

AC300 Series Frequency Inverter



VEICHI

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VEICHI Electric Co., Ltd. is a high-tech enterprise that is professionally engaged in the development, manufacturing and marketing of industrial automatic control products, and we are committed to becoming a global leading provider of industrial automatic control products and system solutions.

VEICHI is a competitive company and adopts the dual-base operating mode, which contains the Shenzhen VEICHI and Suzhou VEICHI. Suzhou VEICHI Electric Co., LTD is located in Suzhou Wuzhong Economic and Technological Development Zone, which covers 50 acres. The total construction area is approximately 80 thousand square meters and all properties are privately run. Additionally, VEICHI is always at the forefront of the domestic industrial automation field.

VEICHI has become the flagship company of industrial automation, which owns an innovative R&D team and establishes a good corporation relationship with famous universities and research institutions. Currently, VEICHI owns more than 110 patents of invention, and many of them are in the leading position both at home and abroad, which completely has independent intellectual property rights.

VEICHI produces a variety of core products, including Variable Frequency Drive (VFD), Servo Drive System, Photovoltaic Inverter, PLC, HMI, and Automation Equipment, which are widely used in industries such as oil & gas, chemical, ceramic, crane & construction hoist, lathe, Auto making, metallurgy, electrical cable and wire, plastic, print and package, textile, chemical fiber, metal work and, coalmining and municipal engineering. Suitable solutions and products are always ready to meet the demands and improve comprehensive competitiveness of customers.

"Innovation is the lifeblood of VEICHI", therefore we're committed to becoming one of the leading providers of electric drives, industrial control and green energy products. VEICHI has set up more than 40 brand offices in China and dozens of partners in Asia, Europe

VEICHI has been named Chinese Electrical Industry's Top Ten National Brands, Chinese Electrical Industry Top Ten Satisfying Brands and Top Ten National Brands of Inverter Industry. VEICHI products have become the first choice of many enterprises.











AC300 Series High Performance Inverter

Sense & Simplicity

Inherit the superior platform technology Industrial leading vector control technology Compatible with AM/PMSM

Simplify

Simple wiring, euro terminal, can save the wiring time and cost Adopt the domestic general parameters group, optimize the keyboard buttons, easy to use Simple debugging, specialized host software VCACSoft Ver1.3, can reduce the debugging time and difficulty to the maximum

Thinner, integration of design and aesthetics

The "book-body machine" of inverter

Book narrow-body design, can reduce 60% size at most

Straight deduct of heat dissipation, parallel installation of multi-inverters, can greatly reduce the size of electric cabinet



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AC300 Series High Performance Inverter

Ac300 series inverter is the product developed on the platform of VEICHI latest high-performance vector technology. It not only adopts the internationally leading filed-orientation vector control technology, which is compatible with AM and PMSM control, but also makes the most reasonable layout of components under the premise of high-performance and high-reliability, so as to achieve the book narrow-body design. Besides, to strengthen the usability and industrial specialization, it is equipped with rich extension interfaces and new extension accessories, realizing the features of high performance, high reliability, high power density and high usability.

Product Features

Features Overview

- High-performance vector general platform, new motor control algorithm.
- © Compatible with AM and PMSM, Open loop and Closed-loop.
- Accurate decoupling of torque excitation, excellent performance of dynamic response.
- Full range of book-body design, can save the installation space to the maximum
- Comprehensive thermal simulation design, can guarantee the rationality of hardware layout.
- New design of air duct and full range of DC fan cooling, safe and reliable.
- Creative grounding method of AC300 series, can quickly solve the EMI problem.
- $\,\,^{\odot}\,$ Modular design of software and hardware, powerful extension capability.
- Rich extension interfaces and extension accessories, can cover all kinds of applications.
- Optimized keyboard design, and support external keyboard.
- Much easier and more convenient debugging on-site, can support the firmware upgrading on-site.
- Tri-proof design of whole machine and tri-proof painting of PCB, can ensure the stability and reliability of products.

