



PHI-CON

# 30 W AC-DC Converter PAC30DxxBS3-Series

- Enclosed plastic case
- 85 ... 305 V<sub>AC</sub>, 100 ... 430 V<sub>DC</sub> universal input range
- Continuously short circuit protected
- Over voltage protection
- Safety EN 62368-1, EN 60355-1, EN 61558-1 class II



## Model guide

Type	Output voltage		Load regulation [%] typ.	Ripple & noise [mVp-p]	Over voltage protection [V] max.	Output current [A] max.	Output power [W] max.	No load power consumption at V <sub>in</sub> 230 V <sub>AC</sub>	Efficiency typ. @ full load [%]	Capacitive load [μF] max.
	[V <sub>DC</sub> ]	tolerance [%] typ.								
PAC30D03BS3	3.3	±3	2	≤100	6.3	6.0	19.8	≤ 0.1 W	85	6600
PAC30D05BS3	5.0	±2	1.5	≤100	16	6.0	30.0	≤ 0.1 W	86	6600
PAC30D09BS3	9.0	±2	1	≤100	16	3.4	30.6	≤ 0.1 W	88	4400
PAC30D12BS3	12	±2	1	≤100	16	2.5	30.0	≤ 0.1 W	90	4400
PAC30D15BS3	15	±2	1	≤100	25	2.0	30.0	≤ 0.1 W	90	3300
PAC30D24BS3	24	±2	1	≤150	35	1.3	31.2	≤ 0.1 W	88	1000
PAC30D48BS3	48	±2	1	≤150	60	0.63	30.2	≤ 0.15 W	90	470

## Specifications

Input	
Voltage range	85...305 V <sub>AC</sub> or 100...430 V <sub>DC</sub>
Line frequency range	47...63 Hz
Full load input current	750 mA, max. @ 115 V <sub>AC</sub> 500 mA, max. @ 230 V <sub>AC</sub>
No load power consumption	See Model Guide
Inrush current	25 A, typ. @ 115 V <sub>AC</sub> 50 A, typ. @ 230 V <sub>AC</sub>
Recommended fuse	2 A / 300 V~, time delayed type
Hold up time @ full load	10 ms, typ. @ 115 V <sub>AC</sub> 50 ms, typ. @ 230 V <sub>AC</sub>
Isolation, input to output	
Isolation voltage	4200 V <sub>AC</sub> for 1 Minute test
Isolation resistance at 500 V <sub>DC</sub>	100 MΩ
Leakage current	≤ 0.1 mA @ V <sub>in</sub> 277 V <sub>AC</sub> , 50 Hz
Output	
Line regulation at full load	± 0.5 %, typ.
Load regulation @ 0..100 % load	See Model Guide
Ripple & noise @ BW 20 MHz	See Model Guide & see Figure 1
Minimum load	Not required
Temperature coefficient	± 0.02 % / °C
Protection	
Over voltage	Via hiccup see Model Guide
Short circuit	Continuous, hiccup, auto restart
Over current	≥ 110 % of rated current
General	
Switching frequency	65 kHz, typ.
Reliability MTBF MIL-HDBK-217F@25°C	> 500000 h
Vibration	10...500 Hz, 5 g, X,Y,Z – axes, 10 Minutes per cycle
Safety standard	EN -, IEC -, UL 62368-1, EN 60355-1, EN 61558-1
Safety class	Class II

