




bel POWER SOLUTIONS & PROTECTION

a bel group

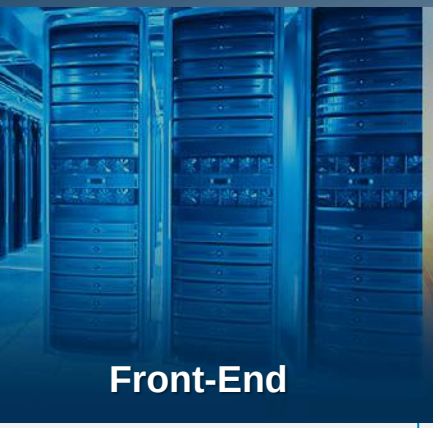
Product Focus & Roadmap

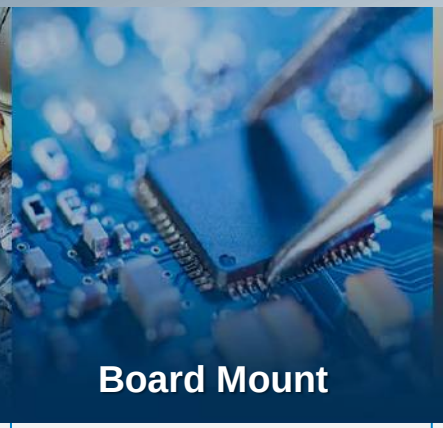
September 2020

About Bel Power Solutions

The Bel Power Solutions group provides power conversion and value-added solutions for a broad base of customers in networking, storage, industrial and transportation markets.

BPS Product Portfolio





Bel Power Solutions

Design Centers

Product Development
Product Realization

Dubnica, Slovakia

Industrial, Rail & HEV Technology & Product Development for AC/DC, DC/DC & DC/AC.

Shenzhen, China

Servers, Storage & Networking Power Solutions. AC/DC & DC/DC Front-Ends & Digital Controls.

Hangzhou, China

Expertise in DC/DC, AC/DC & Embedded Controller Design. Board Mount Power & Modular AC/DC.

Camparada, Italy

Focused on Broadcasting & Industrial Power. Expertise in AC/DC, DC/DC & Power Systems Integration.

Bel Power Solutions

Design Support Centers

Experienced Local Resources
Application Solutions

Westborough, MA

Expertise in DC/DC, AC/DC, Power Systems Integration & Embedded Controller Design.

San Jose, CA

High-level Design Support Adjacent to a Major Technology Hub.

Maidstone, England

Industrial, Consumer, Commercial & Military. Provides Turnkey/ODM Solutions & Offers a Diverse Range of Design Capabilities.

Taoyuan, TW

High-level Design Support Adjacent to a Major Technology Hub.

Front-End Products

Bel Power Solutions provides leading OCP power conversion modules and shelves and is a technology leader in the development of high efficiency and high power front-end products. We continue to push for leading edge power solutions for OCP IT Racks to Data Centers.

80 PLUS PLATINUM

80 PLUS TITANIUM

Slim FE Overview & the Next Generation

PFx/TET Series – Existing Models

Narrow Form Factor

MODEL	V_{out}	OUTPUT POWER	Dims (mm) w/o connector (L x W x H)
AC INPUT			
PFE600-12-054xA	12 V	600 W	321.5 x 54.5 x 40
PFE850-12-054xA	12 V	850 W	321.5 x 54.5 x 40
PFE1100-12-054xA	12 V	1100 W	321.5 x 54.5 x 40
PFE1300-48-054NA	48 V	1300 W	321.5 x 54.5 x 40
PFE1500-12-054xA	12 V	1500 W	321.5 x 54.5 x 40
PFE3000-12-069RA	12 V	3000 W	555 x 69 x 42
PFE3000-360-069RA	12 V	3000 W	528 x 69 x 40.6
PFE3600-12-069RA	12 V	3600 W	555 x 69 x 42
DC INPUT			
PFE1100-12-054xD	12 V	1100 W	321.5 x 54.5 x 40
PFE1500-12-054xD	12 V	1500 W	321.5 x 54.5 x 40
PFF3000-12-069RD	12 V	3000 W	555 x 69 x 42

New PFE “Short” Platform

54mm X 228mm length

PFS1200-12-054xA
PFS1200-12-054xD

CRPS Front-End Overview

CRPS AC-DC Series

MODEL	V_{out}	OUTPUT POWER	DIMENSIONS (L x W x H)
PEC550-12-074xA	12 V	550 W	185 x 74 x 40 mm
PEC800-12-074xA	12 V	800 W	185 x 74 x 40 mm
PEC1300-12-074xA	12 V	1300 W	185 x 74 x 40 mm
PEC1600-12-074xA	12 V	1600 W	185 x 74 x 40 mm
TEC2400-12-074xA	12 V	2400 W	185 x 74 x 40 mm

- Input Voltage:
  Universal: 90 – 264 VAC
  HVDC: 180 – 300(350) VDC
- 12 V Standby Output
- Power Management Bus Communication Protocol
- Black Box Recorder; Internal ORing
- Safety Approvals: IEC/EN 62368-1, UL/CSA 62368-1

CRPS DC-DC Series

MODEL	V_{out}	OUTPUT POWER	DIMENSIONS (L x W x H)
PEC550-12-074xD	12 V	550 W	185 x 74 x 40 mm
PEC800-12-074xD	12 V	800 W	185 x 74 x 40 mm
PEC1300-12-074xD	12 V	1300 W	185 x 74 x 40 mm
PEC1600-12-074xD	12 V	1600 W	185 x 74 x 40 mm
TEC2400-12-074xD	12 V	2400 W	185 x 74 x 40 mm

- Input Voltage: -36 to -72 VDC
- 12 V Standby Output
- Power Management Bus Communication Protocol
- Black Box Recorder; Internal ORing
- Safety Approvals: IEC/EN 62368-1, UL/CSA 62368-1

Power Shelves & Accessories

Power shelves and accessories provide rectification, system management and power distribution, while maintaining high reliability and offering flexibility for future expansion.

Bel Power Shelf Selection Table

			INPUT					
			AC (Y) 277/480 VAC	AC (Y) 240/415 VAC	AC (Δ) 208 VAC	AC (1-Phase) 3x 230 VAC	- 48 VDC	+380 VDC
OUTPUT	+12 VDC	Triple Busbar Straight	SPSPFE3-05G	SPSPFE3-15*	SPSPFE3-09	-	SPSPFF3-03*	SPSPFE3-13*
		Single Busbar Straight	SPSPFE3-06G	SPSPFE3-16*	SPSPFE3-10	SPSTET4-02	SPSPFF3-02*	SPSPFE3-12*
		Single Busbar Offset [1]	SPSPFE3-08	SPSPFE3-14*	SPSPFE3-11	-	SPSPFF3-01	SPSPFE3-07
	+48 VDC	Single Busbar Offset Short [2]	SPSTET4-01	SPSTET4-11	SPSTET4-03*	-	N/A	SPSTET4-04*
		Single Busbar Offset Long [1]	SPSTET4-07	SPSTET4-12	-	-	N/A	-
		Single Busbar Straight Long	SPSTET4-09	SPSTET4-13	-	-	N/A	-
		Triple Busbar Straight Long	SPSTET4-08	SPSTET4-14	-	-	N/A	-
	+380 VDC	Connector Type	SPSTET4-05*	-	SPSTET4-06*	-	-	N/A

[1] Mates with V2 *[2] Mates with V2 shallow rack* ** Available on request requiring short design cycle.*

BPS OCP Product Portfolio & Roadmap

12Vo Shelves:
SPSPFE3 Series

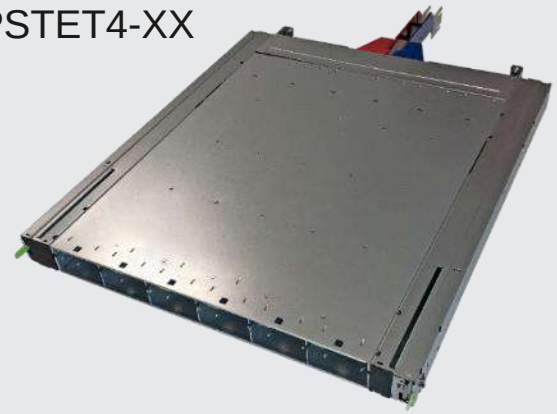
- Designed for OCP Racks
- 1Open U Power Shelves
- Up to 18kW in 5+1 Redundancy
- Dual 3-Phase Y or Δ & HVDC (240-400Vdc) Inputs
- Single or Triple 12V Busbar Output
- Customized Busbar Options are Possible
- Optional Ethernet Controller
- 3000W or 3600W PSUs
- PDUs Available
- The Shelves can be Paralleled (Active Power Sharing) to Provide Higher Rack Power
- Shelves can be Modified for a 19" Rack

