

# EM30

## FREQUENCY INVERTER

0.4kW - 11kW / 0.5HP - 15HP

cUL/UL Certification valid for 0.4kW-4.0kW / 0.5HP-5.5HP



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### 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.MOVBUS RS - 485 and CANbus ready

Numerous standard inverter functions, to make it suitable for a variety of industrial, civil, and retrofit applications. Universal parameter set for all kind of industrial applications, including integrated PID controller routines, automatic carrier frequency and V/Hz curve adjustment for advanced torque control C3 class EMC filter build in, optional kit for internal C1 class filter available

Eura DV Software, 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

Mark	Certification type
None	None
U1	CE
U5	UL+cUL+CE
Mark	Field bus type
None	None
F2	MOVBUS 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

**U5 F2 AC02 C21 B1 R3 IC1**

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	0.5Hz/100% (VVVF); 0.5Hz/150% (SVC)
	DC Braking	DC braking frequency: 0.20-50.00Hz; Braking time: 0.00~30.00s; Braking current: 0.0~100%
Operation Function	Jogging Control	Jogging frequency range: min frequency ~ max frequency, Jogging acceleration/ deceleration time: 0.1~3000.0s
	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				
TB2				
TC2				
AO1	Analog Output	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.	
AO2				
10V	Analog Power Supply	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.	
AI1	Analog Input	Voltage / Current analog input port	AI1:0~5V、0~10V、0~20Ma ;	
AI2			AI2:0~5V、0~10V、0~20Ma	
GND	Analog Grounding	Self-contained power supply ground	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	Power Supply	Control power supply	Power: 24±1.5V, grounding is CM; Current is restricted below 200mA for external use.	
DI1	Digital Input Control Terminal	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		When this terminal is valid, inverter will run forward.
DI4		"REV" Terminal		When this terminal is valid, inverter will run reversely.
DI5		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) Communication protocol: MODBUS Communication rate: 1200/2400/4800/9600/19200/38400/57600bps
B-		Negative polarity of differential signal	
CAN_H <sup>Note</sup>	Communication Terminal	CAN communication terminal high level	CAN_H bus line (dominant high)
CAN_L <sup>Note</sup>		CAN communication terminal low level	CAN_L bus line (dominant low)
GND <sup>Note</sup>		Signal grounding	Ground/0V/V-

Note:

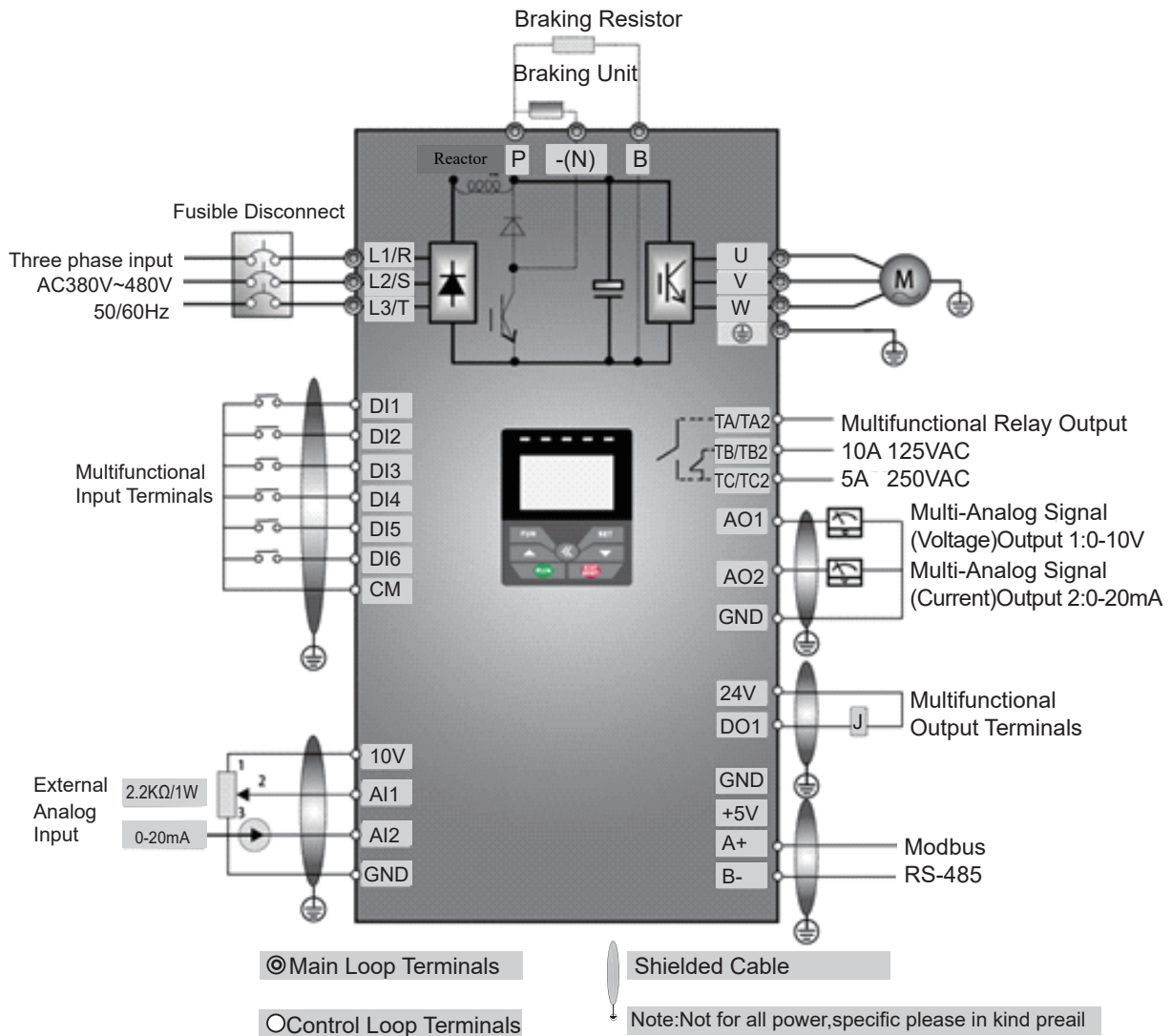
GND terminal is on the left side of drive, shielded twisted-pair cable is recommended for communication cable. Please turn J8 coding switch of the first inverter and the last inverter on CAN communication to ON position, turn J8 coding switch of the other inverters on CAN communication to OFF position. 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 Output Current(A)	Input Protection Current(A)	Remarks
EM30-0004S2	0.4/0.5	2.5	10.0	1-phase 230V
EM30-0007S2	0.75/1	4.5	18.1	
EM30-0015S2	1.5/2	7	25.2	
EM30-0022S2	2.2/3	10	32.0	
EM30-0004T2	0.4/0.5	2.5	10.0	3-phase 230V
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	
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	3-phase 400V
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	
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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