Customer hotline: *400-619-2001*

EXCELLENT & SMART

**Create a better life with smart drive**

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CUMARK

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CUMARK



# ES series

## 1140V Three-level High-performance En-gineering Frequency Conversion Drive with Explosion-proof Core



Official website

WeChat public platform

# ES Series Inverter

## *Excellent & Efficient*
## *Intelligence Drives the Future*

Cumark elaborately produces ES series high-performance vector frequency converters, based on many years of experience accumulation in electric drive R&D and various industrial automation applications, in combination with internationally first-class drive technologies.

ES series products can meet industrial control demands from different fields under severe environments with their high performance, rich functions and perfect structures, and provide all-round competitive advantages including excellent quality, friendly human-machine interface, and convenient services.

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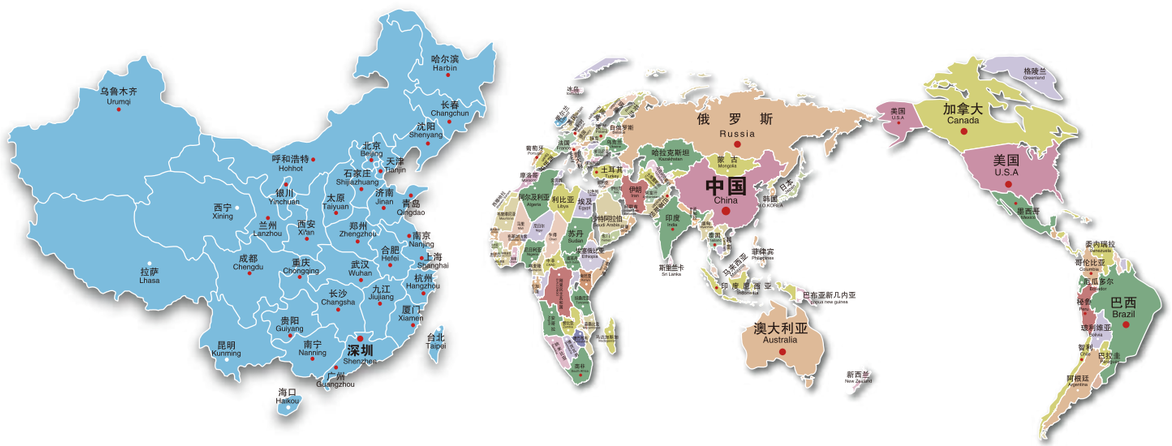

## Company Profile



SHENZHEN CUMARK SCI.& TECH CO.,LTD. was founded on March 19, 2001. It has been focusing on R&D, production and sales of power electronic transmission and automation products . It is a national high-tech enterprise and awarded as "special frequency conversion engineering technology R&D center of Guangdong Province". It relies on excellent technology and many years accumulated industry application experience, and provides users with efficient and reliable intelligent drive products and complete automation solutions.

CUMARK' s high, medium and low voltage series of intelligent frequency inverters and their relatd automation integrated products have a wide range of application prospects. They can be widely used in CNC machine tools and robots, marine engineering equipment, ships, rail transit equipment, Energy-saving and new energy vehicles, agricultural machinery and equipment, logistics and warehousing, electric power, coal, petrochemical, chemical, environmental protection, pharmaceuticals, non-ferrous metals, steel and other fields can help manufacturers improve equipment automation, energy conservation and efficiency, and reduce production costs, help the equipment manufacturing industry products green and intelligent upgrades and improve market competitiveness.

## Cumark global service network



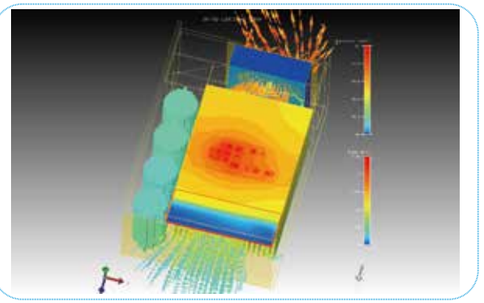

## 1140V three-level variable frequency drive explosion-proof variable frequency core product list

| Type | Performance | Target market | Series | Appearance |
|---|---|---|---|---|
| 1140V Three-level High-performance En-gineering Frequency Conversion Drive | 1）Support SVC and FVC vector control ;<br>2）Support permanent magnet synchronous motor/ asynchronous motor control ;<br>3）Can be externally connected to a large screen LCD keyboard ;<br>4）Three level output with low harmonic content, reducing usage The cost of filters;<br>5）Reduce the rate of output voltage change (du/dt) and minimize insulation damage to the motor;<br>6）Reduce the common mode voltage of the motor and decrease the shaft current<br>7）All DI terminals support PNP and NPN input types, and DI7 supports high-speed input at 50kHz;<br>8）Standard magnetic flux braking function ;<br>9）Carrier frequency can be intelligently adjusted according to temperature ; | Oilfield equipment;<br>Belt transmission;<br>Coal mining equipment;<br>Mining card fan;<br>Electric locomotive;<br>Wind power equipment;<br>Upgrade equipment;<br>Air compression;<br>Ship Machinery;<br>Rubber Machinery;<br>Flywheel energy storage;<br>Winch equipment;<br>wait. | ES850L-15/16 （Air cooling）<br>1140V 3PH 250~710kW<br>Other powers can be customized |  |
| 1140V Three-level High-performance En-gineering Frequency Conversion Drive | 1）Support SVC and FVC vector control ;<br>2）Support permanent magnet synchronous motor/ asynchronous motor control ;<br>3）Can be externally connected to a large screen LCD keyboard ;<br>4）Three level output with low harmonic content, reducing usage The cost of filters;<br>5）Reduce the rate of output voltage change (du/dt) and minimize insulation damage to the motor;<br>6）Reduce the common mode voltage of the motor and decrease the shaft current<br>7）All DI terminals support PNP and NPN input types, and DI7 supports high-speed input at 50kHz;<br>8）Standard magnetic flux braking function ;<br>9）Carrier frequency can be intelligently adjusted according to temperature ; | Oilfield equipment;<br>Belt transmission;<br>Coal mining equipment;<br>Mining card fan;<br>Electric locomotive;<br>Wind power equipment;<br>Upgrade equipment;<br>Air compression;<br>Ship Machinery;<br>Rubber Machinery;<br>Flywheel energy storage;<br>Winch equipment;<br>wait | ES850L-15W/16W<br>（water cooling）<br>1140V 3PH 250~710kW |  |
| with Explosion -proof Core | 1）Integrated miniaturization design: suitable for 1140V explosion-proof frequency converters;<br>2）High component quality: The main components of the frequency converter are all from well-known domestic and foreign brands, ensuring reliable operation in harsh working conditions;<br>3）Complete protection functions: The frequency converter has reliable protection functions such as short circuit, overload overvoltage, undervoltage, phase loss, overheating, etc. to ensure the safe operation of the frequency converter and the dragged motor;<br>4）Direct torque control: high control accuracy, fast dynamic response speed, high starting torque<br>5）Cooling method: water-cooled/air-cooled; | Belt transmission;<br>Coal mining equipment;<br>Electric submersible oil pump;<br>Roadheader;<br>1140V mining frequency converter;<br>wait. | BP850L-15E/16E<br>（with Explosion–proof Core）<br>1140V 3PH 250~710kW |  |

