

Press release electronic loads with energy recovery

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## **Think green for the sake of the environment**

Testing of power supplies, energy storage or electronic components for function, performance and parameters is generally done using electronic loads. During testing voltage, current, resistance and output can be set and controlled. In this way a reproducible process is enabled and guaranteed.

The commonly used electronic loads generate and control the required current via semi-conductors. The power is partially converted to heat in the semi-conductors, which then need a complex cooling process. Similarly the surrounding room often requires an elaborate air conditioning. This leads to a running cost for energy, maintenance and space in addition to the capital costs for the loads and the air conditioning.

The electronic loads in the series ELR 9000 from EA Elektro-Automatik lead to cost reduction. Up to 95% of the power required for testing is converted by an inverter with PFC to sine wave and redirected back to the grid and thus little heat is generated. The expensive conditioning units are no longer required and high energy costs are eliminated. Environmental balance is improved, costs reduced

This can be shown in a typical application. For a burn-in test, a -48V DC power supply of a telecom transmitter system is to be tested. The 3kW supply unit with a 56 V output voltage is tested for 2 hours at 53,5A. In an 8 hour day total usage is 24 kWh. Using the load with power feed back at least 90% of this power will be redirected.

Test costs with conventional load	24 kWh x 0,25 € = 6,00 € / Tag = 1.320,00 € / Year
Test costs with power feedback load (2,4 kW resulting from a 90% feedback)	2,4 kWh x 0,25 € = 0,60 € / Tag = 132,00 € / Year -----

Annual saving 1.320,00 € - 132,00 € = 1.188,00 €

This high saving rate generates a fast pay back for a power feedback load compared to a conventional load, without the potential savings for air conditioning. This calculation is even valid for the replacement of a conventional load with a power feedback. And the environment is grateful.

## **Flexible input, extensive functionality and fittings**

The feedback loads in the ELR 9000 series have a modular concept which can satisfy a wide spectrum of usage. The product line covers the voltage range up to 1500VDC, current range up to 510A and power rating of 3.5kW, 7kW and 10.5kW. The galvanically insulated input of the load starts operating right as from 0 V, increases linearly and can take the full current from approx. 1 percent of the nominal voltage. With the performance hyperbole higher currents and voltages can be flexibly handled. Thus the user can apply different current and voltages for different applications.

For a higher power requirement up to 16 units can be connected in parallel using the master-slave bus. The master unit can control and monitor the complete installation via the HMI, an analog or digital interface.

The performance of the loads allows not only static but also dynamic load profiles. For special applications, such as testing of photovoltaic modules, a FPGA controlled unit is available. This unit is not only highly accurate but also has a high dynamic. Here the load offers the possibility to run a dynamic curve progression, produced in the function generator, calculated in an integrated program or simply loaded as a table via a USB stick.

## **New operating concept**

The calculation program and function generator are intuitively operated in a new HMI with a large graphic display. This uses new menu navigation with a touch screen. This concept allows the user to make adjustments quickly and easily. With few touches the parameters may be selected and the values entered via encoder or numerically. Displayed are the actual values for voltage, current and power. At the same time the user has an overview of the target settings, current control mode, alarms and warnings, and the output status. If the equipment is in remote operation the display will show the interface being used.

Menu language selection - in the basic version German, English and Chinese – simplifies operation by international users. On request other languages can be supplied.

In the function generator curves such as sine, triangle, rectangle or automobile starter curves (DIN 40839) are provided. With the input of the required parameters the user can quickly and straightforwardly achieve the desired result. Pulse operation with adjustable phases is suitable both for testing components or other electrical equipment and for simulation of a vehicle electrical system. In arbitrary mode up to 100 sequences may be programmed in order to produce a customized signal form. Furthermore it is possible to load and store 4096 voltage and current values in freely programmable tables. The signals can be programmed for any control cycle, i.e. for voltage, current and power. Further parameters are configurable. This includes limits for voltage, current and power. Out of limit levels can generate alarms, warnings or messages.

## Communication is paramount

Standard configuration of the communication unit, which serves as the control centre between load module, user interface and externals, contains a USB connection, an analog interface and master-slave port. Thus the equipment may be operated and monitored remotely both digitally and analog without additional options. In order to connect to other digital networks a hot-plug compatible slot is available with interface options such as RS232, Ethernet, Profibus, Profinet, Devicenet or CANbus.

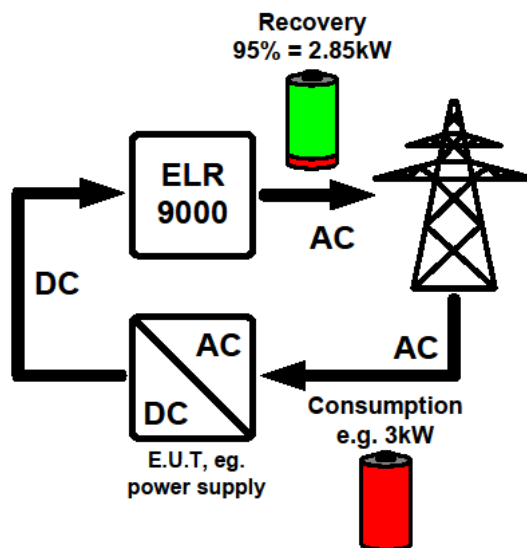
The loads are contained in a 3HE high and 600mm deep 19" housing.

On the front side are the mains switch, HMI and ventilation openings. Airflow with temperature controlled ventilators is from front to back. On the back side are connectors for network, power input and digital and analog interfaces, as well as RJ45 sockets for the master-slave bus. These can be connected with standard network patch cables.

Adoption of ELR 9000 loads allows developers and producers of power supplies to improve their environmental balance and with that to reduce costs. Whether for laboratory equipment or industrial power supply, DC/DC converters or chargers, almost all power supplies can be tested with these loads. Also energy storage with various battery technologies or fuel cells can use these new loads to advantage.

With an input voltage range of 0 up to 1500 V the loads are also suitable for testing hybrid vehicles using Li battery packs of hundreds of volts.

## Feedback principle Energy Recovery





EA-ELR 9080-510 19" 3U, 0-80V, 0-510A, 0-10,5kW