3 Busbar	Single Busbar Straight	Single Busbar Offset
		

BPS OCP Product Portfolio & Roadmap

48Vo Shelves:
SPSTET4 Series

- Designed for OCP 48Vo Racks
- Compatible for 1 Open U
- Up to 20kW in 5+1 redundancy (22.5kW is in roadmap)
- Dual 3-Phase Y or Δ & HVDC Inputs
- Single 48V Output Busbar for V2 or Shallow Racks
- Customized Busbar Options are Possible
- Optional Ethernet Controller
- 4000W (4800W) PSUs
- Very High Efficiency Power Module (>97.5%)
- They can be Paralleled (Active Current Sharing) to Provide Higher Rack Power
- Shelves can be Modified for a 19" Rack

PSU	Shelf
TET4000-48-069RA 	SPSTET4-XX 

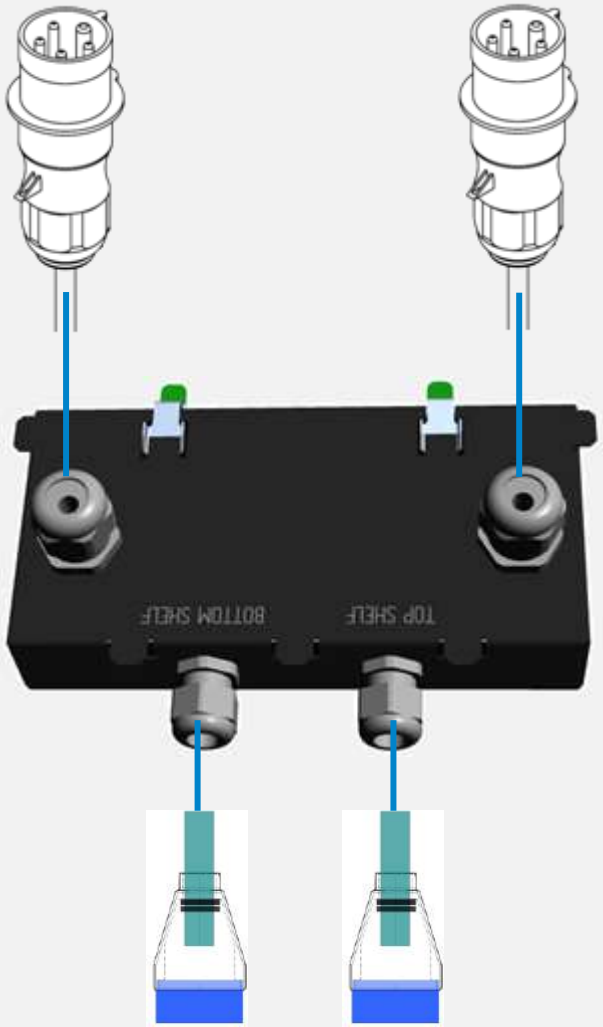
BPS OCP Product Portfolio & Roadmap

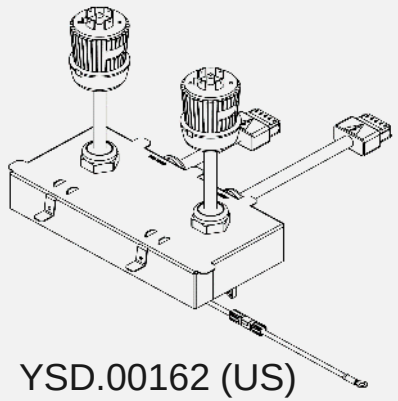
48Vi Shelves:
SPSPFF3 Series

- Dual 48Vin DC Input
- Designed for OCP 12Vo Racks
- Up to 15kW in 5+1 Redundancy (9+9 kW is in 3+3)
- Single or Triple 12Vo Busbar Output
- Customized Busbar Options are Possible
- Optional Ethernet Controller
- 3000W Power Modules (>95% Efficiency)
- PDU Available
- Shelves can be Modified for a 19" Rack

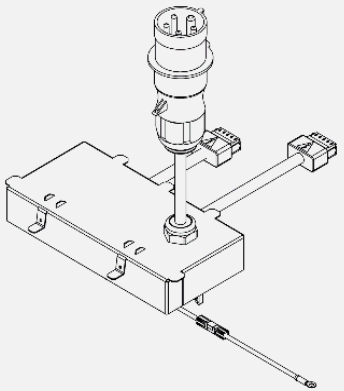
PSU	Shelf
PFF3000-12-069RD 	SPSPFF3-01 

PDUs for Mid-Power Racks



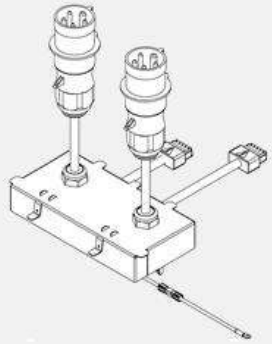


YSD.00162 (US)
YSD.00220 (US)
YSD.00222 (US)



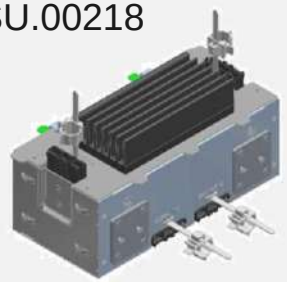
YSD.00152 (EU)

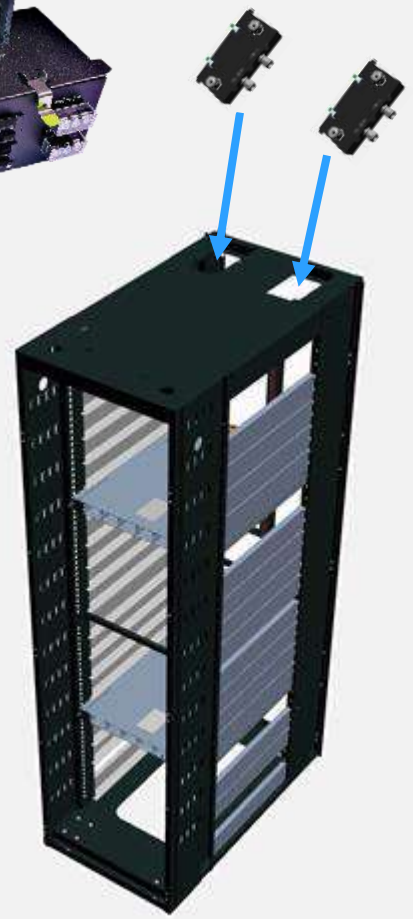
YSD.00273



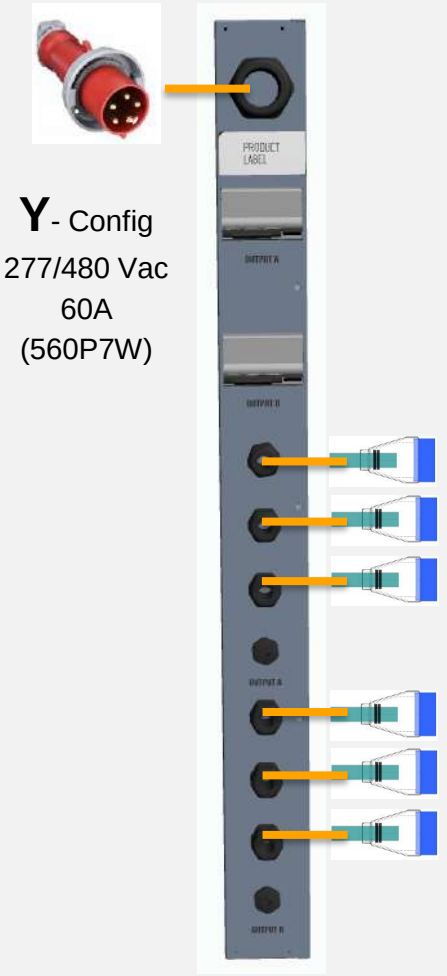
YSD.00220 (EU)

