

Embedded Generator Single Line Diagram templates

These template diagrams show typical acceptable layouts for a range of embedded generator sizes and configurations, and off-grid and UPS/backup systems.

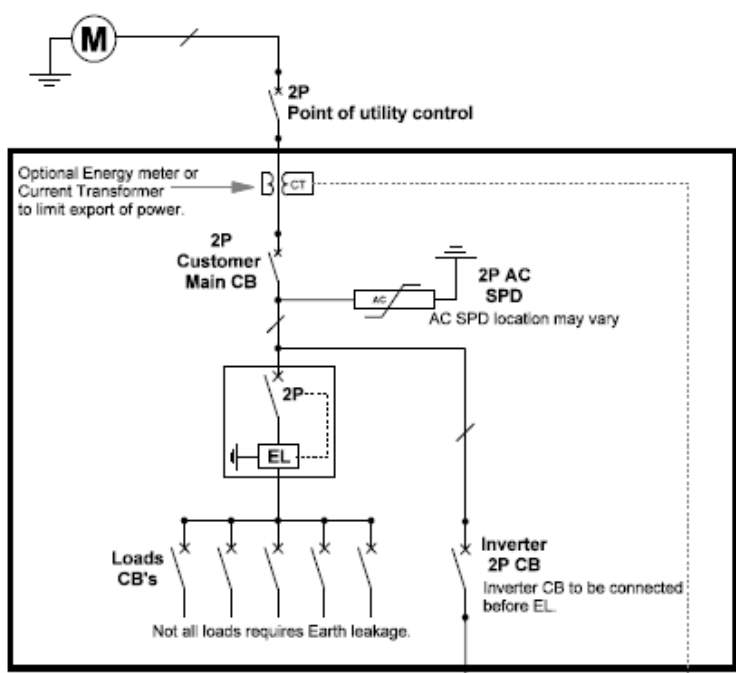
CONTENTS:

- EG Drawing 1 PV no storage Single phase up to 20kW
- EG Drawing 2 PV Storage All loads Single phase up to 20kW
- EG Drawing 3 PV Storage Split loads Single phase up to 20kW
- EG Drawing 4 13.8kVA to 1MW 3 phase
- EG Drawing 5 1MW to 20MW 3 phase
- EG Drawing 6 LV to MV for MV Customers
- EG Drawing 7 Off grid Hybrid System Single phase
- EG Drawing 8 Back-up No PV or UPS Single phase
- EG Drawing 9 Solar with back-up generators Single phase

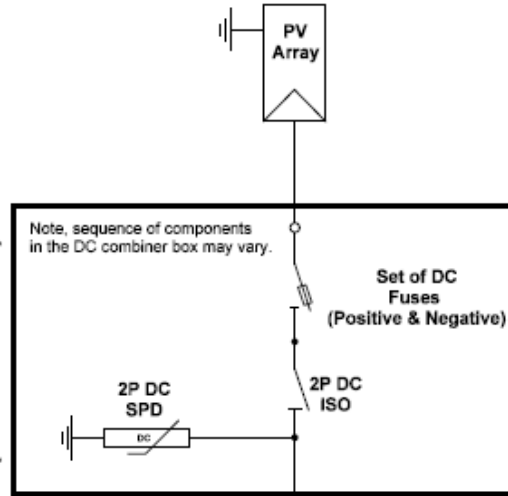
Developed by the Municipal Embedded Generation Support Program



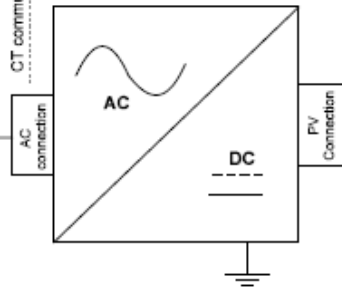
Main (AC) Distribution board



DC Combiner Box (Junction box)



Grid-Tied Inverter



Notes:

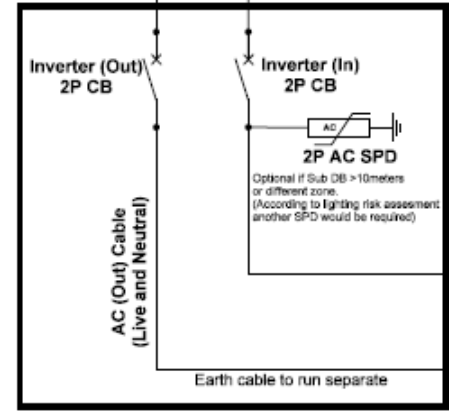
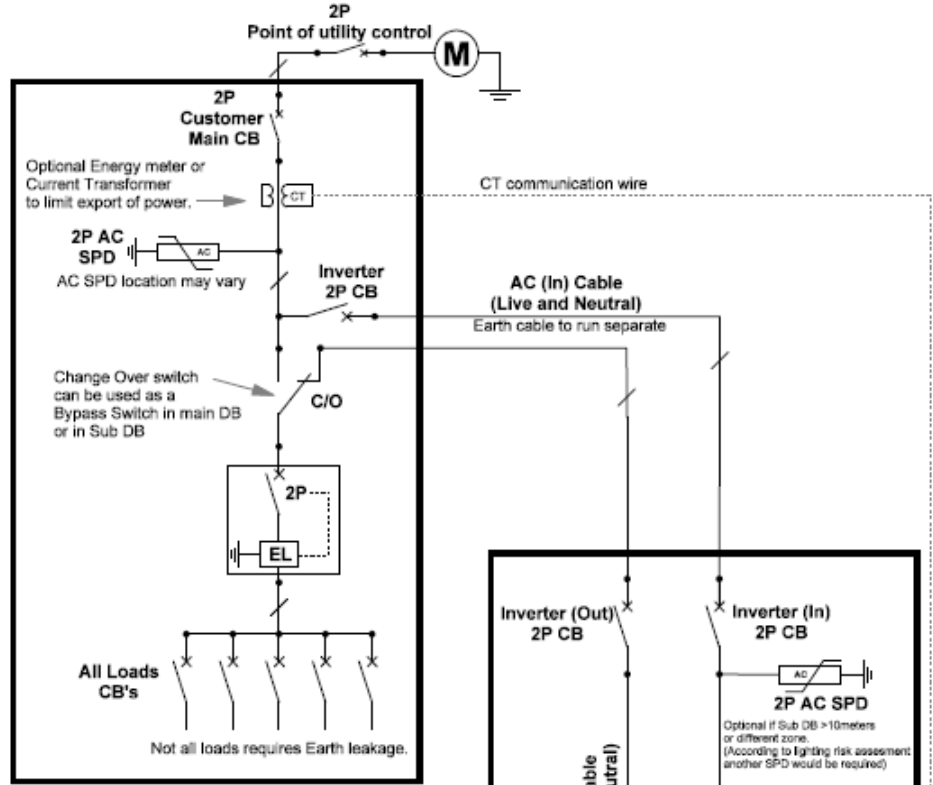
Installation, Earthing, and bonding needs to comply with the latest version of the SANS 10142-1 and listed normative references and product specifications e.g., SANS 60364-7-712. Systems with micro-inverters or power optimisers may have different wiring to that indicated in this drawing.

Legend:

Utility electrical meter	(M)
Circuit breaker (CB)	[Symbol]
AC rated Surge Arrestor	[Symbol]
Single Phase indicator	[Symbol]
Earth leakage (EL)	[Symbol]
Current Transformer	[Symbol]
2 (two) Pole	2P
PV module	[Symbol]
DC rated fuse	[Symbol]
DC rated Isolator	[Symbol]
DC rated Surge Arrestor	[Symbol]
Earth connected symbol	[Symbol]
Inverter symbol	[Symbol]

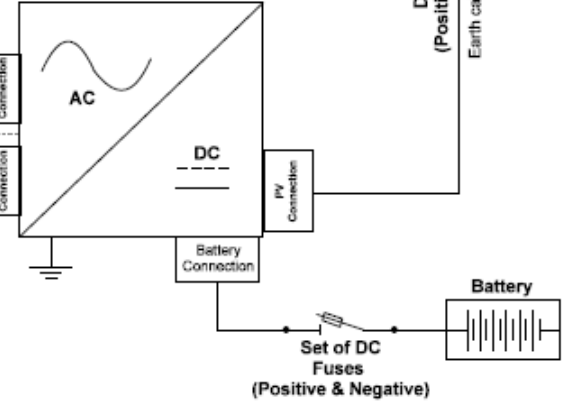
REVISION:	Version 01	DATE:		PROJECT NAME:	SHEET		
Municipal Embedded Generation Support Program Template A set of drawings showing acceptable layouts for a range of different systems www.sseg.org.za		EDITOR:		Small Scale Embedded Generator PV No Storage		1	
		INSTALLER:					
		SIGNOFF:		Description:		SCALE	OF
		PRINT NAME:		Grid Tied system Single phase up to 20kW		N/A	1

Main (AC) Distribution board

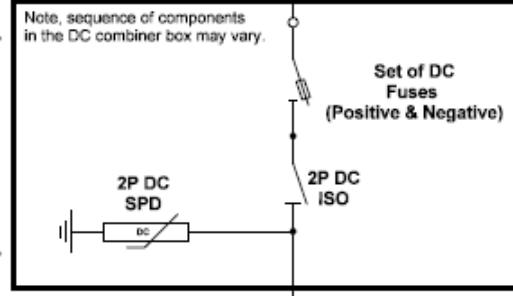


Sub AC DB (Optional)

