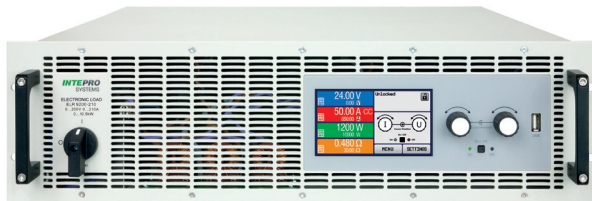


# ELR 9000 Series

3.5 kW to 10.5 kW

CE



Electronic DC  
Loads with Energy  
Recovery

**INTEPRO**  
SYSTEMS

THE POWER TEST EXPERTS

# ELR 9000 Series

3.5 kW to 10.5 kW



## Product Overview



ELR9000



The ELR 9000 Series is a DC Regenerative Load designed to provide high performance in an efficient, compact chassis. Utilizing an optimized mix of the latest digital and analog technologies, a modular architecture and robust standard features enables us to deliver a product that helps increase profitability.

The ELR 9000 offers industry-leading power density. 3.5-10.5kW of DC loading can be achieved via a single 3U chassis.

The ELR Series saves you money in 2 different ways when compared to a conventional DC Load. Instead of dissipating energy as heat into your environment, the ELR synchronizes with and regenerates the energy back to your local mains. As a byproduct of this key feature, minimal internal cooling is required and fan (acoustic) noise is thereby reduced. This helps the creative process and improves the ability to communicate inside the lab or other closed environments.

Four regulation modes (CV, CC, CP, CR), Touchscreen/Gorilla Glass/Front Panel Display, standard waveforms and an arbitrary function generator highlight the standard features offered in this aforementioned robust design based on FPGA circuit control. A table based regulation circuit is used for simulation of non-linear resistance.

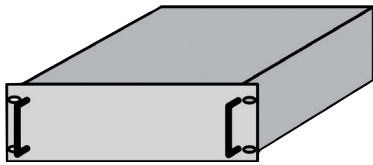
## Applications

The ELR 9000 offers features that make testing both easy and efficient. The built-in Battery Test function is ideal for charge-discharge testing. Energy recovery comes in handy for burn-in or EOL/Production Testing.

Our products and systems are designed by engineers, for engineers. We take pride in making your tests quicker, cheaper and easier without having to sacrifice performance.

## Featured Benefits

- Energy recovery of the supplied DC energy into the local or public grid
- Galvanically isolated DC input
- Input power ratings up to 10.5 kW per chassis
- Expandable to 240kW
- Input voltages up to 1500 V
- Input currents up to 510 A per chassis
- FPGA/DSP based digital control
- Multilingual TFT touch panel
- User profiles, true function generator
- Analog interface and USB interface built-in
- Master-slave bus for parallel connection
- Extra USB port on the front for USB stick
- Optional, digital, plug & play interfaces or alternatively installed IEEE/GPIB port
- SCPI command language supported
- Optional automatic isolation unit



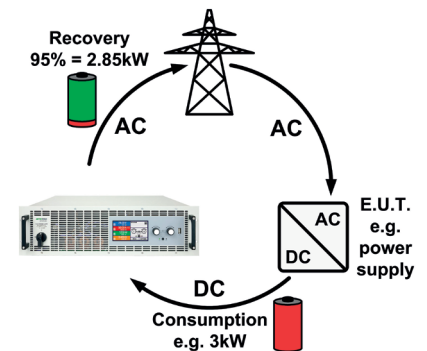
Enclosure

## Construction

All models are built in 19" wide rack enclosures with 3U height and 24" depth, which makes them ideal for use in 19" cabinets of various sizes.

## Energy Recovery

The most important feature of the ELR series is that the AC input, i.e. grid connection, is also used as the output for the recovery of supplied DC energy with approximately 95% efficiency. Recovering the loaded energy reduces energy costs and avoids expensive cooling systems that are commonly required for conventional air-cooled and water-cooled loads that dissipate energy in the form of heat.

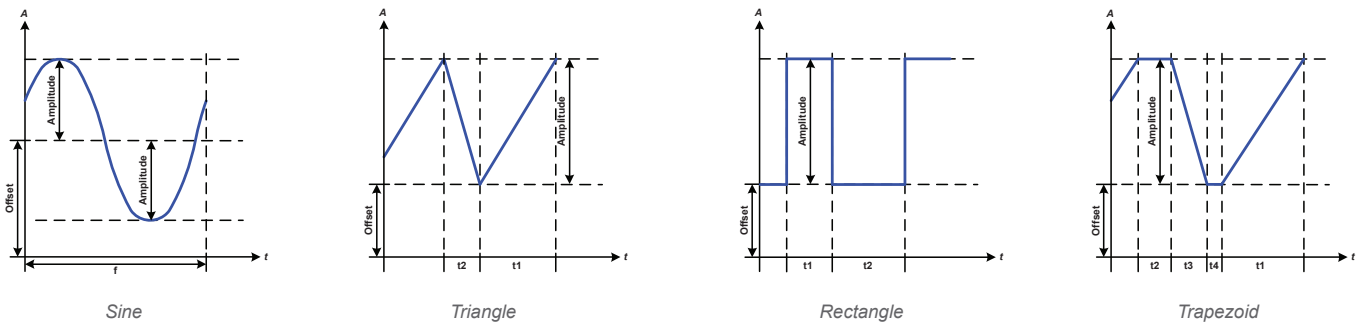


# Integrated Function Generator

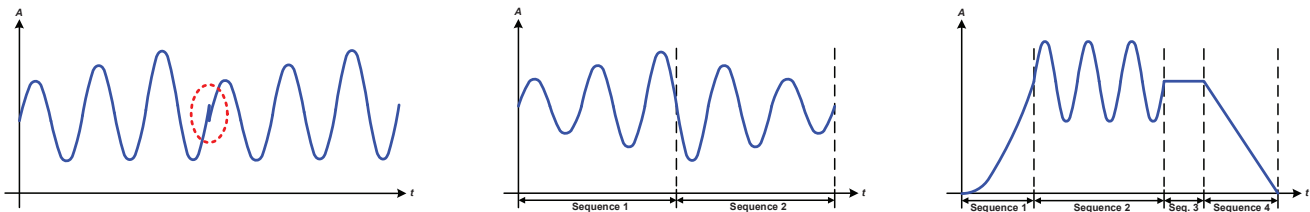
An integrated function generator is able to create various non-linear load conditions based on 4096 data points and apply these to the set value of voltage or current.

