

ETC 1000 MK5 POWER ELECTRONICS TECHNICAL DATASHEET

| Overview | |
|-------------------|---|
| Converter type | Diode rectifier for 6-phase generator, DC boost converter and a 3-phase grid-connect inverter |
| Electrical power | 110 kW |
| Cooling | Liquid cooled converter heatsink with ventilated cabinet |
| Control principle | Voltage oriented control (VOC) |

| Electrical data - auxiliary power supply | |
|--|--|
| Input voltage | 3 ph + earth, 400 VAC to 480 VAC, $\pm 10\%$ |
| Power consumption | < 150 W |
| Hold-on time | 30s w / int'l 24 VDC sealed rechargeable lead-acid battery |
| Black-start support input | 24 VDC, $\pm 10\%$, 10 A max fuse protected |

| Electrical data - input (AC) | |
|--|-----------------|
| Generator frequency (max) | 2500 Hz |
| Input current, per phase (max) | 116 A |
| Generator voltage phase to phase w / crest factor 1.25 (max) | 634 VAC |
| Generator voltage for rated power operation (min) | 398 VAC |
| Generator voltage for 60 kW power operation (min) | 214 VAC |
| Generator-side converter common mode dv / dt | < 2 kV/ μ s |

| Electrical data - output (AC) | |
|---|---|
| Rated grid voltage | 400 VAC, 3 ph, $\pm 10\%$ |
| Rated power (@ 230 V, 50 Hz, $\cos \varphi = 0.8$) | 110 kW |
| AC apparent power (max) | 137 kVA |
| AC grid frequency range | 50 or 60 Hz nominal (-6 to +5 Hz) |
| Output current at 360 VAC (max) | 221 A |
| Uninterrupted short-circuit current (Ik) | 221 A |
| Power factor, adjustable | 0.8 overexcited to 0.8 underexcited |
| Efficiency at nominal maximum power condition | $\geq 95\%$ |
| Grid harmonics | Max 5% (total harmonic current distortion at rated current) |

| Protective devices | |
|---|--|
| Grid connection | Output circuit breaker external to cabinet |
| AC surge arrester (as per IEC 61643-11) | Type II |
| Protection class (as per IEC 62109-1) / overvoltage category (as per IEC 62109-1) | I / III |

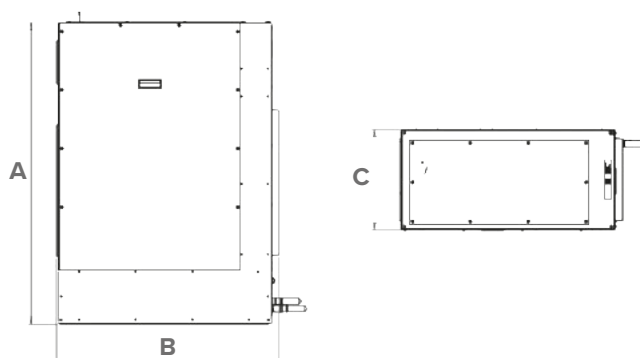
ETC 1000 MK5 POWER ELECTRONICS TECHNICAL DATASHEET

| General data | |
|--|---|
| Dimensions (W / H / D) (not inc'l external brake) | 405 x 1200 x 850 mm |
| Weight (not inc'l external brake or coolant) | 255kg |
| Ambient operating temperature range | 0 to +55°C (-15°C on request) |
| Storage / transport temperature range | -25 to +60°C |
| Noise emission, full current | <95 dBA |
| Degree of protection (according to IEC 60529) | IP23 |
| Climatic category (as per IEC 60721-3-3) | 3K3 |
| Permissible value for relative humidity (max) | 85% (non-condensing) |
| Altitude | Up to 2000 m (without derating) |
| Coolant inlet temperature typical / transient limits | +5 to +65°C / -15 to +70°C |
| Coolant type | 50:50 ethylene glycol (with corrosion and algae inhibitors) |
| Coolant flow rate (min / max) | 12 / 18 litres / minute |
| Coolant pressure (max) | 600 kPa gauge |
| Display | Optional LCD alphanumeric 20 characters x 4 lines |
| Field bus interface | SAE J1939 CAN bus and modbus (RS485 / RS232) |
| Ethernet interface | Modbus over TCP / IP |

| Product compliance | |
|---|--|
| Grid code compliance certificates and permits * | VDE-AR-N-4110, ENA EREC G99, ISO8528 class G2 volt / freq transients. Others on request |
| Product markings | CE (EMC & LVD) |
| EMC emissions | EN 61000-6-4 industrial generic emissions together with CIS- PR. 11 class A group 1 equipment > 75kVA |
| EMC immunity | EN 61000-4-4 immunity to fast transients (± 2 kV power lines, ± 1 kV signal lines). EN 61000-5-4 immunity to surges (± 2 kV power lines). EN 61000-4-2 ESD immunity limits (8kV contact) |
| Vibration | Transport simulation random vibration IEC 60068-2-64 test fh |
| Shock | IEC 60068-2-27 test ea half sine, 150 m/s ² 11ms, 30 bumps. Performed in each of 3 axes |
| Management systems | QMS (ISO 9001), EMS (ISO 14001) |

* Planned for 2019

| Dimensions (mm) | |
|-----------------|------|
| A | 1203 |
| B | 886 |
| C | 400 |



For more information please contact bowmansales@bowmanpower.co.uk
or visit bowmanpower.com