Microcontroller based – digitally controlled DC Load Electronic DC Load

DCL 3000 Series
Power 3000Watt

Zentro-Elektrik is announcing topically with its electronic DC load series DCL3000 a load for highest demands.

In not more than 3 U of a 19" rack, the power pack delivers a max. power dissipation of 3000Watt. This was only possible to achieve by choosing the most demanding and available semiconductors and by an optimized construction combined with fast monitoring and regulation.

The controller is a fully digital PID controller with 100 kHz sample rate with 16bit resolution of set point and 24bit resolution of actuating variable. The innovative controller design with automatically offset correction achieves an excellent accuracy of 0.15% of max. load current combined with extremely short transient time.

One of the big advantages is the opportunity to adapt the controller characteristics according to the attributes of the control path. The user easily can adjust the rise time in the range of 50µs...2s or optimizing the controller performance by varying the coefficients of the controller. That means, the load can be adapted fully flexible by the user to the situation of the load circuitry.

The novel control concept offers excellent flexibility. The load directly can be controlled from a computer by USB, IEEE, RS232, LAN (Ethernet) or via an operation panel which communicates via a USB.

Summing up, this is a generation of DC loads which fulfils the high requirements of each customer and is an excellent choice for complex test devices or single test places.

Since many years Zentro-Elektrik DC loads are a leader in demanding applications such as Fuel Cells, Accumulators, Power Supplies, Generators and Motors.

Technical Data:

Input:

Input voltage	100...240VAC, ±10%, 47–63Hz
Load voltage	0,3V .... 60V (0,6V at I_{max})
Load current	0,01A...320A
Load power	3000W (Derating at 30°C)
Mode of operation	I-, U-, P-, G-Mode (R-Mode) MPP-Mode Master-Slave Mode (5x load power)

Regulation:

Controller	digital PID-Controller (f_s=100kHz)
Resolution of digital controller (actuating variable)	24Bit
Resolution of set point	16Bit
Resolution measured values	16Bit
Accuracy	0,15% I_{max}
Rise time (10 – 90%, I-Mode)	50µs ... 2s, by user defined PID-Controller coefficient

Protection- and Control:

Over voltage protection	Switch OFF U_{Lmax} + 5%
Under voltage protection	Switch OFF U_{Lmin} - 0,1V
Load limitation	Limitation to P_{Lmax} when overstepping P_{Lmax} + 20%
Thermal protection:	Warning signal $T_{kk} \geq 82°C$ Switch OFF $T_{kk} \geq 85°C$ with automat. Switch ON after hysteresis undercut
Emergency stop function	external emergency stop (active +5V)
Galvanic isolation	Galvanic isolation between Load circuit and Control circuit
Protection load circuit	lead fuse

Environmental Conditions:

Operating temperature range	4 - 35°C, non-condensing
Cooling	int. fan, temperature controlled

Safety:

Electrical safety	EN 61010-1
Isolation test voltage	
Primary – PE	1390V_{eff}
Load input – PE	860V_{eff}
Primary – Load input	1430V_{eff}

EMC:

Input EMI filter	EN 61000-6-3
Input immunity	EN 61000-6-2

Control- Operation- and Indication Elements:

Operation elements	none
Control	LabView Driver or custom designed software with individual instruction set Modulation input BNC-bushing 50Ω Bandwidth (-3dB) 50Hz – 30kHz

zentro-elektrik GmbH KG | Tel.: ++49 (0) 7232-31310 | Fax: ++49 (0) 7232-3131399 | E-mail: info@zentro-elektrik.de

Indication	Over-, under voltage, Load limitation, Over temperature, Load_ON, Error, USB, 1 LED each
Interface	1 USB-interface each on the back- and front side

Electrical Connection:

Input voltage	IEC-connector on backside with switch on the front side
Load	Bus bars 12x12mm with studs M6x10 on unit back side
Sense connectors	Bushing 4mm, back side

