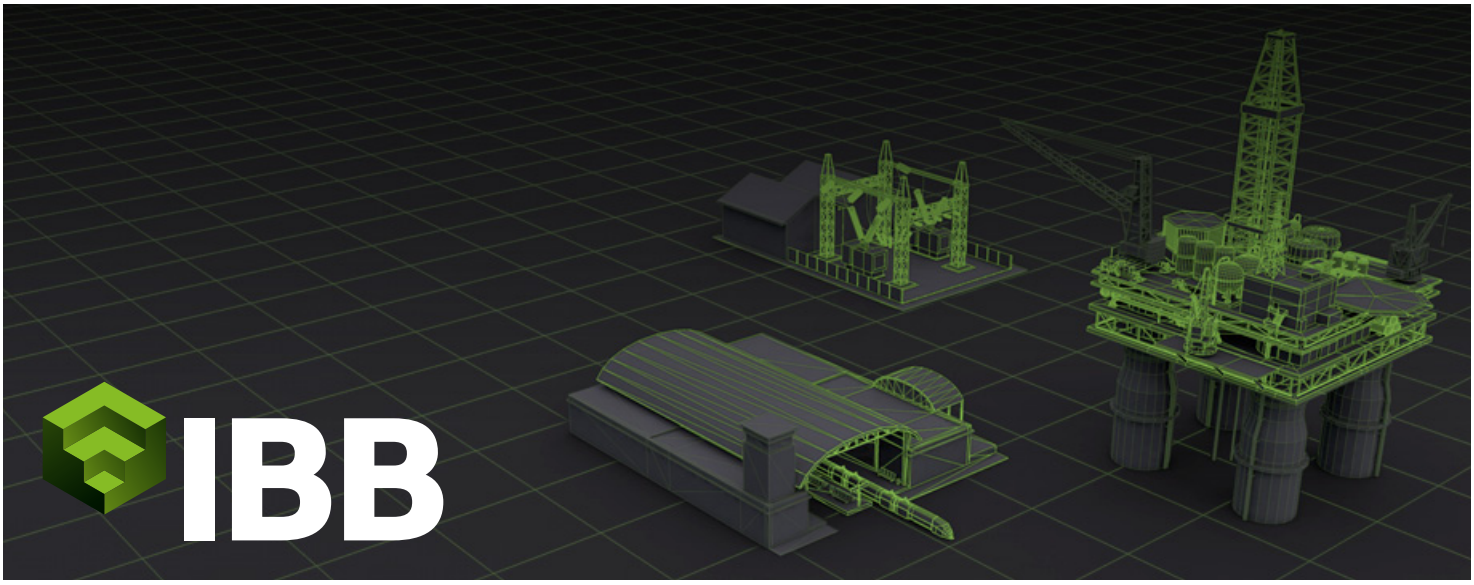
ELTEK

PRECONFIGURED BUILDING BLOCKS

- the easy way to smart power



IBF AC/DC

INDUSTRIAL DC SYSTEM

IBF DC/DC-HV

DC/AC INVERTER

High Efficiency Industrial Power Solutions

Eltek IBB Industrial power systems offer end users a significant advantage over current technology in both cost and performance. The modular architecture, industry-leading efficiency, compact size, innovative design and comprehensive monitoring and control features provide significant benefits over the current industry standard.

Eltek IBB Power systems and building blocks are built around our Flatpack2 High Efficiency (HE) rectifiers and designed for a number of power-critical Industrial applications, including Power Generation & Distribution, Rail, Marine & Offshore, Oil & Gas and other demanding industries.

IBB SYSTEMS

BUILDING BLOCKS FOR INDUSTRIAL POWER

INDUSTRY APPLICATIONS

Power Utilities
- Low & High Voltage switchgear
- Transformer & Substations
- Power Generation & Distribution
- Control & protection
- SCADA Communication
- Emergency lighting

Offshore and process industry
- Safety and Automation Systems (SAS)

Marine
- Communication systems onboard ships

Railway infrastructure
- Control & protection
- Power conversion
- Signaling
- GSM-R
- Safety Systems
- Communication systems

Front panel Smartpack2 Master Ctrl

Flatpack2 HE converters

KEY FEATURES

- Compact design and easy installation
- Industry-leading efficiency; less power consumption and heat dissipation
- Modular Hot Plug-in architecture allows:
  - Redundancy; n+1, n+2 configuration
  - Very low MTTR: <5min
  - MTBF of each module > 350.000h
- Extensive control & alarm functions with remote control capabilities
- Pre-engineered and tested systems and building blocks
- Overall size and footprint; 50% less than thyristor systems
- Graphical 3.2" TFT high contrast, high resolution color display for easy navigation in user menu
- Optional built in VRLA batteries (up to 125VDC)

Building blocks for IBB Systems

FPC Cabinets

FPC is a family of high-end indoor cabinets, designed for flexibility. With its robust design, removable side panels and variety of options, the FPC cabinet can be used in a wide range of applications.

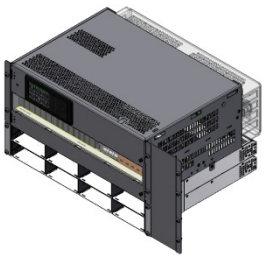
(For additional information about FPC cabinets, please see separate data sheet)

FPC Cabinets

IBF-SP2 Power Core

A complete 19" & 23" Power core pre-engineered and designed for: 24, 30, 48, 60, 110, 125 and 220 VDC with the following features:

- Power rack housing up to 8 FP2 rectifiers, AC Input fusing and SPD (Surge protection)
- Smartpack2 Controller with 3,2" TFT Color display, including Ethernet and Web interface for remote monitoring
- 300A DC Bus bars
- 6 Digital inputs for external alarm management
- 6 Relay outputs NO, COM, NC for remote alarm indications
- Power Suite Configuration software for easy programming
- Battery shunt

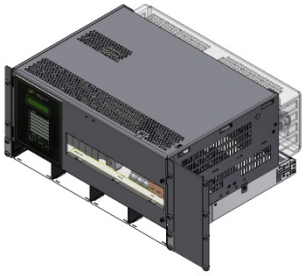


IBF-SP2 with DC bulk feed output

IBF-UPC4 Power Core

A complete 19" & 23" Power core pre-engineered and designed for: 24, 30, 48, 60, 110, 125 and 220 VDC with the following features:

- Power rack housing up to 8 FP2 rectifiers, AC Input fusing and SPD (Surge protection)
- UPC4 DC Controller with multi module (rectifier, DC/DC Converter, Inverter and STS) control functionality and display
- 300A DC Bus bars
- 6 Digital inputs for external alarm management
- 6 Relay outputs NO, COM, NC for remote alarm indications
- MMT Configuration software for easy programming
- Battery shunt



IBF-UPC4 with DC bulk feed output

Distribution Unit

A complete 23" Distribution unit designed for: 24, 30, 48, 60, 110, 125 and 220 VDC with the following features:

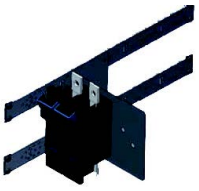
- Up to 12 2-Pole MCBs 6-40A with or without fuse trip alarms

Distribution unit

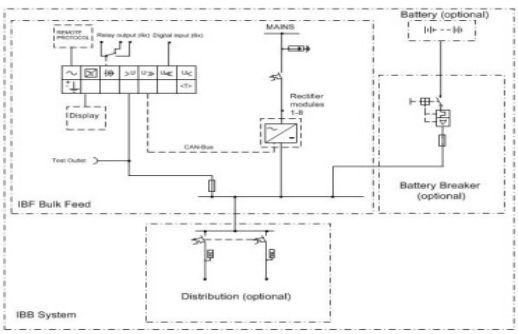
Battery fuse Unit

A complete battery fuse unit for system mounting designed for: 24, 30, 48, 60, 110, 125 and 220V_{DC} with the following features:

- NH00 and NH1, 63-250A Fuses with fuse trip alarm or
- MCCB, 63-250A Circuit breakers with fuse trip alarm



Battery fuse unit



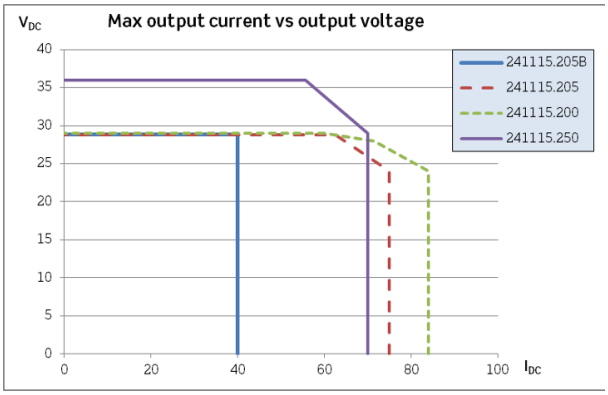
General single line diagram

24V/30V Systems

Applications

The 24V/30V rectifiers are suitable for parallel operation with all types of stationary batteries, including lead acid or nickel cadmium types, and can also operate without batteries.
Typical applications:

- Alarm systems
- Diesel start float application
- PABX systems
- Emergency lightning
- Industrial control systems



AVAILABLE 24V/30V RECTIFIERS

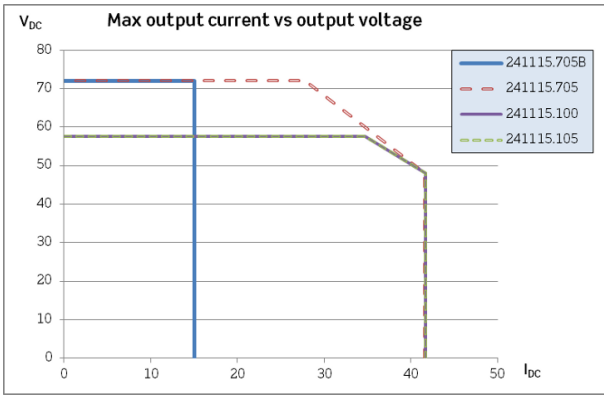
Part Number	Description	Voltage Range	Efficiency	Maximum Current		Output protection
				1 Module	Max/Syst.	
241115.205B	Flatpack2 24V/40A HE	21.7 – 28.8 V	> 95% (30-65% load)	40 A	4/160A	Fuse
241115.205	Flatpack2 24V/1800W HE	21.7 – 28.8 V	> 95% (30-65% load)	75 A	4/300A	Fuse
241115.200	Flatpack2 24V/2000W	21 – 29 V	> 89% (25-100% load)	84 A	4/300A	Blocking diode
241115.250	Flatpack2 24V/2000W WOR	21.5 – 36 V	> 91% (25-85% load)	70 A	4/280A	Fuse

48V/60V Systems

Applications

The 48V rectifiers are deigned to meet international telecom standards for safe and reliable operation in telecom environments or any industrial communication system.
Typical applications:

- Telecommunication systems; SCADA, GSM-R
- PABX systems
- Emergency lightning
- Industrial control systems



AVAILABLE 48V/60V RECTIFIERS

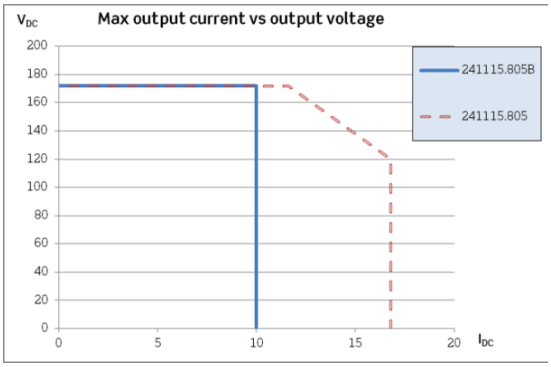
Part Number	Description	Voltage Range	Efficiency	Maximum Current		Output protection
				1 Module	Max/Syst.	
241115.705B	Flatpack2 48-60V/15A HE	39.9 – 72 V	> 95.5% (50-100% load)	15 A	8/120A	Fuse
241115.705	Flatpack2 48-60V/2000W HE	39.9 – 72 V	> 95.5% (25-75% load)	41.6 A	8/166,4A	Fuse
241115.100	Flatpack2 48V/2000W	43.2 – 57.6 V	> 91.5% (45-95% load)	41.6 A	8/166,4A	Blocking diode
241115.105	Flatpack2 48V/2000W HE	43.5 – 57.6 V	> 96% (30-70% load)	41.6 A	8/166,4A	Fuse

110V/125V Systems

Applications

The 110V rectifiers are designed for demanding environments and comply with IEC61000-6.5 (Immunity Power Stations and Substations) for reliable operation in critical applications.
Typical applications:

- Low & High Voltage switchgear
- Transformer & SUB Stations
- Power Generation & Distribution



AVAILABLE 110V/125V RECTIFIERS

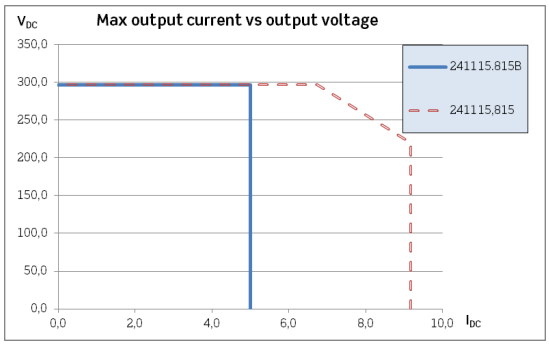
Part Number	Description	Voltage Range	Efficiency	Maximum Current		Output protection
				1 Module	Max/Syst.	
241115.805B	Flatpack2 110-125V/10A HE	89.2-171.6 V	> 94% (45-100% load)	10 A	8/80 A	Oring diode
241115.805	Flatpack2 110-125V/2000W HE	89.2-171.6 V	> 94% (30-70% load)	16.8 A	8/134,4A	Oring diode

