

SINEE



Selection Guidance

of SINEE Inverters

Ver 0.1

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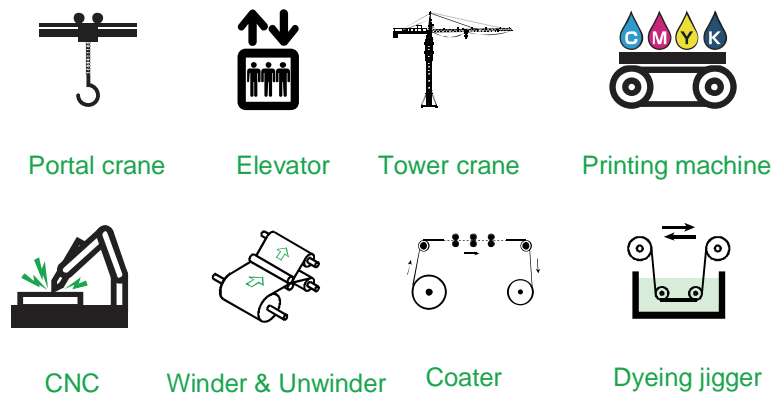
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EM300A

Universal Vector Control Standard Inverter

220V (single phase) 0.4 ~ 4.0 kw
 220V (three phase) 0.4 ~ 200 kw
 380V (three phase) 0.75 ~ 400 kw

EM300A series inverters are applied to the occasions which have high requirement for accuracy such as:

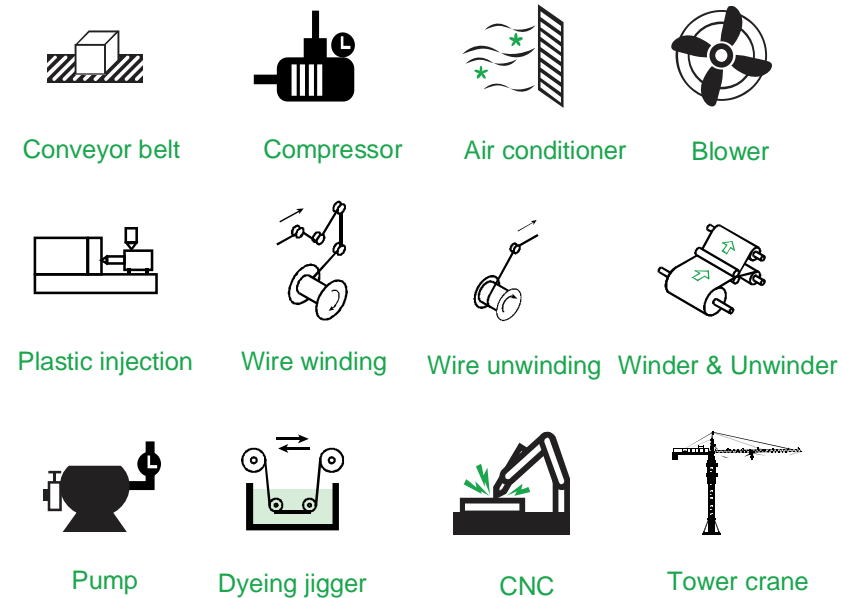


EM303A

Open Loop Vector Control Standard Inverter

220V (single phase) 0.4 ~ 4.0 kw
 220V (three phase) 0.4 ~ 200 kw
 380V (three phase) 0.75 ~ 400 kw

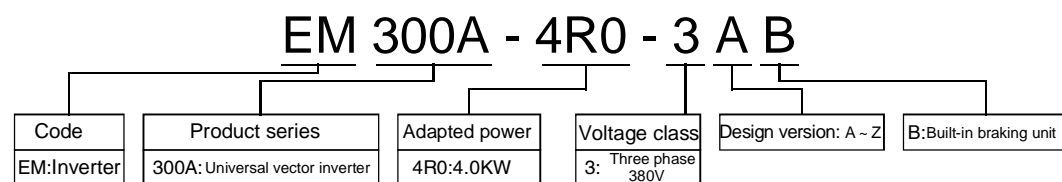
EM303A series inverters are commonly used in various industries in open loop control mode. Please refer to following examples:



Technical features:

1. High accuracy and wide range of speed regulation, strong loading shock resistance, big torque output at low frequency, swift response;
2. Can directly set up and control output torque of AC induction motor;
3. With PG board and speed sensor, can realize precise speed and torque control, the performance is equal or higher than that of DC speed regulation system;
4. Fixed length and position control can be acquired by installing speed sensor and PG board;
5. LCD keypad, can select and display 4 rows of information as desired.

