













Features

- Compliance to BS EN/EN50155 and BS EN/EN45545-2 railway standard
- Ultra compact and 1U low profile(25mm)
- 4:1 wide input range
- No minimum load required
- Protections: Short circuit / Overload / Over voltage / Input reverse polarity
- 4000VDC I/O isolation (reinforced isolation)
- · Half encapsulated, cooling by free air convection
- -40~+70°C wide working temperature
- · Built-in constant current limiting circuit
- · LED indicator for power on
- 3 years warranty

ğ







Applications

- · Bus,tram,metro or railway system
- Wireless network
- Telecom or datacom system
- Highly vibrating, highly dusty, extremely low or high temperature harsh environment

GTIN CODE

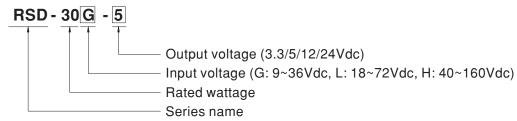
MW Search: https://www.meanwell.com/serviceGTIN.aspx

Description

RSD-30 is a 30W enclosed type DC-DC reliable railway converter. This series is compliant with BS EN/EN50155/ IEC60571 railway standard, constituting three types of models with 4:1 wide but different input ranges 9~36V/18~72V/40~160V, suitable for railway and all kinds of transportation systems exploiting the frequently used standard input voltages such as 12V, 24V, 36V, 48V, 72V, 96V and 110V. Various output voltages, 3.3V, 5V, 12V and 24V are available for selection.

This series has the capability of working under -40° C, low ripple and noise, supreme EMC characteristics, 4KVDC I/P-OP, low enclosure profile 25mm and an interior with semi-potted silicone. It does not only well fits the in-car systems or the facilities by rails for railway, trams and buses but also can be used in the harsh environment with high vibration, high dust, extremely low or high temperature, etc.

■ Model Encoding





SPECIFICATION

MODEL		RSD-30G-3.3	RSD-30G-5	RSD-30G-12	RSD-30G-24	RSD-30L-3.3	RSD-30L-5	RSD-30L-12	RSD-30L-24
	DC VOLTAGE	3.3V	5V	12V	24V	3.3V	5V	12V	24V
	RATED CURRENT	6A	6A	2.5A	1.25A	6A	6A	2.5A	1.25A
	CURRENT RANGE	0 ~ 6A	0 ~ 6A	0 ~ 2.5A	0 ~ 1.25A	0 ~ 6A	0 ~ 6A	0 ~ 2.5A	0 ~ 1.25A
	RATED POWER	19.8W	30W	30W	30W	19.8W	30W	30W	30W
OUTDUT	RIPPLE & NOISE (max.) Note.2	70mVp-p	70mVp-p	60mVp-p	50mVp-p	70mVp-p	70mVp-p	60mVp-p	50mVp-p
DUTPUT	VOLTAGE TOLERANCE Note.3	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%
	LINE REGULATION	±0.5%	±0.5%	±0.3%	±0.2%	±0.5%	±0.5%	±0.3%	±0.2%
	LOAD REGULATION	±0.5%	±0.5%	±0.3%	±0.2%	±0.5%	±0.5%	±0.3%	±0.2%
	SETUP, RISE TIME	120ms, 85ms a	t full load						
	HOLD UP TIME (Typ.)	Please refer to	page 5 Hold up	Time(Load de	-rating curve)				
	VOLTAGE RANGE CONTINUOUS	9 ~ 36VDC				18 ~ 72VDC			
	EFFICIENCY (Typ.)	84%	84%	86.5%	89%	84%	86%	90%	91%
NPUT	DC CURRENT (Typ.)	1.1A/24V	1.5A/24V	<u>'</u>		0.52A/48V	0.8A/48V	<u>.</u>	
01	INRUSH CURRENT (Typ.)	20A/24VDC	'			20A/48VDC			
	INTERRUPTION OF VOLTAGE SUPPLY	EN50155:2007-0	3 type comply w	ith S1 level(3ms) @full load,S2 le	vel(10ms) @80%	load; L type con	nply with S2 level	10ms) @full lo
	INTERROPTION OF VOLTAGE SUPPLY	EN50155:2017-	Comply with S1	level					
		105 ~ 135% rat	ed output power	•					
	OVERLOAD	Protection type	: Constant curre	ent limiting, reco	vers automatical	ly after fault cond	ition is removed	i	
PROTECTION	OVER VOLTAGE	3.8 ~ 4.5V	5.75 ~ 7V	13.8 ~ 16.2V	27.6 ~ 32.4V	3.8 ~ 4.5V	5.75 ~ 7V	13.8 ~ 16.2V	27.6 ~ 32.4
	OVER VOLTAGE	Protection type	: Shut down o/p	voltage, re-pov	ver on to recover	•			•
	WORKING TEMP.	-40 ~ +55°C (no	40 ~ +55°C (no derating); +70°C @ 60% load by free air convection; +70°C (no derating with external base plate)						
	WORKING HUMIDITY 5 ~ 95% RH non-condensing								
	STORAGE TEMP.	-40 ~ +85°C							
NVIRONMENT	TEMP. COEFFICIENT	±0.03%/°C (0~50°C)							
	VIBRATION	10 ~ 500Hz, 50	10min./1cycle,	60min. each ald	ong X, Y, Z axes ;	Mounting : compl	iance to IEC613	373	
	OPERATING ALTITUDE	5000 meters							
	SAFETY STANDARDS	IEC 62368-1, UL 62368-1, AS/NZS 62368-1, EAC TP TC 004 approved, Design refer to BS EN/EN62368-1							
	WITHSTAND VOLTAGE	I/P-O/P:4KVDC I/P-FG:2.5KVDC O/P-FG:2.5KVDC							
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH							
		Parameter Standard Test Level / Note							
		Conducted BS EN/EN55032		Class A	Class A				
	EMC EMISSION	Radiated		BS	BS EN/EN55032		Class B		
SAFETY &		Harmonic Current BS EN/EN61000-3-:							
EMC		Voltage Flicker							
(Note 4)		BS EN/EN5503	35						
		Parameter		Sta	ındard		Test Lev	vel / Note	
		ESD		BS	EN/EN61000-4-2	2	Level 3, ±8KV air ; Level 3, ±6KV co		
				EN/EN61000-4-3					
	EMC IMMUNITY	EFT / Burst		BS	EN/EN61000-4-4	1			
		Surge			EN/EN61000-4-5				3. 2KV Line-E
		Conducted BS EN/EN61000-4-6				Level 3			
	RAILWAY STANDARD	Compliance to BS	EN/EN45545-2 fo				61373 for shock 8	k vibration, BS EN/E	N50121-3-2 for E
	MTBF	3093.5K hrs mi			e) ; 396.9K hrs mi		217F (25°C)	,	
OTHERS	DIMENSION	113*60*25mm		511 002 (B011001	0), 000.011110111	III. IIIIE TIBBIT	2111 (20 0)		
,	PACKING		,	-					
	All parameters NOT speciall Ripple & noise are measure	0.25Kg; 56pcs/15Kg/0.81CUFT Illy mentioned are measured at 24,48VDC input, rated load and 25°C of ambient temperature. ed at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 μ F & 47 μ F parallel capacitor. tolerance, line regulation and load regulation.							
NOTE	 The power supply is conside a 360mm*360mm metal plat perform these EMC tests, pl (as available on https://www Strongly recommended that The ambient temperature de	te with 1mm of the ease refer to "E meanwell.com/ external outputherating of 3.5°C/	hickness. The f MI testing of co 'Upload/PDF/EI' capacitance sh 1000m with fan	inal equipment imponent powe MI_statement_e ould not exceed less models an	must be re-confir supplies." en.pdf) d 5000uF. d of 5°C/1000m	rmed that it still i	neets EMC dir	ectives. For guida	ance on how



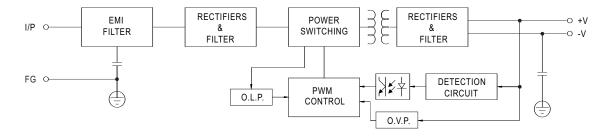
SPECIFICATION

MODEL		RSD-30H-3.3	RSD-30H-5	RSD-30H-12	RSD-30	H-24		
	DC VOLTAGE	3.3V	5V	12V	24V			
	RATED CURRENT	6A	6A	2.5A	1.25A			
	CURRENT RANGE	0 ~ 6A	0 ~ 6A	0 ~ 2.5A	0 ~ 1.25	A		
	RATED POWER	19.8W	30W	30W	30W			
	RIPPLE & NOISE (max.) Note.2	70mVp-p	70mVp-p	60mVp-p	50mVp-	p		
OUTPUT	VOLTAGE TOLERANCE Note.3	±2.0%	±2.0%	±2.0%	±2.0%			
	LINE REGULATION	±0.5%	±0.5%	±0.3%	±0.2%			
	LOAD REGULATION	±0.5%	±0.5%	±0.3%	±0.2%			
	SETUP, RISE TIME	120ms, 85ms at full load						
	HOLD UP TIME (Typ.)	Please refer to page 5 Hold up	Time(Load de-rating curve)					
	VOLTAGE RANGE CONTINUOUS	40 ~ 160VDC						
	EFFICIENCY (Typ.)	87%	87%	89%	89%			
	DC CURRENT (Typ.)	·	'					
INPUT	INRUSH CURRENT (Typ.)	20A/110VDC						
	1	EN50155:2007-H-type comply	y with S2 level(10ms) @ full loa	ıd				
	INTERRUPTION OF VOLTAGE SUPPLY	EN50155:2017-Comply with S	1 level					
		105 ~ 135% rated output power						
	OVERLOAD	' '	nt limiting, recovers automaticall	v after fault condition is	s removed			
PROTECTION		3.8 ~ 4.5V	5.75 ~ 7V	13.8 ~ 16.2V				
	OVER VOLTAGE	Protection type : Shut down o/p		111111111111111111111111111111111111111				
	WORKING TEMP.		© @ 60% load by free air conve	tion ; +70°C (no derati	ing with external base	e plate)		
	WORKING HUMIDITY	5 ~ 95% RH non-condensing		, , , , , , , , , , , , , , , , , , , ,	<u> </u>	, , , ,		
	STORAGE TEMP.	-40 ~ +85°C						
ENVIRONMENT	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 50°C)						
	VIBRATION	10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: compliance to IEC61373						
	OPERATING ALTITUDE	5000 meters	John Caon along X, 1, 2 axcs , 1	wounting . compliance	10 12 00 10 10			
	SAFETY STANDARDS	IEC 62368-1, UL 62368-1, AS/NZS 62368-1, EAC TP TC 004 approved, Design refer to BS EN/EN62368-1						
	WITHSTAND VOLTAGE	1/P-O/P:4KVDC						
	ISOLATION RESISTANCE	I/P-0/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C/ 70% RH						
		Parameter Standard Test Level / Note						
		Conducted	BS EN/EN55032		Class A			
	EMC EMISSION	Radiated	BS EN/EN55032		Class B			
		Harmonic Current	BS EN/EN61000-3-2					
		Voltage Flicker	BS EN/EN61000-3-3					
SAFETY &		BS EN/EN55035						
EMC		Parameter	Standard		Test Level / Note			
(Note 4)		ESD	BS EN/EN61000-4-2		Level 3, ±8KV air;	Level 3, ±6KV contact		
	EMC IMMUNITY	Radiated Field	BS EN/EN61000-4-3		Level X, 20V/m	·		
	EMC IMMUNITY	EFT / Burst	BS EN/EN61000-4-4		Level 3, 2KV at pow	/er		
		Surge	BS EN/EN61000-4-5		Level 3,1KV Line-Line, Level 3, 2KV Line-Ea			
		Conducted	BS EN/EN61000-4-6					
	RAILWAY STANDARD	Compliance to BS EN/EN45545-2 for	fire protection;BS EN/EN50155 /IEC			S EN/EN50121-3-2 for EMC		
	MTBF		R-332 (Bellcore) ; 396.9K hrs mi					
OTHERS	DIMENSION	113*60*25mm (L*W*H)	,,,		,			
	PACKING	0.25Kg; 56pcs/15Kg/0.81CUFT						
NOTE	 All parameters NOT specially mentioned are measured at 110VDC input, rated load and 25°C of ambient temperature. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 μ F & 47 μ F parallel capacitor. Tolerance: includes set up tolerance, line regulation and load regulation. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the u a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on https://www.meanwell.com//Upload/PDF/EMI_statement_en.pdf) Strongly recommended that external output capacitance should not exceed 5000uF. The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m Product Liability Disclaimer: For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx 				nounting the unit on guidance on how to			



■ Block Diagram

fosc: 110KHz



■ Input Fuse

There is one fuse connected in series to the positive input line, which is used to protect against abnormal surge. Fuse specifications of each model are shown as below.

Type	Fuse Type	Reference and Rating
G	Time-Lag	CONQUE MST, 6.3A, 250V
L	Time-Lag	CONQUE MST, 3.15A, 250V
Н	Time-Lag	CONQUE MST, 2A, 250V

■ Input Reverse Polarity Protection

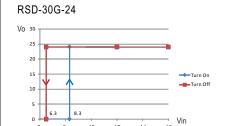
There is a MOSFET connected in series to the negative input line. If the input polarity is connected reversely, the MOSFET opens and there will be no output to protect the unit.

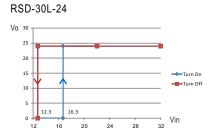
■ Input Range and Transient Ability

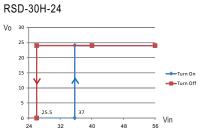
The series has a wide range input capability. With $\pm 40\%$ of rated input voltage, it can withstand that for 1 second.

■ Input Under-Voltage Protection

If input voltage drops below Vimin, the internal control IC shuts down and there is no output voltage. It recovers automatically when input voltage reaches above Vimin, please refer to the cruve below.







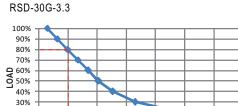
■ Inrush Current

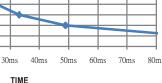
Inrush current is suppressed by a resistor during the initial start-up, and then the resistor is bypassed by a MOSFET to reduce power consumption after accomplishing the start-up.

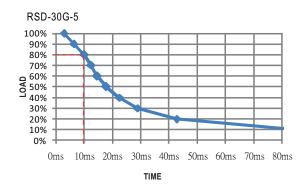


■ Hold-up Time

• EN50155: 2007 version - H type is in compliance with S2 level (10ms), while G and L types are in compliance with S1 level (3ms) at full load output condition. To fulfil the requirements of S2 level (10ms), G types require de-rating their output load to 80%, please refer to the curve diagrams below.







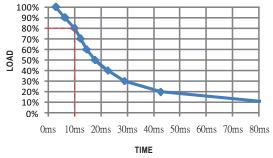


20%

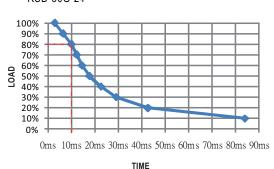
0ms

10ms

20ms



RSD-30G-24



• EN50155: 2017 version - Comply with S1 level (3ms)

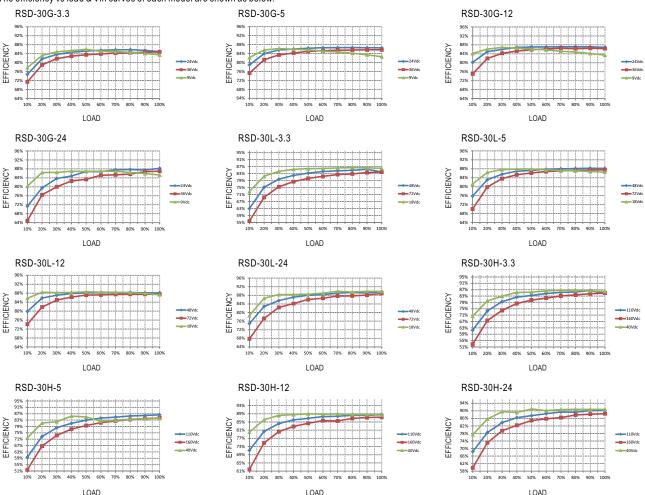
■ Output Voltage Adjustment

This function is optional, which the standard product does not have it. If you do need the function, please contact MW for details.

MEAN WELL

■ Efficiency vs Load & Vin Curve

The efficiency vs load & Vin curves of each model are shown as below.

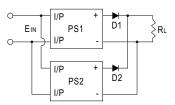


■ Parallel and Series Connection

A.Operation in Parallel

Since RSD-30 series don't have built-in parallel circuit, it can only use external circuits to achieve the redundant operation but not increase the current rating.

1.Add a diode at the positive-output of each power supply (as shown as below), the current rating of the diode should be larger than the maximum output current rating and attached to a suitable heat sink. This is only for redundant use (increase the reliability of the system) and users have to check suitability of the circuit by themselves.

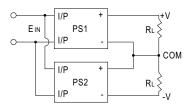


2. When using S.P.S. in parallel connection, the leakage current will increase at the same time. This could pose as a shock hazard for the user. So please contact the supplier if you have this kind of application.

B.Operation in Series

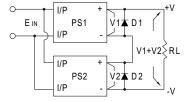
RSD-30 can be operated in series. Here are the methods of doing it:

1. Positive and negative terminals are connected as shown as below. According to the connection, you can get the positive and negative output voltages for your loads.



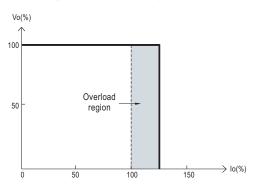


2. Increase the output voltage (current does not change). Because RSD-30 series have no reverse blocking diode in the unit, you should add an external blocking diode to prevent the damage of every unit while starting up. The voltage rating of the external diode should be larger than V1+V2 (as shown as below).



■ Overload Protection

If the output draw up to 105~135% of its output power rating, the converter will go into overload protection which is constant current mode. After the faulty condition is removed, it will recover automatically. Please refer to the diagram below for the detail operation characteristic. Please note that it's not suitable to operate within the overload region continuously, or it may cause to over temperature and reduce the life of the power supply unit or even damage it.



■ Over Voltage Protection

The converter shuts off to protect itself when the output voltage drawn exceeds 115~140% of its output rating. It must be repowered on to recover.

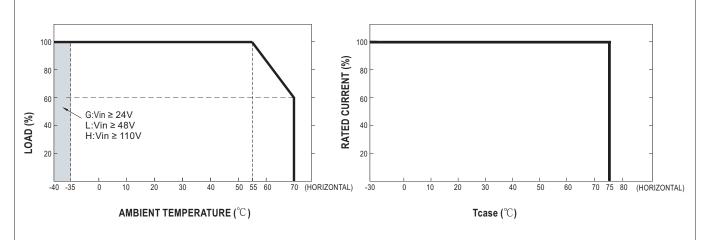
■ LED Indicator

Equipped with a built-in LED indicator, the converter provides an easy way for users to check its condition through the LED indicator. Green: normal operation; No signal: no power or failure.