220V Systems

Applications

The 220V rectifiers are designed for demanding environments and also comply with IEC61000-6.5 (Immunity Power Stations and Substations) for reliable operation in critical applications. Typical applications:

- Low & High Voltage switchgear
- Transformer & SUB Stations
- Power Generation & Distribution



AVAILABLE 220V RECTIFIERS

Part Number	Description	Voltage Range	Efficiency	Maximum Current		Output protection
				1 Module	Max/Syst.	
241115.815B	Flatpack2 220V/5A HE	178,5-297 V	> 95% (45-95% load)	5 A	8/40A	Oring diode
241115.815	Flatpack2 220V/2000W HE	178,5-297 V	> 95% (35-65% load)	9.16 A	8/73.3A	Oring diode

GENERAL TECHNICAL SPECIFICATIONS

Model	Industrial DC Systems IBB 24-220V_{DC}
Part number	Depending on configuration
INPUT DATA	
Voltage (range)	115 - 400 V_{AC} (Δ) or (Y), Derating <185V_{AC}, 45-66Hz
Input protection	MCBs and SPD (OVP Class 2)
Rectifier protection	Individual fuse in rectifier modules
Connection	Terminals 10mm^2
OUTPUT DATA	
Voltage (nominal)	24V_{DC}, 30V_{DC}, 48V_{DC}, 60VD_C, 110V_{DC}, 125V_{DC} &220V_{DC}
Power (maximum) @ nominal input	16kW
Current (maximum) @ nominal input	See previous page or applicable Flatpack2 rectifier datasheet
Protected battery output	1 x 2 pole NH00/NH1 Fuses (63 - 250A) or MCCB Circuit Breaker(63 - 250A) with or without fuse trip alarm
Protected load outputs	1-24 x 2 pole (6 - 40A) MCB:s with or without fuse trip alarm
Integrated battery shunt	100/300A
Load connection	Terminal, max 16mm^2
Output Protection in rectifiers	Blocking OR-ing FET or fuse, Short circuit proof & High temperature protection
CONTROL AND MONITORING	
Monitoring Unit	Smartpack2 or UPC4
Local Operation	Display and keys, WEB interface via standard browser using WebPower
Remote Operation	WebPower (WEB Interface, SNMP protocol and email)
Alarm Relays (Connection: clamp ≤ 1.5 mm^2)	6 x Potential free change over contacts (NO, NC, C) [Max 75V/2A/60W] Optional; 3 x Potential free change over contacts (NO, NC, C) [Max 430V_{DC}/0,1A]
Inputs	6 x Configurable (digital, analog max 75V) and 3 temperature
Current measurements	Rectifier current and, if battery shunt is used, battery current and load current
Alarms	Low & high output voltage alarms (Minor and major levels), Earth fault alarm, Temperature alarm, Mains outage alarm, Battery remaining capacity/low quality alarms, Battery/load breaker tripped alarm and much more
OTHER SPECIFICATIONS	
Isolation	3.0 kV_{AC} - input to output 1.5 kV_{AC} - input to earth 0.5 kV_{DC} - output to earth[1)]
Operating temperature	-40 to +45°C (-40 to +113°F), humidity 5 - 95% RH non-condensing Output power de-rates at high temperature, see datasheet for applicable rectifier
Storage temperature	-40 to +85°C (-40 to +185°F), humidity 0 - 99% RH non-condensing
Dimensions[WxHxD]	600 x 1800/2000 x 600mm
DESIGN STANDARDS	
Electrical safety	UL 60950-1-3rd edition, EN 60950-1-3rd edition
EMC	ETSI EN 300 386 V.1.4.1 EN 61000-6-1 / -2 / -3 / -4 / -5
Environment	ETSI EN 300 019, ETSI EN 300 132 - 2

1) 1.5kV_{AC} for IBB with 110V & 220V Flatpack2 rectifiers

19” Power supply system

The Industrial bulk feed (IBF) unit is designed for systems with 24-220 VDC output, from 2-16 kW output power. The Power Core is built around the Flatpack2 rectifiers, and designed for applications such as switchgear, telecom, emergency lighting and alarm systems.

Its compact design and simple installation make it a powerful 19” power supply package.

The IBF unit can be used as a stand-alone system or as integrated unit into our IBB systems together with our Flatpack2 rectifiers.

IBF AC/DC

24 VDC, 48 VDC , 60 VDC , 125 VDC & 220 VDC SYSTEMS

DOC. NO: CI020806.400.DS3, V1

INDUSTRY APPLICATIONS

Power Utilities
- Low & High Voltage switchgear
- Transformer & SUB Stations
- Power Generation & Distribution
- Control & protection
- SCADA
- Communications equipment

Marine
- Communication onboard ships

Railway infrastructure
- Control & protection
- Signaling

Telecom - Mobile – Fixed / Wireless
- Radio Base stations/ Cell Sites
- Distributed Antenna Systems
- Microwave
- Broadband

Front panel Smartpack2 Master Ctrl

Flatpack2 HE rectifiers

KEY FEATURES

- COMPACT DESIGN
- SIMPLE INSTALLATION
- HOUSE UP TO 8 RECTIFIER
- 85-300 VAC INPUT
- 2-16 KW OUTPUT
- BULK FEED OUTPUT
- MAX 300 A, DC OUTPUT
- INTEGRATED BATTERY SHUNT
- GRAPGHICAL 3.2” TFT DISPLAY
- 6 RELAY OUTPUTS
- 6 DIGITAL INPUTS
- ETHERNET
- WEB BROWSER
- SNMP
- MODBUS TCP/IP (RTU)

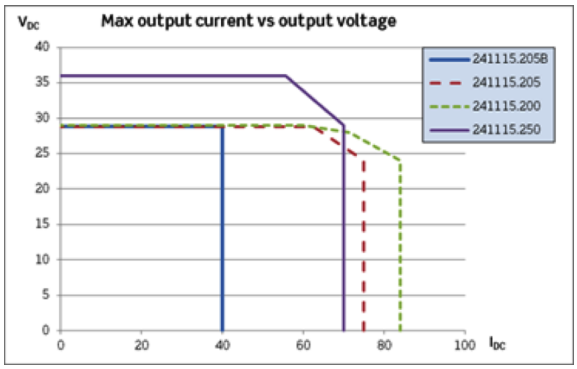
24V/30V Systems

Applications

The 24V/30V rectifiers are suitable for parallel operation with all types of stationary batteries, including lead acid or nickel cadmium types, and can also operate without batteries.
Typical applications:

- Alarm systems
- Diesel start float application
- PABX systems
- Emergency lighting
- Industrial control systems

