



Image shown may not reflect actual configuration

## **Cat® Energy Time Shift Module**

250 kW, 286 kWh to 2280 kWh

1000 kW, 1144 kWh

50 Hz 380-415 Volt

60 Hz 380-480 Volt

The Cat® energy time shift module is a scalable, rapidly deployable energy storage system. Energy storage systems can integrate with solar or other renewable sources to store energy from the overproduction of the renewable source for use when the renewable source is not available. Cat energy storage systems can also provide temporary backup power to facilities in the event of a power outage.

## **Features**

### **Reliable and Scalable**

The Cat Energy Time Shift Module (ETSM) is a robust, scalable energy storage system. The energy storage module consists of a pre-engineered container that can be easily installed on site. Multiple energy storage modules can be operated in parallel to provide increased power output and/or increase the battery kWh capacity.

### **Renewable Integration**

The energy storage modules are designed to work with an array of renewable systems, including solar and wind. Seamless integration with the Cat Microgrid Master Controller (MMC) allows for maximum renewable penetration and full asset control. The grid forming Cat Bi-Directional Power (BDP) inverters allow generator sets to be completely switched off, further reducing fuel consumption and operating costs.

### **Grid Stabilization**

The energy time shift module also protects against many typical power problems, including power failure, voltage sags/surges, and under/over voltage conditions.

### **BDP Bi-Directional Power Inverters**

The Cat BDP Bi-Directional Power inverters are the core to the energy storage module. Based on technology developed for Cat electric drive machines, the Cat BDP provides exceptional reliability and durability. The BDP features:

- Intelligent controls for the charging and discharging of the energy storage equipment.
- Static VAR compensator

- Full four-quadrant output power factor control
- Automatic anti-islanding
- Grid forming
- Parallel-ready – multiple modules may be used in parallel to increase total output

### **Energy Storage**

The energy storage consists of advanced lithium-ion batteries that provide good energy density, high discharge/recharge efficiency and high cycle life.

### **Standard Equipment**

- Cat BDP250 bi-directional power inverters
- Energy storage batteries
- Color HMI touchscreen
- Remote communications via Modbus TCP
- HVAC system to maintain 15°C to 27°C (60°F to 80°F) interior temperatures
- Interior AC lighting and convenience receptacles
- Fire suppression system

### **Applications**

- Time shifting of renewable energy
- Renewable smoothing
- Peak shaving
- Grid firming/grid stabilization
- Facility backup
- Spinning reserve

### **Worldwide Product Support**

Cat dealers provide extensive post-sale support including maintenance and repair agreements. Cat dealers have over 1,800 dealer branch stores operating in 200 countries.

## Technical Data

		ES287H250	ES1.0H250	ES1.8H250	ES2.3H250	ES1.2H1.0
<b>System Output Power</b>						
Continuous at 0.8 PF	kW	250	250	250	250	1000
15 min Overload at 1.0 PF	kW	250	350	350	350	1000
1 min Overload at 1.0 PF	kW	250	430	430	430	1000
10 s Overload at 1.0 PF	kW	250	600	600	600	1000
<b>Output Voltage</b>	V	380 - 600				
Output Voltage THD		<3%				
<b>Energy (Nameplate Start of Life)</b>	kWh	287	1005	1794	2512	1148
Energy Type		Li-Ion (Power)				
Battery Chemistry		NMC				
<b>Inverter (PCS) Model</b>		BDP250				
Number of Inverters		1	1	1	1	4
<b>Dimensions</b>						
Length	m (ft)	3.0 (10)	6.1 (20)	9.1 (30)	12.2 (40)	12.2 (40)
Width	m (ft)	2.4 (8)				
Height	m (ft)	2.8 (9.5)				
Weight	kg (lbs)	7401 (16,320)	16,043 (35,370)	25,696 (56,650)	34,242 (75,490)	27,119 (59,790)
<b>Ambient Temperature Capability</b>	°C	-40 to 50				
<b>Average Parasitic Load</b>						
At 40°C and 0 load	kW	1.5	2.5	4	5	5.5
At 40°C and 100% load	kW	7	14.5	23	30.5	27
<b>Features</b>						
Microgrid Stabilization		Yes				
Seamless Mode Transfer		Yes				
Islanding Detection		Yes				
Grid Forming		Yes				
Virtual Spinning Reserve Function		Yes				
Plug-and-Play Parallel Ready		Yes				
Intelligent Energy Storage Management		Yes				
Human-Machine Interface		Yes				
Communications Protocols		Modbus TCP/IP				
Fire Suppression System		Yes				

[www.cat.com/powergeneration](http://www.cat.com/powergeneration)

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