■ Derating Curve

a.Single unit operation

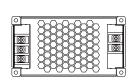
If the unit has no iron plate mounted on its bottom, the maximum ambient temperature for the unit will be 55°C as operating under full load condition. It requires de-rating output current when ambient temperature is between 55~70°C, please refer to the de-rating curve as below.

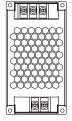


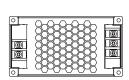


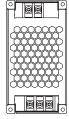
Suitable installation methods are shown as below. Since RSD-30 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.





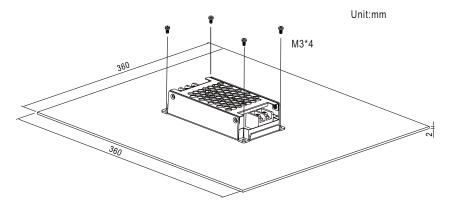




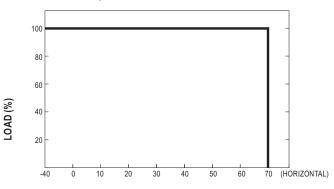


b. Operate with additional iron plate

If it is necessary to fulfil the requirements of EN50155 TX level that operate the unit fully-loaded at 70° C, RSD-30 series must be installed onto an iron plate on the bottom. The size of the suggested iron plate is shown as below. In order for optimal thermal performance, the iron plate must have an even & smooth surface and RSD-30 series must be firmly mounted at the center of the iron plate.

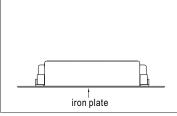


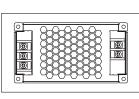
The load vs ambient temperature curve is shown as below.

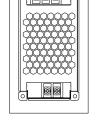


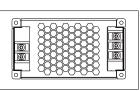
AMBIENT TEMPERATURE (°C)

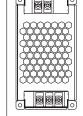
Suitable installation methods are shown as below. Since RSD-30 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.













■ Immunity to Environmental Conditions

Test method	Standard	Test conditions	Status
Cooling Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 2 hrs/cycle	No damage
Dry Heat Test	EN 50155 section 12.2.4 (Column 2, Class TX) EN 50155 section 12.2.4 (Column 3, Class TX & Column 4, Class TX) EN 60068-2-2	Temperature: 70°C / 85°C Duration: 6 hrs / 10min	PASS
Damp Heat Test, Cyclic	EN 50155 section 12.2.5 EN 60068-2-30	Temperature: 25°C~55°C Humidity: 90%~100% RH Duration: 48 hrs	PASS
Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 10 mins	PASS
Increased Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 5 hrs	PASS
Shock Test	EN 50155 section 12.2.11 EN 61373	Temperature: $21\pm3^{\circ}\text{C}$ Humidity: $65\pm5\%$ Duration: $30\text{ms*}18$	PASS
Low Temperature Storage Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 16 hrs	PASS
Salt Mist Test	EN 50155 section 12.2.10 (Class ST4)	Temperature: 35°C ±2°C Duration: 96 hrs	PASS

■ EN45545-2 Fire Test Conditions

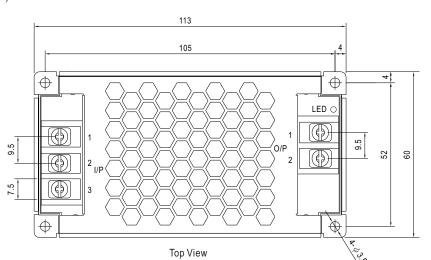
Test Ite	Items Hazard Level				
Items Star		Standard	HL1	HL2	HL3
R24	Oxygen index test	EN 45545-2:2013+A1:2015 EN ISO 4589-2:1996	PASS	PASS	PASS
R25	Glow-wire test	EN 45545-2:2013+A1:2015 EN 60695-2-11:2000	PASS	PASS	PASS
R26	Vertical flame test	EN 45545-2:2013+A1:2015 EN 60695-11:2003	PASS	PASS	PASS

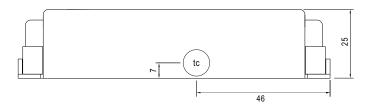
Case No.253A



■ Mechanical Specification

(Unit: mm , tolerance ± 1mm)





• (tc): Max. Case Temperature

Side View

Input Terminal Pin No. Assignment:

Output Terminal Pin No. Assignment:

Pin No.	Assignment
1	DC INPUT V+
2	DC INPUT V-
3	FG ±

Pin No.	Assignment
1	DC OUTPUT -V
2	DC OUTPUT +V

■ Installation Manual

Please refer to : http://www.meanwell.com/manual.html



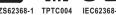














- Compliance to BS EN/EN50155 and BS EN/EN45545-2 railway standard
- Ultra compact and 1U low profile(25mm)
- 4:1 wide input range
- · No minimum load required
- Protections: Short circuit / Overload / Over voltage / Input reverse polarity
- 4000VDC I/O isolation (Reinforced isolation)
- · Half encapsulated, cooling by free air convection
- -40~+70°C wide working temperature
- · Built-in constant current limiting circuit
- · LED indicator for power on
- 3 years warranty

Pailway







Applications

- · Bus,tram,metro or railway system
- Highly vibrating, highly dusty, extremely low or high temperature harsh environment
- Wireless network
- Telecom or datacom system
- · Industry control system

GTIN CODE

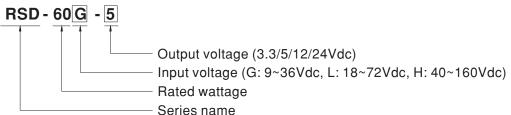
MW Search: https://www.meanwell.com/serviceGTIN.aspx

Description

RSD-60 is a 60W enclosed type DC-DC reliable railway converter. This series is compliant with BS EN/EN50155/IEC60571 railway standard, constituting three types of models with 4:1 wide but different input ranges 9~36V/18~72V/40~160V, suitable for railway and all kinds of transportation systems exploiting the frequently used standard input voltages such as 12V, 24V, 36V, 48V, 72V, 96V and 110V. Various output voltages, 3.3V, 5V, 12V and 24V are available for selection.

This series has the capability of working under -40° C, low ripple and noise, supreme EMC characteristics, 4KVDC I/P-OP, low enclosure profile 25mm and an interior with semi-potted silicone. It does not only well fits the in-car systems or the facilities by rails for railway, trams and buses but also can be used in the harsh environment with high vibration, high dust, extremely low or high temperature, etc.

■ Model Encoding





SPECIFICATION

MODEL		RSD-60G-3.3	RSD-60G-5	RSD-60G-12	RSD-60G-24	RSD-60L-3.3	RSD-60L-5	RSD-60L-12	RSD-60L-24		
	DC VOLTAGE	3.3V	5V	12V	24V	3.3V	5V	12V	24V		
	RATED CURRENT	12A	12A	5A	2.5A	12A	12A	5A	2.5A		
	CURRENT RANGE	0 ~ 12A	0 ~ 12A	0 ~ 5A	0 ~ 2.5A	0 ~ 12A	0 ~ 12A	0 ~ 5A	0 ~ 2.5A		
	RATED POWER	39.6W	60W	60W	60W	39.6W	60W	60W	60W		
	RIPPLE & NOISE (max.) Note.2	60mVp-p	100mVp-p	50mVp-p	50mVp-p	60mVp-p	60mVp-p	50mVp-p	50mVp-p		
OUTPUT	VOLTAGE TOLERANCE Note.3		±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	5A 2A 0 ~ 5A 60W Vp-p 50mVp-p 0% ± 2.0% 5% ± 0.3% 5% ± 0.3% 40.3% L type comply with \$2 level(2 removed 7 V 13.8 ~ 16.2V 13.8 ~ 16.2V 15 removed 15 removed 16 removed 17 removed 18 removed 19 removed 19 removed 10 removed 10 removed 10 removed 11 removed 12 removed 13 removed 13 removed 14 removed 15 removed 16 removed 17 removed 18 removed 19 removed 19 removed 10 removed 10 removed 10 removed 10 removed 10 removed 11 removed 12 removed 13 removed 13 removed 14 removed 15 removed 16 removed 17 removed 18 removed 19 removed 19 removed 10 removed 11 removed 12 removed 13 removed 13 removed 14 removed 15 removed 16 removed 17 removed 18 removed 19 removed 19 removed 10 removed	±2.0%		
	LINE REGULATION	±0.5%	±0.5%	±0.3%	±0.2%	±0.5%	±0.5%		±0.2%		
	LOAD REGULATION	±0.5%	±0.5%	±0.3%	±0.2%	±0.5%	±0.5%		±0.2%		
	SETUP, RISE TIME		20.5 % ±0.								
	HOLD UP TIME (Typ.)			Time(Load de-	rating curve)						
	VOLTAGE RANGE CONTINUOUS		1.2.			18 ~ 72VDC					
	EFFICIENCY (Typ.)	86.5%	88%	92%	90%	88.5%	89%	93%	91.5%		
	DC CURRENT (Typ.)	2.1A/24VDC	3A/24VDC	10270	10070	0.95A/48VDC	1.5A/48VDC	0070	0.11070		
NPUT	INRUSH CURRENT (Typ.)	20A/24VDC	071724180			20A/48VDC	1.0/040000				
	INTOON CORRENT (199.)		C type comply w	ith C1 lovel/2mg) @full load \$2 lo		load: L type cor	maly with \$2 lovel	(10mc) @full lo		
	INTERRUPTION OF VOLTAGE SUPPLY		Comply with S1	,	3) @1u11 10au,52 le	vei(Tollis) @50%	load, L type cor	iipiy witii 52 level	(TOTTIS) WIUTITO		
			ed output power								
	OVERLOAD							1			
PROTECTION		* * *			_				07.0.00.41		
	OVER VOLTAGE	4.3 ~ 5.3V	5.75 ~ 7V	13.8 ~ 16.2V		4.3 ~ 4.95V	5.75 ~ 7V	13.8 ~ 16.2V	27.6 ~ 32.4		
		,,			er on to recover	=0°0 /	(no develop with automal base plate)				
	WORKING TEMP.			C @ 60% load	by free air conve	ction; +/0 C (no	derating with ex	xternal base plate	!)		
	WORKING HUMIDITY	5 ~ 95% RH no	n-condensing								
ENVIRONMENT	STORAGE TEMP.	-40 ~ +85°C									
	TEMP. COEFFICIENT	±0.03%/°C (0~50°C)									
	VIBRATION	10 ~ 500Hz, 5G	, 5G 10min./1cycle, 60min. each along X, Y, Z axes ; Mounting : compliance to IEC61373					373			
OPERATING ALTITUDE 5000 meters											
	SAFETY STANDARDS	IEC 62368-1, UL 62368-1, AS/NZS 62368-1, EAC TP TC 004 approved, Design refer to BS EN/EN62368-1									
	WITHSTAND VOLTAGE	I/P-O/P:4KVDC I/P-FG:2.5KVDC O/P-FG:2.5KVDC									
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH									
		Parameter Standard Test Level / Note									
		Conducted		BS	EN/EN55032		Class A				
		Radiated		BS	EN/EN55032		Class B				
	EMC EMISSION	Harmonic Curi	ent	BS	BS EN/EN61000-3-2						
SAFETY &		Voltage Flicker		BS	EN/EN61000-3-3						
EMC		BS EN/EN5503	35								
(Note 4)		Parameter		Sta	ndard		Test Lev	vel / Note			
		ESD		BS	EN/EN61000-4-2		Level 3,	\pm 8KV air ; Level	3, \pm 6KV cont		
	EMO IMMUNITY	Radiated Field		BS	EN/EN61000-4-3	}	Level X,	20V/m			
	EMC IMMUNITY	EFT / Burst		BS	BS EN/EN61000-4-4 Lev		Level 3,	el 3, 2KV at power			
		Surge		BS	EN/EN61000-4-5	;	Level 3,1	Level 3,1KV Line-Line, Level 3, 2KV Line-E			
		Conducted									
	RAILWAY STANDARD	Compliance to BS EN/EN45545-2 for fire protection; BS EN/EN50155 / IEC60571 including IEC61373 for shock & vibration, BS EN/EN50121-3-2 for EMC									
	MTBF	2738.8K hrs mi	n. Telcordia S	SR-332 (Bellcore	e) ; 593.9K hrs mi	n. MIL-HDBK-	217F (25°C)				
OTHERS	DIMENSION	128*60*25mm		,,_	,,		(- /				
	PACKING		,	FT							
NOTE	 PACKING 0.29Kg; 48pcs/14.9Kg/0.75CUFT All parameters NOT specially mentioned are measured at 24,48VDC input, rated load and 25°C of ambient temperature. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 μ F & 47 μ F parallel capacitor. Tolerance: includes set up tolerance, line regulation and load regulation. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the ur a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on her perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on https://www.meanwell.com//Upload/PDF/EMI_statement_en.pdf) Strongly recommended that external output capacitance should not exceed 5000uF. The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(Product Liability Disclaimer: For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx 					ting the unit or					



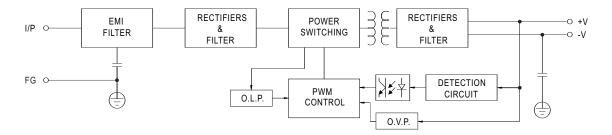
SPECIFICATION

MODEL		RSD-60H-3.3	RSD-60H-5	RSD-60H-12	RSD-60H-24			
	DC VOLTAGE	3.3V	5V	12V	24V			
	RATED CURRENT	12A	12A	5A	2.5A			
	CURRENT RANGE	0 ~ 12A	0 ~ 12A	0 ~ 5A	0 ~ 2.5A			
	RATED POWER	39.6W	60W	60W	60W			
	RIPPLE & NOISE (max.) Note.2	80mVp-p	60mVp-p	50mVp-p	50mVp-p			
OUTPUT	VOLTAGE TOLERANCE Note.3		±2.0%	±2.0%	±2.0%			
	LINE REGULATION	±0.5%	±0.5%	±0.3%	±0.2%			
	LOAD REGULATION	±0.5%	±0.5%	±0.3%	±0.2%			
	SETUP, RISE TIME	100ms, 60ms at full load	= 0.070	= 0.070	- 0.2 /0			
	HOLD UP TIME (Typ.)	Please refer to page 5 Hold up	Time(Load de-rating curve)					
	VOLTAGE RANGE CONTINUOUS	. • •	Time (Load de-rating curve)					
		87.5%	89%	92.5%	91.5%			
	EFFICIENCY (Typ.)			92.5%	91.5%			
INPUT	DC CURRENT (Typ.)	0.415A/110VDC	0.62A/110V					
	INRUSH CURRENT (Typ.)	20A/110VDC						
	INTERRUPTION OF VOLTAGE SUPPLY	EN50155:2007-H-type comply	. , ,	ad				
	EN50155:2017-Comply with S1 level							
	OVERLOAD	105 ~ 135% rated output power						
PROTECTION	OVERLOAD	Protection type : Constant currer		y after fault condition is	s removed			
FROILCIION	OVED VOLTAGE	4.3 ~ 4.95V	5.75 ~ 7V	13.8 ~ 16.2V	27.6 ~ 32.4V			
	OVER VOLTAGE	Protection type : Shut down o/p	voltage, re-power on to recover					
	WORKING TEMP.	-40 ~ +55°C (no derating); +70°	C @ 60% load by free air conve	ction ; +70°C (no derati	derating with external base plate)			
	WORKING HUMIDITY	NG HUMIDITY 5 ~ 95% RH non-condensing						
ENVIRONMENT	STORAGE TEMP.	-40 ~ +85°C						
	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 50°C)	C)					
	VIBRATION	to IEC61373						
	OPERATING ALTITUDE	5000 meters	· · · · · · · · · · · · · · · · · · ·	5 [
	SAFETY STANDARDS	IEC 62368-1, UL 62368-1, AS/NZS 62368-1, EAC TP TC 004 approved, Design refer to BS EN/EN62368-1						
	WITHSTAND VOLTAGE	I/P-O/P:4KVDC I/P-FG:2.5KVDC O/P-FG:2.5KVDC						
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C/ 70% RH						
	IOOLATION REGIOTARGE	Parameter Standard Test Level / Note						
		Conducted	BS EN/EN55032		Class A			
		Radiated	BS EN/EN55032		Class B			
	EMC EMISSION	Harmonic Current						
SAFETY &			BS EN/EN61000-3-2					
EMC		Voltage Flicker	BS EN/EN61000-3-3					
(Note 4)		BS EN/EN55035	04 1 1		T (1 1/N (
		Parameter	Standard		Test Level / Note			
		ESD	BS EN/EN61000-4-2		Level 3, ±8KV air ; Level 3, ±6KV contact			
	EMC IMMUNITY	Radiated Field	BS EN/EN61000-4-3		Level X, 20V/m			
		EFT / Burst	BS EN/EN61000-4-4		Level 3, 2KV at power			
		Surge	BS EN/EN61000-4-5		Level 3,1KV Line-Line, Level 3, 2KV Line-Earth			
		Conducted	BS EN/EN61000-4-6	i	Level 3			
	RAILWAY STANDARD	Compliance to BS EN/EN45545-2 for fire protection; BS EN/EN50155 / IEC60571 including IEC61373 for shock & vibration, BS EN/EN50121-3-2 for EMC						
	MTBF		R-332 (Bellcore) ; 593.9K hrs mi	n. MIL-HDBK-217F	(25°C)			
OTHERS	DIMENSION	128*60*25mm (L*W*H)	IN-552 (Delicore) , 385.8K IIIS IIII	II. WIL-HUDK-ZI/F	(23 0)			
JIIILING		0.29Kg; 48pcs/14.9Kg/0.75CUF	Т					
	PACKING	0. 1		0				
	 All parameters NOT specially mentioned are measured at 110VDC input, rated load and 25°C of ambient temperature. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 μ F & 47 μ F parallel capacitor. Tolerance: includes set up tolerance, line regulation and load regulation. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on 							
NOTE	a 360mm*360mm metal pla perform these EMC tests, p (as available on https://www 5. Strongly recommended that 6. The ambient temperature d	te with 1mm of thickness. The folloase refer to "EMI testing of co v.meanwell.com//Upload/PDF/EM t external output capacitance sho	inal equipment must be re-conf mponent power supplies." MI_statement_en.pdf) ould not exceed 5000uF. less models and of 5°C/1000m	irmed that it still meets with fan models for op	s EMC directives. For guidance on how to perating altitude higher than 2000m(6500ft)			



■ Block Diagram

fosc: 130KHz



■ Input Fuse

There is one fuse connected in series to the positive input line, which is used to protect against abnormal surge. Fuse specifications of each model are shown as below.

