

# Electronic DC Load

**Series EL500, EL1000, EL3000, EL4500, EL6000**

**Power 500 W - 6000 W, Cooled by int. fans**

Constant I-Mode, U-Mode, P-Mode or G-Mode

All Modes ext. programmable

Nominal value indication and offline setting of all Modes

Auto change to true values

Overload possible for a short period

Stand-alone use and intended for 19" rack

Option:

Installed IEEE 488.2 Interface with Lab View Driver

USB and CAN Interface with Driversoftware

on request  
overload possible

CE



## Input:

Input voltage 230 V<sub>AC</sub> ± 10 %, 50 – 60 Hz

Load voltage see table

Load current see table

Power see table

## Regulation:

Set point accuracy ≤ 0,1 % I<sub>max</sub>, U<sub>max</sub>

(Voltage range ± 20 %) ≤ 1 % G<sub>max</sub>, P<sub>max</sub>

Rise time (at I-Mode, 10 – < 10 μs

90 % nominal value change)

Correction time EL 500, EL 1000 < 200 μs

(at I-Mode 10-90% EL 3000 - EL 6000 < 300 μs

nominal value change)

Temperature coefficient ≤ 0,1 % / K I<sub>max</sub>

(after 15 min. working time, (within 8 hours)

const. ambient temp. and

const. input voltage)

## Protection:

Overload protection min. 2-times, normal load for a

short period

Overvoltage protection power shutdown U<sub>Lmax</sub> + 5 %

Thermal protection power shutdown,

manual reset current limit I<sub>max</sub> + 20 %

Overcurrent fuse and wattless current

Safety for load circuit and diode for I<sub>L</sub> ≤ 200 A

Reverse polarity protection

## Environmental Conditions:

Operating temperature 0 – +35 °C

Cooling int. fan, temperature controlled

## Safety:

Safety standard EN61010

Isolation

AC input - load input: U<sub>L</sub> ≤ 350 V: 2,3 kV<sub>eff</sub>

U<sub>L</sub> > 350 V – 800 V: 3,7 kV<sub>eff</sub>

AC input - ground: 1,35 kV<sub>eff</sub>

Load input - ground: U<sub>L</sub> ≤ 150 V: 500 V<sub>eff</sub>

U<sub>L</sub> > 150 – 300 V: 820 V<sub>eff</sub>

U<sub>L</sub> > 300 – 600 V: 1,35 kV<sub>eff</sub>

U<sub>L</sub> > 600 – 800 V: 2,2 kV<sub>eff</sub>

## EMC:

Input EMI filter EN61000-6-3

Input immunity EN61000-6-2

## Operation and Control:

Manual adjust:

Adjustment

Pulse-generator I, U, P, G

Programming

Parallel operation

Monitor Signals

Indication

Instruments

## Connectors:

Input

Load

Ext. programming

## Physical Specifications:

Dimensions

Weight

current, voltage, power and

conductance (see table):

each 2 levels (max., min.)

each over 2 channels adjustable

I-Mode 20/100%, G-Mode 5/100%

selectable

100 Hz or 1 kHz switch-selected,

waveform: square-wave 1 : 1

ext. voltage (reference - U<sub>L</sub>)

0 – 10 V ± 0 – I<sub>max</sub>

0 – 10 V ± 0 – U<sub>max</sub>

0 – 10 V ± 0 – P<sub>max</sub>

0 – 10 V ± 0 – G<sub>max</sub>

any waveform, frequency range

EL500, EL1000: 0–30 kHz(-3 dB)

EL3000, EL6000: 0–10 kHz(-3 dB)

same units

current-, voltage-, power- and

conductance-monitor, signal

undervoltage, sum alarm signals

for overcurrent, temp. limit,

overload or overvoltage

overcurrent, temp. limit,

overload, over- and under-

voltage each 1 LED

LED digital for voltage,

current/conductance and power

3½ dig., accuracy 0,2 % ± 1d

Euro-plug rear side

with switch front side

EL 500, EL 1000:

I<sub>L</sub> ≤ 25 A: female plug 4 mm

EL 500, EL 1000:

I<sub>L</sub> > 25 A: plug 6 mm

lockable, dependent on type

I<sub>L</sub> ≥ 100 A: typ DIX SE50

female plug incl.

