

Power Storage Units PSU

UPS systems, long-living, low maintenance

- **Short-time buffer: PSU-110**
Buffer for seconds, output voltage: 110 ... 322 VDC

Application 1: buffer for network analyzers, protection relays or monitoring devices:

During short-term interruptions all safety related devices or power-quality meters have to be buffered. In case of automatic transfer functions, the power outage during switching-over needs to be buffered.

PSU-110 short-time buffer for control units or measurement devices in data centers or safety related applications

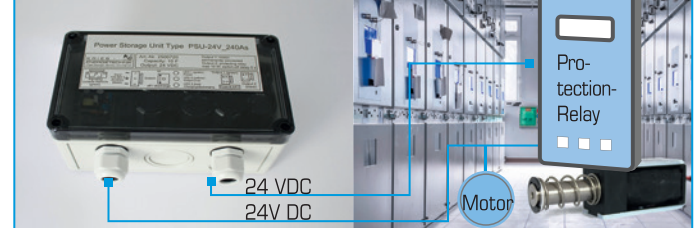


- **Supply extension after power outage: PSU-24**
Buffer for seconds or minutes; output voltage: 24 VDC

Application 2: Buffer for protection relays, RTUs, motors or tripping coils of switchgears:

After power loss in secondary substations, auxiliary power has to be buffered for a few seconds or minutes to operate motors or tripping coils via protection-relays.

PSU-24 medium-time buffer for motors and tripping coils and measurement devices in secondary substations

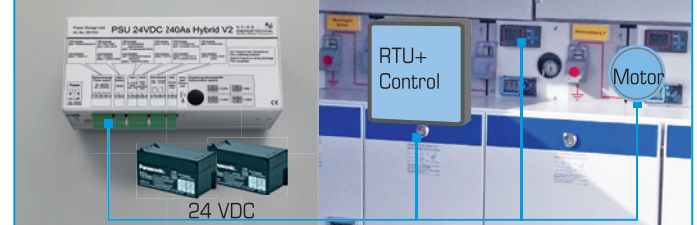


- **Long-term buffer: PSU-Hybrid**
Buffer for minutes or hours, output voltage: 24 VDC

Application 3: Buffer for complete switchgear incl. control devices and RTU.

After power loss in secondary remote operated switchgears, RTUs and motors have to be buffered for minutes or hours. PSU-Hybrid offers a combination of battery and capacitive buffer to supply high-current motor start-up and tripping coils even during very low temperature or older battery.




PSU-Hybrid long-term buffer for motors, tripping coils, RTUs and protection relays in substations



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| Type | Capacity | Auxiliary Power | Voltage | Voltage | Charge Q out 1 Buffer Time dt out 1 | Voltage | Voltage | Charge Q out 2 Buffer Time dt out 2 | Application | Item no. | Picture |
|----------------|-----------------|------------------------------------|--|----------------------------|---|--|----------------------------|--|-------------|----------|---------|
| | farad | input | out 1 Un= Uout nominal | out 1 Min ... Max | $Q = I_{max} \times dt$ $Q = 0.5C (U_1^2 - U_2^2) / U_n$ dt (s) = E / P | out 2 Un= Uout nominal | out 2 Min ... Max | $Q = I_{max} \times dt$ $Q = 0.5C (U_1^2 - U_2^2) / U_n$ dt (s) = E / P | preferred | | |
| PSU_24V_1,8As | 220 mF | 100 ... 240 VAC/DC | 24 VDC | 19 ... 26 VDC | $Q = 1.8 \text{ As}$ dt = 33.6 J/P | 24 VDC | regulated | $Q = 0.45 \text{ A} \times 2 \text{ s}$ dt = 21.6 J/P (Pmax = 10 VA) | 1 | 2500044 | |
| PSU_24V_240As | 10 F | 85 ... 240 VAC/DC | 24 VDC | 12 ... 25 VDC | $Q = 100 \text{ As} = 4 \text{ A} \times 25 \text{ s}$ dt = 2400 J/P (Pmax = 150 VA) | 24 VDC | regulated | $Q = 0.4 \text{ A} \times 5 \text{ s}$ dt = 48 J/P (Pmax = 10 VA) | 1, 2 | 2500720 | 2 |
| PSU_110V_0,1As | 600 + 300 uF | 110 ... 240 VAC/DC | DC in = DC out AC in x 1.4 = DC out | ... 240 VDC ... 336 VDC | | DC in = DC out AC in x 1.4 = DC out | ... 240 VDC ... 336 VDC | | 1 | 2500722 | 3 |
| example 1 | | 110 VAC | 110 VAC x 1.4 = 154 VDC | 100 ... 154 VDC | $Q_1 = 0.04 \text{ As (I}_{max} = 100 \text{ A)}$ dt = 6.16 J/P | 110 VAC x 1.4 = 154 VDC | 100 ... 154 VDC | $Q_1 = 0.133 \text{ As (I}_{max} = 100 \text{ A)}$ dt = 2 J/P (Pmax = 10 VA) | | | |
| example 2 | | 230 VAC | 230 VAC x 1.4 = 322 VDC | 200 ... 322 VDC | $Q_2 = 0.09 \text{ As (I}_{max} = 200 \text{ A)}$ dt = 29 J/P | 230 VAC x 1.4 = 322 VDC | 200 ... 322 VDC | $Q_2 = 0.03 \text{ As (I}_{max} = 200 \text{ A)}$ dt = 9.5 J/P (Pmax = 10 VA) | | | |
| PSU-Hybrid | 8.. F | 100 ... 240 VAC 127 ... 300 VDC | 24 VDC | 12 ... 25 VDC | $Q = 100 \text{ As} = 4 \text{ A} \times 25 \text{ s}$ dt = 2400 J/P | 24 VDC, 60 VA | 23 ... 25 VDC | size of battery selectable | 3 | 2501704 | 4 |

| | dimensions - h x w x d | | mounting |
|-----------|------------------------|--|-------------------|
| Picture 2 | 110 x 180 x 90 mm |  | wall mounting |
| Picture 3 | 78 x 100 x 125 mm |  | DIN-rail mounting |
| Picture 4 | 225 x 105 x 110 mm |  | DIN-rail mounting |

Rule of thumb for calculation of buffer capacity required

$$C = (2 * P * dt) / (U_1^2 - U_2^2)$$

P: Nominal power of tripping coil or motor

dt: duration of operation

Rule of thumb for calculation of buffer time

$$dt = C * (U_1^2 - U_2^2) / 2P$$

U1: Maximum output voltage

U2: Minimum output voltage



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