

EF20 SFC



The EF20 series of Static Frequency Converters consists of a wide range of single and three phase input systems with a single phase output. Custom built systems to meet specific requirements are our speciality, the EF20's modular microprocessor based design makes it incredibly flexible and thus easy to meet almost any build requirement.

Manufactured in the UK

EF20 SFC

System Operation

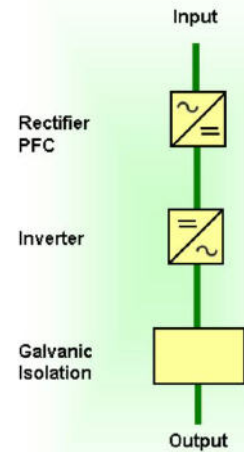
- The Power Factor Corrected rectifier converts the single or three phase mains supply into DC, the PWM inverter then switches the DC back to AC at the desired frequency and voltage, the output transformer provides Galvanic Isolation which isolates the input and output from each other.

Specifications

Enclosure

- High quality steel enclosure finished in RAL7032 powder coating
- Cable entry is at the rear for NA, NB and NC enclosures and top cable entry on the SD enclosure, all systems have removable gland/back plates to allow for simple installation
- IP rating for standard enclosures is IP21 (higher IP ratings available)
- Castors are provided on systems supplied in NA, NB and NC enclosures to allow good manoeuvrability during installation. A Plinth on systems supplied in SD enclosures allows good manoeuvrability with forklift or pallet truck during installation, cabinets are sized to fit through standard doors. Plinth colour RAL7011
- The SD enclosure is supplied with a Key locked front door with the option of double key locks available for units with restricted security access

System Operation

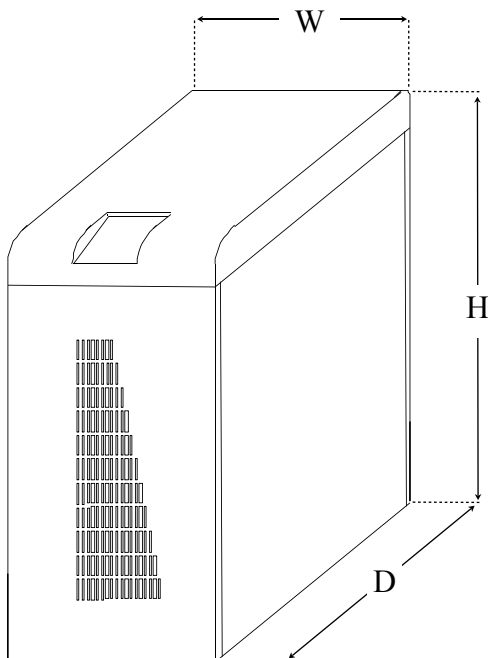


Dimensions

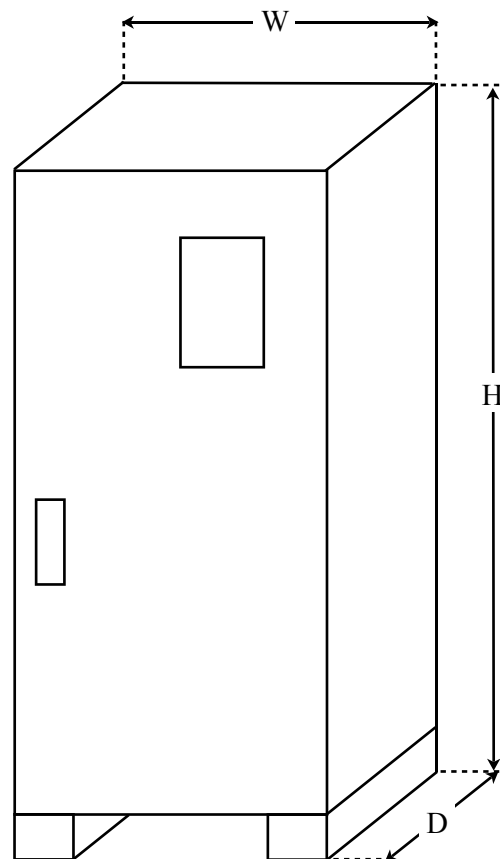
| Type | H | W | D |
|------|------|-----|-----|
| NA | 870 | 350 | 700 |
| NB | 870 | 450 | 850 |
| NC | 980 | 530 | 850 |
| SD | 1800 | 820 | 620 |

