



**Features**

- Input voltage up to 150 VDC, surges up to 168 V
- 1 to 4 isolated outputs 3.3 to 96 VDC
- Class I equipment



- RoHS lead solder exemption compliant
- Extremely slim case (4 TE), fully enclosed
- Extremely low inrush current, hot swappable
- Operating ambient temperature range -40 to 71 °C with convection cooling

**Model Selection**

Output 1			Output 2			Output 3			Output 4			Type	Type
$V_{O\ nom}$	$P_{O\ nom}$	$P_{O\ max}$	$V_{O\ nom}$	$P_{O\ nom}$	$P_{O\ max}$	$V_{O\ nom}$	$P_{O\ nom}$	$P_{O\ max}$	$V_{O\ nom}$	$P_{O\ nom}$	$P_{O\ max}$	Input voltage	Input voltage
[VDC]	[W]	[W]	[VDC]	[W]	[W]	[VDC]	[W]	[W]	[VDC]	[W]	[W]	16 - 36 VDC	33.6 - 75 VDC
3.3	100	132	-	-	-	-	-	-	-	-	-	BP 1101-7R	CP 1101-7R
5.1	122	183	-	-	-	-	-	-	-	-	-	BP 1001-7R	CP 1001-7R
3.3	50	66	5.1	61	91	-	-	-	-	-	-	BP 2101-7R	CP 2101-7R
5.1	61	91	5.1	61	91	-	-	-	-	-	-	BP 2001-7R	CP 2001-7R
12	60	96	12	60	96	-	-	-	-	-	-	BP 2320-7R	CP 2320-7R
15	60	97	15	60	97	-	-	-	-	-	-	BP 2540-7R	CP 2540-7R
24	60	96	24	60	96	-	-	-	-	-	-	BP 2660-7R	CP 2660-7R
5.1	61	91	12	30	48	12	30	48	-	-	-	BP 3020-7R	CP 3020-7R
5.1	61	91	15	30	48	15	30	48	-	-	-	BP 3040-7R	CP 3040-7R
5.1	61	91	24	30	48	24	30	48	-	-	-	BP 3060-7R	CP 3060-7R
5.1	20	30	12	30	48	12	30	48	3.3	10	20	BP 4720-7R	CP 4720-7R
12	30	48	12	30	48	12	30	48	12	30	48	BP 4320-7R	CP 4320-7R
15	30	48	15	30	48	15	30	48	15	30	48	BP 4540-7R	CP 4540-7R
24	30	48	24	30	48	24	30	48	24	30	48	BP 4660-7R	CP 4660-7R

Output 1			Output 2			Output 3			Output 4			Type	Type
$V_{O\ nom}$	$P_{O\ nom}$	$P_{O\ max}$	$V_{O\ nom}$	$P_{O\ nom}$	$P_{O\ max}$	$V_{O\ nom}$	$P_{O\ nom}$	$P_{O\ max}$	$V_{O\ nom}$	$P_{O\ nom}$	$P_{O\ max}$	Input voltage	Input voltage
[VDC]	[W]	[W]	[VDC]	[W]	[W]	[VDC]	[W]	[W]	[VDC]	[W]	[W]	40 - 100.8 VDC	66 - 150 VDC
3.3	100	132	-	-	-	-	-	-	-	-	-	DP 1101-7R	EP 1101-7R
5.1	122	183	-	-	-	-	-	-	-	-	-	DP 1001-7R	EP 1001-7R
3.3	50	66	5.1	61	91	-	-	-	-	-	-	DP 2101-7R	EP 2101-7R
5.1	61	91	5.1	61	91	-	-	-	-	-	-	DP 2001-7R	EP 2001-7R
12	60	96	12	60	96	-	-	-	-	-	-	DP 2320-7R	EP 2320-7R
15	60	97	15	60	97	-	-	-	-	-	-	DP 2540-7R	EP 2540-7R
24	60	96	24	60	96	-	-	-	-	-	-	DP 2660-7R	EP 2660-7R
5.1	61	91	12	30	48	12	30	48	-	-	-	DP 3020-7R	EP 3020-7R
5.1	61	91	15	30	48	15	30	48	-	-	-	DP 3040-7R	EP 3040-7R
5.1	61	91	24	30	48	24	30	48	-	-	-	DP 3060-7R	EP 3060-7R
5.1	20	30	12	30	48	12	30	48	3.3	10	20	DP 4720-7R	EP 4720-7R
12	30	48	12	30	48	12	30	48	12	30	48	DP 4320-7R	EP 4320-7R
15	30	48	15	30	48	15	30	48	15	30	48	DP 4540-7R	EP 4540-7R
24	30	48	24	30	48	24	30	48	24	30	48	DP 4660-7R	EP 4660-7R

