

DC/DC Power Module for Non-Automotive Transportation

Railway, Off-Road & Industrial Vehicles

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 **DELTA**
Smarter. Greener. Together.

FOR RAILWAY APPLICATION

Delta provides isolated DC/DC power converters in non-automotive transportation industry including all industrial electric-powered vehicles and various railway applications such as drive controls, lighting, safety monitors, and communications systems.

In railway applications, Delta offers 10W to 300W DC/DC converters, under industrial standard footprint and pinout, with features of ultra wide input range and high efficiency, full protection (OTP, input UVLO, output OCP, OVP), Remote ON/OFF, and high isolation (up to 4242Vdc). All products provide high reliability under extremely harsh operating conditions by designing without tantalum capacitors inside of module and possessing outstanding electrical and thermal performance. These converters are designed to meet the European standard EN 50155 and the European fire protection standard EN 45545-2.



Product Introduction



S24SE S24DE

1" x 1" DC/DC Converter

Power: 10-30W
Vin: 9-36V



IEC/EN/UL/CSA 60950-1

S24SP

2" x 1" DC/DC Converter

Power: 40-60W
Vin: 9-36V



Efficiency up to 93.7%
IEC/EN/UL/CSA 62368-1

E35SE

Eighth Brick DC/DC Converter

Power: Max. 150W
Vin: 9-60V



Efficiency up to 92.2%
Wide output voltage trim range
Working altitude up to 5500 m
Operating Base Plate Temp: - 40°C to 105°C
IEC/EN/UL/CSA 62368-1

QA1SV Q80SV

Quarter Brick DC/DC Converter

Power: 200W (QA1SV) 150W (Q80SV)
Vin: 40V-170V (QA1SV)
transient 200/1s
14.4V-170V (Q80SV)
transient 12-14.4V/1s, 170-200/1s

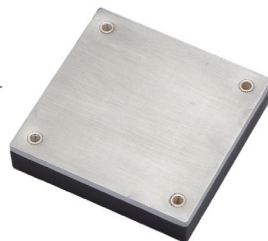


Efficiency up to 90%
Working altitude up to 5000 m
Operating Base Plate Temp: - 40°C to 105°C
IEC/EN/UL/CSA 62368-1

HA0SP

Half Brick DC/DC Converter

Power: 300W
Vin: 40V-160V
transient 200V/1s



Efficiency up to 89%
Parallel operation
Operating Base Plate Temp: - 40°C to 105°C
IEC/EN/UL/CSA 62368-1

