

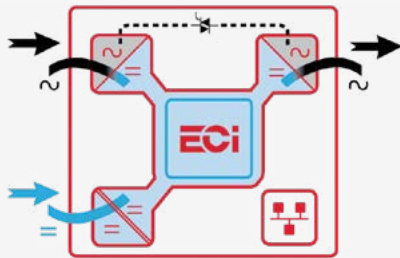
# BRAVO ECI 48/230

## HOT-SWAPPABLE MODULAR INVERTER

### 48Vdc & 230Vac to 230Vac @ 3kVA

#### 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 up to 36kVA.

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 36kVA
- ◆ Multiple phase options:
  - 1-phase L-N
  - 3-phase L1-L2-L3-N
- ◆ No disturbances on DC loads & batteries

**TWO-YEAR WARRANTY**

#### SAFETY CERTIFICATION

EN62040-1



#### SYSTEM COMPONENTS

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
Relay Rack Mid-Mount Kit	208.9280.20
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

[To configure a system see the guide on page 6](#)

#### INDUSTRIES & 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.



Telecom



Cable



Utilities



Government



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## 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
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

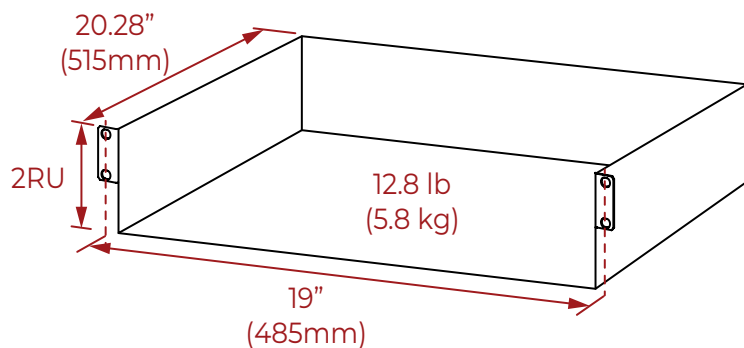
Max. Voltage Interruption	0s
Total Transient Voltage Duration (max)	0s

#### SIGNALING & SUPERVISION

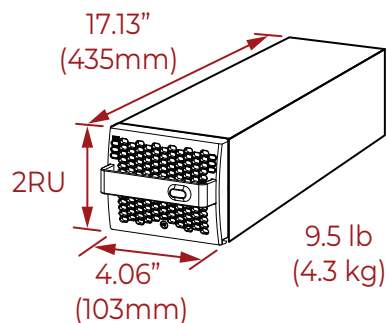
Display	Synoptic LED
Alarms Output & Supervision	Dry contacts on shelf / Standard USB port and MODBUS on T2S, optional : Candis Display / Candis TCP-IP
Remote on/off	on rear terminal of the shelf via T2S

#### OUTLINE DRAWINGS

##### RACK-MOUNT SHELF



##### INVERTER MODULE

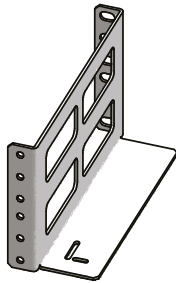


## RELAY RACK MID-MOUNTING

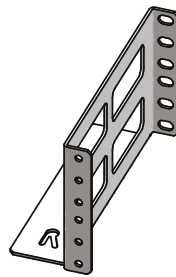
The BRAVO TSI shelf is provided with front face mounting brackets. To facilitate mid-mounting in an open relay rack UNIPOWER offers a mid-mount kit comprising 4x 8.5" brackets. Total depth is 20" when installed.

### KIT COMPONENTS

Left-hand  
Support Rail  
(x2)



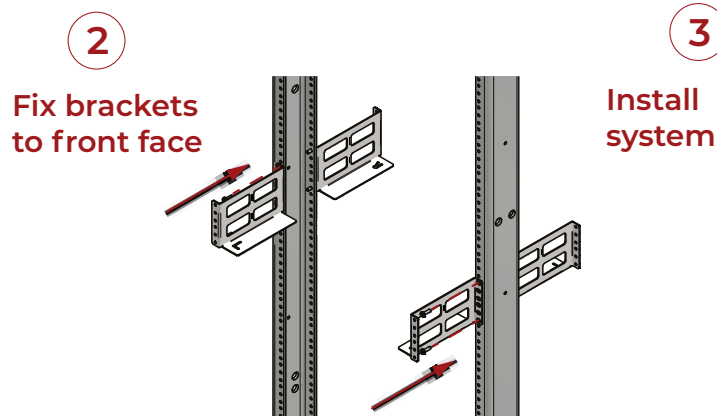
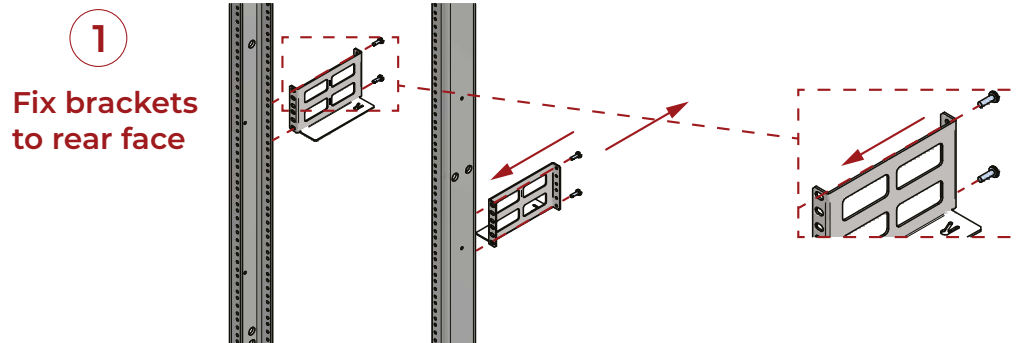
Right-hand  
Support Rail  
(x2)