# High Reliability

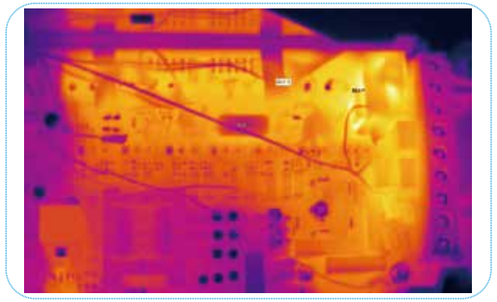
## Innovative Thermal Design Philosophy and Professional Thermal Simulation Analysis

- The innovative thermal design philosophy and first-class efficient thermal simulation software bring about the innovative and unique design, which provides this product with a comprehensive and systematical heat dissipation structure and solution.
- Advanced heat test and verification technologies like thermal imaging efficiently and completely check theoretical results of the thermal design, and further guarantee thermal reliability of the product system.



## Rigorous Temperature RiseTest on the Whole Converter

- Rigorous testing procedures for full load and overload verification as well as strict temperature rise acceptance standards for key componentsare adopted to enable the product to operate reliably under extreme overload conditions for a long time.
- High temperature aging testing with 120% at 40℃
- All products shall pass the loaded high temperature aging test before delivery, which can effectively prevent scattered components from being invalid, and guarantee product quality.



## Spraying Process of Conformal Coatings

- Multiple high-quality conformal coatings are sprayed to enhance the product's good applicability to the environment.
- The automatic spraying process of conformal coatings is adopted to effectively ensure uniform coating thickness of the circuit board and consistency of batched products.



Note: The automatic spraying process of conformal coatings



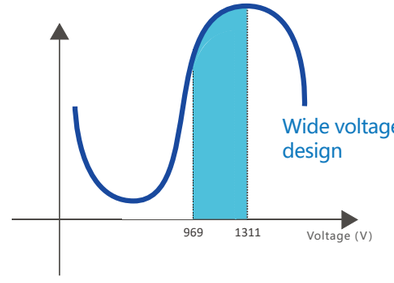
## High Anti-interference Capability

- Standard configuration with optimized design AC input reactor (additional purchase), reducing high-order harmonics and external conducted radiation interference, enhancing grid adaptability effective



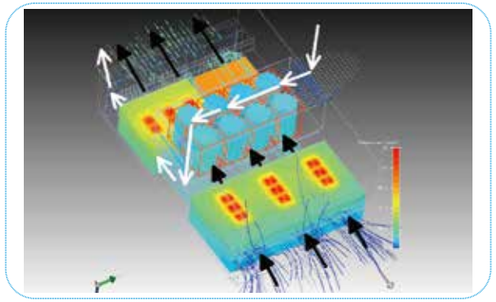
## Wide Voltage Range Design

- Rated voltage: three-phase 1140V
- Voltage frequency:50-60Hz±5Hz
- Allowable voltage fluctuation: -15% to +15%




## Innovative and Independent Air Duct Design

- The design can effectively prevent dust and other foreign matters from entering the inside of the frequency converter,thereby avoiding faults caused by electric short circuits and damaged components.
- Electronic components are separated from the main cooling system by the poor conductor or wind screen, to avoid component failuresdue to too high temperature caused by heat radiation from the main-power radiator.

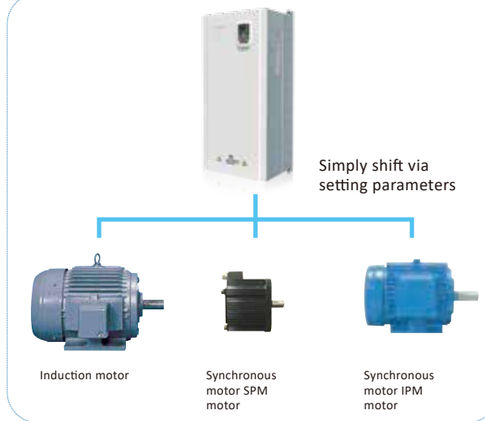


## Selection and Design of Key Components

- Strict component selection testing procedures are adopted.All power components such as the rectifier bridge, IGBT and electrolytic capacitor use mainstream products of the first-class manufacturers. Performance and reliability of key components are guaranteed from selection to manufacturing
- Large allowance and derating design ensures reliability of key components.

