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48VDC
ENCLOSURE SYSTEMS

UL Listed
NEBS Lvl 3

TSi 10-225 kVA

TELECOM | DATACOM | MASS TRANSIT | OIL & GAS | POWER UTILITIES

MODULAR INVERTER SYSTEM

INPUT 48 Vdc
OUTPUT 120 Vac
or 120/240 Vac
or 120/208 Vac

DESCRIPTION

The enclosure systems are designed to provide a pure sine wave AC supply as a complement to any existing DC power solution.

Compact, friendly Plug & Play installation, self standing 19" enclosures, ideal for low MTTR applications in power room. It is a fully integrated AC power center with built-in in and out protections. Thanks to TSI specifics it provides outstanding power conditioning and high end availability.

APPLICATIONS

Convenient for any Mission Critical Applications. A must when any glitch matters.
The solution to power up demanding AC loads at low OPEX from a combination of AC and DC sources present on site.
It reveals its full worth in harsh electrical environments and for long autonomy requirements. It handles any type of AC load including laser printers, compressors and induction motors.
Typical applications include core network infrastructure components (MSC & HLR servers, core routers, SDP/SCP…), HVAC equipments, signaling concentrators, datacenter…

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 footprint
- Operates until 65°C (de-rating may apply)
- Can be provided with 120Vac, 120/240 Vac and 120/208 Vac system configurations

Leading AC Backup Technology

CET POWER

48VDC

GENERAL	
Applicable standards	IEC 61000-4 / FCC part 15 / cULus 1778 Listed / ROhS
MTBF (each module)	240,000 hrs
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
Vibrations	
non-UL & UL standard versions	GR63 office vibration 0 to 100hz-0,1g Transport vibration 5-100Hz 0,5g 100 to 500hz-1,5g Drop test
NEBS Lvl 3 standard versions non-UL & UL optional versions	Earthquake Zone 4 (NEBS Lvl 3)
Altitude above sea	< 1500m; no derating >1500m; 0.8 % / 100 m derating
Operating temperature measured at both room and inlet levels	-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 environment / Ingress Protection	Free from dust and corrosive materials / NEMA 1 (3)
Material (casing)	Coated steel-ALU ZINC
ENERGY SOURCE CHANGEOVER	
Total transient voltage duration (max) (as seen from the load)	0 s (and no glitch)
Maintenance Bypass (MBP)	Yes
Non-UL & UL versions	integrated (optional)
NEBS Level 3 - EQZ4 versions	external (optional)
SIGNALING & SUPERVISION	
Display	LED w/module status and power bargraph + Catena 7" touchscreen
Alarms output / supervision	No3 Dry Contacts (Maj, Min, User adjustable)
Remote Monitoring	TCP-IP with SNMP V1 (4)
Remote on / off	via T2S controller

	non-UL	UL cULus 1778 Listed)	NEBS Level 3 EQ Zone 4
1 Phase			
20 kVA	CET-48-1-20-00-08	MIPS-48-1-20-00-08	T1PS-48-1-20-00-08
25 kVA	CET-48-1-25-00-10	MIPS-48-1-25-00-10	T1PS-48-1-25-00-10
2 Phase			
20 kVA	CET-48-2-20-00-08	MIPS-48-2-20-00-08	T1PS-48-2-20-00-08
40 kVA	CET-48-2-40-00-16	MIPS-48-2-40-00-16	T1PS-48-2-40-00-16
50kVA	CET-48-2-50-00-20	MIPS-48-2-50-00-20	T1PS-48-2-50-00-20
3 Phase			
30 kVA	CET-48-3-30-00-12	MIPS-48-3-30-00-12	T1PS-48-3-30-00-12
60 kVA	CET-48-3-60-00-24	MIPS-48-3-60-00-24	T1PS-48-3-60-00-24
75 kVA	CET-48-3-30-00-12	MIPS-48-3-75-00-30	T1PS-48-3-75-00-30
150 kVA	CET-48-3-150-00-60	MIPS-48-3-150-00-60	T1PS-48-3-150-00-60
225 kVA	CET-48-3-225-00-90	MIPS-48-3-225-00-90	T1PS-48-3-225-00-90