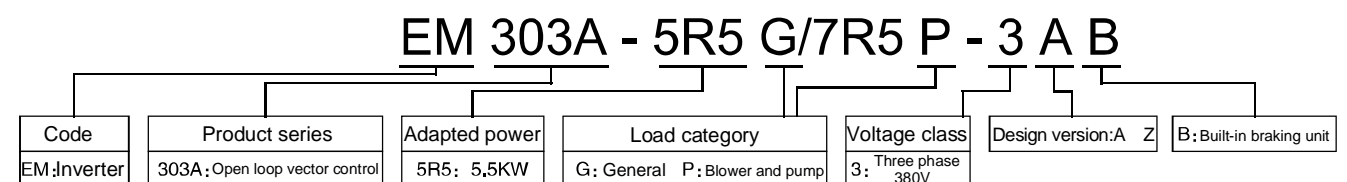
Model Description :



Technical features

1. Commissioning and setting are simple, no special requirements for user's technical level;
2. Reliable product design, strict quality standard ensure long life and high performance;
3. TI DSP executes complicated logic operation with high speed and accuracy;
4. Flexible speed setting mode, analog value synchronicity, digital value synchronicity and communication synchronicity, to satisfy different requirements from users;
5. Open loop vector control, can directly set and control output torque of AC induction motor without speed sensor and PG board.

Model Description:



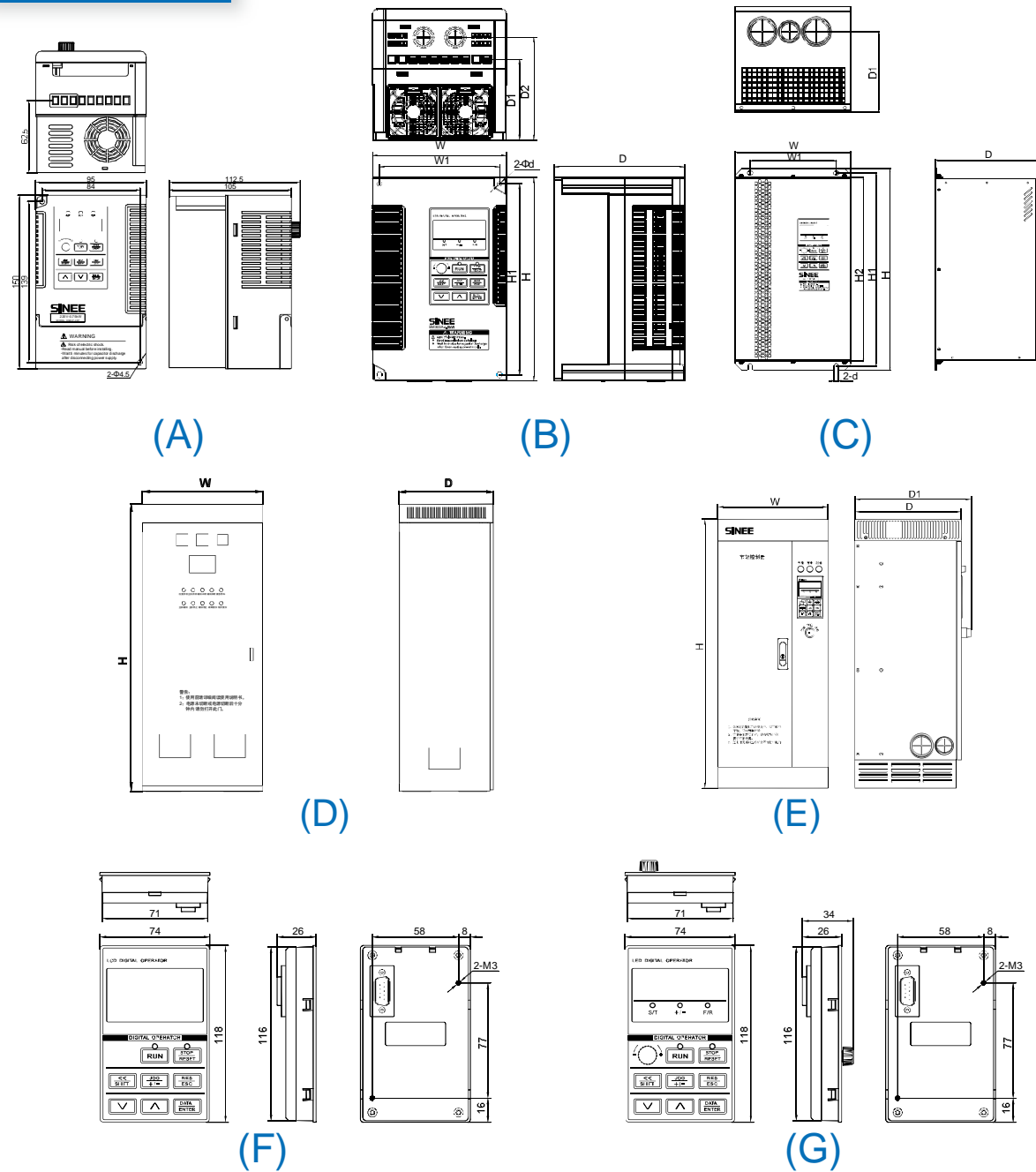
EM300A Inverter

Contents		Specification
Power	Rated power supply	380V, 220V, ±20%
Output	Max. output voltage	To be equal to input voltage
	Rated output current	100% rated current continuous output
	Max. overload current	150% rated current for 1 minute, 180% rated current for 2 seconds.
Basic control function	Drive mode	V/F open loop, vector w/o PG (0 and 1 mode), vector with PG
	Setting mode	Frequency (Speed) setting, torque setting
	Running mode	Keypad, control terminals (2-line control, 3-line control), RS485
	Output frequency	0.00~600.00Hz
	Input frequency resolution	Digital input:0.01Hz Analog input: 0.05Hz
	Speed regulation width	1:50(SV) 1:100(Vector w/o PG) 1:1000(Vector with PG)
	Accuracy of speed control	±0.5% (VF, Vector w/o PG), ±0.05% Vector with PG of rated synchronous rotational speed
	Acc. / dec. time	0.01~600.00 s/0.01~600 min
	V/F characteristic	Rated output voltage 20%~100% adjustable. fundamental frequency 20Hz~600Hz adjustable.
	Torque magnification	Automatic torque magnification, fixed torque magnification curve, arbitrary V/F curve optional
	Starting torque	150%/1Hz(SV), 150%/0.5Hz(Vector w/o PG), 150%/0Hz(Vector with PG)
	Torque control accuracy	±15% rated torque (Vector 1 w/o PG), ±5% rated torque (Vector with PG)
	AVR(auto voltage regulation)	If AVR is enabled, output voltage will keep almost constant as input voltage changes
	Current auto limitation	To avoid frequent over current tripping
	DC braking	Frequency: 0.1~60Hz Time: 0~30S Current: 0~100% rated current.
	Signal input source	Digital, analog voltage, analog voltage, analog current, high speed pulse, multiple-step speed, simple PLC and its combinations
	Special function control	Textile pendulum frequency
Fixed length control		After reaching to setting length, inverter excutes the command as set.
Count control		After reaching to setting number, inverter excutes the command as set.
Droop control		The speed droops as load increases, applied to the case where one equipment is driven by multiple motors.
Input & output function	Reference power	10V/20mA
	Terminal control power	24V/150mA
	Digital input terminal	8 programmable digital input terminals X8 is for high speed pulse input.
	Analog input terminal	2 terminals for 0~10V differential voltage source input and 2 terminals for 0~20mA current source input
	Digital output terminal	2 OC outputs and 2 relay outputs are programmable. OC max. current output : 50mA Relay contact capacity: 250VAC/3A or 30VDC/1A, when in motion, EA-EC/RA-RC closes, EB-EC/RB-RC opens.
Analog output terminal	2 programmable analog output terminals for 0~10V or 0~20mA output, 1 programmable high speed pulse output	
PG	Speed feedback	Up to 6 differential or O/C input Support 5V, 12V or 24V encoder
Keypad display	LCD display	Display up to 4 groups of information
	Parameter copy	Fast parameter copy by uploading and downloading inverter code information
Protection	Protective function	Short circuit, over current, overload, over voltage, under voltage, lack phase, overheating, external fault and PG wire cut etc.
Use	Installation site	Indoor, altitude: <1000m Free of avoid dust, corrosive gas and direct sunlight.

