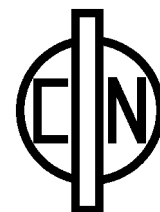


40W AC-DC Modules PA40A-Series



PHI-CON

- AC-DC Power module
- Universal input 85-265 VAC
- High efficiency up to 87 %
- Short circuit protection
- Internal input filter
- 3 years warranty
- Medical safety approved
- Low leakage current



Model selection guide

Typ	Output power [W]	Input voltage range [V _{AC}]	Output voltage [V _{DC}]	Output current [mA]	Efficiency typ. [%]
Single output					
PA40A03_01	28	85 – 265	+3.3	8500	78
PA40A05_01	40	85 – 265	+5	8000	82
PA40A12_01	40.8	85 – 265	+12	3400	86
PA40A15_01	40.5	85 – 265	+15	2700	87
PA40A24_01	40.8	85 – 265	+24	1700	87
Dual output					
PA40A12D_01	40.8	85 – 265	±12	±1700	85
PA40A15D_01	40.5	85 – 265	±15	±1350	86
PA40A512D_01	40	85 – 265	+5 / +12	+5000 / +1250	83
PA40A524D_01	39	85 – 265	+5 / +24	+3000 / +1000	83

40W AC-DC Modules PA40A-Series

Specifications

All specifications typical at normal line, full load, 25 °C unless otherwise noticed.

Input	
Voltage range	85 – 265 VAC 120 – 375 VDC
Rated input voltage	100 – 240 VAC
Line frequency	47 – 63 Hz
Inrush current	max. 20 A @ 115 VAC max. 40 A @ 230 VAC
Input current	115/230 VAC, I _o nom 0.75 / 0.45 A
Rated input current	100 – 240 VAC, I _o nom 0.8 – 0.4 A
Leakage current	Normal condition: 100 µA Single fault condition: 300 µA
Isolation	
Voltage	4236 / 6000 VAC/VDC
Resistance	100 MΩ @ 500 VDC
Output	
Voltage accuracy	Single output ± 1% max Dual output ± 2 % max 524D model ± 4 % max
Minimum Load	single output models: 0% dual output models: 20% (each output)
Line voltage regulation	± 1%, max.
Load voltage regulation	single models: ± 1% max. dual models: ± 2% max.
Cross regulation (dual model)	Asymmetrical load 20 % / 100 % FL: ± 6 %
Hold up time	V _i : 115/230 VAC, I _o nom: 20 / 100 ms
Turn on time	1000 ms
Rise time	150 ms
Fall time	150 ms
Transient recovery time	V _i nom, 1 ~0.5 I _o nom: 1 ms
Ripple & noise	V _i nom, I _o nom, BW = 20 MHz: 50 mV
External trim ADJ. Range (for single output only)	I _o = 5 % ... 100 % Min -10 %, max + 10 %
Temperature coefficient	± 0.03% / °C

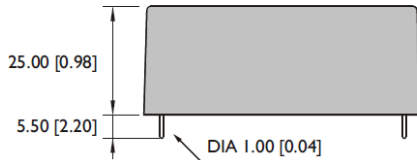
General	
Efficiency	Up to 87 %, see model list and typ efficiency curve
Switching frequency	65 kHz, typ.
MTBF	Bellcore issue 6 @ 40 °C, GB 3,3V, 5V, 512D & 524D models: 606000 hours 12V, 12D & 15D models: 615000 hours 15V & 24V models: 623000 hours
Altitude during operation	IEC 60068-2-13 max 4850 m
Environmental	
Operating temperature (ambient)	-40 °C – +71 °C
Storage temperature	-40 °C – +100 °C
Case temperature	+85°C max.
Derating +61 to +71°C	2,5% / °C
Humidity	20 to 95%
Cooling	Free-air convection
Physical	
Dimensions	89x63.5x25 mm
Weight	250 g
Case material	plastic
Potting material	Epoxy
Control and protection	
Input fuse	T2A / 250 VAC internal
Internal surge voltage protection	IEC 61000-4-5 Varistor
Output short circuit	Hiccup mode
Rated over load protection	Min 120 %, max 160 %
Approvals and standards	
UL / cUL	UL60950-1, UL60601-1 Recognized
TUV	EN60950-1 EN 60601-1
CE	EN 60601-1-2, EN 55011, EN 61000-6-3, EN 55022 Class B, EN 61000-3-2 EN 61000-3-3, EN 61000- 6-2, EN 55024, EN61000- 4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000- 4-8, EN 61000-4-11, EN 61204-3
Vibration resistance	Meet IEC 60068-2-6 (10- 500 Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis)
Shock resistance	Meet IEC 60068-2-27 (15G 11 ms, 3 axes, 6 faces, 3 times for each face)

