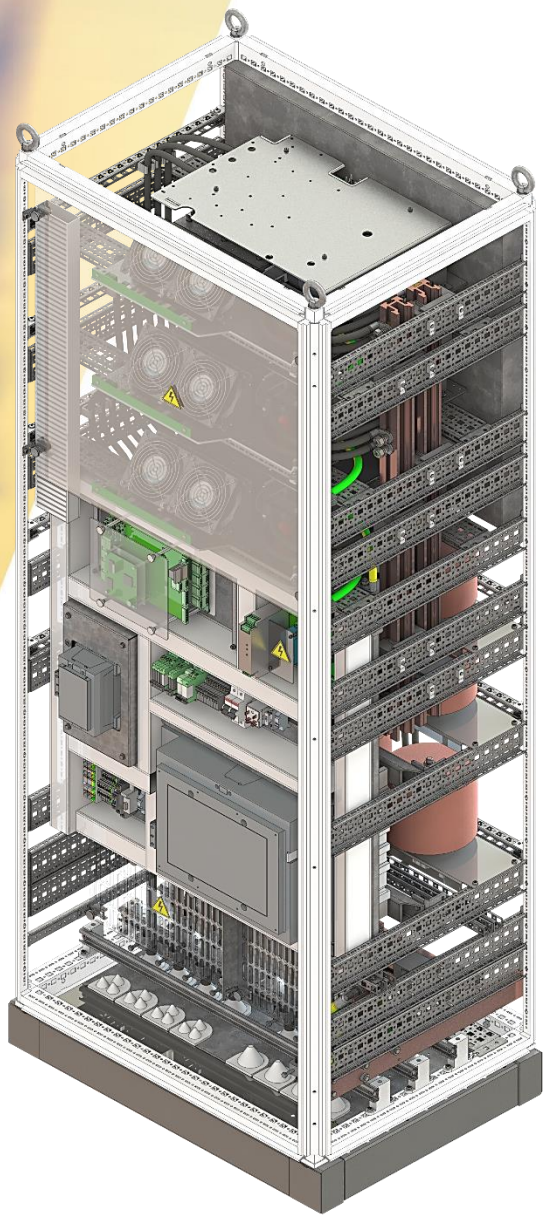
Hybrid Power



AEP 900

Bidirectional DC/DC converter

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

Features

- Low output current ripple for DC/DC application
- Short-circuit-proved output
- Integrated current and temperature sensors
- CAN-Bus communication
- Includes DC Switchgear

Applications

- DC/DC converter (e.g. charging and discharging of energy storage) current source.

Mechanical Data

Width x Height x Depth
810 x 2102 x 659 mm
Approx. 600 kg

aephybridpower.com
sales@aephybridpower.com
+31 (0)78 692 2100

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Technical Characteristics

Example of use for 900kw DC/DC converter at 4 kHz

Symbol	Parameter	Description	Value	Unit
	General			
U_{IN_nom}	Voltage Input nom. (DC)		700	V
U_{IN_max}	Voltage Input max. (DC)		850	V
U_{OUT_max}	Voltage Output max. (DC)		0 to 700	V
I_{IN}	Current Input (DC)	@ Voltage Input nom.	1000 A nominal 1350 A max. (< 20 s, 50% load cycle)	A
I_{OUT}	Current Output (DC)		1000 A nominal 1500 A max. (< 20 s, 50% load cycle)	A
P	Power	@ Voltage Output max.	700 kW nominal 1000 kW max. (< 20 s, 50% load cycle)	kW
f_{sw}	Switching frequency		4	kHz
	Auxiliary Supply	Additional Inputs	24 VDC, 1 kW (converter fan, control voltage) 230 VAC, 2 kVA (cabinet fan, main switch power supply)	
	Environment			
	Operating temperature		0 to 40 (40 to 45 with derating)	°C
	Storage temperature		-20 till +50	°C
	Humidity	< 95 % non-condensing		
	Insulation coordination, safety	EN 50178		
	EMC	EN 61000-6-4, EN 61000-6-2, EN 61000-3 (C2)		
	Panel sheet coating	Pre-galvanized steel		

