

SINUS M

Drive for AC three-phase induction motors

SINUS M 0005 4T BA2K2 Model



The inverters of the **SINUS M** series manufactured by Enertronica Santerno SpA allow adjusting speed value of three-phase asynchronous motors by way of two 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.

HIGHLIGHTS

- Power ranges: 0.37~22 kW
- Power Supply: 200-230Vac and 380-480Vac
- Built-in dynamic braking unit
- Possibility of connecting a DC choke (depends on the model)
- N.2 Control modes: V/F and Sensorless Vector Control
- RS485 serial port with MODBUS RTU protocol
- Remotable smart keyboard
- Overload up to 150% of rated current for 60 s
- Overload up to 200% of rated current for 0.5 s
- Maximum torque 180% T_n
- Regulation of output frequency from 0 to 400Hz
- Anti-stalling and overvoltage trip prevention
- The ground-fault protection of output terminal is possible during running
- N.8 speed sets
- Up to 3 frequency jumps (skip)
- Inputting analog signals from -10V to 10V provides user-friendly operation
- Lower motor noise with random modulation and carrier frequency up to 15kHz
- Automatic and manual torque boost
- Built-in PID control
- “S” ramps
- Fire Mode function available
- External brake control
- EMC compliant EN 61800-3 2nd edition SECOND ENVIRONMENT C3 Category, for industrial users
- Global standard compliance: CE, RCM, EAC and UL standards

Main features	
Model	SINUS M 0005 4T BA2K2
Integrated Braking Module	Yes
Integrated EMC filter	Yes A2 type - EN 61800-3 issue 2 SECOND ENVIRONMENT Category C3, EN55011 gr.2 cl. A for industrial users
Degree of protection	IP20
Operating temperature range	-10 ÷ 50°C
Max. operating temperature without derating ⁽¹⁾	50° C
Storage temperature range	-20 ÷ 65 °C
Max. operating altitude	Below 1000 m a.s.l.
Input Ratings	
Input frequency	50 / 60 Hz (±5%)
AC power supply voltage range	3 Ø 380 ~ 480 VAC (+10%, -15%)
Output Ratings (AC)	
Continuous rated current	6 A
Maximum current (deliverable current for max for 60 s)	9 A
Peak current (deliverable current for max. 0.5 s)	12 A
Power efficiency	
Efficiency ⁽²⁾	97.6 %
Applicable Motor	
Applicable motor power ⁽³⁾	2.2 kW / 3 HP @ 380-415V 2.2-3 kW / 3-4 HP @ 440-460V
Dimensions and weight	
Inverter dimensions (WxHxD)	140 x 128 x 155 mm
Inverter weight	1.84 kg

NOTE

⁽¹⁾ Max temperature for carrier frequency up to 3kHz. For carrier frequency over 3kHz apply 2.5% derating of the rated current for every degree over 40°C up to 50°C.

⁽²⁾ Measured conditions: 50Hz; 100% Current Load; Default Carrier Frequency.

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

Additional information	
Standard I/O	N.8 NPN/PNP programmable digital inputs N.2 analog inputs 0-10Vdc and 4-20mA N.1 programmable open-collector output N.1 programmable relay output N.1 analog output 0-10Vdc
Dissipated power at rated current	47 W
Display	Alphanumerical display/keypad
Maximum value for relative humidity	90% non-condensing
Cooling system	Forced cooling
Vibrations	Lower than 5.9 m/sec ² (= 0.6G)
Communication	RS485 with Modbus RTU protocol up to 38400 Baud
Standards	CE, cULus, EAC, RCM

SINUS M

One product, 2 integrated motor control modes:

- Inverter Frequency Drive (V/F): vector modulation function for general-purpose applications (V/F pattern).
- Sensorless Vector Control: sensorless vector function for high-torque demanding applications.

The Sinus M series is characterized by 3 current values:

- Rated current (I_{nom}) is the continuous current that can be delivered
- Maximum current (I_{max}) is the max. current that can be delivered under overload conditions for a time period of 60s
- Peak current (I_{peak}) is the maximum current that can be delivered under overload conditions for a time period of 0.5s

SINUS M main options

The following options are available on Sinus M inverters:

Keypad Remoting Kits

The inverter keypad may be remoted. A special kit is supplied, which includes the material needed to installing the keypad on the front door or on the wall of a cabinet.

Conduit Kits

A special NEMA1 kit is supplied to protect the terminals block.

External Relay

An optional external relay with a +24Vdc coil may be connected to the Open Collector output.

Communicator kit

External kit with converting protocol card Modbus/Profibus DP for 31 drives connection, complete with cables and programming SW. Other buses available on request: CANopen, CC-Link, Modbus TCP, Profinet, Lonworks, etc.

EMC Input Filters

The inverters of the Sinus M serie are always delivered with integrated EMC filter A2 class, category C3 according to EN61800-3 2nd ed, for industrial utilities. Moreover may be delivered with an external filter B class, category C1 according to EN61800-3 2nd ed.

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

Input DC Inductors

The DC inductance can be connected for reducing the THD, available from Sinus M 0017 to 0030 models.

Output Inductors (DU/DT Filters)

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

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.