Powervamp
ADVANCED POWER SOLUTIONS

EF 20 ELI Range

EMERGENCY LIGHTING STATIC INVERTER
Single Phase 1.5 – 30.0 kVA

The Effekta EF 20 ELI is compact, easily maintained and provides optional single or three phase input with single phase output. Systems can be configured to suit downstream distribution with required fault clearance and are offered with contactor changeover or static switch changeover (no-break if specified). Standard mains AC light fittings may be used as well as upgraded styles as and when required.

Through incorporating these additional features the Effekta EF 20 ELI Range offers dependable emergency lighting systems that save time, money and comply with required industry standards.

FEATURES

- **Sine wave output**
- **Output configurable to be maintained, non-maintained or switched**
- **Deep Discharge Protection for Batteries**
- **Microprocessor Control**
- **4 x Volt Free Contacts for Remote Monitoring or BMS**
- **Battery Temperature Compensation**
- **Reverse Battery Polarity Protection**
- **Modular Design Improving Reliability and Serviceability**
- **Compact Floor Standing Enclosure**
- **Data Logger Storing up to 200 Alarms**
- **Complies with BS EN 50171**

OPTIONAL FEATURES

Internal Distribution:
- Additional single or double pole output circuit breakers can be fitted internally for direct distribution to the luminaires or sub circuits

DC Earth Leakage Protection:
- Protects system from leaking batteries, displays mA reading and alarm if leakage current is too high

AC Output Earth Leakage Protection:
- Protects downstream circuits from earth leakage, can be set to 30, 100 or 300mA

Additional Volt Free Contacts:
- Provides additional 6 volt free contacts for more comprehensive system monitoring

Remote Monitoring RS 232/LAN
- The system can be monitored and interrogated remotely by local or networked PC

Local Printer:
- Panel mounted or free standing hard copy printer provides print out of battery test

High IP Rating:
- Enclosure ratings are available from Standard IP 21 to maximum IP 54

Extended Run Times:
- Run times can be extended or reduced to suit specific applications

Other Voltages / Frequencies:
- Configuration is flexible to operate at other mains voltages and frequencies e.g. 110/115/120V 60Hz. Three phase input is also available

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GREENER POWER

TECHNICAL DATA

EF 20 ELI Range	1.5K	2.0K	2.5K	3.0K	3.5K	4.8K	5.6K	6.0K	8.0K	10.0K	12.0K	14.0K	16.0K	20.0K	24.0K	30.0K
Output active power (kW)	1.25	1.70	2.10	2.5	3.0	4.1	4.8	5.1	6.8	8.5	10.2	11.9	13.6	17.0	20.4	25.5
Apparent output power (kVA)	1.5	2.0	2.5	3.0	3.5	4.8	5.6	6.0	8.0	10.0	12.0	14.0	16.0	20.0	24.0	30.0

INPUT																
Number of phases	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3
Nominal input voltage (VAC)	230	230	230	230	230	230	230	230	230	230	230	230	230	230	400	400
Voltage tolerance	+ / - 10%															
Nominal input frequency	50 Hz (+ / - 5%)															
Three phase input available on request																

OUTPUT	
Nominal output voltage	220 / 230 / 240 VAC
Static voltage regulation	+ / - 1%
Nominal output frequency	50 Hz
Output frequency stability	0.1 Hz
Inverter wave shape	sine wave
Load power factor	0.85 lagging
Overload	120% continuous

GENERAL	
Operating temperature	0 – 40°C
Relative humidity	90% non-condensing
Altitude	Max 1000m before derating
Protection level	IP 21
Colour	RAL 7035 (other colours available)
Noise level	< 55–70 dBA @ 1m (free field conditions)

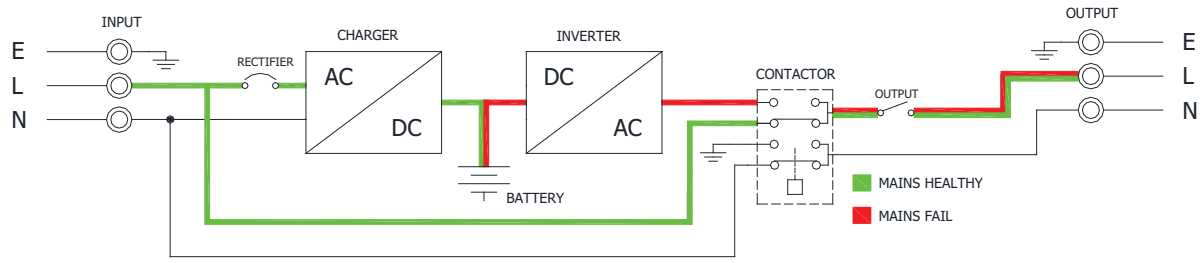
BATTERY	
Type	VRLA front terminal
Life expectancy	10 years @ 20°C
Ageing factor	included

