

CLIENT APPROVAL SHEET

DRAWING CONTENTS

DRAWING TITLE	REVISION	DATE	BY	CHK	NOTES
SITE PLAN	RI	14/11/25	EG	NC	PDF SUPPLIED

PV PLOT DETAILS

BLOCK A	R4	28/11/25	EG	TH	PLOTS: BLOCK A
BLOCK B	R2	20/11/25	EG	TH	PLOTS: BLOCK B
BLOCK B (2)	R2	20/11/25	EG	TH	PLOTS: BLOCK B
BLOCK C	R3	02/12/25	EG	ND	PLOTS: BLOCK C
BLOCK C (2)	R1	02/12/25	EG	ND	PLOTS: BLOCK C
BLOCK D	R2	20/11/25	EG	TH	PLOTS: BLOCK D

REVISION INPUT

REVISION HISTORY

REVISION	DATE	DETAILS
R1	14/11/2025	INDICATIVE LAYOUT FOR PARCEL Q - BLOCKS A-D
R2	20/11/2025	STRING/SCHEMATICS ADDED TO DESIGN PACK
R3	25/11/2025	AMENDED AS PER COMMENTS PROVIDED
R4	28/11/2025	BLOCK NAMES AND ELECTRICAL LAYOUT ADDED
R5	28/11/2025	BLOCK A - PARTY WALL REVERTED TO R2
R6	02/12/2025	AMENDMENTS MADE TO BLOCKS B,C - PANELS OVER PARTY WALLS
R7	15/01/2025	INVERTER/ISOLATOR LOCATIONS, RISER LAYOUT AND DATASHEETS ADDED

STANDARD DETAILS

DRAWING TITLE	REVISION	DATE	BY	CHK	NOTES
BLOCK A - PV SCHEMATIC	RI	20/11/25	EG	TH	
BLOCK B - PV SCHEMATIC	RI	20/11/25	EG	TH	
BLOCK C - PV SCHEMATIC	R2	02/12/25	EG	TH	
BLOCK D - PV SCHEMATIC	RI	20/11/25	EG	TH	
ELECTRICAL LAYOUT - RISER CUBOARD	RI	28/11/25	EG	TH	
ELECTRICAL LAYOUT - SECTION DETAIL	RI	19/12/25	EG	TH	
BLOCK A-D - INVERTER/ISOLATOR LOCATIONS	RI	19/12/25	EG	TH	
EQUIPMENT DATASHEETS AND CERTIFICATION					

PLOT NUMBERS WITH *
AGAINST THEM DO NOT
ADHERE TO SAP ORIENTATION.
PLEASE CHECK THE TARGET IS
STILL ACHIEVED.

SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
CLIENT CHECKING SHEET
SITE ID: 09649PV

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DY11 7SL

CLIENT CHECKING - WE REQUIRE THE DESIGNS TO BE CHECKED, SIGNED AND RETURNED BEFORE PROJECTS CAN BE HANDED TO OPERATIONS

TICK BOX APPLICABLE		CLIENT NOTES	
CHECKED AND AGREED			
CHECKED REQUIRES AMENDS			CLIENT SIGNATURE (ABOVE)
REJECTED			DATE:

IMPORTANT INFORMATION - SUMMARY OF SCOPE

Eco2solar to decommission existing system in parcel Q - Blocks A,B,C,D. PV panels to be removed and reinstalled with clearline fusion/virdiaIn 445W panels. All datasheets have been added to the back of this pack.

All drawings have been designed using information provided by your teams, any housetype discrepancies resulting in failed installs will be reviewed by Eco2solar and charges may be applicable for redesign fees and aborted visits.

Roof must be at felt and batten stage prior to Eco2solar first fix failure to comply will result in aborted visits fees and delay.

Fire stopping is the responsibility of the builder. All inter-batten fire stopping should be in place prior to our first fix attendance.

Clear scaffold access is required to all roof levels on elevations designed for solar installation - access should not require operatives to climb barriers to access ladders. Clear loading bays are required.

It is the roofing contractors responsibility to neatly tile around the array, making the required tile cuts and correctly dressing the bottom flashings.

Prior to second fix the plot must have permanent power form the grid - we cannot accept plots powered by generator or DNO generator. This is due to PV export.

- Eco2solar will install the specified cabling from inverter location to distribution board - specified on schematics
- Eco2solar will install the specified size 3-phase MCB/RCBO installed (to be confirmed, dependant on cable run length)
- The plot will have the specified size main switch in the distribution board

Coils of cable left in the loft will be clipped above the level of the insulation to prevent disturbing the final insulation

Any plots where the inverter is not in the loft. Only PV Ultra SWA cable will be accepted. Standard cable or SWA cable is not in line with regulations (to be provided by Eco2solar if required)

Three phase inverters require minimum 300mm ventilation space on all sides. Inverter locations confirmed within the third/second floor electrical riser of each block. Any additional equipment that interferes with the clearance may result in a delay with completion

Sites where DNO approval has not yet been received will require the isolator to be padlocked. Removing the padlock prior to consent is an offence and can lead to fines and prosecution

Please ensure that you include schematics in your review of our information. This is important for your electrical contractor to have reference to for their electrical 1st fix to avoid any delays to programme

Failure to comply will result in aborted visit fees and delay.

Inclusions/Exclusions	Supplied and Installed by	
	Eco2solar	Others
MCS Approved PV Panels	X	
MCS Approved Fixing System for System Quoted	X	
Single Core DC Cable	X	
DC Isolators	X	
Grid Approved Inverters including Fire Retardant Board	X	
Generation Meter	X	
AC Isolators x2	X	
DC Works Fully Installed by Eco2solar	X	
Commissioned by Eco2solar	X	
Full Working Drawings	X	
DNO Applictaion	X	
User Manuals/Handover Packs	X	
Export Limitation Devices (if required) at additional cost	X	
6mm² AC supply cable installed from consumer unit (CU)/distribution board (DB) to inverter locTaion. (Please see site guide, schematics and technical plot schedule for detailed specification)	X	
CAT5/6 STP cable installed from external meter box to inverter location	N/A	
Type A Bi Directional Double Pole RCBO in the high integrity CU/DB	X	
1.2m x 1.2m Landing Deck/platform next to the loft hatch (inverter in loft)	N/A	
Provide x2 solid vertical timber upstands next to the loft hatch 600mm apart fo inverter board (inverter in loft)	n/a	
PV Ultra SWA or DC cable containment within the building (subject to site visit)	x	
Connection charges or network study costs from DNO		X
Heat/smoke detectors & fire stopping on party walls		X
Production of BS7671 Certificate for AC cable installed by others	x	
Lightning protection and surge protection for PV system		X
Sacrificial layer/membrane (if needed) on flat roof		X
Cable entry provided		X
Installation of import/export meter or GSM meter		X
Structural assessment/calculations to confirm roof can support the loads generated by the PV system		X
Application for planning and building control approval		X
Choice of electricity supplier, informing electricity supplier of installation or negotiation of SEG		X
Safe working environment (scaffolding/edge protection)		X
Site access/lifting equipment/banksman/slinger/signaller		X
Off-loading facilities		X
Site welfare		X
Parking		X



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ARC BOXES TO BE FITTED - 2 PER STRING
INVERTER TO BE LOCATED IN
TOP FLOOR RISER

①

SOLAR PV DESIGN -
ELEVATION TREATMENT MAY VARY

SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK A - BRIDLE HOUSE
SITE ID: 09649PV



AS SHOWN - BLOCK A

MIRRORED - NONE

FRONT ELEVATION

②

STRING KEY

● STRING 1	9	● STRING 2	9
● STRING 3	12	● STRING 4	12
● STRING 5	0	● STRING 6	0
● STRING 7	0	● STRING 8	0

✦ DC CABLE ENTRY 2ND FELT LAP T TIGO OPTIMISER

DRAWN BY: EG
DATE: 28/11/25
CHECKED BY: TH
DATE: 28/11/25
POSITION: PORTRAIT/LANDSCAPE
REVISION: R4
SCHEMATIC CODE: BLOCK A PV SCHEMATIC

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AS SHOWN - BLOCK A

MIRRORED - NONE

SIDE ELEVATION

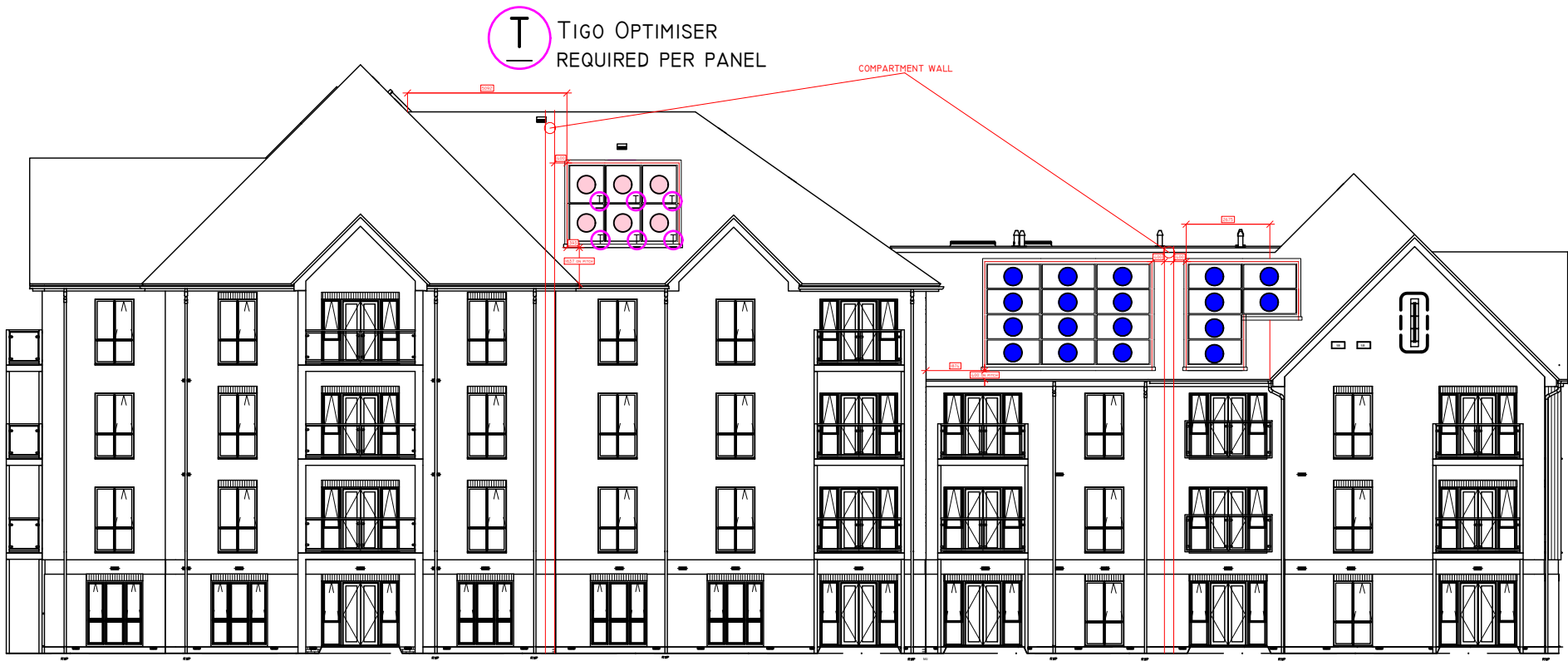
ARC BOXES TO BE FITTED - 2 PER STRING
INVERTER TO BE LOCATED IN
TOP FLOOR RISER



AS SHOWN - BLOCK B

MIRRORED - NONE

FRONT ELEVATION



AS SHOWN - BLOCK B

MIRRORED - NONE

REAR ELEVATION

SOLAR PV DESIGN -
ELEVATION TREATMENT MAY VARY

SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK B - KIRKPATRICK
HOUSE
SITE ID: 09649PV

STRING KEY					
●	STRING 1	18	●	STRING 2	18
●	STRING 3	12	●	STRING 4	0
●	STRING 5	0	●	STRING 6	0
●	STRING 7	0	●	STRING 8	0

✦ DC CABLE ENTRY
2ND FELT LAP

T TIGO OPTIMISER

DRAWN BY: EG
DATE: 20/11/25
CHECKED BY: TH
DATE: 20/11/25
POSITION: PORTRAIT/LANDSCAPE
REVISION: R2
SCHEMATIC CODE: BLOCK B PV SCHEMATIC

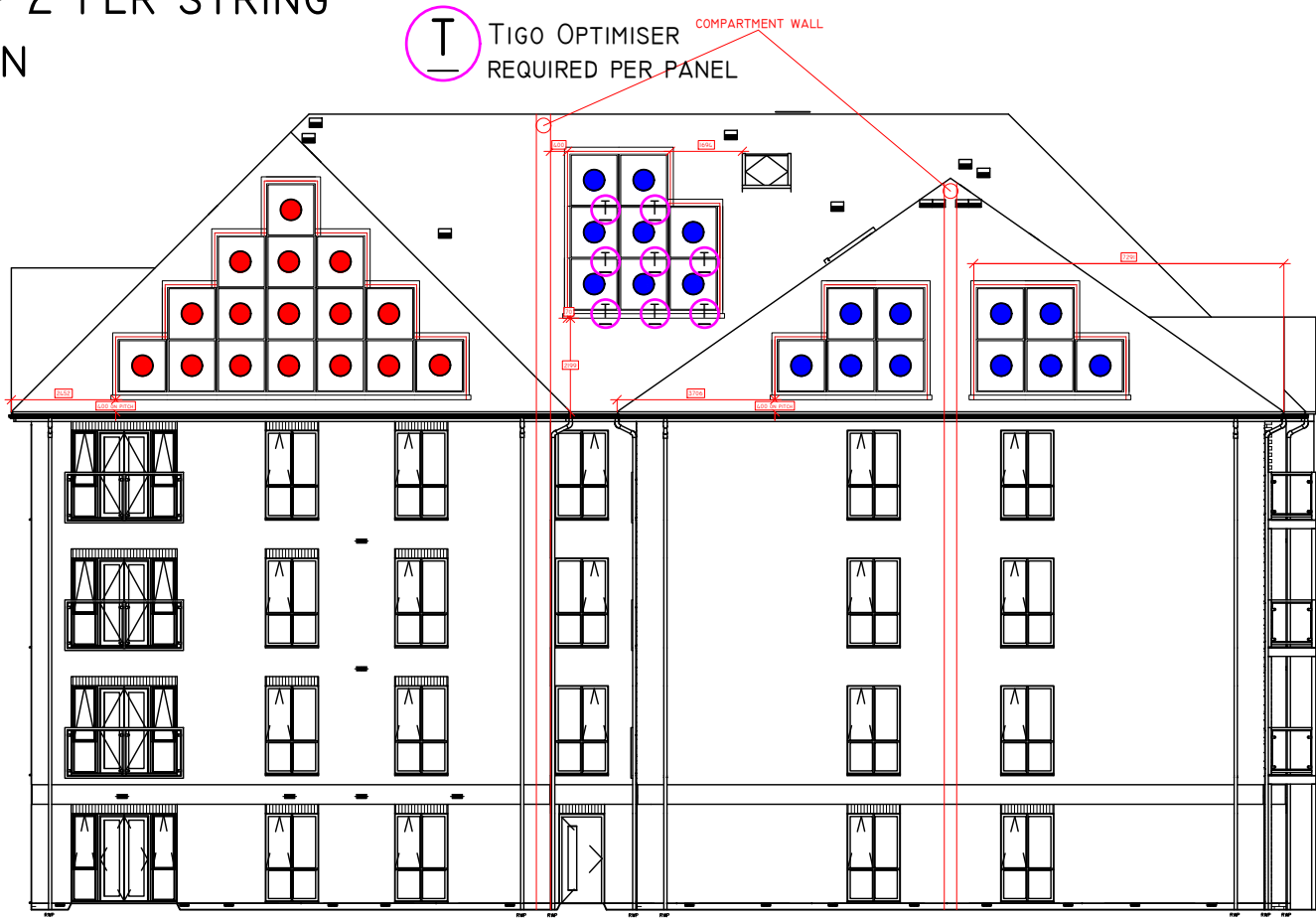
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ARC BOXES TO BE FITTED - 2 PER STRING
INVERTER TO BE LOCATED IN
TOP FLOOR RISER



AS SHOWN - BLOCK C
MIRRORED - NONE

FRONT ELEVATION

SOLAR PV DESIGN -
ELEVATION TREATMENT MAY VARY

SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK C - CARRIAGE HOUSE
SITE ID: 09649PV

STRING KEY					
	STRING 1	16		STRING 2	18
	STRING 3	7		STRING 4	7
	STRING 5	0		STRING 6	0
	STRING 7	0		STRING 8	0

✦ DC CABLE ENTRY
2ND FELT LAP

⌊ TIGO OPTIMISER

DRAWN BY: EG
DATE: 02/12/25
CHECKED BY: ND
DATE: 02/12/25
POSITION: PORTRAIT
REVISION: R3
SCHEMATIC CODE: BLOCK C PV SCHEMATIC

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AS SHOWN - BLOCK C
MIRRORED - NONE

SIDE ELEVATION

ARC BOXES TO BE FITTED - 2 PER STRING
INVERTER TO BE LOCATED IN
TOP FLOOR RISER

1

SOLAR PV DESIGN -
ELEVATION TREATMENT MAY VARY

SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK C - CARRIAGE HOUSE
(2)
SITE ID: 09649PV



STRING KEY

● STRING 1	0	● STRING 2	0
● STRING 3	0	● STRING 4	0
● STRING 5	10	● STRING 6	0
● STRING 7	0	● STRING 8	0

✦ DC CABLE ENTRY
2ND FELT LAP

T TIGO OPTIMISER

DRAWN BY: EG
DATE: 02/12/25
CHECKED BY: ND
DATE: 02/12/25
POSITION: PORTRAIT
REVISION: RI
SCHEMATIC CODE: BLOCK C PV SCHEMATIC

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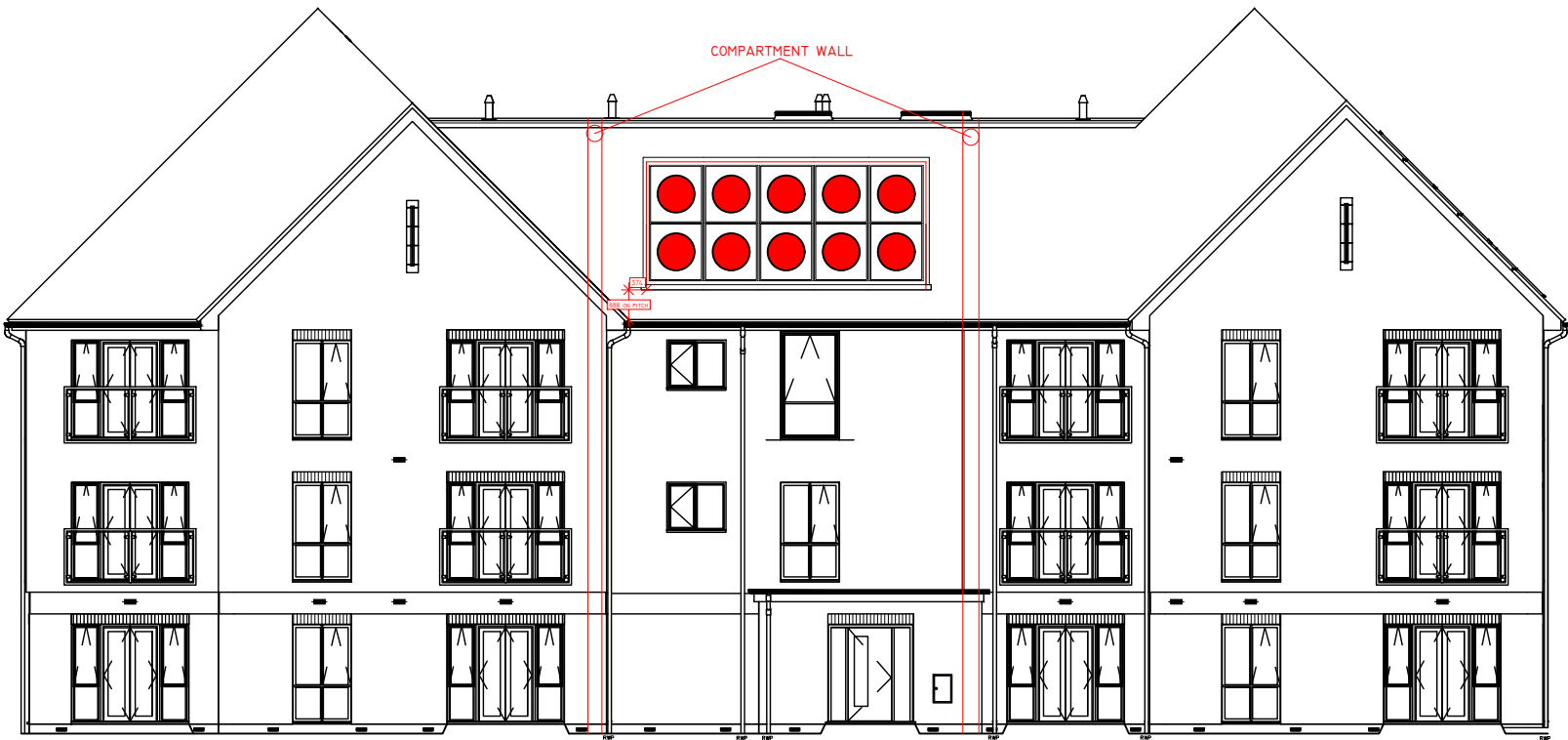
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DY11 7SL

