

SINUS H

Drive for AC Three-Phase induction
and PM-synchronous motors

SINUS H 0002 4T BA2K2 Model



(picture is for illustration purposes only)

The inverters of the **SINUS H** series allow adjusting speed value of three-phase asynchronous and PM-synchronous motors 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 H – Models Range

- Power supply voltage range:
 - 2S: 200 ~ 240 V single-phase (-15%/+10%)
 - 2T: 200 ~ 240 V three-phase (-15%/+10%)
 - 4T: 380 ~ 480 V three-phase (-15%/+10%)
- Applicable motor power range:
 - Sinus H with single-phase power supply: 0.4 ~ 3.7 kW
 - Sinus H with three-phase power supply: 0.4 ~ 37 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, Sensorless Vector Control for asynchronous motors and Sensorless Vector Control for PM-synchronous motors.
- Built-in dynamic braking unit up to Sinus H 0030 model.
- Integrated EMC filter compliant to EN61800-3, 2nd Environment, C3 Category for industrial users. Available for Sinus H 0001 ~ 0034 4T.
EMC filter Category C2 is available also for Sinus H 0001 ~ 0005 2S.
- Integrated DC Reactor for Sinus H 0034 model.
- Selectable rotary/standstill auto-tuning.
- Starting torque of 200% / 0.5 Hz
- Lifecycle estimation:
 - Main capacitor: estimated by monitoring changes in capacitance value.
 - Fans: warning signal is displayed when the fan is operated over a preset duration.
- Safety Built-in STO certified Function. By using this function, short-time operations and maintenance work on non-electrical parts of the machinery can be performed without switching off the power supply to the drive.
- P2P function embedded: I/Os can be shared among master and slave drives.
- User sequence function: simple PLC sequences can be operated with various function block combinations.
- 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.
- IP20 Protection degree as standard. IP66 and NEMA4X models are available up to 22 kW.
- Air exhaust structure for internal cooling system enhances inverter protection and improves the life of Sinus H in dusty working environment.

Main features		
Model	SINUS H 0002 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	
Integrated disconnecting switch	No	
Integrated DC reactor	No	
Degree of protection	IP20	
Operating temperature range ⁽¹⁾	-10 ÷ 50 °C - Heavy Duty -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	
	Normal Duty Application (up to 120% for 60 s)	Heavy Duty Application (up to 150% for 60 s)
Input rated current	3.3 A	2.4 A
Output Ratings		
Frequency	0..400 Hz (Sensorless IM: 0..120 Hz; Sensorless PM: 0..180 Hz)	
	Normal Duty Application (up to 120% for 60 s)	Heavy Duty Application (up to 150% for 60 s)
Continuous rated current	3.1 A	2.5 A
	Normal Duty Application (up to 120% for 60 s)	Heavy Duty Application (up to 150% for 60 s)
Maximum power ⁽²⁾	2.4 kVA	1.9 kVA
Applicable Motor		
	Normal Duty Application (up to 120% for 60 s)	Heavy Duty Application (up to 150% for 60 s)
Applicable motor power ⁽³⁾	1.5 kW / 2 HP	0.75 kW / 1 HP
Dimensions and weight		
Inverter dimensions (WxHxD)	68 x 180 x 130 mm	
Inverter weight	1.18 kg / 2.6 lb	

NOTE

⁽¹⁾ Apply 2%/°C derating in Normal Duty up to 50 °C. Max temperature without derating is also affected by the carrier frequency and installation type.

⁽²⁾ The values indicated are based on a 220 V supply voltage for 2S and 2T inverters, 440 V supply voltage for 4T inverters.

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

Additional information	
Standard I/O	N.7 Programmable digital inputs N.1 Analog input 0-10 Vdc N.1 Analog input 0-10 V / 4-20 mA N.1 Analog pulse train input N.1 Analog output 0-10 Vdc/4-20 mA N.1 Analog pulse train output (0.5~32 kHz) N.1 Programmable open-collector output N.1 Programmable relay output
Communication	Built-in RS485 Modbus RTU communication protocol up to 115 kbps
Display	Integrated 7-segment display/keypad with 8 keys
Maximum value for relative humidity	90% non-condensing
Cooling system	Forced air-cooling
Vibrations	Lower than 9.8 m/sec ² (= 1G)
Certification	UL, CE, RoHS
Pollution degree	Class 2

SINUS H

One product, 3 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.
- Sensorless Vector Control for PM-synchronous motors: vector function for high-torque demanding applications without speed feedback from the motor.

SINUS H Main Options

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

Graphic LCD keypad

All the models up to Sinus H 0030 can be equipped with a graphic LCD keypad (128x64 Pixels) with n.11 keys. Moreover, the graphic LCD can be used as a Multi-Keypad feature. This function allows changing the parameters of multiple drives via a single keypad. The graphic LCD installed on the master drive enables to access every drive (Slave) connected via inbuilt RS485 communication so that the users adjust and monitor parameters easily.

Only Sinus H 0034 model features the in-built Graphic LCD keypad as a standard.

Conduit Kit

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

Flange Kit

This option allows the heat sink to be installed outside the panel in order to improve the cooling capability.

Communicator Kit

Optional kit with converting protocol card: Modbus/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

Input DC Reactor

The DC reactor can be connected to reduce the THD. Available from Sinus H 0001 to 0030 models. Only Sinus H 0034 model features the in-built DC reactor as a standard.

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.