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A1 Series Inverter

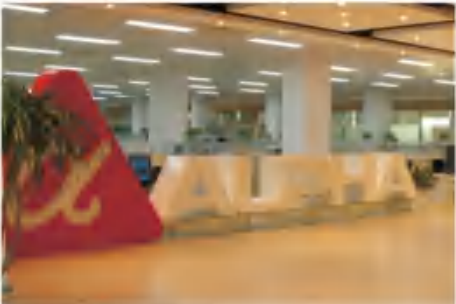


» Company Profile

Shenzhen ALPHA Electric Co.,Ltd was established in 2000, and owns more than 30 subsidiaries and 50 after-sale service centers across China. Our headquarter is located in Longhua district of Shenzhen City and has another 2 manufacturing bases are located in Zhejiang Province and Jiangxi Province. The company employs more than 500 people, of which about 60 percent are technology staff.

Our main business is in the design, development, and sales of industrial automation, power assembly of new energy automobile, and intelligent elevator control system. Meanwhile, as a High-Tech enterprise, we put a lot of focus in R&D expenditures. We have several comprehensive laboratories, we have introduced the advanced technology from both domestic and abroad, we also allied with a number of scientific research institutions and universities.

Through years of efforts, our professional sales and after-sale service teams help Alpha not only gain the customers recognition by reliable products, but also gain the customers trust by premium services. In the future, we will continue to serve our partners with professional spirit and excellent services based on industrial automation, new energy vehicle, and elevator control fields, achieve win-win collaboration.



► Product introduction

This series of inverters adopt the most advanced current vector control technology. That features low speed rated torque output and ultra-quiet stable running. They are characterized by diverse control modes, up to 36 perfect protection and alarm functions, on-line monitoring and on-line adjustment of a variety of parameters, built-in RS-485 communication interface, flexible operation, and thus satisfy various needs of users.



► Product features

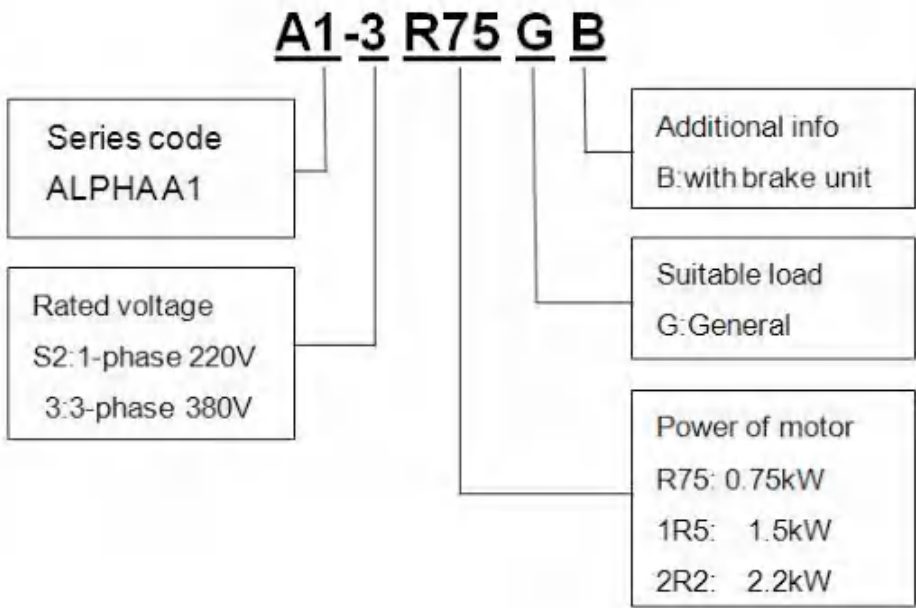
Compact structure	Optimized structural design,leading technology platform	
	Perfect brake loop scheme	
	Can be installed side by side,can be in stalle drail	
Excellent performance	High speed accuracy and wide speed range	
	High speed output under vector control	
	Low-speed and high-torque,torque ripple is small	
	Optimized algorithm VF	
	High accuracy of parameters for self-tuning motor	
High reliability	ACAVR(automatic voltage regulation) Ensure high output torque at low input voltage	
	Efficient heat dissipation	Independent fan design
	Heating test	Wide voltage input range in line with international standards
	Automatic painting process of anti-paint	Long performance life
Easy to use	Upgrade design specification of EMC	Meet the CE requirement
	Overexcitation function	Built-in communication interface RS485,MODBUS
	Instant stop function	Fan,pump energy-saving application
	The machine protection is more perfect	Achieve VF semi-separation and complete separation
	Epitaxial keyboard	Teminal functions are versatile and use freely