Available functions:

Function	Short Description
Sine	Sine wave generation with adjustable amplitude, offset and frequency
Triangle	Triangular wave signal generation with adjustable amplitude, offset, gain and decay times
Rectangular	Rectangular wave signal generation with adjustable amplitude, offset and duty cycle
Trapezoid	Trapezoidal wave signal generation with adjustable amplitude, offset, rise time, pulse time, fall time, idle time
DIN 40839	Simulated automobile engine start curve according to DIN 40839 / EN ISO 7637, split into 5 curve sequences, each with a start voltage, final voltage and time
Arbitrary	Generation of a process with up to 100 freely configurable steps, each with a start and end value (AC/DC), start and end frequency, phase angle and total duration
Ramp	Generation of a linear rise or fall ramp with start and end values and time before and after the ramp
UI-IU	Table (.csv) with values for U or I, uploaded from a USB flash drive

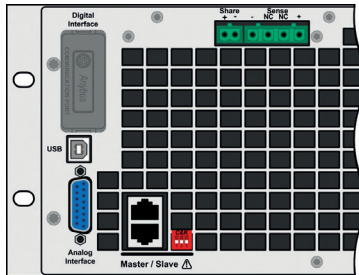
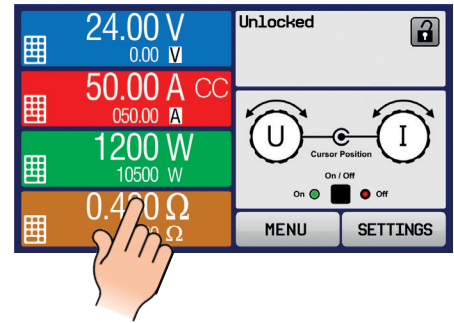


By linking together a number of differently configured sequences, complex progressions can be created. Smart configuration of the arbitrary generator can be used to match triangular, sine, rectangular or trapezoidal wave functions and thus, e.g. a sequence of rectangular waves with differing amplitudes or duty cycles could be produced.

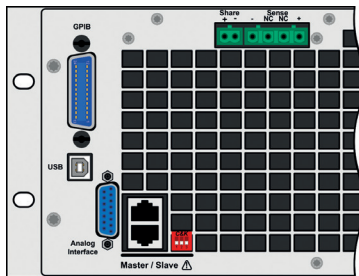


## Operation (HMI)

Manual operation is done with a resistive touchpanel, two rotary knobs and a pushbutton. The large blue display shows all relevant set values and actual values at a glance. The whole setup is also done with the human-machine interface, as well as the configuration of functions (square, triangle, sine) etc.



Rear connectors of the standard models



Rear connectors of models with option 3W

## Remote Control & Connectivity

For remote control, there are by default two interface ports (1x analog, 1x USB) available on the rear of the devices, which can also be extended by optional, pluggable and retrofittable, digital interface modules (dedicated slot).

Alternatively, all models can be equipped with a three-way interface (option 3W, see below), which then offers 1x GPIB/IEEE, 1x USB and 1x Analog on the rear side of the device.

Another USB port, located on the front side, is intended for USB flash drives in order to load and save functions and user profiles.

For the implementation into the LabView IDE we offer ready-to-use components (VIs) to be used with the interfaces types USB, RS232, GPIB and Ethernet. Other IDEs and interfaces may be supported upon request.

## Options

Digital, Pluggable and Retrofittable Interface Options	
IF-AB-RS232	RS232
IF-AB-PBUS	Profibus DPV1
IF-AB-CANO	CANopen
IF-AB-DNET	DeviceNet
IF-AB-MBUS1P	Modbus-TCP 1 Port
IF-AB-MBUS2P	Modbus-TCP 2 Port
IF-AB-ETH1P	Ethernet/IP 1 Port
IF-AB-ETH2P	Ethernet/IP 2 Port
IF-AB-PNET1P	Profinet-IO 1 Port
IF-AB-PNET2P	Profinet-IO 2 Port
Option 3	3-Way interface Analog/USB/GPIB



## Software

In addition to the ability to thrive in many software environments, the ELR 9000 works best with our PowerStar Test Suite. PowerStar is a truly hardware-independent architecture that allows you to easily swap out equipment in your test bench to address obsolescence or changes to standards/requirements – without having to re-write your program. PowerStar allows you to “Program without coding”™ and utilizes a drag and drop feature that enables users to create complicated, custom test scripts or select from a vast library of built in routines. All these features drive efficiency as less time setting up your test means more time for actual testing.

