

# Sync DIN Rail Power Supply

## 24V 30W 1 Phase (NEC Class 2) / DRS-24V30W1AZ

# sync



### Highlights & Features

- Ultra compact size and galvanic isolation up to 3.0kVac between input to output
- Universal AC input voltage and full power from -10°C to +55°C operation
- Up to 88.0% efficiency
- Low earth leakage current < 0.5mA @ 240Vac
- NEC Class 2 / Limited Power Source (LPS) certified
- Overvoltage / Overcurrent / Over Temperature Protections
- Meet Surge Immunity IEC 61000-4-5, Level 4 (CM: 4kV, DM: 2kV)

### Safety Standards



CB Certified for worldwide use

**Model Number:** DRS-24V30W1AZ  
**Unit Weight:** 0.10 kg (0.22 lb)  
**Dimensions (L x W x D):** 75 x 21 x 89.5 mm (2.95 x 0.83 x 3.52 inch)

### General Description

The ultra-compact and competitively priced Delta Sync DIN rail power supply series is designed for industrial applications requiring highly reliable power supply within a tight space. The Sync series operates with universal AC input range and offers full power up to 55°C. All models in the series are certified according to IEC/EN/UL 60950-1 & IEC/EN/UL 62368-1 for Information Technology Equipment (ITE) and UL 508 Industrial Control Equipment (ICE). The series is also fully compliant with RoHS Directive for environmental protection. NEC Class 2 and Limited Power Source (LPS) approvals are available for this product.

### Model Information

Sync DIN Rail Power Supply

| Model Number  | Input Voltage Range | Rated Output Voltage | Rated Output Current |
|---------------|---------------------|----------------------|----------------------|
| DRS-24V30W1AZ | 85-264Vac           | 24Vdc                | 1.25A                |

### Model Numbering

| DR       | S –                               | 24V            | 30W          | 1            | A      | Z                              |
|----------|-----------------------------------|----------------|--------------|--------------|--------|--------------------------------|
| DIN Rail | Product Series<br>S – Sync Series | Output Voltage | Output Power | Single Phase | No PFC | Without DC OK<br>Relay Contact |

# Sync DIN Rail Power Supply

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### Specifications

#### Input Ratings / Characteristics

|                                 |                                    |                          |
|---------------------------------|------------------------------------|--------------------------|
| Nominal Input Voltage           | 100-240Vac                         |                          |
| Input Voltage Range             | 85-264Vac                          |                          |
| Nominal Input Frequency         | 50-60Hz                            |                          |
| Input Frequency Range           | 47-63Hz                            |                          |
| Input Current                   | < 0.80A @ 115Vac, < 0.40A @ 230Vac |                          |
| Efficiency at 100% Load         | 88.0% typ. @ 230Vac                |                          |
| Max Power Dissipation           | No load                            | < 0.5W @ 115Vac & 230Vac |
|                                 | 100% load                          | < 2.5W @ 115Vac & 230Vac |
| Max Inrush Current (Cold Start) | < 30A @ 115Vac, < 60A @ 230Vac     |                          |
| Leakage Current                 | < 0.5mA @ 240Vac                   |                          |

#### Output Ratings / Characteristics\*

|  |  |
|--|--|
| Nominal Output Voltage                                   | 24Vdc  |
| Factory Set point Tolerance                              | 24Vdc $\pm$ 1%   |
| Output Voltage Adjustment Range                          | 21.6-26.4Vdc   |
| Output Current   | 1.25A (30W max.)   |
| Output Power   | 30W  |
| Line Regulation  | < 1% typ. (@ 85-264Vac, 100% load)   |
| Load Regulation  | < 1% typ. (@ 85-264Vac, 0-100% load)   |
| PARD** (20MHz)   | < 150mVpp @ > 0°C to 70°C<br>< 500mVpp @ 0°C to -20°C  |
| Rise Time  | < 50ms @ nominal input (100% load)   |
| Start-up Time  | < 3,000ms @ 115Vac (100% load)<br>< 1,600ms @ 230Vac (100% load)   |
| Hold-up Time   | > 20ms @ 230Vac (100% load)  |
| Dynamic Response<br>(Overshoot & Undershoot O/P Voltage) | $\pm$ 5% @ 85-264Vac input, 0-50% load, 50-100%<br>(Slew Rate: 0.1A/ $\mu$ s, 50% duty cycle @ 5Hz to 100Hz) |
| Start-up with Capacitive Loads                           | 3,000 $\mu$ F Max  |

\*For power de-rating from < -10°C to -20°C, and 55°C to 70°C, see power de-rating on page 3.

\*\*PARD is measured with an AC coupling mode, 5cm wires, and in parallel with 0.1 $\mu$ F ceramic capacitor & 47 $\mu$ F electrolytic capacitor.

