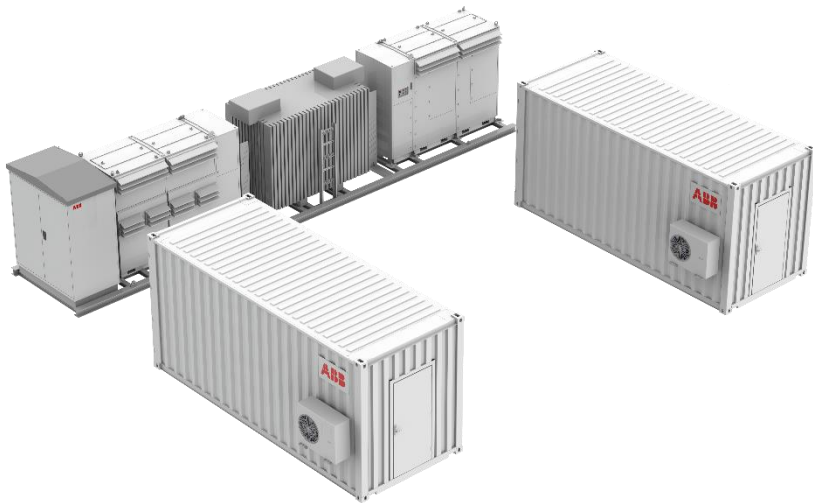# ABB eStorage Max
Scalable Energy Storage System

The state-of-the-art ABB eStorage Max is a scalable energy storage system based on pre-engineered building blocks. The eStorage Max is designed to maximize the return of investment with an industrialized solution that reduces installation time, complexity and transportation costs. The solution is optimized for functionality featuring digital intelligence that improves solution performance and operating costs.

eStorage Max - STPP
example outside view

Pre-engineered building blocks
Provides predesigned skids for electrification equipment and e-houses for all the required batteries, safety features, cooling, and protection and controls.

Factory tested
Factory built solution integrates comprehensive safety features that bring extensive quality control for the highest level of safety.

Complete solution
Designed with careful equipment selection and executed under full responsibility from ABB – including eHouses and project management beyond the eStorage Max.

Applications

- **Grid support:** compensating grid fluctuations in voltage and frequency by regulating reactive and active power.
- **Spinning reserve:** providing milliseconds response to maintain network continuity under outages while back-up generators are brought online to provide reliability.
- **Intermittent power generation:** using more of the power generated with distributed energy resources.

- **Islanding:** supporting microgrids and loads during power outages with seamless transition and black start capabilities.
- **Time of use:** using the storage system based on the electricity cost (charge when low, discharge when high).
- **Peak shaving:** reducing energy and powertariffs by capping the consumption peaks.
- **Stacking applications:** combining several applications with dedicated priorities.

Complete Solution Equipment (STPP)

1. Switchgear (AC)
2. Transformer
3. Power conversion system (PCS)
4. Integrated battery eHouse

System Architecture

The eStorage Max can be provided in multiple, scalable configurations. All configurations are optimized to ensure customer and site requirements are met. The architecture will always include a transformer, power conversion system, battery storage and eStorage OS. Additional configuration options include switchgear (AC) and additional power conversion systems.