YSU.00218



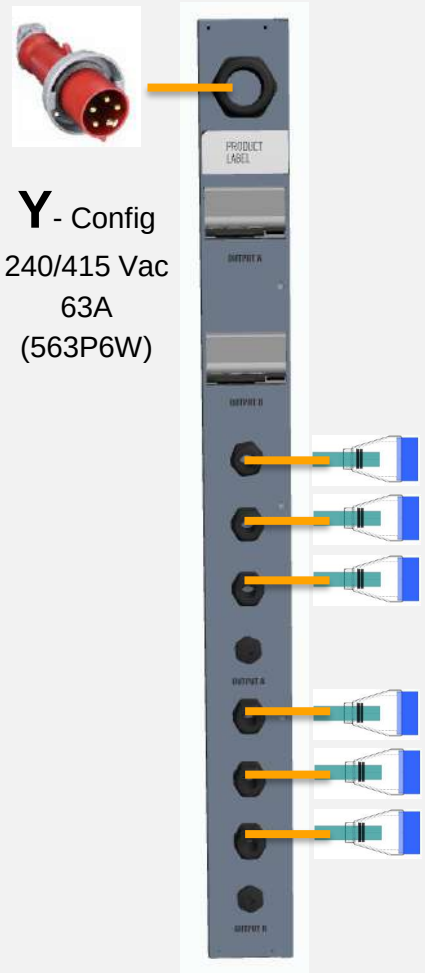


PDUs for High Power Racks



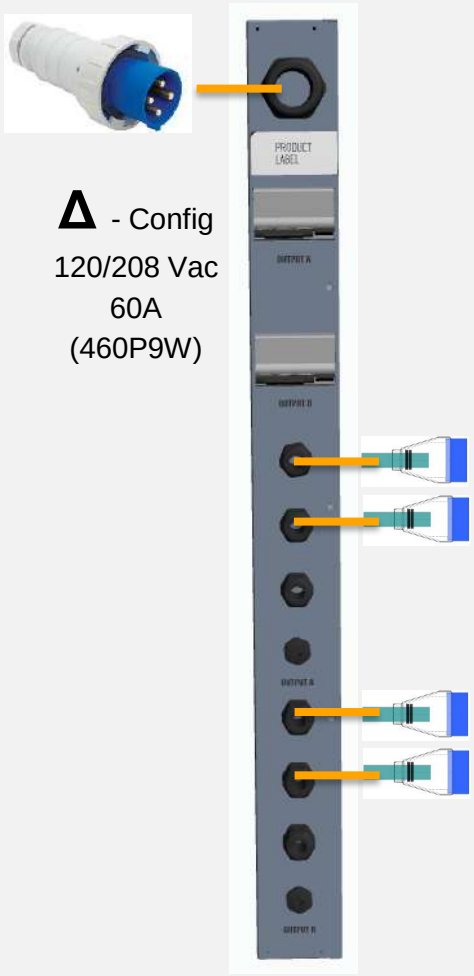
Y- Config
277/480 Vac
60A
(560P7W)

YSU.00219



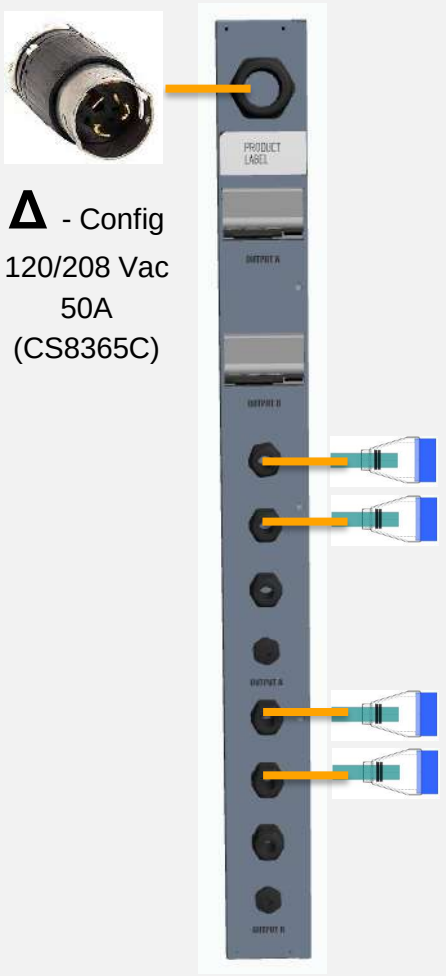
Y- Config
240/415 Vac
63A
(563P6W)

YSU.00223



Δ - Config
120/208 Vac
60A
(460P9W)

YSD.00226



Δ - Config
120/208 Vac
50A
(CS8365C)

YSD.00227

Network Attached Controller (NAC)

Front-accessible, hot-pluggable Network Attached Controller for direct connection of power shelf to data center control and monitoring communication network

Ethernet Port	
DHCP	Dynamic distribution of network configuration parameters; Supports IPv4 and IPv6
SNMP	To monitor the controller / shelf / power supplies via predefined Objects (MIB File); Supports SNMPv1/2c/3 (including encryption for secure access)
SNTP	To synchronize the on-board real time clock which provides time stamps for warning/fault logs
HTTPs	Secure web page interface displaying basic power supply, controller and back plane information and to provide an interface for remote upgradeability of the components

LEDs	
Green	Controller status information
Yellow	Ethernet status

New Linux-NAC available in 2020!

AC & DC Medical & Industrial Power Conversion

Medical Open Frame Power Supplies deliver up to 1000 W of output power and accommodate the universal input voltage range 90 – 264 VAC. These power supplies are suitable for medical applications, such as monitoring, imaging, therapy & other portable medical equipment.

Industrial Open Frame Power Supplies feature a wide universal AC input range of 90 – 264 VAC, offering from 40 to 1000 W of output power. The high efficiency & high power density ensures minimal power loss in end-use equipment. The low-profile ABC series with their under 1" height are ideal for use in broad array of space-constrained applications.

ABC/MBC Series Open Frame Power Supplies

Industrial Series	Medical Series	Power [W]	Voltages [V]	Mechanical Package	Dimensions [in]
ABC40	MBC40	40	5, 12, 15, 24, 48	Open Frame	2 x 4 x 1.2
ABC41	MBC41	40	5, 12, 15, 24, 30, 48, 58	Open Frame	2 x 3 x 0.75
ABC60	MBC60	60	5, 12, 15, 24, 48	Open Frame	2 x 4 x 1.2
ABC75	MBC75	75	12, 15, 24, 30, 48, 58	Open Frame	2 x 3 x 1
ABC120	MBC120	120	12, 15, 24, 30, 48, 58	Open Frame	2 x 3 x 1.18
ABC150	MBC150	150	5, 12, 15, 24, 48	Open Frame	2 x 4 x 1.3
ABC180	MBC180	180	12, 15, 24, 30, 48, 58	Open Frame	2 x 4 x 0.75
ABC200	-	200	12, 15, 24, 48	Open Frame	2 x 4 x 1.5
ABC201	MBC201	200	5, 12, 15, 24, 30, 48	Open Frame	3 x 5 x 1.5
ABC225	MBC225	225	12, 15, 24, 30, 48, 58	Open Frame	2 x 4 x 1
-	MBC250	250	12, 24, 48	U-Channel	3 x 5 x 1.5
ABC275	MBC275	275	12, 15, 24, 30, 48, 58	Open Frame	3 x 5 x 0.75
ABC300	MBC300	300	5, 12, 15, 24, 30, 48	Open Frame	3 x 5 x 1.5
ABC350	MBC350	350	12, 15, 24, 30, 48, 58	Open Frame	3 x 5 x 1
ABC400	-	400	12, 24, 48	U-Channel	3 x 5 x 1.5
ABS400 New	MBS400 New	400	12, 24, 36, 48	Sealed Chassis (heatsink)	3.27 x 8.34 x 1.65(2.76)
ABC401 New	MBC401 New	400	12, 24, 28, 36, 48	Open Frame, U-Channel, Perforated Cover, Vented Cover (Top Fan), Enclosed (Front Fan)	Multiple dimensions
ABC450	MBC450	450	5, 12, 15, 24, 30, 48	U-Channel	4 x 6.5 x 1.6
ABC550	MBC550	550	12, 15, 24, 30, 48, 58	Open Frame	3 x 5 x 1.5
ABC600	MBC600	600	12, 15, 24, 28, 48, 52	U-Channel	5 x 8 x 1.6
ABC601 New	-	600	24, 28, 36, 48	U-Channel, Enclosed (Front Fan)	4.21 x 7.03 x 1.61
ACC600	MCC600	600	12, 15, 24, 30, 48, 58	U-Channel	5 x 8.5 x 1.61
ABS601 New	MBS601 New	600	24, 48	Sealed Chassis	4.92 x 9.86 x 2.36
ACC750 New	MCC750 New	750	24, 48	U-Channel, Protective Cover	4 x 9.24 x 1.61
ABC800	MBC800	800	12, 15, 24, 30, 48, 58	U-Channel	5 x 8.5 x 1.61
ABE1000 New	MBE1000 New	1000	12, 15, 24, 30, 48, 58	Enclosed (Front Fan)	5 x 9.45 x 1.61
ABC/ABE1200	MBC/MBE1200	1200	12, 24	U-Channel, Protective Cover, Enclosed (Front Fan)	4 x 10.4 x 1.61

