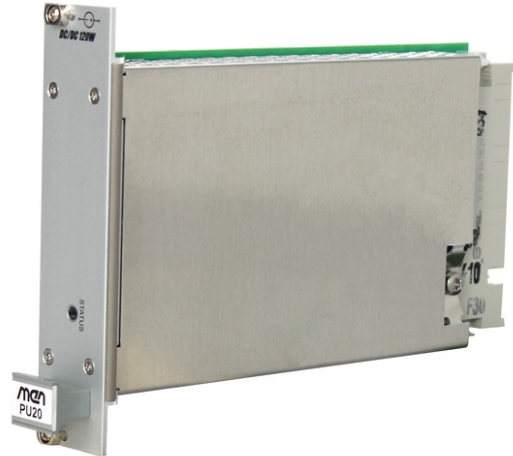


# PU20

## Wide-Range Railway Power Supply Unit, 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 24, 36, 48, 74, 96 V DC
- » Output power 120 W without derating
- » Hold up time 10 ms (EN 50155 Class S2)
- » Active power sharing
- » Inverse current protection
- » H15 rear connector
- » -40 °C to +85 °C
- » Conformal coating
- » Input voltage according to S-9401
- » EN 50155 compliance



### Designed for Rail Applications, Vehicle and Wayside

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 rolling-stock and wayside use.

### Wide-Range Input

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.

### Advanced Power Supply Functionality

The standard output voltage is 12.6 V DC with a dynamic load sharing between 12.6 V DC and 5 V DC with 120 W. The output power at 3.3 V is 30 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 5 W to supply the independent shelf controller, and to support wake-on-LAN functionality. The standby voltage is always on.

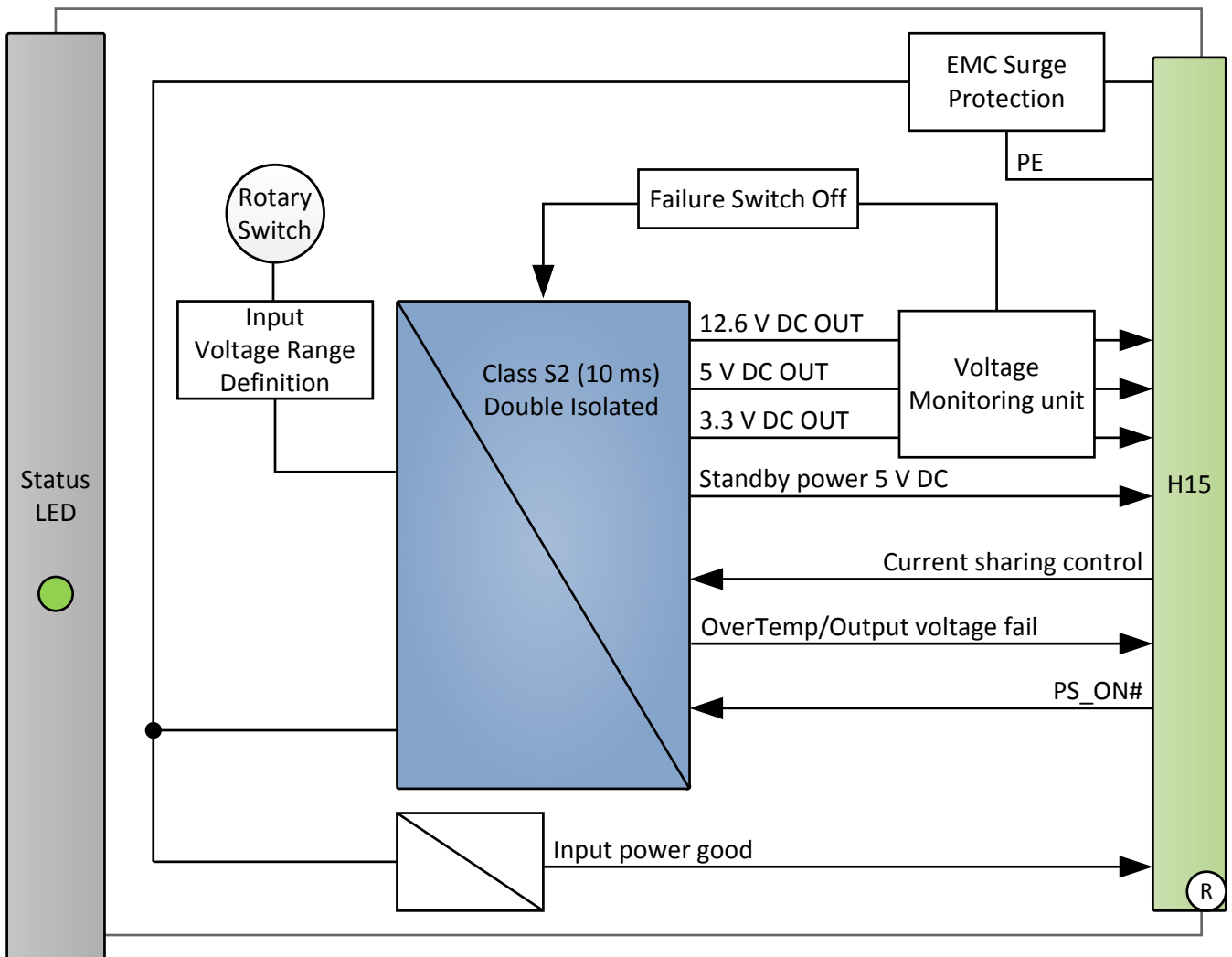
The PSU provides an inhibit port for switching the output voltages. It also indicates the event of an input power failure, output voltage failure or an over temperature.

### Rugged Design

The PSU is coated conformally, and all components are secured against vibration. When more power supplies run in parallel, there is a load sharing. The double voltage 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. It operates under temperatures from -40 °C to +70 °C with increments to +85 °C for 10 minutes (class TX), with a hold up time of 10 ms in accordance with EN 50155 Class 2.

(R) Rear I/O connector



**Input Characteristics**

- Nominal voltage input: 24 V, 36 V, 48 V, 72 V, 96 V, 110 V (according to EN 50155)
  - Max. input power range of 14.4 VDC to 154 VDC or
  - 9 VDC to 36 VDC (on request)
  - 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: 20 to 130 VDC
  - Power-on/-off threshold according to EN 50155
- Power Variations
  - No functional disturbance with input voltage variations according to EN 50155
- 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:
  - +3.3 V (-1%/+1% of the nominal value)
  - +5 V (-1%/+1% of the nominal value)
  - +12.6 V (-1%/+1.5% of the nominal value)
  - +5 VSB (-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 for input and output

**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°C to +85°C
- Cooling concept
  - Air-cooled, natural convection, or
  - Air-cooled, forced convection with fan tray at system bottom
  - Conduction-cooled in MEN CCA frame
- Cooling test according to EN 60068-2-1
- Dry heat test according to EN 60068-2-2
- Shock: 50 m/s<sup>2</sup>, 30 ms (EN 61373)
- Vibration (function): 2.02 m/s<sup>2</sup>, 5 Hz to 200 Hz (EN 61373)
- Vibration (lifetime): 11.44 m/s<sup>2</sup>, 5 Hz to 200 Hz (EN 61373)

## MTBF

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

## Safety

- Flammability (PCBs)
  - UL 94 V-0
- Fire Protection
  - EN 5510-2
- Electrical Safety
  - EN 60950-1
  - UL 60950-1 (UL certification no: Dk-52670-UL)
  - 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 to reach class B for radiated and conducted emissions
- EMC Emission:
  - EN 55022: CISPR 22 - Class A
  - 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)

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