



**Notice for Inviting
Expression of Interest (EOI)
For
Carrying out Proof of Concept (POC) on Outdoor Cabinet**

6th May, 2024

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Notice Inviting for Expression of Interest (EOI)

Ref. No.: BTL/OP/EOI/2024/

Dated 26th April, 2024

This EOI Document is being published by Bhutan Telecom Ltd. (BTL) for carrying out the POC on Outdoor Cabinet which is in line with the Digital Roadmap of the company to replace traditional Prefab Shelters, not only to help improve the network reliability but also due to many advantages over the Prefab Shelters.

BTL invites the leading vendors to participant in carrying out POC on Outdoor Cabinets based on the technical specifications and other compliances mentioned in this document.

Tentative Calendar of Events:

#	Milestones	Activities	Date	Time
1	Sharing of Expression of Interest (EoI) to Vendors		6 th May, 2024	17:00 Hrs
2	Pre-EoI Queries		7 th May – 3rd June, 2024	17:00 Hrs
3	Last date (deadline) for submission of EoI	Feedback & suggestions in response to the EOI, should be submitted through email to: a) manager.procurement@bt.bt b) procurement@bt.bt c) manager.power&infra@bt.bt	4 th June, 2024	11:00 hrs
4	Opening of EOI		4 th June, 2024	14:00 hrs

The dates mentioned above are subject to change (pre-pone or post-pone). In case a change is made, it shall be notified through mail to the identified vendors and the right to accept/reject any or all the responses received is reserved with BTL without assigning any reason thereof

Introduction

About BTL

Bhutan Telecom Limited (BTL) is the leading provider of telecommunications and Internet services in the Kingdom of Bhutan. Besides fixed line telephony, it provides GSM, GPRS, EDGE, UMTS, LTE Mobile services under its flagship brand B-Mobile, and Internet Services under the brand name of DrukNet. It is the leading provider of both mobile telephony and Internet services in the country, and the only fixed line telephony services provider in the country. In addition, 5G will be introduced soon to the customer.

BTL came into existence on 1 July 2000 as a fully state-owned company, with the corporatization of the erstwhile Department of Telecommunications which was established in 1970. The first rudimentary works in building a telecommunication network in the country was taken up in 1963 to aid development works of the First Five Year Plan for modern economic development of the country. Since then, BTL has come a long way from its humble beginnings and today boasts of a fully digital microwave and optical fiber backbone network covering the length and breadth of the country.

BTL has left no stone unturned in its efforts towards fulfilling both its commercial and social mandates. Today, BTL's revenue and customer base are growing at a sustained pace. B-Mobile has taken its services to even the remotest corners of the country where commercial viability is out of the question and its network has covered all 205 Gewogs (Blocks) in the country.

Vision: “To be the company of choice”

Objective:

Outdoor telecom cabinets play a crucial role in maintaining reliable telecommunications networks by providing a secure and accessible location for essential sensitive network equipment and components. The key features of the outdoor cabinets include:

1. Durability and Weather Resistance
2. Accessibility and Security
3. Size & Capacity
4. Power and Cooling Systems

By choosing outdoor telecom cabinets for your telecommunications needs, you can have peace of mind knowing that your equipment is safe from the elements and secure from unauthorized access. With the right size cabinet, power and cooling systems, and durability features in place, you can ensure that your telecommunications systems are reliable and secure.

Technical and Commercial Evaluation Process

Scope of Technical Evaluation

Scope of evaluation is to evaluate a technical aspect in line with the technical specifications enshrined in the EOI document. Further, the evaluation is also based on the submission and verification of OEM/dealership certificates, data sheets/catalogs, GADs, etc. to be submitted by the bidders along with the bids as one of the criteria for evaluation.

During the period of evaluation, bidders may be asked to provide more details and explanations about information provided in the EoI document. Bidders should respond to such requests within the time frame indicated in the letter/e-mail seeking explanation. Non-compliance or non-responsive to any of the technical specification or clarification may result in rejection of the proposal without assigning any reason. All the successful bidders who all qualified in the technical stages will be further asked to supply the product for the conduction of proof of concept.

Scope of Commercial Evaluation

The commercial bids of bidders will be only considered for the evaluation, after the qualification of POC. The lowest commercial quote after qualification in the POC would be identified as lowest evaluated bid (L1). Bhutan Telecom might recognize the L1 bidder for signing the contract for the scope of work defined within the EoI document.

