

Product Overview:

Data

(Gen. 2020)

AC/DC Power Supply

This high power, high efficiency AC / DC power supply for naval military applications is based on fixed frequency rectifier technology.

Military AC / DC power supplies meet or exceed MIL-SPEC reliability requirements, including MIL-STD-1399, MIL-STD-461, MIL-STD-810, MIL-STD-704 and other requirements critics.

The power supply is designed to provide extremely high power conversion efficiency across the entire output power range.

The AC / DC power supply is designed to operate in the harshest marine environmental conditions. The wide input range of this AC / DC power supply allows designers and integrators to power a wide variety of products with a single type of part.

The outputs can be set between +/- 20% of the rated output voltage of the power supply. The impressive power density of the internal power modules helps optimize space in an industry where space is at a premium.

Proser's highly reliable, field-proven technology shortens design cycles and helps designers / integrators deliver reliable solutions for military naval markets.



Product Description:

AC/DC Power Supply

Description:

The AC / DC power supply via a connector accepts a type of service line in input 60Hz, three phase, 115Vac line to line, three wires without neutral, star configured, "as for STANAG 1008 Edition 9" to transform into voltage DC output.



AC / DC is a converter with multiple outputs on different connectors, it is also equipped with two I / O interface connectors and guarantees the following features and functions:

- To execute commands
- Manage the sequence of switching on the output voltages.
- To monitor the output voltages
- To protect the loads from overvoltage or undervoltage events on the output voltages
- To protect the loads from overcurrent events on the output voltages
- To protect RESM_PS from over temperature events
- Manage communication with the ETR function "Elapsed time recorder".

All connectors used are compliant to operate in the marine environment "Circular MIL Spec D38999 III Series", and are supplied with Safe-T cable according to NASM 33540.

The power supply designed to provide extremely high power conversion efficiency across the entire output power range is based on fixed frequency rectifier technology and uses no optocouplers for the voltage control loop. The components used follow the conservative guidelines of component downgrading, with the aim of increasing reliability.

The quality level of the selected components and electronic parts is adequate for the assignment of quality factors in accordance with Section 2 of ANSI / VITA 51.1-2008.

The AC / DC power supply is composed as follows:

- ✓ Anti-Surge Section
- ✓ EMI filter section
- ✓ AC / DC Conversion Section + Power Factor Correction
- ✓ DC / DC Converters Section
- ✓ Output filters section
- ✓ Control and Signal section
- ✓ Recorder of the elapsed time

The structure of the AC / DC as well as the internal parts are made of aluminum alloy of the 5000 and 6000 series equipped with Surtec 650 conductive anticorrosive treatment, according to MIL DTL 5541F Class III, the external surfaces can be painted on request.

Each power supply is 100% tested and with the ability to perform Environmental Stress Screening (ESS) based on specific program requirements.

MIL-STD-810G w/Change1 and MIL-STD-461F fully qualified.

REACH compliance with the regulation CE n° 1907/2006, CE marked.

Key Specifications:

- Input Line type:
60Hz, three phases, 115Vac line to line, without neutral, star configured as for STANAG 1008 Edition 9.
- Power Outputs:

| | | |
|-----------|-----------------------|-----------------------|
| ▪ 28Vdc | $I_{OUT-MAX} = 39A$ | $P_{OUT-MAX} = 1100W$ |
| ▪ 28Vdc | $I_{OUT-MAX} = 19A$ | $P_{OUT-MAX} = 530W$ |
| ▪ 54Vdc | $I_{OUT-MAX} = 9A$ | $P_{OUT-MAX} = 490W$ |
| ▪ 45,5Vdc | $I_{OUT-MAX} = 12,5A$ | $P_{OUT-MAX} = 570W$ |
- Overvoltage; Undervoltage; Overcurrent protection on each single output
- Operating Temperature -5 to 55°C
- Storage Temperature -40 to 85°C
- Light Indicators Input AC Line; Output DC Line; Fail; H.T°;
- EMI/EMC Compliant with MIL-STD-461F
- Environmental conditions compliant with MIL-STD-810G with Change1.
- CE Marked
- REACH compliant with the regulation CE n° 1907/2006
- Dimensions (h x l x d): 265 x 356 x 395mm
- Weight: 25kg

