


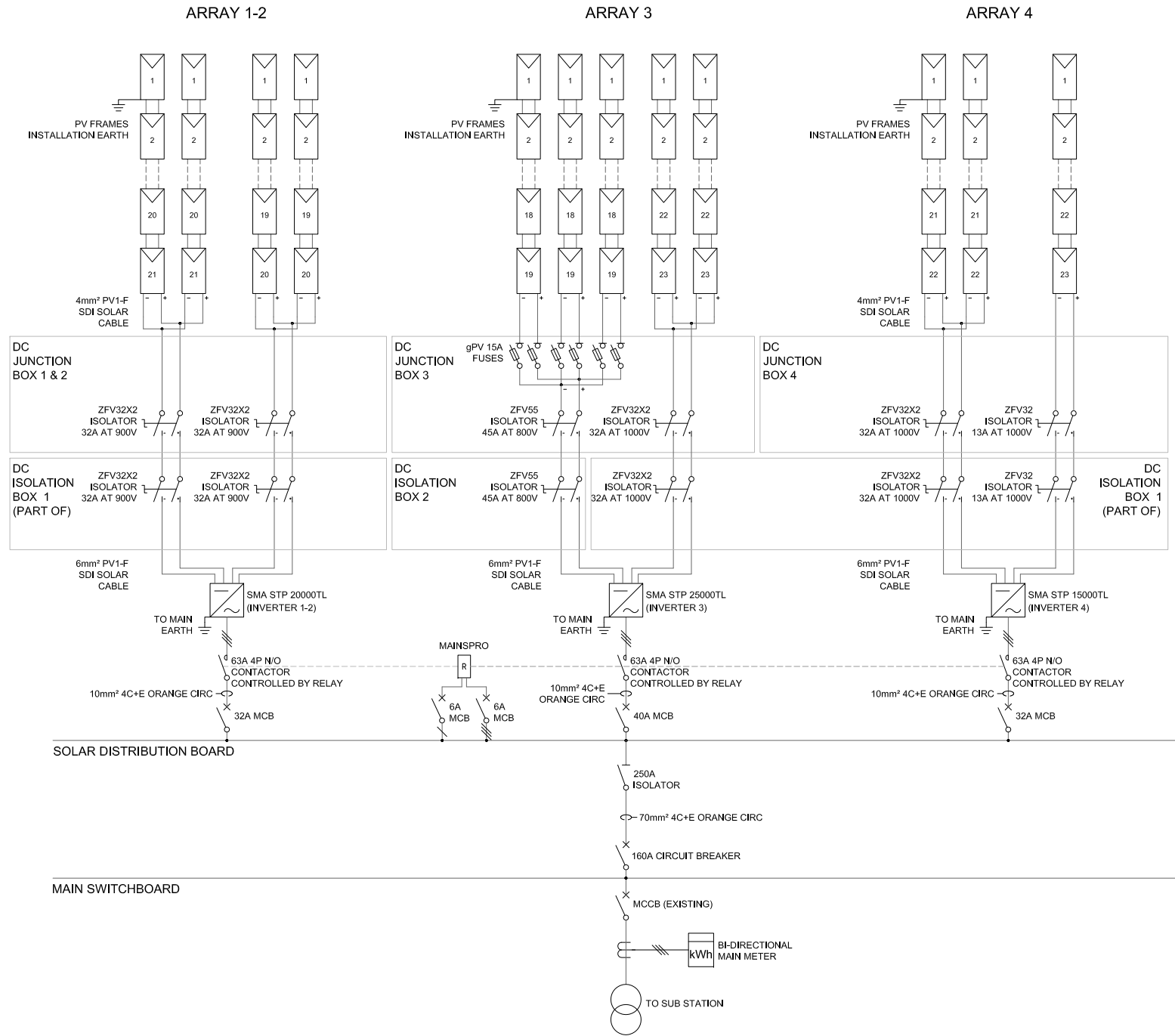
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1. Technology: Solar PV
 2. Maximum Power: 80 kW
 3. Contribution to fault levels: N/A
 4. Size & rating of the relevant Transformer: N/A
 5. Single line diagram: refer to following page
 6. Protection Systems & Communication Systems: refer to following page
 7. Voltage Control and reactive power capability: N/A
 8. Details specific to the location of facility: N/A

ITEM	SPECIFICATION	QTY
MODULE	DUOMAX 260W	334
INVERTER	SMA STP 25000TL	1
	SMA STP 20000TL	2
	SMA STP 15000TL	1
TOTAL		86.84kWp



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- DO NOT SCALE FROM THE DRAWINGS.
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN MILLIMETERS UNLESS NOTED OTHERWISE.
- EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED ON SITE.
- MCB TO MATCH MAKE, MODEL AND FAULT CURRENT OF EXISTING CIRCUIT BREAKERS.