General specification

single-phase 220V 50/60Hz	0.75-220KW
three-phase 220V 50/60Hz	0.75-220KW
three-phase 380V 50/60Hz	0.75-710KW
Allowable voltage fluctuation	Voltage:320V~440V Voltage unbalance rate:<3%
Allowable frequency fluctuation	Frequency:±5%
Distortion rate	IEC61800-2
Output voltage	$0 \sim input \ voltage$, error with 5%
Output frequency range	0-600Hz
Overload capacity	150% rated current 1min 180% rated current 10s 200% rated current 0.5s
	single-phase 220V 50/60Hz three-phase 220V 50/60Hz three-phase 380V 50/60Hz Allowable voltage fluctuation Allowable frequency fluctuation Distortion rate Output voltage Output frequency range

Performance Features

Support various types of motor / load

AC300 series inverter could drive normal AM, variable frequency motor, AC servo motor, PM, high-speed motor and motorized spindle.



Control modes selection

Control mode	Speed control	Torque control	Position control	Matched motor
VF mode	√	×	×	AM
Voltage frequency separation	√	×	×	Torque motor, EPS power
High-performance VC control without PG	√	√	×	AM, PMSM
High-performance VC control with PG	√	√	\checkmark	AM, PMSM

Excellent control performance

Control mode	Speed regulation range	Start-up torque	Matched motor
High-performance VC control without PG	1:100	150%	PMSM
High-performance VC control without PG	1:100	150%	AM
High-performance VC control with PG	1:1000	200%	AM, PMSM

Closed-loop torque response <10ms, steady speed accuracy 0.02%, speed pulsation 0.2%.

Open-loop torque response <20ms, steady speed accuracy 0.2% (PMSM), 0.5% (AM).

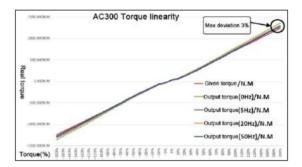
The maximum output frequency is 600 Hz under VC control, and the minimum carrier frequency is 1kHz.

High start-up torque characteristic

High torque at lower frequency. It can output 200% rated torque at 0.0Hz under closed-loop VC mode, and can run smoothly with load at ultra-low speed 0.01Hz. Powerful lower torque output, can effectively ensure a stable and smooth start.

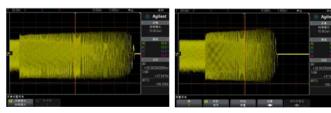


Stable torque output under torque control mode. The torque linearity bias is within 3%, which greatly guarantees the stable operation of devices.



Over-excitation braking function

Without using braking resistance, it can realize fast braking with over-excitation braking function in some occasions of inertia stop, so as to improve the usability of products. The over-excitation function could effectively suppress the rising of bus voltage in the process of deceleration to avoid the overvoltage fault, and at the same time, it could realize fast braking to meet the fast stop while power off.

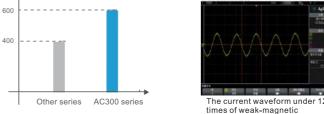


Disable over excitation

Enable over excitation

Stable high-speed weak-magnetic control

The new weak-magnetic control algorithm and high-bandwidth current VC control algorithm realize the steady high-speed weak-magnetic operation, and could support maximum 12 times of weak-magnetic high-precision output



Other series: The maximum output frequency could reach 320/100Hz under VC control;

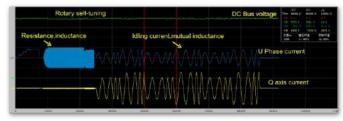
AC300 series: The maximum output frequency could reach 600Hz under VC control;

Self-tuning of motor parameters

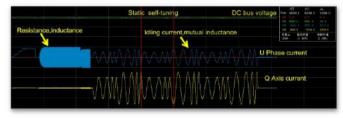
It could accurately acquire the motor parameters both in rotary and static self-tuning, so as to provide higher control accuracy and response speed, which is convenient and simple.

Rotary self-tuning: Must unload the motor. Suit for applications with higher requirement of control accuracy.

Fully static self-tuning: Leading motor tuning algorithm, can acquire the motor parameters in static status, which is comparable to the rotary self-tuning.