Item 3  
10-32 x 5/8"  
Pan Head Screw  
(x8)



### QUICK INSTALLATION GUIDE



## 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.

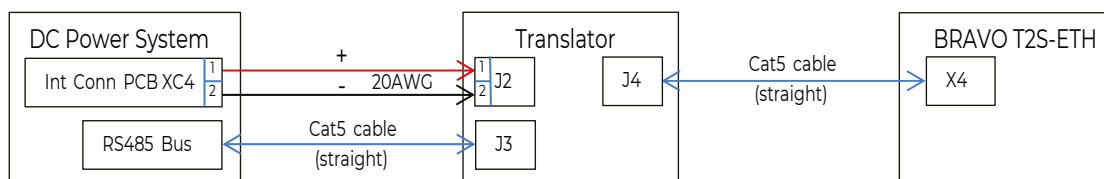


Top View of translator board



PowCom showing BRAVO data

## BLOCK DIAGRAM



## NON-STOCK CONFIGURATION GUIDE

(normally configured from stock 'base' units)

PLEASE COMPLETE THE BELOW TABLE AND SUBMIT TO UNIPOWER FOR VERIFICATION AND CONF. NO. ALLOCATION (This form is fully interactive and may be completed electronically OR it can be printed and complete by hand)		
<b>STEP 1 - CUSTOMER DETAILS</b>		
Company: _____ Address: _____ Zip Code: _____ Country: _____	Contact Name: _____ Email Address: _____ Telephone: _____ Quantity for quotation: _____	
<b>STEP 2 - PHASE CONFIGURATION - Choose one only</b>		
1- Phase - 120VAC L-N 3-Phase - 230VAC L1-L2-L3-N OR 208VAC L1-L2, L2-L3, L3-L1	1-Phase 3-Phase	go to step 3a go to step 3b
<b>STEP 3a - OUTPUT CAPACITY - 1-phase</b>		
3kVA	included parts: 1 x shelf, 1 x inverter Module, 3 x inverter blanks, 1 x management module.	
6kVA	included parts: 1 x shelf, 2 x inverter Module, 2 x inverter blanks, 1 x management module.	
9kVA	included parts: 1 x shelf, 3 x inverter Module, 1 x inverter blanks, 1 x management module.	
12kVA	included parts: 1 x shelf, 4 x inverter Module, 1 x management module.	
15kVA	included parts: 2 x shelf, 5 x inverter Module, 3 x inverter blanks, 1 x management module, 1 x management module blank & 1 x two-shelf cable.	
18kVA	included parts: 2 x shelf, 6 x inverter Module, 2 x inverter blanks, 1 x management module, 1 x management module blank & 1 x two-shelf cable.	
21kVA	included parts: 2 x shelf, 7 x inverter Module, 1 x inverter blanks, 1 x management module, 1 x management module blank & 1 x two-shelf cable.	
24kVA	included parts: 2 x shelf, 8 x inverter Module, 1 x management module, 1 x management module blank & 1 x two-shelf cable.	
27kVA	included parts: 3 x shelf, 9 x inverter Module, 3 x inverter blanks, 1 x management module, 2 x management module blanks & 1 x three-shelf cable.	
30kVA	included parts: 3 x shelf, 10 x inverter Module, 2 x inverter blanks, 1 x management module, 2 x management module blanks & 1 x three-shelf cable.	
33kVA	included parts: 3 x shelf, 11 x inverter Module, 1 x inverter blanks, 1 x management module, 2 x management module blanks & 1 x three-shelf cable.	
36kVA	included parts: 3 x shelf, 12 x inverter Module, 1 x management module, 2 x management module blanks & 1 x three-shelf cable.	
<b>STEP 3b - OUTPUT CAPACITY - 3-phase</b>		
9kVA	included parts: 3 x shelves, 3 x inverter Modules, 9 x inverter blanks, 1 x management module, 2 x management module blanks & 1 x three-shelf cable.	
18kVA	included parts: 3 x shelves, 6 x inverter Modules, 6 x inverter blanks, 1 x management module, 2 x management module blanks & 1 x three-shelf cable.	
27kVA	included parts: 3 x shelves, 9 x inverter Modules, 3 x inverter blanks, 1 x management module, 2 x management module blanks & 1 x three-shelf cable.	
36kVA	included parts: 3 x shelves, 12 x inverter Modules, 1 x management module, 2 x management module blanks & 1 x three-shelf cable.	
<b>STEP 4 - SHELF OPTIONS [one will be included for each shelf when selected]</b>		
Shelf Protection Covers	YES	NO
Mid-Mount Relay Rack Kit	YES	NO
19" to 23" Rack-Mount Adaptor Kit	YES	NO
<b>STEP 5 - INTEGRATION WITH ASPIRO OR GUARDIAN DC POWER SYSTEM</b>		
Bravo to ACX Translator	YES	NO
<b>STEP 6 - SUBMIT COMPLETED FORM TO UNIPOWER FOR CHECKING AND ALLOCATION OF CONFIGURATION PART NUMBER</b>		
Configuration Part Number: TSI-48/120-_____ (leave blank for completion by UNIPOWER)		