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System Overview

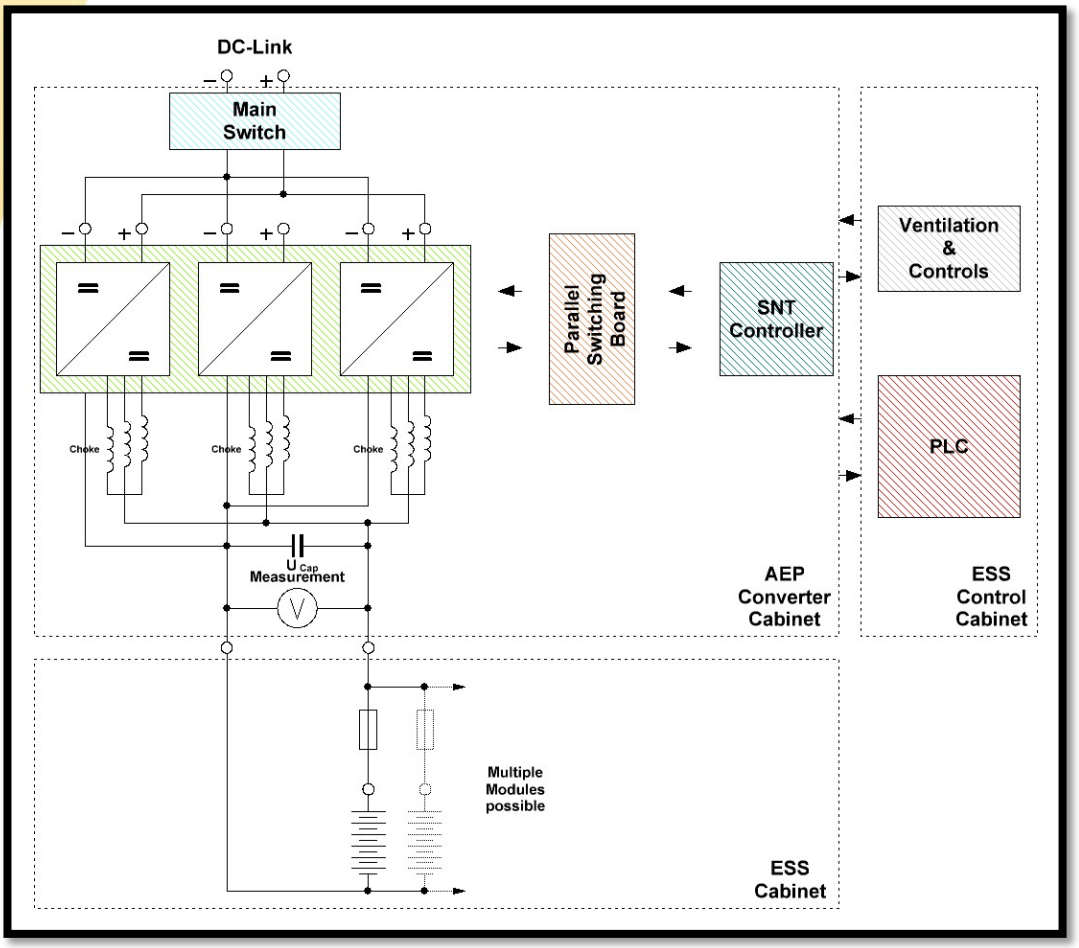

Figure 1: Basic Block Diagram of Cabinet Setup

Figure 2: Cabinet design

Component Lay-out

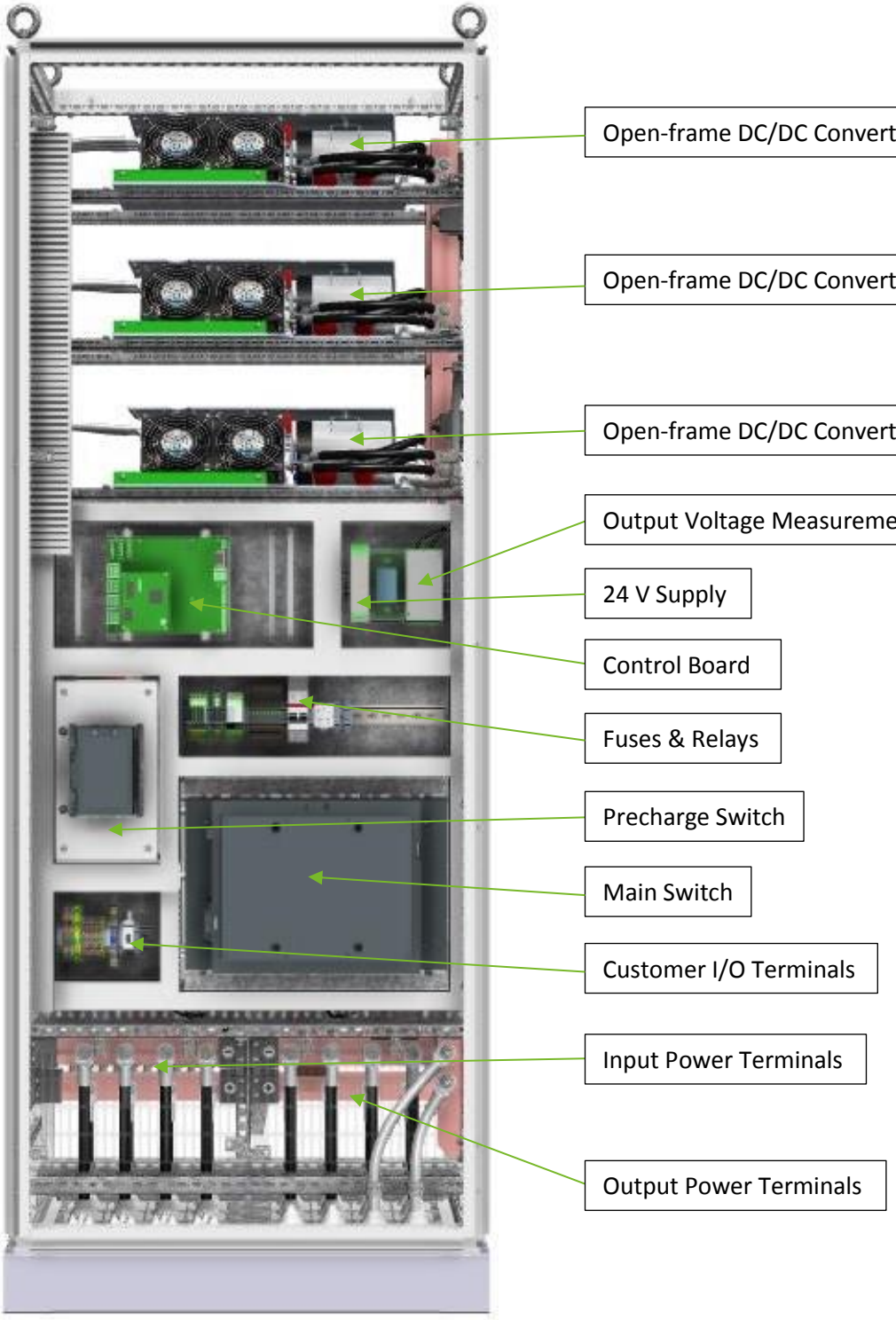

Figure 3: Component Lay-out inside the cabinet

