



Elektro-Automatik



PS 10000 3U

High-Performance DC Power Solutions for Precision Applications | 5 kW - 10 kW - 15 kW

High Performance & Efficiency: Delivers up to 15 kW of power per unit with efficiency rates up to 96%, reducing energy consumption and operational costs.

Wide Autoranging Capability: Supports voltage ranges from 0-60 V to 0-2000 V and current up to 510 A, providing flexibility for diverse applications.

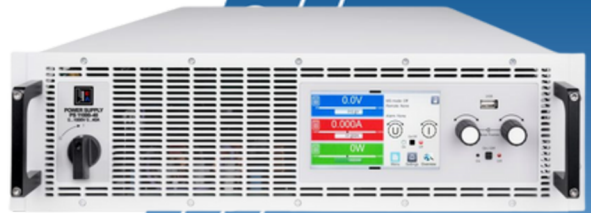
Scalable Parallel Operation: Allows connection of up to 64 units, ideal for large-scale systems.

Advanced Regulation Modes: Includes CV, CC, CP, and CR modes with fast crossover and high-resolution digital control, ensuring precision and adaptability.

User-Friendly Interface: Features a 5-inch color TFT touchscreen with intuitive controls for seamless operation and monitoring.

EA-PS 10000 3U 5 kW - 10 kW - 15 kW

Programmable DC power supply



Features

- Wide range input: 208 V - 480 V, +10%, 3ph AC
- Active Power Factor Correction, typical 0.99
- Very high efficiency of up to 96%
- High performance of up to 15 kW per unit
- Voltages from 0 - 60 V up to 0 - 2000 V
- Currents from 0 - 20 A up to 0 - 510 A
- Flexible power regulated DC output stages (autoranging)
- Regulation modes CV, CC, CP, CR with fast crossover
- Digital regulation, high resolution with 16-bit ADCs and DACs, selection of voltage regulation speed: Normal, Fast, Slow
- Color 5" TFT display with touch control and intuitive user interface
- Galvanically isolated Share-Bus for parallel operation of all power classes in the 10000 series
- Master-Slave Bus for parallel operation of up to 64 units of all power classes in the 10000 series
- Command languages and drivers: SCPI and ModBus, LabVIEW, IVI

Built-in interfaces

- USB
- Ethernet
- Analog
- USB (front panel)
- Master-Slave-Bus
- Share-Bus

Optional interfaces

- CAN
- CANopen
- RS232
- Profibus
- EtherCAT
- Profinet, with one or two ports
- Modbus, with one or two ports
- Ethernet, with one or two ports

Software

- EA - Power Control



SPECIFICATIONS

AC Input

- **Voltage, Phases:**
 - Range 1: 208 V, $\pm 10\%$, 3ph AC (with DC output power derating to 3 / 6 / 9 kW)
 - Range 2: 380 - 480 V, $\pm 10\%$, 3ph AC
- **Frequency:** 45 - 65 Hz
- **Power Factor:** ca. 0.99
- **Leakage Current:** <5 mA
- **Inrush Current @400 V:** ca. 40 A per phase
- **Overvoltage Category:** 2

DC Output (static)

- **Load Regulation CV:** $\leq 0.05\%$ FS (0 - 100% load, constant output voltage and constant temperature)
- **Line Regulation CV:** $\leq 0.01\%$ FS (208 V - 480 V AC +10% input voltage, constant load and constant temperature)
- **Stability CV:** $\leq 0.02\%$ FS (during 8 h of operation, after 30 minutes of warm-up, at constant output voltage, load and temperature)
- **Temperature Coefficient CV:** ≤ 30 ppm/ $^{\circ}$ C (after 30 minutes of warm-up)
- **Compensation (Remote Sense):** $\leq 5\%$ UNominal
- **Load Regulation CC:** $\leq 0.1\%$ FS (0 - 100% load, constant output voltage and constant temperature)
- **Line Regulation CC:** $\leq 0.01\%$ FS (208 V - 480 V AC +10% input voltage, constant load and constant temperature)
- **Stability CC:** $\leq 0.02\%$ FS (during 8 h of operation, after 30 minutes of warm-up, at constant output voltage, load and temperature)
- **Temperature Coefficient CC:** ≤ 50 ppm/ $^{\circ}$ C (after 30 minutes of warm-up)
- **Load Regulation CP:** $\leq 0.3\%$ FS (0 - 100% load, constant output voltage and constant temperature)
- **Load Regulation CR:** $\leq 0.3\%$ FS + 0.1% FS current (0 - 100% load, constant output voltage and constant temperature)

