



TSI BRAVO ST 120 VAC



2.5-5
kVA

TELECOM



DATAKOM



MASS TRANSIT



OIL & GAS



POWER UTILITIES



STANDALONE INVERTER SYSTEM

INPUT 48 / 125 Vdc
OUTPUT 120 Vac



**Integrated
PDU**

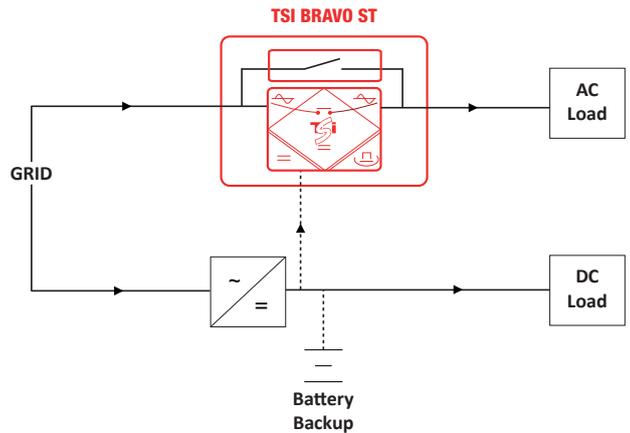
DESCRIPTION

BRAVO-ST is a compact inverter with automated by-pass solution providing a pure sine wave AC supply. In conjunction with a DC Power system, it provides an excellent AC backup solution. It uses the latest inverter technology, providing superior energy efficiency in a compact size.

The "Twin Sine Inverter" (TSI) technology allow 3 operations mode (EPC double conversion AC to AC, ON LINE DC to AC from battery and off line by-pass to AC). The automatic by-pass to AC allow easy hot plug module replacement without stopping the load giving highest AC output availability and avoid the need of an external manual by-pass.

APPLICATIONS

All business critical applications and all types of AC loads. The solution is design for highest AC output availability. Both inverter modules and by-pass are hot-swappable which ensures low Mean Time to Repair (MTTR), reduction in service costs.



MAIN FEATURES

- » Permanent AC to AC double conversion
- » Great disturbance rejection rate
- » Redundant AC & DC input sources
- » Source changover not visible by the load
- » Highly efficient energy conversion
- » Preserve battery life expectancy
- » Compact form factor with short depth
- » Operates until 65°C (de-rating may apply)



	ST-48-5-xx-02	ST-125-5-xx-02
GENERAL		
Applicable standards	IEC 61000-4 / FCC part 15 / cULus 1778 Listed / ROHS	
MTBF (each module)	240,000 hrs	
Nominal Output power (VA) / (W) ⁽⁶⁾	5 kVA / 4 kW	
Efficiency (Typical): Enhanced Power Conversion / On Line	95% / 91%	
Dielectric strength DC/AC	4,300 Vdc	
True Redundant Systems 3 Disconnection levels on AC out and DC in power ports 4 disconnection levels on AC in port"	Compliant	
Vibration	GR63 office vibration 0 to 100hz-0,1g Transport vibration 5-100Hz 0,5g 100 to 500hz-1,5g Drop test	
Altitude above sea	< 1500m; no derating >1500m; 0.8 % / 100 m derating	
Operating temperature (Ambient & measured @ air inlet)	-20 to 40 °C; -4°F to 104°F for rated power ⁽¹⁾ 40 °C to 65°C with 2%/°C derating ⁽²⁾ 104°F to 149°F with 1%/°F derating ⁽²⁾	
Ambient / storage temperature / relative humidity	-40 to 70 °C -40°F to 158°F	
Relative humidity	95%, non-condensing	
Operating ambience / Ingress Protection	Free from dust and corrosive materials / NEMA 1	
Material (casing)	Coated steel-ALU ZINC	
DC INPUT SPECIFICATIONS		
Nominal voltage (DC) / Voltage range	48V / (40 - 60V)	125V / (90 - 160V)
Nominal DC current (at floating voltage and 2000W per module output) ⁽⁶⁾	92.6 A No1 feeder	40.40 A No1 feeder
Voltage ripple	<2 mV Psopho	<200 mV rms
Input voltage boundaries	Adjustable from 40V to 57V	Adjustable from 90V to 160V
DC input connection ⁽⁴⁾	Terminal block	
DC input protections	none	
AC INPUT SPECIFICATIONS		
Nominal voltage (AC)	120 Vac L-N	
Voltage range (AC) (Full power rating)	104 – 138 Vac	
Nominal AC input current ^{(3) (6)} (at 120Vac and 2000W per module output)	35.08 A	
Brownout range and behavior	80 – 104 Vac use DC source contribution if need be (can be disabled)	
Conformity range before transfer to DC	Adjustable from 80 to 138Vac	
Power factor	>99%	
Frequency range (selectable) / synchronization range	50 – 60 Hz / 47 – 53 Hz or 57 – 63 Hz	
AC input connection / protection ⁽⁴⁾	Terminal block / none	
AC OUTPUT SPECIFICATIONS		
Nominal voltage (AC)	120 Vac L-N	
Nominal AC output current. Protected against reverse current ⁽⁶⁾	41.66 A	
Admissible load power factor	Full VA power rating from 0 inductive to 0 capacitive Limited to W power rating from Pf 0,8 to 1	
Frequency / frequency accuracy	50 - 60 Hz / 0.03 %	
Total harmonic distortion (resistive load)	<1.5%	
Load impact recovery time	0.4 ms	
Turn on delay	30 s	
Short duration overload capacity	150% - 15 second	
Long duration overload capacity	110% permanent	
Crest factor at nominal power With short circuit management and protection	3.1	
Short circuit clear up capacity ⁽⁵⁾	10 x I _n for 20 ms	
Short circuit clear up capacity when AC is not present	1.5 x I _n for 15 second	
Short circuit current after clear up capacity ⁽⁶⁾	62.5 A	
ENERGY SOURCE CHANGEOVER		
Total transient voltage duration (max) (as seen from the load)	0 s (and no glitch)	
Automatic Bypass	Fast acting relay	
SIGNALING & SUPERVISION		
Display	LED w/module status and power bargraph + CANDIS Display (1/ph) (optional)	
Alarms output / supervision	No3 Dry Contacts (Maj, Min, User adjustable)	
Remote Monitoring	TCP-IP with SNMP V1 (optional)	
Remote on / off	via T2S controller	

