

AC/DC Battery Charger

1000 W

1000 LGB 230 M36

$V_{I\text{ nom}} = 230\text{VAC}$

$V_{O\text{ nom}} = 36\text{ V}$ $I_{O} = 28\text{ A}$

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
INPUT						
V_I	Input voltage range	Continuously	190		265	V_{AC}
$V_{I\text{ freq}}$	Input line frequency		47		63	Hz
$V_{I\text{ min}}$	Converter shutdown, brown out		180	185	190	V_{AC}
$V_{I\text{ start}}$	Converter start, brown in			200	-	V_{AC}
I_I	Input current	No load	$V_I = 265V_{AC}, I_O = 0\text{ A}$		20	mA
		Nominal load	$V_I = 230V_{AC}, P_{Out} = 1000\text{W}$		4.7	A
		Nominal load	$V_I = 190\text{ V}_{AC}, P_{Out} = 1000\text{W}$		5.7	A
	Input current integral	$V_I = 190\text{ V}_{AC}$			20	A^2s
$I_{I\text{ max}}$	Max. input switch on current $V_I \geq V_{I\text{ min}}$	$V_I = 265V_{AC}, I_O = 42\text{ A}$ $\Delta t \leq 500\text{ ms}$	15			A
	Input fuse	bel 0697H9100	10 AT			
C_I	Converter input capacity	inrush current limited		1000		μF
C_X	Converter X-capacitance	no inrush current limitation		2		μF
	Reverse input protection	B2U rectifier				
	Leakage current	$V_I = 265V_{AC}, 50\text{Hz}$			3	mA

OUTPUT: Power unit

$190\text{ V}_{AC} \leq V_I \leq 265\text{ V}_{AC}$

$P_{O\text{ nom}}$	Output power			1000	1100	W
$V_{O\text{ nom}}$	Output voltage adjustment, factory set	for $T_{Amb} = 25^\circ\text{C}, V_{in} = 230V_{AC}, I_{out} = 28\text{A}$	35.7	36.0	36.3	V_{DC}
ΔV_O	Regulation	$0\text{ A} \leq I_I \leq 28\text{ A}$ $T_A = -25^\circ\text{C} \dots +60^\circ\text{C}$	$\leq 2\% V_{O\text{ nom}}$			V
$\Delta V_{O\text{ dyn}}$	Load regulation dynamic	Pulse load: $20 - 80 - 20\% \times I_{O\text{ nom}}$			500	mV
t_{dyn}	Response time	Pulse load: $20 - 80 - 20\% \times I_{O\text{ nom}}$		5	10	ms
$V_{O\text{ rms}}$	Ripple	Nom. load BW 300 kHz		100	250	mV_{rms}
$V_{O\text{ pp}}$	Noise	Nom. load BW 20 MHz			350	mV_{rms}
t_{on}	Turn on time V_O , rise time	$0\text{ A} \leq I_I \leq 28\text{ A}$, Resistive load		15	50	ms
$t_{on\text{ delay}}$	Turn on delay time			300		ms
t_h	Hold up time	$P_{Out} = 1000\text{ W}$	10			ms
	Overshoot shutdown V_O ($45\text{V} \leq V_O \leq 50.4\text{V}$ for $t \leq 1\text{sec}$ possible)	$0\text{ A} \leq I_{Out} \leq 28\text{ A}$	Converter off: $V_{Out} \geq 50.5\text{ V}$			
I_O	Output current			28	30	A
	Output current limitation of I_O	Free programmable, V_O dependant	29	30	33	A
	Output short circuit current	Short circuit between $+V_O$ and $-V_O$			60	A
C_O	Output capacitance			8		mF
	Output fuses (battery lines)	Two fuses in parallel	30A / 58VDC			

