

Maintenance Scope and Schedule

After the BESS containerized battery energy storage system is put into operation, regular inspection and maintenance of the system equipment is required. According to the maintenance time and maintenance items, the inspection and maintenance of the equipment are divided into two types: Regular inspection and maintenance (recommended once a quarter) and annual maintenance (once a year).

Customers can make adjustments based on the environment and actual needs of the equipment installation site.

Notice:

- On-site manhour based on estimation, real maintenance time depend on project situation;
- Trip time: 2 days across European;
- Involved service engineers: minimum 2 engineers due to electrical work safety requirements;

1. Quarterly Operation and Maintenance

Estimated maintenance hour is 6 hours, real maintenance time may vary due to project;

Subsystem	Check Item	Method	Solution	Manhour(min)
Container	Container appearance	Check the exterior for damage or rust and whether repainting is needed	Visual checking	15
	Container flooding	Check whether there is any sign of water inside the container	Contact the manufacturer to investigate the cause of the flooding.	5
	Container nameplate	Check whether the nameplate on the container has fallen off	Re-post nameplate	1
	Container door lock	Check whether the cabinet door lock can be opened smoothly	Contact the manufacturer to eliminate the cause of the fault	15
	Container interior cleaning	Check and clean the interior of the container	Clean up the internal debris	15
	Container top	Check and clean the top of the cabinet to see if there is any accumulation of fallen leaves, branches or debris.	Clear the fallen leaves, branches or debris on the top of the cabinet	15
	Container rubber strip	Check whether the container rubber strips are falling off or damaged	Fix or replace the rubber strip	10

Subsystem	Check Item	Method	Solution	Manhour(min)
	External emergency stop of container	Check whether the emergency stop switch on the outside of the container is working properly. Press the emergency stop switch to shut down the system.	Contact the manufacturer to find out the cause of the fault	10
Container interior lighting	Lighting tube	Check that all lighting tubes are working properly	Contact the manufacturer to find out the cause of the fault and replace the lighting tube	10
	Emergency lights	Check that all emergency lights are working properly	Contact the manufacturer to check the cause of the fault and replace the emergency light	10
Power distribution control box	Visual inspection	Visually check whether all components and circuits in the power distribution control box are damaged.	Check the cause of damage and replace the damaged device	10
PCS cabinet	PCS cabinet indicator light	Check whether the PCS cabinet indicator is normal	Contact the manufacturer to find out the cause of the fault	5
	PCS module indicator	Check whether the PCS module indicator is normal.	Contact the manufacturer, troubleshoot the cause of the fault, and replace the PCS module.	5
	PCS module fan	Check whether the PCS module fan is working properly	Contact the manufacturer, troubleshoot the cause of the fault, and replace the PCS module.	5
	Visual inspection	Visually inspect all components in the PCS cabinet, especially the power cables and bolts to see if they are burnt or have obvious damage.	Contact the manufacturer to find out the cause of the fault	5
	Lightning arrester	Visually check whether the lightning arrester window is still green	Replacement of lightning arrester	2
	Breaker	Check if the circuit breaker is working properly	Contact the manufacturer, check the cause of the fault, and replace the circuit breaker switch	2
	PCS cabinet door lock	Check whether the cabinet door lock can be opened smoothly	Contact the manufacturer to find out the cause of the fault	2
Battery cabinet	Battery cabinet appearance	Check the exterior for damage or rust and whether repainting is needed	Visual inspection	15

