AC70 Sensorless Vector Control Inverter (G/P mode)

A dual mode design with optimized V/f control and open loop vector control (OLV) without PG card to achieve sophisticatedmotor control, developed base on AC60 general purpose drive platform, adding enhanced performance.

High cost-performance, high speed accuracy control, quick torque respond time and high starting torque, etc excellent motor control performance make it suites for a variety of industrial application.

AC70 vector control drive designed to meet global OEM and end-user demands for flexibility, space savings and ease of use. AC70 G mode frequency inverter are cost-effective solutions for speed control of applications such asdiverters, smart conveyors, packaging machines, palletizers, drafting machines, ring spinning machines and synthetic fiber spinning machines.　　AC70 P mode AC drive speical for fans, pumps, etc variable torque loard for energy saving.

Table of Contents

PS: Compnay brief introduction:

Shenzhen Veichi Electric Co., Ltd is a high-tech enterprise that is engaged in the development, manufacturing and marketing of variable frequency drives, industrial control and renewable energy. Since the start-up in July 2005, the company has grown quickly into a well-known provider of VFDs and motor control solutions. In 2012, with a sales turnover above 51 million USD, we were ranked the top three position among China frequency inverter manufacturers. Now we own over 500 staffs, and 106 of them are R&D engineers, two manufacturing base in Shenzhen and Suzhou.

AC70 Sensorless Vector Drive Features

Outstanding motor control performance

✧ Torque respond speed ≤20ms in OLV without PG

✧ 150% rated torque output under 1 Hz in OLV without PG

✧ Wide input voltage range, fluctuation±15% is allowable

✧ Outstanding overload capacity, 150% rated current for 60s, 180% rated current for 2s, 200% rated current for instantaneous.

✧ Speed control accuracy ≤ 1% rated synchronous speed

✧ Speed control range 1:100 in OLV

✧ Carrier frequency 0.6〜15.0kHz,randomly-modulated

Brief production feature

➢ Long working life component design to extend service life of inverter. More than10 years working life design.

➢ Compact structure, small size design to meet various application challenge.

➢ Independent air duct design, improve ventilation and anti-dust ability, through installation to meet various requirement.

➢ Removable DC fan design to protect system stable running, easy replace and cleaning.

➢ Plug and play removable keypad, LCD/LED display, parameters copy is available.

➢ Standard built in RS485 interface for all model, built in braking transistor through 18.5kw.   built it DC reactor for above 160kw.

Rich I/O Terminals Function

♣ 6 Digital Inputs, (forward, reverse, jog, multi-speed.. up to 28 designate)

♣ 3 Analog Inputs. VS1, VS2 (0-10V, -10V to 10V), AS (0/4 to 20mA)

♣ 1 Pulse train Inputs.

♣ 3 Digital Outputs. (2Opto Coupler and 1 relay)

♣ 2 Analog Outputs (0-10V, 0/4-20mA)

♣ 1 Pulse train Output

♣ RS485 Modbus RTU Communication terminals

Functions describe.
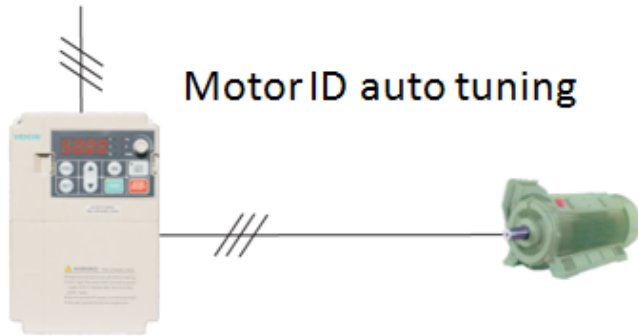
Two control mode is selectable

V/F control   Uses for all application which no   high respond and highly accuracy speed control requirement, 1 inverter drive for multi-motors, and parameter of motor is not easy to gained, motor auto tuning can't be able to performed.
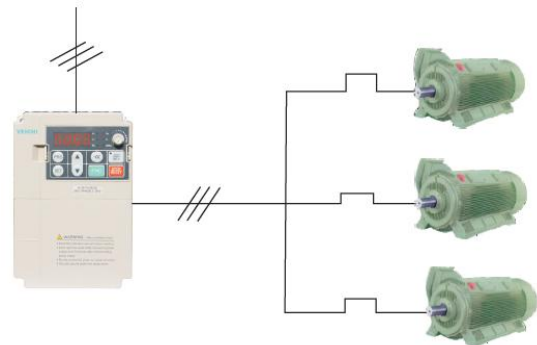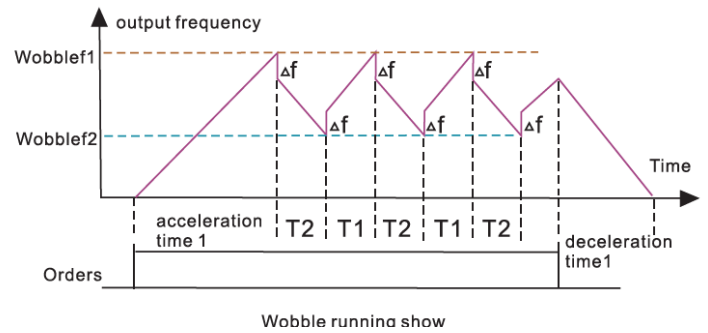

OLV sensorless vector control without PG

Suitable for all application which need high accuracy speed control , high starting torque and quick torque respond .