Features

- Efficiency up to 94%
- Adjustable Output Voltage
- Operating Temperature -40° to +70°C
- No Minimum Load Required
- High Convection Rating
- Low Profile Series (-L) - Height ≤ 1 Inch
- Multiple Outputs Available (XBC40/XBC60)
- Cover Kits Available
- CSA/UL60950-1, EN/IEC 60950-1 (Industrial)
- CSA/UL60601-1, EN/IEC 60601-1, 2x MOPP for Class I & II Apps (Medical)
- **Medical Applications:** Monitoring, Diagnostic, Ultrasound, Dialysis, Home Health Care, Drug Pump Devices
- **Industrial Applications:** Instrumentation, Lighting, Process Control, Test Equipment, Factory Automation, Mil COTS

Open Frame Power Supplies

ACC / MCC600 Series

- 5 x 8.5 x 1.61" Form Factor
- Universal Input Voltage:
  85 – 264 VAC (120 – 390 VDC)
- Output Voltages: 12, 15, 14, 30, 48, 58 V
- Output Power up to 600 W
- Convection Cooling Rated
- Current Sharing & Peak Power Capability
- 5 V Standby Provision
- Operating Temperature -40 to +70°C
- Safety Approvals:
  - IEC/EN 62368-1, UL/CSA 62368-1 (Industrial)
  - IEC/EN 60601-1, ANSI/AAMI ES 60601-1,
    CSA 60601-1 (Medical)

ABE / MBE1000 Series

- 5 x 9.51 x 1.61" Form Factor
- Universal Input Voltage:
  85 – 264 VAC (120 – 390 VDC)
- Output Voltages: 12, 15, 14, 30, 48, 58 V
- Output Power up to 1000 W
- Fan Cooled & Peak Power Capability
- 5 V Standby Provision
- Operating Temperature -40 to +70°C
- Safety Approvals:
  - IEC/EN 62368-1, UL/CSA 62368-1 (Industrial)
  - IEC/EN 60601-1, ANSI/AAMI ES 60601-1,
    CSA 60601-1 (Medical)

Open Frame Power Supplies

ABC / MBC401 Series

- Universal Input Voltage: 90 – 264 VAC
- Output Voltages: 12, 24, 28, 36, 48 V
- Output Power up to 400 W
- Convection, Forced Air or Fan Cooled
- +5 V Standby and 12 V Auxiliary Outputs
- Operating Temperature -20 to +50°C
- **5 Different Size Packages: All Fit 1U Installation**
- Safety Approvals:
  - IEC/EN 60950-1, UL/CSA 60950-1 (Industrial)
  - IEC/EN 60601-1, ANSI/AAMI ES 60601-1, CSA 60601-1, 2x MoPP (Medical)

ABC601 Series

- Universal Input Voltage: 85 – 305 VAC
- Output Voltages: 24, 28, 36, 48 V
- Output Power up to 600 W (Peak 800 W 10 s)
- +5 V Standby and 12 V Auxiliary / Fan Outputs
- Operating Temperature -20 to +50°C
- Two Packages:
  - U-Channel: Convection/Forced Air Cooled (4.21 x 7.03 x 1.61“)
  - Enclosed, Front Mounted Fan: Fan Cooled (4.21 x 8.11 x 1.6“)
- Safety Approvals:
  - IEC/EN 60950-1, UL/CSA 60950-1 (Industrial)
  - IEC/EN 60601-1, ANSI/AAMI ES 60601-1, CSA 60601-1, 2x MoPP (Medical)

Open Frame Power Supplies - Sealed

ABS / MBS400 Series

- Universal Input Voltage: 90 – 264 VAC
- Output Voltages: 12, 24, 36, 48 V
- Output Power up to 400 W
- Convection or Conduction Cooled (heat sink)
- **Sealed**, Potted Package **IP67** Rated
- Operating Temperature -20 to +70°C
- +5 V Standby and 12 V Auxiliary Outputs
- Dimensions: 3.27 x 8.34 x 1.65(2.76)" (heatsink)
- Safety Approvals:
  - IEC/EN 60950-1, UL/CSA 60950-1 (Industrial)
  - IEC/EN 60601-1, ANSI/AAMI ES 60601-1, CSA 60601-1, 2x MoPP (Medical)

ABS / MBS601 Series

- Universal Input Voltage: 85 – 264 VAC
- Output Voltages: 12, 48 V
- Output Power up to 600 W
- Natural Convection Cooling Rated
- **Sealed** Enclosure, **IP66/67/68** Rated
- Operating Temperature -30 to +55°C
- SL Option: 5 V Standby Output + Control Signals
- Dimensions: 4.92 x 9.86 x 2.36“
- Safety Approvals:
  - IEC/EN 60950-1, UL/CSA 60950-1 (Industrial)
  - IEC/EN 60601-1, ANSI/AAMI ES 60601-1, CSA 60601-1, 2x MoPP (Medical)

Open Frame Power Supplies

ACC / MCC750 Series

- Universal Input Voltage: 85 – 305 VAC
- Output Voltages: 24, 48 V
- Output Power up to 750 W
- **Power Management Bus Communication**
- +5 V Standby and 12 V Auxiliary Outputs
- Operating Temperature -20 to +60°C
- Natural Convection Cooling Rated
- Dimensions: 4.00 x 9.24 x 1.61"
- Safety Approvals:
  - IEC/EN 62368-1, UL/CSA 62368-1 (Industrial)
  - IEC/EN 60601-1, ANSI/AAMI ES 60601-1, CSA 60601-1 (Medical)

ABC / ABE1200 Series
MBC / MBE1200 Series

- Universal Input Voltage: 85 – 305 VAC
- Output Voltages: 24, 48 V
- Output Power up to 1200 W
- **Power Management Bus Communication**
- +5 V and 12 V Standby Outputs
- Operating Temperature -20 to +60°C
- ABC/MBC1200 Series
  - U-Channel (Protective Cover): Forced Air Cooled (4.0 x 9.21(9.24) x 1.61“)
- ABE/MBE1200 Series
  - Enclosed, Front Mounted Fan: Fan Cooled (4.0 x 10.4 x 1.6")
- Safety Approvals:
  - IEC/EN 60950-1, UL/CSA 60950-1 (Industrial)
  - IEC/EN 60601-1, ANSI/AAMI ES 60601-1, CSA 60601-1, 2x MoPP (Medical)

TCP / TXP Series

The TCP / TXP Series of AC-DC power supplies converts a universal 3-phase AC input to an adjustable, wide range DC voltage. These industrial power supplies enable monitoring of all electrical parameters and allow control of the PSU from an external system controller.