# Sync DIN Rail Power Supply

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### Mechanical

|                                   |  |                         |
|-----------------------------------|--|-------------------------|
| Case Cover / Chassis              | Plastic  |                         |
| Dimensions (L x W x D)            | 75 x 21 x 89.5 mm (2.95 x 0.83 x 3.52 inch)        |                         |
| Unit Weight                       | 0.10 kg (0.22 lb)                                  |                         |
| LED Indicator                     | Green LED  | DC OK                   |
| Cooling System                    | Convection   |                         |
| Terminal                          | Input  | 3 Pins (Rated 300V/16A) |
|                                   | Output   | 2 Pins (Rated 300V/16A) |
| Wire                              | Input / Output                                     | AWG 26-12               |
| Mounting Rail                     | Standard TS35 DIN Rail in accordance with EN 60715 |                         |
| Noise (1 Meter from power supply) | Sound Pressure Level (SPL) < 25dBA                 |                         |

### Environment

|                             |                               |   |
|-----------------------------|-------------------------------|---|
| Surrounding Air Temperature | Operating                     | -20°C to +70°C  |
|                             | Storage                       | -40°C to +85°C  |
| Power De-rating             | Temperature                   | -10°C to -20°C de-rate power by 5% / °C<br>> 55°C de-rate power by 3.33% / °C                                 |
| Operating Humidity          | 5 to 95% RH (Non-Condensing)  |   |
| Operating Altitude          | 0 to 2,000 Meters (6,560 ft.) |   |
| Shock Test                  | Non-Operating                 | IEC60068-2-27, Half Sine Wave: 50G for a duration of 11ms; 3 times per direction                              |
|                             | Operating                     | IEC 60068-2-27, Half Sine Wave: 10G for a duration of 11ms, 1 shock for X direction                           |
| Vibration                   | Non-Operating                 | IEC 60068-2-6, Random: 5-500Hz; 2.09Grms, 20 min per axis for all X, Y, Z directions                          |
|                             | Operating                     | IEC 60068-2-6, Sine Wave: 10-500Hz @ 19.6m/S <sup>2</sup> (2G peak); 10 min per cycle, 60 min for X direction |
| Over Voltage Category       | II                            |   |
| Pollution Degree            | 2                             |   |

### Protections

|                          |   |
|--------------------------|---|
| Overvoltage              | < 34.8V, SELV Output, Auto-Recovery   |
| Overload / Overcurrent   | 110-150% of rated load current, Hiccup Mode, Non-Latching (Auto-Recovery when the fault is removed) |
| Over Temperature         | Auto-Recovery   |
| Short Circuit            | Auto-Recovery when the fault is removed   |
| Internal Fuse at L pin   | T3.15A  |
| Degree of Protection     | IP20  |
| Protection Against Shock | Class I with PE* connection   |

\*PE: Primary Earth

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### Reliability Data

|                        |                                    |                |  |
|------------------------|------------------------------------|----------------|--|
| MTBF                   | Telcordia SR-332                   | > 700,000 hrs. | I/P: 100Vac,<br>O/P: 100% load, Ta: 25°C |
| Expected Cap Life Time | 10 years (230Vac, 50% load @ 40°C) |                |  |

### Safety Standards / Directives

|                              |                   |  |
|------------------------------|-------------------|--|
| Safety Entry Low Voltage     |                   | SELV (EN 60950)  |
| Electrical Safety            | TUV Bauart        | EN 60950-1, EN 62368-1   |
|                              | UL/cUL recognized | UL 60950-1, CSA C22.2 No. 60950-1 (File No. E131881)<br>UL 62368-1, CSA C22.2 No. 62368-1 (File No. E131881)   |
|                              | CB Scheme         | IEC 60950-1, IEC 62368-1 Limited Power Source (LPS)  |
| Industrial Control Equipment | UL/cUL listed     | UL 508 and CSA C22.2 No. 107.1-01 (File No. E338991)   |
| Class 2 Power Supply         | UL/cUL recognized | UL 60950-1, CSA C22.2 No. 60950-1 (File No. E131881)<br>UL 62368-1, CSA C22.2 No. 62368-1 (File No. E131881)   |
| CCC                          |                   | GB9254, GB17625.1 and GB4943.1   |
| CE                           |                   | In conformance with EMC Directive 2014/30/EU and Low Voltage Directive 2014/35/EU  |
| UKCA                         |                   | In conformance with 2016 No. 1101. The Electrical Equipment (Safety) Regulations 2016 and 2016 No. 1091 The Electromagnetic Compatibility Regulations 2016 |
| Galvanic Isolation           | Input to Output   | 3.0KVac  |
|                              | Input to Ground   | 1.5KVac  |
|                              | Output to Ground  | 0.5KVac  |

