



PHI-CON

65 W AC-DC Power Supply PACO65A-Series

- 85 ... 264 V_{AC} / 120 ... 370 V_{DC} universal input
- Continuous short circuit-, over current- & over voltage protection
- 3 kV_{AC} input/output isolation
- EN 62368-1, IEC 62368-1, UL 62368-1, Safety class I
- MTBF > 300000 h
- Small outlines 2" x 3" x 1.2"



Model guide

Type	Output voltage	Output		Efficiency@ full load & Vin 230 V _{AC} [%] typ.	Capacitive load [μF] max.
	[V _{DC}] nom.	Current [A]	Power [W]		
PACO65A05S	5	10	50	80	40000
PACO65A09S	9	6.6	60	83	12000
PACO65A12S	12	5.42	65	85	8000
PACO65A15S	15	4.34	65	85	7000
PACO65A24S	24	2.71	65	87	1500
PACO65A48S	48	1.36	65	87	1000

Specifications

Input	
Voltage range	85 .. 264 V _{AC} Or 120 .. 370 V _{DC} Power derating see diagram
Frequency	47 ..63 Hz
Full load input current	≤ 1.6 A @ 115 V _{AC} ≤ 0.9 A @ 230 V _{AC}
Inrush current	35 A typ. @ 115 V _{AC} 50 A typ. @ 230 V _{AC}
Standby power @ 230 V _{AC}	≤ 0.5 W
Hot plug	Not possible
Isolation	
Isolation voltage Input to output	3000 V _{AC} (1 Minute, < 10 mA)
Output	
Voltage tolerance	± 2 %, typ.
Line regulation	± 0.5 %, typ.
Load regulation @ 0 to 100 % load change	± 1 %, typ.
Minimum load	Not required
Ripple & noise (BW 20 MHz)	≤ 150 mVp-p (see Figure 1)
Hold up time @ Vin 230 V _{AC}	35 ms, typ.
Start up delay time @ Vin 230 V _{AC} and full load	50 ms, typ.
Temperature coefficient	0.02 % / °C
Protection	
Short circuit	Continuous, hiccup, auto recovery
Over voltage protection	Vout: 5V ≤ 9 V
	Vout: 9V ≤ 16 V
(Output voltage clamp or turn off)	Vout: 12V ≤ 20 V
	Vout: 15V ≤ 24 V
	Vout: 24V ≤ 35 V
	Vout: 48V ≤ 60 V

Safety standards		EN 62368-1, IEC 62368-1 & UL 62368-1, Safety Class II	
EMC			
CE	EN 55032, CISPR 32	Class B	
RE	EN 55032, CISPR 32	Class B	
ESD	EN-, IEC 61000-4-2	Contact ±6 kV	Perf. Crit. B
RS	EN-, IEC 61000-4-3	10 V/m	Perf. Crit. A
EFT	EN-, IEC 61000-4-4	±2 kV	Perf. Crit. B
Surge	EN-, IEC 61000-4-5	±1 kV	Perf. Crit. B
CS	EN-, IEC 61000-4-6	10 Vrms	Perf. Crit. A
Voltage dips, short interruptions and voltage variations immunity EN-, IEC 61000-4-11		100 % dip 1 period 30 % dips 30 periods 100 % interruptions 250 periods	Perf. Crit. B
General			
Reliability MTBF MIL-HDBK-217 @ 25 °C		> 300000 h	
Environmental			
Operating ambient temperature		-25 ... 70 °C	
Storage temperature		-25 ... 85 °C	
Power derating		see diagram	
Storage humidity		90 %	
Cooling		Free air convection, (see derating diagram)	
Physical			
Dimensions		50.8 x 76.2 x 30mm	
Weight		90 g	
Case material		Non (Open frame)	
Soldering temperature & Time		Wave: ≤ 265 °C duration, ≤ 10 s Manual: ≤ 370 °C duration, ≤ 5 s	

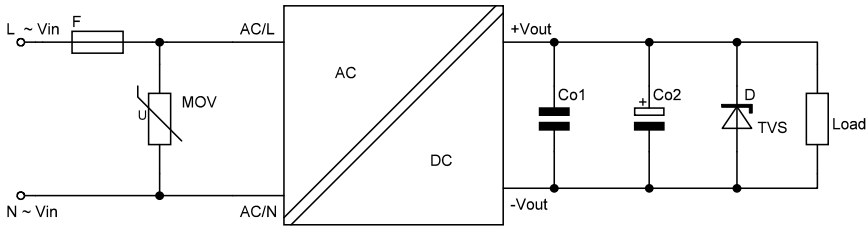
Note:

- All specifications were measured at Ta 25 °C, humidity < 75 %, nominal input voltage (230 V_{AC}) and rated output load unless otherwise specified.