FLATPACK2 24/30 V RECTIFIERS



1 POWER RACK (1PR) — AVAILABLE 24/30V RECTIFIERS

Part Number	Description	Output Voltage Range	Efficiency	Max Output current				Output protection
				1 Module	2 Module	3 Module	4 Module	
241115.205B	Flatpack2 24V/40A HE	21.7 – 28.8 V	> 95% (30-65% load)	40 A	80 A	120 A	160 A	Fuse
241115.205	Flatpack2 24V/1800W HE	21.7 – 28.8 V	> 95% (30-65% load)	75 A	150 A	225 A	300 A	Fuse
241115.200	Flatpack2 24V/2000W	21 – 29 V	> 89% (25-100% load)	84 A	168 A	252 A	-	Blocking diode
241115.250	Flatpack2 24V/2000W WOR	21.5 – 36 V	> 91% (25-85% load)	70 A	140 A	210 A	280 A	Fuse

2 POWER RACK (2PR) — AVAILABLE 24/30V RECTIFIERS

Part Number	Description	Output Voltage Range	Efficiency	Max Output current				Output protection
				5 Module	6 Module	7 Module	8 Module	
241115.205B	Flatpack2 24V/40A HE	21.7 – 28.8 V	> 95% (30-65% load)	200 A	240 A	280 A	-	Fuse
241115.205	Flatpack2 24V/1800W HE	21.7 – 28.8 V	> 95% (30-65% load)	-	-	-	-	Fuse
241115.200	Flatpack2 24V/2000W	21 – 29 V	> 89% (25-100% load)	-	-	-	-	Blocking diode
241115.250	Flatpack2 24V/2000W WOR	21.5 – 36 V	> 91% (25-85% load)	-	-	-	-	Fuse

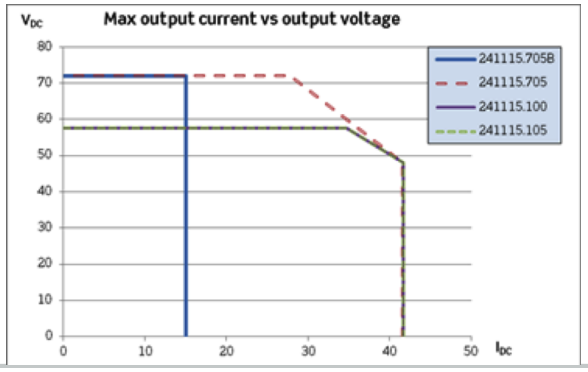
48V/60V Systems

Applications

The 48V rectifiers are deigned to meet international telecom standards for safe and reliable operation in telecom environments or any industrial communication system.
Typical applications:

- Telecommunication systems; SCADA, GSM-R
- PABX systems
- Emergency lighting
- Industrial control systems

FLATPACK2 48/60 V RECTIFIERS



1 POWER RACK (1PR) — AVAILABLE 48/60V RECTIFIERS

Part Number	Description	Output Voltage Range	Efficiency	Max Output current				Output protection
				1 Module	2 Module	3 Module	4 Module	
241115.705B	Flatpack2 48-60V/15A HE	39.9 – 72 V	> 95.5% (50-100% load)	15 A	30 A	45A	60 A	Fuse
241115.705	Flatpack2 48-60V/2000W HE	39.9 – 72 V	> 95.5% (25-75% load)	41.6 A	83.2 A	124,8 A	166,4 A	Fuse
241115.100	Flatpack2 48V/2000W	43.2 – 57.6 V	> 91.5% (45-95% load)	41.6 A	83.2 A	124,8 A	166,4 A	Blocking diode
241115.105	Flatpack2 48V/2000W HE	43.5 – 57.6 V	> 96% (30-70% load)	41.6 A	83.2 A	124,8 A	166,4 A	Fuse

2 POWER RACK (2PR) — AVAILABLE 48/60V RECTIFIERS

Part Number	Description	Output Voltage Range	Efficiency	Max Output current				Output protection
				5 Module	6 Module	7 Module	8 Module	
241115.705B	Flatpack2 48-60V/15A HE	39.9 – 72 V	> 95.5% (50-100% load)	75 A	90 A	105 A	120 A	Fuse
241115.705	Flatpack2 48-60V/2000W HE	39.9 – 72 V	> 95.5% (25-75% load)	208 A	249,6 A	291,6 A	-	Fuse
241115.100	Flatpack2 48V/2000W	43.2 – 57.6 V	> 91.5% (45-95% load)	208 A	249,6 A	291,6 A	-	Blocking diode
241115.105	Flatpack2 48V/2000W HE	43.5 – 57.6 V	> 96% (30-70% load)	208 A	249,6 A	291,6 A	-	Fuse

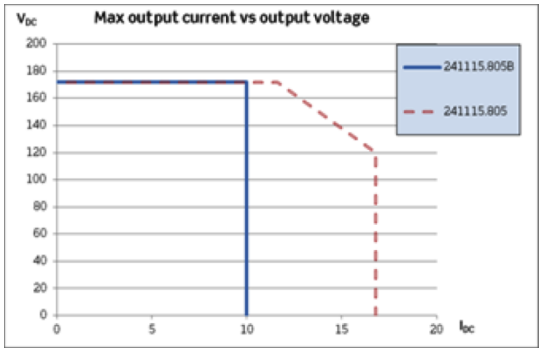
110V/125V Systems

Applications

The 110/125V rectifiers are designed for demanding environments and comply with IEC61000-6.5 (Immunity Power Stations and Substations) for reliable operation in critical applications.
Typical applications:

- Low & High Voltage switchgear
- Transformer & SUB Stations
- Power Generation & Distribution

FLATPACK2 110/125 V RECTIFIERS



1 POWER RACK (1PR) — **AVAILABLE 110/125V RECTIFIERS**

Part Number	Description	Output Voltage Range	Efficiency	Max Output current				Output protection
				1 Module	2 Module	3 Module	4 Module	
241115.805B	Flatpack2 110-125V/10A HE	89.2-171.6 V	> 94% (45-100% load)	10 A	20 A	30 A	40 A	Oring diode
241115.805	Flatpack2 110V/2000W HE	89.2-171.6 V	> 94% (30-70% load)	16.8 A	33.6A	50,4	67,2	Oring diode

2 POWER RACK (2PR) — **AVAILABLE 110/125V RECTIFIERS**

Part Number	Description	Output Voltage Range	Efficiency	Max Output current				Output protection
				5 Module	6 Module	7 Module	8 Module	
241115.805B	Flatpack2 110-125V/10A HE	89.2-171.6 V	> 94% (45-100% load)	50 A	60 A	70 A	80 A	Oring diode
241115.805	Flatpack2 110V/2000W HE	89.2-171.6 V	> 94% (30-70% load)	84 A	96 A	117,6 A	134,4 A	Oring diode

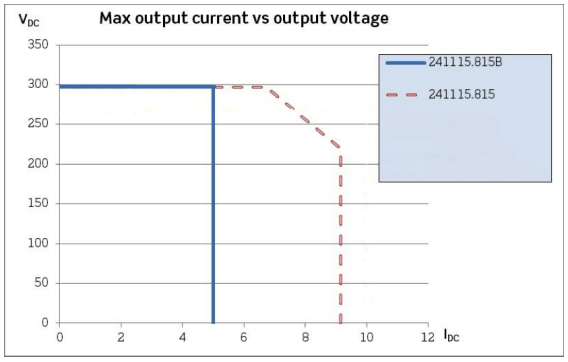
220V Systems

Applications

The 220V rectifiers are designed for demanding environments and comply with IEC61000-6.5 (Immunity Power Stations and Substations) for reliable operation in critical applications.
Typical applications:

