

1 u. 3 Φ AC/DC Converter

500 W

500 LWB 400 M24 W00

$V_{I\text{ nom}} = 400\text{V}\sim, 440\text{V}\sim, 50\text{Hz}$ 3 Phase Input
230V $\sim, 379\text{V}\sim, 50\text{Hz}$ Single Phase

$V_{O\text{ nom}} = 24\text{ V}$ $I_O = 20\text{ A}$

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
INPUT						
V_I	Input voltage range 1 phase	Continuous	207		417	V_{AC}
		Short term $0.2\text{s} \leq t \leq 2.0\text{s}$	417		588	V_{AC}
V_I	Input voltage range 3 phase	Continuous	360	400	484	V_{AC}
		Klemme X11				
f	Line frequency 1, 3 ph.		47		63	Hz
$V_{I\text{ DC}}$	Input voltage range	DC and single phase operation				V_{DC}
$V_{I\text{ DC}}$	Converter shutdown DC		200		850	V_{DC}
λ	Power factor	$340\text{ V}\sim \leq V_I \leq 500\text{ V}\sim, I_O \leq 20\text{ A}$	0.55			
I_I	Input current	No load Nominal load Nominal load	$V_I = 440\text{ V}\sim, I_O = 0\text{ A}$ $V_I = 400\text{ V}\sim, I_O = 20\text{ A}$ $V_I = 230\text{ V}\sim, I_O = 20\text{ A}$		35 0.85 1.4	mA_{rms} A_{rms} A_{rms}
	Input current integral	$V_I = 440\text{ V}\sim$			15	A^2s
$I_{I\text{ max}}$	Max. input switch on current	$I_O = 20\text{ A}$ $\Delta t \leq 100\text{ ms}$	on request			
C_I	Converter input capacity			100		μF
	Reverse input protection at DC input	6 B Rectifier				
	Input fuse	Yes		10 AT		

OUTPUT: Power unit

230 V $\sim, 379\text{V}\sim, 400\text{ V}\sim, 440\text{V}\sim \pm 10\%$

$P_{O\text{ nom}}$	Output power			500		W
$V_{O\text{ nom}}$	Output voltage factory adjust		23.75	24.0	24.25	V_{DC}
V_O	Voltage accuracy	$0\text{ A} \leq I_O \leq 20\text{ A}$ $T_A = -40^\circ\text{C} \dots +70^\circ\text{C}$		± 1	± 3	%
$V_{O\text{ rms}}$	Output voltage ripple	$0\text{ A} \leq I_O \leq 20\text{ A}$ $T_A = -40^\circ\text{C} \dots +70^\circ\text{C}$		150	250	mV_{rms}
$V_{O\text{ pp}}$	Output voltage noise	$0\text{ A} \leq I_O \leq 20\text{ A}$ $T_A = -40^\circ\text{C} \dots +70^\circ\text{C}$			350	mV_{pp}
V_O	Voltage stability ($\Delta V_O/V_{O\text{ nom}} \cdot 100\%$)	$0\text{ A} \leq I_O \leq 20\text{ A}$ $T_A = -40^\circ\text{C} \dots +70^\circ\text{C}$		0.5	1.0	%
$V_{O\text{ pp}}$	Ripple (50Hz, 100Hz) & Noise	$0\text{ A} \leq I_O \leq 20\text{ A}$ Nom. load BW 20 MHz			3.0	V_{rms}
t_h		$0\text{ A} \leq I_O \leq 20\text{ A}$	20			ms
	Overvoltage shutdown V_O	$0\text{ A} \leq I_O \leq 20\text{ A}$	Converter OFF $V_O \leq 30.0\text{ V}$			V
I_O	Output current	X1 - X2		10		A
I_O	Output current	X1 - X2 10A at each connector	10			A
	Output current limitation threshold of I_O	X1/X2	10.5		12	A
	Output short circuit current	Short circuit between + V_O and - V_O at each connector		13	15	A
C_O	Output capacity			10		mF

SIGNALS, Control

	Input voltage Output voltage Overload	Input o.k. Output o.k. Output current overload	LED green ON LED green ON LED red ON			
EN_1	ENABLE for continuous operation	X21 Pin 1 connect to ext. voltage	16.8	24	30	V_{DC}
EN_2		X21 Pin 2 connect to ext. voltage	16.8	24	30	V_{DC}
Adj	Adjust output voltage to 26V	X21 Pin 3 connect to ext. voltage	16.8	24	30	V_{DC}