Best suited for plastic extrusion, punch, air compressor which need high starting torque and fast respond.
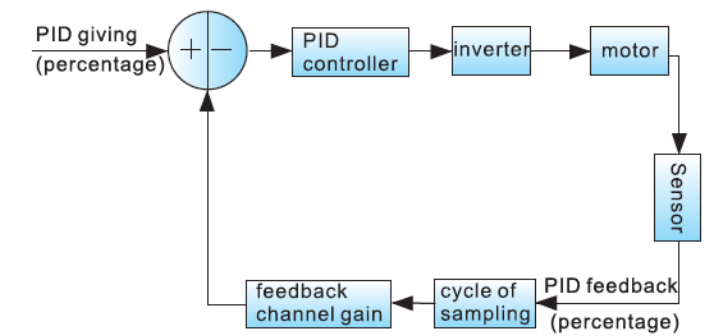
Motor ID auto tuning

Rich auto tuning function

Rotational and stationary auto tuning is selectable via parameters setting	
Stationary auto tuning	Suits for application which motor and load difficult for disconnecting, such as gear box with motor
Rotational auto tuning	Suits for motor and load disconnect completely application. Get more accuracy motor parameters

Speed search mode

Speed searching for one inverter drives for multi-motor in light load is available, optimized hardware speed search function to gain highly accuracy reliability speed search.

Software speed search   Hardware speed search

Application: Best suits for fan, blower etc equipment which have rotator.
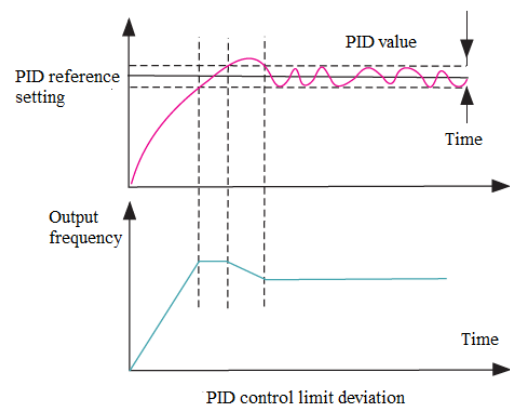
Wobble frequency function

Wobble running show

Application: Best suits for textile, chemical fiber application which need swing frequency.

Multiple PID function

Built it general PID and pressure close loop special PID mode Wider using range, more professional for specific industrial

PID control mode

PID control limit deviation

Application: Best suits for fluid machinery ,such as fans, pumps and blowers.

Energy Saving

➢ New generation energy saving running, high efficiency running for induction motor with energy saving control technology

➢ In the running mode, inverter will calculate best output voltage for driving load according the load condition to achieve energy saving
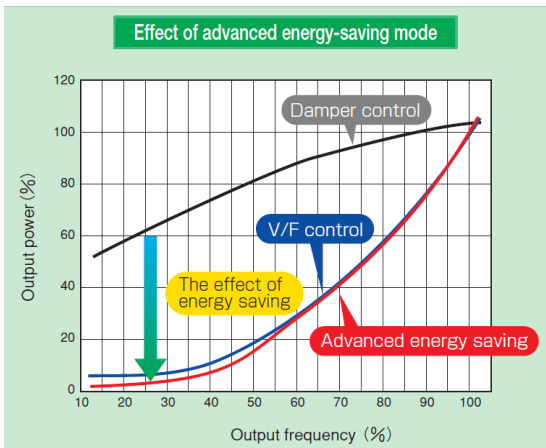
Application: Best suited for injection molding machine, EPS and balling machine impacting load.

Strong environment adaptability

Strong and thick PCB coating to protect moisture, salt and mould.

Protection degree IP20, customer make higher protection degree is available.