Terms & Conditions

1. Supply order for the delivery and installation of outdoor cabinet for conducting of POC at site shall be awarded to all the prospective bidders on SOR (Sale or Return) basis.
2. All the integration works such as configurations/settings including arrangement of expertise and other resources for integrating with the Huawei NetEco RMS must be under the bidder's scope.
3. POC duration shall be for a period of 2 months from the date of installation and testing.
4. If POC becomes successful, the product for the lowest evaluated bid shall be retained as per supply order terms and conditions.
5. Only upon successful completion of POC, BT shall enlist the brand/make of product in the future tender.
6. Bidders are encouraged to visit the BT office for the inspection of sample cabinet.

Specification of the Outdoor Cabinets:

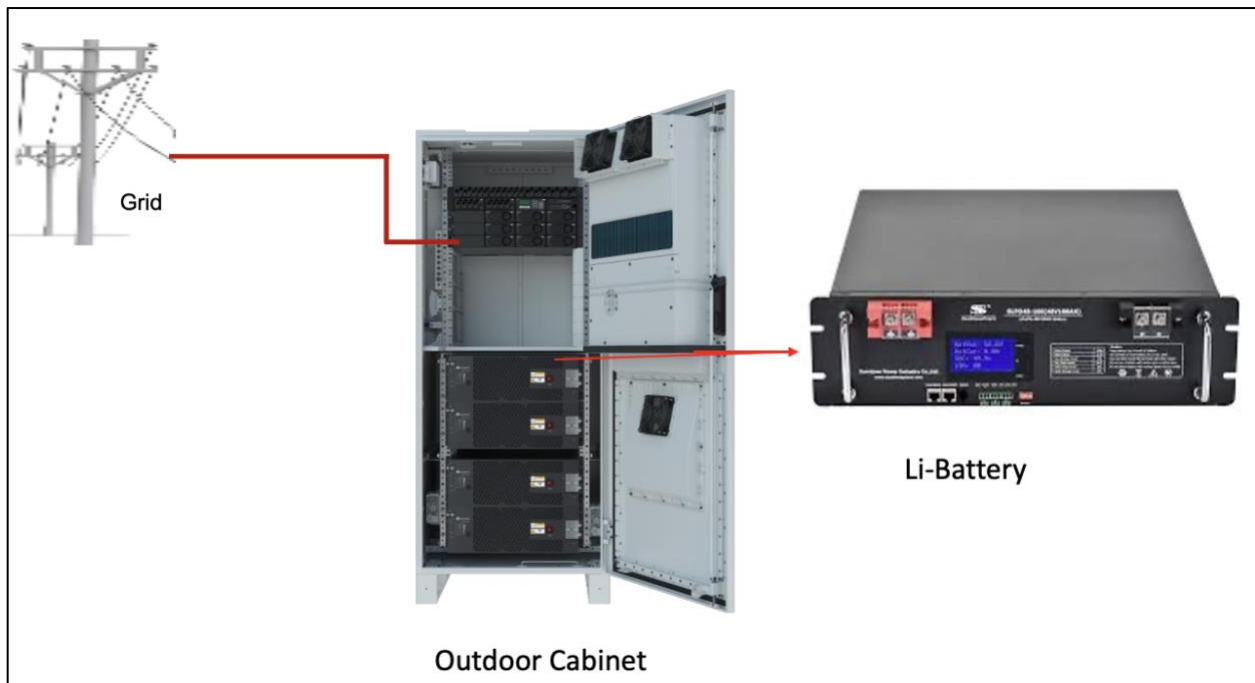
1.1 Scenario 1: BPC Grid Only

1.1.1 Assumption (per site):

- 1.1.1.1 Typical Site Load: 3000 W
- 1.1.1.2 Site Power Supply: Single Phase AC Mains
- 1.1.1.3 Battery Backup Duration: 12 Hours
- 1.1.1.4 Environment Temperature: - 20 Deg to +45 Deg