### EMC

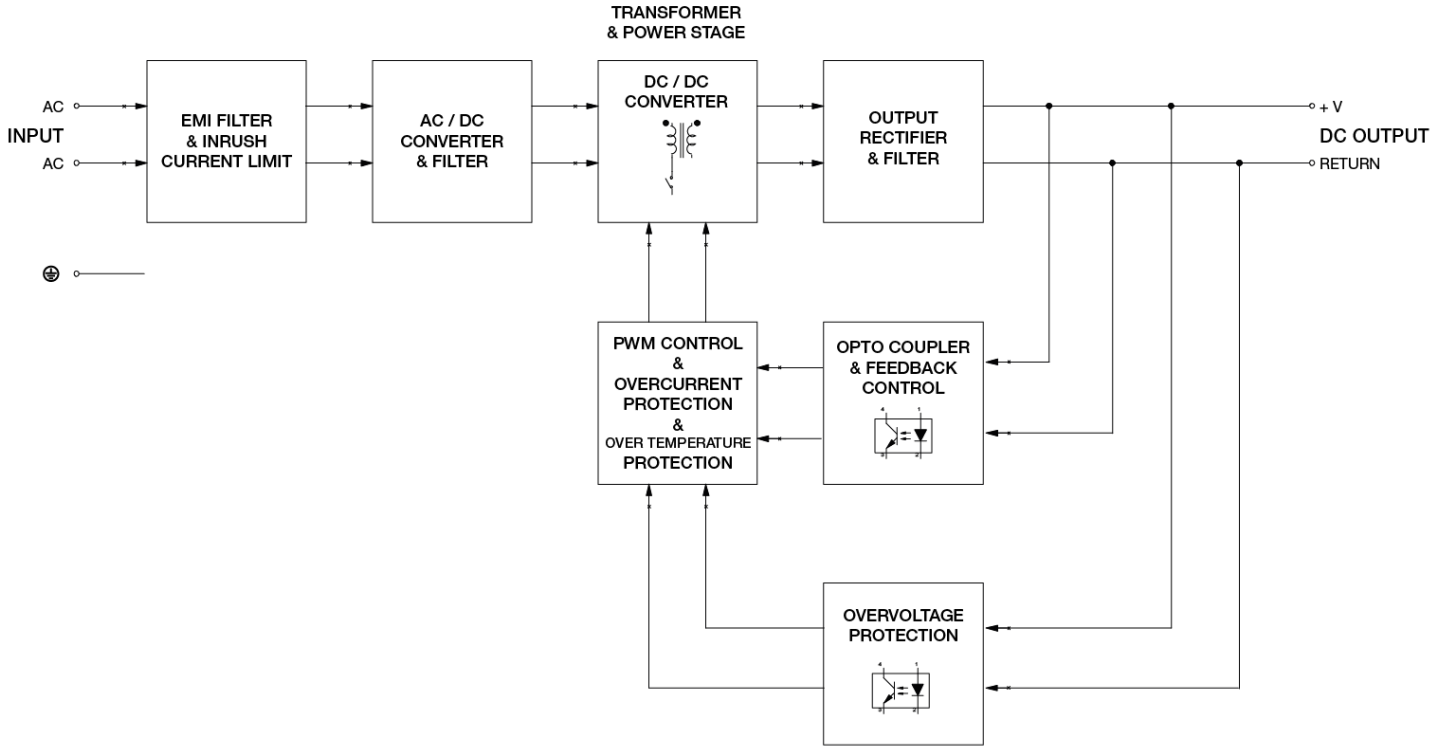
|                                   |                |  |
|-----------------------------------|----------------|--|
| Emissions (CE & RE)               |                | Generic Standards: EN 61000-6-3, EN 61000-6-4<br>CISPR 32, EN 55032, FCC Title 47: Class B                   |
| Immunity                          |                | Generic Standards: EN 55024  |
| Electrostatic Discharge           | IEC 61000-4-2  | Criteria A <sup>1)</sup><br>Air Discharge: 8kV(Level 3)<br>Contact Discharge: 8kV(Level 4)                   |
| Radiated Field                    | IEC 61000-4-3  | Level 3 Criteria A <sup>1)</sup><br>80MHz-1GHz, 10V/M with 1kHz tone / 80% modulation                        |
| Electrical Fast Transient / Burst | IEC 61000-4-4  | Level 4 Criteria A <sup>1)</sup><br>4kV  |
| Surge                             | IEC 61000-4-5  | Level 4 Criteria A <sup>1)</sup><br>Common Mode <sup>2)</sup> : 4kV<br>Differential Mode <sup>3)</sup> : 2kV |
| Conducted                         | IEC 61000-4-6  | Level 3 Criteria A <sup>1)</sup><br>150kHz-80MHz, 10Vrms   |
| Power Frequency Magnetic Fields   | IEC 61000-4-8  | Criteria A <sup>1)</sup><br>1A/Meter   |
| Voltage Dips and Interruptions    | IEC 61000-4-11 | > 100% dip; 1 cycle (20ms)   |
| Voltage Fluctuation and Flicker   |                | IEC/EN 61000-3-3   |

1) Criteria A: Normal performance within the specification limits  
2) Asymmetrical: Common mode (Line to earth)  
3) Symmetrical: Differential mode (Line to line)

