

# Electronic DC Load - System

Made in Europe 

IEC-BUS  
compatible with  
Interface Series  
INT 2



**Power max. 80 kW**  
**Cooled by air or liquid**  
**Series ELS**

Constant I- Mode, U- Mode,  
P- Mode, or G- Mode,  
All Modes I, U, P and G- Mode  
ext. programmable  
Nominal value indication and presetting of all Modes  
Auto change to true values  
19" rack  
Option: Installed Interface

## Input:

Input voltage	230 V <sub>AC</sub> ± 10 %, 50 ÷ 60 Hz (115V opt)
Load voltage	max. 800 V
Load current	max. 2000 A
Power	max. 80 kW (100 kW consult factory)

## Regulation:

Set point accuracy (Voltage range ± 20 %)	≤ 0,1% I <sub>max</sub> , U <sub>max</sub> ≤ 1% G <sub>max</sub> , P <sub>max</sub>
Rise time (10 ÷ 90 % nominal value change)	50 ÷ 100 μs at I-Mode
Temperature coefficient (after 15 min. working time, const. ambient temp. and const. input voltage)	≤ 0,1% /K I <sub>max</sub> (within 8 hours)

## Protection:

Overload protection	power limit P <sub>max</sub> + 5%
Overvoltage protection	power shutdown U <sub>Lmax</sub> + 5%
Thermal protection	power shutdown, manual reset
Overcurrent	current limit I <sub>max</sub> + 20%
Safety for load circuit and reverse polarity protection	fuse and wattless current diode

## Environmental Conditions:

### Air-cooled:

Operating temperature	0 ÷ +35 °C
Cooling	int. fans, temperature controlled

### Liquid-cooled:

Humidity	max. 70 %, non condensing
Operating temperature	+15° C ÷ +35 °C
Cooling	cooling liquid, temperature controlled
Coolant pressure	3 bar ≤ P ≤ 6 bar
Coolant temperature	+12 °C ≤ t ≤ +20 °C

## Safety:

Safety standard	EN61010
Isolation	
AC input - load input:	U <sub>L</sub> ≤ 60 V: 1 kV <sub>rms</sub> U <sub>L</sub> > 60 ÷ 160 V: 1,5 kV <sub>rms</sub> U <sub>L</sub> > 160 ÷ 800 V: 2,5 kV <sub>rms</sub>
AC input - ground:	1 kV <sub>rms</sub>
Load input - ground:	U <sub>L</sub> ≤ 60 V: 500 V <sub>rms</sub> U <sub>L</sub> > 60 ÷ 160 V: 1 kV <sub>rms</sub> U <sub>L</sub> > 160 ÷ 800 V: 2,5 kV <sub>rms</sub>

## EMC:

Input EMI filter	EN50081-1
Input immunity	EN50082-1

## Operation and Control:

Manual adjust: Adjustment	current, voltage, power and conductance (see table): each 2 levels (max., min.) each over 2 channels adjustable I- and G-Mode coarse/fine selectable
Pulse-generator I, U, P, G	100 Hz or 1 kHz switch-selected, waveform: square-wave 1 : 1 ext. voltage (reference - U <sub>L</sub> )
Programming	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 0 ÷ 10 kHz (3 dB)
Parallel operation	max. 4 same Load-Modules with a Control-Unit
Monitor Signals	current-, voltage-, power- and conductance-monitor, signal undervoltage, sum alarm signals for overcurrent, temp. limit, overload or overvoltage
Indication	overcurrent, temp. limit, overload, over- and under- voltage each 1 LED
Instruments	LED digital for voltage, current/conductance and power 3½ dig., accuracy 0,2% ± 1d
<b>Connectors:</b>	
Input	Euro - plug with switch, rear side
Load	Terminal area, rear side (inside)
Ext. programming	25 pole Sub D female plug
Coolant	R 1 IG
<b>Physical Specifications:</b>	
Dimensions w x h x d	ELS 38 U: 600 x 1900 x 950 mm
Weight	without Modules ca. 200 kg