1.1.2 Bill of Materials

#	Equipment	Qty	UoM
1	Integrated Outdoor Cabinet	1	No
2	Rectifier (3kW)	5	Nos
3	Lithium Battery (100 Ah)	4	Nos



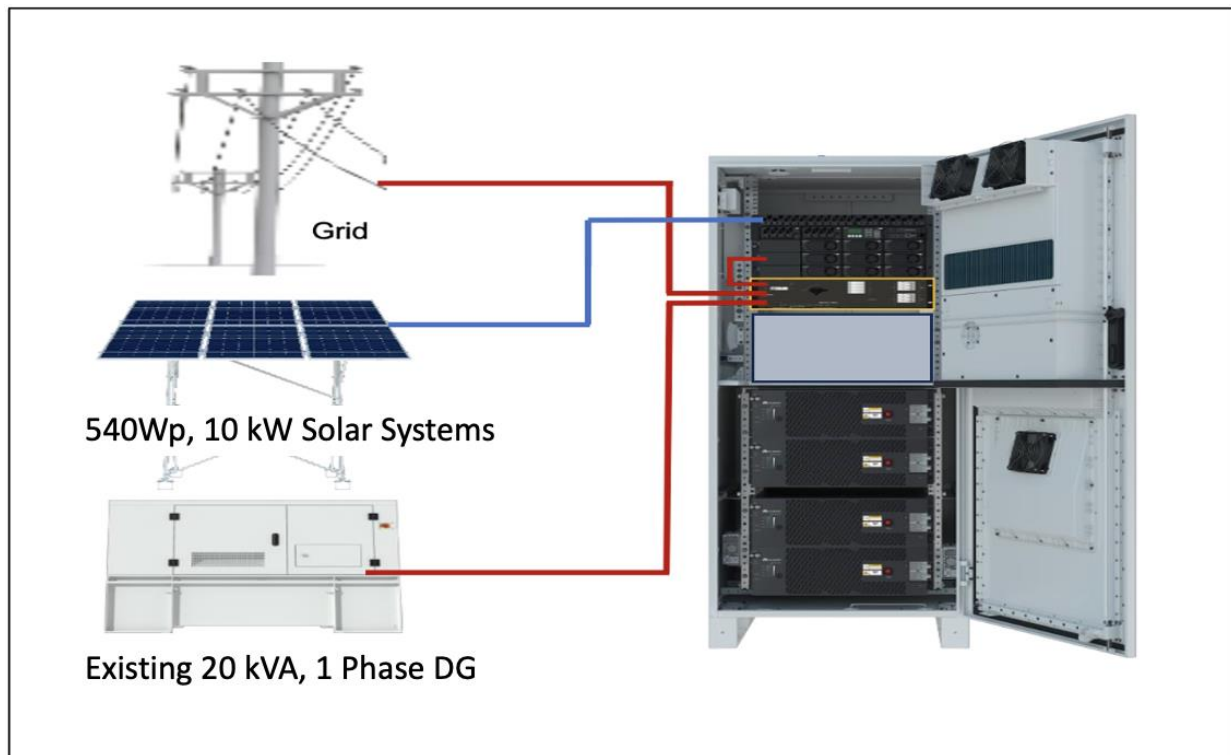
1.2 Scenario 2: Solar Hybrid (Grid + DG + Solar)

1.2.1 Assumptions:

- 1.2.1.1 Typical Site Load: 3000 W
- 1.2.1.2 Site Power Supply: Single Phase AC Mains, Solar and DG
- 1.2.1.3 Average sunlight required per day: 5 – 6 hrs
- 1.2.1.4 Battery Backup Duration: 12 Hours
- 1.2.1.5 Environment Temperature: -20 Deg to +45 Deg

1.2.2 Bill of Materials:

#	Equipment	Qty	UoM
1	Integrated Outdoor Cabinet	1	No
2	Rectifier (3kW)	5	Nos
3	Lithium Battery (100 Ah)	4	Nos
4	AMF/ATS Panel	1	No
5	DEG Interface Module	1	No
6	Solar Panels (540Wp, 10 kW)	18	Nos



