

# ED510 Series

## High Performance Universal Inverter



# C O N T E N T S

	Page #
Company Introduction .....	01
About the product .....	02
Wiring Diagram of ED510 .....	02
ED510 Product Details .....	03
Connection of Peripheral Devices .....	04
External Dimensions 380V .....	05
External Dimensions 220V .....	5-6
Installation Space .....	06
Specification of Breaker .....	07
- Contactor	
- Cable	
Applications .....	08
Breaking Unit IBU Series Features .....	09
- Diagram	
- Application Environment	
Breaking Unit selection guide .....	10
Auxiliary Parts .....	10
Selection for Input / Output AC Reactors .....	11
Specifications for AC Input/output filters .....	12
Handling Instructions .....	13
Environmental requirements .....	13
Other Environmental requirements .....	13

# COMPANY INTRODUCTION



Invent Power Tech Limited, is a subsidiary of M KHALIL Electric & Co. Which was established in 2005 as an importer and aimed to provide services in the field of variable frequency drives. Later on ,we take the pride of Pakistan's first inverter manufacturing company that manufactures high quality and reliable frequency drives for three phase AC motors widely found in equipment manufacturing industries, Elevators, Chemical, Steel mills, Oil and gas, Plastic molding , Drawing machines , Fabric printing, Solar energy, Air compressors and so on.

Invent Power Tech Limited is a pioneer in the inverter manufacturing industry deal in manufacturing of universal VFD inverters, Sensor less vector control inverters, Close loop vector control inverters, Inverters for PV Pumps, inverters for Elevators and special purpose Ring spinning inverters as per the customer's requirements.

The main focus of Invent Power Tech Limited is to provide customers with best products and solutions across Pakistan. We use high quality and precise components for our product with the capacity of manufacturing up to 20,000 units annually with ratings **0.75KW to 1MW** low voltage frequency drives. We are committed to continuously improve the VFD technology with our R & D Electronic field professionals.

## **Vision:**

To be the leading inverter manufacturer and service provider in Pakistan by offering innovative product solutions for our customers while exceeding stakeholder value & employee expectations.

