

RACM3000-M / RDC3000-M Series ▾ AC/DC Power Supply

3000W ▾ Input: 100V-240VAC or 400-800VDC

RECOM
AC/DC Converter

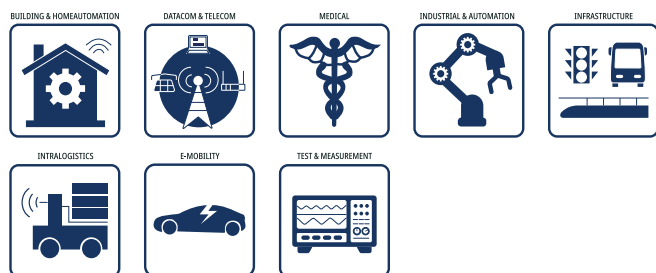
FEATURES

- 3000W DC-out @ In: 180-264VAC or 400-800VDC
- UL62368 & UL60601; IEC60335 (-2-29)
- 5V/2A standby output
- Active current sharing support; (optional OR-ing FET)
- Intelligent fan speed control
- CAN-BUS programming Output voltage & current
- Semi F47-0706; and medical 2xMOPP grade
- 3 year warranty



Dimensions: 278.1 x 108.8 x 41.0mm (11.8 x 4.3 x 1.6 inch)
2000g typ. (4.4 lbs)

APPLICATIONS



SAFETY & EMC



DESCRIPTION

The RACM3000-M and RDC3000-M series are high-performance 3000W power supplies designed for demanding medical, industrial, and household applications. For high-voltage DC applications, the RDC3000-M variant supports input voltages from 400 to 800VDC. The RACM3000-M operates from 180–264VAC and delivers the full 3000W output power, while providing 1500W output power across a wide input range from 90VAC. With approvals according to UL/IEC 60601 (medical), UL/IEC 62368 (industrial and ICT), and IEC 60335-2-29 (household) standards, the series offers a versatile platform suitable for a broad range of end equipment and power infrastructure. Designed for maximum flexibility, the modules feature output voltage adjustment via analogue potentiometer or CAN bus, a 5V/2A standby output, remote on/off control, remote sense, and a DC-OK signal. Comprehensive CAN bus monitoring and control functions enable advanced system integration and power management. For applications requiring higher power levels, optional OR-ing FETs and active current sharing allow multiple units to operate in parallel safely and efficiently. A built-in temperature-controlled smart fan minimizes audible noise while ensuring reliable thermal performance. Customized features are available on project-demands with Europe made variants.

SELECTION GUIDE

Part Number	Operating Input Range [VAC]	Output Voltage Factory Set [VDC]	Output Voltage Range [VDC]	Output Current max. [A]	Efficiency ⁽¹⁾ typ. [%]	Output Power continuous [W]
RACM3000-24SM/RF	90-264	24	24-28	125	92.5	3000
RACM3000-36SM/RF	90-264	36	33-40	83.4	93	3000
RACM3000-48SM/RF	90-264	48	42-53.5	62.5	94	3000

SELECTION GUIDE (COMING SOON)

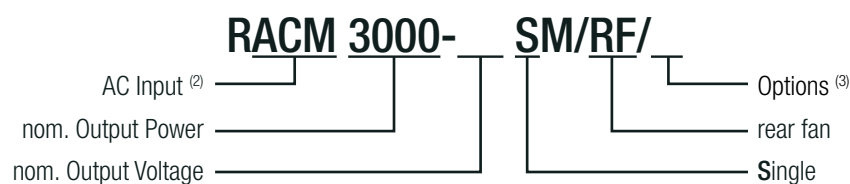
Part Number	Operating Input Range [VDC]	Output Voltage Factory Set [VDC]	Output Voltage Range [VDC]	Output Current max. [A]	Efficiency ⁽¹⁾ typ. [%]	Output Power continuous [W]
RDC3000-48SM/RF	400-800	48	42-48	62.5	TBD	3000

Note1: Efficiency is tested at nominal input and rated load at +25°C ambient.

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3000W ◊ Input: 100V-240VAC or 400-800VDC

MODEL NUMBERING



Note2: refer to „Nominal Input Voltage“

Note3: Options are available on request:

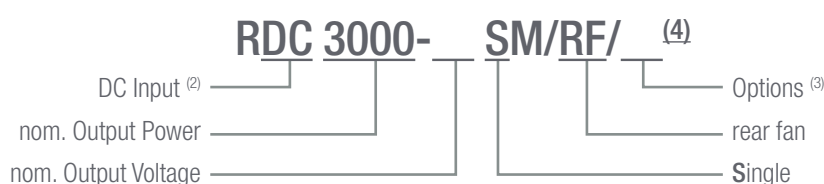
“/OR” = ORing FET integrated

“/LB” = long 2-hole DC-Bar connector

“/LB/OR” = long 2-hole DC-Bar connector, ORing FET

For master commands please refer to link: [CAN Communication.pdf](#)

For customized features please get in touch with your RECOM contact.