Type	Fuse Type	Reference and Rating
G	Time-Lag	CONQUE MST, 10A, 250V
L	Time-Lag	CONQUE MST, 5A, 250V
Н	Time-Lag	CONQUE MST, 2.5A, 250V

■ Input Reverse Polarity Protection

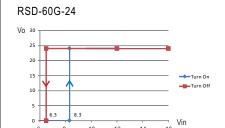
There is a MOSFET connected in series to the negative input line. If the input polarity is connected reversely, the MOSFET opens and there will be no output to protect the unit.

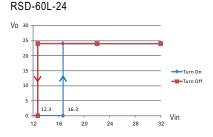
■ Input Range and Transient Ability

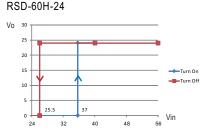
The series has a wide range input capability. With $\pm 40\%$ of rated input voltage, it can withstand that for 1 second.

■ Input Under-Voltage Protection

If input voltage drops below Vimin, the internal control IC shuts down and there is no output voltage. It recovers automatically when input voltage reaches above Vimin, please refer to the cruve below.







■ Inrush Current

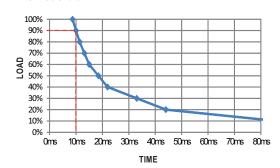
Inrush current is suppressed by a resistor during the initial start-up, and then the resistor is bypassed by a MOSFET to reduce power consumption after accomplishing the start-up.



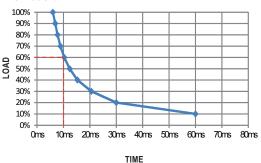
■ Hold-up Time

• En50155: 2007 version - L/H type is in compliance with S2 level (10ms), while G types are in compliance with S1 level (3ms) at full load output condition. To fulfil the requirements of S2 level (10ms), G types require de-rating their output load to 50%, please refer to the curve diagrams below.

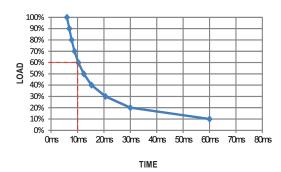
RSD-60G-3.3



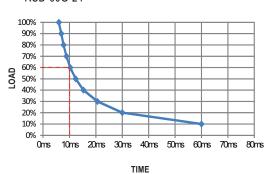
RSD-60G-5



RSD-60G-12



RSD-60G-24



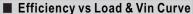
• EN50155: 2017 version - Comply with S1 level (3ms)

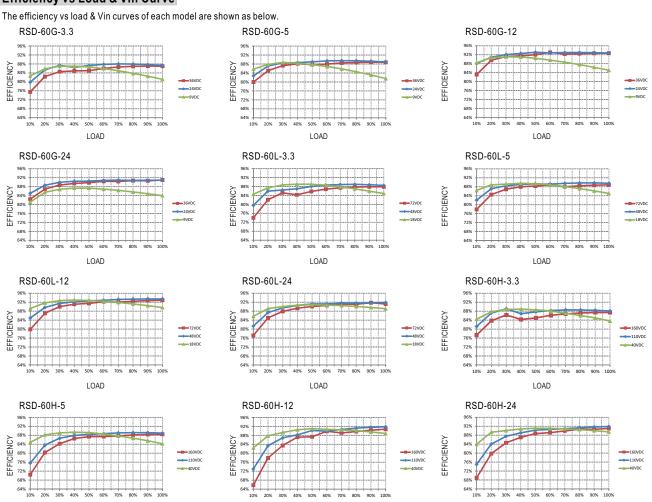
■ Output Voltage Adjustment

This function is optional, which the standard product does not have it. If you do need the function, please contact MW for details.

LOAD







■ Parallel and Series Connection

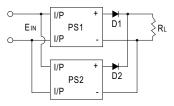
LOAD

A.Operation in Parallel

Since RSD-60 series don't have built-in parallel circuit, it can only use external circuits to achieve the redundant operation but not increase the current rating.

LOAD

1.Add a diode at the positive-output of each power supply (as shown as below), the current rating of the diode should be larger than the maximum output current rating and attached to a suitable heat sink. This is only for redundant use (increase the reliability of the system) and users have to check suitability of the circuit by themselves.

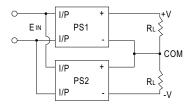


2. When using S.P.S. in parallel connection, the leakage current will increase at the same time. This could pose as a shock hazard for the user. So please contact the supplier if you have this kind of application.

B.Operation in Series

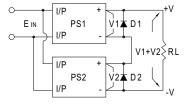
RSD-60 can be operated in series. Here are the methods of doing it:

1. Positive and negative terminals are connected as shown as below. According to the connection, you can get the positive and negative output voltages for your loads.



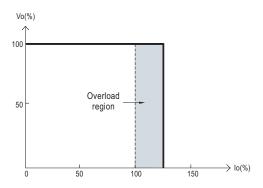


2. Increase the output voltage (current does not change). Because RSD-60 series have no reverse blocking diode in the unit, you should add an external blocking diode to prevent the damage of every unit while starting up. The voltage rating of the external diode should be larger than V1+V2 (as shown as below).



■ Overload Protection

If the output draw up to 105~135% of its output power rating, the converter will go into overload protection which is constant current mode. After the faulty condition is removed, it will recover automatically. Please refer to the diagram below for the detail operation characteristic. Please note that it's not suitable to operate within the overload region continuously, or it may cause to over temperature and reduce the life of the power supply unit or even damage it.



■ Over Voltage Protection

The converter shuts off to protect itself when the output voltage drawn exceeds 115~140% of its output rating. It must be repowered on to recover.

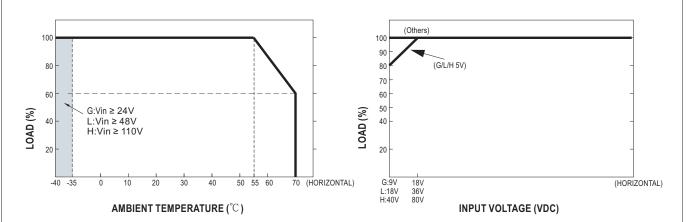
■ LED Indicator

Equipped with a built-in LED indicator, the converter provides an easy way for users to check its condition through the LED indicator. Green: normal operation; No signal: no power or failure.

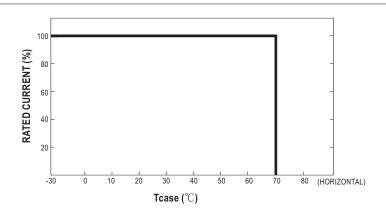
■ Derating Curve

a.Single unit operation

If the unit has no iron plate mounted on its bottom, the maximum ambient temperature for the unit will be 55°C as operating under full load condition. It requires de-rating output current when ambient temperature is between 55~70°C, please refer to the de-rating curve as below.

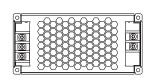




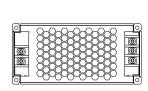


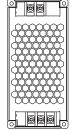
Suitable installation methods are shown as below. Since RSD-60 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.





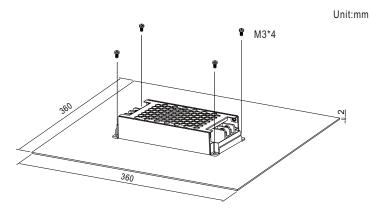




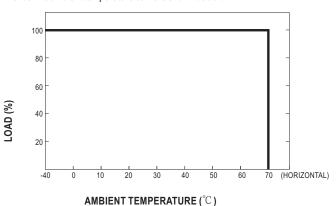


b. Operate with additional iron plate

If it is necessary to fulfil the requirements of EN50155 TX level that operate the unit fully-loaded at 70° C, RSD-60 series must be installed onto an iron plate on the bottom. The size of the suggested iron plate is shown as below. In order for optimal thermal performance, the iron plate must have an even & smooth surface and RSD-60 series must be firmly mounted at the center of the iron plate.

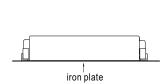


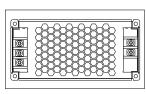
The load vs ambient temperature curve is shown as below.

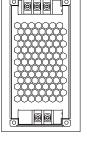


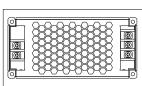


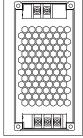
Suitable installation methods are shown as below. Since RSD-60 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.











■ Immunity to Environmental Conditions

Test method	Standard	Test conditions	Status
Cooling Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 2 hrs/cycle	No damage
Dry Heat Test	EN 50155 section 12.2.4 (Column 2, Class TX) EN 50155 section 12.2.4 (Column 3, Class TX & Column 4, Class TX) EN 60068-2-2	Temperature: 70°C / 85°C Duration: 6 hrs / 10min	PASS
Damp Heat Test, Cyclic	EN 50155 section 12.2.5 EN 60068-2-30	Temperature: 25°C~55°C Humidity: 90%~100% RH Duration: 48 hrs	PASS
Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 10 mins	PASS
Increased Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 5 hrs	PASS
Shock Test	EN 50155 section 12.2.11 EN 61373	Temperature: $21\pm3^{\circ}\text{C}$ Humidity: $65\pm5\%$ Duration: $30\text{ms*}18$	PASS
Low Temperature Storage Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 16 hrs	PASS
Salt Mist Test	EN 50155 section 12.2.10 (Class ST4)	Temperature: 35°C ±2°C Duration: 96 hrs	PASS

■ EN45545-2 Fire Test Conditions

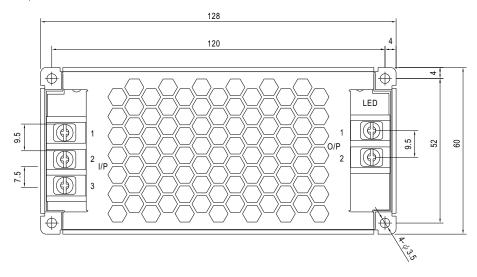
Test Ite	ms			Hazard Level	
	Items	Standard	HL1	HL2	HL3
	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS
R22	Smoke density test	EN 45545-2:2013 EN ISO 5659-2:2006	PASS	PASS	PASS
	Smoke toxicity test	EN 45545-2:2013 NF X70-100:2006	PASS	PASS	PASS
R24	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS
R25	Glow-wire test	EN 45545-2:2013 EN 60695-2-11:2000	PASS	PASS	PASS
R26	Vertical flame test	EN 45545-2:2013 EN 60695-11:2003	PASS	PASS	PASS

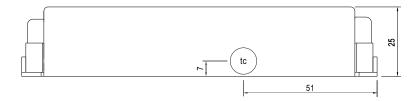


■ Mechanical Specification

(Unit: mm , tolerance ± 1mm)

Case No.255





• tc : Max. Case Temperature

Input Terminal Pin No. Assignment:

Output Terminal Pin No. Assignment:

Pin No.	Assignment
1	DC INPUT V+
2	DC INPUT V-
3	FG ±

Pin No.	Assignment	
1	DC OUTPUT -V	
2	DC OUTPUT +V	

■ Installation Manual

Please refer to : http://www.meanwell.com/manual.html

User's Manual



GTIN CODE



MW Search: https://www.meanwell.com/serviceGTIN.aspx

■ Features :

- Compliance to BS EN/EN50155 and BS EN/EN45545-2 railway standard
- 2:1 wide input range
- Protections: Short circuit / Overload / Over voltage / Input reverse polarity
- 4000VDC I/O isolation
- Cooling by free air convection
- Half encapsulated
- · Built-in constant current limiting circuit
- 1U low profile 36mm
- All using 105[°]C long life electrolytic capacitors
- · LED indicator for power on
- 100% full load burn-in test
- 3 years warranty



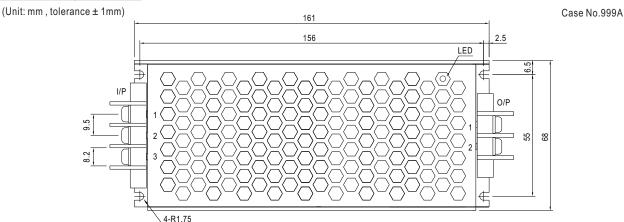
SPECIFICATION UL62368-1 AS/NZS62368-1 TPTC004 IEC62368-1 MODEL RSD-100B-5 RSD-100B-12 RSD-100B-24 RSD-100C-5 RSD-100C-12 RSD-100C-24 RSD-100D-5 RSD-100D-12 RSD-100D-24 DC VOLTAGE 5V 12V 24V 24V 12V 24V RATED CURRENT 20A 8.4A 4.2A 20A 8.4A 4.2A 20A 8.4A 4.2A **CURRENT RANGE** 0 ~ 20A 0~84A 0 ~ 4.2A 0 ~ 20A 0~84A 0~42A 0 ~ 20A 0~84A 0 ~ 4.2A RATED POWER 100W 100.8W 100 8W 100W 100.8W 100 8W 100W 100.8W 100.8W RIPPLE & NOISE (max.) Note.2 100mVp-p 120mVp-p 150mVp-p 100mVp-p 120mVp-p 150mVp-p 100mVp-p 120mVp-p 150mVp-p **OUTPUT** VOLTAGE TOLERANCE Note.3 $\pm 2.0\%$ $\pm 2.0\%$ $\pm 2.0\%$ $\pm 2.0\%$ $\pm 2.0\%$ $\pm 2.0\%$ ±2.0% $\pm 2.0\%$ $\pm 2.0\%$ LINE REGULATION +0.5% $\pm 0.3\%$ $\pm 0.2\%$ $\pm 0.5\%$ $\pm 0.3\%$ $\pm 0.2\%$ $\pm 0.5\%$ $\pm 0.2\%$ $\pm 0.2\%$ LOAD REGULATION ±1.0% $\pm 1.0\%$ ±1.0% $\pm 1.0\%$ ±1.0% ±1.0% ±1.0% ±1.0% +1.0%SETUP. RISE TIME 800ms, 50ms at full load HOLD UP TIME (Typ.) Please refer to page 3 Hold up Time(Load de-rating curve) CONTINUOUS 16.8 ~ 31.2VDC 67.2 ~ 143VDC **VOLTAGE** 33.6 ~ 62.4VDC RANGE 57.6 ~ 154VDC 14.4 ~ 33.6VDC 28.8 ~ 67.2VDC 1 SEC. 89% EFFICIENCY (Typ.) 88% 89% 89% 91% 91% 89.5% 91% 90% INPUT DC CURRENT (Typ.) 4.8A/24V 4.8A/24V 4.8A/24V 2.4A/48V 2.4A/48V 2.4A/48V 1.2A/110V 1.2A/110V 1.2A/110V **INRUSH CURRENT (Typ.)** 30A/24VDC 30A/48VDC 30A/110VDC EN50155:2007-B/C- type comply with S1 level @ full load, comply with S2 level @ 70% load; D-type comply with S2 level @ full load INTERRUPTION OF VOLTAGE SUPPLY EN50155:2017-Comply with S1 level 105 ~ 135% rated output power OVERLOAD Protection type: Constant current limiting, recovers automatically after fault condition is removed **PROTECTION** 13.8 ~ 16.2V 27.6 ~ 32.4V 5.75 ~ 7V 13.8 ~ 16.2V | 27.6 ~ 32.4V | 5.75 ~ 7V 13.8 ~ 16.2V | 27.6 ~ 32.4V **OVER VOLTAGE** Protection type: Shut down o/p voltage, re-power on to recover -40 ~ +55°C (no derating); +70°C @ 60% load by free air convection; +70°C no derating with external base plate, TX class compliance WORKING TEMP. 5 ~ 95% RH non-condensing WORKING HUMIDITY **ENVIRONMENT** -40 ~ +85°C STORAGE TEMP. TEMP. COEFFICIENT $\pm 0.03\%$ /°C (0 ~ 50°C) 10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: compliance to IEC61373 VIBRATION **OPERATING ALTITUDE** IEC 62368-1, UL 62368-1, AS/NZS 62368-1, EAC TP TC 004 approved, Design refer to BS EN/EN62368-1 SAFETY STANDARDS WITHSTAND VOLTAGE I/P-O/P:4KVDC I/P-FG:2.5KVDC O/P-FG:2.5KVDC **SAFETY &** ISOLATION RESISTANCE I/P-O/P. I/P-FG. O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH **EMC** Compliance to BS EN/EN55032 (CISPR32) Conduction Emission: Class A, Radiation Emission: Class B, EAC TP TC 020 **EMC EMISSION** (Note 5) **EMC IMMUNITY** Compliance to BS EN/EN61000-4-2,3,4,5,6,8, BS EN/EN55035, light industry level, EAC TP TC 020 BS EN/EN50155 / IEC60571 including IEC61373 for shock & vibration, BS EN/EN50121-3-2 for EMC; BS EN/EN45545-2 for fire protection **RAILWAY STANDARD** MTBF Telcordia SR-332 (Bellcore); 254.2K hrs min. MII -HDBK-217F (25°C) 2446.2K hrs min. **DIMENSION OTHERS** 161*68*36mm (L*W*H) **PACKING** 0.563Kg; 24pcs/14.5Kg/0.91CUFT 1. All parameters NOT specially mentioned are measured at 24,48,110VDC input, rated load and 25°C of ambient temperature. NOTE 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 μ F & 47 μ F parallel capacitor. 3. Tolerance: includes set up tolerance, line regulation and load regulation. 4. Strongly recommended that external output capacitance should not exceed 5000uF. (Only for: RSD-100-5 / -12) 5. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies, (as available on https://www.meanwell.com//Upload/PDF/EMI_statement_en.pdf)

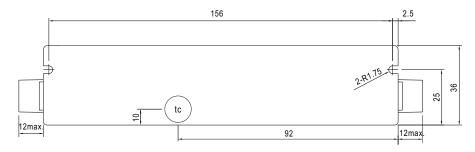
6. The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft).

Product Liability Disclaimer: For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx



■ Mechanical Specification





• tc : Max. Case Temperature

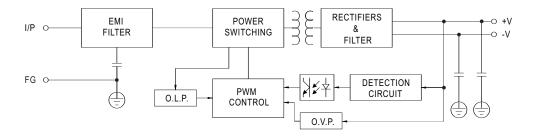
Input Terminal Pin No. Assignment:

Pin No.	Assignment
1	DC INPUT V+
2	DC INPUT V-
3	FG ±

Output Terminal Pin No. Assignment:

Pin No. Assignment	
1	DC OUTPUT -V
2	DC OUTPUT +V

■ Block Diagram



■ Input Fuse

There is one fuse connected in series to the positive input line, which is used to protect against abnormal surge. Fuse specifications of each model are shown as below.

