


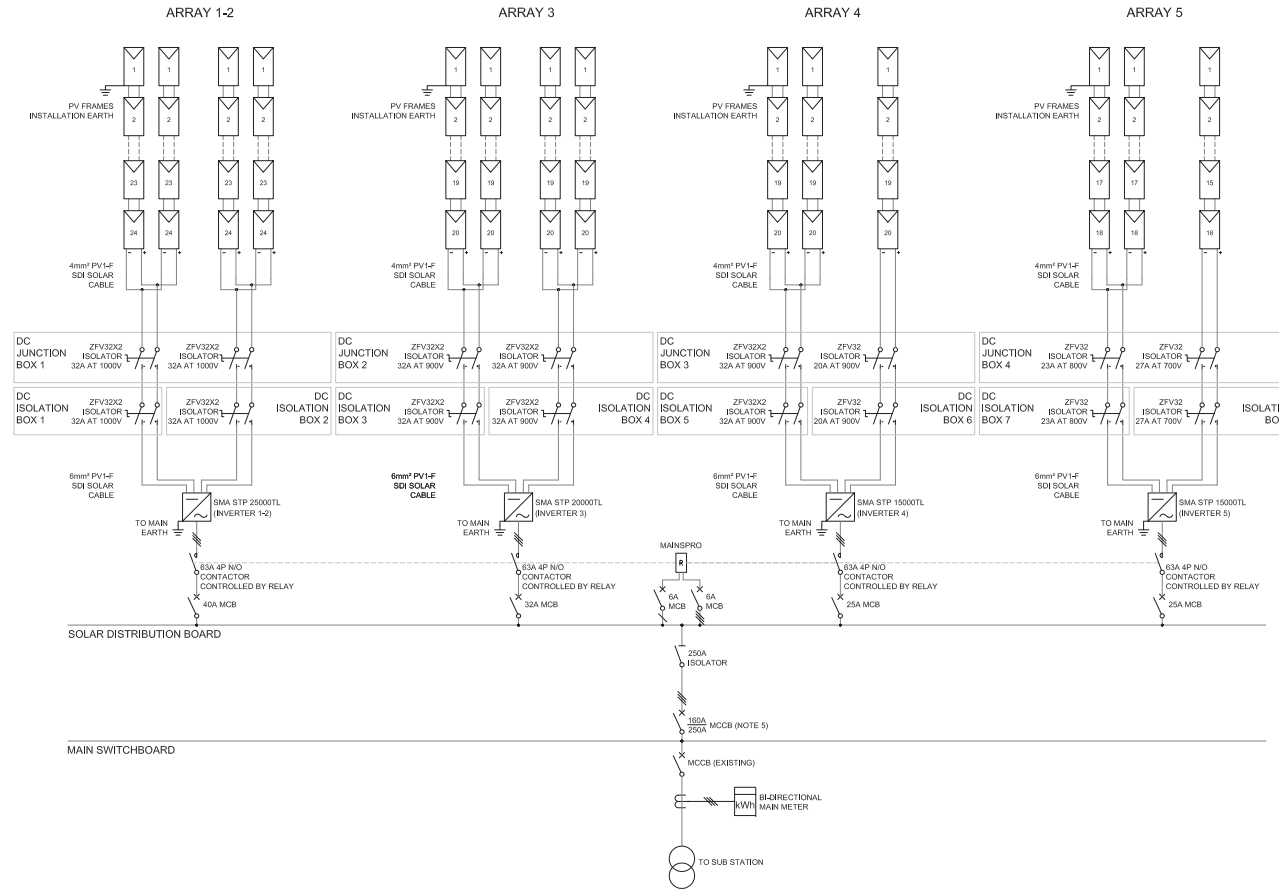
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1. Technology: Solar PV
 2. Maximum Power: 100 kW
 3. Contribution to fault levels: N/A
 4. Size & rating of the relevant Transformer: N/A
 5. Single line diagram: refer to following page
 6. Protection Systems & Communication Systems: refer to following 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	384
INVERTER	SMA STP 25000TL	2
	SMA STP 20000TL	1
	SMA STP 15000TL	2
TOTAL		99.84kWp



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- 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:

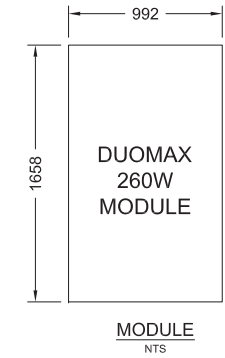
- ISOLATOR
- SINGLE PHASE CIRCUIT
- CIRCUIT BREAKER
- THREE PHASE CIRCUIT
- ROTARY SWITCH
- EARTH POTENTIAL
- EARTH CONDUCTOR SYMBOL
- MOULDED CASE CIRCUIT BREAKER, 100A DENOTES 100AMPS RATING, 200A DENOTES MINIMUM FRAME SIZE
- MAINSPRO RELAY
- AC SUPPLY WIRING
- CONTROL WIRING
- 260W POLYCRYSTALLINE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

