



Features

- RoHS lead-solder-exempt compliant¹
- Rugged electrical and mechanical design
- Outputs individually controlled with excellent dynamic properties
- Operating ambient temperature range of -40 to 71 °C with convection cooling



¹ The solder exemption refers to all the restricted materials except lead in solder.

Description

The M Series of AC-DC cassettes represents a broad and flexible range of power supplies for use in advanced industrial electronic systems. Features include high efficiency, reliability, low output voltage noise, and excellent dynamic response to load/line changes due to individual regulation of each output.

Model Selection

Output 1		Output 2		Output 3		Nom. Input Voltage V_i [VAC]	Model	Options
V_o nom [VDC]	I_o nom [A]	V_o nom [VDC]	I_o nom [A]	V_o nom [VDC]	I_o nom [A]			
5.1	8	-	-	-	-	100 - 240	LM1001-7R	-9, E, P, D, V, A, F
12	4	-	-	-	-	100 - 240	LM1301-7R	-9, E, P, D, A, F
15	3.4	-	-	-	-	100 - 240	LM1501-7R	-9, E, P, D, A, F
24	2	-	-	-	-	100 - 240	LM1601-7R	-9, E, P, D, A, F
48	1	-	-	-	-	100 - 240	LM1901-7R	-9, E, P, D, A, F
12	2	12	2	-	-	100 - 240	LM2320-7	-9, E, P, D, A, F
15	1.7	15	1.7	-	-	100 - 240	LM2540-7	-9, E, P, D, A, F
5.1	5	12	0.7	12	0.7	100 - 240	LM3020-7	-9, E, P, D, V, A, F
5.1	5	15	0.6	15	0.6	100 - 240	LM3040-7	-9, E, P, D, V, A, F

Input

Nom. voltage and frequency	continuous range	100 - 240 VAC, 50 - 60, 440 Hz
Operating voltage and frequency	continuous range	85 - 264 VAC, 47 - 440 Hz
Inrush current limitation	by thermistor	

Output

Efficiency	$V_{i\ nom}, I_{o\ nom}$	up to 81%
Output voltage setting accuracy	$V_{i\ nom}, I_{o\ nom}$	better than $\pm 1\% V_{o\ nom}$
Output voltage switching noise	IEC/EN 61204, total	typ. 50 mVpp
Line regulation	$V_{i\ min} - V_{i\ max}, I_{o\ nom}$, each output regulated	typ. $\pm 0.2\% V_{o\ nom}$
Load regulation	$V_{i\ nom}, 0 - I_{o\ nom}$, each output regulated	typ. $0.15\% V_{o\ nom}$
Minimum load	not required	0 A
Current limitation main output	rectangular V/I characteristic	typ. $110\% I_{o\ nom}$
Current limitation aux. output(s)	rectangular V/I characteristic	typ. $120\% I_{o\ nom}$
Operation in parallel	by current limitation, only main outputs	
Hold-up time	$V_i = 230\ V\ AC, I_{o\ nom}$	typ. 90 ms

Protection

Input fuse	built-in	T 2.5 A, 250 V AC
Input undervoltage lockout		typ. $80\% V_{i\ min}$
Input overvoltage lockout		typ. $110\% V_{i\ max}$
Input transient protection	varistor or suppressor diode	
Output	no-load, overload, and short-circuit proof	
Output overvoltage	suppressor diode in each output	typ. $150\% V_{o\ nom}$
Overtemperature protection	switch-off with auto restart	TC typ. $100\ ^\circ C$

Control

Output voltage adjustment	single output types	0 - $110\% V_{o1\ nom}$
Inhibit	TTL input, output(s) disabled if open circuit	
Status indication	3 LEDs: OK, inhibit, overload	

Safety

Approvals	EN 60950, UL 1950, CSAC22.2 No. 950	Class I equipment
Protection degree	units without options	IP 40
Electric strength test voltage	Input against (case + outputs)	2 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/B
Electr. fast transients/bursts	IEC/EN 61000-4-4, input, level 3/4 (2/4 kV)	criterion A/B
Surge	IEC/EN 61000-4-5, input, level 3/4 (2/4 kV)	criterion A
Conducted disturbances	IEC/EN 61000-4-6, level 3 (10 V)	criterion B
Electromagnetic emissions	CISPR 22/EN 55022, class I, conducted	class B

Environmental

Operating ambient temperature	Vi nom, Io nom, convection cooled	-25 to 71 °C
Operating case temperature TC	Vi nom, Io nom	-25 to 95 °C
Storage temperature	non operational	-40 to 100 °C
Damp heat	IEC/EN 60068-2-78, 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 to 500 Hz	4.9 g _n rms
MTBF	MIL-HDBK-217E, GB, 40 °C, single output models	320 000 h