## Comprehensive Motor Drive Technology

- Supports drive control for all (three-phase asynchronous permanent magnet synchronous) motors supports speed torque control mode Frequency Converter with Synchronous Motor Has Better Energy Saving Effect




## Accurate and Comprehensive Auto-turning Function

- can accurately perform self-learning of motor parameters Easy to debug Provide higher control accuracy and response speed.
- Comprehensive and rich self-learning features Includes multiple motor selflearning functions.

| Motor Comprehensive Auto-turning | |
|---|---|
| Rotary Auto-turning | Mostly suitable in applications of high starting torque, high speed and high control precision. |
| Static Auto-tuning | Mostly suitable in applications of commissioning when the motor and handling machines are connected. |

## Rich Fieldbus Communication

- Built in RS-485
- Built-in Modbus-RTU as standard
- Support several kinds of field bus communication protocols(PROFIBUS-DP、CANopen、Profinet、EtherCAT)

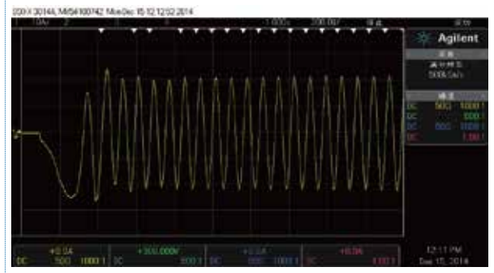





Turn complex into simple, computer monitoring software

## Large Startup Torque

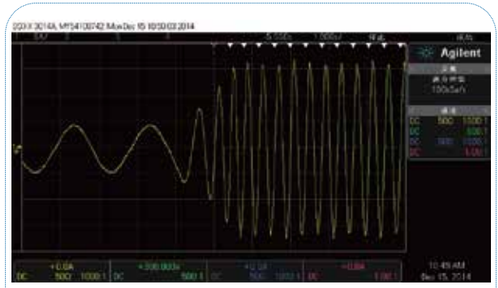
- Synchronous motor
  Open-loop vector : 0.5Hz/200%
  Close-loop vector : 0Hz/200%
- Asynchronous motor
  Open-loop vector : 0.25Hz/200%
  Close-loop vector : 0Hz/200%



280kW asynchronous motor 150% load fast start current waveform

## Fast Torque Response, Low Torque Pulse

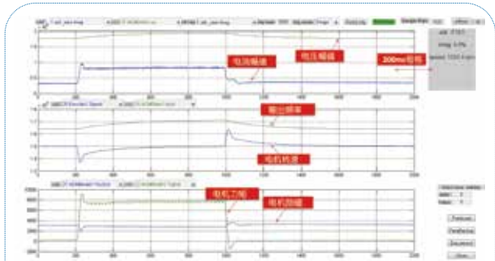
- Torque response open-loop vector : <20ms
- Torque response close-loop vector : <5ms
- The device can run steadily with load at a ultra-low speed of 0.01Hz. The low torque pulse ensures stable running.



Current waveform of 280kW asynchronous motor with 0.5Hz sudden increase of 150% load

## Wide Speed Range, High Steady-speed Precision

- Speed range :
  Open-loop vector : 1 : 200
  Close-loop vector : 1 : 3000
- Steady-speed precision :
  Open-loop vector : 10% rated slip
  Close-loop vector : ± 0.01%



Waveforms of different key signals when the 280kW asynchronous motor is suddenly loaded or unloaded with 150% load at 1500 rpm in the open-loop state (data is collected from the frequency converter and the background tool of the computer only receives data and generates waveforms)

## High Overload Capacity

- Run for 60s at 150% rated load

## LCD Smart Keyboard Adopted in Standard Configuration

- Large-text and multi-function Chinese or English LCD display for faster and more accurate parameter settings.
- Detailed status display for monitoring and setting.
- Detailed diagnosis information. Status information and waves of key nodes, fault records, and diagnosis information can be viewed for fault query and maintenance.
- Automatically setting of optimum parameter values. With the usage selection function, users need to only select the mechanical function. Then, the device automatically sets parameters to optimum values, thereby eliminating tedious parameter settingand shortening trial run time.
- Storage of application parameters of up to 4 user groups, which is convenient for fast process switching.
- Reliable built-in parameter backup &duplicating function.
- Built-in parameter change logging function.
- LCD keyboard can be imported externally




## Rich Extension Functions

- Built in RS-485 communication interface.
- Support several kinds of field bus communication protocols
- Support various PG cards.

  Support collector open encoder, differential output encoder, rotary-transformer-type encoder,and sin-cos encoder.



## Rich I/O Interfaces

- Type of Terminals Qty Characteristics

| | | |
|---|---|---|
| Digital input | 7 | Maximum input frequency:1kHz, compatible with NPN and PNP input types |
| High-speed pulse input | 1 | Maximum input frequency: 50kHz, compatible with NPN and PNP input types |
| Analog Input | 3 | 0~10V, -0~ +20mA |
| Digital output | 2 | Maximum output frequency: 1kHz |
| High-speed pulse output | 1 | Maximum output frequency: 50kHz |
| Analog output | 2 | 0~10V, 0~20mA |
| Relay output | 2 | 3A/250VAC,1A/30VDC, normally open+normally close |

## Systematic and Comprehensive Protection Functions

- Frequency converter protection function: short circuit protection, overcurrent protection, overvoltage protection, under-voltage protection, input & output phase loss protection, overload protection and overheat protection.
- Motor protection function: overload protection and motor temperature protection.