I<sub>L</sub> ≥ 250 A contact rail

each pole 2 x M10

25 pole Sub D female plug

| Power | Load voltage | Load current | Load current in the operating range from 0,1 V to 2,5 V |       | Conductance max. | Model Number    |
|-------|--------------|--------------|---------------------------------------------------------|-------|------------------|-----------------|
| (W)   | (V)          | (A)          | (A)                                                     | (A)   | (S)              |                 |
| 500   | 2,5 - 60     | 0,01 - 10    | 0,4                                                     | 10    | 4                | EL500/60/10     |
| 500   | 2,5 - 60     | 0,01 - 25    | 1                                                       | 25    | 10               | EL500/60/25     |
| 500   | 2,5 - 60     | 0,01 - 50    | 2                                                       | 50    | 20               | EL500/60/50     |
| 500   | 2,5 - 60     | 0,01 - 100   | 4                                                       | 100   | 40               | EL500/60/100    |
| 500   | 2,5 - 160    | 0,01 - 10    | 0,4                                                     | 10    | 4                | EL500/160/10    |
| 500   | 2,5 - 160    | 0,01 - 25    | 1                                                       | 25    | 10               | EL500/160/25    |
| 500   | 2,5 - 160    | 0,01 - 50    | 2                                                       | 50    | 20               | EL500/160/50    |
| 500   | 2,5 - 400    | 0,01 - 10    | 0,4                                                     | 10    | 4                | EL500/400/10    |
| 500   | 5 - 400      | 0,01 - 25    | 0,5                                                     | 25*   | 5                | EL500/400/25    |
| 500   | 5 - 800      | 0,01 - 10    | 0,2                                                     | 10*   | 2                | EL500/800/10    |
| 1000  | 2,5 - 20     | 0,01 - 100   | 0,4                                                     | 100   | 40               | EL1000/20/100   |
| 1000  | 2,5 - 60     | 0,01 - 20    | 0,8                                                     | 25    | 8                | EL1000/60/20    |
| 1000  | 2,5 - 60     | 0,01 - 50    | 2                                                       | 50    | 20               | EL1000/60/50    |
| 1000  | 2,5 - 60     | 0,01 - 100   | 4                                                       | 100   | 40               | EL1000/60/100   |
| 1000  | 2,5 - 60     | 0,01 - 200   | 8                                                       | 200   | 80               | EL1000/60/200   |
| 1000  | 2,5 - 160    | 0,01 - 20    | 0,8                                                     | 20    | 8                | EL1000/160/20   |
| 1000  | 2,5 - 160    | 0,01 - 50    | 2                                                       | 50    | 20               | EL1000/160/50   |
| 1000  | 2,5 - 160    | 0,01 - 100   | 4                                                       | 100   | 40               | EL1000/160/100  |
| 1000  | 2,5 - 400    | 0,01 - 20    | 0,8                                                     | 20    | 8                | EL1000/400/20   |
| 1000  | 5 - 400      | 0,01 - 50    | 1                                                       | 50*   | 10               | EL1000/400/50   |
| 1000  | 5 - 800      | 0,01 - 20    | 0,4                                                     | 20*   | 4                | EL1000/800/20   |
| 3000  | 2,5 - 60     | 0,01 - 100   | 4                                                       | 100   | 40               | EL3000/60/100   |
| 3000  | 2,5 - 60     | 0,01 - 250   | 10                                                      | 250   | 100              | EL3000/60/250   |
| 3000  | 2,5 - 60     | 0,01 - 500   | 20                                                      | 500   | 200              | EL3000/60/500   |
| 3000  | 2,5 - 160    | 0,01 - 100   | 4                                                       | 100   | 40               | EL3000/160/100  |
| 3000  | 2,5 - 160    | 0,01 - 250   | 10                                                      | 250   | 100              | EL3000/160/250  |
| 3000  | 2,5 - 160    | 0,01 - 500   | 20                                                      | 500   | 200              | EL3000/160/500  |
| 3000  | 2,5 - 400    | 0,01 - 100   | 4                                                       | 100   | 40               | EL3000/400/100  |
| 3000  | 2,5 - 400    | 0,01 - 250   | 10                                                      | 250   | 100              | EL3000/400/250  |
| 3000  | 5 - 400      | 0,01 - 500   | 20                                                      | 500*  | 100              | EL3000/400/500  |
| 4500  | 2,5 - 60     | 0,01 - 150   | 8                                                       | 150   | 80               | EL4500/60/150   |
| 4500  | 2,5 - 60     | 0,01 - 375   | 20                                                      | 375   | 200              | EL4500/60/375   |
| 4500  | 2,5 - 60     | 0,01 - 750   | 40                                                      | 750   | 400              | EL4500/60/750   |
| 4500  | 2,5 - 160    | 0,01 - 150   | 8                                                       | 150   | 80               | EL4500/160/150  |
| 4500  | 2,5 - 160    | 0,01 - 375   | 20                                                      | 375   | 200              | EL4500/160/375  |
| 4500  | 2,5 - 160    | 0,01 - 750   | 40                                                      | 750   | 400              | EL4500/160/750  |
| 4500  | 2,5 - 400    | 0,01 - 150   | 8                                                       | 150   | 80               | EL4500/400/150  |
| 4500  | 2,5 - 400    | 0,01 - 375   | 20                                                      | 375   | 200              | EL4500/400/375  |
| 4500  | 5 - 400      | 0,01 - 750   | 40                                                      | 750*  | 200              | EL4500/400/750  |
| 6000  | 2,5 - 60     | 0,01 - 200   | 8                                                       | 200   | 80               | EL6000/60/200   |
| 6000  | 2,5 - 60     | 0,01 - 500   | 20                                                      | 500   | 200              | EL6000/60/500   |
| 6000  | 2,5 - 60     | 0,01 - 1000  | 40                                                      | 1000  | 400              | EL6000/60/1000  |
| 6000  | 2,5 - 160    | 0,01 - 200   | 8                                                       | 200   | 80               | EL6000/160/200  |
| 6000  | 2,5 - 160    | 0,01 - 500   | 20                                                      | 500   | 200              | EL6000/160/500  |
| 6000  | 2,5 - 160    | 0,01 - 1000  | 40                                                      | 1000  | 400              | EL6000/160/1000 |
| 6000  | 2,5 - 400    | 0,01 - 200   | 8                                                       | 200   | 80               | EL6000/400/200  |
| 6000  | 2,5 - 400    | 0,01 - 500   | 20                                                      | 500   | 200              | EL6000/400/500  |
| 6000  | 5 - 400      | 0,01 - 1000  | 40                                                      | 1000* | 200              | EL6000/400/1000 |

