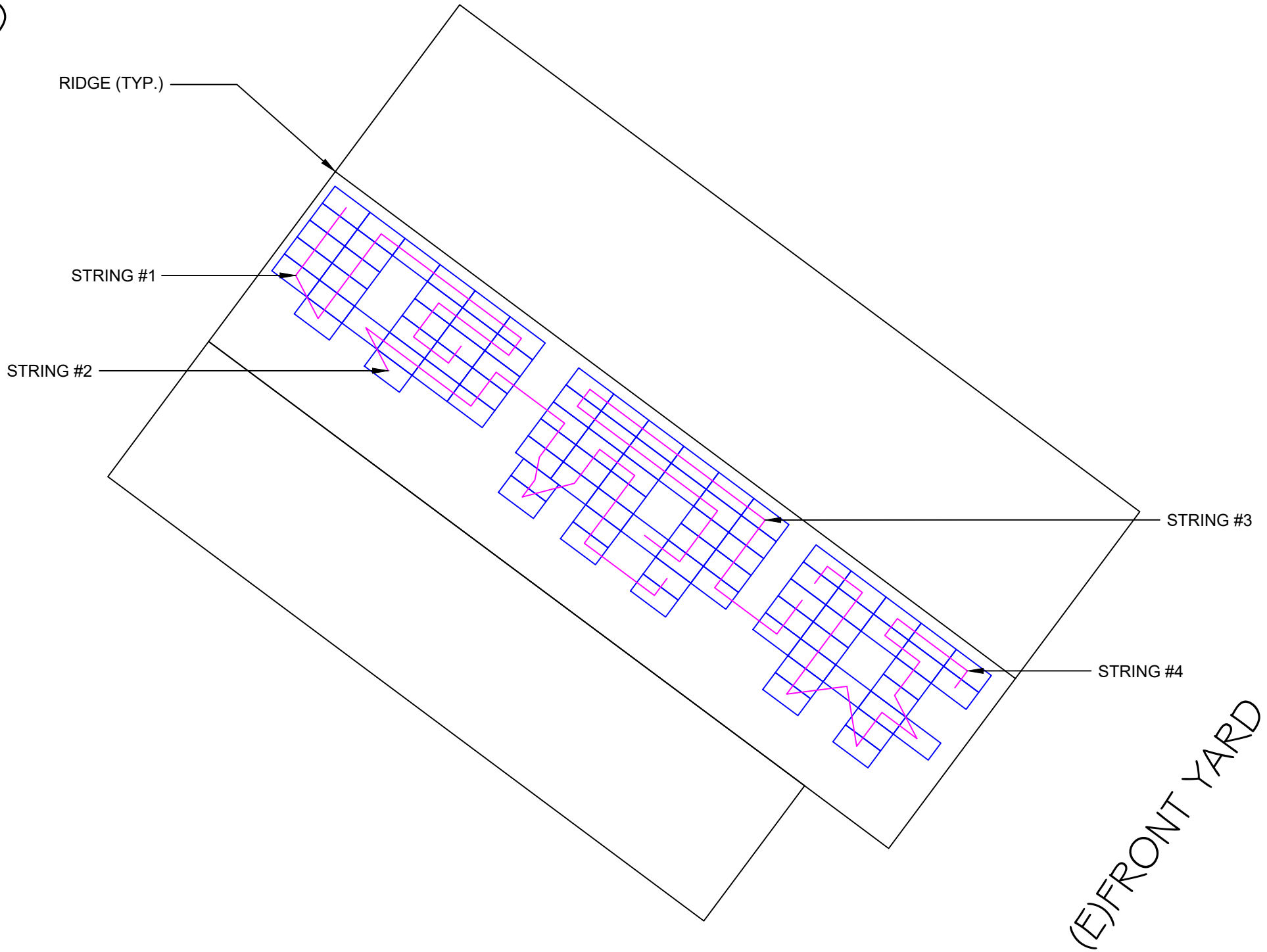
ARRAY LAYOUTS DETAILS

SCALE: 3/64" = 1'-0"

(88) JA SOLAR JAM60S10-340/MR 340W MODULES

(4) STRINGS OF 22 MODULES CONNECTED IN SERIES

(E)BACKYARD



(E)FRONT YARD

OLD MIXON CRES

1

STRING LAYOUT

SCALE: 3/64" = 1'-0"

CONTRACTOR INFO

COMPANY LOGO

COMPANY NAME
COMPANY CONTACT
ADDRESS
PHONE NO: (XXX) XXX-XXXX
LIC #: XXXXXXXX

REVISIONS		
DESCRIPTION	Date	REV

Signature With Seal

PROJECT NAME AND ADDRESS

OLD MIXON CRES, WESTON
SUPER MARE BS24 9AX

DESIGNER

DESIGNER NAME
DESIGN PRESENTATION
DATE: XX/XX/XXXX
PHONE NO: (XXX)-XXX-XXXX

SHEET NAME

STRING LAYOUT

SHEET SIZE

ANSI FULL BLEED B
11"X17"

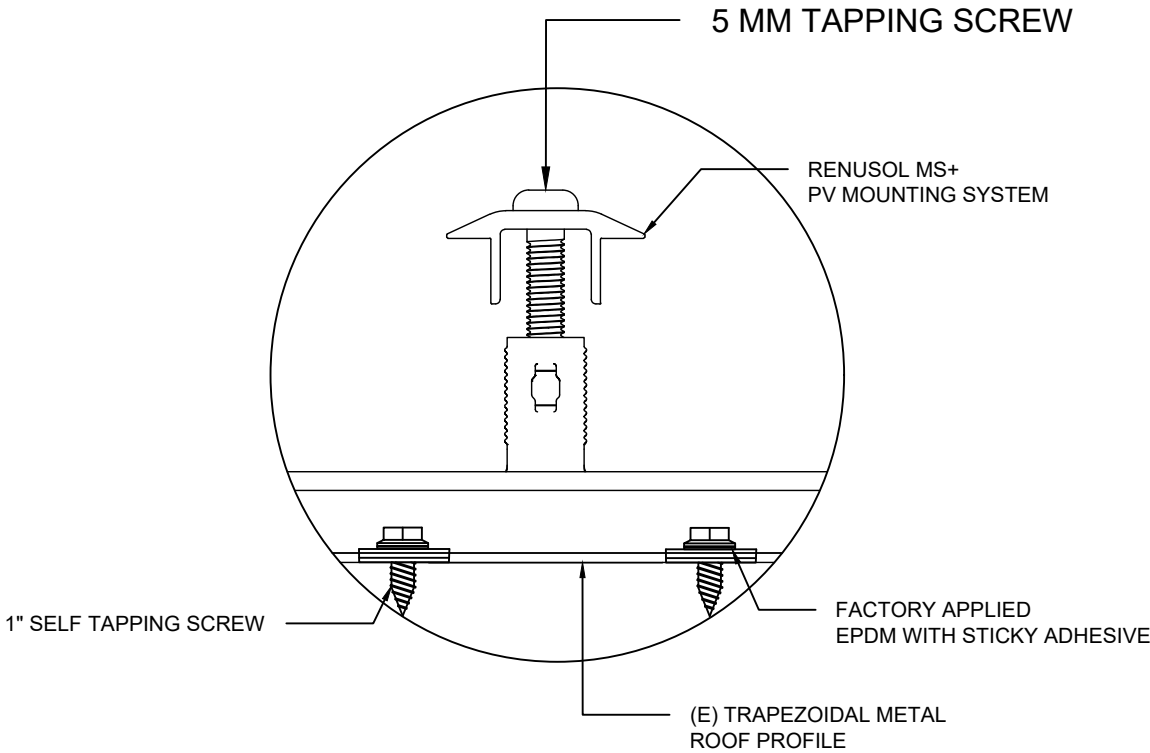
SHEET NUMBER

PV-4.0

1

ATTACHMENT DETAIL (enlarged section view)

