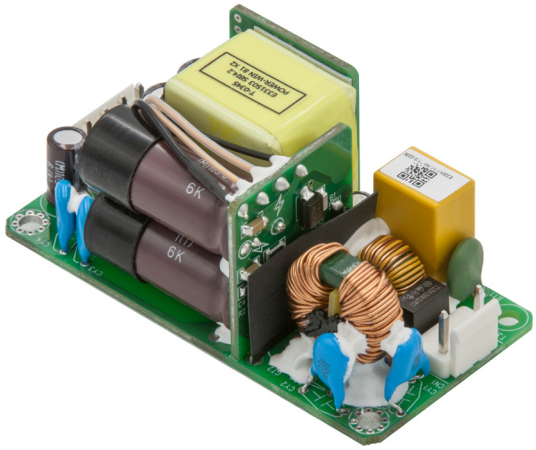
TCF85 SERIES



AC-DC

85W

50W

DIMENSIONS:

OPEN FRAME:
3 x 1.5 x 1.26"
(76.2 x 38.1 x 32mm)

<75mW NO-LOAD | **FAN OR CONVECTION** | **EN55032 LEVEL B**

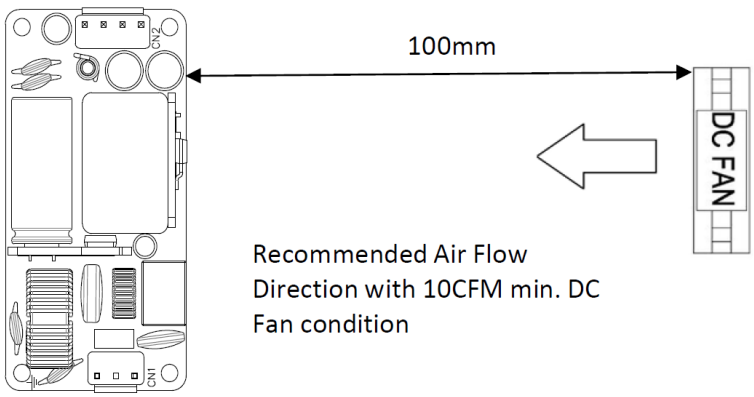
Part numbers

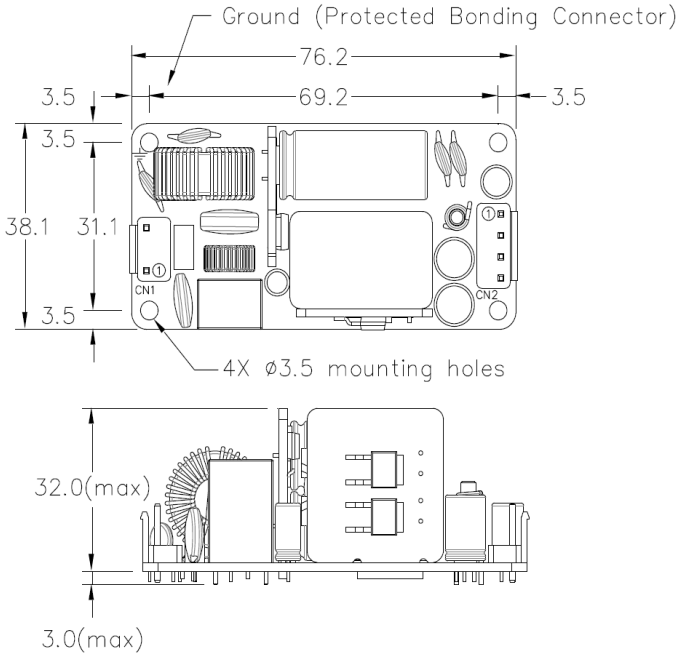
TCF	85	05
Series	Power (W)	Output voltage
		05 = 5VDC 12 = 12VDC 15 = 15VDC 18 = 18VDC 24 = 24VDC 28 = 28VDC 36 = 36VDC 48 = 48VDC

Key specifications

Input range	Safety certification	Efficiency	Environmental performance
90-264VAC	UL/IEC/EN 62368-1 (UL pending for 28V & 36V)	87-90-%	-20 to 70°C

Mechanical





Connector	Pin/Function
Input Connector	1. AC Neutral 2. AC Line
Output	1. +Vo 2. +Vo 3. -Vo 4. -Vo

