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# E2100

## FREQUENCY INVERTER

0.4 kW - 400 kW



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## FREQUENCY INVERTER

### HIGHLIGHTS

High-tech motor control concept, based on advanced DSP-technology - ready for V/Hz, SENSORLESS VECTOR, CLV and permanent magnet synchronous motor control PMSM  
Intelligent AUTOTUNING functions for easy setup

Compact in size, modular in concept, rugged construction, build for the worldwide market

Flexible inverter control, dual high resolution analogue inputs, free mapping for all I/O channels

Ready for all commonly used fieldbus systems

Universal parameter-set for all kind of industrial and residential applications, including integrated PID/ controller routines

Smart PC-tools for inverter control, parametrization and troubleshooting

Parameter-duplication stick

EMC filter(C3 class) integrated.optional C1 footprint filter.

Approved and certified for worldwide standards, by independent bodies.



## Naming rule

### Model naming rule

**E2100 – 0007 S2**

Input power type:  
S2 means single-phase 230VAC  
T3 means three-phase 400 VAC

Motor power

Relation

Mark	0007	0015	0022	.....
Motor power(kW)	0.75	1.5	2.2	.....

Product series

### Function naming rule

**E2 U5 F2 AF03 B1 R3**

Filter	R3	C3 level filter	Remarks1
Braking type	B1	Dynamic braking	Remarks2
Keypad	AF03	AF English no potentiometer LED keypad	Remarks3
Communication	F2	Modbus is connected by terminal	Remarks4
Certificate	U5	UL+CE	Remarks5
Structure code	E2	E2 structure	

#### Remarks:

- 1.Filter for 45kw and below 45kw includes R3 and R5. R3 is EMC C3 level standard (testing condition is 25m motor cable). R5 is EMC C3 level standard (testing condition is 10m unshielded motor cable). R5 is standard, R3 is optional. 55kw and above 55kw meet the need of EMC C3 level standard.
- 2.For 3-phase 400V 30kw and below 30kW, braking unit is standard.  
For 1-phase 230V and 3-phase 37kW-110kW, braking unit is built-in and optional.  
For 3-phase 230V, 1.5kW and below 1.5kW, 4.0kW~11kW, braking unit is standard.  
For 132kW and above 132kW, there is no built-in braking unit.



## Local keypad:

Structure code	Keypad code	Contents
E1	AE03	AE English version without potentiometer
	AE04	AE English version with potentiometer
E2~E6	AF03	AF English version without potentiometer
	AF04	AF English version with potentiometer
E7~CB	A603	A6 English LED without potentiometer
	A604	A6 English LED with potentiometer
	A607	A6 English 9-key LED without potentiometer
	A608	A6 English 9-key LED with potentiometer
	A614	A6 English LED with digital potentiometer
	A902	A9 English LCD4 without potentiometer

## Remote keypad model:

Keypad	
A603	A6 English LED without potentiometer
A604	A6 English LED with potentiometer
A607	A6 English 9-key LED without potentiometer
A608	A6 English 9-key LED with potentiometer
A614	A6 English LED with digital potentiometer
A902	A9 English LCD4 without potentiometer
AA03	AA English LED without potentiometer
AA04	AA English LED with potentiometer

## 3.Communication

Structure code	Communication codee	Contents
E1	F2	Modbus
E2 structure and above	F2	Modbus
	F4	CANOpen+Modbus
	F5	EtherCAT+Modbus
	F9	Profibus-DP+Modbus
	F12	BACnet+Modbus

