

# SINUS J

Drive for AC Three-Phase induction motors

## SINUS J 0003 4T BA2K2 Model



*(picture is for illustration purposes only)*

The inverters of the **SINUS J** series allow adjusting speed value of three-phase asynchronous by way of several control modes.

Control modes may be user-defined and allow obtaining the best performance in terms of fine-tuning and energy saving for any industrial application.

### **Sinus J – Models Range**

- Power supply voltage range:
  - 200 ~ 240 V three-phase ( -15%/+10% )
  - 220 ~ 240 V single-phase ( -5%/+10% )
  - 380 ~ 480 V three-phase ( -15%/+10% )
- Applicable motor power range (Heavy Duty):
  - Sinus J with single-phase power supply: 0.2 ~ 15 kW
  - Sinus J with three-phase power supply: 0.4 ~ 22 kW
- Overload capacity (Dual rating):
  - Up to 150% for 60 s (Heavy Duty)
  - Up to 120% for 60 s (Normal Duty)

### **HIGHLIGHTS**

- Control methods: V/f and Sensorless Vector Control for asynchronous motors.
- Selectable rotary/standstill auto-tuning.
- Starting torque of 200% / 0.5 Hz
- Built-in dynamic braking unit.
- Integrated EMC filter compliant to EN61800-3, 2nd Environment, C3 Category for industrial users. Available for Sinus J three-phase 380 ~ 480 V class.
- IP20 Protection degree.
- New UL compliance (UL 61800-5-1).
- 4 Digit 7-Segment / 6 Key Buttons; Built-in Potentiometer.
- Easy to set-up: Parameter Copy (Read/Write) with RJ45 Port in Box (it doesn't have to open case).
- Lifetime diagnosis for fans: a warning signal is displayed when the fan is operated over a preset duration.
- Easy cooling fan replacement: replaceable fan without complete disassembly.
- Side by Side Installation: when installing multiple inverters, the size of the panel can be reduced due to minimized gap between products (2 mm).
- DIN-rail mount (up to 4 kW).
- Fieldbus option modules.
- Remote keypad option.
- 3C2 Coating Class.

| Main features                              |                                                                                                                |                                                 |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| Model                                      | SINUS J 0003 4T BA2K2                                                                                          |                                                 |
| Integrated braking module                  | Yes                                                                                                            |                                                 |
| Integrated EMC filter                      | Yes<br>A2 type - EN 61800-3 issue 2 SECOND ENVIRONMENT<br>Category C3, EN55011 gr.2 cl. A for industrial users |                                                 |
| Degree of protection                       | IP20                                                                                                           |                                                 |
| Operating temperature range <sup>(1)</sup> | -10 ÷ 50°C - Heavy Duty<br>-10 ÷ 40°C - Normal Duty                                                            |                                                 |
| Storage temperature range                  | -20 ÷ 65 °C                                                                                                    |                                                 |
| Max. operating altitude                    | 1000 m a.s.l.                                                                                                  |                                                 |
| Input Ratings                              |                                                                                                                |                                                 |
| Frequency                                  | 50-60 Hz (±5%)                                                                                                 |                                                 |
| AC power supply voltage range              | 380÷480 Vac, 3-phase                                                                                           |                                                 |
| Input rated current                        | Heavy Duty Application<br>(up to 150% for 60 s)                                                                | Heavy Duty Application<br>(up to 150% for 60 s) |
|                                            | 5.5 A                                                                                                          | 4.2 A                                           |
| Output Ratings                             |                                                                                                                |                                                 |
| Frequency                                  | 0..400 Hz (Sensorless: 0..120 Hz)                                                                              |                                                 |
| Continuous rated current                   | Normal Duty Application<br>(up to 120% for 60 s)                                                               | Heavy Duty Application<br>(up to 150% for 60 s) |
|                                            | 5.1 A                                                                                                          | 4 A                                             |
| Rated capacity <sup>(2)</sup>              | Normal Duty Application<br>(up to 120% for 60 s)                                                               | Heavy Duty Application<br>(up to 150% for 60 s) |
|                                            | 3.9 kVA                                                                                                        | 3 kVA                                           |
| Applicable Motor                           |                                                                                                                |                                                 |
| Applicable motor power <sup>(3)</sup>      | Normal Duty Application<br>(up to 120% for 60 s)                                                               | Heavy Duty Application<br>(up to 150% for 60 s) |
|                                            | 2.2 kW / 3 HP                                                                                                  | 1.5 kW / 2 HP                                   |
| Dimensions and weight                      |                                                                                                                |                                                 |
| Inverter dimensions (WxHxD)                | 101 x 167 x 150.5 mm                                                                                           |                                                 |
| Inverter weight                            | 1.44 kg / 3.17 lb                                                                                              |                                                 |