EMC		
CE	EN 55032, CISPR 32	Class B
	EN 55014-1	
RE	EN 55032, CISPR 32	Class B
	EN 55014-1	
ESD	EN-, IEC 61000-4-2, EN-, IEC 55014-2	Contact ± 8 kV, Air ±15 kV, perf. Crit. A
RS	EN-, IEC 61000-4-3, EN-, IEC 55014-2	10 V/m perf. Crit. A
EFT	EN-, IEC 61000-4-4	± 2kV, perf. Crit. A
	EN-, IEC 55014-2	± 4kV, perf. Crit. A (see Figure 3)
Surge	EN-, IEC 61000-4-5	Line to line ± 2 kV perf. Crit. A
		Line to line ± 2 kV, perf. Crit. A
		Line to ground ± 4 kV, perf. Crit. A (see Figure 3)
CS	EN-, IEC 61000-4-6	10 Vrms perf. Crit. A
	EN-, IEC 55014-2	perf. Crit. A
Voltage dips, short interruptions and voltage variations	EN 61000-4-11 IEC 61000-4-11	0 %, 70 % perf. Crit. B
	EN 55014-2, IEC 55014-2	perf. Crit. B
Environmental		
Operating ambient temperature	-40 ... 85 °C with derating	
Storage temperature	-40 ... 85 °C	
Power derating	See diagrams	
Storage humidity	95 %, non condensing	
Cooling	Free air convection, ≥ 35 LFM	
Physical		
	Dimensions [mm]	Weight [g]
PAC30DxxBS3	39 x 69.5 x 25	100
PAC30DxxBS3A2	54 x 91 x 32.5	147
PAC30DxxBS3A4	54 x 91 x 37.1	190
Case material	Black plastic, UL94V-0 rated	
Wave soldering temperature	≤ 260 °C duration ≤ 10 s, ≥ 1.5 mm distance from case	
Manual soldering temperature	≤ 360 °C duration ≤ 5 s, ≥ 1.5 mm distance from case	

## Note:

1. Unless otherwise specified are all values specified at Ta 25 °C, humidity < 75 % and rated output load current.
2. The outputs of the AC/DC converters are not suitable for parallel operation.

# 30 W AC-DC Converter PAC30DxxBS3-Series

Part number information													
PHI-CON	AC/DC-Converter	Output Power		Series	Output voltage		Output		Extended Vin range		Mountable on		
P	AC	30	30 W	D	03	3.3 V	S	single	3	85...305 V~		blanc	PCB
					05	5 V						A2	Chassis
					09	9 V						A4	DIN Rail
					12	12 V							
					15	15 V							
					24	24 V							
					48	48 V							
Example:	PAC30D12BS3	PHI-CON AC/DC Converter, Pout: 30 W, Vout: 12 V, Vin range: 85...305 V~, single Out, PCB mountable											