## Technical Information

3.5 kW	Model 230 V			
	ELR 9080-170	ELR 9250-70	ELR 9500-30	ELR 9750-22
<b>AC Input/Output</b>				
Input/output voltage	195...253 V L-N	195...253 V L-N	195...253 V L-N	195...253 V L-N
Input/output connection	L,N,PE	L,N,PE	L,N,PE	L,N,PE
Input/output frequency	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%
Input/output fuse (internal)	T16 A	T16 A	T16 A	T16 A
Efficiency <sup>(2)</sup>	≤ 92.5%	≤ 93.5%	≤ 94.5%	≤ 94.5%
<b>DC Input</b>				
Max. input voltage $U_{Max}$	80 V	250 V	500 V	750 V
Max. input power $P_{Max}$	3500 W	3500 W	3500 W	3500 W
Max. input current $I_{Max}$	170 A	70 A	30 A	22 A
Overvoltage protection range	0...1.1 * $U_{Max}$	0...1.1 * $U_{Max}$	0...1.1 * $U_{Max}$	0...1.1 * $U_{Max}$
Overcurrent protection range	0...1.1 * $I_{Max}$	0...1.1 * $I_{Max}$	0...1.1 * $I_{Max}$	0...1.1 * $I_{Max}$
Overpower protection range	0...1.1 * $P_{Max}$	0...1.1 * $P_{Max}$	0...1.1 * $P_{Max}$	0...1.1 * $P_{Max}$
Max. allowed input voltage	100 V	300 V	600 V	850 V
Min. input voltage for $I_{Max}$	0.73 V	2.3 V	4.6 V	6.8 V
Input capacitance	Ca. 770 µF	Ca. 310 µF	Ca. 98 µF	Ca. 60 µF
Temperature coefficient for set values $\Delta / K$	Voltage / current: 100 ppm			
<b>Voltage regulation</b>				
Adjustment range	0...80 V	0...250 V	0...500 V	0...750 V
Stability at $\Delta I$	< 0.05% $U_{Max}$	< 0.05% $U_{Max}$	< 0.05% $U_{Max}$	< 0.05% $U_{Max}$
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 0.3% $U_{Max}$	< 0.3% $U_{Max}$	< 0.3% $U_{Max}$	< 0.3% $U_{Max}$
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“			
Display: Accuracy <sup>(3)</sup>	≤ 0.2%			
Remote sensing compensation	Max. 5% $U_{Max}$			
<b>Current regulation</b>				
Adjustment range	0...170 A	0...70 A	0...30 A	0...22 A
Stability at $\Delta U$	< 0.15% $I_{Max}$	< 0.15% $I_{Max}$	< 0.15% $I_{Max}$	< 0.15% $I_{Max}$
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 0.4% $I_{Max}$	< 0.4% $I_{Max}$	< 0.4% $I_{Max}$	< 0.4% $I_{Max}$
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“			
Display: Accuracy <sup>(3)</sup>	≤ 0.2%			
Compensation 10-90% $\Delta U_{DC}$	< 0.6 ms	< 0.6 ms	< 0.6 ms	< 0.6 ms
<b>Power regulation</b>				
Adjustment range	0...3500 W	0...3500 W	0...3500 W	0...3500 W
Stability at $\Delta I / \Delta U$	< 0.75% $P_{Max}$	< 0.75% $P_{Max}$	< 0.75% $P_{Max}$	< 0.75% $P_{Max}$
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 1.25% $P_{Max}$	< 1.5% $P_{Max}$	< 1.4% $P_{Max}$	< 1.5% $P_{Max}$
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“			
Display: Accuracy <sup>(3)</sup>	≤ 0.2%			
<b>Resistance regulation</b>				
Adjustment range	0.01...12 Ω	0.09...120 Ω	0.42...480 Ω	0.8...1100 Ω
Accuracy <sup>(4)</sup> (at 23±5°C / 73±9°F)	≤ 1% of max. resistance ± 0.3% of maximum current			
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“			



3.5 kW	Model 230 V			
	ELR 9080-170	ELR 9250-70	ELR 9500-30	ELR 9750-22
<b>Analog interface <sup>(a)</sup></b>				
Set value inputs	U, I, P, R			
Actual value output	U, I			
Control signals	DC on/off, remote control on/off, resistance mode on/off			
Status signals	CV, OVP, OCP, OPP, PF, OT, DC input status			
Galvanic isolation to the device	Max. 1500 V DC			
Sample rate (set value inputs)	500 Hz			
<b>Insulation</b>				
Input (DC) to enclosure	DC minus: permanent max. $\pm 400$ V DC plus: permanent max. ( $\pm 400$ V + input voltage)			
Input (AC) to input (DC)	Max. 2500 V, short-term			
<b>Environment</b>				
Cooling	Temperature controlled fans			
Ambient temperature	0..50 °C (32...122 °F)			
Storage temperature	-20...70 °C (-4...158 °F)			
<b>Digital interfaces</b>				
Featured	1x USB-B for communication, 1x USB-A for functions and logging, 1x Master-slave bus, 1x GPIB (optional)			
Interface modules slot <sup>(b)</sup>	Optional: CANopen, Profibus, Profinet, RS232, CAN, Ethernet, ModBus TCP, EtherCAT			
Galvanic isolation to the device	Max. 1500 V DC			
<b>Terminals</b>				
Rear side	Share Bus, DC input, AC input/output, remote sensing, analog interface, USB-B, master-slave bus, Interface module slot			
Front side	USB-A			
<b>Dimensions</b>				
Enclosure (WxHxD)	19" x 3U x 609 mm (24")			
Total (WxHxD)	483 mm x 133 mm x 714 mm (19" x 5.2" x 28.1")			
<b>Standards</b>				
EN 60950, EN 50160 (grid class 2)				
<b>Weight</b>	17 kg (37.5 lb)	17 kg (37.5 lb)	17 kg (37.5 lb)	17 kg (37.5 lb)
<b>Article number <sup>(c)</sup></b>	33200401	33200402	33200403	33200404

(1 Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value.

Example: a 80 V model has min. 0.3% voltage accuracy, that is 240 mV. When adjusting the voltage to 5 V, the actual value is allowed to differ max. 240 mV, which means it might be between 4.76 V and 5.24 V.

(2 Typical value at 100% input voltage and 100% power

(3 Set values as in the display or as data readable via digital interfaces are more accurate than the corresponding value on the DC input. Their accuracy subtracts from the general accuracy. For actual values it is vice versa. There the display accuracy adds to the general accuracy, so the error (i.e. deviation) will be higher.

