

# Linear regulated power supplies unipolar Series NLN from 6,5 V to 500 V / 35 W to 1400 W



## Design examples

**NLN 1400 - 20**  
20V / 60A

### Features:

- Voltage and current setting with 10-turn potentiometers with precision scale; the adjusting knob can be locked
- Output voltage and output current are fast programmable
- No output capacitor
- All units are short circuit proof and allow unlimited operation with full current in short circuit condition
- Voltage and current regulation with automatic and sharp transition; control mode indicated by LEDs
- 4½ 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 350V nominal voltage. The rated voltage always refers to the output terminals
- Suitable also for inductive and capacitive loads
- Standard starting current limitation from 700W nominal power onwards

### Function:

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 given via a set of power transistors to the output. The series transistor defines the final stability of the output voltage and the regulation speed. Optionally a set of power transistors parallel to the output can act as a current sink to provide active pull down ability. The design of linear regulated power supplies is optimized for fast programming speed.

### Design:

- For 35W nominal power - ½19" table-top case,
- other models - 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. ±500V. Each of the output terminals may be connected to earth.
- 4mm safety connectors up to 20A on the rear panel. For higher currents clamps installed on the rear.

### Technical Data:

- Mains connection:  
Up to 1400W nominal power: 230V ±10% 47Hz to 63Hz  
For 2800W and higher: 400V ±10% 47Hz to 63Hz, three-phase
- Ambient temperature: 0°C to +40°C
- Power loss:  
At nominal load approx. 25%, during short circuit at nominal current approx 125% 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 from page 54.)

- Setting range:  
from approx. 0,1% to 100%
- Setting resolution:  
 $\pm 1 \times 10^{-4}$
- Residual ripple (0 - 10MHz):  
 $< 5 \times 10^{-4} \text{pp} + 10 \text{mVpp}$
- Recovery time:  
 $< 50 \mu\text{s}$  for load changes from 10% to 100% or from 100% to 10%
- Setting time at nominal load:  
 $< 1 \text{ms}$  for full range
- Deviation:  
For ±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 (The positive output has to be earthed; see also page 44)
- Analog programming, floating (see page 44)
- DVM with higher resolution
- Computer interfaces - IEEE 488, RS 232, RS 422, Profibus DP, USB, LAN (more on request) (see page 46)
- Active pull-down control. Parallel to the output is a set of power transistors operating as a current sink. (see page 48)
- 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.

# Linear regulated power supplies unipolar

## Series NLN from 6,5 V to 500 V / 35 W to 1400 W



### Design example

**NLN 700 - 250**  
250V / 2,8A

Customised design  
(Non standard voltage/ current  
prepared for 19" build-in)

| Type            | Voltage    | Current    | Width         | Height       | Depth  | Weight |
|-----------------|------------|------------|---------------|--------------|--------|--------|
| NLN 35 - 6,5    | 0 - 6,5 V  | 0 - 5 A    | ½19" / 222 mm | 3 U / 133 mm | 350 mm | 5 kg   |
| NLN 140 - 6,5   | 0 - 6,5 V  | 0 - 10 A   | 19" / 443 mm  | 3 U / 133 mm | 350 mm | 10 kg  |
| NLN 350 - 6,5   | 0 - 6,5 V  | 0 - 30 A   | 19" / 443 mm  | 4 U / 177 mm | 450 mm | 19 kg  |
| NLN 700 - 6,5   | 0 - 6,5 V  | 0 - 60 A   | 19" / 443 mm  | 4 U / 177 mm | 550 mm | 38 kg  |
| NLN 1400 - 6,5  | 0 - 6,5 V  | 0 - 120 A  | 19" / 443 mm  | 7 U / 310 mm | 550 mm | 50 kg  |
| NLN 35 - 12,5   | 0 - 12,5 V | 0 - 2,5 A  | ½19" / 222 mm | 3 U / 133 mm | 350 mm | 5 kg   |
| NLN 140 - 12,5  | 0 - 12,5 V | 0 - 8 A    | 19" / 443 mm  | 3 U / 133 mm | 350 mm | 10 kg  |
| NLN 350 - 12,5  | 0 - 12,5 V | 0 - 20 A   | 19" / 443 mm  | 4 U / 177 mm | 450 mm | 19 kg  |
| NLN 700 - 12,5  | 0 - 12,5 V | 0 - 50 A   | 19" / 443 mm  | 4 U / 177 mm | 550 mm | 38 kg  |
| NLN 1400 - 12,5 | 0 - 12,5 V | 0 - 80 A   | 19" / 443 mm  | 7 U / 310 mm | 550 mm | 50 kg  |
| NLN 35 - 20     | 0 - 20 V   | 0 - 1,5 A  | ½19" / 222 mm | 3 U / 133 mm | 350 mm | 5 kg   |
| NLN 140 - 20    | 0 - 20 V   | 0 - 6 A    | 19" / 443 mm  | 3 U / 133 mm | 350 mm | 10 kg  |
| NLN 350 - 20    | 0 - 20 V   | 0 - 15 A   | 19" / 443 mm  | 4 U / 177 mm | 450 mm | 19 kg  |
| NLN 700 - 20    | 0 - 20 V   | 0 - 30 A   | 19" / 443 mm  | 4 U / 177 mm | 550 mm | 35 kg  |
| NLN 1400 - 20   | 0 - 20 V   | 0 - 60 A   | 19" / 443 mm  | 7 U / 310 mm | 550 mm | 50 kg  |
| NLN 35 - 35     | 0 - 35 V   | 0 - 1 A    | ½19" / 222 mm | 3 U / 133 mm | 350 mm | 5 kg   |
| NLN 140 - 35    | 0 - 35 V   | 0 - 4 A    | 19" / 443 mm  | 3 U / 133 mm | 350 mm | 10 kg  |
| NLN 350 - 35    | 0 - 35 V   | 0 - 10 A   | 19" / 443 mm  | 4 U / 177 mm | 450 mm | 19 kg  |
| NLN 700 - 35    | 0 - 35 V   | 0 - 20 A   | 19" / 443 mm  | 4 U / 177 mm | 550 mm | 35 kg  |
| NLN 1400 - 35   | 0 - 35 V   | 0 - 40 A   | 19" / 443 mm  | 7 U / 310 mm | 550 mm | 50 kg  |
| NLN 35 - 65     | 0 - 65 V   | 0 - 500 mA | ½19" / 222 mm | 3 U / 133 mm | 350 mm | 5 kg   |
| NLN 140 - 65    | 0 - 65 V   | 0 - 2 A    | 19" / 443 mm  | 3 U / 133 mm | 350 mm | 10 kg  |
| NLN 350 - 65    | 0 - 65 V   | 0 - 5 A    | 19" / 443 mm  | 4 U / 177 mm | 450 mm | 19 kg  |
| NLN 700 - 65    | 0 - 65 V   | 0 - 10 A   | 19" / 443 mm  | 4 U / 177 mm | 550 mm | 35 kg  |
| NLN 1400 - 65   | 0 - 65 V   | 0 - 20 A   | 19" / 443 mm  | 7 U / 310 mm | 550 mm | 50 kg  |