H80SV

Half Brick DC/DC Converter

Power: 100-200W
Vin: 16.8~137.5V
transient 14.4V/1s, 200V/1s



Efficiency up to 92.5%
Pin option for hold up time
IEC/EN/UL/CSA 62368-1

Product Specifications

Series	Part Number	Input Voltage	Output Voltage	Vo Trim Range	Output Current	Output Power	Efficiency	Isolation Voltage	Size (LxWxH)
S24SE	S24SE3R303	9~36V	3.3V	2.97~3.63V	3A	10W	87.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24SE05002	9~36V	5V	4.5~5.5V	2A	10W	87.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24SE120R8	9~36V	12V	10.8~13.2V	0.83A	10W	86.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24SE150R6	9~36V	15V	13.5~16.5V	0.67A	10W	87.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24SE3R305	9~36V	3.3V	2.97~3.63V	4.5A	15W	87.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24SE05003	9~36V	5V	4.5~5.5V	3A	15W	89.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24SE12001	9~36V	12V	10.8~13.2V	1.25A	15W	87.5%	1600V	25.4 x 25.4 x 10.2 mm
	S24SE150R9	9~36V	15V	13.5~16.5V	1A	15W	87.5%	1600V	25.4 x 25.4 x 10.2 mm
	S24SE3R306	9~36V	3.3V	2.97~3.63V	6A	20W	87.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24SE05004	9~36V	5V	4.5~5.5V	4A	20W	88.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24SE12002	9~36V	12V	10.8~13.2V	1.67A	20W	88.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24SE15001	9~36V	15V	13.5~16.5V	1.33A	20W	88.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24SE3R307	9~36V	3.3V	2.97~3.63V	7.5A	30W	88.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24SE05006	9~36V	5V	4.5~5.5V	6A	30W	89.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24SE12003	9~36V	12V	10.8~13.2V	2.5A	30W	88.0%	1600V	25.4 x 25.4 x 10.2 mm
S24SE15002	9~36V	15V	13.5~16.5V	2A	30W	88.0%	1600V	25.4 x 25.4 x 10.2 mm	
S24DE	S24DE120R4	9~36V	±12V	-	0.42A	10W	87.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24DE150R3	9~36V	±15V	-	0.33A	10W	87.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24DE120R6	9~36V	±12V	-	0.625A	15W	87.5%	1600V	25.4 x 25.4 x 10.2 mm
	S24DE150R5	9~36V	±15V	-	0.5A	15W	87.5%	1600V	25.4 x 25.4 x 10.2 mm
	S24DE120R8	9~36V	±12V	-	0.83A	20W	88.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24DE150R6	9~36V	±15V	-	0.67A	20W	88.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24DE12001	9~36V	±12V	-	1.25A	30W	88.0%	1600V	25.4 x 25.4 x 10.2 mm
	S24DE15001	9~36V	±15V	-	1A	30W	88.0%	1600V	25.4 x 25.4 x 10.2 mm
S24SP	S24SP05008	9~36V	5V	4.5~5.5V	8A	40W	92.8%	1500V	50.8 x 25.4 x 10.2 mm
	S24SP12004	9~36V	12V	10.8~13.2V	3.5A	40W	92.8%	1500V	50.8 x 25.4 x 10.2 mm
	S24SP15003	9~36V	15V	13.5~16.5V	2.7A	40W	93.7%	1500V	50.8 x 25.4 x 10.2 mm
	S24SP24002	9~36V	24V	21.6~26.4V	1.7A	40W	92.5%	1500V	50.8 x 25.4 x 10.2 mm
	S24SP05012	9~36V	5V	4.5~5.5V	12A	60W	92.4%	1500V	50.8 x 25.4 x 10.2 mm
	S24SP12005	9~36V	12V	10.8~13.2V	5A	60W	92.8%	1500V	50.8 x 25.4 x 10.2 mm
	S24SP15004	9~36V	15V	13.5~16.5V	4A	60W	93.3%	1500V	50.8 x 25.4 x 10.2 mm
	S24SP24003	9~36V	24V	21.6~26.4V	2.5A	60W	93.0%	1500V	50.8 x 25.4 x 10.2 mm
E35SE	E35SE05030	9~60V	5V	4~6V	24A / 30A	Max. 150W	92.2%	4242V	58.4x22.8x13.5mm
	E35SE12013	9~60V	12V	9.6~14.4V	10A / 13A	Max. 150W	91.0%	4242V	58.4x22.8x13.5mm
	E35SE24006	9~60V	24V	19.2~28.8V	5A / 6A	Max. 150W	92.2%	4242V	58.4x22.8x13.5mm
	E35SE48003	9~60V	48V	38.4~57.6V	2.5A / 3A	Max. 150W	91.2%	4242V	58.4x22.8x13.5mm
Q80SV	Q80SV05030	14.4~170V	5V	4~5.5V	30A	150W	88.3%	4242V	60.6 x 39 x 12.7 mm
	Q80SV12013	14.4~170V	12V	9.6~13.2V	12.5A	150W	90.0%	4242V	60.6 x 39 x 12.7 mm
	Q80SV15010	14.4~170V	15V	12~16.5V	10A	150W	89.5%	4242V	60.6 x 39 x 12.7 mm
	Q80SV24006	14.4~170V	24V	19.2~28.3V	6.3A	150W	89.3%	4242V	60.6 x 39 x 12.7 mm
	Q80SV54003	14.4~170V	54V	43.2~59.4V	2.8A	150W	89.5%	4242V	60.6 x 39 x 12.7 mm
QA1SV	QA1SV05040	40~170V	5V	4~5.5V	40A	200W	88.5%	4242V	60.6x 39 x 12.7 mm
	QA1SV12017	40~170V	12V	9.6~13.2V	17A	200W	90.0%	4242V	60.6x 39 x 12.7 mm
	QA1SV15013	40~170V	15V	12~16.5V	13.5A	200W	89.5%	4242V	60.6x 39 x 12.7 mm
	QA1SV24008	40~170V	24V	19.2~28.3V	8.5A	200W	89.5%	4242V	60.6x 39 x 12.7 mm
	QA1SV54004	40~170V	54V	43.2~59.4V	3.7A	200W	89.8%	4242V	60.6x 39 x 12.7 mm
HA0SP	HA0SP12025	40~160V	12V	9.6 ~ 13.2V	25A	300W	89%	4242V	60.6 x 63.1 x 13.1 mm
	HA0SP13822	40~160V	13.8V	11.0 ~ 15.1V	22A	300W	89%	4242V	60.6 x 63.1 x 13.1 mm
	HA0SP15020	40~160V	15V	12.0 ~ 16.5V	20A	300W	89%	4242V	60.6 x 63.1 x 13.1 mm