Figure 1 Output ripple & noise measure method BW 20 MHz

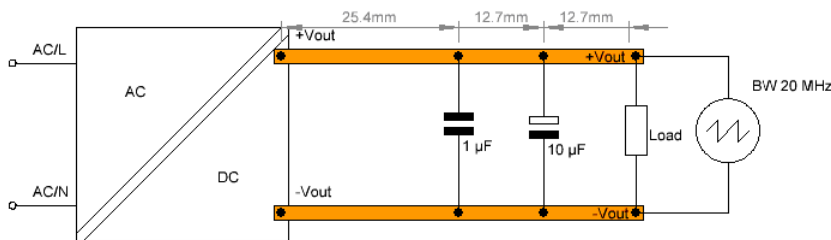


Figure 2 Typical application circuit

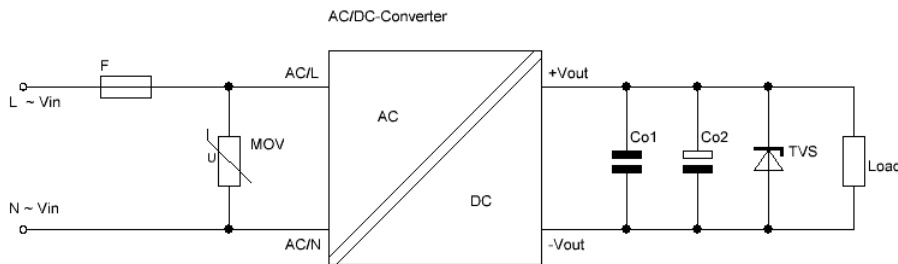


Table1 for Figure 2 and 3 typical circuit					
Type	F Time delayed type	MOV	Co1	Co2	TVS
PAC30D03BS3	1 AT / $\geq 300$ V~	S14K350	1 $\mu$ F, MLCC	220 $\mu$ F, $\geq 10$ V	SMBJ7.0A
PAC30D05BS3	1 AT / $\geq 300$ V~	S14K350	1 $\mu$ F, MLCC	220 $\mu$ F, $\geq 10$ V	SMBJ7.0A
PAC30D09BS3	1 AT / $\geq 300$ V~	S14K350	1 $\mu$ F, MLCC	100 $\mu$ F, $\geq 25$ V	SMBJ12A
PAC30D12BS3	1 AT / $\geq 300$ V~	S14K350	1 $\mu$ F, MLCC	100 $\mu$ F, $\geq 25$ V	SMBJ20A
PAC30D15BS3	1 AT / $\geq 300$ V~	S14K350	1 $\mu$ F, MLCC	100 $\mu$ F, $\geq 25$ V	SMBJ20A
PAC30D24BS3	1 AT / $\geq 300$ V~	S14K350	1 $\mu$ F, MLCC	47 $\mu$ F, $\geq 35$ V	SMBJ30A

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Figure 3 Application circuit for higher EMC performance

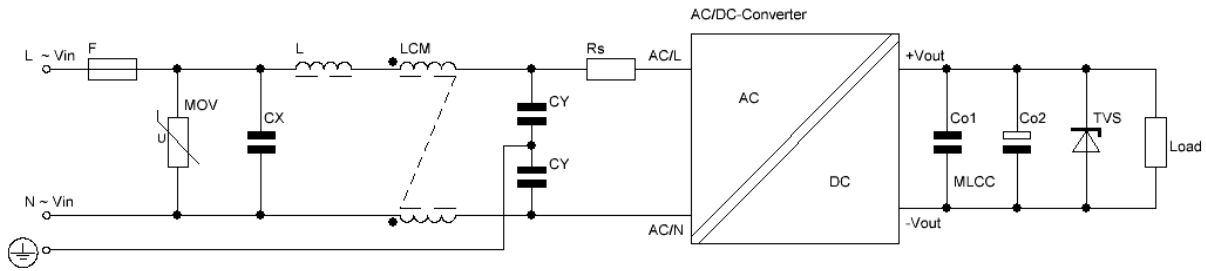
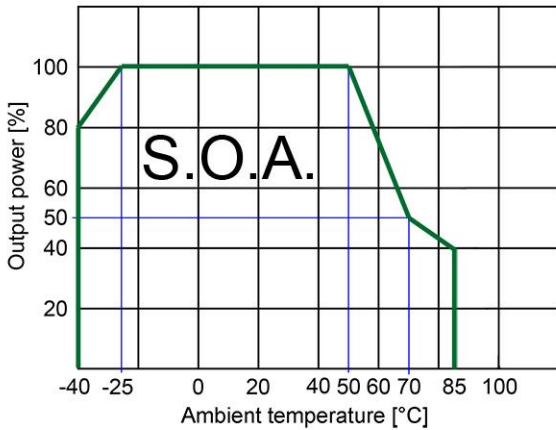
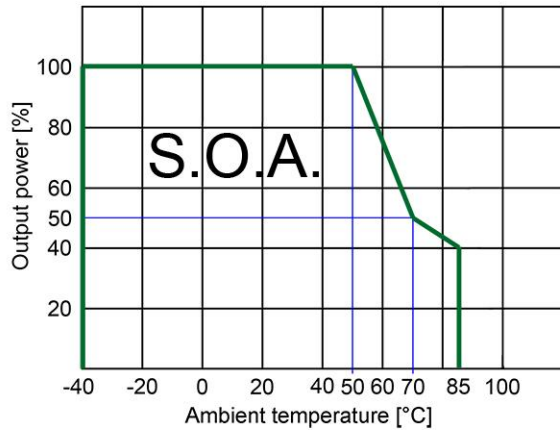


Table for Figure 3									
F1 Time delayed type	MOV1	CX	L	LCM	CY	Rs	Co1	Co2	TVS
2 AT / $\geq 300$ V~	S14K350	100 nF, 400 V <sub>AC</sub>	4.7 $\mu$ H, 2 A	2.2 mH	1 nF, 400 V <sub>AC</sub>	33 $\Omega$ , 3 W			See Table 1

