SERIES: VMS-120C | **DESCRIPTION:** AC-DC POWER SUPPLY

FEATURES

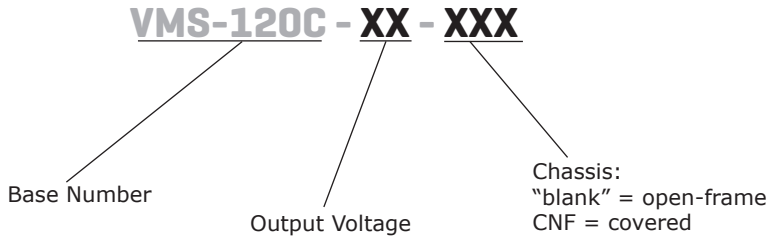
- universal input voltage (85 ~ 264 Vac)
- wide operating temperature (-40 to +85C)
- active power factor correction
- certified to 60601, 60335, and 61558 safety standards
- suitable for safety class I or class II installations
- over voltage, over current, over temperature, and short circuit protections
- adjustable output via trim POT
- low leakage current (< 0.1 mA)
- low standby power consumption (0.5 W)

MODEL

MODEL	output voltage		output current	output power	transient[2] output power	ripple and noise[3]	efficiency[4]
	(Vdc)	range[1] (Vdc)	max (A)	max (W)	max (W)	max (mVp-p)	typ (%)
VMS-120C-12	12	11.4~12.6	9.5	114.0	141.6	120	94.0
VMS-120C-15	15	14.3~15.8	7.6	114.0	142.5	120	94.0
VMS-120C-24	24	22.8~25.2	5.0	120.0	150.0	150	95.0
VMS-120C-27	27	25.6~28.4	4.44	119.9	149.8	150	95.0
VMS-120C-36	36	35.28~37.8	3.33	120.0	149.7	200	94.0
VMS-120C-48	48	45.6~50.4	2.5	120.0	150.0	200	94.5

Notes:
1. When the output voltage is increased, the total output power cannot exceed the nominal output power.
2. If the total output power exceeds the nominal output power, it can be maintained for a maximum of 10 seconds, but not repeated for at least 30 minutes. The power supply cannot exceed the transient power. When the output voltage is increased, the total output power cannot exceed the nominal output power.
3. At full load, nominal input, 20 MHz bandwidth oscilloscope, tip & barrel method, output terminated with 47 µF electrolytic and 0.1 µF ceramic capacitors. Under light load conditions (<15%) the measurement may double in an effort to maximize converter efficiency.
4. At 230 Vac.

PART NUMBER KEY



INPUT

parameter	conditions/description	min	typ	max	units
voltage	ac input dc input	85 120		264 370	Vac Vdc
frequency		47		63	Hz
current	at 115 Vac at 230 Vac			2.0 1.0	A A
inrush current	at 115 Vac, cold start at 230 Vac, cold start		40 75		A A
leakage current	at 240 Vac			0.1	mA
power factor correction	at 115 Vac, full load at 230 Vac, full load	0.98 0.94			
no load power consumption			0.5		W

OUTPUT

parameter	conditions/description	min	typ	max	units
output capacitance	12 Vdc output model 15 Vdc output model 24 Vdc output model 27 Vdc output model 36 Vdc output model 48 Vdc output model			6,000 5,000 3,200 2,400 2,000 1,600	µF µF µF µF µF µF
initial set point accuracy	at full load, 25°C 12 & 15 Vdc output models 24, 27, 36 & 48 Vdc output models		 ±2 ±1		 % %
line regulation	rated load		±0.5		%
load regulation	0 ~ 100% load		±1		%
hold-up time	at 230 Vac, 25°C	15			ms
temperature coefficient			±0.03		%/°C
adjustability	via built-in trimpot		±5		%

PROTECTIONS

parameter	conditions/description	min	typ	max	units
over voltage protection	output shutdown, latching 12 Vdc output model 15 Vdc output model 24 Vdc output model 27 Vdc output model 36 Vdc output model 48 Vdc output model		 16 25 32 35 50 60		 Vdc Vdc Vdc Vdc Vdc Vdc
over current protection	hiccup, auto recovery	130			%
short circuit protection	continuous, auto recovery, hiccup				
over temperature protection	output shutdown, auto recovery				

