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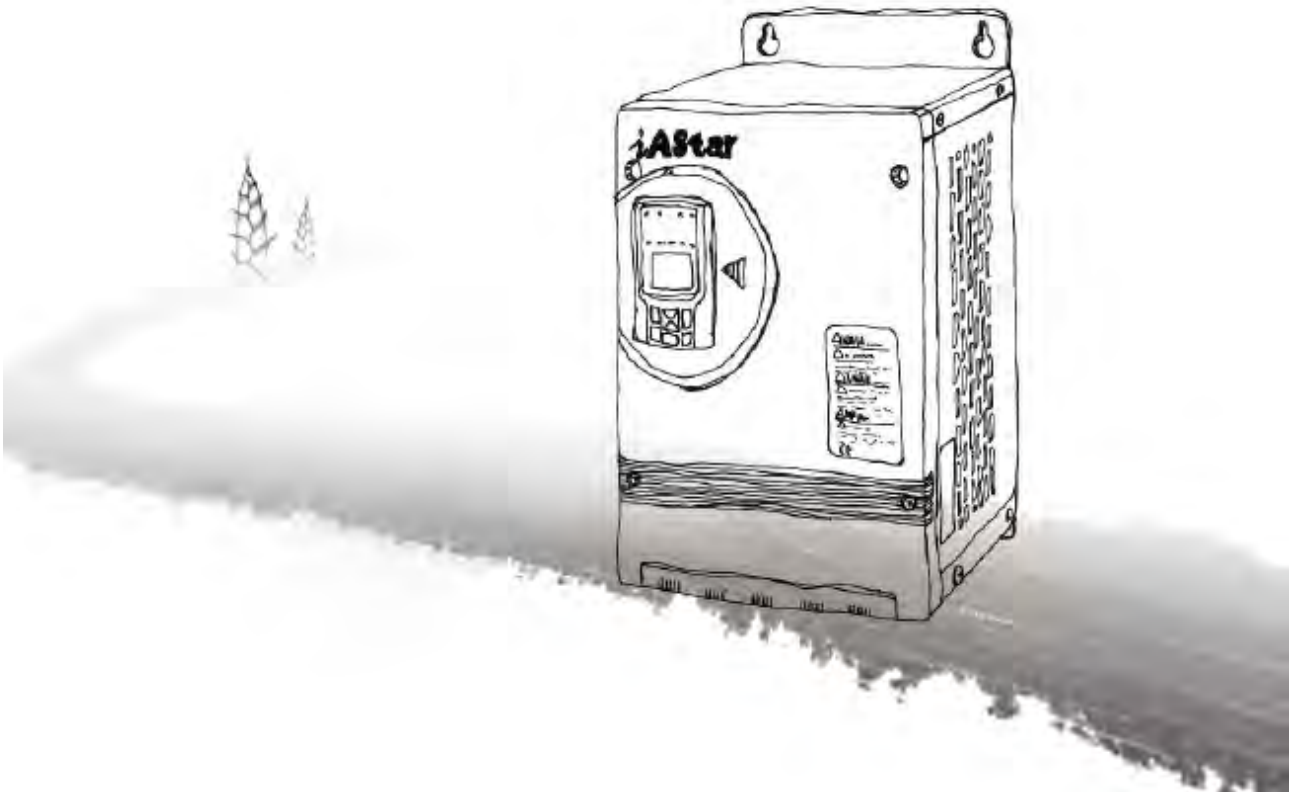
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AS510 Series

Rectifier Feedback Unit – Feedback energy, Regeneration energy



iAStar

With Creative Science and Technology You Will find Such is The World

Company Introduction

Shanghai Sigriner STEP Electric Co., Ltd is a subsidiary of Shanghai STEP Electric Corporation. Shanghai STEP Electric Corporation is an enterprise group and was founded in 1995. The registered trademark is “STEP” and the registered capital 200 million Yuan. STEP Group mainly specializes in R&D, manufacture and sales of control and drive systems, is a high-tech listed enterprise that provides services for global industrial and machinery manufacturing industry. It owns the following subsidiaries in China: Shanghai STEP Elevator Components Co., Ltd., Shanghai STEP Electric Wire & Cable Co., Ltd., Shanghai STEP Software Technology Co., Ltd., Shanghai Sigriner STEP Electric Co., Ltd. and the following overseas companies: STEP Sigriner Elektronik GmbH (Germany) and Hong Kong International STEP Holding Co., Ltd.

STEP came into the A-share market publicly on December 24, 2010 while the opening bell of Shenzhen Stock Exchange was sounded.

Stock: STEP; stock code: 002527.

In 2006, Shanghai STEP Electric Corporation invested in and established the Shanghai Sigriner STEP Electric Co., Ltd, having a modern R&D and manufacture facility of drive product, with area of 30000 square meters, equipped with the first class test instruments and production equipments in the world. And advanced management systems and strict quality controls are implemented to make sure of providing clients with drive products and services of high quality. The company owns various series of products, including high/low voltage fan/pump inverter, high/low voltage vector inverter, four-quadrant inverter, elevator inverter, crane inverter, integrated driving controller, energy feedback unit, door inverter, AC servo system, etc.

As utilization of the STEP global strategy, the products have been exported to over 30 countries and regions in Europe, North America, and Asia. In China, STEP has set up 18 agencies and liaison offices, with sales and services covering the entire country.

STEP insists in the enterprise spirit: Face the world; pursue the best, stay always ahead of the line. It strives to provide the best control, drive and energy-saving products to our customers and benefits the society and the personnel, as well as desires to be an international high-tech enterprise in electric industry step by step!

COMPANY CULTURE

STEP Spirit: Face the world, pursue the best, stay always ahead of the line.

STEP Value: Faith, innovation, excellence.

STEP Tenet: Customer satisfaction, employee pride, community benefit.

STEP Mission: Provide the best control, drive and energy-saving products to our customers, and benefit the society and the personnel.