AS SHOWN - BLOCK C

MIRRORED - NONE

SIDE ELEVATION

ARC BOXES TO BE FITTED - 2 PER STRING
INVERTER TO BE LOCATED IN
TOP FLOOR RISER



AS SHOWN - BLOCK D

MIRRORED - NONE

FRONT ELEVATION

SOLAR PV DESIGN -
ELEVATION TREATMENT MAY VARY

SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK D - SADDLE HOUSE
SITE ID: 09649PV

STRING KEY					
●	STRING 1	10	●	STRING 2	18
●	STRING 3	18	●	STRING 4	0
●	STRING 5	0	●	STRING 6	0
●	STRING 7	0	●	STRING 8	0

✦ DC CABLE ENTRY
2ND FELT LAP

T TIGO OPTIMISER

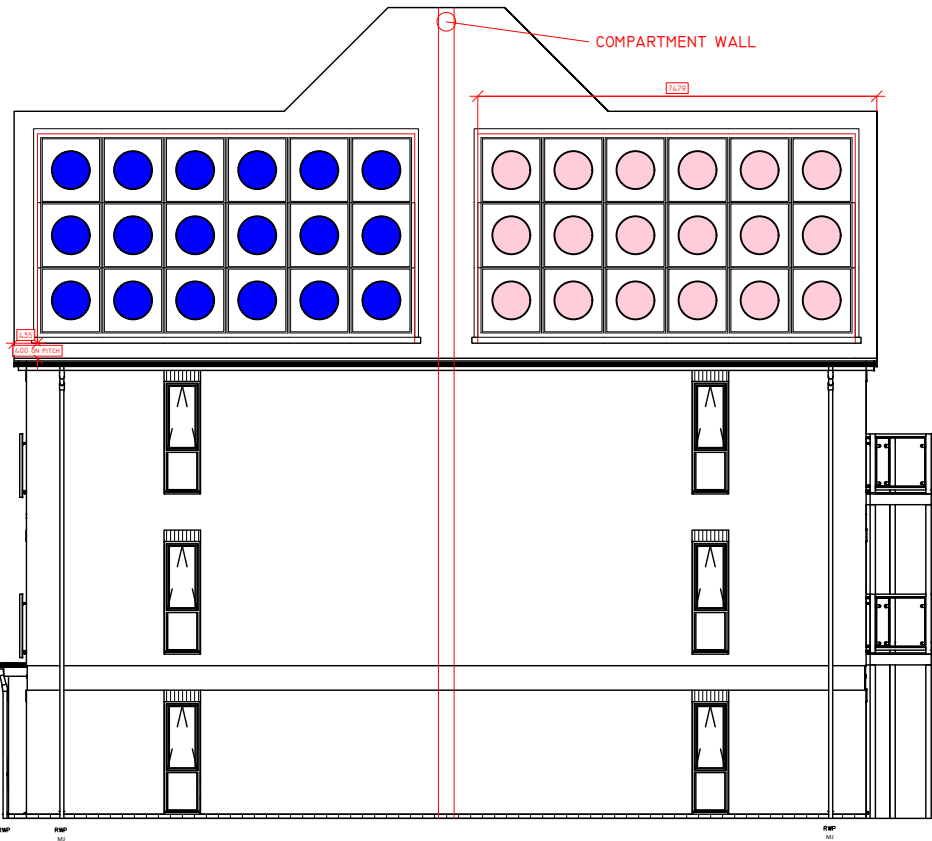
DRAWN BY: EG
DATE: 20/11/25
CHECKED BY: TH
DATE: 20/11/25
POSITION: PORTRAIT/LANDSCAPE
REVISION: R2
SCHEMATIC CODE: BLOCK D PV SCHEMATIC

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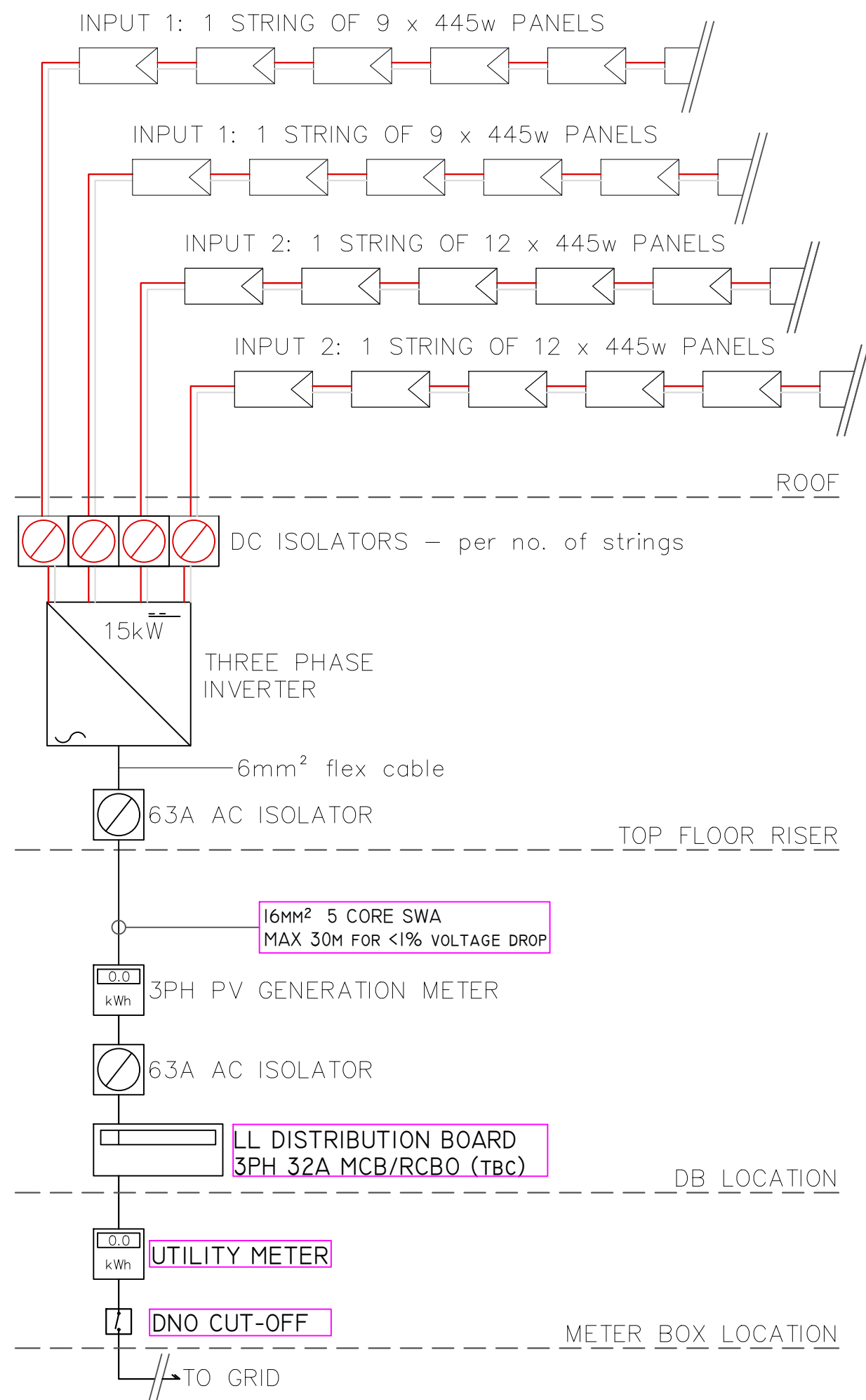
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AS SHOWN - BLOCK D

MIRRORED - NONE

SIDE ELEVATION



SCHEMATIC LIBRARY

BLOCK A - PV SCHEMATIC

All DC/AC works to be carried out by Eco2Solar. MCB/RCBO to be confirmed on site depending on cable route.

Any penetration through the compartment walls are to be fire sealed by client.

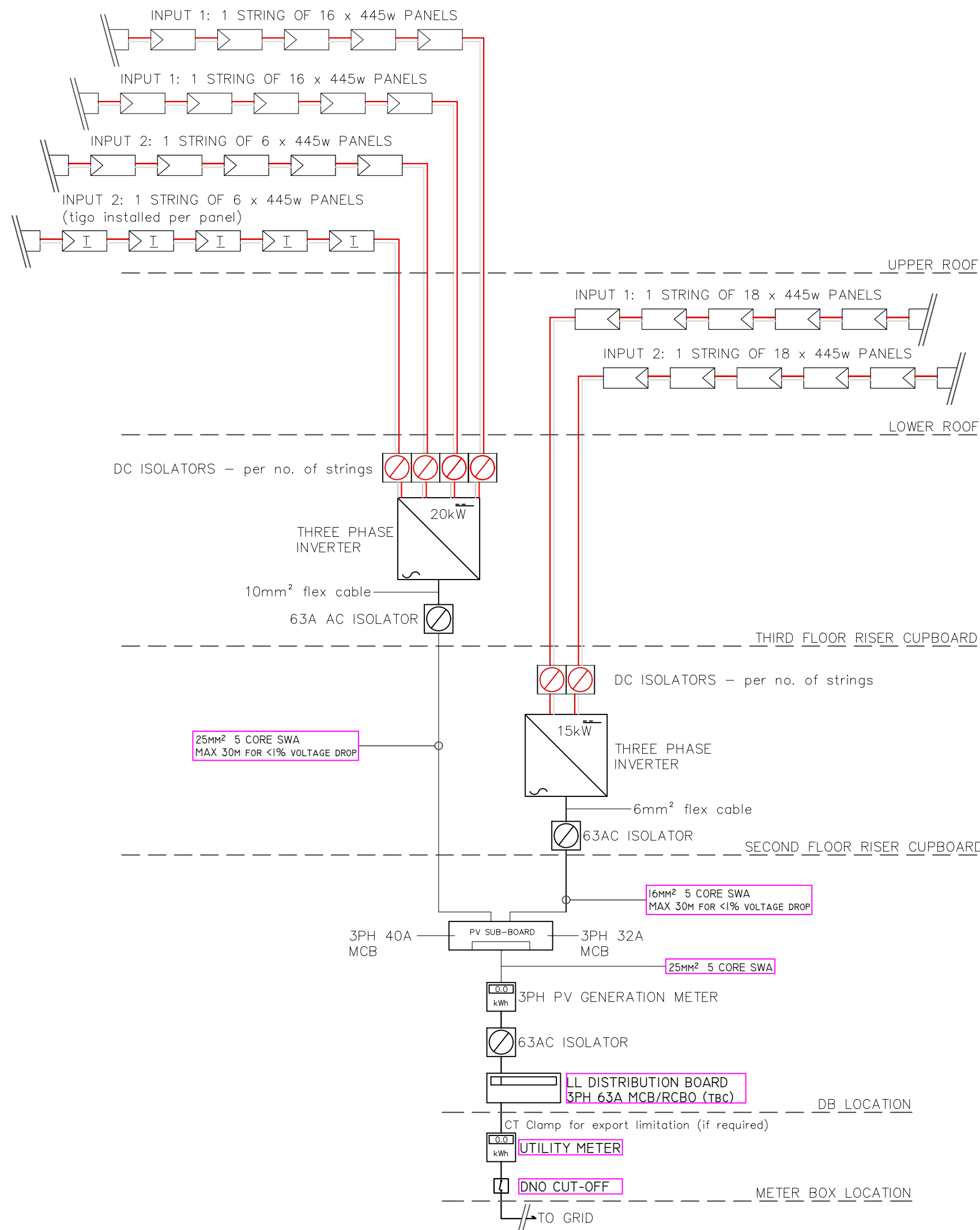
DRAWN BY: EG
DATE: 20/11/25
CHECKED BY: TH
DATE: 20/11/2025

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SCHEMATIC LIBRARY

BLOCK B- PV SCHEMATIC

All DC/AC works to be carried out by Eco2Solar. MCB/RCBO to be confirmed on site depending on cable route.

Any penetration through the compartment walls are to be fire sealed by client.

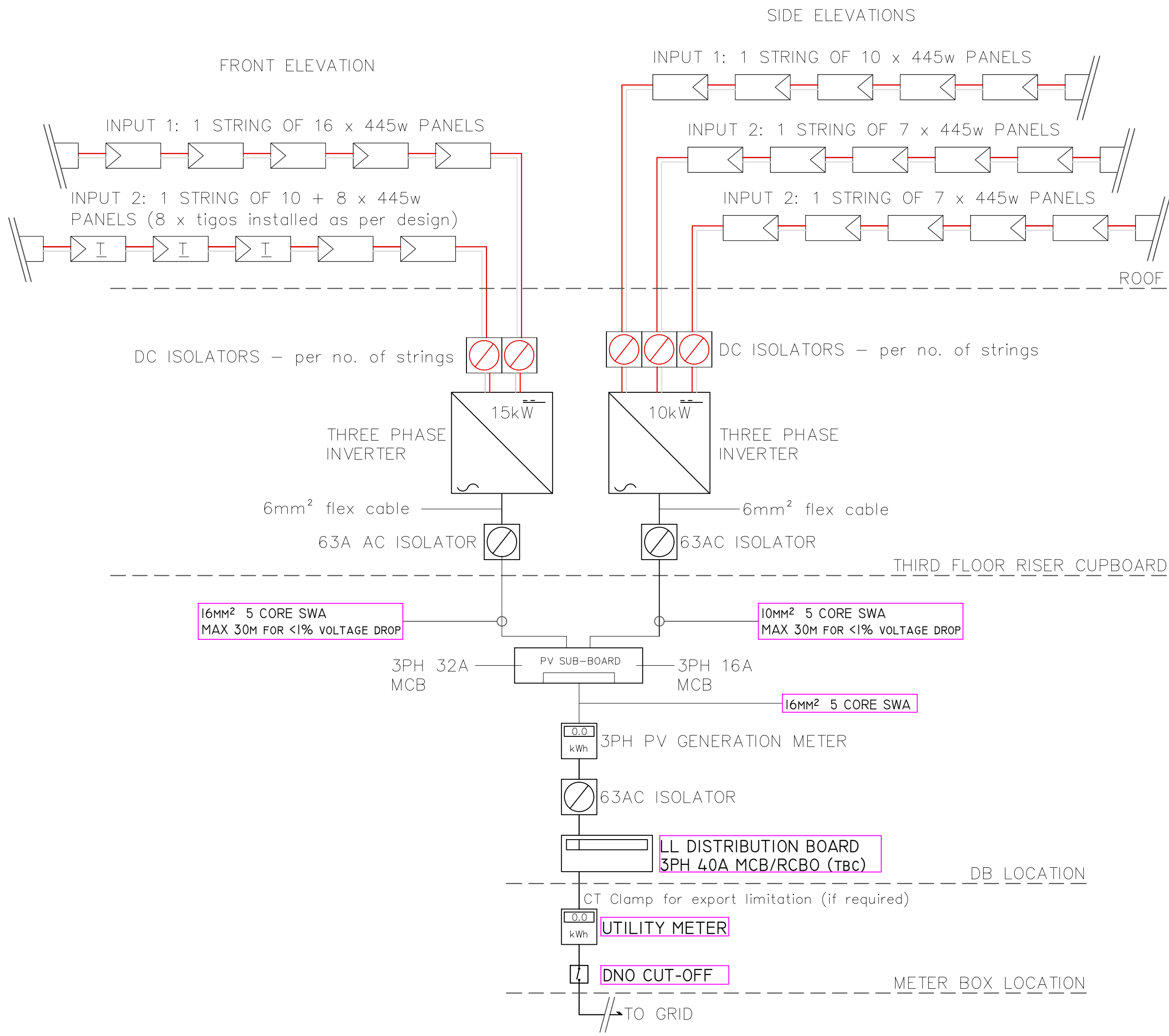
DRAWN BY: EG
DATE: 20/11/25
CHECKED BY: TH
DATE: 20/11/2025

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SCHEMATIC LIBRARY

BLOCK C- PV SCHEMATIC

All DC/AC works to be carried out by Eco2Solar. MCB/RCBO to be confirmed on site depending on cable route.

Any penetration through the compartment walls are to be fire sealed by client.

"3PH 10k inverter location TBC - dependant on space within riser cupboard. Propose 2nd floor riser cupboard if space is restricted - PV Ultra SWA may be required"

DRAWN BY: EG

DATE: 02/12/25

CHECKED BY: TH

DATE: 02/12/2025

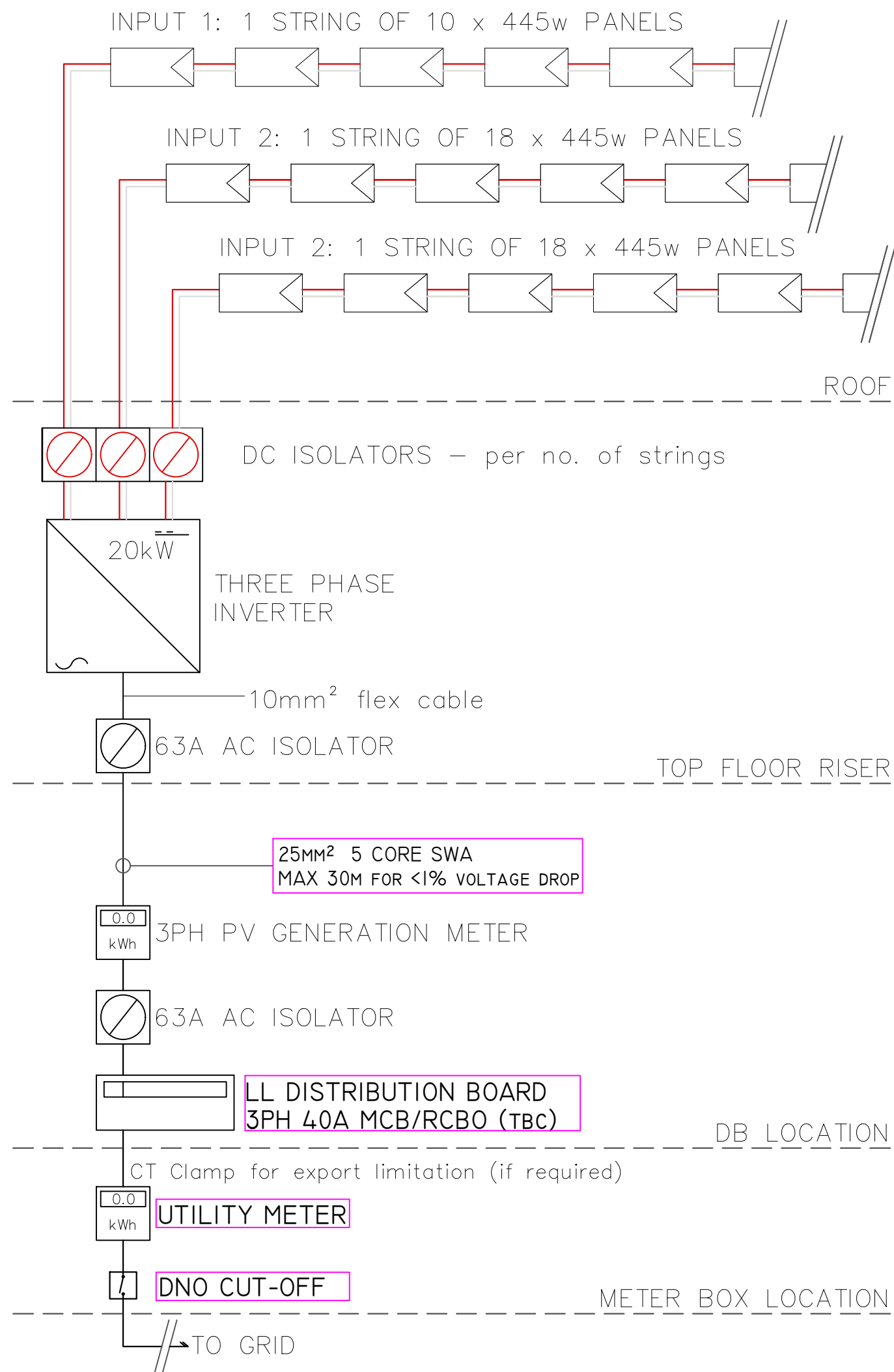
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SCHEMATIC LIBRARY

BLOCK D- PV SCHEMATIC

All DC/AC works to be carried out by Eco2Solar. MCB/RCBO to be confirmed on site depending on cable route.

Any penetration through the compartment walls are to be fire sealed by client.