Sizes subject to change without notice

NA/NB/NC Enclosure



SD Enclosure



Rectifier

- Power Factor Corrected, microprocessor controlled rectifier, this means that the current drawn from the mains is in phase with the voltage (0.99pF @ full load). In simple terms it means that you pay less money on your electric bill to achieve the same result as a non-power factor corrected rectifier, it also means less distortion of your mains supply.
- Single and three phase input available
- Protection against DC over-voltage, input mains low and mains surges e.g. Surges caused by lightning.
- Battery charging facility for systems with optional battery backup

Inverter

- High Frequency microprocessor controlled pulse width modulation (PWM) IGBT inverter
- High quality sinewave output
- Galvanic isolation with grounded neutral
- High efficiency
- Reliable, proven design

Remote Monitoring circuits

- Volt free contacts

Datalogger

- 200 Alarm records, optional printer is available for hardcopy printout.

Display

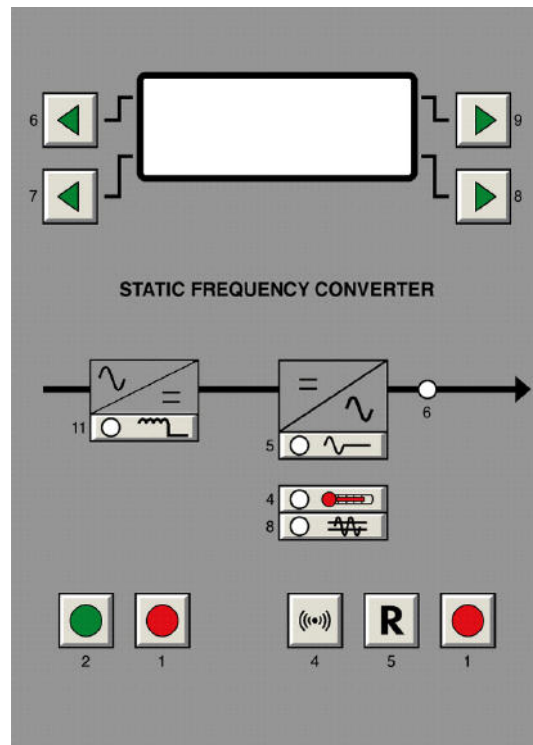
- Consists of 4 x 20 character LCD Dot-matrix with five indicating lights (LED's), ten scrolling / command buttons and audible alarm which sounds whenever there is a problem.

LCD Digital Meter readings (top two lines)

- **Inverter:** Volts AC / Amps / KVA / % Load / Frequency
- **Rectifier:** Volts AC / Frequency
- **DC:** Volts DC
- **Environment:** Ambient Temperature
- **General:** Time / Date

LCD Scrolling Alarms / Status Text (lower two lines)

- Rectifier Mains Fail
- DC Over-voltage
- Overload
- Short-circuit
- Over-temperature
- Inverter Under-voltage
- Inverter IGBT saturation fault
- Inverter Peak current fault
- Power Supply fault



System and Installation considerations

- **Room ventilation:** Adequate ventilation should be provided to disperse any heat dissipated by the unit. The system will generate a small amount of heat during standby operation but as load is added a greater amount of heat will be generated, as guide, 100W of heat will be generated for every 1000W of load
- **Environment:** All systems use forced cooling to extract heat from the enclosure, therefore it is important that the room is kept dry and free from dirt and dust.

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- **Correct rating of system:** All loads should be checked for actual power consumption and then summed to determine the actual load on the system. Spare capacity should be allowed for future growth. Some loads demand a high inrush current; air-conditioning systems, compressors and motors are some of the most common, x10 inrush currents are common with these types of loads so it is very important that these are allowed for when sizing the system

Optional Factory Fitted Features

Internally fitted options

- **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
- **Printer:** An impact printer is available for hardcopy printout of Datalogger
- **RS232 Port:** For remote monitoring Software via RS232
- **SNMP Adapter:** For remote monitoring of system via LAN
- **AC output Earth Leakage protection:** Can be set to 30/100/300mA depending on application
- **Battery backup (SFC + UPS):** Valve Regulated Lead Acid (VRLA), 10 Year life at 20 Degrees C and complies with BS EN60896-2
- **Rectifier input display:** Amps / KVA / % Load
- **High IP rating:** Maximum IP55

