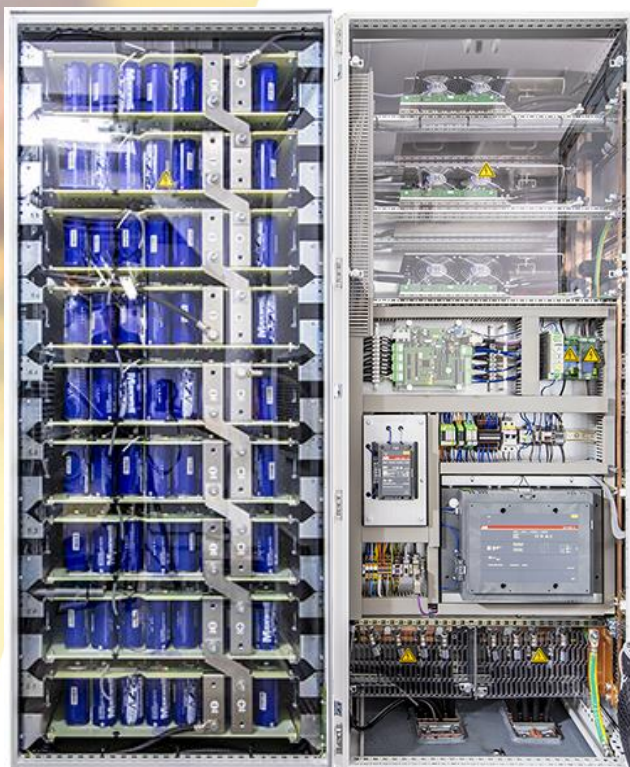




# ESS cabinet

## With 1 MW converter



- Innovative in Energy Storage & Power Electronics
- Custom-made solutions
- Optional Design and system integration
- Optional complete solution: Storage & Power Electronics

### ESS Features

- Flexible configuration possible of modules in series/parallel
- Cost effective in kW/m<sup>3</sup>
- Diagnostic interface via fiber optics
- Voltage-/temperature monitoring and balancing of every individual cell

### Converter Features

- Maximum rated power: 1000 kW
- Maximum operational voltage: 850V
- Air cooling
- Main contactor and pre-charge

### Applications

- Peak shaving for large cranes: STS, RTG, Grab cranes, etc.
- Peak shaving for maritime: Heave compensation, cranes, propulsion thrusters, winches, etc.

## Mechanical Data

Width x Height x Depth

Typical ESS:

800 x 2000 x 600 mm

Approx. 600 kg

Typical converter:

810 x 2102 x 659 mm

Approx. 600 kg

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## ESS Cabinet electrical specifications

Symbol	Parameter	Description	Value	Unit
	<b>General</b>			
$U_{DC\_max}$	Ultracapacitor max voltage	Monitoring from 30 V to $U_{DC\_max}$	780	V
$U_{DCop}$	Ultracapacitor max operating voltage		750	V
	Ultracapacitor rms current		150	A
	Ultracapacitor peak current	< 5 s	1500	A
	Discharge time	30 min, from $U_{DCop}$ to 1 V		
	Auxiliary DC supply	@ 1 A	24	VDC
	Auxiliary AC supply	1 phase 50 Hz, 10 A fuse B type	230	VAC
	<b>Mechanical parameters</b>			
	Maximum enclosure height	With socket, elevated roof and discharge resistor	2500	mm
	Type enclosure	Rittal TS8 (steel panel, zinc coated)		
	Cooling	Forced air convection: Air inlet through fan in the front door, air outlet through elevated roof		
	Socket			
	Color	RAL 7035; light gray		
	Degree of protection	Cabinet closed / opened	IP20	
	Lock-up system	Comfort handle with lock insert		



## Converter electrical specifications

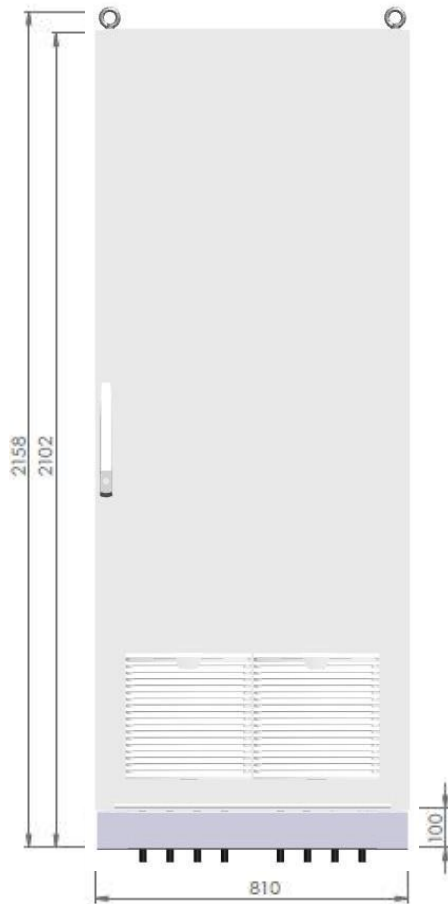
Symbol	Parameter	Description	Value	Unit
	<b>General</b>			
	Rated Capacity		10,42	F
	Tolerance		+20/-0	%
	<b>Voltage</b>			
	Max. voltage	Monitoring from 30V to $U_{DCmax}$	780	VDC
	Max. operating voltage		750	VDC
	Isolation voltage	Max. voltage at base isolation	1800	VDC
	<b>Internal resistance</b>			
	Equivalent series resistance DC	@25 °C (initial ... lifetime)	54 ... 168	mΩ
	Equivalent series resistance AC	@25 °C and 1 kHz (initial)	66	mΩ
	<b>Environment</b>			
	Operating temperature range		0 till 40	°C
	Storage temperature range		-20 till 50	°C
	Protection degree	Cabinet open or closed	IP20	
	<b>Energy</b>			
	Energy density	@ $V_r$	26,4	Wh/kg
	Usable energy	Between $V_r$ and $\frac{1}{2} V_r$	660	Wh
	<b>Current</b>			
	Rated current	Continuous	150	Arms
	Peak current	< 5 sec.	1500	A
	Leakage current	After 72 hours @25 °C and $V_r$ (only the cells)	5,2	mA
	<b>Lifetime</b>			
	Projected cycle life	Between $V_r$ and $\frac{1}{2} V_r$ @25 °C	1.000.000	
	Projected DC life	@ $V_r$ and 25 °C @ $V_r$ and 65 °C	10 1500	a h



## Mechanical Data Converter

Width x Height x Depth: 810 x 2102 x 659 mm

Weight converter: Approx. 600 kg





## Mechanical Data ESS

Width x Height x Depth: 800 x 2000 x 600 mm

Weight converter: Approx. 500 kg

