

Raynen / New West Technologies Ltd.  
Makes Industry More Intelligent

**Raynen** 睿能  
Raynen Technology Co., Ltd.

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Expert in industrial automation products and solutions



CT3000Pro/FP Series  
Variable frequency drive

# About Raynen

2007

Raynen Technology was established

## Main Board Listing

Listed on the main board of Shanghai Stock Exchange in 2017  
Stock Code: 603933

It is a high-tech enterprise specializing in the research and development, production, sales and service of industrial automation products.

## Innovation Strength

The company is headquartered in Fuzhou, with nearly 20 subsidiaries and R&D centers in Shanghai, Wuhan, Fuzhou and Changzhou. It is a "Key High-tech Enterprise of the National Torch Program", "Fujian Provincial Enterprise Technology Center", "China Textile Machinery Industry Computerized Flat Knitting Machine Intelligent Control System Product R&D Center", "Fujian Textile Equipment Intelligent Control Enterprise Engineering Technology Research Center", etc. The company insists on driving the development of technology and products with scientific and technological innovation, and through years of accumulation, has formed a number of core technologies and patent technologies with domestic leading level.

## Business Area

As a domestic technology-leading supplier of industrial automatic control products, Raynen Technology focuses on the research of control and drive technology. After years of product and technology cultivation, it has completed the comprehensive expansion from industry-specific electronic control systems to general automation products. The company's general automation products include core products such as AC servo systems, frequency converters, programmable controllers, human-machine interfaces, and Internet of Things gateways. They are widely used in electronics, textile machinery, machine tools, printing and packaging machinery, logistics equipment, intelligent manipulators, woodworking machinery, laser processing equipment, metallurgy, petroleum, and chemical industries. It provides equipment manufacturing companies with competitive products and personalized solutions with leading technologies.

## Mission and Vision

Raynen Technology has always taken "making industry smarter" as its mission, adhering to the business philosophy of "honest cooperation, open innovation, customer success, and common growth", and is committed to becoming a world-class supplier of industrial automation products and solutions to achieve the common growth of corporate value and customer value.



# CT3000Pro

variable frequency drive

## Product summary

CT3000Pro/FP Series High Performance Dual-Display VFD, which apply to 0.75~800kW three-phase asynchronous motor, has a unique book appearance structure design, rich function, stable performance. The series adopts advanced speed sensorless vector control technology, motor parameter identification technology, online estimation technology and flux estimation technology, which has greatly improved performance in the speed range, dynamic response, control accuracy and low frequency torque. It can be widely used in material handling, packaging, textile, lifting, material processing, wood processing, metal processing, fan and other industries.

## Characteristics

- Compact structure design, saves installation space
- Clear terminal layout marking, easier to install
- Wide voltage range design ensures the adaptability of products to power network fluctuations
- Advanced independent duct design, adapt to a variety of complex, harsh site environment

## Application

Material handling, packaging, textile, lifting, material processing, wood processing, metal processing, fan, etc



Thermal Power Generation



Petrochemical



Coal Mine



Metallurgy



Cement Manufacturing



Textile



Packaging



Material handling



Wood processing



Fan and Water pump



## Product functions

### High Load Balancing Performance

- Multiple motors drive the load, the load balancing is achieved by calibrating the motor speed to extend the life of the motor and equipment
- Applications: Conveying Equipment  
Centrifugal Equipment



### PTC Resistor Importability

- Receive PTC signal and strengthen protection.