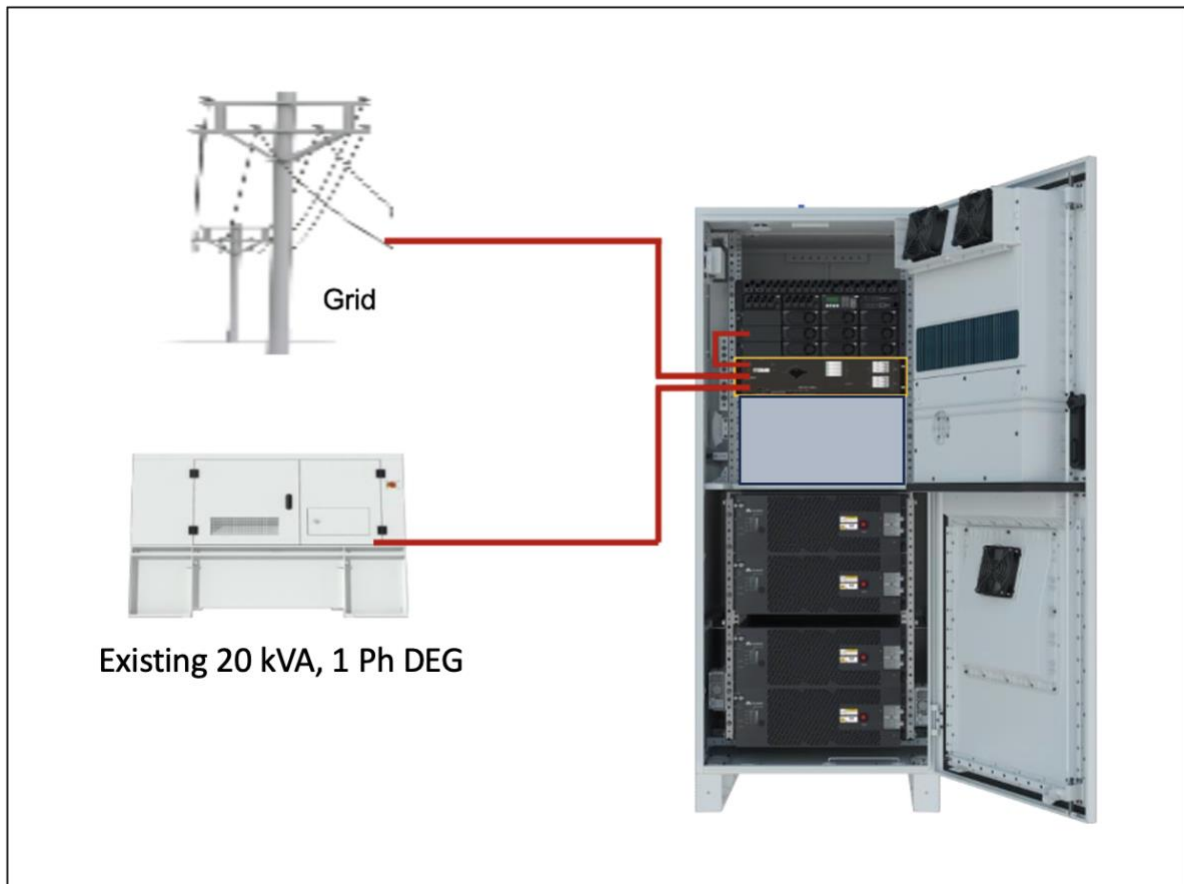
1.3 Scenario 3: Advanced Hybrid (Grid+DG)

1.3.1 Assumptions:

- 1.2.1.6 Typical Site Load: 3000 W
- 1.2.1.7 Site Power Supply: Single Phase AC Mains and DG
- 1.2.1.8 Battery Backup Duration: 12 Hours
- 1.2.1.9 Environment Temperature: - 20 Deg to +45 Deg

1.3.2 Bill of Materials:

#	Equipment	Qty	UoM
1	Integrated Outdoor Cabinet	1	No
2	Rectifier (3kW)	5	Nos
3	Lithium Battery (100 Ah)	4	Nos
4	AMF/ATS Panel (20 kVA)	1	No
5	DEG Interface Module	1	No