Note4: DC input version coming soon

BASIC CHARACTERISTICS (measured @ T_{AMB} = 25°C, nom. V_{IN}, full load and after warm-up unless otherwise stated)

Parameter	Condition		Min.	Typ.	Max.
Nominal Input Voltage	RACM3000-M	50/60Hz	100VAC		240VAC
	RDC3000-M		400VDC		800VDC
Operating Range ⁽⁵⁾	RACM3000-M	47-63Hz	90VAC		264VAC
	RDC3000-M		400VDC		800VDC
Input Surge Voltage					300VAC
Input Under Voltage Lockout			80VAC typ., auto restart after fault is removed		
Input Current	100-240VAC				18A
	400VDC				9A
	800VDC				4.5A
Inrush Current	cold start at 25°C	240VAC, 50Hz			32.8A
		800VDC			40A
No Load Power Consumption	115VAC				26W
	230VAC				12W
Standby Power Consumption	main output off, 5VSB output unloaded	115VAC			7W
		230VAC			8W
Input Frequency Range	AC input		47Hz		63Hz
Minimum Load			0%		
Power Factor			0.99		
Start-up time	90VAC			1.2s	2s
	264VAC			0.9s	
Rise time	90VAC			4ms	50ms
	264VAC			8ms	50ms
Hold-up time	T _{AMB} = 25°C, 230VAC		10ms	15ms	
	T _{AMB} = -20°C, 230VAC		10ms	14ms	
Output Ripple and Noise ⁽⁶⁾	20MHz BW				240mVpp

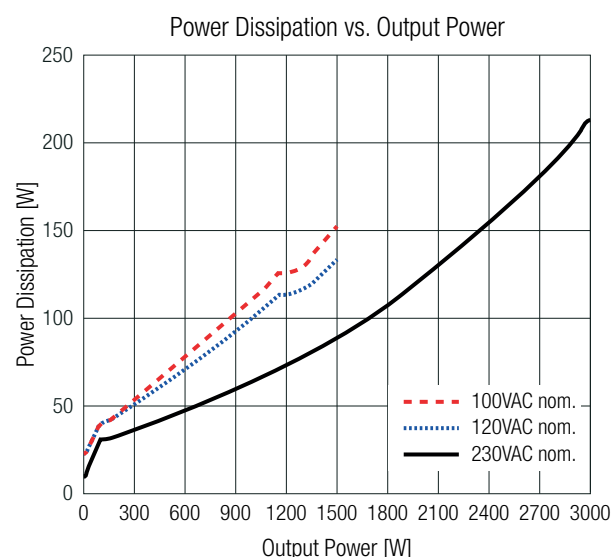
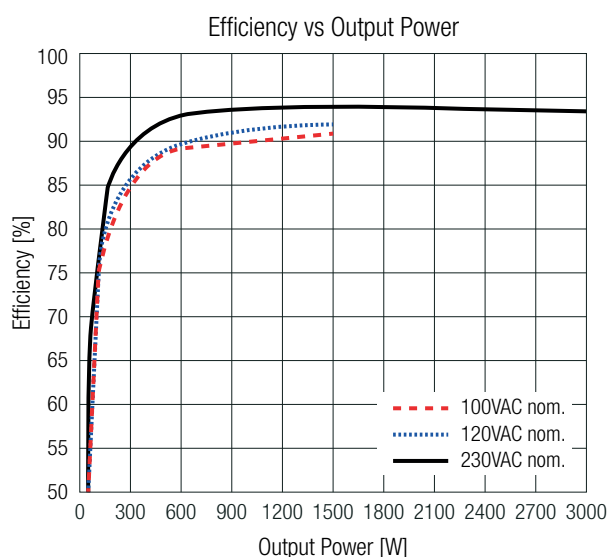
Note5: The products were submitted to all safety files at AC-operation (90-264VAC).

Note6: Measurements are made with a 0.1µF MLCC & 100µF E-cap in parallel across output (low ESR).

The test setup can have an impact on ripple noise values (placement of scope probe, capacitors, it's specifications, wires, PCB tracks, distances, etc.)

RACM3000-M / RDC3000-M Series $\diamond$ AC/DC Power Supply

3000W $\diamond$ Input: 100V-240VAC or 400-800VDC

BASIC CHARACTERISTICS (measured @ $T_{AMB} = 25^{\circ}\text{C}$, nom. V_{IN} , full load and after warm-up unless otherwise stated)


ADDITIONAL FEATURES

Parameter	Condition		Min.	Typ.	Max.
5VSB Stand By Output Voltage	always on				5VDC
5VSB Stand By Output Current					2A
Output Voltage Adjustability ⁽⁷⁾	potentiometer	RACM3000-24SM/RF	24VDC		28VDC
		RACM3000-36SM/RF	33VDC		40VDC
		RACM3000-48SM/RF	42VDC		53.5VDC
Remote ON/OFF			„Remote ON/OFF“		
„Remote Sense“	differential mode, cable loss compensation				500mV
DC_OK Signal			refer to „DC_OK Signal“		
Current Share			refer to „INSTALLATION & APPLICATION“		
LED Indication	green		DC_OK		
	alternating green/red		80% <Load		
	flash green		Short Circuit		
	flash red		Over Temperature		
	red		Over Voltage		

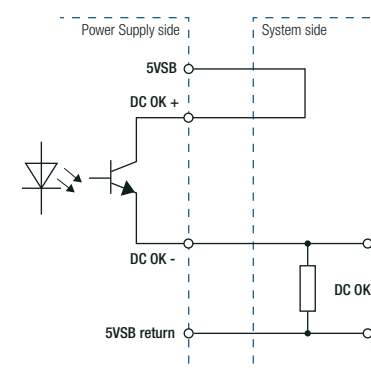
Note7: By trimming up, decrease output current to avoid exceeding rated output power. By trimming down, do not exceed maximum continuous output current. Switch the potentiometer clockwise to increase the output voltage, switch the potentiometer counterclockwise to decrease the output voltage.