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

# Linear regulated power supplies unipolar

## Series NLN from 6,5 V to 500 V / 35 W to 1400 W



**Design example**  
**Customer specific**  
**special versions**

**NLN 22500M - 15**  
 15V / 1500A for 0,5s

Special design:  
 Intermediate storage of energy  
 Adjustable internal resistance

**NLN 3000M - 10**  
 10V / 300A  
 In rel. Duty cycle 10%



| Type           | Voltage   | Current    | Width         | Height       | Depth  | Weight |
|----------------|-----------|------------|---------------|--------------|--------|--------|
| NLN 35 - 125   | 0 - 125 V | 0 - 250 mA | ½19" / 222 mm | 3 U / 133 mm | 350 mm | 5 kg   |
| NLN 140 - 125  | 0 - 125 V | 0 - 1 A    | 19" / 443 mm  | 3 U / 133 mm | 350 mm | 10 kg  |
| NLN 350 - 125  | 0 - 125 V | 0 - 2,5 A  | 19" / 443 mm  | 4 U / 177 mm | 450 mm | 19 kg  |
| NLN 700 - 125  | 0 - 125 V | 0 - 5 A    | 19" / 443 mm  | 4 U / 177 mm | 550 mm | 30 kg  |
| NLN 1400 - 125 | 0 - 125 V | 0 - 10 A   | 19" / 443 mm  | 7 U / 310 mm | 550 mm | 50 kg  |
| NLN 35 - 200   | 0 - 200 V | 0 - 150 mA | ½19" / 222 mm | 3 U / 133 mm | 350 mm | 5 kg   |
| NLN 140 - 200  | 0 - 200 V | 0 - 600 mA | 19" / 443 mm  | 3 U / 133 mm | 350 mm | 10 kg  |
| NLN 350 - 200  | 0 - 200 V | 0 - 1,5 A  | 19" / 443 mm  | 4 U / 177 mm | 450 mm | 19 kg  |
| NLN 700 - 200  | 0 - 200 V | 0 - 3 A    | 19" / 443 mm  | 4 U / 177 mm | 550 mm | 30 kg  |
| NLN 1400 - 200 | 0 - 200 V | 0 - 6 A    | 19" / 443 mm  | 7 U / 310 mm | 550 mm | 50 kg  |
| NLN 35 - 350   | 0 - 350 V | 0 - 100 mA | ½19" / 222 mm | 3 U / 133 mm | 350 mm | 5 kg   |
| NLN 140 - 350  | 0 - 350 V | 0 - 400 mA | 19" / 443 mm  | 3 U / 133 mm | 350 mm | 10 kg  |
| NLN 350 - 350  | 0 - 350 V | 0 - 1 A    | 19" / 443 mm  | 4 U / 177 mm | 450 mm | 19 kg  |
| NLN 700 - 350  | 0 - 350 V | 0 - 2 A    | 19" / 443 mm  | 4 U / 177 mm | 550 mm | 25 kg  |
| NLN 1400 - 350 | 0 - 350 V | 0 - 4 A    | 19" / 443 mm  | 7 U / 310 mm | 550 mm | 50 kg  |
| NLN 35 - 500   | 0 - 500 V | 0 - 60 mA  | ½19" / 222 mm | 3 U / 133 mm | 350 mm | 5 kg   |
| NLN 140 - 500  | 0 - 500 V | 0 - 250 mA | 19" / 443 mm  | 3 U / 133 mm | 350 mm | 10 kg  |
| NLN 350 - 500  | 0 - 500 V | 0 - 600 mA | 19" / 443 mm  | 4 U / 177 mm | 450 mm | 19 kg  |
| NLN 700 - 500  | 0 - 500 V | 0 - 1,2 A  | 19" / 443 mm  | 4 U / 177 mm | 550 mm | 25 kg  |
| NLN 1400 - 500 | 0 - 500 V | 0 - 2,5 A  | 19" / 443 mm  | 7 U / 310 mm | 550 mm | 50 kg  |

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