1 Internal temperature management and switch off
2 Operation beyond 40°C (104°F) and derating are not UL certified

3 Specific version (provided on request)
4 Modbus available on request
n/a option not available

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	1 Phase - 120 Vac - L,N	
	20 kVA / 16 kW	25 kVA / 20 kW
VERSIONS & REFERENCES		
Non-UL	CET-48-1-20-00-08	CET-48-1-25-00-08
UL (cULus 1778 Listed)	MIPS-48-1-20-00-08	MIPS-48-1-25-00-08
NEBS Level 3 EQ Zone 4	T1PS-48-1-20-00-08	T1PS-48-1-25-00-08
DC INPUT SPECIFICATIONS		
Nominal voltage (DC) / Voltage range	48 V / (40 -60 V)	
DC input connection (1)	Double hole lug, 1 or 2 feed	
Nominal DC current (at floating voltage and 2000W per module output)	370.4 A 1 feed or 2 x 185.2 A	463 A 1 feed or 2 x 231.5 A
DC input protections (built-in)	No1 60 A MCB per module	
Voltage ripple	<2 mV Psopho	
Input voltage boundaries	Adjustable from 40V to 57V	
AC INPUT SPECIFICATIONS		
Nominal voltage (AC) Input	120 Vac L-N	
Voltage range (AC) (Full power rating)	104 – 138 Vac	
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	
Nominal AC input current (at 120Vac and 2000W per module output)	140.32 A	175.4 A
Power factor	>99%	
Frequency range (selectable) / synchronization range	50 – 60 Hz / 47 – 53 Hz or 57 – 63 Hz	
AC input connection	Terminal Block	
AC input protection (1)		
Non-UL versions	none	
UL versions	Breaker 225 A	Breaker 250 A
NEBS Level 3 - EQZ4 versions	none	
AC OUTPUT SPECIFICATIONS		
Nominal voltage AC Output	120 Vac L-N	
Nominal Output current	166.64 A	208.3 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 (2)	10 x In 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	250 A	315 A
AC output connection	Terminal Block	
AC output protection (1)		
Non-UL versions	Breaker 225 A	Breaker 250 A
UL versions	Breaker 225 A	Breaker 250 A
NEBS Level 3 - EQZ4 versions	none	
Dimensions (Width / Depth / Height)		
Non-UL & UL versions	600 x 600 x 2100 mm 24" x 24" x 83"	
NEBS Level 3 - EQZ4 versions	600 x 700 x 2100 mm 24" x 28" x 83"	
Weight		
Non-UL & UL versions	386 kg / 851 lbs	
NEBS Level 3 - EQZ4 versions	396 kg / 873 lbs	

1 Refer to specific document for NEC compliance for external protections and cable sizing
2 While the boost function is enabled and AC source present
n/a Option not available

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	2 Phase - 120/240 Vac - L,L,N		
	20 kVA / 16 kW	40 kVA / 32 kW	50 kVA / 40 kW
VERSIONS & REFERENCES			
Non-UL	CET-48-2-20-00-08	CET-48-2-40-00-16	CET-48-2-50-00-20
UL (cULus 1778 Listed)	MIPS-48-2-20-00-08	MIPS-48-2-40-00-16	MIPS-48-2-50-00-20
NEBS Level 3 EQ Zone 4	T1PS-48-2-20-00-08	T1PS-48-2-40-00-16	T1PS-48-2-50-00-20
DC INPUT SPECIFICATIONS			
Nominal voltage (DC) / Voltage range	48 V / (40 -60 V)		
DC input connection (1)	Double hole lug, 1 or 2 feed	Double hole lug, 2 feed	
Nominal DC current (at floating voltage and 2000W per module output)	370.4 A 1 feed or 2 x 185.2 A	2 x 370.4 A	2 x 463 A
DC input protections (built-in)	No1 60 A MCB per module		
Voltage ripple	<2 mV Psopho		
Input voltage boundaries	Adjustable from 40V to 57V		
AC INPUT SPECIFICATIONS			
Nominal voltage (AC) Input	120/240 Vac (120/208 Vac optional)		
Voltage range (AC) (Full power rating)	104 – 138 Vac		
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		
Nominal AC input current (at 120Vac and 2000W per module output)	70.16 A per phase	140.32 A per phase	175.4 A per phase
Power factor	>99%		
Frequency range (selectable) / synchronization range	50 – 60 Hz / 47 – 53 Hz or 57 – 63 Hz		
AC input connection	Terminal Block		
AC input protection (1)			
Non-UL versions	none		
UL versions	Breaker 110 A 2p	Breaker 225 A 2p	Breaker 250 A 2p
NEBS Level 3 - EQZ4 versions	none		
AC OUTPUT SPECIFICATIONS			
Nominal voltage AC Output	120/240 Vac (120/208 Vac optional)		
Nominal Output current	83.32 A per phase	166.64 A per phase	208.3 A per phase
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 (2)	10 x In 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	125 A per phase	250 A per phase	312.5 A per phase
AC output connection	Terminal Block		
AC output protection (1)			
Non-UL versions	Breaker 110 A 2p	Breaker 225 A 2p	Breaker 250 A 2p
UL versions	Breaker 110 A 2p	Breaker 225 A 2p	Breaker 250 A 2p
NEBS Level 3 - EQZ4 versions	none		
Dimensions (Width / Depth / Height)			
Non-UL & UL versions	600 x 600 x 2100 mm 24" x 24" x 83"		
NEBS Level 3 - EQZ4 versions	600 x 700 x 2100 mm 24" x 28" x 83"		
Weight			
Non-UL & UL versions	386 kg / 851 lbs		
NEBS Level 3 - EQZ4 versions	396 kg / 873 lbs		

