

# Power Supplies Datasheet

## Single Output Multi-Range Power Supplies

### Broad Product Range

**Current: Up to 72 Amps**

**Voltage: Up to 800 Volts**

**Power: Up to 720 Watts**



### Tools for Improved Debugging

- Multi-range operation extends the Voltage and Current limit up to 3 times compared to conventional supply.
  - ✓ Single unit covers wide Voltage and Current Ranges.
- Adjustable Slew Rates for the level transition of both Current and Voltage.
  - ✓ Adjustable slew rates allows flexible output setting in various testing conditions.
- Ch1 and Ch2 support Constant Voltage and Constant Current Operation.
  - ✓ Flexible voltage and current output configurations for a broader application coverage.
- Fully programmable via LAN and USB interface.
  - ✓ Full remote control extends the usability from the bench to automated systems.
- 3 years warranty as standard.
  - ✓ Reliable product gives peace of mind.

### Models and Characteristics

| Models      | Voltage   | Current    | Power |
|-------------|-----------|------------|-------|
| T3PS30721P  | 0 – 30 V  | 0 – 72 A   | 720 W |
| T3PS80271P  | 0 – 80 V  | 0 – 27 A   | 720 W |
| T3PS160141P | 0 – 160 V | 0 – 14.4 A | 720 W |
| T3PS250041P | 0 – 250 V | 0 – 4.5 A  | 360 W |
| T3PS800011P | 0 – 800 V | 0 – 1.44 A | 360 W |

# MULTI-OUTPUT PROGRAMMABLE DC POWER SUPPLY

**The new T3PS series are single-output multi-range programmable switching DC Power Supplies covering a power range up to 720 W. This series of products offers five models with rated voltages of 30 V, 80 V, 160 V, 250 V and 800 V and 360 W and 720 W maximum output powers. The multi-range feature allows for a flexible and efficient configuration of voltage and current within the rated power range. A maximum of two units in series and a maximum of three units in parallel can be connected for applications requiring Voltage/Current higher than the rated output. The combination of multi-range power output feature and series/parallel operation capability of T3PS series significantly reduces the cost by accommodating the projects with wide range of power requirements.**

The C.V/C.C priority selection of the T3PS series is a very useful feature for DUT protection. The conventional power supply normally operates under C.V mode when the power output is turned on. This could bring a high inrush current to the capacitive load or current-intensive load at the power-On stage. Taking the I-V curve verification of LED as an example, it becomes a very challenging task to perform this measurement using a conventional power supply. With LED connected to a power supply under C.V mode as the initial setting, when the power output is turned on and the voltage rises to the LED forward voltage, the current will suddenly peak up and exceed the preset value of current limit. Upon detecting this high current, the power supply starts the transition from C.V mode to C.C mode. Though the current becomes stable after the C.C mode being activated, the current spike occurred at the C.V and C.C crossover point may possibly damage the DUT. At the power output-on stage, the T3PS supply is capable of operating under C.C priority to limit the current spike occurred at the threshold voltage and protects DUT from the inrush current damage.

The adjustable slew rate of the PSW-Series allows users to set a specific rise/fall time for signal transitions of either output voltage or output current. The adjustable slew rate feature is useful in manufacturing tests of lighting where a device or large capacitor during power output-on are associated with the occurrence of high surge current, which can greatly reduce the life time of the DUT. To prevent inrush current from damaging currentintensive devices, a smooth and slow voltage transition during power On-Off can significantly reduce the spike current and protect the device from high current damage.

The T3PS series offers OVP and OCP. Both OVP and OCP levels can be selected, with default level set at 110 % of the rated voltage/current of the power supply. When any of the protection levels is tripped, the power output will be disabled to protect the DUT. The T3PS provides USB Host/Device and LAN interfaces as standard. An analog control/monitoring connector is also available on the rear panel for external control of power On/Off and external monitoring of power output Voltage and Current.