	ARRAY 1-2	
	MPP1	MPP2
Panel Type	Triu Duomax 260P	260P
Number of Panels in Series (N)	20	20
Number of Parallel Strings	2	2
Total Number of Panels	40	40
Inverter Type	SMA STP2500TL10	SMA STP2000TL10
Number of Individual MPP's	2	2
Rated Power (W)	10395	10395
Total Rated Power (W)	41580	41580
Panel Voc (V)	37.6	37.6
Panel Voc (A)	2.1	2.1
Fill Factor	0.759460254	0.759460254
Input Voc (V)	752	752
Input Voc (A)	18.2	18.2
PV Array Min Voltage	489.08	489.08
PV Array Max Voltage	839.38	839.38
Distance to Junction Box (m)	60	60
DC Cable Resistance (Ohm*mm2/m)	0.0372	0.0372
Min cable size (mm2)	2.08	2.08
Cable Size selected (mm2)	4	4
Voltage drop (%)	0.62	0.62
String Protection Needed	NO	NO
Distance to Inverter (m)	40	40
DC Cable Resistance (Ohm*mm2/m)	0.0372	0.0372
Min cable size (mm2)	1.32	1.32
Cable Size selected (mm2)	6	6
Voltage drop (%)	0.46	0.46
Total voltage drop (panel-inverter) (%)	0.98	0.98
DC Isolation min voltage (per pole rating) (V)	839.38	839.38
DC Isolation min Current (A)	22.75	22.75
Phases output	3	3
Max AC current (per phase, line to neutral) (A)	36.14	25.00
AC Breaker min Current (A)	36.14	25.00
AC Breaker max Current (A)	72.28	50.00
AC Breaker Chosen (A)	40	32
Distance to POC (m)	10.00	10.00
Cable Impedance (Ohm*mm2/m)	0.018	0.038
Min cable size (mm2)	3.62	4.23
AC Cable size (mm2)	10.00	6.00

	ARRAY 3	
	MPP1	MPP2
Panel Type	Triu Duomax 260P	260P
Number of Panels in Series (N)	20	20
Number of Parallel Strings	2	2
Total Number of Panels	40	40
Inverter Type	SMA STP2500TL10	SMA STP2000TL10
Number of Individual MPP's	2	2
Rated Power (W)	10395	10395
Total Rated Power (W)	41580	41580
Panel Voc (V)	37.6	37.6
Panel Voc (A)	2.1	2.1
Fill Factor	0.759460254	0.759460254
Input Voc (V)	752	752
Input Voc (A)	18.2	18.2
PV Array Min Voltage	489.08	489.08
PV Array Max Voltage	839.38	839.38
Distance to Junction Box (m)	60	60
DC Cable Resistance (Ohm*mm2/m)	0.0372	0.0372
Min cable size (mm2)	2.08	2.08
Cable Size selected (mm2)	4	4
Voltage drop (%)	0.62	0.62
String Protection Needed	NO	NO
Distance to Inverter (m)	40	40
DC Cable Resistance (Ohm*mm2/m)	0.0372	0.0372
Min cable size (mm2)	1.40	1.40
Cable Size selected (mm2)	6	6
Voltage drop (%)	0.56	0.56
Total voltage drop (panel-inverter) (%)	1.18	1.18
DC Isolation min voltage (per pole rating) (V)	839.38	839.38
DC Isolation min Current (A)	22.75	22.75
Phases output	3	3
Max AC current (per phase, line to neutral) (A)	25.00	25.00
AC Breaker min Current (A)	25.00	25.00
AC Breaker max Current (A)	50.00	32
AC Breaker Chosen (A)	32	32
Distance to POC (m)	10.00	10.00
Cable Impedance (Ohm*mm2/m)	0.038	0.038
Min cable size (mm2)	4.23	4.23
AC Cable size (mm2)	6.00	6.00

