

PU20 - Wide-Range Power Supply Unit for Railway Systems, 24 to 110 VDC, 120 W

3U 6 HP PSU

- » **3U, 6 HP, 19" rack mountable**
- » **Wide range input 24 V DC to 110 V DC nominal**
- » **Configurable voltage range for 36, 48, 74, 96 V DC**
- » **Output power 120 W without derating**
- » **Holdup time 10 ms according to Class S2**
- » **Active power sharing**
- » **Inverse current protection**
- » **Redundant output voltage monitoring**
- » **H15 rear connector**
- » **-40 to +85 °C with qualified components**
- » **Conformal coating**
- » **Input voltage according to S-9401**
- » **EN 50155 compliance**



The PU20 is a plug-in power supply unit for 19" systems (like VMEbus and CompactPCI Serial). It is especially designed for computer systems in public transport vehicles and for harsh environments, like railway applications, making it suitable for both onboard and wayside use.

The PU20 has a nominal input power range of 24 V DC to 110 V DC with a max. input voltage range of 14.4 V DC to 154 V DC (according to EN 50155 and S-9401). The PU20 has a configurable voltage range for 24, 36, 48, 74, 96, 110 V DC or wide input range, which is controlled by a rotary switch.

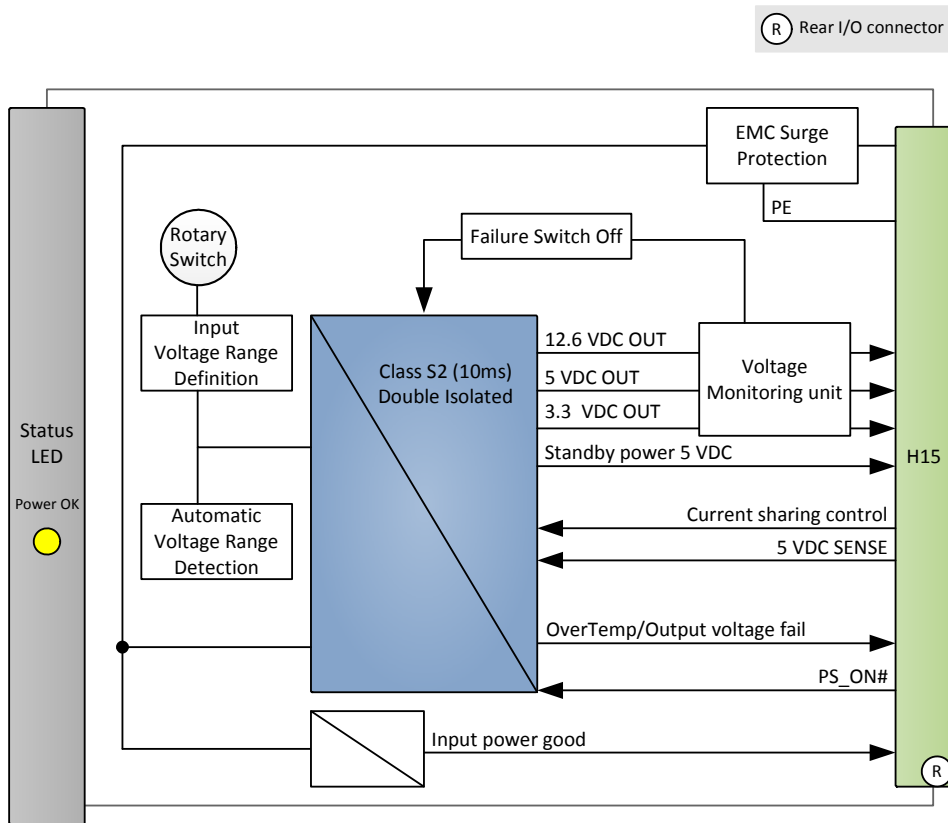
The standard output voltage is 12.6 V DC with a dynamic load sharing of between 12.6 and 5 V DC with 120 W. The output power at 3.3 V is 35 W, which is shared with the 5 V load. Switch-on behavior is independent of the load.

The PU20 also has a standby voltage of 5 V with 5W to supply the independent shelf controller, and to support wake-on-LAN functionality.

The PSU provides an inhibit port for switching the output voltages. It also indicates the event of an input power failure, output voltage failure or a fail-over temperature.

The PSU is coated conformally, and all components are secured against vibration. When more power supplies run in parallel, the performance loss is shared evenly and, in case of a fault in one of the power supplies, the output power is removed completely so as to avoid any negative effects. The double power monitoring ensures that the output voltage is within the valid range. In case of error, the voltage is powered-down. The thermal stress is extremely low due to integrated heat sinks, and diversion of dissipated heat over the mounting surface.

The PU20 is compliant with EN 50155, meeting all shock, vibration, EMC and isolation requirements. Operating under temperatures ranging from -40 to 70°C with increments to 85°C for 10 minutes (class TX), with a hold up time of 10 ms, as is in accordance with EN 50155 Class 2.