Part number information									
PHI-CON	AC/DC-Converter open Frame	Output Power		Series	Output voltage		Rev.	Output	
P	ACO	65	65 W	A	5	5 V	-	S	single
					9	9 V			
					12	12 V			
					15	15 V			
					24	24 V			
					48	48 V			
Example:	PACO65A12S	PHI-CON AC/DC Converter, open frame, Pout: 65 W, Vout: 12 V, single output							

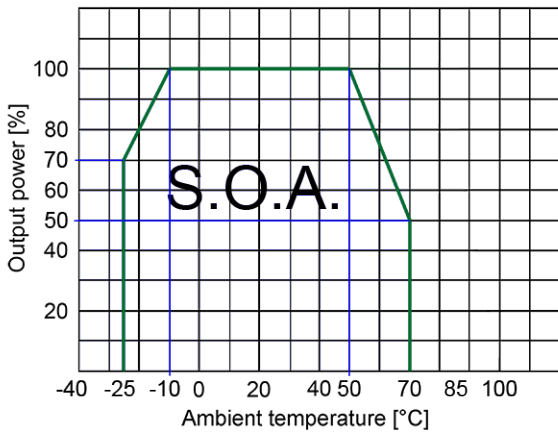
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Figure 1 Output ripple and noise measure circuit

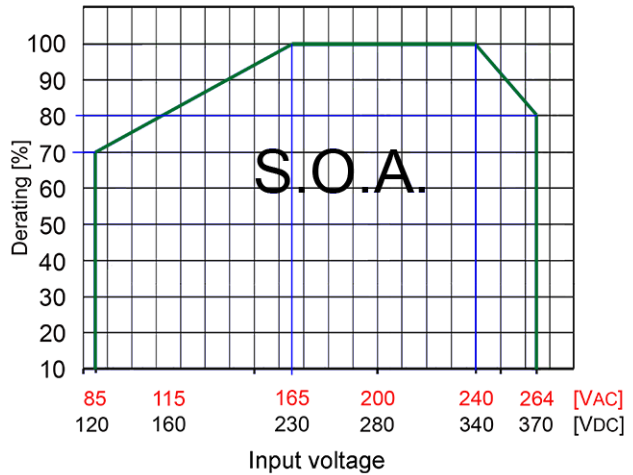


List of components for circuit Figure 1						
Type	Fuse Time delayed type	MOV	Co1	Co2	D TVS	
PACO65A05S	3.15 A, 250 V _{AC}	S14K300	1 μF, 16 V	330 μF, 10V	SMBJ7.0A	
PACO65A09S	3.15 A, 250 V _{AC}	S14K300	1 μF, 16 V	47 μF, 16 V	SMBJ12A	
PACO65A12S	3.15 A, 250 V _{AC}	S14K300	1 μF, 25 V	47 μF, 25 V	SMBJ20A	
PACO65A15S	3.15 A, 250 V _{AC}	S14K300	1 μF, 25 V	47 μF, 25 V	SMBJ20A	
PACO65A24S	3.15 A, 250 V _{AC}	S14K300	1 μF, 50 V	47 μF, 35 V	SMBJ30A	
PACO65A48S	3.15 A, 250 V _{AC}	S14K300	1 μF, 100 V	47 μF, 63 V	SMBJ64A	

