Technical Data Sheet

RPDD7000-SW / Industrial Application

7000W / Wide Range

RECOM DC/DC Converter

FEATURES

- Manufactured and tested according to related standards
- Wide input voltage range: 30VDC – 62VDC
- Output voltage options: 48VDC, programmable from 38V to 60V
- Maximum output power: 7000W at 48VDC
- High efficiency: up to 95% (typical)
- Maximum input current: 220A
- Output current: up to 190A at 48V
- Line and load regulation: ±5%
- Low ripple and noise: <200mV (0–20 MHz, @ 25°C)
- Comprehensive protections: input overvoltage, output overcurrent, output overvoltage, heatsink over-temperature, and reverse polarity (MOSFET-based)



Dimensions: see Mechanical Data Table

APPLICATION



SAFETY & EMC

CE RoHS² compliant 10 from 10 Reach compliant

- The converter follows LVD 2014/35/EU Directive and EMC 2014/30/EU Directive.
- The converter is CE compliant. EMC radiation must be evaluated and tested in the complete system since mounting and wiring have a large influence on radiation behaviour.
- Cybersecurity: the product features a serial communication interface. CRA-relevant security aspects have been considered in the product design and documentation, including risk assessment. The product complies with the Cyber Resilience Act (CRA, EU Regulation 2024/2847) when installed in accordance with the instruction sheet.

DESCRIPTION

The RPDD7000-SW Series is a high-power DC/DC converter for industrial and mobile applications. The unit converts a nominal 48VDC input to a regulated 48VDC output and operates over a wide input voltage range from 30VDC to 62VDC. It provides up to 7000W output power with high efficiency of up to 95% typ.

The output voltage is programmable from 38VDC to 60VDC. The converter supports CAN J1939 communication for monitoring and control and can be configured for battery charger or power supply operation. Different heat sink options are available. Integrated protection functions include input overvoltage, output overcurrent, output overvoltage, overtemperature and reverse polarity protection.

MODELS

Part Number	Input Voltage nom. [VDC]	Input Current Max. [A]	Output Voltage nom. [VDC]	Output Current Max. [A]	Output Power Max [W]
RPDD7000-48-48-SW	48	220	48	190	7000

RPDD7000-48-48-SW-

Nominal power
Nominal Input Voltage
Options
Nominal Output Voltage

Options:

- HS3: liquid-cooled flat heat sink

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RECOM
DC/DC Converter

BASIC CHARACTERISTICS

Parameter	Conditions		Min.	Typ.	Max.
DC INPUT					
Rated Input Voltage				48VDC	
Input Voltage Range			30VDC		62VDC
Max. Input Current					220A
Max. Input Power					7000W
DC OUTPUT					
Rated Output Voltage				48VDC	
Output Voltage Range			38VDC		60VDC
Output Current			10A		190A
Line regulation	VIN (min ÷ Max)				5%
Load regulation	10 ÷ 100% load				5%
Ripple & Noise	0 ÷ 30MHz				2%
Max. Output Power					7000W
Efficiency	Nominal load			95%	
Input Signals	ON / OFF	Open contact ON / OFF		PWM Off	
		Close contact ON / OFF		PWM On	
	ENABLE	Open Enable		Unit works as Battery Charge	
		Close Enable		Unit works as Power Supply	
Communication				CAN J1939	
Adjustment	Analog Optional			CAN J1939	

ENVIRONMENTAL CONDITIONS

Parameter	Conditions	Min.	Typ.	Max.
Operating Temperature Range		-10°C		+55°C
Storage Temperature Range		-40°C		+85°C
Operating Humidity	Not condensated	0%		95%
Storage Humidity	Not condensated	0%		95%
Operating Altitude				2000m
Storage Altitude				2000m
Cooling	Contact base plate with additional ventilation			

INTERFACE

Converter with CAN interface J1939: reading the measurements of Iin, Iout, Vin, Vout command for set point and I/O limits
On request Vprog and Iprog 0÷10V Analog programming alternatively of CAN command

SAFETY AND PROTECTIVE FUNCTIONS

Parameter	Conditions		Min.	Typ.	Max.
Dielectrics withstand voltage	EN 62368-1	Input – P.E.		500Vdc	
		Output – P.E.		500Vdc	
Output short circuit protection	Output nominal current			Shut off	
Output over current protection	Output nominal current		100%		110%
Output overvoltage protection	Voltage Max		1.05		1.15
Overtemperature protection	Heat-sink				+90°C

INPUT OVERVOLTAGE PROTECTION

Overvoltage protection is integrated into the converter to provide permanent protection against overloading.
Also, on the output side, overvoltage protection is integrated.