- Low & High Voltage switchgear
- Transformer & SUB Stations
- Power Generation & Distribution

FLATPACK2 220 V RECTIFIERS



1 POWER RACK (1PR) — **AVAILABLE 220V RECTIFIERS**

Part Number	Description	Output Voltage Range	Efficiency	Max Output current				Output protection
				1 Module	2 Module	3 Module	4 Module	
241115.815B	Flatpack2 220V/5A HE	178,5-297 V	> 94% (45-100% load)	5 A	10 A	15 A	20 A	Oring diode
241115.815	Flatpack2 220V/2000W HE	178,5-297 V	> 94% (30-70% load)	9,16 A	18,32 A	27,48 A	36,64 A	Oring diode

2 POWER RACK (2PR) — **AVAILABLE 220V RECTIFIERS**

Part Number	Description	Output Voltage Range	Efficiency	Max Output current				Output protection
				5 Module	6 Module	7 Module	8 Module	
241115.815B	Flatpack2 220V/5A HE	178,5-297 V	> 94% (45-100% load)	25 A	30 A	35 A	40 A	Oring diode
241115.815	Flatpack2 220V/2000W HE	178,5-297 V	> 94% (30-70% load)	45,8 A	54,96 A	64,12 A	73,28 A	Oring diode

IBF AC/DC

TECHNICAL SPECIFICATIONS

Model	IBF-AC/DC-1PR-Std.Basic	IBF-AC/DC-2PR-Std.Basic	IBF-AC/DC-1PR-Ind.Basic	IBF-AC/DC-2PR-Ind.Basic
Part number	CIO20405.xxx	CIO20806.xxx	CIO20405.xxx	CIO20806.xxx
INPUT DATA				
Voltage (range)	85 - 300 $_{AC}$			
Surge Protection	OVP Class 2			
AC Input protection TN network	3*25 A MCB (single pol)	3*40 A MCB (single pol)	3*25 A MCB (single pol)	3*40 A MCB (single pol)
AC Input protection IT network	1*32 A MCB (three pol)	1*63 A MCB (three pol)	1*32 A MCB (three pol)	1*63 A MCB (three pol)
Input protection in rectifiers	Individual fuse in rectifier modules			
Connection	Individual screw terminal 6 mm^2 PE screw terminal, max 6 mm^2 and M5 cable lug directly to chassis			
OUTPUT DATA				
Voltage (default)	24-125 V_{DC}		24-220 V_{DC}	
Power (maximum) @ nominal input	8000 W	16000 W	8000 W	16000 W
Current (maximum) @ nominal input	See previous page or applicable Flatpack2 datasheet			
Unprotected bulk output	•			
Connection bulk output	M8 bolt			
Built in battery shunt	•			
Output Protection in rectifiers	Blocking OR-ing FET or fuse, Short circuit proof & High temperature protection			
CONTROL AND MONITORING				
Monitoring Unit	Smartpack 2 Control System with Standard Basic		Smartpack 2 Control System with Industrial Basic	
Local Operation	Display and keys, WEB interface via standard browser			
Remote Operation	WebPower (WEB Interface, SNMP protocol and email)			
Alarm Relays (Connection: clamp $\leq$ 1.5 mm^2)	6 x Potential free contacts (NO, NC, C) [Max 75 VDC/1,0 A]			
Alarm Relays (Connection: clamp $\leq$ 1.5 mm^2)	-		3 x Potential free contacts (NO,NC,C) [Max 300 VDC/0,1 A]	
Digital Inputs	6x NO/NC			
MODBUS	TCP/IP		TCP/IP & RTU	
Communication ports	RJ45		RJ45, RS232, RS485	
Battery symmetry measurements	-		•	
Current measurements	Rectifier, Battery & Load Current			
Alarms	Low & high output voltage alarms (Minor and major levels) Earth fault alarm, Temperature alarm, AC Input outage alarm, load breaker & battery breaker alarm and much more			
OTHER SPECIFICATIONS				
Isolation	3.0 kV_{AC} - input to output 1.5 kV_{AC} - input to earth 0.5 kV_{DC} - output to earth (1.5 kV_{DC} for 110 & 220 V rectifiers)			
Operating temperature	-40 to +45°C (-40 to +113°F), humidity 5 - 95% RH non-condensing Output power de-rates at high temperature, see datasheet for applicable rectifier			
Storage temperature	-40 to +85°C (-40 to +185°F), humidity 0 - 99% RH non-condensing			
Dimensions[WxDxH]	482*432*222mm (5U)	482*432*267mm (6U)	482*432*222mm (5U)	482*432*267mm (6U)
Weight (without rectifiers)	17 kg	16 kg	17 kg	16 kg
DESIGN STANDARDS				
Electrical safety	EN 60950-1			
EMC	ETSI EN 300 386 V.1.6.1 EN 61000-6-1 /-2 /-3 /-4 /-5 (Depending on module)			
Environment	ETSI EN 300 019, ETSI EN 300 132 - 2			

DC/DC Converter system

The Industrial bulk feed (IBF) unit is designed for systems with high voltage DC input (85-300 VDC). The Power Core is built around the Flatpack2 HE converters, and designed for applications such as switchgear, telecom, emergency lighting and alarm systems.

Its compact design and simple installation make it a powerful 19" power supply package.

The IBF unit can be used as a stand-alone system or as an integrated unit together with our Flatpack2 rectifiers.

IBF DC/DC-HV (HIGH VOLTAGE)

24 VDC, 48 VDC , 60 VDC , 110 VDC , 125 VDC & 220 VDC SYSTEMS

DOC. NO: CIE20806.400.DS3, V1

INDUSTRY APPLICATIONS

Power Utilities
- Low & High Voltage switchgear
- Transformer & SUB Stations
- Power Generation & Distribution
- Control & protection
- SCADA
- Communications equipment

Offshore and process industry
- Safety and Automation Systems (SAS)

Marine
- Communication onboard ships

Railway infrastructure
- Control & protection
- Signaling

Telecom – Mobile - Fixed / Wireless
- Radio Base stations/ Cell Sites
- LTE / 4G / WiMAX
- Distributed Antenna Systems
- Microwave & Broadband

Front panel Smartpack2 Master Ctrl

Flatpack2 HE converters

KEY FEATURES

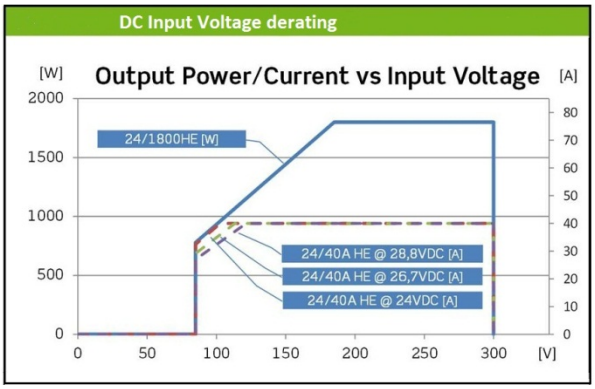
- Compact design and simple installation
- 85-300 DC Input
- House up to 8 rectifier modules
- 24-220 VDC converter systems
- Bulk feed output
- Option with integrated 2 pole load fuse output
- Graphical 3.2" TFT high contrast, high resolution color display for easy navigation in user menu
- Ethernet for remote or local monitoring and control via WEB Browser
- SNMP protocol with TRAP, SET and GET on Ethernet. Email of TRAP alarms
- 3 digital programmable relay outputs
- 3 programmable multipurpose inputs ("digital inputs" or analog signals).