## 4.Certificate

Certificate code	Contents	Inverter power
U1	CE	≤400 kW
U5	UL+CE	≤185 kW

# Technical product data

Items		Contents
Input	Rated Voltage Range	3-phase 380-480V (+10%, -15%) note 1 3-phase 220V~240V ±15% 1-phase 220-240V ±15%
	Rated Frequency	50/60Hz
Output	Rated Voltage Range	3-phase 0-INPUT (V)
	Frequency Range	0.50~590.0Hz (In SVC control mode, the max frequency should be lower than 500Hz.)
Control Mode	Carrier Frequency	800~16000Hz; Fixed carrier-wave and random carrier-wave can be selected by F159.
	Input Frequency Resolution	Digital setting: 0.01Hz, analog setting: max frequency X 0.1%
	Control Mode	For induction motor: SVC (open-loop vector control) control, V/F control, VC (Closed-loop vector control) control For PMSM: SVC (open-loop vector control) control
	Start Torque	0.5 Hz / 150% (SVC), 0Hz/180% (VC), 5% of rated speed/100% of rated torque (PMSM SVC)
	Speed-control Scope	1:100 (SVC), 1:1000 (VC), 1:20 (in PMSM SVC)
	Steady Speed Precision	±0.5%~ (SVC), ±0.02%(VC)
	Torque Control Precision	±5%
	Overload Capacity	150% rated current, 60 seconds.
	Torque Elevating	Auto torque promotion, Manual Torque Promotion includes 1-20 curves.
	V/F Curve	3 kinds of modes: beeline type, square type and under-defined V/F curve.
	Startup mode	Direct startup, speed track startup (V/F control)
	DC Braking	DC braking frequency: 0.20-50.00 Hz, braking time: 0.00~30.00s
	Jogging Control	Jogging frequency range: min frequency~ max frequency, jogging acceleration/deceleration time: 0.1~3000s

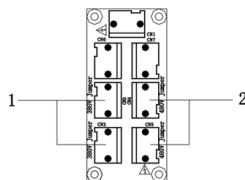
Items		Contents
Control Mode	Auto Circulating Running and multi-stage speed running	Auto circulating running or terminals control can realize 15-stage speed running.
	Built-in PID adjusting	Easy to realize a system for process closed-loop control
	Auto voltage regulation (AVR)	When the source voltage changes, the modulation rate can be adjusted automatically,so that the output voltage is unchanged.
Operation Function	Frequency Setting	Potentiometer or external analog signal (0~5V, 0~10V, 0~20Ma); keypad (terminal)▲/▼ keys, external control logic and automatic circulation setting.
	Start/Stop Control	Terminal control, keypad control or communication control.
	Running Command Channels	3 kinds of channels from keypad panel, control terminal and MODBUS.
	Frequency Source	Frequency sources: given digit, given analog voltage, given analog current and given MODBUS
	Accessorial frequency Source	7 kinds of accessorial frequency
Optional	Built-in EMI filter, built-in braking unit, Modbus, tele-control panel	
Protection Function	Input phase loss, Output phase loss, input under-voltage, DC over-voltage, over-current, inverter over-load, motor over-load, current stall, over-heat, external disturbance, under-load, pressure control, analog line disconnected, PG line disconnection, keypad disconnection, oPEN protection, STO and STO1.	
Display	Keypad showing present output frequency, present rotate-speed (rpm), present output current, present output voltage, present linear-velocity, types of faults, and parameters for the system and operation; LED indicators showing the current working status of inverter.	
Environment Conditions	Equipment Location	In an indoor location, Prevent exposure from direct sunlight, Free from dust, tangy caustic gases, flammable gases, steam or the salt-contented, etc.
	Environment Temperature	-10℃ ~+50℃
	Environment Humidity	Below 90% (no water-bead coagulation)
	Vibration Strength	Below 0.5g (acceleration)
	Height above sea level	1000m or below
Protection level	IP20	
Applicable Motor	0.2~400kW	

Note 1: under different voltage level, user should connect jumper on the pin board, the model of pin board is E2F3UZ00.

1)When input voltage is 380~420VAC, please connect CN2 to CN3 (380V Jumper).

2)When input voltage is 420~480VAC, please connect CN4 to CN5(480V Jumper).

The default system is 380~420VAC, if some operation is needed, please power off inverter and contact with profession engineer.