1 Refer to specific document for NEC compliance for external protections and cable sizing
2 While the boost function is enabled and AC source present
n/a Option not available

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	3 Phase / 120/208 Vac				
	30 kVA / 24 kW	60 kVA / 48 kW	75 kVA / 60 kW	150 kVA / 120 kW	225 kVA / 180 kW
VERSIONS & REFERENCES					
Non-UL	CET-48-3-30-00-12	CET-48-3-60-00-24	CET-48-3-75-00-30	CET-48-3-150-00-60	CET-48-3-225-00-90
UL (cULus 1778 Listed)	MIPS-48-3-30-00-12	MIPS-48-3-60-00-24	MIPS-48-3-75-00-30	MIPS-48-3-150-00-60	MIPS-48-3-225-00-90
NEBS Level 3 EQ Zone 4	T1PS-48-3-30-00-12	T1PS-48-3-60-00-24	T1PS-48-3-75-00-30	T1PS-48-3-150-00-60	T1PS-48-3-225-00-90
DC INPUT SPECIFICATIONS					
Nominal voltage (DC) / Voltage range	48 V / (40 -60 V)				
DC input connection (1)	Double hole lug, 1 or 3 feed	Double hole lug, 3 feed	Double hole lug, 3 feed	Double hole lug, 6 feed	Double hole lug, 9 feed
Nominal DC current (at floating voltage and 2000W per module output)	555.6 A 1 feed or 2 x 185.2 A	3 x 370.4 A	3 x 463 A	6 x463 A	9 x 463 A
DC input protections (built-in)	No1 60 A MCB per module				
Voltage ripple	<2 mV Psopho				
Input voltage boundaries	Adjustable from 40V to 57V				
AC INPUT SPECIFICATIONS					
Nominal voltage (AC) Input	120 / 208 Vac				
Voltage range (AC) (Full power rating)	104 – 138 Vac				
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				
Nominal AC input current (at 120Vac and 2000W per module output)	70.16 A per phase	140.32 A per phase	175.4 A per phase	2 x 175.4 per phase	3 x 175.4 per phase
Power factor	>99%				
Frequency range (selectable) / synchronization range	50 – 60 Hz / 47 – 53 Hz or 57 – 63 Hz				
AC input connection / protection (1)					
Non-UL	Terminal Block / none				
UL	Terminal Block / Breaker				
NEBS Level 3 - EQZ4	Terminal Block / none				
AC OUTPUT SPECIFICATIONS					
Nominal voltage AC Output	120 / 208 Vac				
Nominal Output current	83.32 A per phase	166.64 A per phase	208.3 A per phase	416.6 A per phase	624.9 A per phase
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 (2)	10 x In 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	125 A per phase	250 A per phase	312.5 A per phase	625 A per phase	937.5 A per phase
AC output connection	Terminal Block				
AC output protection (1)					
Non-UL versions	Breaker 110 A 3p	Breaker 225 A 3p	Breaker 250 A 3p	2 x Breaker 250 A 3p	3 x Breaker 250 A 3p
UL versions	Breaker 110 A 3p	Breaker 225 A 3p	Breaker 250 A 3p	2 x Breaker 250 A 3p	3 x Breaker 250 A 3p
NEBS Level 3 - EQZ4 versions	none	none	none	none	none
Dimensions (Width / Depth / Height)					
Non-UL & UL versions	600 x 600 x 2100 mm 24" x 24" x 83"			1200 x 600 x 2100 mm 48" x 24" x 83"	1800 x 600 x 2100 mm 72" x 24" x 83"
NEBS Level 3 - EQZ4 versions	600 x 700 x 2100 mm 24" x 28" x 83"			1200 x 700 x 2100 mm 48" x 28" x 83"	1800 x 700 x 2100 mm 72" x 28 x 83"
Weight (non populated cabinets)					
Non-UL & UL versions	386 kg / 851 lbs	386 kg / 851 lbs	386 kg / 851 lbs	772 kg / 1702 lbs	1158 kg / 2553 lbs
NEBS Level 3 - EQZ4 versions	396 kg / 873 lbs			792 kg / 1746 lbs	1188 kg / 2619 lbs

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2 While the boost function is enabled and AC source present
n/a Option not available

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