Protective Functions

- **Overvoltage Protection (OVP):** Adjustable 0 - 110% UNominal
- **Overcurrent Protection (OCP):** Adjustable 0 - 110% INominal
- **Overpower Protection (OPP):** Adjustable 0 - 110% PNominal
- **Overtemperature Protection (OT):** DC output shuts down in case of insufficient cooling

DC Output (Dynamic)

- **Rise Time 10 - 90% CV:** ≤ 20 ms
- **Fall Time 90 - 10% CV:** ≤ 20 ms
- **Rise Time 10 - 90% CC:** ≤ 10 ms
- **Fall Time 90 - 10% CC:** ≤ 10 ms

Display Accuracy

- **Voltage:** $\leq 0.05\%$ FS
- **Current:** $\leq 0.1\%$ FS

Insulation

- **AC Input to DC Output:** 3750 Vrms (1 minute, creepage distance >8 mm)
- **AC Input to Case (PE):** 2500 Vrms
- **DC-Output to case (PE):** Depending on the model, see model table
- **DC Output to Interfaces:** 1000 V DC (models up to 360 V rating), 1500 V DC (models from 500 V rating)

Interfaces (Digital)

- **Built-in, Galvanically Isolated:** USB, Ethernet (100 MBit), USB front panel, all for communication
- **Optional, Galvanically Isolated:** CAN, CANopen, RS232, Modbus TCP, Profinet, Profibus, EtherCAT, Ethernet

Interfaces (Analog)

- **Built-in, Galvanically Isolated:** 15 pole D-Sub
- **Signal Range:** 0 - 10 V or 0 - 5 V (switchable)
- **Inputs:** U, I, P, R, remote control on/off, DC output on/off, resistance mode on/off
- **Outputs:** Monitor U and I, alarms, reference voltage, DC output status, CV/CC regulation mode
- **Accuracy U / I / P / R:** 0 - 10 V: $\leq 0.2\%$, 0 - 5 V: $\leq 0.4\%$

Device Configuration

- **Parallel Operation:** Up to 64 units of any power class in the 10000 series, with Master-Slave Bus and Share Bus

Safety and EMC

- **Safety Standards:** EN 61010-1, IEC 61010-1, UL 61010-1, CSA C22.2 No 61010-1, BS EN 61010-1
- **EMC Compliance:** EN 55011 (Class B), CISPR 11 (Class B), FCC 47 CFR part 15B (Class B)
- **EN 61326-1 Includes tests:** EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6
- **Safety Protection Class:** Class 1
- **Ingress Protection:** IP20

Environmental Conditions

- **Operating Temperature:** 0–50 $^{\circ}$ C (32–122 $^{\circ}$ F)
- **Storage Temperature:** -20–70 $^{\circ}$ C (-4–158 $^{\circ}$ F)
- **Humidity:** $\leq 80\%$ relative humidity, non-condensing
- **Altitude:** ≤ 2000 m ($\leq 6,600$ ft)
- **Pollution Degree:** 2

Mechanical Construction

- **Cooling:** Forced air flow from front to rear (temperature-controlled fans)
- **Dimensions (W x H x D):** 19" x 3U x 668 mm
- **Weight:** 5 kW unit: 18 kg (40 lb), 10 kW unit: 25.4 kg (56 lb), 15 kW unit: 32.8 kg (72 lb)