Application industry

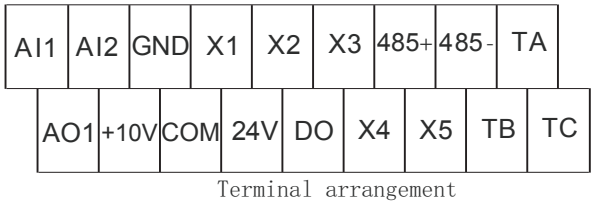
Textile machinery,food machinery,ceramic machinery,woodworking machinery ,printing machinery,packaging machinery,fans,pumps,etc

Product information

Naming rule



Control loop board



Function of control board

Category	Terminal label	Name	Description of terminal function	Specification
Analog input	AI1	Analog input 1	Receive voltage input.	Input voltage range: 0~10V (input resistance: 22kΩ)
	AI2	Analog input 2	Receive voltage/current input. Voltage or current are selected by DIP switch J2. Voltage input mode is the default mode.	Input voltage range: 0~10V (input resistance: 22kΩ) Input current range: 0~20mA Reference ground: GND
Analog output	AO1	Analog output	Be able to output analog voltage/current. Voltage or current are selected by DIP switch J3.	Output voltage range: 0/2~10V Output current range: 0/4~20mA Reference ground: GND
Communication	485+	RS485 communication interface	485 differential signal positive terminal	Standard RS-485 communication interface, Not isolated to GND Please use twisted-pair cable or shielded cable
	485-		485 differential signal negative terminal	
Multi-function input terminal	X1-X4	Multi-function input terminal 1-4	It can be defined as a multi-function discrete input terminal through programming.	Optical-isolator input Input resistance: R=3.9kΩ Max input frequency: 400Hz/ 50kHz Input voltage range: 0~30V Reference ground: COM
Multi-function input terminal	X5	Multi-function input terminal 5	Terminals X5 can be used as common multi-function terminals (same with X1~X4), it can also be used as high speed pulse input port.	Opto-coupler isolation input Input impedance R =3.9kΩ Maximum input frequency: 50kHz Input voltage range: 0~30V Reference ground: COM
Multi-function output	DO	Open collector output terminal	It can be defined as a multi-function output terminal for pulse signal through programming. It can also be used as an on-off output terminal.	Opto-coupler isolated open collector output. Range of operating voltage: 0V~26V Maximum output current: 50mA Range of Output frequency: 0~50kHz Reference ground: COM
Relay output	TA	Relay output	It can be defined as a multi-function relay output terminal through programming. Please refer to Section 5.4 I/O terminals control (Group P3) for details.	TA-TB: NC; TA-TC: NO. Contact capacity: 250VAC/2A (COSΦ=1.0) 250VAC/1A (COSΦ=0.4) 30VDC/1A
	TB			
	TC			
Power	+10V	+10V power supply	Provide +10V power supply externally (Reference ground: GND)	Maximum output current 20 mA Open circuit voltage can be up to 12V
	24V	+24V power supply	Provide +24V power supply externally (Reference ground: COM)	Maximum output current 100mA
Power	GND	+10V Reference GND	Reference GND for analog signal and +10V power supply	Inner Isolated from COM COM for +10V, AI1, AI2, and AO1
	COM	+24V Common GND	Used with other terminals	Isolated from GND
	PE	Shield ground	It is used for grounding of terminal wiring shield layer. Shield layer of analog signal lines, 485 communication lines, and motor cables can be connected to this terminal	It is internally connected to connection terminal PE of main circuit.

