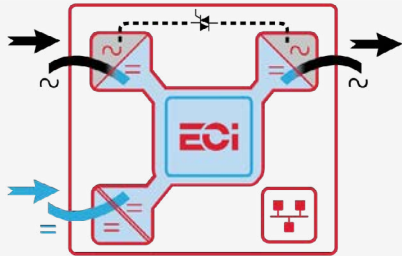


DESCRIPTION

BRAVO ECI 48/230 is a compact and scalable modular inverter providing a pure sine wave AC supply. In conjunction with a DC Power system, it provides an excellent AC backup solution using the latest inverter technology, providing superior energy efficiency in a compact size.



The ECI technology eliminates all single points of failure with full scalability; up to 32 modules in parallel and high efficiency of up to 96% in AC to AC conversion and above 93.5% in DC/AC conversion; hence reducing operating costs. Systems can be scaled right up to 2.7MVA.

BRAVO ECI 48/230 systems can be configured for operation in split phase and three phase applications using a combination of shelves.

Integration with Aspiro and Guardian DC Power Systems is achieved using a translator board that enables the ACX Advanced controller to monitor key parameters.

FEATURES

- ◆ Extra AC input for increased efficiency
- ◆ Compact design
- ◆ Up to 2.7MVA
- ◆ Multiple phase options:
 - 1-phase L-N
 - 2-phase L1-L2-N
 - 3-phase L1-L2-L3-N
- ◆ No disturbances on DC loads & batteries

TWO-YEAR WARRANTY

SAFETY CERTIFICATION

EN62040-1

www.unipowerco.com

North America & CALA: +1 954-346-2442 · EMEA: +1 561-990-3830 · sales@unipowerco.com



ORDERING GUIDE

DESCRIPTION	UNIPOWER PART NUMBER
Inverter Module (4 per shelf max.)	105.5725.48
Management Module (T2S ETH)	105.5701.2448
Power Shelf: 19" x 2RU	105.5720.00
Rear Protection Cover for Shelf	105.5720.02
19" to 23" / 600mm fixing kit	385.6300.2302
BUS Cable Kit: 2-shelf	105.5720.03
BUS Cable Kit: 3-Shelf	105.5720.04
Inverter Module Blank	105.5725.01
Management Module Blank	105.5701.01
BRAVO to ACX Translator	001-5301-0000

APPLICATIONS

All business critical applications and all types of AC loads.

The design is modular and scalable with hot-swappable inverter modules which ensures low Mean Time to Repair (MTTR), reduction in service costs and meets the changing needs for future expansion.

SPECIFICATIONS

GENERAL

Part Number UNIPOWER Order Code	T521730301 105.5725.48
EMC	EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, ETSI EN 300386 v1.9.1
Safety	EN62040-1
Cooling	Forced
MTBF	240,000 hrs (MIL-217-F)
Efficiency (Typical)	Enhanced Power Conversion On-Line
	96% >93.5%
Dielectric Strength DC/AC	4300 Vdc
RoHS	Compliant
Operating Temperature Range	Tested according ETS300-019-2-3 Class 3.1 -20°C to 65°C, power de-rating from 40°C to 65°C
Storage Temperature Range	Tested according ETS300-019-2-1 Class 1.2 -40°C to 70°C
Public Transport Temperature Range	Tested according ETS300-019-2-2 Class 3.1 -40°C to 70°C
Relative Humidity, max.	95%, non-condensing for 96 hours per year
Case Material	Zinc coated steel

AC OUTPUT POWER

Nominal Output Power	3000VA 2400W
Overload Capacity	125% (15 seconds)
Admissible Load Power Factor	Full power rating from 0 inductive to 0 capacitive

DC INPUT

Nominal Voltage	48Vdc
Voltage Range	40 to 60Vdc Permanent 2400W / derating apply based on internal heatsink T°.
Nominal Current	53.2A (at 48Vdc and 2400W output)
Maximum input current (for 15 second)	66.5A
Voltage Ripple	<10mV RMS

AC INPUT

Nominal Voltage	230Vac
Voltage Range	150-265Vac
Brownout	1600W @ 150Vac / 2400W @ 190Vac linear decreasing
Power Factor	>99%
Frequency range (selectable) synchronization range	50Hz (range 47-53Hz) / 60Hz (range 57-63Hz)

AC OUTPUT

Nominal Voltage Operation within lower voltage networks leads to de-rating of power performances	Adjustable: 220Vac - 240Vac
Frequency Accuracy	50 or 60Hz 0.03%
Total Harmonic Distortion (Resistive Load)	<3%
Load Impact Recovery Time (10% - 90% load)	≤0.4ms
Nominal Current	13A @ 230Vac
Crest Factor Nominal Power	3 : 1 for load P.F. ≤0.7
Short Circuit Clear-up Capacity 0-20ms	100A for 20ms - Available while Mains is available at AC input port / 34A RMS in DC/AC
Short circuit current after >20ms -15s	18A RMS