Туре	Fuse Type	Reference and Rating
B Time-Lag C		Conquer UDA-A, 10A, 250V
C Time-Lag		Conquer UDA-A, 5A, 250V
D	Time-Lag	Conquer UDA-A, 3.15A, 250V

fosc: 130KHz



■ Input Reverse Polarity Protection

There is a MOSFET connected in series to the negative input line. If the input polarity is connected reversely, the MOSFET opens and there will be no output to protect the unit.

■ Input Range and Transient Ability

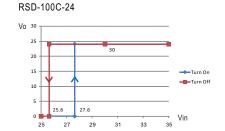
The series has a wide range input capability. Within $\pm 30\%$ of rated input voltage, it can be executed at full-load operation and operate properly; with $\pm 40\%$ of rated input voltage, it can withstand that for 1 second.

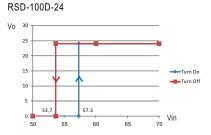
■ Input Under-Voltage Protection

If input voltage drops below Vimin, the internal control IC shuts down and there is no output voltage. It recovers automatically when input voltage reaches above Vimin, please refer to the cruve below.

RSD-100B-24

Vo 30
25
20
15
10
5
Turn Off





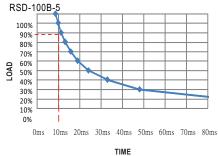
■ Inrush Current

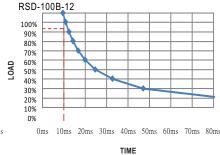
Inrush current is suppressed by a resistor during the initial start-up, and then the resistor is bypassed by a MOSFET to reduce power consumption after accomplishing the start-up.

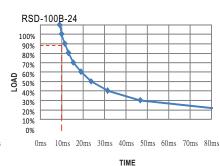
■ Hold-up Time

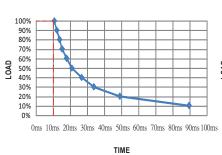
RSD-100C-5

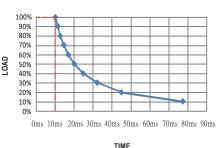
• EN50155: 2007 version - D type is in compliance with S2 level, while B and C types are in compliance with S1 level at full load output condition. To fulfil the requirements of S2 level, B and C types require de-rating their output load to 70%, please refer to the curve diagrams below.

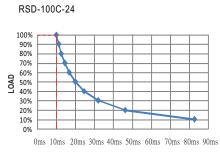












TIME TIME

• EN50155: 2017 version - Comply with S1 level

■ Output Voltage Adjustment

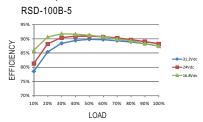
This function is optional, which the standard product does not have it. If you do need the function, please contact MW for details.

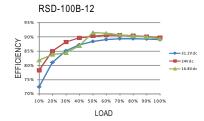
RSD-100C-12

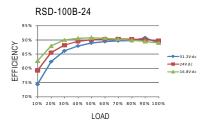


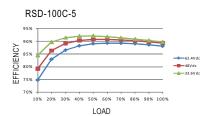
■ Efficiency vs Load & Vin Curve

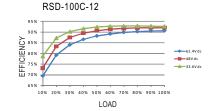
The efficiency vs load & Vin curves of each model are shown as below.

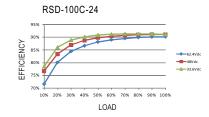


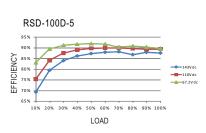


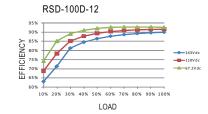


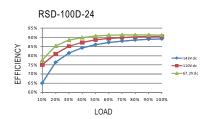










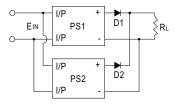


■ Parallel and Series Connection

A.Operation in Parallel

Since RSD-100 series don't have built-in parallel circuit, it can only use external circuits to achieve the redundant operation but not increase the current rating.

1.Add a diode at the positive-output of each power supply (as shown as below), the current rating of the diode should be larger than the maximum output current rating and attached to a suitable heat sink. This is only for redundant use (increase the reliability of the system) and users have to check suitability of the circuit by themselves.

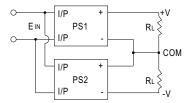


2. When using S.P.S. in parallel connection, the leakage current will increase at the same time. This could pose as a shock hazard for the user. So please contact the supplier if you have this kind of application.

B.Operation in Series

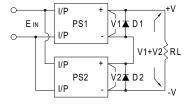
RSD-100 can be operated in series. Here are the methods of doing it:

1. Positive and negative terminals are connected as shown as below. According to the connection, you can get the positive and negative output voltages for your loads.



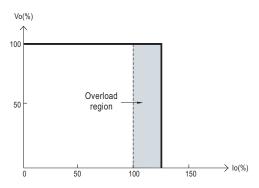


2. Increase the output voltage (current does not change). Because RSD-100 series have no reverse blocking diode in the unit, you should add an external blocking diode to prevent the damage of every unit while starting up. The voltage rating of the external diode should be larger than V1+V2 (as shown as below).



■ Overload Protection

If the output draw up to 105~135% of its output power rating, the converter will go into overload protection which is constant current mode. After the faulty condition is removed, it will recover automatically. Please refer to the diagram below for the detail operation characteristic. Please note that it's not suitable to operate within the overload region continuously, or it may cause to over temperature and reduce the life of the power supply unit or even damage it.



■ Over Voltage Protection

The converter shuts off to protect itself when the output voltage drawn exceeds 115~140% of its output rating. It must be repowered on to recover.

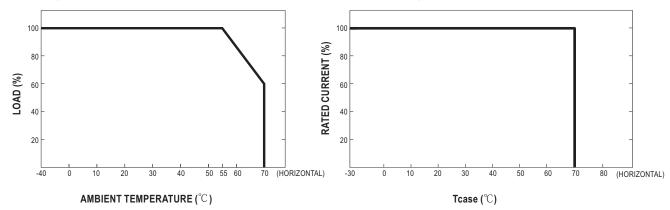
■ LED Indicator

Equipped with a built-in LED indicator, the converter provides an easy way for users to check its condition through the LED indicator. Green: normal operation; No signal: no power or failure.

■ Derating Curve

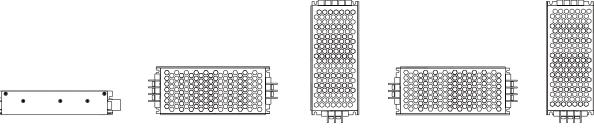
a.Single unit operation

If the unit has no iron plate mounted on its bottom, the maximum ambient temperature for the unit will be 55°C as operating under full load condition. It requires de-rating output current when ambient temperature is between 55-70°C, please refer to the de-rating curve as below.



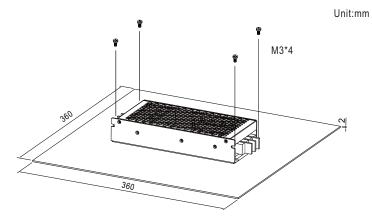


Suitable installation methods are shown as below. Since RSD-100 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.

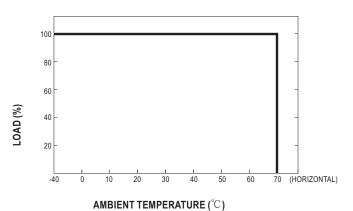


b. Operate with additional iron plate

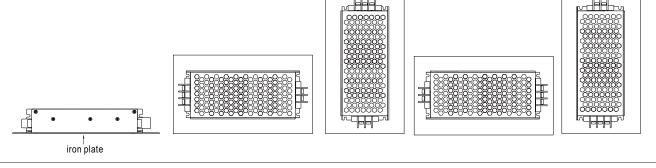
If it is necessary to fulfil the requirements of EN50155 TX level that operate the unit fully-loaded at 70° C, RSD-100 series must be installed onto an iron plate on the bottom. The size of the suggested iron plate is shown as below. In order for optimal thermal performance, the iron plate must have an even & smooth surface and RSD-100 series must be firmly mounted at the center of the iron plate.



The load vs ambient temperature curve is shown as below.



Suitable installation methods are shown as below. Since RSD-100 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.





■ Immunity to Environmental Conditions

Test method	Standard	Test conditions	Status
Cooling Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 2 hrs/cycle	No damage
Dry Heat Test	EN 50155 section 12.2.4 (Column 2, Class TX) EN 50155 section 12.2.4 (Column 3, Class TX & Column 4, Class TX) EN 60068-2-2	Temperature: 70°C / 85°C Duration: 6 hrs / 10min	PASS
Damp Heat Test, Cyclic	EN 50155 section 12.2.5 EN 60068-2-30	Temperature: 25°C~55°C Humidity: 90%~100% RH Duration: 48 hrs	PASS
Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 10 mins	PASS
Increased Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 5 hrs	PASS
Shock Test	EN 50155 section 12.2.11 EN 61373	Temperature: $21\pm3^{\circ}\text{C}$ Humidity: $65\pm5\%$ Duration: $30\text{ms*}18$	PASS
Low Temperature Storage Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 16 hrs	PASS
Salt Mist Test	EN 50155 section 12.2.10 (Class ST4)	Temperature: 35°C ±2°C Duration: 96 hrs	PASS

■ EN45545-2 Fire Test Conditions

Test Ite	Test Items		Hazard Level		
	Items	Standard	HL1	HL2	HL3
	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS
R22	Smoke density test	EN 45545-2:2013 EN ISO 5659-2:2006	PASS	PASS	PASS
	Smoke toxicity test	EN 45545-2:2013 NF X70-100:2006	PASS	PASS	PASS
R24	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS
R25	Glow-wire test	EN 45545-2:2013 EN 60695-2-11:2000	PASS	PASS	PASS
R26	Vertical flame test	EN 45545-2:2013 EN 60695-11:2003	PASS	PASS	PASS



GTIN CODE

SPECIFICATION

NOTE



MW Search: https://www.meanwell.com/serviceGTIN.aspx

■ Features :

- Compliance to BS EN/EN50155 and BS EN/EN45545-2 railway standard
- 2:1 wide input range
- Protections: Short circuit / Overload / Over voltage / Over temperature / Input reverse polarity
- 4000VDC I/O isolation
- Cooling by free air convection
- Half encapsulated
- Built-in constant current limiting circuit
- 1U low profile 36mm
- All using 105°C long life electrolytic capacitors
- LED indicator for power on
- 100% full load burn-in test



EM CB(€路 3 years warranty

MODEL			RSD-150B-5	RSD-150B-12	RSD-150B-24	RSD-150C-5	RSD-150C-12	RSD-150C-24	RSD-150D-5	RSD-150D-12	RSD-150D-24
DC VOLTAGE		5V	12V	24V	5V	12V	24V	5V	12V	24V	
	RATED CUR	RENT	30A	12.5A	6.3A	30A	12.5A	6.3A	30A	12.5A	6.3A
	CURRENT RANGE		0 ~ 30A	0 ~ 12.5A	0 ~ 6.3A	0 ~ 30A	0 ~ 12.5A	0 ~ 6.3A	0 ~ 30A	0 ~ 12.5A	0 ~ 6.3A
	RATED POW	ER	150W	150W	151.2W	150W	150W	151.2W	150W	150W	151.2W
	RIPPLE & NOISE (max.) Note.2		100mVp-p	120mVp-p	150mVp-p	100mVp-p	120mVp-p	150mVp-p	100mVp-p	120mVp-p	150mVp-p
OUTPUT	VOLTAGE TO	LERANCE Note.3	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%
	LINE REGULATION		±0.5%	±0.3%	±0.2%	±0.5%	±0.3%	±0.2%	±0.5%	±0.2%	±0.2%
	LOAD REGU	LATION	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	SETUP, RISE	TIME	800ms, 50ms	at full load		·	l				
	HOLD UP TII	ИЕ (Тур.)	Please refer t	o page 3 Hold	up Time(Load	de-rating curv	ve)				
	VOLTAGE	CONTINUOUS	16.8 ~ 31.2VD	iC	·	33.6 ~ 62.4VI	OC		67.2 ~ 143VD	С	
	RANGE	1 SEC.	14.4 ~ 33.6VD	C		28.8 ~ 67.2VI	DC .		57.6 ~ 154VD	С	
	EFFICIENCY	(Typ.)	89%	90%	90%	90%	92%	91%	90%	92%	91%
INPUT	DC CURREN	T (Typ.)	7.3A/24V	7.3A/24V	7.3A/24V	3.6A/48V	3.6A/48V	3.6A/48V	1.5A/110V	1.5A/110V	1.5A/110V
INFO	INRUSH CUF	RRENT (Typ.)	45A/24VDC			45A/48VDC			45A/110VDC		
	INTERRUPTION	INTERRUPTION OF VOLTAGE SUPPLY		EN50155:2007-B/C- type comply with S1 level @ full load, comply with S2 level @ 70% load (except RSD-150B-5 @ 60% load); D-type comply with S2 level @ full load							
			EN50155:2017-Comply with S1 level								
	OVERLOAD		105 ~ 135% rated output power								
BBATTATION			Protection type: Constant current limiting, recovers automatically after fault condition is removed 5.75 ~ 7V								
PROTECTION	OVER VOLTAGE							21.0 ~ 32.40	5.75~7V	13.8 ~ 10.20	21.0 ~ 32.4
	OVED TEMP	EDATURE	Protection type: Shut down o/p voltage, re-power on to recover Shut down o/p voltage, recovers automatically after temperature goes down								
	OVER TEMP								ith oxtornal had	o plato TY clas	e complianc
	WORKING T		-40 ~ +55°C (no derating); +70°C @ 60% load by free air convection; +70°C no derating with external base plate, TX class compliance 5 ~ 95% RH non-condensing								
	WORKING H		-40 ~ +85°C								
ENVIRONMENT	STORAGE T		±0.03%/°C (0 - F0°C\							
	VIBRATION	FICIENT	,	,	la 60min agah	along V V 7	avoc : Mountine	ı : compliance t	:0 IEC61272		
		3 ALTITUDE	10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: compliance to IEC61373 5000 meters								
	SAFETY STA			III 62368_1 A	S/N7S 62369 1	, EAC TP TC 004	1 annroyed Doc	ian refer to BS F	N/FN62368_1		
-	WITHSTAND		-		5KVDC O/P-		r approved, Des	Igit Telet to DO E	-14/L140Z300-1		
SAFETY &		RESISTANCE				/DC / 25°C / 70	% RH				
EMC	EMC EMISSI		,			Conduction Er		A. Radiation Fr	nission: Class	B. EAC TP TC (020
(Note 4)	EMC IMMUN		· ·		,	6,8, BS EN/EN5				_, _, 0 11 10 1	
}	RAILWAY ST		· ·			373 for shock &				/FN45545-2 for	fire protection
	MTBF		2405.1K hrs n			core); 223.3K		-HDBK-217F (,	5 protootic
OTHERS	DIMENSION		189*77*36mr		31. 00E (BOII						
J.IILINO	PACKING 0.8Kg; 15pcs/13Kg/0.75CUFT										
		eters NOT specia				DC input_rate	d load and 25°	of ambient t	emperature		

- 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 μ F & 47 μ F parallel capacitor.

3. Tolerance : includes set up tolerance, line regulation and load regulation.

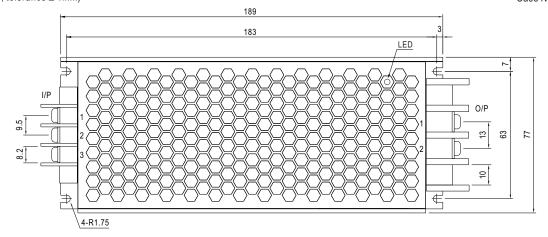
- 4. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on https://www.meanwell.com//Upload/PDF/EMI_statement_en.pdf)
- 5. Strongly recommended that external output capacitance should not exceed 5000uF. (Only for: RSD-150-5/-12)
- 6. The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft).
- Product Liability Disclaimer: For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx

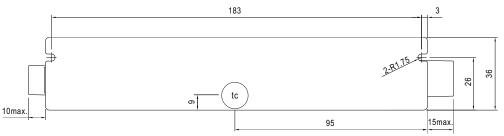


■ Mechanical Specification

(Unit: mm , tolerance ± 1mm)

Case No.978A





• (tc) : Max. Case Temperature

Input Terminal Pin No. Assignment:

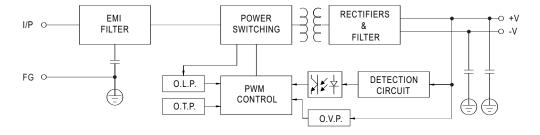
Pin No.	Assignment
1	DC INPUT V+
2	DC INPUT V-
3	FG ≟

Output Terminal Pin No. Assignment :

Pin No.	Assignment	
1	DC OUTPUT -V	
2	DC OUTPUT +V	

■ Block Diagram

fosc: 130KHz



■ Input Fuse

There is one fuse connected in series to the positive input line, which is used to protect against abnormal surge. Fuse specifications of each model are shown as below.

Type	Fuse Type	Reference and Rating
В	Time-Lag	Conquer UDA-A, 15A, 250V
С	Time-Lag	Conquer UDA-A, 10A, 250V
D	Time-Lag	Conquer UDA-A, 4A, 250V



■ Input Reverse Polarity Protection

There is a MOSFET connected in series to the negative input line. If the input polarity is connected reversely, the MOSFET opens and there will be no output to protect the unit

■ Input Range and Transient Ability

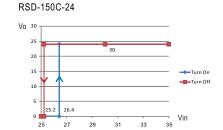
The series has a wide range input capability. Within $\pm 30\%$ of rated input voltage, it can be executed at full-load operation and operate properly; with $\pm 40\%$ of rated input voltage, it can withstand that for 1 second.

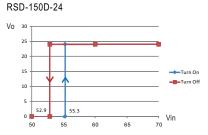
■ Input Under-Voltage Protection

If input voltage drops below Vimin, the internal control IC shuts down and there is no output voltage. It recovers automatically when input voltage reaches above Vimin, please refer to the cruve below.

RSD-150B-24

Vo 30
25
20
15
10
Turn On
Turn Off





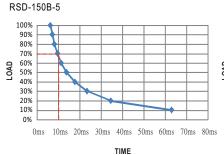
■ Inrush Current

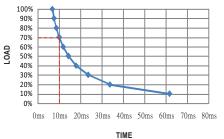
Inrush current is suppressed by a resistor during the initial start-up, and then the resistor is bypassed by a MOSFET to reduce power consumption after accomplishing the start-up.

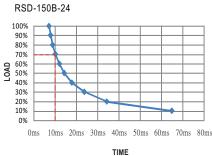
■ Hold-up Time

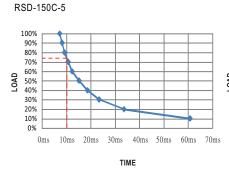
• EN50155: 2007 version - D type is in compliance with S2 level, while B and C types are in compliance with S1 level at full load output condition. To fulfil the requirements of S2 level, B and C types require de-rating their output load to 70% (except RSD-150B-5 requires de-rating its output load to 60%), please refer to the curve diagrams below.