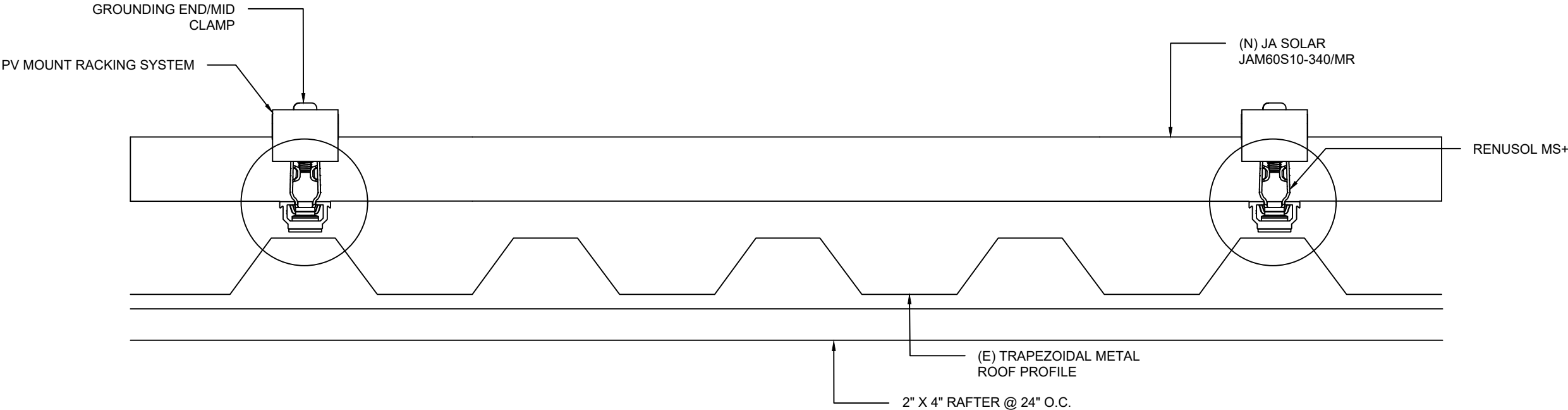
SCALE: NTS



2

ATTACHMENT DETAIL

SCALE: NTS



CONTRACTOR INFO



COMPANY NAME
COMPANY CONTACT
ADDRESS
PHONE NO: (XXX) XXX-XXXX
LIC #: XXXXXXXX

REVISIONS		
DESCRIPTION	Date	REV

Signature With Seal

PROJECT NAME AND ADDRESS

OLDMIXON CRES, WESTON
SUPER MARE BS24 9AX

DESIGNER

DESIGNER NAME
DESIGN PRESENTATION
DATE: XX/XX/XXXX
PHONE NO: (XXX)-XXX-XXXX

SHEET NAME
ATTACHMENT
DETAIL

SHEET SIZE
ANSI FULL BLEED B
11"X17"

SHEET NUMBER
PV-5.0

CONTRACTOR INFO

COMPANY
LOGO

COMPANY NAME
COMPANY CONTACT
ADDRESS
PHONE NO: (XXX) XXX-XXXX
LIC #: XXXXXXXX

REVISIONS

DESCRIPTION	Date	REV

Signature With Seal

PROJECT NAME AND ADDRESS

OLDMIXON CRES, WESTON
SUPER MARE BS24 9AX

DESIGNER

DESIGNER NAME
DESIGN PRESENTATION
DATE: XX/XX/XXXX
PHONE NO: (XXX)-XXX-XXXX

SHEET NAME

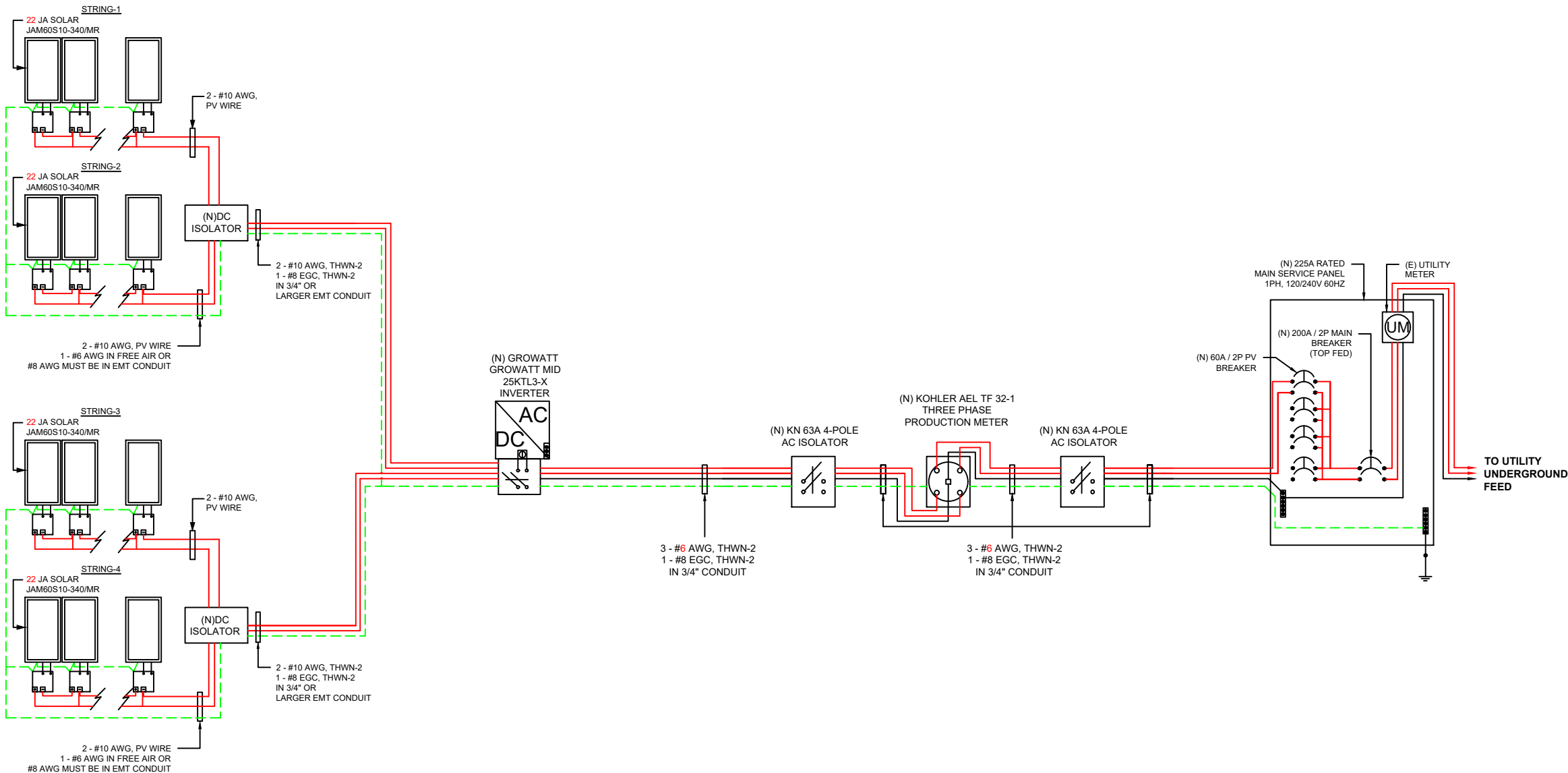
EARTHING DIAGRAM

SHEET SIZE

ANSI FULL BLEED B
11"X17"

SHEET NUMBER

PV-6.0



PV ARRAY INFORMATION

88 JA SOLAR 340 WATT SOLAR MODULES
MODULE MODEL # JAM60S10-340/MR
INVERTER MODEL # GROWATT MID 25KTL3-X

PANELS INFORMATION

RATED VOLTAGE (Vmpp) = 34.73 V
RATED CURRENT (Impp) = 9.79 A
OPEN-CIRCUIT VOLTAGE (Voc) = 41.55 V
SHORT-CIRCUIT CURRENT (Isc) = 10.46 A

OUTPUT CALCULATIONS

PV SYSTEM MAX DC OUTPUT:
88 * 340W = 29920W
PV SYSTEM MAX AC OUTPUT:
(88) MODULE MODEL #JAM60S10-340/MR
(1) INVERTER MODEL #GROWATT MID 25KTL3-X
Pmax (PTC Rating) PER MODULE: 315.4W
315.4W * 88 = 27.755 KW
CEC-AC RATING : 27.3943kW AC @ 240V