SIGNALS

Signal	Description	LED	active
Vin	Input Voltage	green	$V_{in} \geq 190V_{AC}$
Vout	Output voltage	green	output enabled and $V_{cv} \geq 33.0\text{VDC}$ and $V_{cv} \leq 44.6\text{VDC}$
OTP	Overtemperature	red	$T_{bt} \geq 70^\circ\text{C}$ on $T_{bt} \leq 65^\circ\text{C}$ Off or OTP converter
CV-CC	Constant voltage charge – constant current charge	yellow	CV: LED continuous on – CC: LED flashes
TXD	Serial Port	red	PC sends Data to MCU
RXD	Serial Port	green	PC receives Data from MCU

GENERAL SPECIFICATIONS

f	Switching frequency DC/DC stage	$190\text{ V}_{AC} \leq V_I \leq 265\text{ V}_{AC}$, $0\text{ A} \leq I_O \leq 28\text{ A}$		100		kHz
	Switching frequency PFC stage	Free running frequency	40		550	kHz
η	Efficiency	$P_O \geq 0.7 \times P_{O\text{ nom}}$	92	94		%
	MTBF (SN 29500)	$V_I = 230V_{AC}, I_O = 28\text{ A}, T_A = +40^\circ\text{C}$		300.000		h
	No load, short circuit proof		Continuously			

* - sign: sink current

** dimensions upon consultation

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SAFETY / DIMENSIONS						
	Creepage / clearance distances PD2 PCB FR4, V0	Input – output Input – case Output – case	4.0 2.2 1.8			mm mm mm
	Converter dielectric strength test Unit test: 2s. Type test converter: 1 min	Input – output Input – case Output – case			3000 2100 750	VDC VDC VDC
	Connectors	Input: + V _I and – V _I Output: + V _O and – V _O PE: (connector optional)	Wago 231-3 Clamp block, max. 10 mm ² Screw bolts M4			
	Protection class, protection system		I, IP 20			
	Dimensions with mounting plate	w x h x d	220 x 290 x 110			mm
	Assembling	Wall mounting with screws	4 x M6			
	Weight			4.0		kg

ENVIRONMENTAL CONDITIONS

T _A	Operating temperature range	for 10 min. T _A = + 60 °C ... + 70 °C	- 25		+ 60	°C
T _{Storage}	Storage Temperature		- 25		+ 85	°C
	Cooling		free air convection			
	Humidity	EN 50155, IEC 60571	75% averaged year, 95% 30 days			
	Vibration / shock	IEC 61373, IEC 68-2-27, BN 411002 Cat. I 3 Shocks per axis	50 m / s ² , 30 ms			

EMC

	Emission	Line conducted and radiated	EN 50121 - 3 - 2: 2016			
	Immunity	ESD EN 61000 - 4 - 2	6 kV / 8 kV Performance criteria - A -			
		High frequency field EN 61000 - 4 - 3	20 V / m 80 MHz ... 6 GHz Performance criteria - A -			*)
		Burst EN 61000 - 4 - 4	Level 3 asym., sym. Performance criteria - A -			
		Surge EN 61000 - 4 - 5	2 kV asym. / 1 kV sym. R _i = 42 Ω Performance criteria - A -			
		HF – Current injection EN 61000 - 4 - 6	10 V _{eff} , R _i = 150 Ω Performance criteria - A -			

STANDARDS

Applied standards:	EN 50155: 2016	BN 411 002	EN 50124 - 1: 1996	EN 50121 - 3 - 2: 2016	IEC 60571
	SN 29500	EN 50121 - 1	EN 50125 - 1	EN 60068 - 2 - 6, 2...27	EN 61000 - 4 - 2...6
	IEC 571	IEC 61373: 1999	EN 60721 - 3 - 5	EN 61373 : 1999	EN 60529

*) 1400 MHz – 2000MHz 10V/m, 200MHz – 2500MHz 5V/m, 5100MHz – 6000MHz 3V/m
Technical specifications valid for: - 25° C ≤ T_A ≤ + 60° C, 190 V_{AC} ≤ V_I ≤ 265 V_{AC}, unless otherwise noted.

