

AC/DC Battery Charger

1000 W

1000 LGB 230 M24

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

$V_{O\text{nom}} = 24\text{ V}$ $I_{O} = 40\text{ A}$

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
INPUT						
V_I	Input voltage range	Continuously	190		265	V_{AC}
$V_{I\text{f}}$	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	$V_I = 265\text{VAC}$, $I_O = 0\text{ A}$		20	mA
		Nominal load	$V_I = 230\text{VAC}$, $P_O = 1000\text{W}$	4.7	-	A
		Nominal load	$V_I = 190\text{ VAC}$, $P_O = 1000\text{W}$	5.7	-	A
	Input current integral	$V_I = 190\text{ VAC}$			20	A^2s
$I_{I\text{max}}$	Max. input switch on current	$V_I = 265\text{VAC}$, $I_O = 42\text{ A}$		15		A
	$V_I \geq V_{I\text{min}}$	$\Delta t \leq 500\text{ ms}$				
	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	$V_I = 265\text{VAC}$, 50Hz			3	mA

OUTPUT: Power unit		190 VAC $\leq V_I \leq 265\text{ VAC}$			
$P_{O\text{nom}}$	Output power		1000 1100	W	
$V_{O\text{nom}}$	Output voltage adjustment, factory set	for $T_A = 25^\circ\text{C}$, $V_{I\text{in}} = 230\text{VAC}$, $I_{O\text{out}} = 40\text{A}$	23,8 24,0 24,2	V_{DC}	
ΔV_O	Regulation	$0\text{ A} \leq I_O \leq 45\text{ A}$ $T_A = -25^\circ\text{C} \dots +60^\circ\text{C}$	$\leq 2\% V_{O\text{nom}}$	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	$0\text{ A} \leq I_O \leq 45\text{ A}$, Resistive load	15 50	ms	
$t_{\text{on delay}}$	Turn on delay time		300	ms	
t_h	Hold up time	$P_O = 1000\text{ W}$	10	ms	
	Overshoot shutdown V_O ($30\text{V} \leq V_O \leq 32.5\text{V}$ for $t \leq 1\text{s}$ possible)	$0\text{ A} \leq I_O \leq 45\text{ A}$	Converter off: $V_O \geq 30.0\text{ V}$		
I_O	Output current		42 45	A	
	Output current limitation of I_O	Free programmable, V_O dependant		45	A
	Output short circuit current	Short circuit between + V_O and - V_O		60	A
C_O	Output capacitance		10.8	mF	
	Output fuses (battery lines)	Two fuses in parallel	30A / 58VDC		

SIGNALS				
Signal	Description	LED	active	
Vin	Input Voltage	green	$V_{I\text{in}} \geq 190\text{VAC}$	
Vout	Output voltage	green	output enabled and $V_{CV} \geq 22.0\text{VDC}$ and $V_{CV} \leq 29.7\text{VDC}$	
OTP	Overtemperature	red	$T_{\text{bt}} \geq +70^\circ\text{C}$ on $T_{\text{bt}} \leq +65^\circ\text{C}$ or OTP converter	OFF
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	$190\text{ VAC} \leq V_I \leq 265\text{ VAC}$, $0\text{ A} \leq I_O \leq 45\text{ A}$		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)	$V_I = 230\text{VAC}$, $I_O = 40\text{ A}$, $T_A = +40^\circ\text{C}$		300.000	h
	No load, short circuit proof		Continuously		

* - sign: sink current
** dimensions upon consultation

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
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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	V _{DC} V _{DC} V _{DC}
	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	240 x 290 x 110			mm
	Assembling	Wall mounting with screws	4 x M6			
	Weight			4.0		kg

ENVIROMENTAL 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 VAC ≤ V_I ≤ 265 VAC, unless otherwise noted.

