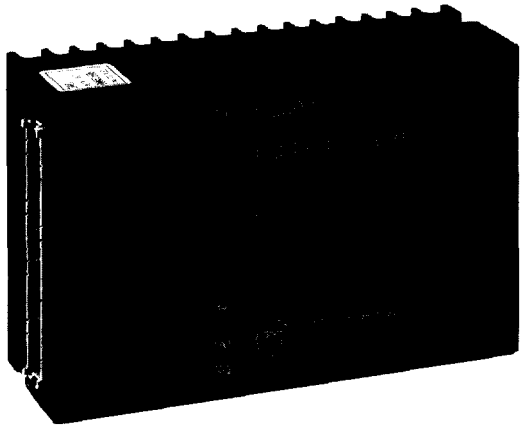


Wide input voltage ranges from 8...385 V DC
1or 2 isolated outputs up to 48 V DC
4 kV AC I/O electric strengh test voltage

- Rugged electrical and mechanical design
- Fully isolated outputs
- Operating ambient temperature range –40...71 °C with convection cooling

## Selection chart

| Output 1 $U_{o\,nom}$ [V DC] | Output 1 $I_{o\,nom}$ [A] | Output 2 $U_{o\,nom}$ [V DC] | Output 2 $I_{o\,nom}$ [A] | Type Input Voltage 8...35 V DC | Type Input Voltage 14...70 V DC | Type Input Voltage 20...100 V DC | Options |
|---|---|---|---|---|---|---|---|
| 5.1 | 16 | - | - | AS 1001-7R | BS 1001-7R | FS 1001-7R | -9, E, D, V, P, T, B1 |
| 12 | 8 | - | - | AS 1301-7R | BS 1301-7R | FS 1301-7R | -9, E, D, P, T, B1 |
| 15 | 6.5 | - | - | AS 1501-7R | BS 1501-7R | FS 1501-7R | -9, E, D, P, T, B1 |
| 24 | 4.2 | - | - | AS 1601-7R | BS 1601-7R | FS 1601-7R | -9, E, D, P, T, B1 |
| 24 | 4 | - | - | AS 2320-7R | BS 2320-7R | FS 2320-7R | -9, E, D, P, T, B1 |
| 30 | 3.2 | - | - | AS 2540-7R | BS 2540-7R | FS 2540-7R | -9, E, D, P, T, B1 |
| 48 | 2 | - | - | AS 2660-7R | BS 2660-7R | FS 2660-7R | -9, E, D, P, T, B1 |
| 12 | 4 | 12 | 4 | AS 2320-7R | BS 2320-7R | FS 2320-7R | -9, E, D, P, T, B1 |
| 15 | 3.2 | 15 | 3.2 | AS 2540-7R | BS 2540-7R | FS 2540-7R | -9, E, D, P, T, B1 |
| 24 | 2 | 24 | 2 | AS 2660-7R | BS 2660-7R | FS 2660-7R | -9, E, D, P, T, B1 |

| Output 1 $U_{o\,nom}$ [V DC] | Output 1 $I_{o\,nom}$ [A] | Output 2 $U_{o\,nom}$ [V DC] | Output 2 $I_{o\,nom}$ [A] | Type Input Voltage 28...140 V DC | Type Input Voltage 44...220 V DC | Type Input Voltage 67...385 V DC | Options |
|---|---|---|---|---|---|---|---|
| 5.1 | 16 | - | - | CS 1001-7R | DS 1001-7R | ES 1001-7R | -9, E, D, V, P, T, B1 |
| 12 | 8 | - | - | CS 1301-7R | DS 1301-7R | ES 1301-7R | -9, E, D, P, T, B1 |
| 15 | 6.5 | - | - | CS 1501-7R | DS 1501-7R | ES 1501-7R | -9, E, D, P, T, B1 |
| 24 | 4.2 | - | - | CS 1601-7R | DS 1601-7R | ES 1601-7R | -9, E, D, P, T, B1 |
| 24 | 4 | - | - | CS 2320-7R | DS 2320-7R | ES 2320-7R | -9, E, D, P, T, B1 |
| 30 | 3.2 | - | - | CS 2540-7R | DS 2540-7R | ES 2540-7R | -9, E, D, P, T, B1 |
| 48 | 2 | - | - | CS 2660-7R | DS 2660-7R | ES 2660-7R | -9, E, D, P, T, B1 |
| 12 | 4 | 12 | 4 | CS 2320-7R | DS 2320-7R | ES 2320-7R | -9, E, D, P, T, B1 |
| 15 | 3.2 | 15 | 3.2 | CS 2540-7R | DS 2540-7R | ES 2540-7R | -9, E, D, P, T, B1 |
| 24 | 2 | 24 | 2 | CS 2660-7R | DS 2660-7R | ES 2660-7R | -9, E, D, P, T, B1 |