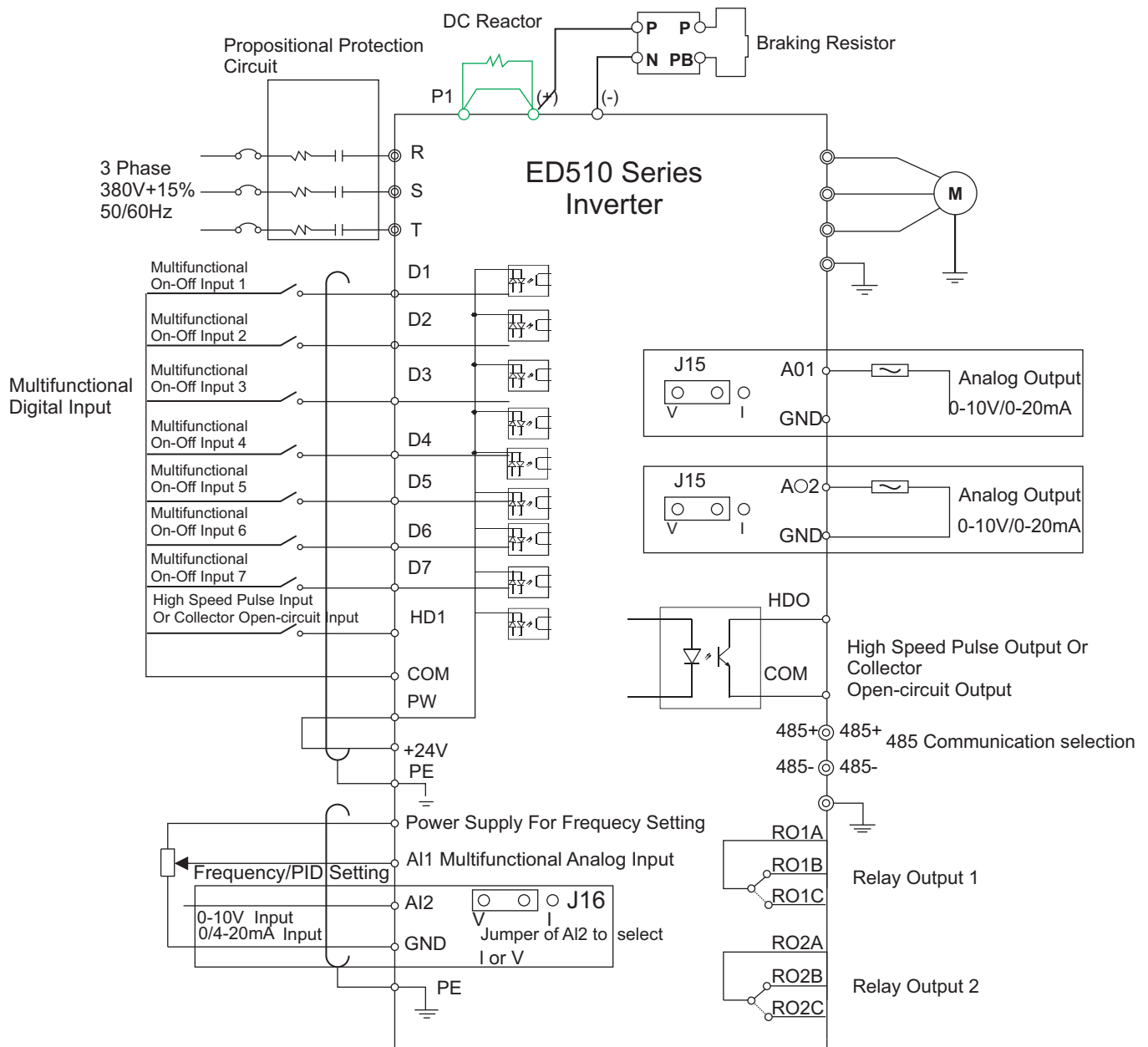
## **Mission:**

To focus on our customers, market challenges and needs, by providing reliable, quality product and services in the best price in order to consistently create maximum values for customers.

## ABOUT THE PRODUCT

ED510 is a universal inverter suitable for all applications which do not need high speed accuracy such as pump, fans, milling etc. ED510 is reliable and high performance inverter which increase the life of equipments by decreasing the initial impact of torque to grid up to 0% which decrease the maintenance cost and save energy. ED510 series have V/F control mode, sensor less vector control mode and torque control mode. ED510 also provide PID function, traverse control function, speed trace control, simple PLC up to 23 fault protections built in I/O programmable terminals up to 7 inputs and 2 relay outputs.