Series	Part Number	Input Voltage	Output Voltage	Vo Trim Range	Output Current	Output Power	Efficiency	Isolation Voltage	Size (LxWxH)
H80SV	H80SV12008	16.8~137.5V	12V	9.6~13.2V	8.5A	100W	89.0%	4242V	60.6 x 63.1 x 13 mm
	H80SV15007	16.8~137.5V	15V	12~16.5V	7A	100W	92.5%	4242V	60.6 x 63.1 x 13 mm
	H80SV24004	16.8~137.5V	24V	19.2~26.4V	4.2A	100W	88.0%	4242V	60.6 x 63.1 x 13 mm
	H80SV48002	16.8~137.5V	48V	38.4~52.8V	2.1A	100W	90.0%	4242V	60.6 x 63.1 x 13 mm
	H80SV54002	16.8~137.5V	54V	43.2~59.4V	1.9A	100W	90.0%	4242V	60.6 x 63.1 x 13 mm
	H80SV12017	16.8~137.5V	12V	9.6~13.2V	17A	200W	91.0%	4242V	60.6 x 63.1 x 13 mm
	H80SV15013	16.8~137.5V	15V	12~16.5V	13.5A	200W	91.5%	4242V	60.6 x 63.1 x 13 mm
	H80SV24008	16.8~137.5V	24V	19.2~26.4V	8.5A	200W	88.0%	4242V	60.6 x 63.1 x 13 mm
	H80SV48004	16.8~137.5V	48V	38.4~52.8V	4.2A	200W	90.0%	4242V	60.6 x 63.1 x 13 mm
H80SV54004	16.8~137.5V	54V	43.2~59.4V	3.8A	200W	90.6%	4242V	60.6 x 63.1 x 13 mm	

Part Numbering System

S	24	<input type="checkbox"/>	E	XXX	XX	<input type="checkbox"/>	<input type="checkbox"/>	F	<input type="checkbox"/>
Form Factor	Input Voltage	Number of Outputs	Product Series	Output Voltage	Output Current	ON/OFF Logic	Pin Length	RoHS	Option Code
S - Small Size	24 - 9~36V	S - Single D - Dual	E - 1"x1" Series	3R3 - 3.3V 050 - 5.0V 120 - 12V or ±12V 150 - 15V or ±15V	R3 - 0.33A R6 - 0.6A 02 - 2A 03 - 3A 06 - 6A etc.	N - Negative P - Positive	R - 0.17" T - 0.22" D - 0.24"	F - RoHS Compliant (Lead Free)	A - Standard with Metal Case H - With Metal Case and Heatsink