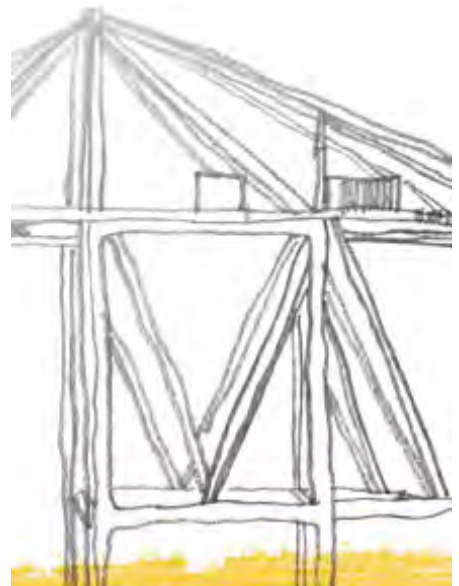
STEP vision: To be an international high-tech enterprise in electric industry.





Table of Contents

1. Product Introduction.....	01
2. Features.....	01
3. Applications.....	04
4. Scope of Application.....	05
5. Standard Wiring Diagram and Case Diagram.....	06
6. Selection and Ordering.....	12
7. Service Commitment.....	15
8. After-sales Service Network.....	16



1.0 Product Introduction

AS510 series inverter is high-performance AFE rectifier feedback unit researched and developed by Shanghai Sigriner STEP Electric Co., Ltd. The product adopts the latest power and electronic technology, space vector pulse-width modulation technology and microcomputer control technology based on DSP control principle, quick system dynamic response, accurate control and small output wave-form distortion factor, with combination of IGBT power module feature, thus realizing bidirectional flow of energy and four-quadrant operation.



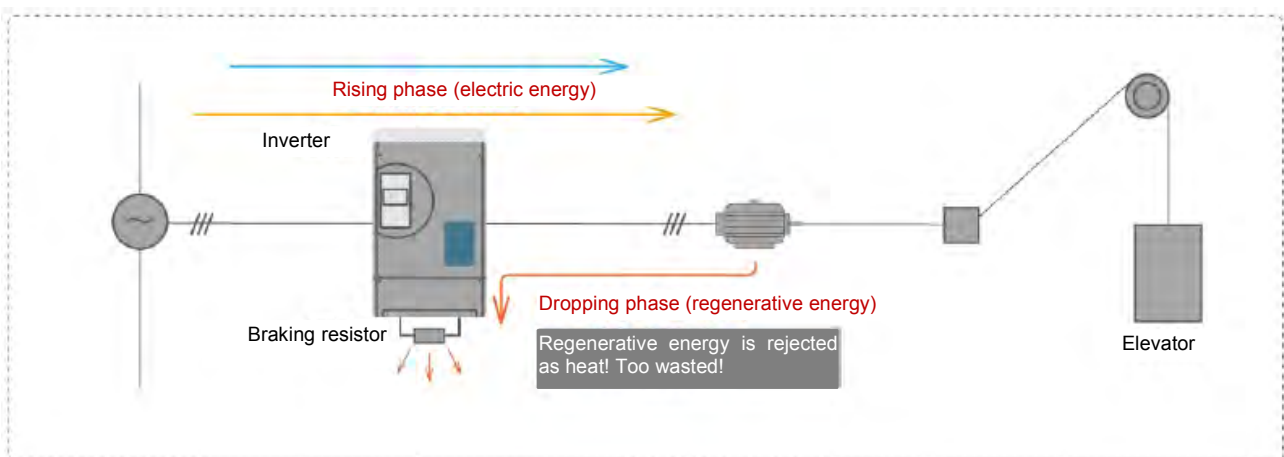
1. AS510 Series AFE Rectifier Feedback Unit



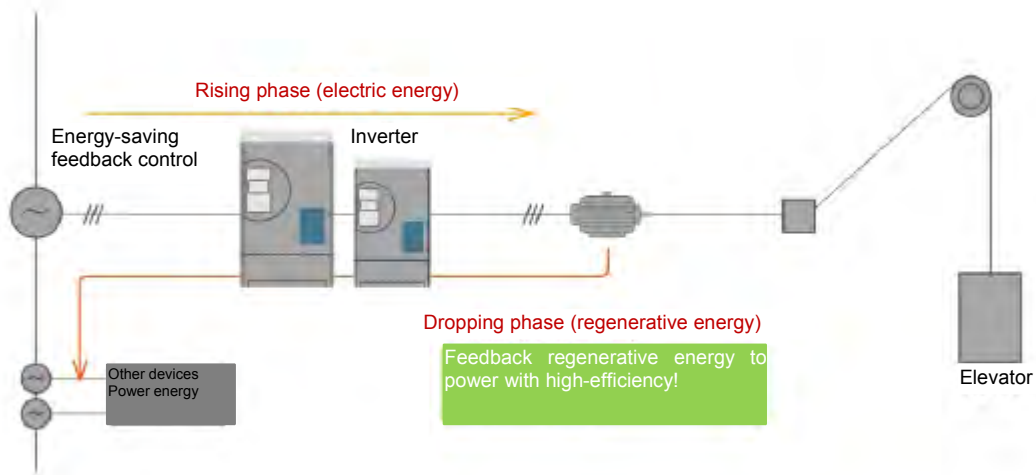
- 2. AS160 Series Fan/Water Pump Inverters
- 3. AS450 General Vector Inverters
- 4. AS500 Series 660V High Performance Vector Inverters
- 5. AS210 Series Servo Systems
- 6. AS300 Series Door Inverters
- 7. AS320 Series Elevator Inverters
- 8. AS.RG (Energy Feedback Unit)
- 9. AS700 Series Port Cabinet Inverters
- 10. AS800 Series Vector High Voltage Inverters

2.0 Features

Energy regeneration (energy-saving mechanism)



Apply uncontrollable rectification control mode. Regenerative energy generated during self-motion is released via braking resistor through "heat dissipation".



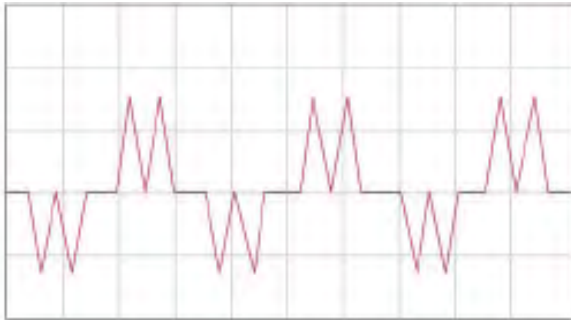
Apply AFE rectification control mode, and convert regenerative energy generated due to self-motion to electric power of corresponding voltage and feedback to the grid for other electric devices within area grid, which reaches energy-saving purpose.