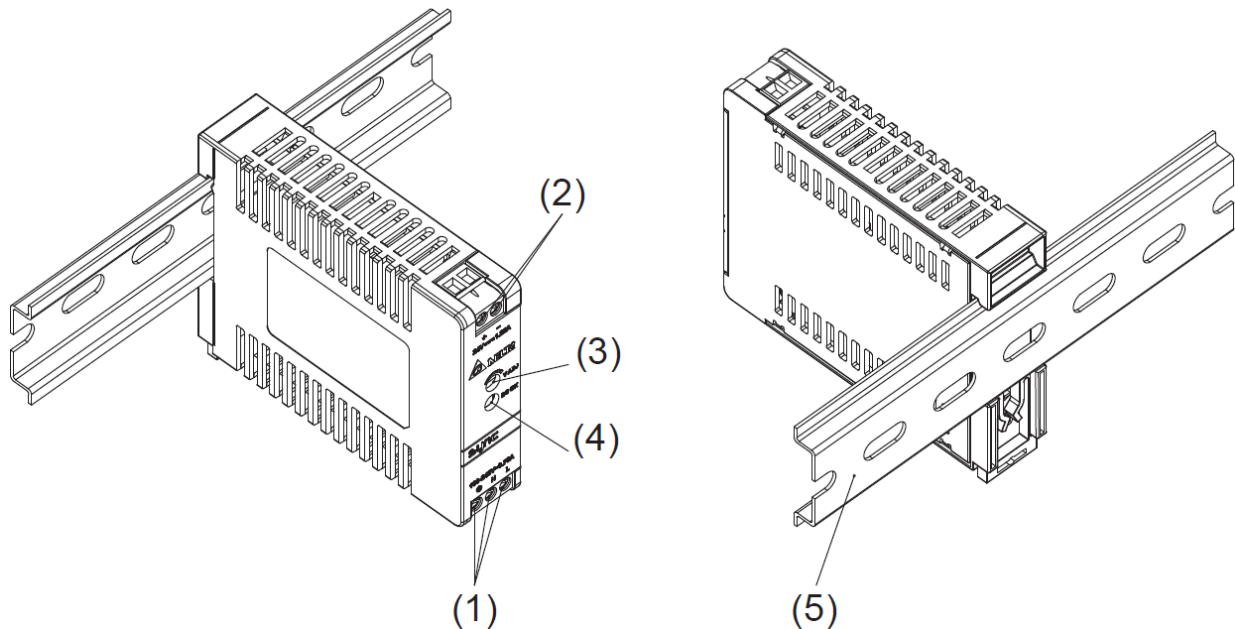
# Sync DIN Rail Power Supply

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## Block Diagram



## Device Description



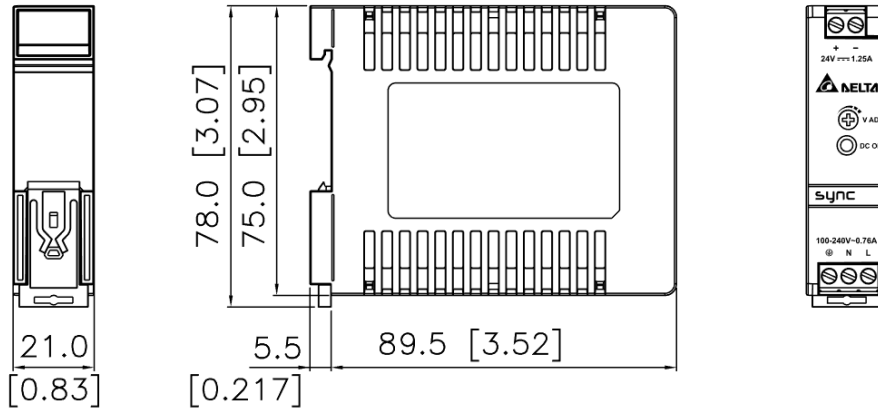
- 1) Input terminal block connector
- 2) Output terminal block connector
- 3) DC voltage adjustment potentiometer
- 4) DC OK LED (Green)
- 5) Universal mounting system

# Sync DIN Rail Power Supply

## 24V 30W 1 Phase (NEC Class 2) / DRS-24V30W1AZ

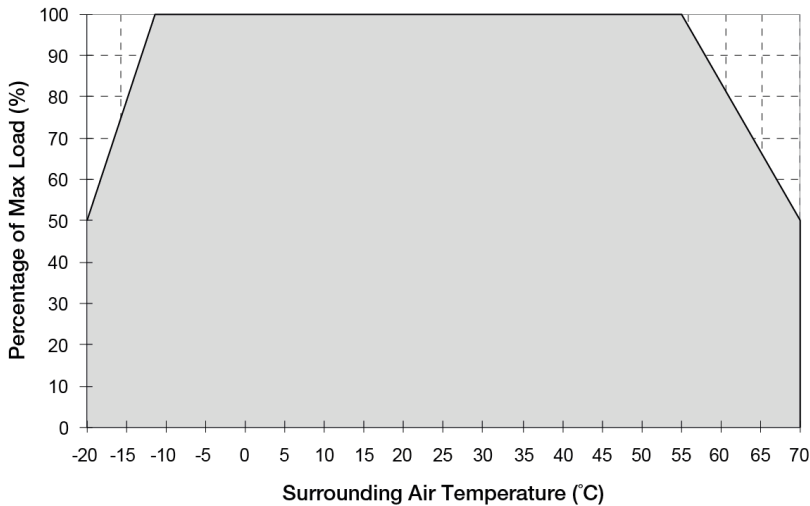
### Dimensions

L x W x D: 75 x 21 x 89.5 mm [2.95 x 0.83 x 3.52 inch]



