



Wide input voltage ranges up to 60 V DC
 1, 2 or 3 outputs up to 48 V DC
 4 kA DC I/O electric strength test voltage



- Rugged electrical and mechanical design
- Output 1 regulated, outputs 2 and 3 tracking
- Operating ambient temperature range -25...71 °C with convection cooling

Selection chart

| Output 1 | | Output 2 | | Output 3 | | Input voltage U_i [V DC] | Type | Options |
|-------------------------------|----------------------------|-------------------------------|----------------------------|-------------------------------|----------------------------|----------------------------------|------------|----------|
| $U_{o \text{ nom}}$ [V DC] | $I_{o \text{ nom}}$ [A] | $U_{o \text{ nom}}$ [V DC] | $I_{o \text{ nom}}$ [A] | $U_{o \text{ nom}}$ [V DC] | $I_{o \text{ nom}}$ [A] | | | |
| 5.1 | 8 | - | - | - | - | 8...15 | 12H1001-2R | -7, D, V |
| 5.1 | 8 | - | - | - | - | 14...30 | 24H1001-2R | -7, D, V |
| 5.1 | 8 | - | - | - | - | 28...60 | 48H1001-2R | -7, D, V |
| 12 | 4 | - | - | - | - | 8...15 | 12H1301-2R | -7, D |
| 12 | 4 | - | - | - | - | 14...30 | 24H1301-2R | -7, D |
| 12 | 4 | - | - | - | - | 28...60 | 48H1301-2R | -7, D |
| 15 | 3.4 | - | - | - | - | 8...15 | 12H1501-2R | -7, D |
| 15 | 3.4 | - | - | - | - | 14...30 | 24H1501-2R | -7, D |
| 15 | 3.4 | - | - | - | - | 28...60 | 48H1501-2R | -7, D |
| 24 | 2 | - | - | - | - | 8...15 | 12H1601-2R | -7, D |
| 24 | 2 | - | - | - | - | 14...30 | 24H1601-2R | -7, D |
| 24 | 2 | - | - | - | - | 28...60 | 48H1601-2R | -7, D |
| 48 | 1 | - | - | - | - | 9...15 | 12H1901-2R | -7, D |
| 48 | 1 | - | - | - | - | 18...30 | 24H1901-2R | -7, D |
| 48 | 1 | - | - | - | - | 36...60 | 48H1901-2R | -7, D |
| 12 | 2 | 12 | 2 | - | - | 8...15 | 12H2320-2 | -7, D |
| 12 | 2 | 12 | 2 | - | - | 14...30 | 24H2320-2 | -7, D |
| 12 | 2 | 12 | 2 | - | - | 28...60 | 48H2320-2 | -7, D |
| 15 | 1.7 | 15 | 1.7 | - | - | 8...15 | 12H2540-2 | -7, D |
| 15 | 1.7 | 15 | 1.7 | - | - | 14...30 | 24H2540-2 | -7, D |
| 15 | 1.7 | 15 | 1.7 | - | - | 28...60 | 48H2540-2 | -7, D |
| 5.1 | 5 | 12 | 0.7 | 12 | 0.7 | 8...15 | 12H3020-2 | -7, D, V |
| 5.1 | 5 | 12 | 0.7 | 12 | 0.7 | 14...30 | 24H3020-2 | -7, D, V |
| 5.1 | 5 | 12 | 0.7 | 12 | 0.7 | 28...60 | 48H3020-2 | -7, D, V |
| 5.1 | 5 | 15 | 0.6 | 15 | 0.6 | 8...15 | 12H3040-2 | -7, D, V |
| 5.1 | 5 | 15 | 0.6 | 15 | 0.6 | 14...30 | 24H3040-2 | -7, D, V |
| 5.1 | 5 | 15 | 0.6 | 15 | 0.6 | 28...60 | 48H3040-2 | -7, D, V |

Input

| | |
|---------------|--------------------------|
| Input voltage | refer to selection chart |
|---------------|--------------------------|

Output

| | | |
|-----------------------------------|--|----------------------------------|
| Efficiency | $U_{i \text{ nom}}, I_{o \text{ nom}}$ | up to 86% |
| Output voltage 1 setting acc. | $U_{i \text{ nom}}, I_{o \text{ nom}}$ | $\pm 2\% U_{o1 \text{ nom}}$ |
| Output voltage 2, 3 setting acc. | $U_{i \text{ nom}}, I_{o \text{ nom}}$ | $\pm 7.5\% U_{o2,3 \text{ nom}}$ |
| Output voltage switching noise | IEC/EN 61204, total | typ. 200 mV _{pp} |
| Line regulation | $U_{i \text{ min}} \dots U_{i \text{ max}}, I_{o \text{ nom}}$ | typ. $\pm 1\% U_{o \text{ nom}}$ |
| Load regulation output 1 | $U_{i \text{ nom}}, 0 \dots I_{o1 \text{ nom}}$ | typ. 0.2% $U_{o1 \text{ nom}}$ |
| Load regulation output 2, 3 | 10...100% $I_{o2,3 \text{ nom}}$ | typ. 0.7 V |
| Output voltage 2, 3 | $U_{i \text{ nom}}, I_{o1 \text{ nom}}, I_{o2,3} = 0$ | max. 115% $U_{o2,3 \text{ nom}}$ |
| Cross load regulation outp. 2, 3 | 0...100% $I_{o1 \text{ nom}}$ | typ. 0.7 V |
| Minimum output current | not required | 0 A |
| Current limitation main output | rectangular U/I characteristic | typ. 110% $I_{o \text{ nom}}$ |
| Current limitation aux. output(s) | rectangular U/I characteristic | typ. 120% $I_{o \text{ nom}}$ |
| Operation in parallel | by current limitation | |
| Hold-up time | $U_{i \text{ nom}}, I_{o \text{ nom}}$, with ext. diode in input line | up to 1 ms |