40W AC-DC Modules PA40A-Series

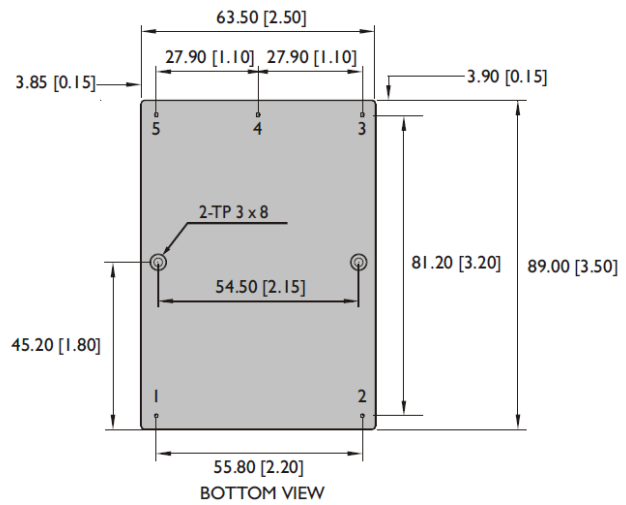


Mechanism & Pin Configuration

mm [inch]



GENERAL TOLERANCE	
0.00[0.00] - 30.00[1.18]	±0.30[0.01]
30.00[1.18] - 120.00[4.72]	±0.50[0.02]

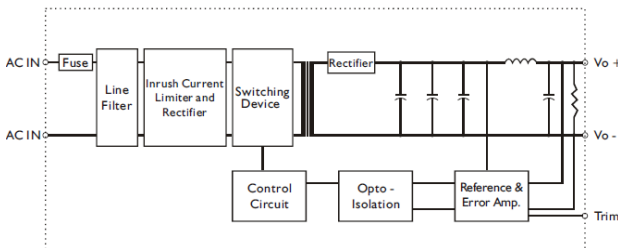


PIN Assignment

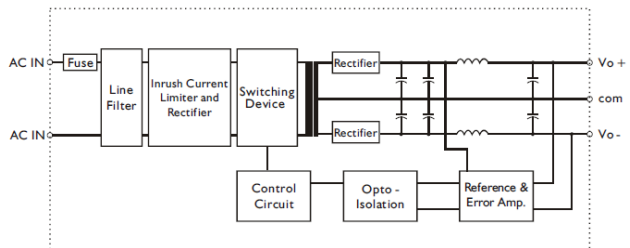
PIN No.	1	2	3	4	5
Single	AC IN	AC IN	Vo +	Vo -	Trim
Dual 12D 15D	AC IN	AC IN	Vo +	Com	Vo -
Dual 512 D	AC IN	AC IN	+ 5V	Com	+ 12V
Dual 524 D	AC IN	AC IN	+ 5V	Com	+ 24V