(1) Internal temperature management and switch off
 (2) Operation beyond 40°C (104°F) and derating are not UL certified
 (3) Inverter module current consumption only.
 Use output current for circuit sizing as bypass is present.

(4) Refer to specific document for NEC compliance for external protections and cable sizing
 (5) While the boost function is enabled and AC source present
 (6) When fully populated



SELECTABLE OPTIONS

Bulk output	
AC output connection / protection ⁽⁴⁾	Terminal block / none
Mechanical	Figure 1
15R output	
AC output connection / protection ⁽⁴⁾	12 x 15R receptacle / 6 x 20A breakers
Mechanical	Figure 2
20R output	
AC output connection / protection ⁽⁴⁾	6 x 20R receptacle / 6 x 20A breakers
Mechanical	Figure 3
15R-20R mix output	
AC output connection / protection ⁽⁴⁾	4 X 15R + 4 x 20R receptacle / 6 x 20A breakers
Mechanical	Figure 4

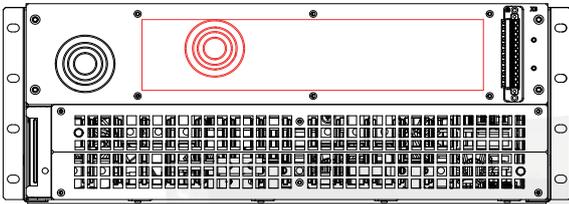


Figure 1

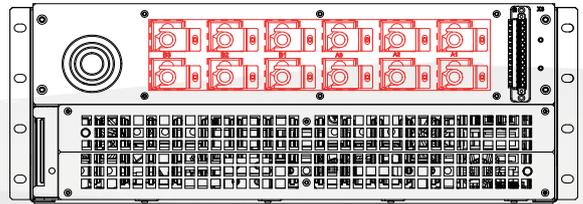


Figure 2

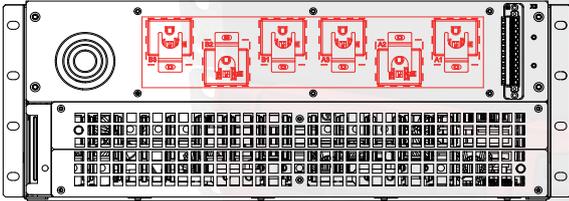


Figure 3

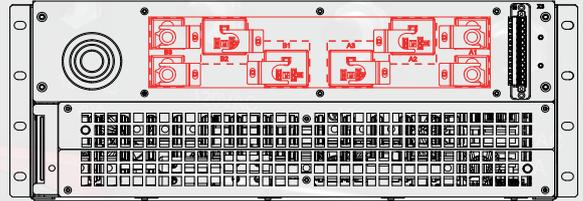


Figure 4