EM303A Inverter

Contents		Specification
Power	Rated power supply	380V, 220V, ±20%
Output	Max. output voltage	To be equal to input voltage
	Rated output current	100% rated current continuous output
	Max. overload current	G: 150% rated current for 1 minute, 180% rated current for 2 seconds. P: 120% rated current for 1 minute, 150% rated current for 2 seconds.
Basic control function	Drive mode	V/F open loop, vector w/o PG (0 and 1 mode)
	Setting mode	Frequency (Speed) setting, torque setting
	Running mode	Keypad, control terminals (2-line control, 3-line control), RS485
	Output frequency	0.00~600.00Hz
	Input frequency resolution	Digital input:0.01Hz Analog input: 0.05Hz
	Speed regulation width	1:50(SV) 1:100(Vector w/o PG)
	Accuracy of speed control	±0.5% rated synchronous rotational speed
	Acc. / dec. time	0.01~600.00 s/0.01~600 min
	V/F characteristic	Rated output voltage 20%~100% adjustable. fundamental frequency 20Hz~600Hz adjustable.
	Torque magnification	Automatic torque magnification, fixed torque magnification curve, arbitrary V/F curve optional
	Starting torque	150%/1Hz(SV), 150%/0.5Hz(Vector w/o PG)
	Torque control accuracy	±15% rated torque (VC 1 w/o PG)
	AVR (auto voltage regulation)	If AVR is enabled, output voltage will keep almost constant as input voltage changes
Current auto limitation	To avoid frequent over current tripping	
DC braking	Frequency: 0.1~60Hz Time: 0~30S Current: 0~100% rated current.	
Signal input source	Digital, analog voltage, analog voltage, analog current, multiple-step speed, simple PLC and its combinations	
Special function control	Textile pendulum frequency	To achieve pendulum frequency amplitude, pendulum frequency time and pendulum frequency sudden jump
	Droop control	The speed droops as load increases, applied to the case where one equipment is driven by multiple motors.
Input & output function	Reference power	10V/20mA
	Terminal control power	24V/150mA
	Digital input terminal	7 programmable digital input terminals
	Analog input terminal	2 terminals for 0~10V differential voltage source input and 2 terminals for 0~20mA current source input
	Digital output terminal	2 OC outputs and 1 relay output are programmable. OC max. current output : 50mA Relay contact capacity: 250VAC/3A or 30VDC/1A, when in motion, EA-EC closes, EB-EC opens.
Analog output terminal	2 programmable analog output terminals for 0~10V or 0~20mA output	
Keypad display	LED display	Display relevant information of inverter
	Parameter copy	Fast parameter copy by uploading and downloading inverter code information
Protection	Protection function	Short circuit, over current, overload, over voltage, under voltage, lack phase, overheating, external fault etc.
Conditions of use	Installation site	Indoor, altitude: <1000m Free of avoid dust, corrosive gas and direct sunlight.
	Ambient requirments	Temperature: -10°C~+40°C Humidity :20%~90%RH(no dew)
	Vibration	<0.5g

Structure



Note: 1. Installation cushion is available for following models if not necessary to be installed in a cabinet: EM300A-055~075, EM300A-090~132, EM300A-160~200, EM300A-220~280 and EM300A-315 400. The width is the same as each inverter, and the heights are 120mm, 250mm, 300mm, 300mm and 350mm respectively.
 2. For inverter of 90 kW and above, power supply R.S.T. on the top of inverter, and output U.V.W on the base;
 3. Dimension of other model in the same power is the same as above.