Temperature vs output current derating diagram at free air convection



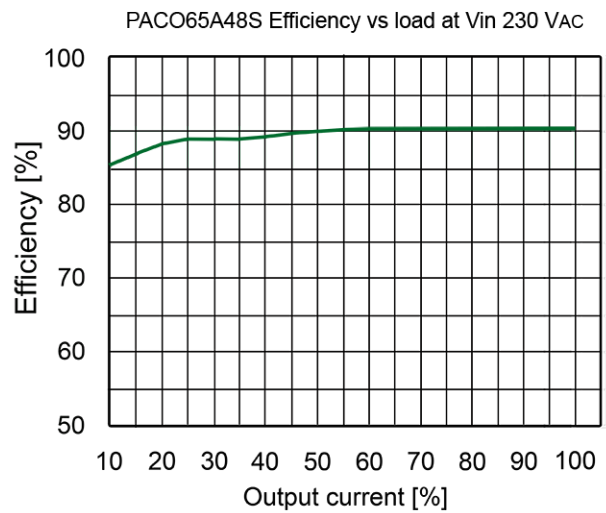
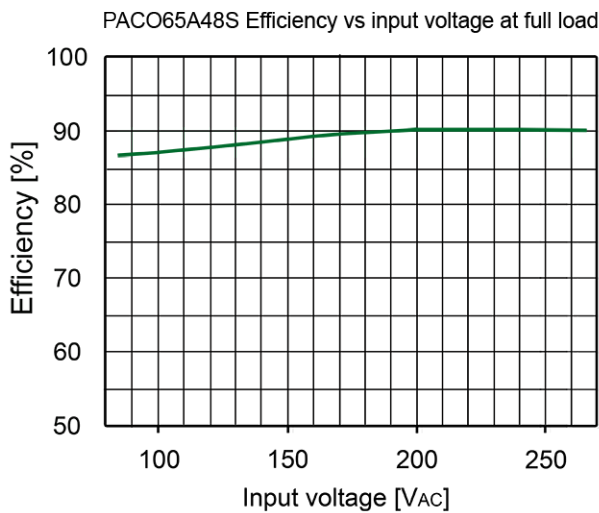
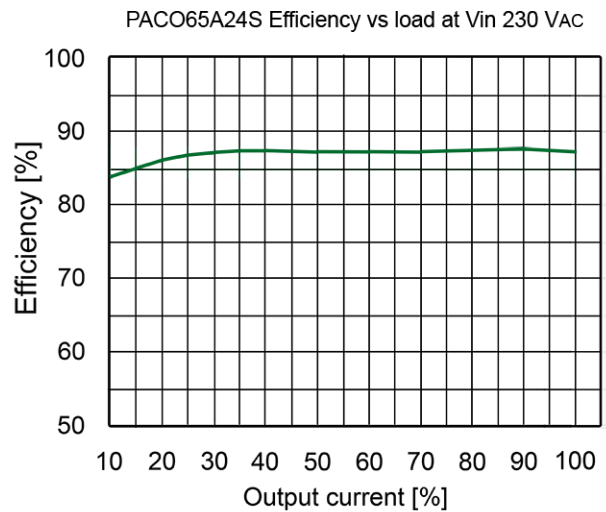
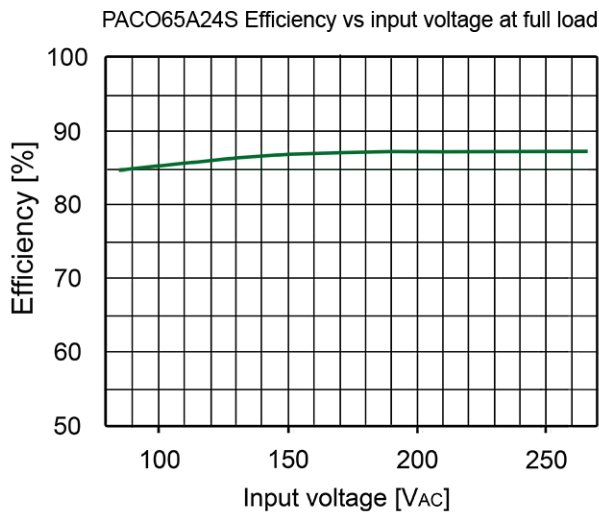
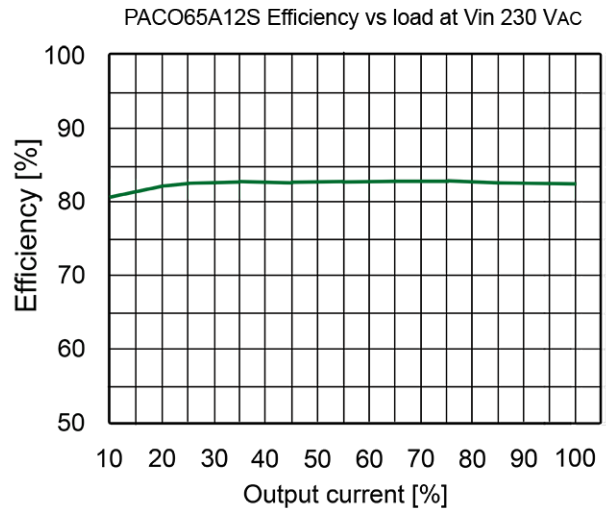
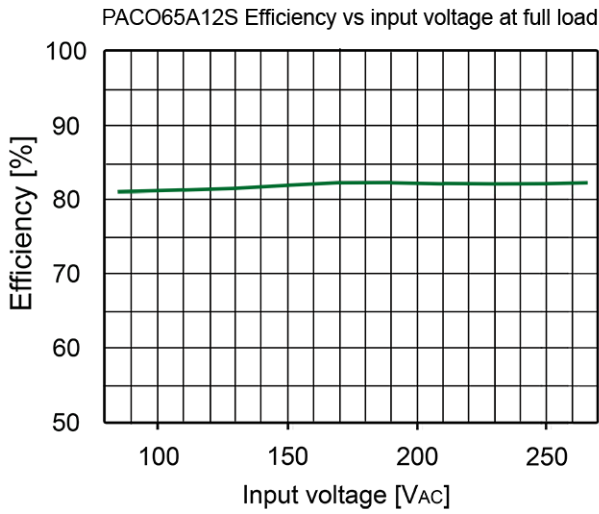
Derating vs input voltage at free air confection