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ELECTRICAL CHARACTERISTICS

| Parameter | INPUT CHARACTERISTIC | Min. | Typ. | Max. | UNIT |
|---|--|----------------------------------|------|------|----------------------|
| Voltage Level | Nominal Voltage Level | | 115V | | V _{RMS} |
| | Steady state Tolerance Limits (due to the combined effects) | 105 | | 125 | V _{RMS} |
| | Transient Tolerance Limits (due to the combined effects) Time=2.00 s | 89 | | 141 | V _{RMS} |
| Voltage | Voltage spike (peak value, includes fundamental) | ±1kV | | | V _{dc} |
| Voltage Waveform | Total harmonic distortion (Maximum) | 5 | | | % |
| | Individual harmonic (Maximum) | 3 | | | |
| | Deviation factor | 5 | | | |
| Frequency | Nominal Frequency | 60 | | | Hz |
| | Frequency tolerance (4) | ±3 | | | % |
| | Frequency modulation (5) | 0.5 | | | % |
| | Frequency transient tolerance (6) | ±4 | | | % |
| | Maximum departure from the nominal frequency due to the combined effects of (4), (5) and (6) | ±5.5 | | | % |
| | Frequency transient tolerance (6) | 2 | | | seconds |
| Parameter | Isolation Characteristics | Min. | Typ. | Max. | UNIT |
| Safety | Isolation Voltage (dielectric strength) | | | 1000 | V _{RMS} |
| | Isolation Resistance @ 500Vdc | 1 | | | MΩ |
| FEATURE CHARACTERISTICS | | Min. | Typ. | Max. | UNIT |
| Switching Frequency | | | 200 | | kHz |
| ON/OFF Control Off-State Voltage On-State Voltage | | | | | |
| | | Input Signal Active Low | | | |
| | | Input Signal Non Active Floating | | | |
| Over-Temperature Shutdown | | | 100 | | °C |
| Over-Temperature Shutdown Restart Hysteresis | | | 10 | | °C |
| Cooling | Forced air by FAN UNIT | | | | |
| MECHANICAL FEATURES | | | | | |
| Dimensions | (H x W x D) | 265 x 356 x 395mm | | | |
| Weight | 25kg | | | | |
| RELIABILITY CHARACTERISTICS | | Min. | Typ. | Max. | UNIT |
| Calculated MTBF MIL-HDBK-217F Notice 2 @ TA=40°C Naval Sheltered (N _S) | | | 45 | | 10 ³ Hrs. |

ELECTRICAL CHARACTERISTICS (28V 1100W)

| Parameter | Test Condition | Min. | Typ. | Max. | UNIT |
|---|---|------------------|------|------|------------------|
| Nominal Voltage (at nominal input line and within min to max load range) | Measured at output connector pins | 27 | 28 | 29 | V _{dc} |
| Nominal Current load | (See Note 1) | 0 | | 39 | A |
| Total Static Regulation (Line and Load Reg. and Thermal Stability) | | | | 1 | V _{dc} |
| Total Dynamic Regulation Load: (from 50% to 100% load transient) | | | | | |
| Under-Voltage | | | | 0.9 | V _{dc} |
| Over-Voltage | | | | 0.9 | V _{dc} |
| Recovery Time | | | | 3 | ms |
| Ripple: Low Frequency (50Hz to 200MHz) | | | | 500 | mV _{pp} |
| Limiting Current Protection | Converter Shut Down with Automatic Recovery (See Note 3) | | 51 | | |
| Under voltage Protection Threshold | Converter Shut Down with Automatic Recovery | 24 | | | V _{dc} |
| Over voltage Protection Threshold | Converter Shut Down with Automatic Recovery | | | 31.5 | V _{dc} |
| Auto Reset Retry (Hiccup Mode) | Min Interval Between Auto Reset Retry For Limiting Current and Over Voltage Protections | 0.6 | | 1 | s |
| Turn-on Time | Input-Output Voltage Delay | | | 200 | ms |
| Rise Time | | | | 150 | ms |
| Delay Time | (See Note 4) | | | | |
| Isolation Voltage | Vs. chassis | 100 | | | V _{dc} |
| Insulation resistance | | 1 | | | MΩ |
| External load Impedance Max. | | | | 10 | mF |
| Reference Return Ground | (See Note 2) | GND ₁ | | | |