Available Models

SKU	PS 10060-170	PS 10080-170	PS 10200-70	PS 10360-40	PS 10500-30	PS 10750-20
Voltage Range (V)	0-60 V	0-80 V	0-200 V	0-360 V	0-500 V	0-750 V
Ripple in CV (rms)	≤10 mV	≤10 mV	≤40 mV	≤55 mV	≤70 mV	≤200 mV
Ripple in CV (pp)	≤100 mV	≤100 mV	≤300 mV	≤320 mV	≤350 mV	≤800 mV
Current Range (A)	0-170 A	0-170 A	0-70 A	0-40 A	0-30 A	0-20 A
Power Range (W)	0-5000 W	0-5000 W	0-5000 W	0-5000 W	0-5000 W	0-5000 W
Resistance Range (Ω)	0.016-26 Ω	0.016-26 Ω	0.1-160 Ω	0.3-520 Ω	0.6-1000 Ω	1.2-2200 Ω
Output Capacitance (μF)	7790 μF	7790 μF	2520 μF	393 μF	180 μF	180 μF
Efficiency (up to)	94.5%	94.5%	94.5%	95.5%	95.5%	95.5%

SKU	PS 10060-340	PS 10080-340	PS 10200-140	PS 10360-80	PS 10500-60	PS 10750-40	PS 11000-30	PS 11500-20
Voltage Range (V)	0-60 V	0-80 V	0-200 V	0-360 V	0-500 V	0-750 V	0-1000 V	0-1500 V
Ripple in CV (rms)	≤10 mV	≤10 mV	≤40 mV	≤55 mV	≤70 mV	≤200 mV	≤200 mV	≤400 mV
Ripple in CV (pp)	≤100 mV	≤100 mV	≤300 mV	≤320 mV	≤350 mV	≤800 mV	≤1000 mV	≤2000 mV
Current Range (A)	0-340 A	0-340 A	0-140 A	0-80 A	0-60 A	0-40 A	0-30 A	0-20 A
Power Range (W)	0-10000 W	0-10000 W	0-10000 W	0-10000 W	0-10000 W	0-10000 W	0-10000 W	0-10000 W
Resistance Range (Ω)	0.008-13 Ω	0.008-13 Ω	0.05-80 Ω	0.15-260 Ω	0.3-500 Ω	0.6-1100 Ω	1.2-2000 Ω	2.6-4500 Ω
Output Capacitance (μF)	15980 μF	15980 μF	5040 μF	786 μF	360 μF	360 μF	90 μF	90 μF
Efficiency (up to)	94.5%	94.5%	94.5%	95.5%	95.5%	95.5%	95.5%	95.5%

Available Models

SKU	PS 10060-510	PS 10080-510	PS 10200-210	PS 10360-120	PS 10500-90
Voltage Range (V)	0-60 V	0-80 V	0-200 V	0-360 V	0-500 V
Ripple in CV (rms)	≤10 mV	≤10 mV	≤40 mV	≤55 mV	≤70 mV
Ripple in CV (pp)	≤100 mV	≤100 mV	≤300 mV	≤320 mV	≤350 mV
Current Range (A)	0-510 A	0-510 A	0-210 A	0-120 A	0-90 A
Power Range (W)	0-15000 W	0-15000 W	0-15000 W	0-15000 W	0-15000 W
Resistance Range (Ω)	0.006-9 Ω	0.006-9 Ω	0.03-50 Ω	0.1-180 Ω	0.2-330 Ω
Output Capacitance (μF)	23970 μF	23970 μF	7560 μF	1179 μF	540 μF
Efficiency (up to)	94.5%	94.5%	94.5%	95.5%	95.5%

