BEAR INSTRUMENTS

BILabEVSE-60-800

Bi-Directional Isolated Laboratory EVSE – 60 kW – 800 V

Bear Instruments have developed a bi-directional laboratory EVSE for use in validation of electric powertrain components and for use in battery testing.

Using our modular power electronics, configurable systems up to 320 kW are available. Full data from power electronics modules and from charge control ECU is available via a standard CAN 2.0 interface.



Electrical Specifications – Charging

	Property	Value	Unit	Notes
AC Side	Grid Voltage	304 – 485	V_{RMS}	Line - Line
	Grid Frequency	50 or 60	Hz	Binary, +/- 5%
	Input Current	0 - 114	A_{RMS}	
	Power Factor	>= 0.99		Fully Loaded
DC Side	Output Voltage	150 - 800	V	
	Output Current	120	A	
	Rated Output Power	60	kW	
	Efficiency	95	%	
	Voltage Accuracy	+/- 0.5	%	
	Current Accuracy	+/- 1	%	
	Voltage Ripple	<1%		of the Output Voltage

Electrical Specifications – Discharging (Grid Tied Inverter)

	Property	Value	Unit	Notes
AC Side	Grid Voltage	304 – 485	V_{RMS}	Line - Line
	Grid Frequency	50 or 60	Hz	Binary, +/- 5%
	Output Current	0 - 114	A_{RMS}	
	Power Factor	>= 0.99		Fully Loaded
DC Side	Input Voltage	150 - 800	V	
	Input Current	120	A	
	Rated Input Power	60	kW	
	Efficiency	95	%	
	Voltage Accuracy	+/- 0.5	%	
	Current Accuracy	+/- 1	%	

Electrical Specifications – Discharging (Off Grid)

	Property	Value	Unit	Notes
AC Side	Load Voltage	210 / 220 / 230 or 240	V_{RMS}	Phase - Star
	Load Frequency	50 or 60	Hz	Binary, +/- 5%
	Output Current	0 - 114	A_{RMS}	
	Power Factor	Load Dependent		
DC Side	Input Voltage	150 - 800	V	
	Input Current	120	A	
	Rated Input Power	60	kW	
	Efficiency	95	%	
	Voltage Accuracy	+/- 0.5	%	
	Current Accuracy	+/- 1	%	
	Voltage Ripple	<1%		of the Output Voltage

Communications & Connectivity Specifications

	Property	Value	Unit	Notes
Test System	Protocol	CAN 2.0B		ISO 11898
	Baud Rate	**1**	**Mbit/s**	
	Connector	9 Pin D-Sub Socket		
	Termination	120	Ω	Internally terminated
	Location	Rear Panel		
AC Side	Connector	3 ph + N + E, 125A “Ceeform”		IEC 60309
	Location	Rear Panel		Removable
Vehicle Side	Protocol	ISO 15118		CP + PP + HVDC PLC Communications
	Connector	CCS2, GB/T, Chaoji		Specify when ordering
	Location	Rear Panel		Cable gland through bulkhead
	Lead Length	5	m	
	Gun Temperature Sensors	3 x		K-Type or PT 1000

Mechanical Specifications

Property	Value	Unit	Notes
Dimensions	610 D x 600 W x 460 H mm	mm	
Mass	67	kg	
Cooling	Forced Air		Automatically controlled based on electrical load
Ingress Protection	IP 20		
Audible noise	<60	dBA @ 1 m	
Storage Temperature	-40 - 75	°C	
Operating Temperature	-30 - 65	°C	Power de-rated >55 °C

Electrical Protection

Property	Value	Unit	Notes
DC Side HW overcurrent	610 D x 600 W x 460 H	mm	
Mass	67	kg	
Cooling	Forced Air		Automatically controlled based on electrical load
Ingress Protection	IP 20		
Audible noise	<60	dBA @ 1 m	
Storage Temperature	-40 - 75	°C	
Operating Temperature	-30 - 65	°C	Power de-rated >55 °C