Output Voltage Adjustability

The power supply provides a potentiometer for user to adjust the output voltage. Switch the potentiometer clockwise to increase the output voltage, switch the potentiometer counterclockwise to decrease the output voltage. Please reference to Output Specification for the output voltage range which user shall trim the voltage within. When the output is adjusted below nominal value, the maximum output current is the same as the nominal output, when the output is adjusted above nominal value, the output power cannot exceed the nominal maximum power (the maximum output current used should be reduced accordingly).

DC_OK Signal

DC_OK Signal is designed to indicate the main DC output status. When DC output is present, DC_OK Signal (Shown in below figure) generated will be high. When DC output is off, the internal transistor will be turned off. When AC input is off, there will be a minimum of 5 milliseconds between the time the DC_OK internal transistor turns off, and the time when the output reaches 90% of its rated value.



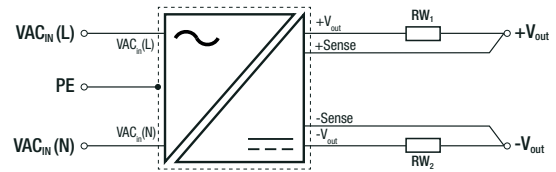
RACM3000-M / RDC3000-M Series $\diamond$ AC/DC Power Supply

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ADDITIONAL FEATURES

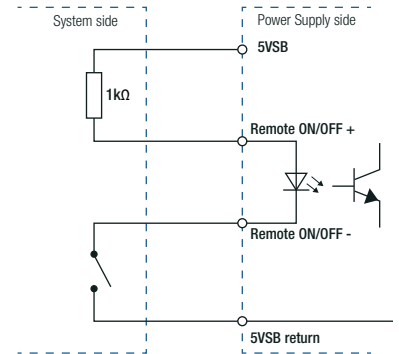
Remote Sense

Remote sense features can be used to compensate for the extra voltage drop on output wires that are connected from the main output terminals to the load. With wires connected from the remote sense pins, at the same locations as the wires from the main output, the remote sense function can compensate up to 500mV voltage drop.



Remote ON/OFF

Remote ON/OFF input can be used to turn off or turn on the power supply main output. The output ON/OFF can be controlled by conducting an isolated diode located within the power supply. When the main output is disabled, the +5V Standby output will continue to operate. System can use a switch to conduct through this diode (suggested pull up resistor to 5V standby with 1k Ω resistor) to disable the main out. The signal can be floated (no connection to the signal), in order to enable the main output.



REGULATIONS (measured @ $T_{AMB} = 25^{\circ}\text{C}$, nom. V_{IN} , full load and after warm-up unless otherwise stated)

Parameter	Condition	Value
Output Accuracy	MAIN, factory set-point	$\pm 0.5\%$ typ.
	AUX	$\pm 250\text{mV}$ typ.
Line Regulation	25°C , full load	0.046% typ.
	full load, full temperature range	0.1% typ / 3.0% max.
	-20°C , full load	0.078% typ.
Load Regulation		1.0% typ / 3.0% max.
Transient Response Voltage/Current	5-55% load	0.6V typ. / 5V max.
	50-100% load	1V typ. / 5V max.

PROTECTIONS (measured @ $T_{AMB} = 25^{\circ}\text{C}$, nom. V_{IN} , full load and after warm-up unless otherwise stated)

Parameter	Type	Value
Short Circuit Protection (SCP)	below $100\text{m}\Omega$	auto recovery
Over Voltage Protection (OVP)		130% , latch off
Over Voltage Category (OVC)		OVC II (5000m)
Over Current Protection (OCP)	115VAC ($P_{OUT} = 1500\text{W}$)	125% , auto recovery
	230VAC	$125\% - 137\%$, auto recovery
	AUX	2.5A , auto recovery
Over Temperature Protection (OTP)		latch off
Class of Equipment	with PE	Class I
Isolation Voltage ⁽⁸⁾	I/P to O/P	according to 60601-1
		according to 60335-2-29
		according to 62386-1
Isolation Resistance	I/P to O/P, $V_{ISO} = 500\text{VDC}$	$1\text{G}\Omega$ min.
Isolation Capacitance	I/P to O/P, $100\text{kHz}/0.1\text{V}$	100pF max.
Insulation Grade	I/P to O/P	reinforced
Means of Protection	I/P to O/P	2MOPP
Medical Device Classification	built-in power supply	designed to support type BF applications
Touch Current	$264\text{VAC}/63\text{Hz}$	normal condition
		single fault
Earth Leakage Current	normal condition & single fault	$<500\mu\text{A}$

Note8: For repeat Hi-Pot testing, reduce the time and/or the test voltage.