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DATE: 20/11/25
CHECKED BY: TH
DATE: 20/11/2025

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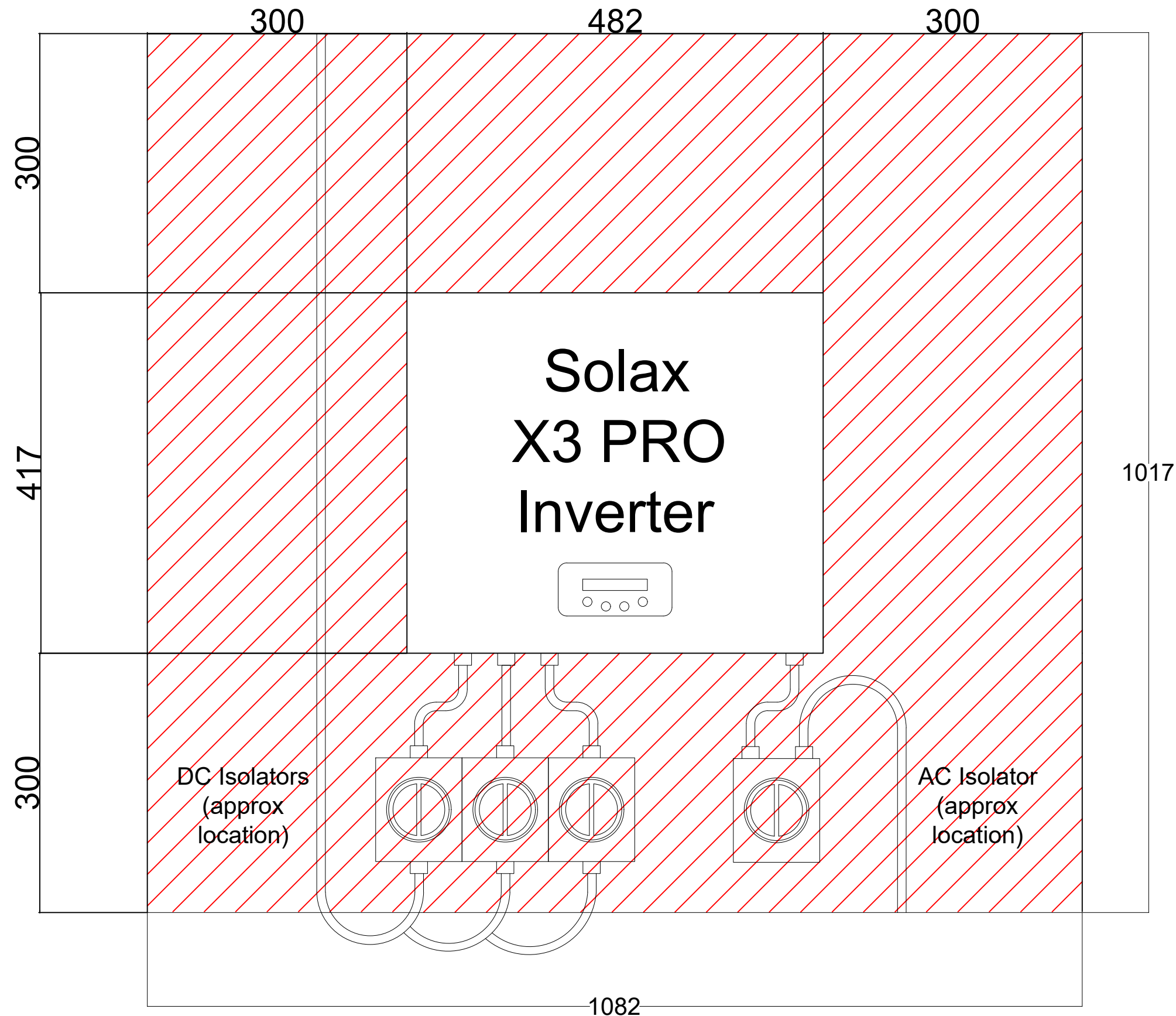
NOT TO SCALE

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ELECTRICAL LAYOUT - RISER CUPBOARD

- Isolator locations approximate
- Inverter dimensions 482mm x 417mm x 181mm (W x H x D)
- 300mm clearance required on all sides of inverter



DRAWN BY: EG
DATE: 28/11/25
CHECKED BY: TH
DATE: 28/11/2025

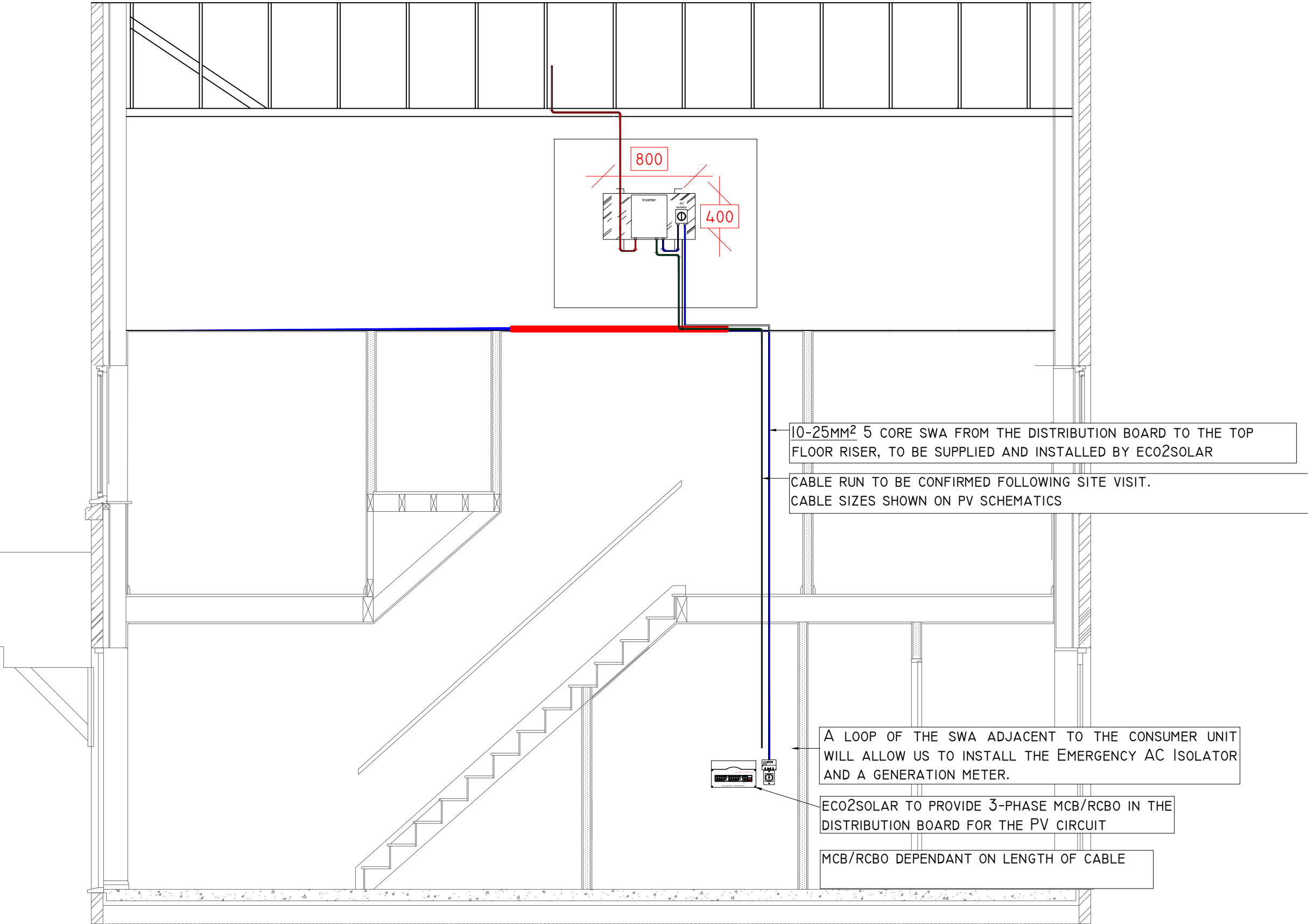
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ELECTRICAL LAYOUT - ELECTRICAL RISER CUPBOARD



SOLAR PV ARRANGEMENT CREST NICHOLSON SOUTH READING ARBORFIELD ELECTRICAL LAYOUT - SECTION DETAIL

SITE ID: 09649PV

DRAWN BY: EG
DATE: 05/01/26
CHECKED BY: NC
DATE: 05/01/26
SCALE @ A3: NTS
REVISION: RI

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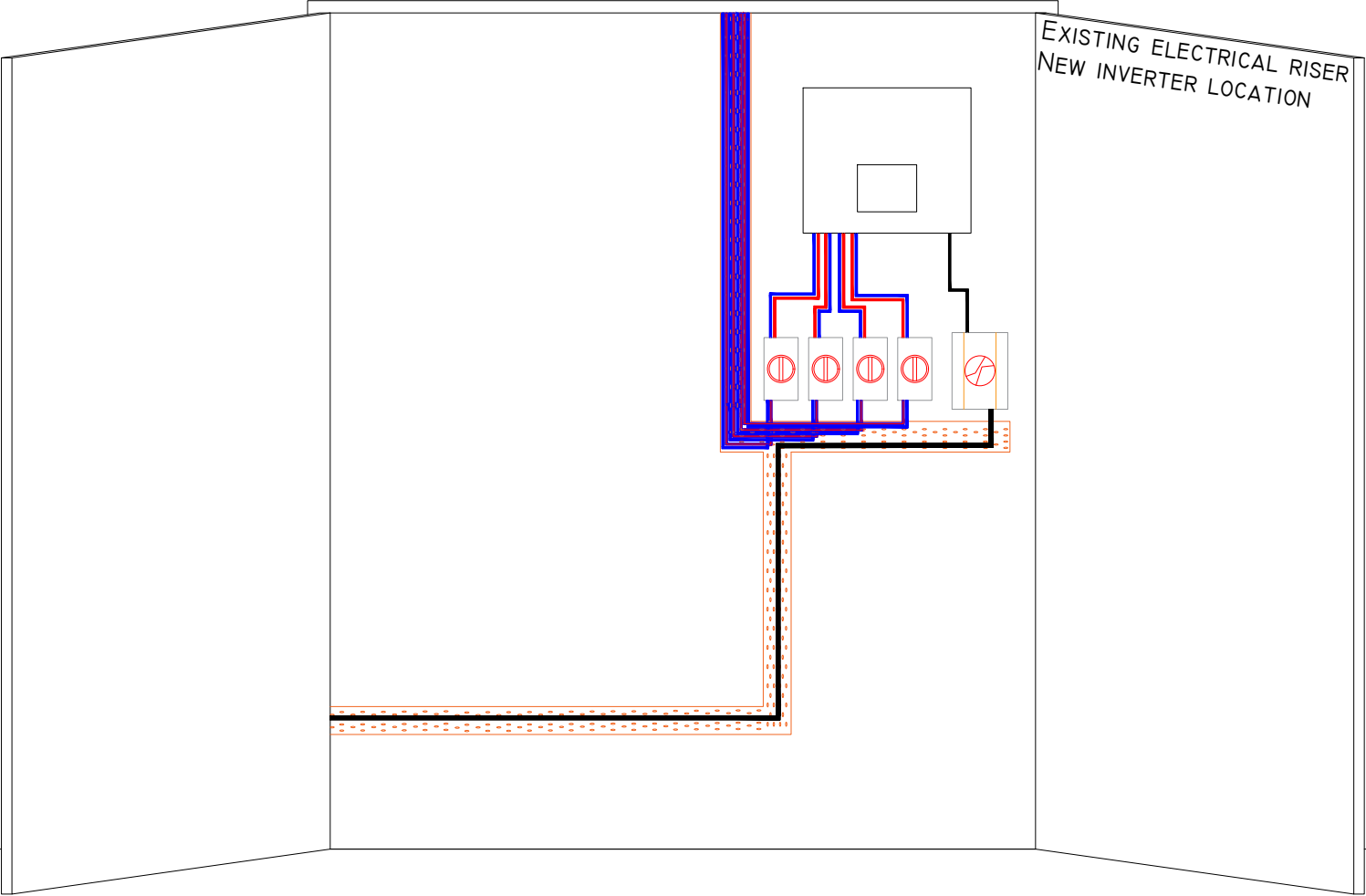
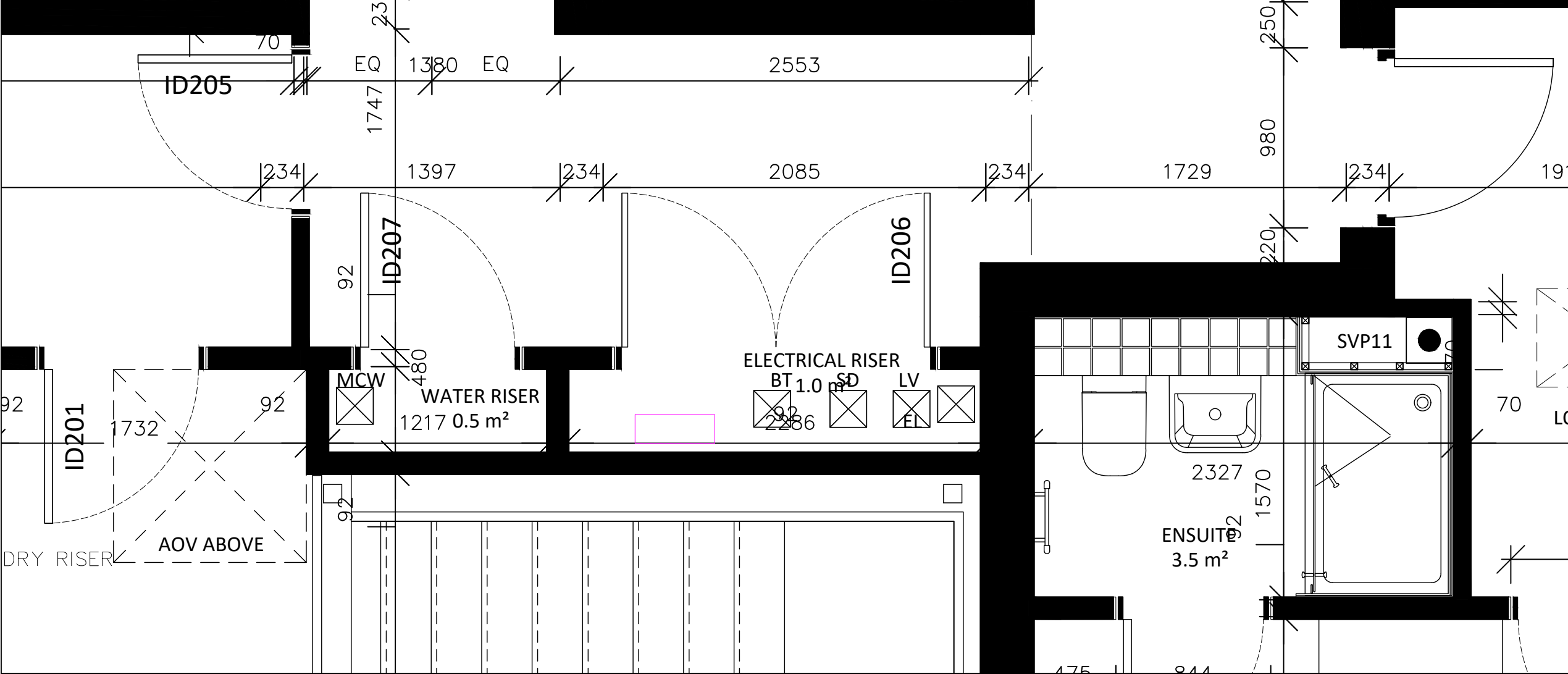
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SOLAR PV DESIGN -
ELEVATION TREATMENT MAY VARY

SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK A - INVERTER
LOCATION
SITE ID: 09649PV

INVERTER LOCATION



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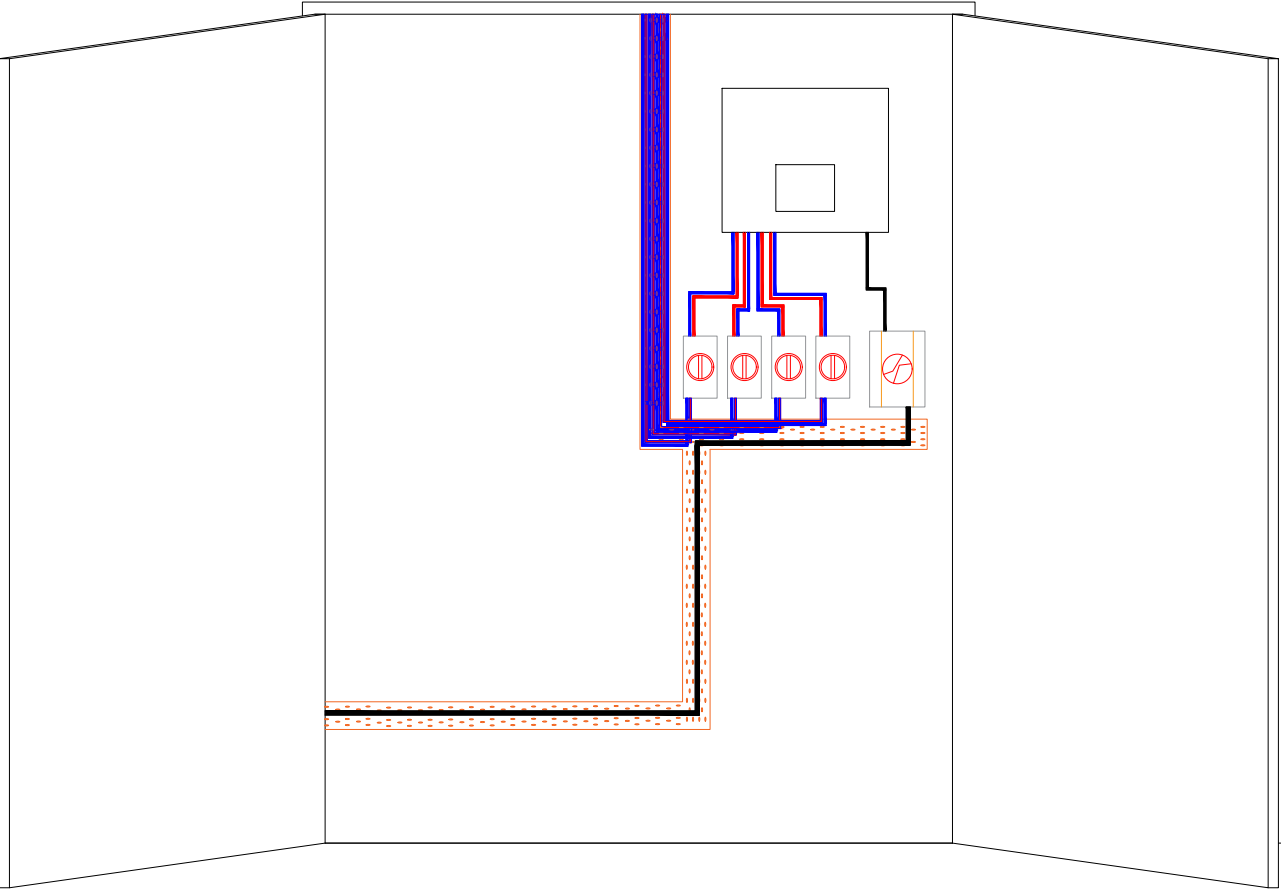
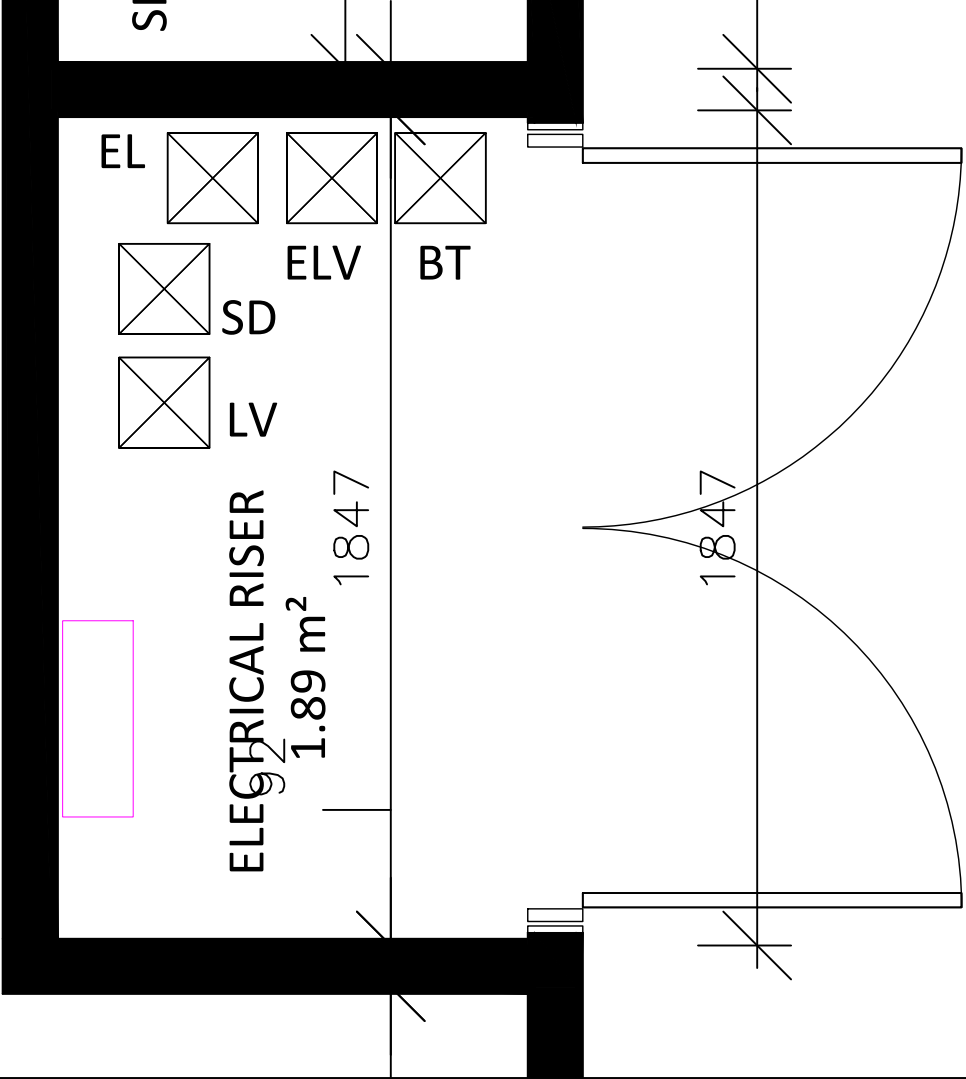
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SOLAR PV DESIGN -
ELEVATION TREATMENT MAY VARY

SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK B - INVERTER
LOCATION THIRD FLOOR
SITE ID: 09649PV

 INVERTER LOCATION



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SOLAR PV DESIGN -
ELEVATION TREATMENT MAY VARY

SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK B - INVERTER
LOCATION SECOND FLOOR
SITE ID: 09649PV

INVERTER LOCATION

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SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK C - INVERTER
LOCATION THIRD FLOOR
SITE ID: 09649PV

INVERTER LOCATION
(3PH 10K LOCATION TBC)

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SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK C - INVERTER
LOCATION SECOND FLOOR
SITE ID: 09649PV

