



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



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

Selection chart

Output 1		Output 2		Type	Type	Type	Options
$U_{o\ nom}$ [V DC]	$I_{o\ nom}$ [A]	$U_{o\ nom}$ [V DC]	$I_{o\ nom}$ [A]	Input Voltage 8...35 V DC	Input Voltage 14...70 V DC	Input Voltage 20...100 V DC	
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		Output 2		Type	Type	Type	Options
$U_{o\ nom}$ [V DC]	$I_{o\ nom}$ [A]	$U_{o\ nom}$ [V DC]	$I_{o\ nom}$ [A]	Input Voltage 28...140 V DC	Input Voltage 44...220 V DC	Input Voltage 67...385 V DC	
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	$U_{i\text{ nom}}, I_{o\text{ nom}}$	up to 86%
Output voltage setting accuracy	$U_{i\text{ nom}}, I_{o\text{ nom}}$	$\pm 0.6\% U_{o\text{ nom}}$
Output voltage switching noise	IEC/EN 61204, total	typ. 100 mV <sub>pp</sub>
Line regulation	$U_{i\text{ min}} \dots U_{i\text{ max}}, I_{o\text{ nom}}$	typ. $\pm 0.3\% U_{o\text{ nom}}$
Load regulation	$U_{i\text{ nom}}, 10 \dots 100\% I_{o\text{ nom}}$ , symmetrical output load	typ. $0.4\% U_{o\text{ nom}}$
Minimum load	not required	0 A
Current limitation	rectangular U/I characteristic	typ. 110% $I_{o\text{ nom}}$
Operation in parallel	by current limitation	
Hold-up time	$U_{i\text{ nom}}, I_{o\text{ nom}}$ , CS/DS/ES/FS with ext. diode in input line	12...40 ms
	$U_{i\text{ nom}}, I_{o\text{ nom}}$ , 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% $U_{i\text{ min}}$
Input overvoltage lockout		typ. 108% $U_{i\text{ max}}$
Input transient protection	varistor or suppressor diode	
Output	no-load, overload and short circuit proof	
Output overvoltage	suppressor diode in each output	typ. 130% $U_{o\text{ nom}}$
Overtemperature	switch-off with auto restart	$T_C$ typ. 100°C
Output voltage adjustment		0...110% $U_{o\text{ nom}}$
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**

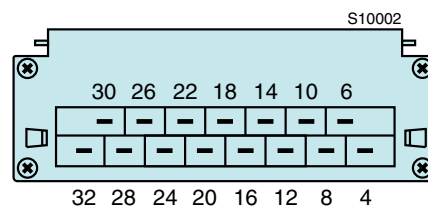
Operating ambient temperature	$U_{i\ nom}, I_{o\ nom}$ , convection cooled	-25...71 °C
Operating case temperature $T_C$	$U_{i\ nom}, I_{o\ nom}$	-25...95 °C
Storage temperature	non operational	-40...100 °C
Damp heat	IEC/EN 60068-2-3, 93 %, 40 °C	56 days
Vibration, sinusoidal	IEC/EN 60068-2-6, 10...60/60...2000 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

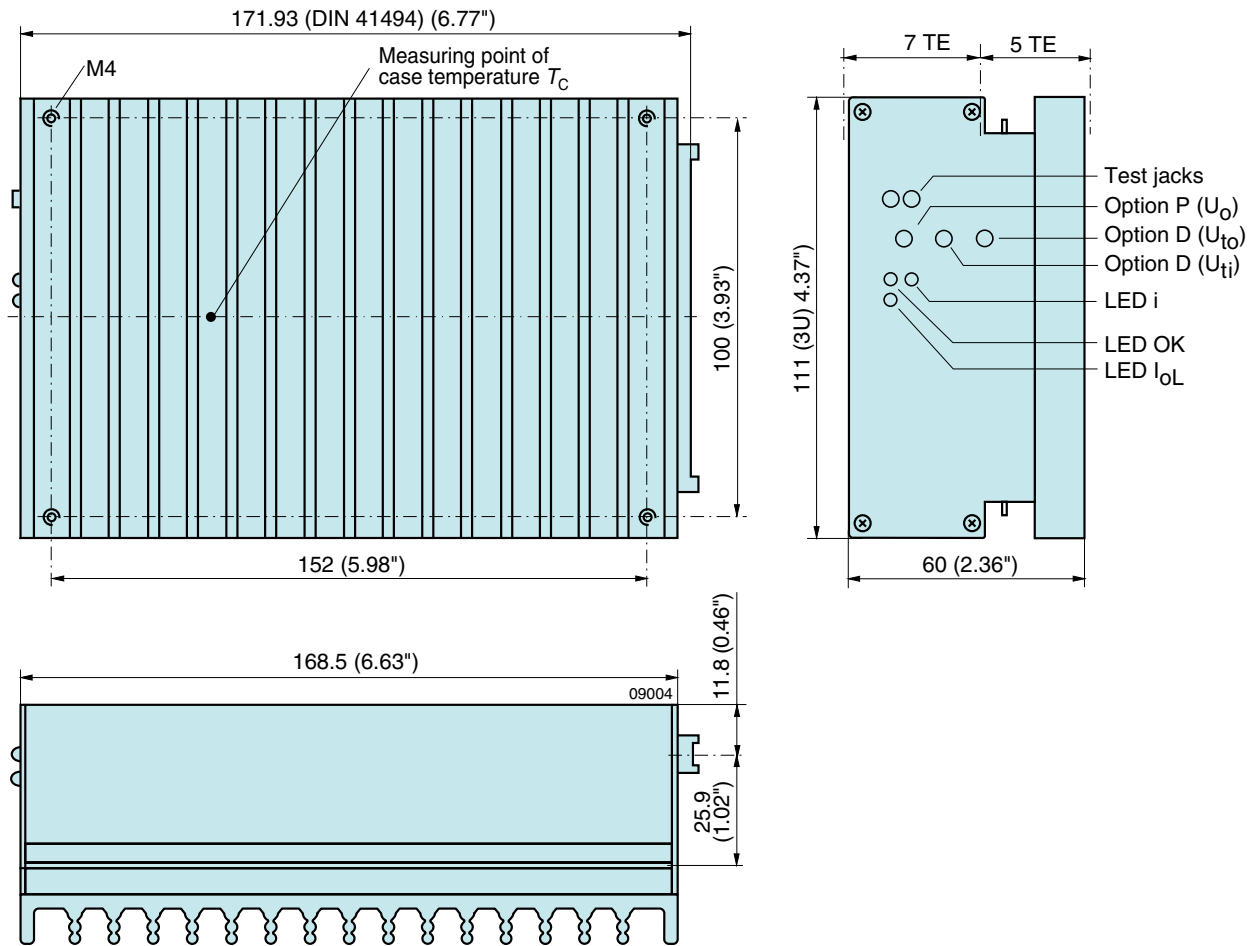
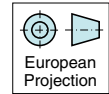
**Pin allocation**

Pin	AS...ES 1000		AS...ES 2000	
	4	Vo1+	Output 1	Vo2+
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  $\pm 0.3$  mm (0.012") unless otherwise indicated.



## 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