## WIRING DIAGRAM OF ED-510 SERIES INVERTER



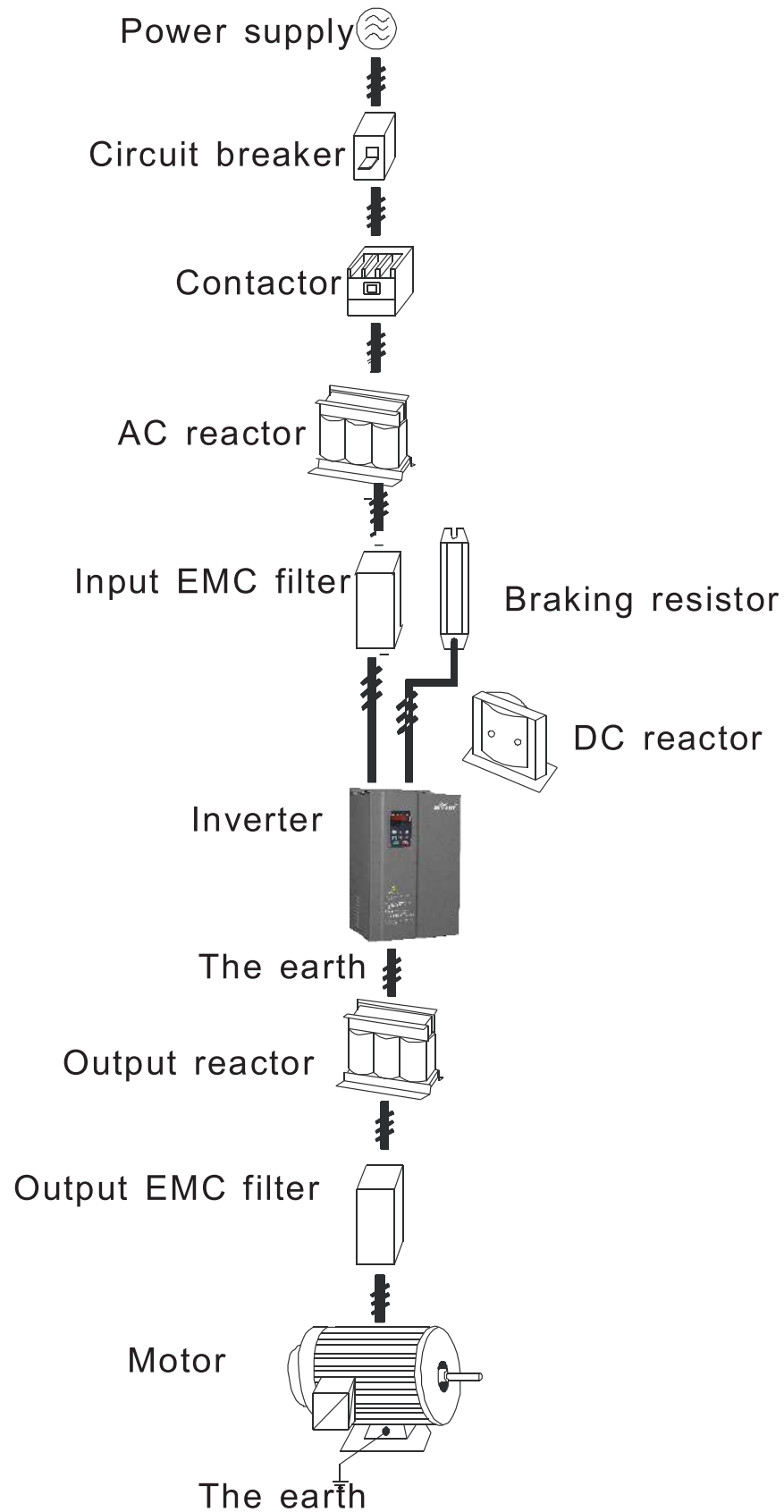
# ED510 PRODUCT DETAILS

## ED510 SENSOR LESS VECTOR CONTROL UNIVERSAL INVERTER PRODUCT SELECTION GUIDE

Model No.	Rated Power (kw)	Rated Output Current (A)	Braking Unit	Min. Braking Resistance	Size (H*W*D) mm
SINGLE PHASE 220V ±15%					
ED510-0R7C-S2	0.75KW	4.5A	BUILT IN	130Ω/260W	186*134*164
ED510-1R5C-S2	1.5KW	7A	BUILT IN	130Ω/260W	
ED510-2R2C-S2	2.2KW	10A	BUILT IN	80Ω/400W	
THREE PHASE 220V ± 15%					
ED510-0R7C-2	0.75KW	4.5A	BUILT IN	130Ω/260W	186*134*164
ED510-1R5C-2	1.5KW	7A	BUILT IN	130Ω/260W	
ED510-2R2C-2	2.2KW	10A	BUILT IN	80Ω/260W	
ED510-04C-2	4KW	16A	BUILT IN	48Ω/400W	265*162*197
ED510-5R5C-2	5.5KW	20A	BUILT IN	35Ω/550W	
ED510-7R5C-2	7.5KW	30A	BUILT IN	26Ω/780W	313*205*222
THREE PHASE 380V ±15%					
ED510-0R7C-4	0.75KW	2.5A	BUILT IN	400Ω/260W	186*134*164
ED510-1R5C-4	1.5KW	3.7A	BUILT IN	400Ω/260W	
ED510-2R2C-4	2.2KW	5A	BUILT IN	150Ω/390W	
ED510-04C-4	4KW	9A	BUILT IN	150Ω/390W	265*162*197
ED510-5R5C-4	5.5KW	13A	BUILT IN	100Ω/520W	
ED510-7R5CC-4	7.5KW	17A	BUILT IN	50Ω/1040W	313*205*222
ED510-011C-4	11KW	25A	BUILT IN	50Ω/1040W	
ED510-015C-4	15KW	32A	BUILT IN	40Ω/560W	
ED510-18R5C-4	18.5KW	37A	IBU-060A-4	20Ω/6000W	467*290*215
ED510-022C-4	22KW	45A	IBU-060A-4	20Ω/6000W	
ED510-030C-4	30KW	60A	IBU-060A-4	20Ω/6000W	