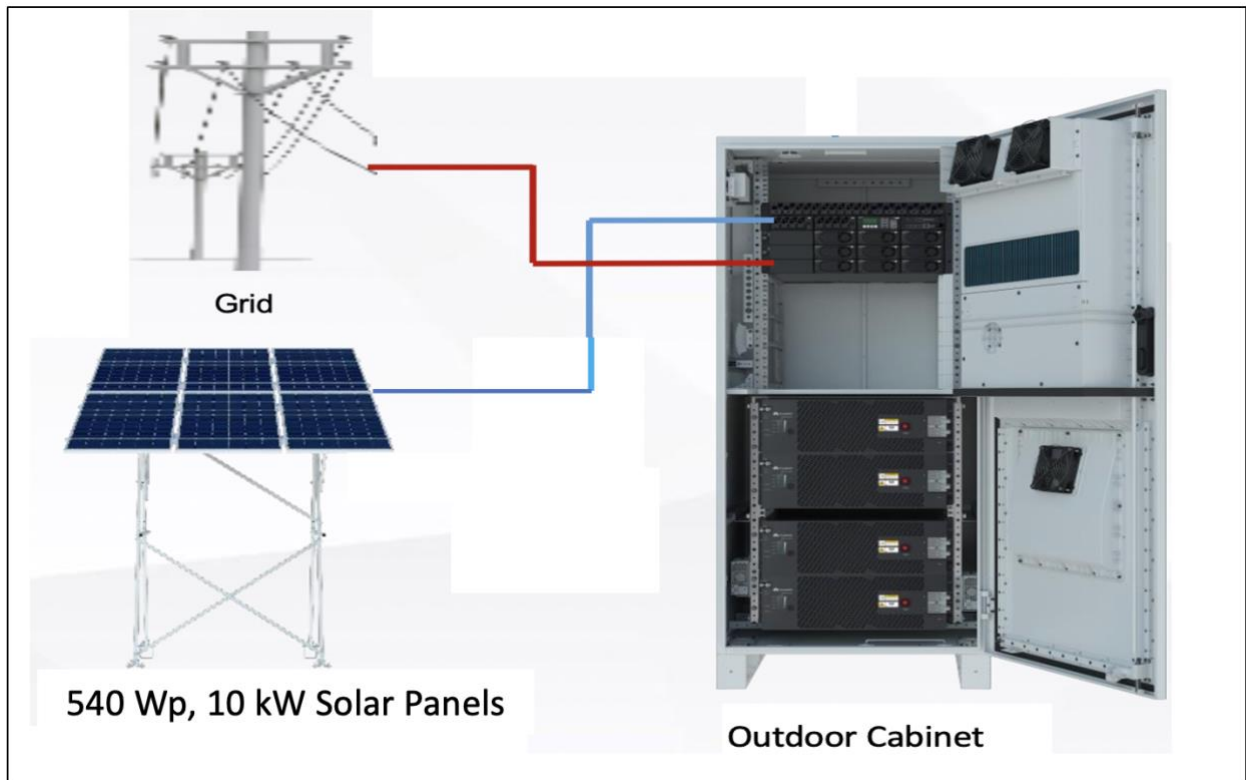
1.4 Scenario 4: Advanced Hybrid (Grid+ Solar)

1.4.1 Assumptions:

- 1.2.1.10 Typical Site Load: 3000 W
- 1.2.1.11 Site Power Supply: Single Phase AC Mains and Solar
- 1.2.1.12 Battery Backup Duration: 12 Hours
- 1.2.1.13 Average sunlight required per day: 5 – 6 hrs
- 1.2.1.14 Environment Temperature: - 20 Deg to +45 Deg

1.4.2 Bill of Materials:

#	Equipment	Qty	UoM
1	Integrated Outdoor Cabinet	1	No
2	Rectifier (3kW)	5	Nos
3	Lithium Battery (100 Ah)	4	Nos
4	Solar Panels (540Wp, 18 kW)	18	Nos
5	DEG Interface Module	1	No