OVERCURRENT PROTECTION

Overcurrent protection is integrated in the converter to avoid overload damage. The quick sensor system detects any overcurrent and either reduces the current by regulation or shuts the converter down.

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CERTIFICATIONS

Environmental		
Compliance	**Parameter**	**Standard / Criterion**
RoHS + RoHS2 Restriction of the use of certain hazardous substances in electrical and electronic equipment		RoHS 2011/65/EU + AM2015/863
Reach Regulation marking		EC 1907/2006
CE marking		CE

CERTIFICATIONS

Safety		
Compliance	**Parameter**	**Standard / Criterion**
Low voltage the electrical equipment (safety) regulations		2014/35/EU
Safety requirements for electronic power converters and associated equipment		IEC 62477-1

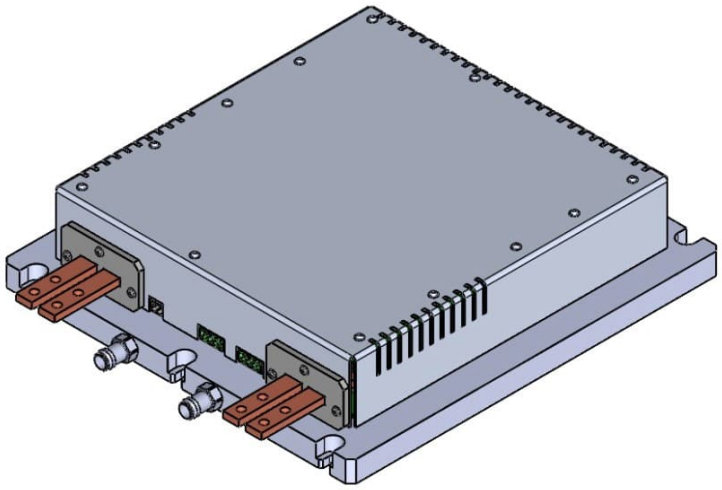
CERTIFICATIONS

EMC Compliance		
Compliance	**Parameter**	**Standard / Criterion**
EMC Electromagnetic compatibility regulations		2014/30/EU