SAFETY & COMPLIANCE

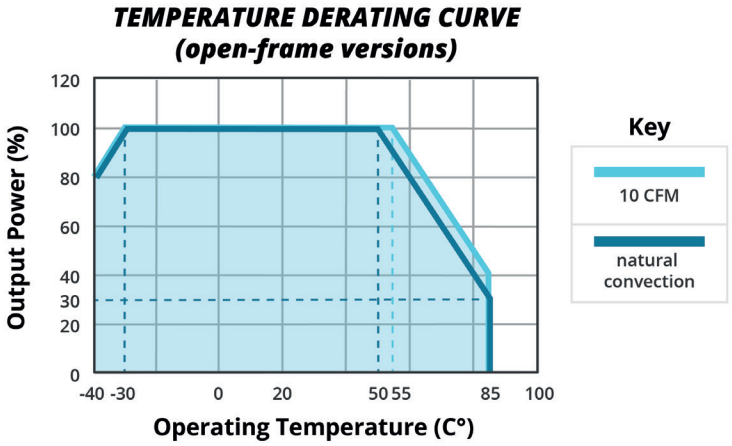
parameter	conditions/description	min	typ	max	units
isolation voltage	input to ground for 1 minute; <10 mA input to output for 1 minute; <10 mA output to ground for 1 minute; <10 mA	1,500 4,000 1,500			Vac Vac Vac
safety approvals	certified to 60601: ES, EN certified to 60335: EN certified to 61558: EN				
safety class	class I (with PE), class II (without PE)				
conducted emissions[1]	CISPR32/EN55032 CLASS B				
radiated emissions[1]	CISPR32/EN55032 (Class B for safety class I installations; Class A for safety class II installations)				
harmonic current	IEC/EN61000-3-2 CLASS A				
ESD	IEC/EN 61000-4-2 Contact ±8KV/Air ±15KV perf. Criteria A				
radiated immunity	IEC/EN 61000-4-3 10V/m perf. Criteria A				
EFT/burst	IEC/EN 61000-4-4 ±2KV perf. Criteria A				
surge	IEC/EN 61000-4-5 line to line ±2KV/line to ground ±4KV perf. Criteria A				
conducted immunity	IEC/EN61000-4-6 10 Vr.m.s perf. Criteria A				
voltage dips and interruptions	IEC/EN61000-4-11 0%, 70% perf. Criteria B				
MTBF	as per MIL-HDBK-217F at 25°C	300,000			hours
RoHS	yes				

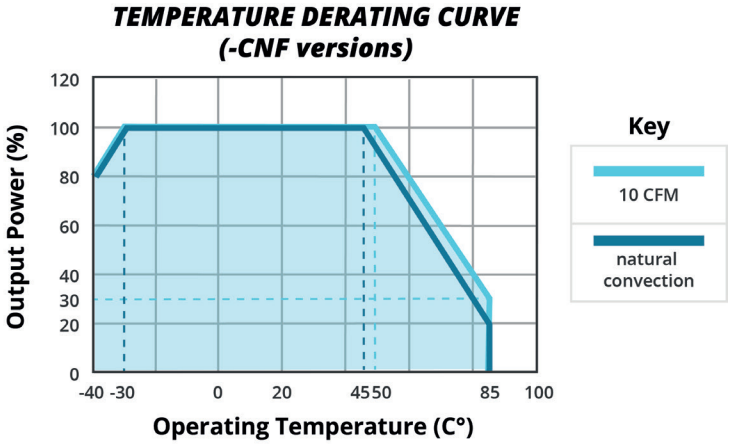
Notes: 1. The power supply is considered a component of the end system. All EMC performance has been tested on a metal plate with the dimensions 360 x 360 x 1 mm. The power supply must be integrated into the end system for proper electromagnetic compatibility testing.

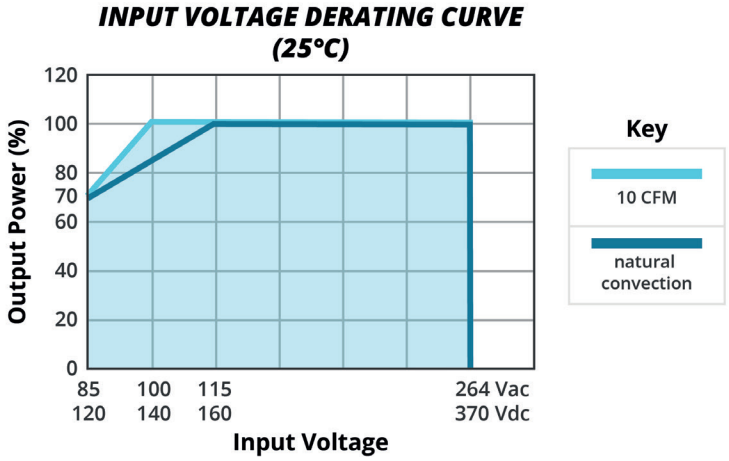
ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature	see derating curves	-40		85	°C
storage temperature		-40		85	°C
operating humidity	non-condensing	20		90	%
storage humidity	non-condensing	10		95	%

