

# mt CONVERTER

## MARINE TYPE CONVERTER SFC Series 40 kVA-40 MVA



MARINE



INDUSTRY



TRANSPORT



MODULAR



SERVICE



POWER FACTOR



### Overview

The Marine Type SFC system allows power systems that require 60Hz power to be fed from 50Hz networks or systems that require 50Hz supply to be fed from 60Hz networks. In addition, it is also used to meet the different voltage standards required by the loads.

### System Operation

The Marine Type SFC system consists of one or more rectifier and inverter modules, which consist of power electronics components with a modular structure. The system has a double conversion structure and first converts the AC voltage to filtered DC voltage with the rectifier module, then the inverter module converts this filtered DC voltage to the AC frequency and voltage standard that the load needs.

The Marine Type SFC can operate in parallel with different voltage sources such as generators and other SFCs. Load sharing is done without the need for any communication, thanks to its programmable droop control feature.

Marine Type SFC takes the load without any interruption from sources such as generators by connecting to live busbars under energy due to its remote synchronization feature.

### Highlights

- High reliability and quick maintenance through its modular structure
- Low cost of ownership.
- Minimum spare parts requirement
- Ability to work in parallel with other sources with droop control.

### Field of Applications

- Industrial loads that need a 50/60Hz or 60/50Hz conversion.
- Ship to Shore power or shaft alternator applications for fuel savings and carbon emission reduction.
- Static Frequency Converter (SFC)
- Shore Power Converter (SPC)
- Active Voltage Conditioner (AVC)
- Energy Storage System (ESS)
- Static Synchronous Compensator (STATCOM)
- GreenPort Applications
- Reactive Power Compensation
- Applications of generating isolated source at different frequencies and feeding loads from unregulated networks.
- Bi-directional working.

### Main Features

- By parallel connection up to 40MVA can be supplied.
- High efficiency power conversion
- Output voltage in clean and full sinusoidal waveform
- High power factor with regenerative power and PWM rectifier structure with low current IGBT
- High reliability operation due to the modular structure and spare module.
- Fully isolated output with optional output transformer
- 50/60Hz wide input voltage range
- Small footprint design
- Touchscreen with color graphic display
- Wide range of communication options
- Output cable voltage drop compensation
- Seamless load transfer between sources
- Uninterrupted load transfer between sources
- Load sharing with SFCs of different power and generators
- Bi-directional working due to four quadrant operation without any problem and feeding to the mains. Power can always flow to both directions.

## TECHNICAL SPECIFICATIONS

|                                  | 40 kVA - 40 MVA                                                                                                                                                     |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Grid - Input</b>              |                                                                                                                                                                     |
| Voltage                          | 380 – 480V $\pm 10\%$ (different input voltages with input transformer)                                                                                             |
| Maximum Supply Voltage           | 110%                                                                                                                                                                |
| Nominal Input Frequency          | 50/60Hz                                                                                                                                                             |
| Frequency Tolerance              | $\pm 15\text{Hz}$                                                                                                                                                   |
| Grid Standard                    | 3 phase or 3 phase + Neutral                                                                                                                                        |
| Overvoltage Category             | III                                                                                                                                                                 |
| Current Harmonic                 | <3% THDi (at nominal load)                                                                                                                                          |
| Power Factor                     | >0.99                                                                                                                                                               |
| <b>Load - Output</b>             |                                                                                                                                                                     |
| System Capacity                  | 40 kVA to 40 MVA 0.9pf (higher powers with parallel connection)                                                                                                     |
| Voltage                          | 115VAC/440VAC $\pm 1\%$ (3 PHASE)(MIL-STD-1399 (Tip III) compliance for marine applications)                                                                        |
| Frequency                        | 400Hz $\pm 0.1$ (MIL-STD-1399 (Tip III) compliance for marine applications)                                                                                         |
| Voltage Harmonic                 | <2.5% THDv (at linear load)                                                                                                                                         |
| Overload Capacity                | 120% 10 min.<br>150% 30 sec.                                                                                                                                        |
| Short-circuit Rating             | 200% 2 sec.                                                                                                                                                         |
| Static Voltage Sensitivity       | $\pm 1\%$                                                                                                                                                           |
| Frequency Sensitivity            | $\pm 0.1\%$                                                                                                                                                         |
| <b>Performance</b>               |                                                                                                                                                                     |
| Efficiency                       | >93                                                                                                                                                                 |
| <b>General</b>                   |                                                                                                                                                                     |
| Cabinets IP Option               | IP20 Cabinet or Rack<br>IP42 Cabinet Only<br>(IP43 Optional)                                                                                                        |
| User Panel                       | 7 inch. Touchpanel with colour TFT                                                                                                                                  |
| Operating Temperature            | 0 – 40°C (-20°C +45°C Optional)                                                                                                                                     |
| Cooling                          | Forced Air Cooling with a fan that speed is adjusted according to the load                                                                                          |
| Temperature Effect               | 2% power loss per 1°C up to 50°C above 40°C.                                                                                                                        |
| Capacity Derating With Elevation | 1% power loss for every 100m up to 2000m over 1000m.                                                                                                                |
| Humidity                         | <95% without condensation                                                                                                                                           |
| Aquistic Noise                   | 65–75dBA<br>ISO9001<br>IEC62103/ EN50178;CE                                                                                                                         |
| Standards                        | Marine Certificates on Request DV, DNV, GL, ABS, CCS(++)<br>MIL-STD-167-1 Standard Compliance / MIL-T-17221B & VDE530 Standard Compliance / MIL-STD-461E Compliance |

## SINGLE LINE DIAGRAM

