TAD65-P SERIES

AC-DC

65W

DIMENSIONS:

Open frame: 3 x 2 x 0.94″
(76.2 x 50.8 x 24mm)
U channel: 3.53 x 2.38 x 1.31″
(89.7 x 60.5 x 133.3mm)
Covered: 3.53 x 2.38 x 1.31″
(89.7 x 60.5 x 33.3mm)

-40 to 85°C OPERATION

PEAK 90W 5 SECS

VOLTAGE ADJUST -20% TO +10%

EN/IEC/UK 62368-1

EN55032 LEVEL B

4 MECHANICAL VERSIONS

Part numbers

TAD	65	U	S	12	C	-	M	P
Series	Power	Input voltage	Options	Output voltage	Options		Input connector	Input Options
		U = Universal 85-264 VAC	S = Single	5 = 5VDC 7.5 = 7.5VDC 9 = 9VDC 12 = 12VDC 15 = 15VDC 18 = 18VDC 24 = 24VDC 28 = 28VDC 36 = 36VDC 48 = 48VDC 53 = 53VDC	C = Class I D = Class II		M = Molex T = Terminal	Blank = None P = Peak power

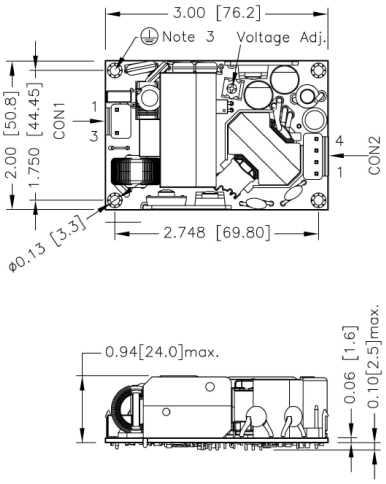
Key specifications

Input range	Safety certification	Efficiency	Environmental performance
85-264VAC	EN/UL/IEC 62368-1	Up to 93.5%	Operational: -40 to 85°C