## Functions of Control Terminals

Terminal	Type	Description	Function
DO1	Output signal	Multifunctional output terminal 1	When the token function is valid, the value between this terminal and CM is 0V; when the inverter is stopped, the value is 24V. When DO1 is as high-frequency output terminal, the max output frequency is 100KHz and please do not connect to intermediate relay.
DO2 <sup>Note 1</sup>		Multifunctional output terminal 2	When the token function is valid, the value between this terminal and CM is 0V; when the inverter is stopped, the value is 24V.
TA		Relay contac	TC is a common point, TB-TC are normally closed contacts, TA-TC are normally open contacts. The contact capacity is 10A/125VAC, NO/NC 3A 250VAC/30VDC.
TB			
TC			

The functions of output terminals shall be defined per manufacturer's value. Their initial state may be changed through changing function codes.



# Functions of Control Terminals

Terminal			Type	Description	Function															
AO1			Output signal	Voltage/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				Current output	It is connected with ammeter externally, and its minus pole is connected with GND. See F427～F430 for details															
10V			Analog power supply	Self contained power supply	Internal 10V self-contained power supply of the inverter provides power to inverter. When used externally, it can only be used as the power supply for voltage control signal, with current restricted below 20mA.															
AI1 <sup>ote 2</sup>			Input Signal	Voltage analog input port	When analog speed control is adopted, the voltage or current signal is input through this terminal. The range of voltage input is 0~5V or 0~10V or -10V-10V, and the current input is 0～20mA, the input resistor is 500Ohm, and grounding: GND. If the input is 4～20mA, it can be realized by setting F406=2. The voltage or current signal can be chosen by coding switch. See table 5-2, 5-3 for details, the default setting of AI1 is 0~10V, and the default setting of AI2 is 0~20mA.															
AI2				Voltage / Current analog input por																
GND			Power supply	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				Control power supply	Power: 24±1.5V, grounding is CM; current is restricted below 200mA for external use.															
DI1				Jogging terminal	When this terminal is valid, the inverter will have jogging running. The jogging function of this terminal is valid under both at stopped and running status. This terminal can also be used as high-speed pulse input port. The max frequency is 100KHz.												The functions of input terminals shall be defined per manufacturer' value. Other functions can also be defined by changing function codes.			
DI2			External Emergency Stop	When this terminal is valid, “ESP” malfunction signal will be displayed.																
DI3			“FWD” Termina	When this terminal is valid, inverter will run forward.																
DI4			“REV” Terminal	When this terminal is valid, inverter will run reversely.																
DI5			Reset terminal	Make this terminal valid under fault status to reset the inverter.																
DI6			Free-stop	Make this terminal valid during running can realize free stop.																
DI7 <sup>Note 1</sup>			Running terminal	When this terminal is in the valid state, inverter will run by the acceleration time.																
DI8 <sup>Note 1</sup>			Stop terminal	Make this terminal valid during running can realize stop by the deceleration time.																
CM			Common port	Grounding of control power supply	The grounding of 24V power supply and other control signals.															
GND			485 communication terminals	Grounding of differential signal	Grounding of differential signal															
5V				Power of differential signal	Power of differential signal															
A+				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																
TA	TB	TC	D01	D02	24V	CM	DI1	DI2	DI3	DI4	DI5	DI6	DI7	DI8	10V	AI1	AI2	GND	AO1	AO2
GND			5V	A+	B-															