Strong moisture resistance, anti dust, anti oil and anti vibration
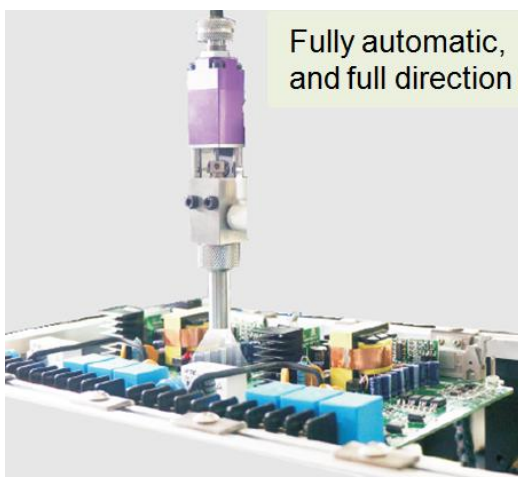

Strong load adaptability

1. Auto current limiter, and auto frequency adjusting technology to challenge load suddenly change.

2. To avoid fault occurs frequently, make machine long term operation.
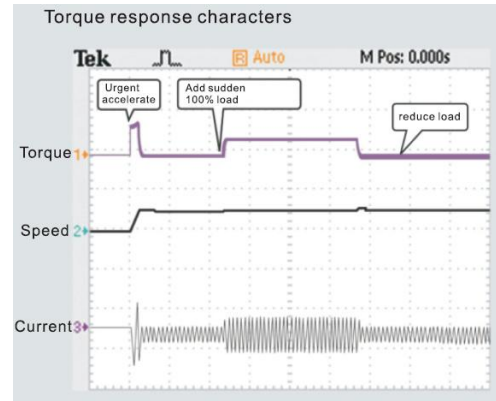
Application: Best suited for injection molding machine, EPS and balling machine impacting load.

Power loss ride through with no stop function

Instantaneous energy compensation is available for driving light load or big inertia load.

1. Executing instantaneous power loss compensation when detecting lower input voltage.

2., Search speed in free running status to restart easily, improve the reliability of system
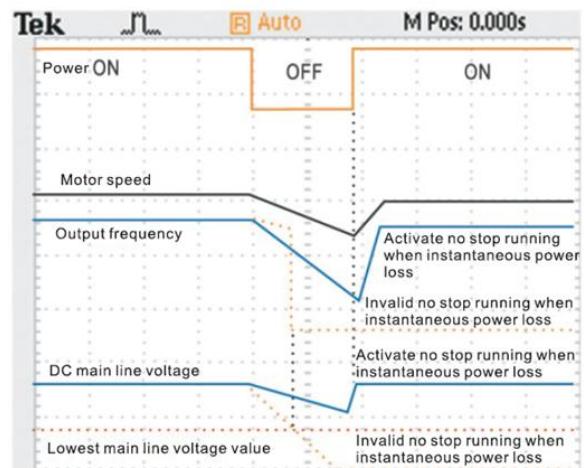
Application: Best suits for spin-drier, film production line, fans and pumps which need momentary power loss ride-through function.

Communication mode

● Standard built in RS485 interface in all mode, Compatible for Modbus-RTU and Profibus-DP protocol are available.

● Best suited for industrial bus control, network control with upper controller, PLC. PC. HMI…

DC power supply

DC power supply directly, particularly for common DC bus project and EPS source supply.

More energy saving, environment protecting and lower cost.

Randomly-modulated carrier frequency

Randomly-modulated carrier frequency function reduce motor noise effectively , to suppress inverter interference for exterior equipment .

fixed carrier frequency strong interference

Randomly-modulated carrier frequency reduce the noise
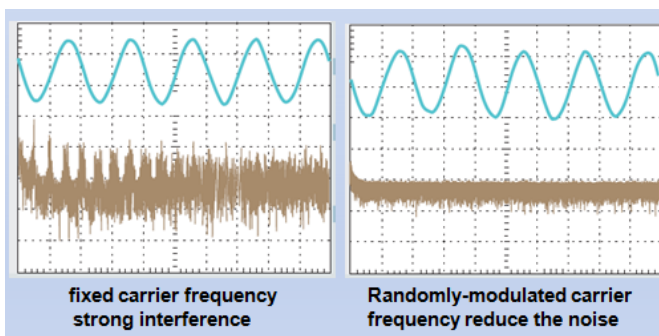
Installation mode

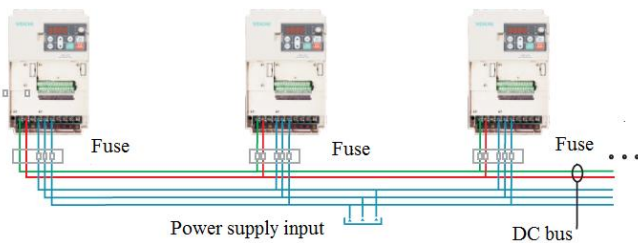Adopt DC fans in fully range, replaces conveniently, longer working life. Through installation to meet various application

Through installation through 11kw
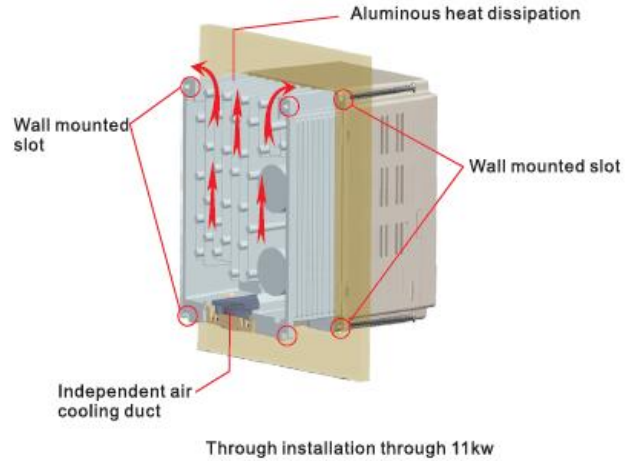
Safety Environment

Approved by CE certification to meet safety environment.