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3000W ⬠ Input: 100V-240VAC or 400-800VDC



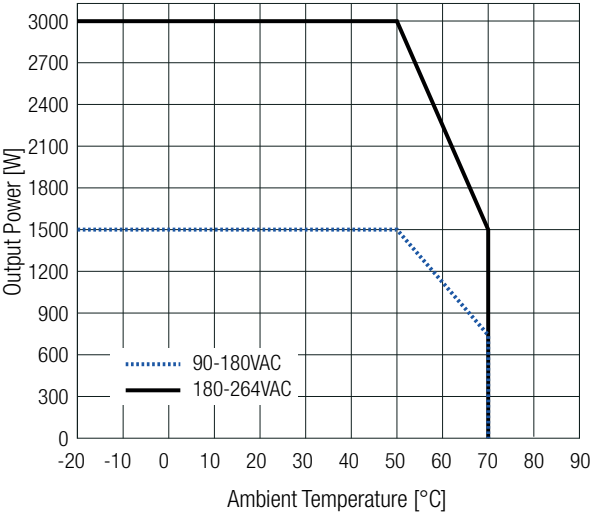
ENVIRONMENTAL (measured @ T_{AMB}= 25°C, nom. V_{IN}, full load and after warm-up unless otherwise stated)

Parameter	Condition	Value
Operating Ambient Temperature Range	@ natural convection (0.1m/s), refer to „Derating Graph“	-20°C to +70°C
Operating Altitude ⁽⁹⁾		5000m
Operating Humidity	non-condensing	90% RH max.
Pollution Degree		PD2
Shock	with package	196m/s²
Vibration	10-55Hz (1 min sweep), 1 hour for each axis, with package	19.6m/s²
MTBF	Telcordia SR-332, 115VAC, 25°C	500 x 103 hours
Design Lifetime		43.8 x 103 hours
FAN Audible Noise	80% load, 1m distance	45dB

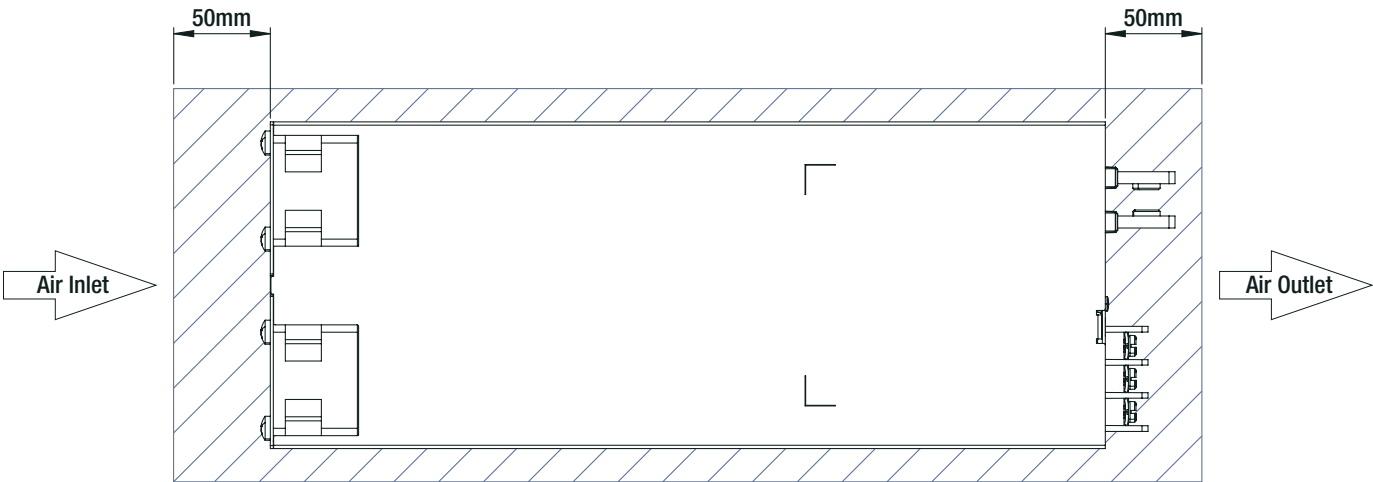
Note9: Recognized by safety agency for safe operation up to 5000m. High altitude operation may impact the performance and lifetime.
Please contact RECOM tech support for advice.

Derating Graph

no external airflow, head dissipation controlled by internal smart-fan



Ventilation Direction



The RACM3000-M models are force-cooled by integrated fans. The air inlet and outlet must not be obstructed. Ensure a minimum clearance of 50 mm between any obstruction and both the air inlet and air outlet of the power supply.

