PowerWAVE EL MOD
(4–24 kVA)

Technical Specification

KOHLER POWER
uninterruptible

The Power Pro EL Modular Series is an emergency lighting Inverter that can be configured between 4 – 24kVA with incremental steps of 4kVA power.
Designed with high fault clearance capability and operation with high inrush light fittings.
The adaptability of the EL MOD system provides three modes of operation as standard and the ability to convert from single phase input to three phase input without modification.

Low MTTR (Mean Time to Repair) is achieved with all electronic components in modular format and complete front access.

EL MOD FEATURES

- 24 KVA Power Cabinet, built up of 4kVA Power Modules
- 1/1 & 3/1 Configuration via display
- Hot-Swap Power Module
- True Sine Wave Output
- Output Configurable to 3 Modes of Operation (Changeover / Inverter / Non-Maintained)
- No Break Load Transfer for use with Discharge Lamps
- Deep Discharge Protection
- Reverse Battery Polarity Protection
- Front Access for all Maintenance and Repair
- Each module automatically equally shares the input and output current, All Inverter modules share the batteries
- Battery Short Circuit Protection
- Battery discharge management, auto-transfer between floating and equal charging, temperature compensation
- Multiple User options RS232, RS485, dry contacts, TCP/IP Adapter for local and remote communication.
- Compliant to BS EN50171

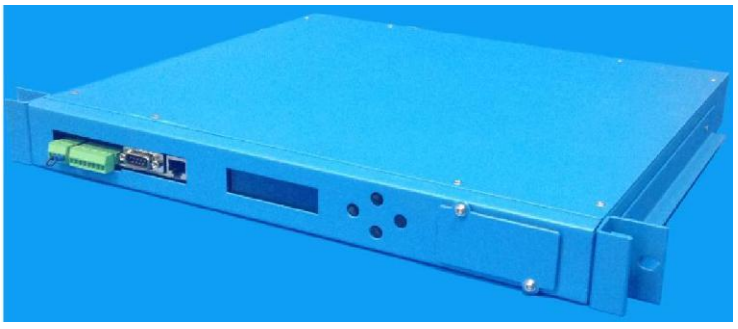
OPTIONAL FEATURES

- Input/output Transformer
- Load Distribution Module
- 10min, 1 Hour & 3 Hour Test key Switch
- Internal Maintenance Bypass Switch
- DC Earth Leakage Protection
- High IP Rating
- Other voltage options

POWER PRO EL MOD FRAME

24kVA – 6 MODULE RACK

4kVA POWER MODULE



24kVA CONTROL MODULE

DISPLAY MEASURMENT READINGS

Input Voltage L-N Per Phase
Bypass Voltage L-N Per Phase

Output Load Percentage Per Phase
Output Voltage L-N Per Phase
Output Voltage L-N for each module
Output Current Per Phase
Output Current for each module
Output Frequency

Positive Battery Voltage
Negative Battery Voltage
Positive Battery Charge Current
Negative Battery Charge Current
Positive Battery Discharge Current
Negative Battery Discharge Current
Battery Capacity %
Battery Temperature

DISPLAY ALARMS

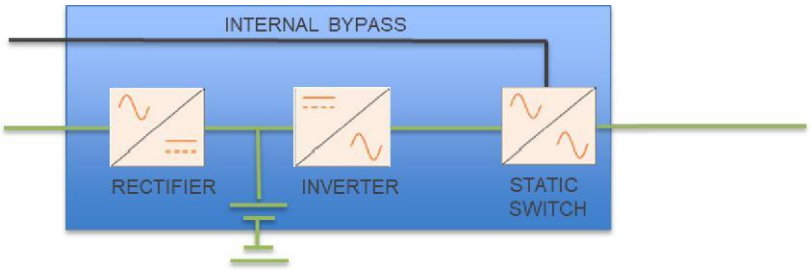
MAINS ANOMALY	OUTPUT SHORTCIRCUIT	OPERATION REJECTED
BYPASS ANOMALY	BATTERY SUPPLYING LOAD	OUTPUT BREAKER OFF
BATTERY ANOMALY	SYSTEM ON-LINE	EQUALISATION CHARGE
INVERTER ANOMALY	MAINS RESTORED	FLOAT CHARGE
PHASE SEQUANCE ANOMALY	BYPASS RESTORED	EPO WARNING
PRE OVERLOAD	BATTERY RESTORED	COMMUNICATION FAULT
OVER LOAD	INVERTER RESTORED	FAN FAULT
HEAVY LOAD	INCOMONG PHASES OK	MODULE FAULT

MODES OF OPERATION

With multiple ways to control lights within an application, the below descriptions and drawings show the various ways the lighting load may be controlled.