## Naming Rules

ES XXX - XX - XXXG - 11

- ES: Water-cooled/air-cooled transmission product series
- BP: Explosion-proof frequency conversion movement

- ES: Water-cooled/air-cooled transmission product series
- 850L: Three-level High-performance Engineering Frequency Conversion Drive with Explosion-proof Core

Voltage class : three phase 1140V

Overall dimensions

Air cooled frequency converter
15:The first external dimension structure
16:The second external dimension result

Water cooled frequency converter
15W:The first external dimension structure
16W:The second external dimension result

Explosion proof variable frequency movement
15E:The first external dimension structure
16E:The second external dimension result

Rated power in general applications

| | | | | | |
|---|---|---|---|---|---|
| 250G | … | 500G | … | 710G | … |
| 250kW | … | 500kW | … | 710kW | … |



# Technical Data

| Item | | Specification and Technical Data |
|---|---|---|
| Main power connection | Input voltage U1 | AC 3PH 970V~1310V rated voltage：1140V； |
| | Input frequency f1 | 50...60Hz ±5Hz |
| | Output voltage U2 | 0...U1 (V)(The maximum output voltage equals the input power voltage.) |
| | Output frequency f2 | 0-599Hz |
| | Carrier frequency | 2-8 K (The device can intelligently and automatically make optimal adjustment according to load characteristics and drive temperature.)Consult manufacturers for higher carrier frequencies |
| | Input voltage unbalance degree | Maximum: ±3% of rated inter-phase input voltage |
| | Efficiency | ≈ 98% (when operating at rated power) |
| Basic functions | Speed range | 0~599Hz（0 ~18000 rpm，optional36000 rpm） |
| | Resolution of given speed | Digital setting: 1RPM<br>Analog setting: 0.025% of maximum RPM |
| | Control mode | SVC control / FVC vector control |
| | Starting speed | 200% @ 0.25Hz @ Open loop (SVC)<br>200% @ 0Hz @ Close loop (FVC) |
| | Speed ratio | 1:200 @ Open loop (SVC)<br>1:3000 @ Close loop (FVC) |
| | Steady-speed precision | ±0.5% @ Open loop (SVC)<br>±0.01% @ Close loop (FVC) |
| | Overload capacity | 150% rated current 60S @ 40 ℃In other cases, the duration depends on the temperature of the transmission. |
| | Torque boost | Automatic torque boost. Manual torque boost 0.1-30% |
| | Acceleration and deceleration curves | straight-line or S-curve acceleration and deceleration mode<br>Two acceleration time values. The acceleration and deceleration time range : 0.0s-6500.0s |
| | Simple PLCfunction | Achieve operationof up-to-16-stages speed(Implemented through built-in PLC or control terminals) |
| | Built-in PID | Conveniently achieve the process control close-loop control system |
| | Automatic voltage regulation (AVR) | When the grid voltage changes, the device automatically maintainsconstant output voltage. |
| | Overvoltage and overcurrent stall control | The current and voltage are automatically limited during running to avoid jump faults due to frequent overcurrent and overvoltage |
| Enhancements | Torque limiting and control | The torque is automatically limited operating (to avoid frequent overcurrent jumping fault due to too large torque). |
| | Protection function | Output shortcircuit protection, input & output phase loss protection, overcurrent protection, overvoltage protection,undervoltage protection, overheat protection, overload protection, brake chopper overload protection, brake chopper shortcircuit protection, brake resistor overload protection etc. |
| | Non-stop during transient interruption | When the power grid suddenly loses power or drops abnormally, the frequency inverter can be maintained to continue running, and the duration depends on the mechanical inertia of the load at the moment of operation |
| | Speed tracking restart | Asynchronous motor speed tracking start can be realized ( standard ) and synchronous motor speed tracking start ( optional) |
| | Timing control | Timing control function. The time range and precision is 0.0-6500.0(min). |
| | Switching multiple motors | Support switching among four groups of motor parameters. |
| | Bus communication | The standard configuration uses the built-in Modbus,communication, which can be extended to （Profibus-DP、CANopen、Profinet、EtherCAT）bus communication. Etc. |
| | Intelligent temperature control | Full cover system temperature testing, intelligent real-time IGBT chip temperature monitoring, and intelligent and optimized adjustment of the carrier and current based on drive temperature changes |
| | Type of encoders supported | Support differential encoders, collector open encoders, rotary transformer encoders , and Sin-Cos Encoders |
| | Communication linkage synchronization | Easily realize multi-motor synchronous transmission, and can freely choose to realize the linkage balance of multi-motor by current, torque or power. |
| | Debug window | Visual parameter debugging, fault display and waveform monitoring can be easily realized through the PC terminal etc. |

| Item | | Specification and Technical Data |
|---|---|---|
| I/O Input Output Interface | Command input mode | Control keyboard input, control terminal input, bus communication input, which can be switched mutually. |
| | Speed reference mode | Digital giving, analog voltage (current) giving, pulse giving, bus communication giving and PID giving, which are mutually switched. |
| | Input terminal (input) | The following are standard：<br>7 digital input terminal Among DI7 Supports up to 50 High-speed pulse input at KHz<br>3 analog input terminals (with at least 2 supporting 0-10V electricity<br>Input or0-20mA or 4~20mA current input) |
| | Output terminal (output) | The following are standard:：<br>Two digital output ports , DO2 supports high-speed pulse output, the highest frequency is 50kHz;<br>2 relay output terminals ;<br>2 analog output terminals (0V~10V voltage output or 0~20mA or 0~20mA current output) |
| Display and control | Man-machine interface | Standard intelligent LCD keyboard |
| | Parameters duplicating | Rapidly duplicating parameters via the LCD control keyboard |
| Application environment | Application site | Indoor, free of direct sunshine, dusts, corrosive gases, flammable gases, oil mist, water vapor, drip or salts |
| | Altitude | 0-1000m; 1000-4000m, for every 100m increase in sea level, the capacity decreases by 1% (more accurate values need to be consulted with professionals) |
| | Operation ambient temperature | -10C to+40C (When the ambient temperature is between 40C and 55C, the transmission will automatically derate for self-protection) |
| | Relative humidity | Less than 95%RH. No droplets condensed (condensation) |
| | Sinusoidal vibration | (IEC 60068- 2/ - 6.TestFc)<br>Max.0.1mm (10 to 57Hz) ; max.10m/$S^2$ (57 to 150 Hz) sinusoidal vibration (F8-F9) |
| | Impact | Not allowed (during operation); maximum 100m/$S^2$, 11ms (during storage and transportation with packing) |
| | Storage & transportation temperature | -40℃ to+70℃ (-40 to+158°F) |
| Protection grade | | Movement： IP00<br>Standard machine： IP20 |
| Cooling mode | | Water cooling or air cooling options |
| Application standard | | IEC 61800-3 , IEC 61800-5-1 ; GB12668 (see the nameplate for details). |