# PANEL INTRODUCTION

## 720 W Models: T3PS30721P, T3PS80271P, T3PS160141P



- |                 |                            |
|-----------------|----------------------------|
| 1 Voltage Knob  | 9 Analog Control Connector |
| 2 Current Knob  | 10 USB B Port              |
| 3 Output Key    | 11 Output Terminal (+)     |
| 4 Function Keys | 12 Sense Terminal (+/-)    |
| 5 USB A Port    | 13 Output Terminal (-)     |
| 6 Display       | 14 Fan                     |
| 7 Cover Panel   | 15 AC Input                |
| 8 Power Switch  | 16 LAN Port                |



**Output Terminals**  
(30, 80, 160 volt models)



**Output Terminals**  
(250, 800 volt models)

## Features

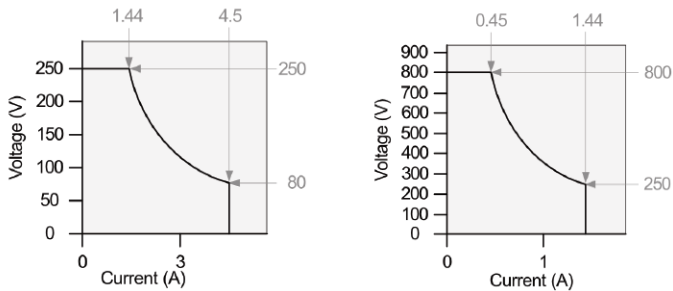
- Voltage Rating: 30 V / 80 V / 160 V / 250 V / 800 V, Output Power Rating: 360 W – 720 W
- Multi-range Voltage & Current Combinations in One Power Supply
- C.V/C.C Priority; Particularly Suitable for the Battery and LED Industry Adjustable Slew Rate
- Series Operation (2 units in Series), Parallel Operation (3 units in Parallel)
- High Efficiency and High Power Density
- 1/6, 1/3 Rack Mount Size Design (EIA/JIS Standard) for 360 W, 720 W
- Standard Interface: LAN, USB, Analog Control Interface

## 360 W Models: T3PS250041P, T3PS800011P

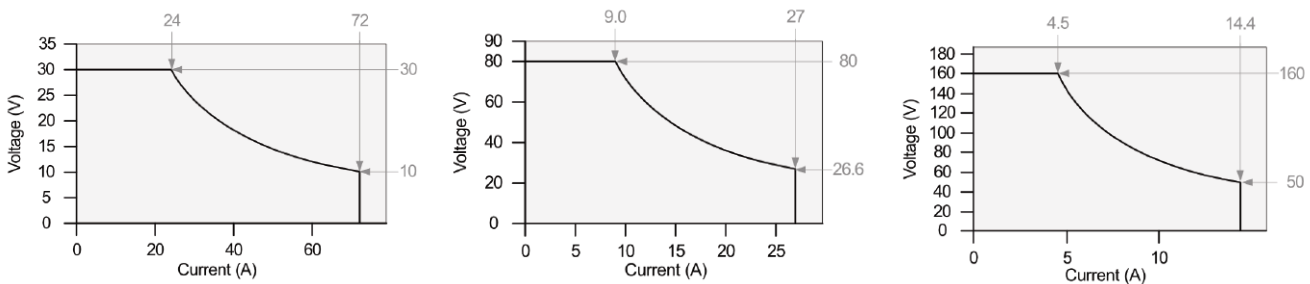


# FEATURES

## A. MULTI-RANGE OPERATION



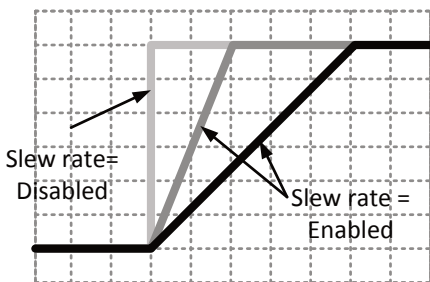
Operating areas of 360 W Models: T3PS250041P, T3PS800011P



Operating areas of 720 W Models: T3PS30721P, T3PS80271P, T3PS160141P

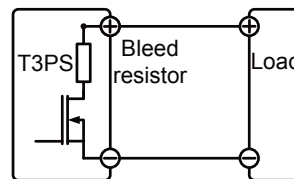
When the power supply is configured so that the total output (current x voltage output) is less than the rated power output, the power supply functions as a typical constant current, constant voltage power supply. If however, the power supply is configured such that the total output (current x voltage output) exceeds the rated power output, the effective output is actually limited to the power limit or the operating area of the unit. In this case the output current and voltage then depend purely on the load value. The graphs above display the operating areas of each power supply.

## B. ADJUSTABLE SLEW RATE



The T3PS has selectable slew rates for CC and CV mode. This gives the T3PS power supply the ability to limit the current/voltage draw of the power supply. Slew rate settings are divided into High Speed Priority and Slew Rate Priority. High Speed Priority mode disables slew rate settings for CC or CV mode. Slew Rate Priority mode allows for user adjustable slew rates for CC or CV mode. The rising and falling slew rate can be set independently.