(4) Already includes the accuracy of the displayed actual resistance

(a) For technical specifications of the analog interface see *User Manual*

(b) Only in the standard version

(c) Article number of the standard version, devices with options will have a different number



7 kW	Model 230 V				
	ELR 9080-340	ELR 9250-140	ELR 9500-60	ELR 9750-44	ELR 91000-30
<b>AC Input/Output</b>					
Input/output voltage	195...253 V L-N 340...440 V L-L	195...253 V L-N 340...440 V L-L	195...253 V L-N 340...440 V L-L	195...253 V L-N 340...440 V L-L	195...253 V L-N 340...440 V L-L
Input/output connection	L1, L3, N, PE	L1, L3, N, PE	L1, L3, N, PE	L1, L3, N, PE	L1, L3, N, PE
Input/output frequency	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%
Input/output fuse (internal)	T16 A	T16 A	T16 A	T16 A	T16 A
Efficiency <sup>(2)</sup>	≤ 92.5%	≤ 93.5%	≤ 94.5%	≤ 94.5%	≤ 94.5%
<b>DC Input</b>					
Max. input voltage U <sub>Max</sub>	80 V	250 V	500 V	750 V	1000 V
Max. input power P <sub>Max</sub>	7 kW	7 kW	7 kW	7 kW	7 kW
Max. input current I <sub>Max</sub>	340 A	140 A	60 A	44 A	30 A
Overvoltage protection range	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>
Overcurrent protection range	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>
Overpower protection range	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>
Max. allowed input voltage	100 V	300 V	600 V	850 V	1200 V
Min. input voltage for I <sub>Max</sub>	0.73 V	2.3 V	4.6 V	6.9 V	9.2 V
Input capacitance	Ca. 1540 µF	Ca. 620 µF	Ca. 196 µF	Ca. 120 µF	Ca. 49 µF
Temperature coefficient for set values Δ / K	Voltage / current: 100 ppm				
<b>Voltage regulation</b>					
Adjustment range	0...80 V	0...250 V	0...500 V	0...750 V	0...1000 V
Stability at ΔI	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy <sup>(3)</sup>	≤ 0.2%				
Remote sensing compensation	Max. 5% U <sub>Max</sub>				
<b>Current regulation</b>					
Adjustment range	0...340 A	0...140 A	0...60 A	0...44 A	0...30 A
Stability at ΔU	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy <sup>(3)</sup>	≤ 0.2%				
Compensation 10-90% ΔU <sub>DC</sub>	< 0.6 ms	< 0.6 ms	< 0.6 ms	< 0.6 ms	< 0.6 ms
<b>Power regulation</b>					
Adjustment range	0...7 kW	0...7 kW	0...7 kW	0...7 kW	0...7 kW
Stability at ΔI / ΔU	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 1.3% P <sub>Max</sub>	< 1.5% P <sub>Max</sub>	< 1.4% P <sub>Max</sub>	< 1.5% P <sub>Max</sub>	< 1.4% P <sub>Max</sub>
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy <sup>(3)</sup>	≤ 0.2%				
<b>Resistance regulation</b>					
Adjustment range	0.005...6 Ω	0.04...60 Ω	0.21...240 Ω	0.43...550 Ω	0.83...950 Ω
Accuracy <sup>(4)</sup> (at 23±5°C / 73±9°F)	≤1% of max. resistance ± 0.3% of maximum current				
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				

7 kW	Model 230 V				
	ELR 9080-340	ELR 9250-140	ELR 9500-60	ELR 9750-44	ELR 91000-30
<b>Analog interface</b> <sup>(a)</sup>					
Set value inputs	U, I, P, R				
Actual value output	U, I				
Control signals	DC on/off, remote control on/off, resistance mode on/off				
Status signals	CV, OVP, OCP, OPP, PF, OT, DC input status				
Galvanic isolation to the device	Max. 1500 V DC				
Sample rate (set value inputs)	500 Hz				
<b>Insulation</b>					
Input (DC) to enclosure	DC minus: permanent max. $\pm 400$ V DC plus: permanent max. ( $\pm 400$ V + input voltage)				
Input (AC) to input (DC)	Max. 2500 V, short-term				
<b>Environment</b>					
Cooling	Temperature controlled fans				
Ambient temperature	0..50 °C (32...122 °F)				
Storage temperature	-20...70 °C (-4...158 °F)				
<b>Digital interfaces</b>					
Featured	1x USB-B for communication, 1x USB-A for functions and logging, 1x Master-slave bus, 1x GPIB (optional)				
Interface modules slot <sup>(b)</sup>	Optional: CANopen, Profibus, Profinet, RS232, CAN, Ethernet, ModBus TCP, EtherCAT				
Galvanic isolation to the device	Max. 1500 V DC				
<b>Terminals</b>					
Rear side	Share Bus, DC input, AC input/output, remote sensing, analog interface, USB-B, master-slave bus, Interface module slot				
Front side	USB-A				
<b>Dimensions</b>					
Enclosure (WxHxD)	19" x 3U x 609 mm (24")				
Total (WxHxD)	483 mm x 133 mm x 714 mm (19" x 5.2" x 28.1")				
<b>Standards</b>					
EN 60950, EN 50160 (grid class 2)					
<b>Weight</b>	24 kg (52.9 lb)	24 kg (52.9 lb)	24 kg (52.9 lb)	24 kg (52.9 lb)	24 kg (52.9 lb)
<b>Article number</b> <sup>(c)</sup>	33200405	33200406	33200407	33200408	33200409

(1 Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value.

Example: a 80 V model has min. 0.3% voltage accuracy, that is 240 mV. When adjusting the voltage to 5 V, the actual value is allowed to differ max. 240 mV, which means it might be between 4.76 V and 5.24 V.

(2 Typical value at 100% input voltage and 100% power

(3 Set values as in the display or as data readable via digital interfaces are more accurate than the corresponding value on the DC input. Their accuracy subtracts from the general accuracy. For actual values it is vice versa. There the display accuracy adds to the general accuracy, so the error (i.e. deviation) will be higher.

4) Already includes the accuracy of the displayed actual resistance

(a For technical specifications of the analog interface see User Manual

(b Only in the standard version

(c Article number of the standard version, devices with options will have a different number