Standards

Property	Name	Standard
EMC	EMC Directive	EU Directive 2014/30/EU
Product Safety	Low Voltage Directive	EU Directive 2014/35/EU
Charging Standards (including EMC)		EN 62368-1
		IEC 61851-1
		IEC 61851-23
		IEC 61851-24
		IEC 61851-21-2
		IEC 62196-1
		IEC 62196-3
		IEC 62195-4
		GB/T 20234.x
		GB/T 27930
		ISO 15118-1
		ISO 15118-2
		ISO 15118-3
		ISO 15118-20
Power Electronics Safety and Performance		IEC 62477-1
		IEC 62477-2
Grid Connection		EN 50549-1
		EN 50549-2
CAN Communications		ISO 11898-1
		ISO 11898-2

Electrical Derating Curves

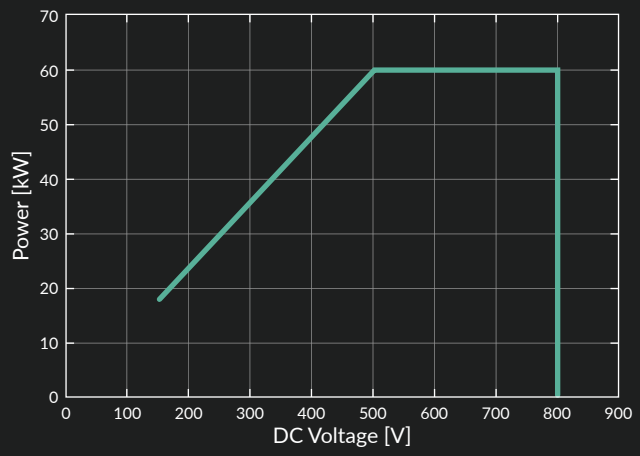


Figure 1: Available output power as a function of DC side voltage

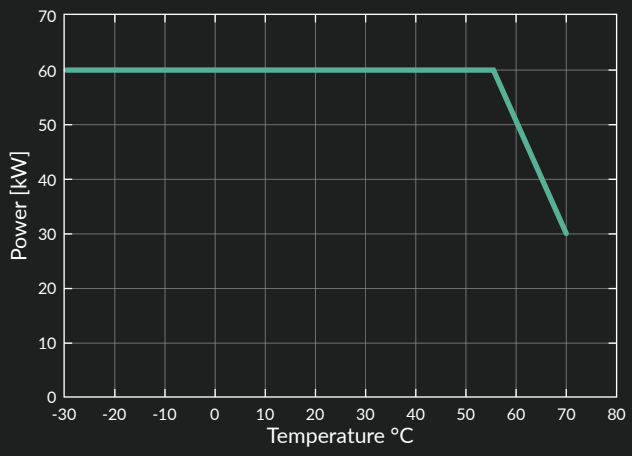


Figure 2: Available output power as a function of ambient temperature.

Front Panel Indicators

Indicator	Colour	State	Interpretation
Normal	Green	Continuously Illuminated	Unit is operating (i.e. Power is flowing)
		Un-illuminated	Alarm or Fault raised see other indicators or interrogate fault codes using CAN or view faults using the supplied software
		Flashing 1 second period	Standby (grid detected or AC side load detected, no power flowing)
Alarm	Yellow	Un-illuminated	No Alarm
		Continuously Illuminated	Alarm raised. Interrogate alarms using CAN or view alarms using the supplied software
Fault	Red	Un-illuminated	No Faults
		Continuously Illuminated	Fault raised. Interrogate faults using CAN or view faults using the supplied software

Software + CAN DBC

Software is available as MATLAB® App both the source files and executable using the MATLAB environment are available.

DBC file and documentation is available to allow users to develop their own software using their preferred software ecosystem (e.g. Vector tools)

Warning Labels

Ensure the protective earth on the AC side is reliably connected to the building earth potential.



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