High power factor

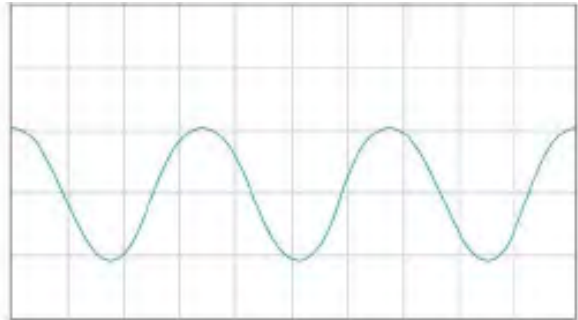
Built-in power factor improvement function; reduce harmonic wave pollution of power, with power factor close to 1; reduce loss of reactive power and improve effective uses of electric energy.

Input power current wave while using general inverter:



Distortion rate of power current about 80%, and power factor about 0.7

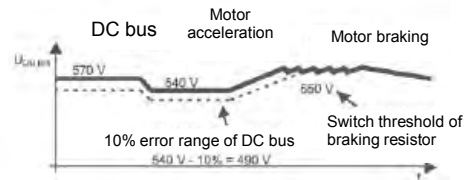
Input power current wave while using general inverter + AS510:



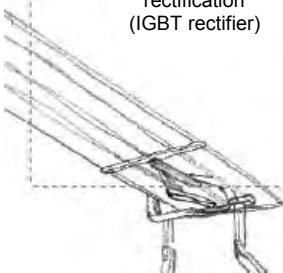
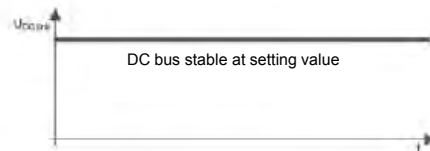
Distortion rate of power current about 5%, and power factor about 1.0

More stable DC bus voltage

Uncontrollable rectification (Diode rectifier)

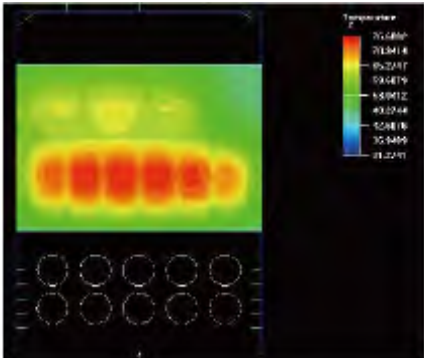


Controllable rectification (IGBT rectifier)



Perfect design in heat dissipation structure

Independent air duct, compact structure design, three-proofings (moisture, salt spray, fungus) design of whole machine, and overheat alarm protection.



The maximum temperature rise of inverter at 40 °C will not exceed 30 °C , which is far lower than the national standard.

Reliable product design

With components of long service life, the service life of the inverter reaches 10 years above.

With low-inductance bus technology, the bus inductance is significantly reduced, which prevents the important components (such as IGBT) from breakdown and greatly increases the safety of the module.

All-around protection for whole machine.

High-precision current detection and protection.

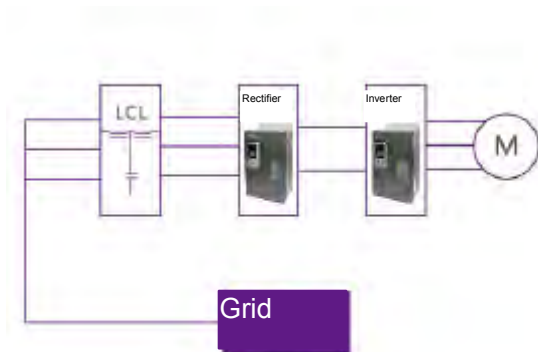
All-around switching power supply protection.

Components	Service life
Capacitor of main circuit	10 years
Capacitor of control circuit	10 years