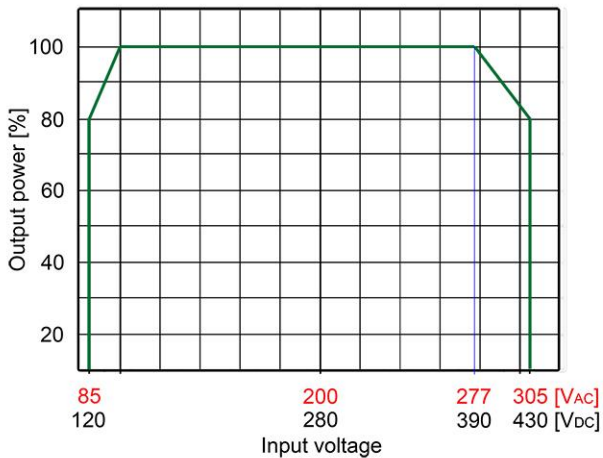
Derating diagram power vs ambient temperature at Vin 85...115 V<sub>AC</sub>



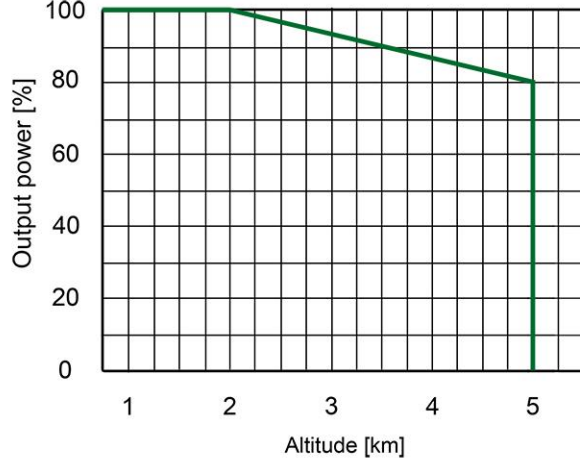
Derating diagram power vs ambient temperature at Vin 115...305 V<sub>AC</sub>



Derating vs input voltage at Ta 25 °C



Power derating vs altitude

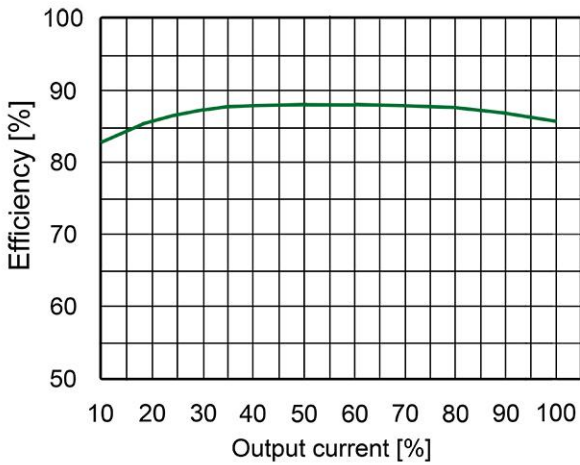


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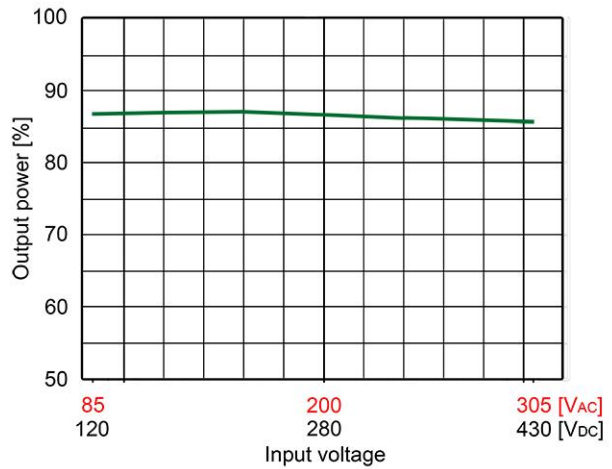