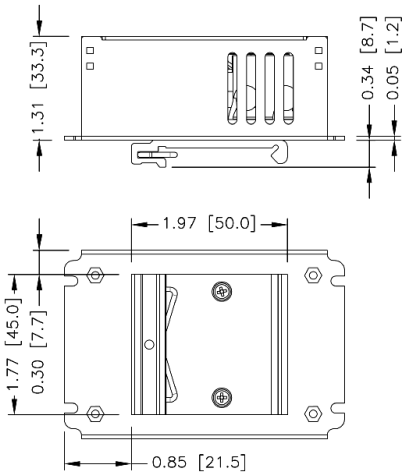
TAD65-P SERIES

Mechanical

TAD open frame



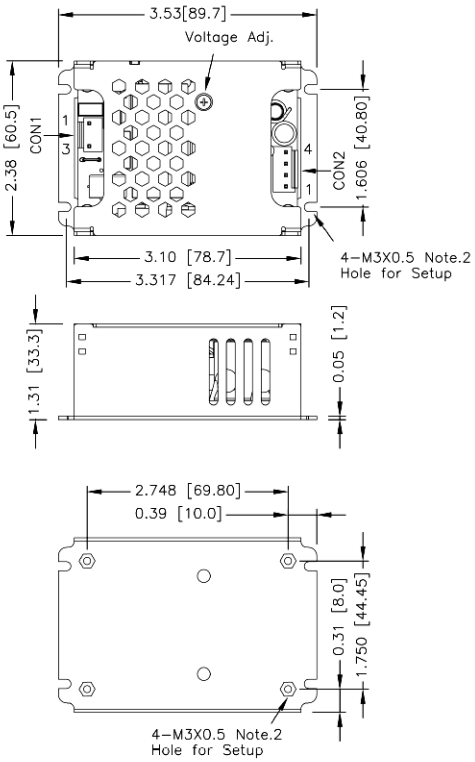
TDD din rail



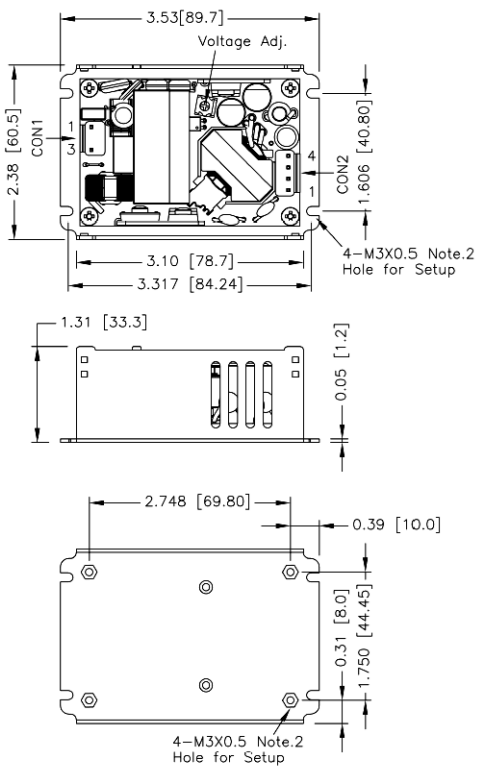
Connector CN1	Function
1	Line
2	Void
3	Neutral

Connector CN2	Function
1	-Vout
2	-Vout
3	+Vout
4	+Vout

TED covered



TUD U channel



Notes

1. Mates with JST VHR-3N, molex version mates with 09-50-8031, screw terminal accepts 26-16AWG
2. Mates with JST VHR-4N, molex version mates with 09-50-8041, screw terminal accepts 26-16AWG
3.Any mouting hole can be used for PE connection
4. All dimensions shown in inches [mm]
5. Tolerance:2DP ±0.02"[1DP ±0.5mm], 3DP ±0.01"[2DP ±0.25mm]

Weight

TAD Open frame	117g
TUD U channel	157g
TED Covered	172g
TDD Din rail	193g

Models & Ratings

Model Number[1]	Output Voltage	Output Current		Output Power		Efficiency	Capacitive Load	Noise and ripple
		Nominal	Peak [2]	Nominal	Peak [2]			
TAD65US05C-P	5V	10A	13A	50W	65W	90%	20000uF	75mVp-p
TAD65US7P5C-P	7.5V	8.67A	12A	65W	90W	90%	11560uF	75mVp-p
TAD65US09C-P	9V	7.23A	10A	65W	90W	91%	8033uF	75mVp-p
TAD65US12C-P	12V	5.42A	7.5A	65W	90W	92.5%	4520uF	75mVp-p
TAD65US15C-P	15V	4.34A	6A	65W	90W	93.5%	2900uF	75mVp-p
TAD65US18C-P	18V	3.62A	5A	65W	90W	93%	2015uF	75mVp-p
TAD65US24C-P	24V	2.71A	3.75A	65W	90W	93.5%	1130uF	75mVp-p
TAD65US241C-P	24V	2.71A	3.75A	65W	90W	92%	1130uF	75mVp-p
TAD65US28C-P	28V	2.33A	3.21A	65W	90W	93.5%	830uF	75mVp-p
TAD65US281C-P	28V	2.33A	3.21A	65W	90W	91.5%	830uF	75mVp-p
TAD65US36C-P	36V	1.81A	2.5A	65W	90W	92.5%	520uF	75mVp-p
TAD65US48C-P	48V	1.36A	1.875A	65W	90W	93%	285uF	48mVp-p
TAD65US53C-P	53V	1.24A	1.69A	65W	90W	92.5%	235uF	53mVp-p

1. For class II version change C for D. For Molex or screw terminal input and output terminals add M or T respectively to part number after - (dash). For example TAD65US05D-MP for class II Molex input & output terminals. For U channel, enclosed or DIN rail variants, change A for U, E or D respectively. Add R to the end of part number for conformal coating.

2. Peak max duration is 5sec, 20% duty with average below 70%

Input

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Input voltage	85		264	VAC	120-370VDC See page 8 for derating curve
Input frequency	47		63	Hz	
Input current	0.9		1.6	A	0.4A at 240VAC, 0.8A at 100 VAC
Leakage current			75	uA	at 264VAC. BF rated
Start up time			1000	ms	
Rise Time		20		ms	
No load power		0.11		mW	230VAC