S	24	S	P	XXX	XX	<input type="checkbox"/>	<input type="checkbox"/>	F	<input type="checkbox"/>
Form Factor	Input Voltage	Number of Outputs	Product Series	Output Voltage	Output Current	ON/OFF Logic	Pin Length	RoHS	Option Code
S - Small Size	24 - 9~36V	S - Single	P - 2"x1" Series	050 - 5.0V	08 - 8A 12 - 12A	N - Negative P - Positive	R - 0.17" T - 0.22" D - 0.24"	F - RoHS Compliant (Lead Free)	A - Standard with Metal Case H - With Metal Case and Heatsink
				120 - 12V	04 - 3.5A 05 - 5A				
				150 - 15V	03 - 2.7A 04 - 4A				
				240 - 24V	02 - 1.7A 03 - 2.5A				

E	35	S	E	XXX	XX	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Form Factor	Input Voltage	Number of Outputs	Product Series	Output Voltage	Output Current	ON/OFF Logic	Pin Length	Operating Ambient Temperature	Option Code
E - 1/8 Brick	35 - 9~60V	S - Single	E - Standard Product	050 - 5.0V	30 - 30A	N - Negative P - Positive	R - 0.17" T - 0.22" D - 0.24"	P - -40~85°C	A - Open Frame H - With Baseplate G - With Potting and Regular Case
				120 - 12V	13 - 13A				
				240 - 24V	06 - 6A				
				480 - 48V	03 - 3A				

Q	XX	S	V	XXX	XX	<input type="checkbox"/>	R	F	<input type="checkbox"/>
Form Factor	Input Voltage	Number of Outputs	Product Series	Output Voltage	Output Current	ON/OFF Logic	Pin Length	RoHS	Option Code
Q - 1/4 Brick	80 - 14.4~170V A1 - 40~170V	S - Single	V - Railway Wide Input Series	050 - 5V	30 - 30A 40 - 40A	N - Negative P - Positive	R - 0.17"	F - RoHS Compliant (Lead Free)	A - Unthreaded Mounting Hole S - With Threaded Mounting Hole (M3*0.5)
				120 - 12V	13 - 12.5A 17 - 17A				
				150 - 15V	10 - 10A 13 - 13.5A				
				240 - 24V	06 - 6.3A 08 - 8.5A				
				540 - 54V	03 - 2.8A 04 - 3.7A				

H	A0	S	P	XXX	XX	<input type="checkbox"/>	R	F	<input type="checkbox"/>
Form Factor	Input Voltage	Number of Outputs	Product Series	Output Voltage	Output Current	ON/OFF Logic	Pin Length	RoHS	Option Code
H - 1/2 Brick	A0 - 40~160V	S - Single	P - Standard Product Series	120 - 12V 138 - 13.8V 150 - 15V	20 - 20A 22 - 22A 25 - 25A	N - Negative P - Positive	R - 0.17"	F - RoHS Compliant (Lead Free)	A - Unthreaded Mounting Hole S - With Threaded Mounting Hole (M3*0.5)

H	80	S	V	XXX	XX	<input type="checkbox"/>	R	F	<input type="checkbox"/>
Form Factor	Input Voltage	Number of Outputs	Product Series	Output Voltage	Output Current	ON/OFF Logic	Pin Length	RoHS	Option Code
H - 1/2 Brick	80 - 16.8~137.5V	S - Single	V - Railway Wide Input Series	120 - 12V 150 - 15V 240 - 24V 480 - 48V 540 - 54V	02 - 2A 04 - 4A 07 - 7A 08 - 8A 13 - 13A 17 - 17A	N - Negative P - Positive	R - 0.17"	F - RoHS Compliant (Lead Free)	A - Unthreaded Mounting Hole S - With Threaded Mounting Hole (M3*0.5)



To learn more about DC/DC Converter for railway applications
Please visit www.deltaww.com/dcdc for latest product information.