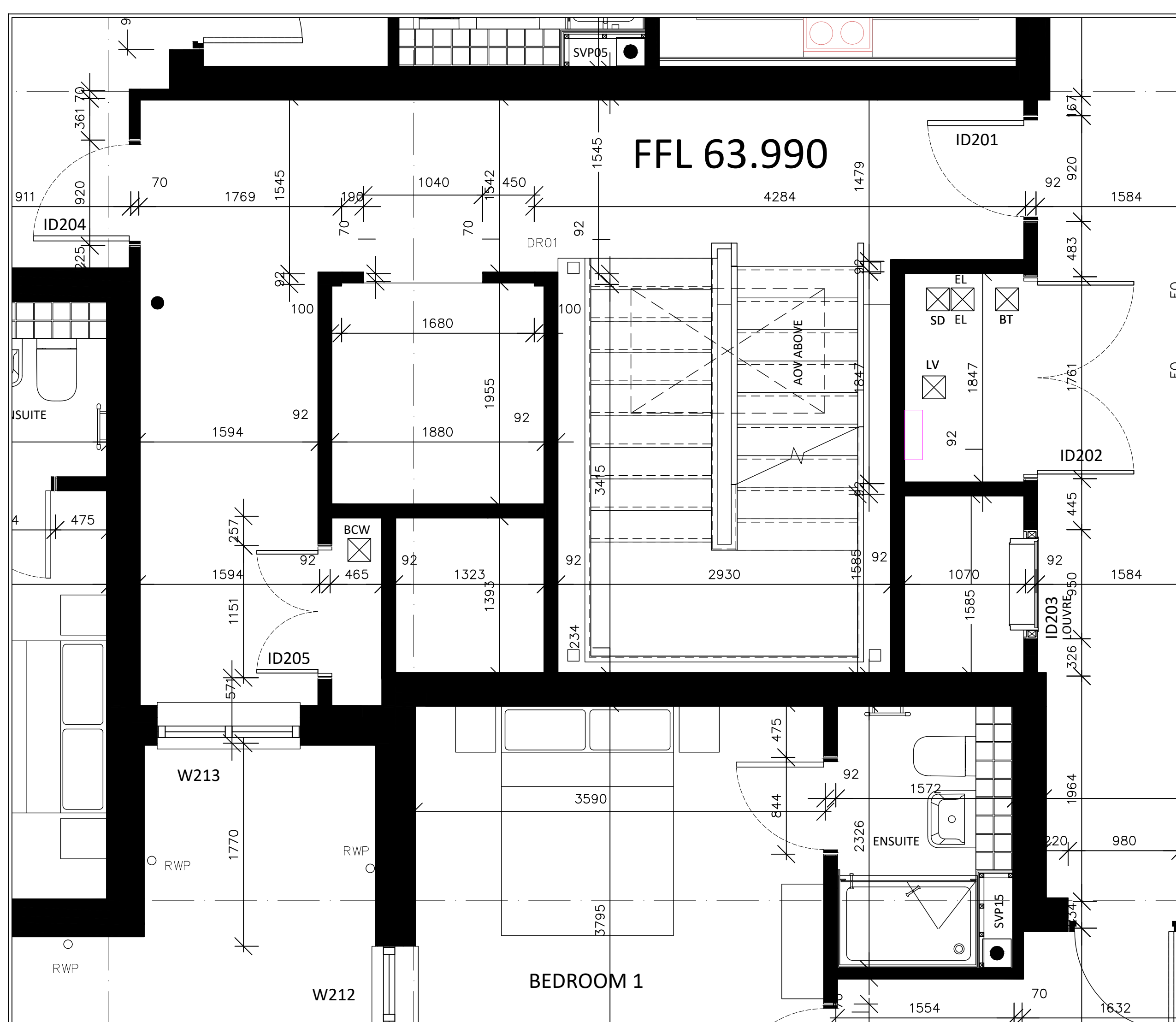
INVERTER LOCATION

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SOLAR PV DESIGN -
ELEVATION TREATMENT MAY VARY

SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK D - INVERTER
LOCATION
SITE ID: 09649PV

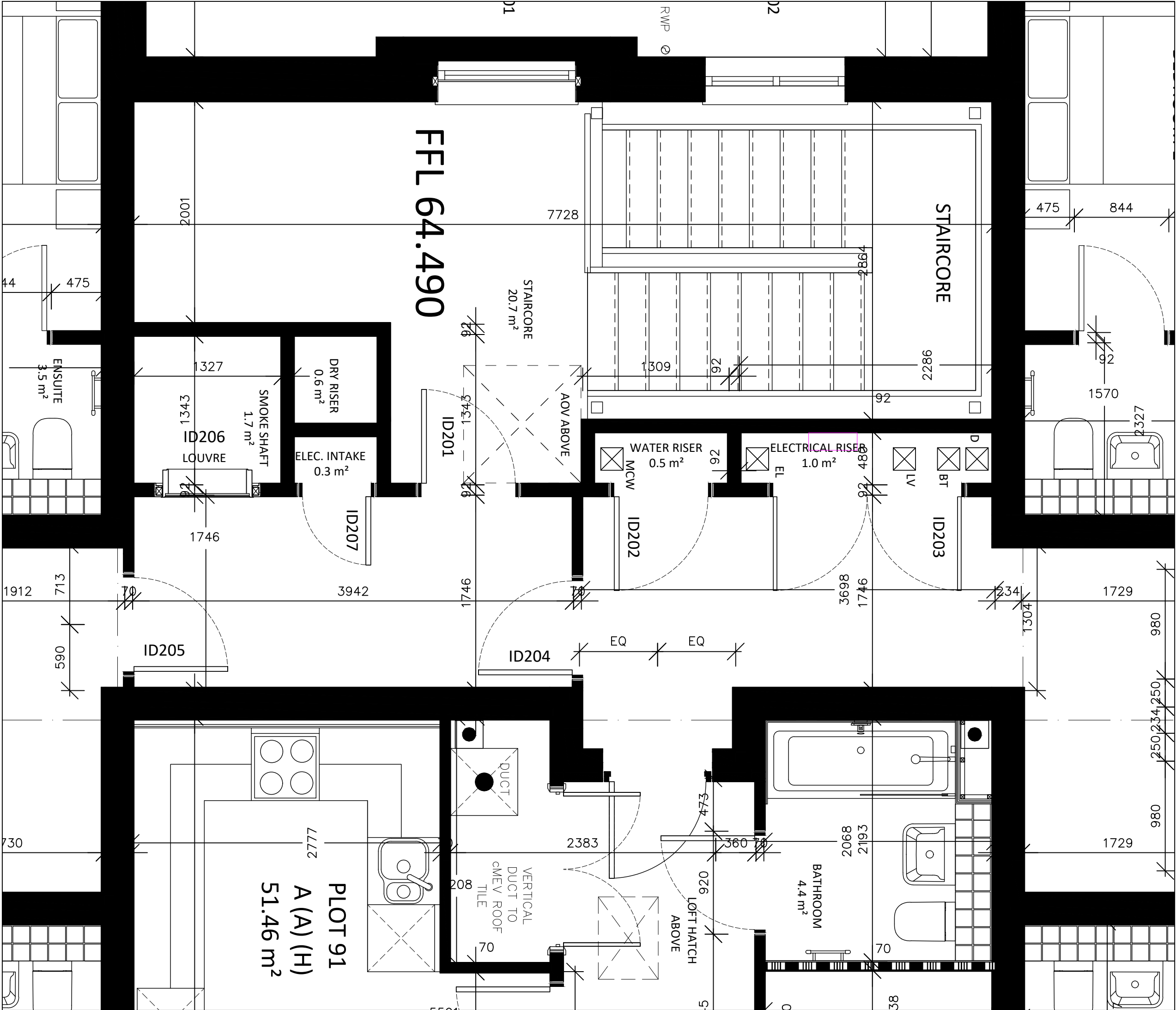
INVERTER LOCATION

DISCLAIMER:
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INCORRECT INFORMATION SUPPLIED FROM THE CLIENT

NOT TO SCALE



SUMMERFIELD HOUSE, ARTHUR DRIVE
H00 FARM INDUSTRIAL ESTATE
KIDDERMINSTER, WORCESTERSHIRE
DY11 7SL



SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK A - GF ISOLATOR
SITE ID: 09649PV

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DY11 7SL

SUMMERFIELD HOUSE, ARTHUR DRIVE
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KIDDERMINSTER, WORCESTERSHIRE
DY11 7SL

SOLAR PV DESIGN -
ELEVATION TREATMENT MAY VARY

SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK B - GF ISOLATOR
SITE ID: 09649PV

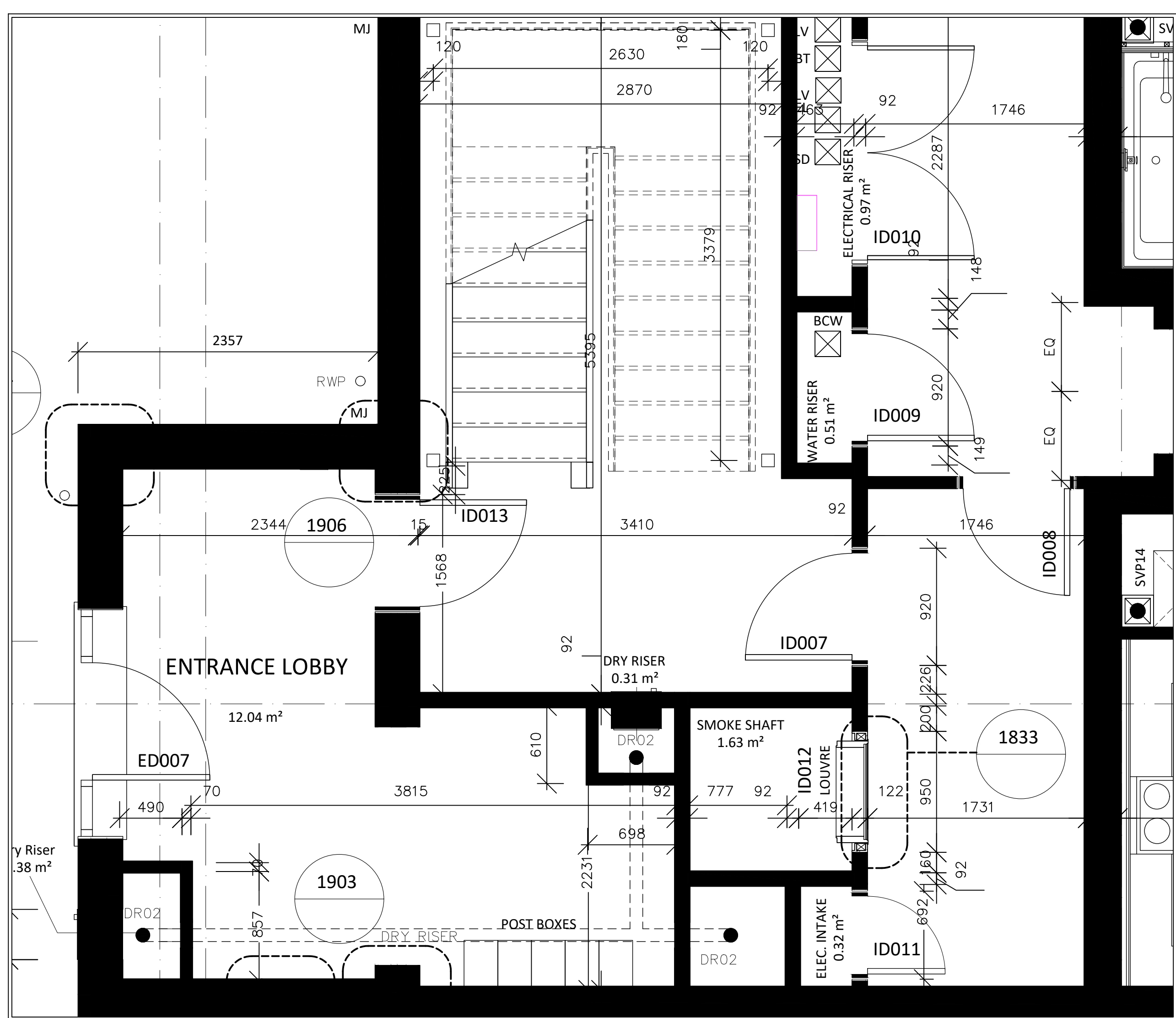
ISOLATOR/METER LOCATION

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DY11 7SL



SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK C - GF ISOLATOR
SITE ID: 09649PV

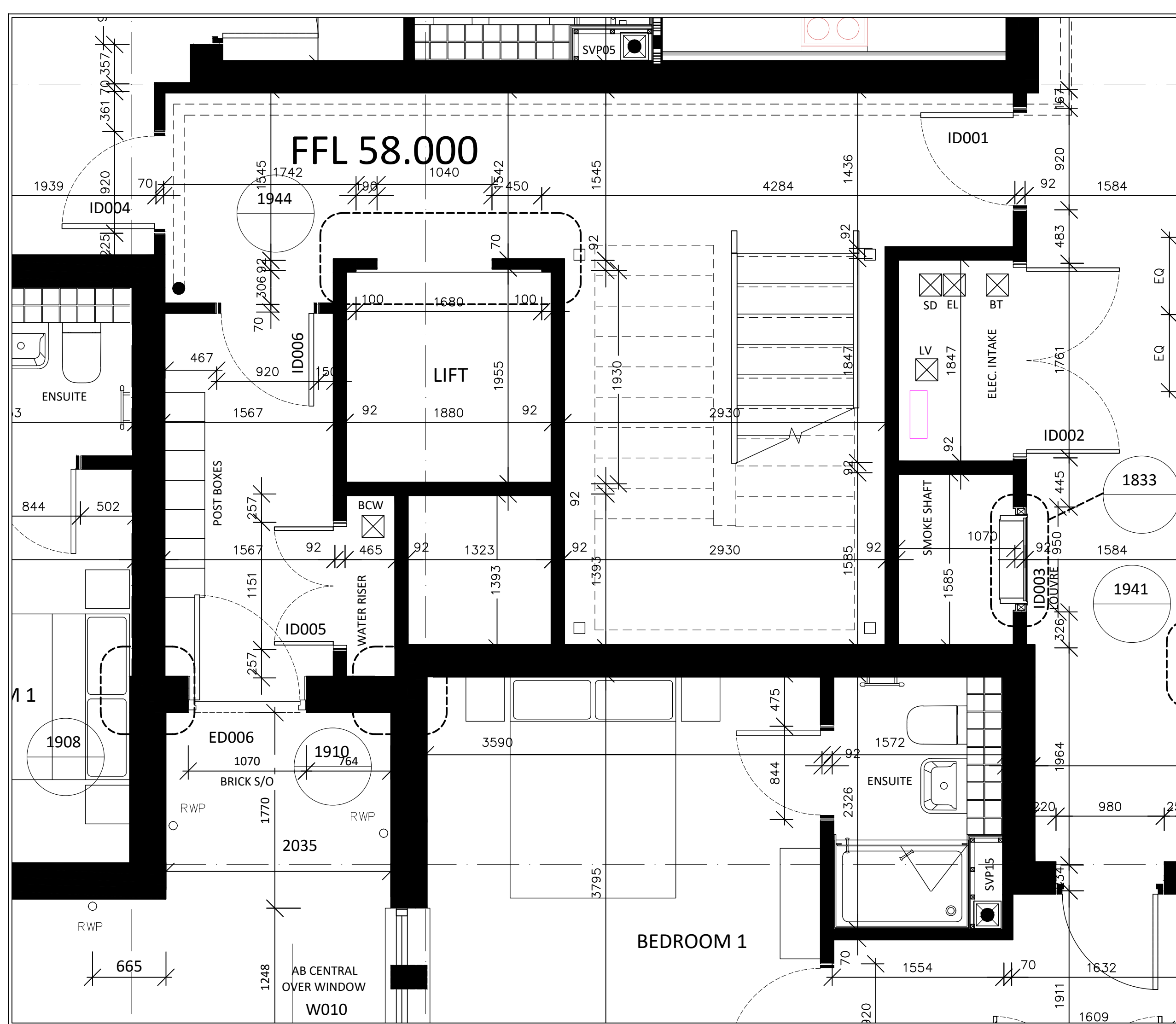
ISOLATOR/METER LOCATION

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DY11 7SL



SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
BLOCK D - GF ISOLATOR
SITE ID: 09649PV

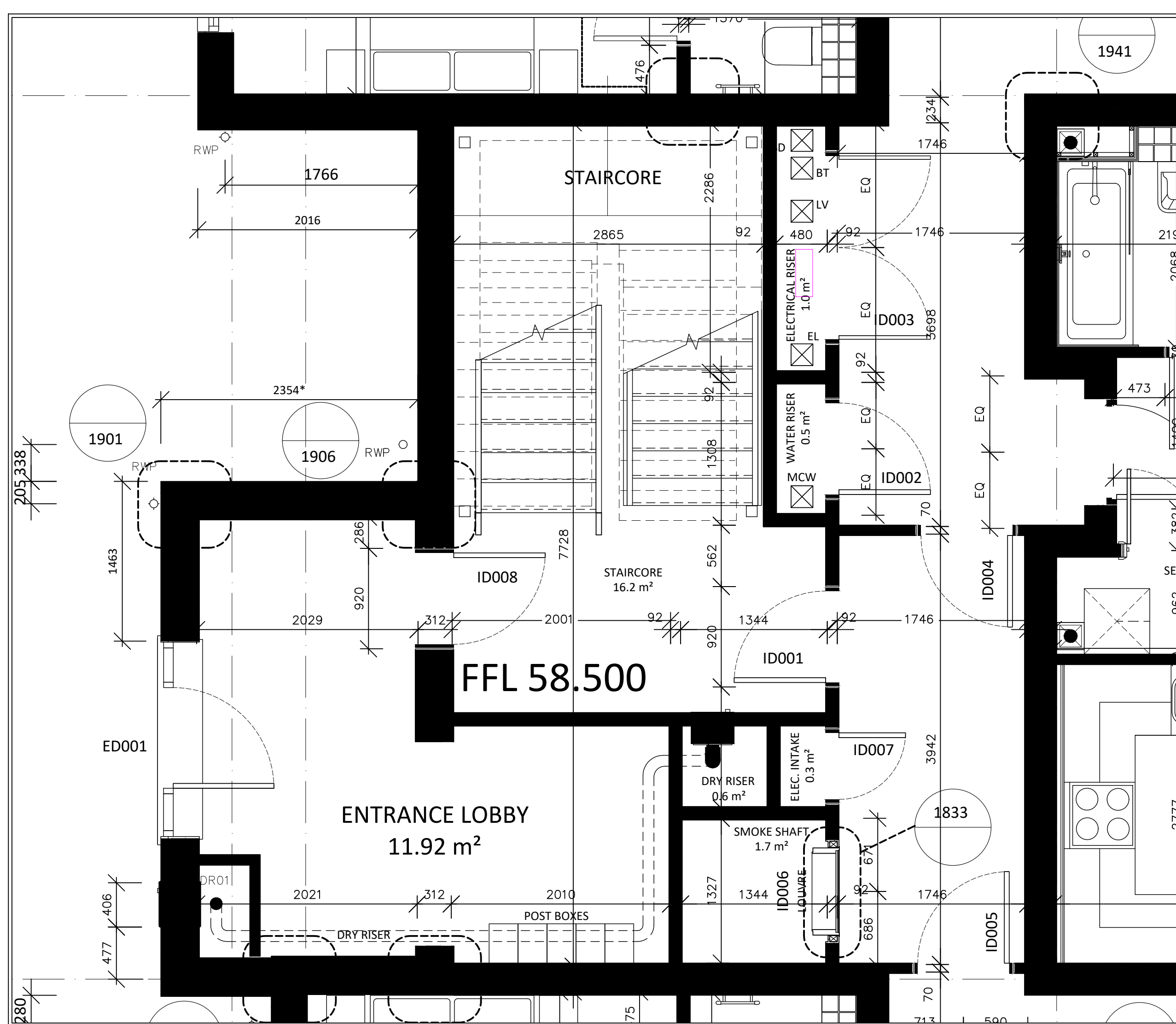
ISOLATOR/METER LOCATION

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NOT TO SCALE

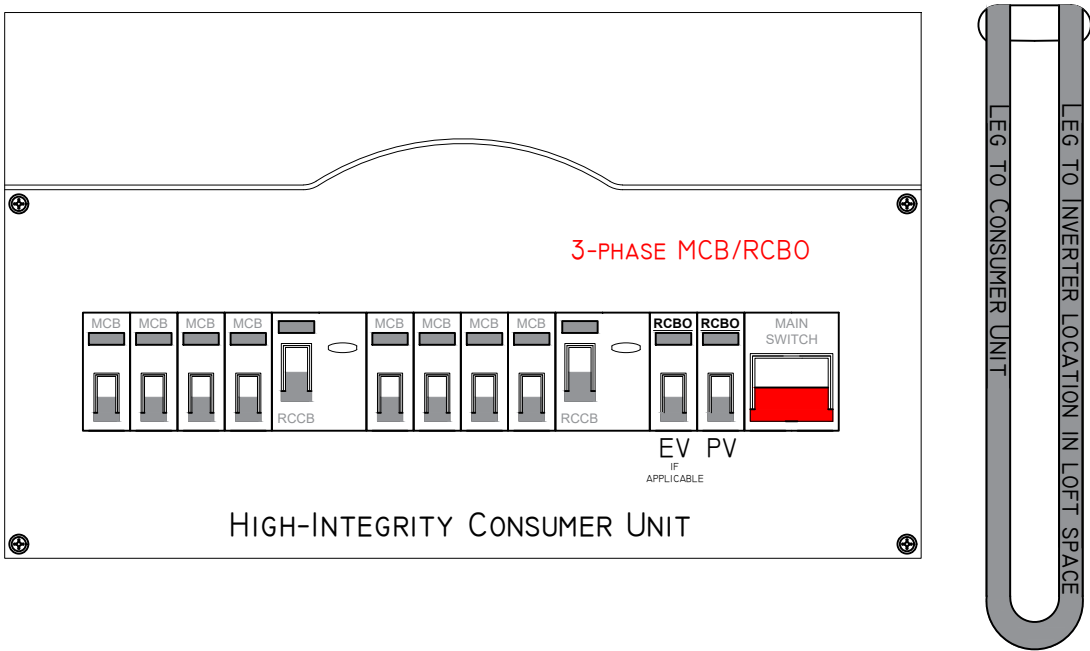
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SUMMERFIELD HOUSE, ARTHUR DRIVE
HOO FARM INDUSTRIAL ESTATE
KIDDERMINSTER, WORCESTERSHIRE
DY11 7SL