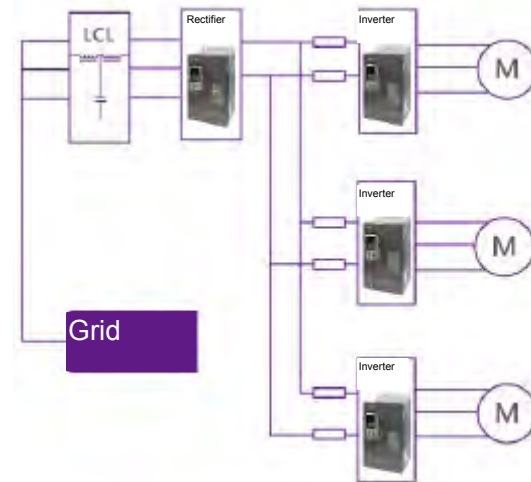
3.0 Applications

Easily retrofit and system integration

Low harmonic wave drive plan 1:1 application



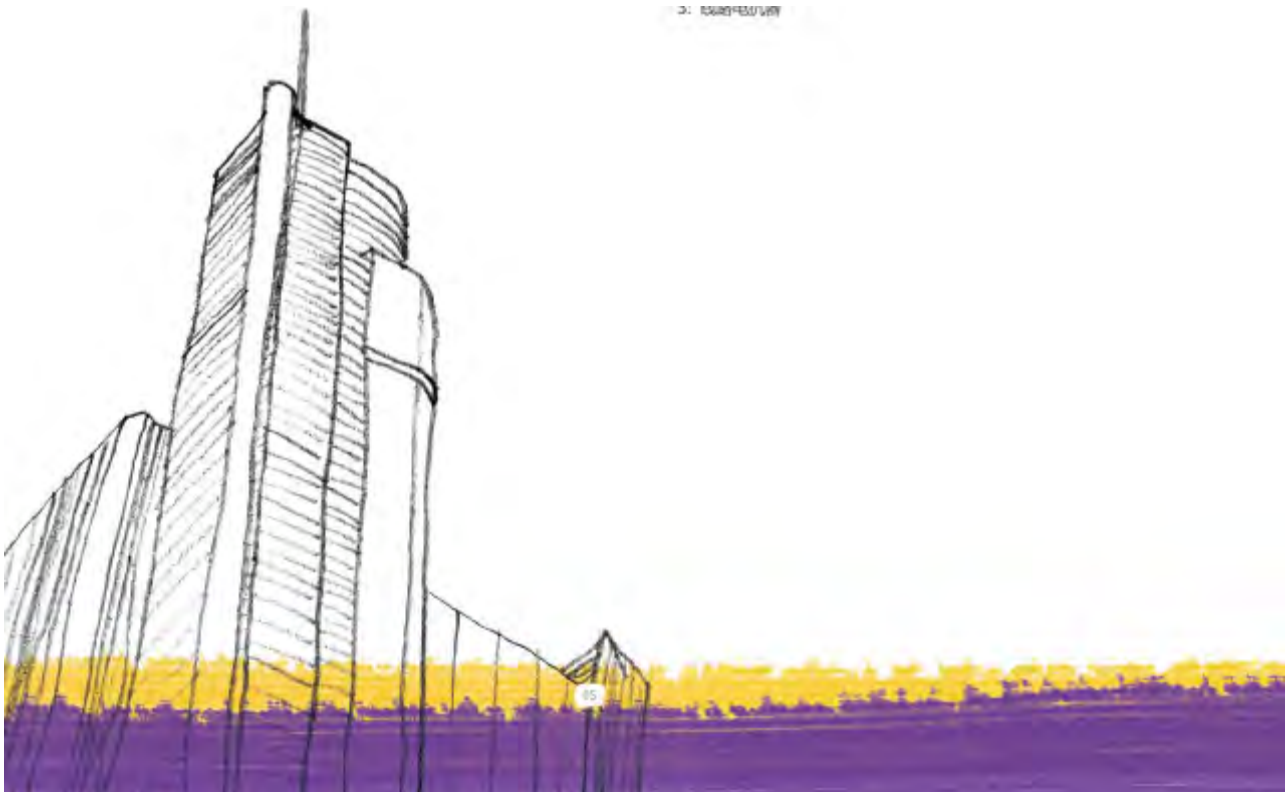
Low harmonic wave drive plan 1:N application, realizing running with common bus with multi-inverter



4.0 Scope of Application

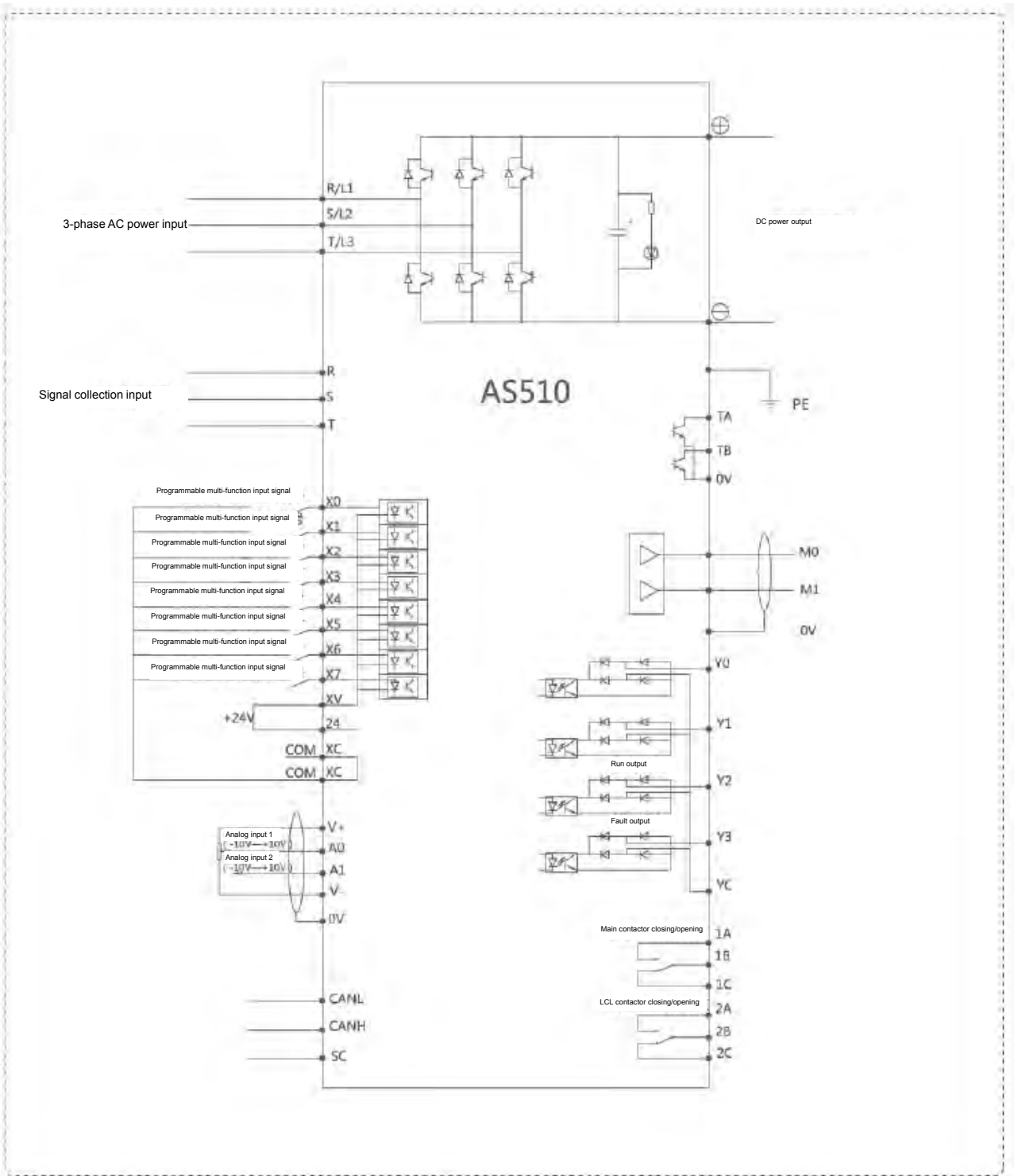


- Potential energy load, such as crane application (crane, long-distance transportation etc.)
- Inertia load, such as centrifuge
- Downgrade conveying belt, windlass, escalator
- Complicated drive system
- Test bench and high dynamic driver
- Pump/turbine combination
- Active front-end with several integration function, which can meet complicated requirements on industry, equipment, building and automation fields
- Its design can realize simple application with inverter combination, and can construct one public DC bus for several drivers.
- Active front-end upstream connects to the grid, which is made up of three parts:
 1. Active front-end rectifier inverter.
 2. Line filter module (EMC filter, line contactor and charging circuit)
 3. Line reactor