24V DC/DC Converter

Applications

All HE modules operates with DC input (85-300 VDC), making it a versatile DC/DC converter for stepping down a DC supply or act as a buffer to isolate branches.

- Alarm systems
- PABX systems
- Emergency lighting
- Industrial control systems



1 POWER RACK (1PR) — **AVAILABLE 24V DC/DC CONVERTERS**

Part Number	Description	Output Voltage Range	Efficiency	Max Output current depending on Input Voltage (see curve above)				Output protection
				1 Module	2 Module	3 Module	4 Module	
241115.205B	Flatpack2 24V/40A HE	21.7 – 28.8 V	> 95% (30-65% load)	40 A	80 A	120 A	160 A	Fuse
241115.205	Flatpack2 24V/1800W HE	21.7 – 28.8 V	> 95% (30-65% load)	75 A	150 A	225 A	300 A	Fuse

2 POWER RACK (2PR) — **AVAILABLE 24V DC/DC CONVERTERS**

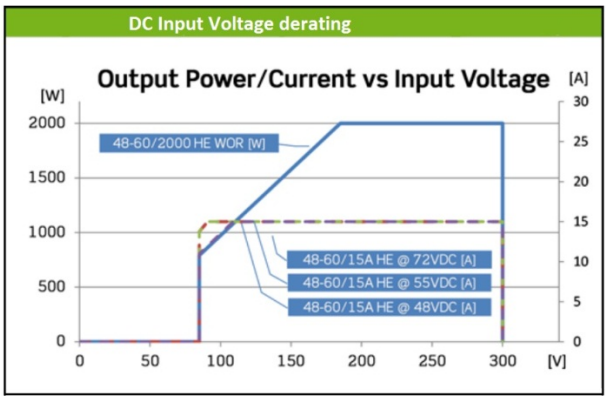
Part Number	Description	Output Voltage Range	Efficiency	Max Output current depending on Input Voltage (see curve above)				Output protection
				5 Module	6 Module	7 Module	8 Module	
241115.205B	Flatpack2 24V/40A HE	21.7 – 28.8 V	> 95% (30-65% load)	200 A	240 A	280 A	-	Fuse
241115.205	Flatpack2 24V/1800W HE	21.7 – 28.8 V	> 95% (30-65% load)	-	-	-	-	Fuse

48V/60V DC/DC Converters

Applications

All HE modules operates with DC input (85-300 VDC), making it a versatile DC/DC converter for stepping down a DC supply or act as a buffer to isolate branches.

- Telecommunication systems; SCADA, GSM-R
- PABX systems
- Emergency lighting
- Industrial control systems



1 POWER RACK (1PR) — **AVAILABLE 48/60V DC/DC CONVERTERS**

Part Number	Description	Output Voltage Range	Efficiency	Max Output current depending on Input Voltage (see curve above)				Output protection
				1 Module	2 Module	3 Module	4 Module	
241115.705B	Flatpack2 48-60V/15A HE	39.9 – 72 V	> 95.5% (50-100% load)	15 A	30 A	45A	60 A	Fuse
241115.705	Flatpack2 48-60V/2000W HE	39.9 – 72 V	> 95.5% (25-75% load)	41.6 A	83.2 A	124,8 A	166,4 A	Fuse
241115.105	Flatpack2 48V/2000W HE	43.5 – 57.6 V	> 96% (30-70% load)	41.6 A	83.2 A	124,8 A	166,4 A	Fuse

2 POWER RACK (2PR) — **AVAILABLE 48/60V DC/DC CONVERTERS**

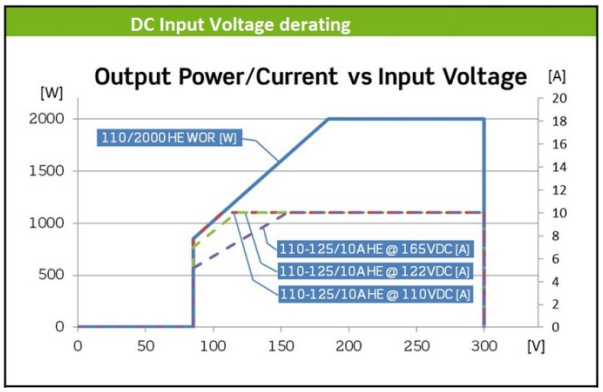
Part Number	Description	Output Voltage Range	Efficiency	Max Output current depending on Input Voltage (see curve above)				Output protection
				5 Module	6 Module	7 Module	8 Module	
241115.705B	Flatpack2 48-60V/15A HE	39.9 – 72 V	> 95.5% (50-100% load)	75 A	90 A	105 A	120 A	Fuse
241115.705	Flatpack2 48-60V/2000W HE	39.9 – 72 V	> 95.5% (25-75% load)	208 A	249,6 A	291,2 A	-	Fuse
241115.105	Flatpack2 48V/2000W HE	43.5 – 57.6 V	> 96% (30-70% load)	208 A	249,6 A	291,2 A	-	Fuse

110V/125V DC/DC Converters

Applications

All HE modules operates with DC input (85-300 VDC), making it a versatile DC/DC converter for stepping down a DC supply or act as a buffer to isolate branches.