Hybrid Inverter With Storage



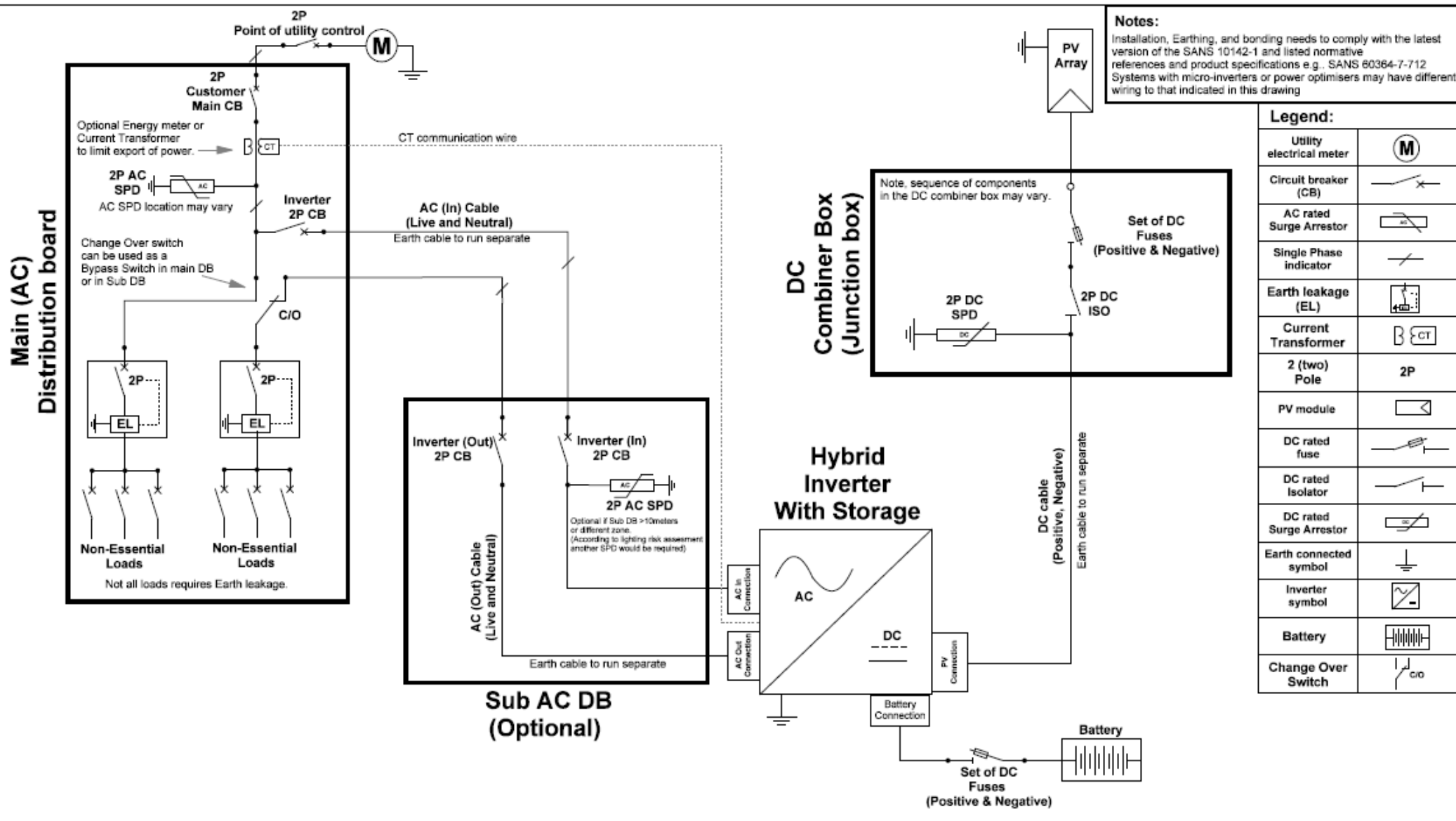
DC Combiner Box (Junction box)



Notes:
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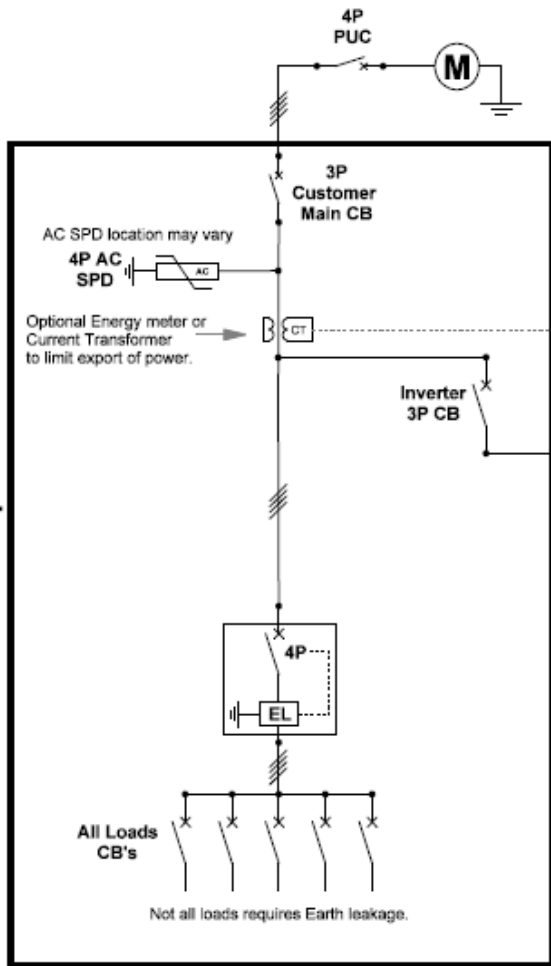
Legend:	
Utility electrical meter	(M)
Circuit breaker (CB)	[Symbol]
AC rated Surge Arrestor	[Symbol]
Single Phase Indicator	[Symbol]
Earth leakage (EL)	[Symbol]
Current Transformer	[Symbol]
2 (two) Pole	2P
PV module	[Symbol]
DC rated fuse	[Symbol]
DC rated isolator	[Symbol]
DC rated Surge Arrestor	[Symbol]
Earth connected symbol	[Symbol]
Inverter symbol	[Symbol]
Battery	[Symbol]
Change Over Switch	[Symbol]

