

# EVO (Enhanced Voltage Optimisation)

## Specification for Voltage Optimisation Equipment

> May 2014



EVO technology helps reduce electricity consumption and consequently reduces energy costs and CO<sub>2</sub> emissions. In addition it helps to protect the electrical infrastructure and help equipment work more efficiently, for longer, by regulating and controlling a building's incoming electrical supply. enhanced (EVO) combines energy savings and automatic voltage in a composite solution.

### General Specification

- > The EVO technology shall have the ability to reduce electricity consumption, reduce CO<sub>2</sub> emissions and balance phase voltage.
- > The EVO technology shall be capable of controlling and reducing the incoming low voltage supply down to 220V AC as measured single phase.
- > The EVO shall have operating losses <0.1% at peak efficiency.
- > The EVO shall have a declaration of conformity and testing related to short circuit withstand and conditional performance to up to 50 kA depending upon SVO kVA rating.
- > The proposed installation shall have a complete voltage logging survey completed prior to installation.
- > The EVO performance shall be evaluated using IPMVP.
- > The EVO performance shall be monitored before and after and will include input and output voltage, power active and reactive, power factor and THD.
- > The EVO performance shall be monitored continuously and shall include input and output voltage, power active and reactive, power factor and THD and shall be communicated using Modbus communications.
- > The EVO shall be established for use within an EPC.  
The EVO shall have at least 5 IVMVP performance evaluations.
- > The EVO shall have associated equipment to maintain a power factor of at least 0.95 lagging and harmonic mitigation to achieve G5/4-1 compliance.
- > The EVO shall have multiple optimisation settings including a zero % setting
- > The EVO shall require no additional maintenance apart from cleaning and wiring checks. (Recommended annually)
- > The EVO warranty shall be at least 15 years for the optimiser and 3 years for the AVC
- > The EVO product shall have a standardised design platform up to 2000 kVA
- > The EVO optimiser shall have in-built thermal protection
- > The EVO shall be suitable for >98% end of life recycling
- > The AVC response time shall be between 1 and 2 μs
- > The EVO shall have an automatic voltage bypass

## Product Specification

High purity cold-wound copper sheeting, low-inertia flaked silicon-steel core. Dry type.

> CE Mark: **BS EN 60076:11-2004**

Electrical Configuration	
Ratings	70kVA (100A), 110kVA (160A), 175kVA (250A), 220kVA (315A), 280kVA (400A) 350kVA (500A), 440kVA (630A), 560kVA (800A), 690kVA (1000A) 830kVA (1200A), 1MVA (1450A), 1.25MVA (1800A), 1.5MVA (2150A), 2MVA (2900A)
3 Phase 3 wire	3 wire in, 3 wire out, no neutral connection required
Impedance	0.5%
Input voltage	400V +/- 10%
Input/output frequency	50/60 Hz
Optimisation settings	Range: 4, 5, 6 & 7%   6, 7, 8 & 9%   8, 9, 10 & 11%

Mechanical Configuration				
IP Rating: <b>IP44 as standard</b>				
Rating (kVA/Amperes)	Height(mm)	Width(mm)	Depth(mm)	Weight (approx kg)
EVO070 70kVA / 100A	1056	960	576	250
EVO110 110kVA / 160A	1056	960	576	280
EVO175 175kVA / 250A	1248	960	576	350
EVO 220 220kVA / 315A	1248	960	576	360
EVO280 280kVA / 400A	1440	1344	576	425
EVO440 440kVA / 630A	1440	1344	576	550
EVO560 560kVA / 800A	1440	1344	768	710
EVO690 690kVA / 1000A	1440	1344	768	900
EVO830 830kVA / 1200A	1440	1344	768	950
EVO1000 1000kVA / 1450A	1440	1344	768	950
EVO1250 1250kVA / 1800A	1824	1536	768	1250
EVO1250 1500kVA / 2150A	1824	1536	768	1250
EVO2000 2000kVA / 2900A	1824	1536	768	1600
Insulation class	IEC 726 Class H (180°C)			
Colour	RAL 9001			
Cooling	Natural air ventilation			
Mounting	Floor mounting			
Voltage Withstand:	3kV 1 minute			
Environment Operating Range:	-10°C to +50°C			
Environment Humidity Range:	30% to 90%			
Microcontroller:	ARM7TDMI-S based high-performance 32-bit RISC Microcontroller			
USB Memory Stick:	8GB 100+ years of data storage			
BMS Volt free – Fail Safe Alarm				

## Performance

Peak efficiency	99.94%
Insulation class	IEC 726 Class H (180°C)
Typical energy savings	6 – 20%
Overload ability	150% for 8 hours
Estimated lifetime	50 years
Product warranty	Optimiser 15 Years, AVC 3 Years
Electrical withstand	18 kA 1 sec (Up to 175 kVA) 35 kA 1 sec (210 up to 280 kVA) 50 kA 1 sec (440 kVA up to 2 MVA)
Short Circuit Withstand	18 kA conditional (up to 175 kVA) 35 kA conditional (210 up to 280 kVA) 50 kA conditional (440 kVA up to 2 MVA)

## Additional Functionality

Input and output voltage indications.

> Output metering connectivity (phase voltage references)

### Enhanced Voltage Optimisation (EVO)

unit for sites with volatile voltage supply

- Dynamic voltage control
- Enhanced voltage optimisation unit (size range - 70kVA to 2000kVA)
- Automatic Voltage Controller (AVC) responds to voltage fluctuations to maintain voltage within a fixed range
- Boost up to 4% to correct under-voltage
- Eff. ≤99.94%



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