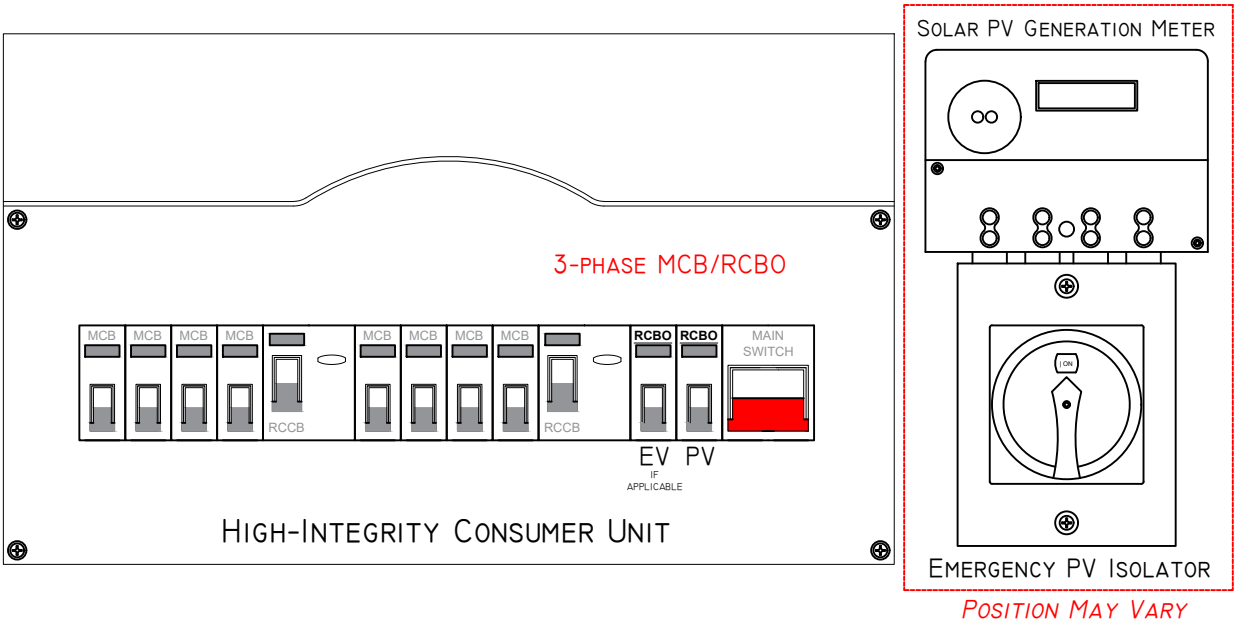


CONSUMER UNIT

- * Eco2SOLAR SHALL INSTALL A CONTINUOUS 10-25MM² SWA CABLE FROM THE DISTRIBUTION BOARD VIA A (LOCAL) LOOP AND THEN TO THE TOP FLOOR RISER FOR ALL BLOCKS
- * THE SUPPLY CABLE SHALL BE SELECTED AND INSTALLED SO AS TO COMPLY WITH THE LATEST REQUIREMENTS OF BS 7671
- * Eco2SOLAR WILL INSTALL THE AC ISOLATOR AND GENERATION METER NEAR THE DISTRIBUTION BOARD.
- * Eco₂SOLAR WILL TERMINATE THE AC CABLE DURING T&C OF THE SYSTEM.
- * Eco2SOLAR WILL PROVIDE A 3-PHASE MCB/RCBO FOR THE PV CIRCUIT (SIZES SHOWN ON PV SCHEMATICS)



BEFORE SOLAR 2ND FIX



AFTER SOLAR 2ND FIX

SOLAR PV ARRANGEMENT
CREST NICHOLSON SOUTH
READING ARBORFIELD
AC CONSUMER UNIT
SITE ID: 09649PV

DRAWN BY: TH
DATE: 09/10/2025
CHECKED BY: AL
DATE: 09/10/2025
SCALE @ A3: NTS
REVISION: R4

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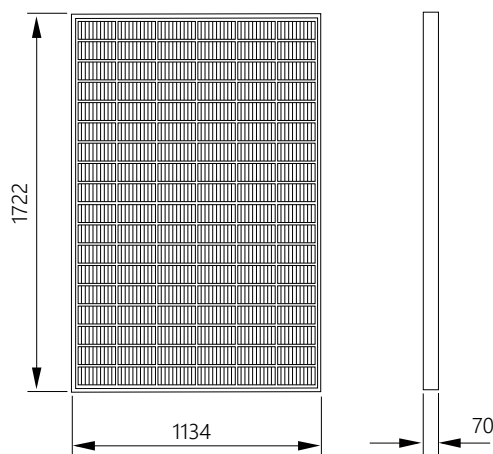
eco₂solar

SUMMERFIELD HOUSE, ARTHUR DRIVE
HOO FARM INDUSTRIAL ESTATE
KIDDERMINSTER, WORCESTERSHIRE
DY11 7SL



PV16-445AG-M10

- Simple roof integration with clean, low-profile aesthetic for new build and retrofit
- Rapid installation times of less than 45 min/kWp easily achieved
- Compatible with the widest range of slate and tile including special fixings for different batten thickness
- Fitted during the normal roofing programme, enabling clarity of responsibility and safe working practices
- Achieves highest fire rating and wind resistance without modifications to the roof



PV16-445AG-M10



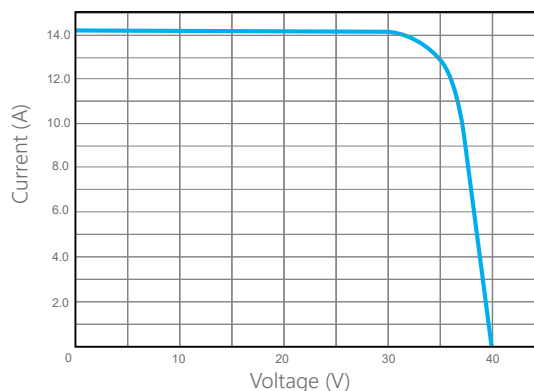
Mechanical Specification

Model		PV16-445AG-M10
Aperture Area	m ²	1.885
Width	mm	1,134
Length	mm	1,722
Thickness	mm	70
Weight	kg	28.3
Static roof loading (distributed)	kg / m ²	14.5
Characteristic Wind Resistance	kPa	4.65
Ultimate Design Load ¹	kPa	4.65
Positive Design Load	IEC 61215	5.40
Roofing System Fire Rating	EN 13501-5	B _{ROOF} (T1, T4)
Power Warranty	% rated	95% 10 years, 87% 30 years
Product Warranty		15 years
Standards		IEC61215, 61730, TUV, MCS05, MCS12
Structural Durability		Equivalent to roof structure

Electrical Specification

Model		PV16-445AG-M10
Peak Power ²	Wp	445
Module Efficiency ³	%	23.6
Number of Cells		54x2
Maximum Power Voltage (V _{mpp})	V	33.02
Maximum Power Current (I _{mpp})	A	13.48
Open Circuit Voltage (V _{oc})	V	39.90
Short Circuit Current (I _{sc})	A	14.18
NOCT ⁴	°C	42.0
Cell Type		N-Type TOPCon
Power Temperature Coefficient	% / °C	-0.29
Current Temperature Coefficient	% / °C	0.04
Voltage Temperature Coefficient	% / °C	-0.25
Maximum System Voltage	VDC	1,000
Maximum Fuse Rating	A	30
Safety Classification		Class 2
Electrical Connectors		Genuine Stäubli MC4 PV-KST4, PV-KBT4

I-V Curve



¹ Design resistance to ultimate loads includes a partial material safety factor of 1.0

² Subject to a manufacturing tolerance of +/- 5 %.

³ Based on aperture area.

⁴ Nominal Operating Cell Temperature

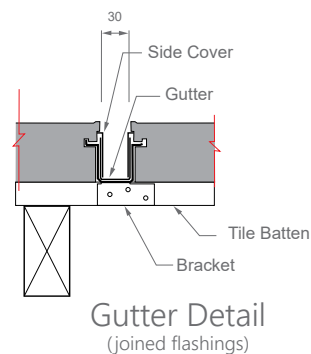
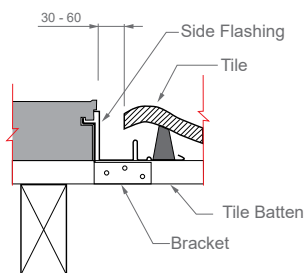
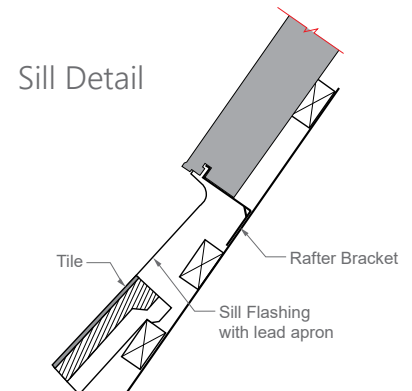
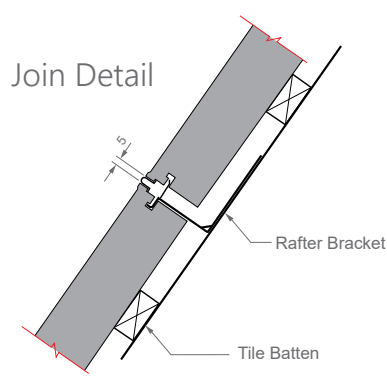
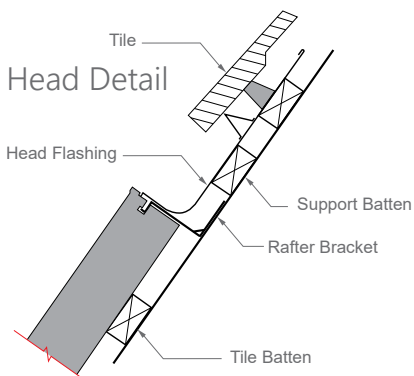
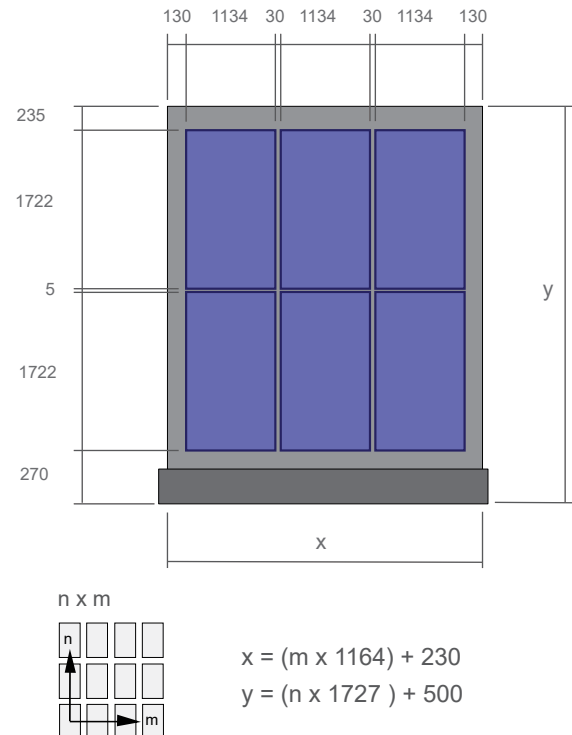
Electrical specification measured under standard test conditions: Irradiation 1 kW/m² with light spectrum AM 1.5 and a cell temperature of 25°C.

AG-M10 Solar Photovoltaic Panels

Pitched Roof Integration

Sleek, low-profile integrated solar that replaces the roof covering for an improved aesthetic and for simple roof maintenance, now at similar cost to above-roof panels. Simple, beautiful, durable.

Solar never looked so good.



Short Form Classification Report No. 22059T

PRODUCT

Clearline PV16-series

SPONSOR

Viridian Solar Limited

PRODUCT DETAILS

Integrated solar panel

- Range of panels: see annex A
- Thickness: 70/69 mm
- Weight: 27,5 kg / 25,0 kg / 23,5 kg / 21,7 kg / 21,4 kg
- Dimensions: 1903 x 1134 mm / 1722 x 1134 mm / 1762 x 1039 mm / 1686 x 1000 mm / 1640 x 992 mm
- Mechanically fixed

FIELD OF APPLICATION

- Range of pitches: > 10°.
- Supporting structure: as tested.
- Full extended field of application: see Annex A.

CLASSIFICATION

Broof(T4) & EXT S.A.A

STANDARDS

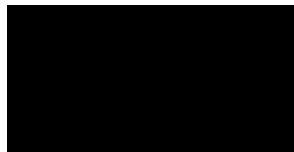
Test standards: CEN/TS 1187:2012 & BS 476-3:2004

Classification standard: EN 13501-5:2016 & PD 476-3:2012

SIGNED

	Mikel Nachtergaele (Signature) Project coordinator 2022.06.08 12:36:24 +02'00'
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APPROVED

	Bart Sette (Signature) General Manager Ghent 2022.06.08 13:44:18 +02'00'
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For and on behalf of WFRGENT nv

This short form classification report has been drafted according to EGOLF agreement EGA 039:2021 "Application note: clause 7.8 [7.8/1] – Types of reports". Whilst the test data and classification provided within this short form report was obtained in a test conducted fully in accordance with the standards CEN/TS 1187:2012, BS 476-3:2004, EN 13501-5:2016 & PD 476-3:2012, the presentation of the results in this short form report may not satisfy the requirements of those standards and EN ISO/IEC 17025:2017. The presentation of the results in this manner is made by agreement with the sponsor and use of the information herein for product assessment, approval or certification purposes will be restricted.

The full classification reports Nos **22059Q & 22059S** are available at **Viridian Solar Limited**.

This document is the original version of this report and is written in English. This document may be used only literally and completely for publications. For publications of certain texts, in which this document is mentioned, our permission must be obtained in advance. The authenticity of the electronic signatures is assured by Belgium Root CA.

Annex A: Extended field of application

➤ Layer 0: Integrated solar panel

Range of panels:	Clearline PV16-260P-B/W, Clearline PV16-270, Clearline PV16-270P-B/W, Clearline PV16-280 and Clearline PV16-300, Clearline PV16-320, Clearline PV16-325, Clearline PV16-330, Clearline PV16-335, Clearline PV16-340, Clearline PV16-345, Clearline PV16-350, Clearline PV16-355, , Clearline PV16-360, Clearline PV16-365, Clearline PV16-370, Clearline PV16-375, Clearline PV16-380, Clearline PV16-385, Clearline PV16-390, Clearline PV16-395, Clearline PV16-400, Clearline PV16-405, Clearline PV16-410, Clearline PV16-415, Clearline PV16-425, Clearline PV16-430, Clearline PV16-435, Clearline PV16-440, Clearline PV16-445, Clearline PV16-450, Clearline PV16-455 and Clearline PV16-460
Facing:	Low-iron glass
Backing	PV Backsheet (Black and white)
Thickness:	70/69 mm
Weight of 1 solar panel:	27,5 kg / 25,0 kg / 23,5 kg / 21,7 kg / 21,4 kg
Dimensions:	1903 x 1134 mm / 1722 x 1134 mm / 1762 x 1039 mm / 1686 x 1000 mm / 1640 x 992 mm
Direction:	Portrait or landscape
Fixation:	Mechanically fixed and installed with the respective flashings including Fusion Portrait Flashing Kits, Fusion Landscape Flashing Kits and Fusion Flashing Kits for Sarking Boards

➤ Layer 1: Non-combustible roof tiles and slates

Range of products:	Any non-combustible tile or slate (A1 according to EN 13501-1)
--------------------	--

➤ Layer 2: Wooden battens

Dimensions:	25 x 50 mm
Density:	450 kg/m ³

➤ Layer 3: Polyethylene vapour barrier

Reaction to fire according to EN13501-1:	E,d2 or better
--	----------------

➤ Layer 4: Supporting timbers

Dimensions:	47 x 70 mm
Density:	450 kg/m ³

Viridian Solar Ltd

Atlas Building, Stirling Way,
Papworth,
Cambridgeshire CB23 3GY

Tel: 01480 839865

e-mail: info@viridiansolar.co.uk

website: www.viridiansolar.co.uk



Agrément Certificate

24/7109

Product Sheet 1 Issue 1

VIRIDIAN SOLAR PANELS

CLEARLINE RANGE OF ROOF-INTEGRATED SOLAR PHOTOVOLTAIC PANELS

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Clearline Range of Roof-Integrated Solar Photovoltaic Panels, a system of roof flashing kits and solar panels, for use as electricity generation from sunlight, in new and existing pitched roofs of domestic and non-domestic buildings of between 20 and 60° in pitch, subject to the loadbearing capacity of the roof construction.

(1) Hereinafter referred to as 'Certificate'.

The assessment includes

Product factors:

- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

Process factors:

- compliance with Scheme requirements
- installation, delivery, handling and storage
- production and quality controls
- maintenance and repair

Ongoing contractual Scheme elements†:

- regular assessment of production
- formal 3-yearly review



KEY FACTORS ASSESSED

- Section 1. Mechanical resistance and stability
- Section 2. Safety in case of fire
- Section 3. Hygiene, health and the environment
- Section 4. Safety and accessibility in use
- Section 5. Protection against noise
- Section 6. Energy economy and heat retention
- Section 7. Sustainable use of natural resources
- Section 8. Durability

The BBA has awarded this Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of issue: 21 February 2024

Hardy Giesler
Chief Executive Officer

This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.

The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 0357).

Readers MUST check that this is the latest issue of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

The Certificate should be read in full as it may be misleading to read clauses in isolation.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

British Board of Agrément

1st Floor, Building 3, Hatters Lane
Croxley Park, Watford
Herts WD18 8YG

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tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk

SUMMARY OF ASSESSMENT AND COMPLIANCE

This section provides a summary of the assessment conclusions; readers should refer to the later sections of this Certificate for information about the assessments carried out.

Compliance with Regulations

Having assessed the key factors, the opinion of the BBA is that the Clearline Range of Roof-Integrated Solar Photovoltaic Panels, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations:



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	A1(1)(b)	Loading
Comment:		The products adequately transmit self-weight and imposed loads to a roof structure. See section 1 of this Certificate.
Requirement:	B4(2)	External fire spread
Comment:		The products are unrestricted by this Requirement. See section 2 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The products can contribute to satisfying this Requirement. See section 3 of this Certificate.
Regulation:	7(1)	Materials and workmanship
Comment:		The products are acceptable. See sections 8 and 9 of this Certificate.
Regulation:	25B	Nearly zero-energy requirements for new buildings
Regulation:	26	CO₂ emission roles for new buildings
Regulation:	26C	Target primary energy rates for new buildings (applicable to England only)
Regulation:	26C	Minimum energy efficiency rating (applicable to Wales only)
Comment:		The products can contribute to reducing the total carbon dioxide emissions of the building. See section 6 of the Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The products are acceptable. See sections 8 and 9 of this Certificate.
Regulation:	9	Building standards – construction
Standard:	1.1b	Structure
Comment:		The products can have sufficient strength and stiffness to sustain design loads, with reference to clauses 1.1.0 ⁽¹⁾ and 1.1.1 ⁽¹⁾ . See section 1 of this Certificate.
Standard:	2.8	Spread from neighbouring buildings
Comment:		The products are unrestricted by this Standard, with reference to clause 2.8.1 ⁽¹⁾⁽²⁾ . See section 2 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The products can contribute to satisfying this Standard, with reference to clause 3.10.7 ⁽¹⁾⁽²⁾ . See section 3 of this Certificate.
Standard:	6.1(b)(c)	Carbon dioxide emissions
Comment:		The products can contribute to reducing to satisfying this Standard, with reference to clauses 6.1.2 ⁽¹⁾ and 6.1.4 ⁽²⁾ . See section 6 of this Certificate.

Standard:	6.7	Commissioning building services
Comment:		Electrical wiring must be carried out by a suitably qualified and competent person in accordance with the requirements of Technical Standard 6.7.1 ⁽¹⁾⁽²⁾ .
Standard:	6.8	Written information
Comment:		The building occupier must be provided with appropriate written information in accordance with the requirements of Technical Standards 6.8.1 ⁽¹⁾⁽²⁾ and 6.8.2 ⁽¹⁾
Standard:	7(a)(b)	Statement of sustainability
Comment:		The products can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze or bronze active level of sustainability as defined in this Standard. In addition, the products can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.3 ⁽¹⁾⁽²⁾ , 7.1.4 ⁽¹⁾⁽²⁾ , 7.1.5 ⁽¹⁾⁽²⁾ , 7.1.6 ⁽¹⁾⁽²⁾ and 7.1.7 ⁽¹⁾⁽²⁾ . See section 6 of this Certificate.
Regulation:	12	Building standards – conversion
Comment:		All comments given for the products under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ .
(1) Technical Handbook (Domestic).		
(2) Technical Handbook (Non-Domestic).		