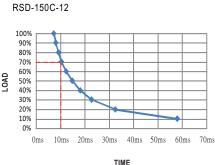
RSD-150B-12

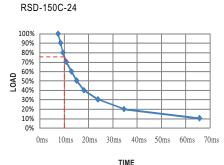












• EN50155: 2017 version - Comply with S1 level

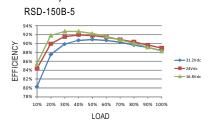
■ Output Voltage Adjustment

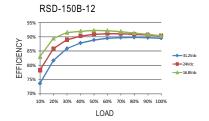
This function is optional, which the standard product does not have it. If you do need the function, please contact MW for details.

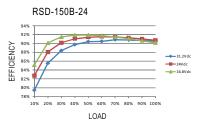


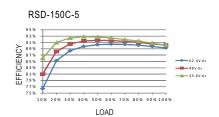
■ Efficiency vs Load & Vin Curve

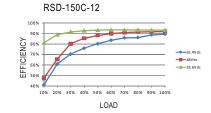
The efficiency vs load & Vin curves of each model are shown as below.

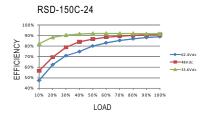


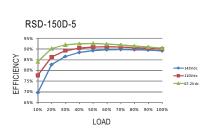


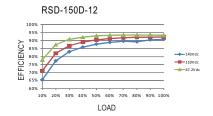


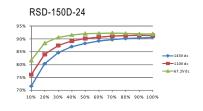










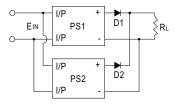


■ Parallel and Series Connection

A.Operation in Parallel

Since RSD-150 series don't have built-in parallel circuit, it can only use external circuits to achieve the redundant operation but not increase the current rating.

1.Add a diode at the positive-output of each power supply (as shown as below), the current rating of the diode should be larger than the maximum output current rating and attached to a suitable heat sink. This is only for redundant use (increase the reliability of the system) and users have to check suitability of the circuit by themselves.

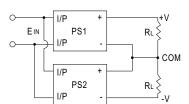


2. When using S.P.S. in parallel connection, the leakage current will increase at the same time. This could pose as a shock hazard for the user. So please contact the supplier if you have this kind of application.

B.Operation in Series

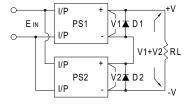
RSD-150 can be operated in series. Here are the methods of doing it:

1. Positive and negative terminals are connected as shown as below. According to the connection, you can get the positive and negative output voltages for your loads.



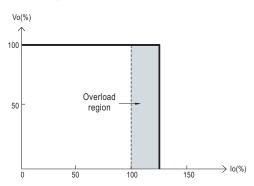


2. Increase the output voltage (current does not change). Because RSD-150 series have no reverse blocking diode in the unit, you should add an external blocking diode to prevent the damage of every unit while starting up. The voltage rating of the external diode should be larger than V1+V2 (as shown as below).



■ Overload Protection

If the output draw up to 105~135% of its output power rating, the converter will go into overload protection which is constant current mode. After the faulty condition is removed, it will recover automatically. Please refer to the diagram below for the detail operation characteristic. Please note that it's not suitable to operate within the overload region continuously, or it may cause to over temperature and reduce the life of the power supply unit or even damage it.



■ Over Voltage Protection

The converter shuts off to protect itself when the output voltage drawn exceeds 115~140% of its output rating. It must be repowered on to recover.

Over Temperature Protection

The converter shuts off to protect itself when the built-in temperature sensor mounted on the main power transformer senses a high temperature. The output recovers automatically if the temperature drops below the limit.

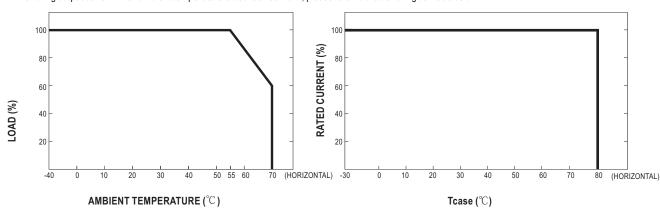
■ LED Indicator

Equipped with a built-in LED indicator, the converter provides an easy way for users to check its condition through the LED indicator. Green: normal operation; No signal: no power or failure.

■ Derating Curve

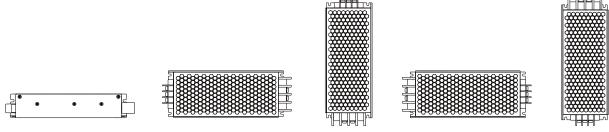
a. Single unit operation

If the unit has no iron plate mounted on its bottom, the maximum ambient temperature for the unit will be 55° C as operating under full load condition. It requires de-rating output current when ambient temperature is between $55-70^{\circ}$ C, please refer to the de-rating curve as below.



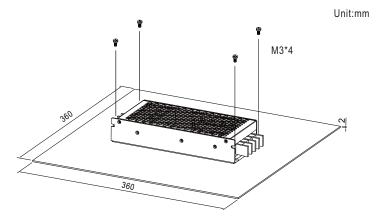


Suitable installation methods are shown as below. Since RSD-150 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.

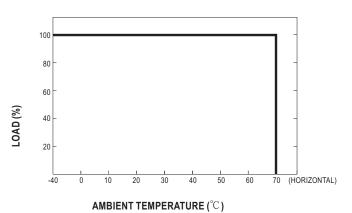


b. Operate with additional iron plate

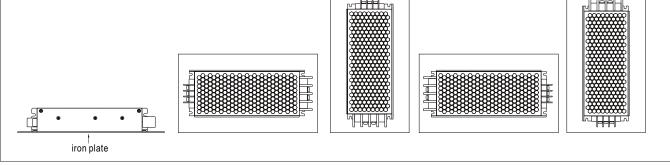
If it is necessary to fulfil the requirements of EN50155 TX level that operate the unit fully-loaded at 70° C, RSD-150 series must be installed onto an iron plate on the bottom. The size of the suggested iron plate is shown as below. In order for optimal thermal performance, the iron plate must have an even & smooth surface and RSD-150 series must be firmly mounted at the center of the iron plate.



The load vs ambient temperature curve is shown as below.



Suitable installation methods are shown as below. Since RSD-150 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.



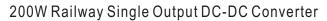


■ Immunity to Environmental Conditions

Test method	Standard	Test conditions	Status
Cooling Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 2 hrs/cycle	No damage
Dry Heat Test	EN 50155 section 12.2.4 (Column 2, Class TX) EN 50155 section 12.2.4 (Column 3, Class TX & Column 4, Class TX) EN 60068-2-2	Temperature: 70°C / 85°C Duration: 6 hrs / 10min	PASS
Damp Heat Test, Cyclic	EN 50155 section 12.2.5 EN 60068-2-30	Temperature: 25°C ~55°C Humidity: 90%~100% RH Duration: 48 hrs	PASS
Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 10 mins	PASS
Increased Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 5 hrs	PASS
Shock Test	EN 50155 section 12.2.11 EN 61373	Temperature: 21± 3°C Humidity: 65 ± 5% Duration: 30ms*18	PASS
Low Temperature Storage Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 16 hrs	PASS
Salt Mist Test	EN 50155 section 12.2.10 (Class ST4)	Temperature: 35°C ±2°C Duration: 96 hrs	PASS

■ EN45545-2 Fire Test Conditions

Test Ite	ms		Hazard Level			
Items		Standard	HL1	HL2	HL3	
	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS	
R22	Smoke density test	EN 45545-2:2013 EN ISO 5659-2:2006	PASS	PASS	PASS	
	Smoke toxicity test	EN 45545-2:2013 NF X70-100:2006	PASS	PASS	PASS	
R24	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS	
R25	Glow-wire test	EN 45545-2:2013 EN 60695-2-11:2000	PASS	PASS	PASS	
R26	Vertical flame test	EN 45545-2:2013 EN 60695-11:2003	PASS	PASS	PASS	





■ GTIN CODE



■ Features :

- Compliance to BS EN/EN50155 and BS EN/EN45545-2 railway standard
- 2:1 wide input range
- Protections: Short circuit / Overload / Over voltage / Over temperature / Input reverse polarity
- 4000VDC I/O isolation
- Cooling by free air convection
- Half encapsulated
- Built-in constant current limiting circuit
- 1U low profile 40mm
- $^{\bullet}$ All using 105 $^{\circ}\text{C}$ long life electrolytic capacitors
- LED indicator for power on
- 100% full load burn-in test



c**知**us & EECBCEK MW Search: https://www.meanwell.com/serviceGTIN.aspx • 3 years warranty **SPECIFICATION**

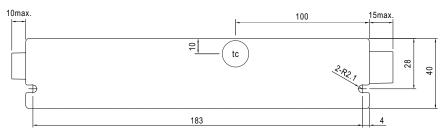
SPECIFIC	ATION				1		UL623t	68-1 AS/NZS623	368-1 IPIC004	IEC62368-1	
MODEL			RSD-200B-12	RSD-200B-24	RSD-200B-48	RSD-200C-12	RSD-200C-24	RSD-200C-48	RSD-200D-12	RSD-200D-24	RSD-200D-48
	DC VOLTAGE		12V	24V	48V	12V	24V	48V	12V	24V	48V
	RATED CURRENT		16.7A	8.4A	4.2A	16.7A	8.4A	4.2A	16.7A	8.4A	4.2A
	CURRENT R	ANGE	0 ~ 16.7A	0~8.4A	0 ~ 4.2A	0 ~ 16.7A	0 ~ 8.4A	0 ~ 4.2A	0 ~ 16.7A	0 ~ 8.4A	0 ~ 4.2A
	RATED POWER		200.4W	201.6W	201.6W	200.4W	201.6W	201.6W	200.4W	201.6W	201.6W
OUTPUT	RIPPLE & NOISE (max.) Note.2		120mVp-p	150mVp-p	180mVp-p	120mVp-p	150mVp-p	180mVp-p	120mVp-p	150mVp-p	180mVp-p
	VOLTAGE TOLERANCE Note.3		±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%
	LINE REGULATION		±0.2%	±0.2%	±0.5%	±0.2%	±0.2%	±0.5%	±0.2%	±0.2%	±0.5%
	LOAD REGULATION		±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	SETUP, RISE TIME		800ms, 50ms at full load								
	HOLD UP TIN	ЛЕ (Тур.)	Please refer to page 3 Hold up Time(Load de-rating curve)								
	VOLTAGE CONTINUOUS		16.8 ~ 31.2VDC 33.6 ~ 62.4VDC				67.2 ~ 143VDC				
	1011111	1 SEC.	14.4 ~ 33.6VDC			28.8 ~ 67.2VDC			57.6 ~ 154VDC		
	EFFICIENCY	(Typ.)	89%	89%	89%	91%	91%	91%	91%	91%	91%
INPUT	DC CURREN		9.6A/24V	9.6A/24V	9.6A/24V	4.8A/48V	4.8A/48V	4.8A/48V	2.1A/110V	2.1A/110V	2.1A/110V
	INRUSH CURRENT (Typ.)		45A/24VDC			45A/48VDC			45A/110VDC		
				7-B/C- type con	nply with S1 lev		omply with S2 I	evel @ 70% loa	ad ; D-type com	ply with S2 leve	l @ full load
	INTERRUPTION	OF VOLTAGE SUPPLY	EN50155:2007-B/C- type comply with S1 level @ full load, comply with S2 level @ 70% load; D-type comply with S2 level @ full load EN50155:2017-Comply with S1 level								
			105 ~ 135% rated output power								
	OVERLOAD		Protection type : Constant current limiting, recovers automatically after fault condition is removed								
PROTECTION	OVER VOLTAGE		13.8 ~ 16.2V 27.6 ~ 32.4V 55.2 ~ 64.8V 13.8 ~ 16.2V 27.6 ~ 32.4V 55.2 ~ 64.8V 13.8 ~ 16.2V 27.6 ~ 32.4V 55.2 ~ 64.8V								
INOTEOTION			Protection type: Shut down o/p voltage, re-power on to recover								
	OVER TEMP	FRATURE	Shut down o/p voltage, recovers automatically after temperature goes down								
	WORKING TI		-40 ~ +55°C (no derating); +70°C @ 60% load by free air convection; +70°C no derating with external base plate, TX class compliance								
	WORKING H		5 ~ 95% RH non-condensing								
	STORAGE TI		-40 ~ +85°C								
ENVIRONMENT	TEMP. COEF		±0.03%/°C (0~50°C)								
	VIBRATION		10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: compliance to IEC61373								
	OPERATING	ALTITUDE	5000 meters								
	SAFETY STA		UL 62368-1, IEC 62368-1, AS/NZS 62368-1, EAC TP TC 004 approved, Design refer to BS EN/EN62368-1								
	WITHSTAND		I/P-O/P:4KVDC I/P-FG:2.5KVDC O/P-FG:2.5KVDC								
SAFETY &	ISOLATION F		I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C/ 70% RH								
EMC	EMC EMISSI								B, EAC TP TC	020	
(Note 4)	EMC IMMUNI	TY	Compliance to BS EN/EN61000-4-2,3,4,5,6,8, BS EN/EN55035, light industry level, EAC TP TC 020								
	RAILWAY ST								fire protection		
	MTBF		2125.5K hrs min. Telcordia SR-332 (Bellcore); 218.2K hrs min. MIL-HDBK-217F (25°C)								
OTHERS	DIMENSION		191*86*40mm (L*W*H)								
	PACKING		0.94Kg; 12pcs/12.3Kg/0.73CUFT								
NOTE	2. Ripple & r 3. Tolerance 4. The power a 360mm perform the (as availa) 5. Strongly r	noise are measure : includes set up er supply is consid *360mm metal planese EMC tests, p ble on https://www ecommended that	ally mentioned are measured at 24,48,110VDC input, rated load and 25°C of ambient temperature. It wisted to all pair-wire terminated with a 0.1 μ F & 47 μ F parallel capacitor. It polerance, line regulation and load regulation. It is equipment all the EMC tests are been executed by mounting the unit on late with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to please refer to "EMI testing of component power supplies." ww.meanwell.com//Upload//PDF/EMI_statement_en.pdf at external output capacitance should not exceed 5000uF. (Only for: RSD-200-12) derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft). For: For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx								



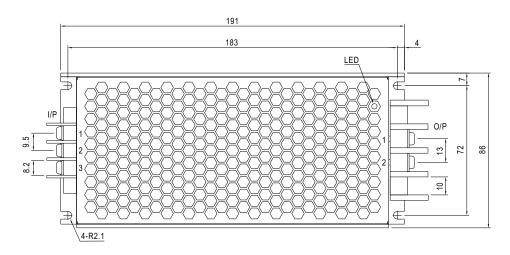
■ Mechanical Specification

(Unit: mm , tolerance ± 1mm)

Case No.203A



• (tc): Max. Case Temperature



Input Terminal Pin No. Assignment:

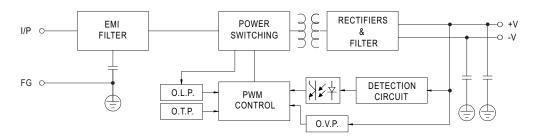
Pin No.	Assignment
1	DC INPUT V+
2	DC INPUT V-
3	FG ±

Output Terminal Pin No. Assignment:

Pin No.	Assignment			
1	DC OUTPUT -V			
2	DC OUTPUT +V			

■ Block Diagram





■ Input Fuse

There are one or two fuses connected in series to the positive input line, which are used to protect against abnormal surge. Fuse specifications of each model are shown as below.

Туре	Fuse Type	Reference and Rating
В	Time-Lag	2*Conquer UDA-A, 10A, 250V
С	Time-Lag	Conquer UDA-A, 10A, 250V
D	Time-Lag	Conquer UDA-A, 5A, 250V



■ Input Reverse Polarity Protection

There is a MOSFET connected in series to the negative input line. If the input polarity is connected reversely, the MOSFET opens and there will be no output to protect the unit.

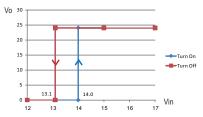
■ Input Range and Transient Ability

The series has a wide range input capability. Within $\pm 30\%$ of rated input voltage, it can be executed at full-load operation and operate properly; with $\pm 40\%$ of rated input voltage, it can withstand that for 1 second.

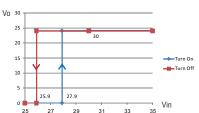
■ Input Under-Voltage Protection

If input voltage drops below Vimin, the internal control IC shuts down and there is no output voltage. It recovers automatically when input voltage reaches above Vimin, please refer to the cruve below.

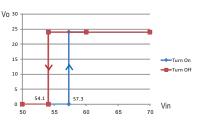
RSD-200B-24



RSD-200C-24



RSD-200D-24

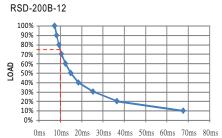


■ Inrush Current

Inrush current is suppressed by a resistor during the initial start-up, and then the resistor is bypassed by a MOSFET to reduce power consumption after accomplishing the start-up.

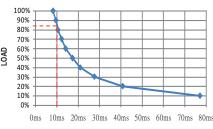
■ Hold-up Time

• EN50155: 2007 version - D type is in compliance with S2 level, while B and C types are in compliance with S1 level at full load output condition. To fulfil the requirements of S2 level, B and C types require de-rating their output load to 70%, please refer to the curve diagrams below.



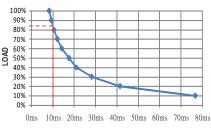
TIME

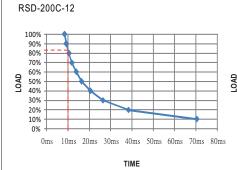
RSD-200B-24



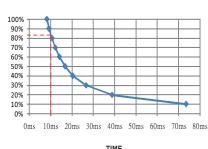
TIME

KSD-200B-40

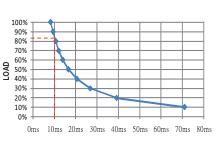




RSD-200C-24



RSD-200C-48



EN50155: 2017 version - Comply with S1 level

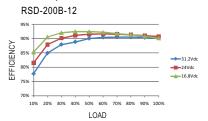
Output Voltage Adjustment

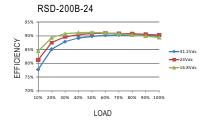
This function is optional, which the standard product does not have it. If you do need the function, please contact MW for details.