380V Class Inverter

Unit: mm

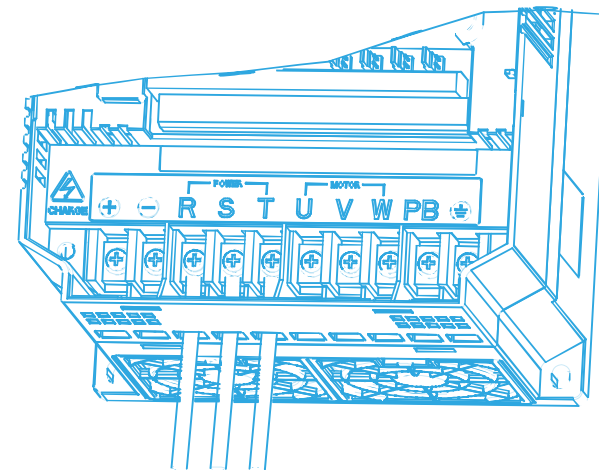
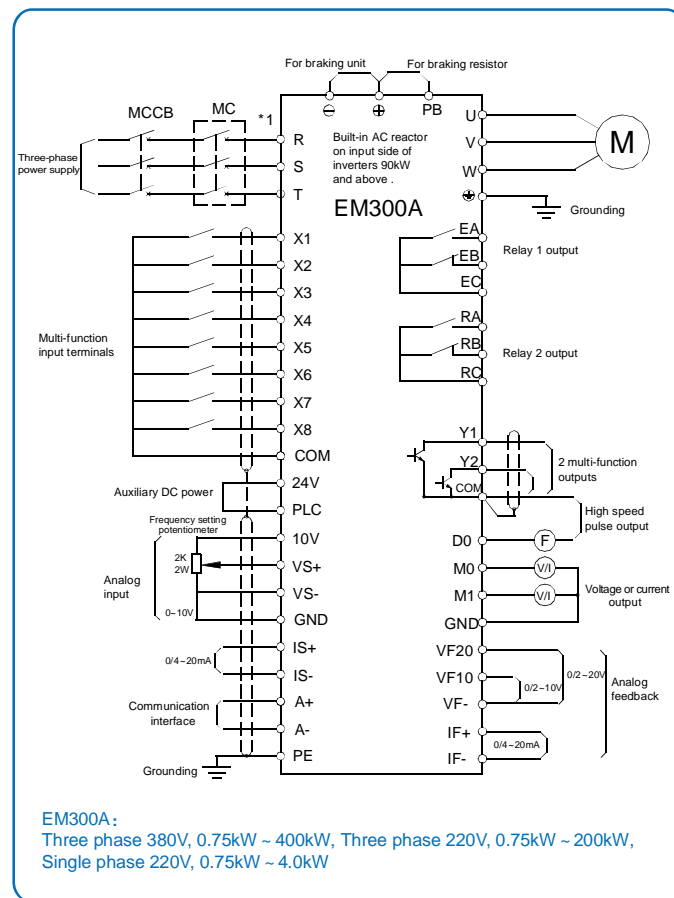
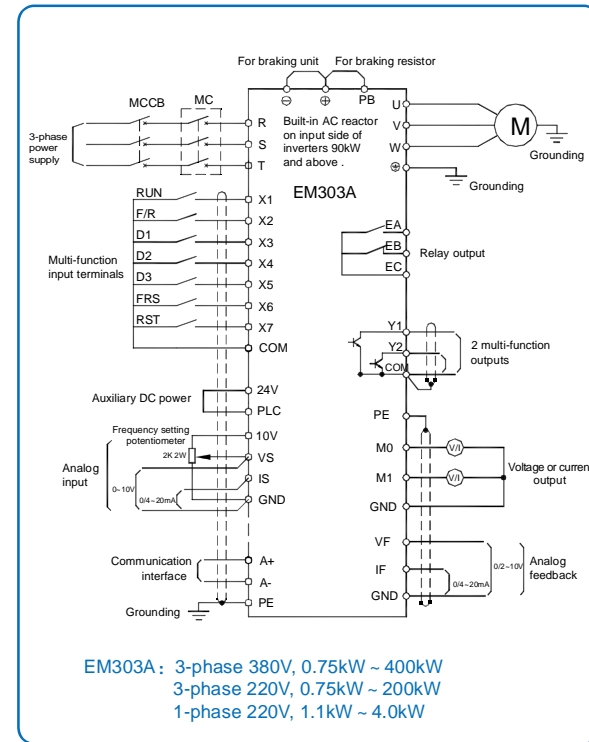
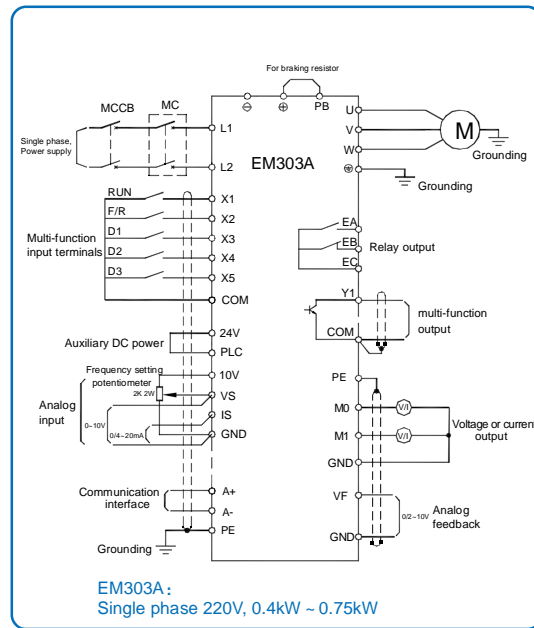
Model (380V class)		W	W1	H	H1	H2	D	D1	D2	d	Structure	G.W.(kg)
EM300A-0R7-3AB	EM303A-0R7G/1R1P-3AB	140	125	220	205	--	152	98	120	6	(B)	3.3
EM300A-1R1-3AB	EM303A-1R1G/1R5P-3AB											
EM300A-1R5-3AB	EM303A-1R5G/2R2P-3AB											
EM300A-2R2-3AB	EM303A-2R2G/3R0P-3AB											
EM300A-3R0-3AB	EM303A-3R0G/4R0P-3AB											
EM300A-4R0-3AB	EM303A-4R0G/5R5P-3AB	165	148	250	235	--	161	92	126	6	(B)	5.4
EM300A-5R5-3AB	EM303A-5R5G/7R5P-3AB											
EM300A-7R5-3AB	EM303A-7R5G/9R0P-3AB											
EM300A-9R0-3AB	EM303A-9R0G/011P-3AB											
EM300A-011-3AB	EM303A-011G/015P-3AB											
EM300A-015-3AB	EM303A-015G/018P-3AB	215	150	352	335	317	215	171	--	7	(C)	10
EM300A-018-3A	EM303A-018G/022P-3A											
EM300A-022-3A	EM303A-022G/030P-3A											
EM300A-030-3A	EM303A-030G/037P-3A											
EM300A-037-3A	EM303A-037G/045P-3A											
EM300A-045-3A	EM303A-045G/055P-3A	270	200	470	450	424	245	187	--	10	(C)	22
EM300A-055-3A	EM303A-055G/075P-3A											
EM300A-075-3A	EM303A-075G/090P-3A											
EM300A-090-3A	EM303A-090G/110P-3A											
EM300A-110-3A	EM303A-110G/132P-3A											
EM300A-132-3A	EM303A-132G/160P-3A	560	400	828	803	775	355	255	--	12	(C)	135
EM300A-160-3A	EM303A-160G/185P-3A											
EM300A-185-3A	EM303A-185G/200P-3A											
EM300A-200-3A	EM303A-200G/220P-3A											
EM300A-220-3A	EM303A-220G/250P-3A											
EM300A-250-3A	EM303A-250G/280P-3A	825	660	1200	1170	1137	400	320	--	13	(C)	270
EM300A-280-3A	EM303A-280G/315P-3A											
EM300A-315-3A	EM303A-315G/355P-3A											
EM300A-355-3A	EM303A-355G/400P-3A											
EM300A-400-3A	EM303A-400G/450P-3A											
	EM318A-090-3AE	670	--	1840	--	--	600	--	--	--	(D)	N/A
	EM318A-110-3AE											
	EM318A-132-3AE											
	EM318A-160-3AE	770	--	1840	--	--	600	--	--	--	(D)	N/A
	EM318A-185-3AE											
	EM318A-200-3AE											
	EM318A-220-3AE	970	--	1900	--	--	600	--	--	--	(D)	N/A
	EM318A-250-3AE											
	EM318A-280-3AE											
	EM308A-011-3A	250	--	670	--	--	250	280	--	--	(E)	21
	EM308A-015-3A											
	EM308A-018-3A											
	EM308A-022-3A	310	--	760	--	--	300	330	--	--	(E)	42
	EM308A-030-3A											
	EM308A-037-3A											
	EM308A-045-3A	350	--	860	--	--	330	360	--	--	(E)	56
	EM308A-055-3A											
	EM308A-075-3A											

