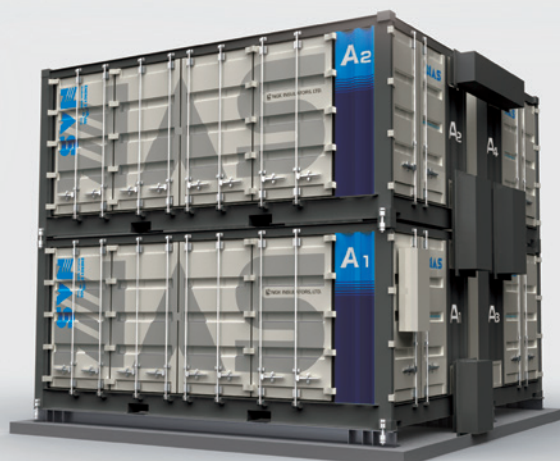


# Technical Data Sheet for NAS<sup>®</sup> Battery System



<b>Type of Battery</b>	High temperature sodium-sulfur battery
<b>Battery Name</b>	NAS <sup>®</sup> Battery
<b>Manufacturer</b>	NGK Insulators, LTD., Japan
<b>Distributor</b>	BASF Stationary Energy Storage GmbH, Germany
<b>Website Link</b>	<a href="http://www.nasbatteries.basf.com">www.nasbatteries.basf.com</a>

Mechanical properties	Values	Units	Notes (optional)
Structure (unit)	20 ft container		
Number of units in one DC-string	1, 2, 3 or 4		
Site condition	outdoor		
Dimensions	approx. 6058 x 2438 x 2591	mm	
Total weight	approx. 21	tons	
Standard paint color	RAL 9010 (Pure white)		
Cooling method	forced air cooling		No air conditioning required for battery module. Air conditioning only for control cabinet (BMS)
Ambient temperature	-20 to +45	°C	optional: -40 to +55 °C
Relative humidity (annual average)	15-85	%	without dew condensation
Altitude	1000	m	maximum altitude
Seismic	1.0	g	static horizontal acceleration
Water protection class	IP 54		
Fire protection class			Module withstand specified fire exposure test for 30 minutes

To find out more about NAS<sup>®</sup> Batteries, please contact us:

**BASF Stationary Energy Storage GmbH**  
Benckiserplatz 1  
67059 Ludwigshafen am Rhein, Germany

Email: [nasbatteries@basf.com](mailto:nasbatteries@basf.com)  
Website: [www.nasbatteries.basf.com](http://www.nasbatteries.basf.com)



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Operational parameters	Values	Units	Notes (optional)
Maximum charge and discharge power (DC)	250	kW-dc	
Useable discharge energy at DC terminal (BOL)	1450	kWh-dc	
Number of equivalent cycles* (for design life)	7300	cycles	
Battery design life (idealized)	20	years	
Useable discharge energy at DC terminal (EOL)	921	kWh-dc	@7300 equivalent cycles
Capacity degradation rate	5	%	per 1000 equivalent cycles
Depth of discharge	100	%	
Maximum auxiliary power consumption for heating up battery (@440 V-ac)	30	kW-ac	voltage range between 400 – 480 V-ac is possible for auxiliary power supply, max. power will vary accordingly
Operating temperature (inside module)	305–340	°C	
Nominal voltage	192	V-dc	voltage range: 135–228 V-dc
Minimum state of charge	0	%	
Maximum state of charge	100	%	referred to the useable capacity
Maximum charge current	1200	A	
Maximum discharge current	1500	A	
Interface with PCS controller	Modbus TCP		

Footnotes: \* Equivalent cycle is only defined by accumulated discharged energy and is independent from operating depth of discharge (DOD).

## Standards & Norms

NAS<sup>®</sup> Batteries comply with CE marking requirement.

NAS<sup>®</sup> Batteries cells modules are certified as recognized components to UL 1973 standard.

Additionally, NAS<sup>®</sup> Battery cells and modules have been evaluated using UL 9540A