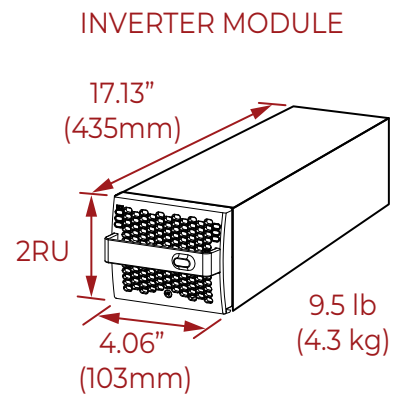
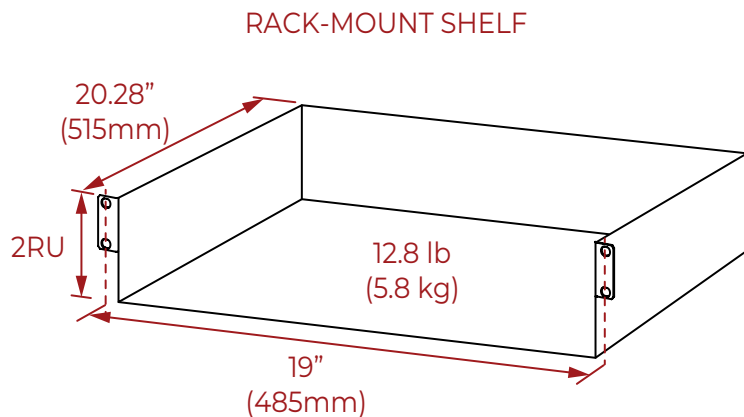
IN TRANSFER PERFORMANCE

Max. Voltage Interruption	0s
Total Transient Voltage Duration (max)	0s

SIGNALING & SUPERVISION

Display	Synoptic LED
Alarms Output & Supervision	Dry contacts on shelf / Standard USB port and MODBUS on T2S, optional : Candis Display / Candis TCP-IP
Remote on/off	on rear terminal of the shelf via T2S

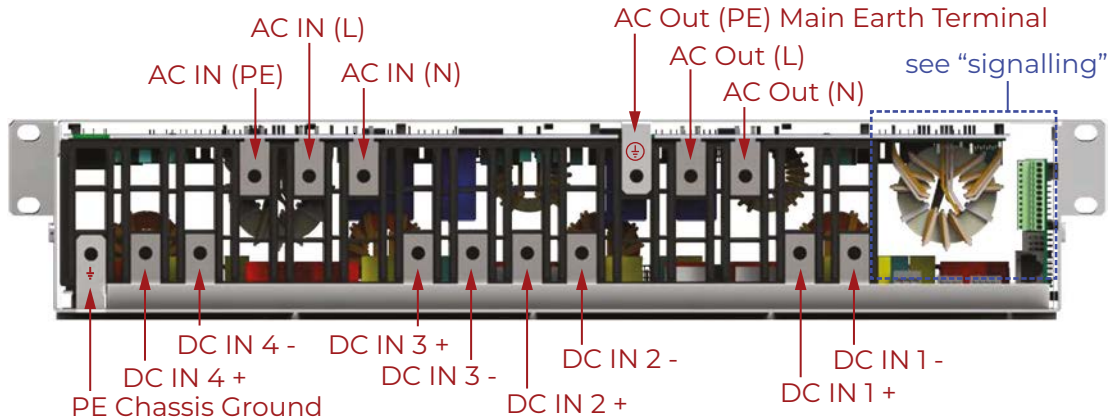
OUTLINE DRAWINGS



INSTALLATION INFORMATION

Terminations

All terminations are clearly marked as shown below.



Grounding

“PE CHASSIS GROUND”

PE Chassis ground shall be wired to MET or distributed earth bar connected to MET, according to local regulations.

DC Input

MCB per inverter module	Cable, min	Connector	Torque
63 A	2 x 16 mm ²	M5	5 Nm

Note: Module operates on derated power from 260 Vdc to 200 Vdc.

AC Input

WARNING!!! - Recommendation of IEC 60364 4. 43

431.3 Disconnection and reconnection of the neutral conductor in multi-phase systems

Where disconnection of the neutral conductor is required, disconnection and reconnection shall be such that the neutral conductor shall not be disconnected before the line conductors and shall be reconnected at the same time as or before the line conductors.