Output 1			Output 2			Output 3			Output 4			Type
$V_{o\ nom}$ [VDC]	$P_{o\ nom}$ [W]	$P_{o\ max}$ [W]	$V_{o\ nom}$ [VDC]	$P_{o\ nom}$ [W]	$P_{o\ max}$ [W]	$V_{o\ nom}$ [VDC]	$P_{o\ nom}$ [W]	$P_{o\ max}$ [W]	$V_{o\ nom}$ [VDC]	$P_{o\ nom}$ [W]	$P_{o\ max}$ [W]	Input voltage 21.6 - 50.4 VDC
3.3	100	132	-	-	-	-	-	-	-	-	-	GP 1101-7R
5.1	122	183	-	-	-	-	-	-	-	-	-	GP 1001-7R
3.3	50	66	5.1	61	91	-	-	-	-	-	-	GP 2101-7R
5.1	61	91	5.1	61	91	-	-	-	-	-	-	GP 2001-7R
12	60	96	12	60	96	-	-	-	-	-	-	GP 2320-7R
15	60	97	15	60	97	-	-	-	-	-	-	GP 2540-7R
24	60	96	24	60	96	-	-	-	-	-	-	GP 2660-7R
5.1	61	91	12	30	48	12	30	48	-	-	-	GP 3020-7R
5.1	61	91	15	30	48	15	30	48	-	-	-	GP 3040-7R
5.1	61	91	24	30	48	24	30	48	-	-	-	GP 3060-7R
5.1	20	30	12	30	48	12	30	48	3.3	10	20	GP 4720-7R
12	30	48	12	30	48	12	30	48	12	30	48	GP 4320-7R
15	30	48	15	30	48	15	30	48	15	30	48	GP 4540-7R
24	30	48	24	30	48	24	30	48	24	30	48	GP 4660-7R

## Input

Input voltage refer to selection chart

## Output

Efficiency	$V_{i\ nom}, I_{o\ nom}$	up to 92%
Nominal output current $I_{o1,2,3,4\ nom}$		$P_{o1,2,3,4\ nom}/V_{o1,2,3,4\ nom}$
Maximal output current $I_{o1,2,3,4\ max}$		$P_{o1,2,3,4\ max}/V_{o1,2,3,4}$
Voltage setting accuracy 1, 2	$V_{i\ nom}, I_{o\ nom}$	up to $\pm 0.6\% V_{o1,2\ nom}$
Voltage setting accuracy 3, 4	$V_{i\ nom}, I_{o\ nom}$	$\pm 2\% V_{o3,4\ nom}$
Worst case output voltage 1, 2	$V_{i\ min}$ to $V_{i\ max}$ , 0 to $I_{o1,2\ max}$ , $T_C\ min$ to $T_C\ max$	$\pm 1.6\% V_{o\ nom}$
Minimum output current 1, 4	in parallel configuration not required	0 A
	in individual or series configuration	5% $I_{o1,4\ nom}$
Minimum output current 2, 3	in parallel configuration not required	0 A
	in individual or series configuration	5% $I_{o2,3\ nom}$
Cross load reg. output 4	$I_{o1,4\ min}$ to $I_{o1,4\ max}$	typ. $100\ m\Omega \cdot (I_{o1} - I_{o4})$
Cross load reg. output 3	$I_{o2,3\ min}$ to $I_{o2,3\ max}$	typ. $100\ m\Omega \cdot (I_{o2} - I_{o3})$
Output voltage switching noise	IEC/EN 61204, total, peak-peak	typ. $0.4\% V_{o\ nom}$
Common power limitation	$(P_{o1} + P_{o4})$ rectangular U/I characteristic	typ. $130\% P_{o\ max}/2$
	$(P_{o2} + P_{o3})$ rectangular U/I characteristic	typ. $130\% P_{o\ max}/2$

## Protection

Input reverse polarity	built-in fuse	
Input undervoltage lockout		typ. 90% $V_{i\ min}$
Input overvoltage lockout		typ. 110% $V_{i\ max}$
Input transient protection	varistor	
Output	no-load, overload and short-circuit proof	
Output overvoltage	transient suppressor or 2 <sup>nd</sup> control loop	typ. 125% $V_{o\ nom}$
Overtemperature	switch-off with auto restart	$T_C$ typ. 100°C