ED510-037C-4	37KW	75A	IBU-060A-4	13Ω/9600W	577*375*270
ED510-045C-4	45KW	90A	IBU-0110A-4	13Ω/9600W	
ED510-055C-4	55KW	110A	IBU-0110A-4	13Ω/9600W	
ED510-075C-4	75KW	150A	IBU-0110A-4	13Ω/9600W × 2	755*460*330
ED510-090C-4	90KW	176A	IBU-160A-4	13Ω/9600W × 2	
ED510-110C-4	110KW	210A	IBU-160A-4	13Ω/9600W × 2	
ED510-132C-4	132KW	250A	IBU-220A-4	4Ω/30000W	1275*490*390 1490*490*390 (WITH BASE)
ED510-160C-4	160KW	300A	IBU-320A-4	4Ω/30000W	
ED510-185C-4	185KW	340A	IBU-320A-4	3Ω/40000W	
ED510-200C-4	200KW	380	IBU-320A-4	3Ω/40000W	1385*750*400 1670*750*400 (WITH BASE)
ED510-220C-4	220KW	415A	IBU-400A-4	3Ω/40000W	
ED510-250C-4	250KW	470A	IBU-400A-4	2Ω/60000W	
ED510-280C-4	280KW	520A	IBU-320A-4 × 2	2Ω/60000W	1950*1200*502
ED510-315C-4	315KW	600A	IBU-320A-4 × 2	2Ω/60000W	
ED510-350C-4	350KW	640A	IBU-320A-4 × 2	3Ω/40000W × 2	
ED510-400C-4	400KW	690A	IBU-320A-4 × 2	3Ω/40000W × 2	1670*750*400 × 2
ED510-500C-4	500KW	860A	IBU-400A-4 × 2	2Ω/60000W × 2	
ED510-630C-4	630KW	1100A	IBU-320A-4 × 4	2Ω/60000W × 4	
ED510-700C-4	700KW	1280A	IBU-320A-4 × 4	2Ω/60000W × 4	1950*1200*502 × 2
ED510-800C-4	800KW	1380A	IBU-400A-4 × 4	2Ω/60000W × 4	
ED510-1000C-4	1000KW	1700A	IBU-400A-4 × 4	2Ω/60000W × 4	

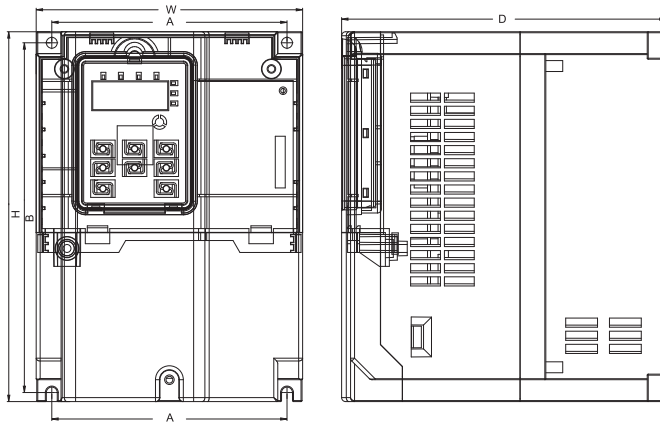


## CONNECTION OF PERIPHERAL DEVICES

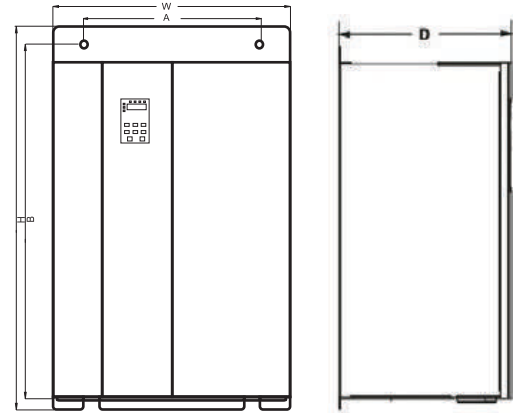


Connection of peripheral devices.