NOTES

CONDUIT WILL RUN OVER THE ROOF AT 0.5"
HEIGHT FROM THE ROOF SURFACE
ALL EXTERIOR CONDUIT, FITTINGS, AND BOXES SHALL
BE RAIN-TIGHT AND APPROVED FOR USE IN WET LOCATIONS

INVERTER INFORMATION

Maximum Input Voltage = 250Vdc
Nominal DC Input Voltage = 580Vdc
Maximum String Power = 7812.5Wp

DC ISOLATOR INFORMATION

Rating Per String = 20A
Input DC Switch Voltage = 340V

AC ISOLATOR INFORMATION

Maximum Output Current = 63A
AC Switch Voltage = 240V

CONDUCTOR CALCULATIONS

INVERTER MAX. CONTINUOUS OUTPUT CURRENT = 40.2A
CONSIDER CONTINUOUS: 40.2A * 1.25 = 50.25A
TEMP. DERATE FACTOR - 50.25A / 0.91 = 55.22A
WIRE SIZE FROM NEC TABLE 310.15(b)16 - **6 AWG**
AMBIENT TEM FACTOR 0.91 PER BS 7671 (NEC)

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
.80	4-6
.70	7-9
.50	10-20

AMBIENT TEMPERATURE SPECS

RECORD LOW TEMP	-1°
AMBIENT TEMP (HIGH TEMP 2%)	43°
CONDUIT HEIGHT	1.0"
ARRAY TOP TEMP	65°
CONDUCTOR TEMPERATURE RATE	90°

CHECK BOX FOR WHETHER SYSTEM IS GROUNDED OR UNGROUNDED:
☐ GROUNDED (INCLUDE GEC)
☒ UNGROUNDED
FOR UNGROUNDED SYSTEMS:
☐ DC OCPD DISCONNECT BOTH CONDUCTORS OF EACH SOURCE CIRCUIT
☐ UNGROUNDED CONDUCTORS MUST BE IDENTIFIED PER 210.5(C).
WHITE FINISHED CONDUCTORS ARE NOT PERMITTED.

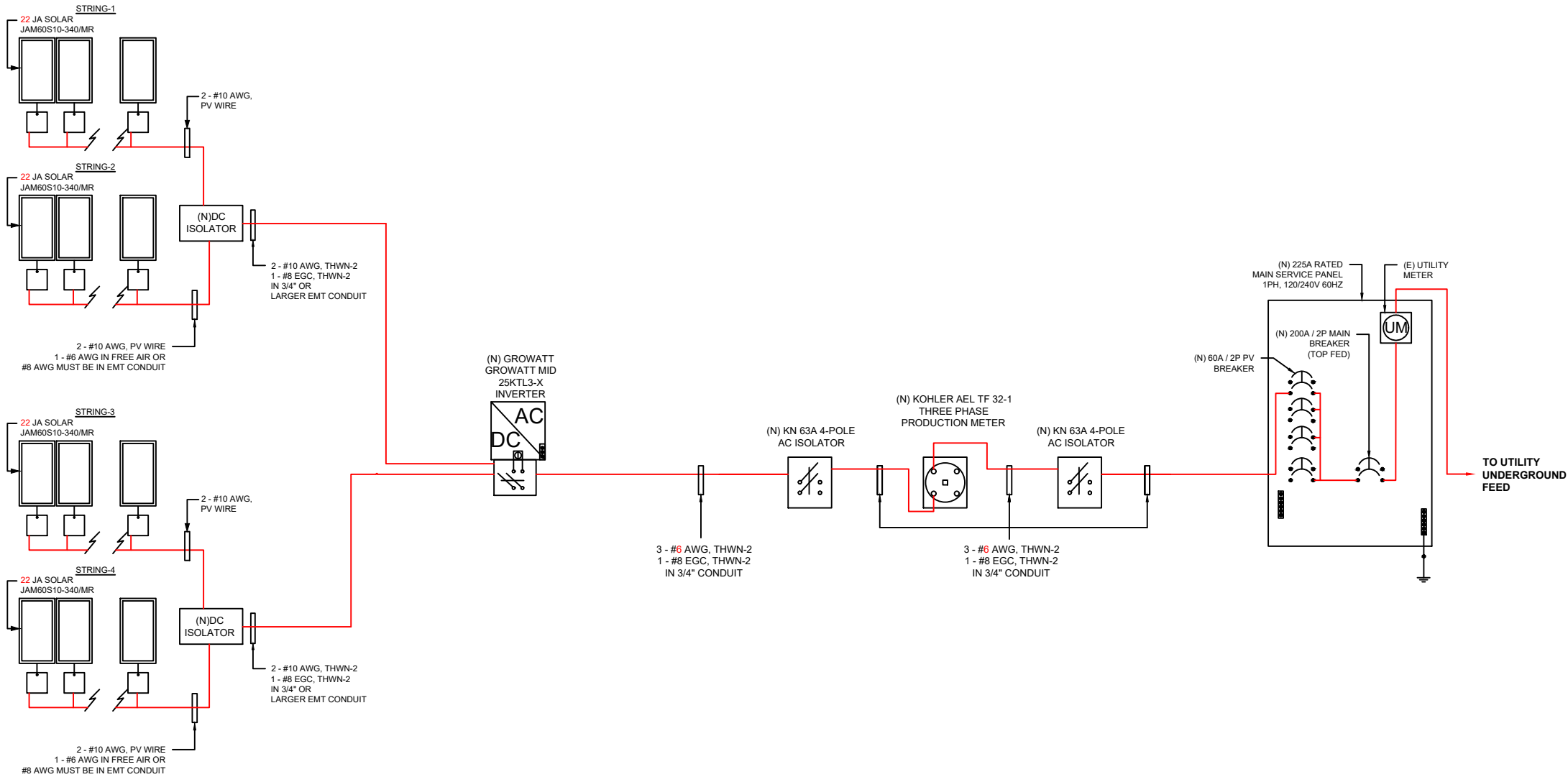
MAIN PANEL RATING

1 PHASE: 3W, 120/240V
BUSBAR RATING = 225A
MAIN SERVICE BREAKER = 200A TOP FED
120% RULE:
MAX ALLOWABLE BACKFEED:
(225A * 1.2) - 200A = 70A
ACTUAL PV BACKFEED:
60A (PV) <= 70A OK

1.25 * 40.2A = 50.25A (60A PV BREAKER)

ELECTRICAL NOTES

- 1.PROPER LISTING EXPECTED FOR CONDITIONS OF USE ON ALL LUGS,FITTINGS,CRIMPS,ETC.
- 2.ALL CONDUIT BEND RADII TO CONFORM THE NEC MINIMUM BEND RADII REQUIREMENTS.
- 3.MINIMUM CLEARANCE SHALL BE MAINTAINED PER NEC FOR ALL NEW EQUIPMENTS TO BE INSTALLED
- 4.EXISTING GROUNDING ELECTRODE SYSTEM MUST MEET NEC AND LOCAL UTILITY REQUIREMENTS.
- 5.COPPER CONDUCTORS SHALL BE USED UNLESS SPECIFIED.
- 6.TYPE NM (ROMEX) CONDUCTORS ARE ALLOWED FOR INTERNAL AND ATTIC RUNS AND SHALL BE INSTALLED MEETING NEC REQUIREMENTS.
- 7.IF MAIN SERVICE PANEL IS TO BE UPGRADED,IT WILL BE PERMITTED AND INSTALLED BY 3RD PARTY.
- 8.CONDUIT SIZE BASED ON 2 BENDS MAXIMUM.ANY ADDITIONAL BENDS MAY REQUIRE UPSIZE.
- 9.AC WIRING SHALL UPSIZE IF VOLTAGE DROP EXCEEDS 2%
- 10.RUN CONDUCTORS IN EXISTING CONDUIT WHEN AVAILABLE PROVIDED IT HAS NO OTHER CONDUCTORS RUNNING THROUGH.