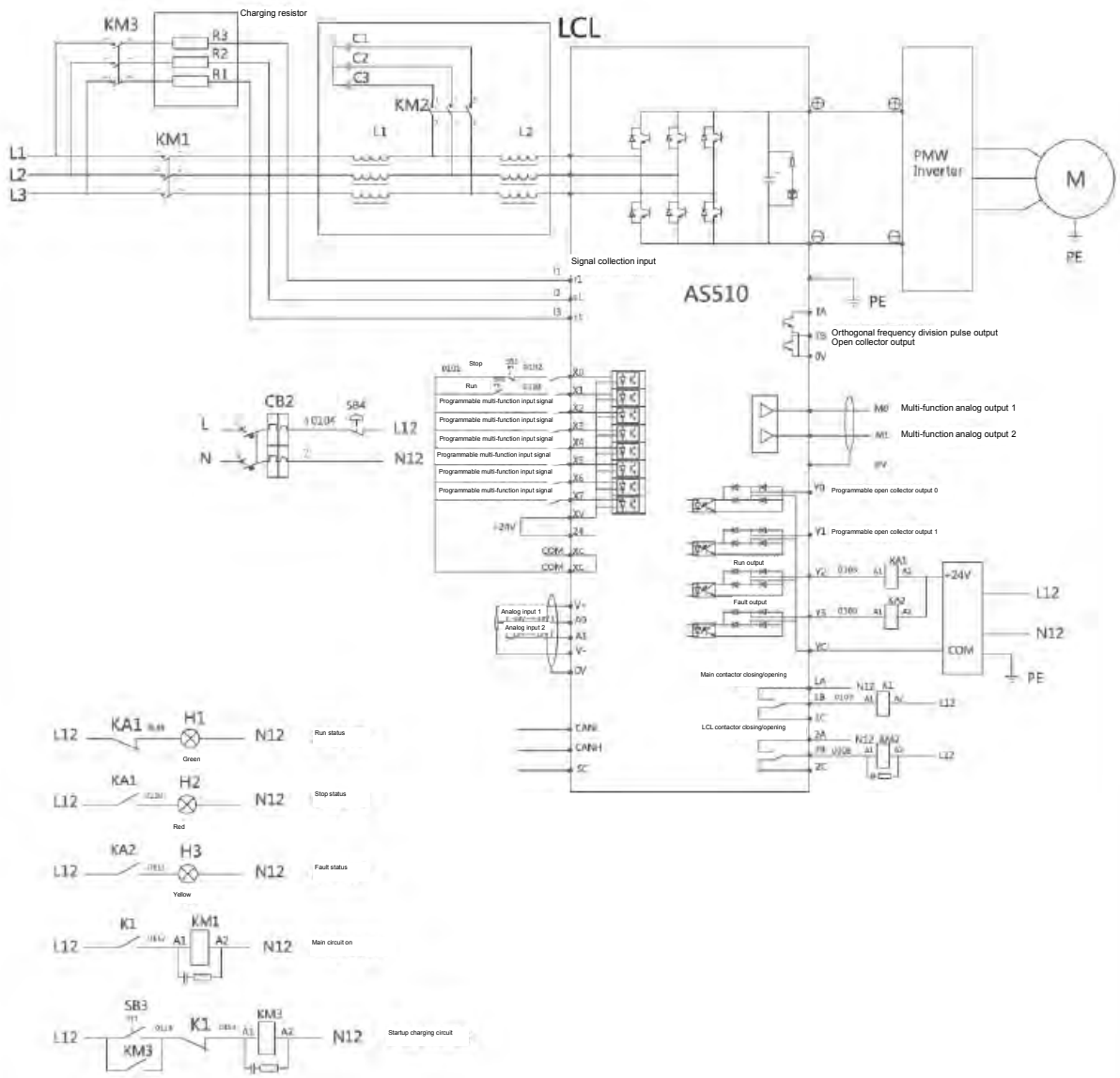


5.0 Standard Wiring Diagram and Case Diagram

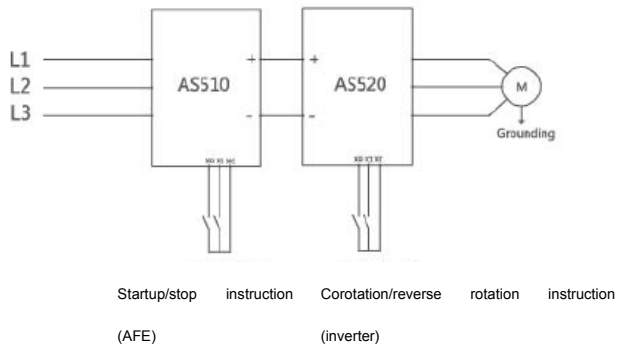
Wiring diagram



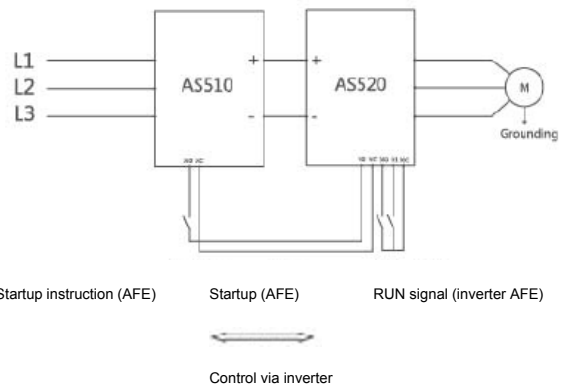
Case diagram



1. Via startup/stop signal control
 AFE and AS520 or inverter is controlled independently respectively via free startup instruction.

