This triple-output power supply uses a two-step wide-range converter and an active MOSFET rectifier. It operates over a wide range (100 - 240V AC) without any switch over.

Hold-up time is up to 250ms at 230V AC. Load distribution is flexible; there is no minimum load and the full power of 60W can be delivered from any one output.

EMC compatibility is a major feature. It has low spurious noise, and noise suppression meets EN 55022 class B. Noise immunity meets EN 61000-4 and VDE 0106 class 2, even at full load.

Over-voltage and over-temperature protection avoid problems even in extreme working environments.

Vout [DC]  Iout a/b  Pout  Features  Order-No.
Vout1  5.15V  8A / 12A  60W  Wide input range,  AP346.112
      2  +12V  2A / 5A  60W  PF, OTP, OVP
      3  -12V  2A / 5A  60W
Max. total power:  60W
Vout1  5.15V  8A / 12A  60W  Wide input range,  AP346.122
      2  +15V  1.5A / 4A  60W  PF, OTP, OVP
      3  -15V  1.5A / 4A  60W
Max. total power:  60W

*P* appended to Order No. means front panel 8 HP included and fitted.

Iout a: Current range with increased accuracy (see page 2).
Iout b: maximum output current (see page 2).

Accessories: H15 connector, 6.3mm flat contacts: ZP100
H15 connector with soldering pins: ZP120

Warranty: 2 years from date of delivery.

### Output

<table>
<thead>
<tr>
<th>Voltage Vout1,2,3</th>
<th>Iout a/b</th>
<th>Pout</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vout1 5.15V</td>
<td>8A / 12A</td>
<td>60W</td>
<td>Wide input range, Includes production-adjustment with no load.</td>
</tr>
<tr>
<td>Vout2 12V</td>
<td>2A / 5A</td>
<td>60W</td>
<td>PF, OTP, OVP</td>
</tr>
<tr>
<td>Vout3 12V</td>
<td>2A / 5A</td>
<td>60W</td>
<td>PF, OTP, OVP</td>
</tr>
</tbody>
</table>

Over-voltage protection typ. 6.0V Vout1, threshold accur. ± 3.5%.
Over-temperature protection typ. 1.5W/K +55° to +70°C Ta.
Derating operating indicator 1 green LED On the front, Vout1.
Isolation Vout to Vin SELV EN 60 950, VDE 0805.
Vout1 to Vout2/3 500V AC

All outputs are protected against open-circuit, short-circuit, and overload.

### Input

- Line input AC 100...240V AC Wide-range converter.
- Line input DC 85...265V AC Wide-range converter.
- Line frequency 47...63Hz DC or 400Hz, see page 2.
- Input current rms max. 1.5A @ 85V AC.
- Noise suppression EN 55 022/B

Specifications are valid at 230V AC, unless otherwise stated. They are subject to change without prior notice.
### Output (continued)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>AP346.112 5.15V ±12V</th>
<th>AP346.122 5V ±15V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage regulation</td>
<td>±0.1 ±0.1 ±0.1 ±0.1</td>
<td>±0.1 ±0.1 ±0.1 ±0.1</td>
</tr>
<tr>
<td>- Line regulation max. %</td>
<td>±0.3 ±0.3 ±0.3 ±0.3</td>
<td>±0.3 ±0.3 ±0.3 ±0.3</td>
</tr>
<tr>
<td>- Load regulation stat. ΔUstat max.</td>
<td>±0.7/1 ±0.2/3 ±0.3/3.5</td>
<td>±0.7/1 ±0.2/3 ±0.3/3.5</td>
</tr>
<tr>
<td>- Load regulation dyn. ΔUdyn max. %</td>
<td>±5/8 ±0.8/3 ±5/8 ±1/2</td>
<td>±5/8 ±0.8/3 ±5/8 ±1/2</td>
</tr>
<tr>
<td>Response time t_r max. ms</td>
<td>1 1.5 1 1.5</td>
<td>1 1.5 1 1.5</td>
</tr>
<tr>
<td>- Temperature coefficient typ. %/K</td>
<td>±0.01 ±0.01</td>
<td>±0.01 ±0.01</td>
</tr>
<tr>
<td>Ripple max. mVpp</td>
<td>10 10 10 10</td>
<td>10 10 10 10</td>
</tr>
<tr>
<td>- incl. spikes max. mVpp</td>
<td>20 10 20 10</td>
<td>20 10 20 10</td>
</tr>
</tbody>
</table>

