



POWER for PROCESS INDUSTRIES

Industrial UPS Systems

5kVA to 100kVA with single phase output
and 10kVA to 200kVA with three phase output

This EF20 series of Industrial Uninterruptible Power Supply systems design replaces our RTC product range and is based on a well proven engineering concept to which custom features may be added to meet the specification of the purchaser. The control logic uses discrete sections dedicated for the rectifier, inverter and static bypass. The rectifier, inverter and bypass sections can be operated as individual elements, the inverter can also be started from the battery without the rectifier operating. The UPS is designed to start and run without a battery connected. The inverter output is via a static interrupter and not via a low cost electro-mechanical contactor as used by a number of competitors. The control logic is housed in a shielded logic section and enables the system to operate in the most contaminated environmental conditions. This product designed to operate continuously for at least 20 years in an environment where there is stray field harmonics and magnetic radiation in power generation stations and in high voltage power grid transformer stations and for the power stations in metal smelting and processing applications. These environmental conditions, contaminated by electro-magnetic conducted and radiated emissions and plasma discharges are well recognised elements that cause operational stability and unreliability of the microprocessor control logic used in the commercial types of UPS systems and other power conversion systems.

The engineering standard, mechanical construction, ingress protection, thermal management and air flow control within this type of UPS enclosure ensures the systems will operate in high ambient temperatures, in high humidity conditions and in an environment where carbon dust and vapours are present in the available air flow for cooling the power systems.

This product range is a high quality, very reliable power source for the most critical load applications. The engineering design, construction and performance specification of the rectifiers, inverters and operating systems have been developed from extensive operational duty experience in many types of industrial applications and in demanding environmental conditions.

The EF20 series industrial product range of UPS systems uses a true Active On-line Double Conversion topology with the rectifier stage presenting a sine wave input to the mains power source with high power factor and a THD of less than 5%. The inverter uses the latest in power conversion switching technology is a high frequency pulse width modulation (PWM) type using IGBT power semiconductor devices.



The use of the high performance PWM inverters ensures exceptional high efficiency performance an ability to handle high crest factor non-linear loads and is very quiet in operation.

The UPS systems have a galvanic isolation between the battery and the output, with optional galvanic isolation at the input. The DC bus voltage can be made according to the customer's specification and preferred battery type.

The rectifier has float, boost and equalise facilities and is designed for use with any type of lead acid battery or NiCd batteries.

This EF series of industrial UPS systems is available with three phase input and single phase output up to 100kVA (E21), and three phase input and three phase output in sizes up to 200kVA (E23). The standard single phase output is 230V AC 50Hz and the standard three phase output is 400V AC 50Hz, however, virtually any voltage is achievable and the product can be configured as a frequency converter.

The fully featured microprocessor based control logic, designed and made in the UK provides an operational status indication, numerous alarms and data logging and event recording. A metering function is provided by a menu keypad and LCD panel and the power flow is shown on a mimic panel fixed to the front door of the UPS system. The mimic panel uses high brightness LED's to indicate the status of the rectifier, inverter and bypass and battery.

The alarm conditions are shown on the mimic panel with audible as well as visual indication. A remote alarm, monitoring and diagnostics interface printed circuit board is provided with a MODBUS data port and facilities for other protocols.

- **Features**

- **6 pulse rectifier**
- **12 pulse rectifier (optional)**
- **Data-logger and battery test data**
- **Volt free contacts for remote alarms**
- **RS485 Port for remote data monitoring**
- **SNMP Adaptor for remote monitoring via LAN**
- **Battery earth leakage alarm**
- **Temperature compensated battery charging**
- **Low battery voltage disconnect**
- **Rectifier input isolation (optional)**
- **Inverter output isolation transformer**
- **AC output earth leakage protection**
- **Ingress protection IP27.50 – (IP31,IP42 and IP55 options)**
- **Analogue metering (optional)**
- **Engraved mimic panel with LED power flow status (optional)**



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