PV ARRAY INFORMATION
88 JA SOLAR 340 WATT SOLAR MODULES
MODULE MODEL # JAM60S10-340/MR
INVERTER MODEL # GROWATT MID 25KTL3-X

PANELS INFORMATION
RATED VOLTAGE (Vmpp) = 34.73 V
RATED CURRENT (Impp) = 9.79 A
OPEN-CIRCUIT VOLTAGE (Voc) = 41.55 V
SHORT-CIRCUIT CURRENT (Isc) = 10.46 A

OUTPUT CALCULATIONS
PV SYSTEM MAX DC OUTPUT:
88 * 340W = 29920W
PV SYSTEM MAX AC OUTPUT:
(88) MODULE MODEL #JAM60S10-340/MR
(1) INVERTER MODEL #GROWATT MID 25KTL3-X
Pmax (PTC Rating) PER MODULE: 315.4W
315.4W * 88 = 27.755 KW
CEC-AC RATING : 27.3943kW AC @ 240V

NOTES
CONDUIT WILL RUN OVER THE ROOF AT 0.5" HEIGHT FROM THE ROOF SURFACE
ALL EXTERIOR CONDUIT, FITTINGS, AND BOXES SHALL BE RAIN-TIGHT AND APPROVED FOR USE IN WET LOCATIONS

INVERTER INFORMATION
Maximum Input Voltage = 250Vdc
Nominal DC Input Voltage = 580Vdc
Maximum String Power = 7812.5Wp

DC ISOLATOR INFORMATION
Rating Per String = 20A
Input DC Switch Voltage = 340V

AC ISOLATOR INFORMATION
Maximum Output Current = 63A
AC Switch Voltage = 240V

CONDUCTOR CALCULATIONS
INVERTER MAX. CONTINUOUS OUTPUT CURRENT = 40.2A
CONSIDER CONTINUOUS: 40.2A * 1.25 = 50.25A
TEMP. DERATE FACTOR - 50.25A / 0.91 = 55.22A
WIRE SIZE FROM NEC TABLE 310.15(b)16 - **6 AWG**
AMBIENT TEM FACTOR 0.91 PER BS 7671 (NEC)

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
.80	4-6
.70	7-9
.50	10-20

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-1°
AMBIENT TEMP (HIGH TEMP 2%)	43°
CONDUIT HEIGHT	1.0"
ARRAY TOP TEMP	65°
CONDUCTOR TEMPERATURE RATE	90°

CHECK BOX FOR WHETHER SYSTEM IS GROUNDED OR UNGROUNDED:
☐ GROUNDED (INCLUDE GEC)
☒ UNGROUNDED
FOR UNGROUNDED SYSTEMS:
☐ DC OCPD DISCONNECT BOTH CONDUCTORS OF EACH SOURCE CIRCUIT
☐ UNGROUNDED CONDUCTORS MUST BE IDENTIFIED PER 210.5(C).
WHITE FINISHED CONDUCTORS ARE NOT PERMITTED.

MAIN PANEL RATING
1 PHASE: 3W, 120/240V
BUSBAR RATING = 225A
MAIN SERVICE BREAKER = 200A TOP FED
120% RULE:
MAX ALLOWABLE BACKFEED:
(225A * 1.2) - 200A = 70A
ACTUAL PV BACKFEED:
60A (PV) <= 70A OK
1.25 * 40.2A = 50.25A (60A PV BREAKER)

ELECTRICAL NOTES
1.PROPER LISTING EXPECTED FOR CONDITIONS OF USE ON ALL LUGS,FITTINGS,CRIMPS,ETC.
2.ALL CONDUIT BEND RADII TO CONFORM THE NEC MINIMUM BEND RADII REQUIREMENTS.
3.MINIMUM CLEARANCE SHALL BE MAINTAINED PER NEC FOR ALL NEW EQUIPMENTS TO BE INSTALLED
4.EXISTING GROUNDING ELECTRODE SYSTEM MUST MEET NEC AND LOCAL UTILITY REQUIREMENTS.
5.COPPER CONDUCTORS SHALL BE USED UNLESS SPECIFIED.
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9.AC WIRING SHALL UPSIZE IF VOLTAGE DROP EXCEEDS 2%
10.RUN CONDUCTORS IN EXISTING CONDUIT WHEN AVAILABLE PROVIDED IT HAS NO OTHER CONDUCTORS RUNNING THROUGH.

CONTRACTOR INFO

COMPANY LOGO

COMPANY NAME
COMPANY CONTACT
ADDRESS
PHONE NO: (XXX) XXX-XXXX
LIC #: XXXXXXXX

REVISIONS

DESCRIPTION	Date	REV

Signature With Seal

PROJECT NAME AND ADDRESS

OLDMIXON CRES, WESTON
SUPER MARE BS24 9AX

DESIGNER
DESIGNER NAME
DESIGN PRESENTATION
DATE: XX/XX/XXXX
PHONE NO: (XXX)-XXX-XXXX

SHEET NAME
ELECTRICAL SLD

SHEET SIZE
ANSI FULL BLEED B
11"X17"

SHEET NUMBER
PV-7.0

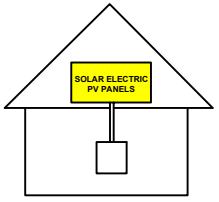
WARNING:
POWER SOURCE OUTPUT
CONNECTION
DO NOT RELOCATE THIS
OVERCURRENT DEVICE.

705.12(B)(2)(3)(b)

**SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN**

**TURN RAPID
SHUTDOWN SWITCH TO
THE "OFF" POSITION TO
SHUT DOWN PV SYSTEM
AND REDUCE SHOCK
HAZARD IN THE ARRAY**

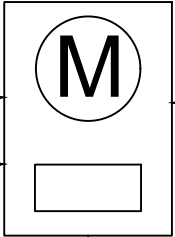
690.56(C)(1)(A)



PV METER

**RAPID SHUTDOWN SWITCH FOR
SOLAR PV SYSTEM**

690.56(C)(3)



"WARNING"
DUAL POWER SOURCES
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM
RATED AC OUTPUT CURRENT - 40.2 AMPS
AC NORMAL OPERATING VOLTAGE - 250 VOLTS

690.54

PM

AC

PV SYSTEM AC DISCONNECT
RATED AC OUTPUT CURRENT - 40.2 AMPS
AC NORMAL OPERATING VOLTAGE - 250 VOLTS

690.15, 690.54

INVERTER

"WARNING"
ELECTRICAL SHOCK HAZARD.
TERMINALS ON BOTH LINE AND LOAD SIDES
MAY BE ENERGIZED IN THE OPEN POSITION.

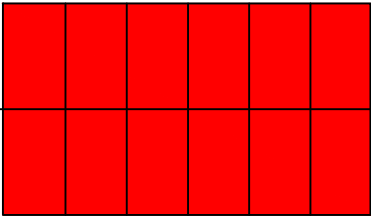
690.13 (B)

PV SYSTEM DC DISCONNECT
MAXIMUM VOLTAGE: 480V
MAXIMUM CIRCUIT CURRENT: 40.2A
MAX RATED OUTPUT CURRENT OF
THE CONTROLLER OR DC-TO-DC
CONVERTER: 15A

690.53

DC

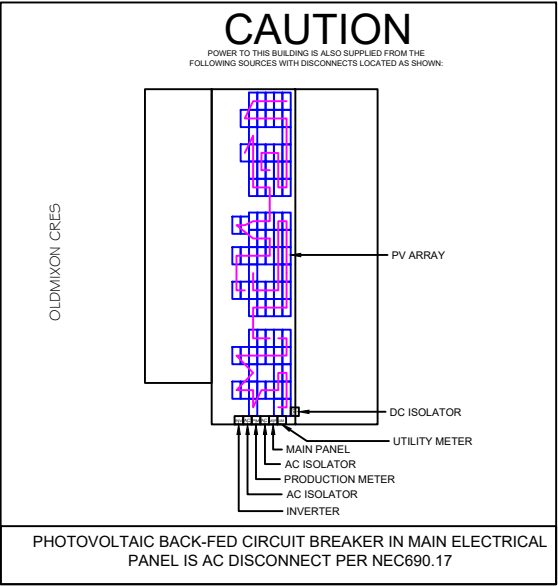
J/B



NEC 690.31(G)(3) & (4)

"WARNING"
PHOTOVOLTAIC POWER SOURCE

EVERY 10' ON CONDUIT AND ENCLOSURES



NOTES:

1. NEC ARTICLES 690 AND 705 AND NEC SECTION R324 MARKINGS SHOWN HEREON.
2. ALL MARKING SHALL CONSIST OF THE FOLLOWING:
 - A. UV RESISTANT SIGN MATERIAL WITH ENGRAVED OR MACHINE PRINTED LETTERS OR ELECTRO-PLATING.
 - B. RED BACKGROUND COLOR WHITE TEXT AND LINE WORK.
 - C. AERIAL FONT.
3. ALL SIGNS SHALL BE SIZED APPROPRIATELY AND PLACED IN THE LOCATIONS SPECIFIED. SIGNAGE CANNOT BE HAND-WRITTEN.
3. SIGNS SHALL BE ATTACHED TO THE SERVICE EQUIPMENT WITH POP-RIVETS OR SCREWS.