### Various Keypad and Long Distance Communication

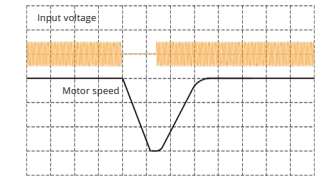
- Optional LED or LCD external panel, LCD panel for Chinese multi-line display, monitoring, more convenient: The whole series of external panel and the internal panel
- of 15kW or above are connected by communication mode, and the data transmission can reach hundreds of meters



Multi-line display, monitoring multiple run information  
Large LCD screen for clearer display

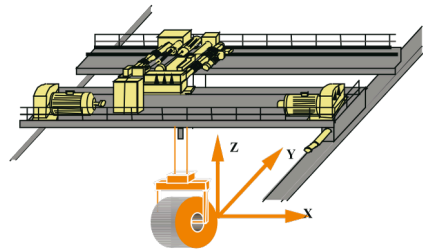
### Instantaneous blackout protection

- In case of instantaneous power failure or sudden decrease of input voltage, inertia energy of load side is fed back to DC bus by reducing motor speed to make up temporary energy gap, maintain DC voltage higher than undervoltage action value, and avoid shutdown due to undervoltage.



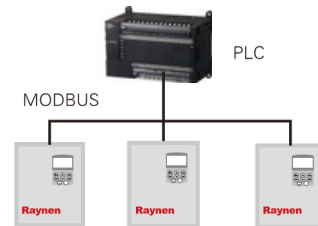
### Reliable braking

- Magnetic excitation before starting, and then through frequency, current and other ways to open the brake to prevent the load slip
- Before the stop, trigger lock brake in advance to ensure the stability of stop. Applications: Crane, Capstan



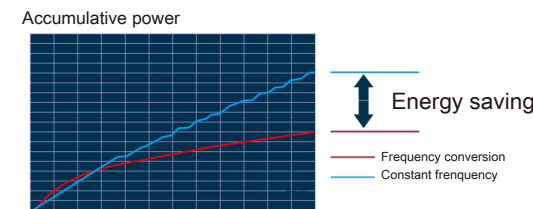
### Flexible communication interface

- Modbus communication is configured with RJ45 and terminal interface to realize system integration and networked control
- For continuous parameters and dispersed parameters can be effectively read and write



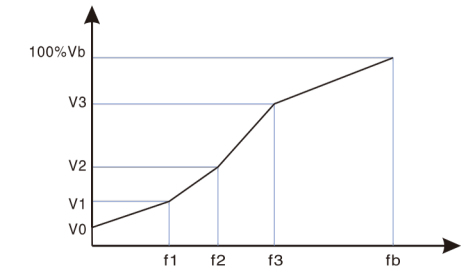
### Striking energy saving function

- Under energy saving mode, CT3000Pro VFD will monitor real load value to automatically adjust motor's voltage and current to reach best energy saving result.



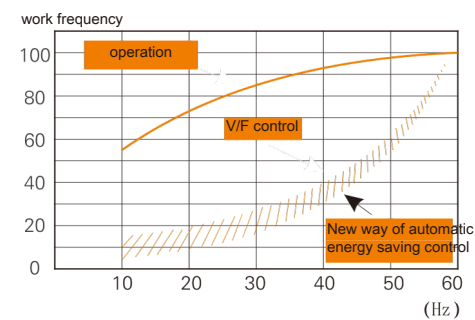
### Smart multi-segment V/F control

- CT3000Pro VFD has multi-segment V/F function to better service different load so as to improve motor running efficiency.



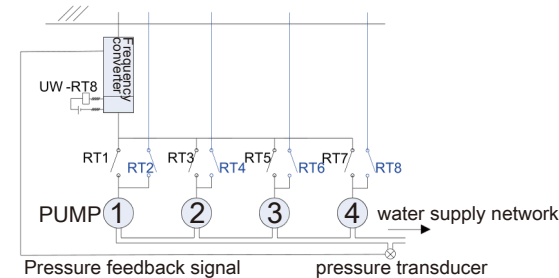
### Significant Energy Saving

- Under energy-saving mode, CT3000Pro frequency inverter will monitor real load value to automatically adjust motor's voltage and current to reach best energy saving result
- This function has obvious effect on variable torque load of fan and water pump.



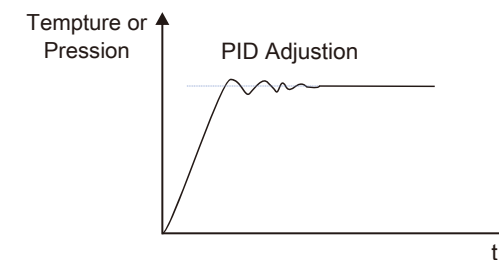
### PTC Resistor Importability

- Using the built-in PID controller, according to the different pressure, it can automatically switch between multiple pumps:
- Regular rotation between the pump, as far as possible to average the running time of each pump; Can be set up a small sleep pump, to ensure the stability of the pressure when the water consumption is very low.
- Note: Please specify this function when ordering.



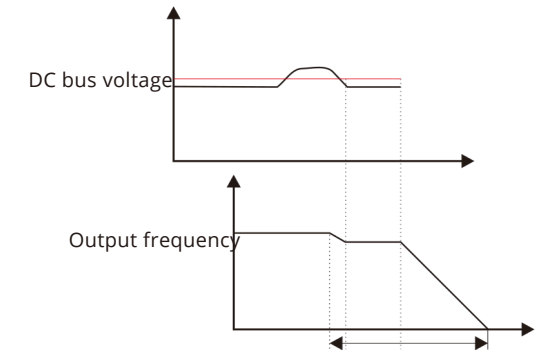
### Outstanding anti-interference performance

- Adopt modified PID control technology to make quicker torque response and least motor speed changing amplitude as load changes suddenly.



### Unique over voltage protection

- During deceleration process, it will protect CT3000Pro VFD according to selected over voltage mode when DC bus voltage is over setting value.



**Strong and Weak Electrical Isolation Design**

Adopt strong & weak electrical isolation Design, to avoid magnetic field interference and increase service life.

**Heat Dissipation Structure**

Independent cooling duct optimization design, from the original right angle optimization to rounded corner, reduce the thermal disk accumulation, greatly increase the efficiency of heat dissipation.

After heat dissipation optimization, based on the previous structure to reduce the side heat dissipation hole, the actual protection level can be up to IP40, the protection performance is far ahead of similar products.

**Laminated Structure**

BUS capacitor board and POWER motherboard laminated design. The BUS capacitor board is arranged in an independent cooling air duct to effectively dissipate heat.

The new design of laminated bus can reduce stray inductance, reduce peak voltage and protect IGBT. At the same time, compact structure, save installation space.

**High Protection Structure Design**

The inlet and outlet of the copper bar are closed with rubber rings, which can effectively isolate the external dust and corrosive gas.

Epoxy partition is added to isolate the circuit installation area and form an independent internal space to avoid damage to the circuit board from the external environment and extend the service life.

**EMC Design**

With the surge current absorption circuit, can inhibit the surge current when the power input

Ac input reactor, AC output reactor or DC reactor can be selected to greatly reduce harmonic current

EMC filter is optional to reduce interference to external equipment and meet C2 international standards

**Long Life Design**

The key components are all made from the industry's first-class manufacturers, with long design life

The components can be comprehensively monitored.

When the life of any component is about to expire, the frequency converter will automatically remind it

**Thermal design and thermal reliability**

Independent air duct: including IGBT, rectifier bridge, electrolytic capacitor

Above 25Hz, it adopts low loss design. Peak and trough of wave 1/6 cycle non-chopper to enhance local heat dissipation design

Parts strictly adopt international standards, type test main test content

Details	Absolute allowable temperature
Transformer, IC, rectifier bridge	125 °C
Electrolytic Capacitors	95°C
Contactors	130°C
PCB	120°C
Charging resistor	180°C
IGBT heat sink	85°C

VFD Temperature test: 40°C

Exfactory aging test: high temperature 60°C

**Three Anti-paint Automatic Spraying Process**

Three anti-paint automatic spraying equipment, according to the layout characteristics of the circuit board programming spraying path, to ensure that the coating is comprehensive, uniform, good consistency. Thickened coatings can be ordered for use under particularly harsh conditions

**Wide Voltage Input Range**

Wide voltage input range in line with international standards, allowing appropriate voltage fluctuations

Rated voltage 3-phase 380-480V, 50Hz/60Hz

Allowable voltage fluctuation range: 323V-506V, 50Hz/60Hz



## Product configuration

Electrical characteristics	
Input voltage	AC3PH, 380–480V, 50/60Hz
Output voltage	0–480V, 0.5Hz–400Hz
Control mode	V/F control for constant torque, V/F control for quadratic load, vector control without PG, Energy-saving mode
Switching frequency	1.5kHz~12kHz, according to junction temperature automatically reduce the switching frequency
Overload capacity	150% of rated out current for 60s, 200% of rated output Current for 2s

Control signal		
Frequency setting signa	Integrated operation keypad	Film switch (Press button), speed control knob (potentiometer)
	Outside signal	Given UP/DOWN, analogue input, multi-speed, remote keypad and series communication
Start & Stop control signall	Integrated operation keypad	Press button of 'RUN' and 'STOP'
	Outside signal	Logic input terminal, remote keypad and series communication

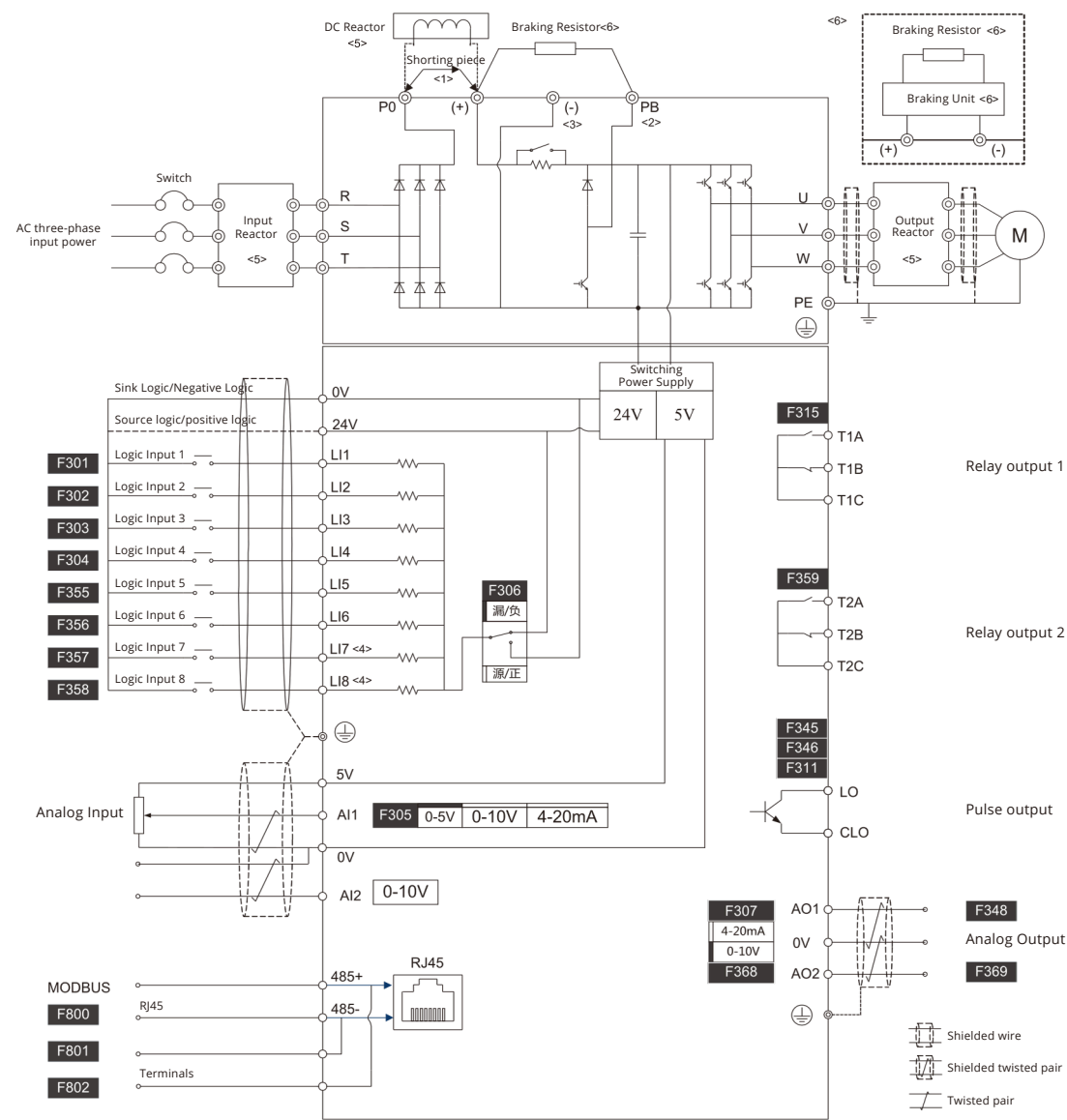
Protection function	
Protection for VFD	Input phase failure, output phase failure, under load monitor, over torque, under voltage, over current, over heat, short circuit among three phases
Protection for motor	Motor overheat, motor current limiting amplitude, motor over load, motor short circuit

Environment characteristics			
Ingress protection	IP20	Humidity	No condensed water or drip at 5~95%. In accordance with IEC60068-2-3 Installation place Altitude
Work temperature/storage temperature	-10~50℃/-20~60℃	Installation place	Room
Cooling method	Forced Air cooling	Altitude	1000m or below (Derating is necessary when the altitude is higher than 1000m)

Control circuit characteristics		
Available inside power supply	5V 24V	5V DC 5%, maximum current 10mA, it is used for benchmark potentiometer 24V DC 5%, maximum current 100mA, it is used for logic input entrance
Analog input	AI1	Voltage analog input: 0–5V DC or 0–10 V DC, Impedance is 30kΩ Current analog input: 0.4–20mA DC, impedance is 250Ω Resolution: 10 digital A/D switch Factory default set: 0–5 V DC voltage input
	AI2	Voltage analog input: 0–10V DC or PTC probe input Resolution: 10 digital A/D switch
Logic input	LI1–LI8	0–24V DC power supply Positive logic (source) and negative logic (sink) are optional. Factory default set is negative logic. There are 69 functions available such as forward, reverse, run, fault reset, and multi-speed and so on. Only 6 ways below 11KW (including): LI1–LI6
Logic input	AI1, AI2	AI1 and AI2 could be set to logic input for Pro frequency inverter with power below (including) 11 kW.
	Mandatory effective input	F309 and F310 are mandatory effective input. It will guarantee the set function effective during powering on.
Analog output	AO1, AO2	Voltage analog output: 0–10V DC, minimum load impedance is 470Ω Current analog output: 0–20mA, maximum load impedance is 700Ω Resolution: 8 digital
Logic output	L0, CL0	Open collector, maximum current 100mA, maximum voltage 30VDC Optional for logic output or pulse output, factory default is logic output Output frequency, output current and given speed are optional
Relay output	T1A, T1B, T1C T2A, T2B, T2C	T1A constant open, T1B constant close, T1C public Point T2A constant open, T2 B constant close, T 2C public point Touch point capacity: 5A@250VAC, 5A@30VDC Many functions optional such as fault, alarm and set frequency reach
Series communication		2-way RS-485, MODBUS-RTU, RJ45 connection port

Basic application function	
Torque raise at low frequency	To improve low frequency torque about 0.1%–30% under V/f control and sensorless speed vector control through raising voltage and torque.
V/f curve	Linear type or multi-point type
Acceleration and deceleration curve	Linear type or Model S acceleration and deceleration; Three groups acceleration and deceleration time: Acceleration and deceleration time range: 0–3200s.
AVR	When network voltage changes, it could keep constant output voltage.
Built-in PID	Convenient to realize process control under close-loop control system.
DC brake	DC brake range: 0– maximum frequency; brake time: 0–20.0s; brake action current value: 0–100%.
Jog control	To realize instant start and instant stop; jog frequency setting range: 0–20Hz; jog stop type: freedom/DC brake
Jump frequency	Available to set three jump frequency points and related jump frequency ranges
Multi-speed	Available to set 15 running frequencies through logic input terminals
Input sum	The algebraic operation of 2-way analog input is used as frequency setting to make frequency setting more intelligent
Two sets of motor parameter switch	Available to set two sets of motor parameter and could freely switch each other in order to match currently droved motor.

## Wiring diagram

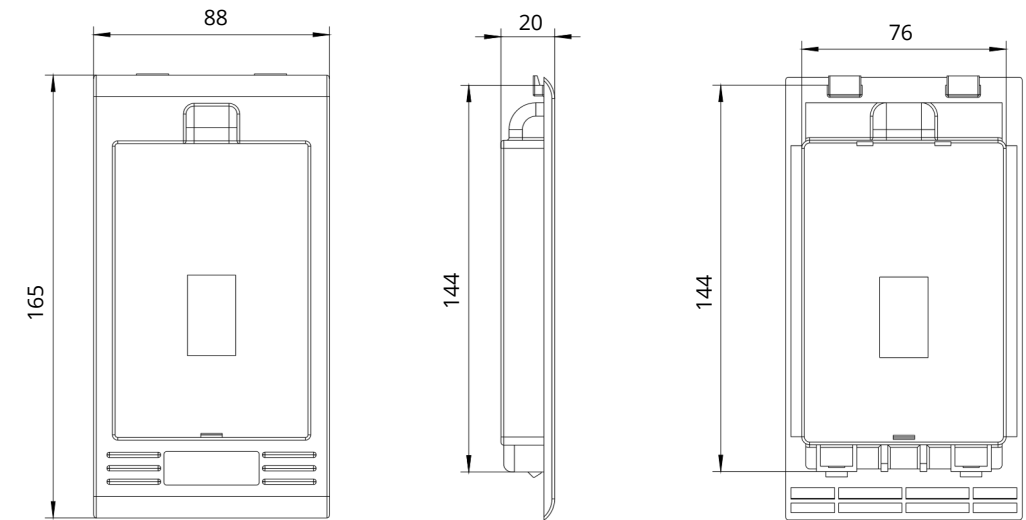


- 0.75–37kW inverters do not have P0 terminals: for inverters above 45kW (inclusive), be sure to remove the short-circuit between P0 and (+) when installing the DC reactor (optional). Only 0.75–37kW inverters have PB terminals, and a brake resistor can be connected between PB and (+). For inverters above 45kW (inclusive), a brake unit and a brake resistor are required for braking.

- 0.75–11kW inverters do not have (-) terminals.
- 0.75–11kW inverters do not have LI7 and LI8 terminals.

● Input reactors and DC reactors: They can suppress harmonic currents on the input side, improve the power factor, and weaken the impact of surge voltage and current in the input circuit on the inverter, weaken the impact of power supply voltage imbalance, and reduce the failure rate of the inverter. Output reactor: Compensate for the charging and discharging effects of the distributed capacitance when the motor is running with a long cable, and avoid overcurrent of the inverter; effectively suppress the voltage spike of the PWM wave at the motor end, reduce the adverse effects on the cable insulation and motor insulation, and extend the life of the equipment.  
 Braking unit, braking resistor: consume the feedback energy during rapid shutdown, and avoid overvoltage faults of the inverter during rapid shutdown.

## Keypad size



## LCD display operation panel (optional)



The dimensions of the LCD display operation panel are the same as those of the digital display panel of the inverter.

Features are as follows:

- Extra large LCD display screen, clearer display
- With multi-line display function, multiple operating information can be monitored at the same time
- Super intelligent English display, more suitable for international applications

The CT3000Pro/FP Series inverter operation panel can realize functions such as status display, frequency setting parameter setting, start and stop control, etc. It can also be used as an external panel. When the operation panel is used as an external panel, the maximum distance can reach 100 meters.

Note: The operation panel of the CT3000Pro/FP Series 0.75kW–11kW inverter cannot be externally connected, and the operation panel information is only applicable to 15kW–800kW inverters.



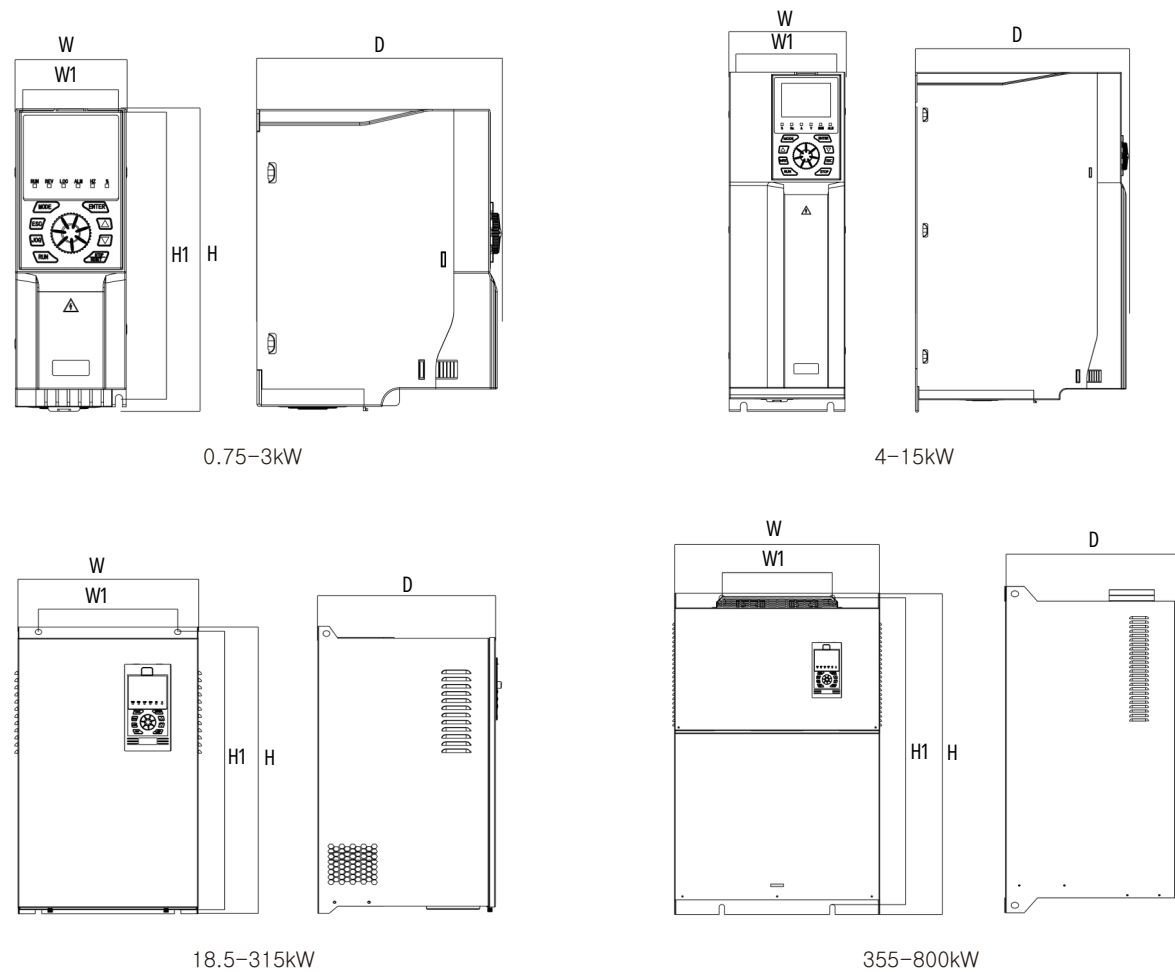
## Model discription

CT3000Pro - T3 - 11 G / 15 P

①      ②      ③ ④      /      ③ ④

① Product Series	② Supply Voltage	③ Applied Motor Power	④ Load Type
CT3000Pro: General Used VFD	T2: input 3ph 220V output 3ph 220V  T3: input 3ph 380V output 3ph 380V  S2: input 1ph 220V output 3ph 220V  S3: input 1ph 220V output 3ph 380v	0R7: 0.75kW 1R5: 1.7kW 2R2: 2.2kW 3: 3kW 4: 4kW ... 400: 400kW 700: 700kW 800: 800kW	G: Heavy load P: Light load

## Appearance size



## Model selection

Model(380V)	G Type (Heavy load) Pro			P Type (Light load) FP			Dimension (H*W*D mm)	Installation size (H1*W1 mm)
	Rated Input Current(A)	Rated Output Current(A)	Motor Power (KW)	Rated Input Current(A)	Rated Output Current(A)	Motor Power (kW)		
CT3000Pro-T3-0R7G	3.6	2.6	0.75	6.4	4.1	1.5	206*76.5*165	195*66.5
CT3000Pro-T3-1R5G	6.4	4.1	1.5	8.7	5.5	2.2		
CT3000Pro-T3-2R2G	8.7	5.5	2.2	10.9	6.9	3		
CT3000Pro-T3-3G	10.9	6.9	3	14	9.5	4	262*100*168	253*90
CT3000Pro-T3-4G	14	9.5	4	20.7	12.6	5.5		
CT3000Pro-T3-5R5G	20.7	12.6	5.5	26.5	18.5	7.5		
CT3000Pro-T3-7R5G	26.5	18.5	7.5	36.6	25	11	340*118*214	341*106
CT3000Pro-T3-11G	36.6	25	11	40	32	15		
CT3000Pro-T3-15G	40	32	15	47	38	18.5		
CT3000Pro-T3-18G	47	38	18.5	56	45	22	335*200*195	321*140
CT3000Pro-T3-22G	56	45	22	70	60	30		
CT3000Pro-T3-30G	70	60	30	80	75	37		
CT3000Pro-T3-37G	80	75	37	94	92	45	410*260*214	396*180
CT3000Pro-T3-45G	94	92	45	128	115	55		
CT3000Pro-T3-55G	128	115	55	160	150	75		
CT3000Pro-T3-75G	160	150	75	190	180	90	600*310*310	583*240
CT3000Pro-T3-90G	190	180	90	225	215	110		
CT3000Pro-T3-110G	225	215	110	265	260	132		
CT3000Pro-T3-132G	265	260	132	310	305	160	720*355*345	698*240
CT3000Pro-T3-160G	310	305	160	355	350	185		
CT3000Pro-T3-185G	355	350	185	385	380	200		
CT3000Pro-T3-200G	385	380	200	430	425	220	920*480*390	898*320
CT3000Pro-T3-220G	430	425	220	485	480	250		
CT3000Pro-T3-250G	485	480	250	545	530	280		
CT3000Pro-T3-280G	545	530	180	610	600	315	1100*480*405	1078*320
CT3000Pro-T3-315G	610	600	315	665	650	355		
CT3000Pro-T3-355G	665	650	355	-	-	-		
CT3000Pro-T3-400G	785	725	400	-	-	-	1100*650*465	1060*350
CT3000Pro-T3-500G	890	860	500	-	-	-		
CT3000Pro-T3-560G	950	950	560	-	-	-		
CT3000Pro-T3-630G	1100	1100	630	-	-	-	2200*1100*800	943*665
CT3000Pro-T3-710G	1280	1280	710	-	-	-		
CT3000Pro-T3-800G	1380	1380	800	-	-	-		