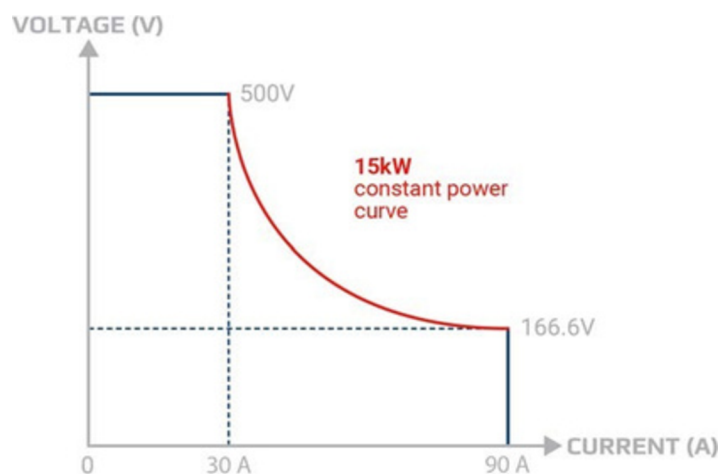
SKU	PS 10750-60	PS 11000-40	PS 11500-30	PS 12000-20
Voltage Range (V)	0-750 V	0-1000 V	0-1500 V	0-2000 V
Ripple in CV (rms)	≤200 mV	≤300 mV	≤400 mV	≤400 mV
Ripple in CV (pp)	≤800 mV	≤1600 mV	≤2400 mV	≤2400 mV
Current Range (A)	0-60 A	0-40 A	0-30 A	0-20 A
Power Range (W)	0-15000 W	0-15000 W	0-15000 W	0-15000 W
Resistance Range (Ω)	0.4-750 Ω	0.8-1300 Ω	1.7-3000 Ω	3.5-5300 Ω
Output Capacitance (μF)	540 μF	131 μF	60 μF	60 μF
Efficiency (up to)	95.5%	95.5%	95.5%	95.5%

General

The PS 10000 series DC power supplies from EA Elektro-Automatik convert grid energy into regulated DC output with efficiency up to 96%. Available in single-phase and three-phase models, these devices support a wide input range, making them compatible with global power grids. The flexible autoranging output delivers DC voltages from 0-60 V to 0-2000 V and currents from 0-6 A to 0-1000 A, enabling a broader range of applications. With the ability to connect up to 64 units in parallel, the system can achieve outputs of up to 1920 kW and 64,000 A, operating seamlessly as a single device. Additional features like a function generator, alarm management, and industrial interfaces make this series an ideal solution for laboratories and industrial environments.

DC Output

The PS 10000 3U delivers DC outputs with voltage ranges from 0-60 V to 0-2000 V and currents up to 510 A, offering a flexible autoranging design. This functionality allows a single device to cover a wide range of applications with consistent power delivery, optimizing performance and reducing equipment requirements.



The Principle of Autoranging

Autoranging enables the PS 10000 series to provide full power across a wide range of voltage and current combinations. This feature allows a single unit to replace multiple fixed-range power supplies, simplifying system design, reducing costs, and providing engineers with unparalleled flexibility.

Interfaces

The PS 10000 series comes with standard galvanically isolated interfaces, including USB, Ethernet, and an analog interface configurable for voltage, current, power, and resistance monitoring. Additional plug-and-play industrial interfaces such as CAN, Profinet, EtherCAT, and Modbus expand the device's capabilities, ensuring seamless integration into diverse setups.

AC Connection

The PS 10000 series is equipped with Active Power Factor Correction (PFC) for high efficiency and low energy consumption. The devices support input voltages ranging from 110/120 V to 240 V for single-phase models and 208 V to 480 V for three-phase models, ensuring compatibility with most global grids. Automatic adjustment to grid voltage eliminates the need for manual configuration, while built-in derating in 110/120 V and 208 V grids ensures reliable operation.

DC Connection

DC output connections are made through rear-mounted copper blades, ensuring robust and efficient connectivity. For higher performance requirements, multiple devices can be seamlessly connected in parallel using vertical copper rails. A contact protection cover ensures safety during operation.

High-Performance Systems

For high-power applications, the PS 10000 3U can be scaled up to 960 kW by connecting multiple units in parallel. A single 42U cabinet can house up to 12 units, providing up to 180 kW of power while occupying only 0.6 m² of floor space. The system's modular design supports up to 64 units, enabling engineers to build powerful and space-efficient systems.

Master-Slave-Bus and Share-Bus

The integrated Master-Slave and Share Buses ensure multi-device systems operate as a single unit. The Master-Slave Bus consolidates system data, such as total power and current, displaying it on the master device while managing alarms and warnings from slave units. The Share Bus distributes loads evenly across all connected devices, optimizing performance and ensuring system reliability.