TYPICAL SYSTEM SCHEMATIC
NTS

LEGEND:

- | | | | | | | | |
|--|-----------------|--|--------------------------|--|---|--|-----------------------------------|
| | ISOLATOR | | SINGLE PHASE CIRCUIT | | MOULDED CASE CIRCUIT BREAKER.
100A DENOTES 100AMPS RATING
200A DENOTES MINIMUM FRAME SIZE | | 260W POLYCRYSTALLINE SOLAR MODULE |
| | CIRCUIT BREAKER | | THREE PHASE CIRCUIT | | MAINSPRO RELAY | | INVERTER |
| | ROTARY SWITCH | | NEUTRAL CONDUCTOR SYMBOL | | AC SUPPLY WIRING | | MAIN METER |
| | EARTH POTENTIAL | | EARTH CONDUCTOR SYMBOL | | CONTROL WIRING | | |

ARRAY 1-2

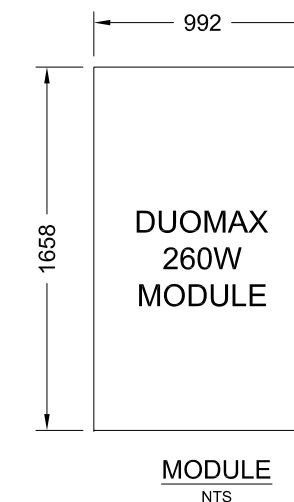
	MPPT1	MPPT2
Panel Type	Trina Duomax 260P	Trina Duomax 260P
Number of Panels in Series (N)	21	20
Number of Parallel Strings	2	2
Total Number of Panels	82	
Inverter Type	SMA STP20000TL-30	
Number of Individual MPPT's	2	
Rated Power (W)	10915	10395
Total Rated Power (W)	21310	
Panel Voc (V)	37.6	37.6
Panel Isc (A)	9.1	9.1
Fill Factor	0.759469254	0.759469254
Input Voc (V)	789.6	752
Input Isc (A)	18.2	18.2
PV Array Min Voltage	514.164	489.68
PV Array Max Voltage	860.35	819.38
Distance to Junction Box (m)	120	
DC Cable Resistance (Ohm*mm2/m)	0.0172	
Min cable size (mm2)	2.38	2.50
Cable Size selected (mm2)	4	4
Voltage drop (%)	1.19	1.25
String Protection Needed	NO	NO
Distance to Inverter (m)	15	
DC Cable Resistance (Ohm*mm2/m)	0.0172	
Min cable size (mm2)	0.66	0.71
Cable Size selected (mm2)	6	6
Voltage drop (%)	0.20	0.21
Total voltage drop (panel-inverter) (%)	1.39	1.46
DC Isolation min voltage [per pole rating] (V)	860.35	819.38
DC Isolation min Current (A)	22.75	22.75
Phases output	3	
Max AC current [per phase, line to neutral] (A)	29.00	
AC Breaker min Current (A)	29.00	
AC Breaker max Current (A)	58.00	
AC Breaker Chosen (A)	32	
Distance to POC (m)	10.00	
Cable Impedance (Ohm*mm2/m)	0.018	
Min cable size (mm2)	4.35	
AC Cable size (mm2)	10.00	