ELECTRICAL CHARACTERISTICS (28V 532W)

| Parameter | Test Condition | Min. | Typ. | Max. | UNIT |
|---|---|------------------|------|------|------------------|
| Nominal Voltage (at nominal input line and within min to max load range) | Measured at output connector pins | 27 | 28 | 29 | V _{dc} |
| Nominal Current load | (See Note 1) | 0 | | 19 | A |
| Total Static Regulation (Line and Load Reg. and Thermal Stability) | | | | 1 | V _{dc} |
| Total Dynamic Regulation Load: (from 50% to 100% load transient) | | | | | |
| Under-Voltage | | | | 0.7 | V _{dc} |
| Over-Voltage | | | | 0.7 | V _{dc} |
| Recovery Time | | | | 3 | ms |
| Ripple: Low Frequency (50Hz to 200MHz) | | | | 500 | mV _{pp} |
| Limiting Current Protection | Converter Shut Down with Automatic Recovery (See Note 3) | | 25 | | |
| Under voltage Protection Threshold | Converter Shut Down with Automatic Recovery | 24 | | | V _{dc} |
| Over voltage Protection Threshold | Converter Shut Down with Automatic Recovery | | | 31.5 | V _{dc} |
| Auto Reset Retry (Hiccup Mode) | Min Interval Between Auto Reset Retry For Limiting Current and Over Voltage Protections | 0.6 | | 1 | s |
| Turn-on Time | Input-Output Voltage Delay | | | 100 | ms |
| Rise Time | | | | 50 | ms |
| Delay Time | (See Note 4) | | | | |
| Isolation Voltage | Vs. chassis | 100 | | | V _{dc} |
| Insulation resistance | | 1 | | | MΩ |
| External load Impedance Max. | | | | 5 | mF |
| Reference Return Ground | (See Note 2) | GND ₂ | | | |

ELECTRICAL CHARACTERISTICS (54V 486W)

| Parameter | Test Condition | Min. | Typ. | Max. | UNIT |
|---|---|------------------|------|------|------------------|
| Nominal Voltage (at nominal input line and within min to max load range) | Measured at output connector pins | 52 | 54 | 56 | V _{dc} |
| Nominal Current load | (See Note 1) | 0 | | 9 | A |
| Total Static Regulation (Line and Load Reg. and Thermal Stability) | | | | 1 | V _{dc} |
| Total Dynamic Regulation Load: (from 50% to 100% load transient) | | | | | |
| Under-Voltage | | | | 0.7 | V _{dc} |
| Over-Voltage | | | | 0.7 | V _{dc} |
| Recovery Time | | | | 3 | ms |
| Ripple: Low Frequency (50Hz to 200MHz) | | | | 500 | mV _{pp} |
| Limiting Current Protection | Converter Shut Down with Automatic Recovery (See Note 3) | | 11.8 | | |
| Under voltage Protection Threshold | Converter Shut Down with Automatic Recovery | 49 | | | V _{dc} |
| Over voltage Protection Threshold | Converter Shut Down with Automatic Recovery | | | 59 | V _{dc} |
| Auto Reset Retry (Hiccup Mode) | Min Interval Between Auto Reset Retry For Limiting Current and Over Voltage Protections | 0.6 | | 1 | s |
| Turn-on Time | Input-Output Voltage Delay | | | 100 | ms |
| Rise Time | | | | 50 | ms |
| Delay Time | (See Note 4) | | | | |
| Isolation Voltage | Vs. chassis | 100 | | | V _{dc} |
| Insulation resistance | | 1 | | | MΩ |
| External load Impedance Max. | | | | 3 | mF |
| Reference Return Ground | (See Note 2) | GND ₃ | | | |