Protection

| | | |
|----------------------------|---|------------------------------|
| Input reverse polarity | with external fuse | |
| Input undervoltage lockout | | typ 80% $U_{i \text{ min}}$ |
| Input overvoltage lockout | | typ 110% $U_{i \text{ max}}$ |
| Input transient protection | suppressor diode | |
| Output | no-load, overload g2d short circuit proof | |
| Output overvoltage | suppressor diode in each output | typ 150% $U_{o \text{ nom}}$ |
| Overtemperature | switch-off with auto restart | T_C typ 100°C |

Control

| | | |
|---------------------------|--|-------------------------------|
| Output voltage adjustment | single output models | 0...110% $U_{o1 \text{ nom}}$ |
| Inhibit | TTL input, output(s) disabled if left open-circuit | |
| Status indication | LEDs: OK, inhibit | |

Safety

| | | |
|--------------------------------|--------------------------------------|-----------|
| Approvals | EN 60950, UL 1950, CSA C22.2 No. 950 | |
| Class of equipment | | class I |
| Protection degree | units without options | IP 40 |
| Electric strength test voltage | I/case | 2 kV AC |
| | I/O | 4 kV AC |
| | O/case | 1 kV AC |
| | O/O | 0.2 kV AC |

EMC

| | | |
|--------------------------------|---|-------------|
| Electrostatic discharge | IEC/EN 61000-4-2, contact discharge, level 2 (4 kV) | criterion A |
| Electromagnetic field | IEC/EN 61000-4-3, level x (20 V/m) | criterion A |
| Electr. fast transients/bursts | IEC/EN 61000-4-4, input, level 1 (0.5 kV) | criterion A |
| Surge | IEC/EN 61000-4-5, input, level 1 (0.5 kV) | criterion A |
| Electromagnetic emissions | CISPR 22/EN 55022, 12H, conducted | class A |
| | CISPR 22/EN 55022, 12H, radiated | class B |
| | CISPR 22/EN 55022, 24H, 48H, radiated and conducted | class B |

Environmental

| | | |
|----------------------------------|--|-----------------|
| Operating ambient temperature | $U_{i\ nom}, I_{o\ nom}$, convection cooled | -10...50 °C |
| Operating case temperature T_C | $U_{i\ nom}, I_{o\ nom}$ | -10...80 °C |
| Storage temperature | non operational | -25...100 °C |
| Damp heat | IEC/EN 60068-2-3, 93%, 40°C | 21 days |
| Vibration, sinusoidal | IEC/EN 60068-2-6, 10...60/60...150 Hz | 0.15 mm/2 g_n |
| Shock | IEC/EN 60068-2-27, 11 ms | 15 g_n |
| Bump | IEC/EN 60068-2-29, 16 ms | 10 g_n |
| MTBF | MIL-HDBK-217E, G_B , 40°C, single output types | 384'000 h |

Options

| | | |
|--|--------------------------------|---------|
| Extended temperature range | -25...71°C, ambient, operating | -7 |
| Input and/or output undervoltage monitoring, excludes option V | | D1...D8 |
| Input and/or output undervoltage monitoring (VME), excludes option D | | V2, V3 |

Accessories

- Front panels 19" (Schroff/Intermas)
- Mating H11 connectors with screw, solder, fast-on or press-fit terminals
- Connector retention facilities and code key system for connector coding
- Flexible PCB for connecting the converter via an H11 connector, if mounted on a PCB
- Chassis or wall mounting plates for frontal access
- Universal mounting brackets for chassis or DIN-rail mounting

Pin allocation

| Pin | Electrical Determination | H1000 | H2000 | H3000 |
|-----|---------------------------|--------|--------|--------|
| 2 | Inhibit control input | i | i | i |
| 5 | Save Data or ACFAIL | D or V | D or V | D or V |
| 8 | Output voltage (positive) | Vo1+ | | Vo3+ |
| 11 | Output voltage (negative) | Vo1- | | Vo3- |
| 14 | Control input + | R | | |
| 17 | Control input - | G | | |
| 14 | Output voltage (positive) | | Vo2+ | Vo2+ |
| 17 | Output voltage (negative) | | Vo2- | Vo2- |
| 20 | Output voltage (positive) | Vo1+ | Vo1+ | Vo1+ |
| 23 | Output voltage (negative) | Vo1- | Vo1- | Vo1- |
| 26 | Protective earthing | ⊕ | ⊕ | ⊕ |
| 29 | DC input voltage | Vi+ | Vi+ | Vi+ |
| 32 | DC input voltage | Vi- | Vi- | Vi- |

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Mechanical data

Tolerances ± 0.3 mm (0.012") unless otherwise indicated.