	ARRAY 4	
	MPP1	MPP2
Panel Type	Triu Duomax 260P	260P
Number of Panels in Series (N)	20	20
Number of Parallel Strings	2	2
Total Number of Panels	40	40
Inverter Type	SMA STP2500TL10	SMA STP2000TL10
Number of Individual MPP's	2	2
Rated Power (W)	10395	10395
Total Rated Power (W)	41580	41580
Panel Voc (V)	37.6	37.6
Panel Voc (A)	2.1	2.1
Fill Factor	0.759460254	0.759460254
Input Voc (V)	752	752
Input Voc (A)	18.2	18.2
PV Array Min Voltage	489.08	489.08
PV Array Max Voltage	839.38	839.38
Distance to Junction Box (m)	60	60
DC Cable Resistance (Ohm*mm2/m)	0.0372	0.0372
Min cable size (mm2)	2.08	2.08
Cable Size selected (mm2)	4	4
Voltage drop (%)	0.62	0.62
String Protection Needed	NO	NO
Distance to Inverter (m)	40	40
DC Cable Resistance (Ohm*mm2/m)	0.0372	0.0372
Min cable size (mm2)	1.34	0.67
Cable Size selected (mm2)	6	6
Voltage drop (%)	0.56	0.28
Total voltage drop (panel-inverter) (%)	1.08	0.80
DC Isolation min voltage (per pole rating) (V)	839.38	839.38
DC Isolation min Current (A)	22.75	11.38
Phases output	3	3
Max AC current (per phase, line to neutral) (A)	22.60	15.58
AC Breaker min Current (A)	22.60	15.58
AC Breaker max Current (A)	49.19	39.17
AC Breaker Chosen (A)	26	26
Distance to POC (m)	10.00	10.00
Cable Impedance (Ohm*mm2/m)	0.018	0.038
Min cable size (mm2)	1.39	2.94
AC Cable size (mm2)	6.00	6.00

	ARRAY 5	
	MPP1	MPP2
Panel Type	Triu Duomax 260P	260P
Number of Panels in Series (N)	18	18
Number of Parallel Strings	2	1
Total Number of Panels	36	18
Inverter Type	SMA STP2500TL10	SMA STP2000TL10
Number of Individual MPP's	2	2
Rated Power (W)	9395	4158
Total Rated Power (W)	13553	13553
Panel Voc (V)	37.6	37.6
Panel Voc (A)	2.1	2.1
Fill Factor	0.759460254	0.759460254
Input Voc (V)	676.8	601.8
Input Voc (A)	18.2	9.1
PV Array Min Voltage	440.73	391.74
PV Array Max Voltage	797.44	655.63
Distance to Junction Box (m)	50	50
DC Cable Resistance (Ohm*mm2/m)	0.0372	0.0372
Min cable size (mm2)	2.31	2.60
Cable Size selected (mm2)	6	6
Voltage drop (%)	0.62	0.65
String Protection Needed	NO	NO
Distance to Inverter (m)	40	40
DC Cable Resistance (Ohm*mm2/m)	0.0372	0.0372
Min cable size (mm2)	1.53	0.89
Cable Size selected (mm2)	6	6
Voltage drop (%)	0.62	0.35
Total voltage drop (panel-inverter) (%)	1.19	1.00
DC Isolation min voltage (per pole rating) (V)	797.44	655.63
DC Isolation min Current (A)	22.75	11.38
Phases output	3	3
Max AC current (per phase, line to neutral) (A)	15.58	15.58
AC Breaker min Current (A)	15.58	15.58
AC Breaker max Current (A)	39.17	39.17
AC Breaker Chosen (A)	26	26
Distance to POC (m)	10.00	10.00
Cable Impedance (Ohm*mm2/m)	0.038	0.038
Min cable size (mm2)	2.94	2.94
AC Cable size (mm2)	6.00	6.00



B	ISOLATORS UPDATED	08.12.15	
A	PRELIMINARY DESIGN	22.07.15	
Rev	Description	Date	Checked/Authorised

PROJECT: [Redacted]

CLIENT: [Redacted]

SOLGEN ENERGY PTY LTD

DRAWING TITLE:
99.84kWp PHOTOVOLTAIC SYSTEM SCHEMATIC

SCALE	DRAWN	CHECKED	AUTHORISED	ISSUE
AS SHOWN	DATE	DATE	DATE	DATE
	22.07.2015	22.07.2015	22.07.2015	
DRAWING No.	D-EL-25123P7-201			Rev B

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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.

SOLAR DB COMPONENT SCHEDULE			
PART NR.	ID	MANUFACTURER	DESCRIPTION
1	MCB 1	GE	40A 3P MCB (INV 1 CONNECTION)
2	MCB 2	GE	40A 3P MCB (INV 2 CONNECTION)
3	MCB 3	GE	32A 3P MCB (INV 3 CONNECTION)
4	MCB 4	GE	25A 3P MCB (INV 4 CONNECTION)
5	MCB 5	GE	25A 3P MCB (INV 5 CONNECTION)
6	MCB 6	GE	6A 1P MCB (CONTROL SUPPLY)
7	MCB 7	GE	6A 1P MCB (RELAY POWER SUPPLY)
8	MCB 8	GE	6A 3P MCB (RELAY VOLTAGE REFERENCE)
9	MAIN SWITCH	GE	250A 3P ISOLATOR
10	CONTACTOR 1	ELKO	63A 4P N/O CONTACTOR (INV 1 CONTROL)
11	CONTACTOR 2	ELKO	63A 4P N/O CONTACTOR (INV 2 CONTROL)
12	CONTACTOR 3	ELKO	63A 4P N/O CONTACTOR (INV 3 CONTROL)
13	CONTACTOR 4	ELKO	63A 4P N/O CONTACTOR (INV 4 CONTROL)
14	CONTACTOR 5	ELKO	63A 4P N/O CONTACTOR (INV 5 CONTROL)
15	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	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 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