TCP Series Features

- Worldwide 3-Phase Input Voltage Range (180 – 528 Vac L-L)
- **Pulse Load Capability** (0 - 100 kHz) with Low Voltage Droop
- Wide Adjustable Output Voltage Range (30-100 Vdc) with **Fast Setting Response** (5 ms)
- Parallel Operation up to 16 Units (up to 57.6 kW) – shelves optional
- Efficiency >94%
- Two RS485 Interfaces
- **SEMI F47** Compliant
- Cold-Plate Cooling System

TXP Series Features

- Worldwide 3-phase Input Voltage Range (nom. 200 to 480 Vrms)
- High Power Density 16 W/in³
- **Power Factor > 0.94**
- Adjustable Output Voltage Ranges:
  - 10 – 50 VDC for the 3500 W; 30 – 137.5 VDC for the 4000 W
- Auxiliary Output 12 V / 0.8 A
- Parallel Operation up to 8 Units (28/32 kW); Serial Operation up to 4 Units
- Possibility to Install 3 Units in 2U 19" Rack
- Internal Fan Cooling System
- RS485 / CAN Bus Interface

LPM / LMM Modular Overview

Visit our online configuration tool at:
https://belfuse.com/resources/lpm-configurator

MODULE	NO. OF OUTPUTS	OUTPUT 1				OUTPUT 2				MODULE DESIGNATOR
		VOLTAGE RANGE LOW [V]	VOLTAGE RANGE HIGH [V]	MAX. POWER [W]	CURRENT RATING [A]	VOLTAGE RANGE LOW [V]	VOLTAGE RANGE HIGH [V]	MAX. POWER [W]	CURRENT RATING [A]	
LPM126-OUTA1-05	1	2	5.2	265	53	-	-	-	-	E
LPM126-OUTA1-12	1	5.3	14.9	265	22	-	-	-	-	F
LPM126-OUTA1-24	1	15	29.9	265	11	-	-	-	-	G
LPM126-OUTA1-36	1	30	43.9	265	7.4	-	-	-	-	H
LPM126-OUTA1-48	1	44	54	265	5.5	-	-	-	-	J
LPM109-OUTA1-10	1	1.5	12	90	6	-	-	-	-	K
LPM109-OUTA1-20	1	12.1	32	90	3	-	-	-	-	L
LPM118-OUTA2-10	2	1.5	12	90	6	1.5	12	90	6	M
LPM118-OUTA2-20	2	12.1	32	90	3	12.1	32	90	3	N

- Highly Configurable
- Modules from 2 VDC to 51 VDC
- Two Families:
  - LPM/LMM409 Series:
    900 W up to 8 outputs
  - LPM/LMM616 Series:
    1600 W up to 12 outputs

- 1U Height, 40.64 mm
- Medical EN60601-1, 3rd Ed., MOPP

DIN Rail Overview

LDN Series

1-PHASE, FOR GENERAL PURPOSE

The flat power supply for small cabinets

Class II, LDN20/40/80 Power Supplies are suitable for low power applications from 20 to 80 W. The units are hosted in a rugged plastic housing compliant with the installation in standard cabinets.

High efficiency in minimum size

LDN120/240/480 Switching Mode Power Supplies were specifically designed for medium power industrial automation applications. Output voltages from 5 to 72 VDC (model dependent) are available in a compact size, with important overload capability.

LDC Series

1-PHASE, MEDIUM POWER PREMIUM, ULTRACOMPACT

High flexibility in industrial environment

DIN Rail Power Supplies from 120 to 480 W specially designed for space sensitive and demanding applications. They have unrivalled performance and cover output voltages from 12 to 72 VDC (model dependent).

LDP Series

PROGRAMMABLE, WIDE INPUT RANGE

Extremely versatile

LDP200 is the first user programmable unit on the market that can supply any voltage between 36 and 205 VDC, offering unmatched flexibility for many applications.

LDW Series

1/2/3-PHASE, COMPACT, WIDE INPUT RANGE

Top flexibility in premium size

Switching Mode Power Supplies with universal input 185 – 550 VAC with 1/2/3-phase wiring or DC (350 – 725 VDC), for powers from 120 to 480 W, without any derating. They fit many applications, including renewable energy and decrease considerably the material management costs.

LDT Series

3-PHASE, HIGH POWER

High power in minimum size

Switching Mode Power Supplies with 3-phase input 340 – 550 VAC for powers from 480 to 2400 W, covering from 12 to 170 V (model dependent). They fit demanding applications where compactness and high power are needed.

LDD Series

MEDIUM POWER DC/DC CONVERTERS

Wide choice for voltage adapting

DC-DC converters with an optimal response to the applications where compactness and high reliability are requested. All are isolated and offer a wide range of input voltages.

DIN Rail Accessories

LDX-D20 / D503

Active ORing Controller

- Ultra compact redundancy module
- Wide input voltage range: 12 – 85 VDC
- Out: 20 or 50 A
- Extremely low loss up to 99% efficiency
- Hot-pluggable & CPU-controlled

LDX-B20

Buffer Module

- Wide input voltage range: 12 – 85 VDC
- DC BUS voltage self-tracking
- Provides 500W for 0.3 seconds
- >150 Joules energy storage
- Easily paralleled

LD Series

Battery Charger & DC UPS Units

- Accessory for charging 12 or 24 VDC batteries
- Suitable for power supplies with adjustable output
- For Lead Acid & LiFePO4 batteries
- Feeds the load & charges the battery at once

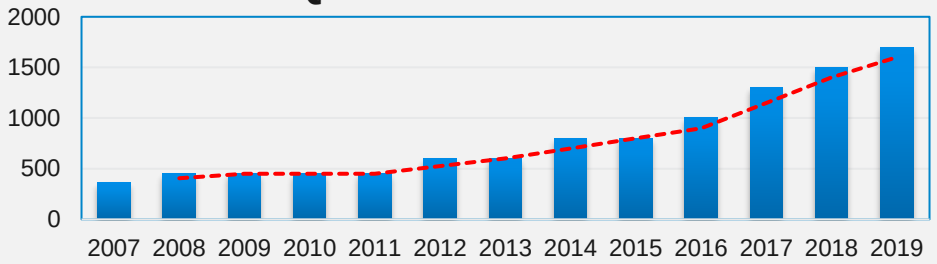
Board Mount Products

DC-DC converters available in all standard brick footprints from 1/16 to ½ plus the contemporary Power Stamp footprint. These products provide high efficiencies & power densities, ultra-low profiles, wide input voltage ranges, high input-transient with-stand capabilities & start-up into pre-biased loads.

Bel Power Solutions is an active member of the DOSA alliance and offers models compliant with the DOSA standards.

Regulated Bus Converters

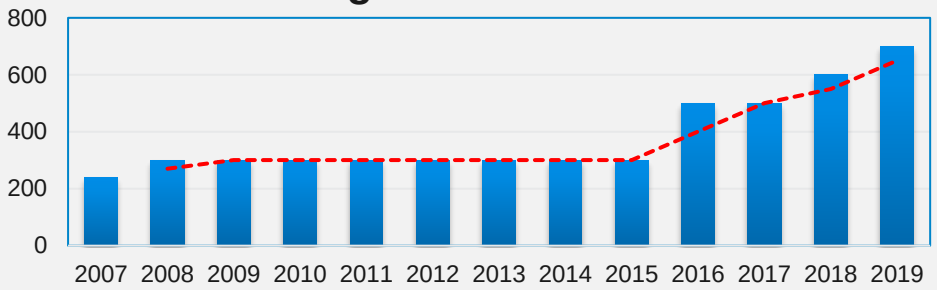
Quarter Brick Power



Year	Power	Year	Power
2007	360	2016	1000
2011	450	2017	1300
2013	600	2018	1500
2015	800	2019	1700

Quarter Brick
(2.3" x 1.45")

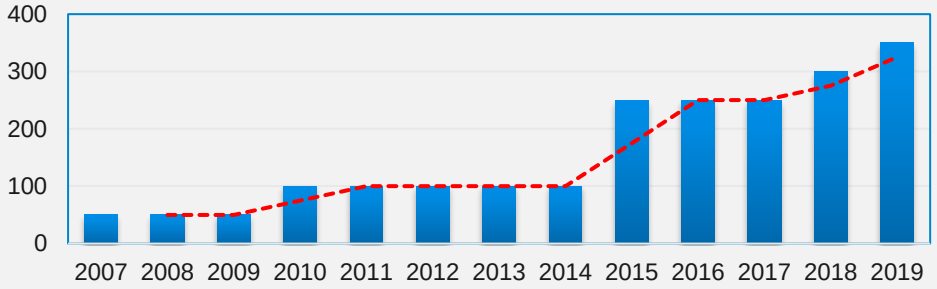
Eighth Brick Power



Year	Power	Year	Power
2007	240	2018	600
2015	300	2019	700
2016	500		

Eighth Brick
(2.3" x 0.9")

Sixteenth Brick Power



Year	Power	Year	Power
2007	50	2018	300
2014	100	2019	350
2017	250		

Sixteenth Brick
(1.3" x 0.9")

Regulated Bus Converters

Quarter Brick – 1300 W

- 45-57 Vdc Input
- 10.4Vdc @ 125A Output
- Power Good Indication
- **High Efficiency 97.3% @ Half Load**
- Direct Droop Current Sharing
- Good Thermal Performance
- Isolated & Regulated
- Power Management Bus Version Available