\* up to 5 V

#### Option:

Autorange current-/voltage-const.

Installed IEEE 488.2 Interface

Euro-Card INT2E

Cutt-off regulation (application: battery discharging, dynamo / generator test)

Additional input to modulate upon ( application: impedance measurements for fuel cells)

Additional sense-jack on the rear panel

Input Voltage 115VAC  $\pm$  10%

USB Interface

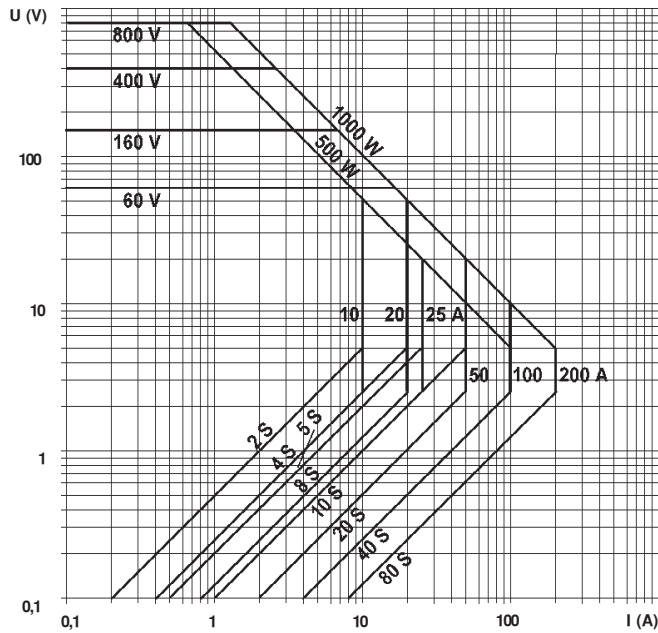
CAN Open Interface

#### Dimensions and weight:

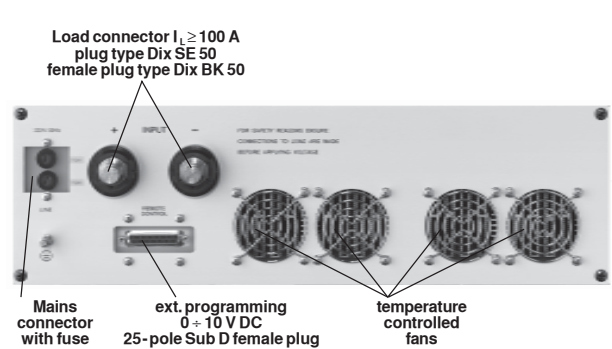
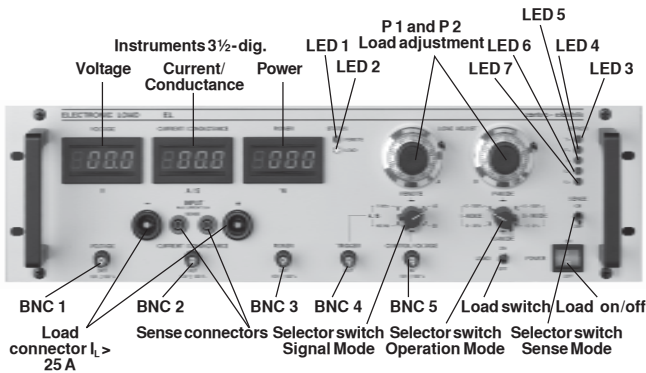
| Model Number | Dimensions w x h x d (mm) | Weight (kg) |
|--------------|---------------------------|-------------|
| EL500        | 485 x 155 x 400           | 10          |
| EL1000       | 485 x 155 x 400           | 13          |
| EL3000       | 485 x 285 x 500           | 32          |
| EL4500       | 485 x 420 x 500           | 45          |
| EL6000       | 485 x 420 x 500           | 48          |