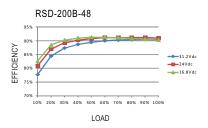


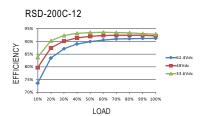
■ Efficiency vs Load & Vin Curve

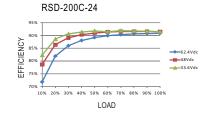
The efficiency vs load & Vin curves of each model are shown as below.

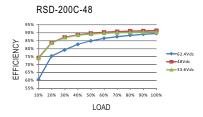


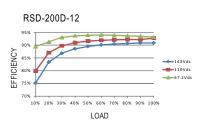


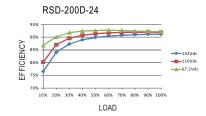


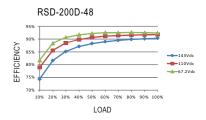










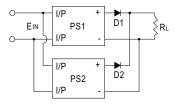


■ Parallel and Series Connection

A.Operation in Parallel

Since RSD-200 series don't have built-in parallel circuit, it can only use external circuits to achieve the redundant operation but not increase the current rating.

1.Add a diode at the positive-output of each power supply (as shown as below), the current rating of the diode should be larger than the maximum output current rating and attached to a suitable heat sink. This is only for redundant use (increase the reliability of the system) and users have to check suitability of the circuit by themselves.

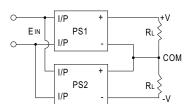


2. When using S.P.S. in parallel connection, the leakage current will increase at the same time. This could pose as a shock hazard for the user. So please contact the supplier if you have this kind of application.

B.Operation in Series

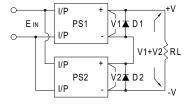
RSD-200 can be operated in series. Here are the methods of doing it:

1. Positive and negative terminals are connected as shown as below. According to the connection, you can get the positive and negative output voltages for your loads.



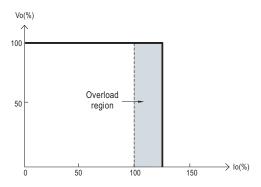


2. Increase the output voltage (current does not change). Because RSD-200 series have no reverse blocking diode in the unit, you should add an external blocking diode to prevent the damage of every unit while starting up. The voltage rating of the external diode should be larger than V1+V2 (as shown as below).



■ Overload Protection

If the output draw up to 105~135% of its output power rating, the converter will go into overload protection which is constant current mode. After the faulty condition is removed, it will recover automatically. Please refer to the diagram below for the detail operation characteristic. Please note that it's not suitable to operate within the overload region continuously, or it may cause to over temperature and reduce the life of the power supply unit or even damage it.



■ Over Voltage Protection

The converter shuts off to protect itself when the output voltage drawn exceeds 115~135% of its output rating. It must be repowered on to recover.

Over Temperature Protection

The converter shuts off to protect itself when the built-in temperature sensor mounted on the main power transformer senses a high temperature. The output recovers automatically if the temperature drops below the limit.

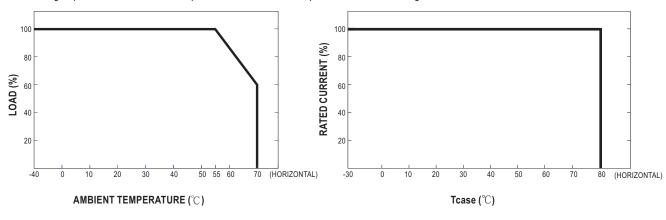
■ LED Indicator

Equipped with a built-in LED indicator, the converter provides an easy way for users to check its condition through the LED indicator. Green: normal operation; No signal: no power or failure.

■ Derating Curve

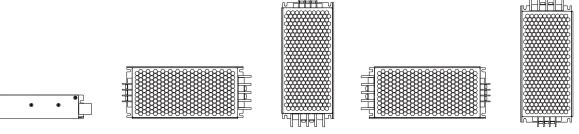
a.Single unit operation

If the unit has no iron plate mounted on its bottom, the maximum ambient temperature for the unit will be 55° C as operating under full load condition. It requires de-rating output current when ambient temperature is between $55-70^{\circ}$ C, please refer to the de-rating curve as below.



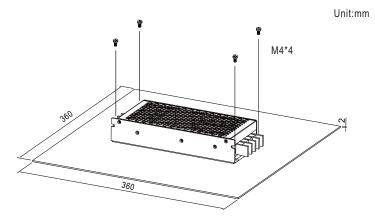


Suitable installation methods are shown as below. Since RSD-200 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.

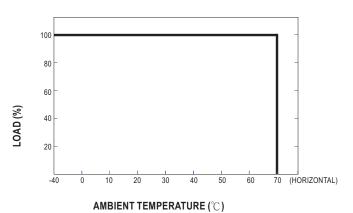


b. Operate with additional iron plate

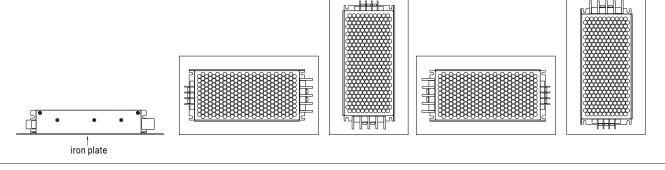
If it is necessary to fulfil the requirements of EN50155 TX level that operate the unit fully-loaded at 70° C, RSD-200 series must be installed onto an iron plate on the bottom. The size of the suggested iron plate is shown as below. In order for optimal thermal performance, the iron plate must have an even & smooth surface and RSD-200 series must be firmly mounted at the center of the iron plate.



The load vs ambient temperature curve is shown as below.



Suitable installation methods are shown as below. Since RSD-200 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.





■ Immunity to Environmental Conditions

Test method	Standard	Test conditions	Status
Cooling Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 2 hrs/cycle	No damage
Dry Heat Test	EN 50155 section 12.2.4 (Column 2, Class TX) EN 50155 section 12.2.4 (Column 3, Class TX & Column 4, Class TX) EN 60068-2-2		
Damp Heat Test, Cyclic	EN 50155 section 12.2.5 EN 60068-2-30	Temperature: 25°C~55°C Humidity: 90%~100% RH Duration: 48 hrs	PASS
Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 10 mins	PASS
Increased Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 5 hrs	PASS
Shock Test	EN 50155 section 12.2.11 EN 61373	Temperature: 21± 3°C Humidity: 65 ± 5% Duration: 30ms*18	PASS
Low Temperature Storage Test	mperature Storage Test EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1		PASS
Salt Mist Test	EN 50155 section 12.2.10 (Class ST4)	Temperature: 35°C ±2°C Duration: 96 hrs	PASS

■ EN45545-2 Fire Test Conditions

Test Ite	Test Items Hazard Level				
Items Standard		Standard	HL1	HL2	HL3
	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS
R22	Smoke density test	EN 45545-2:2013 EN ISO 5659-2:2006	PASS	PASS	PASS
	Smoke toxicity test	EN 45545-2:2013 NF X70-100:2006	PASS	PASS	PASS
R24	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS
R25	Glow-wire test	EN 45545-2:2013 EN 60695-2-11:2000	PASS	PASS	PASS
R26	Vertical flame test	EN 45545-2:2013 EN 60695-11:2003	PASS	PASS	PASS



RSD-300 series



GTIN CODE



MW Search: https://www.meanwell.com/serviceGTIN.aspx

Features:

- Compliance to BS EN/EN50155 and BS EN/EN45545-2 railway standard
- 2:1 wide input range
- Protections: Short circuit / Overload / Over voltage / Over temperature / Input reverse polarity
- 4000VDC I/O isolation
- Cooling by free air convection
- Half encapsulated
- Built-in constant current limiting circuit
- 1U low profile 40mm
- All using 105[°]C long life electrolytic capacitors
- LED indicator for power on
- 100% full load burn-in test
- 3 years warranty



SPECIFICATION UL62368-1 AS/NZS62368-1 TPTC004 IEC62368-MODEL RSD-300B-5 RSD-300B-12 RSD-300B-24 RSD-300C-5 RSD-300C-12 RSD-300C-24 RSD-300C-48 RSD-300B-48 DC VOLTAGE 5V 12V 24V 48V 12V 48V RATED CURRENT 42A 22 5A 11.3A 5 7A 25A 12 5A 6 3A **CURRENT RANGE** 0 ~ 42A 0 ~ 22.5A 0 ~ 11.3A 0 ~ 5.7A 0 ~ 42A 0 ~ 25A 0 ~ 12.5A 0 ~ 6.3A RATED POWER 210W 270W 271.2W 273.6W 210W 300W 300W 302.4W RIPPLE & NOISE (max.) Note.2 100mVp-p 120mVp-p 150mVp-p 180mVp-p 100mVp-p 120mVp-p 150mVp-p 180mVp-p OUTPUT VOLTAGE TOLERANCE Note.3 ±2.0% $\pm 2.0\%$ ±2.0% +20% ±2.0% ±2.0% $\pm 2.0\%$ ±2.0% LINE REGULATION $\pm 0.5\%$ $\pm 0.3\%$ $\pm 0.2\%$ $\pm 0.5\%$ $\pm 0.5\%$ $\pm 0.3\%$ ±0.2% ±0.5% LOAD REGULATION ±1.0% ±1.0% ±1.0% ±1.0% ±1.0% ±1.0% ±1.0% $\pm 1.0\%$ SETUP. RISE TIME 800ms, 50ms at full load HOLD UP TIME (Typ.) Please refer to page 5,6 Hold up Time(Load de-rating curve) CONTINUOUS 16.8 ~ 31.2VDC 33 6 ~ 62 4VDC VOLTAGE RANGE 14.4 ~ 33.6VDC 28.8 ~ 67.2VDC 1 SEC. INPUT EFFICIENCY (Typ.) 89% 89.5% 90% 91.5% 90.5% 91% 91.5% 92% DC CURRENT (Typ.) 9.7A/24V 14.6A/24V 14.6A/24V 14.6A/24V 4.8A/48V 7.2A/48V 7.2A/48V 7.2A/48V **INRUSH CURRENT (Typ.)** 45A/24VDC 45A/48VDC EN50155:2007-B/C- type comply with S1 level @ full load, comply with S2 level @ 70% load INTERRUPTION OF VOLTAGE SUPPLY EN50155:2017-Comply with S1 level 105 ~ 135% rated output power **OVERLOAD** Protection type: Constant current limiting, recovers automatically after fault condition is removed 13.8 ~ 16.2V | 27.6 ~ 32.4V | 55.2 ~ 64.8V | 5.75 ~ 7V 5.75 ~ 7V **PROTECTION** 13.8 ~ 16.2V | 27.6 ~ 32.4V | 55.2 ~ 64.8V **OVER VOLTAGE** Protection type: Shut down o/p voltage, re-power on to recover OVER TEMPERATURE Shut down o/p voltage, recovers automatically after temperature goes down -40 ~ +55°C (no derating); +70°C @ 60% load by free air convection; +70°C no derating with external base plate, TX class compliance WORKING TEMP. 5 ~ 95% RH non-condensing **WORKING HUMIDITY** ENVIRONMENT -40 ~ +85°C STORAGE TEMP. TEMP. COEFFICIENT $\pm 0.03\%$ /°C (0 ~ 55°C) VIRRATION 10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: compliance to IEC61373 **OPERATING ALTITUDE** SAFETY STANDARDS IEC 62368-1, UL 62368-1, AS/NZS 62368-1, EAC TP TC 004 approved, Design refer to BS EN/EN62368-1 WITHSTAND VOLTAGE I/P-O/P:4KVDC I/P-FG:2.5KVDC O/P-FG:2.5KVDC **SAFETY &** ISOLATION RESISTANCE I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C/ 70% RH **EMC** Compliance to BS EN/EN55032 (CISPR32) Conduction Emission: Class A, Radiation Emission: Class B, EAC TP TC 020 **EMC EMISSION** (Note 5) **EMC IMMUNITY** Compliance to BS EN/EN61000-4-2,3,4,5,6,8, BS EN/EN55035, light industry level, EAC TP TC 020 **RAILWAY STANDARD** BS EN/EN50155 / IEC60571 including IEC61373 for shock & vibration, BS EN/EN50121-3-2 for EMC; BS EN/EN45545-2 for fire protection MTBF 1850.1K hrs min. Telcordia SR-332 (Bellcore); 130.8K hrs min. MIL-HDBK-217F (25°C) **OTHERS DIMENSION** 216*96.5*40mm (L*W*H) 1.19Kg; 12pcs/15.3Kg/0.97CUFT PACKING 1. All parameters NOT specially mentioned are measured at 24,48VDC input, rated load and 25°C of ambient temperature. NOTE 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 μ F & 47 μ F parallel capacitor. 3. Tolerance: includes set up tolerance, line regulation and load regulation. 4. Strongly recommended that external output capacitance should not exceed 5000uF. (Only for: RSD-300-5 / -12) 5. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to

- perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on https://www.meanwell.com//Upload/PDF/EMI_statement_en.pdf)
- The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft).
- % Product Liability Disclaimer: For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx





RSD-300 series

User's Manual





■ Features :

- Compliance to BS EN/EN50155 and BS EN/EN45545-2 railway standard
- 2:1 wide input range
- Protections: Short circuit / Overload / Over voltage / Over temperature / Input reverse polarity
- 4000VDC I/O isolation
- Cooling by free air convection
- Half encapsulated
- Built-in constant current limiting circuit
- * 1U low profile 40mm
- All using 105°C long life electrolytic capacitors
- · LED indicator for power on
- 100% full load burn-in test
- 3 years warranty



GTIN CODE

 $\textbf{MW Search:} \ \underline{\textbf{https://www.meanwell.com/serviceGTIN.aspx}}$

CD			CAT	ION
Эr	ᆫ	IFI	CAI	IUN

RSD-300E-12 RSD-300E-24 RSD-300E-48 MODEL RSD-300D-5 RSD-300D-12 RSD-300D-24 RSD-300D-48 RSD-300E-5 DC VOLTAGE 5V 12V 24V 48V RATED CURRENT 12 5A 6 3A 25A 12 5A 6 3A **CURRENT RANGE** 0 ~ 42A 0 ~ 25A 0 ~ 12.5A 0~6.3A 0 ~ 42A 0 ~ 25A 0 ~ 12.5A 0 ~ 6.3A RATED POWER 210W 300W 300W 302.4W 210W 300W 300W 302.4W RIPPLE & NOISE (max.) Note.2 100mVp-p 120mVp-p 150mVp-p 180mVp-p 100mVp-p 120mVp-p 150mVp-p 180mVp-p OUTPUT VOLTAGE TOLERANCE Note.3 ±2.0% $\pm 2.0\%$ $\pm 2.0\%$ +20% ±2.0% ±2.0% $\pm 2.0\%$ ±2.0% LINE REGULATION $\pm 0.5\%$ ±0.2% $\pm 0.2\%$ $\pm 0.5\%$ $\pm 0.5\%$ $\pm 0.3\%$ ±0.2% $\pm 0.5\%$ LOAD REGULATION ±1.0% ±1.0% ±1.0% ±1.0% ±1.0% ±1.0% ±1.0% $\pm 1.0\%$ SETUP. RISE TIME 800ms, 50ms at full load HOLD UP TIME (Typ.) Please refer to page 5,6 Hold up Time(Load de-rating curve) CONTINUOUS 67.2 ~ 143VDC 25.2 ~ 46.8VDC VOLTAGE RANGE 57.6 ~ 154VDC 21.6 ~ 50.4VDC 1 SEC. INPUT EFFICIENCY (Typ.) 90% 91.5% 91.5% 91.5% 88% 90% 91% 91% DC CURRENT (Typ.) 2.1A/110V 3.1A/110V 3.1A/110V 3.1A/110V 6.5A/36V 9.2A/36V 9.2A/36V 9.2A/36V **INRUSH CURRENT (Typ.)** 45A/110VDC 45A/36VDC EN50155:2007-D-type and E-5 comply with S2 level @ full load; other E- type comply with S1 level @ full load, comply with S2 level @ 70% load INTERRUPTION OF VOLTAGE SUPPLY EN50155:2017-Comply with S1 level 105 ~ 135% rated output power **OVERLOAD** Protection type: Constant current limiting, recovers automatically after fault condition is removed 13.8 ~ 16.2V | 27.6 ~ 32.4V | 55.2 ~ 64.8V | 5.75 ~ 7V **PROTECTION** 5.75 ~ 7V 13.8 ~ 16.2V | 27.6 ~ 32.4V | 55.2 ~ 64.8V **OVER VOLTAGE** Protection type: Shut down o/p voltage, re-power on to recover OVER TEMPERATURE Shut down o/p voltage, recovers automatically after temperature goes down -40 ~ +55°C (no derating); +70°C @ 60% load by free air convection; +70°C no derating with external base plate, TX class compliance WORKING TEMP. 5 ~ 95% RH non-condensing **WORKING HUMIDITY** ENVIRONMENT -40 ~ +85°C STORAGE TEMP. TEMP. COEFFICIENT $\pm 0.03\%$ /°C (0 ~ 55°C) VIBRATION 10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: compliance to IEC61373 **OPERATING ALTITUDE** SAFETY STANDARDS IEC 62368-1, UL 62368-1, AS/NZS 62368-1, EAC TP TC 004 approved, Design refer to BS EN/EN62368-1 WITHSTAND VOLTAGE I/P-O/P:4KVDC I/P-FG:2.5KVDC O/P-FG:2.5KVDC **SAFETY &** I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH ISOLATION RESISTANCE **EMC** Compliance to BS EN/EN55032 (CISPR32) Conduction Emission: Class A, Radiation Emission: Class B, EAC TP TC 020 **EMC EMISSION** (Note 5) Compliance to BS EN/EN61000-4-2,3,4,5,6,8, BS EN/EN55035, light industry level, EAC TP TC 020 **EMC IMMUNITY RAILWAY STANDARD** BS EN/EN50155 / IEC60571 including IEC61373 for shock & vibration, BS EN/EN50121-3-2 for EMC; BS EN/EN45545-2 for fire protection MTBF 1850.1K hrs min. Telcordia SR-332 (Bellcore); 130.8K hrs min. MIL-HDBK-217F (25°C) **OTHERS DIMENSION** 216*96.5*40mm (L*W*H) 1.19Kg; 12pcs/15.3Kg/0.97CUFT PACKING 1. All parameters NOT specially mentioned are measured at 36,110VDC input, rated load and 25°C of ambient temperature. NOTE 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 µ F & 47 µ F parallel capacitor. 3. Tolerance: includes set up tolerance, line regulation and load regulation. 4. Strongly recommended that external output capacitance should not exceed 5000uF. (Only for: RSD-300-5 / -12) 5. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on https://www.meanwell.com//Upload/PDF/EMI_statement_en.pdf) The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft). ※ Product Liability Disclaimer: For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx





■ Features :