## EXTERNAL DIMENSIONS 380V

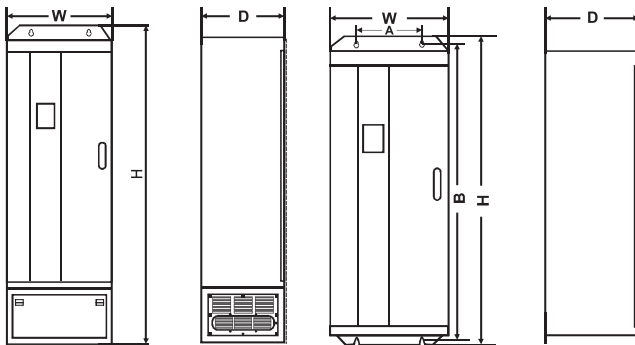


Dimensions (15kW and Below) (380V)



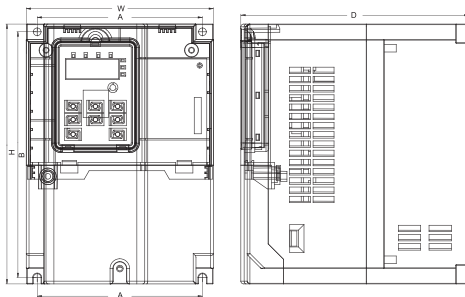
Dimensions (18.5 ~ 110kW) (380V)

Dimensions (132~500kW With Base or Without Base) (380V)

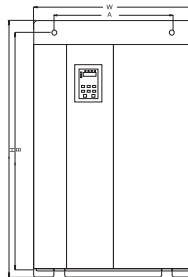


Power (kW)	A (mm)	B (mm)	H (mm)	W (mm)	D (mm)	Installati on Hole (mm)
	Installation Dimension		External Dimension			
1.5 ~ 2.2	118.3	175.9	186	134	164	5
4~5.5	155	254	265	162	197	5
7.5~15	195	304	313	205	222	6
18.5~30	176	454.5	467	290	215	6.5
37~55	230.0	564.5	577.0	375.0	270.0	7.0
75~110	320.0	738.5	755.0	460.0	330.0	9.0
132~185	270	1233	1275	490	391	13
	——	——	1490	490	391	——
200~315	500	1324	1358	750	402	12.5
	——	——	1670	750	402	——
350~500	——	——	1950	1200	502	——

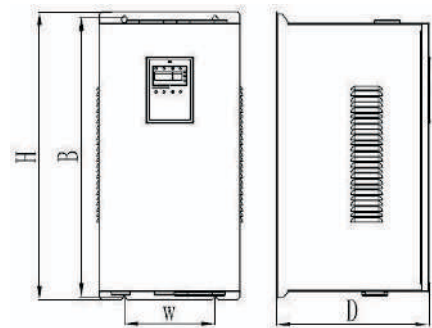
## EXTERNAL DIMENSION 220V



7.5kW and Lower (220V)



11kW~18.5kW (220V)



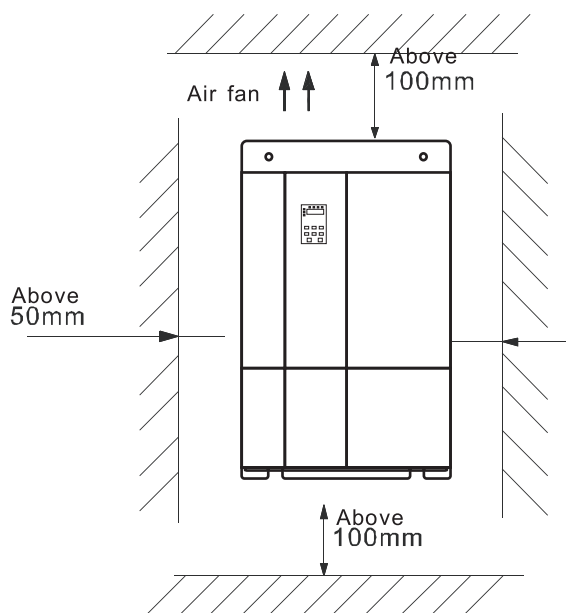
22~55kW (220V)