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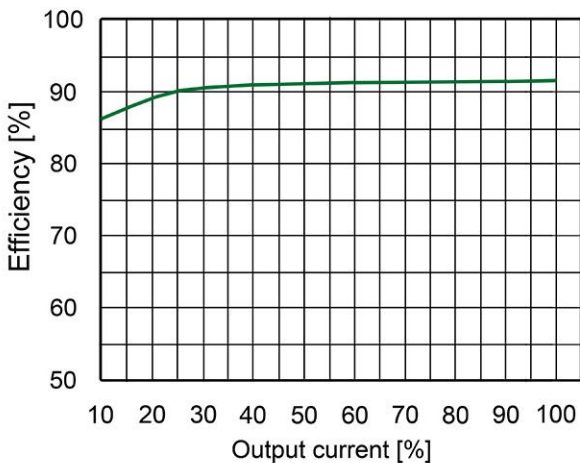
PAC30D05BS3 Efficiency vs output load at Vin 230 VAC



PAC30D05BS3 Efficiency vs input voltage at full load



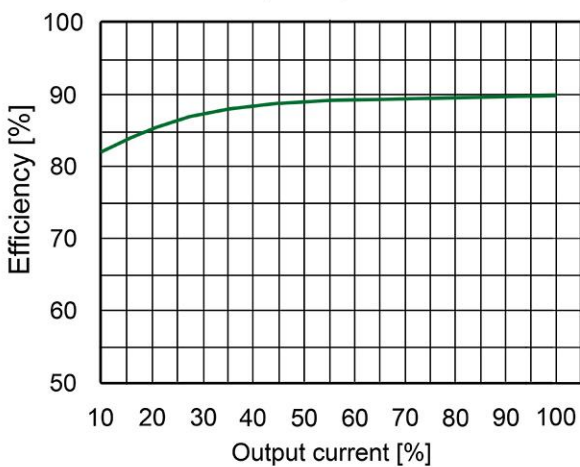
PAC30D12BS3 Efficiency vs output load at Vin 230 VAC



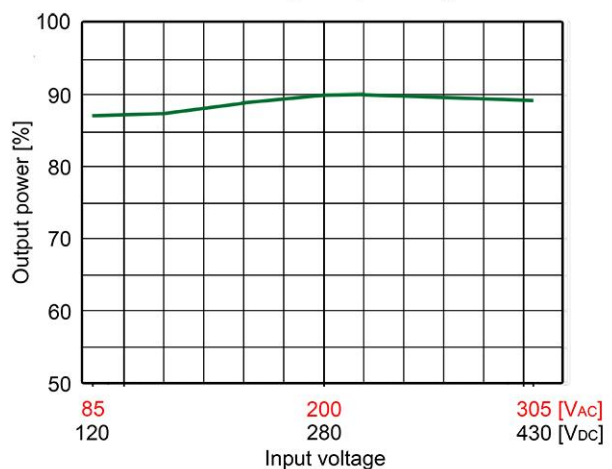
PAC30D12BS3 Efficiency vs input voltage at full load