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SAFETY & CERTIFICATIONS

Certificate Type (Safety)	Report Number	Standard
Audio/Video, information and communication technology equipment - Part1: Safety requirements 3rd Edition	E224736	UL62368-1:2019 3rd Edition
		CAN/CSA-C22.2 No. 62368-1-19 3rd Edition
Medical electrical equipment Part 1: General requirements for basic safety and essential performance	E314885	ANSI/AAMI ES60601-1:2005 + A2:2010
		CAN/CSA-C22.2 No. 60601-1:14 3rd Edition
Medical electrical equipment Part 1: General requirements for basic safety and essential performance	E314885-D6004-CB-1	IEC60601-1:2005 + AM2:2020 Edition 3.2
		EN60601-1:2006 + A13:2024
Household and similar electrical appliances – Safety – Part 1: General requirements	4792072808.2	IEC60335-1:2010 + A2:2016 5th Edition
		EN60335-1:2012+A15:2021
Household and similar electrical appliances – Safety – Part 2-29: Particular requirements for battery chargers	4792072808.2	IEC60335-2-29:2016 + A1:2019
		EN60335-2-29:2021 + A11:2024
Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure	4792072808.2	EN62233:2008
RoHS2		RoHS-2011/65/EU + AM-2015/863
EMC Compliance according to EN55032	Condition	Standard
Electromagnetic compatibility of multimedia equipment – Emission Requirements		EN55032:2015 + A11:2020
EMC Compliance according to EN61204-3	Condition	Standard
Low voltage power supplies, d.c. output Part 3: Electromagnetic compatibility (EMC)	CN2600UW-001	EN/IEC 61204-3:2018
ESD Electrostatic discharge immunity test	Air: ±8, 15kV Contact: ±4, 8kV	IEC61000-4-2, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	10V/m (80-1000MHz) 3V/m (1400-2000MHz) 1V/m (2000-2700MHz)	IEC61000-4-3, Criteria A
Fast Transient and Burst Immunity	AC Port: 2kV	IEC61000-4-4, Criteria A
Surge Immunity	L-N: ±0.5, 1kV L (N)-PE: ±0.5, 1kV, 2kV	IEC61000-4-5, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	10Vrms (0.15-80MHz)	IEC61000-4-6, Criteria A
Power Magnetic Field Immunity	30A/m	IEC61000-4-8, Criteria A
Voltage Dips and Interruptions	Dips: 100% (0.5P, 1.0P) 60%, 30% or 20% Interruptions:100%	IEC61000-4-11, Criteria B
		IEC61000-4-11, Criteria C
		IEC61000-4-11, Criteria C
Limits of Harmonic Current Emissions		IEC61000-3-2:2014
Limits of Voltage Fluctuations & Flicker		IEC61000-3-3:2013 + A2:2021
EMC Compliance according to EN60601-1	Condition	Standard
Medical electrical equipment Part 1-2: General requirements for basic safety and essential performance		IEC60601-1-2:2014 + A1:2020 Edition 4.1
ESD Electrostatic discharge immunity test	Air: ±2, 4, 8, 15kV Contact: ±8kV	IEC61000-4-2:2008
Radiated, radio-frequency, electromagnetic field immunity test	10 V/m (80-2700MHz), 27V/m (385MHz), 28V/m (450MHz), 9V/m (710, 745, 780MHz), 28V/m (810, 870, 930MHz), 28V/m (1720, 1845, 1970MHz), 28V/m (2450MHz), 9V/m (5240, 5500, 5785MHz)	IEC61000-4-3:2006 + A2:2010
Fast Transient and Burst Immunity	AC Port: 2kV	IEC61000-4-4:2012
Surge Immunity	L-N: ±0.5, 1kV L (N)-PE: ±0.5, 1kV, 2kV	IEC61000-4-5:2014 + A1:2017
Immunity to conducted disturbances, induced by radio-frequency fields	10Vrms (0.15-80MHz) 6Vrms (IMS bands)	IEC61000-4-6:2013
Power Magnetic Field Immunity	30A/m	IEC61000-4-8:2009

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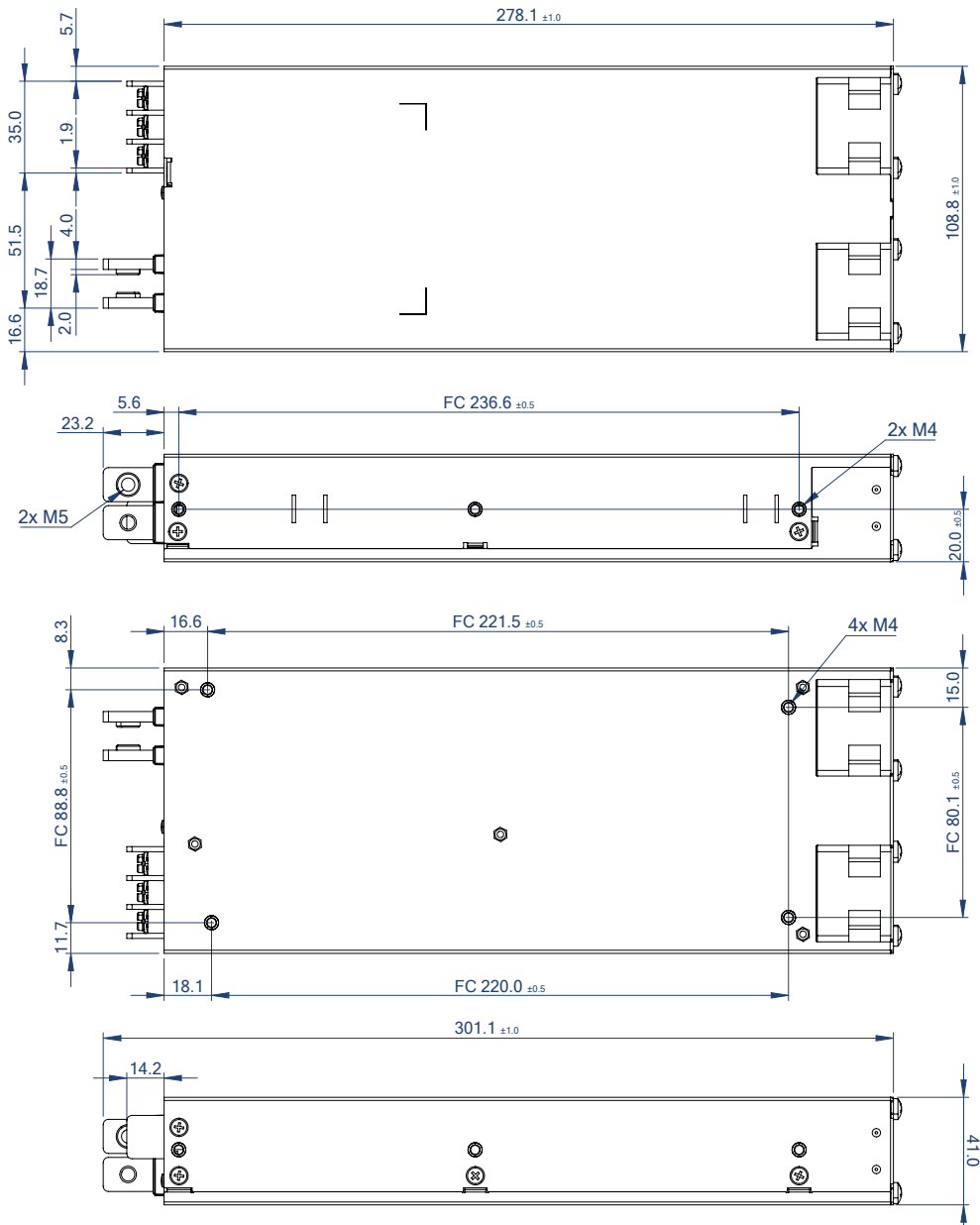
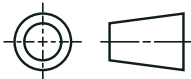
SAFETY & CERTIFICATIONS