DERATING CURVES

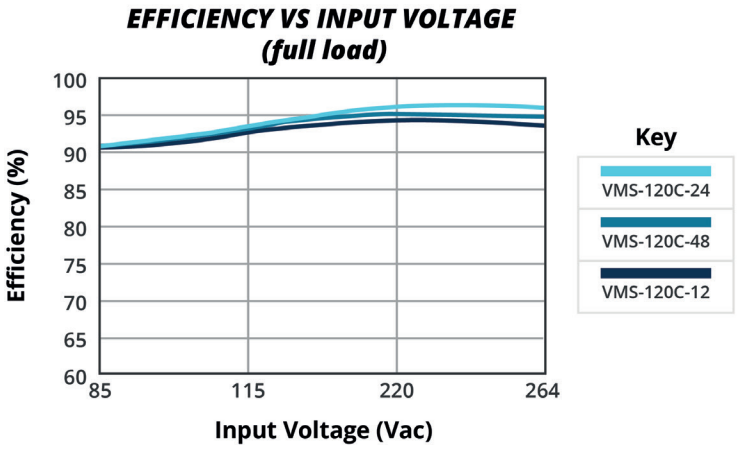


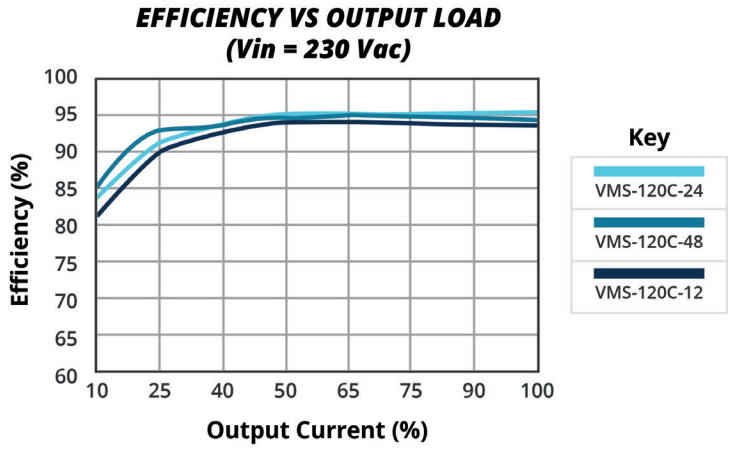




Note: With an AC input voltage between 85 ~ 115 and a DC input between 120 ~ 160 Vdc the output power must be derated as per the temperature derating curve.

EFFICIENCY CURVES





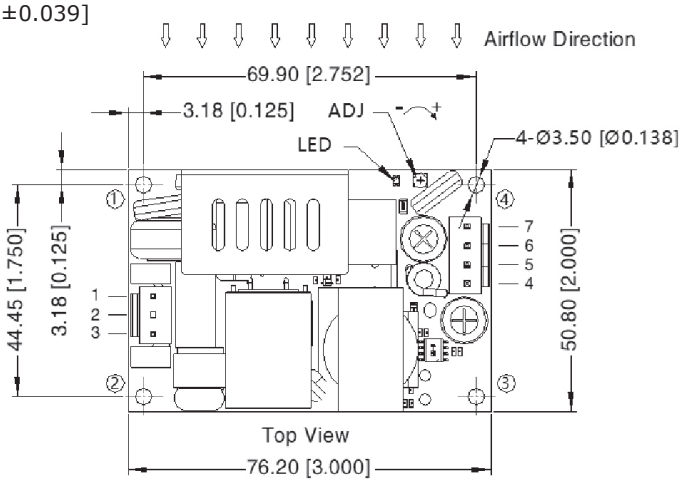
MECHANICAL

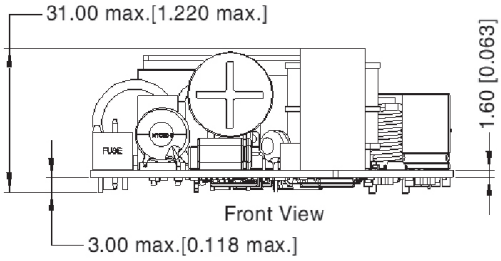
parameter	conditions/description	min	typ	max	units
dimensions	open frame models: 76.20 x 50.80 x 31.00 [3.0 x 2.0 x 1.381 inch] covered models: 80.0 × 62.0 × 40.0 [3.149 x 2.440 x 1.574 inch]				mm mm
weight	open frame models covered models		125 180		g g
cooling	natural convection (no integrated fan)				

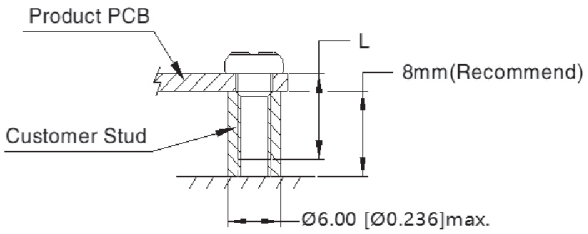
MECHANICAL DRAWING

Open-frame
units: mm [inch]
general tolerance: ±1.00 [±0.039]