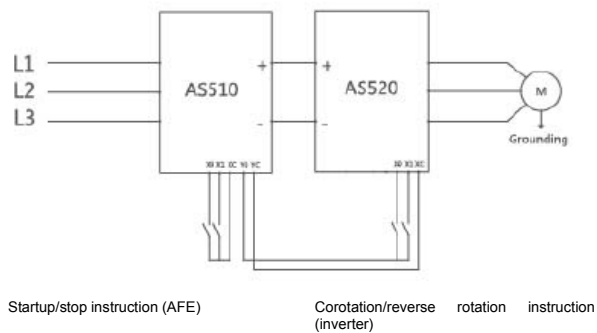


2. Via inverter startup/stop signal control
 AFE is not controlled via free startup instruction; instead, it is via AS520 or inverter.

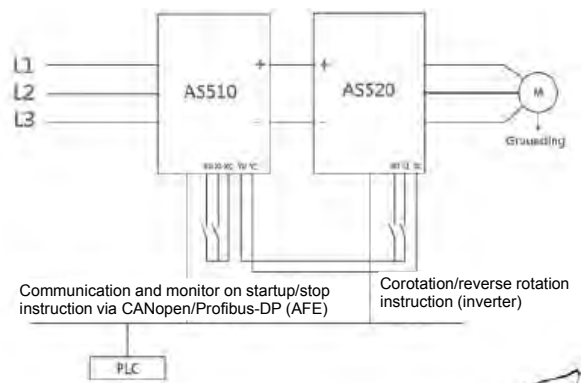


No direct information exchange between AFE and inverter

3. Control over AS520 or inverter via AFE
 AS520 or inverter started via AFE startup/stop signal



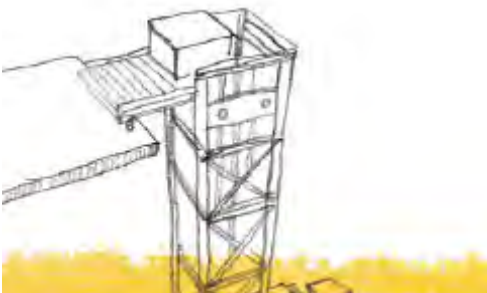
4. AFE control via PLC
 Communication between AFE and AS520 or inverter from PLC via CANopen/Profibus-DP to control startup and stop of AFE.



Control circuit terminal function

1A	1B	1C	2A	2B	2C	Y1	Y3	YC	24	XV	X1	X3	X5	X7	SC	0V	0V	A0	A1
						Y0	Y2	XC	XC	X0	X2	X4	X6	CH	CL	M0	M1	V+	V-

Designation	Terminal Code	Description of Signal	Remarks				
Digital input terminal	X0	Multi-function input 1 (Function code P30.00)	Contact input, so that the input signal is effective when the contact is closed. Digital input circuit specifications are as follows: <table border="1" data-bbox="922 734 1326 869"> <tr> <td>Internal power supply</td><td>+24 VDC</td></tr> <tr> <td>Maximum load current</td><td>20 mA</td></tr> </table>	Internal power supply	+24 VDC	Maximum load current	20 mA
	Internal power supply	+24 VDC					
	Maximum load current	20 mA					
	X1	Multi-function input 2 (Function code P30.01)					
	X2	Multi-function input 3 (Function code P30.02)					
	X3	Multi-function input 4 (Function code P30.03)					
	X4	Multi-function input 5 (Function code P30.04)					
	X5	Multi-function input 6 (Function code P30.05)					
	X6	Multi-function input 7 (Function code P30.06)					
	X7	Multi-function input 8 (Function code P30.07)					
	24	Internal +24VDC power output					
XV	Input signal common terminal						
XC	Internal 24V power supply 0V						
Analog input terminal	A0	Multi-function analog input 1 (function code P32.01)	Voltage input signal: -10 ~ +10V, may be used as analog speed given signal input.				
	A1	Multi-function analog input 2 (function code P32.07 (voltage))	External analog input signal: -10 ~ +10V, may be used as analog signal input.				
	V+	+10V power output	+10VDC power output terminal used for analog input, with permissible maximum current of 50 mA.				
	V-	-10V power output	-10VDC power output terminal used for analog input, with permissible maximum current of 50 mA.				
	0V	Reference ground for analog input signal	Reference ground for analog input signal				

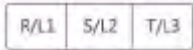


Control circuit terminal function (continued)

Designation	Terminal Code	Description of Signal	Remarks								
Relay output terminal	1A/1B/1C	Programmable relay output (function code P31.00) 1A-1B: NO contact (make contact) 1B-1C: NC contact (break contact)	The programmable relay output functions can be selected. A pair of switching contacts is provided, and their contact specifications are as follows: <table border="1" data-bbox="911 394 1361 658"> <thead> <tr> <th>Item</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Rated capacity</td> <td>5A/250VAC 5A/30VDC</td> </tr> <tr> <td>Switching frequency 120 times/min</td> <td>Failure rate P level 10mA/5V</td> </tr> <tr> <td>Action time</td> <td>Less than 10ms</td> </tr> </tbody> </table>	Item	Description	Rated capacity	5A/250VAC 5A/30VDC	Switching frequency 120 times/min	Failure rate P level 10mA/5V	Action time	Less than 10ms
	Item	Description									
Rated capacity	5A/250VAC 5A/30VDC										
Switching frequency 120 times/min	Failure rate P level 10mA/5V										
Action time	Less than 10ms										
2A/2B/2C	Programmable relay output (function code P31.01) 2A-2B: NO contact (make contact) 2B-2C: NC contact (break contact)										
Open collector output terminal of transistor	Y0	Programmable open collector output 1 (Function code P31.02)	Programmable open collector output functions can be selected. Drive capacity: No more than DC30V, 50 mA.								
	Y1	Programmable open collector output 2 (Function code P31.03)									
	Y2	Programmable open collector output 3 (Function code P31.04)									
	Y3	Programmable open collector output 4 (Function code P31.05)									
	YC	Programmable open collector output common terminal									
Analog output terminal	M0	Programmable analog output 1 (Function code P33.00)	Programmable analog output functions can be selected. May be used for output monitoring and input from other devices.								
	M1	Programmable analog output 2 (Function code P33.03)									
	0V	Reference ground for analog output signal	Reference ground for analog output signal								
CAN communication terminal	CH	Communication signal +	CAN communication signal terminals								
	CL	Communication signal -									
	SC	Signal ground	Communication signal ground								

Note: 24V and XV must be short-circuited.