**Load Units air cooled:**

Power (W)	Load voltage (V)	Load current (A)	Load current in the operating range		Conductance max. (S)	Model Number
			from 0,1 V (A)	to 2,5 V (A)		
3000	2,5 ÷ 60	0,01 ÷ 100	4	100	40	ELM3000/60/100
3000	2,5 ÷ 60	0,01 ÷ 250	10	250	100	ELM3000/60/250
3000	2,5 ÷ 60	0,01 ÷ 500	20	500	200	ELM3000/60/500
3000	2,5 ÷ 160	0,01 ÷ 100	4	100	40	ELM3000/160/100
3000	2,5 ÷ 160	0,01 ÷ 250	10	250	100	ELM3000/160/250
3000	2,5 ÷ 160	0,01 ÷ 500	20	500	200	ELM3000/160/500
3000	2,5 ÷ 400	0,01 ÷ 100	4	100	40	ELM3000/400/100
3000	2,5 ÷ 400	0,01 ÷ 250	10	250	100	ELM3000/400/250
3000	2,5 ÷ 400	0,01 ÷ 500	20	500	200	ELM3000/400/500
6000	2,5 ÷ 60	0,01 ÷ 200	8	200	80	ELM6000/60/200
6000	2,5 ÷ 60	0,01 ÷ 500	20	500	200	ELM6000/60/500
6000	2,5 ÷ 60	0,01 ÷ 1000	40	1000	400	ELM6000/60/1000
6000	2,5 ÷ 160	0,01 ÷ 200	8	200	80	ELM6000/160/200
6000	2,5 ÷ 160	0,01 ÷ 500	20	500	200	ELM6000/160/500
6000	2,5 ÷ 160	0,01 ÷ 1000	40	1000	400	ELM6000/160/1000
6000	2,5 ÷ 400	0,01 ÷ 200	8	200	80	ELM6000/400/200
6000	2,5 ÷ 400	0,01 ÷ 500	20	500	200	ELM6000/400/500
6000	2,5 ÷ 400	0,01 ÷ 1000	40	1000	400	ELM6000/400/1000

**Load Units liquid cooled:**

Power (W)	Load voltage (V)	Load current (A)	Load current in the operating range		Conductance max. (S)	Model Number
			from 0,1 V (A)	to 2,5 V (A)		
10000	2,5 ÷ 60	0,01 ÷ 200	8	200	80	ELM10000/60/200
10000	2,5 ÷ 60	0,01 ÷ 500	20	500	200	ELM10000/60/500
10000	2,5 ÷ 60	0,01 ÷ 1000	40	1000	400	ELM10000/60/1000
10000	2,5 ÷ 160	0,01 ÷ 100	4	100	40	ELM10000/160/100
10000	2,5 ÷ 160	0,01 ÷ 200	8	200	80	ELM10000/160/200
10000	2,5 ÷ 160	0,01 ÷ 500	20	500	200	ELM10000/160/500
10000	2,5 ÷ 160	0,01 ÷ 1000	40	1000	400	ELM10000/160/1000
10000	2,5 ÷ 400	0,01 ÷ 100	4	100	40	ELM10000/400/100
10000	2,5 ÷ 400	0,01 ÷ 200	8	200	80	ELM10000/400/200
10000	2,5 ÷ 800	0,01 ÷ 100	4	100	40	ELM10000/800/100
10000	2,5 ÷ 800	0,01 ÷ 200	8	200	80	ELM10000/800/200
20000	2,5 ÷ 60	0,01 ÷ 400	16	400	160	ELM20000/60/400
20000	2,5 ÷ 60	0,01 ÷ 1000	40	1000	400	ELM20000/60/1000
20000	2,5 ÷ 160	0,01 ÷ 200	8	200	80	ELM20000/160/200
20000	2,5 ÷ 160	0,01 ÷ 400	16	400	160	ELM20000/160/400
20000	2,5 ÷ 160	0,01 ÷ 1000	40	1000	400	ELM20000/160/1000
20000	2,5 ÷ 400	0,01 ÷ 100	4	100	40	ELM20000/400/100
20000	2,5 ÷ 400	0,01 ÷ 200	8	200	80	ELM20000/400/200
20000	2,5 ÷ 400	0,01 ÷ 400	16	400	160	ELM20000/400/400
20000	2,5 ÷ 800	0,01 ÷ 100	4	100	40	ELM20000/800/100
20000	2,5 ÷ 800	0,01 ÷ 200	8	200	80	ELM20000/800/200
20000	2,5 ÷ 800	0,01 ÷ 400	16	400	160	ELM20000/800/400

**Control Unit:**

Description	Model Number
Control Unit for max. 4 Load Modules	ELC

**19" rack:**

Description	Model number
19" rack air cooled (prepared for 3 or 4 Load Modules and 1 Control Unit)	19" rack air
19" rack liquid cooled (prepared for max. 4 Load Modules and 1 Control Unit)	19" rack liquid

**The Load System includes one Control Unit and max. 4 same Load Units, and also one 19" rack!**

The System will be delivered completely assembled in a 19" rack or as separate units in single cases.