PIN-OUT	
PIN	Function
1	AC (N)
2	NC
3	AC (L)
4, 5	-Vo
6, 7	+Vo







CONNECTORS		
	Product Connector	Customer Connector
AC CONNECTORS	JST B3P-VH or equivalent	Housing: JST VHR Contact: JST SVH-21T-P1.1 or equivalent
DC CONNECTORS	JST B4P-VH or equivalent	Housing: JST VHR Contact: JST SVH-21T-P1.1 or equivalent

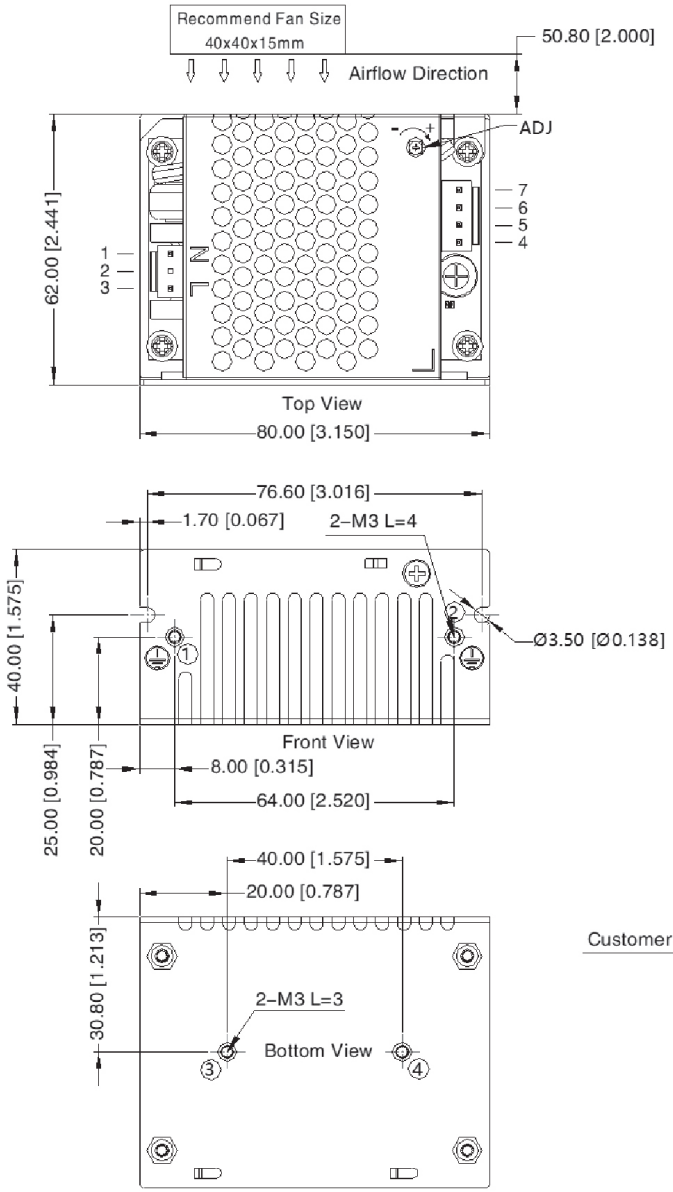
MOUNTING SCREWS			
Position	Screw Spec.	L (recommended)	Torque
①~④	M3	6mm	0.4 N·m

Note: 1. Class I system ①, ④ positions must be connected to the protective earth ground (⏚).
2. Class II system ①, ④ positions must be connected together.
3. It is recommended that a minimum distance of 10mm be placed between the PCB edge and all other components.

MECHANICAL DRAWING (CONTINUED)

Covered
units: mm [inch]
general tolerance: ±1.00 [±0.039]

PIN-OUT	
PIN	Function
1	AC (N)
2	NC
3	AC (L)
4, 5	-Vo
6, 7	+Vo



CONNECTORS		
	Product Connector	Customer Connector
AC CONNECTORS	JST B3P-VH or equivalent	Housing: JST VHR Contact: JST SVH-21T-P1.1 or equivalent
DC CONNECTORS	JST B4P-VH or equivalent	Housing: JST VHR Contact: JST SVH-21T-P1.1 or equivalent

Position	Screw Spec.	L (recommended)	Torque
①~②	M3	4mm	0.4 N·m
③~④	M3	3mm	0.4 N·m

Note: 1. Safety Class I integrations require the metal case to be securely fastened to protective earth ground (⏚).

REVISION HISTORY

rev.	description	date
1.0	initial release	06/08/2021
1.01	OVP updated	06/15/2021
1.02	derating curves updated	02/08/2022
1.03	UKCA mark added	06/13/2022
1.04	medical icon added	05/04/2023

The revision history provided is for informational purposes only and is believed to be accurate.

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