

Linear regulated power supplies bipolar

Series NLB from $\pm 6,5 \text{ V}$ to $\pm 350 \text{ V}$ / 35 W to 1400 W



Design example

NLB 350 - 20
 $\pm 20 \text{ V} / \pm 15 \text{ A}$

Features:

- Single output power supply with adjustable bipolar output voltage and current. Instantaneous change of polarity.
- Voltage and current setting with 10-turn potentiometers with precision scale; the adjusting knob can be locked
- When equipped with an interface or with the analog programming, fast programmable including change of polarity
- Short circuit proof and allow unlimited operation with full current in short circuit condition
- One of the potentiometers is used for set point adjustment (selectable for voltage or current). The second potentiometer is for limiting the respective other value.
- $4\frac{1}{2}$ digit DVM for voltage and current (for table-top models)
- Sense terminals for the compensation of voltage drop on the load lines, for units up to 350 V nominal voltage.
- 4-quadrant operation is possible for passive loads (when the stored energy is low, optionally also for active loads or higher energy with reverse current)
- Suitable also for inductive and capacitive loads
- Standard starting current limitation from 700 W nominal power onwards

Function:

Bipolar linear regulated power supplies supply one output voltage, where the value and polarity is adjustable. The mains voltage is transformed to the appropriate level and rectified. The rectified voltage charges a bank of capacitors of the intermediate circuit to a constant voltage, which it is fed, via a set of serial power transistors, to the output. The output stages of the positive and the negative circuits are switched together in a push-pull manner. The regulation transistors define the final stability of the output voltage and the regulation speed. Bipolar power supplies are able to operate as 4-quadrant power amplifier. (optionally also for active loads).

Design:

- 19" table-top case (19" rack adaptors available)
- Cooling:
Convection or built-in fan with air outlet on the rear

Output:

- Output isolation:
The output is floating. Operating voltage with respect to earth: max. $\pm 500 \text{ V}$.
- Output terminals:
4mm safety connectors up to 20 A on the rear panel. For higher currents clamps installed on the rear

Technical Data:

- Mains connection:
Up to 1400 W nominal power:
 $230 \text{ V} \pm 10\%$ 47 Hz to 63 Hz
For 2800 W and higher:
 $400 \text{ V} \pm 10\%$ 47 Hz to 63 Hz , three-phase
- Ambient temperature:
 0°C to $+40^\circ \text{C}$
- Power loss:
at nominal load approx. 35%, during short circuit at nominal current approx. 140% and at no load approx. 15% of the nominal power.

The following data applies for voltage and current regulation, and refers to the rated value (unless otherwise stated): (For explanations please refer to Definitions and Terms on page 54.)

- Setting range:
from -100% to $+100\%$
- Setting resolution:
 $\pm 2 \times 10^{-4}$
- Residual ripple (0 - 10 MHz):
 $< 5 \times 10^{-4} \text{ pp} + 10 \text{ mVpp}$
- Recovery time:
Voltage regulation
 $< 50 \mu\text{s}$ for load changes from 10% to 100% or from 100% to 10%
Current regulation: $< 1 \text{ ms}$
- Setting time at nominal load:
 $< 1 \text{ ms}$ for full range
- Deviation:
For $\pm 10\%$ mains voltage variation:
 $< \pm 2 \times 10^{-5}$
For no load / full load:
 $< 2 \times 10^{-4}$
Over 8 hours under constant conditions:
 $< \pm 2 \times 10^{-4}$
Within the temperature range:
 $< \pm 2 \times 10^{-4} / \text{K}$

Possible Options:

- Analog programming (Output "A0" on "0V" potential, see page 44)
- Analog programming, floating (page 44)
- Computer interfaces - IEEE 488, RS 232, RS 422, Profibus DP, USB, LAN (more on request) (see page 46)
- Full 4-quadrant operation, even with active loads
- Higher programming speed

More options and special solutions on request. Some options may involve changes to the description of the unit - especially concerning the mechanical design.

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Type	Voltage	Current	Width	Height	Depth	Weight
NLB 35 - 6,5	0 - $\pm 6,5$ V	0 - ± 5 A	19" / 443 mm	4 U / 177 mm	450 mm	9 kg
NLB 140 - 6,5	0 - $\pm 6,5$ V	0 - ± 10 A	19" / 443 mm	4 U / 177 mm	450 mm	12 kg
NLB 350 - 6,5	0 - $\pm 6,5$ V	0 - ± 30 A	19" / 443 mm	4 U / 177 mm	550 mm	22 kg
NLB 700 - 6,5	0 - $\pm 6,5$ V	0 - ± 60 A	19" / 443 mm	8 U / 355 mm	550 mm	35 kg
NLB 1400 - 6,5	0 - $\pm 6,5$ V	0 - ± 120 A	19" / 443 mm	10 U / 443 mm	550 mm	55 kg
NLB 35 - 12,5	0 - $\pm 12,5$ V	0 - $\pm 2,5$ A	19" / 443 mm	4 U / 177 mm	450 mm	9 kg
NLB 140 - 12,5	0 - $\pm 12,5$ V	0 - ± 8 A	19" / 443 mm	4 U / 177 mm	450 mm	12 kg
NLB 350 - 12,5	0 - $\pm 12,5$ V	0 - ± 20 A	19" / 443 mm	4 U / 177 mm	550 mm	22 kg
NLB 700 - 12,5	0 - $\pm 12,5$ V	0 - ± 50 A	19" / 443 mm	5 U / 221 mm	550 mm	35 kg
NLB 1400 - 12,5	0 - $\pm 12,5$ V	0 - ± 80 A	19" / 443 mm	8 U / 355 mm	550 mm	55 kg
NLB 35 - 20	0 - ± 20 V	0 - $\pm 1,5$ A	19" / 443 mm	4 U / 177 mm	450 mm	9 kg
NLB 140 - 20	0 - ± 20 V	0 - ± 6 A	19" / 443 mm	4 U / 177 mm	450 mm	12 kg
NLB 350 - 20	0 - ± 20 V	0 - ± 15 A	19" / 443 mm	4 U / 177 mm	550 mm	22 kg
NLB 700 - 20	0 - ± 20 V	0 - ± 30 A	19" / 443 mm	5 U / 221 mm	550 mm	35 kg
NLB 1400 - 20	0 - ± 20 V	0 - ± 60 A	19" / 443 mm	8 U / 355 mm	550 mm	55 kg
NLB 35 - 35	0 - ± 35 V	0 - ± 1 A	19" / 443 mm	4 U / 177 mm	450 mm	9 kg
NLB 140 - 35	0 - ± 35 V	0 - ± 4 A	19" / 443 mm	4 U / 177 mm	450 mm	12 kg
NLB 350 - 35	0 - ± 35 V	0 - ± 10 A	19" / 443 mm	4 U / 177 mm	550 mm	22 kg
NLB 700 - 35	0 - ± 35 V	0 - ± 20 A	19" / 443 mm	5 U / 221 mm	550 mm	35 kg
NLB 1400 - 35	0 - ± 35 V	0 - ± 40 A	19" / 443 mm	7 U / 310 mm	550 mm	55 kg
NLB 35 - 65	0 - ± 65 V	0 - ± 500 mA	19" / 443 mm	4 U / 177 mm	450 mm	9 kg
NLB 140 - 65	0 - ± 65 V	0 - ± 2 A	19" / 443 mm	4 U / 177 mm	450 mm	12 kg
NLB 350 - 65	0 - ± 65 V	0 - ± 5 A	19" / 443 mm	4 U / 177 mm	550 mm	22 kg
NLB 700 - 65	0 - ± 65 V	0 - ± 10 A	19" / 443 mm	5 U / 221 mm	550 mm	35 kg
NLB 1400 - 65	0 - ± 65 V	0 - ± 20 A	19" / 443 mm	7 U / 310 mm	550 mm	55 kg

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Type	Voltage	Current	Width	Height	Depth	Weight
NLB 35 - 125	0 - ± 125 V	0 - ± 250 mA	19" / 443 mm	4 U / 177 mm	450 mm	9 kg
NLB 140 - 125	0 - ± 125 V	0 - ± 1 A	19" / 443 mm	4 U / 177 mm	450 mm	12 kg
NLB 350 - 125	0 - ± 125 V	0 - $\pm 2,5$ A	19" / 443 mm	4 U / 177 mm	550 mm	22 kg
NLB 700 - 125	0 - ± 125 V	0 - ± 5 A	19" / 443 mm	5 U / 221 mm	550 mm	35 kg
NLB 1400 - 125	0 - ± 125 V	0 - ± 10 A	19" / 443 mm	7 U / 310 mm	550 mm	55 kg
NLB 35 - 200	0 - ± 200 V	0 - ± 150 mA	19" / 443 mm	4 U / 177 mm	450 mm	9 kg
NLB 140 - 200	0 - ± 200 V	0 - ± 600 mA	19" / 443 mm	4 U / 177 mm	450 mm	12 kg
NLB 350 - 200	0 - ± 200 V	0 - $\pm 1,5$ A	19" / 443 mm	4 U / 177 mm	550 mm	22 kg
NLB 700 - 200	0 - ± 200 V	0 - ± 3 A	19" / 443 mm	5 U / 221 mm	550 mm	35 kg
NLB 1400 - 200	0 - ± 200 V	0 - ± 6 A	19" / 443 mm	7 U / 310 mm	550 mm	55 kg
NLB 35 - 350	0 - ± 350 V	0 - ± 100 mA	19" / 443 mm	4 U / 177 mm	450 mm	9 kg
NLB 140 - 350	0 - ± 350 V	0 - ± 400 mA	19" / 443 mm	4 U / 177 mm	450 mm	12 kg
NLB 350 - 350	0 - ± 350 V	0 - ± 1 A	19" / 443 mm	4 U / 177 mm	550 mm	22 kg
NLB 700 - 350	0 - ± 350 V	0 - ± 2 A	19" / 443 mm	5 U / 221 mm	550 mm	35 kg
NLB 1400 - 350	0 - ± 350 V	0 - ± 4 A	19" / 443 mm	7 U / 310 mm	550 mm	55 kg

On request we deliver power supplies of this type also with higher power.