10.5 kW	Model 230 V				
	ELR 9080-510	ELR 9250-210	ELR 9500-90	ELR 9750-66	ELR 91500-30
<b>AC Input/Output</b>					
Input/output voltage	195...253 V L-N 340...440 V L-L	195...253 V L-N 340...440 V L-L	195...253 V L-N 340...440 V L-L	195...253 V L-N 340...440 V L-L	195...253 V L-N 340...440 V L-L
Input/output connection	L1,L2,L3,N,PE	L1,L2,L3,N,PE	L1,L2,L3,N,PE	L1,L2,L3,N,PE	L1,L2,L3,N,PE
Input/output frequency	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%
Input/output fuse (internal)	T16 A	T16 A	T16 A	T16 A	T16 A
Efficiency <sup>(2)</sup>	≤ 92.5%	≤ 93.5%	≤ 94.5%	≤ 94.5%	≤ 94.5%
<b>DC Input</b>					
Max. input voltage U <sub>Max</sub>	80 V	250 V	500 V	750 V	1500 V
Max. input power P <sub>Max</sub>	10.5 kW	10.5 kW	10.5 kW	10.5 kW	10.5 kW
Max. input current I <sub>Max</sub>	510 A	210 A	90 A	66 A	30 A
Overvoltage protection range	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>
Overcurrent protection range	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>
Overpower protection range	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>
Max. allowed input voltage	100 V	300 V	600 V	850 V	1750 V
Min. input voltage for I <sub>Max</sub>	0.73 V	2.3 V	4.6 V	6.9 V	9.2 V
Input capacitance	Ca. 2310 µF	Ca. 930 µF	Ca. 294 µF	Ca. 180 µF	Ca. 33 µF
Temperature coefficient for set values Δ / K	Voltage / current: 100 ppm				
<b>Voltage regulation</b>					
Adjustment range	0...80 V	0...250 V	0...500 V	0...750 V	0...1500 V
Stability at ΔI	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy <sup>(3)</sup>	≤0.2%				
Remote sensing compensation	Max. 5% U <sub>Max</sub>				
<b>Current regulation</b>					
Adjustment range	0...510 A	0...210 A	0...90 A	0...66 A	0...30 A
Stability at ΔU	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy <sup>(3)</sup>	≤0.2%				
Compensation 10-90% ΔU <sub>DC</sub>	< 0.6 ms	< 0.6 ms	< 0.6 ms	< 0.6 ms	< 0.6 ms
<b>Power regulation</b>					
Adjustment range	0...10.5 kW	0...10.5 kW	0...10.5 kW	0...10.5 kW	0...10.5 kW
Stability at ΔI / ΔU	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 1.3% P <sub>Max</sub>	< 1.5% P <sub>Max</sub>	< 1.4% P <sub>Max</sub>	< 1.5% P <sub>Max</sub>	< 1.4% P <sub>Max</sub>
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy <sup>(3)</sup>	≤0.2%				
<b>Resistance regulation</b>					
Adjustment range	0.003...4 Ω	0.03...40 Ω	0.14...160 Ω	0.29...360 Ω	1.2...1450 Ω
Accuracy <sup>(4)</sup> (at 23±5°C / 73±9°F)	≤2% of max. resistance ± 0.3% of maximum current				
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				

10.5 kW	Model 230 V				
	ELR 9080-510	ELR 9250-210	ELR 9500-90	ELR 9750-66	ELR 91500-30
<b>Analog interface</b> <sup>(a)</sup>					
Set value inputs	U, I, P, R				
Actual value output	U, I				
Control signals	DC on/off, remote control on/off, resistance mode on/off				
Status signals	CV, OVP, OCP, OPP, PF, OT, DC input status				
Galvanic isolation to the device	Max. 1500 V DC				
Sample rate (set value inputs)	500 Hz				
<b>Insulation</b>					
Input (DC) to enclosure	DC minus: permanent max. $\pm 400$ V DC plus: permanent max. ( $\pm 400$ V + input voltage)				
Input (AC) to input (DC)	Max. 2500 V, short-term				
<b>Environment</b>					
Cooling	Temperature controlled fans				
Ambient temperature	0..50 °C (32...122 °F)				
Storage temperature	-20...70 °C (-4...158 °F)				
<b>Digital interfaces</b>					
Featured	1x USB-B for communication, 1x USB-A for functions and logging, 1x Master-slave bus, 1x GPIB (optional)				
Interface modules slot <sup>(b)</sup>	Optional: CANopen, Profibus, Profinet, RS232, CAN, Ethernet, ModBus TCP, EtherCAT				
Galvanic isolation to the device	Max. 1500 V DC				
<b>Terminals</b>					
Rear side	Share Bus, DC input, AC input/output, remote sensing, analog interface, USB-B, master-slave bus, Interface module slot				
Front side	USB-A				
<b>Dimensions</b>					
Enclosure (WxHxD)	19" x 3U x 609 mm (24")				
Total (WxHxD)	483 mm x 133 mm x 714 mm (19" x 5.2" x 28.1")				
<b>Standards</b>					
EN 60950, EN 50160 (grid class 2),					
<b>Weight</b>	31 kg (68.3 lb)	31 kg (68.3 lb)	31 kg (68.3 lb)	31 kg (68.3 lb)	31 kg (68.3 lb)
<b>Article number</b> <sup>(c)</sup>	33200410	33200411	33200412	33200413	33200414

(1 Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value. Example: a 80 V model has min. 0.3% voltage accuracy, that is 240 mV. When adjusting the voltage to 5 V, the actual value is allowed to differ max. 240 mV, which means it might be between 4.76 V and 5.24 V.

(2 Typical value at 100% input voltage and 100% power

(3 Set values as in the display or as data readable via digital interfaces are more accurate than the corresponding value on the DC input. Their accuracy subtracts from the general accuracy. For actual values it is vice versa. There the display accuracy adds to the general accuracy, so the error (i.e. deviation) will be higher.

4) Already includes the accuracy of the displayed actual resistance

(a For technical specifications of the analog interface see *User Manual*

(b Only in the standard version

(c Article number of the standard version, devices with options will have a different number