FOR OFF-ROAD & INDUSTRIAL VEHICLE APPLICATIONS

Panel-mounted DC/DC converter, the BOX series, a wide input voltage range of 18~106V, can provide up to 500W, regulated DC output voltage with high efficiency. The power module offers input UVLO, output over current limit, short circuit, output over voltage, over temperature, and input reverse polarity protections. It has an option for integrated fuse holder and enable on/off function. The BOX series also has parallel function; and allows a wide operating temperature range of -40°C to +75°C. With specific mating connector, the BOX series can meet IP67 protection. This series is usually applied to non-automotive vehicle such as forklift, golf cart, and other electric industrial and off-road vehicles. All products possess outstanding electrical and thermal performance, as well as high reliability under extremely harsh operating conditions.



Product Introduction



B40SR B62SR B70SR

BOX Type DC/DC Power Module

Power: 300W-360W
Vin: 18-60V, 18-106V, 36-106V
Vout: 12V, 13.7V, 24V

- Parallel connection of multiple units
- Operating temperature range -40°C to +75°C
- Minimized inrush current
- Integrated fuse holder and enable on/off (optional)
- Isolation voltage 2250VDC
- IP67 protection for selective model
- IEC/EN/UL/CSA 60950-1, CE Mark
- EMC compatible: EN12895, EN55011, EN55014-2, CISPR11 Class A

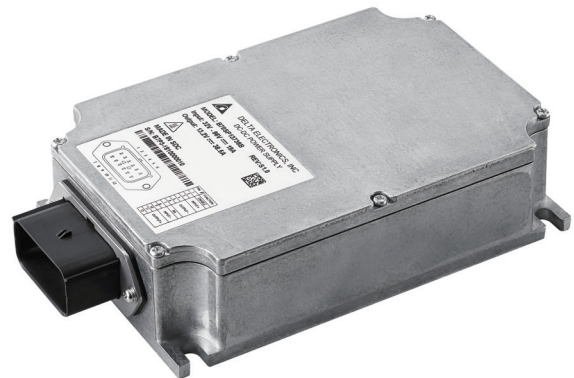


B70SP

BOX Type DC/DC Power Module

Power: 500W
Vin: 32-96V
Vout: 12V, 13.7V, 24V

- Full load efficiency up to 91.5% @48Vin and 72Vin
- Parallel connection of multiple units
- Operating temperature Range - 40°C to +90°C
- Enable on/off
- Isolation voltage 2250VDC
- IP67 protection (with fully assembled mating connector)
- IEC/EN/UL/CSA 62368-1, CE Mark
- EMC compatible: EN12895-2015, EN55011, EN55014-2, CISPR11 Class A



Product Specifications

Series	Part Number	Input Voltage	Output Voltage	Output Current	Output Power	Efficiency	Size (LxWxH)
B40SR	B40SR12424A/B/C/D	18~60V	12.4V	24A	200W @18~27Vin	88.3%	190.0 x 76.0 x 44.0 mm
	B40SR13722A/B/C/D	18~60V	13.7V	22A	300W @27~60Vin	88.5%	190.0 x 76.0 x 44.0 mm
B62SR	B62SR12424A/B/C/D	18~106V	12.4V	24A	200W @18~27Vin 300W @27~106Vin	88.0%	190.0 x 76.0 x 44.0 mm
	B62SR13722A/B/C/D	18~106V	13.7V	22A		88.5%	190.0 x 76.0 x 44.0 mm
	B62SR24125A/B/C/D	18~106V	24V	12.5A	200W @18~27Vin 300W @27~60Vin	91.0%	190.0 x 76.0 x 44.0 mm
	B62SR24015A/B/C/D	18~106V	24V	15A		90.5%	190.0 x 76.0 x 44.0 mm
B70SR	B70SR12424A/B/C/D	36~106V	12.4V	24A	300W	89.5%	190.0 x 76.0 x 44.0 mm
	B70SR13722A/B/C/D	36~106V	13.7V	22A		90.2%	190.0 x 76.0 x 44.0 mm
	B70SR24125A/B/C/D	36~106V	24V	12.5A		92.5%	190.0 x 76.0 x 44.0 mm
B70SP	B70SP12440A/B	32~96V	12.4V	40A	500W	89.0%	198.0 x 113.0 x 45.0 mm
	B70SP13736A/B	32~96V	13.7V	36.5A	500W	90.0%	198.0 x 113.0 x 45.0 mm
	B70SP24020A/B	32~96V	24.5V	21A	500W	91.5%	198.0 x 113.0 x 45.0 mm

