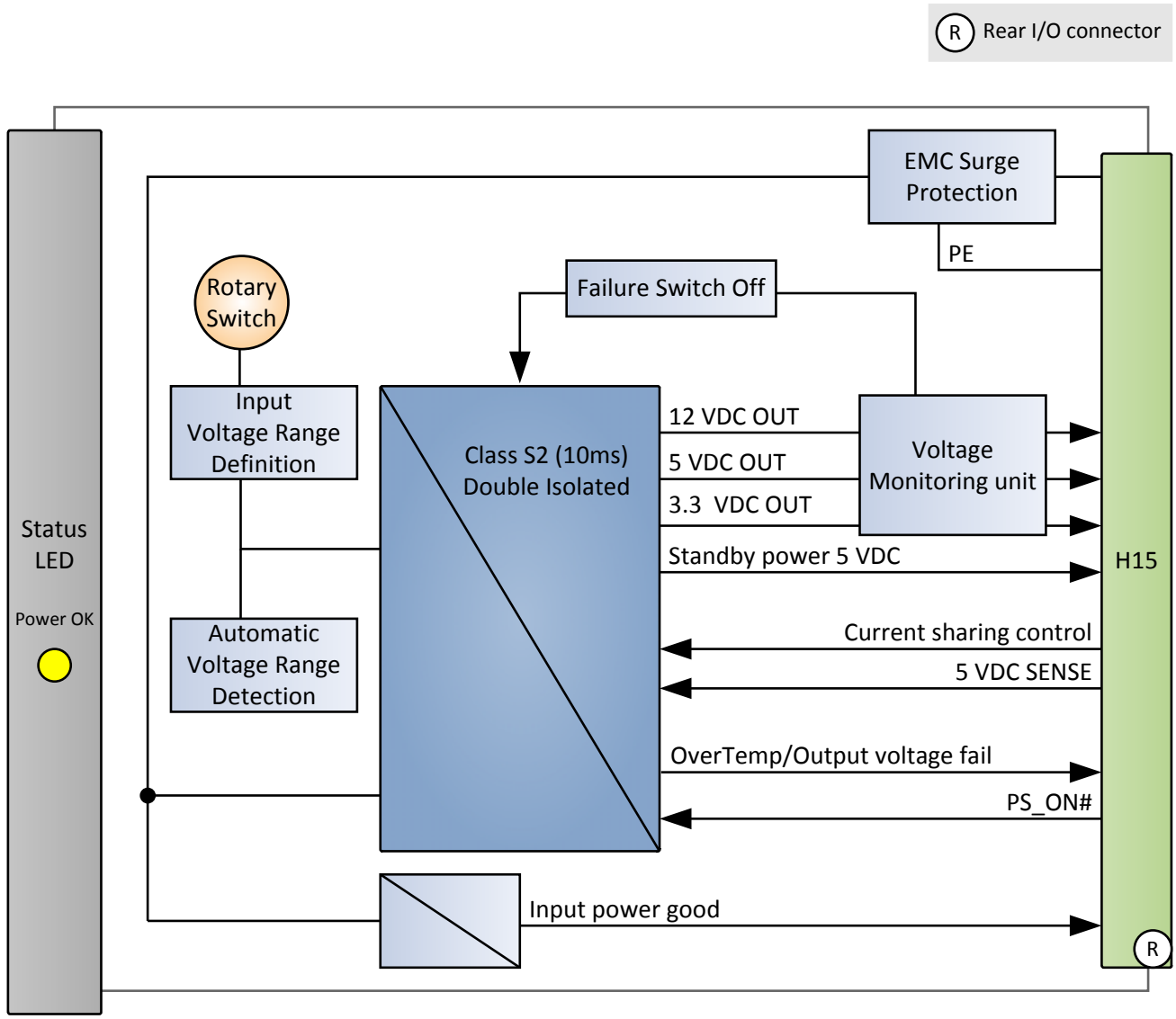
PU20 – 3U 6 HP Wide-Range PSU for Railway Systems, 24 to 110 VDC, 120 W