1 HOUR SYSTEMS	1.5K	2.0K	2.5K	3.0K	3.5K	4.8K	5.6K	6.0K	8.0K	10.0K	12.0K	14.0K	16.0K	20.0K	24.0K	30.0K
Enclosure (see Enclosures below)	SC	SC	SC	SC	SC	SC	SC	SC	SD	SD	SD	SD	SD	SD	SD	SD
Additional battery enclosure	X	X	X	X	X	X	X	X	X	X	SD	SD	SD	SD	SD	CS
Weight (Kg)	345	345	345	355	355	385	430	470	615	780	940	1005	1145	1240	1545	1785

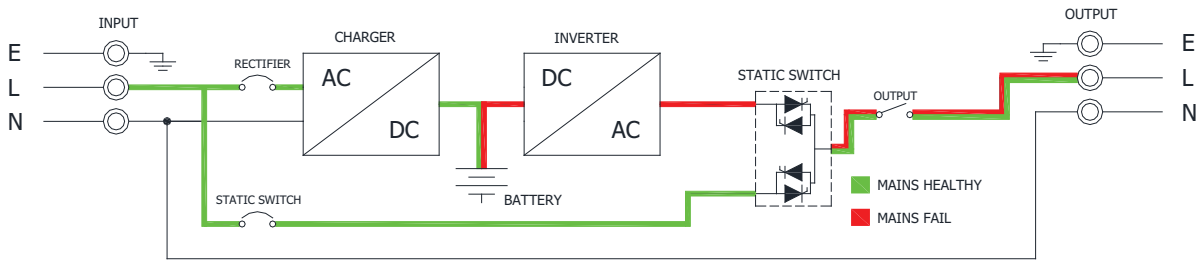
3 HOUR SYSTEMS	1.5K	2.0K	2.5K	3.0K	3.5K	4.8K	5.6K	6.0K	8.0K	10.0K	12.0K	14.0K	16.0K	20.0K	24.0K	30.0K
Enclosure (see Enclosures below)	SC	SC	SC	SC	SC	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Additional battery enclosure	X	X	X	X	X	X	X	X	X	SD	CS	CS	CS	CS	CS	CS
Weight (Kg)	345	400	450	510	575	735	855	920	1150	1470	1640	2075	2790	2815	3390	5000

DIMENSIONS	Height (mm)	Width (mm)	Depth (mm)
SC	1715	800	400
SD	1850	830	630
CS	Battery stand dimensions on application		

STANDARDS	
Emergency lighting	BS EN 50171
Safety	EN 62040-1
Emissions	EN 61000-6-4
Immunity	EN 61000-6-2
Batteries	BS EN 6290-4



ACTIVE OR PASSIVE STANDBY - CONTACTOR CHANGEOVER (BREAK)



ACTIVE STANDBY - STATIC SWICH CHANGEOVER (NO-BREAK)

SYSTEM OPERATION

The EF 20 ELI comprises a battery charger, battery, inverter and changeover.

Mains Healthy:

The battery charger charges the batteries and the load is supplied via the changeover.

Mains Failure:

The load is transferred to the inverter which will supply the load for the rated duration (usually one or three hours) or until the mains power is restored.

The system can be supplied with either a contactor or a static switch changeover. A contactor is suitable for most applications.

When connecting discharge lamps, a static switch provides the required no-break changeover on mains failure /return.

Contactor Changeover

- More efficient than no-break type
- Short break during changeover
- Inverter normally off (passive standby)
- Load fed via contactor (maintained)

Static Switch Changeover (No-break)

- Virtually no-break during changeover
- Inverter normally on (active standby)
- Load fed via static switch (maintained)
- Suitable for use with discharge lamps

Systems up to 24kVA are typically supplied with a single phase input. Larger systems require three phase input. Three phase input systems utilise one phase from the input to supply any maintained load (via the changeover).

MONITORING

Battery Monitoring:

A Manual Test raises an alarm if the battery is discharging faster than predicted by comparing actual discharge current against a typical discharge curve. This critical emergency system feature provides early warning of battery failure.

Data Logging Digital Display:

Allows access to 200 alarm and 200 battery records for accurate determination of event time line during fault diagnosis.

PROTECTIONS

Overload Protection:

During mains healthy conditions the overall load is monitored, overload is displayed and the buzzer sounds if the rated load is exceeded for more than 5 seconds.

During mains failure the overall load is monitored, overload is displayed and the buzzer sounds if the rated load is exceeded for more than 5 seconds. If the overload exceeds 120% of the rated load, then the inverter will reduce its output voltage to protect the inverter whilst continuing to supply power to the load.