REVISION:	Version 01	DATE:		PROJECT NAME:	Small Scale Embedded Generator PV With Storage		SHEET
Municipal Embedded Generation Support Program Template A set of drawings showing acceptable layouts for a range of different systems www.sseg.org.za		EDITOR:		Description:		SCALE	OF
		INSTALLER:					
		SIGNOFF:		Hybrid system - All loads Single phase up to 20kW		N/A	1
		PRINT NAME:					

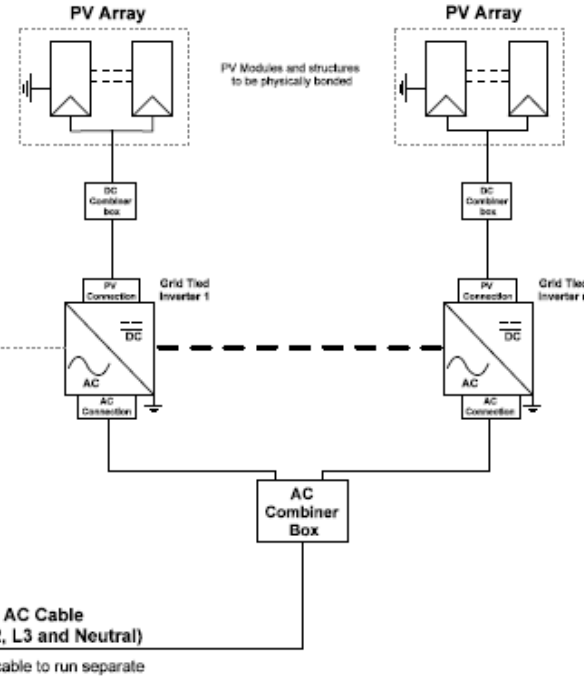


REVISION:	Version 01	DATE:		PROJECT NAME:	SHEET		
Municipal Embedded Generation Support Program Template A set of drawings showing acceptable layouts for a range of different systems www.sseq.org.za		EDITOR:		Small Scale Embedded Generator PV With Storage		1	
		INSTALLER:					
		SIGNOFF:		Description:	Hybrid system - Split loads Single phase up to 20kW	SCALE	OF
		PRINT NAME:				N/A	1

Main (AC) Distribution board LV Multi point



CT communication wire



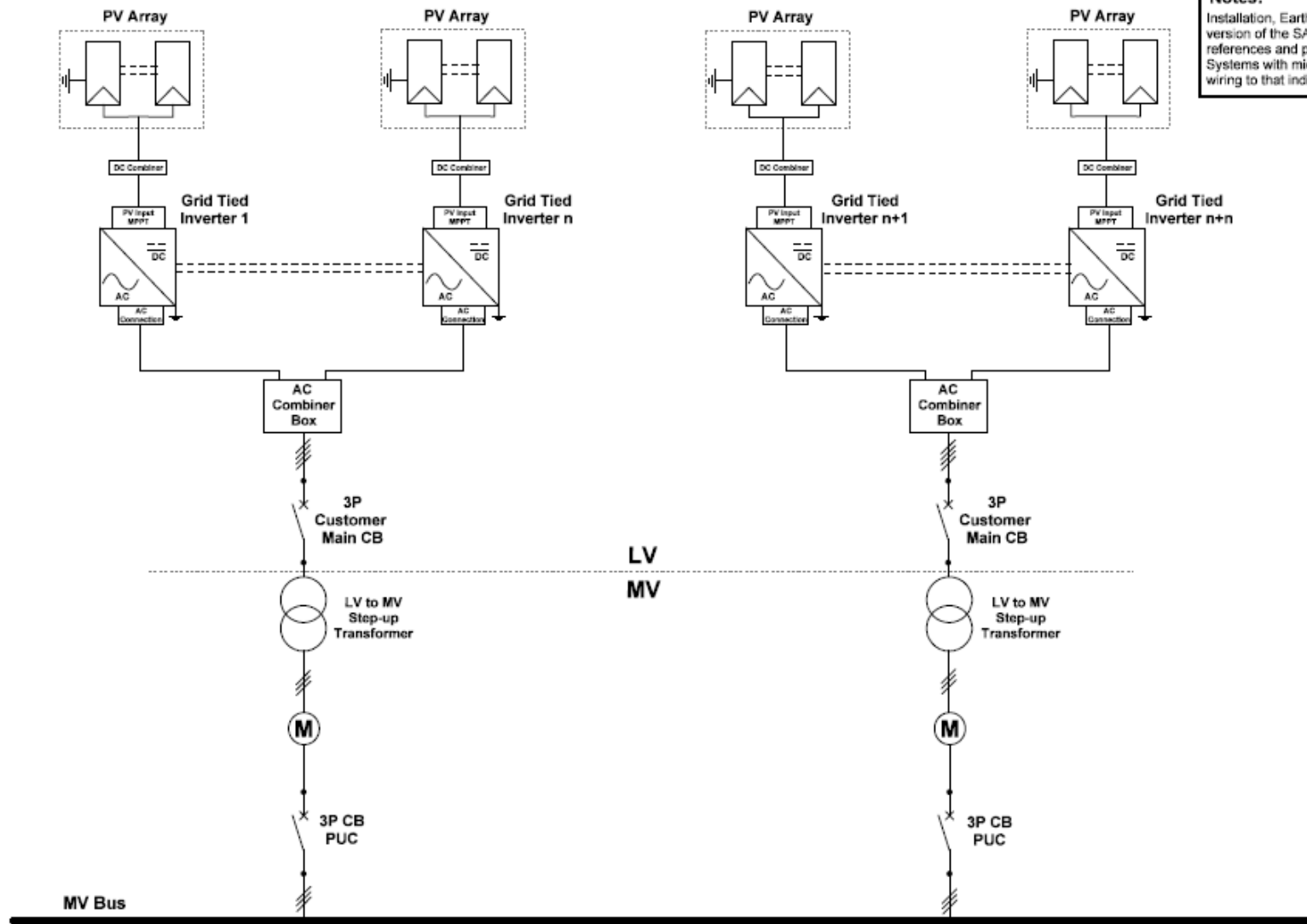
Notes:

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Legend:

Utility electrical meter	
Circuit breaker (CB)	
AC rated Surge Arrestor	
Single Phase indicator	
Earth leakage (EL)	
Current Transformer	
3 (Three) Pole	3P
4 (Four) Pole	4P
PV module	
DC rated fuse	
DC rated Isolator	
DC rated Surge Arrestor	
Earth connected symbol	
Inverter symbol	
Battery	
3 Phase Indicator	

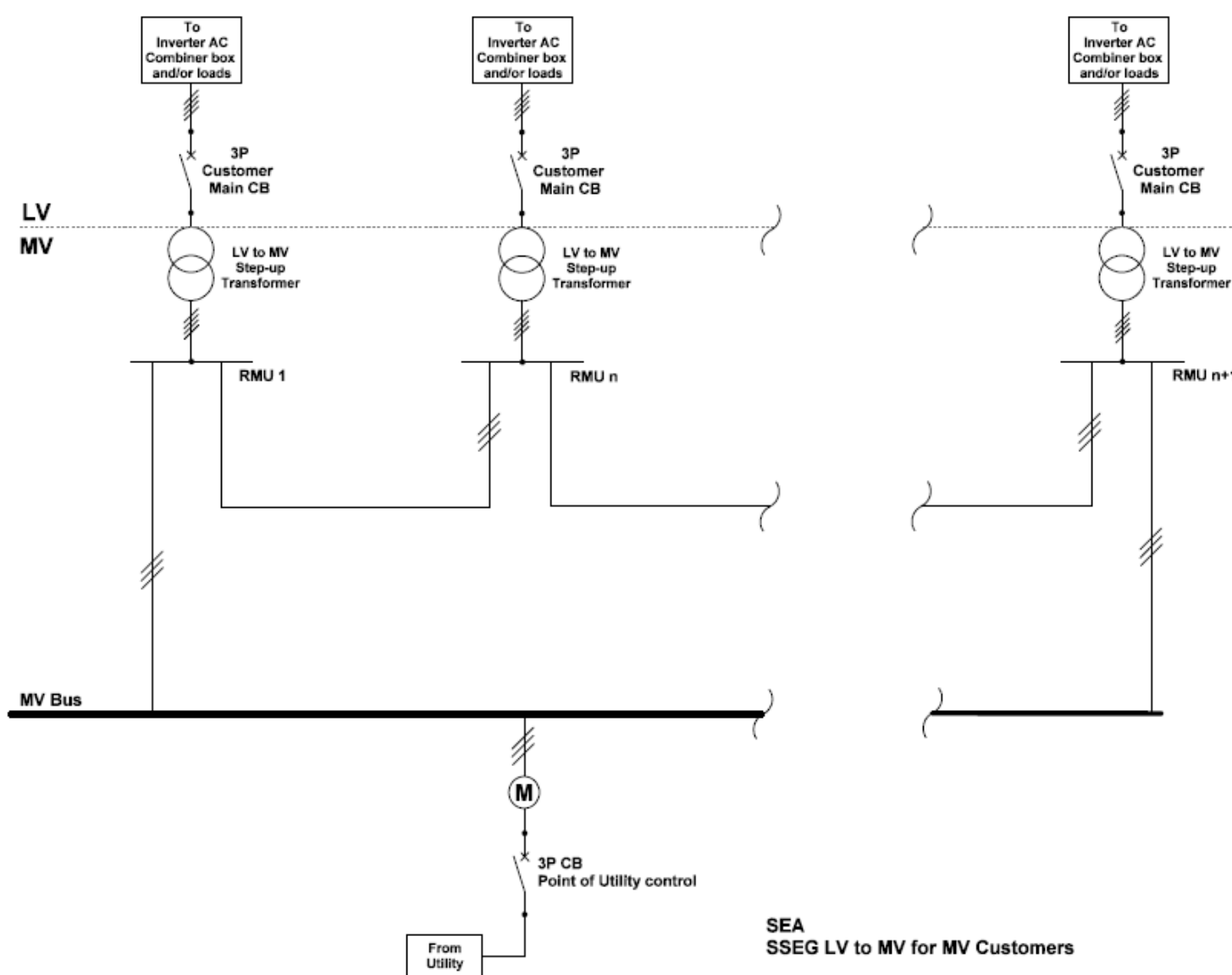
REVISION:	Version 01	DATE:		PROJECT NAME:		SHEET
Municipal Embedded Generation Support Program Template A set of drawings showing acceptable layouts for a range of different systems www.sseg.org.za		EDITOR:		Small Scale Embedded Generator PV 13.8kVa to 1MW (Scalable)		1
		INSTALLER:				
		SIGNOFF:		Description:	SCALE	OF
		PRINT NAME:		Grid Tied system 3 Phase- 1MW	N/A	1