Output

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Output voltage	5		53	VDC	See Models & Ratings table
Output voltage adjust	-20		+10		
Set point accuracy			±1	%	Full load 230VAC
Line regulation			±0.2	%	Low line to high line at full load
Load regulation	±0.5		±0.7		0-100% load. ±0.7 for 5V
	±0.4		±0.6		10-90% load change. ±0.6 for 5V
Minimum load	0			%	
Ripple & noise	75		150	mVp-p	20 MHz bandwidth.5-18V use 10pF/25V X7R MLCC, 24-36V use 1u/50V X7R MLCC, 48-53V use 0.1uF/100V X7R MLCC See models and ratings table p5
Transient response			3	%	Recovery within 1% within 600 µs for 50-75% step at 2.5A/us
Hold up time		16		mS	At full load & 115VAC

Protections

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Overload		165		%	Trip and restart. Automatic recovery
Short circuit					Trip and restart. Automatic recovery
Overvoltage	125		140	%	Trip and restart. Automatic recovery

Safety

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Safety standards	EN/UL/IEC 62368-1				
Isolation: Input to output	3000			VAC	Input to functional ground 2500VAC
Insulation resistance	1000			MΩ	500VDC

EMC: Immunity

	Standard	Test level	Criteria	Notes/Conditions
ESD	EN61000-4-2	3	A	±15kV air, ±6kV contact
Radiated	EN61000-4-3	4	A	20A/m
EFT	EN61000-4-4	4	A	±4kV
Surges	EN61000-4-5	Installation class 3	A	±2kV Live-Neutral, Line-PE ±4kV
Conducted	EN61000-4-6	3	A	20Vrms
PFMF	EN61000-4-8	4	A	100A/m
Dips & interruptions	EN61000-4-11			
Damped oscillatory wave	EN61000-4-18		A	±1kV Live-Neutral, Line-PE ±2.5kV

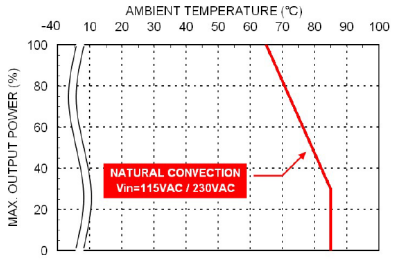
EMC: Emissions

	Standard	Test level	Criteria	Notes/Conditions
Conducted	EN55032	B		
Radiated	EN55032	B		Extra components may be required for Class I install
Harmonic current	EN61000-3-2	Class A		
Voltage flicker	EN61000-3-3			

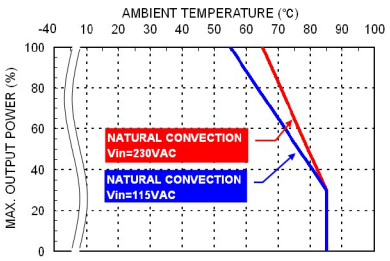
Environmental

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Operating temperature	-40		85	°C	See derating curve
Storage temperature	-40		85	°C	
Cooling					Convection cooled
Temperature coefficient			±0.02	%/°C	
Humidity	5		95	%RH	Non condensing
Operating altitude			5000	M	
MBTF		1.494			MIL-HBDK-217F, 25°C
Shock & Vibration	Shock IEC60068-2-27, vibration IEC60068-2-6				

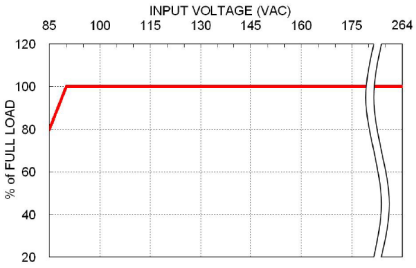
TAD65 & TUD65 derating curve vs. ambient temperature



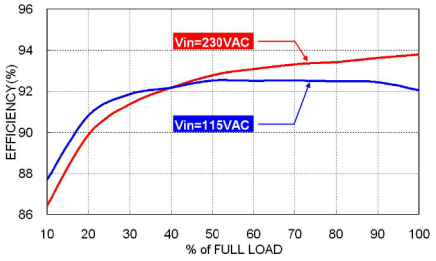
TED65 & TDD65 Derating curve vs. input voltage