Circuit Schematic

Block diagram for single output

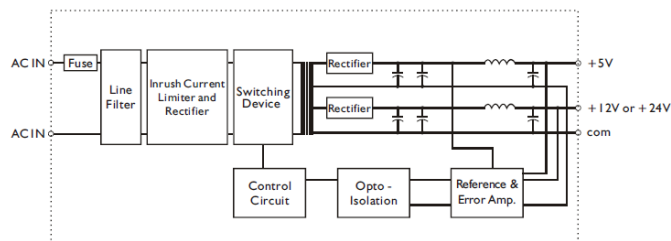


Block diagram for dual output

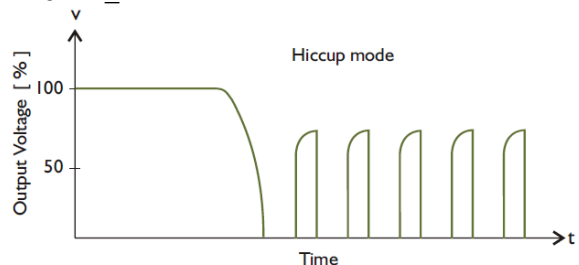


Circuit Schematic

Block diagram for PA40A512D_01



Typ. Current Limited Curve
PA40A24_1



40W AC-DC Modules PA40A-Series



Typ. Efficiency Curve

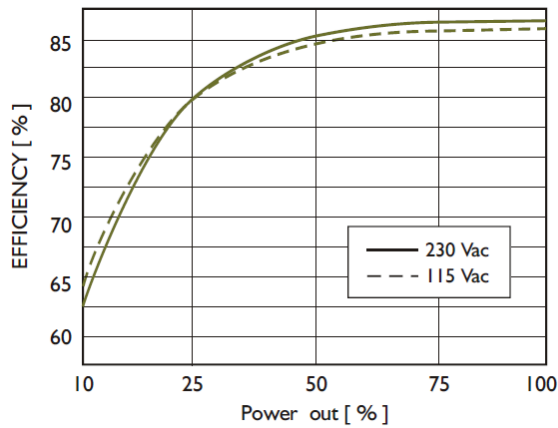
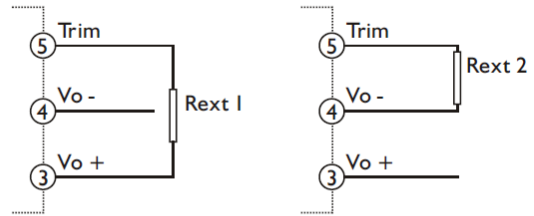


Fig. 1 Trim connection (for single output only)



Derating Curve

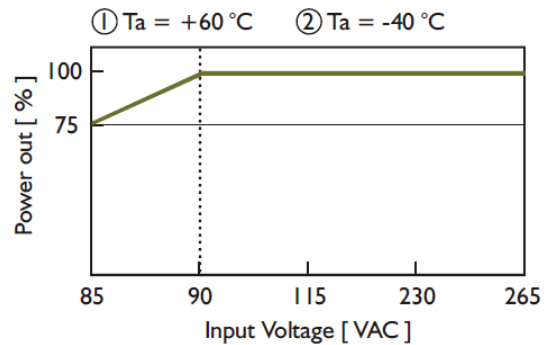
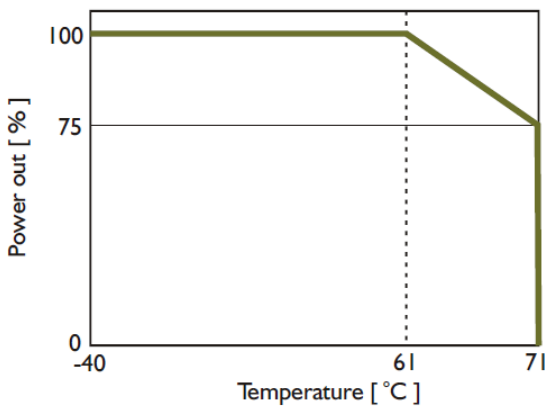


Table I Typical resistor values for various output voltage adjustment settings and max continuous power

Type	Rext 1 Vo nom -5 %	Rext 1 Vo nom - 10%	Rext 2 Vo nom +5%	Rext 2 Vo nom +10%	Maximal continuous power
PA40A03_01	20 kΩ	5.1 kΩ	3 kΩ	1 kΩ	28 W
PA40A05_01	5.1 kΩ	1 kΩ	6.8 kΩ	2 kΩ	40 W
PA40A12_01	39 kΩ	20 kΩ	10 kΩ	0 Ω	40.8 W
PA40A15_01	180 kΩ	56 kΩ	30 kΩ	5.1 kΩ	40.5 W
PA40A24_01	150 kΩ	51 kΩ	8.2 kΩ	0 Ω	40.8 W