



AEP300 - 800 - IP20

Bidirectional DC/DC converter

- Innovative in energy storage & Power Electronics
- Custom-made solutions
- Complete solution: storage & Power Electronics
- Design and system integration



Features

- 300 kW converter, U_{pri} 800V
- Step up and step down mode
- Binary and analog I/O
- RS 232 / CAN bus interface
- 24 Vdc Supply
- Air-Cooling



Applications

A selection of potential applications are:

- Heavy transport
 - Fast energy storage hybrid driveline
 - Combination diesel-electric, fuel cell & batteries
- Maritime & offshore
 - Dynamic energy storage vessels
 - Heavy lifting, cranes etc.
- Industrial & UPS back-up
 - Peak power supply
 - Short term bridge power

Mechanical Data

Depth x Width x Height
477 x 502 x 203 mm
Approx. 22 kg



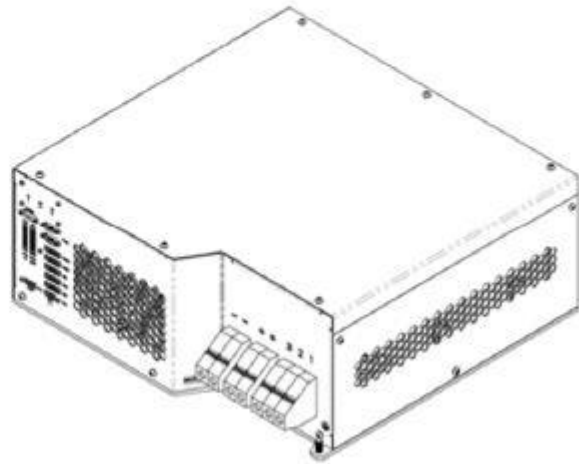
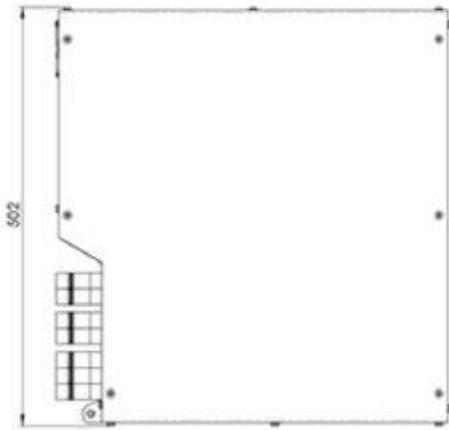
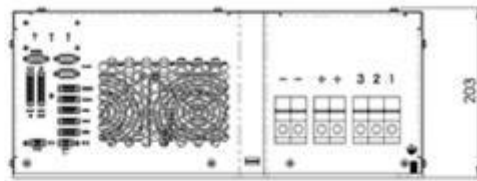
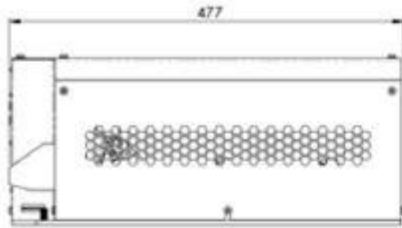
Technical Characteristics

Symbol	Parameter	Description	Value	Unit
General				
P_R	Rated power	@ U_{sec} 1000V	300	kW
F_r	Switching frequency		3-4	kHz
η_r	Efficiency	@ P_R	>95	%
Primary				
U_{pri}	DC voltage range		0-800	VDC
$U_{pri, max}$	Max. operating voltage		850	VDC
Secondary				
U_{sec}	Rated voltage		0 – 750	VDC
$U_{sec, max}$	Max. operating voltage		780	VDC
I_{max}	Max cont. current		510	A
I_{peak}	Peak current	<5 seconds	600	A
Supply power				
	Control voltage	Rated Value between	24	VDC
			18 till 30	VDC
	Control current		2	A
Environment				
T_o	Operating temperature		0 till 50	°C
$T_{m, max}$	Advisable temperature		30 till 40	°C
T_s	Storage temperature		-20 till 60	°C
	Protection degree		IP20	
Cooling				
	Kind		Forced air cooling	
	Power losses		≤1500	W
	Airflow		600	m ³ /h
Communication				
	Data	CAN 2.0B / RS232		
	Binary signal	On/Off, Enable, Error, Reset, Emergency stop		
	Additionally	Conventional error, Temperature output		



Mechanical Data

Length x Width x Height: 502 x 477 x 203 mm
Weight converter: Approx. 22 kg
Weight inductors: Approx. 110 kg
Enclosure: IP-20