**NOTE**

<sup>(1)</sup> Max temperature without derating is also affected by the carrier frequency and installation type.

<sup>(2)</sup> The standard used for 2T/S inverters is based on a 220 V supply voltage, 440 V for 4T supply voltage for 4T inverters.

<sup>(3)</sup> Only for reference. Data contained in the tables relate to standard 4-pole motors.

| Additional information              |                                                                                                                                                                                                       |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standard I/O                        | N.5 Programmable digital inputs<br>N.1 Analog input 0-10 Vdc<br>N.1 Analog input 4-20 mA<br><br>N.1 Analog output 0-10 Vdc<br>N.1 Programmable relay output NO/NC<br>N.1 Programmable relay output NO |
| Communication                       | Built-in RS485 Modbus RTU communication protocol up to 115 kbps                                                                                                                                       |
| Fieldbus                            | Profibus DP, CANopen, Modbus TCP, Ethernet/IP                                                                                                                                                         |
| Display                             | 4 Digit 7-Segment                                                                                                                                                                                     |
| Keypad                              | 6 Key Buttons; Built-in Potentiometer                                                                                                                                                                 |
| Maximum value for relative humidity | 90% non-condensing                                                                                                                                                                                    |
| Cooling system                      | Forced air-cooling                                                                                                                                                                                    |
| Vibrations                          | Lower than 9.8 m/sec <sup>2</sup> (= 1G)                                                                                                                                                              |
| Certification                       | UL, CE, RoHS                                                                                                                                                                                          |
| Pollution degree                    | Class 2                                                                                                                                                                                               |

## SINUS J

One product, 2 integrated motor control modes:

- Inverter Frequency Drive (V/f): vector modulation function for general-purpose applications (V/f pattern). According to the application, the V/f pattern can be configured as follows:
  - Linear V/f pattern: configures the inverter to increase or decrease the output voltage at a fixed rate for different operation frequencies based on V/f characteristics. A linear V/f pattern is particularly useful when a constant torque load is applied.
  - Square reduction V/f pattern: ideal for loads such as fans and pumps. It provides non-linear acceleration and deceleration patterns to sustain torque throughout the whole frequency range.
  - User-defined V/f patterns: to suit the load characteristics of special motors.
- Sensorless Vector Control for asynchronous motors: vector function for high-torque demanding applications without speed feedback from the motor.

## **SINUS J Main Options**

The following options are available for **Sinus J** inverters:

### **Conduit Kit**

An optional special NEMA1 kit is supplied to protect the terminals block.

### **Fieldbus Card**

Profibus DP, CANopen, Modbus TCP, Ethernet/IP.

### **Input Three – Phase Inductors**

Three-phase inductor can be installed on the supply line to obtain the following benefits:

- limit input current peaks on the input circuit of the inverter and value  $di/dt$
- reducing supply harmonic current
- increasing power factor and the duration of line capacitors inside the inverter

### **Output Inductors (du/dT Filters)**

Using du/dt filters is always recommended when the motor cable length is over 100 m.

### **Resistive Braking**

When a large braking torque is required or the load connected to the motor is pulled, the power regenerated by the motor is to be dissipated. This can be obtained by dissipating energy to braking resistors. The braking resistor is to be connected outside the inverter.

### **Output Toroid Filters**

Ferrite is a simple radiofrequency filter. Ferrite cores are high-permeable ferromagnetic materials used to weaken cable disturbance.