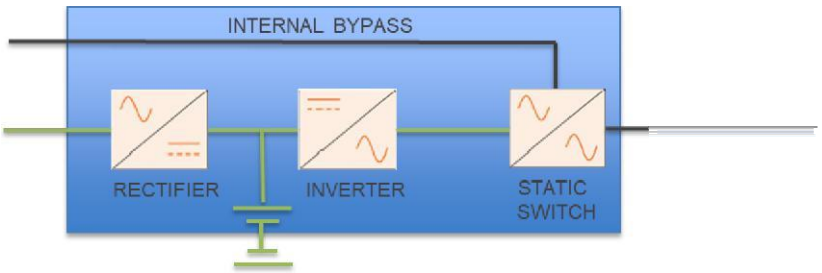
INVERTER MODE

Static Inverter provides continuous power to the emergency luminaires during normal operation and during power failure.
Luminaires are supplied directly from the inverter to provide luminaires requiring zero transfer time.
Operating efficiency 93%



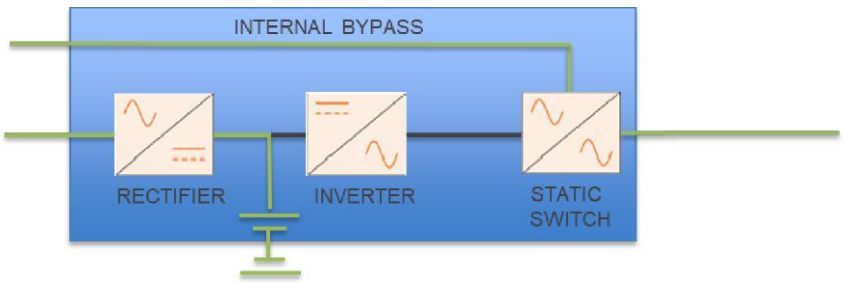
NON-MAINTAINED MODE

No Output power to the emergency luminaires during normal operation, during power failure luminaires fed from the battery via the Inverter.
Operating Efficiency 98%



CHANGEOVER MODE

Emergency luminaires are fed from Incoming mains during normal operation, Inverter feeds luminaires during power failure.
Changeover Time between Mains to Inverter <5ms
Operating Efficiency 98%



EL POWER MODULE TECHNICAL SPECIFICATION

Model	ELM-04
Capacity	4KVA
Input / Output mode	1/1
Input PF	> 0.99
THDI (%)	~ 3%
Overload ability	Comply to system overload requirement
Charging power	1600W
Weight (kg)	7

1:1 EL MOD SYSTEM TECHNICAL SPECIFICATION

SYSTEM		ELMOD 11					
POWER		4kVA	8kVA	12kVA	16kVA	20kVA	24kVA
Mains Input	Input Mode	1-phase +N +E					
	Input voltage	220V / 230V / 240V ±25%					
	Input frequency	50Hz±10%, 60Hz±10%					
	Maximum Input Current	26A	52A	78A	104A	130A	156A
	Power wolk-in (Sec.)	60secs					
	THDI (%)	< 3%					
	Input PF	> 0.99					
Bypass Input	Input voltage	220V/230V/240V±20%					
	Input frequency	50 Hz, 60 Hz					
	Range of Frequency Synchro	50Hz ±4%, 60Hz ±4%					
Dc input	Rated Input voltage	±240VDC					
	Max DC Current	12A	24A	36A	48A	60A	70A
Battery Charging	Charging current limited	YES					
	Charging ability	12 hours (3 hours back up)					
	Stability of charging voltage	±1%					
AC Output	Output Power Factor	0.9					
	Output voltage	220,230,240VAC					
	Output frequency	±4%; ±0.2%(battery supply)					
	Output Current	19.2A	38.4A	57.6A	76.8A	96A	115.2A
	Output voltage stability	±1%					
	Output voltage recovering time	20ms (load 0~100% change)					
	Overload ability	120% Continuous, 150% for 10mins, 175% for 1					
	Transfer from mains to battery supply	0ms					
	Transfer from changeover to inverter	<1ms					
	Peak factor	3:1					
	Waveform distortion	~ 1% (linear load), ~ 3%(non-linear load)					
	Overall efficiency	> 93% Inverter Mode, > 98% Changeover Mode					
	Load share precision	≤5%					
Environment	Operating temperature	-5°C ~ 40°C					
	Maximum operation altitude	~ 1000m					
	Relative humidity	~ 93% non-condensing					
	Protection degree	IP30					
	Cooling	Forced Cooling Front to Back					
	Applicable safety standards	EN62040-1-1:2003 IEC60950-1:2001 EN50171					
	Electromagnetic compatibility	EN62040-2:2006					
	Acoustic noise	~ 55DB					
Others	Interface	RS232, RS485, 4 dry contact, TCP/IP					
	Dry Ports	Mains Failure / Common Alarm / On Battery / Battery					
	Weight (kg)	107	114	121	128	135	142
	Dimension (mm)	D-850mm x W-510mm x H-1340mm					