EMC Compliance according to EN60601-1	Condition	Standard
Voltage Dips and Interruptions	Dips: 100% (0.5P, 1.0P) 30% Interruptions:100%	IEC61000-4-11:2004+A1:2017
Limits of Harmonic Current Emissions		IEC61000-3-2:2018 + A1:2020
Limits of Voltage Fluctuations & Flicker		IEC61000-3-3:2013 + A2:2021

DIMENSION & PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Materials	PCB	FR4, (UL94-V0)
	chassis	aluminum
Dimension (LxWxH)	without connectors	278.1 x 108.8 x 41.0mm 11.8 x 4.3 x 1.6 inch
Weight		2000g typ. 4.4 lbs

Dimension Drawing version (mm)



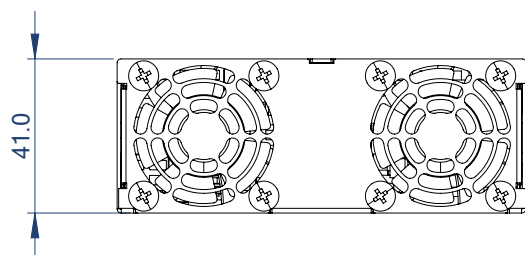
Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm

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3000W $\diamond$ Input: 100V-240VAC or 400-800VDC

DIMENSION & PHYSICAL CHARACTERISTICS

Dimension Drawing version (mm)



AC Input (CON1)

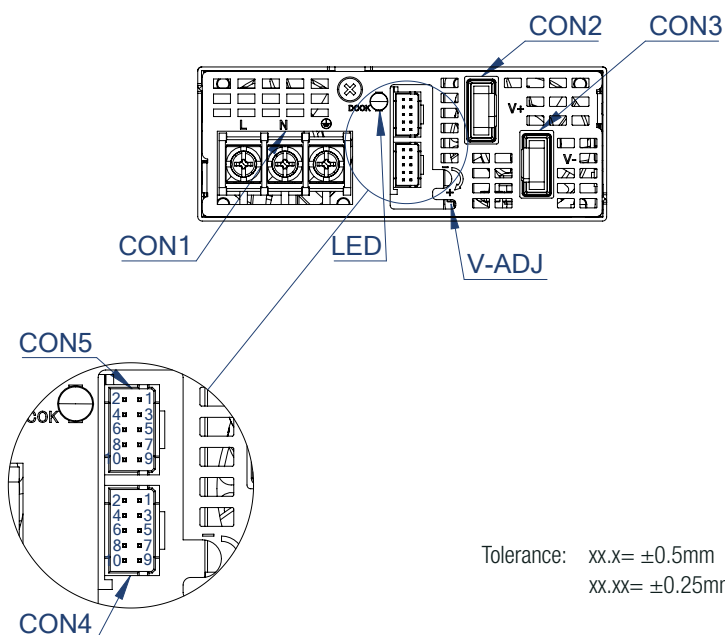
#	Function	Screw Terminal
1	VAC in (L)	M4 Screw Type Terminal Connector
2	VAC in (N)	
3	PE	

max. tightening torque: 1.0Nm

DC Output (CON2, CON3)

#	Function	Terminal
4	-Vout	bushing: Brass, M5 x 0.8-6H thread, nickel plating $\geq 8\mu\text{m}$, torque $\geq 5\text{Nm}$
5	+Vout	

max. tightening torque: 3.4Nm


Tolerance: xx.x= $\pm 0.5\text{mm}$
xx.xx= $\pm 0.25\text{mm}$

Note11: The length of the signal cables is limited to a maximum of 3 meter.

Control Connector (CON4)

#	Function	Connector
1	Current share	Mating with CJT connector A2008H -2X5P or equivalent
2	Output return	
3	Remote sense+	
4	Remote sense-	
5	Reserve no connection	
6	Reserve no connection	
7	5VSB	
8	5VSB	
9	5VSB return	
10	5VSB return	

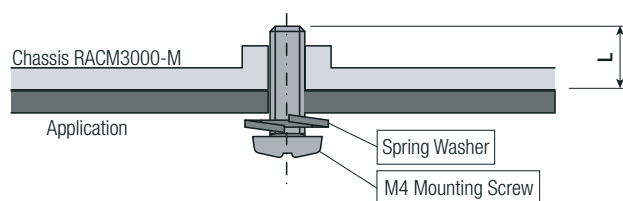
Control Connector (CON5)

#	Function	Connector
1	DC_OK-	Mating with CJT connector A2008H -2X5P or equivalent
2	DC_OK+	
3	Remote ON/OFF-	
4	Remote ON/OFF+	
5	Reserve no connection	
6	Reserve no connection	
7	CAN_L	
8	CAN_H	
9	CAN_5V+	
10	CAN_5V return	