Features

- Easy to use features

Programmable definition for a variety of functions of the switching input terminal and high speed pulse input terminal, the functions of each input terminal can be flexibly combined.

- Wide voltage input range

Rated input voltage: 380V-440V, Allowable fluctuation range: $380V \pm 20\%$

- High speed accuracy and wide speed range

High speed accuracy: under vector control is $\pm 0.2\%$, under V/F control is $\pm 0.5\%$ speed range: vector model 1:200, V/F model 1:100

- Fast torque response

The dynamic torque response time of vector control is less than 20ms

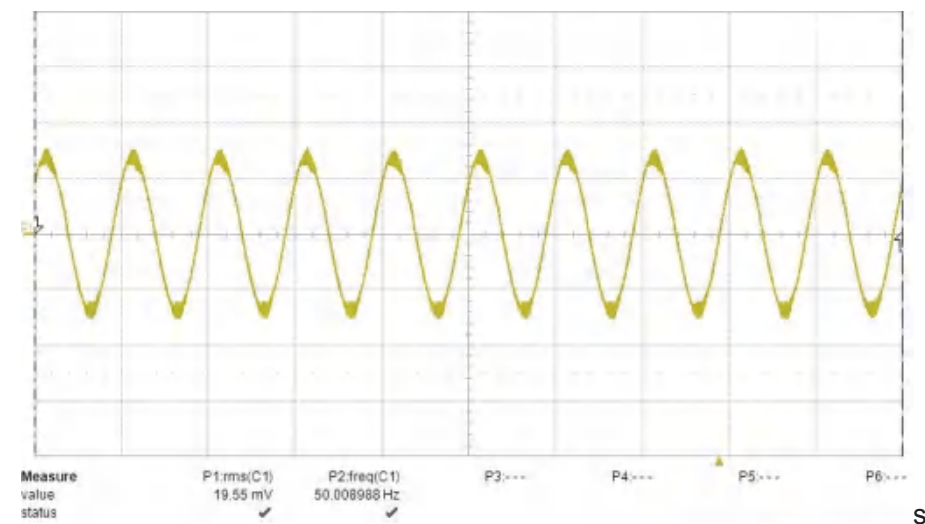
- Overload capacity

Heavy load overload capacity 150%60s, 180%20s

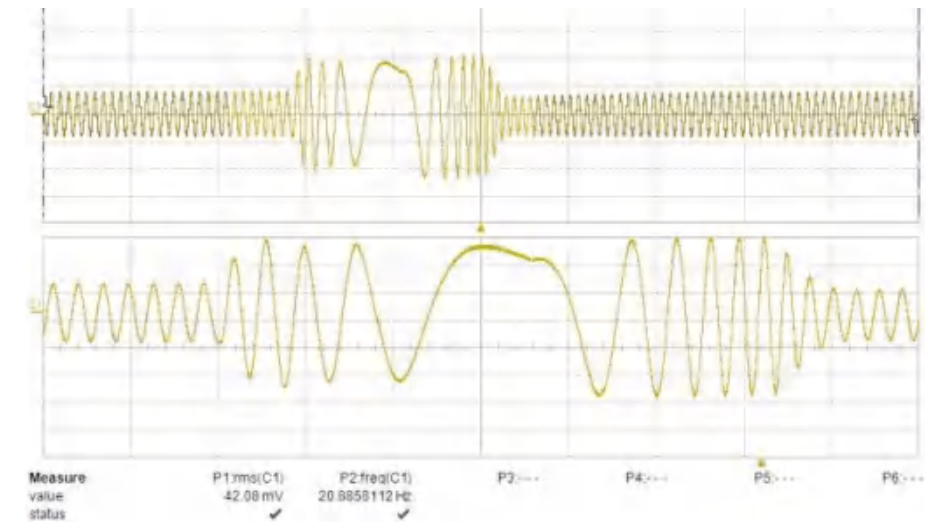
- High speed output under vector control

The highest output frequency under vector control corresponds to four times weak magnetic field