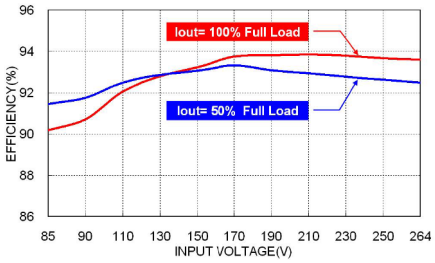
Derating curve vs. input voltage



TAD30US24B-P efficiency vs. output load

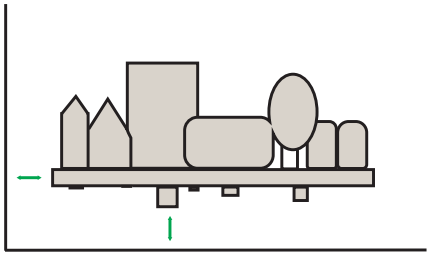


TAD30US24B-P efficiency vs. input voltage



Installation Advice

Safety

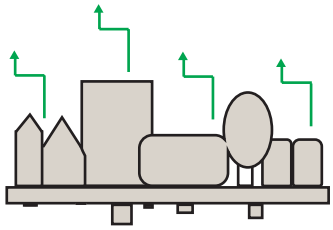


On installation customers must consider the required creepage and clearance distances between the PSU and the end-equipment enclosure. These distances vary depending on the installation class and safety standard requirements.

For **Class I** installations there should be 3-4mm between any part of the PSU and any earthed metal part of the enclosure. 3mm is acceptable for IT applications, 4mm required for medical applications. In Class I installations the PSU earth point must be connected to system safety ground.
For **Class II** installations distances may need to be increased if being installed into a surrounding metal enclosure.
Ensure consideration of components on the underside of the PCB or low lying spills when measuring clearance distances between the PSU and the end-equipment. Also top surface especially in tight enclosures such as 1U boxes. An insulation material can be used between PSU and metal if smaller gap required.

Fidus recommends installing the PSU on 6mm stand offs typically, but check the distances.

EMC

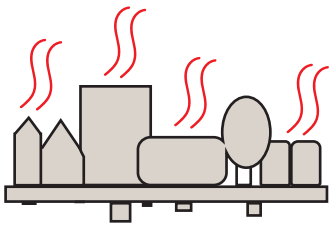


Conducted and radiated emissions compliance is a common application consideration. It is important to remember that even when using a properly filtered PSU, an application may still not achieve compliance if it is not designed to minimise emissions. That being said, there are a number of things that can be done to optimise EMC performance either as best practice, or if you are struggling for compliance:

1) Connect all marked EMI ground points to earth. Often these are combined with the safety earth point (in class I installations), but on some power supplies there may be additional earth tags or mounting points.
2) Minimise the length of input/output wiring where possible and try to maintain max distance of the conductors from the PSU, to prevent noise pick up. Avoid bundling input and output cables together. A common component to avoid placing wiring near is the PFC inductor in power factor corrected power supplies.
3) Apply additional filtering before the PSU input (ensure consideration of which frequencies there are issues with before selecting a filter).
4) When using an open frame PSU, mount the supply on a metal plate and connect EMI mounting points.
5) In multi circuit systems, decouple the circuits locally.
6) Ferrites added between the PSU and system input connector and/or the DC output cables can help in reducing radiated noise issues in systems. If seen, issues are commonly in the 30-150MHz area.

For more detailed assistance, if you still have any concerns with compliance, please get in contact with our Engineering department who are on hand to assist with any queries.

Thermal



Thermal management is an important consideration when thinking about equipment service life. Electrolytic capacitors within the PSU wear with time and are typically the first end-of-life failure. Keeping the operation temperature of key components within the PSU, such as the electrolytic capacitors, as low as possible is paramount. As a general rule, for every 10°C drop in the operating temperature of the electrolytic capacitors you double their lifetime, and thus the lifetime of the power supply. When looking at thermal performance it is helpful to test under a worst-case set of conditions, to ensure component temperatures are in an acceptable range for the required service life. Then consider the impact of operational time, load and temperature profile to estimate a more realistic lifetime for your PSU.

Also, many Fidus power supplies offer a Peak Power rating to provide for customers with pulsing loads. When using a peak power capability customers must consider:
1) Peak duration rating: the maximum length of time the peak can be drawn for
2) Duty cycle: the frequency with which the peak can be drawn. (e.g. 10% duty cycle, 1 second on: 9 seconds off)
3) Average power value: datasheets will state the maximum average power acceptable with peak power PSUs. If any of these elements are exceeded the supply may overheat, with performance and lifetime suffering as a result.

21st May 2025