Subsystem	Check Item	Method	Solution	Manhour(min)
	Battery cabinet identification	Check whether the warning sign on the battery cabinet has fallen off.	Re-post warning signs	10
	Battery cabinet indicator light	Check whether the indicator light of the battery cabinet is working properly	Contact the manufacturer to find out the cause of the fault	5
	Breaker	Check if the circuit breaker is working properly	Contact the manufacturer, check the cause of the fault, and replace the circuit breaker	10
	Battery cabinet door	Check whether the battery cabinet door is closed tightly	Close the battery cabinet door again	10
	Battery cabinet rubber strip	Check whether the battery cabinet door rubber strip is damaged or falling off	Fix or replace the rubber strip	15
	Battery cabinet leaking	Check if there is any leakage in the battery cabinet	Contact the manufacturer to find out the cause of the fault	5
	Battery cabinet door lock	Check whether the battery cabinet door lock can be opened smoothly	Contact the manufacturer to find out the cause of the fault	10
	Battery cabinet door lock rod	Check whether the battery cabinet door lock rod is deformed	Replace the battery cabinet door lock rod	10
	Battery power cable/bronze	Visual inspection for obvious damage or burning	Contact the manufacturer to find out the cause of the fault	15
	Battery module appearance	Visually inspect the battery to see if it is bulging or leaking.	Contact the manufacturer to replace the battery module	10
	Battery terminal	Visual inspection for obvious damage or burning	Contact the manufacturer to find out the cause of the fault	10
	Air conditioner	Check whether the air conditioner is operating normally and whether there is any abnormal sound.	Contact the manufacturer to replace the battery module	10
		Check if the air conditioner drain outlet is blocked	Unclogging the air conditioning drain	5
	Fire extinguishing hose	Visually check whether the fire pipe pressure gauge pointer is in the green normal area	Contact the manufacturer to refill the gas or replace the fire hose	10

Subsystem	Check Item	Method	Solution	Manhour(min)
	Smoke sensor	Is the smoke sensor indicator light flashing normally?	Contact the manufacturer to find out the cause of the fault	10

2. Annual Operation and Maintenance

Last Quarterly maintenance can be done together with Annual maintenance, estimated maintenance hour is around 8 hours, real maintenance time may vary due to project;

Subsystem	Check Item	Method	Manhour(min)
Container	Container appearance	Repair paint on damaged or rusted areas of containers	30
	Container grounding	Check the grounding of the container and confirm the grounding resistance	10
	Container dust screen	Use vacuum cleaner to clean dust from container dust screen	10
	Inside the container	Vacuum the inside of the container to remove dust	10
Power distribution control box	Dust removal in power distribution control box	Use vacuum cleaner to clean the dust inside the power distribution control box	10
PCS cabinet	Dust removal inside the cabinet	Use a vacuum cleaner to clean the dust on the copper plate, terminals, mesh holes, etc. in the PCS cabinet.	10
	Power cable	Check whether the power connection wires and connection terminals in the cabinet are damaged or burnt.	10
	Power connection	Check the power line connection terminals for looseness and tighten them. If loose, use a torque wrench to re-torque them for torque marking.	10
	Ground connection	Check whether the grounding wire connection in the cabinet is reliable and whether the grounding wire fixing terminal is loose. If it is loose, use a torque wrench to re-torque it for torque marking.	5
	Battery cabinet appearance	Battery cabinet paint or rust repair	15
	Dust removal in battery cabinet	Use a vacuum cleaner to clean the dust inside the battery cabinet	10

Battery cabinet	Power cable	Check whether the power connection wires and connection terminals in the battery cabinet are damaged or burnt.	10
	Power connection	Check the power line connection terminals for looseness and tighten them. If loose, use a torque wrench to re-torque them for torque marking.	10
	Ground connection	Check whether the grounding wire connection in the cabinet is reliable and whether the grounding wire fixing terminal is loose. If it is loose, use a torque wrench to re-torque it for torque marking.	5
	Air conditioner	Check the cleanliness of the condenser and clean it with compressed air	10
	Fire fighting	Clean the dust from the fire nozzle	10
System	SOC verification	The system is discharged at rated power until the system discharge protection is cut off, and then left to stand for 30 minutes; The system charges at rated power until the charging protection is cut off, and the system is left to stand for 30 minutes, and the charging data is recorded; The system discharges at rated power until the system discharge protection is cut off, and the discharge data is recorded.	Optional, customer can do it remotely, and this part will take around 5 hours;