## Control

Output voltage adjustment	output 1, 4 (with feature R)	60 - 110% $V_{o\ nom}$
Inhibit on primary side	TTL input, output disabled if left open-circuit	
Status indication	LEDs: In OK, Out OK	
Output good signal (Out OK)	isolated open-collector signal	

## Safety

Approvals	EN 60950, UL 1950, CSA C22.2 No. 950	
Class of equipment		class I
Protection degree		IP 40
Electric strength test voltage	I/case, I/O, I/aux	2100 VDC
	O/case, aux/case	2100 VDC
	O/O, O/aux	500 V DC

### EMC

Electrostatic discharge	IEC/EN 61000-4-2, level 4 (8/15 kV)	criterion B
Electromagnetic field	IEC/EN 61000-4-3, level 3 (10 V/m)	criterion A
Electr. fast transients/bursts	IEC/EN 61000-4-4, input/output, level 3/4 (2/4 kV)	criterion B
Surge	IEC/EN 61000-4-5, input, level 2/3 (1/2 kV)	criterion B
Conducted disturbances	IEC/EN 61000-4-6, level 2/3 (3/10 V)	criterion A
Electromagnetic emissions	CISPR 22/EN 55022, conducted	class B

### Environmental

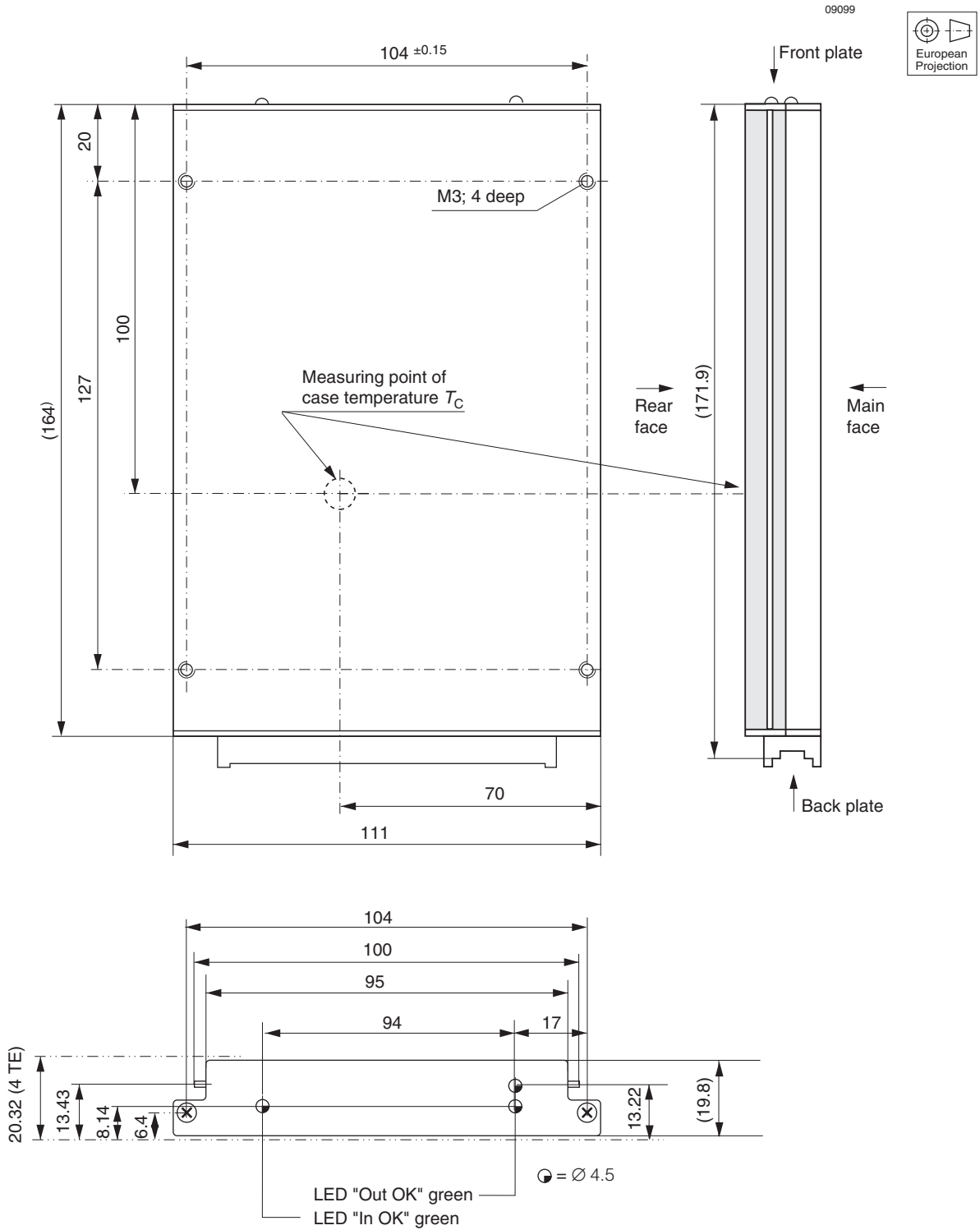
Operating ambient temp. (-7)	$V_{i\ nom}, P_{o\ nom}$ , convection cooled	-25 to 71 °C
Operating case temp. (-7)	$V_{i\ nom}, P_{o\ nom}/P_{o\ max}$	-25 to 95 °C
Storage temperature	non operational	-40 to 100 °C
Damp heat	IEC/EN 60068-2-3, 93%, 40 °C	56 days
Vibration, sinusoidal	IEC/EN 60068-2-6, 10 - 60/60 - 2000 Hz	0.35 mm/5 $g_n$
Shock	IEC/EN 60068-2-27, 11 ms	50 $g_n$
Bump	IEC/EN 60068-2-29, 11 ms	25 $g_n$
Random vibration	IEC/EN 60068-2-64, 20 - 500 Hz	4.9 $g_{n\ rms}$