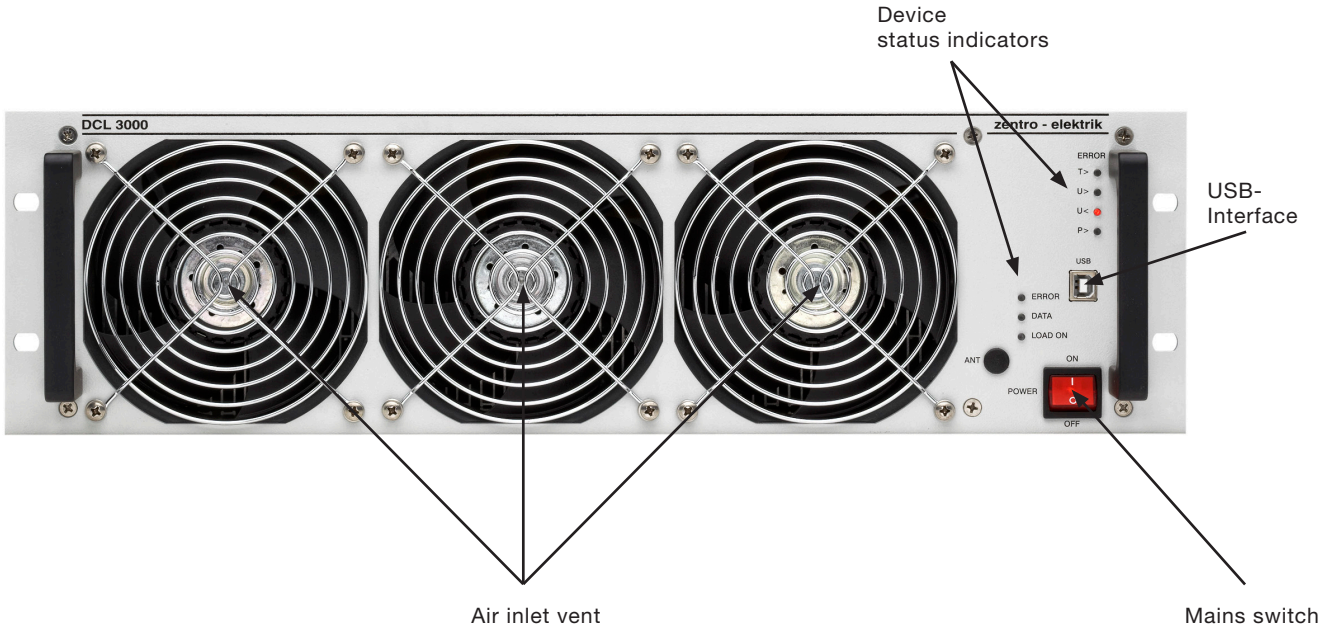
Dimension and weight:

Dimensions	19“ slide in module, 3U
wxhxd (dimension over all)	483 x 132.5 x 569mm
wxhxd (19“ dimension)	445 x 132,5 x 525mm
Weight	approx. 26kg

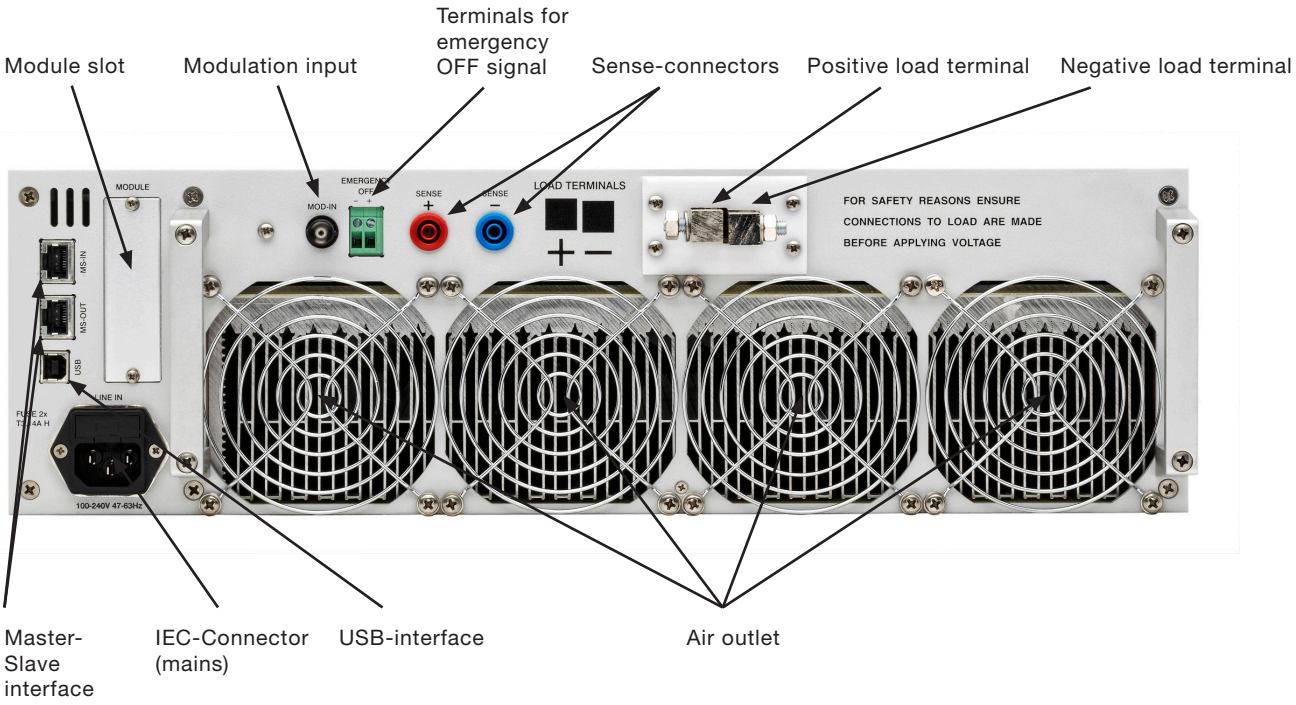
Options::