## main loop and user interface

| Terminal marking | Terminal Function Description |
|---|---|
| R、S、T | Three-phase AC input |
| U、V、W | Three-phase AC output |
| DC+、DC- | DC bus output (standard model support) |
| ⏚ | Earth terminal |

## Rated voltage of air-cooled frequency converter 3ph 1140V

| Model Code | Rated power | | Rated input current | Rated output curr | Input AC reactance Sensory quantity (Must be equipped) | Output AC reactor inductance (Must be equipped) |
|---|---|---|---|---|---|---|
| | Power(kW) | Voltage(V) | input current(A) | output current(A) | mH | mH |
| ES850L-15-250G-11 | 250 | 1140 | 150 | 160 | 0.42 | 0.13 |
| ES850L-15-315G-11 | 315 | 1140 | 185 | 195 | 0.34 | 0.11 |
| ES850L-15-400G-11 | 400 | 1140 | 235 | 250 | 0.27 | 0.08 |
| ES850L-16-500G-11 | 500 | 1140 | 300 | 310 | 0.21 | 0.07 |
| ES850L-16-630G-11 | 630 | 1140 | 380 | 395 | 0.17 | 0.05 |
| ES850L-16-710G-11 | 710 | 1140 | 430 | 450 | 0.15 | 0.05 |

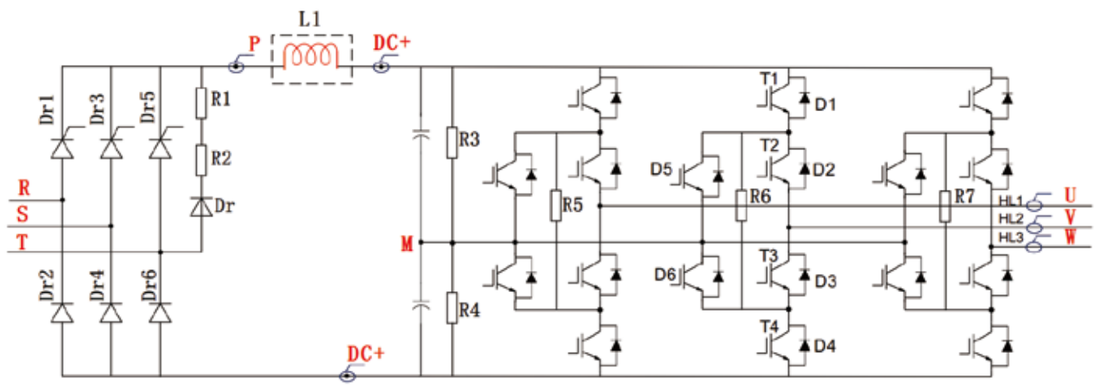
## Rated voltage of water-cooled frequency converter 3ph 1140V

| Model Code | Rated power | | Rated input current | Rated output curr | Input AC reactance Sensory quantity (Must be equipped) | Output AC reactor inductance (Must be equipped) |
|---|---|---|---|---|---|---|
| | Power(kW) | Voltage(V) | input current(A) | output current(A) | mH | mH |
| ES850L-15W-250G-11 | 250 | 1140 | 150 | 160 | 0.42 | 0.13 |
| ES850L-15W-315G-11 | 315 | 1140 | 185 | 195 | 0.34 | 0.11 |
| ES850L-15W-400G-11 | 400 | 1140 | 235 | 250 | 0.27 | 0.08 |
| ES850L-16W-500G-11 | 500 | 1140 | 300 | 310 | 0.21 | 0.07 |
| ES850L-16W-630G-11 | 630 | 1140 | 380 | 395 | 0.17 | 0.05 |
| ES850L-16W-710G-11 | 710 | 1140 | 430 | 450 | 0.15 | 0.05 |

## Explosion proof frequency converter core rated voltage 3ph 1140V

| Model Code | Rated power | | Rated input current | Rated output curr | Input AC reactance Sensory quantity (Must be equipped) | Output AC reactor inductance (Must be equipped) |
|---|---|---|---|---|---|---|
| | Power(kW) | Voltage(V) | input current(A) | output current(A) | mH | mH |
| BP850L-15E-250G-11 | 250 | 1140 | 150 | 160 | 0.42 | 0.13 |
| BP850L-15E-315G-11 | 315 | 1140 | 185 | 195 | 0.34 | 0.11 |
| BP850L-15E-400G-11 | 400 | 1140 | 235 | 250 | 0.27 | 0.08 |
| BP850L-16E-500G-11 | 500 | 1140 | 300 | 310 | 0.21 | 0.07 |
| BP850L-16E-630G-11 | 630 | 1140 | 380 | 395 | 0.17 | 0.05 |
| BP850L-16E-710G-11 | 710 | 1140 | 430 | 450 | 0.15 | 0.05 |