3.1 kW	Model 208 V			
	ELR 9080-170	ELR 9250-70	ELR 9500-30	ELR 9750-22
<b>AC Input/Output</b>				
Input/output voltage	208 V, ±10%, L-L	208 V, ±10%, L-L	208 V, ±10%, L-L	208 V, ±10%, L-L
Input/output connection	L2, L3, PE	L2, L3, PE	L2, L3, PE	L2, L3, PE
Input/output frequency	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%
Input/output fuse (internal)	T16 A	T16 A	T16 A	T16 A
Efficiency <sup>(2)</sup>	≤ 92.5%	≤ 93.5%	≤ 94.5%	≤ 94.5%
<b>DC Input</b>				
Max. input voltage $U_{Max}$	80 V	250 V	500 V	750 V
Max. input power $P_{Max}$	3100 W	3100 W	3100 W	3100 W
Max. input current $I_{Max}$	170 A	70 A	30 A	22 A
Overvoltage protection range	0...1.1 * $U_{Max}$	0...1.1 * $U_{Max}$	0...1.1 * $U_{Max}$	0...1.1 * $U_{Max}$
Overcurrent protection range	0...1.1 * $I_{Max}$	0...1.1 * $I_{Max}$	0...1.1 * $I_{Max}$	0...1.1 * $I_{Max}$
Overpower protection range	0...1.1 * $P_{Max}$	0...1.1 * $P_{Max}$	0...1.1 * $P_{Max}$	0...1.1 * $P_{Max}$
Max. allowed input voltage	100 V	300 V	600 V	850 V
Min. input voltage for $I_{Max}$	0.73 V	2.3 V	4.6 V	6.8 V
Input capacitance	Ca. 770 µF	Ca. 310 µF	Ca. 98 µF	Ca. 60 µF
Temperature coefficient for set values $\Delta / K$	Voltage / current: 100 ppm			
<b>Voltage regulation</b>				
Adjustment range	0...80 V	0...250 V	0...500 V	0...750 V
Stability at $\Delta I$	< 0.05% $U_{Max}$	< 0.05% $U_{Max}$	< 0.05% $U_{Max}$	< 0.05% $U_{Max}$
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 0.3% $U_{Max}$	< 0.3% $U_{Max}$	< 0.3% $U_{Max}$	< 0.3% $U_{Max}$
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“			
Display: Accuracy <sup>(3)</sup>	≤ 0.2%			
Remote sensing compensation	Max. 5% $U_{Max}$			
<b>Current regulation</b>				
Adjustment range	0...170 A	0...70 A	0...30 A	0...22 A
Stability at $\Delta U$	< 0.15% $I_{Max}$	< 0.15% $I_{Max}$	< 0.15% $I_{Max}$	< 0.15% $I_{Max}$
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 0.4% $I_{Max}$	< 0.4% $I_{Max}$	< 0.4% $I_{Max}$	< 0.4% $I_{Max}$
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“			
Display: Accuracy <sup>(3)</sup>	≤ 0.2%			
Compensation 10-90% $\Delta U_{DC}$	< 0.6 ms	< 0.6 ms	< 0.6 ms	< 0.6 ms
<b>Power regulation</b>				
Adjustment range	0...3100 W	0...3100 W	0...3100 W	0...3100 W
Stability at $\Delta I / \Delta U$	< 0.75% $P_{Max}$	< 0.75% $P_{Max}$	< 0.75% $P_{Max}$	< 0.75% $P_{Max}$
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 1.25% $P_{Max}$	< 1.5% $P_{Max}$	< 1.4% $P_{Max}$	< 1.5% $P_{Max}$
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“			
Display: Accuracy <sup>(3)</sup>	≤ 0.2%			
<b>Resistance regulation</b>				
Adjustment range	0.01...12 Ω	0.09...120 Ω	0.42...480 Ω	0.8...1100 Ω
Accuracy <sup>(4)</sup> (at 23±5°C / 73±9°F)	≤1% of max. resistance ± 0.3% of maximum current			
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“			

3.1 kW	Model 208 V			
	ELR 9080-170	ELR 9250-70	ELR 9500-30	ELR 9750-22
<b>Analog interface <sup>(a)</sup></b>				
Set value inputs	U, I, P, R			
Actual value output	U, I			
Control signals	DC on/off, remote control on/off, resistance mode on/off			
Status signals	CV, OVP, OCP, OPP, PF, OT, DC input status			
Galvanic isolation to the device	Max. 1500 V DC			
Sample rate (set value inputs)	500 Hz			
<b>Insulation</b>				
Input (DC) to enclosure	DC minus: permanent max. $\pm 400$ V DC plus: permanent max. ( $\pm 400$ V + input voltage)			
Input (AC) to input (DC)	Max. 2500 V, short-term			
<b>Environment</b>				
Cooling	Temperature controlled fans			
Ambient temperature	0..50 °C (32...122 °F)			
Storage temperature	-20...70 °C (-4...158 °F)			
<b>Digital interfaces</b>				
Featured	1x USB-B for communication, 1x USB-A for functions and logging, 1x Master-slave bus, 1x GPIB (optional)			
Interface modules slot <sup>(b)</sup>	Optional: CANopen, Profibus, Profinet, RS232, CAN, Ethernet, ModBus TCP, EtherCAT			
Galvanic isolation to the device	Max. 1500 V DC			
<b>Terminals</b>				
Rear side	Share Bus, DC input, AC input/output, remote sensing, analog interface, USB-B, master-slave bus, Interface module slot			
Front side	USB-A			
<b>Dimensions</b>				
Enclosure (WxHxD)	19" x 3U x 609 mm (24")			
Total (WxHxD)	483 mm x 133 mm x 714 mm (19" x 5.2" x 28.1")			
<b>Standards</b>	EN 60950, EN 50160 (grid class 2)			
<b>Weight</b>	17 kg	17 kg	17 kg	17 kg
<b>Article number <sup>(c)</sup></b>	33208401	33208402	33208403	33208404

(1 Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value.

Example: a 80 V model has min. 0.3% voltage accuracy, that is 240 mV. When adjusting the voltage to 5 V, the actual value is allowed to differ max. 240 mV, which means it might be between 4.76 V and 5.24 V.

(2 Typical value at 100% input voltage and 100% power

(3 Set values as in the display or as data readable via digital interfaces are more accurate than the corresponding value on the DC input. Their accuracy subtracts from the general accuracy. For actual values it is vice versa. There the display accuracy adds to the general accuracy, so the error (i.e. deviation) will be higher.

