



## 50/60Hz STATIC FREQUENCY CONVERTER



### Introduction

With years of experience in designing and manufacturing UPS and frequency converter system, we had completed our frequency converter series by static frequency converter using for industrial application. LISA SFC static frequency converter series are outcome of combination between state of the air technology and our excellent experiences. We had created distinguish products by employment of advanced technological components, and take the simplicity of working for main feature.

LISA SFC provides maximum protection and power quality for mission critical loads with maximum reliability. SFC is designed with a transformer isolated inverter, so it provide completed protection for your load.

A rectifier transforms the AC voltage into a continuous stabilized DC link voltage, to power the IGBT inverter that transforms the continuous voltage into a 50Hz or 60Hz alternating sinusoidal stabilized voltage with a PWM modulation. The output inverter voltage feeds a transformer which on its output has the filter capacitors. The output voltage is

sinusoidal with a distortion of 2%. The output has an electronic stabilization both in voltage and in frequency.

### Main Features

- High efficiency up to 95%
- High frequency IGBT technology
- Sinusoidal input current (low THDi <1.5%)
- Easy Installation
- Online Double Converter with sine-wave output
- Galvanic Isolation of Inverter via Inv. Transformer
- Power Factor Correction (PF =1)
- Monitoring and Display controlled by Microprocessor
- Robust design for industrial application
- Single or Dual Output
- Mobile: castor with shock absorbers and stainless Steel Cable Tray
- IP54 enclosure for fixed and mobile units
- CE MARK

### High efficiency

LISA SFC has no moving parts, except for the fans to cool the systems down, and is highly efficient units (up to 95% efficiency). Our High frequency IGBT Technology (Rectifier and inverter) guarantees a perfect sine-wave input with low THDi (THDi <1.5%) and unitary power factor (PF=1), perfect for all sorts of extreme electrical conditions (compatible with Genset output). The advantages of this technology are:

- Fast response to load changes
- Quiet operation
- Reduction in size and weight
- High efficiency – low heat losses
- Short circuit protection



## Parallel

LISA SFC can be Paralleled or connected in Hot Standby in a redundant mode to increase reliability. The units to be paralleled must be of the same rating and no more than 4 in number

When two or more units are connected in Parallel Redundant mode their outputs are connected to a common point via a current equalizing saturable choke. They also interface with each other via a CAN Field Bus so that the instructions and controls are synchronized.

In Hot Standby Operation, both SFC will be ON but only one will be connected to the Load at any one time. If SFC 1 fails SFC 2 will supply the Load via SFC 1 Static Bypass. If both SFC fail the load will be supplied by the Mains via both SFC Static Bypass.

## Control Panel

The control panel consists of a mimic panel that displays the flow of power from the input to the output and a liquid crystal display - LCD (two rows of 40 characters). The display shows the event history log up to 120; the measurements and associated alarms are recorded for each event

## Custom version

We realize custom apparatus according to customer's technical data employing the standard series sets and therefore with experimented feature:

- Fixed or variable input voltage
- Fixed or variable output voltage
- Stainless steel enclosure and IP54 protection
- Drop line compensation
- Additional 28VDC module output
- Parallel version
- UPS version
- Trolley version

## Application

### Application for marine:

LISA static frequency converter is designed to feed the optimum electrical power system to vessel's equipment. LISA SFC is available in two configurations: at the harbour (DOCK series) and on board (NAVY series). The first one, DOCK series, has a fixed input voltage (the harbour's voltage) and a settable output voltage in order to supply power to vessels that are not compatible with the locally available dockside power; the second type, NAVY series, has an input settable voltage and a fixed output voltage to feed and clean on board power from a dockside connection, anywhere in the world.

LISA SFC series, are outcome of a long experience static frequency converter both civil and military field, of UPS and of static Constant Current Regulators for series lighting. All of our equipment distinguish themselves by the employment of advanced technological components, excellent reliability and easy maintenance. The simplicity of working is the main feature of all of our products.

### Application for industry:

The equipment/machine which has other different electricity standard such as 208V/60Hz or 220V/60Hz or 380V/50Hz need to use frequency converter.