Notes:
 Installation, Earthing, and bonding needs to comply with the latest version of the SANS 10142-1 and listed normative references and product specifications e.g., SANS 60364-7-712. Systems with micro-inverters or power optimisers may have different wiring to that indicated in this drawing.

Legend:	
PV module	
Inverter symbol	
3 phase indicator (L1, L2, L3, N)	
Earthed/Bonding symbol	
Circuit breaker	
Municipal electrical meter	
3 (three) Pole	3P
4 (four) Pole	4P
Step up Transformer	
Mega Volt Bus bar	
3 phase indicator (L1, L2, L3)	

REVISION:	Version 01	DATE:		PROJECT NAME:	SHEET		
Municipal Embedded Generation Support Program Template A set of drawings showing acceptable layouts for a range of different systems www.sseg.org.za		EDITOR:		Small Scale Embedded Generator PV 1MW to 20MW (Scalable)		1	
		INSTALLER:					
		SIGNOFF:		Description:		SCALE	OF
		PRINT NAME:		Grid Tied system 3 Phase- 20MW		N/A	1

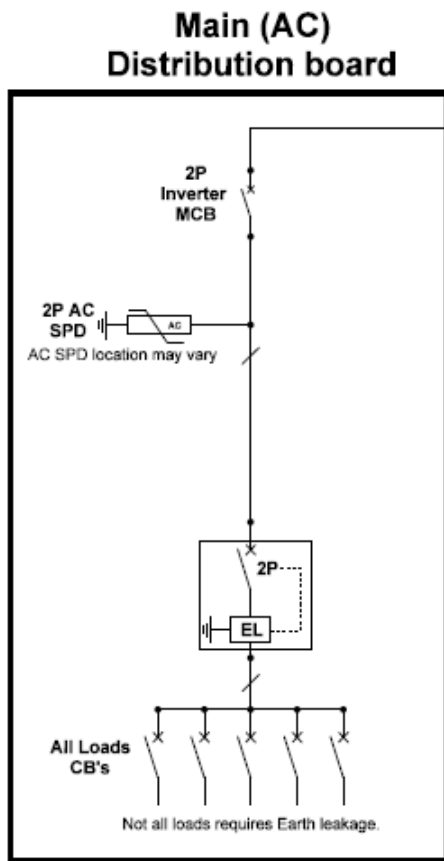


Notes:
 Installation, Earthing, and bonding needs to comply with the latest version of the SANS 10142-1 and listed normative references and product specifications e.g., SANS 60364-7-712. Systems with micro-inverters or power optimisers may have different wiring to that indicated in this drawing.

Legend:	
Earthed/Bonding symbol	
Circuit breaker	
Municipal electrical meter	
3 (three) Pole	3P
4 (four) Pole	4P
Step up Transformer	
Mega Volt Bus bar	
Ring Main Unit	RMU
3 phase indicator (L1, L2, L3)	
3 phase indicator (L1, L2, L3, N)	

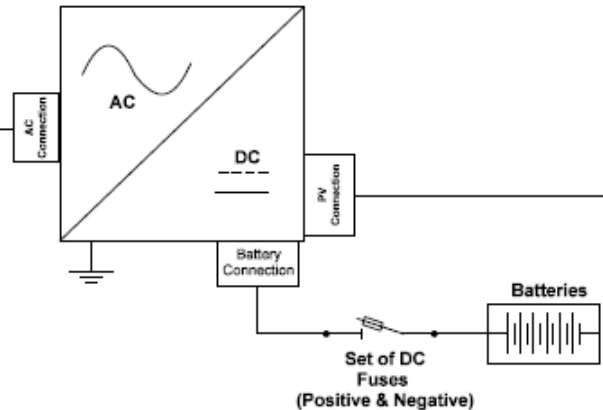
SEA
 SSEG LV to MV for MV Customers

REVISION:	Version 01	DATE:		PROJECT NAME:	SHEET		
Municipal Embedded Generation Support Program Template A set of drawings showing acceptable layouts for a range of different systems www.sseg.org.za		EDITOR:		Small Scale Embedded Generator LV to MV for MV Customers		1	
		INSTALLER:					
		SIGNOFF:		Description:		SCALE	OF
		PRINT NAME:		LV to MV		N/A	1