CONTRACTOR INFO

**COMPANY
LOGO**

COMPANY NAME
COMPANY CONTACT
ADDRESS
PHONE NO: (XXX) XXX-XXXX
LIC #: XXXXXXXX

REVISIONS		
DESCRIPTION	Date	REV

Signature With Seal

PROJECT NAME AND ADDRESS

**OLDMIXON CRES, WESTON
SUPER MARE BS24 9AX**

DESIGNER

DESIGNER NAME
DESIGN PRESENTATION
DATE: XX/XX/XXXX
PHONE NO: (XXX)-XXX-XXXX

SHEET NAME

SIGNAGE

SHEET SIZE

**ANSI FULL BLEED B
11"X17"**

SHEET NUMBER

PV-8.0

1-1011-2021-3031-4041-5051-60

1

2

3

4

5

6

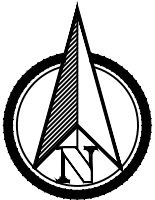
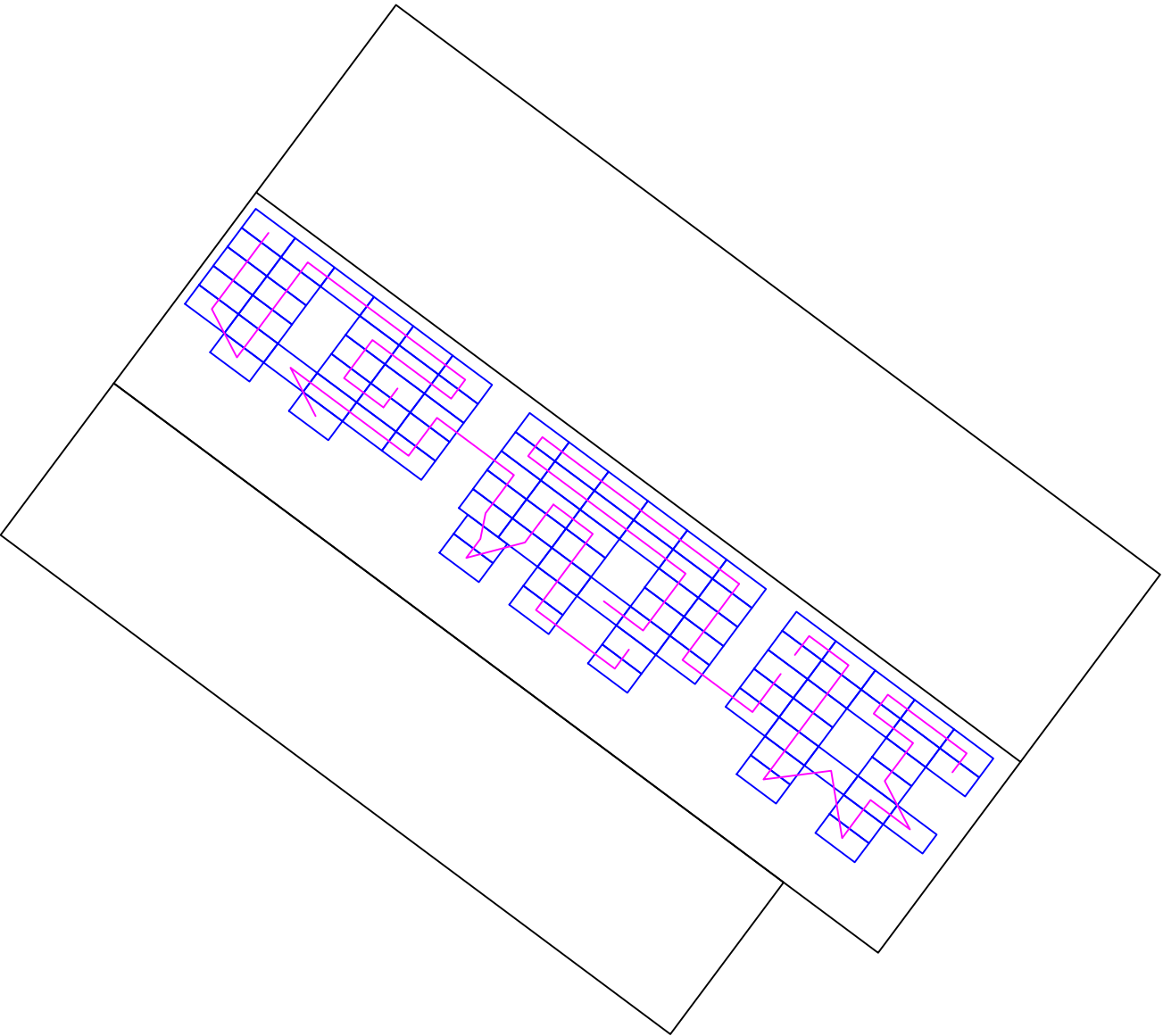
7

8

9

10

STRING CHART



CONTRACTOR INFO

COMPANY
LOGO

COMPANY NAME
COMPANY CONTACT
ADDRESS
PHONE NO: (XXX) XXX-XXXX
LIC #: XXXXXXXX

REVISIONS		
DESCRIPTION	Date	REV

Signature With Seal

PROJECT NAME AND ADDRESS

OLDMIXON CRES, WESTON
SUPER MARE BS24 9AX

DESIGNER
DESIGNER NAME
DESIGN PRESENTATION
DATE: XX/XX/XXXX
PHONE NO: (XXX)-XXX-XXXX

SHEET NAME
STRING CHART

SHEET SIZE
ANSI FULL BLEED B
11"X17"

SHEET NUMBER
PV-9.0

SAFETY PLAN

INSTRUCTIONS:

1. USE SYMBOLS IN KEY TO MARK UP THIS SHEET.
2. SAFETY PLAN MUST BE MARKED BEFORE JOB STARTS AS PART OF THE PRE-PLAN
3. DOCUMENT ALL ADDITIONAL HAZARDS ON THIS PAGE & MAKE NOTES ON THE JHA SHEET