Input Characteristics

- Nominal voltage input: 24 V, 36 V, 48 V, 72 V, 96 V, 110 V (according to EN50155)
 - Max. input power range of 14.4..154 VDC
 - Configurable voltage range for 24, 36, 48, 74, 96, 110 VDC or wide range
 - Power-on/-off threshold according to EN 50155
 - Nominal input voltage of 74 VDC provided (according to S-9401)
 - Voltage range for 74 VDC is 20..130 VDC
 - Power-on/-off threshold according to EN 50155
- Power Variations
 - No functional disturbance with input voltage variations of $0.6 \times U_n < 1.4 \times U_n$ for 0.1 s
 - No functional disturbance with input voltage variations of $1.25 \times U_n < 1.4 \times U_n$ for 1 s
- Inrush current peak: 35 A for max. 150 ms at 24 VDC input voltage

Output Characteristics

- Output voltages: 12.6 VDC, 5 VDC and 3.3 VDC
- Output currents: 9.5 A for 12.6 VDC, 24 A for 5 VDC and 9.1 A for 3.3 VDC
- Total maximum power consumption: 120 W
- Standby output voltage: 5 VDC with a 5 W load
- Accuracy:
 - +3.3V (-1%/+1% of the nominal value)
 - +5V (-1%/+1% of the nominal value)
 - +12.6V (-1%/+1.5% of the nominal value)
 - +5VSB (-1%/+1% of the nominal value)
- Holdup time: 10 ms according to Class S2
- Dynamic load distribution
 - 120 W for complete temperature range without forced airflow
 - Load sharing: 220 W with 2 PSUs, 330 W with 3 PSUs

Front Interfaces

- 1 Status LED

Rear Interfaces

- Type H15, DIN 41612 plug connector
- Overtemperature, PS_ON and power good signal

Parallel Connection

- Up to six power supply units can be used in parallel
 - Extends availability (backup protection against faults)
 - Extends power
 - Increases performance
 - Ensures redundancy

Miscellaneous

- Overload and short circuit protection
- Standby voltage at power down, always available
- Reverse polarity protection for input voltage and short circuit
- Output voltage and temperature supervision
- Overtemperature and overvoltage shutdown

Electrical Specifications

- Isolation (according to EN 50155)
 - Input/output: 3100 VAC
 - Input/shield: 3100 VAC
 - Output/shield: 1000 VAC

Mechanical Specifications

- Dimensions: 3U, 6HP
- Integrated heat sink
- Weight: 630 g

Environmental Specifications

- Temperature: -40° to 70°C, with up to 85°C for 10 minutes according to class Tx (EN 50155)(assembled in the rack)
- Temperature range (storage): -50..+85°C
- Airflow: Convection cooling
- Cooling test according to EN 60068-2-1
- Dry heat test according to EN 60068-2-2
- Shock: 50 m/s², 30 ms (EN 61373)
- Vibration (function): 2.02 m/s², 5 Hz - 200 Hz (EN 61373)
- Vibration (lifetime): 11.44 m/s², 5 Hz - 200 Hz (EN 61373)

MTBF

- min. 600 000h @ 40°C according to IEC/TR 62380 (RDF 2000)

Safety

- Flammability
 - PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers
- Fire Protection
 - EN 5510-2
- Electrical Safety
 - EN 60950-1
 - UL 60950-1
 - CAN/CSA C22.2
 - Insulation measurement test according to EN 50155 (12.2.9.1)
 - Voltage withstand test according to EN 50155 (12.2.9.2)

EMC

- EMC line filter required
- EMC Emission:
 - EN 55022: CISPR 22 - Class B
 - FCC 15.109 and S-9401
- EMC Immunity: EN 55024 - Class A
- EN 50121-3-2 (EMC of rolling stock)
- EN 55011 (radio disturbance)
- IEC 61000-4-2 (ESD)
- IEC 61000-4-3 (electromagnetic field immunity)
- IEC 61000-4-4 (burst)
- IEC 61000-4-5 (surge)
- IEC 61000-4-6 (conducted disturbances)

Standard PU20 Model

- **17PU20-00** ■ 120 W, 3U 6 HP PSU, wide range input 24 to 110 V DC, output 12.6 V / 5 V / 3.3 V DC, - 40..+85°C qualified, conformal coating

Documentation

- **20PU20-00** ■ PU20 User Manual
- **20PU20-ER** ■ PU20 Errata

Germany

MEN Mikro Elektronik GmbH

Neuwieder Straße 3-7
90411 Nuremberg
Phone +49-911-99 33 5-0

sales@men.de
www.men.de

France

MEN Mikro Elektronik SAS

18, rue René Cassin
ZA de la Châtelaine
74240 Gaillard
Phone +33-450-955-312

sales@men-france.fr
www.men-france.fr

USA

MEN Micro Inc.

860 Penllyn Blue Bell Pike
Blue Bell, PA 19422
Phone 215-542-9575

sales@menmicro.com
www.menmicro.com

China

MEN Mikro Elektronik (Shanghai) Co., Ltd.

Room 808-809, Jiaxing Mansion, No. 877 Dongfang Road
200122 Shanghai
Phone +86-21-5058-0961

sales@men-china.cn
www.men-china.cn

Up-to-date information, documentation and ordering information:

www.men.de/products/pu20/

The date of issue stated in this data sheet refers to the Technical Data only. Changes in ordering information given herein do not affect the date of issue. All brand or product names are trademarks or registered trademarks of their respective holders.

MEN is not responsible for the results of any actions taken on the basis of information in the publication, nor for any error in or omission from the publication. MEN expressly disclaims all and any liability and responsibility to any person, whether a reader of the publication or not, in respect of anything, and of the consequences of anything, done or omitted to be done by any such person in reliance, whether wholly or partially, on the whole or any part of the contents of the publication.

The correct function of MEN products in mission-critical and life-critical applications is limited to the environmental specification given for each product in the technical user manual. The correct function of MEN products under extended environmental conditions is limited to the individual requirement specification and subsequent validation documents for each product for the applicable use case and has to be agreed upon in writing by MEN and the customer. Should the customer purchase or use MEN products for any unintended or unauthorized application, the customer shall indemnify and hold MEN and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim or personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that MEN was negligent regarding the design or manufacture of the part. In no case is MEN liable for the correct function of the technical installation where MEN products are a part of.

© 2017 MEN Holding