- **3U, 6 HP, 19" rack mountable**
- **Automatic input voltage range detection for 24, 72, 110 VDC**
- **Configurable voltage range for 36, 48, 74, 96 VDC**
- **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**
- **Fully S-9401 compliant**
- **Prepared for EN 50155 compliance**
- **Prepared for SIL applications**

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 to 110 V with a max. input voltage range of 14.6 to 156 VDC (according to EN 50155 and S-9401). It also has an automatic input voltage range detection for 24, 72, 110 VDC, to define the under-voltage level.
Additionally, the PU20 has a configurable voltage range for 36, 48, 74, 96 VDC, which is controlled by a rotary switch.
The standard output voltage is 5 V with a dynamic load sharing of between 12 and 5 V 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 three ports, on the secondary side, for switching the output voltages. They also indicate 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 as prepared by the SIL applications. The thermal stress is extremely low due to integrated heat sinks, and diversion of dissipated heat over the mounting surface.
The PU20 is fully prepared for EN 50155 compliance (March 2015), 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.

Diagram


R Rear I/O connector
EMC Surge Protection
PE
Rotary Switch
Failure Switch Off
Input Voltage Range Definition
Class S2 (10ms) Double Isolated
12 VDC OUT
5 VDC OUT
3.3 VDC OUT
Voltage Monitoring unit
Standby power 5 VDC
H15
Status LED
Power OK
Automatic Voltage Range Detection
Current sharing control
5 VDC SENSE
OverTemp/Output voltage fail
PS_ON#
Input power good
R

Technical Data

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 14.6..156 VDC □ Automatic input voltage range detection for 24, 72, 110 VDC □ Configurable voltage range for 36, 48, 74, 96 VDC □ Power-on/-off threshold ■ Input voltage range □ Nominal input voltage of 74 VDC provided (according to S-9401) □ Voltage range for 74 VDC is 20..130 VDC ■ Power Variations □ No functional disturbance with input voltage variations of 0.6 x Un < 1.4 x Un for 0.1 s □ No functional disturbance with input voltage variations of 1.25 x Un < 1.4 Un for 1 s ■ Inrush current limiting
Output Characteristics	■ Output voltages: 12 VDC, 5 VDC and 3.3 VDC ■ Standby output voltage: 5 VDC with a 5 W load ■ Accuracy: □ +3.3V (-1%/+3% of the nominal value) □ +5V (-1%/+2% of the nominal value) □ +12V (-3%/+4% of the nominal value) □ +5VSB (-1%/+2% 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 between 12 VDC output and 5 VDC output, including 3.3 VDC
Connection	■ Type H15, DIN 41612 plug connector
Control and Status Indicator	■ Three ports on secondary side □ Switches output voltages □ Indicates input power failure, output voltage failure or fail-over temperature
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 ■ Status LED on front panel
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

Technical Data

Environmental Specifications	■ Temperature range (operation): -40..+70°C (85°C/10 mins), no derating ■ Temperature range (storage): -50..+85°C ■ Temperature: 70°C, with up to 85°C for 10 minutes according to class Tx (EN 50155) ■ EMC Emission: □ EN 55022: CISPR 22 - Class B □ FCC 15.109 and S-9401 ■ EMC Immunity: EN 55024 - Class A ■ 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 ■ Electrical Safety □ EN 60950-1 □ Insulation measurement test according to EN 50155 (12.2.9.1) □ Voltage withstand test according to EN 50155 (12.2.9.2)
EMC Conformity	■ 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)

Configuration & Options

Options

Output voltage	■ Available in two different models: □ 14.4 VDC..156 VDC □ 9 VDC..36 VDC
Cooling Concept	■ Also available with conduction cooling in MEN CCA frame

Please note that some of these options may only be available for large volumes. Please ask our sales staff for more information.

Ordering Information

Standard PU20 Models	**17PU20-00**	120W, 3U 6HP PSU, wide range input 24 to 110VDC, 24VDC nom., output 12V/5/3.3VDC, -40..+85°C with qualified components, conformal coating
Documentation	**20PU20-00**	PU20 User Manual
	20PU20-ER	PU20 Errata

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