- Compliance to BS EN/EN50155 and BS EN/EN45545-2 railway standard
- 2:1 wide input range
- Protections: Short circuit / Overload / Over voltage / Over temperature / Input reverse polarity
- 4000VDC I/O isolation
- Cooling by free air convection
- Half encapsulated
- Built-in constant current limiting circuit
- 1U low profile 40mm
- All using 105°C long life electrolytic capacitors
- LED indicator for power on
- 100% full load burn-in test
- 3 years warranty



User's Manual

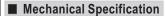
GTIN CODE

 $\textbf{MW Search:} \ \underline{\textbf{https://www.meanwell.com/serviceGTIN.aspx}}$

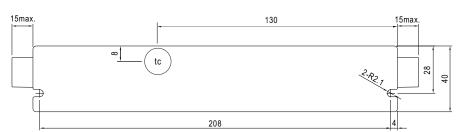
MODEL			RSD-300F-5	RSD-300F-12	RSD-300F-24	RSD-300F-48		
	DC VOLTAG	E	5V	12V	24V	48V		
	RATED CUR	RENT	42A	25A	12.5A	6.3A		
	CURRENT RANGE		0 ~ 42A	0 ~ 25A	0 ~ 12.5A	0 ~ 6.3A		
	RATED POW	ER	210W	300W	300W	302.4W		
OUTDUT	RIPPLE & NO	DISE (max.) Note.2	100mVp-p	120mVp-p	150mVp-p	180mVp-p		
OUTPUT	VOLTAGE TO	LERANCE Note.3	±2.0%	±2.0%	±2.0%	±2.0%		
	LINE REGUL	ATION	±0.5%	±0.3%	±0.2%	±0.5%		
	LOAD REGU	LATION	±1.0%	±1.0%	±1.0%	±1.0%		
	SETUP, RISE	TIME	800ms, 50ms at full load					
	HOLD UP TII	ME (Typ.)	Please refer to page 5,6 Hold u	p Time(Load de-rating curve)				
	VOLTAGE	CONTINUOUS	50.4 ~ 93.6VDC					
	RANGE	1 SEC.	43.2 ~ 100.8VDC					
INPUT	EFFICIENCY	(Typ.)	89%	91%	91%	91.5%		
	DC CURREN		3.25A/72V	4.6A/72V	4.6A/72V	4.6A/72V		
	INRUSH CUF	RRENT (Typ.)	45A/72VDC					
	INTERDURTION	OF VOLTAGE SUPPLY	EN50155:2007-F-type comply wi	th S2 level @ full load				
	INTERRUPTION	OF VOLIAGE SUPPLI	EN50155:2017-Comply with S1 I	evel				
	01/50/ 040		105 ~ 135% rated output power					
	OVERLOAD		Protection type: Constant current limiting, recovers automatically after fault condition is removed					
PROTECTION	OVER VOLTAGE		5.75 ~ 7V	13.8 ~ 16.2V	27.6 ~ 32.4V	55.2 ~ 64.8V		
			Protection type : Shut down o/p voltage, re-power on to recover					
	OVER TEMPERATURE		Shut down o/p voltage, recovers automatically after temperature goes down					
	WORKING TEMP.		-40 ~ +55°C (no derating); +70°C @ 60% load by free air convection; +70°C no derating with external base plate, TX class compliance					
	WORKING HUMIDITY		5 ~ 95% RH non-condensing					
ENVIRONMENT	STORAGE T	EMP.	-40 ~ +85°C					
	TEMP. COEF	FICIENT	±0.03%°C (0~55°C)					
	VIBRATION		10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: compliance to IEC61373					
	-	ALTITUDE	5000 meters					
	SAFETY STA		IEC 62368-1, UL 62368-1, AS/NZS 62368-1, EAC TP TC 004 approved, Design refer to BS EN/EN62368-1					
SAFETY &	WITHSTAND		I/P-O/P:4KVDC I/P-FG:2.5KVDC O/P-FG:2.5KVDC					
EMC		RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH					
(Note 5)	EMC EMISSI		<u> </u>	, ,	: Class A, Radiation Emission: Cl	<u> </u>		
	EMC IMMUN		Compliance to BS EN/EN61000-4-2,3,4,5,6,8, BS EN/EN55035, light industry level, EAC TP TC 020					
	RAILWAY ST	ANDARD	BS EN/EN50155 / IEC60571 including IEC61373 for shock & vibration, BS EN/EN50121-3-2 for EMC; BS EN/EN45545-2 for fire protection					
0711500	MTBF		1850.1K hrs min. Telcordia SR-332 (Bellcore) ; 130.8K hrs min. MIL-HDBK-217F (25°C)					
OTHERS	DIMENSION		216*96.5*40mm (L*W*H)					
	PACKING	stare NOT ensaigl	1.19Kg; 12pcs/15.3Kg/0.97CUFT					
NOTE	 All parameters NOT specially mentioned are measured at 72VDC input, rated load and 25°C of ambient temperature. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 μ F & 47 μ F parallel capacitor. Tolerance: includes set up tolerance, line regulation and load regulation. Strongly recommended that external output capacitance should not exceed 5000uF. (Only for: RSD-300-5 / -12) The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit or a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on https://www.meanwell.com//Upload/PDF/EMI_statement_en.pdf) The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500mm). Product Liability Disclaimer: For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx 					tuted by mounting the unit on tives. For guidance on how to		

Case No.205

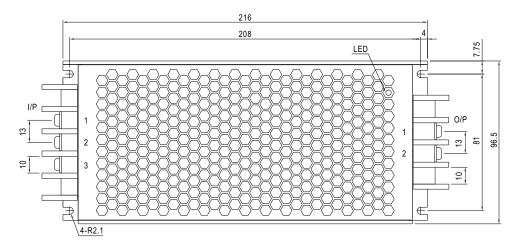


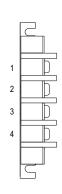


(Unit: mm , tolerance ± 1mm)



• tc : Max. Case Temperature





Input Terminal Pin No. Assignment:

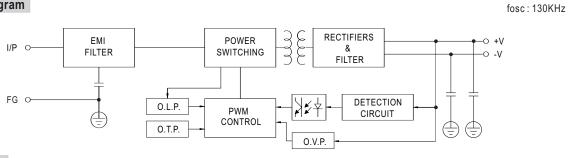
Pin No.	Assignment
1	DC INPUT V+
2	DC INPUT V-
3	FG ±

Output Terminal Pin No. Assignment: (For 12V, 24V, 48V) (For 5V)

1	(101 12 4, 24 4, 40 4)						
	Pin No.	Assignment					
	1	DC OUTPUT -V					
	2	DC OUTPUT +V					

((FUI SV)	
	Pin No.	Assignment
	1,2	DC OUTPUT -V
	3.4	DC OUTPUT +V

■ Block Diagram



■ Input Fuse

There are one or two fuses connected in series to the positive input line, which are used to protect against abnormal surge. Fuse specifications of each model are shown as below.

Type	Fuse Type	Reference and Rating
В	Fast	Littelfuse 257, 30A, 32V
С	Time-Lag	Conquer UDA-A, 16A, 250V
D	Time-Lag	Conquer UDA-A, 8A, 250V
Е	Time-Lag	Conquer UDA-A, 20A, 250V
F	Time-Lag	Conquer UDA-A, 10A, 250V



■ Input Reverse Polarity Protection

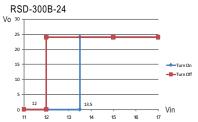
There is a MOSFET connected in series to the negative input line. If the input polarity is connected reversely, the MOSFET opens and there will be no output to protect the unit

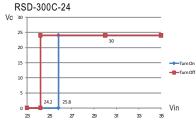
■ Input Range and Transient Ability

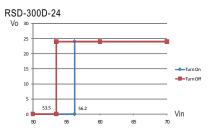
The series has a wide range input capability. Within $\pm 30\%$ of rated input voltage, it can be executed at full-load operation and operate properly; with $\pm 40\%$ of rated input voltage, it can withstand that for 1 second.

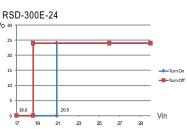
■ Input Under-Voltage Protection

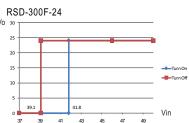
If input voltage drops below Vimin, the internal control IC shuts down and there is no output voltage. It recovers automatically when input voltage reaches above Vimin, please refer to the cruve below.











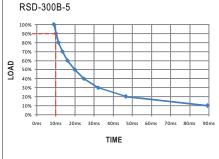
■ Inrush Current

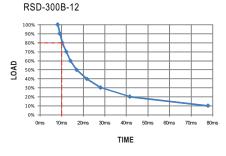
Inrush current is suppressed by a resistor during the initial start-up, and then the resistor is bypassed by a MOSFET to reduce power consumption after accomplishing the start-up.

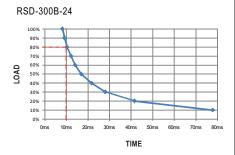
■ Hold-up Time

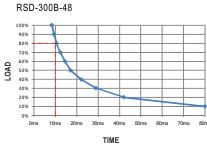
• EN50155: 2007 version - D and F and E-5 types are in compliance with S2 level, while B and C and E types are in compliance with S1 level at full load output condition.

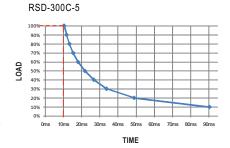
To fulfil the requirements of S2 level, B and C and E types require de-rating their output load to 70%, please refer to the curve diagrams below.

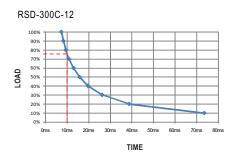






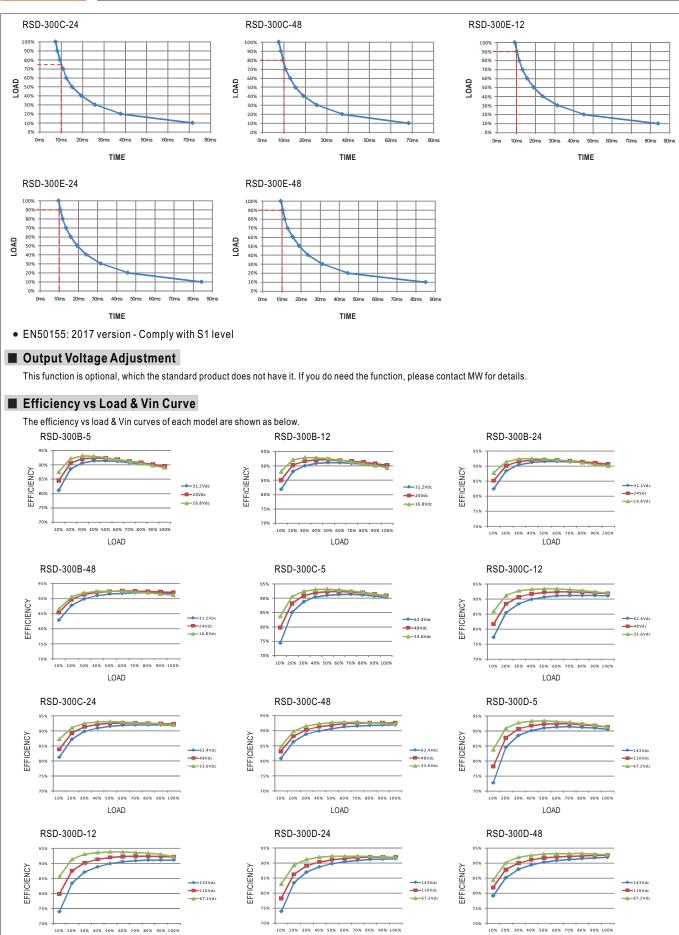








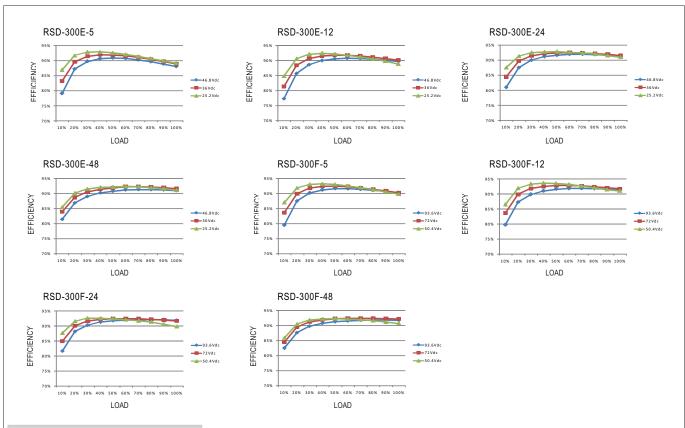
LOAD



LOAD

LOAD



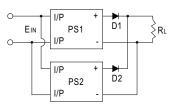


■ Parallel and Series Connection

A.Operation in Parallel

Since RSD-300 series don't have built-in parallel circuit, it can only use external circuits to achieve the redundant operation but not increase the current rating.

1.Add a diode at the positive-output of each power supply (as shown as below), the current rating of the diode should be larger than the maximum output current rating and attached to a suitable heat sink. This is only for redundant use (increase the reliability of the system) and users have to check suitability of the circuit by themselves.

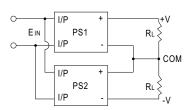


2. When using S.P.S. in parallel connection, the leakage current will increase at the same time. This could pose as a shock hazard for the user. So please contact the supplier if you have this kind of application.

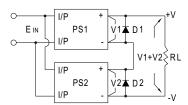
B.Operation in Series

RSD-300 can be operated in series. Here are the methods of doing it:

1. Positive and negative terminals are connected as shown as below. According to the connection, you can get the positive and negative output voltages for your loads.



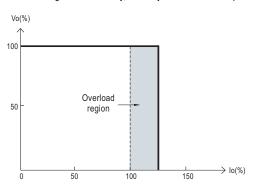
2. Increase the output voltage (current does not change). Because RSD-300 series have no reverse blocking diode in the unit, you should add an external blocking diode to prevent the damage of every unit while starting up. The voltage rating of the external diode should be larger than V1+V2 (as shown as below).





Overload Protection

If the output draw up to 105~135% of its output power rating, the converter will go into overload protection which is constant current mode. After the faulty condition is removed, it will recover automatically. Please refer to the diagram below for the detail operation characteristic. Please note that it's not suitable to operate within the overload region continuously, or it may cause to over temperature and reduce the life of the power supply unit or even damage it.



■ Over Voltage Protection

The converter shuts off to protect itself when the output voltage drawn exceeds 115~140% of its output rating. It must be repowered on to recover.

■ Over Temperature Protection

The converter shuts off to protect itself when the built-in temperature sensor mounted on the main power transformer senses a high temperature. The output recovers automatically if the temperature drops below the limit.

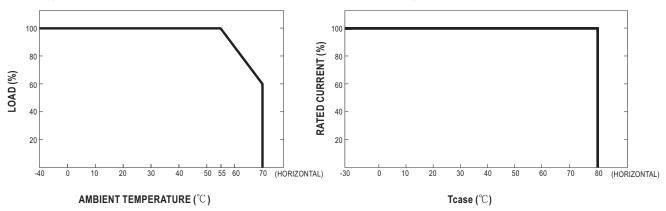
■ LED Indicator

Equipped with a built-in LED indicator, the converter provides an easy way for users to check its condition through the LED indicator. Green: normal operation; No signal: no power or failure.

■ Derating Curve

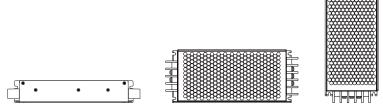
a.Single unit operation

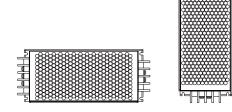
If the unit has no iron plate mounted on its bottom, the maximum ambient temperature for the unit will be 55° C as operating under full load condition. It requires de-rating output current when ambient temperature is between $55-70^{\circ}$ C, please refer to the de-rating curve as below.





Suitable installation methods are shown as below. Since RSD-300 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.

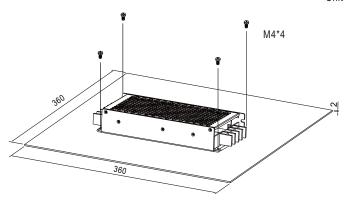




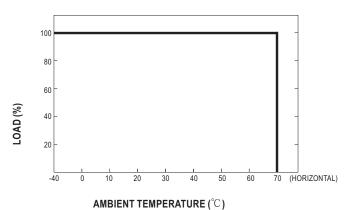
b. Operate with additional iron plate

If it is necessary to fulfil the requirements of EN50155 TX level that operate the unit fully-loaded at 70° C, RSD-300 series must be installed onto an iron plate on the bottom. The size of the suggested iron plate is shown as below. In order for optimal thermal performance, the iron plate must have an even & smooth surface and RSD-300 series must be firmly mounted at the center of the iron plate.

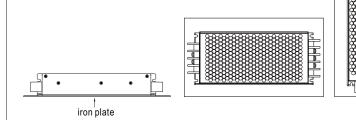
Unit:mm

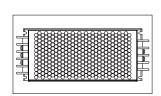


The load vs ambient temperature curve is shown as below.



Suitable installation methods are shown as below. Since RSD-300 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.







■ Immunity to Environmental Conditions

Test method	Standard	Test conditions	Status
Cooling Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 2 hrs/cycle	No damage
Dry Heat Test	Dry Heat Test EN 50155 section 12.2.4 (Column 2, Class TX) EN 50155 section 12.2.4 (Column 3, Class TX & Column 4, Class TX) EN 60068-2-2		
Damp Heat Test, Cyclic	EN 50155 section 12.2.5 EN 60068-2-30	Temperature: 25°C~55°C Humidity: 90%~100% RH Duration: 48 hrs	PASS
Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 10 mins	PASS
Increased Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 5 hrs	PASS
Shock Test	EN 50155 section 12.2.11 EN 61373	Temperature: 21± 3°C Humidity: 65 ± 5% Duration: 30ms*18	PASS
Low Temperature Storage Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 16 hrs	PASS
Salt Mist Test	EN 50155 section 12.2.10 (Class ST4)	Temperature: 35°C ±2°C Duration: 96 hrs	PASS

■ EN45545-2 Fire Test Conditions

Test Ite	Test Items		Hazard Level		
	Items Standard		HL1	HL2	HL3
Oxygen index test		EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS
R22	Smoke density test	EN 45545-2:2013 EN ISO 5659-2:2006	PASS	PASS	PASS
	Smoke toxicity test	EN 45545-2:2013 NF X70-100:2006	PASS	PASS	PASS
R24	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS
R25	Glow-wire test	EN 45545-2:2013 EN 60695-2-11:2000	PASS	PASS	PASS
R26	Vertical flame test	EN 45545-2:2013 EN 60695-11:2003	PASS	PASS	PASS





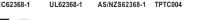












Features

- Compliance to BS EN/EN50155 and BS EN/EN45545-2 railway standard
- 1U low profile 41mm
- 2:1 wide input range
- Fanless design, half encapsulated, cooling by free air convection
- -40~+80°C wide operating temperature
- · DC output adjustable
- Protections: Short circuit / Overload / Over voltage /
 Over temperature / Input reverse polarity/
 Input under voltage protection
- 4KVdc I/O isolation(Reinforced isolation)
- Operating additude up to 5000 meters(Note.5)
- · LED indicator for power on
- · 3 years warranty

Ğ











Applications

- Bus,tram,metro or railway system
- · Industrial control system
- Semi-conductor fabrication equipment
- Factory automation
- Electro-mechanical
- · Wireless network
- Telecom or datacom system
- Highly vibrating, highly dusty, extremely low or high temperature harsh environment

■ GTIN CODE

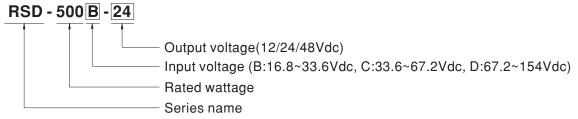
MW Search: https://www.meanwell.com/serviceGTIN.aspx

Description

RSD-500 series is a 500W enclosed type reliable railway DC-DC converter. This series is compliant with BS EN/EN50155/BS EN/EN45545-2 railway standard, constituting three types of models with 2:1 wide but different input ranges 16.8~33.6V/33.6~67.2V/67.2~154V, suitable for railway and all kinds of transportation systems exploiting the frequently used standard input voltages such as 24V, 36V, 48V, 72V, 96V and 110V. Various output voltages, 12V, 24V and 48V are available for selection.