## EXTERNAL DIMENSIONS AND INSTALLATION DIMENSIONS OF 3-PH 220VAC

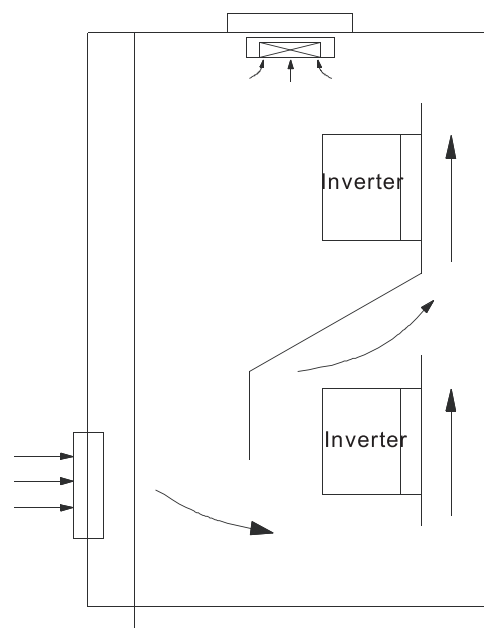
Inverter model	A (mm)	B (mm)	H (mm)	W (mm)	D (mm)	Installation Hole (mm)
	Installation Dimension		External Dimension			
ED510-1R5C-2	147.5	237.5	250	160	175	5
ED510-2R2C-2						
ED510-004C-2						
ED510-5R5C-2						
ED510-7R5C-2	206	305.5	320	220	180	6

Inverter modul	A (mm)	B (mm)	H (mm)	W (mm)	D (mm)	Installation Hole (mm)
	Installation Dimension		External Dimension			
ED510-030C-2	178	663	680	300	280	6
ED510-037C-2						
ED510-045C-2						
ED510-055C-2						

## INSTALLATION SPACE



Installation of multiple inverters.



Safety space

Add the air deflector when apply the up-down installation.



## SPECIFICATIONS OF BREAKER, CABLE AND CONTACTOR

INVERTER MODULE	CIRCUIT BREAKER (A)	INPUT/OUTPUT COPPER CORE CABLE (mm <sup>2</sup> )	THE RATED CURRENT A OF CONTACTOR (VOLTAGE 220V)
ED510-1R5C-S2	20	4	16
ED510-2R2C-S2	32	6	20
ED510-004C-2	40	6	25
ED510-5R5C-2	63	6	32
ED510-7R5C-2	100	10	63

INVERTER MODULE	CIRCUIT BREAKER (A)	INPUT/OUTPUT COPPER CORE CABLE (mm <sup>2</sup> )	THE RATED CURRENT A OF CONTACTOR (VOLTAGE 380V)
ED510-0R7C-4	16	2.5	10
ED510-1R5C-4	16	2.5	10
ED510-2R2C-4	16	2.5	10
ED510-004C/5R5V-4	25	4	16
ED510-5R5C/7R5V-4	25	4	16
ED510-7R5C/011V-4	40	6	25
ED510-011C/015V-4	63	6	32
ED510-015C/018V-4	63	6	50
ED510-018C/022V-4	100	10	63
ED510-022C/030V-4	100	16	80
ED510-030C/037V-4	125	25	95
ED510-037C/045V-4	160	25	120
ED510-045C/055V-4	200	35	135
ED510-055C/075V-4	200	35	170
ED510-075C/090V-4	250	70	230
ED510-090C/110V-4	315	70	280
ED510-110C/132V-4	400	95	315
ED510-132C/160V-4	400	150	380
ED510-160C/185V-4	630	185	450
ED510-185C/200V-4	630	185	500
ED510-200C/220V-4	630	240	580
ED510-220C/250V-4	800	150x2	630
ED510-250C/280V-4	800	150x2	700
ED510-280C/315V-4	1000	185x2	780
ED510-315C/350V-4	1200	240x2	900
ED510-350C-4	1280	240x2	960
ED510-400C-4	1380	185x3	1035
ED510-500C-4	1720	185x3	1290



**CAUTION**

\*Use recommended breaker, cable and contactor ratings according to above table, to avoid property and equipment damage.