The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	23(1)(a)(i)(iii)	Fitness of materials and workmanship
Comment:	(b)(i)(ii)	The products are acceptable. See sections 8 and 9 of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The products can contribute to satisfying this Regulation. See section 3 of this Certificate.
Regulation:	30(a)(b)	Stability
Comment:		The products can contribute to satisfying this Regulation. See section 1 of this Certificate.
Regulation:	36(b)	External fire spread
Comment:		The products are unrestricted by this Regulation. See section 2 of this Certificate.
Regulation:	40(1)(2)	Target carbon dioxide emission rate
Comment:		The products will contribute to satisfying this Regulation. See section 6 of this Certificate.

Additional Information

NHBC Standards 2024

In the opinion of the BBA, the Clearline Range of Roof-Integrated Solar Photovoltaic Panels, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapters 7.2 *Pitched Roofs* and 8.2 *Low or zero carbon technologies*.

Fulfilment of Requirements

The BBA has judged the Clearline Range of Roof-Integrated Solar Photovoltaic Panels to be satisfactory for use as described in this Certificate. The products have been assessed as a roof mounting system and an electricity generation system for use in new and existing pitched roofs of domestic and non-domestic buildings of between 20 and 60° in pitch, subject to the loadbearing capacity of the roof construction.

ASSESSMENT

Product description and intended use

The Certificate holder provided the following description for the products under assessment. The Clearline Range of Roof-Integrated Solar Photovoltaic Panels consist of:

- Roof integrated Photovoltaic (PV) panels — made up of 60, 60 × 2, or 54 × 2 poly and mono-crystalline PV cells with a glass front cover and an aluminium frame. This component has been assessed by the BBA as meeting the requirements of the Microgeneration Certification Scheme, MCS 005, Product Certification Scheme Requirements: Solar Photovoltaic Modules (Certificate number BBA MCS 0032)

Table 1 Nominal characteristics of Viridian Solar Panels

Characteristic (unit)	Components				
	PV16-270P	PV16-300	PV16-335	PV16-340	PV16-405
Panel length (up roof) (m)	1.640	1.640	1.686	1.686	1.722
Panel width (across roof) (m)	0.992	0.992	1.000	1.000	1.134
Panel thickness (mm)	69	69	69	69	70
Aperture area (m ²)	1.6	1.6	1.6	1.6	1.9
Panel weight (kg)	21	21	22	22	25
Nominal peak power rating (W)	270	300	335	340	405

- Roof Flashing kits — manufactured from coated aluminium alloy including mounting brackets and fixings and the appropriate flashings for the application.

Table 2 Nominal characteristics of Viridian Solar Panels

Conditions	Slated/Tiled/Sarking roofs		Sarking roof brackets
	Portrait	Landscape	Portrait/Landscape
Flashing kit	VAT16, F16-TL, F16-TC, F16-TR, F16-TY, F16-J	VAL16, F16-LL, F16-LC, F16-LR, F16-LY, F16-LJ	SB16-L, SB16-C, SB16-R, SB16-Y, SB16-J, SB16-AT

This component has been assessed by the BBA as meeting the requirements of the Microgeneration Certification Scheme, MCS 012, Product Certification Scheme Requirements: Pitched Roof Installation Kits (Certificate number BBA MCS 0145).

Applications

The products are satisfactory for installation in tiled or slated pitched roofs with pitches between 20° and 60°.

Ancillary Items

The Certificate holder recommends the following ancillary items for use with the products, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- DC to AC power inverter
- Consumer unit
- Generation meter
- Connecting cables.

Product assessment – key factors

The products were assessed for the following key factors, and the outcome of the assessment is shown below. Conclusions relating to the Building Regulations apply to the whole of the UK unless otherwise stated.

1 Mechanical resistance and stability

Data were assessed for the following characteristics.

1.1 Properties in relation to loading

1.1.1 Results of load resistance tests are given in Table 3.

Table 3 Load resistance tests

Product assessed	Assessment method	Requirement	Result
Complete test installation (slates and tiles)	MCS 012 Issue 2.4	Value achieved	Design imposed load 5.32 kN·m ⁻²
Complete test installation (sarking boards)	MCS 012 Issue 2.4	Value achieved	Design imposed load 5.32 kN·m ⁻²
Complete test installation (slates and tiles) for PV16-405	MCS 012 Issue 2.4	Value achieved	Design imposed load 4.24 kN·m ⁻²
Complete test installation (sarking boards) for PV16-405	MCS 012 Issue 2.4	Value achieved	Design imposed load 4.24 kN·m ⁻²

2 Safety in case of fire

Data were assessed for the following characteristics.

2.1 External fire spread

2.1.1 The results of a test for external fire exposure to roofs is given in Table 4.

Table 4 External fire exposure test

Product assessed	Assessment method	Requirement	Result
Clearline PV16 and Clearline Fusion Flashing Kits	CEN/TS 1187 : 2012	Classification achieved	B _{Roof} (t4)

2.1.2 On the basis of data assessed, the Clearline Range of Roof-Integrated Solar Photovoltaic Panels are suitable for pitched roofs with pitches between 20 and 60 degrees.

3 Hygiene, health and the environment

Data were assessed for the following characteristics.

3.1 Resistance to weather

Table 4 Resistance to weather testing

Product assessed	Assessment method	Requirement	Result
Complete Clearline Fusion Installation	MCS 012	No leaks	Pass
Clearline Fusion Flashing Kit (slates and tiles, sarking boards)	MCS 012 Clause 6.2.3.1 Weathertightness of the penetrations through the outer surface	No water penetration	Pass

3.1.1 On the basis of data assessed, completed roofs will provide adequate resistance to weather ingress.

3.1.2 Particular attention must be paid to the correct fitting of all components and to the detailing and positioning of gaskets and areas where cables enter the building.

3.2 Resistance to wind uplift

Table 5 Resistance to wind uplift

Product assessed	Assessment method	Requirement	Result
Clearline Fusion Flashing Kit (slates and tiles, sarking boards)	BS EN 14437 : 2004 Determination of the uplift resistance of installed clay or concrete tiles for roofing – roof system test method	Determine characteristic uplift resistance	Characteristic uplift resistance of the roofing tiles Slates and tiles = 5.32 kN·m ⁻² Sarking boards = 5.32 kN·m ⁻²
Clearline Fusion Flashing Kit (slates and tiles, sarking boards) for PV16-405	BS EN 14437 : 2004 Determination of the uplift resistance of installed clay or concrete tiles for roofing – roof system test method	Determine characteristic uplift resistance	Characteristic uplift resistance of the roofing tiles Slates and tiles = 4.24 kN·m ⁻² Sarking boards = 4.24 kN·m ⁻²

4 Safety and accessibility in use

Data were assessed for the following characteristics.

4.1 Safety in use

Results of Design qualification and type approval tests are given in Table 6.

Table 6 Design qualification and type approval

Product assessed	Assessment method	Requirement	Result
Clearline PV16	IEC 61215-1 : 2016	Requirements as listed in IEC 61215-1 : 2016	Pass

5 Protection against noise

Not applicable.

6 Energy economy and heat retention

Data were assessed for the following characteristics.

6.1 Energy performance

6.1.1 The performance of the product was evaluated against IEC 61215-1-1 : 2016 in accordance with MCS 005. The results of the tests are given in Table 7.

Table 7 Energy Performance

Product assessed	Assessment method	Requirement	Result
Clearline PV16	BS EN 61215-1-1 : 2016 BS EN 61730-1 : 2007 BS EN 61730-2 : 2007	Perform in line with declaration	Pass

6.1.2 The electrical characteristics and performance of the module under standard test conditions are given in Table 8.

Table 8 Characteristic electrical output

Characteristic ⁽¹⁾	Photovoltaic panel type				
	PV16-270P	PV16-300	PV16-335	PV16-340	PV16-405
Nominal power rating (W)	270	300	335	340	405
Tolerance (%)	-3%, +3%	-3%, +3%	-3%, +3%	-3%, +3%	-5%, +5%
Open circuit voltage (V)	37.3	40.1	42.0	42.4	37.0
Maximum power voltage (V)	30.7	33.1	34.7	35.0	31.0
Short circuit current (A)	9.3	9.6	10.3	10.4	13.6
Maximum power current (A)	8.8	9.1	9.7	9.7	13.1
Module efficiency (%) ⁽²⁾	17.3	19.2	20.7	21.0	21.5
Maximum system voltage (V)	1,000	1,000	1,000	1,000	1,000
Series fuse rating (A)	15	15	20	20	25

(1) Performance at standard test conditions: irradiance 1000 W·m⁻², cell temperature 25°C, AM 1.5 Spectrum

(2) Based on aperture area.

6.1.3 The nominal peak power output of the modules given in Table 8 must be used in carbon emissions calculations in accordance with the documents supporting the relevant national Building Regulations.

7 Sustainable use of natural resources

Not applicable.

8 Durability

8.1 The potential mechanisms for degradation and the known performance characteristics of the materials in these products were assessed.

8.2 Service life

8.2.1 Under normal service conditions, the products will have a structural life of at least equivalent to the structure in which they are incorporated, provided they are designed, installed and maintained in accordance with this Certificate and the Certificate holder's instructions.

8.2.2 Under normal service conditions, in common with other photovoltaic panels, the peak electrical output will reduce with time. The Certificate holder warrants the power output to 90% of nominal after 10 years and 80% after 25 years. The terms of this warranty are outside the scope of this Certificate.

PROCESS ASSESSMENT

Information provided by the Certificate holder was assessed for the following factors:

9 Design, installation, workmanship and maintenance

9.1 Design

9.1.1 The design process was assessed by the BBA, and the following requirements apply in order to satisfy the performance specified in this Certificate.

9.1.2 It is the responsibility of the system designer and installer to ensure the installed system is able to resist the anticipated loads for each project. The system has a characteristic value of resistance to wind uplift of 5.32 kPa. For design purposes, this value should be divided by a partial material factor of 1.00 to give a design resistance to ultimate loads of 5.32 kPa.

9.1.3 The condition and structural adequacy of the roof into which the products are to be mounted must be evaluated by a site survey and assessed by a suitably experienced and competent individual. The roof must be sufficiently robust to resist the additional loads resulting from the installation of the modules. The maximum rafter spacing is 600 mm (between centres) and the minimum batten size is 50 x 25 mm.

9.1.4 Imposed loads due to wind and snow must be determined by a suitably experienced and competent individual for each project in accordance with BS EN 1991-1-3 : 2003 and BS EN 1991-1-4 : 2005. Further guidance is given in BRE Digest 489 : 2004 . The derived loads must be multiplied by an appropriate partial load factor.

9.1.5 The building's location and the orientation of the modules will have a significant effect on the power generated by the products. A south facing elevation at 30° pitch is ideal (south-east or south-west elevations can also achieve favourable results). Installers must provide an estimate of annual power production for individual sites based on a site survey. If panels are fitted to more than one roof elevation, they must be connected to separate inverters. Annual solar radiation for different roof pitches and orientation can be calculated as per SAP 2012, Appendix U.

9.1.6 Shade, such as that cast from trees or neighbouring buildings, can have a significant impact on the performance of the panels and must be considered when deciding the suitability of a particular site.

9.1.7 Modules connected in series must be installed with the same orientation and tilt. Varying orientations or angles may result in reduced efficiency.

9.2 Installation

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate.

9.2.2 Installation must be carried out in accordance with this Certificate and the Certificate holder's instructions. A summary of instructions and guidance is provided in Annex A.

9.2.3 The electrical wiring must be installed in accordance with BS 7671 : 2008. Additionally, in England and Wales, it must be installed in accordance with the requirements of Part P of the Building Regulations 2010 and, in Scotland, with the relevant requirements of Technical Standard 4.5.

9.2.4 Installation of the panels must not be carried out in very windy or wet conditions.

9.2.5 The modules must be protected from damage during installation.

9.2.6 It must be ensured that other system components do not exert damaging mechanical or electrical influences on the modules. When connected, modules must all have the same voltage and must not be connected together to create a voltage higher than the permitted system voltage.

9.3 Workmanship

9.3.1 Practicability of installation was assessed by the BBA, on the basis of the Certificate holder's information. To achieve the performance described in this Certificate, installation of the product must only be installed by a trained and qualified installer, experienced in the installation of this type of product.

9.3.2 The electrical connections must be made by a competent electrician in accordance with the IEE Wiring Regulations BS 7671 : 2008.

9.4 Maintenance and repair

9.4.1 Ongoing satisfactory performance of the product in use requires that it is suitably maintained. The guidance provided by the Certificate holder was assessed by the BBA and found to be appropriate and adequate.

The following requirements apply in order to satisfy the performance assessed in this Certificate:

9.4.2 Appropriate safety precautions in relation to working at height and the risk of electric shock must be taken when carrying out maintenance on the panels. The front surface of the module must be covered by an opaque cloth or other material before work commences. Appropriate safety equipment (eg insulated tools and gloves) must be used and direct contact with live parts of the cables and connectors avoided where possible.

9.4.3 The panels must be inspected for damage at regular intervals. The Certificate holder must be consulted if damaged panels are discovered in order to decide on the most appropriate method of repair, but such advice is outside the scope of this Certificate.

9.4.4 It is important that the panels are clean to maintain maximum efficiency. It is not normally necessary to clean the modules as rainfall generally has a cleansing effect. Where heavy soiling occurs, the modules may be hosed with plain water (ie without cleaning agents) and gently wiped with a sponge. Abrasives must not be used and dirt must never be scraped or scrubbed away when dry as this may cause scratching.

9.4.5 Security of mountings, cable connections and components must be checked regularly.

9.4.6 Individual PV components (eg the diode, junction box and plug connectors) must not be changed in isolation. If replacement is necessary, the entire unit and associated components must be changed.

10 Manufacture

10.1 The production processes for the products have been assessed, and provide assurance that the quality controls are satisfactory according to the following factors:

10.1.1 The manufacturer has provided documented information on the materials, processes, testing and control factors.

10.1.2 The quality control operated over batches of incoming materials has been assessed and deemed appropriate and adequate.

10.1.3 The quality control procedures and product testing to be undertaken have been assessed and deemed appropriate and adequate.

10.1.4 The process for management of non-conformities has been assessed and deemed appropriate and adequate.

10.1.5 An audit of each production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

10.1.6 An audit of each production location was undertaken, and it was confirmed that the production process was in accordance with MCS 010.

† 10.2 The BBA has undertaken to review the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

11 Delivery and site handling

11.1 The Certificate holder stated that the products are delivered to site in packaging bearing the product name, Certificate holder's name, BBA identification number and the number of this Certificate.

11.2 Delivery and site handling must be performed in accordance with the Certificate holder's instructions and this Certificate, including:

11.2.1 The photovoltaic panels must be stored on a level, clean, dry surface and remain in the packaging until installation. Other ancillary items must be stored inside and treated as electrical items.

11.2.2 Modules must be carried in an upright position and must not be allowed to bend under their own weight or be subjected to any loading. Normal precautions for manual handling must be observed. The weights of modules are given in Table 1.

11.2.3 Sharp implements or edges must be avoided as they could damage the surface of the panels.

11.2.4 Site preparations and delivery must be arranged to minimise site storage time prior to installation. Should it be necessary to store the panels temporarily, a dry, ventilated room must be used. All electrical contacts must be kept clean and dry.

11.2.5 Damaged modules must not be used.

Supporting information in this Annex is relevant to the products but has not formed part of the material assessed for the Certificate.

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

Management Systems Certification for production

The management system of the manufacturer has been assessed and registered as meeting the requirements of ISO 9001 : 2015 by British Assessment Bureau (Certificate 222962).

Additional information on installation

Roofing works

A.1 The photovoltaic panels must be fitted to the roof structure only when roof tile underlay and tile battens are secured in place. The panels must be secured to the battens and rafters using the fixing components provided. Tile battens must be secured to the roof structure following the relevant recommendations of BS 5534 : 2014 and BS 8000-6 : 2013. If there is any doubt about the condition or security of the battens, they must be replaced with suitably treated battens.

A.2 The panels should be fixed into position with rafter brackets at the top and bottom. Where the panel is located above two rafters, four brackets should be used and where it is located above one rafter, two brackets should be used. Each bracket is secured onto the rafter using two 4 by 50 mm screws supplied with the fixing kit.

A.3 Adjacent panels are positioned with a gap of 30 mm between panels.

A.4 The panels are attached to the battens using side brackets with three each side for portrait panels and two each side for landscape panels. Each bracket is secured to the batten using two 4 by 25 mm screws supplied with the fixing kit. Adjacent panels should be secured to alternate battens.

A.5 The cables from the panels are passed through laps in the underlay and carefully secured to the roof structure to ensure a minimal gap is created in the lapped joint of the underlay.

A.6 Once the panels are secured to the roof structure, the appropriate flashing kits are installed. This is commenced with the sill flashings, starting from the left hand panel. Once in place, these can then be followed by the gutters between panels, side flashings or soakers at the sides, and then the top flashings.

A.7 The slating or tiling is then completed, overlapping the flashings.

Electrical works

A.8 Electrical wiring is completed and the system commissioned and correct operation verified. This must be carried out by a suitably qualified and competent person.

A.9 The building occupier should be provided with appropriate written information including details of how the system operates and the maintenance requirements.

Bibliography

CEN/TS 1187 : 2012 *Test methods for external fire exposure to roofs*

BS 5534 : 2014 *Code of practice for slating and tiling (including shingles)*

BS 7671 : 2008 *Requirements for electrical installations — IEE Wiring Regulations — Seventeenth edition*

BS 8000-6 : 2013 *Workmanship on building sites — Code of practice for slating and tiling of roofs and claddings*

BS EN 1991-1-3 : 2003 *Eurocode 1 — Actions on structures — General actions — Snow loads*

BS EN 1991-1-4 : 2005 *Eurocode 1 — Actions on structures — General actions — Wind actions*

BS EN 61730-1 : 2007 *Photovoltaic (PV) module safety qualification — Requirements for construction*

BS EN 61730-2 : 2007 *Photovoltaic (PV) module safety qualification — Requirements for testing*

IEC 61215-1 : 2016 *Terrestrial Photovoltaic (PV) modules – design qualification and type approval – Part 1 : Test Requirements*

IEC 61215-1-1 : 2016 *Terrestrial Photovoltaic (PV) modules – design qualification and type approval – Part 1-1 : Special requirements for testing of crystalline silicon photovoltaic (PV) modules*

BS EN 14437 : 2004 *Determination of uplift resistance of installed clay or concrete tiles for roofing. Roof system test method*

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

BRE Digest 489 : 2004 *Wind loads on roof-mounted photovoltaic and solar thermal systems (revised 2014)*

MCS 005 *Product Certification Scheme Requirements : Solar Photovoltaic Modules 3.1*

MCS 012 *Product Certification Scheme Requirements : Solar Mounting Kits 3.0*

MCS 010 *Product Certification Scheme Requirements : Generic Factory Production Control and Product Quality Requirements*

Conditions of Certificate

Conditions

1 This Certificate:

- relates only to the product that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product or any other product
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product
- actual installations of the product, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to UKCA marking and CE marking.

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

British Board of Agrément

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www.bbacerts.co.uk



Certificate No: MCS BBA 0032

Technology: MCS 005 Solar Photovoltaic Modules

Products:

Monocrystalline Modules

Clearline PV16-xxx (Monocrystalline) – where xxx = 270W to 415W, 425W to 460W in steps of 5W

Clearline PV16-xxxAG – where xxx = 425W to 450W, 470-500W in steps of 5W

Polycrystalline Modules

Clearline PV16-xxxP-W (Polycrystalline) – where xxx = 260W to 320W in steps of 5W

Clearline PV16-xxxP-B (Polycrystalline) – where xxx = 250W to 320W in steps of 5W

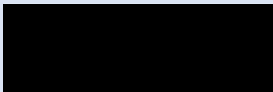
Viridian Solar Limited
Atlas Building
Stirling Way,
Papworth Cambridgeshire CB23 3GY

CERTIFIED

The BBA (British Board of Agrément) has issued this Microgeneration Certification Scheme (MCS) Certificate to the company and products named above, in recognition of the products' compliance with the MCS Scheme Requirements for the technology named above.

On behalf of the British Board of Agrément

Date of Seventh issue: 3 February 2025


Hardy Giesler
Chief Executive Officer

The BBA is a UKAS accredited product certification body – Number 0113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk. Readers MUST check the validity and latest issue number of this MCS Certificate by either referring to the BBA website or contacting the BBA directly.

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Limited Guarantee

Viridian Concepts Ltd., UK trading as Viridian Solar (hereinafter “Viridian”) shall provide to any purchaser (“Purchaser”) of its products as listed in the table below (“Products”), limited guarantees as to the quality and/or performance of its Products in accordance with the following terms and conditions.

1.0 General Conditions

The guarantees will start from the date of installation of the relevant Product and is transferrable to subsequent owners of the location to which the Product is installed. Where the installation date cannot be confirmed, the start date will be taken as one month after the shipment of the product from Viridian. The execution of the guarantees will not lead to any prolongation of the original guarantee period. The guarantees apply to products delivered after 1st December 2020. The Purchaser’s statutory rights under applicable national legislation are not affected by the guarantees.

The guarantees are conditional upon the Products being properly handled and installed by competent persons who have correctly followed the installation instructions applicable at that time and have used best-practice methods for their respective trades. It is also contingent on the Products being used in the manner that Viridian intended. The guarantees are also dependant on the proper use and maintenance of the Products according to Viridian’s instructions. It is the responsibility of the Purchaser to demonstrate, to the reasonable satisfaction of Viridian that the exclusions in this section 1.0 and section 4.0 of this document do not apply in respect of any claim under the guarantees.

The guarantees may not be claimed against unless and until the relevant Product has been paid for in full. Any claim under the guarantees shall be promptly notified in writing by the Purchaser as set out in section 5.0 below.

Viridian does not accept liability (whether in tort [including for negligence or breach of statutory duty], contract, misrepresentation or otherwise) for any loss of profits; loss of business; depletion of goodwill or similar losses; loss of anticipated savings; loss of goods; loss of use; or any special, indirect or consequential losses arising from the failure of the Products howsoever caused.