Connections

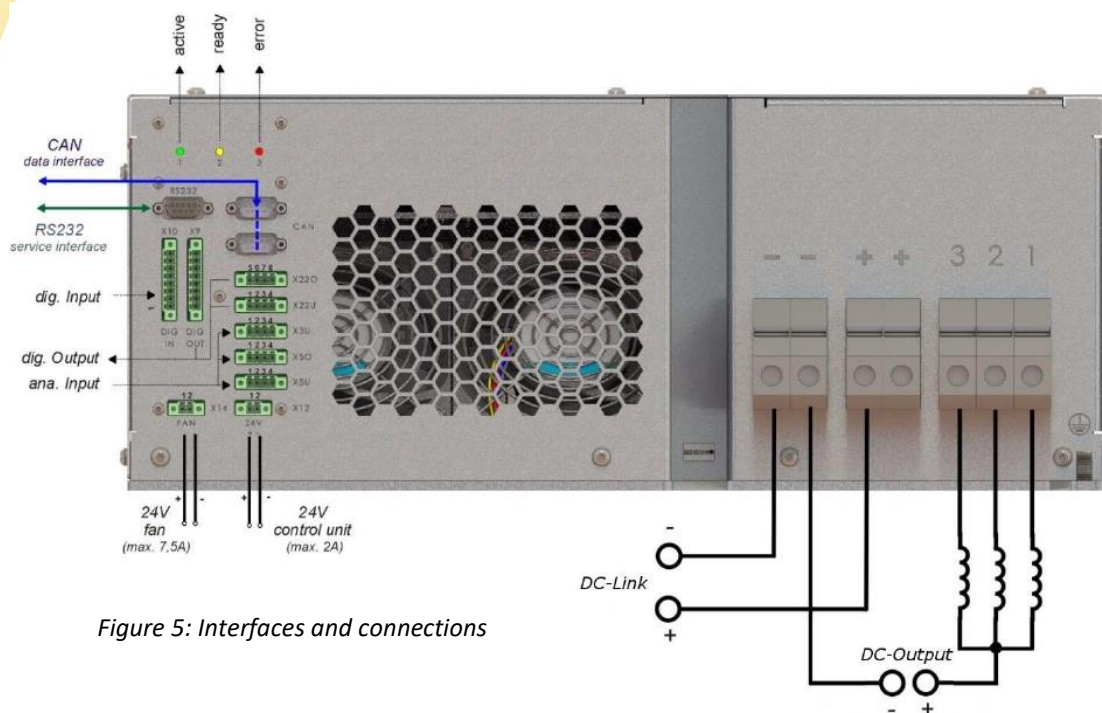


Figure 5: Interfaces and connections

Power terminal

Pin	Signal	Connection cross-section	Connector	Description
1	L1	16 ... 50 mm ²	Terminal with screwed connection	Fastening torque: 6-8 Nm
2	L2	16 ... 50 mm ²	Terminal with screwed connection	Fastening torque: 6-8 Nm
3	L3	16 ... 50 mm ²	Terminal with screwed connection	Fastening torque: 6-8 Nm
+	DC-link +	16 ... 50 mm ²	Terminal with screwed connection	Fastening torque: 6-8 Nm
+	DC-link +	16 ... 50 mm ²	Terminal with screwed connection	Fastening torque: 6-8 Nm
-	DC-link -	16 ... 50 mm ²	Terminal with screwed connection	Fastening torque: 6-8 Nm
-	DC-link -	16 ... 50 mm ²	Terminal with screwed connection	Fastening torque: 6-8 Nm

Auxiliary power

Connector	Pin	Signal	Description
X14, supply for fan control			
	1	FAN_24V	+24V control signal (I _{max} :7,5A)
	2	FAN_GND	Ground for control
X12, voltage supply			
	1	P24IN	+24 supply voltage (I _{max} :2A)
	2	M24IN	Ground for supply voltage