## C. BLEEDER CONTROL



The T3PS DC power supplies employ a bleed resistor in parallel with the output terminals. Bleed resistors are designed to dissipate the power from the power supply filter capacitors when power is turned off and the load is disconnected. Without a bleed resistor, power may remain charged on the filter capacitors for some time and be potentially hazardous.

In addition, bleed resistors also allow for smoother voltage regulation of the power supply as the bleed resistor acts as a minimum voltage load.

The bleed resistance can be turned on or off using the configuration settings.

# SPECIFICATIONS

|  | T3PS30721P | T3PS80271P | T3PS160141P | T3PS250041P | T3PS800011P |
|--|------------|------------|-------------|-------------|-------------|
|--|------------|------------|-------------|-------------|-------------|

## Output Rating

|         |          |          |            |           |            |
|---------|----------|----------|------------|-----------|------------|
| Voltage | 0 – 30 V | 0 – 80 V | 0 – 160 V  | 0 – 250 V | 0 – 800 V  |
| Current | 0 – 72 A | 0 – 27 A | 0 – 14.4 A | 0 – 4.5 A | 0 – 1.44 A |
| Power   | 720 W    | 720 W    | 720 W      | 360 W     | 360 W      |

## Regulation(CV)

|      |       |       |       |        |        |
|------|-------|-------|-------|--------|--------|
| Load | 20 mV | 45 mV | 85 mV | 130 mV | 405 mV |
| Line | 18 mV | 43 mV | 83 mV | 128 mV | 403 mV |

## Regulation(CC)

|      |       |       |         |        |         |
|------|-------|-------|---------|--------|---------|
| Load | 77 mA | 32 mA | 19.4 mA | 9.5 mA | 6.44 mA |
| Line | 77 mA | 32 mA | 19.4 mA | 9.5 mA | 6.44 mA |

## Ripple & Noise (Noise Bandwidth 20 MHz; Ripple Bandwidth = 1 MHz)

|        |        |       |       |       |        |
|--------|--------|-------|-------|-------|--------|
| CVp-p  | 80 mV  | 80 mV | 80 mV | 80 mV | 150 mV |
| CV rms | 11 mV  | 11 mV | 15 mV | 15 mV | 30 mV  |
| CC rms | 144 mA | 54 mA | 30 mA | 10 mA | 5 mA   |

## Programming Accuracy

|         |              |              |               |               |               |
|---------|--------------|--------------|---------------|---------------|---------------|
| Voltage | 0.1% + 10 mV | 0.1% + 10 mV | 0.1% + 100 mV | 0.1% + 200 mV | 0.1% + 400 mV |
| Current | 0.1% + 60 mA | 0.1% + 30 mA | 0.1% + 15 mA  | 0.1% + 5 mA   | 0.1% + 2 mA   |

## Measurement Accuracy

|         |              |              |               |               |               |
|---------|--------------|--------------|---------------|---------------|---------------|
| Voltage | 0.1% + 10 mV | 0.1% + 10 mV | 0.1% + 100 mV | 0.1% + 200 mV | 0.1% + 400 mV |
| Current | 0.1% + 60 mA | 0.1% + 30 mA | 0.1% + 15 mA  | 0.1% + 5 mA   | 0.1% + 2 mA   |

## Response Time

|  |        |        |         |         |         |
|--|--------|--------|---------|---------|---------|
| Rise Time  | 50 ms  | 50 ms  | 100 ms  | 100 ms  | 150 ms  |
| Fall Time (Full Load)                                  | 50 ms  | 50 ms  | 100 ms  | 150 ms  | 300 ms  |
| Fall Time (No Load)                                    | 500 ms | 500 ms | 1000 ms | 1200 ms | 2000 ms |
| Load Transient Recover Time (Load change from 50–100%) | 1 ms   | 1 ms   | 2 ms    | 2 ms    | 2 ms    |

## Programming Resolution (PC Remote Control Mode)

|         |      |      |      |      |       |
|---------|------|------|------|------|-------|
| Voltage | 1 mV | 2 mV | 3 mV | 5 mV | 14 mV |
| Current | 2 mA | 2 mA | 2 mA | 1 mA | 1 mA  |

## Measurement Resolution (PC Remote Control Mode)

|         |      |      |      |      |       |
|---------|------|------|------|------|-------|
| Voltage | 1 mV | 2 mV | 3 mV | 5 mV | 14 mV |
| Current | 2 mA | 2 mA | 2 mA | 1 mA | 1 mA  |