Current limitation
- Threshold typ. W
- Short-circuit typ. A
- Start delay typ. ms
- Vout rise up time typ. ms
- On and off characteristic max. mV
- Power back immunity U_back max. V
- Load capacity max. µF

#### Input (continued)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>AC input range V AC</th>
<th>DC input range V DC</th>
<th>Derated AC range V AC</th>
<th>Derated DC range V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range Hz</td>
<td>47...63</td>
<td>63...400</td>
<td>300...370</td>
<td></td>
</tr>
<tr>
<td>In-rush current max. A</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hold-up time min. ms</td>
<td>250</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- min. ms</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- min. ms</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power factor λ typ.</td>
<td>0.65</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Logic Functions

- PF-signal
  - PF high if
  - Hold-up time
    - from power failure to PF-signal
      - min. ms
        - Vout 2 and Vout 3 serial mode V
          - 24
          - 5
          - 5
          - 30

#### Electromagnetic Compatibility

- Emissions according to EN 50081-1
  - Radio interference, EN 55011, EN 55022
  - Electrostatic discharge ESD
    - Radiated fields, EN 61000-4-3
    - Fast transients, EN 61000-4-4
    - Surge transients, EN 61000-4-5
  - Conducted disturb., ENV 50141 (draft of IEC 801-6)
- Immunity according to further standards
  - Transient voltage, IEC 255
  - NAM-UR-prescription
  - Transient resistance, VDE 0160 §5.3.1.1.2
  - Over-voltage resistance (PULS standard)

- Power fail
  - AC in > 80V AC
    - Open-collector (I_out = 5mA), see figure on page 3.

- Class B
  - No degradation of performance
    - 8kV direct discharge (level 4)
      - 15kV air discharge (level 4)
    - 10kV/m (level 3)
    - 4kV (level 4)
    - 2kV (level 3)
    - 2kV (level 4) cap. coupling
    - 4kV (isolation class 4)
    - 10V (level 3)
    - Differential mode, unit on.
    - 150kHz...80MHz.
  - 5kV
    - Common mode, unit off.
  - Satisfied
    - 750V / 1.3ms (class 2)
    - 300V AC / 0.5s

- EN 50081-2 is also satisfied.
- EN 50082-1 is also satisfied.

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**Input**

- Voltage
  - AC input range V AC
  - DC input range V DC
- Frequency range Hz
  - Derated frequency range Hz
- Hold-up time ms
  - Power factor λ
- Internal fuse
- Input range selection

**Output**

- Voltage regulation
  - Line regulation max. %
  - Load regulation stat. ΔUstat max. %
  - Load regulation dyn. ΔUdyn max. %
- Response time t_r max. ms
  - Temperature coefficient typ. %/K
- Ripple max. mVpp
  - incl. spikes max. mVpp
- Load regulation stat. ΔUstat max. %
  - Short-circuit typ. A
  - Start delay typ. ms
  - Vout rise up time typ. ms
  - On and off characteristic max. mV
  - Power back immunity U_back max. V
  - Load capacity max. µF

**Electromagnetic Compatibility**

- Emissions according to EN 50081-1
  - Radio interference, EN 55011, EN 55022
  - Electrostatic discharge ESD
    - Radiated fields, EN 61000-4-3
    - Fast transients, EN 61000-4-4
    - Surge transients, EN 61000-4-5
  - Conducted disturb., ENV 50141 (draft of IEC 801-6)
- Immunity according to further standards
  - Transient voltage, IEC 255
  - NAM-UR-prescription
  - Transient resistance, VDE 0160 §5.3.1.1.2
  - Over-voltage resistance (PULS standard)

**Logic Functions**

- PF-signal
  - PF high if
  - Hold-up time
    - from power failure to PF-signal
      - min. ms
        - Vout 2 and Vout 3 serial mode V
          - 24
          - 5
          - 5
          - 30