Rotary self-tuning

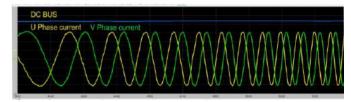


Fully static self-tuning

Software suppression function

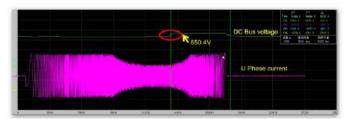
Over current suppression

The current suppression function could avoid the frequent OC fault of inverter. While the current is over the current protection point, it could continuously limit the current below the protection point, so as to protect devices, prevent the overcurrent fault caused by sudden load or interference and reduce the loss caused by stop without reason.



Over voltage suppression

The overvoltage suppression function could prevent inverter from overvoltage fault in ACC/DEC process. During ACC/DEC, if the bus voltage of inverter reaches or exceeds the overvoltage protection point, the overvoltage suppression function could suppress the rising of bus voltage by automatically adjust the operation frequency, so as to protect the devices and avoid the overvoltage fault caused by the rising of bus voltage.



Random carrier frequency

Compared with the sharp motor noise of fixed carrier frequency, the output voltage harmonic spectrum of random carrier frequency is uniform in a wider frequency range, which makes the motor noise much softer.



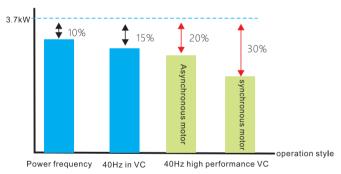
Turn off the spectrum analysis of random carrier frequency



Turn on the spectrum analysis of random carrier frequency

Excellent energy-saving functions

Adopt the new generation of energy-saving control technology to realize the high-efficiency operation of induction motor; reduce the excitation current according to the load current, and automatically adjust according to the loading condition; improve the motor efficiency at most; reduce the motor consumption and energy consumption. 30% of AM&PMSM adopt the VC mode to drive PMSM and the energy utilization could increased by more than 10%.



Comparison diagram of fan energy saving

Support software upgrade on-line

AC300 can upgrade software on-line through VEICHI firmware upgrade software.

AC300 built-in software can be upgraded and replaced directly through the traditional RS485 serial port.



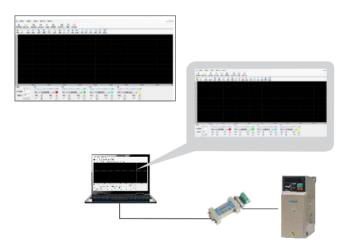
Powerful upper machine software

There is user-friendly upper machine software for AC300, which is convenient to operate and configure. Besides the keyboard, users can also use VCACSoft Ver1.3 to set, copy and monitor parameters. It could timely and conveniently provide the VFD state information for users, so as to provide unprecedented flexibility for debugging, setting, monitoring and troubleshooting.

The software could operate in Windows environment, and perform date exchange by common RS485 interface or field bus.



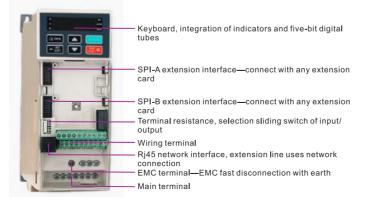




Structural hardware features

Simple internal layout, convenient wiring operation

Full range of narrow-body design and strict control in structure dimension. The main models contain most regular applications, various extension interfaces and ordered terminal layout, which is convenient for wiring.



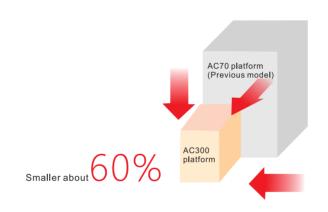
Standard configuration of terminals

No.	Unit Circuit	Quantity	Remarks
1	Common X input	5 channel	Dual-direction input
2	Common Y output	1 channel	
3	Relay output	1 channel	Normal on/off
4	10V power output	1 channel	50mA
4	24V power output	1 channel	200mA

5	Voltage/Current analog input	2 channel	V/A support random switch
			0-10V output
6	Analog output (optional)	1 channel	0-20mA output
			0-50KHz pulse output
7	Rs485 communication	1 channel	ModBus-RTU
8	Low-speed pulse input	1 channel	X5:0-5 KHz input

New book-body structure

Ac300 series all adopt book narrow-body design, and the volume is 60% smaller than the original, which is the real "book-body machine" of inverter.

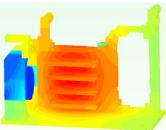


New structure design

Adopt separate deduct design of components and radiator: strengthened protection of capacitors, MOS tube and relays, closed design of inverter sides, to improve the ability to resist environment.