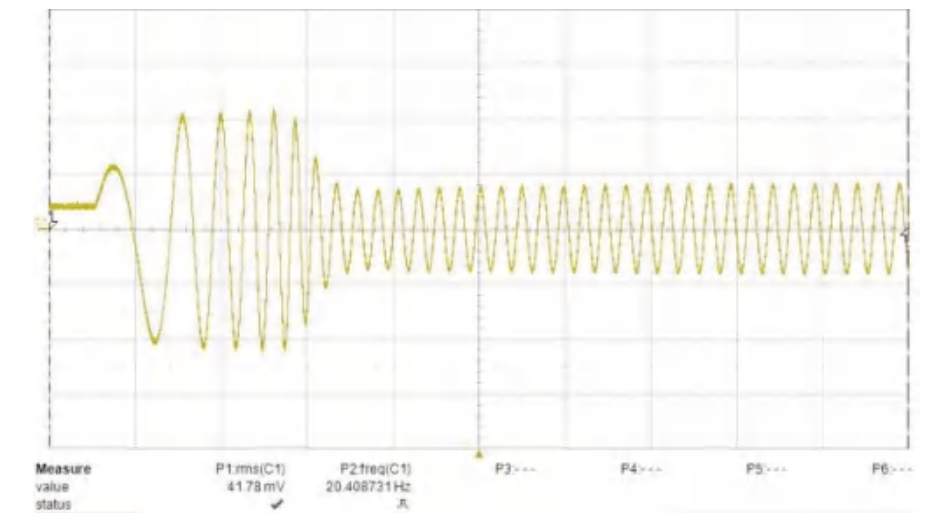
- 50HZ stable operating current waveform