3:1 EL MOD SYSTEM TECHNICAL SPECIFICATION

SYSTEM		ELMOD 31	
POWER		12kVA	24kVA
Mains Input	Input Mode	3-phase +N +E	
	Input voltage	220V / 230V / 240V ±25%	
	Input frequency	50Hz±10%, 60Hz±10%	
	Maximum Input Current	78A	156A
	Power wolk-in (Sec.)	60secs	
	THDI (%)	< 3%	
	Input PF	≥ 0.99	
Bypass Input	Input voltage	220V/230V/240V±20%	
	Input frequency	50 Hz, 60 Hz	
	Range of Frequency Synchro	50Hz ±4%, 60Hz ±4%	
Dc input	Rated Input voltage	±240VDC	
	Max DC Current	36A	70A
Battery Charging	Charging current limited	YES	
	Charging ability	12 hours (3 hours back up)	
	Stability of charging voltage	±1%	
AC Output	Output Power Factor	0.9	
	Output voltage	220,230,240VAC	
	Output frequency	±4%; ±0.2%(battery supply)	
	Output Current	57.6A	115.2A
	Output voltage stability	±1%	
	Output voltage recovering time	20ms (load 0~100% change)	
	Overload ability	120% Continuous, 150% for 10mins, 175% for 1 min	
	Transfer from mains to battery supply	0ms	
	Transfer from changeover to inverter	<1ms	
	Peak factor	3:1	
	Waveform distortion	≤ 1% (linear load), ≤ 3%(non-linear load)	
	Overall efficiency	≥ 93% Inverter Mode, ≥ 98% Changeover Mode	
	Load share precision	≤5%	
Environment	Operating temperature	-5°C ~ 40°C	
	Maximum operation altitude	≤ 1000m	
	Relative humidity	≤ 93% non-condensing	
	Protection degree	IP30	
	Cooling	Forced Cooling Front to Back	
	Applicable safety standards	EN62040-1-1:2003 IEC60950-1:2001 EN50171	
	Electromagnetic compatibility	EN62040-2:2006	
	Acoustic noise	≤ 55DB	
Others	Interface	RS232, RS485, 4 dry contact, TCP/IP adapter	
	Dry Ports	Mains Failure / Common Alarm / On Battery / Battery Low	
	Weight (kg)	121	142
	Dimension (mm)	D-850mm x W-510mm x H-1340mm	

HEAT DISSIPATION

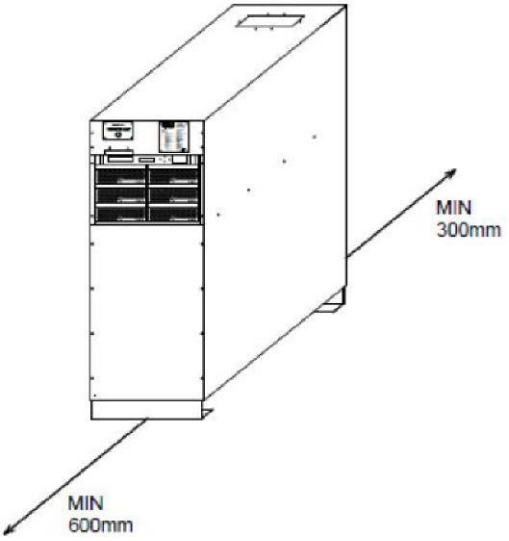
HEAT DISSIPATION AT 100% LOAD & FULLY CHARGED BATTERY						
CONFIGURATION	MODULE QTY					
	1 MODULE	2 MODULE	3 MODULE	4 MODULE	5 MODULE	6 MODULE
CHANGEOVER MODE	120W	240W	360W	480W	600W	720W
INVERTER MODE	280W	560W	840W	1120W	1400W	1680W
NON-MAINTAINED MODE	120W	240W	360W	480W	600W	720W

RECOMMENDED OUTPUT CIRCUIT BREAKERS

BREAKER TYPE	MODULES PER PHASE
B4	1 x Modules per Phase
B6	2 x Modules per Phase
B10	2 x Modules per Phase
B16	3 x Modules per Phase
C10	3 x Modules per Phase

INSTALLATION AND POSITIONING

The EL MOD system should have minimum 300mm rear clearance for fan exhaust and minimum 600mm clearance at front for module extraction.



All electrical cabling can be installed from top or bottom entry gland plates and all connections are accessed from the rear of system.