### Engineering Data

#### Output Load De-rating VS Surrounding Air Temperature



**Fig. 1 De-rating for Vertical Mounting Orientation**

-10°C to -20°C de-rate power by 5% / °C  
 > 55°C de-rate power by 3.33% / °C

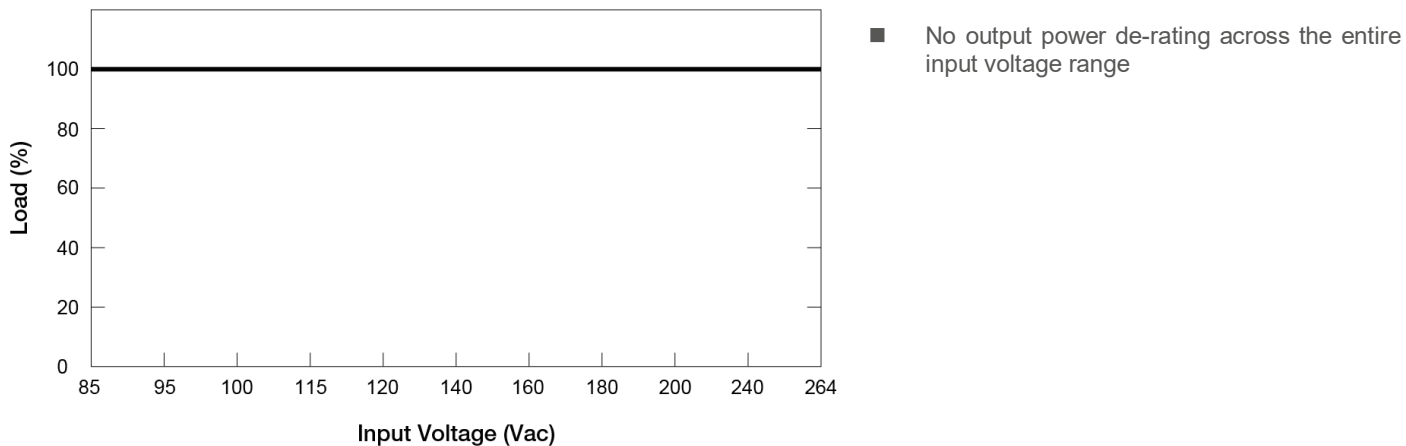
#### Note

1. Power supply components may degrade, or be damaged, when the power supply is continuously used outside the shaded region, refer to the graph shown in Fig. 1.
2. If the output capacity is not reduced when the surrounding air temperature exceeds its specification as defined on Page 3 under "Environment", the device will run into Over Temperature Protection. When activated, the output voltage will go into bouncing mode and will recover when the surrounding air temperature is lowered or the load is reduced as far as necessary to keep the device in working condition.
3. In order for the device to function in the manner intended, it is also necessary to keep a safety distance as recommended in the safety instructions while the device is in operation.
4. Depending on the surrounding air temperature and output load delivered by the power supply, the device can be very hot!
5. If the device has to be mounted in any other orientation, please contact [info@deltapsu.com](mailto:info@deltapsu.com) for more details.

# Sync DIN Rail Power Supply

## 24V 30W 1 Phase (NEC Class 2) / DRS-24V30W1AZ

### Output Load De-rating VS Input Voltage

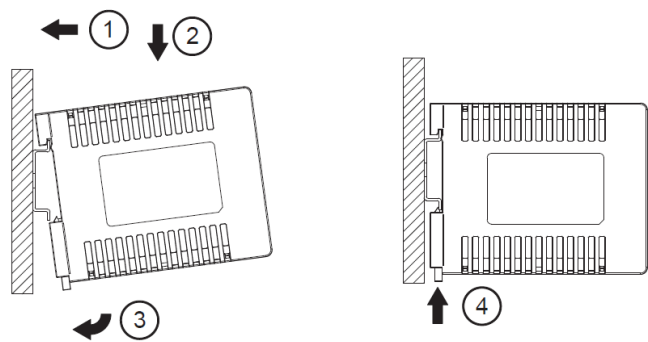


### Assembly & Installation

The power supply unit (PSU) can be mounted on 35 mm (1.38 inch) DIN rails in accordance with EN60715. The device should be installed with input terminal block at the bottom.

Each device is delivered ready to install.

#### Mounting

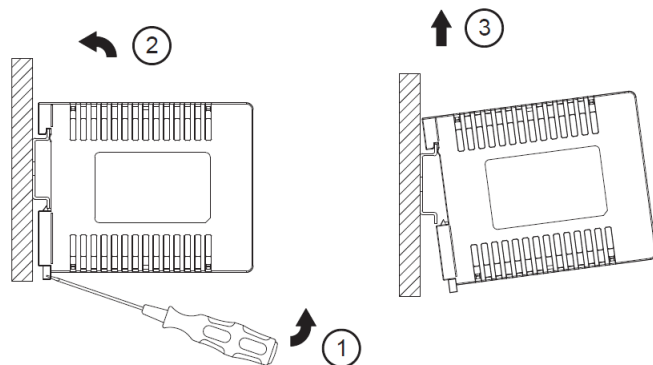


**Fig. 2.1 Mounting**

Snap on the DIN rail as shown in Fig. 2.1:

1. Tilt the unit upwards and insert it onto the DIN rail.
2. Push downwards until stopped.
3. Press against the bottom front side for locking.
4. Shake the unit slightly to ensure that it is secured.