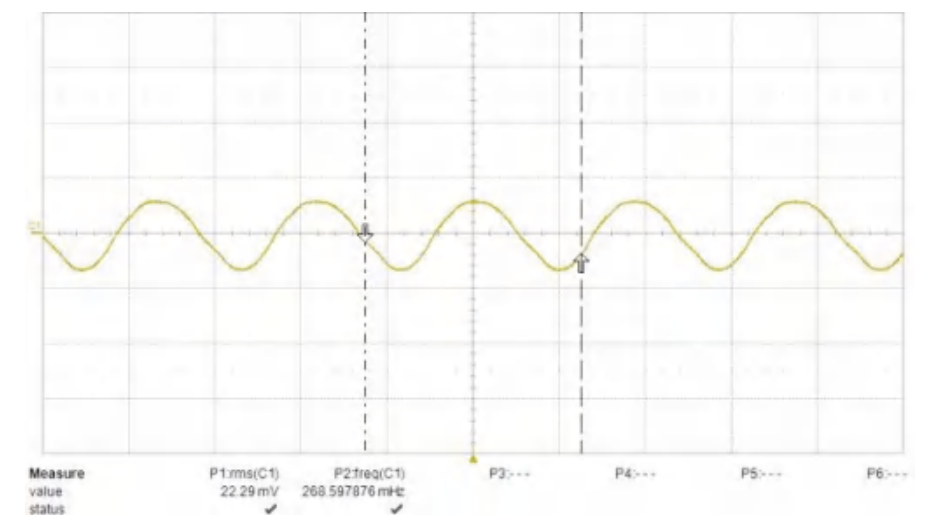
- Reverse switching current waveform



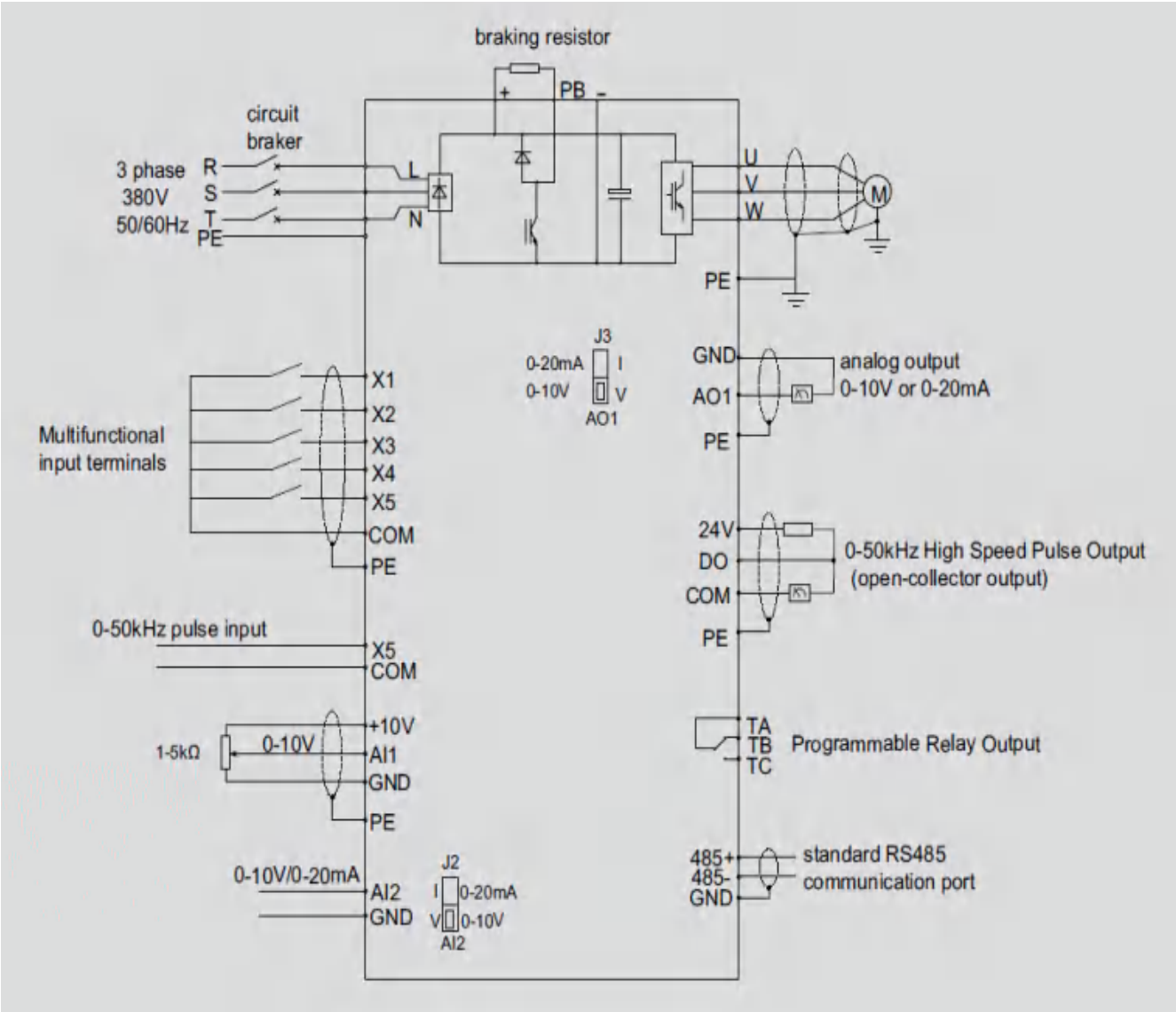
- Waveform of 50HZ accelerated running current



- Low frequency 0.2HZ operating current waveform



▶ Wiring of inverter for basic operation



▶ General technical specification

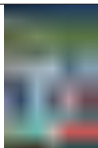
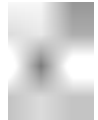

ITEM	SPECIFICATION
Rated input voltage and frequency	Single Phase 220~240V , 50/60Hz Three phase 380~440V , 50/60Hz
Operating range of input voltage	Single Phase 176~264V Three phase 304~456V Voltage unbalance ratio<3%,frequency<±5%