Input and Output Power Terminals

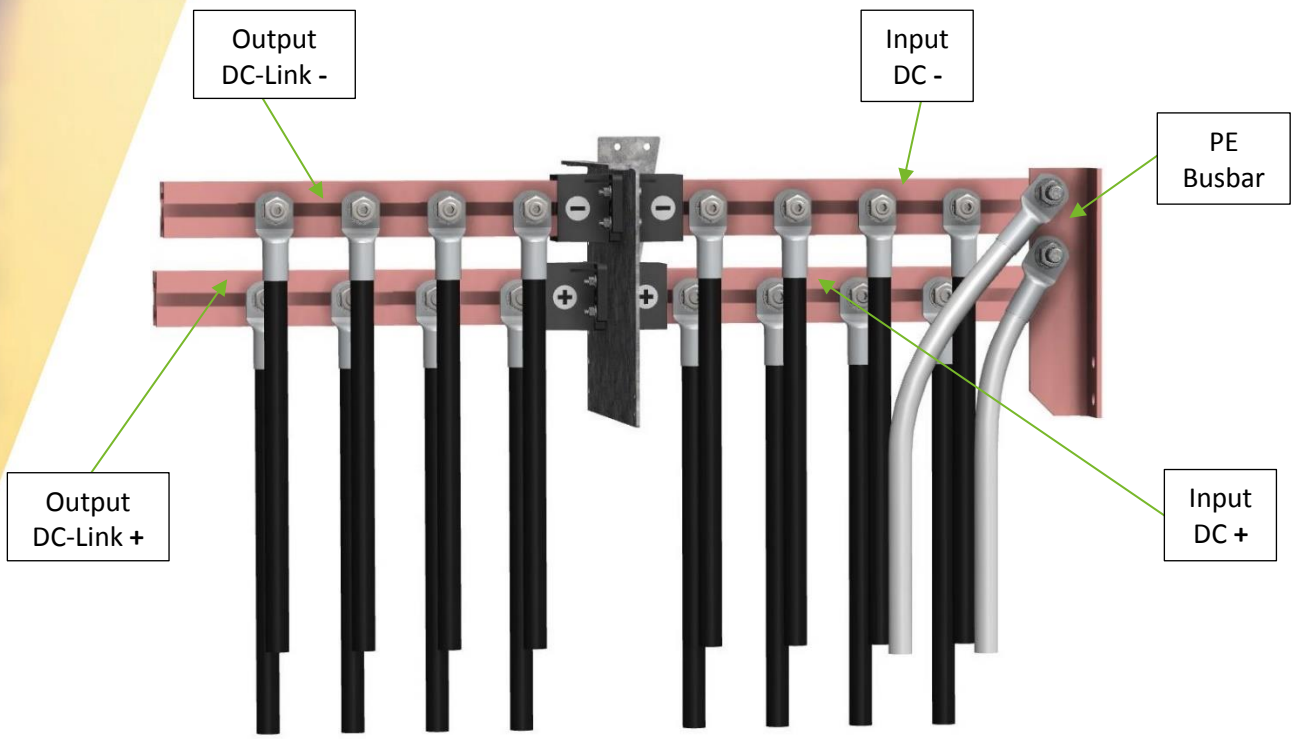

Figure 4: Power Terminals

Power terminal

Pin	Signal	Connection cross-section	Connector	Description
-1W2	Input DC-link +	150 mm²	M12 Terminal Lug (screwed connection)	Fastening torque: 35 Nm
-5W1	Input Load +	150 mm²	M12 Terminal Lug (screwed connection)	Fastening torque: 35 Nm
-1W3	Input DC-link -	150 mm²	M12 Terminal Lug (screwed connection)	Fastening torque: 35 Nm
-1W4	Output Load -	150 mm²	M12 Terminal Lug (screwed connection)	Fastening torque: 35 Nm
-1W1	PE	150 mm²	M12 Terminal Lug (screwed connection)	Fastening torque: 35 Nm