MECHANICAL DATA

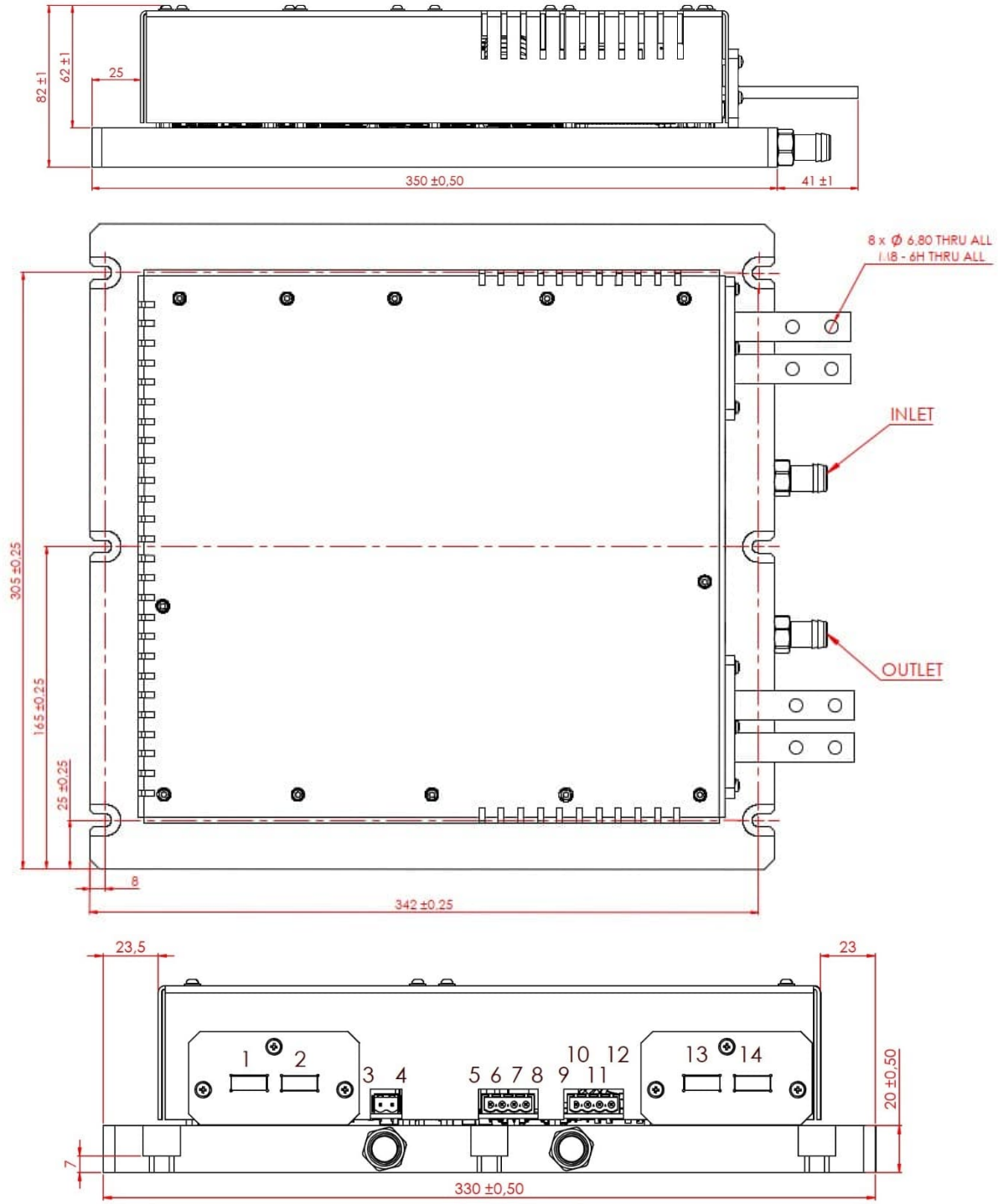
Parameter	Conditions	Min.	Typ.	Max.
Weight	HS3			10.5kg / 23.15lb
Enclosure Material	Aluminum			
IP Protection Class			IP20	
Height	HS3		391mm	
Width			330mm	
Length			82mm	

HS3 OPTION



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DIMENSIONS HS3 OPTION



Position	
1	+Vin
2	-Vin
3	+24Vaux
4	COM
5	+5Ext
6	CANH
7	CANL
8	COM

Position		Open	Close
9	Inhibit	ON	OFF
10	COM		
11	Enable	Battery Charger	Power supply
12	COM		
13	-Vout		
14	+Vout		

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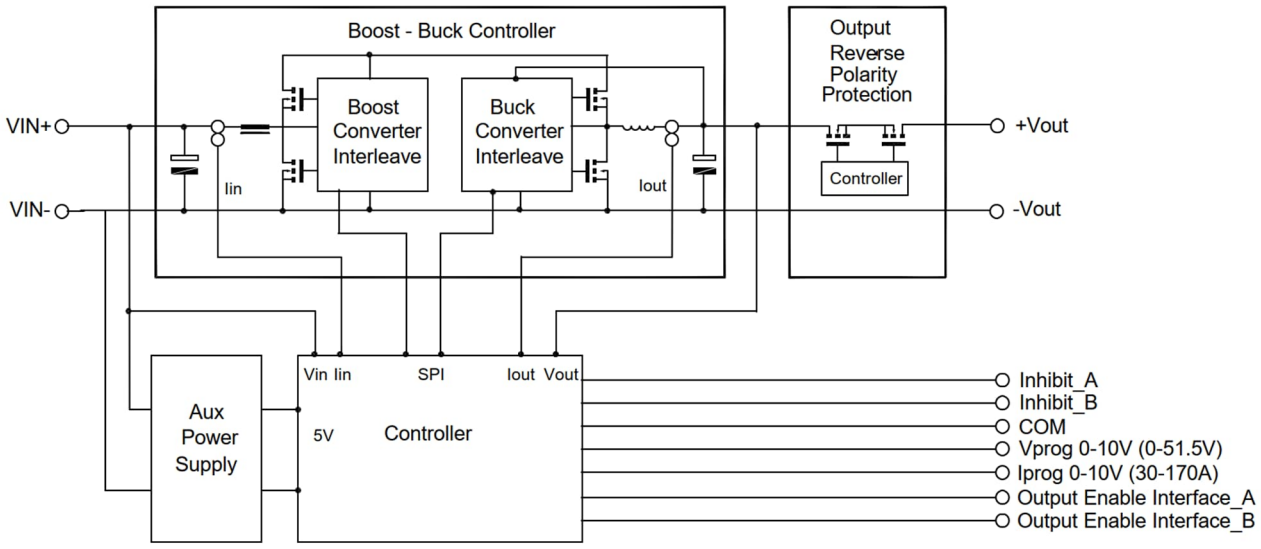
CONNECTIONS			
POSITION	CONNECTION		TYPE
1	+VIN	K1	BUS BAR
2	-VIN	K3	BUS BAR
3	+24VAUX	K5	WEIDMULLER 1148030000
4	COM		
5	+5EXT	K6	WEIDMULLER 1146770000
6	CANH		
7	CANL		
8	COM		
9	INHIBIT	K7	WEIDMULLER 1146770000
10	COM		
11	ENABLE		
12	COM		
13	-VOUT	K8	BUS BAR
14	+VOUT	K10	BUS BAR