This series has the capability of working under -40~+80°C, low ripple and noise, supreme EMC characteristics, 4KVdc I/O isolation, low enclosure profile 41mm and an interior with semi-potted silicone. It does not only well fits the in-car systems or the facilities by rails for railway, trams and buses but also can be used in the harsh environment with high vibration, high dust, extremely low or high temperature, etc.

■ Model Encoding





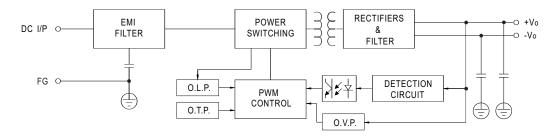
500W Enclosed Type Reliable Railway DC-DC Converter RSD-500 series

SPECIFICATION

DC VOLTAGE RATED CURRENT	12V	24V	40) /						
RATED CURRENT		_ T V	48V	12V	24V	48V	12V	24V	48V
	35A	17.5A	8.8A	35A	19.2A	9.6A	35A	20.8A	10.4A
CURRENT RANGE	0 ~ 35A	0 ~ 17.5A	0~8.8A	0 ~ 35A	0 ~ 19.2A	0 ~ 9.6A	0 ~ 35A	0 ~ 20.8A	0 ~ 10.4A
RATED POWER	420W	420W	422.4W	420W	460.8W	460.8W	420W	499.2W	499.2W
RIPPLE & NOISE (max.) Note.2	100mVp-p	120mVp-p	150mVp-p	100mVp-p	120mVp-p	150mVp-p	100mVp-p	120mVp-p	150mVp-p
VOLTAGE ADJ. RANGE	12 ~ 14V	24 ~ 28V	48~ 56V	12 ~ 14V	24 ~ 28V	48~ 56V	12 ~ 14V	24 ~ 28V	48~ 56V
VOLTAGE TOLERANCE Note.3	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
LINE REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
LOAD REGULATION	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
SETUP, RISE TIME	500ms, 60ms								
HOLD UP TIME (Typ.)	Please refer	to page 4 hold	up time (Load	de-rating curv	/e)				
VOLTAGE CONTINUOUS	16.8 ~ 33.6Vd	<u>. с</u>	. ,	33.6 ~ 67.2V	dc		67.2 ~ 154Vd	lc	
RANGE 1s	14.4 ~ 16.8Vd	С		28.8 ~ 33.6V	dc		57.6 ~ 67.2V	dc	
	92%	92%	92%	93%	93%	93%	93%	93%	93%
	21.5A @24Vd	dc		11A @48Vdc			5A @110Vdc		
() . ,	30A	· ·							
(),	FN50155:201	7-B/C/D type c	omply with S1 I	evel (3ms)@ fu	II load.				
VOLTAGE SUPPLY						comply with S2	level (10ms) @	full load	
OVERLOAD	Constant curr	ent limiting 105	5~135% rated of	output power w	ith auto-recove	ry			
OVER VOLTAGE	14.4 ~ 17.5V	28.8 ~ 35V	57.6 ~ 65V	14.4 ~ 17.5V	28.8 ~ 35V	57.6 ~ 65V	14.4 ~ 17.5V	28.8 ~ 35V	57.6 ~ 65V
OVER VOLTAGE	Protection typ	e : Shut down	o/p voltage, re	-power on to re	cover				
OVER TEMPERATURE	Shut down o/p	voltage, re-po	ower on to reco	ver					
REVERSE POLARITY	By internal, M	OSFET, no dar	mage, recovers	automatically	after fault cond	lition is remove	ed		
UNDER VOLTAGE LOCKOUT							110Vin :Power		
WORKING TEMP			tina Curve")		011 < 001			011 < 001	
,									
	(/								
-									
					oo+ approved,	Design refer to	DO LIV/LIVOZO	100-1	
					0 70 1 (11	Test Lev	el / Note		
	Conducted)32 (CISRP32)	Class A			
EMC EMISSION									
					,				
					000-4-2			3 6KV contact	· criteria A
EMC IMMUNITY									
	-						<u> </u>		
					voro, zivvizino z	ino i o ,ontona i			
RAILWAY STANDARD	Compliance to BS EN/EN45545-2 for fire protection; BS EN/EN50155 / IEC60571 including IEC61373 for shock & vibration,							ration,	
MTBF				llcore) · qq ·	IK hrs min	MII -HDRK-21	7F (25°C)		
			14 OIL 002 (DE	110010), 00.	TETHIOTHIII.	L 110011-Z1	11 (200)		
Ripple & noise are measure Tolerance: includes set up Derating may be needed ur The ambient temperature de The power supply is consident the EMC directives. For guidas available on https://www.	red at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a $0.1\mu f$ & $47\mu f$ parallel capacitor. In the tolerance, line regulation and load regulation. Under low input voltage. Please check the derating curve for more details. Indeed to represent the transport of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m (6500ft). Indeed as an independent unit, but the final equipment still need to re-confirm that the whole system complies with unit and the perform these EMC tests, please refer to "EMI testing of component power supplies." We will be a composed to the final equipment of the								
	VOLTAGE ADJ. RANGE VOLTAGE TOLERANCE Note.3 LINE REGULATION SETUP, RISE TIME HOLD UP TIME (Typ.) VOLTAGE RANGE Note.4 1s EFFICIENCY (Typ.) DC CURRENT (Typ.) INRUSH CURRENT (Typ.) INTERRUPTION OF VOLTAGE SUPPLY OVERLOAD OVER VOLTAGE OVER TEMPERATURE REVERSE POLARITY UNDER VOLTAGE LOCKOUT WORKING TEMP. WORKING HUMIDITY STORAGE TEMP., HUMIDITY TEMP. COEFFICIENT VIBRATION OPERATING ALTITUDE Note.5 SAFETY STANDARDS WITHSTAND VOLTAGE ISOLATION RESISTANCE EMC EMISSION MTBF DIMENSION PACKING 1. All parameters NOT special 2. Ripple & noise are measure 3. Tolerance: includes set up 4. Derating may be needed ur 5. The ambient temperature de 6. The power supply is conside the EMC directives. For guid (as available on https://www.	VOLTAGE ADJ. RANGE	VOLTAGE ADJ. RANGE	VOLTAGE ADJ. RANGE	VOLTAGE ADJ. RANGE 12 - 14V 24 - 28V 48 - 56V 12 - 14V VOLTAGE TOLERANCE Note.3	VOLTAGE ADJ. RANGE 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V VOLTAGE TOLERANCE Note.3 ± 1.0% ± 1.0%	VOLTAGE ADJ. RANGE 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 12 - 14V 24 - 28V 48 - 56V 14 - 10% 12 - 10%	VOLTAGE TOLERANCE Notes 3 ±1.0% ±1.	VOLTAGE TOLERANCE VOLTAGE TOLERANCE VOLTAGE TOLERANCE NOTE TOLERANCE VOLTAGE TOLERANCE NOTE TOLERANCE 10% ±1.0% ±

■ Block Diagram

fosc: 67KHz



■ Input Fuse

There are two or three fuses connected in series to the positive input line, which are used to protect against abnormal surge. Fuse specifications of each model are shown as below.

Type	Fuse Type	Reference and Rating
— /'	, ,	
В	Time-Lag	WALTER WN 20, 20A, 500V *2
С	Time-Lag	Conquer MST, 10A, 250V *3
D	Time-Lag	Conquer MST, 10A, 250V *2

■ Input Reverse Polarity Protection

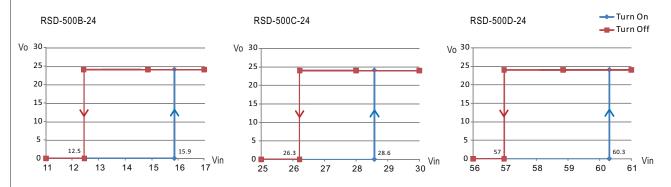
There is a MOSFET connected in series to the negative input line. If the input polarity is connected reversely, the MOSFET opens and there will be no output to protect the unit.

■ Input Range and Transient Ability

The series has a wide range input capability. Within ±30% of rated input voltage, it can be executed at full-load operation and operate properly; with \pm 40% of rated input voltage, it can withstand that for 1 second.

■ Input Under-Voltage Protection

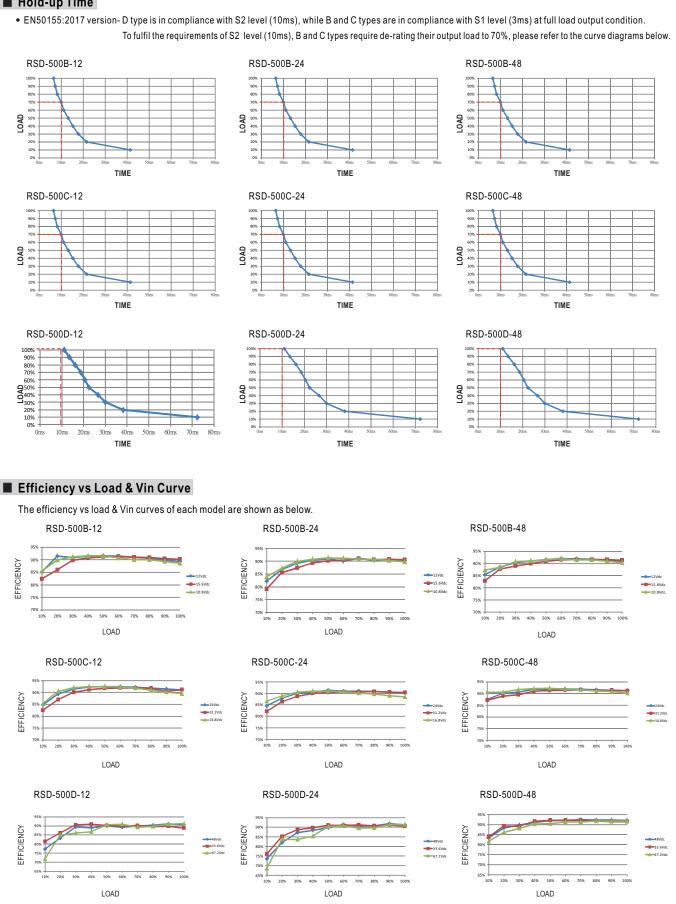
If input voltage drops below Vimin, the internal control IC shuts down and there is no output voltage. It recovers automatically when input voltage reaches above Vimin, please refer to the cruve below.



■ Inrush Current

Inrush current is suppressed by a resistor during the initial start-up, and then the resistor is bypassed by a Relay to reduce power consumption after accomplishing the start-up.

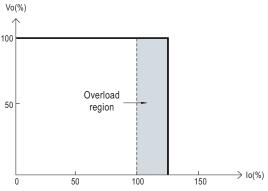
■ Hold-up Time





■ Overload Protection

If the output draw up to 105~135% of its output power rating, the converter will go into overload protection which is constant current mode. After the faulty condition is removed, it will recover automatically. Please refer to the diagram below for the detail operation characteristic. Please note that it's not suitable to operate within the overload region continuously, or it may cause to over temperature and reduce the life of the power supply unit or even damage it.



■ Over Voltage Protection

The converter shuts off to protect itself when the output voltage drawn exceeds 115~140% of its output rating. It must be repowered on to recover.

■ Over Temperature Protection

The converter shuts off to protect itself when the built-in temperature sensor mounted on the main power transformer senses a high temperature. It must be repowered on to recover.

■ LED Indicator

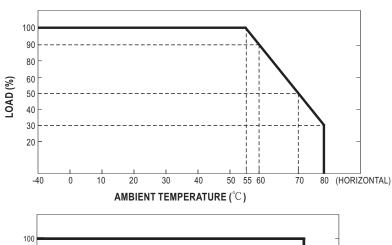
Equipped with a built-in LED indicator, the converter provides an easy way for users to check its condition through the LED indicator. Green: normal operation;

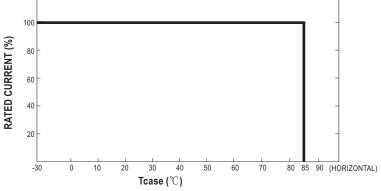
No signal: no power or failure.

■ Derating Curve

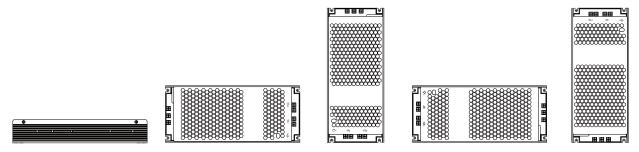
a.Single unit operation

If the unit has no iron plate mounted on its bottom, the maximum ambient temperature for the unit will be 55° C as operating under full load condition. It requires de-rating output current when ambient temperature is between $55 \sim 80^{\circ}$ C, please refer to the de-rating curve as below.



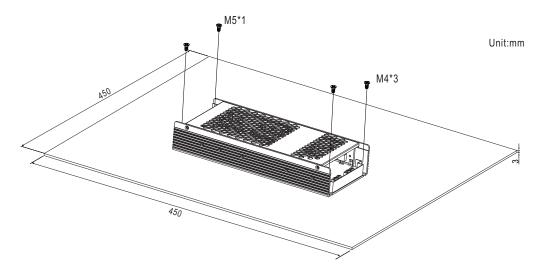


Suitable installation methods are shown as below. Since RSD-500 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.

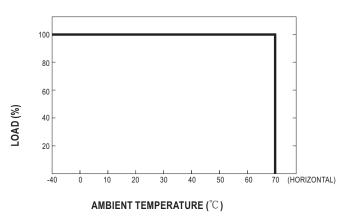


b.Operate with additional iron plate

If it is necessary to fulfil the requirements of EN50155 TX level that operate the unit fully-loaded at 70° C, RSD-500 series must be installed onto an iron plate on the bottom. The size of the suggested iron plate is shown as below. In order for optimal thermal performance, the iron plate must have an even & smooth surface and RSD-500 series must be firmly mounted at the center of the iron plate.

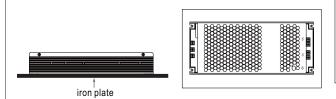


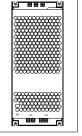
The load vs ambient temperature curve is shown as below.

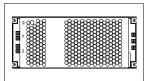


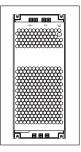
Suitable installation methods are shown as below. Since RSD-500 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.











■ Immunity to Environmental Conditions

Test method	Standard	Test conditions	Status
Cooling Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 2 hrs/cycle	No damage
Dry Heat Test	EN 50155 section 12.2.4 (Column 2, Class TX) EN 50155 section 12.2.4 (Column 3, Class TX & Column 4, Class TX) EN 60068-2-2	Temperature: 70°C / 85°C Duration: 6 hrs / 10min	PASS
Damp Heat Test, Cyclic	EN 50155 section 12.2.5 EN 60068-2-30	Temperature: 25°C~55°C Humidity: 90%~100% RH Duration: 48 hrs	PASS
Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 10 mins	PASS
Increased Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 5 hrs	PASS
Shock Test	EN 50155 section 12.2.11 EN 61373	Temperature: $21\pm3^{\circ}\text{C}$ Humidity: $65\pm5\%$ Duration: $30\text{ms*}18$	PASS
Low Temperature Storage Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 16 hrs	PASS
Salt Mist Test	EN 50155 section 12.2.10 (Class ST4)	Temperature: 35°C ±2°C Duration: 48 hrs	PASS

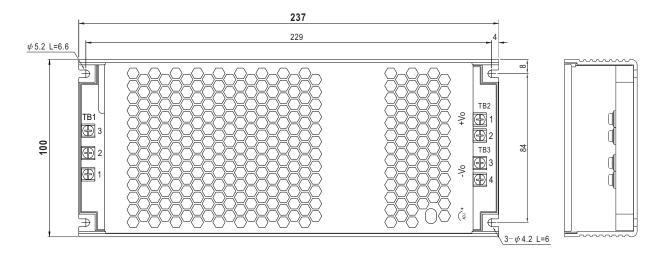
■ EN45545-2 Fire Test Conditions

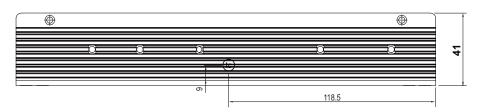
Test Items			Hazard Level		
	Items	Standard	HL1	HL2	HL3
	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS
R22	Smoke density test	EN 45545-2:2013 EN ISO 5659-2:2006	PASS	PASS	PASS
	Smoke toxicity test	EN 45545-2:2013 NF X70-100:2006	PASS	PASS	PASS
R24	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS
R25	Glow-wire test	EN 45545-2:2013 EN 60695-2-11:2000	PASS	PASS	PASS
R26	Vertical flame test	EN 45545-2:2013 EN 60695-11:2003	PASS	PASS	PASS

■ Mechanical Specification

(Unit: mm, tolerance ± 1mm)

Case No.270C





• (tc) : Max. Case Temperature

Input Terminal Pin No. Assignment (TB1)

Pin No.	Assignment
1	DC input +Vin
2	DC input -Vin
3	FG ≟

Output Terminal Pin No. Assignment (TB2,TB3)

Assignment
DC output +Vo
DC output +Vo
DC output -Vo
DC output -Vo

■ Installation Manual

Please refer to : http://www.meanwell.com/manual.html