This exclusion of liability does not affect, or attempt to affect, any of the Purchaser’s rights under applicable national legislation.

The guarantees do not cover costs associated with installation, removal or reinstallation of the Products. The Output Guarantee does not cover compensation for declined energy yield or lost profits from the sale of energy caused by output losses.

In no event will Viridian’s aggregate liability under the guarantees exceed the original value of the Products which are the subject of a claim or dispute.

Any exchanged or replaced components or Products shall pass into the ownership of Viridian.

The Purchaser accepts that the Products were not designed and produced to its individual requirements and that it was responsible for their selection.

2.0 Product Guarantee

For the purposes of this Product Guarantee, a “Defect” means behaviour of the relevant Product which does not meet the relevant specification set out in the technical data sheet (available at www.viridiansolar.com) and which is caused by failings in the materials or workmanship used or deployed in the production of the relevant Product. For the avoidance of doubt, a Defect does not occur when the Product does not meet a



particular need but does meet a reasonable interpretation of the behaviour defined in the technical datasheet.

Viridian guarantees in respect of each Product that, for the periods set out in respect of each Product type below, the relevant Product will not be subject to a Defect.

Product	Product Code Starting	Years
Solar PV Panels	PV16	10
Flashings	F16TL, F16TC, F16TR, F16TY, F16J, VAT16, F16-VC, F16-VB F16LL, F16LC, F16LR, F16LY, F16LJ, VAL16 F16CLB, F16CLBS, F16CRB, F16CLT, F16CRT F16LCLB, F16LCLBS, F16LCRB, F16LCLT, F16LCRT	10

The Purchaser shall promptly notify Viridian in writing of any breach of the above Product Guarantee in accordance with section 5.0.

In the event of a claim being approved, the Purchaser's sole remedy for breach of this Product Guarantee and Viridian's sole obligation shall be that Viridian will, at its sole option, reimburse the Purchaser for the original purchase, repair the Product, supply a new component for the Purchaser to effect a repair or supply a replacement Product. If the type of Product which is subject to the claim is no longer available, a Product of equivalent performance (as judged by Viridian), may be supplied. The above being subject to the return of the defective product unless agreed otherwise by Viridian.

The Purchaser shall provide all information as may be deemed necessary by Viridian to assist Viridian in remedying any Defect.

The period of Output and Product Guarantees for any replacement Products supplied pursuant to this Product Guarantee will be equal to the remainder of the guarantee period of the originally supplied panels.

3.0 Output Guarantee

In addition to the Product Guarantee, the following Output Guarantee applies to degradation of the photovoltaic cells resulting in power loss for the following Products: PV16 only.

Viridian guarantees that for a period of ten (10) years from the date of installation, the power output of the above specified Products will be at least 90% of the minimum output specified in the relevant technical datasheet prevailing at the time and for a period of twenty five (25) years from the date of installation, the power output of the above Products will be at least 80% of the minimum output specified in the relevant technical datasheet prevailing at the time. Where the installation date cannot be confirmed, the start date will be taken as one month after the shipment of the product from Viridian.

The Purchaser shall promptly notify Viridian in writing of any breach of the above Output Guarantee in accordance with section 5.0. In the event of a claim being approved, the Purchaser's sole remedy for breach of this Output Guarantee and Viridian's sole obligation shall be that Viridian will, at its sole option either compensate the Purchaser for the loss of output by supplying additional Products to provide sufficient additional power output so that the total power provided by the original Products together with any additional Products is at least equal to the guaranteed output of 90% or 80% (as applicable) of the minimum output specified in the relevant technical datasheet prevailing at the time of purchase for the original Products or by repairing or (subject to the return of the defective products) replacing the defective Products, or, reimbursing the amount of the purchase price taking into account an annual depreciation of 4% of the original purchase price.

In order to determine whether the above Product Output guarantee has been met, the power output values of the relevant Products will be measured when the voltage is at an optimum and under standard measurement conditions as follows: (a) light spectrum of AM 1.5 (b) irradiation of 1,000 W/m² and (c) cell



temperature of 25 C. Such measurements are carried out in accordance with IEC 60904 as tested at the junction box terminals.

In case of dispute under the Output Guarantee, an independent test institute such as TUV Rheinland in Cologne, Germany will be used for final judgement, with costs borne by the losing party.

The period of Output and Product Guarantees for any replacement Products supplied pursuant to this Output Guarantee will be equal to the remainder of the guarantee period of the originally supplied panels.

4.0 Exclusions

No claim may be brought after expiry of the applicable guarantee periods.

The Product and Output guarantees do not cover output loss or other defects which in Viridian's judgement have been caused by:

- Installations by persons who are not qualified or competent for the task
- Installations that are not in conformance with product specifications, installation instructions, operation manuals, labelling or prevailing standards and regulations
- Failure to demonstrate that recommended maintenance procedures have been followed
- Defective transportation, storage or handling
- Use of incompatible spare parts or accessories or use of the Products with other equipment or systems not supplied or approved by Viridian.
- Unauthorised modification of the Product, including the addition of marks and stickers
- Use of the product for purposes other than those intended by Viridian
- Breakage due to external influences – flying objects, external loads, vandalism or theft.
- Damage caused by external factors – such as dirt, soiling, smoke, chemicals, pollution, the build up of scale
- Use on mobile units such as vehicles
- Damage by natural disasters (such as fires, earthquakes, cyclones, hurricanes, volcano eruptions, lightning, indirect lightning strikes, heavy snow falls, avalanches, frost damage) or other unforeseeable circumstances.
- Removal or modification of the data label on the product
- Relocation from the original place of installation
- Faults caused by interaction with equipment not supplied or approved in writing by Viridian

Change of colour and fading of the Products will not be considered breaches of either guarantee.

Solar PV cells have a natural variation in colour. Viridian Solar does not guarantee colour matching between PV panels. Steps are taken to ensure that colour matching is as close as possible, especially within production batches, but it is the responsibility of the customer to ensure that, where a colour match is important, and before the installation is completed, that the panels used have an adequate colour match.

These limited guarantees cover only the transportation cost for shipment of any repaired or replaced Product to the applicable location. It does not cover the cost for the return of the product to Viridian for confirmation of the validity of the claim. Where onsite inspections conclude that a breach of the guarantees has not occurred, Viridian will charge the Purchaser for its time and costs.

5.0 Claims Procedure

Please submit a written description of the defect and provide the model type, serial number and evidence of the purchase date for the relevant Product. Viridian will endeavour to respond to the claim within 5 working days and resolve the claim within 28 days.



Any guarantee claims should be addressed to

warranty@viridiansolar.co.uk

or
Viridian Solar
Atlas Building
68 Stirling Way
Papworth
Cambridge, UK
CB23 3GY

Viridian will need to agree the validity of the claim, and may require further evidence and/or the defective part to be returned to confirm this.

No returns of Products will be accepted without prior written authorisation from Viridian.

6.0 Disputes

In the event of any dispute arising under this guarantee which cannot be resolved between the parties, either party may propose that the dispute be referred for final determination to an expert ("Expert") who shall be deemed to act as an expert and not as an arbitrator.

The Expert shall be selected by mutual agreement or, failing agreement, within ten (10) business days after a request by one party to the other, shall be chosen at the request of either party by the Chief Executive of the Solar Trade Association.

Both parties shall afford the Expert all necessary assistance that the Expert requires to consider the dispute.

The Expert shall be instructed to deliver his determination to the parties within 60 days after his appointment

Decisions of the Expert shall be final and binding and not subject to appeal, except in the case of fraud or manifest factual error.

The fees of the Expert shall be borne by the parties in the proportion determined by the Expert having regard (amongst other things) to the conduct of the parties.

7.0 Conditions Applying to Specific Jurisdictions

7.1 Australia

Our goods come with guarantees that cannot be excluded under the Australia Consumer Law. You are entitled to a replacement or refund for major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to major failure.

NEW FROM SOLAX

X3-PRO G2



X3-PRO G2

8kW/10kW/12kW/15kW
17kW/20kW/25kW/30kW

Features

High-efficiency

- Maximum efficiency is up to 98.5%
- Low startup voltage, ultrawide MPPT voltage range
- 150% DC oversizing, 110% AC overloading output
- In-built global MPP scan for higher yield efficiency

Safe

- SPD type II protection on both AC&DC
- ARC protection (Optional)
- IP66 protection

Smart

- Built-in export power control
- Intelligent load management - heat pump (Adapter Box required)
- 24h monitoring and maintenance (Optional)
- Multiple monitoring methods supported, Optional: WiFi/LAN/4G

Economic

- Ultra-high power density
- Maximum 32A DC input current per MPP tracker, support high power solar panels
- Up to 3 MPPTs, 2 strings per MPPT
- Support Master/Slave parallel function

Contact Us For More Information

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DC INPUT								
Max. PV array input power [Wp]	12000	15000	18000	22500	25500	30000	37500	45000
Max. PV input voltage [V]	1100	1100	1100	1100	1100	1100	1100	1100
Start startup voltage [V]	200	200	200	200	200	200	200	200
Nominal input voltage [V]	650	650	650	650	650	650	650	650
MPP tracker voltage range [V]	160~980							
No. of MPP trackers	2	2	2	2	2	2	3	3
Strings per MPP tracker	2	2	2	2	2	2	2	2
Max. PV input current [A]	32/32	32/32	32/32	32/32	32/32	32/32	32/32/32	32/32/32
Isc PV Array Short Circuit current [A]	40/40	40/40	40/40	40/40	40/40	40/40	40/40/40	40/40/40
AC OUTPUT								
Rated AC output power [kW]	8000	10000 ^①	12000	15000	17000	20000	25000	30000 ^②
Rated AC output current [A]*	12.2/11.6	15.2/14.5	18.2/17.4	22.8/21.8	25.8/24.7	30.3/29	37.9/36.3	45.5/43.5
Max. AC output apparent power [VA]	8800	11000 ^③	13200	16500	18700	22000	27500	30000 ^③
Max. AC output current [A]	13.2	16	19.3	24.2	27.5	33.6	41.8	45.5
Nominal AC voltage/AC voltage range [V]**	220/380V, 230/400V, 3/N/PE, 3/PE; 95-285V							
Nominal AC frequency/AC frequency range [Hz]**	50/60; ±5							
Power Factor range	0.8 leading ~ 0.8 lagging							
THDi (Rated power) [%]	<3							
SYSTEM DATA								
Max. efficiency [%]	98.20	98.20	98.20	98.30	98.30	98.30	98.50	98.50
Euro efficiency [%]	97.70	97.70	97.70	97.80	97.80	97.80	98.00	98.00
Standby consumption (Night) [W]	<3							
Ingress protection	IP66							
Operating ambient temperature range [°C]	-30~+60 (Derating above 45)							
Max. operation altitude [m]	4000 (Derating above 3000)							
Relative humidity [%]	0~100							
Typical noise emission [dB]	<35	<35	<35	<55	<55	<55	<55	<58
Storage temperature [°C]	-30~+60							
Dimensions (WxHxD) [mm]	482x417x181							
Weight [kg]	24.5			26			28	
Cooling concept	Natural cooling			Smart fan cooling				
Communication interfaces	USB / RS485 / DRM, Optional: Meter							
Optional monitoring dongle	Pocket WiFi/LAN/4G							
Display	2 x LED + LCD (16 x 2) / APP							
PROTECTION								
Over/under voltage protection	YES							
DC isolation protection	YES							
Grid monitoring	YES							
DC injection monitoring	YES							
Residual current detection	YES							
Anti-islanding protection	YES							
Over Temp protection	YES							
SPD (DC/AC)	Type II / Type II							
AC auxiliary power supply (APS)	Optional							
Arc-fault circuit interrupter (AFCI)	Optional							
STANDARD								
Safety	IEC/EN 62109-1; IEC/EN 62109-2; NB/T 32004							
EMC	IEC/EN 61000; NB/T 32004							
Certification	VDE4105; EN 50549; AS 4777.2; VDE4105; IEC 61727; IEC 62116; IEC 61683; IEC 60068; EN 50530; NB/T 32004							

* The two data refer to different grid voltage 220V/230V

** The AC voltage and the frequency range may vary from different country codes

①9999 for AS4777.2 ②29999 for AS4777.2

*V2.5. Information may be subject to modify without notice. 650.00004.00



INVERTERS WARRANTY TERMS & CONDITIONS (V1.4)

(For UK markets only)

ABSTRACT

This document described details of warranty terms and conditions of Solax brand Inverters and accessories which sold and installed in UK, Ireland markets from the date 1st Jan 2023. For any other Inverters or accessories that sold or installed before the date, please refer to previous version of warranty documents accordingly.

Lv 9, Lotus Business Center North Building, 333 Lianhua St, Xihu District, Hangzhou, Zhejiang Province, 310063, China.

Tel: +86 0571 56260011 Email: sales@solaxpower.com



Warranty Terms & Conditions

(For UK market only)

Solax inverters are manufactured by SolaX Power Network Technology (Zhejiang) Co., Ltd. The company (hereinafter referred to as Solax) provides the following warranty to the purchaser (the customer) of the inverters (the products). (Here, the customer is deemed to be the owner of the installed inverters/products at first sale).

This *Limited Manufacturer Warranty is applicable for all products as listed in the **Table 1**, which sold and installed from 1st Jan 2023.

1. Warranty Products

This warranty applies exclusively to Solax inverters & Solax accessories (including online monitoring devices, breakers, CT/Meters, DataHub, and EPS/Parallel/Mate boxes) manufactured and supplied either directly by Solax or through authorized partners (distributors) of Solax. All external and ancillary parts and units (eg. Monitoring/Comm devices, batteries, hardware/software controllers etc) installed with inverters by third-parties are excluded from the warranty.

2. Warranty Terms

Solax warrants all goods to be free from defects in materials or workmanship under normal use, and in the event of the occurrence of a defect for which Solax is responsible during the agreed warranty period, Solax will, at its discretion:

- Fix the problem by updating the software or change the configurations; or
- Repair the defect on the premises of Solax or on the customer's site; or
- Provide an equivalent substitute (repaired, refurbished, or upgraded model with at least equivalent functions) or a new device; or
- Have these services performed by Solax service partners who have undertaken proper training.

3. Transportations costs

Unless there are some unique agreements signed between Solax and the customers (the distributors), the warranty covers only the cost of materials that makes the products functional. Besides, the transportation costs of replacement units, including shipments, duties, import & export fees, are covered by this warranty in UK, Ireland, excluding their affiliated islands and overseas territories.

4. Warranty Period

Solax warrants, on the terms and conditions set out below, that:

Table 1: Product and Warranty Period

Product	Warranty Period
X1/X3-Hybrid-G4; X1/X3-Fit-G4;	5 years standard warranty + 5 years parts warranty, starting from the earlier one of the following two dates: • The date on which the product was first installed; • 9 months after the date of production;
X1-Hybrid/Fit-G3, X3-Hybrid/Fit-G2, X3-MAX; X3-MEGA-G1;	5 years standard warranty, starting from the earlier one of the following two dates: • The date on which the product was first installed; • 9 months after the date of production;
X1-MINI/Boost; X3-MIC-G1 & G2; X3-MIC Pro-G1; X3-MIC Pro-G2;	5 years standard warranty, starting from the earlier one of the following two dates: • The date on which the product was first installed; • 9 months after the date of production; Note: <i>If an inverter connected to Solax cloud and generation data been successfully uploaded to Solax server, the inverter warranty will be freely upgraded to 5 years standard warranty + 5 years parts warranty;</i>
X3-MEGA-G2; X3-Forth;	5 years standard warranty, starting from the earlier one of the following two dates: • The date on which the product was first installed; • 9 months after the date of production; Note: <i>If an inverter connected to Solax cloud and generation data been successfully uploaded to Solax server, the inverter warranty will be freely upgraded to 5 years standard warranty + 1 year parts warranty;</i>
Accessories-1: Meter/CT, Pocket Wifi/Lan/4G, V1000, DataHub, X1/X3-EPS Box, X1/X3-Mate Box; Adaptor Box	2 years standard warranty, starting from the earlier one of the following two dates: • The date on which the product was first installed; • 9 months after the date of production;
Accessories-2: Off-grid EPS Parallel Box; BMS Parallel Box;	5 years standard warranty, starting from the earlier one of the following two dates: • The date on which the product was first installed; • 9 months after the date of production;
5 years (or 1 year) parts warranty: The warranty covers only the cost of hardware material required to get the device functioning again. It excludes any inbound/outbound transportation costs or labor costs of replacement/on-site service.	

In the event of product replacement, the remaining warranty period shall be transferred to the substitutive product. Solax will automatically register such replacement, and you will not be provided a new

certification. If the remaining warranty period is less than 1 year, the warranty period of the device and its substitute will be extended to 1 year automatically.

5. Warranty Registration

The direct customers who have purchased Solax products (Solax inverters and accessories) shall register these products and upload the information (such as the original purchase invoice, inverter SN, and contact information) within **90 days** from the date of commissioning of the products (register online: <https://www.solaxcloud.com/#/warranty>). If a customer fails to register a Solax product before the deadline, the product warranty period will be counted automatically from 6 months after the manufacturing date.

6. Warranty Extension

A warranty extension of 5 or 10 years of limited warranty extension can be purchased from Solax's authorized distributors for the mentioned inverter no later than 6 months after its first installation date (or 12 months after production date), or end users can purchase via Solax cloud website after finish online monitoring registration. The new warranty period of the units will automatically include the extended warranty and the remaining warranty. Solax has the rights to increase the payment standard for warranty extension or reject any application received at a later point of time.

7. Warranty Claim Procedure

For a warranty claim, the following information needs to be provided:

- A completed warranty claim form (**Solax RMA form**);
- A copy of your original invoice, receipt, commissioning report, or any other document which can prove the purchase of the inverter or accessory and/or extended warranty, or the date of installation;

Solax reserves the right to reject the warranty claim:

- If you fail to provide the above-mentioned information;
- If the product (Solax inverter or/and accessory) is replaced without the prior consent of Solax;
- If the defect that is claimed is not caused by defective materials or workmanship;

For the claimant, please contact the local distributor where the product was purchased, or the installer who installed the inverter, they will contact with Solax if necessary. If the claimant was unable to obtain service from them, or was NOT satisfied with their service, the claimant can escalate their service request by contacting with Solax service team (service.eu@solaxpower.com) or contacting via Solax official website <https://www.solaxpower.com/contact/> accordingly.

Solax will seek reimbursement of all costs (labour, travel, delivery, and/or replacement units that have been sent) incurred from the claimant if the product is found to be free from defects in materials or workmanship, or the product is found not to be covered by this Limited Warranty.

8. Warranty Limitations

This limited warranty applies to products sold and installed after date of 1st Jan 2023, and sold through Solax or authorized resellers. The defective parts or units replaced under a warranty claim become the properties of Solax, and must be returned to Solax or Authorized Cooperated Partners (distributors) for inspection with the original or equivalent packaging.

The product is not covered by warranty in the following cases:

- A. The product is out of the warranty period;
- B. Product failure is not reported to Solax within 4 weeks of appearance;
- C. Failed to comply with Solax installation manual or maintenance instructions for the inverter or accessory;
- D. Failed to comply with the safety rules and regulations in respect of the inverter or accessory;
- E. The inverter or accessory is damaged during transportation but the claimant has signed the delivery receipt (which requests the claimant to double check the outside & inside of the package and take pictures as evidence before signing the delivery receipt);
- F. The replaced products have not been returned to Solax or cooperated partners (distributors) within **30** days;
- G. The defect is caused by improper usage of the product or failure to comply with the usage of the product for purposes other than those for which the product was designed or intended;
- H. The product is moved for any reason after it has been installed (regardless of whether it has been reinstalled subsequently or moved back to the same location) unless it is reinstalled at the same address by a qualified installer who has provided a test report to Solax.
- I. The damage or defect is caused by lightning, flood, fire, power surge, corrosion, pest damage, actions of a third-party, or any other force majeure factors;
- J. The damage or defect is caused by embedded or external software or hardware (eg. the devices to control the inverters or the devices to control battery charging or discharging) from third parties without authorization (agreement in writing) from Solax;
- K. The product is modified or altered (including the cases in which the product series number or product label is altered, removed, or defaced);
- L. Flaws (eg. any external scratch or stain, or nature material wearing which does not represent a defect) that do not adversely affect the proper functioning of the inverter or accessory
- M. Normal wear or tear;
- N. Travel and subsistence expenses as well as on-site installation, modification and normal maintenance costs;
- O. Duties, import/export fees or costs and other general administrative costs;

The substitute inverter or accessory with technical improvement may not be entirely compatible with the remaining components of the photovoltaic system. The costs incurred as a consequence will not be covered by the warranty or extended warranty.

Furthermore, all other costs including but not limited to compensation from direct or indirect damages arising from the defective device or other facilities of the PV system, or loss of power generated during the product downtime are not covered by this warranty. In any other case, whether in contract, tort, or otherwise, the maximum compensation for customer losses caused by its faults shall not exceed the amount paid by the customer for the purchase of the equipment.

9. Service after Warranty Expiration

For products which are out of warranty or invalidation, Solax provides an additional charge service, which includes the on-site service fee, materials fee, labor cost, and logistic fee:

- **On-site service fee:** Travel cost and time for the technician to deliver on-site services and the cost of labor time for the technician to install, analyse, repair, test and maintain faulty products;
- **Materials fee:** Cost of replacing the parts or units or any other relevant materials;
- **Logistic fee:** Cost of delivery, including the costs of sending the defective products from end users to Solax, or/and the costs of sending the repaired products from Solax to end users;

10. Geographical Scope

This Limited Warranty terms and conditions only apply for the products which are originally purchased from Solax's authorized channels and installed in the destination defined within UK, Ireland, unless there are specially agreements signed between Solax and the direct purchaser. For any units sold for one country/region but installed in another country/region, the warranty will become invalid if there is no written confirmation/approval from Solax prior to the installation.