Rated input voltage	0~Rated input voltage
Maximum overload current	Type G:150%60s,180%20s
Control method	VF/Current vector control
Frequency control range	Low frequency mode:0.00~630.00Hz
Frequency accuracy	Digital signal±0.01%(-10℃~+40℃) analog signal±0.01%(15℃~+35℃)
Frequency resolution setting	Digital signal 0.01HZ analog signal 1/1000 maximum frequency
Output frequency resolution	0.01Hz
Frequency setting signal	0~10V,0~20mA
Acceleration and deceleration time	0.1~6500s (Independent acceleration and deceleration time setting)
Braking torque	Additional brake resistance can reach 125%
Speciality of voltage and frequency	Three fixed V/F speciality to choose and arbitrary V/F speciality setting
Protect function	Over-voltage,under-voltage,Current limiter,Overcurrent,overload, Electronic thermal relay, overheating, overvoltage stall,Load short circuit, grounding, undervoltage protection, input phase loss, output phase loss, ground and phase short circuit, motor overload protection, etc
Work temperature	-10℃~+40℃
Humidity	5~95%RH(Non coagulate frost)
Storage temperature	-40℃~+70℃
Operation place	Indoor(Non-corrosive odor)
Place of installation	The altitude is not higher than 1000 meters,No dust, no corrosive odor and no direct sunlight
Vibration	<5.9m/s ² (0.6g)
IP grade	IP20

Specification and parameters

Series	Model no.	Input power	Power capacity (KVA)	Input current (A)	Output current (A)	Adaptation motor (KW)
ALPHA A1	S2R4GB	Single-phase 200~240V 50/60Hz	1.0	5.1	2.3	0.4
	S2R75GB		1.7	9.2	4.0	0.75
	S21R5GB		2.8	13.1	7.0	1.5
	S22R2GB		4.0	23	9.6	2.2
	3R75GB	Three-phase 380~440V 50/60Hz	1.6	3.7	2.1	0.75
	31R5GB		3.2	5.4	3.8	1.5
	32R2GB		4.8	7.0	5.1	2.2
	3004GB		6.0	10.7	9.0	4.0

Optional components

Item	Model no.	Description	Diagram
1	KBF20F21-LED01	External keyboard	
2	KB6-C020A	Keyboard extension cord	
3	631MP08-A	Keyboard tray	

Brake resistance and power meter

Voltage (V)	Motor Power(KW)	Resistance value(Ω)	Resistance power(KW)
Single phase 220	0.4	200	0.1
	0.75	150	0.2
	1.5	100	0.4
	2.2	75	0.5
Three phase 380	0.75	300	0.4
	1.5	300	0.4
	2.2	200	0.5
	4	200	0.5

Keyboard

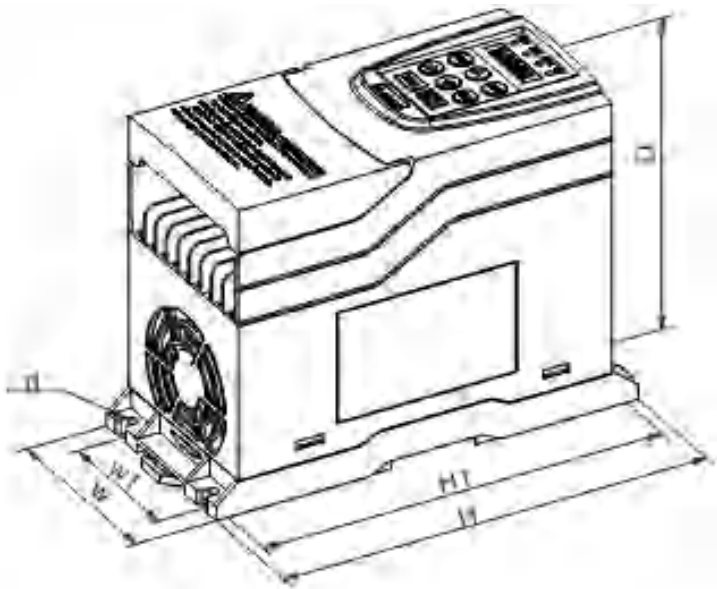


(Unit:mm)

Keyboard tray



Appearance and size



Specification	H	H1	W	W1	D	d
3R75GB ~3 004GB S2 R75GB ~S22R2GB	180	170	81	60	135	4.5

(Unit:mm)