ELECTRICAL CHARACTERISTICS (45.5V 573W)

| Parameter | Test Condition | Min. | Typ. | Max. | UNIT |
|---|---|------------------|------|------|------------------|
| Nominal Voltage (at nominal input line and within min to max load range) | Measured at output connector pins | 44.6 | 45.5 | 46.4 | V _{dc} |
| Nominal Current load | (See Note 1) | 0 | | 12.6 | A |
| Total Static Regulation (Line and Load Reg. and Thermal Stability) | | | | 0.9 | V _{dc} |
| Total Dynamic Regulation Load: (from 50% to 100% load transient) | | | | | |
| Under-Voltage | | | | 0.8 | V _{dc} |
| Over-Voltage | | | | 0.8 | V _{dc} |
| Recovery Time | | | | 3 | ms |
| Ripple: Low Frequency (50Hz to 200MHz) | | | | 500 | mV _{PP} |
| Limiting Current Protection | Converter Shut Down with Automatic Recovery (See Note 3) | 13.9 | | 16.4 | |
| Under voltage Protection Threshold | Converter Shut Down with Automatic Recovery | 36 | | | V _{dc} |
| Over voltage Protection Threshold | Converter Shut Down with Automatic Recovery | | | 48 | V _{dc} |
| Auto Reset Retry (Hiccup Mode) | Min Interval Between Auto Reset Retry For Limiting Current and Over Voltage Protections | 0.6 | | 1 | s |
| Turn-on Time | Input-Output Voltage Delay | | | 200 | ms |
| Rise Time | | | | 150 | ms |
| Delay Time | (See Note 4) | | | | |
| Isolation Voltage | Vs. chassis | 100 | | | V _{dc} |
| Insulation resistance | | 1 | | | MΩ |
| External load Impedance Max. | | | | 7 | mF |
| Reference Return Ground | (See Note 2) | GND ₃ | | | |

STANDARDS & QUALIFICATION

| Parameter | | Notes & Conditions | |
|-----------------------|-----------|---|-----------------------------|
| STANDARDS COMPLIANCE | | | |
| CE Marked | | | |
| REACH | | with the regulation CE n° 1907/2006 | |
| QUALIFICATION TESTING | | | |
| | | MIL-STD-810Gw/Change1 | |
| Low Temperature | Operative | -5°C ÷ +55°C | Method 502.6 Proc. II |
| High Temperature | Operative | -5°C ÷ +55°C | Method 501.6 Proc. II |
| Low Temperature | Storage | -40°C ÷ +85°C | Method 502.6 Proc. I |
| High Temperature | Storage | -40°C ÷ +85°C | Method 501.6 Proc. I |
| Humidity | | RH 70% -5°C ÷ +55°C | Method 507.6. |
| Salt Fog | | 24 hours + 24 hours Number of cycles : 2 | Method 509.6. |
| Vibration | | Amplit. 1 mm Freq. range from 4 to 14Hz | Method. 528.1 Three axis |
| | | Amplit. 0,8 g Freq. range from 14 to 100Hz | |
| Shock | | Acceleration of 30 g and duration of 6ms | Method 516.7 Three axis |
| Fungus | | Method 508.7 | |
| | | MIL-STD-461F Surface Ship Application | |
| CE101 | | Conducted Emissions, Power Leads, 120Hz to 10kHz | |
| CE102 | | Conducted Emissions, Power Leads, 10kHz to 10MHz | |
| CS101 | | Conducted Susceptibility, Power Leads, 120Hz to 150kHz | |
| CS106 | | Conducted Susceptibility, Transients, Power Leads | |
| CS114 | | Conducted Susceptibility, Bulk Cable Injection, 10kHz to 200MHz | |
| CS116 | | Conducted Susceptibility, Damped Sinusoidal Transients, Cables and Power Leads, 10 kHz to 100 MHz | |
| RE101 | | Radiated Emissions, Magnetic Field, 30 Hz to 100 kHz | |
| RE102 | | Radiated Emissions, Electric Field, 10 kHz to 18 GHz “limit Below Desk” | |
| RS101 | | Radiated Susceptibility, Magnetic Field, 30 Hz to 100 kHz | |
| RS103 | | Radiated Susceptibility, Electric Field, 2 MHz to 40 GHz “Limit 10V/m” | |