IN CASE OF EMERGENCY

NEAREST HOSPITAL OR OCCUPATIONAL/INDUSTRIAL CLINIC

NAME: _____

ADDRESS: _____

SAFETY COACH CONTACT INFORMATION

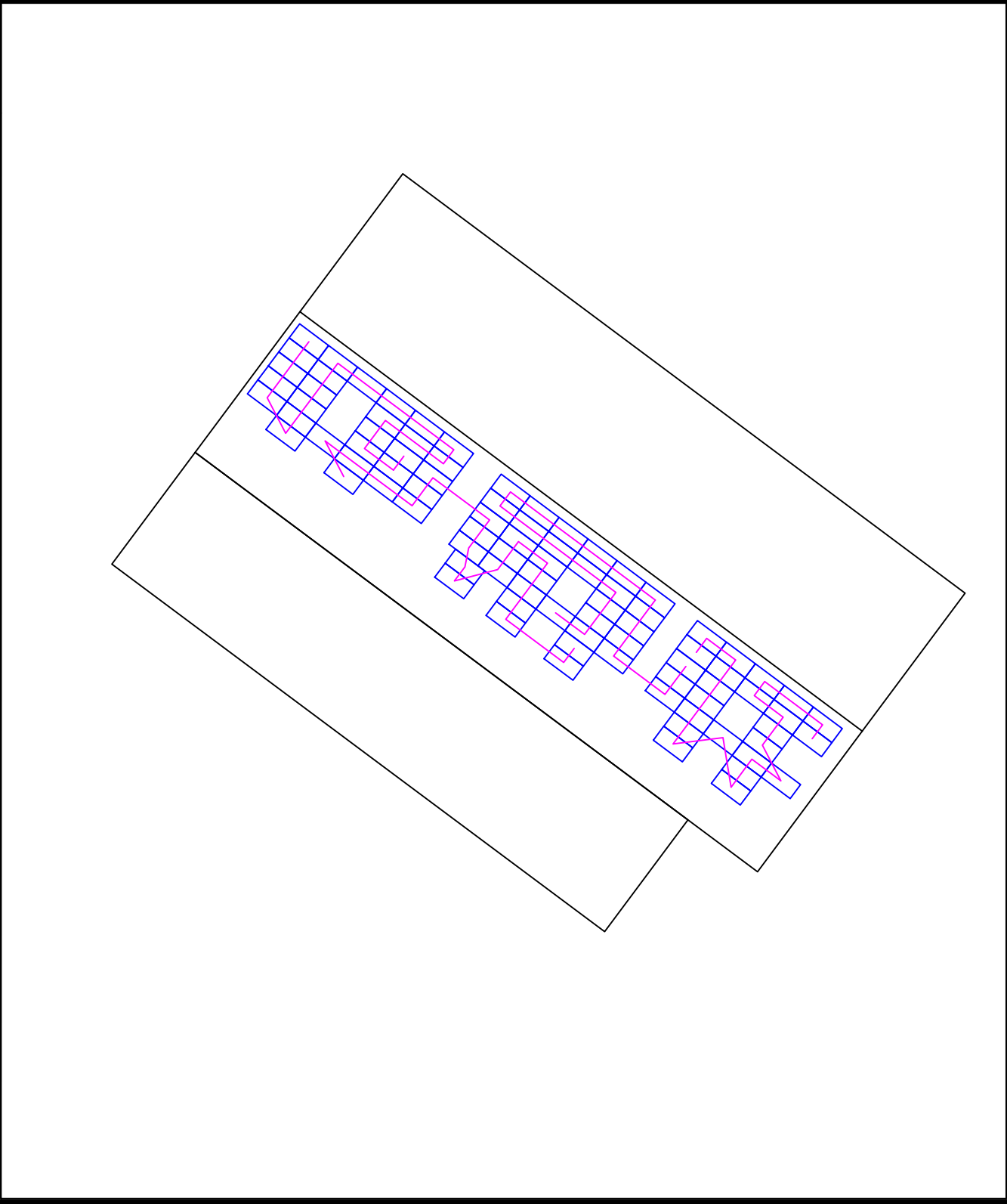
NAME: _____

ADDRESS: _____

ALL EMPLOYEES ON SITE SHALL BE MADE AWARE OF THE SAFETY PLAN AND SIGN INDICATING THAT THEY ARE AWARE OF THE HAZARDS ON-SITE AND THE PLAN FOR WORKING SAFELY.

NAME	SIGNATURE
_____	_____
_____	_____
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_____	_____
_____	_____
_____	_____

DATE: _____ TIME: _____



MARK UP KEY

INV

GROWATT MID 25KTL3-X

M

PRODUCTION METER

DC

DC ISOLATOR

AC

AC ISOLATOR

MSP

MAIN SERVICE PANEL

UM

UTILITY METER

X

SKYLIGHT

—

STRING

CONTRACTOR INFO

COMPANY LOGO

COMPANY NAME

COMPANY CONTACT

ADDRESS

PHONE NO: (XXX) XXX-XXXX

LIC #: XXXXXXXX

REVISIONS

DESCRIPTION	Date	REV

Signature With Seal

PROJECT NAME AND ADDRESS

OLDMIXON CRES, WESTON
SUPER MARE BS24 9AX

DESIGNER

DESIGNER NAME

DESIGN PRESENTATION

DATE: XX/XX/XXXX

PHONE NO: (XXX)-XXX-XXXX

SHEET NAME

SAFETY PLAN

SHEET SIZE

ANSI FULL BLEED B
11"X17"

SHEET NUMBER

PV-10.0

Mono

340W MBB Half-Cell Module JAM60S10 320-340/MR Series

Introduction

Assembled with multi-busbar PERC cells, the half-cell configuration of the modules offers the advantages of higher power output, better temperature-dependent performance, reduced shading effect on the energy generation, lower risk of hot spot, as well as enhanced tolerance for mechanical loading.



Higher output power



Lower LCOE



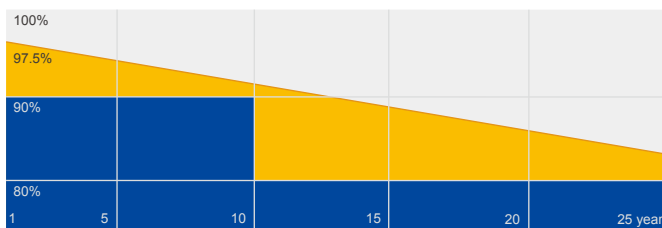
Less shading and lower resistive loss



Better mechanical loading tolerance

Superior Warranty

- 12-year product warranty
- 25-year linear power output warranty



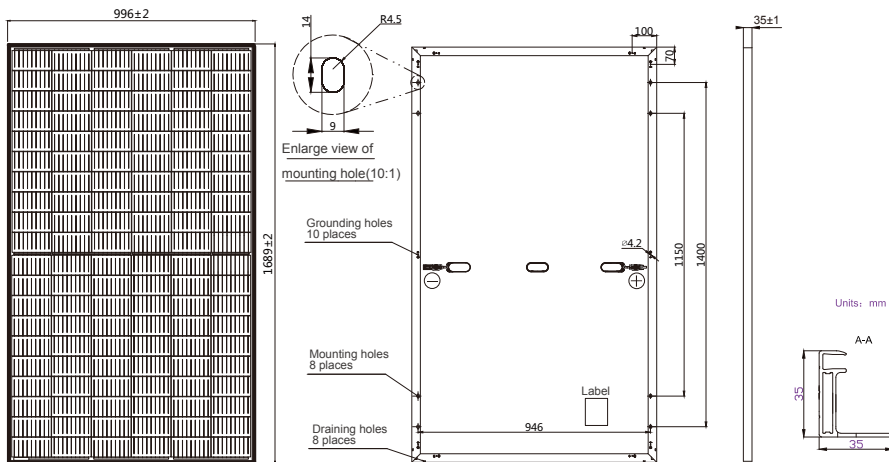
■ JA Linear Power Warranty ■ Industry Warranty

Comprehensive Certificates

- IEC 61215, IEC 61730
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- OHSAS 18001: 2007 Occupational health and safety management systems
- IEC TS 62941: 2016 Terrestrial photovoltaic (PV) modules – Guidelines for increased confidence in PV module design qualification and type approval



MECHANICAL DIAGRAMS



Remark: customized frame color and cable length available upon request

SPECIFICATIONS

Cell	Mono
Weight	19.0kg±3%
Dimensions	1689±2mm×996±2mm×35±1mm
Cable Cross Section Size	4mm ²
No. of cells	120(6×20)
Junction Box	IP68, 3 diodes
Connector	MC4 Original
Cable Length (Including Connector)	Portrait:300mm(+)/400mm(-); Landscape:1000mm(+)/1000mm(-)
Packaging Configuration	30 Per Pallet

ELECTRICAL PARAMETERS AT STC

TYPE	JAM60S10 -320/MR	JAM60S10 -325/MR	JAM60S10 -330/MR	JAM60S10 -335/MR	JAM60S10 -340/MR
Rated Maximum Power(P _{max}) [W]	320	325	330	335	340
Open Circuit Voltage(V _{oc}) [V]	40.60	40.87	41.08	41.32	41.55
Maximum Power Voltage(V _{mp}) [V]	33.73	33.97	34.24	34.48	34.73
Short Circuit Current(I _{sc}) [A]	10.16	10.23	10.30	10.38	10.46
Maximum Power Current(I _{mp}) [A]	9.49	9.57	9.64	9.72	9.79
Module Efficiency [%]	19.0	19.3	19.6	19.9	20.2
Power Tolerance	0~+5W				
Temperature Coefficient of I _{sc} (α _{Isc})	+0.044%/°C				
Temperature Coefficient of V _{oc} (β _{Voc})	-0.272%/°C				
Temperature Coefficient of P _{max} (γ _{Pmp})	-0.350%/°C				
STC	Irradiance 1000W/m ² , cell temperature 25°C, AM1.5G				