## System principle diagram

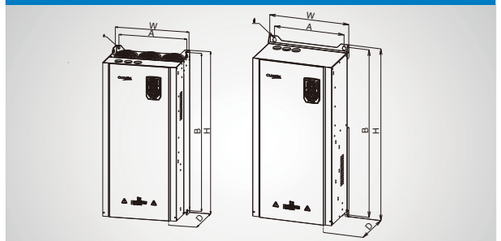






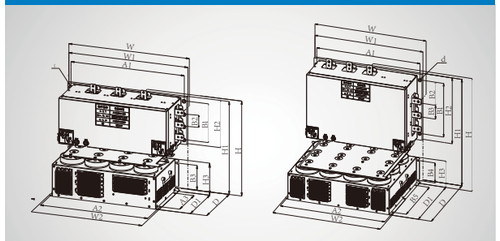

# Installation Dimension

Dimensional drawing of 1140V variable frequency drive cabinet machine



ES850L-15、16　　ES850L-15W、16W

Dimensional drawing of 1140V explosion-proof variable frequency drive core



BP850L-15E　　BP850L-16E

| Rated output curr | Installation hole width spacing A (mm) | Installation hole height spacing B (mm) | Installation hole size d (mm) | Overall width of the machine W (mm) | Overall height H (mm) | The overall appearance of the machine is thick D (mm) | weight(kg) |
|---|---|---|---|---|---|---|---|
| ES850L-15-250G-11 | 460 | 1073 | 13.0 | 500 | 1100 | 362 | 125 |
| ES850L-15-315G-11 | 460 | 1073 | 13.0 | 500 | 1100 | 362 | 130 |
| ES850L-15-400G-11 | 460 | 1073 | 13.0 | 500 | 1100 | 362 | 135 |
| ES850L-16-500G-11 | 580 | 1253 | 13.0 | 620 | 1280 | 362 | 200 |
| ES850L-16-630G-11 | 580 | 1253 | 13.0 | 620 | 1280 | 362 | 220 |
| ES850L-16-710G-11 | 580 | 1253 | 13.0 | 620 | 1280 | 362 | 220 |
| ES850L-15W-250G-11 | 440 | 1060 | 13.0 | 500 | 1096 | 322 | 105 |
| ES850L-15W-315G-11 | 440 | 1060 | 13.0 | 500 | 1096 | 322 | 110 |
| ES850L-15W-400G-11 | 440 | 1060 | 13.0 | 500 | 1096 | 322 | 115 |
| ES850L-16W-500G-11 | 560 | 1280 | 13.0 | 620 | 1316 | 321 | 170 |
| ES850L-16W-630G-11 | 560 | 1280 | 13.0 | 620 | 1316 | 321 | 180 |
| ES850L-16W-710G-11 | 560 | 1280 | 13.0 | 620 | 1316 | 321 | 180 |

Notes: (1) The non explosion proof variable frequency movement should be fixed with 4/6 (ES580L-15W, 16W) screws (or bolts, depending on the size of the driver). Wall mounted is the main application and installation form.

(2) If you need to lift the driver out of the packaging box, you should use a jib crane and consult the manufacturer before placing an order.

| Machine model | Installation hole width spacing (mm) | | Installation hole height spacing (mm) | | | | | Installation hole size d (mm) | Overall width of the machine (mm) | | | Appearance height (mm) | | | | Exterior thickness (mm) | | weight(kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A1 | A2 | B1 | B2 | B3 | B4 | B5 | | W | W1 | W2 | H | H1 | H2 | H3 | D | D1 | |
| BP850L-15E-250G-11 | 600 | 568 | 205 | 65 | 130 | | | 10 | 638 | 630 | 586 | 625 | 492 | 250 | 170 | 328 | 284 | 70 |
| BP850L-15E-315G-11 | 600 | 568 | 205 | 65 | 130 | | | 10 | 638 | 630 | 586 | 625 | 492 | 250 | 170 | 328 | 284 | 70 |
| BP850L-15E-400G-11 | 600 | 568 | 205 | 65 | 130 | | | 10 | 638 | 630 | 586 | 625 | 492 | 250 | 170 | 328 | 284 | 75 |
| BP850L-16E-500G-11 | 650 | 658 | 350 | 151 | 90 | 130 | 400 | 10 | 700 | 680 | 676 | 736 | 695 | 430 | 170 | 528 | 474 | 115 |
| BP850L-16E-630G-11 | 650 | 658 | 350 | 151 | 90 | 130 | 400 | 10 | 700 | 680 | 676 | 736 | 695 | 430 | 170 | 528 | 474 | 125 |
| BP850L-16E-710G-11 | 650 | 658 | 350 | 151 | 90 | 130 | 400 | 10 | 700 | 680 | 676 | 736 | 695 | 430 | 170 | 528 | 474 | 125 |

Notes: (1) The air-cooled frequency converter is a modular frequency converter with a protection level of IP20, suitable for installation in frequency converter cabinets; Water cooled frequency converter is a modular frequency converter that uses water cooling and can be installed in open or completely enclosed frequency converter cabinets. Water cooled frequency converters require external cooling water; The explosion-proof frequency converter core is an IP00 protection level frequency converter that adopts a special installation method.

(2) The explosion-proof variable frequency movement can be installed by hanging on the wall or hanging on the wall with a floor fixed hole. Please consult the manufacturer before ordering.

(3) If you need to lift the driver out of the packaging box, you should use a jib crane and consult the manufacturer before placing an order.

# Optional Accessories

| Legend | Model | Accessory and Main Function |
|---|---|---|
|  | ES-CM-PD | Profibus DP communication card with DB9 pin connection |
|  | ES–CM–PN | Profinet communication card |
|  | ES–CM–ET | EtherCAT communication card |
|  | ES–CM–CAN | Canopen communication card |
|  | ES-PG-OC | Open collector encoder interface card, compatible with 12V power supply, with position control pulse input/output |
| | ES-PG-DF | Differential encoder interface card, compatible with 5V power supply, with position control pulse input/output |
| | ES-PG-DF1 | Differential encoder interface card (supporting 5V/12V) |
| | ES-PG-RT | Rotary transformer encoder interface card with position control pulse input/output |
| | ES-PG-SN | Sine cosine encoder interface card, compatible with 5V power supply, with position control pulse input/output |
| | ES-RU-DTC | Grid voltage acquisition card, after being connected to the grid, is used to detect real-time phase voltage and phase of the grid to achieve the function of variable frequency switching |
|  | ES-PG-SN1 | Sine cosine encoder interface card (subdivision) |
|  | ES-PG-ABS | Heidenhain Absolute Value Encoder |
|  | ES-CP-SU | Control keyboard extension bracket, suitable for LCD keyboard cabinet door installation |
|  | PC Debug software | After installing this software, it is easy to achieve visual parameter debugging, fault display, waveform monitoring, etc. through the PC end |