Example Representation

A fully assembled and operational 240 kW system.

Applications

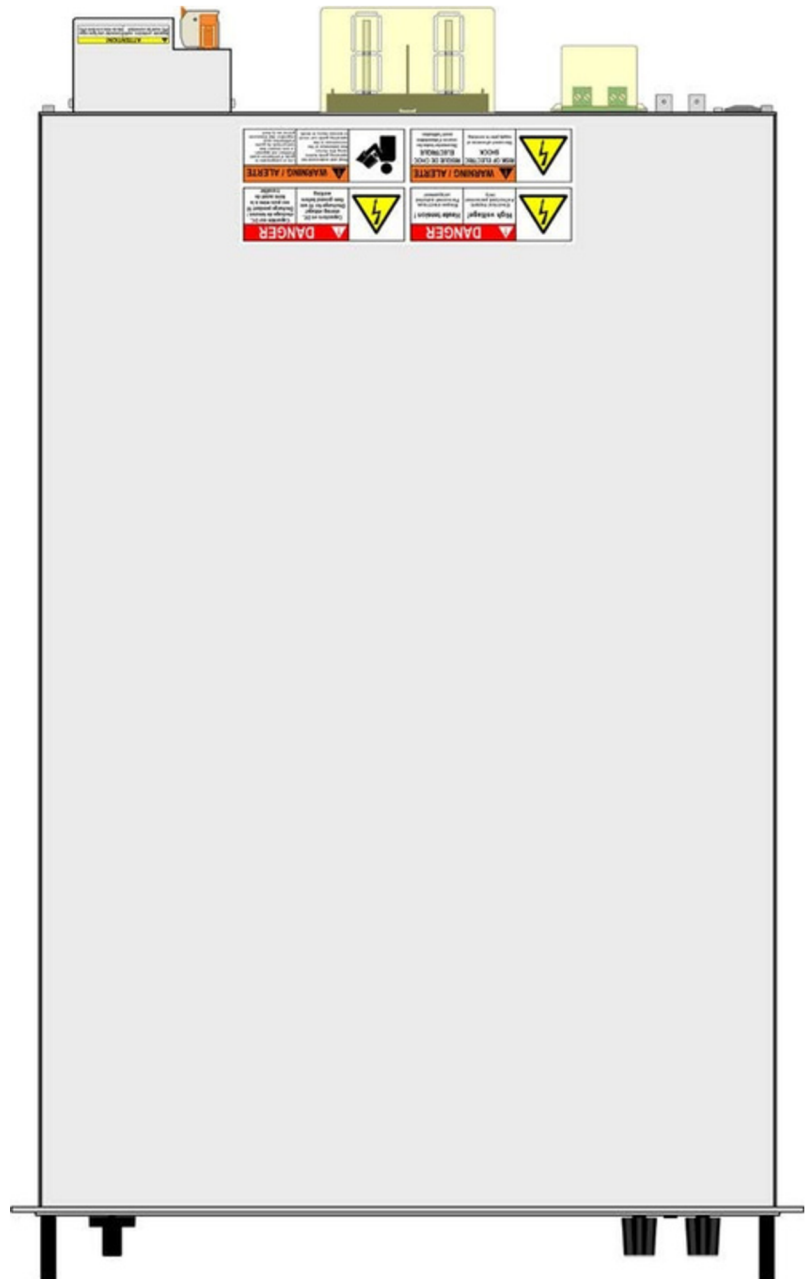
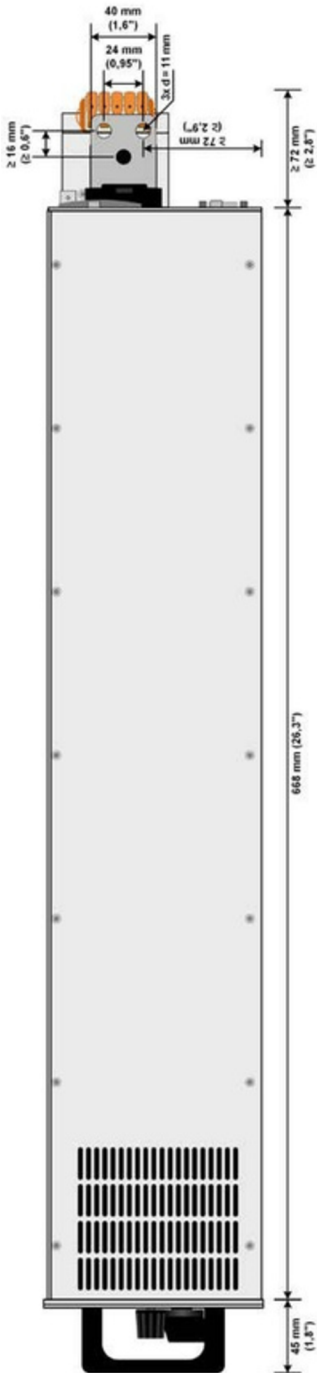
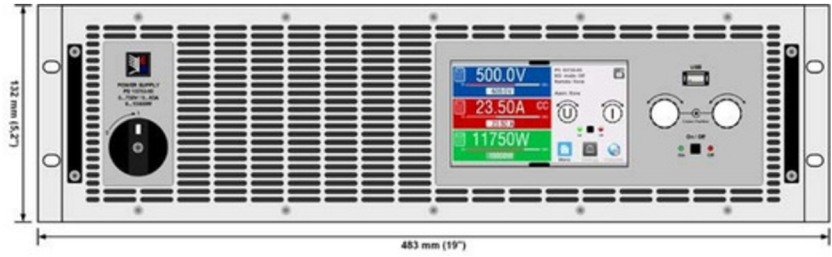
Relay Testing in Production