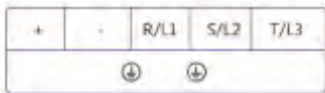
Terminal sign



Phase collection plate terminal function

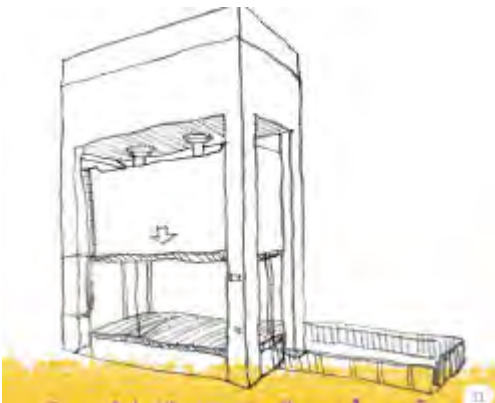
Designation	Terminal Code	Description of Signal	Remarks
Sampling terminal	R	R phase grid sampling	Must be consistent with main circuit terminal "R/L1"
	S	S phase grid sampling	Must be consistent with main circuit terminal "S/L2"
	T	T phase grid sampling	Must be consistent with main circuit terminal "T/L3"

Main circuit terminal function



Main circuit terminal designation and function description

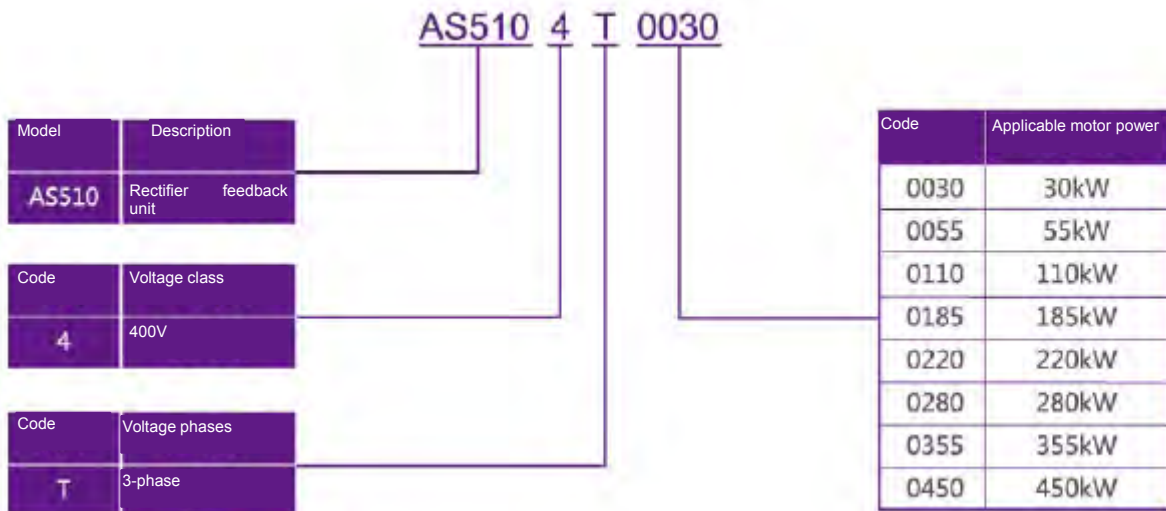
Terminal Symbol	Function description
-	DC bus
+	
R/L1	Main circuit AC power input, connecting to 3-phase input power
S/L2	
T/L3	



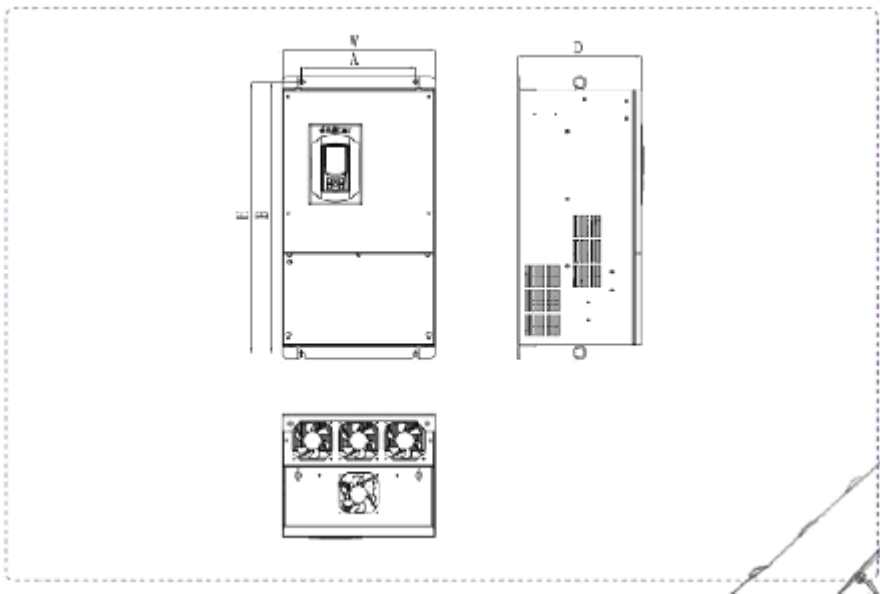
6.0 Selection and Ordering

Product (order number) description

Number and letter are used for indication of inverter specification, voltage class and type and maximum capacity of applicable motor in the "Inverter Model" column of nameplate.