\*Please use proper grounding techniques and connect the input power lines tightly and permanently

## APPLICATIONS

### PAPER INDUSTRY



### CEMENT INDUSTRY



### SUGAR INDUSTRY



### VACUUM PUMP



### CABLE MACHINERY



### PRINTING & PACKING MACHINERY



### STEEL INDUSTRY



### AIR COMPRESSOR



## BRAKING UNIT (IBU SERIES)

IBU Series braking unit is designed by Invent Power Tech for the braking applications of high-performance and heavy-loads. Its continuous braking at rated braking current can meet the requirements of customers in the application of large inertia and rapid deceleration or stopping.

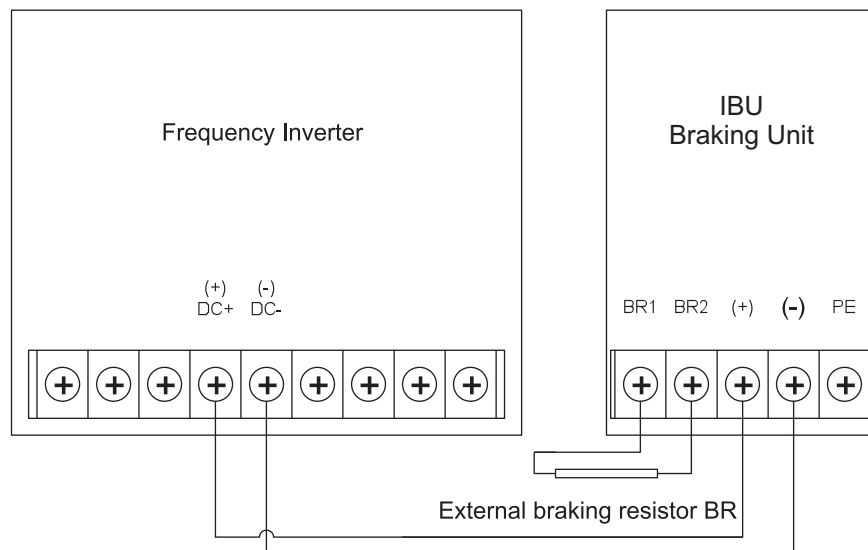
It can be used widely in the industries of elevators, looms, paper-making machinery, centrifugal machines, washing machines, drawing machines, winding machines, linkage systems, crown blocks, mining and lifting etc.



## MAIN FEATURES

- Two voltage degrees of 220V/380V and the braking current is 60A~400A
- Multiple brake voltage thresholds can be set
- Parallel application of multiple machines
- Be applied in the application of 100% motor feedback
- Long-time running at the maximum braking current
- Protection degree is IP20
- A variety of fault outputs and external fault input functions

## WIRING DIAGRAM OF THE MAIN CIRCUIT



Wiring diagram of the main circuit of IBU braking unit with any kind frequency inverter

## APPLICATION ENVIRONMENT OF IBU SERIES PRODUCTS

The device has the best performance and longest service life in the following designated environment:

- Indoor, good ventilation, the altitude is not more than 1000m, no direct sunlight
- Environment temperature: -10 - 40°C
- Avoid high temperature, humidity, rain and water drops, the relative humidity is less than 90% RH (no condensation)
- To prevent electromagnetic interference, keep away from interference sources and vibration
- To prevent the invasion of powder, dust, cotton, metal powder and corrosive gas
- It is prohibited to use in dangerous environment of flammable explosive gas, liquid or solid.