AC70 inverter monitor running status in time providing under voltage, overvoltage, over current, over load, over heat, phase loss , ground error protection alarm. Inverter will stop machine once detecting error occurs to ensure safe operation.

Other functions

Timer, Counter, S curve for smooth start and stop , Sink and source selectable,

hardware design costs and simplify control schemes.

- Timer function: Relay or opto outputs controlled by drive performing timer function.

- **Counter function**: Relay or opto outputs controlled by drive performing counter function.

- DIP switch settable 24V DC sink or source control for control wiring

flexibility.

-Multi-speed function. Up to 7 speed step is available.

-**3 Wire control mode**

-DC braking function

Nameplate and models illustration

1. Nameplate illustrate


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VEICHI
MODEL：  AC70-T3-011G/015P          CE
SOURCE: 3∅ 380V 50/60Hz
OUTPUT1：11KW 25A 0.00-400.0Hz
OUTPUT2：15KW 32A 0.00-400.0Hz
SER NO:    ||||||||||||||||||||||||||||||||
           ****************
Maker:Shenzhen Veichi Electric Co,Ltd
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Note. Source>>> Input voltage rating

Output 1:>>>>>>>G type output

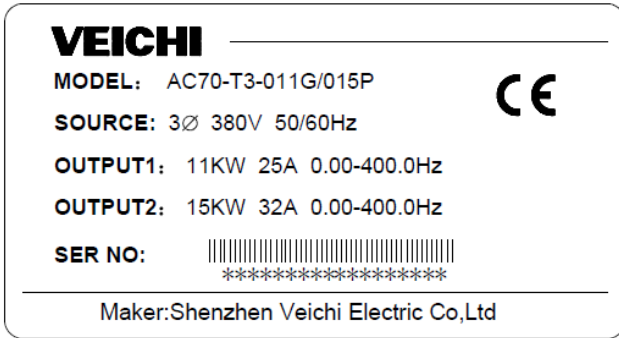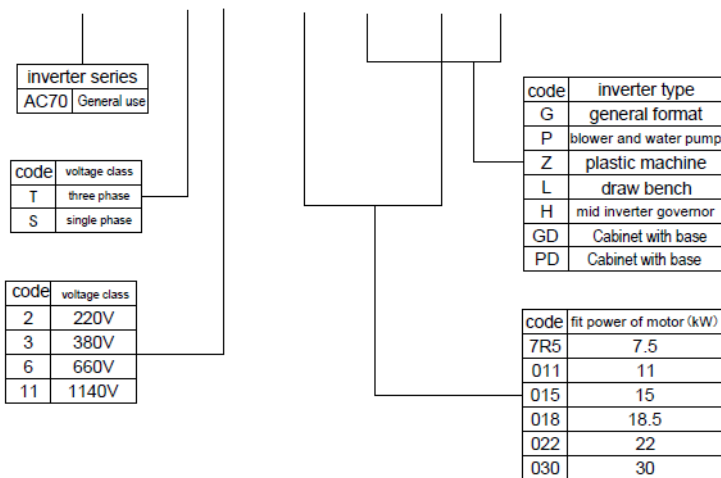Output2:>>>>>>>P type output

2. Models illustration

AC70 - T 3 - 011 G /015 P

inverter series	
AC70	General use

code	voltage class
T	three phase
S	single phase

code	voltage class
2	220V
3	380V
6	660V
11	1140V

code	inverter type
G	general format
P	blower and water pump
Z	plastic machine
L	draw bench
H	mid inverter governor
GD	Cabinet with base
PD	Cabinet with base

code	fit power of motor (kW)
7R5	7.5
011	11
015	15
018	18.5
022	22
030	30

Rating, types, voltage, current

Input voltage	220V	380V	660V	1140V
Rated power	Rated output current(A)	Rated output current(A)	Rated output current(A)	Rated output current(A)
0.4	2.5			
0.75	4	2.3		
1.5	7	3.7		
2.2	10	5.0		
3.7	16	8.5		
5.5	20	13		
7.5	30	17	10	
11	42	25	15	
15	55	32	18	
18.5	70	38	22	
22	80	45	28	
30	110	60	35	
37	130	75	45	25
45	160	90	52	31
55	200	110	63	38
75	260	150	86	52
93	320	180	98	58
110	380	210	121	75
132	420	250	150	86
160	550	310	175	105
185	600	340	198	115
200	660	380	218	132
220	720	415	235	144
250		470	270	162
280		510	330	175
315		600	345	208
355		670	380	220
400		750	430	260
500		860	540	325
560		990	600	365
630		1100	680	400

Specifiation:

Single phase, 220V, 0.4kw to 2.2kw.