- 60 to 50Hz: - Testing products for export to 50Hz countries  
- Operating 50Hz machines in a 60Hz country. Importing a machine or an entire factory
- 50 to 60Hz: - Testing products for export to 60Hz countries  
- Operating 60Hz machines in a 50Hz country



| Technical data sheet the LISA SFC50/60 10-80kVA |   |             |             |             |             |             |             |             |
|---|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| MODELS  | 50SFC<br>10   | 50SFC<br>15 | 50SFC<br>20 | 50SFC<br>30 | 50SFC<br>40 | 50SFC<br>50 | 50SFC<br>60 | 50SFC<br>80 |
| <b>INPUT</b>                                    |   |             |             |             |             |             |             |             |
| Nominal voltage                                 | 3Phase 200VAC/400VAC/480VAC   |             |             |             |             |             |             |             |
| Voltage tolerance                               | ± 15%   |             |             |             |             |             |             |             |
| Nominal frequency                               | 45Hz to 65Hz ±5%  |             |             |             |             |             |             |             |
| Input current harmonics                         | < 3% at full load (sinusoidal)  |             |             |             |             |             |             |             |
| <b>OUTPUT</b>                                   |   |             |             |             |             |             |             |             |
| Nominal power (kVA)                             | 10  | 15          | 20          | 30          | 40          | 50          | 60          | 80          |
| Active power (kW)                               | 10  | 15          | 20          | 30          | 40          | 50          | 60          | 80          |
| Voltage   | 200V/400V/480VAC 3-Phase<br>or 220V/240VAC 1-phase (Other voltage available on request) |             |             |             |             |             |             |             |
| Static regulation 0 -100% load                  | ±1%   |             |             |             |             |             |             |             |
| Dynamic regulation 100%                         | ±5%, recovering to 1% within 40 millisecond   |             |             |             |             |             |             |             |
| Frequency                                       | 50 or 60Hz (selectable)   |             |             |             |             |             |             |             |
| Frequency stability                             | ±0.01% Crystal controlled   |             |             |             |             |             |             |             |
| Overall Efficiency                              | Up to 95 %  |             |             |             |             |             |             |             |
| Max Crest Factor                                | 3 : 1   |             |             |             |             |             |             |             |
| <b>RECTIFIER</b>                                |   |             |             |             |             |             |             |             |
| AC Voltage Range                                | -25% +10%   |             |             |             |             |             |             |             |
| Efficiency                                      | 93% - 97%   |             |             |             |             |             |             |             |
| Input Frequency Deviation                       | ± 5%  |             |             |             |             |             |             |             |
| Overload capacity                               | 150% continuous   |             |             |             |             |             |             |             |
| Current walk in                                 | 5 seconds to maximum  |             |             |             |             |             |             |             |
| Overall current limits                          | 120% continuous   |             |             |             |             |             |             |             |
| <b>INVERTER</b>                                 |   |             |             |             |             |             |             |             |
| Total harmonic distortion                       | < 2% linear load  |             |             |             |             |             |             |             |
| Overload  | 120% for 60s, 150% for 5s, 200% for 2s  |             |             |             |             |             |             |             |
| Waveform  | Sinusoidal  |             |             |             |             |             |             |             |
| Load power factor                               | 0.7 - 1   |             |             |             |             |             |             |             |



## 50/60Hz STATIC FREQUENCY CONVERTER

|                                |   |             |              |              |
|--------------------------------|---|-------------|--------------|--------------|
| Efficiency                     | 93% - 98%   |             |              |              |
| <b>INFO FOR INSTALLATION</b>   |   |             |              |              |
| DIMENSION (WxDxH) mm           | 450x500x700   | 550x500x750 | 700x715x1250 | 700x780x1575 |
| Remote signal                  | Dry contact   |             |              |              |
| Ethernet connection            | Standard with NetAgent                                      |             |              |              |
| CAN (with Remote Panel)        | Optional  |             |              |              |
| Temperature range at sea level | -40°C to +55°C (full load)<br>30°C at 2000m (full load)     |             |              |              |
| Relative humidity              | 10%-100%  |             |              |              |
| Noise level                    | < 65dbA at 1meter   |             |              |              |
| IP rating                      | IP20 (IP42, IP54 optional)                                  |             |              |              |
| Altitude                       | Up to 2500m   |             |              |              |
| Standard                       | CE MARK; EN62040-1-1; EN61558-2-6; EN61000-6-4; EN61000-6-2 |             |              |              |