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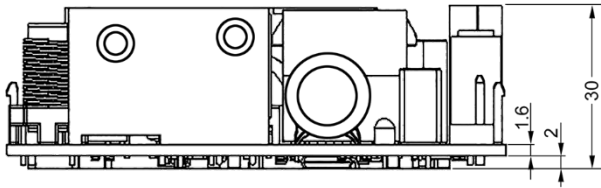




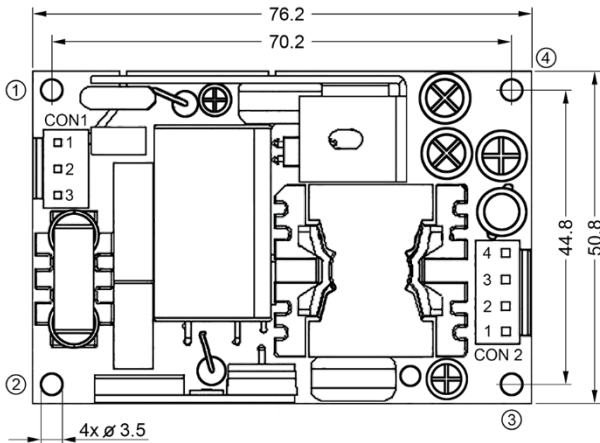
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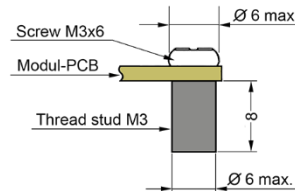
Mechanical dimensions



Connector assignment			
Connector	Pin	Funktion	User Connector
Con. 1	1	AC (L)	Body: VHR-3M Contacts: SVH-21-P1.1 JST or equivalent
	2	No Pin	
	3	AC (N)	
Con. 2	1	-Vout	Body: VHR-4M Contacts: SVH-21-P1.1 JST or equivalent
	2	-Vout	
	3	+Vout	
	4	+Vout	



Unit in mm
General tolerances ± 0.5 mm



Note:

1. The layout of the device is for reference only, please refer to the actual product.
2. The recommended safety distance between the edge of the PCB and the user components should be ≥ 10 mm.

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