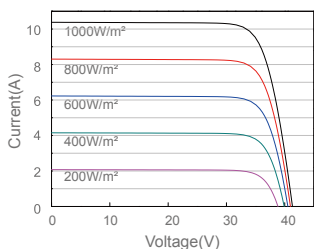
Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

ELECTRICAL PARAMETERS AT NOCT

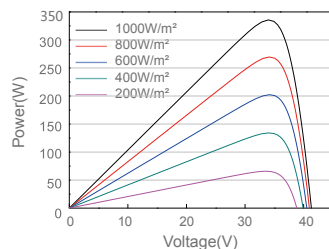
TYPE	JAM60S10 -320/MR	JAM60S10 -325/MR	JAM60S10 -330/MR	JAM60S10 -335/MR	JAM60S10 -340/MR	OPERATING CONDITIONS	
Rated Max Power(P _{max}) [W]	241	245	249	253	257	Maximum System Voltage	1000V/1500V DC(IEC)
Open Circuit Voltage(V _{oc}) [V]	38.05	38.26	38.46	38.68	38.90	Operating Temperature	-40°C~+85°C
Max Power Voltage(V _{mp}) [V]	31.58	31.80	32.02	32.21	32.40	Maximum Series Fuse	20A
Short Circuit Current(I _{sc}) [A]	8.07	8.14	8.21	8.28	8.35	Maximum Static Load, Front	5400Pa
Max Power Current(I _{mp}) [A]	7.63	7.70	7.78	7.85	7.93	Maximum Static Load, Back	2400Pa
NOCT	Irradiance 800W/m ² , ambient temperature 20°C, wind speed 1m/s, AM1.5G					NOCT	45±2°C
						Application Class	Class A

CHARACTERISTICS

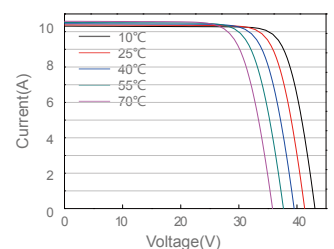
Current-Voltage Curve JAM60S10-335/MR



Power-Voltage Curve JAM60S10-335/MR



Current-Voltage Curve JAM60S10-335/MR



MID 15~25KTL3-X

- Max. efficiency 98.7%
- 40% compact and lighter
- Dual MPP trackers
- Supports export control
- Touch key and OLED display
- Type II SPD on AC and DC side



P O W E R
- I N G
T O M O -
R R O W

Growatt
powering tomorrow

www.ginverter.com

Datasheet	MID 15KTL3-X	MID 17KTL3-X	MID 20KTL3-X	MID 22KTL3-X	MID 25KTL3-X
Input Data					
Max. recommended PV power (for module STC)	19500W	22100W	26000W	28600W	32500W
Max. DC voltage	1100V	1100V	1100V	1100V	1100V
Start Voltage	250V	250V	250V	250V	250V
MPPT voltage range	200V-1000V	200V-1000V	200V-1000V	200V-1000V	200V-1000V
Nominal voltage	580V	580V	580V	580V	580V
Number of MPP trackers/ Strings per MPP tracker	2/2	2/2	2/2	2/2	2/3
Max. input current per MPPT	25	25	25	25	25/37.5
Max. short circuit current per MPPT	32	32	32	32	32/48
Output (AC)					
Rated AC output power	15000W	17000W	20000W	22000W	25000W
Max. AC apparent power	16600VA	18800VA	22000VA	24400VA	27700VA
AC nominal voltage; range	230V/400V; 340-440V	230V/400V; 340-440V	230V/400V; 340-440V	230V/400V; 340-440V	230V/400V; 340-440V
AC grid frequency; range	50/60 Hz; 45~55Hz/55-65 Hz	50/60 Hz; 45~55Hz/55-65 Hz	50/60 Hz; 45~55Hz/55-65 Hz	50/60 Hz; 45~55Hz/55-65 Hz	50/60 Hz; 45~55Hz/55-65 Hz
Max. output current	24.2A	27.4A	31.9A	35.5A	40.2A
Power factor	0.8 leading - 0.8 lagging	0.8 leading - 0.8 lagging	0.8 leading - 0.8 lagging	0.8 leading - 0.8 lagging	0.8 leading - 0.8 lagging
THDI	<3%	<3%	<3%	<3%	<3%
AC grid connection type	3W+N+PE	3W+N+PE	3W+N+PE	3W+N+PE	3W+N+PE
Efficiency					
Max. efficiency	98.5%	98.6%	98.6%	98.7%	98.7%
Euro - eta	98.1%	98.2%	98.2%	98.3%	98.3%
Protection Devices					
DC reverse polarity protection	yes	yes	yes	yes	yes
DC Switch	yes	yes	yes	yes	yes
DC Surge protection	Typell	Typell	Typell	Typell	Typell
Ground fault monitoring	yes	yes	yes	yes	yes
Output short circuit protection	yes	yes	yes	yes	yes
AC Surge protection	Typell	Typell	Typell	Typell	Typell
String monitoring	opt	opt	opt	opt	opt
AFCI protection	opt	opt	opt	opt	opt
General Data					
Dimensions (W / H / D) in mm	525/395/222	525/395/222	525/395/222	525/395/222	525/395/222
Weight	23kg	23kg	23kg	23kg	23kg
Operating temperature range	-25 °C ... +60 °C	-25 °C ... +60 °C	-25 °C ... +60 °C	-25 °C ... +60 °C	-25 °C ... +60 °C
Noise emission (typical)	≤40 dB(A)	≤40 dB(A)	≤40 dB(A)	≤40 dB(A)	≤40 dB(A)
Self-Consumption (night)	<1W	<1W	<1W	<1W	<1W
Topology	Transformerless	Transformerless	Transformerless	Transformerless	Transformerless
Cooling concept	Smart cooling	Smart cooling	Smart cooling	Smart cooling	Smart cooling
Environmental Protection Rating	IP65	IP65	IP65	IP65	IP65
Altitude	4000m	4000m	4000m	4000m	4000m
Relative Humidity	0~100%	0~100%	0~100%	0~100%	0~100%
DC connection	H4/MC4(opt)	H4/MC4(opt)	H4/MC4(opt)	H4/MC4(opt)	H4/MC4(opt)
Features					
Display	OLED+LED WIFI+APP	OLED+LED WIFI+APP	OLED+LED WIFI+APP	OLED+LED WIFI+APP	OLED+LED WIFI+APP
Interfaces: USB/RS485/WIFI/GPRS/4G	yes/yes/opt/opt/opt	yes/yes/opt/opt/opt	yes/yes/opt/opt/opt	yes/yes/opt/opt/opt	yes/yes/opt/opt/opt
CE, EN50549, VDE-AR-N4105, VDE 0126-1-1, VFR2014, CEI 0-21, CEI 0-16, IEC 62116, IEC 61727, G99, As4777					



Short form

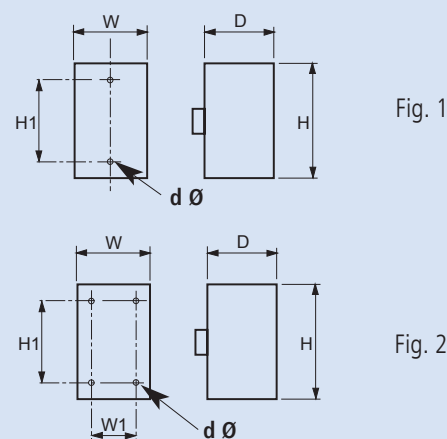
catalogue

Enclosed switches including; grp • insulated • mild & stainless steel • red painted • photovoltaic
Switch-disconnectors including; isolating switches • main/emergency off • changeover switches



DIMENSIONS (units= mm throughout the catalogue unless stated otherwise)

Encl. Ref.	Encl. Dim.			Encl. Dim.			Cable Entries.	Line Drg.
	H	W	D	H1	W1	d		
KSAV	120	85	90	110	-	4.2	4 x 20/25mm k'outs	Fig. 1
KLCV	190	100	93	178	-	5.6	4 x 20/25mm k'outs	Fig. 1
KLD	250	145	107	229	124	6.5	4 x 25/40mm k'outs	Fig. 2
KLDV	250	145	107	229	124	6.5	4 x 25/40mm k'outs	Fig. 2
STE	280	190	180	254	164	7	2 x gland plates	Fig. 2
ST2	280	190	130	254	164	7	2 x gland plates	Fig. 2
ST3	380	280	180	354	254	7	2 x gland plates	Fig. 2
ST4	560	380	180	534	354	7	2 x gland plates	Fig. 2