Inverter appearance

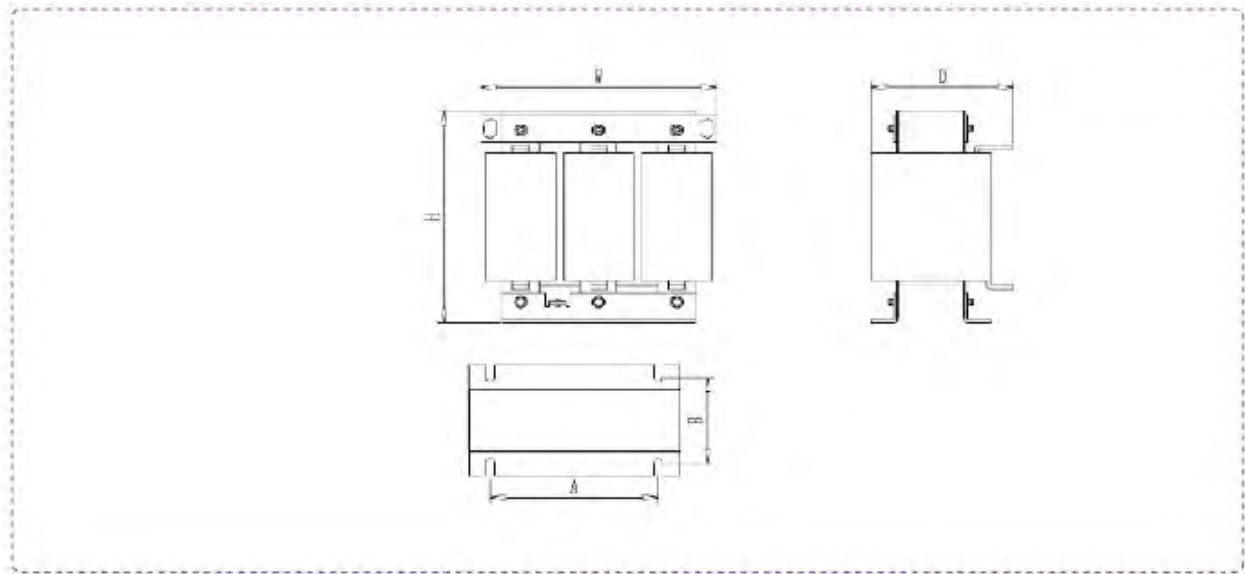


Inverter outline specification

Size	Inverter model	A (mm)	B (mm)	H (mm)	W (mm)	D (mm)	Installation aperture Φ (mm)	Installation		Fastening torque (Nm)
								Bolt	Nut	
1	4T0030	200	518	540	332	247	9.0	8	8	9
2	4T0055	200	587	610	330	310				
3	4T0110	320	768	800	430	350	13.0	12	12	18
4	4T0185	374	844	880	500	350				
	4T0220									
5	4T0280	500	997	1030	630	370	14.0	12	12	18
	4T0355									
6	4T0450	560	1309	1352	774	390	14.0	12	12	18

LCL filter and charging resistor configuration sheet

Product model AS510	Quantity	4T0030	4T0055	4T0110	4T0185	4T0220	4T0280	4T0355	4T0450
		L1(mH)	1	0.32	0.13	0.07	0.048	0.04	0.032
L2(mH)	1	1.28	0.52	0.28	0.192	0.16	0.128	0.105	0.08
Capacitor μ F C1-C3	3	50	100	150	200	200	300	300	400
Charging resistor R1-R3	3	60W 10 Ω	60W 10 Ω	200W 2 Ω	200W 2 Ω	200W 2 Ω	300W 2 Ω	400W 2 Ω	500W 2 Ω



Product model AS510	Reactor sign	Inductance volume	Rated current	A (mm)	B (mm)	H (mm)	W (mm)	D (mm)	Installation aperture Φ	Mass (Kg)
4A0030	L1	1.28mH	65A	243	154	285	330	240	11	43.3
	L2	0.32mH	65A	120	80.5	160	210	180	11	8.5
4T0055	L1	0.52mH	128A	243	139	295	330	225	11	48.3
	L2	0.13mH	128A	120	75.5	210	210	180	11	10
4T0110	L1	0.28mH	240A	250	144	400	370	260	13	72.6
	L2	0.07mH	240A	120	85.5	280	210	185	13	15.7
4T0185	L1	0.192mH	352A	350	172	480	400	300	13	110
	L2	0.048mH	352A	182	93	295	250	200	13	23.5
4T0220	L1	0.16mH	426A	350	171	480	430	350	15	124
	L2	0.04mH	426A	182	108	295	250	220	13	28.6
4T0280	L1	0.128mH	520A	350	186	500	430	370	15	145.2
	L2	0.032mH	520A	182	98	295	250	220	13	30
4T0355	L1	0.105mH	650A	350	206	550	430	370	15	180
	L2	0.026mH	650A	214	122	350	300	220	13	43.2
4T0450	L1	0.08mH	820A	400	191	600	480	370	15	191.8
	L2	0.02mH	820A	214	132	350	300	250	13	48.7

9.0 Service Commitment

When you contact products of Sigriner STEP for the first time, you will find their differences. Our experts own rich experiences and may help you select inverters applicable to your process. From the initial technical specifications to production, delivery and installation, we will comply with all your requirements.

Sigriner STEP's services and supports are not only limited to telephone assistance. At different stages of installation, startup, maintenance and troubleshooting, our representatives will provide technical services and supports for you for 24 hours per day, 7 days per week.

Range of our services

- Round-the-clock service 24/7/365
- Preventive maintenance
- Training
- Spares sales
- Upgrading
- Repair and replacement
- Professional services (harmonic analysis, power quality research, electrical system application, remote diagnosis, etc.)

Our commitment

Sigriner STEP is honorable to its reputation in long-term product services. We commit to provide supports in the whole service life. However long the service life of product is, we shall never give up our responsibilities in product services and will ensure your full satisfaction.

Convenient local services

Because of our long-term field service for all customers, we own numerous professional service personnel. Each one of our service representatives receives all-around special training.

10.0 After-sales Service Network



Domestic service network

Domestic market

5 agencies

14 liaison offices

Agencies

Beijing, Shanghai, Guangzhou, Chengdu

Liaison offices

Dalian, Shenyang, Tianjin, Shijiazhuang, Zhengzhou, Chongqing, Xi'an, Hangzhou, Wuxi, Nanxun, Wujiang, Changsha, Shenzhen, Fuzhou, etc.

Oversea network

Oversea companies

Germany, Hong Kong

Overseas sales

Germany, England, Denmark, Scotland, Canada, Japan, Brazil, Chile, Singapore, Australia, India, Pakistan, Turkey, Saudi Arabia, South Korea, Hong Kong, Macao, Taiwan, etc.