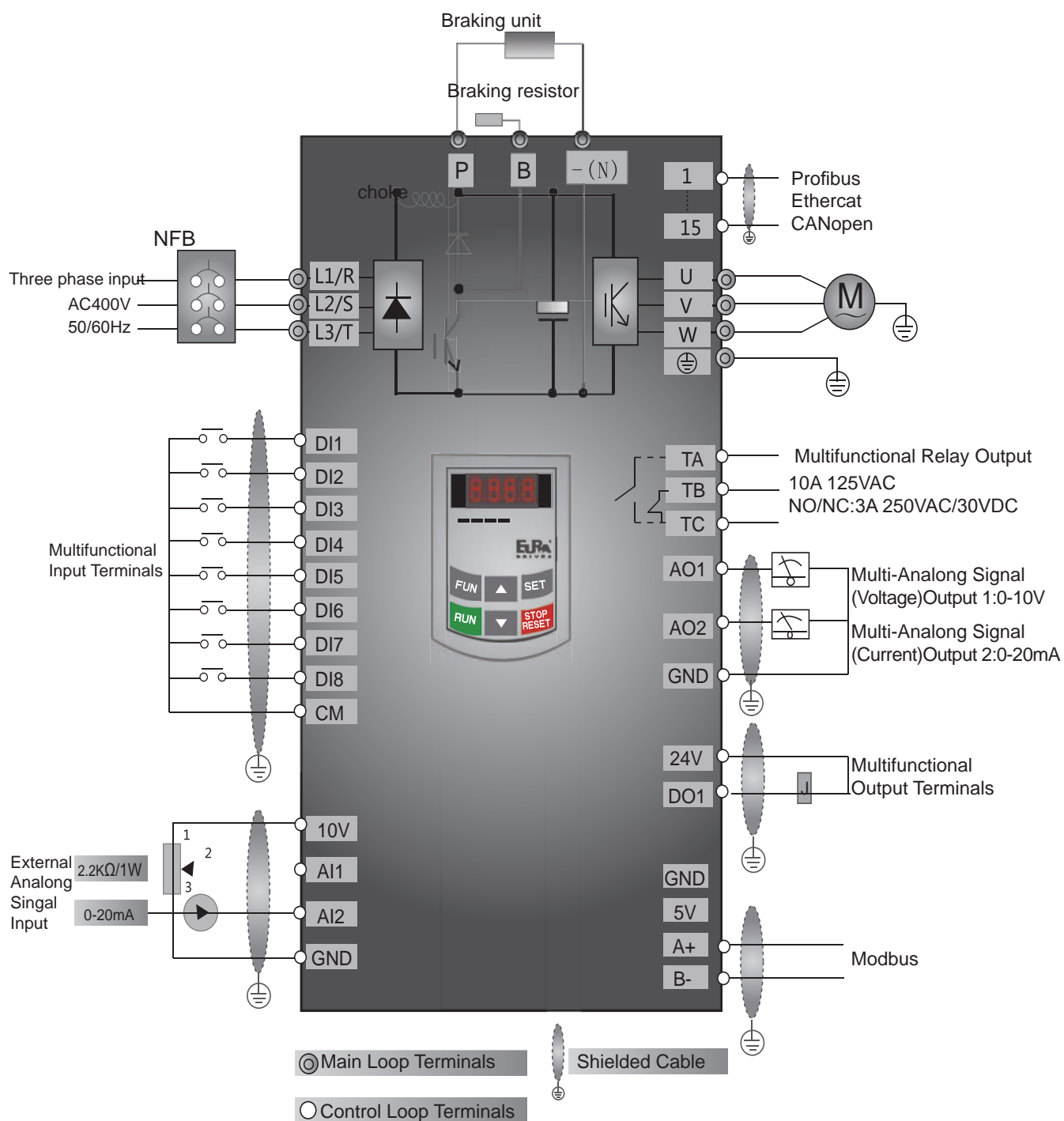
Note:

- 1.T3 30kW and below 30kW and T2 2.2kw and below 2.2kw inverters have no DO2, DI7 and DI8 control terminals.
- 2.AI1 terminal of T3 30kW and below 30kW and T2 2.2kw and below 2.2kw inverters can only accept voltage signal, the default voltage is 0~10V