1.5 Technical Specifications for conducting of POC

1.5.1 Integrated Outdoor Cabinet for Advanced Hybrid (Grid + DG + Solar)

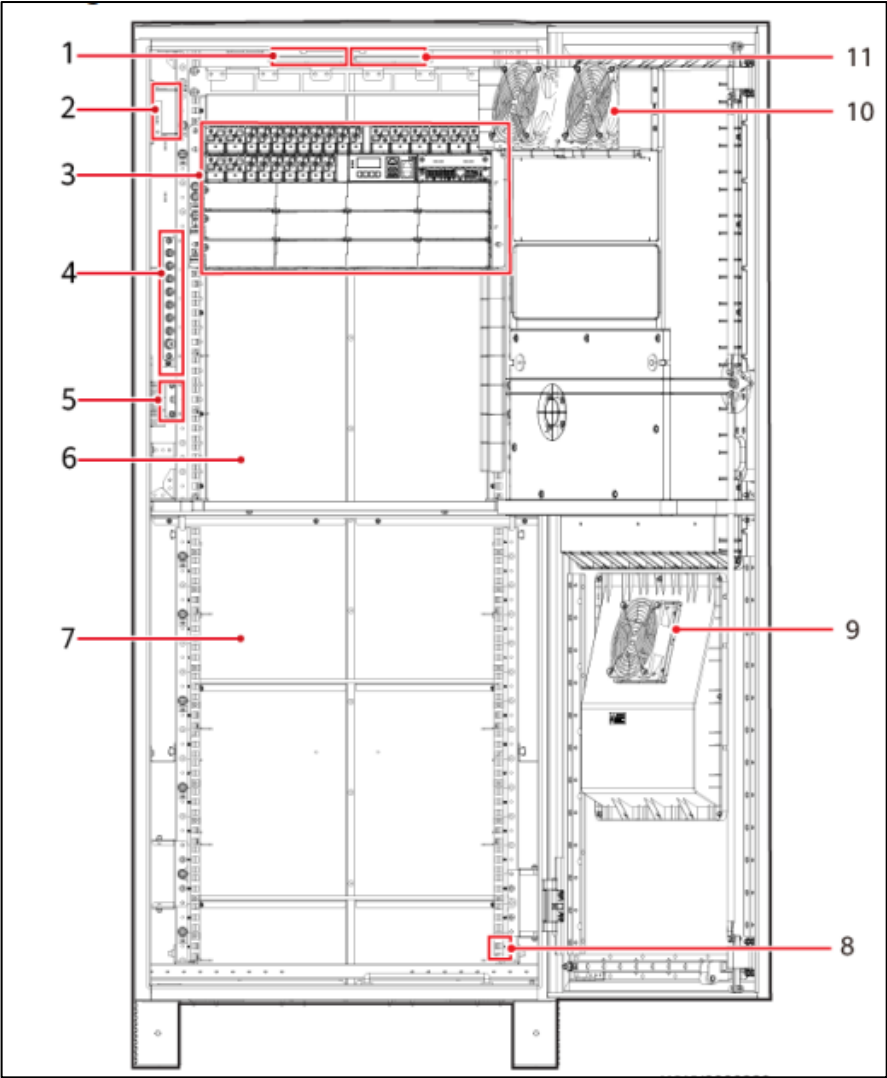


1.5.1.1 Technical Specifications for conducting of POC

System	Dimension (W × D × H)	650mm*650mm*1600mm (including base and protruding part)
	Weight	< 160 kg (without rectifier modules, battery and wrapper)
	Installation Mode	Floor Mounted
	Cabling Mode	From the bottom
	Grounding Bar	7 × M6, 1 × M8
	Cable Hole	8 x 43 mm diameter cable hole
	Security Standards	IEC60950
	EMC	EN 55032 Class A
Equipment Cabin	Inner Rack & Space	8 U, 19-inch rack
	Protection Level	IP55 (EN 60529)
	Cooling Mode	Heat exchanger, cooling capacity@150W/K
Battery Cabin	Battery Type	Max 4 Pcs Li-Battery of 48V/100 Ah or 48V/150 Ah (12 U)
	Protection Level	IP34 (EN 60529)
	Cooling Mode	Direct ventilation heat dissipation; Average temperature of the battery compartment < 5°C+ ambient temperature
Rectifier (3kW x 5 modules)	Input Voltage	Single-phase/dual-live wire: 180–280 Vac
	Output Voltage	Normal mode: -42Vdc ~ -58Vdc (Adjustable output voltage); Rated value: -48Vdc
	Efficiency	>97%
	Working Temperature	-40°C to +75°C
Solar MPPT Modules (3kW x 5 modules)	Input Voltage	58 to 250 V DC
	Output Voltage	42 Vdc to 58 Vdc, rated voltage: 53.5 Vdc/57 Vdc
ATS/AMF Panel	20 kVA/16kW	Single Phase, 230 V, 50 Hz
DC Distribution	Output Voltage	Normal mode: 42VDC - 58VDC, rated value: 53.5VDC
	Battery Branch	3 × 200A MCB
	LLVD branch	2 × 125A MCB, 3 × 63A MCB
	BLVD branch	2 × 63A MCB, 2 × 32A MCB, 2 × 16A MCB
	SPD	10kA/20kA (8/20μs)
AC Distribution	Input Voltage	Single-phase/dual-live wire: 180–280 Vac
	Input Capacity	1X100A/DP MCB
	Output Capacity	2X 10 A MCB, 2X 20 A MCB
	SPD	Class B, 30/60 kA (8/20 μs)
Controller	Signal Input	2 AI (battery temp., ambient temp.) 4 DI (gate, smoke, water, 1 reserved)
	Alarm Output	8 DO
	Communication Port	RS232, RS485, CAN, FE