#### Dismounting



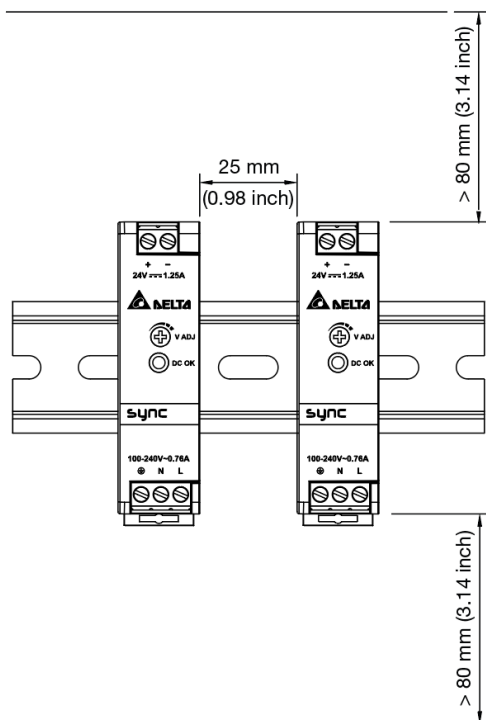
**Fig. 2.2 Dismounting**

To uninstall, pull or slide down the latch with screw driver as shown in Fig. 2.2. Then slide the power supply unit (PSU) in the opposite direction, release the latch and pull out the power supply unit (PSU) from the rail.

# Sync DIN Rail Power Supply

## 24V 30W 1 Phase (NEC Class 2) / DRS-24V30W1AZ

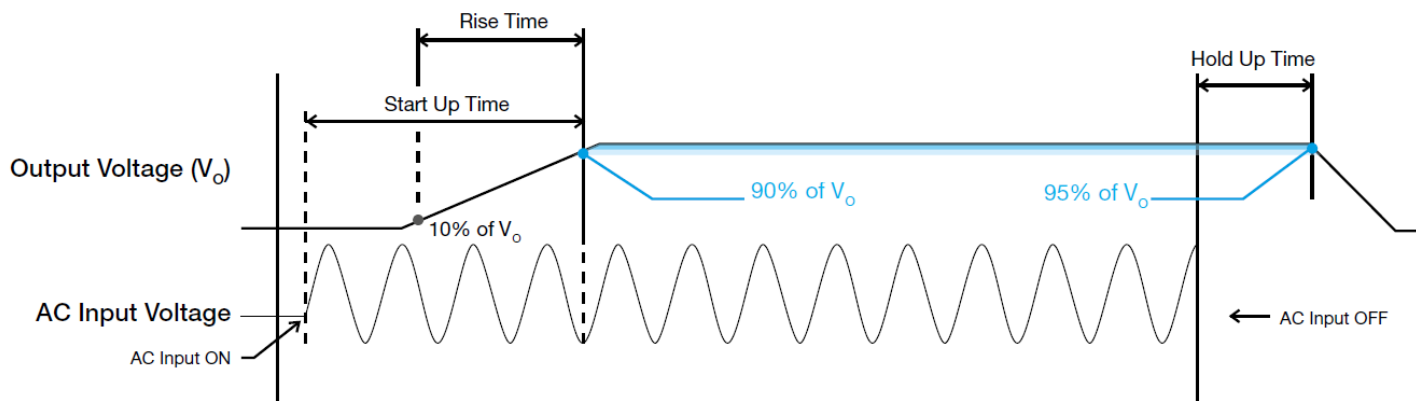
### Safety Instructions



- ALWAYS switch mains of input power OFF before connecting and disconnecting the input voltage to the unit. If mains are not turned OFF, there is risk of explosion / severe damage.
- To guarantee sufficient convection cooling, keep a distance of 80 mm (3.14 inch) above and below the device as well as a lateral distance of 25 mm (0.98 inch) to other units.
- Note that the enclosure of the device can become very hot depending on the surrounding air temperature and load of the power supply. Risk of burns!
- The main power must be turned off before connecting or disconnecting the wires to the terminals!
- DO NOT insert any objects into the device.
- Dangerous voltages present for at least 5 minutes after disconnecting all sources of power.
- The power supplies unit should be installed in minimum IP54 rated enclosure.
- The power supplies are built in units and must be installed in a cabinet or room (condensation free environment and indoor location) that is relatively free of conductive contaminants.

### Functions

#### ■ Graph illustrating the Start-up Time, Rise Time, and Hold-up Time



#### Start-up Time

The time required for the output voltage to reach 90% of its final steady state set value, after the input voltage is applied.

