

**ENGLISH**

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# EM30

## FREQUENCY INVERTER

0.4kW - 11kW / 0.5HP - 15HP



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FREQUENCY INVERTER

## HIGHLIGHTS

High-tech motor control concept, based on advanced DSP- technology V/Hz, SENSORLESS VECTOR with SPEED/TORQUE control, sensorless PMM synchronous motor control

Intelligent AUTOTUNING functions for easy set-up

Rugged construction, all metal enclosure, thermally decoupled from motor, IP66/NEMA 4X, shock proof(4G) – for motor- and wall mounting

Flexible configurable 4 line character LCD display

Ready for all common field bus systems

Numerous standard inverter functions, to make it suitable for a variety of industrial,civil, and retrofit applications

C3 class EMC filter build in, optional kit for internal C1 class filter available

Smart PC-tools, for inverter control, parametrization and troubleshooting. parameter-COPY- stick

Approved for worldwide standards by independent bodies



## Naming rule

### Model naming rule

Product Model	Motor-mounted Inverter			
Motor Power				
Mark	0004	0007	0015	.....
Power(kW)	0.4	0.75	1.5	.....

EM30 - 0007 T3 J1

Structure Code	J1:270×190×165 J2:338×228×193.5
Input Voltage	S2:1-phase 220~240VAC T2:3-phase 220~240VAC T3:3-phase 380~480VAC

### Function naming rule

U5 F2 AC02 C21 B1 R3 IC1

Mark	Certification Type
None	None
U1	CE
U5	UL+CE
Mark	Field Bus Type
None	None
F2	MODBUS with terminal interface
Mark	Keypad Panel Type
AC01	AC English keypad panel, 1-line LCD display,without potentiometer
AC02	AC English keypad panel, 4-line LCD display,without potentiometer

Mark	Installation Type
None	No wall - mount bracket
IC1	Wall - mount bracket
Mark	Filter Type
None	No filter
R3	C3 level filter

Mark	Brake Mode
None	None braking unit
B1	Built-in braking unit

Mark	Clock
None	None
C21	Clock card

# TECHNICAL DATA

	Items	Contents
Input	Rated Voltage Range	T3 380V-480V(+10%/-15%); S2/T2 220V-240V (±15%)
	Rated Frequency	50/60Hz
Output	Rated Voltage Range	3-Phase: 0-INPUT(V)
	Frequency Range	0.50~590.0HZ (In Vector Control Mode: Max frequency is not to exceed 500.00Hz)
Control Mode	Control Mode	Induction Motor: Sensorless Vector Control (SVC), V/F control; PMSM: open-loop vector control (SVC)
	Carrier Frequency	0.8~16KHz; Fixed carrier-wave and random carrier-wave (F159)
	Modulation Mode	Space Vector PWM
	Speed-control Scope	Induction Motor-SVC 1:100; PMSM-SVC 1:20;
	Steady Speed Precision	±0.5% (SVC)
	Torque Response	<20ms (SVC)
	Torque Control Precision	±5% (SVC)
	Start Torque	0.5 Hz/100% (VVVF); 0.5Hz/150%(SVC)
	DC Braking	DC braking frequency: 0.20-50.00 Hz;; Braking time: 0.00~30.00s; Braking current: 0.0~100%
	Jogging Control	Jogging frequency range: min frequency~ max frequency, Jogging acceleration/ deceleration time: 0.1~3000.0s
Operation Function	Frequency Setting mode	Potentiometer or external analog signal (0~5V, 0~10V, 0~20mA); Keypad (terminals) up/down key; External control logic and self-circulation setting.
	Main Frequency Source	Digital given memory, external analog AI1, AI2, input pulse frequency given(100KHZ), digital given without memory, PID, MODBUS
	Auxiliary Frequency Source	Flexible auxiliary frequency trim and the operate mode of main and auxiliary frequency.
	Auto voltage regulation (AVR)	When the source voltage changes, the modulation rate will be adjusted automatically, resulting in an unchanged output voltage
	Analog input	2-channel(AI1/AI2)
	Analog output	2-channel (AO1/AO2)
	Digit input	5-channel common input; 1-channel high-speed pulse input Max frequency: 100Khz, Internal impedance: 3.3KΩ;
	Digit output	1-channel DO1
	Relay output	2 programmable relay output
	Others	Built-in PID adjusting, oscillation inhabitation, common DC bus, auto carrier modulation, auto fast current-limiting, I/O terminals self-checking function and OE automatic adjustment.
Keypad	4-line LCD	Yes
	Parameter copy	Clone module supported.
Protection Function	Power supply under-voltage, phase loss, DC over-voltage, over-current, inverter overload, motor overload, output phase loss, overheat, external disturbance, parameter measure failure, analog line disconnected protection, DC-GND short circuit, water shortage protection, pressure protection, dormant state.	