Three phase, 220V, 0.75kw to 220kw Three phase, 380V/660V/1140V, 0.75 to 1000kw.

Technical specifications

Technical Specification	Items	Description
Power Input	voltage, frequency	single phase 220V, 3 phase, 220V,380V, 660V and 11140V
	Allowable fluctuations	Voltage:320V to 440V;Unbalance of Voltage: < 3%; frequency±5% Distortion of voltage to confirm to IEC61800-s
	Surge close current	less than rated current
	Power Factor	≥0.94(integrated DC reactor)
	Efficiency	≥96%
Power Output	Output Voltage	3 Phase, 0 ~ Input voltage, tolerance less than 5% in standard rating condition
	Frequency Control Range	G type: 0 to 400Hz, P type: 0-400Hz, Z type: 0-400Hz, L type: 0-400Hz,
	Output frequency accuracy	±5% of maximum frequency
	Overload Tolerance capacity	G,H,L type model:150% of rated output current for 60 sec,180% of rated current for 10s,200% of rated current for Z type: 150% rated current for 60 sec, 180% rated current for 30 sec, 250% rated current for instantaneous
Key Control performance	Motor Control Mode	Open loop sensorless vector control without PG, V/F control
	Control system	Optimized Space Vector PWM Modulation
	Carrier frequency	0.6 ~ 15kHz, Randomly-modulated carrier
	Speed control range	OLV without PG with rated load: 1:100
	Stable speed control accuracy	OLV without PG: less than 1% (25°C ±10°C),
	Starting torque	OLV without PG control mode: 150% rated torque under 1Hz,
	Torque response	OLV without PG control mode: ≤20ms
	Frequency Accuracy (Temperature Fluctuation)	Digital inputs: maximum×±0.01% Analog inputs: maximum×±0.2%
	Frequency Setting Resolution	Digital inputs: 0.01 Hz Analog inputs: 0.5% of maximum output frequency
Standard Function	DC Braking	Starting Frequency: 0.00 to 50.00Hz, Braking Time: 0.0 to 60.0s Braking current: 0.0 to 150% rated current
	Torque boost	Auto torque boost:0.0% to 100% Manual torque boost: 0.0% to 30%
	V/F curve	5 kinds curve programmable setting:1 user setting, 1 of linear characteristic torque curve setting. 3 kinds derating torque setting(1.5 power, 1.7 power, 2.0 Power curve)
	Accel / Decel. curve	Two kinds curve: line Accel/Decel, S curve Accel/Decel. 4 Aceel/Decel time unit is 0.1s, maximum time 6500.0s

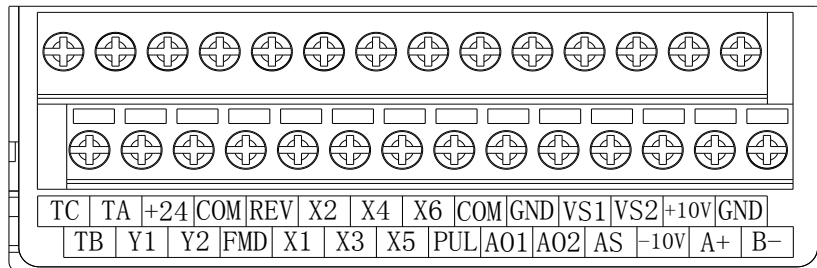|		
	Rated output voltage	Power voltage compensation is available, setting range from 50 to 100%(rated voltage), the output voltage can't over than input
	AVR(Auto Voltage Regulation	automatic voltage regulation for keeping output voltage stable when fluctuation of grid
	Auto energy saving running	Optimized the output voltage according the load to achieve energy saving
	Auto current limit	Auto current limit during running mode to avoid trip occurs frequently
	Momentary Power Loss with no stop running	To achieve continuous running with regenerative enery and DC bus voltage regulation when momentary power loss
	Standard Function	PID control, Carrier frequency adjustable, current limiter, Speed Search, Momentary Power Loss restart,8 Step Speed (max), 3-wire Sequence, Slip Compensation, Frequency Jump, Upper/lower Limits for Frequency
	Frequency Setting Methods	Keypad digital setting, potentiometer of keypad, analog voltage terminal VS1, analog voltage terminal VS2, analog current terminal AS, RS485 communication and multiple terminal, main and auxiliary composition setting.
	Feedback Input Channel	voltage terminal VS1, VS2, current terminal AS, communication , and pulse input PUL
	Running command channel	keypad given, external terminal given, communication given
	Input command signal	Start, Stop, FEW/Reverse, Job, Multiple speed, free stop, Reset, Accel/Decel time, Frequency set point channel, External fault
	Output signal	2 Photo coupler relays: 2 (24 V, up to 50 mA) 1 Contact relays: 1 (250 Vac/up to 1 A, 30 Vdc/up to 1 A) 0-10V output, 4 to 20mA output
Protection function		Overvoltage, under voltage, current limit, over current, overload, electric thermal relay, overheat, Stall prevention, parameter lock
keypad Display	LED Display	One line digit-segments LED display to monitor 1 running status
		Double line digit-segment display to monitor 1 running status
	Parameters copy	upload and download parameter code to achieve easy copy
	Monitor Function	Output frequency, Frequency set point, Out current, Output voltage, motor speed, PID feedback value, PID given setting, IGBT module temperature, I/O terminal status.
	Alarms	Overvoltage, under voltage, over current, short circuit, phase loss, over load, over heat, stall prevention, current limit, parameter lock damage, running status at present alarm, past trip alarm
Environment	Installation Site	Indoor, Altitude should less than 1000m, Free corrosive gases and direct sunlight
	Running Temperature, humidity	-10 ~ +40°C (wall mounting),-10 ~ +45°C(enclosure) 20% to 95% RH (No condensation)
	Vibration	Less than 0.5g when frequency less than 20Hz
	Storage Temperature	-25—+65°C
	Installation mode	Wall-mounted mode, floor stand cabinet install
	Protection Degree	IP20
	Cooling Method	Forced air-cooling

Basic Wiring Diagram

Built in Rs485 terminal A+ and B- for full power range.

Control terminals
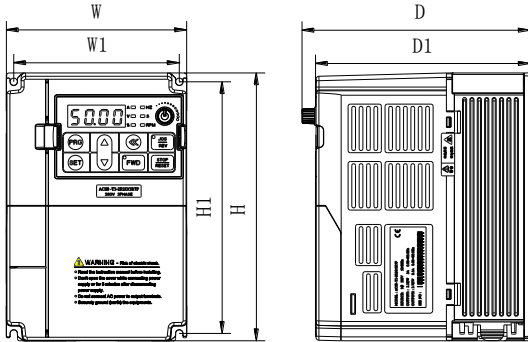

TC	TA	+24	COM	REV	X2	X4	X6	COM	GND	VS1	VS2	+10V	GND
TB	Y1	Y2	FMD	X1	X3	X5	PUL	A01	A02	AS	−10V	A+	B−

VEICHI 伟创电气   www.veichi.com   **Creative Technology, Service Leading!**
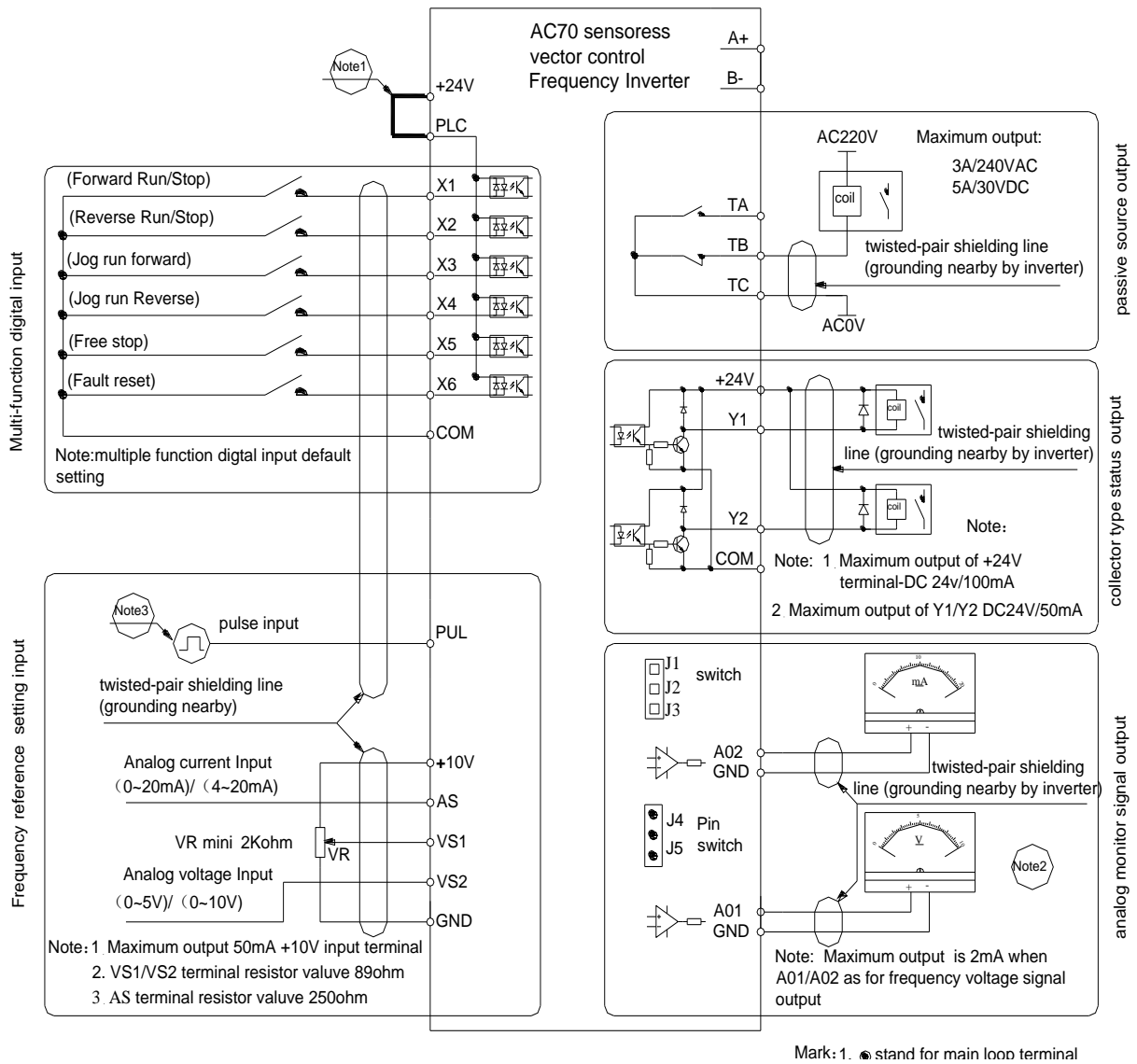
Installation size（units：mm）

1. Installation size with plastic cover

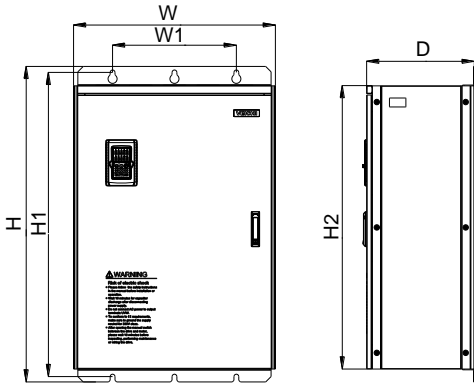| Inverter model	Inverter size				Install size		Install hole size
	W	H	D	D1	W1	H1	
AC70-S2-R40G	122	182	154.5	145	112	171	φ5
AC70-S2-R75G							
AC70-S2-1R5G							
AC70-S2-2R2G	159	246	157.5	148	147.2	236	φ5.5
AC70-T3-R75G/1R5P	122	182	154.5	145	112	171	φ5
AC70-T3-1R5G/2R2P							
AC70-T3-2R2G/004P							
AC70-T3-004G/5R5P	159	246	157.5	148	147.2	236	φ5.5
AC70-T3-5R5G/7R5P							
AC70-T3-7R5G/011P	195	291	167.5	158	179	275	φ7
AC70-T3-011G/015P							

2. Wall-mounted machines installation size
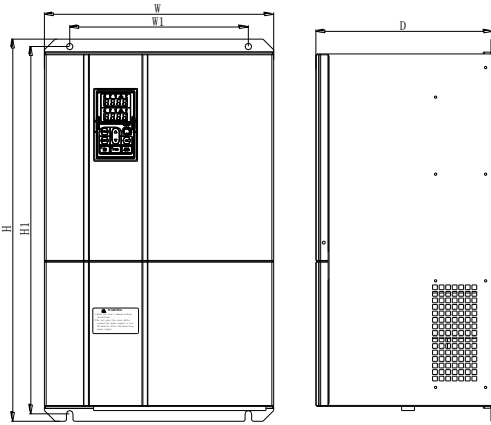
Installation aperture

dimension mark mode(2)

Inverter model	Inverter size				Install size		Install hole size
	W	H	D	H2	W1	H1	
AC70-T3-015G/018P	235	345	200	311	160	331.5	φ7
AC70-T3-018G/022P							
AC70-T3-022G/030P	255	410	225	370	180	395	Φ7
AC70-T3-030G/037P							
AC70-T3-037G/045P	305	570	260	522	180	550	Φ9
AC70-T3-045G/055P							
AC70-T3-055G/075P							
AC70-T3-075G/093P	380	620	290	564	240	595	φ11
AC70-T3-093G/110P							
AC70-T3-110G/132P							

3. Wall mounted type size (Built in DC reactor for above 160kw)

Inverter model	Inverter size				Install size		Install lino hol
	W	H	D	H2	W1	H1	
AC70-T3-132G/160P	500	780	340	708	350	755	φ11
AC70-T3-160G/185P	650	1060	400	950	400	1023	φ16
AC70-T3-185G/200P							
AC70-T3-200G/220P							
AC70-T3-220G/250P	750	1170	400	1050	460	1128	φ18
AC70-T3-250G/280P							
AC70-T3-280G/315P							
AC70-T3-315G/355P	850	1280	450	1150	550	1236	φ20
AC70-T3-355G/400P							
AC70-T3-400G/450P							

4. Floor mounted type sze (Built in DC reactor)
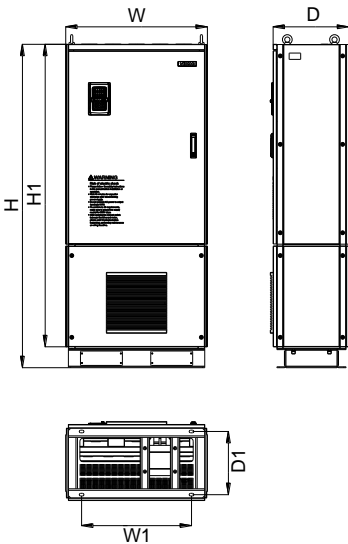
Inverter modle	Inverter size				Install size		Installation hole
	W	H	D	H1	W1	D1	
AC70-T3-160GD/185PD	650	1600	400	1500	492	332	φ14
AC70-T3-185GD/200PD							
AC70-T3-200GD/220PD							
AC70-T3-220GD/250PD	750	1700	400	1600	582	332	φ14
AC70-T3-250GD/280PD							
AC70-T3-280GD/315PD							
AC70-T3-315GD/355PD	850	1800	450	1700	622	382	φ14
AC70-T3-355GD/400PD							
AC70-T3-400GD/450PD							

5. Floor mounted type size (Built in DC reactor)

Inverter modle	Inverter size				Install size		Install ation hloe
	W	H	D	H1	W1	D1	
AC70-T3-450G/500P	1200	1850	550	1750	960	466	φ14
AC70-T3-500G/560P							
AC70-T3-560G/630P							

Operation keyboard size

Double line display keyboard size
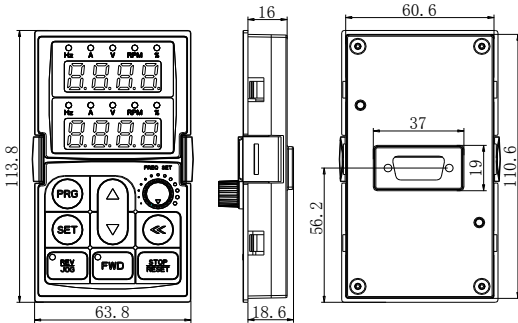
Sigle line display keyboard size
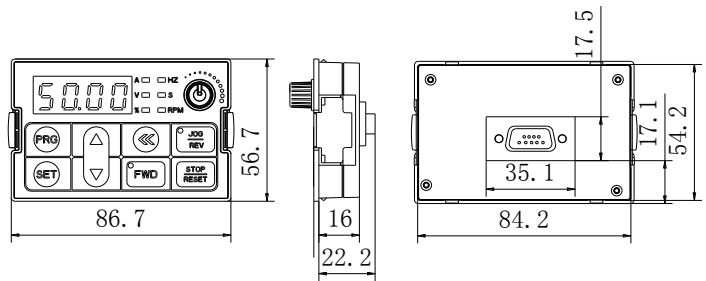
Application.

G type with stronger overload tolerance capability suits for following application:

Textile: P-jump Winders, Extruders, Tufting Machines, spinning machine

Packaging: In-feed / Out-feed, Case Packing, Bottling & Canning, Carton Manufacturing. Beverage packing

Plastics & Rubber: Extruders, Blow Molding, Thermoforming, Injection Molding.

Pulp & Paper: Paper Machines, Debarkers, Winders, Saw Mills

Converting: Coaters ,Laminators ,Slitters ,

Flying Cutters

Air Handling: Supply and Return Fans ,Cooling Towers ,Spray Booths ,Dryers

Oil & Gas: Top Drives ,Pumpjacks, Down-hole Pumping Centrifuges

Material Handling: Conveyors, Sortation, Palletizers, Coil Winding

Metals: Stamping / Punch Press, Wind /Unwind, Cut-to-length, cable drawing.

Wire Draw

Construction Materials: Kilns, Planers, Flying Cutoff, Mixers

Laundry: Dryers, Extractors, Folders, Washers

Food & Beverage: Conveyors, Fillers, Mixers, Centrifuges

Automotive: Stamping, Test Stands, Indexing, Metal Cutting

P type with 120% rated torque for 60s suits for variable torque application.

Pumping: Metering, Irrigation, Chillers, Positive Displacement, Dye Pumps

Fans: blower, Exhaust fans,Suck fans..