# Electronic DC Load

Operating range EL500, EL1000:



EL500, EL1000:



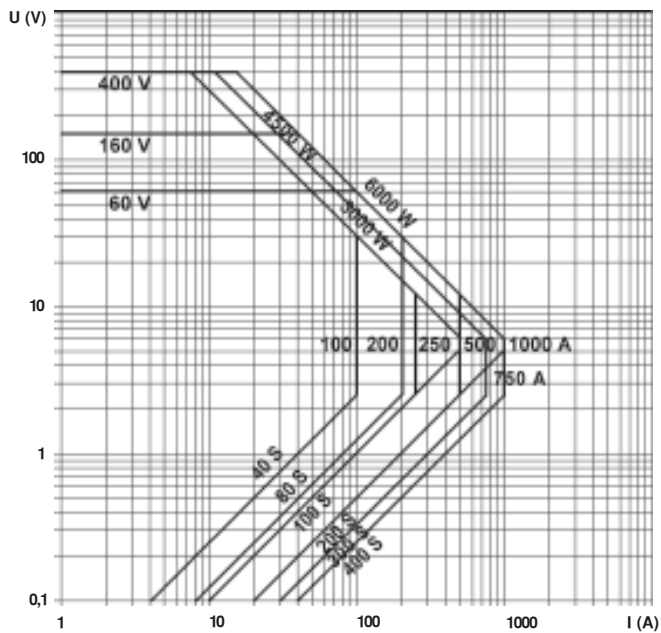
## Signals:

BNC 1: Output true value load voltage  
BNC 2: Output true value load current/ -conductance  
BNC 3: Output true value load power  
BNC 4: Output trigger  
BNC 5: Input control voltage

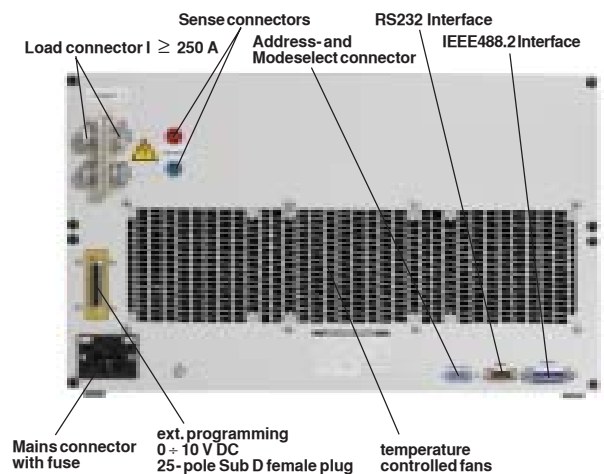
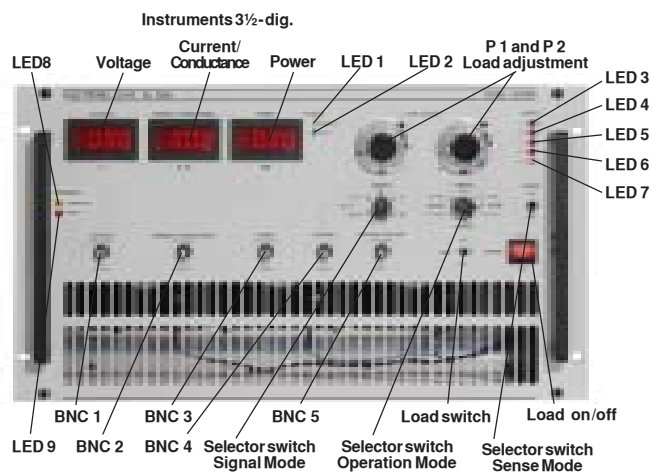
## Indication:

LED 1: Remote on/off  
LED 2: Load on  
LED 3: Temperature limit  
LED 4: Max. power  
LED 5: Max. load current  
LED 6: Max. load voltage  
LED 7: Min. load voltage

## Operating range EL3000, EL4500, EL6000:



## EL3000, EL4500, EL6000:



### Signals:

BNC 1: Output true value load voltage  
BNC 2: Output true value load current/ -conductance  
BNC 3: Output true value load power  
BNC 4: Output trigger  
BNC 5: Input control voltage

### Indication:

LED 1: Remote on/off  
LED 2: Load on  
LED 3: Temperature limit  
LED 4: Max. power  
LED 5: Max. load current  
LED 6: Max. load voltage  
LED 7: Min. load voltage  
LED 8: Signal, addressed  
LED 9: Signal, Error