## Series and Parallel Capability

|                    |   |  |  |     |     |
|--------------------|---|--|--|-----|-----|
| Parallel Operation | Up to 3 units including the master unit |  |  | 3   | 3   |
| Series Operation   | Up to 2 units including the master unit |  |  | N/A | N/A |

## Protection Function

|     |   |              |                |               |                 |
|-----|---|--------------|----------------|---------------|-----------------|
| OVP | 3 – 33 V                                    | 8 – 88 V     | 16 – 176 V     | 20 – 275 V    | 20 – 880 V      |
| OCP | 5 – 79.2 A                                  | 2.7 – 29.7 A | 1.44 – 15.84 A | 0.45 – 4.95 A | 0.144 – 1.584 A |
| OHP | Activated by elevated internal temperatures |              |                |               |                 |

# SPECIFICATIONS

|  | T3PS30721P | T3PS80271P | T3PS160141P | T3PS250041P | T3PS800011P |
|--|------------|------------|-------------|-------------|-------------|
|--|------------|------------|-------------|-------------|-------------|

## Front Panel Display Accuracy, 4 digits

|         |               |               |                |                |                |
|---------|---------------|---------------|----------------|----------------|----------------|
| Voltage | 0.1 % ± 20 mV | 0.1 % ± 20 mV | 0.1 % ± 100 mV | 0.1 % ± 200 mV | 0.1 % ± 400 mV |
| Current | 0.1 % ± 70 mA | 0.1 % ± 40 mA | 0.1 % ± 30 mA  | 0.1 % ± 5 mA   | 0.1 % ± 2 mA   |

## Environment Condition

|                    |                                  |
|--------------------|----------------------------------|
| Operation Temp     | 0 °C – 50 °C                     |
| Storage Temp       | -25 °C – 70 °C                   |
| Operating Humidity | 20 % – 85 % RH; No condensation  |
| Storage Humidity   | 90 % RH or Less; No condensation |

## Read Back Temp Coefficient

|         |   |
|---------|---|
| Voltage | 100 ppm / °C of rated output voltage: after 30 minutes of warm-up |
| Current | 200 ppm / °C of rated output voltage: after 30 minutes of warm-up |

## Other

|                     |  |  |  |   |   |
|---------------------|--|--|--|---|---|
| Analog Control      | Yes  |  |  |   |   |
| Interface           | USB/LAN  |  |  |   |   |
| Fan                 | With thermal sensing control single              |  |  |   |   |
| Power Source        | 85 VAC ~ 265 VAC, 47 ~ 63 Hz, single phase       |  |  |   |   |
| Dimensions & Weight | 142 (W) x 124 (H) x 350 (D) mm;<br>Approx 5.3 kg | 142 (W) x 124 (H) x 350 (D) mm;<br>Approx 5.3 kg | 142 (W) x 124 (H) x 350 (D) mm;<br>Approx 5.3 kg | 71 (W) x 124 (H) x 350 (D) mm;<br>Approx 3 kg | 71 (W) x 124 (H) x 350 (D) mm;<br>Approx 3 kg |

## Ordering Information

|                    |  |   |                             |
|--------------------|--|---|-----------------------------|
| <b>Model</b>       | <b>T3PS30721P</b>  | (0–30 V / 0–72 A / 720 W)   | Multi-Range DC Power Supply |
|                    | <b>T3PS80271P</b>  | (0–80 V / 0–27 A / 720 W)   | Multi-Range DC Power Supply |
|                    | <b>T3PS160141P</b>   | (0–160 V / 0–14.4 A / 720 W)  | Multi-Range DC Power Supply |
|                    | <b>T3PS250041P</b>   | (0–250 V / 0–4.5 A / 360 W)   | Multi-Range DC Power Supply |
|                    | <b>T3PS800011P</b>   | (0–800 V / 0–1.44 A / 360 W)  | Multi-Range DC Power Supply |
| <b>Accessories</b> | Power cord, Output terminal cover, Test leads: 1x red, 1x black, USB Cable |   |                             |
|                    | <b>T3PS30721P, T3PS80271P, T3PS160141P</b>                                 | Basic Accessory Kit: M4 terminal screws and washers x2, M8 terminal bolts, nuts and washers x2, Air filter x1, Analog control protection dummy x1, Analog control lock level x1 |                             |
|                    | <b>T3PS250041P, T3PS800011P</b>  | Basic Accessory Kit: Air filter x1, Analog control protection dummy x1, Analog control lock level x1  |                             |

Warranty: 3 Years return to Teledyne LeCroy.