220V Class Inverter

Unit: mm





Model (220V class)		W	W1	H	H1	H2	D	D1	D2	d	G.W.(kg)
	EM303A-0R4-1AB	95	84	150	139	--	105	62	--	4.5	1.7
	EM303A-0R5-1AB										
	EM303A-0R7-1AB										
EM300A-0R4-1AB/2AB	EM303A-0R4-2AB	140	125	220	205	--	152	98	120	6	3.3
EM300A-0R5-1AB/2AB	EM303A-0R5-2AB										
EM300A-0R7-1AB/2AB	EM303A-0R7-2AB										
EM300A-1R1-1AB/2AB	EM303A-1R1-1AB/2AB	140	125	220	205	--	152	98	120	6	3.3
EM300A-1R5-1AB/2AB	EM303A-1R5-1AB/2AB										
EM300A-2R2-1AB/2AB	EM303A-2R2-1AB/2AB										
EM300A-3R0-1AB/2AB	EM303A-3R0-1AB/2AB	165	148	250	235	--	161	92	126	6	5.4
EM300A-4R0-1AB/2AB	EM303A-4R0-1AB/2AB										

Wiring Diagram of Terminals



Category	Terminal sign	EM300A	EM303A	Description
Analog input	VS		✓	0/2~10V
	VS+, VS-	✓		0/2~10V, with +/- logic
	VF		✓	0/2~10V
	VF10, VF-	✓		0/2~10V, with +/- logic
	IS		✓	0/4~20mA
	IS+, IS-	✓		0/4~20mA, with +/- logic
	IF		✓	0/4~20mA
	IF+, IF-	✓		0/4~20mA, with +/- logic
Digital input	X1/RUN	✓	✓	The input functions of the terminals can be defined by function codes F2.00~F2.07. X8 is multi-function / high speed pulse input terminal
	X2/ F/R	✓	✓	
	X3~X7	✓	✓	
	X8	✓		
	PLC	✓	✓	Common port of multi-function input terminals
Relay output	EA	✓	✓	Relay 1 output terminals: EB-EC: Normally open (N/O) EB-EC: Normally close (N/C)
	EB	✓	✓	
	EC	✓	✓	
	RA	✓		Relay 2 output terminals: RA-RC: Normally open (N/O) RB-RC: Normally close (N/C)
	RB	✓		
	RC	✓		
Multi-function output	Y1	✓	✓	Y1: OC output terminal 1; Y2: OC output terminal 2; D0: OC pulse output terminal Can be defined as multi-function output terminal by program, see introduction of code F2.12 and F2.13
	Y2	✓	✓	
	D0	✓		
Analog output	M0	✓	✓	M0: Analog output terminal 0; M1: Analog output terminal 1; 0~10V or 0~20mA, output reference can be defined by set-up of function codes F2.16~F2.17.
	M1	✓	✓	
Auxiliary power	10V	✓	✓	Analog terminal power supply +10 V / 20 mA
	GND	✓	✓	Common port of analog input & output signal
	24V	✓	✓	DC24V / 150mA output between + port of auxiliary power and COM
	COM	✓	✓	Common port of digital input & output signal
Communication	A+	✓	✓	RS-485, + port of differential signal
	A-	✓	✓	RS-485, - port of differential signal
Shielding	PE	✓	✓	Used for grounding connection of shielding layer of terminal wire

