

## EF20 SFC Range



### STATIC FREQUENCY CONVERTER Single Phase 3.2 – 40.0 kVA

Effekta Static Frequency Converters employ high frequency PWM technology (IGBT's) to achieve a high quality output under all load conditions. The systems are designed with PFC (Power Factor Correction), thereby reducing input current and harmonic distortion.

Effekta Static Frequency Converters are available in a wide power range and include an output isolation transformer as standard. The design offers flexibility on the input as well as the output, and can be configured for a wide variety of voltages and frequencies. A comprehensive LCD display, control panel and data logger provide detailed and accurate status and control of the system.

The Effekta EF20 SFC provides flexibility, efficiency and compatibility in applications where high quality wave shape is a critical factor.

### FEATURES

- Adjustable Output Frequency
- Adjustable Output Voltage
- Sine Wave Output
- Microprocessor Control
- Modular Design Improving Reliability and Serviceability
- Data Logger Stores up to 200 Alarms

### OPTIONAL FEATURES

#### Built-in Distribution:

- Single or double pole output circuit breakers can be fitted internally to eliminate the need for an external distribution board. Maximum number of outlets is 10 for single pole and 5 for double pole

#### AC Output Earth Leakage Indication:

- Indicates downstream earth leakage, can be set to 30, 100 or 300mA

#### Remote Monitoring (RS 232):

- The system can be monitored and interrogated remotely using RS 232 connection

#### Remote Start / Stop:

- Allows the inverter to be controlled remotely

#### High IP Rating:

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

#### Other Voltages / Frequencies:

- Other voltages and frequencies available on request

#### Battery Backup (UPS):

- Valve Regulated Lead Acid (VRLA)
- 10 Year Life at 20°C
- Complies with BS EN 6290-4

#### Additional Volt Free Contacts:

- Available for more comprehensive monitoring

#### Emergency Power Off (EPO):

- Turns off system output and shuts down rectifier

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## TECHNICAL DATA

EF20 SFC Range	3.2K	4.8K	6.4K	8.0K	10K	12K	16K	20K	24K	32K	40K
Output power (kW)	3.20	4.80	6.40	8.00	10.00	12.00	16.00	20.00	24.00	32.00	40.00
Apparent output power (kVA)	3.20	4.80	6.40	8.00	10.00	12.00	16.00	20.00	24.00	32.00	40.00

### INPUT

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

Other voltages and frequencies available on request. Three phase input available on all models.

### OUTPUT

Nominal output voltage	110 / 115 / 120 or 220 / 230 / 240V Single Phase										
Voltage adjustment	90–132V / 180–265V										
Static voltage regulation	+ / - 1%										
Nominal output frequency	50, 60, 400 Hz										
Frequency adjustment	45–65 Hz / 360–440 Hz										
Output frequency stability	0.1 Hz										
Output wave shape	Sine wave										
Load power factor	0.7 LAG – 0.9 LEAD										
Overload	121% -2 mins, 160% - 5 secs										

Other voltages and frequencies available on request.

