



# AEP 300

## Bidirectional DC/DC converter

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

### Features

- Load-dependent PWM fan control
- Low output current ripple for DC/DC application
- Short-circuit-protected output
- Integrated current and temperature sensors
- CAN-Bus communication

### Applications

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



## Mechanical Data

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

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## Technical Characteristics

Example of use as DC/DC converter at 4 kHz

Symbol	Parameter	Description	Value	Unit
<b>General</b>				
$V_{in}$	DC-Link voltage		540 till 800	V
$f_{sw}$	Switching frequency	Up to 16 kHz possible	4	kHz
$V_{out}$	Output voltage	$V_{out} \leq V_{in} - 50$	0 till 750	V
$I_{max}$	Output current	Per phase	180	A <sub>rms</sub>
L	Inductance of the chokes	The chokes will be adopted for the particular application	3 x 550 3 x 180	$\mu$ H A
$I_{ripple}$	Ripple current peak-peak	The ripple current can be adjusted by adjusting the chokes	30	A
	Control modes	Voltage control Current control Power control		
	Connection cross-section		50	mm <sup>2</sup>
<b>Environment</b>				
	Operating temperature		0 till +40	°C
	Storage temperature		-20 till +60	°C
	Max. operational altitude	Without derating	2000	m above sea level
	Protection degree		IP20	
<b>Mechanical data</b>				
	Weight		22	kg
	Width		502	mm
	Height		203	mm
	Depth		477	mm
<b>Cooling</b>				
	Coolant	Forced air cooling		
	Airflow		600	m <sup>3</sup> /h