Options

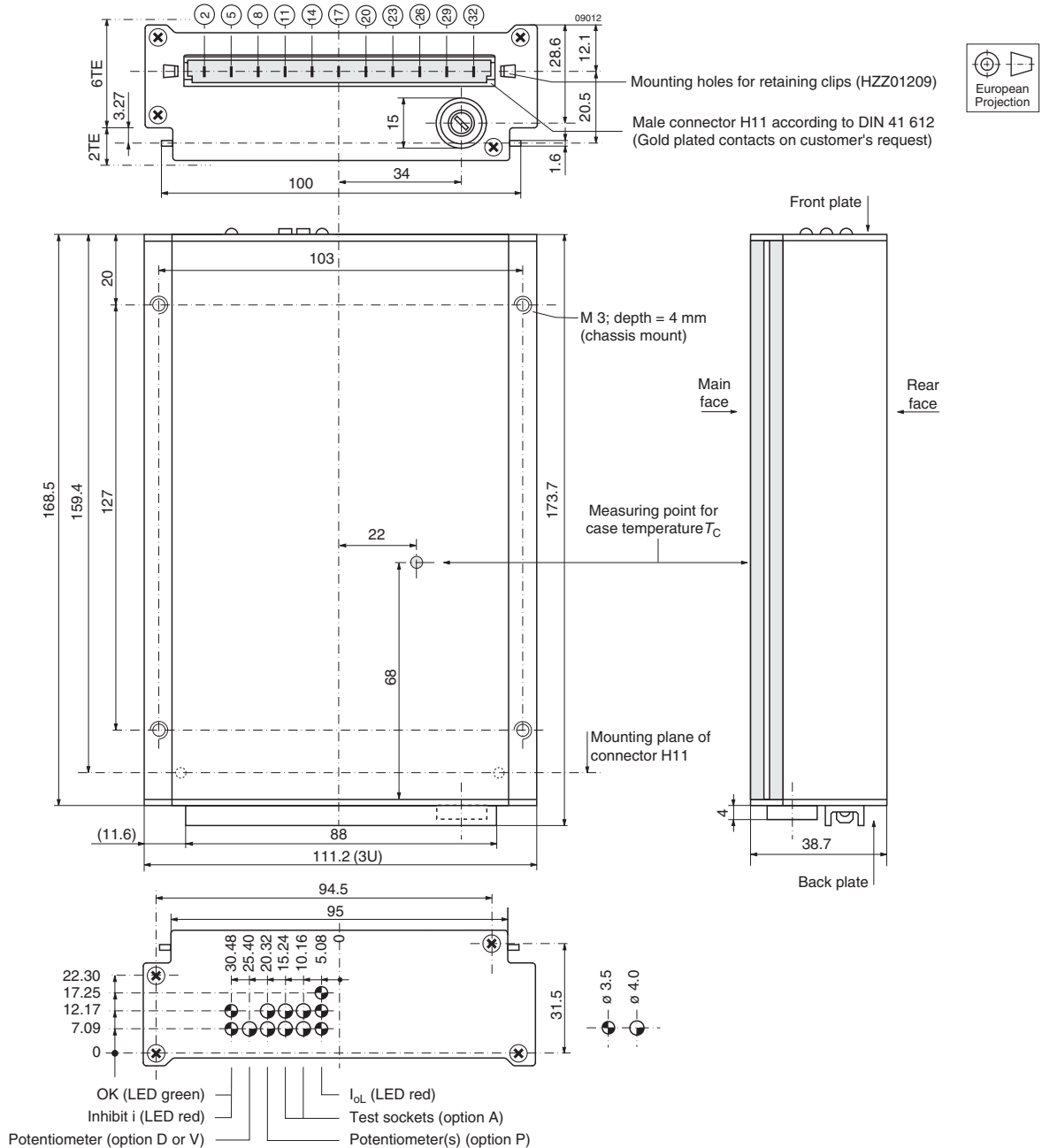
Extended temperature range	-40 to 71 °C, ambient, operating	-9
Electronic inrush current limitation		E
Output voltage adjustment	95 - 105% Vo nom, excludes feature R	P
Input and/or output undervoltage monitoring, excludes option V		D0 - D9
Input and/or output undervoltage monitoring (VME), excludes option D		V1 - V3
Test sockets for check of output voltage		A
Fuse not user-accessible		F

Pin Allocation

Pin	Electrical determination	LM1000	LM2000	LM3000
2	Inhibit control input	i	i	i
5	Data safe or ACFAIL	D or V	D or V	D or V
8	Output positive	Vo+		Vo3+
11	Output negative	Vo-		Vo3-
14	Control input +	R		
17	Control input -	G		
14	Output positive		Vo2+	Vo2+
17	Output negative		Vo2-	Vo2-
20	Output positive	Vo+	Vo1+	Vo1+
23	Output negative	Vo-	Vo1-	Vo1-
26	Protective earth PE	⊖	⊖	⊖
29	AC input neutral	N ~	N ~	N ~
32	AC input phase	L ~	L ~	L ~

Mechanical Data

Dimensions in mm. The power supplies are designed to be inserted into a 19" rack, 160 mm long, according to IEC 60297-3.



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

NUCLEAR AND MEDICAL APPLICATIONS - Power-One products are not designed, intended for use in, or authorized for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems without the express written consent of the respective divisional president of Power-One, Inc.

TECHNICAL REVISIONS - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.