Items		Contents
Environmental Conditions	Environment Temperature	-10°C～+40°C
	Environment Humidity	Below 90% (no water-bead coagulation)
	Vibration Strength	4G
	Height above sea level	1000m or below(Derating use when above 1000m)
Protection level	IP66/NEMA 4X	
Applicable Motor	0.4～11kW	
Efficiency	≥93%	
Others	Cooling Mode	Force-air cooling
	Braking Unit	Built-in braking unit needs external braking resistor.
	Fan	Draught fan is pluggable.
	Installation Mode	Support installing with motor

## Functions of Control Terminals

Terminal	Type	Description	Function
DO1	Digital Output	Multifunctional output terminal 1	When the token function is valid, the value between this terminal and CM is 0V; when the inverter stops, the value is 24V.
TA1		Relay contact	TC is a common point, TB-TC is normally closed contacts, and TA-TC is normally open contacts. The contact capacity is 10A/125VAC、5A/250VAC、5A/30VDC.
TB1			
TC1			
TA2		Running frequency Current output	It is connected with frequency meter, speedometer or ammeter externally, and its minus pole is connected with GND. See F423～F426 for details.,
TB2			
TC2			
AO1	Analog Output	Self-contained power supply	Internal 10V self-contained power supply .When used externally,it can only be used as the power supply for voltage signals with restricted below 20mA.
AO2		AI1	Voltage / Current
10V	Analog power supply	AI2	AI1:0~5V、0~10V、0~20Ma ; AI2:0~5V、0~10V、0~20Ma
AI1		AI2	
AI2		GND	Self-contained Power supply Ground
GND	Digital input control terminal	Ground terminal of external control signal (voltage control signal or current source control signal) is also the ground of 10V power supply of this inverter.	
24V		Control power supply	Power: 24±1.5V, grounding is CM; Current is restricted below 200mA for external use.
DI1		Forward jogging	The functions of input terminals shall be defined per manufacturer's value. Other functions can also be defined by changing function codes.
DI2		External scram	
DI3		“FWD” Terminal	
DI4		When this terminal is valid, inverter will run forward.	
DI5		“REV” Terminal	
DI6		Reset	
DI6		Free-stop	Making this terminal valid during running can realize free stop.

Terminal	Type	Description		Function
CM	Common port	Grounding of control power supply	The grounding of 24V power supply and other control signals.	
+5V	Power supply	RS485 differential signal positive	RS-485 differential signal positive power supply	
A+	485 communication terminals	Positive polarity of differential signal	Standard: TIA/EIA-485(RS-485)	
B-		Negative polarity of differential signal	Communication protocol: MODBUS	
CAN_Hnote		CAN communication terminal high level	Communication rate: 1200/2400/4800/9600/19200/38400/57600bps	
CAN_Lnote	Communication terminal	CAN communication terminal low level	CAN_L bus line(dominant low)	
GNDnote		Signal grounding	Ground/0V/V-	

Note:

GND terminal is on the left side of drive, shielded twisted-pair cable is recommended for communication cable. Please turn J8 coding switch of the first inverter and the last inverter on CAN communication to ON position, turn J8 coding switch of the other inverters on CAN communication to OFF position. Shielding layer is connected to ground by one spot.