Customer I/O Terminals

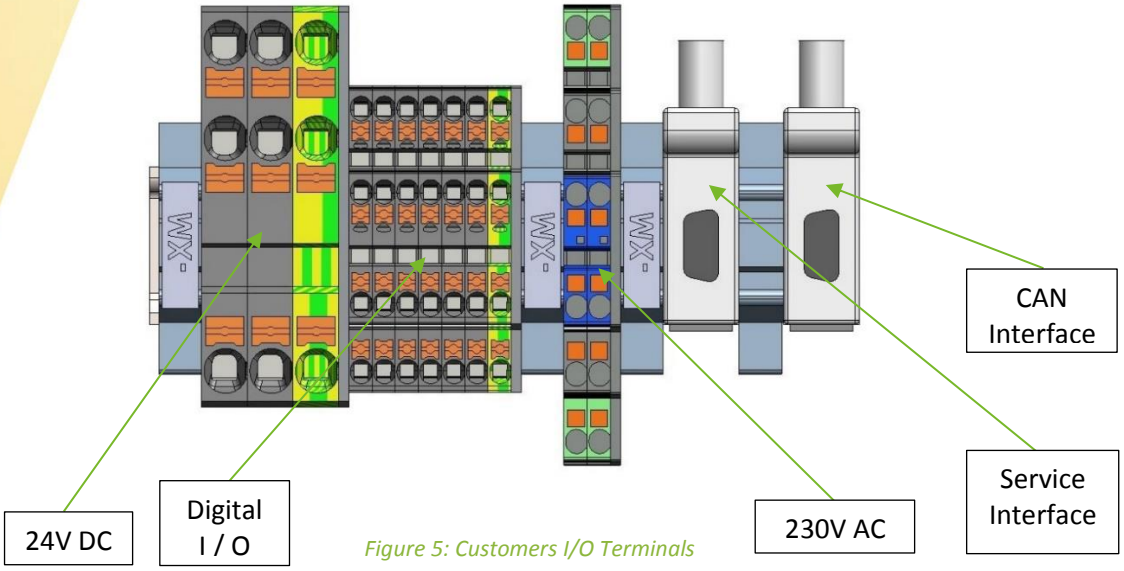

Figure 5: Customers I/O Terminals

Auxiliary power

Connector	Signal	Description
-6X1 (24V DC supply 1000W) – 3 x LT200		
-6X1.15	24V	+24V control signal (max. 25A)
-6X1.16	GND	Ground for control
-7X1 (230V AC supply 2kVA) – Door Fans (Air Inlets)		
-7X1.1	Neutral (N)	Neutral
-7X1.2	Live (L)	230V supply voltage (max. 3A)
-7X1.3	Ground (PE)	Ground for supply voltage

Digital signals

Connector	Signal	Description
-6X1.1 -6X1.2	Switch On (24V) Switch On (GND)	Request pre charge, closing circuit breaker (condition '' ready'') optional: controlled by CAN
-6X1.3 -6X1.4	Enable (24V) Enable (GND)	Request operation, active control (condition ''operation'') optional: controlled by CAN
-6X1.5 -6X1.6	Estop IN Estop OUT	Safety chain, Estop IN and Estop OUT must be connected for converter operation
-6X1.11 -6X1.12	Analogue setpoint (+/-25mA) Analogue setpoint (GND)	Bidirectional analogue setpoint for power control or output current control mode

Analog inputs

Connector	Signal	Description
-6X1.11	Analogue setpoint (+/- 25mA)	Bidirectional analogue setpoint for power control or output current control mode
-6X1.12	Analogue setpoint (GND)	

Communication

Connector	Signal	Description
-6X2 – RS232 (Service diagnostic Interface for PC)		
-6X2.2	TXD	Transit signal
-6X2.3	RXD	Receive signal
-6X2.5	GND_RS232	Ground signal
-6X2.SH	Shield	Grounding conductor
-6X3 – CAN (D-SUB 9 female plug on DIN-Rail)		
-6X3.7	CAN_L1	CAN low signal
-6X3.3	GND_CAN	CAN ground
-6X3.2	CAN_H1	CAN high signal
-6X2.SH	Shield	Grounding conductor

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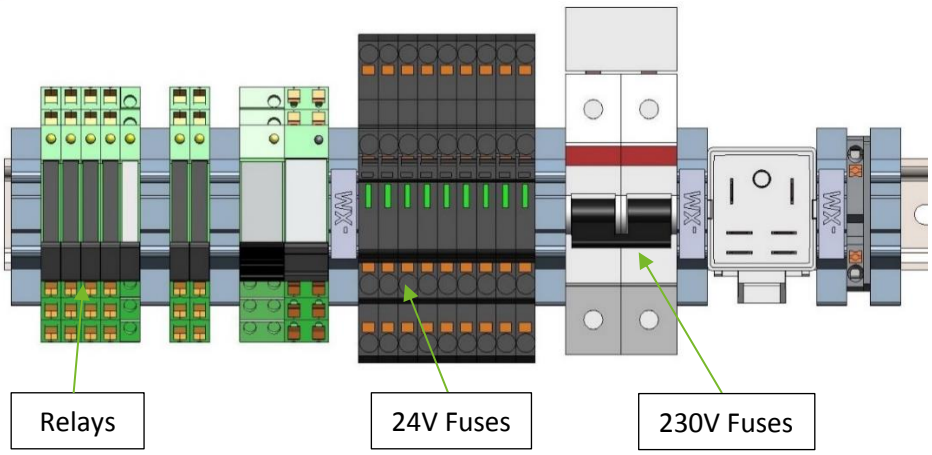
Fuses & Relays