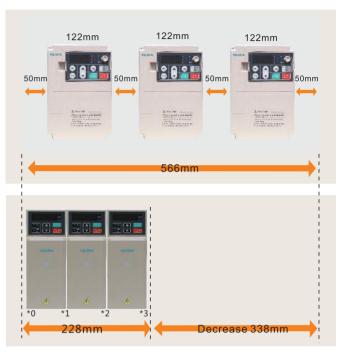
Wide tooth surface of heat dissipation, high air speed design, can ensure no reduction of capacitors with full power inverter in high temperature.



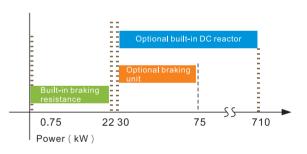
Optimized structure design

Book narrow-body design, rationally utilization of space, can greatly save the size and cost of main cabinet.

380V 2.2kW demonstration



Configuration of braking unit and reactor



- 0.75~22kW built-in braking unit
- 30~75kW optional built-in braking unit
- 30-710kW optional built-in reactor (630~710kW standard configured with input reactor)

Siding selection of interface features

Convenient siding selection of interface features, can fast select input/output features with common screwdrivers.

Sliding diagram	Item	Selection position	Function description
	RS485	485 terminal resistance	RS485 communication connects to 120 ohm terminal resistance
RS485 OFF ON	AO-F	AO output - power	AO2 interface: 0.0~100kHz frequency output
AO-F OFF ON	AO-I	AO output - current	AO2 interface: 0~20mA or 4~20mA current output
AO-U OFF ON	AO-U	AO output - voltage	0~10V voltage output
AI2 U	Al1	Al1 input - current /voltage	AI1 interface input 0~20mA or 4~20mA current or 0~10V voltage
	Al2	Al2 input - current/ voltage	Al2 interface input 0~20mA or 4~20mA current or 0~10V voltage

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Keyboard operation

A new designed keyboard with operational superiority. Built-in keyboard and external keyboard support double display(control right can be selected by parameter)



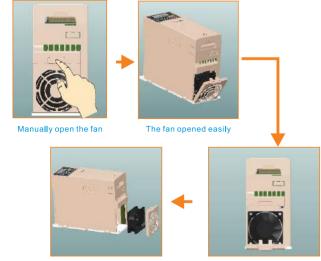


Note: the following 37KW adopts integrated keyboard, 37KW steel machine adopts

	Name	State	Meaning
⊆	Hz	Spark/On	Frequency
Unit indicator light	Α	On	Current
dicat	V	Spark/On	Voltage
or lig	RPM	On	Speed
ħ.	%	Spark/On	Percentage
<u>≅</u> in St	RUN	On	Inverter is forward rotating
State Indicator light	RUN	Spark	Inverter is reverse rotating
악	RUN	Off	Inverter stops

Fan fast disassembly design

With the innovative fan structure design, the fan can be quickly replaced and cleaned without the aid of external tools on the premise of ensuring the stability and efficiency of the fan.



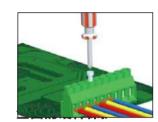
Remove the fan cover for cleaning Remove the fan for replacement

MB Series

Selection of European terminal conforming to IEC60988-2-1:UL1059: UL 486E specification. Save the connection time while ensuring the safety and reliability:wire stripping---Line number---fasten. AC300 inverter adopt MB series on small power main circuit. Using the European terminal to connect the main circuit in the cabinet to the main loop at least half the time compared to the previous machine. Greatly improve the efficiency of customer assembly.



Wire Stripping→line Number→press Wire→fasten

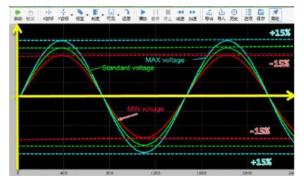


Wire Stripping \rightarrow line Number \rightarrow fasten

	AC300 Model	Wire diameter ∅ (mm)	Intercepting area of wire (mm²)	Wire strip length (mm)
	0.75kW-2.2kW	0.25-2.5	0.05-5.2	7-8
Main circuit terminal	4.0KW-5KW	0.5-2.5	0.2-5.2	6-7
	7.5KW-11KW	0.8-4	0.5-13	10-11
Schematic diagram of stripping	_		Φ (S

Wide voltage design

Input voltage range is 320V-460V. Avoid the impact of voltage fluctuations and meet the harsh grid environment.