GENERAL SPECIFICATIONS

f1	Switching frequency	Step Down Converter		75		kHz
f2	H-Bridge	DC/DC converter		150		kHz
η	Efficiency	$P_O \geq 0.7 \times P_{O\text{ nom}}$	86	91		%
	MTBF (SN 29500)	$V_I = 440\text{ V}\sim, I_O = 20\text{ A}, T_A = +40^\circ\text{C}$		450 000		h
	No load, short circuit proof		Continuously			

Power - Derating: $-2,0\%$ $T_A = +50^\circ\text{C} \dots +70^\circ\text{C}$

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
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SAFETY / DIMENSIONS

	Creepage / clearance distances PD2, OV2 PCB FR4, V0, TG = + 150°C	Input output Input case Output case	6.0 4.0 2.0			mm mm mm
	Converter dielectric strength test every unit with ramp function: 2 s - 3 s - 2 s type test: 1 Minute	Input – output Input – case Output – case			3'500 2'500 500	V _{DC} V _{DC} V _{DC}
	Connectors WAGO Cage Clamp	Input X11 mating connector: Wago Outputs X1 – X2 mating connector Control Signals X21 mating connector SE M4: additional bolt	231_203_026_000 232_102_026_000 232_106_026_000			
	Protection class, protection system		I, IP 20			
	Dimensions with mounting plate <i>see drawing</i>	w x h x d Chassis mounting	200 x 180 x 165			mm
	Assembling	Chassis mounting with screws	see mech. drawing			
	Weight			3.5		kg

ENVIRONMENTAL CONDITIONS

T _A	Operating temperature range T _A	Continuously EN 50155 Class T3	- 40		+ 70	°C
T _{Storage}	Storage Temperature		- 40		+ 70	°C
	Cooling		free air convection			
	Humidity	EN 50155, IEC 60571	75% averaged year, 95% 30 days			
	Vibration / Shock valid only for chassis mounting	IEC 61373, IEC 68-2-27 Cat. I 3 Shocks per axis	50 m / s ² , 30 ms			

EMC

	Emission*)	Line conducted and radiated	EN 50121 - 3 - 2: 2007			
	Immunity*)	ESD EN 61000 - 4 - 2	6 kV / 8 kV Performance criteria - B -			
		High frequency field EN 61000 - 4 - 3	20 V / m 80 MHz ... 2.5 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 , Perf. criteria - A -			
		HF – Current injection EN 61000 - 4 - 6	10 V _{eff} , R _i = 150 Ω Performance criteria - A -			

STANDARDS

	Applied Standards:	EN 50155: 2007	EN 60 950	EN 50124 - 1: 2006	EN 50121 - 3 - 2: 2007	IEC 60571-1
		SN 29500	EN 50121 - 1	EN 50125 - 1	EN 60068 - 2 - 6, 2...27	EN 61000 - 4 - 2...6
		EN 61131-2 :2007	EN 60721 - 3 - 5	EN 61373	EN 60529 : 1991	DIN 41773 T.1
		EN 61000 - 3 - 2	EN 61000-3-3			

Technical specifications valid for: - 40° C ≤ T_A ≤ + 70° C, 230 V~, 379V~ single phase, 400V~ ... 440 V~ 3 phase, unless otherwise noted.

*) In closed housing, emission: radiated @ EN 50121-3-2, conducted @ EN 50121-3-2

**) 1400 MHz – 2100MHz 10V/m 2100MHz – 2500MHz 5V/m

Pin Assignment Power

Input X11		
PIN		Recom. wire gauge
1	L1	1.5 ... 2.5 mm ²
2	L2	1.5 ... 2.5 mm ²
3	L3	1.5 ... 2.5 mm ²
Output X1, X2		
1	+ V _{Out}	4 mm ²
2	- V _{Out}	4 mm ²

Control X21			
1	EN_1	Connect pin to ext. 24V source	1.0mm ²
2	EN_2	Connect pin to ext. 24V source	1.0mm ²
3	Adj V _{out} 26V	Connect pin to ext. 24V source	1.0mm ²
4	- V _{out}	Ground V _{out}	1.0mm ²
5	Powerfail	5/6 closed → V _{out} o.k.	1.0mm ²
6	Powerfail	5/6 open → V _{out} fail	1.0mm ²

Dimensions (in millimetres)