Relay manufacturers require precise and reliable testing solutions to ensure product quality during production. The PS 10000 series delivers highly accurate voltage and current controls essential for evaluating key parameters such as operating, holding, and decay currents in relay coils. For contact testing, the devices measure current-carrying capacity, contact resistance, voltage consistency, and disconnect thresholds with precision, ensuring thorough quality assurance. With diverse interface options and dynamic control over voltage, current, power, and resistance, the PS 10000 series integrates seamlessly into automated test systems, eliminating the need for additional measuring equipment and streamlining the testing process.

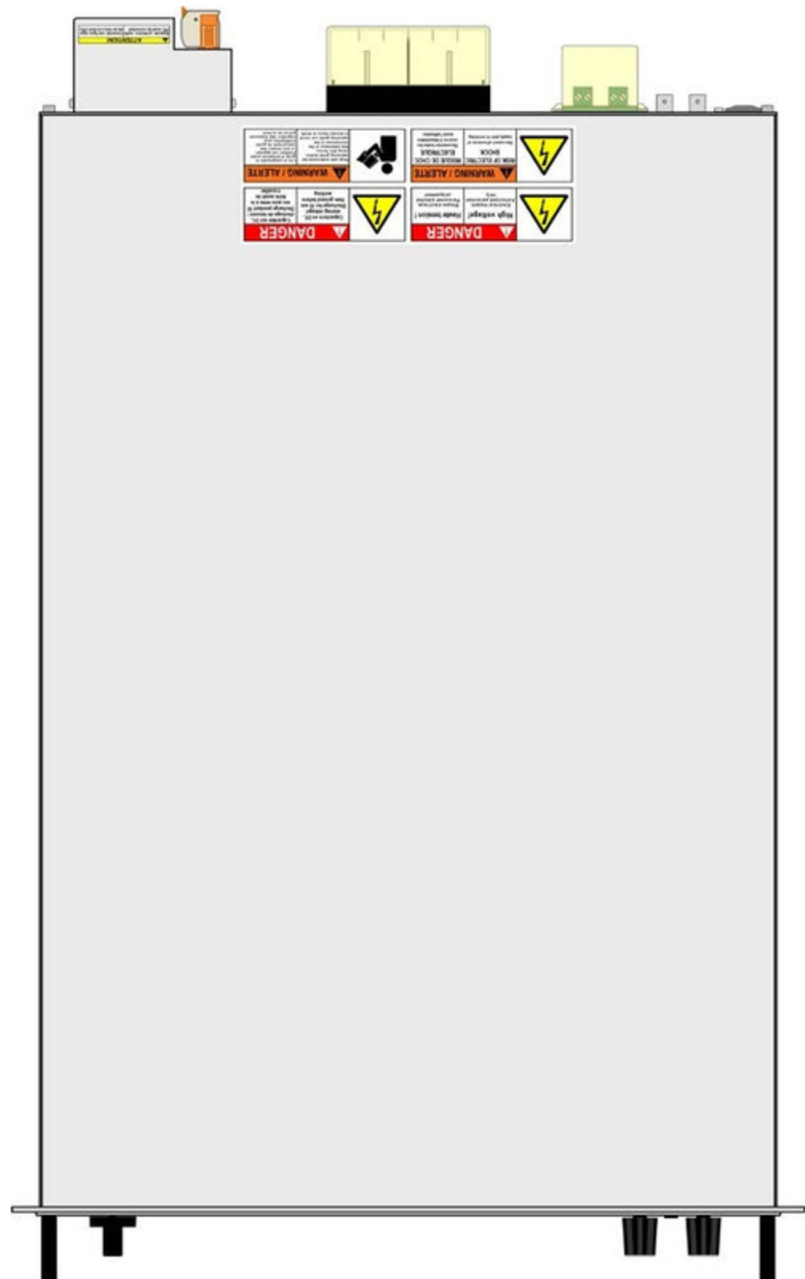