ARRAY 3

	MPPT1	MPPT2
Panel Type	Trina Duomax 260P	Trina Duomax 260P
Number of Panels in Series (N)	19	23
Number of Parallel Strings	3	2
Total Number of Panels	103	
Inverter Type	SMA STP25000TL-30	
Number of Individual MPPT's	2	
Rated Power (W)	14813	11954
Total Rated Power (W)	26767	
Panel Voc (V)	37.6	37.6
Panel Isc (A)	9.1	9.1
Fill Factor	0.759469254	0.759469254
Input Voc (V)	714.4	864.8
Input Isc (A)	27.3	18.2
PV Array Max Voltage	778.41	942.29
Distance to Junction Box (m)	120	
DC Cable Resistance (Ohm*mm2/m)	0.0172	
Min cable size (mm2)	2.63	2.17
Cable Size selected (mm2)	4	4
Voltage drop (%)	1.31	1.09
String Protection Needed	YES	NO
String Protection Min Voltage (V)	778.41	942.29
String Protection Max Current (A)	13.65	13.65
Distance to Inverter (m)	15.00	
DC Cable Resistance (Ohm*mm2/m)	15	
Min cable size (mm2)	1.17	0.57
Cable Size selected (mm2)	6	6
Voltage drop (%)	0.33	0.18
Total voltage drop (panel-inverter) (%)	1.64	1.27
DC Isolation min voltage [per pole rating] (V)	778.41	942.29
DC Isolation min Current (A)	34.13	22.75
Phases output	3	
Max AC current [per phase, line to neutral] (A)	36.20	
AC Breaker min Current (A)	36.20	
AC Breaker max Current (A)	72.40	
AC Breaker Chosen (A)	40	
Distance to POC (m)	10.00	
Cable Impedance (Ohm*mm2/m)	0.018	
Min cable size (mm2)	5.43	
AC Cable size (mm2)	10.00	

ARRAY 4

	MPPT1	MPPT2
Panel Type	Trina Duomax 260P	Trina Duomax 260P
Number of Panels in Series (N)	22	23
Number of Parallel Strings	2	1
Total Number of Panels	67	
Inverter Type	SMA STP15000TL-10	
Number of Individual MPPT's	2	
Rated Power (W)	11434	5977
Total Rated Power (W)	17411	
Panel Voc (V)	37.6	37.6
Panel Isc (A)	9.1	9.1
Fill Factor	0.759469254	0.759469254
Input Voc (V)	827.2	864.8
Input Isc (A)	18.2	9.1
PV Array Min Voltage	538.648	563.132
PV Array Max Voltage	901.32	942.29
Distance to Junction Box (m)	120	
DC Cable Resistance (Ohm*mm2/m)	0.0172	
Min cable size (mm2)	2.27	2.17
Cable Size selected (mm2)	4	4
Voltage drop (%)	1.14	1.09
String Protection Needed	NO	NO
Distance to Inverter (m)	15	
DC Cable Resistance (Ohm*mm2/m)	0.0172	
Min cable size (mm2)	0.61	0.28
Cable Size selected (mm2)	6	6
Voltage drop (%)	0.19	0.09
Total voltage drop (panel-inverter) (%)	1.32	1.18
DC Isolation min voltage [per pole rating] (V)	901.32	942.29
DC Isolation min Current (A)	22.75	11.38
Phases output	3	
Max AC current [per phase, line to neutral] (A)	24.00	
AC Breaker min Current (A)	24.00	
AC Breaker max Current (A)	48.00	
AC Breaker Chosen (A)	32	
Distance to POC (m)	10.00	
Cable Impedance (Ohm*mm2/m)	0.018	
Min cable size (mm2)	3.60	
AC Cable size (mm2)	10.00	



Rev	Description	Date	Checked	Authorised
C	ISOLATOR 2 ADDED	10.12.15		
B	ISOLATOR DETAILS UPDATED	04.12.15		
A	PRELIMINARY DESIGN	22.07.15		

PROJECT:
[Redacted]

CLIENT:
[Redacted]

SOLGEN ENERGY PTY LTD
[Redacted]

DRAWING TITLE:
86.84kWp PHOTOVOLTAIC SYSTEM SCHEMATIC

SCALE	DRAWN	CHECKED	AUTHORISED	SIZE
AS SHOWN	Date: 22.07.2015	Date: 22.07.2015	Date: 22.07.2015	A3
DRAWING No.	D-EL-25123P6-201			Rev C