Interface	RS232, IEEE488, LAN

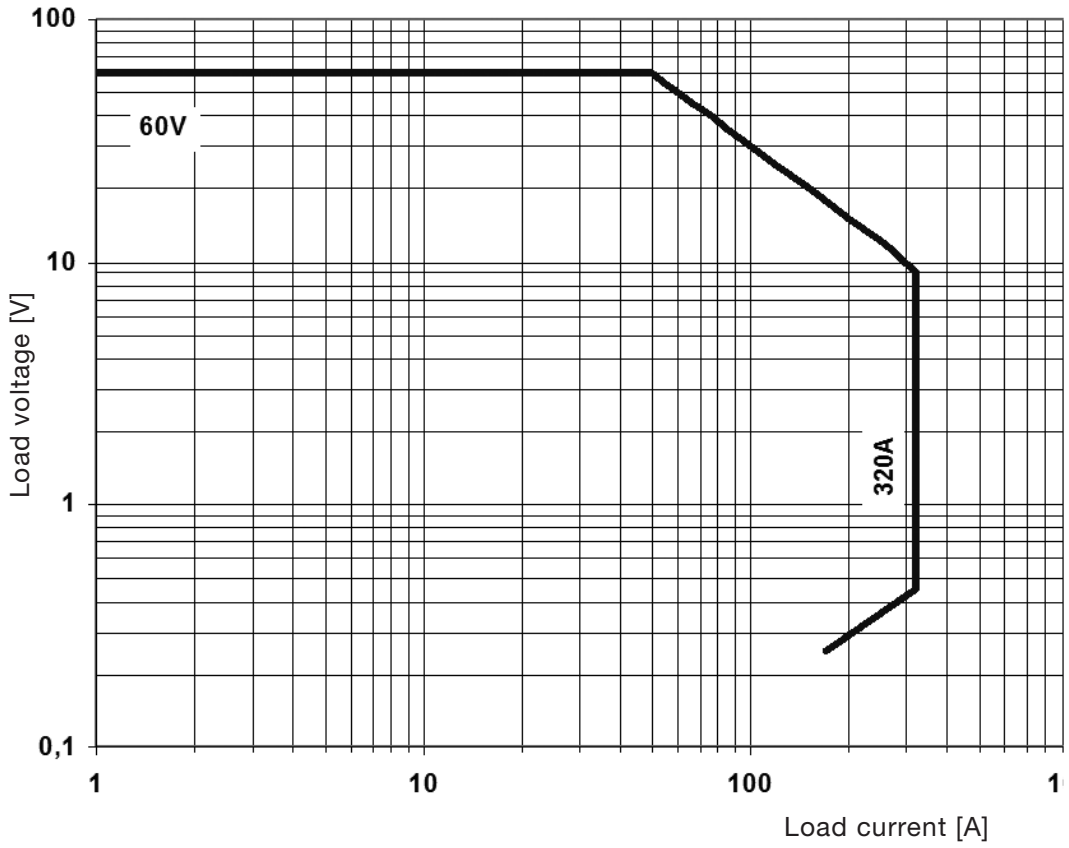
Front side view of DCL 3000



Rear side view of DCL 3000



Operating range DCL 3000



Power DCL 3000