0RQB-X3S11B
0RQP-X3S11B

Eighth Brick – 500 W

- 45-60Vdc Input
- 10.2Vdc @ 49A Output
- **High Efficiency**
- Power Good Indication
- Direct Droop Current Sharing
- Good Thermal Performance
- Isolated & Regulated

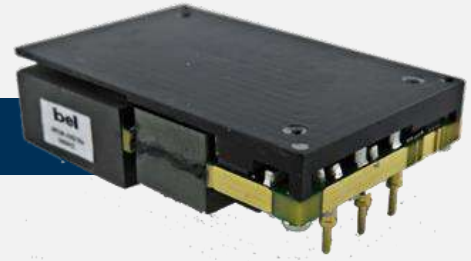
0RCY-F0S10B

Sixteenth Brick – 310 W

- 45-56Vdc Input
- 10.4Vdc @ 30A Output
- **High Efficiency**
- High Power Density
- Direct Droop Current Sharing
- Good Thermal Performance
- Isolated & Regulated

0RSB-D5S10L

Quarter Brick – 1500 W



- 48-60 Vdc Input
- 12Vdc @ 125A Output
- Power Good Indication
- **High Efficiency 97.6% @ Half Load**
- Direct Droop Current Sharing
- Good Thermal Performance
- Isolated & Regulated
- Power Management Bus Version Available

0RQB-X5M12B
0RQP-X5M12B

Isolated Bricks

Quarter Bricks – Wide Input

0RQP-H5T12x

- Industry Standard Pin-Outs
- Input 18-36V, 36-75V, 18-75V
- Output Current up to 100A
- **Output Power up to 650 W**
- Single & Dual Outputs
- Heatsink Options

Eighth Bricks – Wide Input

0RCP-D4T12L

- Industry Standard Pin-Outs
- Input 18-36V, 36-75V, 18-75V
- Output Currents from 5A - 60A
- **Output Power up to 400 W**
- Baseplate Option
- Excellent Thermal Performance

Isolated Bricks – Power Management Bus		
0RQP-X5M12B	1500 W	¼ brick
0RQP-X3S10D	1300 W	¼ brick
0RQP-H5T12x	650 W	¼ brick
0RQP-Q2T12L	420 W	¼ brick
0RCP-Q0S12L	400 W	⅛ brick
0RCP-D4T12L	240 W	⅛ brick
0RCP-T0T12BG	300 W	⅛ brick

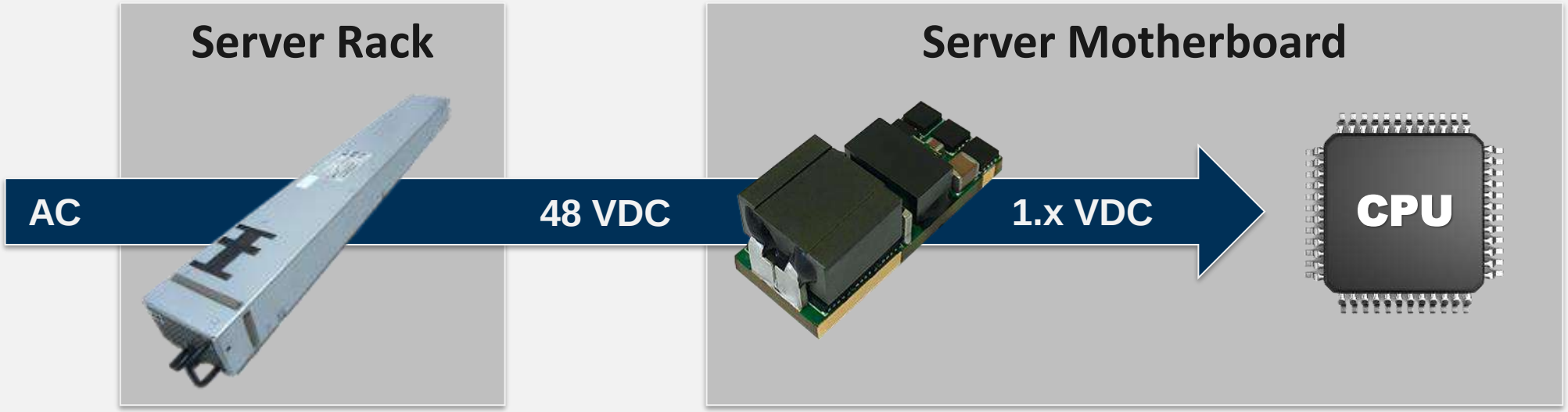
48V to Low Voltage Power Stamps

Direct Conversion Product for OCP

- Bel Power is partnering with STMicroelectronics on the development of a range of products for 48V to 1.xV
- Initial focus is (not limited to) Intel Server Class CPU & DDR4 SDRAM applications

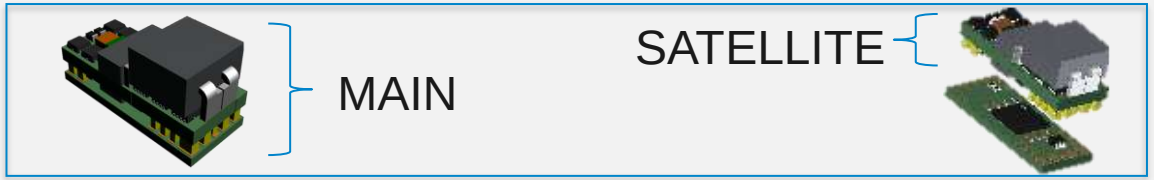
Overview

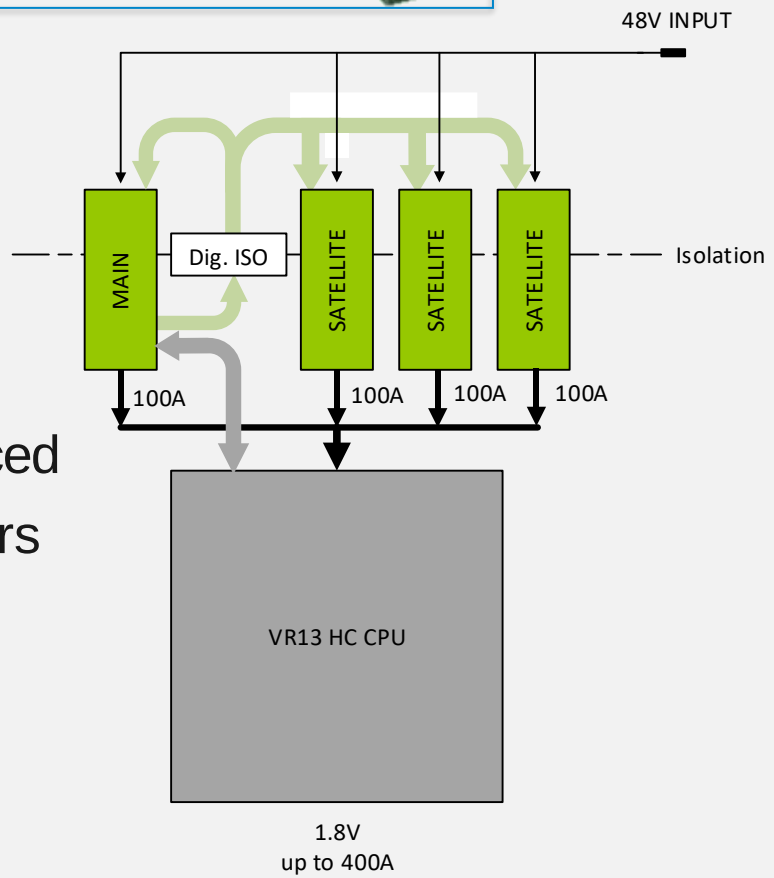
- Any STMicroelectronics Reference Design can be offered in a fully integrated power module
- Highly optimized PCB & planar magnetics for state-of-the-art efficiency & power density
- Module form factor designed for ease of integration, testing & manufacturability in end-user products



Power Stamps – Main & Satellite: Scalable Arrays

- Same size & common pinout for MAIN & SATELLITE
- Block pins for SATELLITE plus LGA footprint for MAIN
- The MAIN is both a power & a control stage
- The SATELLITE is used for scalable power expansion
- When paralleled, MAIN & SATELLITEs operate as a single converter
- Power trains are isolated, MAIN control pins are secondary referenced
- Fully isolated solutions are enabled using external digital isolators
- A maximum of six power stages can be paralleled in an array
- One MAIN & up to five SATELLITEs or one to six SATELLITEs plus an external controller IC