DIMENSIONS AND INSTALLATION INFORMATION

For the installation of converter, the following must be adhered to:

- The converter is designed to be installed inside a rack.
- The converter must be installed in a safe location, out of reach of the vehicle user. This is to prevent hazards such as accidental contact with HV components or skin burns caused by overheated housing.
- When selecting the installation location, ensure that the converter is positioned above the fording depth of the vehicle in question.
- The converter can only be guaranteed to be watertight if all signal cables to the signal connectors are assembled and connected to a watertight unit on both sides. If this is not possible for a cable or wire, it must be sealed separately.
- The mechanical fastening must be designed in such a way that the device is installed in a fixed position and with as little vibration as possible.
- All cable connections must be secured with strain relief elements close to the device (not included in the scope of delivery).
- Cable connections must have sufficient clearance and must not meet components with sharp edges.
- The enclosure must be sufficiently ventilated (no heat build-up).

BLOCK DIAGRAM



MAINTENANCE

The converter does not require any special maintenance apart from replacing the fan after a maximum of 30000 hours at 40°C. The life of the fan may be affected by the operating temperature and the cleanliness of the environment in which it is used. To replace the fan, contact Recom Power Systems.

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INTENDED USE

The device may only be installed and operated by qualified and instructed personnel.

WARRANTY AND GUARANTEE

The warranty corresponds to the regulations in our currently valid general terms and conditions.
RECOM Power Systems wants to point out that all warranty claims expire if:

- the device was opened and/or the seal is damaged.
- the device was changed mechanically or electrically.
- the device was operated under non-intended use
- prohibitions and instructions of this datasheet were violated.
- accessories not approved by RECOM Power Systems were used

CONTROL BEFORE THE FIRST COMMISSIONING

Check the delivery immediately after receiving receipt for completeness and transport damage such as mechanical damage to the device housing, cables or accessories.
If there is damage to the device, this needs to be reported to the transport company immediately.
If there is damage to the device, to cables or accessory parts detected or suspected, do not proceed with the installation and commissioning under any circumstances. In this case, label the device as defective.
After a hard hit or fall damage, the device should not be used anymore.

DISPOSAL OF THE PACKAGING MATERIAL

A basic requirement for the re-use and recycling of used electronic devices is the correct disposal. With the implementation of the electric and electronic device regulation, electronic devices may no longer be disposed of along with ordinary household waste but must be separately collected and recorded by a specialist service.
Disposal through a specialist service significantly helps to avoid dangers to people and nature. Therefore, in the case of disposal, we recommend contacting a recognized specialist disposal service.
Keep using packaging material for a possible reuse.
If this is not possible, ensure an appropriate and environmentally friendly disposal of the packaging material while considering the current environment protection guidelines.

STORAGE

Incorrect or improper storage may result in damage to the device.
Protect the device during storage against pollution, humidity and extreme temperatures.
After long storage times, check the proper function of the device before use.

INSTALLATIONS



SAFETY REQUIREMENTS FOR THE INSTALLATION PLACE

The device may only be operated in the environmental conditions specified in the data sheet.
The device may not be operated in proximity of aggressive vapors, in explosion-endangered areas or in proximity of ignition sources
Use an external ground fault protection circuit external to the device, which monitors the insulation resistance to chassis. The supplementary protection needs to be operated immediately after fault of basic insulation

OPERATING SITUATION

The operation of the device is only allowed in the operating situations described in the data sheet.
The user assumes the sole responsibility for professional execution and safety of the installation.
The device is to be screwed to the mounting surface at all designated points.
It is prohibited to make mechanical changes to the device, such as drilling holes, for the mounting of additional installation points.
Each change to the device may lead to life-threatening operating situations or fire.