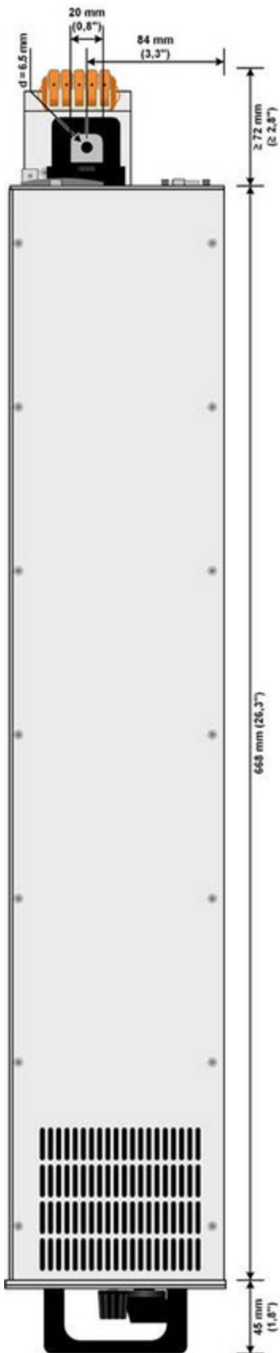
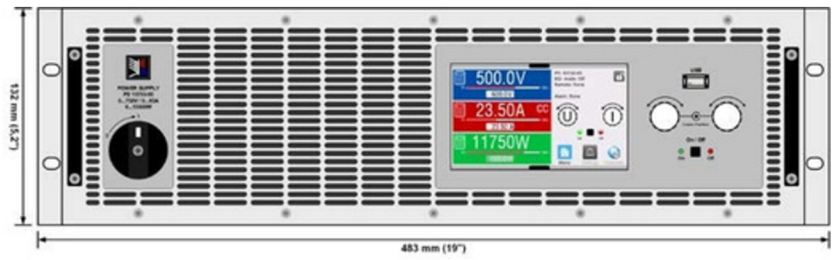
On-Board Charger Test

Testing on-board chargers (OBCs) demands a flexible and precise system to simulate various operational conditions. The PS 10000 series meets these requirements with built-in sequencing and logging capabilities via the EA Power Control software, allowing engineers to generate and save reproducible test results. Adjustable voltage regulation speeds (Normal, Fast, Slow) prevent control loop conflicts between the power supply and the charger under test. For comprehensive testing that requires both sourcing and sinking power, the PS 10000 series pairs seamlessly with an ELR 10000 series electronic load, creating a complete, high-accuracy testing solution for automotive and industrial applications.