#### Rise Time

The time required for the output voltage to change from 10% to 90% of its final steady state set value.

#### Hold-up Time

Time between the collapse of the AC input voltage, and the output falling to 95% of its steady state set value.

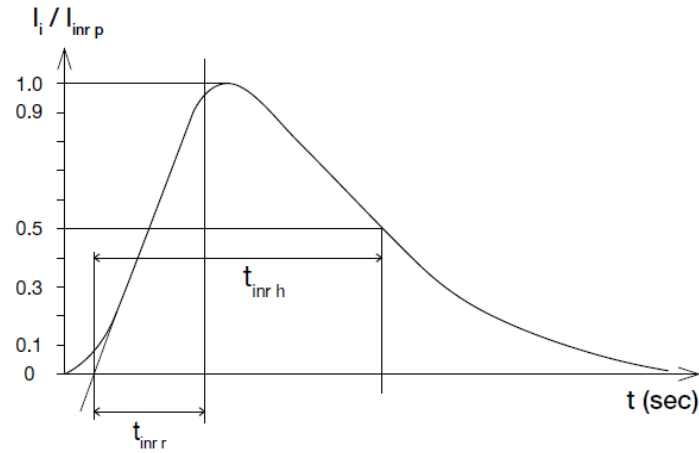


# Sync DIN Rail Power Supply

## 24V 30W 1 Phase (NEC Class 2) / DRS-24V30W1AZ

### Inrush Current

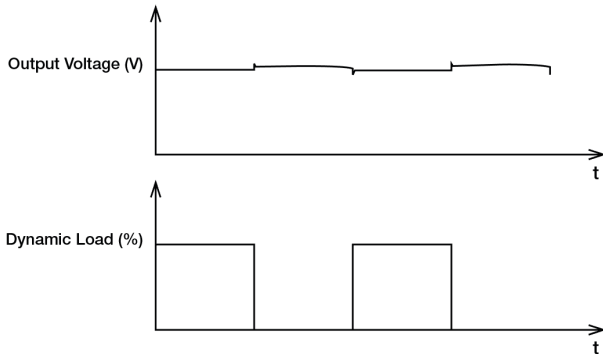
Inrush current is the peak, instantaneous, input current measured and, occurs when the input voltage is first applied. For AC input voltages, the maximum peak value of inrush current will occur during the first half cycle of the applied AC voltage. This peak value decreases exponentially during subsequent cycles of AC voltage.



### Dynamic Response

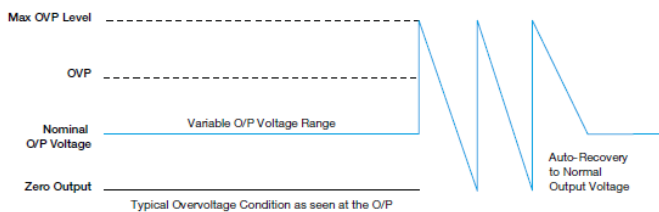
The power supply output voltage will remain within  $\pm 5\%$  of its steady state value, when subjected to a dynamic load from 10% to 100% of its rated current.

■ 50% duty cycle / 5Hz to 100Hz



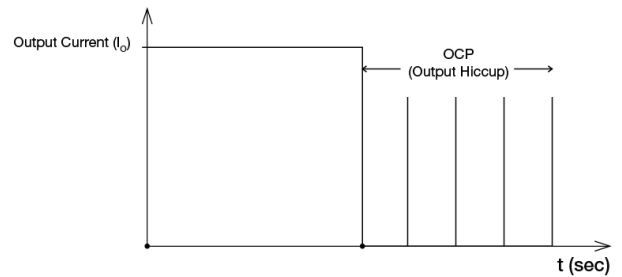
### Overvoltage Protection (Auto-Recovery)

The power supply's overvoltage circuit will be activated when its internal feedback circuit fails. The output voltage shall not exceed its specifications defined on Page 3 under "Protections".



### Overload & Overcurrent Protections (Auto-Recovery)

The power supply's Overload (OLP) and Over current (OCP) Protections will be activated when output current ( $I_o$ ) exceeds its specification as defined on Page 3 under "Protections". In such occurrence, once the power supply has reached its maximum power limit, the protection is activated and the power supply will go into "Hiccup mode" (Auto-Recovery). The power supply will recover once the fault condition of the OLP and OCP is removed and  $I_o$  is back within the specifications.



It is not recommended to prolong the duration of  $I_o$  when it is less than OLP/OCP point, but greater than 100%, since it may cause damage to the PSU.

### Over Temperature Protection (Auto-Recovery)

As described in load de-rating section, the power supply also has Over Temperature Protection (OTP). In the event of a higher operating temperature at 100% load, the power supply will run into OTP when the operating temperature is beyond what is recommended in the de-rating graph. When activated, the output voltage will go into bouncing mode until the temperature drops to its normal operating temperature as recommended in the de-rating graph.

### Short Circuit Protection (Auto-Recovery)

The power supply's output OLP/OCP function also provides protection against short circuits. When a short circuit is applied, the output current will operate in "Hiccup mode", as shown in the illustration in the OLP/OCP section on this page. The power supply will return to normal operation after the short circuit is removed.