SOLAR DB COMPONENT SCHEDULE			
PART NR.	ID	MANUFACTURER	DESCRIPTION
1	MCB 1	GE	32A 3P MCB (INV 1 CONNECTION)
2	MCB 2	GE	32A 3P MCB (INV 2 CONNECTION)
3	MCB 3	GE	40A 3P MCB (INV 3 CONNECTION)
4	MCB 4	GE	32A 3P MCB (INV 4 CONNECTION)
5	MCB 5	GE	6A 1P MCB (CONTROL SUPPLY)
6	MCB 6	GE	6A 1P MCB (RELAY POWER SUPPLY)
7	MCB 7	GE	6A 3P MCB (RELAY VOLTAGE REFERENCE)
8	MAIN SWITCH	GE	250A 3P ISOLATOR
9	CONTACTOR 1	ELKO	63A 4P N/O CONTACTOR (INV 1 CONTROL)
10	CONTACTOR 2	ELKO	63A 4P N/O CONTACTOR (INV 2 CONTROL)
11	CONTACTOR 3	ELKO	63A 4P N/O CONTACTOR (INV 3 CONTROL)
12	CONTACTOR 4	ELKO	63A 4P N/O CONTACTOR (INV 4 CONTROL)
13	MAINSPRO	ComAP	MAINSPRO MAINS DECOUPLING RELAY

MULTIFUNCTION RELAY TERMINAL SCHEDULE		
TERMINAL	FUNCTION	DEFAULT STATE
RE 1	SPARE	/
RE 2	SPARE	/
RE 3	SPARE	/
RE 4	!CommTrpPer	N/O
RE 5	!InternFail	N/O

CABLE SCHEDULE	
INVERTER TO SOLAR DB	4C + E 10mm ² Cu
SOLAR DB TO MSB-BLG2	4C + E 70mm ² Cu
AC CONTROL CIRCUITS	1.5mm ² COPPER

O/U VOLTAGE SETTINGS

Protection Setting	Set Point	
	Value	Units
OV Pick Up	270	V
OV Timing	1.0	S
UV Pick Up	200	V
UV Timing	1.0	S

O/U FREQUENCY SETTINGS

Protection Setting	Set Point	
	Value	Units
OF Pick Up	52	Hz
OF Timing	2.0	S
UF Pick Up	48	Hz
UF Timing	2.0	S

ROCOF SETTINGS

Protection Setting	Set Point	
	Value	Units
+ve ROCOF Pick Up	0.7	Hz/S
+ve ROCOF Timing	1.0	S
-ve ROCOF Pick Up	0.7	Hz/S
-ve ROCOF Timing	1.0	S