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COOLING



The system integrator bears the sole responsibility for a professional installation in the end application and the control of sufficient heat dissipation from the device to the installation surface.
An excess of the maximum permissible temperature can lead to a protective shut-down.

SYMBOLS AND THEIR MEANING

Throughout this manual, certain specific symbols are used. The following table provides an overview of these abbreviations and their meaning:

SYMBOL	MEANING	SYMBOL	MEANING
	General prohibition		Warning! High voltage! Do not touch
	Do not switch		

SYMBOL	MEANING	SYMBOL	MEANING
	General warning of a dangerous area		Warning! Electrical shock!
	Warning! Explosive environment!		Warning! Danger caused by batteries!
	Warning! Hot surface!		Warning! High voltage!
	Warning! High pressure / fluid ejection!		Warning! Fire hazard!

SYMBOL	MEANING	SYMBOL	MEANING
	Disconnect device from power supply		Disconnect device from mains

SYMBOL	MEANING	SYMBOL	MEANING
	Important information on avoiding possible property damage		Important information

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SAFETY INSTRUCTIONS AND DANGER LEVEL

DANGER	
	**This instruction warns about severe irreversible risks of personal injury with possibly fatal consequences.** Avoid this risk by adhering to these instructions!

CAUTION	
	**This instruction warns about a minor risk of injury!** Avoid this risk by adhering to these instructions!

INSTRUCTION	
	This instruction warns against possible damage to property if the following instructions and work procedures are not observed

INFORMATION	
	This type of instruction makes important information known to the reader.

WARNING	
	**This instruction warns about the risk of severe but reversible injury!** Avoid this risk by adhering to these instructions!

GENERALLY APPLICABLE SAFETY MEASURES

The following safety measures have been developed based on the knowledge of the manufacturer. They are incomplete as they can be supplemented by local and/or country-specific safety instructions and guidelines for accident prevention.
The distributor of the device must therefore supplement the present general safety instructions with country-specific and local guidelines.

SAFETY INSTRUCTIONS FOR MECHANICAL SYSTEMS

DANGER	
	**Explosive environment! Danger to life!** Do not store any highly flammable substances or combustible fluids in the direct surroundings of the device! Sparks forming at the device's connections can set these on fire and lead to explosions!

CAUTION	
	**Hot surfaces! Burn hazard**! The device produces high temperatures when in operation! Therefore, the device is to be always handled with care and caution!

INSTRUCTION	
	We strongly recommend that you install a suitable overcurrent protection (fuse) close to the battery between charger and battery, to protect the wires between charger and battery!

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OVERTEMPERATURE PROTECTION (DERATING)

If the temperature of the ambient exceeds +55°C, we recommend shutting down the charger to prevent damage. We recommend not exceeding a maximum ambient temperature of +55°C.

INSTRUCTION	
	Continuous operation at the temperature limit will inevitably lead to a higher level of wear of the components!

REQUIREMENTS ON THE OPERATION PERSONNEL

All courses of action described in this manual may only be carried out by a qualified electrician! Specialist staff are defined as electricians who have had

- specific professional training
- have knowledge and experience in the field of electronics
- as well as knowledge of relevant provisions and dangers

for which they can provide proof. Furthermore, they must be able to assess the work assigned to them independently, identify possible dangers, and establish necessary protection measures.

USE AND LIMITATIONS OF PRODUCT

PROPER USE

The On-Board Charger is suitable for the integration into industrial fleets for charging Lithium and Lead-acid batteries. In case you plan to use it for other purposes, please contact supplier in advance.

- The operator must always ensure that the individual operating limits of the connected battery are not exceeded in any phase of the charging process.
- The charger must exclusively be operated within the limits defined in **ENVINRONMENTAL CONDITIONS.**
- Compliance with the relevant EMC directive must be proven by the vehicle integrator at the vehicle itself.

INFORMATION	
	• Correct function of the charger requires that the voltage range of the battery matches the voltage range of the charger! Batteries with deviating behavior may cause the charger to malfunction! In case of doubt or open questions, please refer to supplier before attempting to operate the unit.

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.

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