### GENERAL

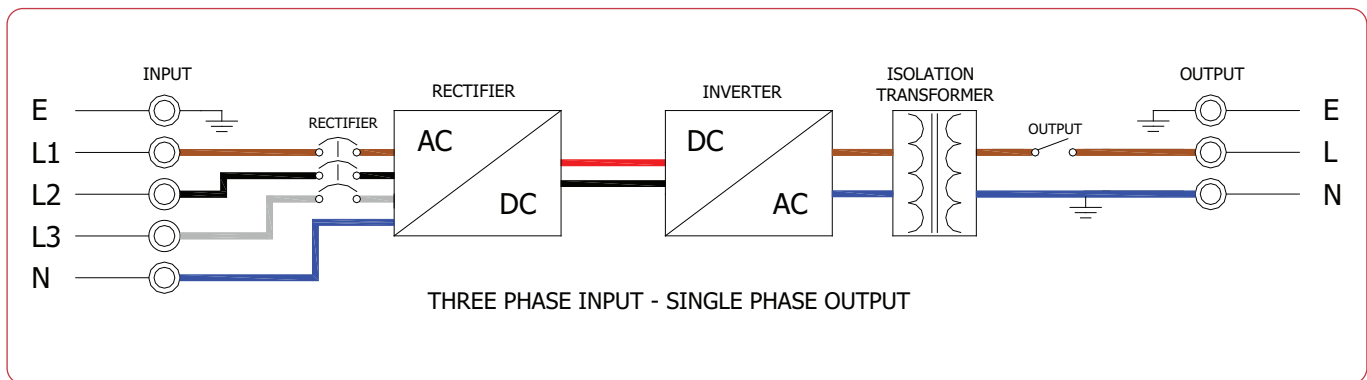
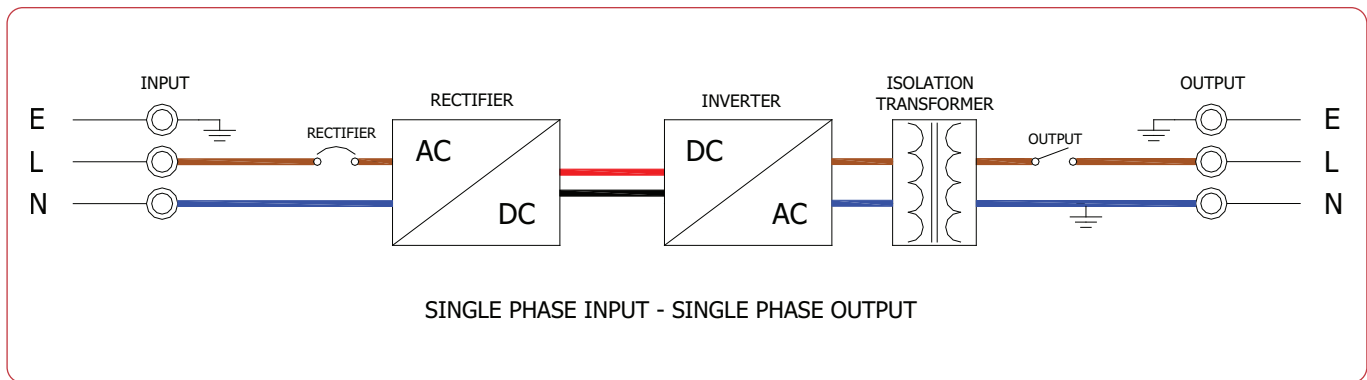
Operating temperature	0 – 40°C										
Relative humidity	90% non-condensing										
Altitude	Max 1000m before derating										
Protection level	IP 21										
Colour	RAL 7035 (other colours available)										
Noise level	< 55 – 70 dBA @ 1m (free field conditions)										

SYSTEM	3.2K	4.8K	6.4K	8.0K	10K	12K	16K	20K	24K	32K	40K
Enclosure (see below for dimensions)	NA	NA	NA	NB	NB	NC	NC	SD	SD	SD	SD
Weight (Kg)	85	130	160	260	290	330	350	375	395	450	500

DIMENSIONS	Height (mm)	Width (mm)	Depth (mm)
NA	870	350	700
NB	870	450	850
NC	980	530	850
SD	1850	830	630

### STANDARDS

Safety	EN 62040-1
Emissions	EN 61000-6-3
Immunity	EN 61000-6-2



## SYSTEM OPERATION

The Power Factor Corrected rectifier converts the single or three phase mains supply into DC, the PWM inverter switches the DC back to AC at the desired frequency and voltage, the output transformer provides Galvanic Isolation which isolates the input from the output. The output neutral is bonded to earth for safety.

## PROTECTIONS

### Overload Protection:

The system provides electronic overload protection to protect the system from excessive loading. Standard overloads settings allow for 121% for 2 minutes and 160% for 5 seconds.