EMC discontent ground line design

Using innovative EMC disconnect ground line design, fast selection through terminal.



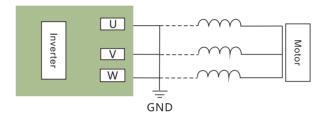
Comprehensive hardware protection

It has such functions as output to ground protection, internal buffer relay protection, fan drive circuit protection, external 24V DC short circuit protection, motor overload protection and other hardware protection functions, so as to realize the omni directional protection from the inverter's internal and peripheral devices.



A new electric motor to ground short circuit detection

The inverter starts to detect the ground short circuit immediately. Once the motor side is found short circuit, then inverter stop the output and protect the motor.



Expansion

Super expansion

Avariety of expansion interfaces to meet various conventional applications. AC300 control board retains two SPI high speed channel outward extension card, Control board automatic identification extension card including expansion card setting parameter group at the same time.

Expansion card

Mode	Requirement
IO expansion card	Optional,high speed pulse,relay
Speed tracking card	Optional (Default software tracking)
PG card	Optional, Multi type encoder
Easy logic board expansion card	Optional
	In development

Communication extension card



Communication type extension card model	Requirements
PROFIBUS-DP card	Optional
CANopen card	Optional
PROFINET card	Optional
Ethernet/EtherCAN card	Optional

IO extension card

property	Terminal	Specification
Input IO	Expansion X6/X7/X8/X9/X10	PLC/COM , Common cathode, Common anode
High speed pulse input	X10	0-100KHz
Digital output	Expansion Y2	DC24V/50mA
Relay output	Expansion relay TA2/TB2/TAC2	3A/240VAC
Temperature detection of synchronous motor	PK+/PK-	Support PT100/PT1000/KTY84, motor temperature detection
Common port	COM/PLC2	External terminal
Common ground	GND	
Change-over Switch	S7	Polarity selection of Input terminal

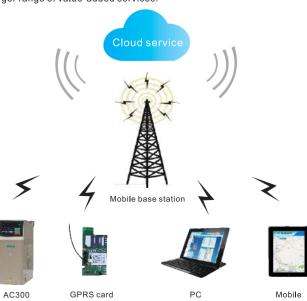
Logic extension card

Inverter takes the place of PLC to perform simple logic control.Adopt development environment with a wide application of MELSEC programmable controllers.The product integrates universal and comprehensive functional blocks.

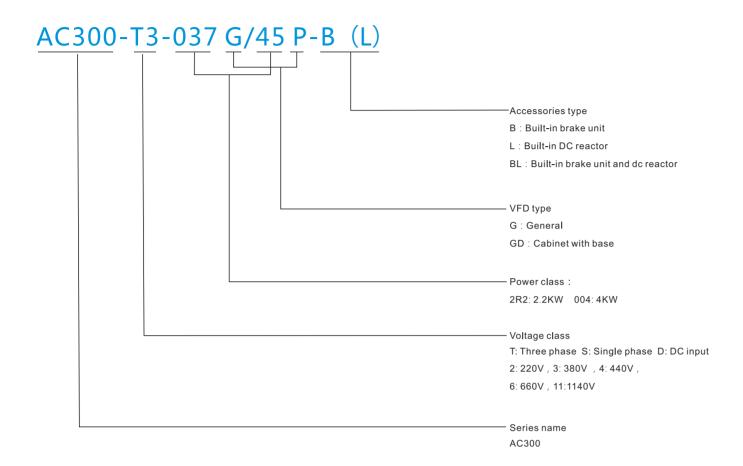


IOT of VEICHI

Intelligent terminal. High positioning accuracy. Small and beautiful. Easy to install. Using GPRS and GSM dual mode communication mode, stable running, reliable performance.Realized online monitoring and faults diagnosis though remote detection module.Provide customers with a larger range of value-added services.