### Options

Extended temperature range	-40 to 71 °C, ambient, operating	-9
Out OK output	excludes option i	D
Current sharing		T
Inhibit on output side	excludes option D	i
Synchronisation		W
Heat Sink	height 20 mm or 30 mm	B1 or B3

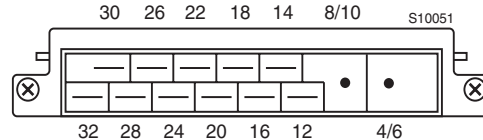
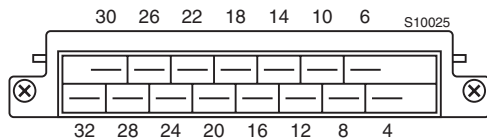
**Mechanical data**

The converters are designed to be inserted into a 19" rack according to IEC 60297-3.



**Pinout Information**

Pin	P 1000		P 2000		P 3000		P 4000	
4	Vo1+	Output 1	Vo1+	Output 1	Vo1+	Output 1	Vo1+	Output 1
6			Vo2+	Output 2	Vo2+	Output 2	Vo2+	Output 2
8	Vo1-	Output 1	Vo1-	Output 1	Vo1-	Output 1	Vo1-	Output 1
10			Vo2-	Output 2	Vo2-	Output 2	Vo2-	Output 2
12	S+	Sense	S1+	Sense 1	S1+	Sense 1	Vo4+	Output 4
14	S-	Sense	S1-	Sense 1	S1-	Sense 1	Vo4-	Output 4
16	R	Control of $V_o$	R1	Control of $V_{o1}$	R1	Control of $V_{o1}$	R1/4	Control of $V_{o1/4}$
			T1	Current sharing	T1	Current sharing		
18	T	Current sharing	S2+	Sense 2	Vo3+	Output 3	Vo3+	Output 3
20	n.c.	Not connected	S2-	Sense 2	Vo3+	Output 3	Vo3+	Output 3
22	Out OK+	Output good	Out OK+	Output good	Out OK+	Output good	Out OK+	Output good
	i+	Inhibit second.	i+	Inhibit second.	i+	Inhibit second.	i+	Inhibit second.
24	Out OK-	Output good	Out OK-	Output good	Out OK-	Output good	Out OK-	Output good
	i-	Inhibit second.	i-	Inhibit second.	i-	Inhibit second.	i-	Inhibit second.
26	⊕	Prot. ground	⊕	Prot. ground	⊕	Prot. ground	⊕	Prot. ground
28	i	Inhibit	i	Inhibit	i	Inhibit	i	Inhibit
	W	Synchronizat.	W	Synchronizat.	W	Synchronizat.	W	Synchronizat.
30	Vi+	Input	Vi+	Input	Vi+	Input	Vi+	Input
32	Vi-	Input	Vi-	Input	Vi-	Input	Vi-	Input



**Accessories**

- Additional external heat sinks for operation above  $P_{o\ nom}$  or  $T_{A\ max}$  (option B1, B3)
- Front panels for 19" rack mounting in 3U or 6U configuration (Schroff/Intermas)
- Mating H15 connectors with screw, solder, fast-on or press-fit terminals
- Mechanical mounting supports for chassis, DIN-rail and PCB mounting

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