- Low & High Voltage switchgear
- Transformer & SUB Stations
- Power Generation & Distribution



1 POWER RACK (1PR) — AVAILABLE 110/125V DC/DC CONVERTERS

Part Number	Description	Output Voltage Range	Efficiency	Max Output current depending on Input Voltage (see curve above)				Output protection
				1 Module	2 Module	3 Module	4 Module	
241115.805B	Flatpack2 110-125V/10A HE	89.2-171.6 V	> 94% (45-100% load)	10 A	20 A	30 A	40 A	Oring diode
241115.805	Flatpack2 110V/2000W HE	89.2-171.6 V	> 94% (30-70% load)	16.8 A	33.6A	50,4	67,2	Oring diode
241119.805	Flatpack2 110-125V/20A HE	99,7-145 V	> 94% (45-100% load)	20 A	40 A	60 A	80 A	Oring diode

2 POWER RACK (2PR) — AVAILABLE 110/125V DC/DC CONVERTERS

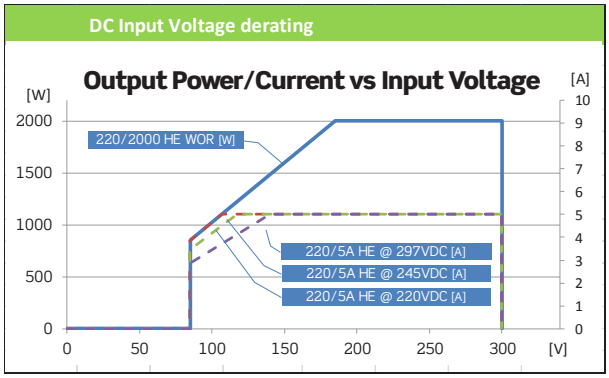
Part Number	Description	Output Voltage Range	Efficiency	Max Output current depending on Input Voltage (see curve above)				Output protection
				5 Module	6 Module	7 Module	8 Module	
241115.805B	Flatpack2 110-125V/10A HE	89.2-171.6 V	> 94% (45-100% load)	50 A	60 A	70 A	80 A	Oring diode
241115.805	Flatpack2 110V/2000W HE	89.2-171.6 V	> 94% (30-70% load)	84 A	96 A	117,6 A	134,4 A	Oring diode
241119.805	Flatpack2 110-125V/20A HE	99,7-145 V	> 94% (45-100% load)	100 A	120 A	140 A	160 A	Oring diode

220V DC/DC Converters

Applications

All HE modules operates with DC input (85-300 VDC), making it a versatile DC/DC converter for stepping down a DC supply or act as a buffer to isolate branches.

- Low & High Voltage switchgear
- Transformer & SUB Stations
- Power Generation & Distribution



1 POWER RACK (1PR) — AVAILABLE 220V DC/DC CONVERTERS

Part Number	Description	Output Voltage Range	Efficiency	Max Output current depending on Input Voltage (see curve above)				Output protection
				1 Module	2 Module	3 Module	4 Module	
241115.815B	Flatpack2 220V/5A HE	178,5-297 V	> 94% (45-100% load)	5 A	10 A	15 A	20 A	Oring diode
241115.815	Flatpack2 220V/2000W HE	178,5-297 V	> 94% (30-70% load)	9,16 A	18,32 A	27,48 A	36,64 A	Oring diode
241119.815	Flatpack2 220V/10A HE	178,5-297 V	> 94% (45-100% load)	10 A	20 A	30 A	40 A	Oring diode

2 POWER RACK (2PR) — AVAILABLE 220V DC/DC CONVERTERS

Part Number	Description	Output Voltage Range	Efficiency	Max Output current depending on Input Voltage (see curve above)				Output protection
				5 Module	6 Module	7 Module	8 Module	
241115.815B	Flatpack2 220V/5A HE	178,5-297 V	> 94% (45-100% load)	25 A	30 A	35 A	40 A	Oring diode
241115.815	Flatpack2 220V/2000W HE	178,5-297 V	> 94% (30-70% load)	45,8 A	54,96 A	64,12 A	73,28 A	Oring diode
241119.815	Flatpack2 220V/10A HE	178,5-297 V	> 94% (45-100% load)	50 A	60 A	70 A	80 A	Oring diode

IBF DC/DC-HV (high voltage)

TECHNICAL SPECIFICATIONS

Model	IBF-DC/DC-1PR-Stand alone	IBF-DC/DC-2PR-Stand alone	IBF-DC/DC-1PR-Integrated	IBF-DC/DC-2PR-Integrated
Part number	CIE20405.xxx	CIE20806.xxx	CIE20405.xxx	CIE20806.xxx
INPUT DATA				
Voltage (range)	85 - 300 $_{DC}$			
4*Indivuduell DC feed	•	-	•	-
8*Individuell DC feed	-	•	-	•
Recommended input breaker	16 A for each individual input 1)			
Protection	Individual fuse in rectifier modules			
Connection	Individual screw terminal 6 mm^2 PE screw terminal, max 6 mm^2 and M5 cable lug directly to chassis			
OUTPUT DATA				
Voltage (default)	24-220 V_{DC}			
Power (maximum) @ nominal input	8000 W	16000 W	8000 W	16000 W
Current (maximum) @ nominal input	See previous page or applicable Flatpack2 datasheet			
Unprotected bulk output	•	•	•	•
Connection bulk output	M8 bolt			
Optional 2 pole load breaker 6-32 A	*Max 8 pcs 2 pole load breaker 6-32 A, B charateristics*			
Connection optional 2 pole load breaker	*Directly on output MCB up to 25 mm²*			
Output Protection in rectifiers	Blocking OR-ing FET or fuse, Short circuit proof & High temperature protection			
CONTROL AND MONITORING				
Monitoring Unit	Smartpack 2 Control System with Industrial Basic		Industrial Basic	
Local Operation	Display and keys, WEB interface via standard browser		-	
Remote Operation	WebPower (WEB Interface, SNMP protocol and email)			
Alarm Relays (Connection: clamp ≤ 1.5 mm^2)	3 x Potential free contacts (NO, NC, C) [Max 430 VDC/0,1 A]			
Inputs	3x NO/NC/Temperature: NTC Probe			
Current measurements	Load Current			
Alarms	Low & high output voltage alarms (Minor and major levels) Earth fault alarm, Temperature alarm, DC Input outage alarm, load breaker alarm and much more			
OTHER SPECIFICATIONS				
Isolation	3.0 kV_{AC} - input to output 1.5 kV_{AC} - input to earth 0.5 kV_{DC} - output to earth			
Operating temperature	-40 to +45°C (-40 to +113°F), humidity 5 - 95% RH non-condensing Output power de-rates at high temperature, see datasheet for applicable rectifier			
Storage temperature	-40 to +85°C (-40 to +185°F), humidity 0 - 99% RH non-condensing			
Dimensions [WxDxH]	482*432*222mm (5U)	482*432*267mm (6U)	482*432*222mm (5U)	482*432*267mm (6U)
Weight (without DC/DC Converters)	17 kg	16 kg	17 kg	16 kg
DESIGN STANDARDS				
Electrical safety	EN 60950-1			
EMC	ETSI EN 300 386 V.1.6.1 EN 61000-6-1 / -2 / -3 / -4 / -5 (Depending on module)			
Environment	ETSI EN 300 019, ETSI EN 300 132 - 2			

1) For 2kW Flatpack2 rectifiers or DC/DC Converters

DC/AC Inverter system

The Industrial bulk feed (IBF) unit is designed for systems with 48, 60, 110, 125 & 220 VDC input. The Power Core is built around the INV 222 inverters, and designed for all type of applications where an uninterruptable AC power supply is needed, such as switchgear, telecom, emergency lighting and alarm systems.

Its compact design and simple installation make it a powerful 19" power supply package.