4) Already includes the accuracy of the displayed actual resistance

(a For technical specifications of the analog interface see user manual

(b Only in the standard version

(c Article number of the standard version, devices with options will have a different number

6.2 kW	Model 208 V				
	ELR 9080-340	ELR 9250-140	ELR 9500-60	ELR 9750-44	ELR 91000-30
<b>AC Input/Output</b>					
Input/output voltage	208 V, ±10%, L-L	208 V, ±10%, L-L	208 V, ±10%, L-L	208 V, ±10%, L-L	208 V, ±10%, L-L
Input/output connection	L1, L2, L3, PE	L1, L2, L3, PE	L1, L2, L3, PE	L1, L2, L3, PE	L1, L2, L3, PE
Input/output frequency	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%
Input/output fuse (internal)	T16 A	T16 A	T16 A	T16 A	T16 A
Efficiency <sup>(2)</sup>	≤ 92.5%	≤ 93.5%	≤ 94.5%	≤ 94.5%	≤ 94.5%
<b>DC Input</b>					
Max. input voltage U <sub>Max</sub>	80 V	250 V	500 V	750 V	1000 V
Max. input power P <sub>Max</sub>	6200 W	6200 W	6200 W	6200 W	6200 W
Max. input current I <sub>Max</sub>	340 A	140 A	60 A	44 A	30 A
Overvoltage protection range	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>
Overcurrent protection range	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>
Overpower protection range	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>
Max. allowed input voltage	100 V	300 V	600 V	850 V	1200 V
Min. input voltage for I <sub>Max</sub>	0.73 V	2.3 V	4.6 V	6.9 V	9.2 V
Input capacitance	Ca. 1540 µF	Ca. 620 µF	Ca. 196 µF	Ca. 120 µF	Ca. 49 µF
Temperature coefficient for set values Δ / K	Voltage / current: 100 ppm				
<b>Voltage regulation</b>					
Adjustment range	0...80 V	0...250 V	0...500 V	0...750 V	0...1000 V
Stability at ΔI	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy <sup>(3)</sup>	≤ 0.2%				
Remote sensing compensation	Max. 5% U <sub>Max</sub>				
<b>Current regulation</b>					
Adjustment range	0...340 A	0...140 A	0...60 A	0...44 A	0...30 A
Stability at ΔU	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy <sup>(3)</sup>	≤ 0.2%				
Compensation 10-90% ΔU <sub>DC</sub>	< 0.6 ms	< 0.6 ms	< 0.6 ms	< 0.6 ms	< 0.6 ms
<b>Power regulation</b>					
Adjustment range	0...6200 W	0...6200 W	0...6200 W	0...6200 W	0...6200 W
Stability at ΔI / ΔU	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 1.3% P <sub>Max</sub>	< 1.5% P <sub>Max</sub>	< 1.4% P <sub>Max</sub>	< 1.5% P <sub>Max</sub>	< 1.4% P <sub>Max</sub>
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy <sup>(3)</sup>	≤ 0.2%				
<b>Resistance regulation</b>					
Adjustment range	0.005...6 Ω	0.04...60 Ω	0.21...240 Ω	0.43...550 Ω	0.83...950 Ω
Accuracy <sup>(4)</sup> (at 23±5°C / 73±9°F)	≤1% of max. resistance ± 0.3% of maximum current				
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				



6.2 kW	Model 208 V				
	ELR 9080-340	ELR 9250-140	ELR 9500-60	ELR 9750-44	ELR 91000-30
<b>Analog interface</b> <sup>(a)</sup>					
Set value inputs	U, I, P, R				
Actual value output	U, I				
Control signals	DC on/off, remote control on/off, resistance mode on/off				
Status signals	CV, OVP, OCP, OPP, PF, OT, DC input status				
Galvanic isolation to the device	max. 1500 V DC				
Sample rate (set value inputs)	500 Hz				
<b>Insulation</b>					
Input (DC) to enclosure	DC minus: permanent max. $\pm 400$ V DC plus: permanent max. ( $\pm 400$ V + input voltage)				
Input (AC) to input (DC)	Max. 2500 V, short-term				
<b>Environment</b>					
Cooling	Temperature controlled fans				
Ambient temperature	0..50 °C (32...122 °F)				
Storage temperature	-20...70 °C (-4...158 °F)				
<b>Digital interfaces</b>					
Featured	1x USB-B for communication, 1x USB-A for functions and logging, 1x Master-slave bus, 1x GPIB (optional)				
Interface modules slot <sup>(b)</sup>	Optional: CANopen, Profibus, Profinet, RS232, CAN, Ethernet, ModBus TCP, EtherCAT				
Galvanic isolation to the device	Max. 1500 V DC				
<b>Terminals</b>					
Rear side	Share Bus, DC input, AC input/output, remote sensing, analog interface, USB-B, master-slave bus, Interface module slot				
Front side	USB-A				
<b>Dimensions</b>					
Enclosure (WxHxD)	19" x 3U x 609 mm (24")				
Total (WxHxD)	483 mm x 133 mm x 714 mm (19" x 5.2" x 28.1")				
<b>Standards</b>					
EN 60950, EN 50160 (grid class 2)					
<b>Weight</b>	24 kg	24 kg	24 kg	24 kg	24 kg
<b>Article number</b> <sup>(c)</sup>	33208405	33208406	33208407	33208408	33208409

(1 Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value.

Example: a 80 V model has min. 0.3% voltage accuracy, that is 240 mV. When adjusting the voltage to 5 V, the actual value is allowed to differ max. 240 mV, which means it might be between 4.76 V and 5.24 V.

(2 Typical value at 100% input voltage and 100% power

(3 Set values as in the display or as data readable via digital interfaces are more accurate than the corresponding value on the DC input. Their accuracy subtracts from the general accuracy. For actual values it is vice versa. There the display accuracy adds to the general accuracy, so the error (i.e. deviation) will be higher.