## 50/60Hz STATIC FREQUENCY CONVERTER

| Technical data sheet the LISA SFC50/60 100-400kVA |   |              |              |              |              |              |              |
|---|---|--------------|--------------|--------------|--------------|--------------|--------------|
| MODELS  | 50SFC<br>100  | 50SFC<br>120 | 50SFC<br>150 | 50SFC<br>200 | 50SFC<br>250 | 50SFC<br>300 | 50SFC<br>400 |
| INPUT   |   |              |              |              |              |              |              |
| Nominal voltage                                   | 3Phase 200VAC/400VAC/480VAC   |              |              |              |              |              |              |
| Voltage tolerance                                 | ± 15%   |              |              |              |              |              |              |
| Nominal frequency                                 | 45Hz to 65Hz ±5%  |              |              |              |              |              |              |
| Input current harmonics                           | < 3% at full load (sinusoidal)  |              |              |              |              |              |              |
| OUTPUT  |   |              |              |              |              |              |              |
| Nominal power (kVA)                               | 100   | 120          | 150          | 200          | 250          | 300          | 400          |
| Active power (kW)                                 | 100   | 120          | 150          | 200          | 250          | 300          | 400          |
| Voltage   | 200V/400V/480VAC 3-Phase<br>or 220V/240VAC 1-phase (Other voltage available on request) |              |              |              |              |              |              |
| Static regulation 0 -100% load                    | ±1%   |              |              |              |              |              |              |
| Dynamic regulation 100%                           | ±5%, recovering to 1% within 40 millisecond   |              |              |              |              |              |              |
| Frequency   | 50 or 60Hz (selectable)   |              |              |              |              |              |              |
| Frequency stability                               | ±0.01% Crystal controlled   |              |              |              |              |              |              |
| Overall Efficiency                                | Up to 95 %  |              |              |              |              |              |              |
| Max Crest Factor                                  | 3 : 1   |              |              |              |              |              |              |
| RECTIFIER   |   |              |              |              |              |              |              |
| AC Voltage Range                                  | -25% +10%   |              |              |              |              |              |              |
| Efficiency  | 93% - 97%   |              |              |              |              |              |              |
| Input Frequency Deviation                         | ± 5%  |              |              |              |              |              |              |
| Overload capacity                                 | 150% continuous   |              |              |              |              |              |              |
| Current walk in                                   | 5 seconds to maximum  |              |              |              |              |              |              |
| Overall current limits                            | 120% continuous   |              |              |              |              |              |              |
| INVERTER  |   |              |              |              |              |              |              |
| Total harmonic distortion                         | < 2% linear load  |              |              |              |              |              |              |
| Overload  | 120% for 60s, 150% for 5s, 200% for 2s  |              |              |              |              |              |              |
| Waveform  | Sinusoidal  |              |              |              |              |              |              |
| Load power factor                                 | 0.7 - 1   |              |              |              |              |              |              |



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|--------------------------------|---|----------------|
| Efficiency                     | 93% - 98%   |                |
| <b>INFO FOR INSTALLATION</b>   |   |                |
| DIMENSION (WxDxH) mm           | 1000x810x1955   | 1600x1000x2000 |
| Remote signal                  | Dry contact   |                |
| Ethernet connection            | Standard with NetAgent                                      |                |
| CAN (with Remote Panel)        | Optional  |                |
| Temperature range at sea level | -40°C to +55°C (full load)<br>30°C at 2000m (full load)     |                |
| Relative humidity              | 10%-100%  |                |
| Noise level                    | < 68dbA at 1meter   |                |
| IP rating                      | IP20 (IP42, IP54 optional)                                  |                |
| Altitude                       | Up to 2500m   |                |
| Standard                       | CE MARK; EN62040-1-1; EN61558-2-6; EN61000-6-4; EN61000-6-2 |                |