## Input AC Reactor Selection Table

| Model | Power (kW) | Voltage (V) | Input current (A) | Input communication Inductance of reactor (mH) | Specifications |
|---|---|---|---|---|---|
| CMK-ACT-250-12T | 250 | 1140 | 150 | 0.42 | 0.42mH 150A 1140V H ≤85K |
| CMK-ACT-315-12T | 315 | 1140 | 185 | 0.34 | 0.34mH 185A 1140V H ≤85K |
| CMK-ACT-400-12T | 400 | 1140 | 235 | 0.27 | 0.27mH 235A 1140V H ≤85K |
| CMK-ACT-500-12T | 500 | 1140 | 300 | 0.21 | 0.21mH 300A 1140V H ≤85K |
| CMK-ACT-630-12T | 630 | 1140 | 380 | 0.17 | 0.17mH 380A 1140V H ≤85K |
| CMK-ACT-710-12T | 710 | 1140 | 430 | 0.15 | 0.15mH 430A 1140V H ≤85K |

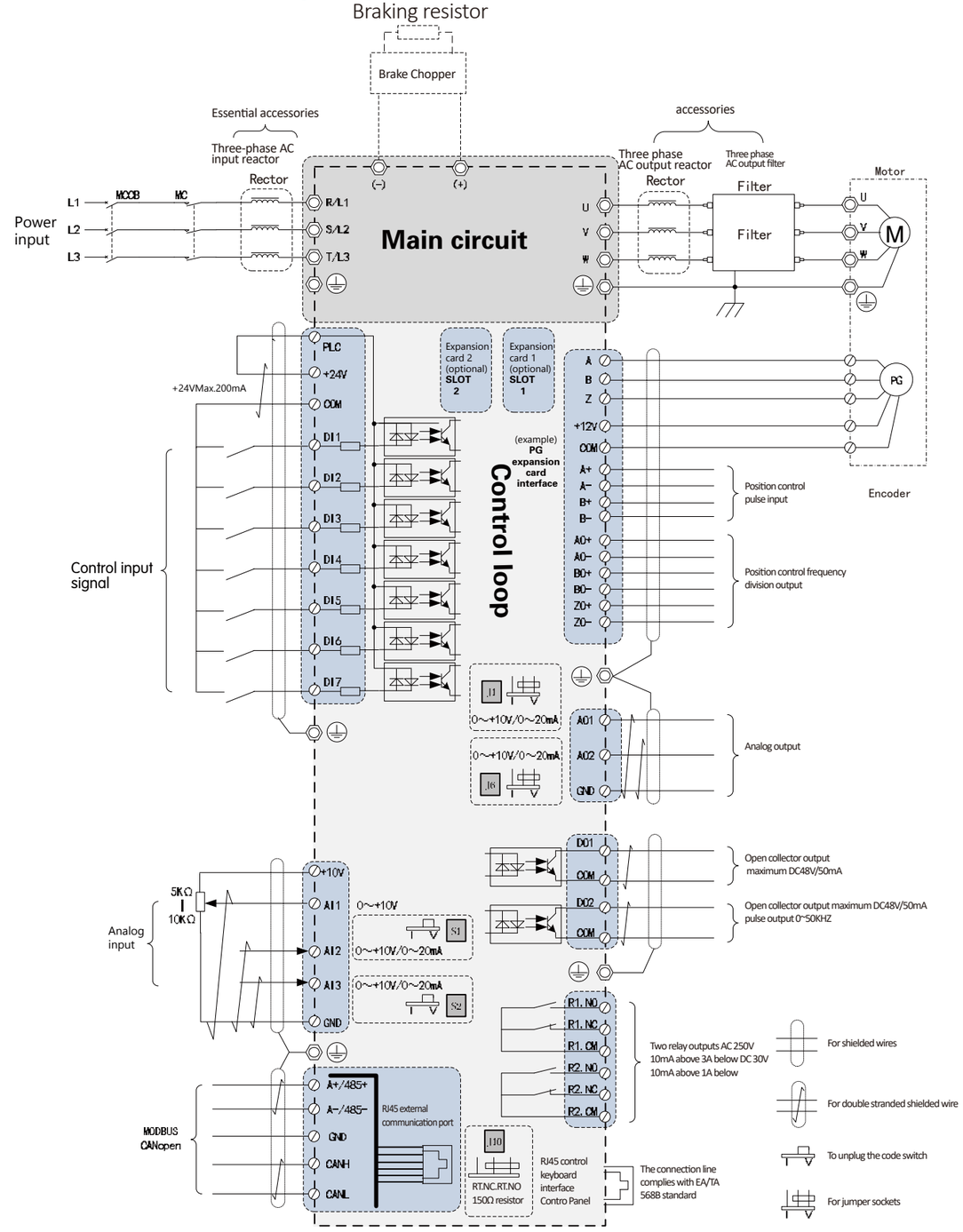
## Output AC Reactor Selection Table

| Model | Power (kW) | Voltage (V) | Input current (A) | Input communication Inductance of reactor (mH) | Specifications |
|---|---|---|---|---|---|
| CMK-OCL-250-12T | 250 | 1140 | 160 | 0.13 | 0.13mH 160A 1140V H ≤85K |
| CMK-OCL-315-12T | 315 | 1140 | 195 | 0.11 | 0.11mH 195A 1140V H ≤85K |
| CMK-OCL-400-12T | 400 | 1140 | 250 | 0.08 | 0.08mH 250A 1140V H ≤85K |
| CMK-OCL-500-12T | 500 | 1140 | 310 | 0.07 | 0.07mH 310A 1140V H ≤85K |
| CMK-OCL-630-12T | 630 | 1140 | 395 | 0.05 | 0.05mH 395A 1140V H ≤85K |
| CMK-OCL-710-12T | 710 | 1140 | 450 | 0.05 | 0.05mH 450A 1140V H ≤85K |