Power Stamps - General Specifications: Output Voltages

1.8Vout – Intel VR13 & VR13 HC Server Class CPUs

Parameter	Specification	Notes
Output Voltage	1.8V 1.6V ÷ 2.0V	Nominal SVID setting
Efficiency	>93%	At TDP point
Output Current	50A TDC / 100A peak	VR13: 3 modules array / VR13HC: 4 modules array
Output Power	100W TDP / 200W peak	Tamb= 40ºC / TBD LFM airflow

1.215Vout – DDR4 Memory DIMMs

Parameter	Specification	Notes
Output Voltage	1.215V 1.16V ÷ 1.26V	Nominal SVID setting
Efficiency	>91.5%	At TDP point
Output Current	50A TDC / 60A peak	8 DIMMs: 2 modules array
Output Power	65W TDP / 75W peak	Tamb= 40ºC / TBD LFM airflow

1.0Vout – IBM Power9 CPUs, GPUs & ASICs

Parameter	Specification	Notes
Output Voltage	1.0V 0.6V ÷ 1.32V	Nominal Power Management Bus with AVS setting
Efficiency	>91%	At TDP point
Output Current	70A TDC / 100A peak	
Output Power	70W TDP / 132W peak	Tamb= 40º / TBD LFM airflow

Power Stamps – Model Selection & Part Numbers

Model Selection

Product Family	Input Voltage	-	Output Voltage	Module style	Output Current	Options
ST	4	-	1V8	M	07	xx
Power Stamp Form Factor	4= 40 – 60V 5= 46 – 59V	-	1V8= 1.8V 1V2= 1.215V 1V0= 1.0V	M= MAIN S= SATELLITE	05= 50A 06= 60A 07= 70A* 08= 80A 09= 90A 10= 100A*	mn= custom (m= letter, n= digit) G= Tray pkg. Ex= Eval. Bd. (x= number of populated stamps)

Part Numbers

Part Number	Input Voltage [V]	Output Voltage* [V]	Output Current [A]	Output Current [A peak]	Efficiency (typical)
MAIN Power Stamps					
ST4-1V8M07xx	40 – 60	1.6 – 2.0	70	100	93.3%
ST4-1V2M07xx	40 – 60	1.16 – 1.26	70	100	91.6%
ST4-1V0M07xx	40 – 60	0.9 – 1.1	70	100	91%
SATELLITE Power Stamps					
ST4-1V8S07xx	40 – 60	1.6 – 2.0	70	100	94%
ST4-1V2S07xx	40 – 60	1.16 – 1.26	70	100	91.6%
ST4-1V0S07xx	40 – 60	0.9 – 1.1	70	100	91%
Controller IC					
STPSA60	-	-	-	-	-

Railway

MELCHER™
The Power Partners.

Under the MELCHER™ brand, Bel Power Solutions is a leading manufacturer of high performance, rugged DC-DC and AC-DC converters for rail, communications and industrial applications where tough, reliable power is paramount.

EN 50155, EN 50121-3-2, EN 45545-2
AREMA, IRIS / ISO-TS 22163:2017

RCM Series: Railway Chassis Mount Power Supplies

MELCHER™ The Power Partners.

MODEL	DC INPUT VOLTAGE	DC OUTPUT VOLTAGE	OUTPUT POWER
12RCM60	12 V (8 – 36 V)	12, 15, 24 V	60 W
XRCM60	24 – 110V (16.8 – 137.5 V)	12, 15, 24V	60 W
24RCM150	24 V (16.8 – 45 V)	12, 15, 24V	150 W
110RCM150	110 V (50.4 – 137.5 V)	12, 15, 24V	150 W
24RCM300	24 V (16.8 – 45 V)	12, 24 V	300 W
110RCM300	110 V (50.4 – 137.5 V)	12, 24 V	300 W
72RCM500	72 V (50.4 – 90 V)	24 V	500 W
110RCM500	110 V (77 – 137.5 V)	24 V	500 W
72RCM1000	72 V (50.4 – 90 V)	24 V	1000 W
110RCM1000	110 V (77 – 137.5 V)	24 V	1000 W

RCM60 Series
DC-DC Converter

RCM150 Series
DC-DC Converter

RCM300 Series
DC-DC Converter

RCM500 Series
DC-DC Converter

RCM1000 Series
DC-DC Converter

5 YEAR warranty Features

- Conduction/convection rated
- Simple connections
- Optional features include: hold up, signals, redundancy, pluggable connectors

Melcher™ Cassettes:
Rugged 3U Cassettes for 19" Rack or Chassis Mount

MELCHER™ The Power Partners.

SERIES	INPUT VOLTAGE	# OF OUTPUT VOLTAGES	OUTPUT POWER
M Series	8 – 385 VDC (6 ranges) 85 – 264 VAC	1, 2 or 3	50 W
S Series	8 – 385 VDC (6 ranges) 85 – 264 VAC	1 or 2	100 W
K Series	8 – 385 VDC (6 ranges) 85 -264 VAC	1 or 2	150 – 200 W
Q Series	14.4 – 150 VDC (5 ranges)	1 or 2	82 – 132 W
P Series	14.4 – 154 VDC (5 ranges)	1, 2, 3 or 4	90 – 192 W
HP Series	12.5 – 154 VDC	1, 2, 3 or 4	120 – 192 W
HR Series	12 – 168 VDC	2	144 – 288 W
LR Series	120 – 300 VDC 90 – 264 VAC	2	240 – 300 W

M Series:
DC-DC &
AC-DC Converter

Q / P / HP Series:
DC-DC Converter

S / K / HR / LR Series:
DC-DC & AC-DC Converter

5 YEAR warranty

Features

- Extremely robust electrical and mechanical design
- High efficiency
- Convection cooling, no derating
- Many options available

IMX Series: Rugged Board Mount DC-DC Converters

SERIES	INPUT VOLTAGE	# OF OUTPUT VOLTAGES	OUTPUT POWER
IMX4 Series	4.7 – 121 VDC (4 ranges)	1 or 2	4 W
IMX 7 Series	8.4 – 150 VDC (4 ranges)	1 or 2	7 W
IMX15 Series	8.4 – 150 VDC (3 ranges)	1 or 2	15 W
IMX35 Series	9 – 150 VDC (4 ranges)	4	35 W
IMX70 Series	12 – 154 VDC (2 ranges)	1 or 2	70 – 90 W
IBX Series	12 – 154 VDC	1	63 – 110 W

Features

- Extremely Robust Electrical & Mechanical Design
- High Efficiency
- Convection Cooling, No Derating
- Magnetic Feedback
- Fit & Forget