## Input

| | | |
|---|---|---|
| Input voltage | 6 wide-input ranges (1:5) | refer to selection chart |
| Inrush current limitation | FS, CS, DS, ES by thermistor | |

## Output

| | | |
|---|---|---|
| Efficiency | $U_{i\,nom}$, $I_{o\,nom}$ | up to 86% |
| Output voltage setting accuracy | $U_{i\,nom}$, $I_{o\,nom}$ | ±0.6% $U_{o\,nom}$ |
| Output voltage switching noise | IEC/EN 61204, total | typ. 100 $mV_{pp}$ |
| Line regulation | $U_{i\,min}$...$U_{i\,max}$, $I_{o\,nom}$ | typ. ±0.3% $U_{o\,nom}$ |
| Load regulation | $U_{i\,nom}$, 10...100% $I_{o\,nom}$, symmetrical output load | typ. 0.4% $U_{o\,nom}$ |
| Minimum load | not required | 0 A |
| Current limitation | rectangular U/I characteristic | typ. 110% $I_{o\,nom}$ |
| Operation in parallel | by current limitation | |
| Hold-up time | $U_{i\,nom}$, $I_{o\,nom}$, CS/DS/ES/FS with ext. diode in input line | 12...40 ms |
| | $U_{i\,nom}$, $I_{o\,nom}$, AS/BS with ext. diode in input line | typ. 1.8 ms |

## Control and protection

| | | |
|---|---|---|
| Input reverse polarity | built-in fuse not user accessible | |
| Input undervoltage lockout | | typ. 80% $U_{i\,min}$ |
| Input overvoltage lockout | | typ. 108% $U_{i\,max}$ |
| Input transient protection | varistor or suppressor diode | |
| Output | no-load, overload and short circuit proof | |
| Output overvoltage | suppressor diode in each output | typ. 130% $U_{o\,nom}$ |
| Overtemperature | switch-off with auto restart | $T_C$ typ. 100°C |
| Output voltage adjustment | | 0...110% $U_{o\,nom}$ |
| Inhibit | TTL input, output(s) disabled if open circuit | |
| Status indication | LEDs: OK, inhibit, overload | |

## Safety

| | | |
|---|---|---|
| Approvals | EN 60950, UL 1950, CSA 22.2 No. 950 | |
| Class of equipment | | class I |
| Protection degree | | IP 30 |
| Electric strength test voltage | I/case | 2 kV AC |
| | I/O | 4 kV AC |
| | O/case | 1 kV AC |
| | O/O | 0.1 kV AC |

## EMC

| | | |
|---|---|---|
| Electrostatic discharge | IEC/EN 61000-4-2, level 4 (8/15 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, level 4 (2/4 kV) | criterion A |
| Surge | IEC/EN 61000-4-5, level 3 (2 kV) | criterion A |
| Conducted disturbances | IEC/EN 61000-4-6, level 3 (10 V) | criterion A |
| Electromagnetic emissions | CISPR 22/EN 55022, conducted | class B |

## Environmental

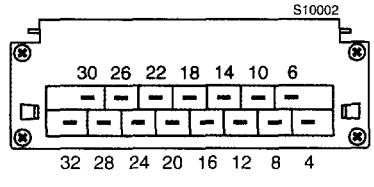
| | | |
|---|---|---|
| Operating ambient temperature | $U_{i\,nom}$, $I_{o\,nom}$, convection cooled | –25...71 °C |
| Operating case temperature $T_C$ | $U_{i\,nom}$, $I_{o\,nom}$ | –25...95 °C |
| Storage temperature | non operational | –40...100 °C |
| Damp heat | IEC/EN 60068-2-3, 93 %, 40 °C | 56 days |
| Vibration, sinusoidal | IEC/EN 60068-2-6, 10...60/60...2000 Hz | 0.35 mm/5 $g_n$ |
| Shock | IEC/EN 60068-2-27, 6 ms | 100 $g_n$ |
| Bump | IEC/EN 60068-2-29, 6 ms | 40 $g_n$ |
| Random vibration | IEC/EN 60068-2-64, 20...500 Hz | 4.9 $g_{n\,rms}$ |
| MTBF | MIL-HDBK-217F, $G_B$, 40°C | 500'000 h |