# Sync DIN Rail Power Supply

## 24V 30W 1 Phase (NEC Class 2) / DRS-24V30W1AZ

### Operating Mode

#### ■ Redundancy Operation

In order to ensure proper redundant operation for the power supply units (PSUs), the output voltage difference between the two units must be kept at 0.45~0.50V for these 24V supplies. Follow simple steps given below to set them up for the redundant operation:

##### Step 1.

Measure output voltage of PSU 1 and PSU 2. If PSU 1 is the master unit, then  $V_O$  of PSU 1 must be higher than PSU 2. In order to set the output voltage, individually connect each power supply to 50% of rated load at any line voltage from 85-264Vac, and set the PSU 1 and PSU 2 output voltage.

##### Step 2.

Connect the power supply units PSU 1 and PSU 2 to  $V_{in} 1$  &  $V_{in} 2$ , respectively, of the DRR-20N (or 20A) module shown on the right of above diagram.

##### Step 3.

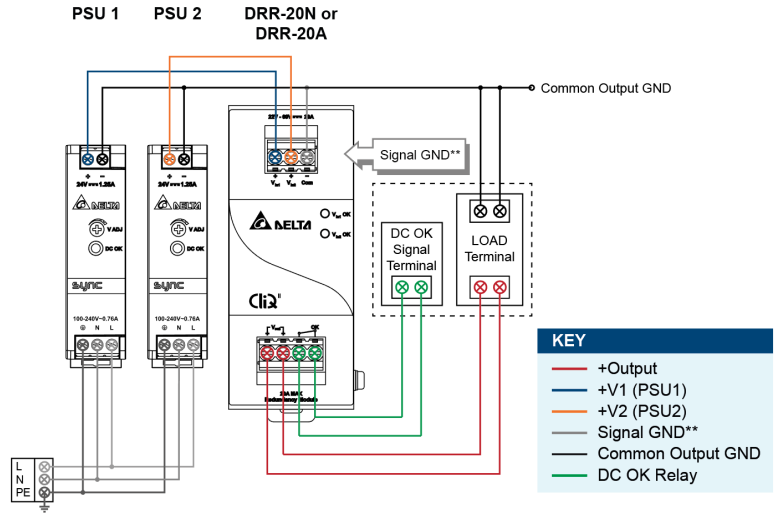
Connect the system load from  $V_{out}$ . Please note that output voltage  $V_{out}$  from DRR module will be  $= V_O$  (output voltage of power supply)  $- V_{drop}^*$  (in DRR module).

\* $V_{drop}$  will vary from 0.60V to 0.90V (Typical 0.65V) depending on the load current and surrounding air temperature.

#### ■ Parallel Operation

The power supply units (PSUs) can also be used for parallel operation in order to increase the output power. The difference in output voltage between the two units must be kept to within 25mV of each other. This difference must be verified with the same output load connected independently to each unit.

Parameters such as EMI, inrush current, leakage current, PARD, start up time will be different from those on the datasheet, when two units are connected in parallel. The user will need to verify that any differences will still allow the two power supplies connected in parallel will work properly in their product/application.



\*\*The Signal GND in the DRR module is for the built-in LED and DC OK signals. The Output GND terminals from the two PSU's do not need to be connected to the Signal GND terminal.

Fig. 3 Redundant Operation Connection Diagram

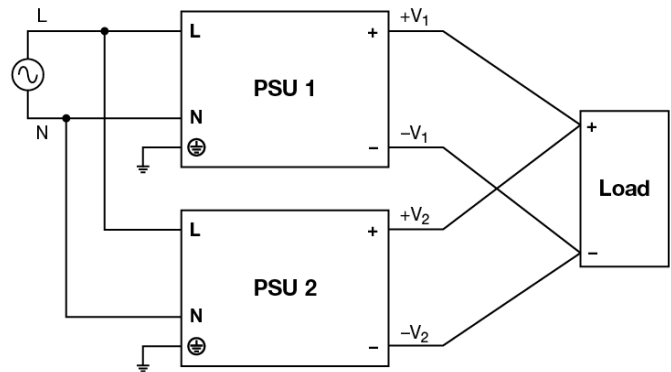


Fig. 4 Parallel Operation Connection Diagram

# Sync DIN Rail Power Supply

## 24V 30W 1 Phase (NEC Class 2) / DRS-24V30W1AZ

### Others

#### Attention

Delta provides all information in the datasheets on an "AS IS" basis and does not offer any kind of warranty through the information for using the product. In the event of any discrepancy between the information in the catalog and datasheets, the datasheets shall prevail (please refer to [www.DeltaPSU.com](http://www.DeltaPSU.com) for the latest datasheets information). Delta shall have no liability of indemnification for any claim or action arising from any error for the provided information in the datasheets. Customer shall take its responsibility for evaluation of using the product before placing an order with Delta.

Delta reserves the right to make changes to the information described in the datasheets without notice.

### Manufacturer and Authorized Representatives Information

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