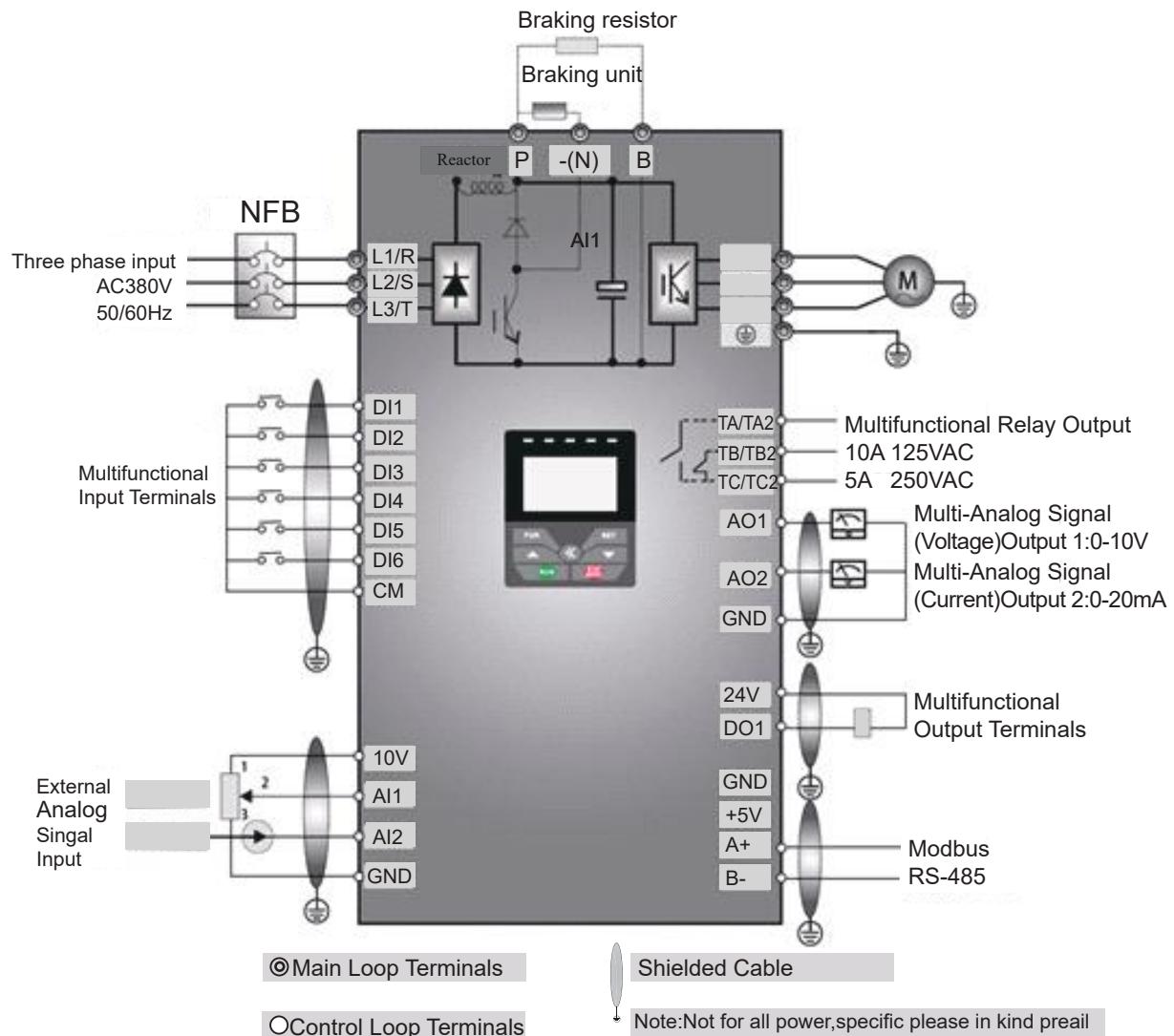
TA1 TB1 TC1 TA2 TB2 TC2 D01 24V CM CM DI1 DI2 DI3 DI4 DI5 DI6 10V AI1 AI2 GND AO1 AO2

GND +5V A+ B- CANH CANH

## Product List and Structure List

Model	Motor power (kW/HP)	Rated Current(A)	Input protection current(A)	Remarks
EM30-0004S2	0.4/0.5	2.5	10.0	
EM30-0007S2	0.75/1	4.5	18.1	
EM30-0015S2	1.5/2	7	25.2	1-phase 230V
EM30-0022S2	2.2/3	10	32.0	
EM30-0004T2	0.4/0.5	2.5	10.0	
EM30-0007T2	0.75/1	4.5	17.0	
EM30-0015T2	1.5/2	7	17.5	
EM30-0022T2	2.2/3	10	25.0	3-phase 230V
EM30-0030T2	3.0/4	12	30.0	
EM30-0040T2	4.0/5.5	17	42.5	
EM30-0055T2	5.5/7.5	21	53.0	
EM30-0007T3	0.75/1	2	6.5	
EM30-0015T3	1.5/2	4	11	
EM30-0022T3	2.2/3	6.5	15.0	
EM30-0030T3	3.0/4	7	16	
EM30-0040T3	4.0/5.5	9	21.0	3-phase 400V
EM30-0055T3	5.5/7.5	12	29.0	
EM30-0075T3	7.5/10	17	34.0	
EM30-0110T3	11.0/15	23	46.5	

# Wiring diagram



Note:

1. The contact capacity of inverter is 10A/125VAC, 5A/250VAC and 5A/30VDC.

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