Notes

1. All dimensions shown in mm
2. CN1 Input connector mates with JST VHR-3N
3. CN2 Output connector mates with JST VHR-4N
4. For Class I systems positions 1, 2 & 4 must be connected to earth for safty and EMI performance
5. For Class II systems positions 1, 2 & 4 must be isolated and connected to chassis by insulative fixtures. For inproved emissions KING CORE:KCF-100-B 1 turn is recommended.
6. General tolerance ±0.5mm
7. 10mm clearance around product is recommended for safety

Weight	100g

Models & Ratings

Model Number	Output voltage	Output Power		Output Current		Ripple and Noise(1)
		Continuous Convection	25 CFM	Continuous Convection	25 CFM	
TCF8505	5V	40W	50W	8A	10A	50mV
TCF8512	12V	60W	85W	5A	7.1A	120mV
TCF8515	15V	60W	85W	4A	5.67A	150mV
TCF8518	18V	65W	85W	3.6A	4.73A	150mV
TCF8524	24V	65W	85W	2.7A	3.54A	150mV
TCF8528	28V	65W	85W	2.3A	3.04A	150mV
TCF8536	36V	65W	85W	1.8A	2.36A	200mV
TCF8548	48V	65W	85W	1.3A	1.78A	200mV

1. Ripple and noise are measured at 115VAC with 20MHz bandwidth by a 47uF electrolytic capacitor and a 0.1uF ceramic capacitor in parallel at output connector.

2. The switching frequency of this series is set within 50KHz to 100KHz at full load.

Input

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Input voltage	90		264	VAC	See page 5 for derating curve
Input frequency	47		63	Hz	
Power factor	0.95				EN61000-3-2 class A
Input current (rms)			2/1	A	115VAC/230VAC
Inrush current	50/65		100/130	A	115/230VAC cold start at 25°C (65/130A for 5V model only)
No load input power			75	mW	

Output

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Output voltage	5		48	VDC	See Models & Ratings table
Regulation		±3		%	Including line, load and setpoint accuracy at 25°C
Minimum load	0			%	
Hold up time	8			ms	115VAC 70% of 85W or for 5V 50W load

Protections

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Overload	105		160	%	Trip and restart. Automatic recovery
Short circuit					Trip and restart. Automatic recovery
Over voltage					Latch off reset
Over temperature					Latch off reset

Safety

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Safety standards	IEC/EN/UL62368-1				
Isolation: Input to output	3000			VAC	
Isolation: Output to ground	500			VAC	

EMC: Immunity

	Standard	Test level	Criteria	Notes/Conditions
ESD	EN61000-4-2	3	A	±4kV contact, air N/A.
Radiated	EN61000-4-3	2	A	3V/m 80MHz-500MHz 80% AM 1kHz
EFT	EN61000-4-4	3	A	±1kV Line-Neutral, ±2kV Line/Neuitral-Earth
Surges	EN61000-4-5	Instalation class 3	A	±2kV Line-Neutral, ±4kV Line/Neutral-Earth
Conducted	EN61000-4-6	2	A	3Vrms
Voltage dips & interruptions	EN61000-4-11		A/B	Voltage dips A, Interuptions B

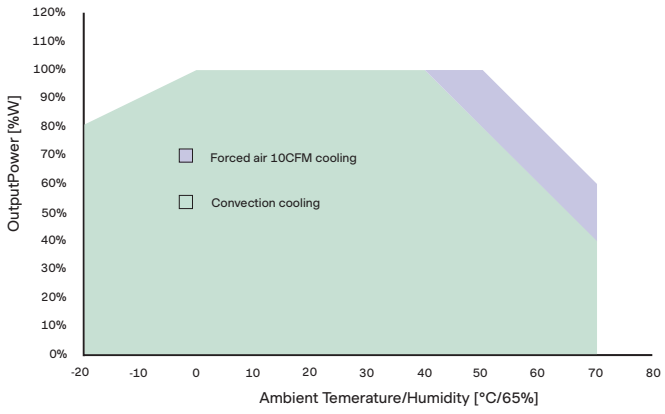
EMC: Emissions

	Standard	Test level	Criteria	Notes/Conditions
Conducted	EN55032	B		
Radiated	EN55032	B		Class II applicaitons require KING CORE:KCF-100-B 1 turn on AC
Harmonic current	EN61000-3-2	Class A		
Voltage flicker	EN61000-3-3			