Part Numbering System

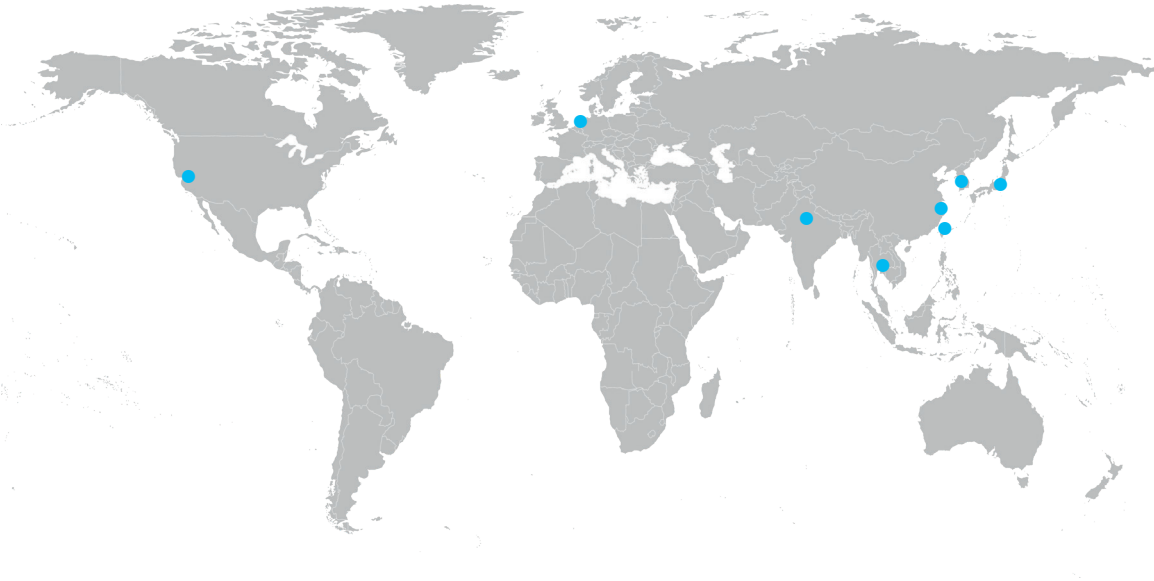
B	XX	S	R	XXX	XX			
Form Factor	Input Voltage	Number of Outputs	Product Series	Output Voltage	Output Current	Option Code	Option Fitting	
B - Box Type	40 - 18~60V	S - Single	R - Standard Series	124 - 12.4V	24 - 24A	A	With Built-in Fuse Holder	Omit - without mating connector kit C - with mating connector kit (housing + terminals)
	62 - 18~106V			137 - 13.7V	22 - 22A	B	With Sealed Connector & Fuse Holder	
	70 - 36~106V			24X - 24V	15 - 15A	C	With Enable Pin	
					125 - 12.5A	D	Without Sealed Connector, Fuse Holder and Enable Pin	
B	70	S	P	XXX	XX			
Form Factor	Input Voltage	Number of Outputs	Product Series	Output Voltage	Output Current	Option Code	Option Fitting	
B - Box Type	70 - 32~96V	S - Single	P - High Power Series	124 - 12.4V	40 - 40A	A	Without parallel function	Omit - without mating connector kit C - with mating connector kit
				137 - 13.7V	36 - 36.5A	B	with parallel function	
				240 - 24.5V	20 - 21A			



To learn more about DC/DC Converter for off-road & industrial vehicle applications
Please visit www.deltaww.com/dcdc for latest product information.



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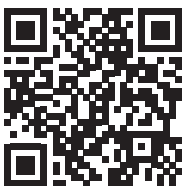
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December 2020 - All information and specifications are subjected to change without prior notice.

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