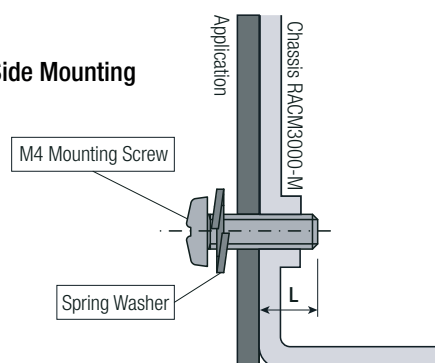
For master commands please refer to link: [CAN Communication.pdf](#)

MOUNTING EQUIPMENT

Baseplate Mounting


Maximum tightening torque= 10 kgf-cm (0.98Nm)
L= 3mm max.

Side Mounting


Maximum tightening torque= 10 kgf-cm (0.98Nm)
L= 4mm max.

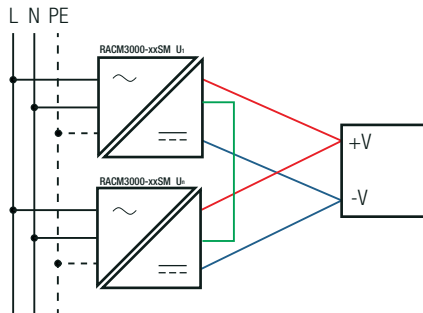
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INSTALLATION & APPLICATION

Parallel operation for increasing output power 1+n

Up to 4 identical power supplies can be connected in parallel to increase the available output current. The Current Share connection helps distribute the load current evenly between the units. This configuration is suitable when the load demand exceeds the capacity of a single power supply.



The green line connects the Current Share pins (CON4 / Pin 1) of both power supplies. This connection allows the two units to communicate with each other and balance the load current between them.

The blue line connects the negative DC output terminals of both power supplies, CON3 / Pin 4 (-Vout), and then connects them to the negative terminal of the load.

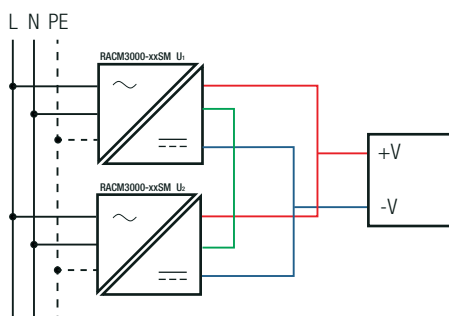
The red line connects the positive DC output terminals of both power supplies, CON2 / Pin 5 (+Vout), and then connects them to the positive terminal of the load.

With this configuration, both power supplies operate in parallel and supply the connected load together, while the Current Share connection helps ensure that the output current is distributed as evenly as possible between the two units.

- 1) Connect the Current Share pins (CON4, Pin 1) of all modules together. This allows the PSUs to automatically balance the output current between them.
- 2) Adjust each power supply to the exact same output voltage with same load and cooling conditions.
- 3) Use the same wire length and cable cross-section for each PSU (star connection) and energize all units at the same time to avoid triggering overload protection.
- 4) A 10% safety margin may be recommended because the power distribution may be slightly asymmetrical depending on the cabling.
- 5) **ATTENTION:** To prevent high reverse currents in the event of a secondary output fault, it is recommended to install a protective circuit at the output of each device when more than two power supplies are connected in parallel (e.g. decoupling diode or DC fuse). Leakage current, EMI, inrush current, harmonics will increase when using multiple power supplies.

Parallel operation for redundancy 1+1

Redundant circuits are suitable for applications with high requirements for operational reliability. For 1+1 redundancy, two power supplies of the same type, power class, and configuration must be used. Each power supply must be capable of supplying the full required load in the event of a failure. During normal operation, both power supplies operate in parallel and each carries up to 50% of the load.



The green line connects the Current Share pins (CON4 / Pin 1) of both power supplies. This connection allows the two units to communicate with each other and balance the load current between them.

The blue line connects the negative DC output terminals of both power supplies, CON3 / Pin 4 (-Vout), and then connects them to the negative terminal of the load.

The red line connects the positive DC output terminals of both power supplies, CON2 / Pin 5 (+Vout), and then connects them to the positive terminal of the load.

With this configuration, both power supplies operate in parallel and supply the connected load together, while the Current Share connection helps ensure that the output current is distributed as evenly as possible between the two units.

- 1) Adjust each power supply to the exact same output voltage with same load and cooling conditions.
- 2) Use the same wire length and cable cross-section for each PSU (star connection) and energize all units at the same time to avoid triggering overload protection.
- 3) It must be ensured that one of the power supply is able to provide the total required output power of the DC load to be supplied.
- 4) In normal operation, each of the two power supplies will be utilized by up to 50%.
- 5) **ATTENTION:** To prevent high reverse currents in the event of a secondary output fault, it is recommended to install a protective circuit at the output of each device when more than two power supplies are connected in parallel (e.g. decoupling diode or DC fuse). Leakage current, EMI, inrush current, harmonics will increase when using multiple power supplies.