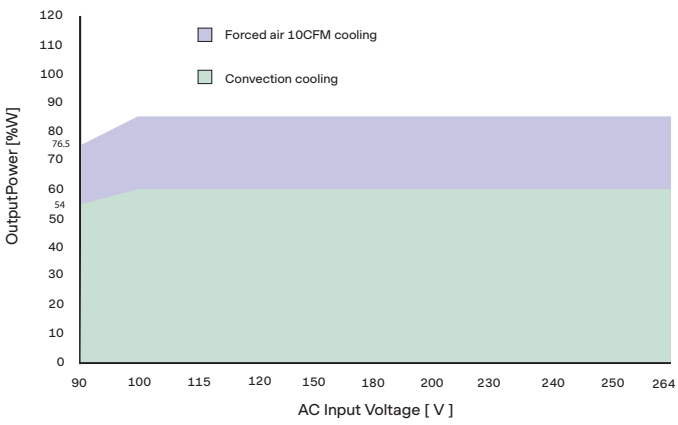
Environmental

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Operating temperature	-20		70	°C	See derating curve
Storage temperature	-20		85	°C	
Cooling					Free air / 10CFM
Operating Humidity	10		95	% RH	
Storage Humidity	0		95	% RH	
MBTF	>450			kHrs	As per Telcordia SR-332 (bellcore)

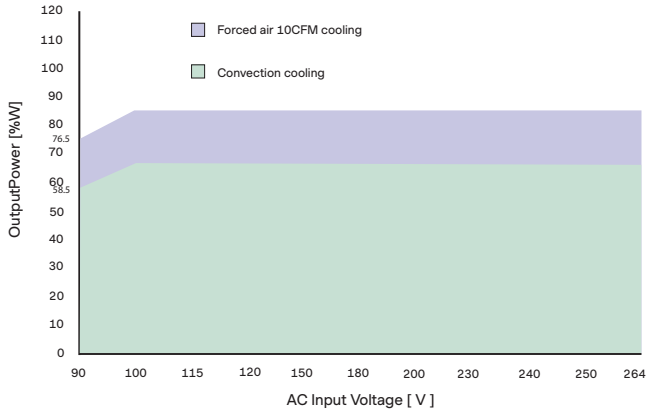
Temperature derating



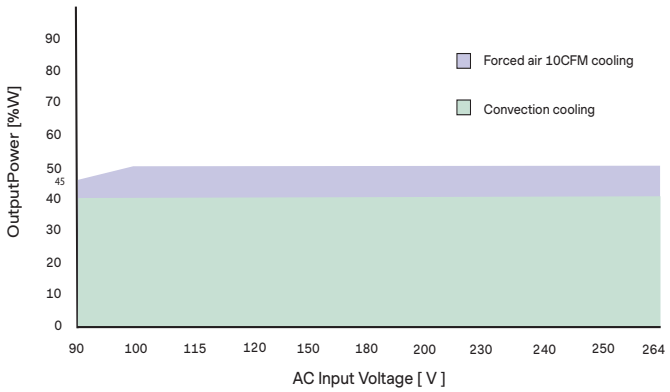
Input voltage derating 12V 15V



Input voltage derating 18V -48V

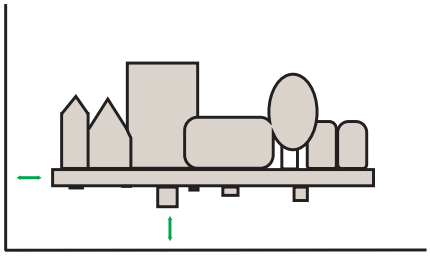


Input voltage derating 5V



Installation Advice

Safety

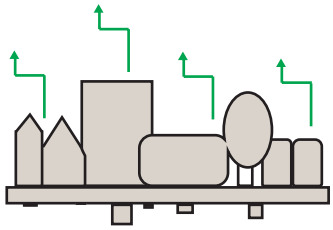


On installation customers must consider the required creepage and clearance distances between the PSU and the end-equipment enclosure. These distances vary depending on the installation class and safety standard requirements.

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

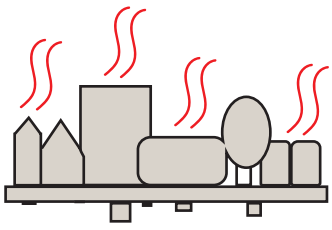


Conducted and radiated emissions compliance is a common application consideration. It is important to remember that even when using a properly filtered PSU, an application may still not achieve compliance if it is not designed to minimise emissions. That being said, there are a number of things that 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 capacitators 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.

30th June 2023