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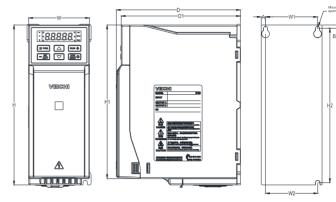


VFD rated output current

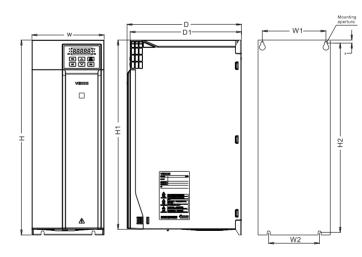
Voltage	220V	380V
Power	Rated outpu	t current (A)
0.75	4	3
1.5	7	4
2.2	10	6
4	16	10
5.5	20	13
7.5	30	17
11	42	25
15	55	32
18.5	70	38
22	80	45
30	110	60
37	130	75
45	160	90
55	200	110
75	260	150
90	320	180

Installation dimension

Plastic model



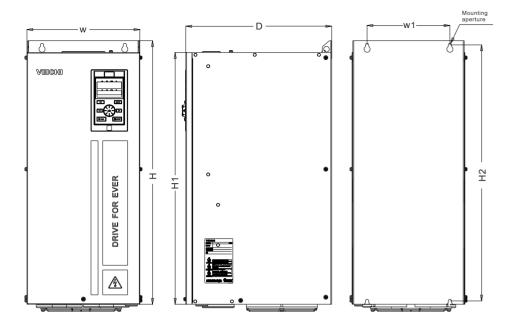
Model		Overall	dimensi	on(mm)		Installation dimension(mm)					Installation aperture
Model	W	Н	H1	D	D1	W1	W2	H2	Α	В	installation aperture
AC300-T/S2-R75G-B	76	200	192	155	149	65	65	193	5.5	4	3 - M4
AC300-T/S2-1R5G-B											
AC300-T/S2-2R2G-B	100	242	231	155	149	84	86.5	231.5	8	5.5	3-M4
AC300-T/S2-004G-B		242									
AC300-T/S2-5R5G-B	116	320	307.5	175	169	98	100	307.5	9	6	3-M5
AC300-T3-R75G/1R5P-B	76	200	192	155	149	65	65	193	5.5	4	3-M4
AC300-T3-1R5G/2R2P-B											
AC300-T3-2R2G-B											
AC300-T3-004G/5R5P-B	100 2	242	231	155	149	84	86.5	231.5	8	5.5	3-M4
AC300-T3-5R5G/7R5P-B		242	231								
AC300-T3-7R5G/011P-B	116	320	307.5	175	169	98	100	307.5	9	6	3-M5



Model	Overall dimension(mm)						ation dim	ension (Installation aperture	
iviodel	W	Н	H1	D	D1	W1	W2	H2	В	installation aperture
AC300-T/S2-7R5G-B	142	383	372	225	219	125	100	372	6	4-M5
AC300-T/S2-011G-B										
AC300-T/S2-015G	172	430	/	225	219	150	150	416.5	7.5	4-M5
AC300-T2-018G										
AC300-T2-022G										
AC300-T3-015G/018P-B	142	383	372	225	219	125	100	372	6	4-M5
AC300-T3-018G/022P-B										
AC300-T3-022G/030P-B										
AC300-T3-030G/037P	172	430	/	225	219	150	150	416.5	7.5	4-M5
AC300-T3-037G/045P										