Model	Picture	Application	Technical features
EM309A Wire take-up inverter		Wire drawing machine	<ol style="list-style-type: none"> 1. Tension is constant when start, stop, acceleration, deceleration, normal running and inching. 2. Automatically regulate rotational speed with winder diameter calculation and PID 3. Quick response, no matter if spool is empty, half or full, the wire will not be cut when start, acceleration or stop; 4. No need for wire cut detection proximity switch, automatically check according to the feedback signal of tension potentiometer.
EM319A Wire winder/unwinder inverter		Cable industry	<ol style="list-style-type: none"> 1. Control mode: speed, magnetic particle clutch 2. Pay-off speed is identical to the processing speed of machine when start, stop, acceleration and deceleration; 3. Completely independent from equipment, automatically regulate motor speed according to winder diameter and wire speed
EM311A Wire drawing inverter		Wire drawing machine	<ol style="list-style-type: none"> 1. Current vector control, great torque output at low frequency to enable smooth threading at low speed, and stable running at high speed; 2. Can process materials such as steel, copper, aluminum, tin, welding rod or CCA etc; 3. Easy operation, no need to set parameters, just connect the inverter well as per technical manual, it can work; 4. Embedded FDT control, when inching threading, take-up motor stops; when normal start, wire drawing motor and take-up motor rotates synchronously; when stop, take-up motor can stop first by parameter set-up, avoid being wire-cut.
EM320A CNC inverter		Lathe, grinder, drilling machine, milling machine, boring machine.	<ol style="list-style-type: none"> 1. 150% rated torque output at 0Hz, great cutting force at low speed; 2. Speed regulation width: 0-6000Hz, can process work piece with high precision in the last step. 3. Auto regulation of motor noise, low temperature rise at low speed; 4. 2 differential voltage inputs (+/-10V and +/-20V), and 2 current source inputs (0-20mA); 5. Automatically trace load variables and limit output current to make it not exceed maximum current permitted.
EM321A Veneer lathe inverter		Veneer lathe	<ol style="list-style-type: none"> 1. LCD keypad shows 4 rows of function codes, can monitor veneer depth, wood diameter, present speed and present current simultaneously; 2. Support ModBus 485, directly communicate with touch screen or text display; 3. Built-in cutter withdrawal mode and position limiting mode; 4. 4 control solutions: dual encoder control solution, single encoder control solution, displacement transducer control solution, displacement + encoder control solution; 5. Depth compensation function, ensure the veneer depth to meet the quality standard; 6. Built-in logic control, no need for PLC or single chip microcomputer.

Model	Picture	Application	Technical features
EM308 Energy saving inverter		Air compressor, plastic injection molding machine, air-conditioner, blower etc.	<ol style="list-style-type: none"> 1. No need to modify equipment or its operating procedures; 2. Great over load capacity at low speed and current limiting technique, ensure plastic injection molding machine to run stably; 3. When inverter fails, can switch mains to power frequency manually; 4. Vector control technique, fast response; 5. Automatically regulate motor's speed according to working status.
EM325A Shear inverter		Shear	<ol style="list-style-type: none"> 1. Automatically cut wood board by fixed length according to the speed of belt conveyor; 2. Unique low speed frequency, automatically cleared after each cutting; 3. No need for PLC
EM330A Crane inverter		Various cranes in harbour, factory or construction site etc.	<ol style="list-style-type: none"> 1. Big torque output and stable running at low frequency, strong over load capacity; 2. Lift braking function, ensure operational safety; 3. Power-fail control function; 4. Auto tuning of motor's parameters; 5. Anti-sway function; 6. Built-in AC reactor for inverters of 90KW or above, effectively eliminate harmonic wave and improve power factor. 7. Wide voltage adaptability: 380V + / - 20%. 8. Can use one inverter to drive two motors asynchronously by storing 2 motor parameters.
EP300A Intelligent annealing power		Wire annealing control	<ol style="list-style-type: none"> 1. Realize single phase AC annealing by single phase transformer; 2. Support modbus RS485; 3. Automatic voltage regulation (AVR) 4. Wire speed sampling is acquired by analog or pulse input; 5. Automatically trace present wire speed, output voltage changes with variables of line speed; 6. Different material size is applicable; 7. Good linearity of analog signal of wire speed, precise control over annealing voltage and current; 8. Complicated system control is operated by software.
EP303A EPS		Emergency power supply for industrial equipments	<ol style="list-style-type: none"> 1. Automatic current limiting technique, 2. Direct DC power supply, wide operating voltage of SPS, low voltage start, no under voltage warning when battery falls below under voltage level of inverter; 3. Lack phase output protection is optional, satisfy the occasion when inverter drives motor and illuminator simultaneously; 4. Cooling fan control technique helps to save energy of battery.