The eStorage OS is a fully integrated digital operating system for the eStorage Max that provides asset management, monitoring, control, protection and communication with the upper-level operator. Remote control, monitoring and embedded energy management functions for different applications are available as predefined options. The eStorage OS can also provide microgrid control and black start capability.
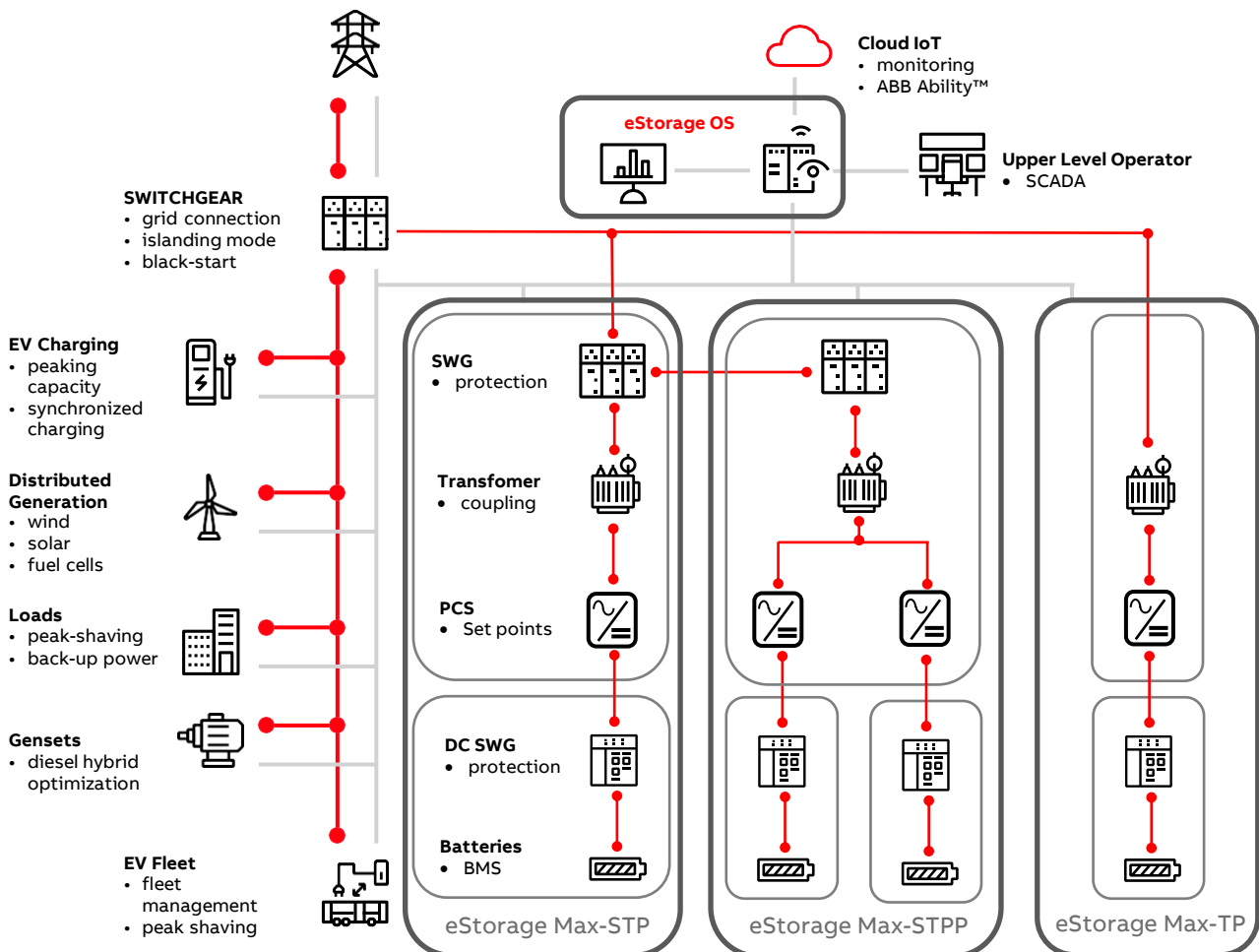
Technical data