VECTOR SHIFT SETTINGS

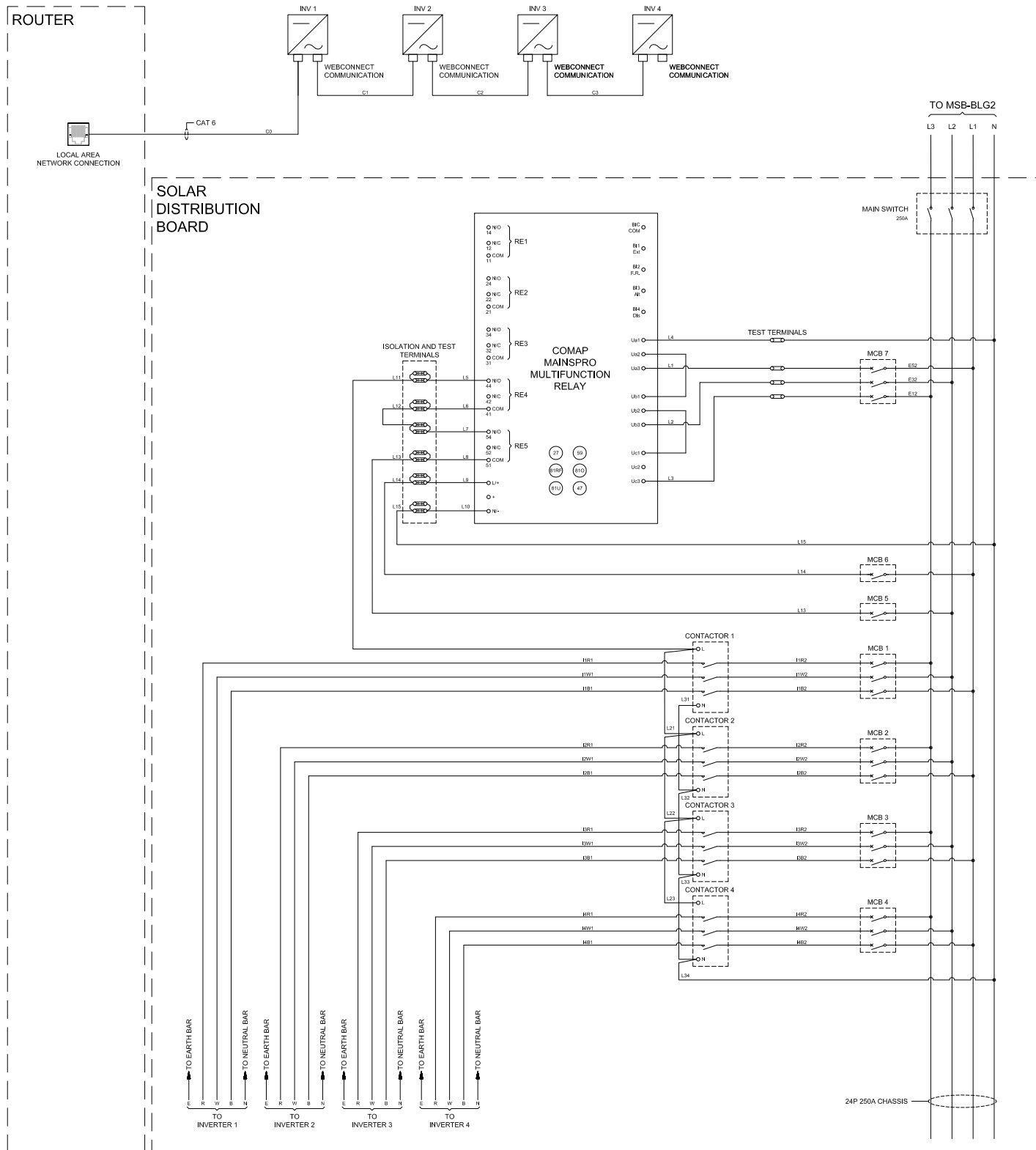
Protection Setting	Set Point	
	Value	Units
+ve Vector Shift Pick Up	8	Degrees
-ve Vector Shift Pick Up	8	Degrees

INVERTER O/U VOLTAGE SETTINGS

Protection Setting	Set Point	
	Value	Units
OV Pick Up	260	V
OV Timing	1.0	S
UV Pick Up	200	V
UV Timing	1.0	S

INVERTER O/U FREQUENCY SETTINGS

Protection Setting	Set Point	
	Value	Units
OF Pick Up	52	Hz
OF Timing	2	S
UF Pick Up	48	Hz
UF Timing	2	S



SOLAR DISTRIBUTION BOARD WIRING SCHEMATIC
NTS

1. MAINSPRO DECOUPLING RELAY USES NORMALLY OPEN CONTACTS. WHEN A FAULT IS DETECTED A CIRCUIT IS BROKEN TO THE AC CONTROL CIRCUIT CAUSING IT TO TRIP THE CONTACTORS.
2. AUTO RECONNECT SETTING: 60 SECONDS AFTER FAULT IS CLEARED.
3. START TRIP ACTIVATED ON RELAY.

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3. EARTH CABLE ROUTE NOT SHOWN FOR CLARITY
4. CABLE SIZED ACCORDINGLY FOR THE APPROPRIATE RATINGS.
5. SOLAR POWER SYSTEM COMPLIES WITH CLASS II INSTALLATION
6. INSTALLATION TO COMPLY WITH AS4777, AS5033, AS3000, AS3430, STATE SERVICE AND INSTALLATION RULES AND ENERGY AUTHORITY NETWORK RULES
7. SOLAR AC SWITCHGEAR SIZED FOR MAXIMUM INVERTER AC OUTPUT.

Rev	Description	Date	Checked	Authorised
A	PRELIMINARY DESIGN	04-12-15		

PROJECT:
[REDACTED]

CLIENT:
[REDACTED]

SOLGEN ENERGY PTY LTD
[REDACTED]

DRAWING TITLE:
SOLAR DB WIRING AND PROTECTION SETTINGS

SCALE	DRAWN	CHECKED	AUTHORISED	SIZE
AS SHOWN	Date	Date	Date	A3
	04.12.2015	04.12.2015	04.12.2015	
DRAWING No.	D-EL-25123P6-203			Rev
				A