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Steel model

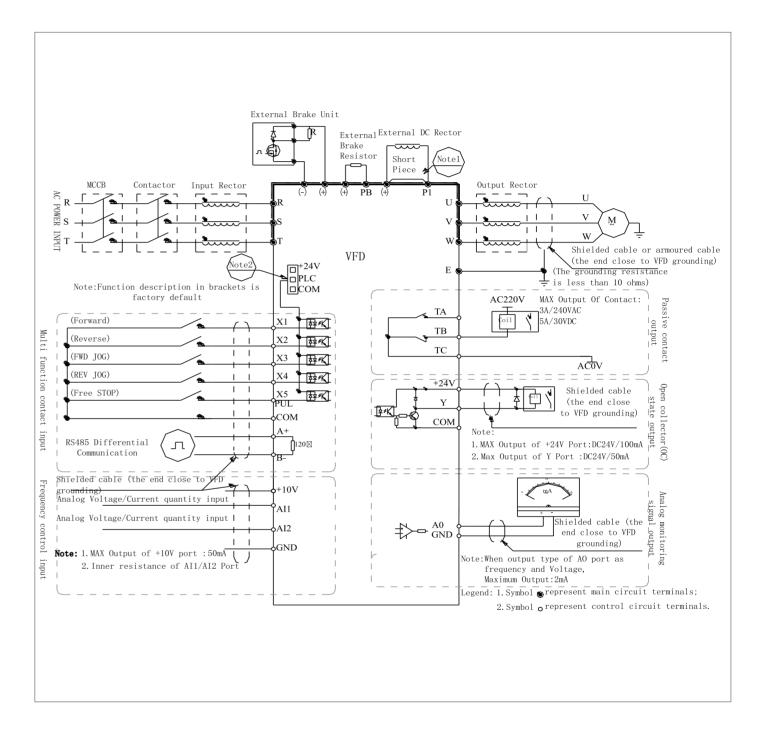


Model	0	verall dim	ension(m	m)	Installation dim	ension (mm)	Installation aperture	
Model	W	Н	H1	D	W1	H2	installation aperture	
AC300-T2-030G								
AC300-T2-037G	240	560	535	310	176	544	4-M6	
AC300-T2-045G	1							
AC300-T2-055G	270	638	580	350	195	615	4-M8	
AC300-T3-045G/055P		560	535	310	176	544	4-M6	
AC300-T3-055G/075P	240							
AC300-T3-075G/090P								
AC300-T3-090G/110P	270	638	580	350	195	615	4-M8	
AC300-T3-110G/132P								
AC300-T3-132G/160P-L	350	738	680	405	220	715	4-M8	
AC300-T3-160G/185P-L								
AC300-T3-185G/200P-L	360	940	850	480	200	910	4-M16	
AC300-T3-200G/220P-L								
AC300-T3-220G/250P-L								
AC300-T3-250G/280P-L	370	1140	1050	545	200	1110	4-M16	
AC300-T3-280G/315P-L	370	1140						
AC300-T3-315G/355P-L	400		1140	545	240	1213	4-M16	
AC300-T3-355G/400P-L		1250						
AC300-T3-400G/450P-L								
AC300-T3-450G/500P-L		1400	1293	545	300	1363	4-M16	
AC300-T3-500G/560P-L	460							
AC300-T3-560G/600P-L								

Cabinet Model

	Model	0	verall dim	ension(m	m)	Installation dim	nension (mm)	Installation aperture
	Model	W	Н	H1	D	W1	H2	instaliation aperture
	AC300-T3-630G/710P	800	1000	1800	700	564	626	Ф14
ſ	AC300-T3-710G/800P		1900					

Wiring Diagram



Note:

- 1. When installing DC reactor, make sure to dismantle the short connector between terminal P1 and(+).
- 2.NPN or PNP transistor signal can be selected as the input of multi-function input terminals (X1~X5/PUL). The inverter built-in power supply (+24V terminal) or external power supply (PLC terminal) can be selected as bias voltage. Factory default: "+24V" short connects with "PLC", which locates between RJ45 and terminals.
- 3. Analog monitor output is the special output for meters such as frequency meter, current meter and voltage meter. It can't be used for control operations such as feedback control.
- 4. As there are multi pulse types, please refer to the details of wiring connection modes.

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Optional parts

AC300-PG01

5V differential signal input, Maximum frequency 500KHz, With input signal disconnection detection function.



AC300DP01

Profibus Communication Expansion Card



AC300RT1

Resolver card, It can support four different transformation ratios: 0.219, 0.286, 0.5, 0.58.

Factory default: 0.5.



KBD10-15

External LED 5 Bit display and operation keypad, with Potentiometer speed regulation.



AC300IO1

Four digital input (X10 can support 50KHz pulse input), one digital output, one analog input, one relay output. It can also support temperature detection (PT100 & KTY84).



KBD300-25

Double line external 5 bit display, Silicone buttons,
Digital potentiometer.



AC300CAN1

CANopen extension card



AC300-GPRS

Device Positioning and Maintenance.

Real-time Monitoring. Data Acquisition.



Application case





























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