Spare parts	Technical features
BR100, Braking unit	<ol style="list-style-type: none"> General dynamic braking unit for any inverter; Power size: 45 kW, 160kW, 315kW For SINEE inverter of 18 kW or above, there is no built-in braking unit, and users can select BR100 braking unit;
Remote operating unit	<ol style="list-style-type: none"> Start, stop and emergency stop control over inverter; Display rotational speed or other information by inverter's analog voltage; Regulate speed by inverter's analog input terminals; Regulate speed in step mode by inverter's multi-function input terminals.
Keypad extension wire	<ol style="list-style-type: none"> 3m, 4m, 5m, 6m, 8m, 10m, 12m, 15m, 20m, 30m Due to attenuation, when the keypad extension wire is more than 10m, say starting from 12m, it is required to use our special remote keypad; Anti interference countermeasures should be taken when keypad is more than 10m to ensure that inverter works normally; It is advised to be controlled by external terminal if inverter needs to be operated 20 meters away.
SINE300-PG, PG board	<ol style="list-style-type: none"> Connect between pulse encoder and inverter, to feedback motor's rotational speed by gathering pulse signals, used for the occasions which demand high speed precision; Can effectively trace motors' rotational speed and direction; EM300A inverter can be connected to PG board; 2 types of PG board available: <ol style="list-style-type: none"> Differential PG board Open collector PG board Terminals of PG boards refer to following table.
Voltage feedback board	<ol style="list-style-type: none"> Connect to transformer and intelligent annealing power, and 0~10V DC output corresponds to AC 0~100V by precisely gathering AC signal, thus to feedback voltage of load on real time and accurately control the voltage of annealing load. For the cases where high voltage precision is demanded, can install voltage feedback board to make closed loop control, the voltage precision is up to 0.5V.
Plastic injection molding board	<ol style="list-style-type: none"> Collect, process and feedback the pressure and flow signal to inverter for precise control during plastic mold locking, injection, melting, cooling and opening; Regulate oil pressure and flow according to real-time state of each technique.

BR100 Braking Unit

Model	Application	Min.resistor (Ω)	Ave.braking cur. I _{av} (A)	Peak current I _{max} (A)	For inverter of (kW)
BR100-045	Dynamic braking	10	45	75	18.5 ~ 45
BR100-160	Dynamic braking	6	75	150	55 ~ 160
BR100-315	Dynamic braking	3	120	300	185 ~ 315

PG Board

Encoder type and signal	Output mode	Model of PG board
A+,A-,B+,B-		SINE300-PG-L B
A+,A-,B+,B-,Z+,Z-		SINE300-PG-L Z
A+,A-,B+,B-,Z+,Z-, U+,U-,V+,V-,W+,W-		SINE300-PG-L W
A, B		SINE300-PG-C B
A, B, Z		SINE300-PG-C Z

Voltage Feedback Board

Term. #	Name	Description	Term. #	Name	Description
1	VI+	AC power input	5	VS	DC output
2	VI-	AC power input	6	GND	Common port of DC output
3	+24V	Auxiliary power input	Output terminal		
4	COM	Common port of auxiliary power	Input terminal		

Plastic Injection Molding Board

Term. #	Name	Description	Term. #	Name	Description
1	V1+/I1+	Signal 1 input	7	VS	DC voltage output
2	V1-/I1-	Signal 1 input	8	VF	DC voltage output
3	V2+/I2+	Signal 2 input	9	GND	Common port of DC output
4	V2-/I2-	Signal 2 input	10	GND	Common port of DC output
5	+24V	Auxiliary power input	Output terminal		
6	COM	Common port of auxiliary power	Input terminal		