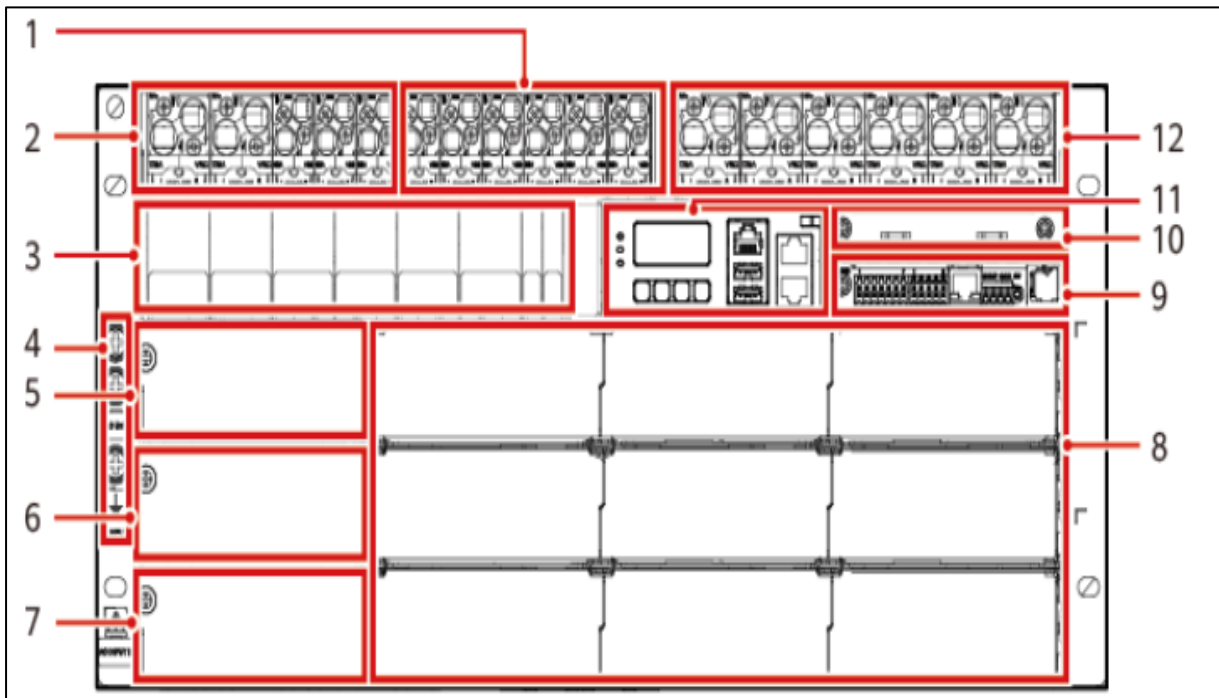
	Storage capacity	Up to 1000 historical records
	Display mode	LCD, support optional mobile APP
	Networking mode	IP, GPRS, In-band
Environment	Operating temperature	-40°C to +65°C
	Storage temperature	-40°C to +70°C
	Operating humidity	5% - 95% (non-condensing)
	Altitude	0 - 4000m (High temperature derating in the environment of 2000m - 4000m, the operating temperature is reduced by 1°C for every 200m increase)
Smart Site Monitoring Unit	Must be compatible with Huawei RMS	<p>To be able to monitor the parameters for the following:</p> <ul style="list-style-type: none"> - Diesel Generator (Voltage, Power, Current, Fuel Level, LLOP, Battery Voltage, failed to start, etc. - Telecom Battery: Voltage, Current, Charging, Discharging, back up time, etc - Solar Systems: Solar Voltage, Current, Power, etc - Load current, voltage, power, etc - Grid Power Supply voltage, current, power - Environmental: Temperature, Water leak detector, smoke sensor, CCTV, etc

1.6 Outdoor Cabinet Interior



- 1. Smoke Sensor
- 2. Power Transfer Box for Temperature Control Device
- 3. DC PDU, ACPDU, Controller
- 4. Ground Bar
- 5. Digital Temperature and Humidity Sensor
- 6. Space for Equipment
- 7. Space for Batteries
- 8. Water Sensor
- 9. Direct Ventilation Unit
- 10. Heat Exchanger
- 11. Light