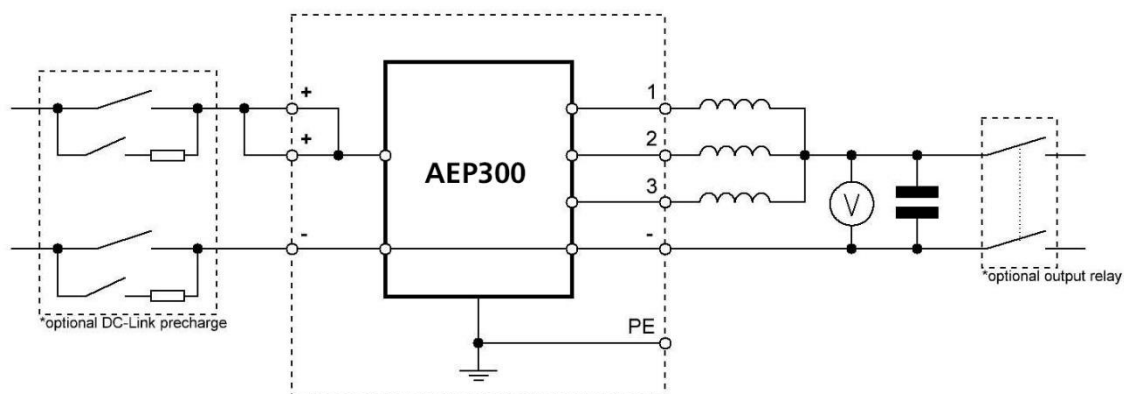


Figure 6: Typical example of use

Digital signals

Connector	Pin	Signal	Description
X10			Digital inputs
	1	SwitchOn	Request pre charge, closing circuit breaker (condition " ready") optional: controlled by CAN
	2	Enable	Request operation, active control (condition "operation") optional: controlled by CAN
	3	Reset	Request error reset (rising edge) optional: controlled by CAN
	4	FB_DC_SWITCH	Monitoring contact main switch DC-link
	5	Estop	IGBT pulse turn off, switches turn off
	6	FB_CAP_RELAY	Monitoring contact output relay
	7	IN_7	Reserve ¹
	8	GND_IO	Ground for digital inputs
X9			Digital outputs
	1	Error	Converter in error state
	2	Ready	Ready for operation
	3	Active	Converter is in operation
	4	Healthy	Reserve ¹
	5	OUT_5	Reserve ¹
	6	OUT_6	Reserve ¹
	7	OUT_7	Reserve ¹
	8	GND_IO	Ground for digital outputs

1: Usage for specific application possible on request



Connector	Pin	Signal	Description
X22u Digital outputs, Open collector			
	1	GND_IO	Ground for digital outputs
	2	PRECHARGE_DC	Start pre-charge, pre-charge relay on
	3	MAINSWITCH_DC	
	4	PRECHARGE_CAP	
X22o Digital outputs, Open collector			
	1	24V_IO	24V potential for digital outputs
	2	RELAY_CAP	Control pre-charge DC-link
	3	RELAY_IGBT_FAN	Control main switch DC-link
	4	PWM_IGBT_FAN	Control pre-charge output side

Analog inputs

Connector	Pin	Signal	Description
X3u Analog input ANA5			
	1	Vcc -15V	-15V supply sensor
	2	GND_ANA	Ground
	3	Signal ANA5	Output voltage
	4	Vcc +15V	+15V supply sensor
X5u Analog input ANA7			
	1	Vcc -15V	-
	2	GND_ANA	-
	3	Signal ANA7	-
	4	Vcc +15V	-
X5o Analog input ANA8			
	1	Vcc -15V	-
	2	GND_ANA	-
	3	Signal ANA8	-
	4	Vcc +15V	-



Communication

Connector	Pin	Signal	Description
X6U – RS232 (diagnostic connection for PC)			
	2	TXD	Transit signal
	3	RXD	Receive signal
	5	GND_RS232	Ground signal
		Shield	Grounding conductor
X6O_1, X6O_2 – CAN (both CAN-plugs are internally connected)			
	2	CAN_L1	CAN low signal
	3	GND_CAN	CAN ground
	7	CAN_H1	CAN high signal
		Shield	Grounding conductor

Accessories

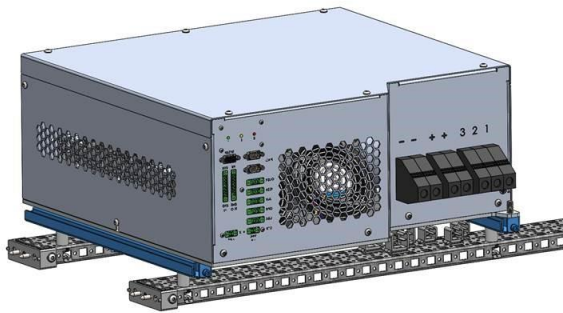


Figure 7: Mounting rails



Figure 8: Pre-charge



Figure 9: EMC filter



Figure 10: Voltage measurement

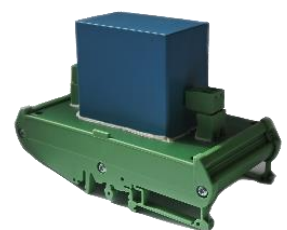


Figure 11: Output cap