The IBF-INV can be fitted with an optional static switch, with uninterruptable switch between mains and inverter mode.

IBF DC/AC-INV (INVERTER)

48 VDC, 60 VDC, 110 VDC, 125 VDC & 220 VDC INPUT

DOC. NO: CINV0306.000.DS3, V1

INDUSTRY APPLICATIONS

Power Utilities
- Low & High Voltage switchgear
- Transformer & SUB Stations
- Power Generation & Distribution
- Control & protection
- SCADA
- Communications equipment

Offshore and process industry
- Safety and Automation Systems (SAS)

Marine
- Communication onboard ships

Railway infrastructure
- Control & protection
- Signaling

Telecom – Mobile - Fixed / Wireless
- Radio Base stations/ Cell Sites
- LTE / 4G / WiMAX
- Distributed Antenna Systems
- Microwave & Broadband

INV 222 inverters

STS 207 Static Switch

KEY FEATURES

- Compact design and simple installation
- 48, 60, 110, 125 & 220 VDC Input
- House up to 3 Inverter modules
- 2,25-6,75 kVA Output
- Built in manual bypass
- Option with static switch
- Input and output protections on each inverter by built in MCB
- Ethernet for remote or local monitoring and control via WEB Browser
- SNMP protocol with TRAP, SET and GET on Ethernet. Email of TRAP alarms
- 1 digital programmable relay output
- Option with 6 relay outputs

48V DC/AC Inverter

The INV 222 inverters, and designed for all type of applications where an uninterruptable AC power supply is needed, such as switchgear, telecom, emergency lighting and alarm systems.

Applications

- Alarm systems
- PABX systems
- Emergency lighting
- Industrial control systems

48V DC INPUT — **AVAILABLE 48V DC INPUT CONVERTERS**

Part Number	Description	Intput Voltage Range	Efficiency	Max Output Power			Output protection
				1 Module	2 Module	3 Module	
501-022-515.00	INV222-48/230-50	40,8-67,5 VDC	> 90%	2,25 kVA	4,5 kVA	6,75 kVA	In IBF DC/AC

60V DC/AC Inverter

The INV 222 inverters, and designed for all type of applications where an uninterruptable AC power supply is needed, such as switchgear, telecom, emergency lighting and alarm systems.

Applications

- Telecommunication systems; SCADA, GSM-R
- PABX systems
- Emergency lighting
- Industrial control systems

60V DC INPUT — **AVAILABLE 60V DC INPUT CONVERTERS**

Part Number	Description	Input Voltage Range	Efficiency	Max Output Power			Output protection
				1 Module	2 Module	3 Module	
501-022-615.00	INV222-60/230-50	52-76 VDC	> 90%	2,25 kVA	4,5 kVA	6,75 kVA	In IBF DC/AC

110/125 V DC/AC Inverter

The INV 222 inverters, and designed for all type of applications where an uninterruptable AC power supply is needed, such as switchgear, telecom, emergency lighting and alarm systems.

Applications

- Low & High Voltage switchgear
- Transformer & SUB Stations
- Power Generation & Distribution

110V/125 V DC INPUT — **AVAILABLE 110V/125 V DC INPUT CONVERTERS**

Part Number	Description	Input Voltage Range	Efficiency	Max Output Power			Output protection
				1 Module	2 Module	3 Module	
501-022-715.10	INV222-110/230-50 WIR	91,8-145 VDC	> 90%	2,25 kVA	4,5 kVA	6,75 kVA	In IBF DC/AC

220 V DC/AC Inverter

The INV 222 inverters, and designed for all type of applications where an uninterruptable AC power supply is needed, such as switchgear, telecom, emergency lighting and alarm systems.

Applications

- Low & High Voltage switchgear
- Transformer & SUB Stations
- Power Generation & Distribution

220V DC INPUT — **AVAILABLE 220V DC INPUT CONVERTERS**

Part Number	Description	Output Voltage Range	Efficiency	Max Output Power			Output protection
				1 Module	2 Module	3 Module	
501-022-815.00	INV222-220/230-50	183,6-270 VDC	> 90%	2,25 kVA	4,5 kVA	6,75 kVA	In IBF DC/AC

IBF DC/AC-INV (Inverter)

TECHNICAL SPECIFICATIONS

Model	IBF-DC/AC-48 VDC Input	IBF-DC/AC-60 VDC Input	IBF-DC/AC-110/125 VDC Input	IBF-DC/AC-220 VDC Input
Part number	CINV0306.xxx	CINV0306.xxx	CINV0306.xxx	CINV0306.xxx
INPUT DATA				
Voltage (range)	40,8-67,5 VDC	52-76 VDC	91,8-145 VDC	183,6-270 VDC
Nominal Input voltage	48 VDC	60 VDC	108 VDC	216 VDC
Nominal Input current (on each Inverter)	41,6 ADC @ 48VDC	33,3ADC @ 60VDC	18,4 ADC @ 108VDC	9,2 ADC @ 216 VDC
DC Input Protection (on each Inverter)	63 A MCB	63 A MCB	25 A MCB	16 A MCB
AC Input Protection	32 A MCB			
Connection AC Input	Individual screw terminal 6 mm2 PE screw terminal, max 6 mm2 and M5 cable lug directly to chassis			
Connection bulk DC input	M8 bolt			
OUTPUT DATA				
Voltage (default)	230 VAC			
Power (maximum)	5400 W/6750 VA @cos phi=0,8			
Current (maximum)	29,4 AAC @cos phi=0,8, 23,4 AAC @ cos phi=1 (resistive power)			
Frequency	50 Hz			
Output protection (on each Inverter)	10 A MCB			
AC Output protection	32 A MCB			
Connection AC Output	screw terminals 6mm2, PE screw terminal max 6 mm2			
CONTROL AND MONITORING				
Monitoring Unit	In STS 207			
Local Operation	Display and keys, WEB interface via standard browser			
Remote Operation	WebPower (WEB Interface & SNMP protocol)			
Alarm Relays (Connection: clamp $\leq$ 1.5 mm^2)	1 x Potential free contacts (NO, NC, C)			
Option: Relayboard DCC-RB6-STS	6 x Potential free contacts (NO, NC, C), 12-300 VDC, 0,1 A			
Monitoring functions	Voltage, Frequency, Synchronization, Over temperature, etc			
Alarms (from Web Interface or RB6 board)	Over temperature, STS outputcurrent too high, Source 1 & 2 failure, Collective failure STS, Load on Inverter etc			
OTHER SPECIFICATIONS				
Protection class	IP 20			
Operating temperature	-20 to +55°C, humidity 5 - 95% RH non-condensing			
Storage temperature	-40 to +85°C, humidity 0 - 99% RH non-condensing			
Dimensions[WxDxH]	482*432*267mm (6U)			
Weight (excluding Inverters & static switch)	17 kg			
DESIGN STANDARDS				
Electrical safety	EN 60950-1			
EMC	EN55011/22 class "B" EN 61000-4 T2-5			