SOLAX

Special Point Out

Regarding HYBRID INSTALLATION

I. For Hybrid inverters installed with Triple Power batteries:

- The default minimum capacity is 10% (can be changed to a higher level). During night time (no PV), when the battery is discharged to the minimum capacity, usually it will go into the “Idle mode” or “Standby mode”. However, the whole hybrid system is still consuming power. Therefore, you may see that the battery capacity sometimes goes down to low than 10%. When the battery capacity is down to 5% (protection level), it will trigger a charging demand, which requests charging from grid until it goes back to the normal minimum capacity level, it may happen in the night time or during winter time when there is no enough PV production or during bad weather days. This is a normal behaviour and won't affect the battery life.
- It is recommended to force charging battery from grid timely during bad weather (like continuous snowstorm, raining, cloudy days), so as to ensure that the battery won't be fully discharged (0 capacity) under such situations. Besides, manually switching off the whole system is a good choice as well when under such conditions.
- When adding a new extra battery to the existing system, it is requested that the new battery has the same capacity level with the existing battery system before it is added (pre-charge the original battery system and new battery to the full capacity, and then install them together), please check triple power battery user manual regarding this point;
- When charging a battery from grid, consider its self-consumption during this process. The total energy taken from grid won't be completely the same as the total energy discharged from the battery system. Hence, the warranty claim under such conditions will not be accepted.

II. For Hybrid inverters installed in completely off-grid settings:

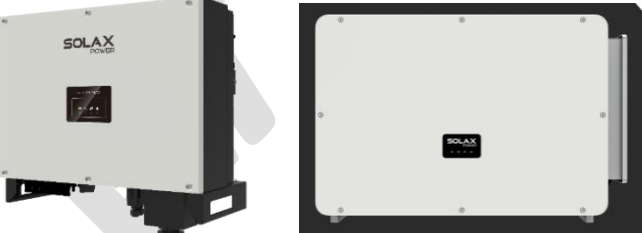
- It is requested that off-grid installation is inspected annually by a qualified electrician and recorded in form of documentation. Failure to comply with the described requirement to maintain the equipment may invalidate any warranty claims;
- For better analysis and troubleshooting in case of a warranty claim, it is recommended that the customer register the inverter system online; otherwise, the customer will need to provide detailed information in Solax RMA form for the warranty claim;
- The load installed with an off-grid system shall be calculated on the basis of its rated power; otherwise, it may have EPS Overload fault during night time or when there is not enough production from PV and battery, especially for inductive loads. Damages to inverters caused by incorrect installation will not be covered by the warranty.

*This Limited Warranty is a basic warranty promise from Solax to the end users. In certain countries/regions, end users may receive an additional warranty promise (should be at least equivalent to the manufacturer's warranty) which is provided by Solax's local distributors; should any claims arise in this respect, please direct them to the local distributor. Please note this limited warranty statement may NOT be the latest version, if any needs, please contact with Solax to get the latest version.

Appendix:

Table 2: Product and Appearance

Product	Appearance
X1-Hybrid/Fit-G4;	
X3-Hybrid/Fit-G4;	
X1-MINI	 
X1-Boost	 
X3-MIC-G1 & G2;	 

X3-MIC Pro-G1 & G2;	 X3-MIC Pro-G1
X1-Hybrid/Fit;	
X3-Hybrid/Fit;	
X3-MAX; X3-Forth;	
X3-MEGA-G1 & G2;	
X1/X3-EPS Box, X1/X3-Mate Box;	

Off-grid eps parallel Box;
BMS Parallel Box;



Meter/CT



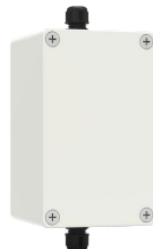
Pocket Wifi/Lan



V1000, DataHub



Adaptor Box





590.EM6303

SWITCH DISCONNECTOR

63A 3P IP66/IP69 160x220x115mm Y2

EMERGENCY YELLOW/RED GW 650°C IK09

Product Approvals

TECHDATA		STANDARDS AND LAWS	
Commercial series	ISOLATORS-TP Series	EN 60947-3 (2009)	[European Standard] Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units
Type of product	SWITCH DISCONNECTOR	EN 60947-1 (2007)	[European Standard] Low-voltage switchgear and controlgear - Part 1: General rules
Synthetical description	SWITCH DISCONNECTOR	EN 60947-1/A1 (2011)	[European Standard] Low-voltage switchgear and controlgear - Part 1: General rules
Material	ENGINEERING PLASTIC	EN 60947-3/A1 (2012)	[European Standard] Low-voltage switchgear and controlgear Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units
Protection degree IP	IP66/IP69	EN 60947-1/A2 (2014)	[European Standard] Low-voltage switchgear and controlgear - Part 1: General rules
Type	EMERGENCY	EN 60947-3/A2 (2015)	[European Standard] Low-voltage switchgear and controlgear Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units
Colour	YELLOW/RED	DIRECTIVE LOW VOLTAGE 2014/35 /UE	[European Directives] Low Voltage Directive
Rated current	63A		
Poles	3P		
Switch size	Y2		
Rated voltage			
Rated voltage	690V		
Dimensions	160x220x115mm		
GLOW WIRE	GW 650°C		
Protection degree IK	IK09		

SI16-PEL64R-2-ECS



Key Features

- Enclosed Solar Isolator
- 600VDC, 16A
- IP30 Protection Rating
- Original Multi-Connect MC4
- 2 Pole, 1 String



Technical Data for DC according to IEC 60947-3

Main Contacts	DC	Units	SI16
Rated Thermal Current $I_{\theta\theta}$		A	16
Rated Insulation Voltage UI ¹⁾		V	1000
Rated Insulation Voltage UI ²⁾		V	1500
Distance of Contacts (per pole)		mm	8
Rated Operational Current I_e DC-PV1	300V	A	16
	350V	A	16
	400V	A	16
	500V	A	16
	600V	A	16
Rated Conditional Short Circuit Current		kA _{eff}	5
Max. Fuse Size	gL (gG)	A	40
Mechanical Life		Ops	10,000
Rated Short-time Withstand Current (1s) I_{cw}		A	800
Short Circuit Making Capacity I_{cw}		A	800
Size of Terminal Screw			M4 Pz2
Tightening Torque		Nm	1.7 - 1.8
Maximum Operation Ambient Temperature		°C	-40 to +45
Maximum Storage Ambient Temperature		°C	-50 to +90
Power Loss at $I_{\theta\theta\max}$		(A) / W	(16) / 1

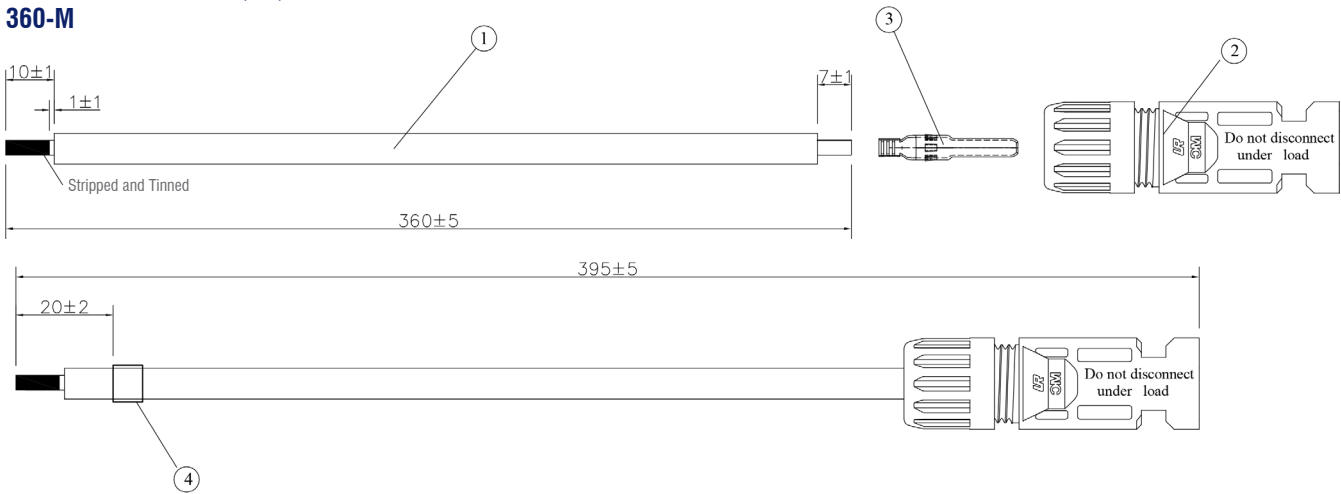
Contact Resistance per pole 1.75mΩ
1) Suitable at overvoltage category I to III, pollution degree 3 (standard-industry): Uimp = 8kV.
2) Suitable at overvoltage category I to III, pollution degree 2 (min. IP55): Uimp = 8kV.

- A. The part will be produced in accordance with the sample provided to Eco2solar and which IMO has also retained the "Evaluation Sample B".
B. The parts will be supplied individually bagged in carton of 10 (to be confirmed).
C. THE SI16-PEL64R-2-ECS CABLE CLAMP SCREWS HAVE BEEN TIGHTENED TO 1.8Nm IN ACCORDANCE WITH THE UNIT'S DESIGN PARAMETERS.
ALL TERMINALS MUST BE CHECKED AGAIN UPON INSTALLATIONS AS THEY MAY HAVE LOOSENED DURING TRANSIT

SI16-PEL64R-2-ECS

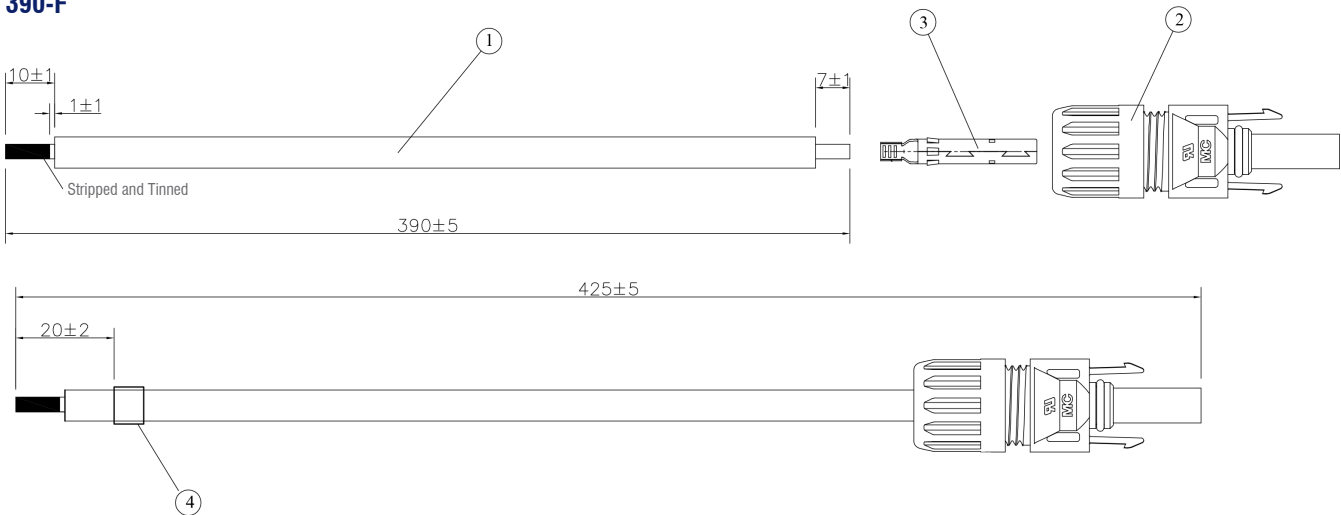
Cable Specifications (600VDC Nominal Voltage)

Terminal 1 - Dimensions (mm) 360-M



Item No.	Description	QTY
①	Cable - 360mm	1pc
②	MC4 Connector	1pc
③	MC Male Connector	1pc
④	Red Colour Marked Label with Number "1", size 29x13mm	1pc

Terminal 3 - Dimensions (mm) 390-F

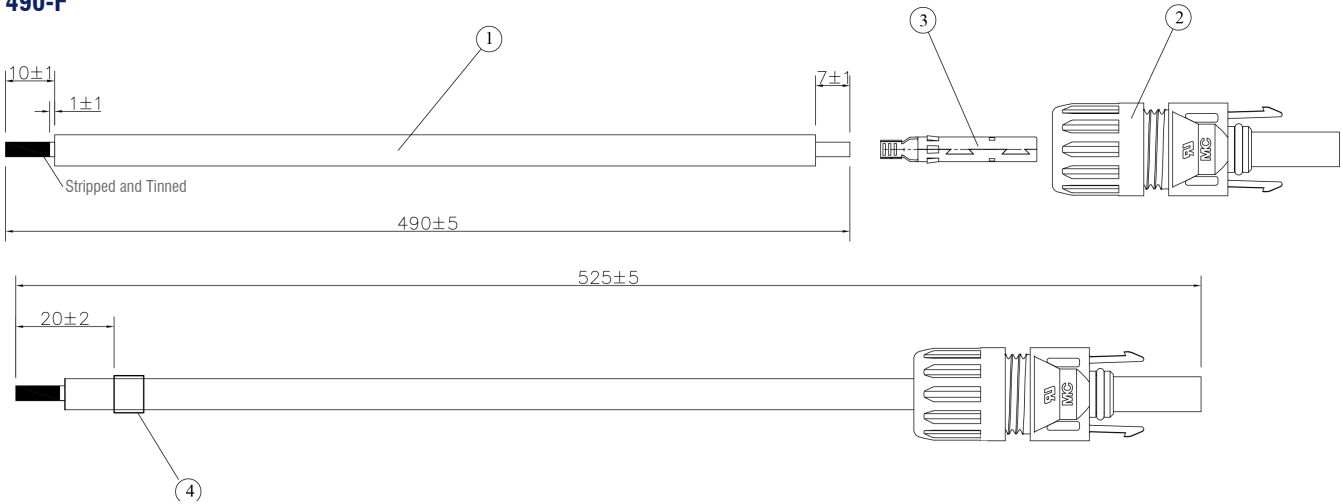


Item No.	Description	QTY
①	Cable - 390mm	1pc
②	MC4 Connector	1pc
③	MC Male Connector	1pc
④	Orange Colour Marked Label with Number "3", size 29x13mm	1pc

- A. The part will be produced in accordance with the sample provided to Eco2solar and which IMO has also retained the "Evaluation Sample B".
- B. The parts will be supplied individually bagged in carton of 10 (to be confirmed).
- C. THE SI16-PEL64R-2-ECS CABLE CLAMP SCREWS HAVE BEEN TIGHTENED TO 1.8Nm IN ACCORDANCE WITH THE UNIT'S DESIGN PARAMETERS.
- ALL TERMINALS MUST BE CHECKED AGAIN UPON INSTALLATIONS AS THEY MAY HAVE LOOSENED DURING TRANSIT

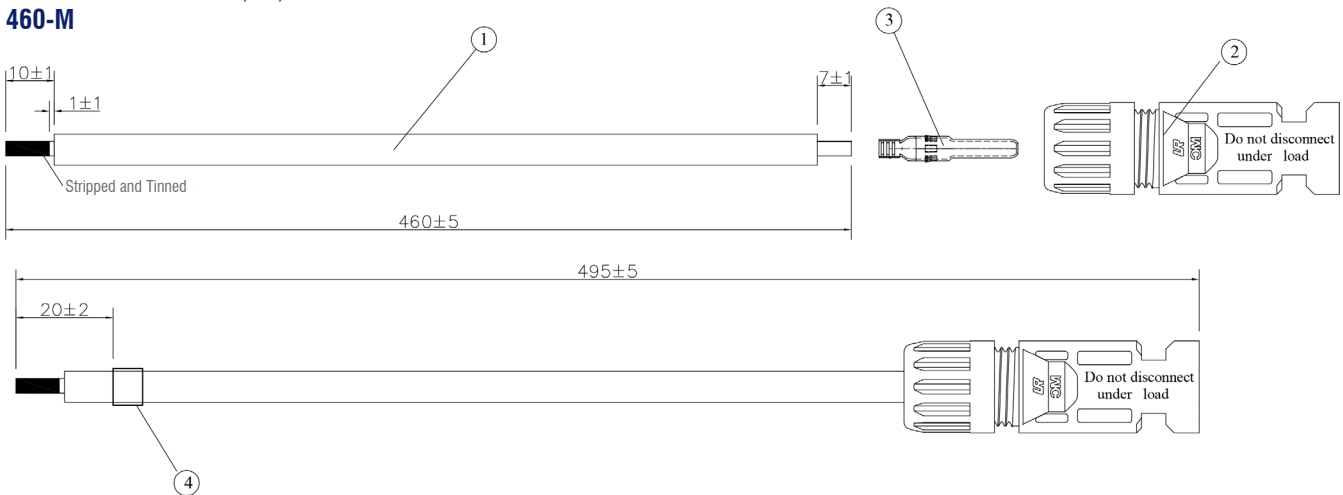
SI16-PEL64R-2-ECS

Terminal 2 - Dimensions (mm) 490-F



Item No.	Description	QTY
①	Cable - 490mm	1pc
②	MC4 Connector	1pc
③	MC Male Connector	1pc
④	Grey Colour Marked Label with Number "4", size 29x13mm	1pc

Terminal 4 - Dimensions (mm) 460-M



Item No.	Description	QTY
①	Cable - 460mm	1pc
②	MC4 Connector	1pc
③	MC Male Connector	1pc
④	Purple Colour Marked Label with Number "2", size 29x13mm	1pc

- A. The part will be produced in accordance with the sample provided to Eco2solar and which IMO has also retained the "Evaluation Sample B".
- B. The parts will be supplied individually bagged in carton of 10 (to be confirmed).
- C. THE SI16-PEL64R-2-ECS CABLE CLAMP SCREWS HAVE BEEN TIGHTENED TO 1.8Nm IN ACCORDANCE WITH THE UNIT'S DESIGN PARAMETERS. ALL TERMINALS MUST BE CHECKED AGAIN UPON INSTALLATIONS AS THEY MAY HAVE LOOSENED DURING TRANSIT



Iskra MT174 – Reading Meter - Summary Sheet

Summary

The Iskra MT174-D2 is quite simply the best wall mounted, direct connect, 3 phase meter on the market with regards to functionality and affordability. The meter is MID approved for billing applications and is manufactured in Europe, (Slovenia).

We have set this model up for use as a simple credit meter and so it only shows Energy (kWh) consumed. Perfect for those who want a no-nonsense meter that's quick and easy to read. However, a number of other parameters, as well as multiple tariffs, can be pre-programmed on to the meter as an optional extra.

This meter has a single pulse output and an RS485 connection. It is suitable for use in three phase 3-and 4-wire networks as well as single phase 2-wire networks.

Product Code

TPWISR

Meter Type

Three Phase

Fitting Type

Wall Mount

Max Current (Amps)

120

MID Approved

Yes

Smart

No

Input Type

Direct Connect

Output Type

RS485 & Pulse

Tariffs

Single

Import / Export

Import Only

Availability

Next Day

Condition

New

Brand

Iskra

Country of Manufacture

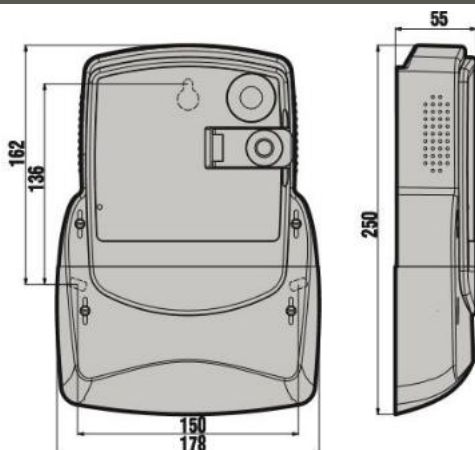
Slovenia

Measured Parameters

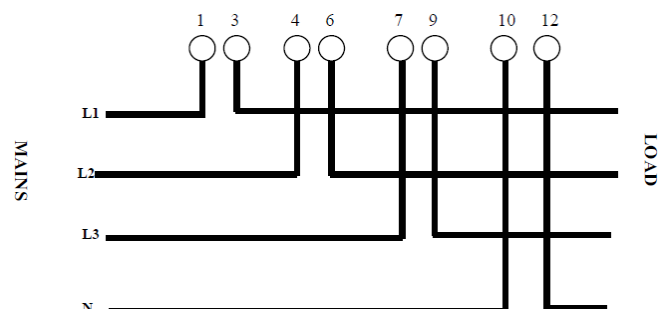
Active Energy (kWh)	✓	Line Power Factor (PF)	✗
Active Power (W) *	✓	Line Reactive Power (kVAr) *	✓
Apparent Energy (kVAh) *	✓	Line to Line Voltage (V)	✗
Apparent Power (VA) *	✓	Line to Neutral Voltage (V) *	✓
Average Current (I)	✗	Maximum Current (I) *	✓
Average Power Demands (W)	✗	Maximum Power Demands (W) *	✓
Average Voltage (V)	✗	Maximum Voltage (V) *	✓
Current (I) *	✓	Power Factor (PF) *	✓
Current in Neutral (I)	✗	Reactive Energy (kVArh) *	✓
Frequency (Hz) *	✓	Reactive Power (VAr) *	✓
Hours Run (hr)	✗	Total Harmonic Distortion (Amps)	✗
Line Active Power (W) *	✓	Total Harmonic Distortion (Volts)	✗
Line Apparent Power (kVA)	✗	Voltage (V) *	✓
Line Current (I) *	✓		

* These parameters can be pre-programmed on to the meter as an optional extra.

Dimensions



Wiring Diagram



Web: www.spwales.com | **Email:** sales@spwales.com | **Phone:** 01803 295430 | **Fax:** 01803 212819

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