Fault Clearance:

Typically the system can clear a circuit breaker 1/3 of the output rating including during battery operation.

Battery Disconnection Protection:

Battery connection is monitored to ensure continuity and if disconnected the display will indicate battery off and the buzzer will sound.

Deep Discharge Protection:

During prolonged mains failures, the system will deplete the battery and shutdown the inverter. To protect the battery from further discharge the discharge current is reduced to virtually zero by the system inducing sleep mode.

Reverse Battery Polarity Protection:

The system is protected from reverse battery connection as required by BS EN 50171.

FRONT TERMINAL VRLA BATTERY (10 YR LIFE)

EF 20 ELI are supplied with Front Terminal batteries as standard allowing for:

- Compact sizes
- Easy and safe battery maintenance

Batteries are:

- Sized in accordance with BS EN 50171 allowing the system to supply the full rated output for the required duration after 10 years
- Charged in line with manufacturers recommendations

Automatic Temperature Compensation adjusts the battery voltage in line with ambient temperature. To maximise battery life, the ambient temperature should not exceed 20°C.

Batteries are mechanically segregated from the remainder of the system.

DIGITAL DISPLAY

Indicating Lights:
- Mains Failure
- Battery low and under voltage
- Load on Inverter
- Load on Reserve (bypass)
- System Okay
- Warning
- Fault
- Inverter Off
- Charger Fault

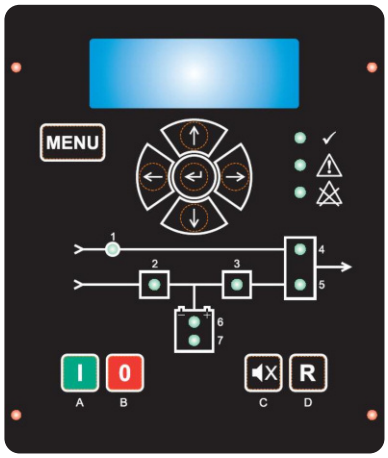
Push Buttons:
- Menu
- Menu Navigation
- Reset
- Inverter On/Off
- Buzzer Mute

Alarms:
- Mains Failure
- Battery Test in Progress
- Battery Disconnected
- Battery Low
- Battery Fault
- Battery Over Voltage
- Overload
- Short Circuit
- Inverter Fault
- Over Temperature
- Charger Fault
- Fire Alarm Test in Progress
- Power Supply Fault

Display Type:
- 4 line x 20 Character LCD

Metering:
- Mains Voltage & Frequency
- Inverter Voltage & Frequency
- Load Current
- Load VA
- Load %
- Battery Voltage
- Battery Discharge Current
- Battery Charge Current

Other Information:
- Time and Date
- Enclosure Temperature
- Setup Information



REMOTE MONITORING / CONNECTIONS

Volt Free Contacts:

Includes 4 volt free contacts for the following alarms;
- System in Battery Mode
- Charger Fault
- Load Alarm
- Common Alarm

Normally open and normally closed contacts are provided for each of the above alarms.

Alarm relays are energised when in healthy condition and relax into the fault condition. This ensures the contacts indicate a fault condition even when the system is off or in sleep mode (no power for extended periods).

Fire Test Input:

The system simulates mains failure on receiving signals from the fire alarm or BMS via a dedicated set of terminals.

Sub-Circuit Monitoring:

In the event of sub-circuit mains failure e.g. local distribution board breaker tripped, the system output is turned on by using the fire test input together with single or three phase remote monitoring devices.

Night-Watchman Switch:

Turns off the maintained output via a single remote switch.

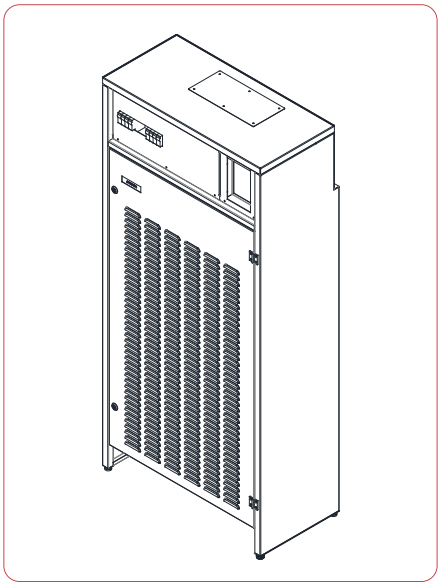
ENCLOSURE

Front terminal batteries minimize space requirements for the EF 20 E.L.I Range. The front access system requires very little side or back room for maintenance or ventilation.

Enclosure Features:
- Zintec Sheet Steel
- Lockable Door
- Top Cable Entry
- Removable Gland Plate

There are two types of enclosure: SC and SD.

The SC enclosure



The SD enclosure