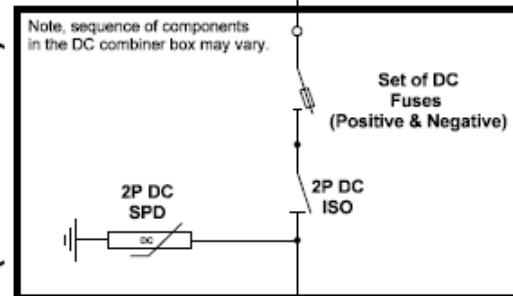


AC (Out) Cable
(Live and Neutral)
Earth cable to run separate

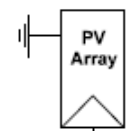
Off grid / Hybrid Inverter With Storage



DC Combiner Box (Junction box)



DC cable
(Positive, Negative)
Earth cable to run separate



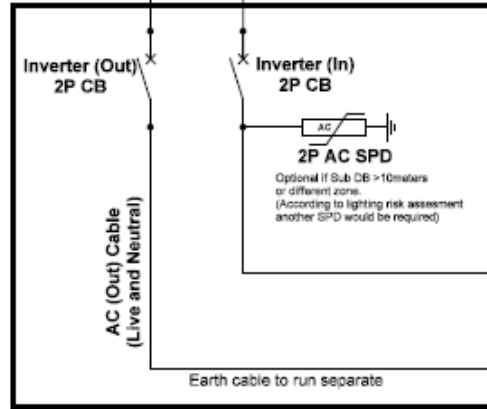
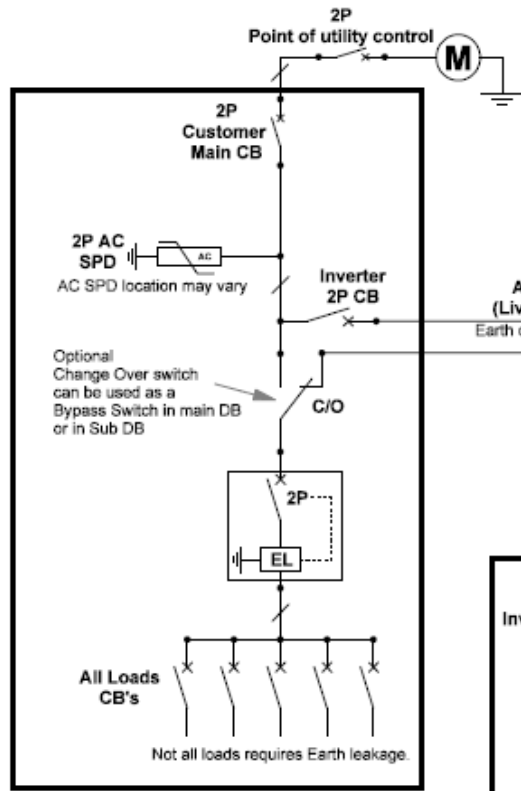
Notes:
Installation, Earthing, and bonding needs to comply with the latest version of the SANS 10142-1 and listed normative references and product specifications e.g., SANS 60364-7-712
Systems with micro-inverters or power optimisers may have different wiring to that indicated in this drawing
NO inter-connection with a utility supply.

Legend:

Circuit breaker (CB)	
AC rated Surge Arrestor	
Single Phase Indicator	
Earth leakage (EL)	
2 (two) Pole	2P
PV module	
DC rated fuse	
DC rated Isolator	
DC rated Surge Arrestor	
Earth connected symbol	
Inverter symbol	
Battery	

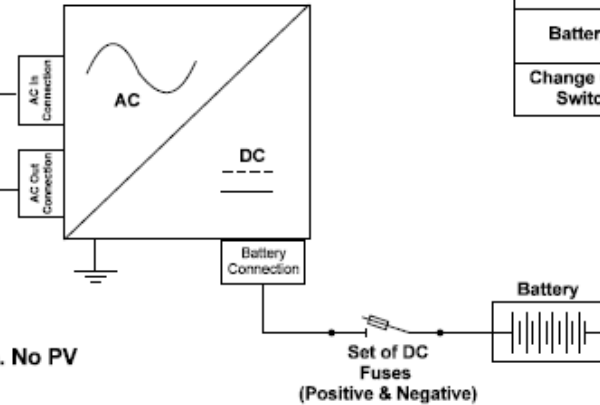
REVISION:	Version 01	DATE:		PROJECT NAME:	SHEET	
Municipal Embedded Generation Support Program Template A set of drawings showing acceptable layouts for a range of different systems www.sseg.org.za	EDITOR:			Small Scale Embedded Generator Off grid / Stand alone Inverter		1
	INSTALLER:					
	SIGNOFF:			Description:	SCALE	OF
	PRINT NAME:			Hybrid/Off grid system - All loads Single phase - No utility connection	N/A	1

Main (AC) Distribution board



Sub AC DB (Optional)

Hybrid/UPS Inverter With Storage



SEA
SSEG Only back up. No PV

Notes:

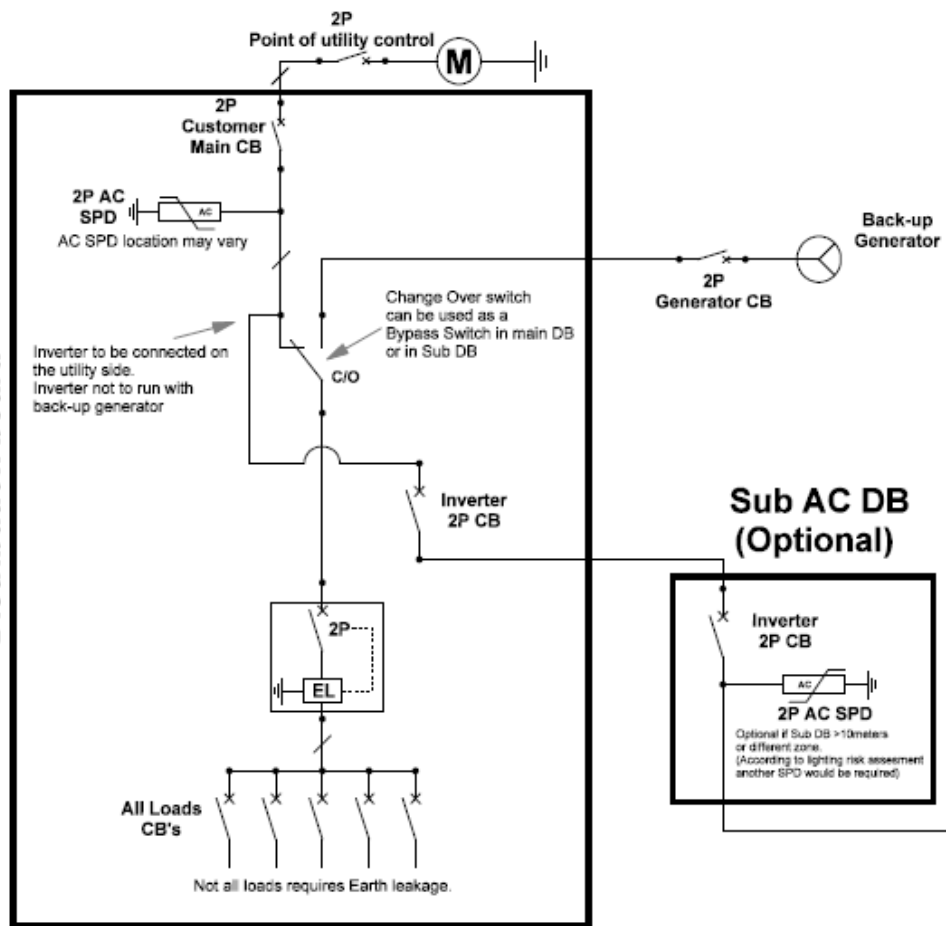
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Legend:

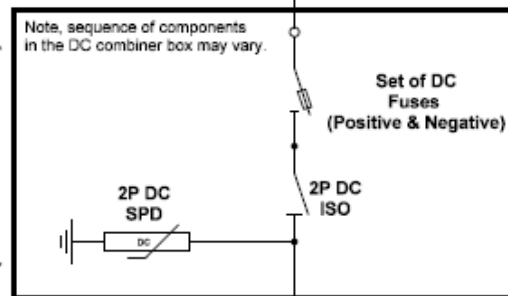
Utility electrical meter	
Circuit breaker (CB)	
AC rated Surge Arrestor	
Single Phase indicator	
Earth leakage (EL)	
Current Transformer	
2 (two) Pole	2P
DC rated fuse	
DC rated Surge Arrestor	
Earth connected symbol	
Inverter symbol	
Battery	
Change Over Switch	

REVISION:	Version 01	DATE:		PROJECT NAME:	SHEET	
Municipal Embedded Generation Support Program Template A set of drawings showing acceptable layouts for a range of different systems www.sseg.org.za		EDITOR:		Small Scale Embedded Generator Back-up or UPS/Standby system		1
		INSTALLER:				
		SIGNOFF:		Description:	SCALE	OF
		PRINT NAME:		Hybrid/UPS system - All loads Single phase	N/A	1

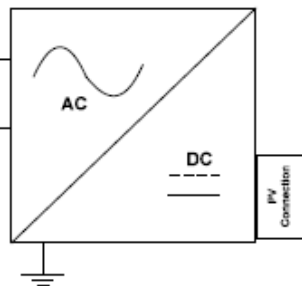
Main (AC) Distribution board



DC Combiner Box (Junction box)



Grid Tied Inverter



Notes:

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Legend:

Utility electrical meter	(M)
Circuit breaker (CB)	
AC rated Surge Arrestor	
Single Phase Indicator	
Earth leakage (EL)	
2 (two) Pole	2P
PV module	
DC rated fuse	
DC rated Isolator	
DC rated Surge Arrestor	
Earth connected symbol	
Inverter symbol	
Change Over Switch	
Back-up Generator	
No inter connection	

REVISION:

Version 01

DATE:

PROJECT NAME:

SHEET

Municipal Embedded Generation Support Program Template

EDITOR:

Small Scale Embedded Generator PV and back-up generator

1

A set of drawings showing acceptable layouts for a range of different systems

INSTALLER:

SIGNOFF:

Description:
Grid Tied with back-up Generator - All loads Single phase

SCALE

N/A

OF

1

PRINT NAME: