

# LDT960 Series

## 960 W 3-Phase DIN Rail Switching Power Supply

LDT960 Series is a high power switching mode power supplies with three phase input voltage 400 – 500 VAC, delivering 960 W of output power, covering output voltages from 24 to 72 V (model dependent).

Their compact size, high efficiency and excellent reliability together with easy installation make them fit demanding applications where compactness and high power are needed.

LDT960 Series are Class I isolation devices suitable for SELV and PELV circuitry (up to 48 VDC models) and are designed to be mounted on DIN rail and installed inside a protective enclosure.



### FEATURES

- Three phase AC input 400 - 500 VAC or DC input 520 - 725 VDC
- Output voltages 24 V, 48 V, 72 V (adjustable)
- Operating ambient temperature range -40°C to +70°C
- Efficiency up to 93%
- Overload 150%
- Constant current or hiccup mode limitation (user settable)
- Low noise thermally regulated “long life” fan
- 72 V output model as standard
- Compact size in aluminum enclosure
- Dimensions: 80 x 127 x 137.5 mm



### APPLICATIONS

- Automation
- Process control
- Communication
- Instrumentation equipment

## 1. MODEL SELECTION

| MODEL     | INPUT VOLTAGE RANGE           | # OF PHASES | OUTPUT VOLTAGE | MAX OUTPUT CURRENT | EFFICIENCY | MAX OUTPUT POWER |
|-----------|-------------------------------|-------------|----------------|--------------------|------------|------------------|
| LDT960-24 | 400 - 500 VAC (520 - 725 VDC) | 3           | 24 V           | 40 A               | 92.5 %     | 960 W            |
| LDT960-48 | 400 - 500 VAC (520 - 725 VDC) | 3           | 48 V           | 20 A               | 92.5 %     | 960 W            |
| LDT960-72 | 400 - 500 VAC (520 - 725 VDC) | 3           | 72 V           | 13.3 A             | 93.0 %     | 960 W            |

## 2. INPUT SPECIFICATIONS

| PARAMETER                              | DESCRIPTION / CONDITIONS                                                                                       | SPECIFICATION                           |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| AC Input Voltage <sup>1</sup>          | Nominal, 3 phases (UL certified)<br>Range                                                                      | 400 - 500 VAC<br>340 - 550 VAC          |
| DC Input Voltage                       |                                                                                                                | 520 - 725 VDC                           |
| Input Frequency                        |                                                                                                                | 47 - 63 Hz                              |
| AC Input Current                       | V <sub>in</sub> = 400 VAC                                                                                      | 2.4 A                                   |
|                                        | V <sub>in</sub> = 500 VAC                                                                                      | 2.1 A                                   |
| DC Input Current                       | V <sub>in</sub> = 520 VDC                                                                                      | 2.2 A                                   |
|                                        | V <sub>in</sub> = 725 VDC                                                                                      | 1.7 A                                   |
| Inrush Peak Current<br>I <sub>pt</sub> | Peak Current measured after 0.2 ms from main connection;<br>400 VAC / 50 Hz; T <sub>a</sub> = 25°C; Cold Start | ≤ 50 A<br>1.86 A <sup>2s</sup>          |
| Touch (Leakage) Current                |                                                                                                                | ≤ 0.1 mA                                |
| Internal Protection Fuse               | None, external fuse must be provided                                                                           |                                         |
| Recommended External Protection        | It is strongly recommended to provide external surge arresters (SPD) according to local regulations.           | Fuse 3x 10 AT<br>or 3x MCB 10 A C curve |

<sup>1</sup> In case of 2-phase-operation, reduce the output load to 50% of the nominal value.

## 3. OUTPUT SPECIFICATIONS

| PARAMETER                        | DESCRIPTION / CONDITIONS                                                          | SPECIFICATION |
|----------------------------------|-----------------------------------------------------------------------------------|---------------|
| Output Voltage (Adjustable)      | 24 V model                                                                        | 23 - 28 VDC   |
|                                  | 48 V model                                                                        | 45 - 55 VDC   |
|                                  | 72 V model                                                                        | 72 - 85 VDC   |
| Output Current (Continuous)      | 24 V model                                                                        | 40 A          |
|                                  | 48 V model                                                                        | 20 A          |
|                                  | 72 V model                                                                        | 13.3 A        |
| Load Regulation                  | 24 V model                                                                        | ≤ 1.0 %       |
|                                  | 48 V & 72 V models                                                                | ≤ 0.5 %       |
| Ripple & Noise <sup>2</sup>      |                                                                                   | ≤ 150 mVpp    |
| Hold-up Time                     |                                                                                   | ≥ 15 ms       |
| Status Signals                   | DC OK - green LED<br>OVERLOAD - red LED<br>DC OK - dry contact (NO, 24 VDC / 1 A) |               |
| Parallel Connection <sup>3</sup> | Possible for redundancy (with external ORing module)                              |               |

<sup>2</sup> Ripple and Noise are measured with 20 MHz bandwidth, probe terminated with a 0.1 μF MKP parallel capacitor.

<sup>3</sup> Pay attention, set the current limitation mode jumper on C.C. mode when connecting more units in parallel.

## 4. PROTECTIONS

| PARAMETER                | DESCRIPTION / CONDITIONS                        | SPECIFICATION   |
|--------------------------|-------------------------------------------------|-----------------|
| Short Circuit Protection | Constant current or Hiccup mode (user settable) |                 |
| Overload Protection      | Overload Limit<br>in constant current mode      | 24 V model 44 A |
|                          |                                                 | 48 V model 22 A |
|                          |                                                 | 72 V model 15 A |
|                          | Overload Limit<br>in hiccup mode (max. 5 s)     | 24 V model 60 A |
|                          |                                                 | 48 V model 30 A |
|                          |                                                 | 72 V model 20 A |
| Thermal Protection       |                                                 |                 |
| Over Voltage Protection  | 24 V model                                      | ≥ 33 VDC        |
|                          | 48 V model                                      | ≥ 68 VDC        |
|                          | 72 V model                                      | ≥ 100 VDC       |

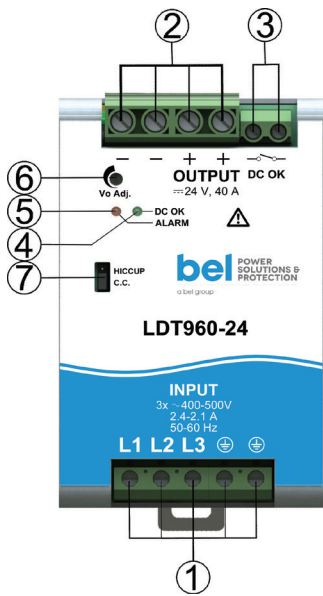
## 5. ENVIRONMENTAL, EMC & SAFETY SPECIFICATIONS

| PARAMETER                    | DESCRIPTION / CONDITIONS                                                                      | SPECIFICATION                                                       |
|------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Operating Temperature        | UL certified up to 45°C<br>Start-up type tested: - 40°C, possible at Vnom with load deration. | -40 to +70 °C                                                       |
| Storage Temperature          |                                                                                               | -40 to +80 °C                                                       |
| Derating                     | Over 45°C                                                                                     | - 15 W/°C                                                           |
| Dissipated Power             | 24 V & 48 V models                                                                            | < 78 W                                                              |
|                              | 72 V model                                                                                    | < 73 W                                                              |
| Humidity                     | Non-condescending                                                                             | 5 - 95 % RH                                                         |
| Life Time Expectancy         | Ta = 25°C, full load                                                                          | 63 200 (7.2) hrs (years)                                            |
| MTBF                         | MIL-HDBK-217F at Ta = 25°C, full load                                                         | > 500 000 hrs                                                       |
| Overvoltage Category         | EN 50178                                                                                      | III                                                                 |
| Pollution Degree             | IEC 60664-1                                                                                   | 2                                                                   |
| Protection Class             | Class I                                                                                       |                                                                     |
| Isolation                    | Input to Output                                                                               | 4.2 kVDC                                                            |
|                              | Input to Ground                                                                               | 2.2 kVDC                                                            |
|                              | Output to Ground                                                                              | 0.75 kVDC                                                           |
| Safety Standards & Approvals | UL 508 (certified)<br>IEC/EN 61010-1<br>IEC/EN 61010-2-201<br>IEC/EN 60950                    |                                                                     |
| EMC Emissions                | EN 55011 / CISPR 11                                                                           | Class A                                                             |
|                              | EN 61000-3-2                                                                                  | Class A                                                             |
| EMC Immunity                 | EN 61000-4-2                                                                                  | Level 3                                                             |
|                              | EN 61000-4-3                                                                                  | Level 3                                                             |
|                              | EN 61000-4-4                                                                                  | Level 3                                                             |
|                              | EN 61000-4-5                                                                                  | Level 4                                                             |
|                              | EN 61000-4-11                                                                                 | Level 2                                                             |
| Protection Degree            | EN 60529                                                                                      | IP20                                                                |
| Vibration Sinusoidal         | IEC 60068-2-6                                                                                 | 5 - 17.8 Hz: ±1.6 mm; 17.8 - 500 Hz:<br>2 g 2 hours / axis (X,Y, Z) |
| Shock                        | IEC 60068-2-27                                                                                | 30 g 6 ms, 20 g 11 ms;<br>3 bumps / direction, 18 bumps total       |

6. MECHANICAL SPECIFICATIONS

| PARAMETER            | DESCRIPTION / CONDITIONS                                                                   | SPECIFICATION                                |
|----------------------|--------------------------------------------------------------------------------------------|----------------------------------------------|
| Dimensions           |                                                                                            | 80 x 127 x 137.5 mm<br>3.15 x 5.00 x 5.41 in |
| Weight               |                                                                                            | 1300 g                                       |
| Mounting Rail        | IEC 60715/H15/TH35-7.5(-15)                                                                |                                              |
| Connection Terminals | Screw type header (16 - 10 AWG)<br>Screw type header (10 - 6 AWG) for output on 24 V model | 1.5 - 6 mm²<br>6 - 16 mm²                    |
| Case Material        | Aluminum                                                                                   |                                              |

7. PIN LAYOUT & DESCRIPTION



| PIN | DESCRIPTION                                   |
|-----|-----------------------------------------------|
| 1   | AC/DC input                                   |
| 2   | DC output (load)                              |
| 3   | Diagnostic Output (dry contact, NC output OK) |
| 4   | Green LED: Output OK                          |
| 5   | Red LED: Overload                             |
| 6   | Output voltage adjustment                     |
| 7   | Selectable limitation mode                    |

| INPUT CONNECTION | Three-phase                                                      | DC Input                                                                            |
|------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                  | L1 = Phase 1<br>L2 = Phase 2<br>L3 = Phase 3<br>⊕ = Earth ground | L1 = + Positive DC<br>L2 = - Negative DC<br>L3 = do not connect<br>⊕ = Earth ground |

| OUTPUT CONNECTION | + = Positive DC<br>- = Negative DC |
|-------------------|------------------------------------|
|-------------------|------------------------------------|

| SIGNALLING | DC OK: dry contact<br>• NO<br>• COM |
|------------|-------------------------------------|
|------------|-------------------------------------|

## 8. MECHANICAL DRAWING

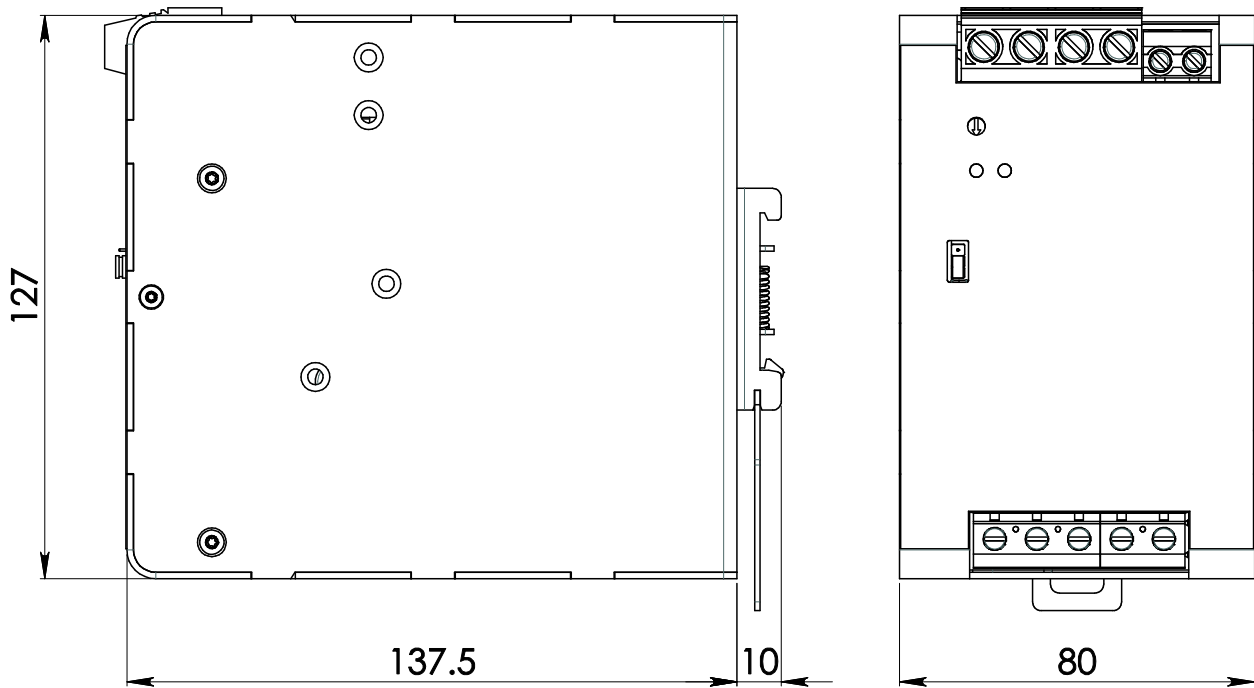


Figure 1. Mechanical Drawing

**Notes:**

Technical parameters are typical, measured in laboratory environment at 25°C and 400 VAC / 50 Hz, at nominal values, after minimum 5 minutes of operation. Power rating, losses, efficiency, ripple, thermal behaviour and start-up may change outside of the nominal rated input range. Contact factory for details.

**NUCLEAR AND MEDICAL APPLICATIONS** - Products are not designed or intended for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems.

**TECHNICAL REVISIONS** - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.