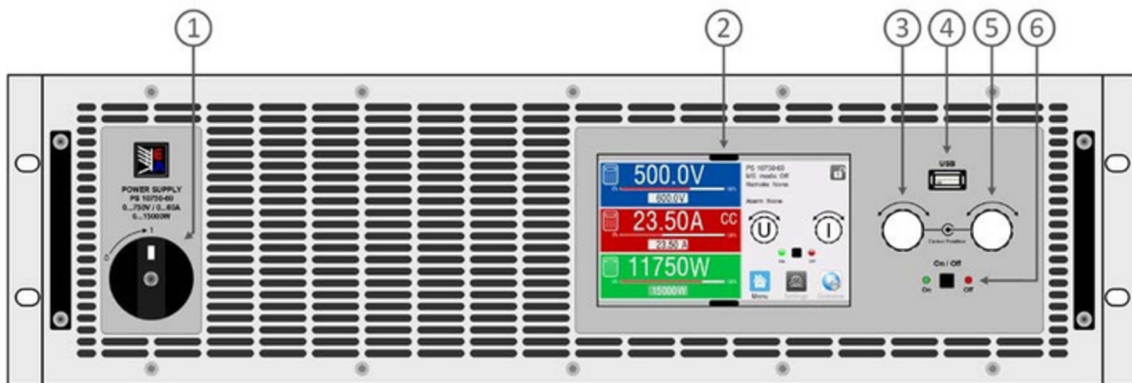
Technical drawings PS 10000 3U <200 V



Technical drawings PS 10000 3U >360 V

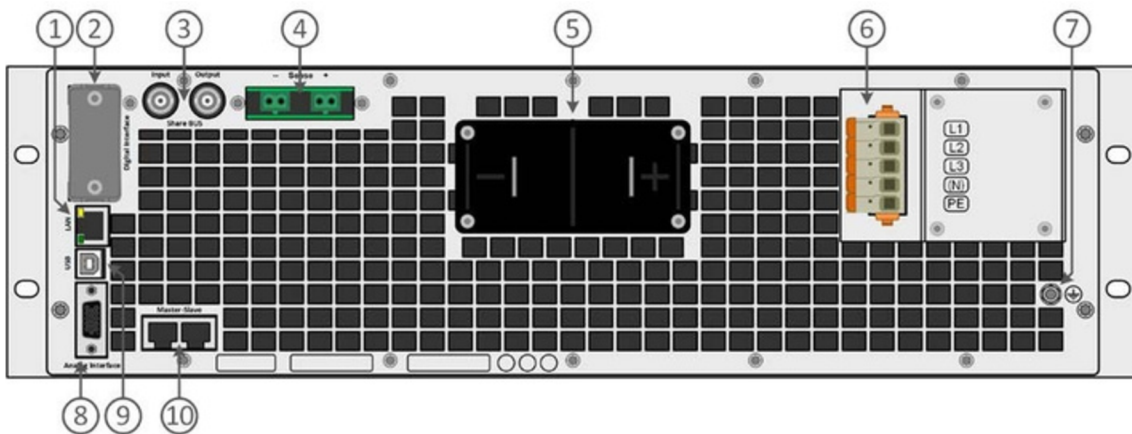


Front panel description PS 10000 3U



1. Power switch
2. TFT control interface, interactive operation and display
3. Rotary knob with push-button action, for settings and control
4. USB host, uses USB sticks for data logging and sequencing
5. Rotary knob with push-button action, for settings and control
6. On / Off push-button with LED status display

Rear panel description PS 10000 3U



1. Ethernet interface
2. Slot for interfaces
3. Share bus connectors to set up a system for parallel connection
4. Remote sense connectors
5. DC output terminal (copper blades)
6. AC input connector
7. Grounding connection screw (PE)
8. Connector (DB15 female) for isolated analog programming, monitor and other functions
9. USB interface
10. Master-slave bus connectors to set up a system for parallel connection

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