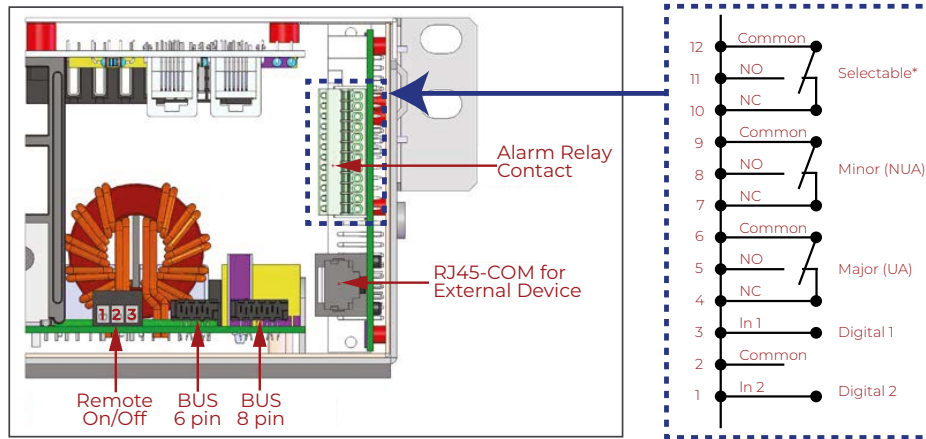
Cable, min	Connector	Torque
3 x 10 mm ²	M5	5 Nm

Note: Icc value measured as 76.2 Arms per shelf with four modules.

AC Output

MCB per shelf	Cable, min	Connector	Torque
2P 63 A	3 x 10 mm ²	M5	5 Nm

Signalling



Relay characteristics (Selectable, Major, Minor)

- Switching power 60W
- Rating 2A at 30Vdc / 1A at 60Vdc
- Max wire size 1mm²

Digital input characteristics (Digital In 1 / 2)

- Signal voltage +5Vdc (galvanic insulated)
- Max wire size 1mm²

Remote ON/OFF

Notice: The shelf is by default equipped with a connection between pin 3 and 2. If remote ON/OFF is not used the strap shall remain in all connected shelves. Should the remote ON/OFF be used, all straps must be removed and in one (1) shelf replaced with a changeover contact or emergency button.

- The remote ON/OFF switch the output AC OFF.
- Input AC and input DC is not affected by the remote ON/OFF.
- The remote ON/OFF can be connected to any shelf.
- The remote ON/OFF requires changeover contacts, one input opens as the other close. If both transitions are not picked up the status is not changed.

Relay characteristics (Remote ON/OFF)

- Signal voltage +5VDC (galvanic insulated)
- Max wire size 1mm²

Functional table for remote ON/OFF function

#	Pin 1-3	Pin 2-3	Status	Indication
1	Open	Open	Normal operation	All (Green)
2	Closed	Open	OFF	AC output (OFF) AC Input (Green) DC Input (Green)
3	Open	Closed	Normal operation	All (Green)
4	Closed	Closed	Normal operation	All (Green)

Warning: If remote ON/OFF is not used, pin 2 and 3 MUST be bridged together!

Internal bus (Bus 6 pin / Bus 8 pin)

- The internal bus comprise of a 6 pole ribbon cable and an 8 pole ribbon cable.
- The internal bus connectors are sensitive and special caution should be taken during installation to keep them out of harms way.
- The internal bus is connected from the first shelf to the last shelf.

MONITORING UNIT - T2S ETH

T2S ETH is a monitoring solution for the full TSI inverter range and is able to monitor up to 32 inverters through a friendly web base interface. T2S also supports Modbus Serial communication (RTU) and SNMP v1 Communication.

This monitoring device provides a graphical user interface, embeds a SNMPv2c/SNMP v3 agent and Modbus TCP support with Catena, if one needs a touch screen display Catena can be connected to T2S ETH and is Compatible. It also allows user to change the configuration of the system.



T2S ETH provides 3 LEDs:

- Red for major alarm signaling
- Orange for minor alarm signaling
- Green for power and network connection status

The RJ45 is a standard Ethernet connector that can be connected on any IPv4 network.

T2S ETH firmware can be upgrade using the Micro SD card.

BRAVO to ACX Advanced Translator - 001-5301-0000

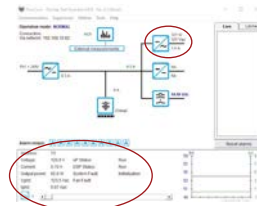
The BRAVO to ACX Advanced Translator provides communications between a UNIPOWER ACX controlled DC power system and a BRAVO inverter system. Relevant inverter data appears in the ACX controller under “SLI module data” and in the PowCom software under the inverter icons.

The ACX controller should have firmware v2.25 minimum (available for download from the website); configuration of BRAVO systems should not be required provided the default T2S-ETH and Modbus settings are used.

The translator mounts to standard 35mm DIN rail profiles.



Top View of translator board



PowCom showing BRAVO data

BLOCK DIAGRAM