Description	eStorage Max-TP	eStorage Max-TPP	eStorage Max-STP	eStorage Max-STPP
Electrical specifications				
Maximum Outputpower (S) [1]	6000kVA (4x1500kVA)	4600kVA (2x2300kVA)	6000kVA (4x1500kVA)	4600kVA (2x2300kVA)
Typical Outputpower (P) [1,2]	<5200kW	<4200kW	<5200kW	<4200kW
Typical Installed Energy	<5500 kWh	<5500 kWh	<5500 kWh	<5500 kWh
Max C-rate	<1C	<1C	<1C	<0.5C
Nominal voltage (kV)	12, 24, 36, 40.5	12, 24, 36, 40.5	12, 24, 36, 40.5	12, 24, 36, 40.5
Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Power factor range	4-quadrant, 0 to 1	4-quadrant, 0 to 1	4-quadrant, 0 to 1	4-quadrant, 0 to 1
Connection method	3-phase	3-phase	3-phase	3-phase
Equipment				
Battery Enclosure	ABB EcoFlex	ABB EcoFlex	ABB EcoFlex	ABB EcoFlex
Battery chemistry	NMC, LFP	NMC, LFP	NMC, LFP	NMC, LFP
Grid connection equipment[3]	ABB Skid	ABB Skid	ABB Skid	ABB Skid
Power conversion system operation modes	PQ, VSI, Vf, CSI, grid forming, blackstart	PQ, VSI, Vf, CSI, grid forming, blackstart	PQ, VSI, Vf, CSI, grid forming, blackstart	PQ, VSI, Vf, CSI, grid forming, blackstart
Transformer type	Oil-filled, dry-type	Oil-filled, dry-type	Oil-filled, dry-type	Oil-filled, dry-type
AC switchgear	N/A	N/A	ABB SafeRing/SafePlus	ABB SafeRing/SafePlus
Environmental conditions				
Ambient temp. range (nom. ratings)	-20°C to +50°C	-20°C to +50°C	-20°C to +50°C	-20°C to +50°C
Relative humidity	5% to 95% non-condensing	5% to 95% non-condensing	5% to 95% non-condensing	5% to 95% non-condensing
IP degree battery compartment	IP54	IP54	IP54	IP54
General specifications				
Overall dimensions - ABB Skid (LxWxH)	6000x2100x2775mm	6000x2100x2775mm	6800x2100x2775mm	12000x2300x2775mm
Overall dimensions - ABB EcoFlex (LxWxH)	12000x2450x2900mm (ISO 40ft)	12000x2450x2900mm (ISO 40ft)	12000x2450x2900mm (ISO 40ft)	12000x2450x2900mm (ISO 40ft)
Product compliances				
Power Conversion System	UL1741, IEEE1547, EN 50549-2, AS4777.2, VDE-AR 4110/4120/4130	UL1741, IEEE1547, EN 50549-2, AS4777.2, VDE-AR 4110/4120/4130	UL1741, IEEE1547, EN 50549-2, AS4777.2, VDE-AR 4110/4120/4130	UL1741, IEEE1547, EN 50549-2, AS4777.2, VDE-AR 4110/4120/4130
Batteries	IEC 62619, UL1973, UN 38.3, UL9540A	IEC 62619, UL1973, UN 38.3, UL9540A	IEC 62619, UL1973, UN 38.3, UL9540A	IEC 62619, UL1973, UN 38.3, UL9540A
Transformer	IEC 60076	IEC 60076	IEC 60076	IEC 60076
Medium-voltage distribution	IEC 62271-200	IEC 62271-200	IEC 62271-200	IEC 62271-200
Fieldbus connectivity (predefined option)	Modbus, Ethernet for remote control and monitoring	Modbus, Ethernet for remote control and monitoring	Modbus, Ethernet for remote control and monitoring	Modbus, Ethernet for remote control and monitoring
Local user interface	ABB local control panel and embedded ABB Energy Management System	ABB local control panel and embedded ABB Energy Management System	ABB local control panel and embedded ABB Energy Management System	ABB local control panel and embedded ABB Energy Management System
Remote connectivity	Advanced SCADA and cloud connection, IEC62443	Advanced SCADA and cloud connection, IEC6443	Advanced SCADA and cloud connection, IEC62443	Advanced SCADA and cloud connection, IEC62443

[1] Derating applies above 1000m
[2] Power factor and performances considered

—

ABB Ltd.

abb.com/mediumvoltage