## Mechanical Data

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

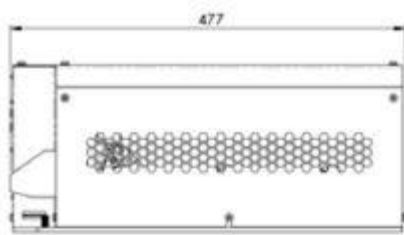


Figure 1: Side view

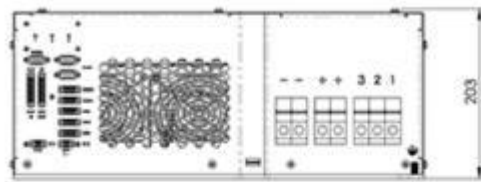


Figure 2: Front view

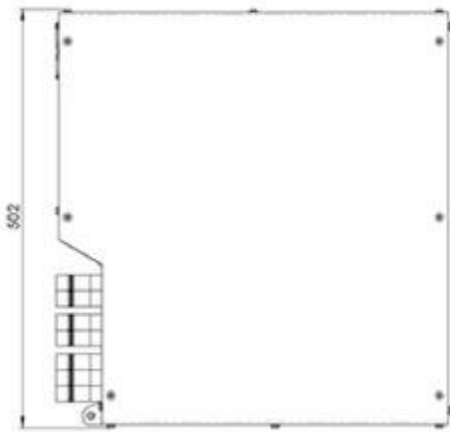


Figure 3: Top view

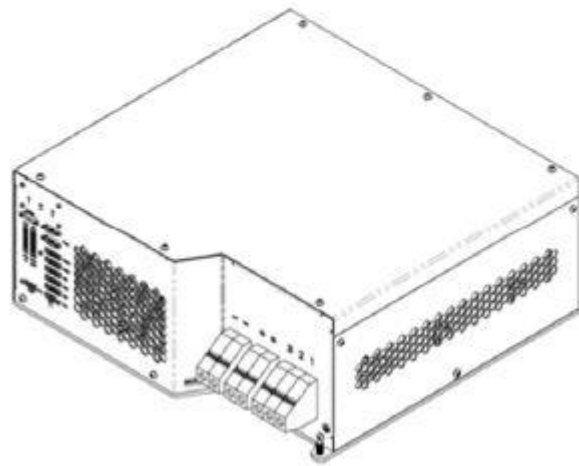


Figure 4: Perspective view

## Connections

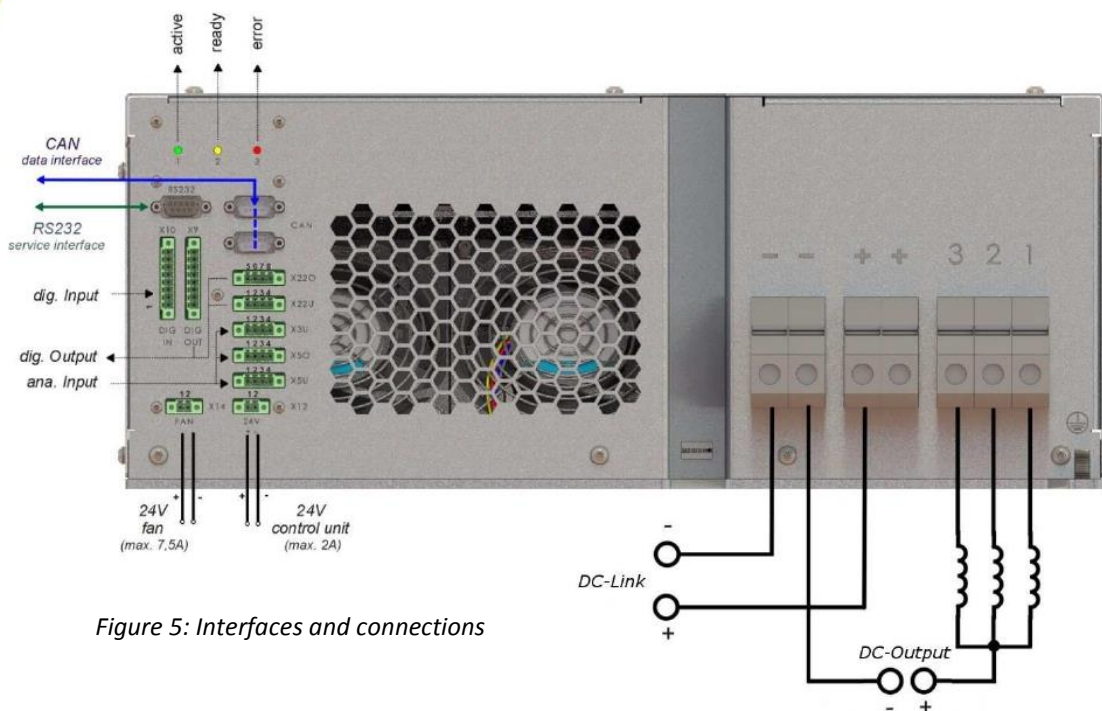


Figure 5: Interfaces and connections

### Power terminal

Pin	Signal	Connection cross-section	Connector	Description
1	L1	16 ... 50 mm <sup>2</sup>	Terminal with screwed connection	Fastening torque: 6-8 Nm
2	L2	16 ... 50 mm <sup>2</sup>	Terminal with screwed connection	Fastening torque: 6-8 Nm
3	L3	16 ... 50 mm <sup>2</sup>	Terminal with screwed connection	Fastening torque: 6-8 Nm
+	DC-link +	16 ... 50 mm <sup>2</sup>	Terminal with screwed connection	Fastening torque: 6-8 Nm
+	DC-link +	16 ... 50 mm <sup>2</sup>	Terminal with screwed connection	Fastening torque: 6-8 Nm
-	DC-link -	16 ... 50 mm <sup>2</sup>	Terminal with screwed connection	Fastening torque: 6-8 Nm
-	DC-link -	16 ... 50 mm <sup>2</sup>	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 <sub>max</sub> :7,5A)
	2	FAN_GND	Ground for control
X12, voltage supply			
	1	P24IN	+24 supply voltage (I <sub>max</sub> :2A)
	2	M24IN	Ground for supply voltage

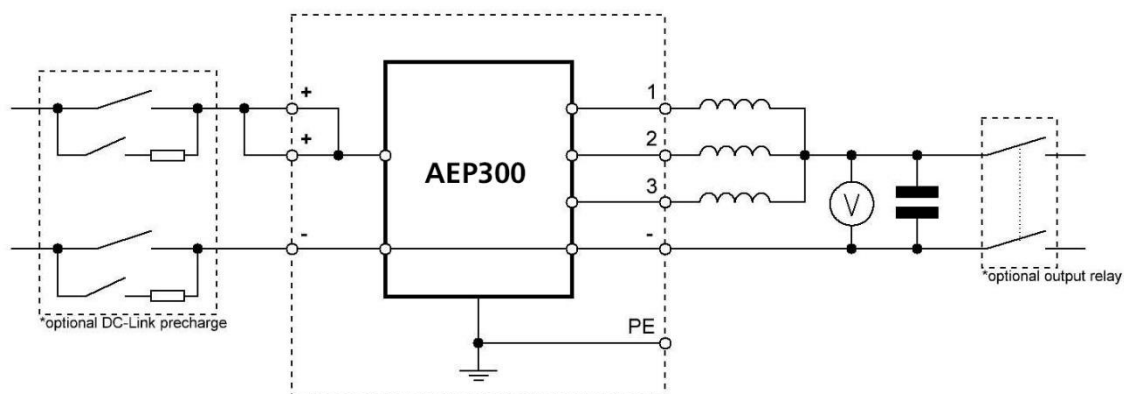


Figure 6: Typical example of use

## 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 <sup>1</sup>
	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 <sup>1</sup>
	5	OUT_5	Reserve <sup>1</sup>
	6	OUT_6	Reserve <sup>1</sup>
	7	OUT_7	Reserve <sup>1</sup>
	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

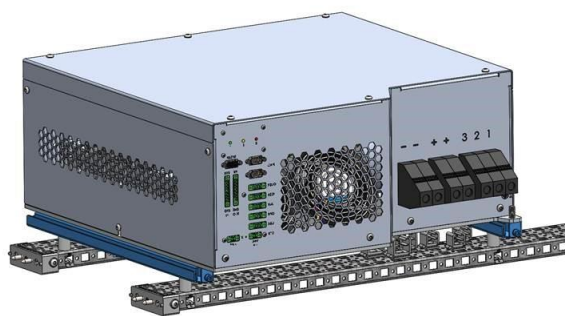


Figure 7: Mounting rails



Figure 8: Pre-charge



Figure 9: EMC filter



Figure 10: Voltage measurement

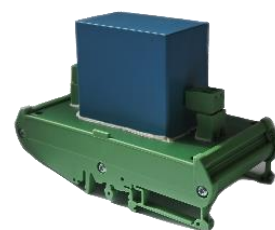


Figure 11: Output cap