# Standard wiring diagram

## Standard Wiring Diagram （Applicable to 850L ）



# Advantageous Industry Applications

## Lifting Machinery

- ◇ Fast response speed and large startup torque properly alleviate vibrations at startup.
- ◇ Zero-speed clasp brake and zero-speed open brake completely eliminate hook sliding and back flush.
- ◇ ow torque pulse ensures more reliable operation of the device;
- ◇ All-round protection functions (frequency converter, motor, brake unit) and overload torque detection function prevent operations beyond the specification or on a mechanical failure.
- ◇ Compact structural design.
- ◇ The Smart drive function facilitates operations (easy for commissioning and maintenance), and helps save labor costs and time.
- ◇ Intelligent LCD keyboard, real-time monitoring of key information, convenient man-machine interactions are provided.
- ◇ The voltage operation range is wide (-15% to +15%).

### Typical Applications


driving


Winch equipment


Mine hoisting

## Fluid Machinery

- ◇ Intelligent commissioning: Intelligent setting of industry application parameters, intelligent V/F curve setting. Complex commissioning by professionals is not required to save labor and time.
- ◇ Compatible with synchronous motors
  energy greatly Used with synchronous motor, down sizing and light weight, saving
  Used with synchronous motor, down sizing and light weight, saving equipment room
- ◇ Standard input AC reactor, effectively reducing power high-order harmonics and external conducted radiation
  Good human-machine interface
- ◇ Real-time monitoring of key parameters; real-time and multi-line LCD display
- ◇ Speed search function: Rotations in the free running mode can be searched after power failure and startup, implementing easy start up.
- ◇ Greater energy saving effects, minimum unit power consumption in the case of equivalent torques

### Typical Applications





High speed magnetic levitation blower  Air compressor


Fan, pump



## Coal mining and oil extraction

- ◇ Strong low-frequency torque, supports low-speed start-up with empty disk and full load
- ◇ Fast response speed, smooth and fast start stop, acceleration and deceleration processes
- ◇ High speed stability accuracy, constant tension control, and smoother swing rod throughout the entire process
- ◇ High protection level (IP40), structural design on closed circuits and multi-layer three proof paint coating thickening process, more effective protection against metal dust
- ◇ Standard input AC reactor, effectively reducing power high-order harmonics and external conducted radiation
- ◇ Smartdrive function, no need for complex debugging, easy to maintain; Save labor and time
- ◇ Intelligent LCD keyboard, real-time monitoring of key information, convenient human-computer interaction

### Typical Applications


Coal conveyor belt


Oilfield pumping unit


Coal mining machine

## Explosion proof variable frequency movement

- ◇ Integrated miniaturization design: suitable for 1140V explosion-proof frequency converters
- ◇ High component quality: The main components of the frequency converter are all from well-known domestic and foreign brands, ensuring reliable operation in harsh working conditions
- ◇ Complete protection functions: The frequency converter has reliable protection functions such as short circuit, overload overvoltage, undervoltage, phase loss, overheating, etc Protect the safe operation of the frequency converter and the dragged motor
- ◇ Direct torque control: high control accuracy, fast dynamic response speed, high starting torque
- ◇ Cooling method: water-cooled/air-cooled

### Typical Applications


Electric submersible oil pump

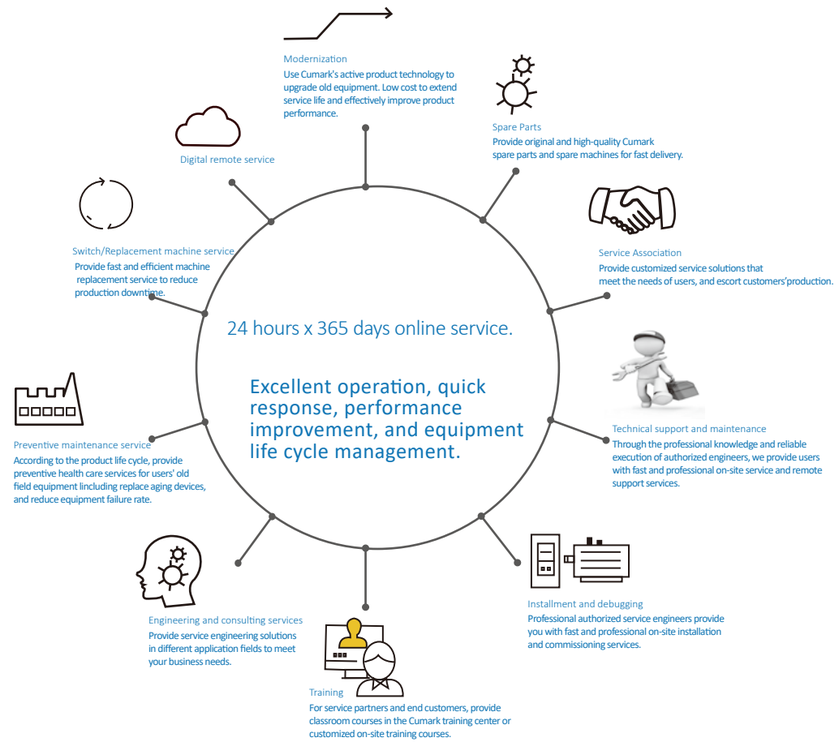

roadheader


1140V mining frequency converter



# Summary of various services

The Cumark technical service teams across China, together with Cumak authorized service partners, provide you with a full range of pre-sales and after-sales technical services. Your success is our goal. Cumark will tailor a full lifecycle management solution for you to escort your business growth.




## Cumark product life cycle management mode