Remote Mounted Options

- **RAP & EPO:** Remote alarm panel which can be connected up to 100 meters away by 4 core cable for remote monitoring of system. Consists of LED display with audible alarm and silence button; it also provides a remote EPO (emergency power off) which turns the inverter off
- **RAP with RAR:** Same as above but with added relays for volt free monitoring as well

System Ratings

Selection Table

| System Type | Input | Output | Watts/VA Rating | Current @ 230V | Current @ 115V | Enclosure |
|-------------|--------|--------|-----------------|----------------|----------------|-----------|
| EF20-3.2k | Single | Single | 3.2K | 13.9A | 27.8A | NA |
| EF20-4.8k | Single | Single | 4.8K | 20.8A | 41.7A | NA |
| EF20-4.8k | Three | Single | 4.8K | 20.8A | 41.7A | NB |
| EF20-6.4k | Single | Single | 6.4K | 27.8A | 55.6A | NA |
| EF20-6.4k | Three | Single | 6.4K | 27.8A | 55.6A | NB |
| EF20-8.0k | Single | Single | 8.0K | 34.7A | 69.5A | NB |
| EF20-8.0k | Three | Single | 8.0K | 34.7A | 69.5A | NB |
| EF20-10k | Single | Single | 10K | 43.4A | 86.9A | NB |
| EF20-10k | Three | Single | 10K | 43.4A | 86.9A | NB |
| EF20-12k | Single | Single | 12K | 52.1A | 104.3A | NC |
| EF20-12k | Three | Single | 12K | 52.1A | 104.3A | NC |
| EF20-16k | Single | Single | 16K | 69.5A | 139.1A | NC |
| EF20-16k | Three | Single | 16K | 69.5A | 139.1A | NC |
| EF20-20k | Single | Single | 20K | 86.9A | 173.9A | SD |
| EF20-20k | Three | Single | 20K | 86.9A | 173.9A | SD |
| EF20 24k | Single | Single | 24K | 104.3A | 208.6A | SD |
| EF20-24k | Three | Single | 24K | 104.3A | 208.6A | SD |
| EF20-32k | Three | Single | 32K | 139.1A | 278.2A | SD |

Note: Sizes subject to change without notice

Technical Data

Enclosure

- **Type:** Floor standing on castors/plinth.
- **Degree of protection:** IP21/23 (IP55 available)
- **Finish:** Textured, epoxy/polyester powder paint, colour RAL 7032
- **Cable entry:** Rear/Top
- **Terminals:** DIN Rail mounted or direct into EMC filter, screw clamp type

Rectifier – Power Factor Corrected

- **Mains Supply Voltage:** 230/400VAC +/-10% Single or Three Phase (other voltages available on request)
- **Mains Supply Frequency:** 50 or 60Hz +/-5% (other frequencies available on request - 16-440Hz)
- **Power Factor:** 0.99pF @ full load
- **Input Protection:** MCB to BS EN60898
- **Fusegear:** gR to IEC 60269-1 and -4, DIN VDE 0636-23
- **Protections:** DC over-voltage protection, mains low protection and input surge protection
- **Technology:** Full wave controlled thyristor / diode bridge with IGBT power factor correction – micro-processor controlled

Inverter

- **Voltage:** 110/115/120 or 220/230/240VAC Single Phase (other voltages available on request)
- **Voltage Regulation:** Static +/-1%, Dynamic +/-6%
- **Voltage Waveform:** Sinusoidal
- **Frequency:** 50, 60 or 400Hz +/-0.1% (other frequencies available on request - 16-850Hz)
- **Distortion (THD):** <3% into linear load
- **Load Power Factor:** 0.3 lag to 0.3 lead
- **Crest Factor:** 3:1
- **Overload (KVA):** 120% continuous 121% for 2 minutes, 160% for 5 seconds without reduction in output voltage
- **Efficiency:** 90-93% depending on system
- **Protections:** Electronic overload / short circuit, over-temperature, inverter over/under-voltage and low voltage shutdown
- **Technology:** High frequency, pulse width modulated IGBT with isolation transformer

General

- **Noise Level:** <55dBA @ 1 metre
- **Maximum Relative Air Humidity:** 90%, non-condensing
- **Maximum Altitude:** 1000m Above sea level before de-rating
- **Max/Min Temperature:** 0-40 Degree C

Standards

- BS EN 50091-1 (Safety)
- BS EN 50091-2 (EMC)
- BS EN 61000-3-4 (Harmonics)