**Electromagnetic Compatibility**

- Emissions according to EN 50081-1
  - Radio interference, EN 55011, EN 55022
  - Electrostatic discharge ESD
    - Radiated fields, EN 61000-4-3
    - Fast transients, EN 61000-4-4
    - Surge transients, EN 61000-4-5
  - Conducted disturb., ENV 50141 (draft of IEC 801-6)
- Immunity according to further standards
  - Transient voltage, IEC 255
  - NAM-UR-prescription
  - Transient resistance, VDE 0160 §5.3.1.1.2
  - Over-voltage resistance (PULS standard)
Protection

Unit protection
- Overload Yes
- Short-circuit proof Yes
- Open-circuit proof Yes
- Over-temperature (OTP) typ. +100°C on heatsink typ. +98°C
- Reverse battery prot. Yes
- ACin range selection Wide range

Load protection
- Over-voltage (OVP) Yes
- Threshold typ. 6.0V
- Accuracy max. ±3.5%
- Restart After line disconnection, wait time 1 min.

Safety

Electrical safety
- Test voltage (each unit) 3kV AC Primary / secondary.
  according to EN 60 950 2.5kV AC Primary / PE.
  for t = 2sec 500V AC Secondary / PE.
- Air- and leakage distance 6.4 / 8mm Primary / secondary.
  4mm Primary / PE.
- Isolation resistance min. 5MΩ VDE 0551.
- Protection class Ι VDE 0106 part 1, IEC 536.
- PE resistance < 0.1Ω VDE 0805.
- Protection system IP20 DIN 40050, IEC 529.
- Leakage current max. 0.1mA EN 60 950 (47...63Hz line).
- Safe low voltage SELV EN 60 950, VDE 0805, VDE 0160.
- Over-voltage class ΙΙ VDE 0110 part 1, IEC 529.
- Touch safety Finger test VDE 0100 §6, EN 60 950, VBG4.
- Penetration protection > ∅ 3mm e.g. screws, small parts etc.

Operation and Ambient Area

Application class KSF DIN 40040.
Operation temperature max. 0°C...+70°C Ta (measured at 1cm distance).
  Derating range +55°C...+70°C Ta.
Storage temperature typ. -20°C...+100°C
Humidity max. 95% Non-condensing.
Mechanical usage Vertical See page 4.
  Lateral spacing None No gap needed.
Cooling Normal convection Don’t obstruct air flow.
Dirt protection level max. 2 VDE 0110 part 1.
Vibration 0.075mm IEC 68-2-6 (10...60Hz).
Shock 11ms / 15g IEC 68-2-27 (3 shocks).
Operation Height max. 2,000m Above sea level.

Efficiency and Power Loss

AP346.112 typ. 81% / 14W @ 230V ACin, Iout = 100%.
AP346.122 typ. 82% / 13W As above.

Reliability and Lifetime

MTBF according to Siemens standard SN29500 typ. 260,000h 230VAC, Iout = 100%, +40°C Ta.
Only long life (>2,000h @ 105°C) electrolytic capacitors are used.
Function test 100% Test certificate enclosed.
In-circuit test Yes
Run-in (burn-in) 24h Full load, Ta = +55°C, on/off cycle.

3 Outputs • 19" Power Supply • 60 Watt • AP346
**AP346 • 3 Outputs • 19" Power Supply • 60 Watt**

**Fuse**
The PSU has electronic protection against external short-circuits. In case of an internal defect, a fuse disconnects the unit. It can only be replaced by opening the unit which should be done by the supplier.

**Installation for Operating**
The unit is constructed for 19" systems: Ensure that pin 4 of H15 connector is on top. For other installation considerations consult your representative. Ensure free air flow!

**Dimensions and Connections**
19" board, with Al/Mg alloy cover on component side, and a plastic cover on the bottom side. 8HP plug in width. See figure below for dimensions.

**Caution:**
Do not remove any screws on box, as internal safety connections could be disconnected!

**Schematic**

![Schematic Diagram]

**Modifications (contact supplier)**
Without PF-Signal.
Lower cost versions.

**Accessory ZP510**
Installation set for mounting on DIN rail.

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H15 pinout (DIN 41312)
NC = No Connection - Do not use!