**Options:**

Autorange current- / voltage const.

Single Case 6 U for ELM 10 kW and 20 kW (1 U = 44,45 mm)

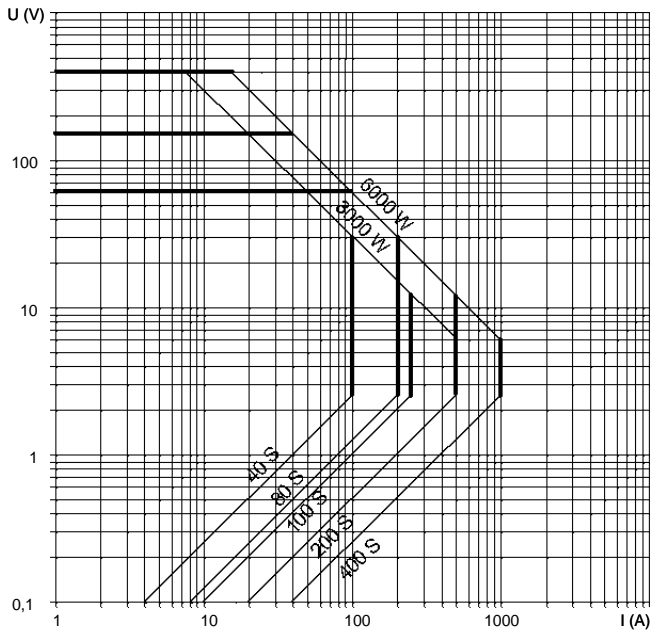
Isolation amplifier with Interface 4 ÷ 20 mA, Input Signal

Isolation amplifier with Interface 4 ÷ 20 mA, Output Signal

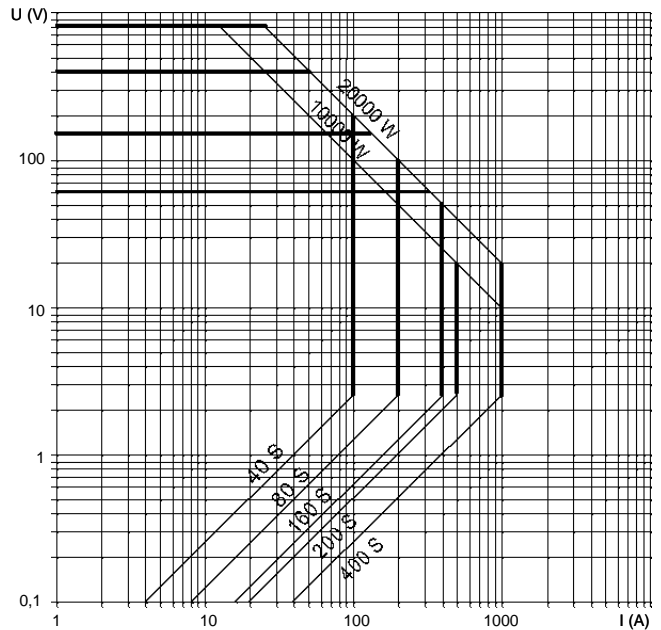
Automatic system configuration (only liquid cooled units)

Installed Interface Euro-Card INT2E (fit in the Control Unit ELC)