Please refer to end of part no. for enclosure reference. See tables below:

4 Pole (3ph + Sw N ²)	Encl. Ref	6 Pole	Encl. Ref	le AC-21A
KG10 T204/GBA290 *KS1V	KSAV	KG10B T206/GBA320 *KS1V	KSAV	20A
KG20 T204/GBA290 *KS1V	KSAV	KG20B T206/GBA320 *KL1V	KLCV	25A
KG32 T204/GBA290 *KS1V	KSAV	KG32B T206/GBA320 *KL1V	KLCV	32A
KG41 T204/GBA290 *KL1V	KLCV	KG41B T206/GBA320 *KL1V	KLDV	40A
KG64 T204/GBA290 *KL1V	KLCV	KG64B T206/GBA320 *KL1V	KLDV	63A
KG80 T204/GBA290 *KL1V	KLDV	KG80 T206/GBA967 *ST	STE	80A
KG100 T204/GBA290 *KL1V	KLDV	KG100 T206/GBA967 *ST	STE	100A
KG105 T204/GBA290 *KL1V	KLDV	KG105 T206/GBA967 *ST	STE	125A
KG125 T204/GBA290 *ST	ST3	KG125 T206/GBA967 *ST	ST4	125A ³⁾
KG160 T204/GBA290 *ST	ST3	KG160 T206/GBA967 *ST	ST4	160A
KG210 T204/GBA290 *ST	ST4			200A
KG250 T204/GBA290 *ST	ST4			250A
KG315 T204/GBA290 *ST	ST4			315A

4 Pole (3ph + Sw N ²)	Encl. Ref	6 Pole	Encl. Ref	8 Pole (2 x 3ph + Sw N ²)	Encl. Ref	le AC-21A
KG10 T204/GBA311 *KS1V	KSAV	KG10 T206/40 *KS51V	KSAV	KG10 T208/GBA002 *KS1V	KSAV	20A
KG20 T204/GBA310 *KS1V	KSAV	KG20B T206/GBA330 *KL1V	KLCV	KG20B T208/GBA008 *KL	KLD	25A
KG32 T204/GBA310 *KS1V	KSAV	KG32B T206/GBA330 *KL1V	KLCV	KG32B T208/GBA008 *KL	KLD	32A
KG41 T204/GBA310 *KL1V	KLCV	KG41B T206/GBA330 *KL1V	KLDV	KG41B T208/GBA008 *ST	ST2	40A
KG64 T204/GBA310 *KL1V	KLCV	KG64B T206/GBA330 *KL1V	KLDV	KG64B T208/GBA008 *ST	ST2	63A
KG80 T204/GBA310 *KL1V	KLDV	KG80 T206/GBA907 *ST	STE	KG80 T208/GBA008 *ST	ST3	80A
KG100 T204/GBA310 *KL1V	KLDV	KG100 T206/GBA907 *ST	STE	KG100 T208/GBA008 *ST	ST3	100A
KG105 T204/GBA310 *KL1V	KLDV	KG105 T206/GBA907 *ST	STE			125A
KG125 T204/GBA075 *ST	ST3	KG125 T206/GBA085 *ST	ST4	KG125 T208/GBA010 *ST	ST4	125A ³⁾
KG160 T204/GBA075 *ST	ST3	KG160 T206/GBA085 *ST	ST4	KG160 T208/GBA010 *ST	ST4	160A
KG210 T204/GBA080 *ST	ST4					200A
KG250 T204/GBA080 *ST	ST4					250A
KG315 T204/GBA080 *ST	ST4					315A

Switch - Disconnecter 2 & 4 pole.

- IP66/67 Protection.
- black/grey padlockable handle.
- insulated enclosure, grey, RAL7035.
- switch interlocked with lid to prevent opening in 'ON' position.
- class II compliant.
- rated for use in ambient temperatures of 50°C.

**Single String DC Switch Disconnectors - Selection Chart DC-21B**

450V	500V	650V	800V	920V	1000V	Order Code No.	FIG.	
25A	21A	20A	18A	11A		KG20 T104/D-P003 KL51V	1	
28A	28A	25A	23A	15A	12A	KG32 T104/D-P003 KL51V	1	
40A						KG41 T104/D-P003 KL11V	2	
			21A		20A	KG20B T106/D-P003 KL11V	2	
			27A		25A	KG32B T106/D-P003 KL11V	2	
		40A	28A			KG41B T106/D-P003 KL11V	3	
			25A			KG20B T108/D-P003 KL11V	3	
					26A	KG32B T108/D-P003 KL11V	3	
				40A	35A	KG41B T108/D-P003 KL11V	3	
		60A				KG80C T106/D-P003 STM	4	
			60A			KG80C T108/D-P003 STM	4	

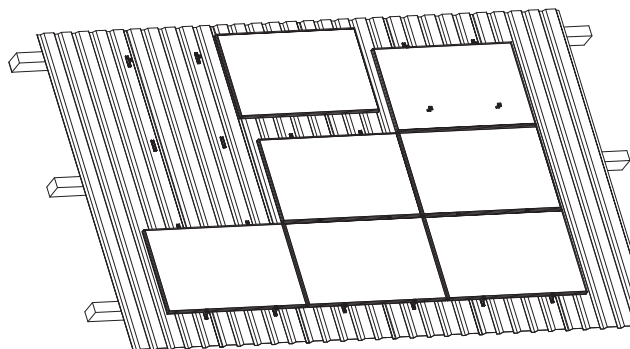
Two String DC Switch Disconnectors - Selection Chart DC-21B

Ratings Per String						Order Code No.	FIG.	
220V	280V	340V	400V	460V	500V			
25A	21A	20A	18A	11A		KG20 T104/GB-P103 KL51V	1	
28A	28A	25A	23A	15A	12A	KG32 T104/GB-P103 KL51V	1	
40A						KG41 T104/GB-P103 KL11V	2	
Ratings Per String						Order Code No.	FIG.	
330V	420V	510V	600V	690V	750V			
25A	21A	20A	18A	11A		KG20B T106/GB-P103 KL11V	2	
27A	27A	25A	23A	15A	12A	KG32B T106/GB-P103 KL11V	2	
40A	28A					KG41B T106/GB-P103 KL11V	3	
Ratings Per String						Order Code No.	FIG.	
440V	560V	680V	800V	920V	1000V			
25A	21A	20A	18A	11A		KG20B T108/GB-P103 KL11V	3	
26A	26A	25A	23A	15A	12A	KG32B T108/GB-P103 KL11V	3	
40A	28A					KG41B T108/GB-P103 KL11V	3	

Please select the correct switch disconnecter according to the maximum voltage and current output of all upstream PV modules, this must include all corrective factors according to relevant standards.

System Datasheet

MS+



General

System	PV-Mounting system for metal sheet roofs
Content	Mounting bracket, fastening elements, module clamps
System warranty	10 years
Application area	Pitched metal sheet roofing (except hydrogen sulfide exposition)
Roof covering	Trapezoidal metal sheet made of steel and aluminum Sandwich trapezoidal sheet according to manufacturer released
Roof types	Trapezoidal sheet metal roof and corrugated sheet metal roof made of steel and aluminium Sandwich plate according to manufacturer's approval
Metal sheet thickness	Steel: 0.4-1.25mm / Aluminum: 0.5-2 mm
Roof slope	min. 5°/max. 45°

System properties

Module tilt	Roof paralell
Material	Stainless steel, aluminum and EPDM

Modules

Type	PV-modules with frame height between 30-50 mm
Module size (max)	Length: unlimited; Width: unlimited
Module guidance	Vertical/Portrait

Certifications

TÜV	ID1111212485 according to 2PFG
Building authority approval	Z-14.1-4, Z-14.1-537 (Fastening material)
Water thightness	MFPA 5.1/10-535
MCS012	IK0197/02 Issue: 04
ETN	BT120019

Services

PV layout	Provided by Renusol
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MS+ 01 2020

EN | Renusol System Datasheet

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