## Options

| | | |
|---|---|---|
| Extended temperature range | –40...71 °C, ambient, operating | -9 |
| Electronic inrush current limitation | | E |
| Output voltage adjustment | 40...110% $U_{o\,nom}$, excludes feature R and vice versa | P |
| Input and/or output undervoltage monitoring, excludes option V | | D0...D9 |
| Input and/or output undervoltage monitoring (VME), excludes option D | | V0, V2, V3 |
| Current sharing | | T |
| Cooling plate | | B1 |

## Pin allocation

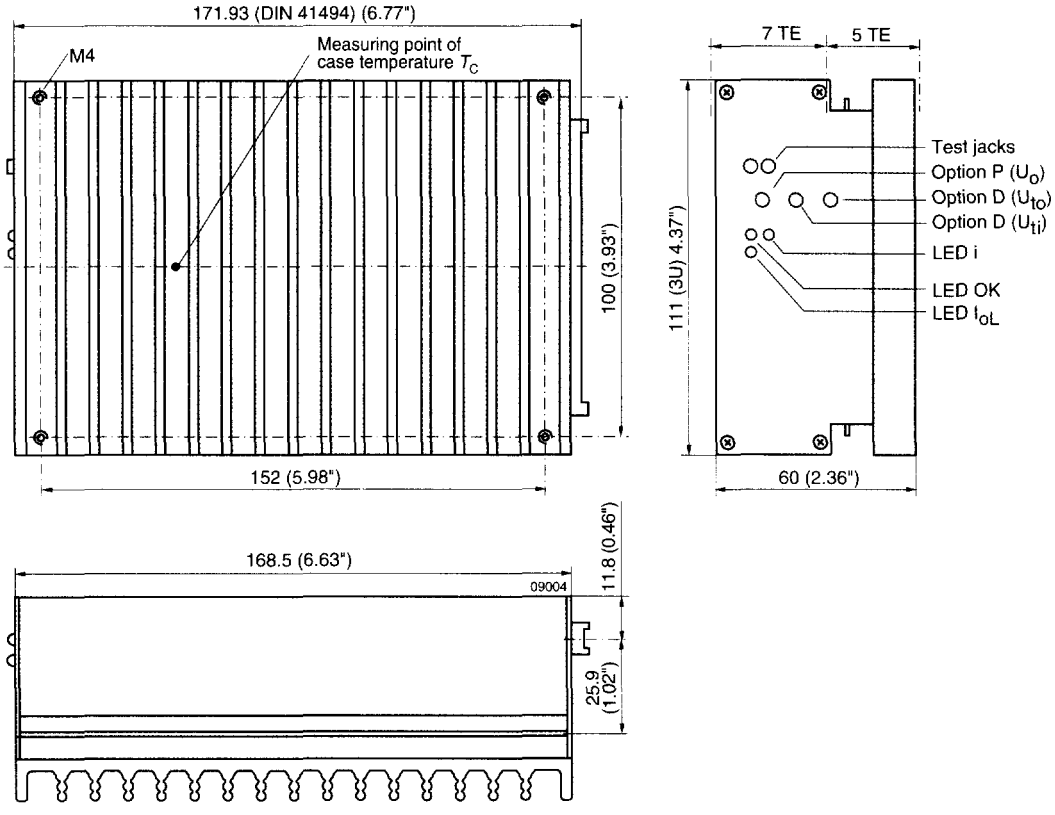
| Pin | AS...ES 1000 | | AS...ES 2000 | |
|---|---|---|---|---|
| 4 | Vo1+ | Output 1 | Vo2+ | Output 2 |
| 6 | Vo1+ | | Vo2+ | |
| 8 | Vo1– | Output 1 | Vo2– | Output 2 |
| 10 | Vo1– | | Vo2– | |
| 12 | S+ | Sense | Vo1+ | Output 1 |
| 14 | S– | Sense | Vo1– | |
| 16 | R | Control of $U_{o1}$ | R | Control of $U_{o1}$ |
| 18 | i | Inhibit | i | Inhibit |
| 20 | D | Save data | D | Save data |
| | V | ACFAIL | | |
| 22 | T | Current sharing | T | Current sharing |
| 24 | ⏚ | Protective earth | ⏚ | Protective earth |
| 26 | Vi+ | Input | Vi+ | Input |
| 28 | Vi+ | | Vi+ | |
| 30 | Vi– | Input | Vi– | Input |
| 32 | Vi– | | Vi– | |



## Mechanical data

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

European Projection




## Accessories

Front panels 19" (Schroff/Intermas)
Mating H15 connectors with screw, solder, fast-on or press-fit terminals
Connector retention facilities and code key system for connector coding
Chassis or wall mounting plates for frontal access
Universal mounting brackets for chassis or DIN-rail mounting