EA-EL 9000 T 400 W - 600 W

Programmable Electronic DC loads

EA-EL 9080-45 T

U I P R OVP OCP OPP OTP USB

Option: LAN

- **Wide AC supply voltage range: 90...264 V, with active PFC**
- **Input power ratings: 0...400 W, 0...500 W, 0...600 W**
- **Input voltages: 0...80 V, 0...200 V, 0...500 V**
- **Input currents: 0...8 A, 0...18 A, 0...45 A**
- **Multilingual color touch panel**
- **True function generator**
- **Adjustable protections: OVP, OCP, OPP**
- **Operation modes: CV, CC, CP, CR**
- **USB port as standard**
- **Ethernet & analog interface optional**
- **SCPI command set and ModBus RTU support**
- **LabView VIs and control software for Windows**

General

The new series of compact electronic DC loads, called EA-EL 9000 T, offers three tower models for the daily application in research laboratories and also schools or similar educational facilities. The low power ratings allow for a multitude of test applications while being cost effective and space saving.
All models support the four regulation modes constant voltage (CV), constant current (CC), constant power (CP) and constant resistance (CR). The core of the control circuit is a fast microprocessor which provides interesting features, such as a true function generator with common functions like sine wave, rectangle or triangle, but also an arbitrary function.
The color TFT touch panel offers an intuitive kind of manual operation, like it is prolific with smart phones or tablet computers.
Response times during remote control of the devices via analog or digital interface have been improved by an ARM processor controlled hardware, compared to older electronic load series.
An USB port is standard with this series, Ethernet and analog interfaces can be optionally retrofitted by the user. All interfaces are galvanically isolated.

Power ratings, voltages, currents

Available are models with inputs voltages of 0...80 V, 0...200 V or 0...500 V and input currents of 0...8 A, 0...18 A or 0...45 A. The series offers three power classes with 400 W, 500 W or 600 W steady power.

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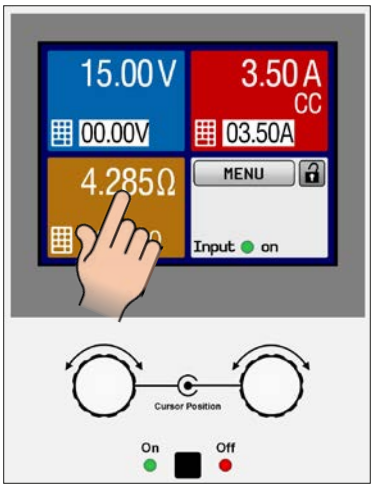
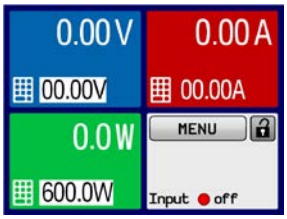
Display and handling

Set values and actual values of input voltage, current and power are clearly represented on the graphic display. The color TFT screen is touch sensitive and can be intuitively used to control all functions of the device with just a finger tip.
Set values of voltage, current, power or resistance can be adjusted using the rotary knobs or entered directly via a numeric pad. To prevent unintentional operations, all operation controls can be locked.



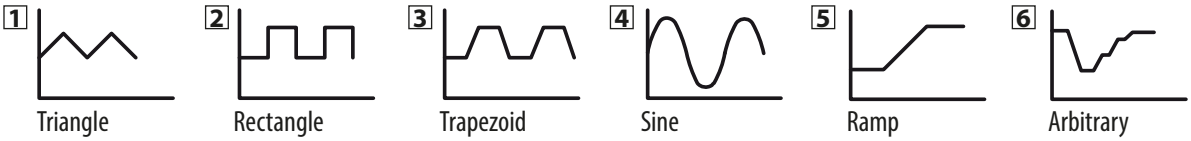
Multi-language control panel



- English
- Russian
- Chinese
- German

Function generator

All models of this series include a function generator which can generate typical functions, as displayed in the figures below, and apply them to either the input voltage or the input current. The generator can be completely configured and controlled by using the touch panel on the front of the device, or by remote control via one of the digital interfaces.
The predefined functions offer all necessary parameters to the user, such as Y offset, time / frequency or amplitude, for full configuration ability. Additionally to the standard functions, which are all based upon a so-called arbitrary generator, this base generator is accessible for the creation and execution of complex sets of functions, separated into up to 99 sequences. These can be used for testing purposes in development and production. The sequences can be loaded from and saved to a standard USB stick via the USB port on the front panel, making it easy to change between different test sequences.



