Hybrid Power

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AEP 10 120A Version

Bidirectional DC/DC converter

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

Features

- 12 kW converter, U_n 100V
- Current 120A
- Low ripple current
- Very low noise emission
- Bidirectional fully controlled H-bridge
- 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:

- Generation of constant supply voltage for off-grid systems from variable input sources
- Charging and discharging of energy storage systems

Typical application field are:

- Fuel cell based energy storages
- Off-grid systems
- Renewable energy systems

Mechanical Data

Length x Width x Height
412 x 230 x 200 mm
Approx. 10 kg

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Technical Characteristics

Symbol	Parameter	Description	Value	Unit
	General			
P_R	Rated power	@U_{pr}	12	kW
F_r	Switching frequency		24	kHz
η_r	Efficiency	@P_r	>95	%
	Primary side			
U_{pr}	Rated voltage		120	V DC
$U_{in, max}$	Maximum voltage		150	V DC
I_{pr}	Maximum current		120	A
	Secondary side			
U_{out}	Rated voltage		50	V DC
$U_{p,max}$	Maximum voltage		150	V DC
I_{max}	Maximum current		120	A
	Power input			
	Control voltage	Nominal value Range	24 20 till 80	V DC
	Control current		<1	A
	Environment			
T_o	Operating temperature		-40 till 70	°C
$T_{storage}$	Storage temperature		-40 till 85	°C
	Protection degree		IP20	
	Interfaces			
	Communication	CAN / RS232 electrically isolated		
	Control signals	ON/OFF; Reset; Enable (Emergency stop)		
	4 binary inputs	Electrically isolated High Low	 17 till 30 0 till 2	 V V
	4 binary outputs	Electrically isolated transistor switch I_{output} High Low	 50 16 till 29 0 till 2	 mA V V
	External measurement for current temperature	Voltage supply Signal current transformer I_{meas} temperature sensor (PT100)	± 15 ± 4 2,5	V V mA
	Additionally	JTAG (internally)		
	Cooling			
T_{amb}	Ambient temperature	Passive air cooling PWM controlled internal fan	<40 >40	°C °C

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Technical Features

The variety of input and output capabilities as well as configurable operation modes account for a multifunctional DC/DC converter which is suitable for a wide range of applications. Self-protection is covered through short circuit detection and overcurrent or overload shutdown.

AEP10 series converters are the right solution for integrated systems which combines charging and discharging of different types of energy storages with monitoring and control functionality. The available user interface PowerPanel assists in the adaption to customer needs and allows a detailed view of the device state.

Connections

X1: CAN – Interface

X2: RS232 – Interface

X3: Digital Inputs

Pin	Signal	Max. cable cross-section	Comment
1	B_{in} 1*	1,5 mm²	Device Enable (can also be used as an Emergency Stop)
2	B_{in} 2*	1,5 mm²	Reserve
3	B_{in} 3*	1,5 mm²	Feedback from optimal Precharge module
4	B_{in} 4*	1,5 mm²	CAN-ID: 2 set (Default: 1)
5	GND_{IO}	1,5 mm²	Ground extern

* Caution! Maximum input voltage 28V!

X4: Digital Outputs

Pin	Signal	Max. cable cross-section	Comment
1	$+24V_{IO}$	1,5 mm²	Supply voltage for binary outputs
2	B_{out} 1**	1,5 mm²	Device Status
3	B_{out} 2**	1,5 mm²	Error
4	B_{out} 3**	1,5 mm²	Activate Precharge from optimal Precharge module
5	B_{out} 4**	1,5 mm²	Activate Main contactor from optimal Precharge module
6	GND_{IO}	1,5 mm²	Ground external

** Caution! Maximum input current 15mA!

X5:

Pin	Signal	Max. cable cross-section	Comment
1	-15V	1,5 mm²	Negative supply voltage
2	GND	1,5 mm²	Signal-GND
3	A_{in} 2	1,5 mm²	Signal from current transformer
4	+ 15V	1,5 mm²	Positive supply voltage

X6:

Pin	Signal	Max. cable cross-section	Comment
1	- I_{meas}	1,5 mm^2	- measurement current
2	GND	1,5 mm^2	- PT100
3	A_{in} 1	1,5 mm^2	+PT100
4	+ I_{meas}	1,5 mm^2	+ measurement current

X7:

Pin	Signal	Max. cable cross-section	Comment
1	$+U_B$	1,5 mm^2	24V supply
2	GND	1,5 mm^2	Ground for +24V supply

X8:

Pin	Signal	Max. cable cross-section	Comment
	DC out	16 - 35 mm^2	Output voltage

X9:

Pin	Signal	Max. cable cross-section	Comment
	DC in	16 - 35 mm^2	Input voltage

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Design Features

- Rugged
- Efficient cooling

Options

- Current control on primary or secondary side
- Additional available pre-charge unit
- Flexible configuration of control software e.g. current control or voltage control

Mechanical Data

Length x Width x Height:	412 x 230 x 200 mm
Weight:	10 kg