4) Already includes the accuracy of the displayed actual resistance

(a) For technical specifications of the analog interface see User Manual

(b) Only in the standard version

(c) Article number of the standard version, devices with options will have a different number

9.3 kW	Model 208 V				
	ELR 9080-510	ELR 9250-210	ELR 9500-90	ELR 9750-66	ELR 91500-30
<b>AC Input/Output</b>					
Input/output voltage	208 V, ±10%, L-L	208 V, ±10%, L-L	208 V, ±10%, L-L	208 V, ±10%, L-L	208 V, ±10%, L-L
Input/output connection	L1, L2, L3, PE	L1, L2, L3, PE	L1, L2, L3, PE	L1, L2, L3, PE	L1, L2, L3, PE
Input/output frequency	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%	50/60 Hz ±10%
Input/output fuse (internal)	T16 A	T16 A	T16 A	T16 A	T16 A
Efficiency <sup>(2)</sup>	≤ 92.5%	≤ 93.5%	≤ 94.5%	≤ 94.5%	≤ 94.5%
<b>DC Input</b>					
Max. input voltage U <sub>Max</sub>	80 V	250 V	500 V	750 V	1500 V
Max. input power P <sub>Max</sub>	9300 W	9300 W	9300 W	9300 W	9300 W
Max. input current I <sub>Max</sub>	510 A	210 A	90 A	66 A	30 A
Overvoltage protection range	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>	0...1.1 * U <sub>Max</sub>
Overcurrent protection range	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>	0...1.1 * I <sub>Max</sub>
Overpower protection range	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>	0...1.1 * P <sub>Max</sub>
Max. allowed input voltage	100 V	300 V	600 V	850 V	1750 V
Min. input voltage for I <sub>Max</sub>	0.73 V	2.3 V	4.6 V	6.9 V	9.2 V
Input capacitance	Ca. 2310 µF	Ca. 930 µF	Ca. 294 µF	Ca. 180 µF	Ca. 33 µF
Temperature coefficient for set values Δ / K	Voltage / current: 100 ppm				
<b>Voltage regulation</b>					
Adjustment range	0...80 V	0...250 V	0...500 V	0...750 V	0...1500 V
Stability at ΔI	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>	< 0.05% U <sub>Max</sub>
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>	< 0.3% U <sub>Max</sub>
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy <sup>(3)</sup>	≤0.2%				
Remote sensing compensation	Max. 5% U <sub>Max</sub>				
<b>Current regulation</b>					
Adjustment range	0...510 A	0...210 A	0...90 A	0...66 A	0...30 A
Stability at ΔU	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>	< 0.15% I <sub>Max</sub>
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>	< 0.4% I <sub>Max</sub>
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy <sup>(3)</sup>	≤0.2%				
Compensation 10-90% ΔU <sub>DC</sub>	< 0.6 ms	< 0.6 ms	< 0.6 ms	< 0.6 ms	< 0.6 ms
<b>Power regulation</b>					
Adjustment range	0...9300 W	0...9300 W	0...9300 W	0...9300 W	0...9300 W
Stability at ΔI / ΔU	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>	< 0.75% P <sub>Max</sub>
Accuracy <sup>(1)</sup> (at 23±5°C / 73±9°F)	< 1.3% P <sub>Max</sub>	< 1.5% P <sub>Max</sub>	< 1.4% P <sub>Max</sub>	< 1.5% P <sub>Max</sub>	< 1.4% P <sub>Max</sub>
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				
Display: Accuracy <sup>(3)</sup>	≤0.2%				
<b>Resistance regulation</b>					
Adjustment range	0.003...4 Ω	0.03...40 Ω	0.14...160 Ω	0.29...360 Ω	1.2...1450 Ω
Accuracy <sup>(4)</sup> (at 23±5°C / 73±9°F)	≤1% of max. resistance ± 0.3% of maximum current				
Display: Adjustment resolution	See section „1.9.6.4. Resolution of the displayed values“				

9.3 kW	Model 208 V				
	ELR 9080-510	ELR 9250-210	ELR 9500-90	ELR 9750-66	ELR 91500-30
<b>Analog interface <sup>(a)</sup></b>					
Set value inputs	U, I, P, R				
Actual value output	U, I				
Control signals	DC on/off, remote control on/off, resistance mode on/off				
Status signals	CV, OVP, OCP, OPP, PF, OT, DC input status				
Galvanic isolation to the device	Max. 1500 V DC				
Sample rate (set value inputs)	500 Hz				
<b>Insulation</b>					
Input (DC) to enclosure	DC minus: permanent max. $\pm 400$ V DC plus: permanent max. ( $\pm 400$ V + input voltage)				
Input (AC) to input (DC)	Max. 2500 V, short-term				
<b>Environment</b>					
Cooling	Temperature controlled fans				
Ambient temperature	0..50 °C (32...122 °F)				
Storage temperature	-20...70 °C (-4...158 °F)				
<b>Digital interfaces</b>					
Featured	1x USB-B for communication, 1x USB-A for functions and logging, 1x Master-slave bus, 1x GPIB (optional)				
Interface modules slot <sup>(b)</sup>	Optional: CANopen, Profibus, Profinet, RS232, CAN, Ethernet, ModBus TCP, EtherCAT				
Galvanic isolation to the device	Max. 1500 V DC				
<b>Terminals</b>					
Rear side	Share Bus, DC input, AC input/output, remote sensing, analog interface, USB-B, master-slave bus, Interface module slot				
Front side	USB-A				
<b>Dimensions</b>					
Enclosure (WxHxD)	19" x 3U x 609 mm (24")				
Total (WxHxD)	483 mm x 133 mm x 714 mm (19" x 5.2" x 28.1")				
<b>Standards</b>					
EN 60950, EN 50160 (grid class 2),					
<b>Weight</b>	31 kg	31 kg	31 kg	31 kg	31 kg
<b>Article number <sup>(c)</sup></b>	33208410	33208411	33208412	33208413	33208414

(1 Related to the nominal values, the accuracy defines the maximum deviation between an adjusted values and the true (actual) value.

Example: a 80 V model has min. 0.3% voltage accuracy, that is 240 mV. When adjusting the voltage to 5 V, the actual value is allowed to differ max. 240 mV, which means it might be between 4.76 V and 5.24 V.

(2 Typical value at 100% input voltage and 100% power

(3 Set values as in the display or as data readable via digital interfaces are more accurate than the corresponding value on the DC input. Their accuracy subtracts from the general accuracy. For actual values it is vice versa. There the display accuracy adds to the general accuracy, so the error (i.e. deviation) will be higher.

4) Already includes the accuracy of the displayed actual resistance

(a) For technical specifications of the analog interface see *User Manual*

(b) Only in the standard version

(c) Article number of the standard version, devices with options will have a different number

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