Fuses

Device designation	Type	
-8X1.1	5 x 20 mm	24V / 10 AT
-8X1.2	5 x 20 mm	24V / 10 AT
-8X1.3	5 x 20 mm	24V / 10 AT
-8X1.4	5 x 20 mm	24V / 6,3 AT
-8X1.5	5 x 20 mm	24V / 20 AT
-8X1.6	5 x 20 mm	24V / 1 AT
-8X1.7	5 x 20 mm	24V / 2 AT
-8X1.8	5 x 20 mm	24V / 1 AT
-8X1.9	5 x 20 mm	24V / 6,3 AT

Device designation	Type	
-9F1	S201-C6	250V / 6 A
-9F2	S201-C6	250V / 6 A

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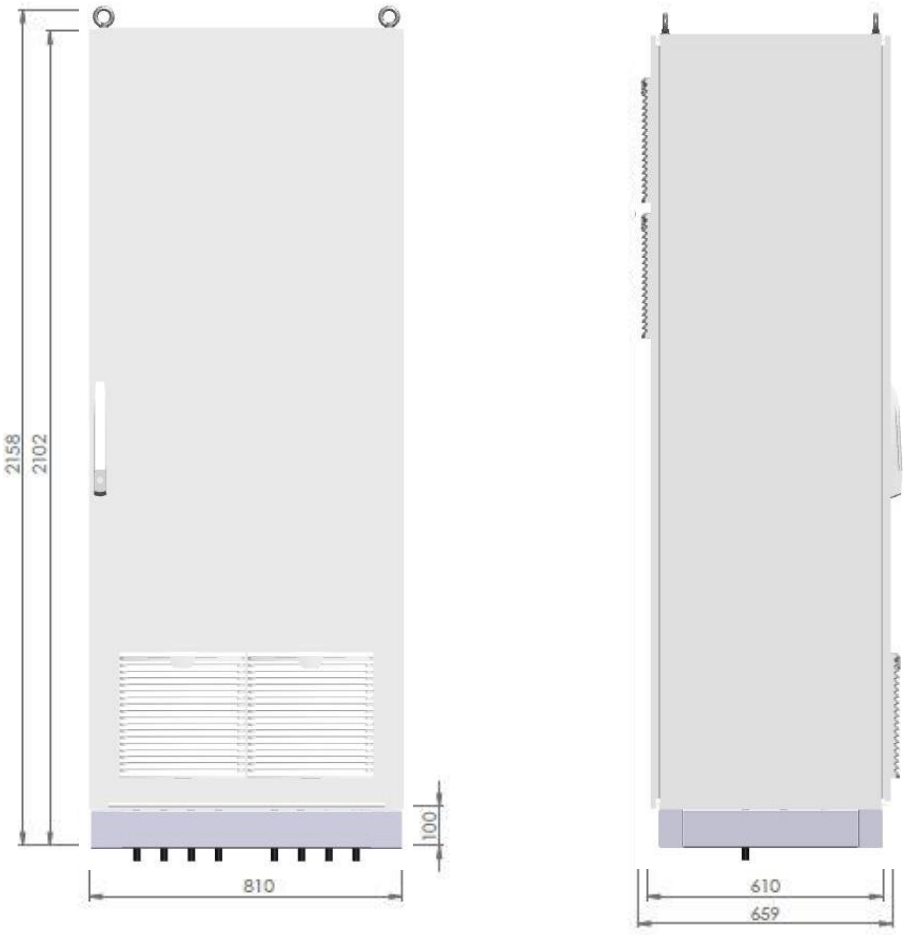
Mechanical Data

Width x Height x Depth:	810 x 2102 x 659 mm
Weight converter:	Approx. 600 kg
Enclosure:	IP 45



Mechanical data			
Weight		600	kg
Dimensions (W x H x D)		810 x 2102 x 610	mm
Enclosure type	Rittal TS 8		
Cooling	Forced air convection: Air inlet: through the front-door filter pad Air outlet at top of backside.		
Socket	100 mm (Rittal standard), RAL		
International Protection degree (IP)	Cabinet closed: IP 45 Cabinet opened: Touch protection based on requirements of DGUV*		

*DGUV – German Social Accident Insurance for “Electrical installations and equipment”.