**Operating range air cooled units:**

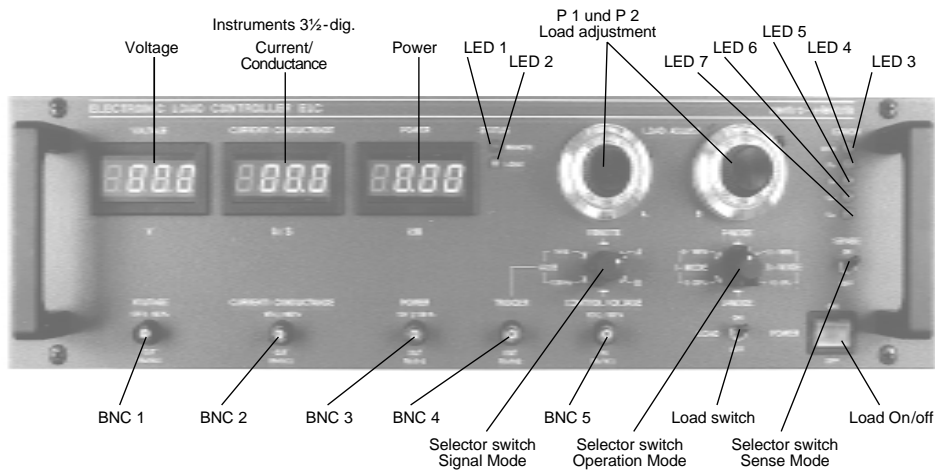


**Operating range liquid cooled units:**



**Control Unit:**

**Front panel:**

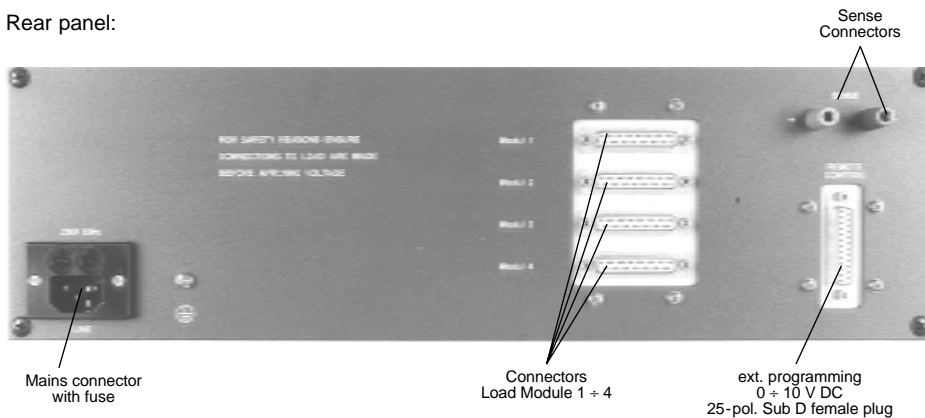


Signals:  
 BNC 1: Outp. true value Load voltage  
 BNC 2: Outp. true value Load current/ -conductance  
 BNC 3: Outp. true value Load power  
 BNC 4: Outp. trigger  
 BNC 5: Inp. control voltage

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

**Rear panel:**



**Examples of component parts for 19" rack:**

**Air cooled units:**

Control Unit ELC1800/160/600	3 HE
Filler panel	1 HE
Load Module ELM6000/160/200	9 HE
Filler panel	1 HE
Load Module ELM6000/160/200	9 HE
Filler panel	1 HE
Load Module ELM6000/160/200	9 HE
Filler panel	2 HE
Terminal Area	3 HE

Fully equipped: Type  
e.g.: ELS18 000/160/600

**Liquid cooled units:**

Control Unit ELC80000/160/800	3 HE
Filler panel	1 HE
Load Module ELM20000/160/200	6 HE
Filler panel	1 HE
Load Module ELM20000/160/200	6 HE
Filler panel	1 HE
Load Module ELM20000/160/200	6 HE
Filler panel	1 HE
Load Module ELM20000/160/200	6 HE
Filler panel	4 HE
Terminal Area	3 HE

Fully equipped: Type  
e.g.: ELS80 000/160/800

Control Unit ELC12000/60/1000	3 HE
Filler panel	1 HE
Load Module ELM6000/60/500	9 HE
Filler panel	1 HE
Load Module ELM6000/60/500	9 HE
Filler panel	12 HE
Terminal Area	3 HE

Partly equipped: Type  
e.g.: ELS12 000/60/1000

Control Unit ELC60000/60/1200	3 HE
Filler panel	1 HE
Load Module ELM20000/60/400	6 HE
Filler panel	1 HE
Load Module ELM20000/60/400	6 HE
Filler panel	1 HE
Load Module ELM20000/60/400	6 HE
Filler panel	11 HE
Terminal Area	3 HE

Partly equipped: Type  
e.g.: ELS60 000/60/1200