PAC30D24BS3 Efficiency vs output load at Vin 230 VAC



PAC30D24BS3 Efficiency vs input voltage at full load

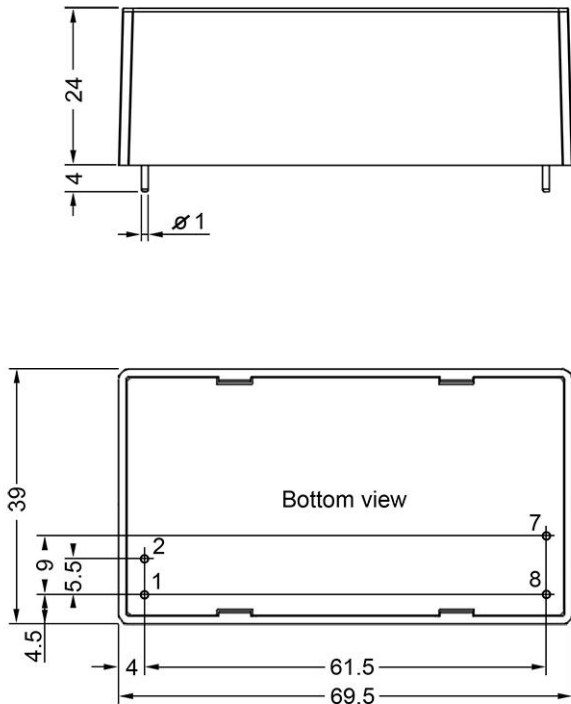




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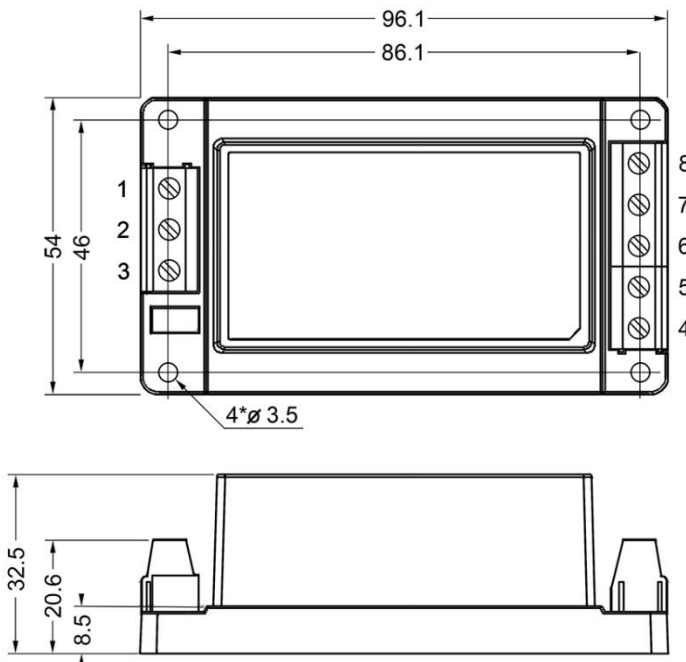
## Mechanical dimensions PCB mountable version



Note  
 Unit: mm  
 Pin diameter:  $1 \pm 0.1$  mm  
 General tolerances:  $\pm 0.5$  mm  
 Recommended drill hole diameter 1.5 mm

Pin assignment	
1	AC In (L)
2	AC In (N)
7	+ V out
8	- V out

## Mechanical dimensions chassis mountable version; Suffix "A2"



Terminal assignment	
1	N.C.
2	AC In (N)
3	AC In (L)
4	+ Vout
5	N.C.
6	N.C.
7	N.C.
8	- Vout

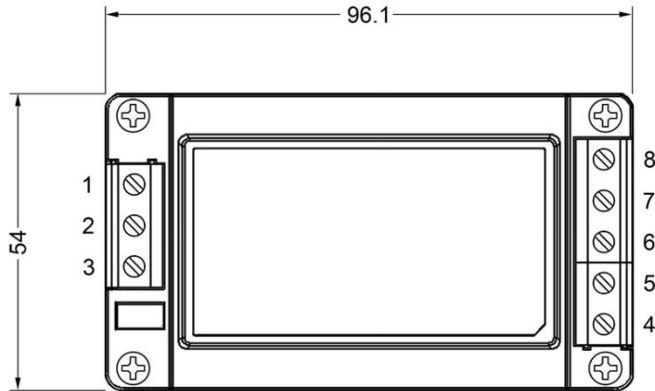


Note  
 Unit: mm  
 General tolerances:  $\pm 1$  mm  
 Wire range: 12...24 AWG  
 Tightening torque:  $< 0.4$  Nm

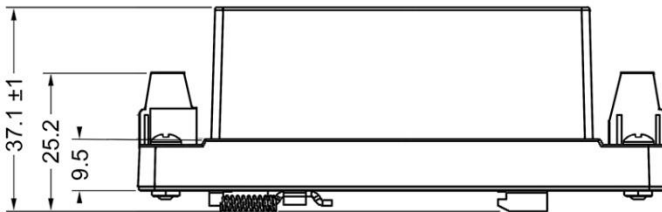
# 30 W AC-DC Converter PAC30DxxBS3-Series



Mechanical dimensions DIN-rail mountable version, Suffix "A4"



Terminal assignment	
1	N.C.
2	AC In (N)
3	AC In (L)
4	+ Vout
5	N.C.
6	N.C.
7	N.C.
8	- Vout



Note  
 Unit: mm  
 General tolerances:  $\pm 1$  mm  
 Wire range: 12...24 AWG  
 Tightening torque:  $< 0.4$  Nm  
 Mountable on DIN Rail TS35  
 DIN Rail must be connected  
 with protection earth

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