

BYD with Acumen EMS™ Controls

HARDWARE & SOFTWARE GUIDE



2-HOUR CHESS		4-HOUR CHESS	
ESS Power (kW)	ESS Capacity (kWh)	ESS Power (kW)	ESS Capacity (kWh)
120*	258*	60*	258*
240	516	120	516
360	774	180	774
480	1032	240	1032
600	1290	300	1290
720	1548	360	1548
840	1806	420	1806
960	2064	480	2064

**Note: The 2-hour 120/258 and 4-hour 60/258 are the only two sizes of the CHESS units. Any of the larger configurations listed consist of multiple CHESS units stacked together.*

BYD - TURNKEY ESS

- ▶ 10-year standard warranty on system components: PCS, battery, enclosure, electronics
- ▶ Easy to assemble and functionally tested to reduce on-site work and cost
- ▶ Commissioning and annual maintenance included
- ▶ Fully integrated PCS and EMS

ETB SOFTWARE SERVICES

- ▶ Acumen EMS perpetual license
- ▶ ETB Monitor Software Subscription (term to be defined)
- ▶ Optional add-on services available upon request

1. What are the lead times for the products?

- ▶ 6-8 months are the standard lead times from beginning of manufacturing. ETB may have stock of units in the US. Inquire about expedited availability.

2. Who manufactures the PCS & battery cells & what is the cell chemistry?

- ▶ PCS and battery cells are all manufactured by BYD in Shenzhen, China. Cell chemistry is lithium iron phosphate (LFP).

3. What UL Certifications does the BYD ESS have?

- ▶ The BYD PCS included in the ESS system is UL 1741 SB certified, while the ESS system has received its UL 9540 certification. Fire testing under the UL 9450A standard has been completed at the cabinet level.

4. Does the product come with HVAC &/or fire suppression?

- ▶ Yes, the units include forced air cooled HVAC and do not require fire suppression as they are 9540A certified.

5. Does the system require an isolation transformer?

- ▶ It is not a requirement, but BYD does recommend the installation of an isolation transformer. This is for electrical safety as well as to avoid risk of electrical distortion to ensure the system is stable.

6. How long is the warranty & what does it cover?

- ▶ The standard warranty is 10 years and it covers the material and labor for any defects. BYD also warrants battery capacity which is dependent on expected battery usage.

7. What is the battery degradation?

- ▶ Battery degradation is variable and highly dependent on project specifics. As a general pattern, the degradation will slow down as the batteries "burn in" after a few years. For modeling purposes, Energy Toolbase currently applies a simple annual average degradation rate of 3%.

8. Can the unit provide back-up power or microgrid capabilities?

- ▶ The BYD PCS does not have grid-forming capability and therefore cannot provide back-up or microgrid capabilities. Please reach out to ETB to discuss options for grid-forming systems.

9. What are response & replacement times on breaks or malfunctions?

- ▶ This will depend on the nature of the issue - if it is concerning safety or the power/energy availability, BYD would work to acknowledge the issue and if on-site service is required, engage onsite service within 24-72 hours. If it is cosmetic, the onsite service will be arranged within 2 weeks.

10. What is the typical installation time for a single CHES unit & does that time double for each additional unit?

- ▶ This will depend on labor force and crew experience. Typical CHES install will be 2 days not including the concrete foundation that is prepared before the product arrival or commissioning which may take an additional day. Additional units shall take less time.

11. What is the size of the physical unit?

- ▶ 1600×1900×2300mm. Weigh is approximately 3 tons depending on the model selected.

12. What is the O&M cost? Is there an O&M requirement for the asset owner?

- ▶ BYD includes the annual maintenance. Energy Toolbase will operate the system through Acumen EMS. Asset owner is responsible for light maintenance checks every 6 months.

13. Does BYD &/or ETB provide commissioning support?

- ▶ BYD will support the commissioning process of the ESS unit onsite for the installers first installation and then remotely for future installations. ETB will remotely support the commissioning of the EMS system.

14. Does BYD have any preferred or approved EPC's for installation?

- ▶ No. The installation will be very straight forward – any EPC with commercial solar installation experience or equivalent should be able to handle it.

15. Can the unit be AC or DC coupled?

- ▶ AC Coupled.

16. Can the BYD CHESS be installed in Marine environments?

- ▶ If installed 1-3 miles from salt water, customer must purchase the BYD marine Protection C4 coating for the warranty to be honored.
- ▶ Under 1 mile from salt water is currently not supported, further testing is under way with BYD factory.

17. What is the end-of-life process/costs?

- ▶ Owner shall decommission the system and contact a battery recycler to remove the system. The current market cost is at about \$0.7-\$1/lb. of LFP battery, so that comes to about \$2.4k to \$3.5k per CHESS unit, plus logistic cost to ship these to the recycler's station.

18. What equipment do I need for offloading & placing equipment?

- ▶ A BYD CHESS will require a minimum 10k forklift for offloading and setting equipment onsite. The unit can also be moved by crane if required due to onsite constraints.