RACM3000-M / RDC3000-M Series ⬠ AC/DC Power Supply

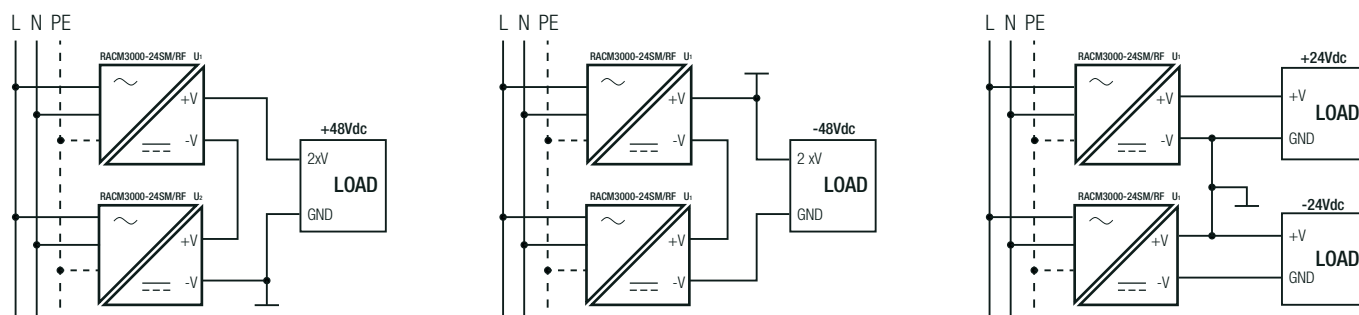
3000W ⬠ Input: 100V-240VAC or 400-800VDC

INSTALLATION & APPLICATION

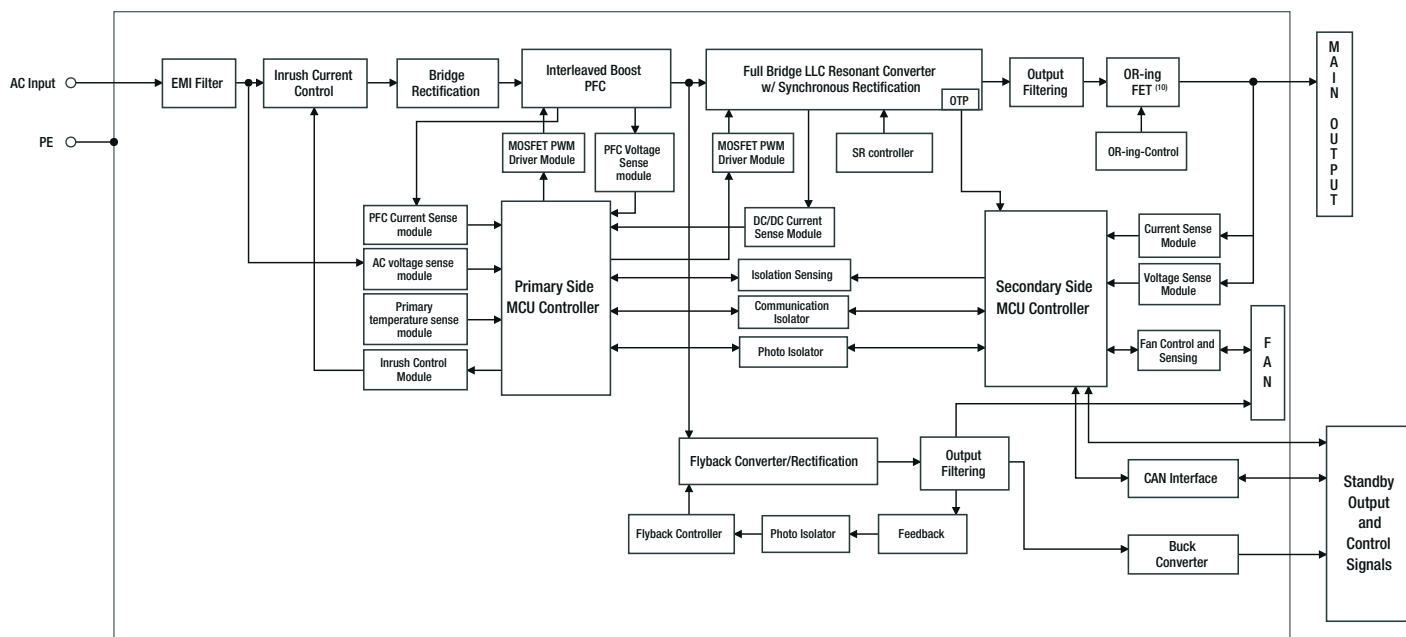
Series Operation

- 1) Only use PSU with the same type and performance class with identical parameters.
- 2) To increase the DC output voltage, connect 2 or more power supply units in series.
- 3) Therefore, negative output terminal "-1" of the first power supply unit must be connected to the positive output terminal "+1" of the second power supply unit and routed to the load. Depending on the common output-side earth reference point of the power supply unit, see below table/figures as example.
- 4) **ATTENTION:** Leakage current, EMI, inrush current, harmonics will increase when using multiple power supplies.

2 PSU's in series:	Figure 1	Figure 2	Figure 3
RACM3000-24SM/RF	+48Vdc	-48Vdc	±24Vdc
RACM3000-36SM/RF	+72Vdc	-72Vdc	±36Vdc
RACM3000-48SM/RF	+96Vdc	-96Vdc	±48Vdc



BLOCK DIAGRAM



Note10: Only valid for "OR" Version. For detailed information refer to „Model Numbering“

PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	carton box	445.0 x 385.0 x 200.0mm
Packaging Quantity		6pcs
Storage Temperature Range		-40°C to +90°C
Storage Humidity	non-condensing	95% RH max.

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