### Short Circuit Protection:

The system provides electronic short circuit protection by combination of IGBT saturation detection and peak current limiting.

### Fault Clearance:

The system has a high fault clearance capability, as a general rule the system can clear a load circuit breaker of typically one third of the output current (C Curve). Designers should bear this in mind when calculating fault discrimination.

### Over Voltage Protection:

The system provides over voltage protection by monitoring the input and output voltages electronically and shutting down the system to prevent damage. In addition, surge arrestors are fitted to the input and output for additional protection.

### Phase Rotation Detection:

On three phase input systems, the phase rotation is checked before initialising the rectifier to ensure phase rotation is correct (clockwise).

## OUTPUT VOLTAGE AND FREQUENCY ADJUSTMENTS

### Voltage Adjustments

- From control panel
- Increments of 1 V
- Range 90–132V / 180–265V

### Frequency Adjustments

- From control panel
  - Increments of 1 Hz
  - Ranges:
    - 45 – 65 Hz
    - 360 – 440 Hz
- Other options available on request

## DIGITAL DISPLAY

### Indicating Lights:

- Load on Inverter
- System Okay
- Warning
- Fault
- Inverter Off
- Rectifier Fault

### Push Buttons:

- Menu
- Menu Navigation
- Reset
- Inverter On/Off
- Buzzer Mute

### Alarms:

- Mains Failure
- Overload
- Short Circuit
- Inverter Fault
- Over Temperature
- Charger Fault
- Under/Over Voltage
- Power Supply Fault
- Phase Rotation Incorrect
- IGBT Saturation

### Display Type:

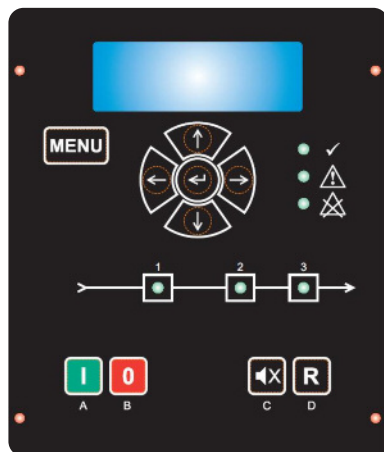
- 4 line x 20 Character LCD

### Metering:

- Mains Voltage & Frequency
- Inverter Voltage & Frequency
- Load VA
- Load %
- Load Current

### Other Information:

- Time and Date
- Enclosure Temperature
- Setup Information



## REMOTE MONITORING / CONNECTIONS

### Volt Free Contacts:

Includes 1 volt free contact for status of the system output. Normally open and normally closed contacts are provided.

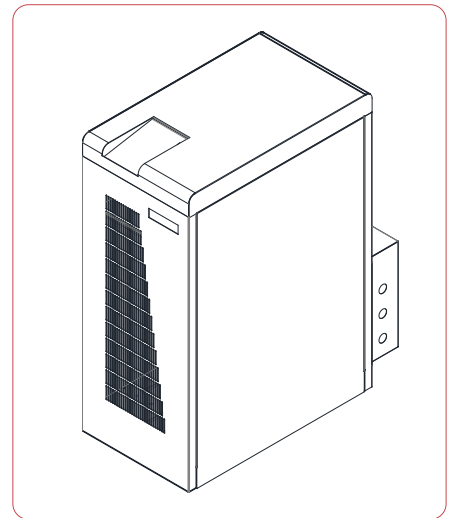
The alarm relay is energised when in healthy condition and relaxes into the fault condition. This ensures the contacts indicate a fault condition even when the system is off.

## ENCLOSURE

### Enclosure Features:

- Zintec Sheet Steel
- Rear Cable Entry (NA/NB/NC)
- Top Cable Entry (SD)
- Removable Gland/Back Plates
- NA/NB/NC Enclosures fitted with castors
- SD Enclosures fitted with 100mm plinth

The NA/NB/NC enclosure



The SD enclosure