Battery test & MPP tracking

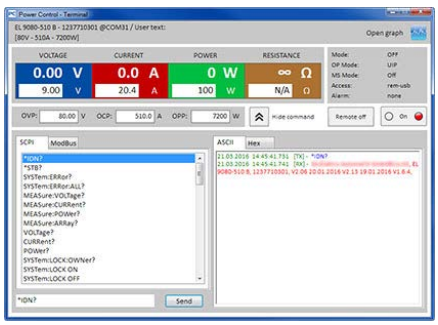
For purposes of testing all kinds of batteries, such as for example constant current or constant resistance discharging, the devices offer a battery test mode. It counts values for elapsed testing time and consumed capacity (Ah) and energy (Wh).
Data recorded by the PC during tests with EA Power Control can be exported as Excel table in CSV format and analyzed later in MS Excel or similar tools and even visualized as a discharge diagram. For more detailed setup, there is also an adjustable threshold to stop the battery test on low battery voltage, as well an adjustable maximum test period.
For photovoltaics related tests there is another function included as standard: MPP tracking. Four modes allow for simulation of the typical characteristics of solar inverters being connected to solar modules or panels. The function is used to determine typical operation parameters, such as the so-called Maximum Power Point and the related values U_{MPP}, I_{MPP} and P_{MPP}. One of the modes even offers particular analysis with different irradiation values in form of a table with 100 points.

Power derating

The devices of the EA-EL 9000 T series are equipped with thermal derating in order to avoid overheating when operating in the maximum power range. The lower the ambient temperature and the better the cooling, the higher the power that the load can take. The nominal intake power before the derating starts is defined at 25°C ambient temperature.

Remote control & connectivity

For remote control, there is by default an USB interface port available on the rear of the devices. As an option, a 3-way system can installed by the user simply by plugging an electronic board, which hold an USB, an Ethernet and an analog interface. Another USB port, located on the front side, is intended for USB sticks in order to load and save functions and user profiles.
Windows users can profit from the free software “EA Power Control”. It offers a feature called “Sequencing”, where the device is controlled through a semi-automatic table in CSV format. This table represents a simple test procedure and can be created and edited in MS Excel or other CSV editors and then imported into the software tool.
This software also allows for the control of up to 20 units at once with an optional feature called “Multi Control” (licensed, not free of charge). See page 118 for more information.



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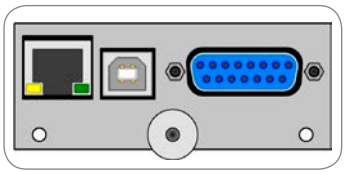
Optional analog interface

A galvanically isolated analog interface can be installed optionally and subsequently, located on the rear of the device. It offers analog inputs to set voltage, current, power and resistance from 0...100% through control voltages of 0 V...10 V or 0 V...5 V. To monitor the DC input voltage and current there are analog outputs with 0 V...10 V or 0 V...5 V. Also, several inputs and outputs are available for controlling and monitoring the device status.

Options

- Retrofittable interface module with USB, Ethernet and analog port



Technical Data	Serie / Series EA-EL 9000 T	
AC: Supply		
- Voltage	90...264 V	
- Frequency	45...66 Hz	
- Power consumption	max. 40 W	
DC input: Voltage		
- Accuracy	<0.1% of rated value	
DC input: Current		
- Accuracy	<0.2% of rated value	
- Load regulation 1-100% ΔU_{DC}	<0.1% of rated value	
- Rise time 10-90%	<50 µs	
DC input: Power		
- Accuracy	<0.5% of rated value	
DC input: Resistance		
- Accuracy	≤1% of max. resistance + 0.3% of rated current	
Display / control panel	Graphics display with TFT touch panel	
Digital interfaces		
- Equipped as standard	1x USB type B (for communication) / 1x USB type A (for storage device)	
- Optionally available	1x Ethernet (not separate, always in combination with USB and analog interface)	
Analog interface (optional)	15 pole D-Sub, galvanically isolated	
- Signal range	0...5 V or 0...10 V (switchable)	
- Inputs	U, I, P, R, remote control on-off, DC input on-off, resistance mode on-off	
- Output	U, I, overvoltage, alarms, reference voltage	
- Accuracy U / I / P / R	0...10 V: <0.2%	0...5 V: <0.4%
Cooling	Temperature-controlled fan	
Ambient temperature	0...50 °C	
Storage temperature	-20...70 °C	
Terminals on front		
- Load input	Plug & screw terminal	
- Remote sensing	Clamp terminal	
- Digital interface	USB (type A)	
Terminals on rear		
- Analog interface	Optional: Sub-D connector 15 pole	
- Digital interfaces	Built-in: USB (type B), optional: Ethernet	
Mechanics		
- Dimensions (W x H x D) (1	92 x 239 x 352 mm (3.6" x 9.4" x 13.8")	
- Weight	≈ 7 kg (15.4 lb)	

(1 Body only

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Model	Power	Power @ 40°C	Voltage	Current	Resistance	U_{Min} for I_{Max} (1	Ordering number
EL 9080-45 T	0...600 W	0...550 W	0...80 V	0...45 A	0.12...40 Ω	≈ 2.2 V	33210511
EL 9200-18 T	0...500 W	0...500 W	0...200 V	0...18 A	1...340 Ω	≈ 2 V	33210512
EL 9500-08T	0...400 W	0...400 W	0...500 V	0...8 A	6...2000 Ω	≈ 6.5 V	33210513

(1 Minimum DC input voltage to supply for the load to achieve the max. input current

Product views