Model	Applicable Motor (kW)	Rated Current Output	Structure Code	External Dimension [AxB(B1)×H] mm	Mounting Size(W×L) mm	Mounting Bolt	Cooling Mode	Remarks
E2100-0002S2	0.2	1.5	E1	80×135(142)×138(153)	70×128	M4	Air- Cooling	1-phase plastic housing
E2100-0004S2	0.4	2.5	E1	80×135(142)×138(153)	70×128	M4	Air- Cooling	
E2100-0007S2	0.75	4.5	E1	80×135(142)×138(153)	70×128	M4	Air- Cooling	
E2100-0015S2	1.5	7.0	E1	80×135(142)×138(153)	70×128	M4	Air- Cooling	
E2100-0022S2	2.2	10.0	E2	106×150(157)×180(195)	94×170	M4	Air- Cooling	3-phase 220V plastic housing
E2100-0002T2	0.2	1.5	E1	80×135(142)×138(153)	70×128	M4	Air- Cooling	
E2100-0004T2	0.4	2.5	E1	80×135(142)×138(153)	70×128	M4	Air- Cooling	
E2100-0007T2	0.75	4.5	E1	80×135(142)×138(153)	70×128	M4	Air- Cooling	
E2100-0015T2	1.5	7	E1	80×135(142)×138(153)	70×128	M4	Air- Cooling	3-phase 380V plastic housing
E2100-0022T2	2.2	10	E2	106×150(157)×180(195)	94×170	M4	Air- Cooling	
E2100-0007T3	0.75	2.0	E1	80×135(142)×138(153)	70×128	M4	Air- Cooling	
E2100-0015T3	1.5	4.0	E1	80×135(142)×138(153)	70×128	M4	Air- Cooling	
E2100-0022T3	2.2	6.5	E2	106×150(157)×180(195)	94×170	M4	Air- Cooling	
E2100-0030T3	3.0	7.0	E2	106×150(157)×180(195)	94×170	M4	Air- Cooling	
E2100-0040T3	4.0	9.0	E2	106×150(157)×180(195)	94×170	M4	Air- Cooling	
E2100-0055T3	5.5	12.0	E4	142×152(159)×235(248)	126×225	M5	Air- Cooling	
E2100-0075T3	7.5	17.0	E4	142×152(159)×235(248)	126×225	M5	Air- Cooling	
E2100-0110T3	11	23.0	E5	161×170(177)×265(280)	146×225	M5	Air- Cooling	
E2100-0150T3	15	32.0	E5	161×170(177)×265(280)	146×225	M5	Air- Cooling	
E2100-0185T3	18.5	38.0	E6	210×196(203)×340(358)	194×330	M5	Air- Cooling	
E2100-0220T3	22	44.0	E6	210×196(203)×340(358)	194×330	M5	Air- Cooling	3-phase 380V metal housing
E2100-0300T3	30	60	E6	210×196(203)×340(358)	194×330	M5	Air- Cooling	
E2100-0370T3	37	75	E7	265×235(242)×435(465)	235×412	M6	Air- Cooling	
E2100-0450T3	45	90	E7	265×235(242)×435(465)	235×412	M6	Air- Cooling	
E2100-0550T3	55	110	C51	360×265×630	320×605	M8	Air- Cooling	
E2100-0750T3	75	150	C51	360×265×630	320×605	M8	Air- Cooling	
E2100-0900T3	90	180	C61	410×300×765	370×740	M10	Air- Cooling	
E2100-1100T3	110	220	C61	410×300×765	370×740	M10	Air- Cooling	
E2100-1320T3	132	265	C61	410×300×765	370×740	M10	Air- Cooling	
E2100-1600T3	160	320	C7	516×326×765	360×740	M10	Air- Cooling	
E2100-1800T3	180	360	C8	560×342×910	390×882	M10	Air- Cooling	
E2100-2000T3	200	400.0	C9	400×385×1310	280×1282	M10	Air- Cooling	
E2100-2200T3	220	440.0	C9	400×385×1310	280×1282	M10	Air- Cooling	
E2100-2500T3	250	480.0	CA	535×380×1340	470×1310	M10	Air- Cooling	
E2100-2800T3	280	530.0	CA	535×380×1340	470×1310	M10	Air- Cooling	
E2100-3150T3	315	580.0	CB0	600×380×1463	545×1433	M10	Air- Cooling	
E2100-3550T3	355	640.0	CB0	600×380×1463	545×1433	M10	Air- Cooling	
E2100-4000T3	400	690.0	CB	600×380×1593	545×1563	M10	Air- Cooling	



# Wiring diagram



Basic Wiring Diagram for Three-phase AC drives(NPN type)



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