5 YEAR warranty

IMX4 Series:
DC-DC Converter

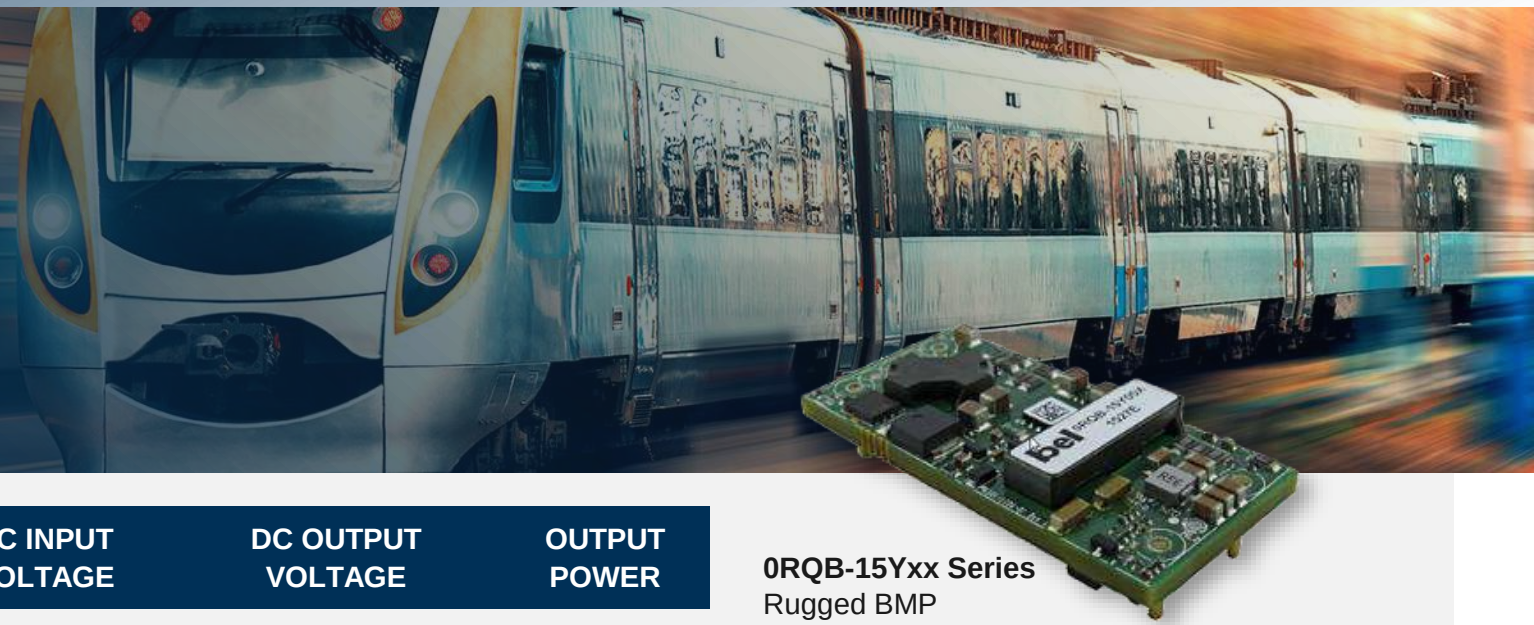
IMX7 Series:
DC-DC Converter

IMX15 Series:
DC-DC Converter

IMX35 / IMX70 Series:
DC-DC Converter

0RQB Series

Railway Board Mount Quarter Brick DC-DC Converters



Features

- 10:1 Wide Input Range
- -40 to 70°C Operating Temperature Range
- Ride-through Function EN 50155 Class S2
- Remote On/Off
- 5 V Auxiliary Output

MODEL	DC INPUT VOLTAGE	DC OUTPUT VOLTAGE	OUTPUT POWER
0RQB-15Yxxx	14.4 – 154 V	5, 12, 24 V	15 W
0RQB-30Yxxx	14.4 – 154 V	5, 12, 24 V	30 W
0RQB-50Yxxx	14.4 – 154 V	5, 12, 24, 48 V	50 W
0RQB-C5Uxxx	14.4 – 67.2 V	12, 24, 44 – 57 V (PoE)	100 – 200 W
0RQB-C5Wxxx	43.2 – 154 V	12, 24, 44 – 57 V (PoE)	100 – 200 W

0RQB-15Yxx Series
Rugged BMP
DC-DC Converter

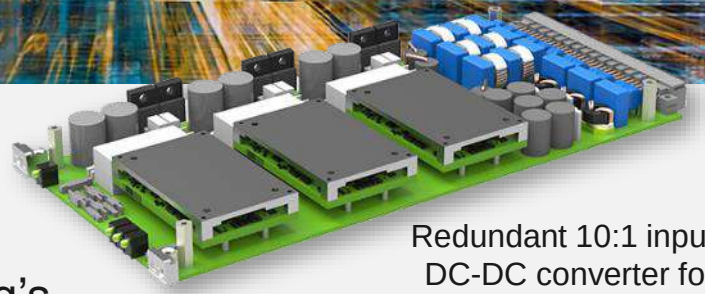
The **0RQB-30Y05L** is an isolated DC/DC converter providing 30 W of output power from a wide input range (24 V, 48 V, 72 V, 96 V, 110 V typical).

Application Specific Solutions

Modified Standard or Full Custom Design

Key Competencies

- Over 40 Years of Design & Mfg. Experience
- Fully Understanding Domestic & Intl. Railway Req's
- Sophisticated Design & Simulation Tools
- Rigorous & Extensive Qualification Test Procedures
- Global Engineering, Mfg. & Sales Support
- Design to Cost



Redundant 10:1 input DC-DC converter for on-board signaling

400 W multiple output DC-DC converter for propulsion control

12 kW on-board battery charger with ETH communication

eMobility

Bel Power Solutions provides a wide range of on-board power conversion products in hybrid and electric vehicles. These products are suitable for electromobiles, trucks, buses and other HEV applications.

Power Conversion for Every Application

DNC Series
4 kW DC-DC Converter (max. 16 kW)

Converts HVDC (240 to 850 VDC) voltages in hybrid and electric vehicles to LVDC voltages suitable to power low voltage (12/24 VDC) accessories.

- Liquid or Convection Cooling
- IP65 & IP67
- E-mark Compliant
- Automotive Standards

INVCH Series
15 kW Bi-Directional Inverter Charger

Converts AC to DC voltages in charge mode (250-435 VDC) for on-board battery charging and DC voltages to pure sine wave AC (120/240 VAC) to power accessories.

- Liquid Cooled Only
- IP65 & IP67
- Optional Grid-Tie Model According to UL1741

INV Series
6 kW DC-AC Inverter (max. 36 kW per phase)

Converts HVDC (240-850 VDC) into split phase AC power (120/240 VAC) required to drive AC accessory loads directly from the high voltage DC drives or battery bus.

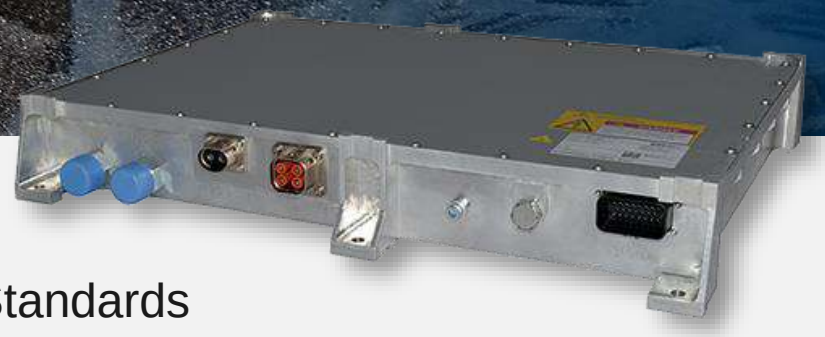
- Optional 3-Phase Configuration Possibility
- Liquid or Convection Cooling
- IP65 & IP67
- E-mark Compliant
- Automotive Standards

Custom Solutions

- Bi-Directional DC/DC Converters
- Motor Controllers for Bow Thrusters
- Inverters for Marine Applications

BCN25-700-8:
25 kW Battery Charger for Mining/Construction Applications

3-Phase On-Board Battery Charger Without Neutral



Features

- Up to 25 kW Output Power
- 93% Typical Efficiency
- AC 3-Phase Input 460-575Vac +/-10% (Line-Line)
- DC Output 500-800 VDC, 37.5 ADC
- J1939 Compliant CAN Control & Monitoring
- Overtemperature, Output Overvoltage & Overcurrent Protections
- IP65 & IP67 Rating, Stackable Chassis
- SAE 1455 Complaint Environmental Standards
- UL & CSA approved

Applications

Charging of hybrid / full electric vehicles operating in a mining or industrial environment. Not intended to connect to the public grid.

BCL25-700-8:
25 kW On-Board Battery Charger for Automotive

The **BCL25-700-8** is a 22/25 kW liquid cooled on-board battery charger that converts 3-Phase AC voltage to DC voltage in hybrid or full electric vehicles.

Features

- Input power up to 22/25 kW @ 400/480 VAC
- Typical efficiency 94%
- AC input range:
  - 3-Phase: 330 - 528 VAC (L-L)
  - 1-Phase: 190 – 264 VAC (L-N)
- DC output 240 - 800 VDC
- Bi-directional operation:
  - AC-DC charge mode
  - DC-AC export mode
- Parallelable up to 4 units in charge mode
- Active HVDC interlock monitoring
- Overtemperature, output overvoltage and overcurrent protections
- Operating temperature -40°C to 60°C at full load
- SAE J1939 compliant CAN bus communication interface
- SAE J1772 & EN 61851 compliant
- IEC 61851-21-1 compliant immunity requirements
- SAE J1455 compliant environmental standards
- IP67, IP6K9K protection
- J1939 compliant CAN Control & Monitoring
- **Suitable for:** Heavy Trucks, Mining Vehicles, Buses, Taxis, Light Vans, Marine, Portable Energy Storage, Harsh Environment Applications

POWER | PROTECT | CONNECT