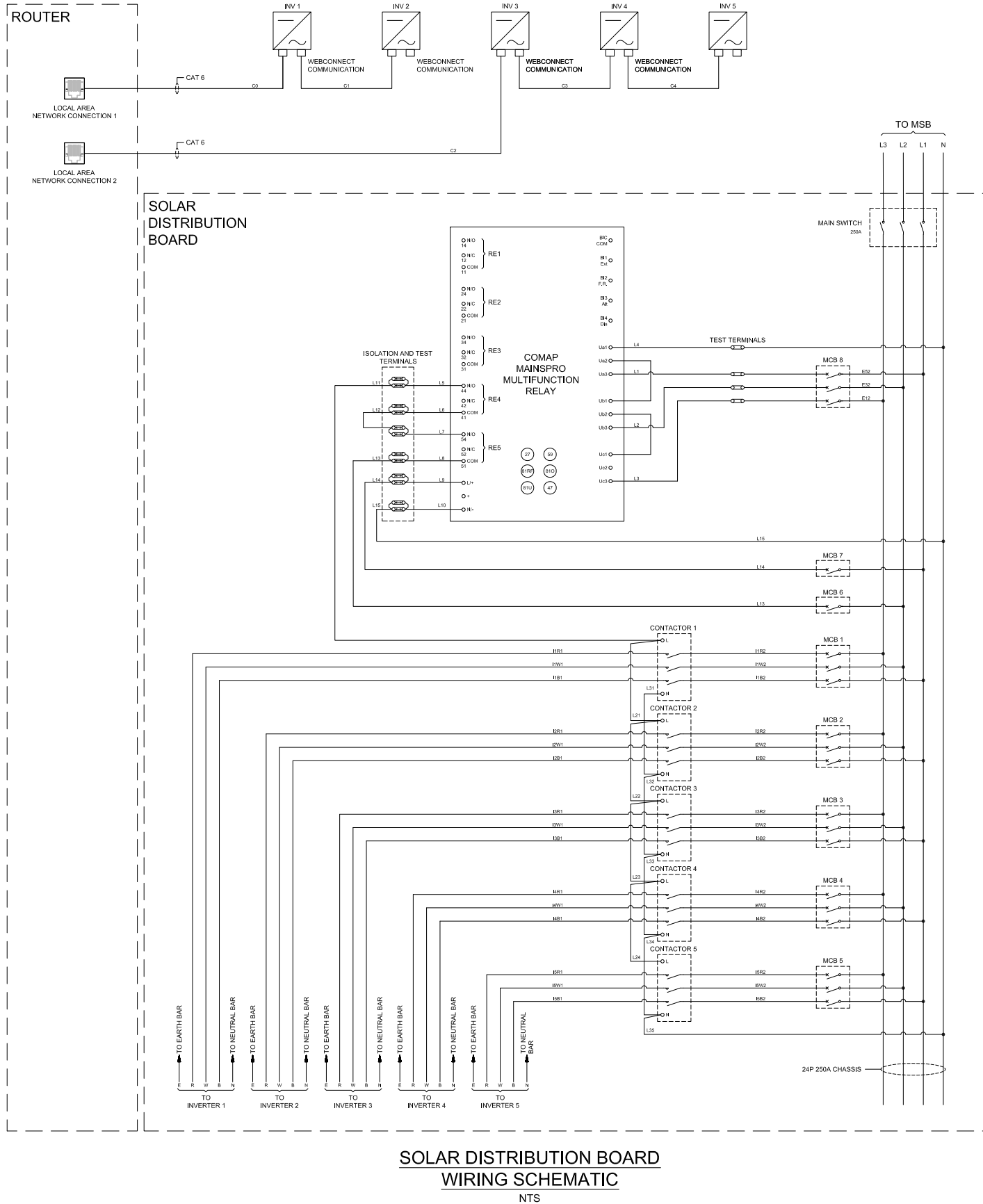
INVERTER O/U VOLTAGE SETTINGS

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

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.



Rev	Description	Date	Checked	Authorised
B	INVERTER ROCOF SETTINGS ADDED	01.02.16		
A	PRELIMINARY DESIGN	15.12.15		

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: 15.12.2015	Date: 15.12.2015	Date: 15.12.2015	A3
DRAWING No. D-EL-25123P7-203				Rev B