1.7 DC Distribution Unit and Site Monitoring Unit



1. DCDB 1
2. DCDB 2
3. Space for expansion of circuit breakers
4. Ground Screw
5. Space for AC output module
6. Space for AC input module 1
7. Space for AC input module 2
8. Space for Rectifier Modules/MPPT Modules
9. Interface Module
10. Space for the expansion of modules
11. Site Monitoring Unit
12. Battery Circuit Breakers

1.8 POC Compliance Statement for Scenario 2: Advanced Solar Hybrid (Grid + DEG + Solar)

Item	Description		Complied Or Not
System	Dimension (W × D × H)	650mm*650mm*1600mm (including base and protruding part)	
	Weight	< 160 kg (without rectifier modules, battery and wrapper)	
	Installation Mode	Floor Mounted	
	Cabling Mode	From the bottom	
	Grounding Bar	Approx.. 7 × M6, 1 × M8	
	Cable Hole	Approx. 8 x 43 mm diameter cable hole	
	Security Standards	IEC60950 or equivalent	
	EMC	EN 55032 Class A	
Equipment Cabin	Inner Rack & Space	8 U, 19-inch rack	
	Protection Level	IP55 (EN 60529)	
	Cooling Mode	Heat exchanger, cooling capacity@150W/K	
Battery Cabin	Battery Type	Max 4 Pcs Li-Battery of 48V/100 Ah or 48V/150 Ah (12 U)	
	Protection Level	IP34 (EN 60529)	
	Cooling Mode	Direct ventilation heat dissipation; Average temperature of the battery compartment < 5°C+ ambient temperature	
Rectifier (3kW x 4 modules)	Input Voltage	Single-phase/dual-live wire: 180–280 Vac	
	Output Voltage	Normal mode: -42Vdc ~ -58Vdc (Adjustable output voltage); Rated value: -48Vdc	
	Efficiency	>97%	
	Working Temperature	-40°C to +75°C	
Solar MPPT Modules (3kW x 4 modules)	Input Voltage	58 to 250 V DC	
	Output Voltage	42 Vdc to 58 Vdc, rated voltage: 53.5 Vdc/57 Vdc	
ATS/AMF Panel	20 kVA/16kW	Single Phase, 230 V, 50 Hz	
DC Distribution	Output Voltage	Normal mode: 42VDC - 58VDC, rated value: 53.5VDC	
	Battery Branch	3 × 200A MCB	
	LLVD branch	2 × 125A MCB, 3 × 63A MCB	
	BLVD branch	2 × 63A MCB, 2 × 32A MCB, 2 × 16A MCB	

	SPD	10kA/20kA (8/20 μ s)	
AC Distribution Controller	Input Voltage	Single-phase/dual-live wire: 180–280 Vac	
	Input Capacity	1X100A/DP MCB	
	Output Capacity	2X 10 A MCB, 2X 20 A MCB	
	SPD	Class B, 30/60 kA (8/20 μ s)	
	Signal Input	2 AI (battery temp., ambient temp.) 4 DI (gate, smoke, water, 1 reserved)	
	Alarm Output	8 DO	
	Communication Port	RS232, RS485, CAN, FE	
	Storage capacity	Up to 1000 historical records	
	Display mode	LCD, support optional mobile APP	
Networking mode	IP, GPRS, In-band		
Environment	Operating temperature	-40°C to +65°C	
	Storage temperature	-40°C to +70°C	
	Operating humidity	5% - 95% (non-condensing)	
	Altitude	0 - 4000m (High temperature derating in the environment of 2000m - 4000m, the operating temperature is reduced by 1°C for every 200m increase)	
Smart Site Monitoring Unit	Must be compatible with Huawei RMS	To be able to monitor the parameters for the following: <ul style="list-style-type: none"> - Diesel Generator (Voltage, Power, Current, Fuel Level, LLOP, Battery Voltage, failed to start, etc. - Telecom Battery: Voltage, Current, Charging, Discharging, back up time, etc - Solar Systems: Solar Voltage, Current, Power, etc - Load current, voltage, power, etc - Grid Power Supply voltage, current, power - Environmental: Temperature, Water leak detector, smoke sensor, CCTV, etc 	
Compliance and standards		Must meet relevant Government or industry standards and certifications, such as RoHS, REACH, EN60529 IP (Ingress Protection) or other local regulations. This also ensures that environmental protection and safety requirements are met.	