## BRAKING UNIT SELECTION GUIDE

### THREE PHASE 380V

MODEL NO.	RATED CURRENT (A)	RATED VOLTAGE (DC)
IBU-060A-4	60A	640VDC ~ 780VDC
IBU-110A-4	110A	640VDC ~ 780VDC
IBU-160A-4	160A	640VDC ~ 780VDC
IBU-220A-4	220A	640VDC ~ 780VDC
IBU-320A-4	320A	640VDC ~ 780VDC
IBU-400A-4	400A	640VDC ~ 780VDC

### SINGLE PHASE 220V

MODEL NO.	RATED CURRENT (A)	RATED VOLTAGE (DC)
IBU-060A-2	60A	350VDC ~ 420VDC
IBU-110A-2	110A	350VDC ~ 420VDC
IBU-160A-2	160A	350VDC ~ 420VDC
IBU-220A-2	220A	350VDC ~ 420VDC

## AUXILIARY PARTS

### BRAKING RESISTOR

Auxiliary equipment for braking system, shorten the deceleration time.



### REACTOR

Input reactor: Improve the power factor of the input side of the inverter and control the higher harmonic current.

Output reactor: Prolong the effective transmitting distance of the inverter and control the sudden high voltage when switching on/off the IGBT of the inverter.



### FILTER

Input filter: Control the electromagnetic interference generated from the inverter, please install close to the input terminal side of the inverter.

Output: Control the interference from the output side of the inverter, please install close to the output terminals of the inverter.



## SELECTION OF INPUT / OUTPUT AC REACTORS

MODEL NO.	INPUT AC REACTOR	INPUT AC REACTOR CURRENT (A)	OUTPUT AC REACTOR	OUTPUT AC REACTOR CURRENT (A)
ED510-0R7C-4	ACIN-1R5C-4	5.0A	OCIN-1R5C-4	3.7A
ED510-1R5C-4	ACIN-1R5C-4	5.0A	OCIN-1R5C-4	3.7A
ED510-2R2C-4	ACIN-2R2C-4	5.8A	OCIN-2R2C-4	5.0A
ED510-04C-4	ACIN-004C-4	10A	OCIN-004C-4	9A
ED510-5R5C-4	ACIN-05R5C-4	15A	OCIN-05R5C-4	13A
ED510-7R5C- 4	ACIN-7R5C-4	20A	OCIN-7R5C-4	17A
ED510-011C-4	ACIN-011C-4	26A	OCIN-011C-4	25A
ED510-015C-4	ACIN-015C-4	35A	OCIN-015C-4	32A
ED510-18R5C-4	ACIN-18RC-4	38A	OCIN-18RC-4	37A
ED510-022C-4	ACIN-022C-4	46A	OCIN-022C-4	45A
ED510-030C-4	ACIN-030C-4	62A	OCIN-030C-4	60A
ED510-037C-4	ACIN-037C-4	76A	OCIN-037C-4	75A
ED510-045C-4	ACIN-045C-4	90A	OCIN-045C-4	90A
ED510-055C-4	ACIN-055C-4	105A	OCIN-055C-4	110A
ED510-075C-4	ACIN-075C-4	140A	OCIN-075C-4	150A
ED510-090C-4	ACIN-090C-4	160A	OCIN-090C-4	176A
ED510-110C-4	ACIN-110C-4	210A	OCIN-110C-4	210A
ED510-132C-4	ACIN-132C-4	240A	OCIN-132C-4	250A
ED510-160C-4	ACIN-160C-4	290A	OCIN-160C-4	300A
ED510-185C-4	ACIN-185C-4	330A	OCIN-185C-4	340A
ED510-200C-4	ACIN-200C-4	370A	OCIN-200C-4	380A
ED510-220C-4	ACIN-220C-4	410A	OCIN-220C-4	415A
ED510-250C-4	ACIN-250C-4	460A	OCIN-250C-4	470A
ED510-280C-4	ACIN-280C-4	500A	OCIN-280C-4	520A
ED510-315C-4	ACIN-315C-4	580A	OCIN-315C-4	600A
ED510-350C-4	ACIN-350C-4	620A	OCIN-350C-4	640A
ED510-400C-4	ACIN-400C-4	670A	OCIN-400C-4	690A
ED510-500C-4	ACIN-500C-4	835A	OCIN-500C-4	860A

### Do You Know ?

- Reactor enhance VFD life
- Reactor control harmonics
- Reactor save energy
- Reactor protect equipment

## SPECIFICATIONS OF INPUT / OUTPUT AC AND DC REACTORS

MODEL NO.	INPUT FILTER	OUTPUT FILTER
ED510-1R5C-2	IFT-E016A-1	IFT-E016A-1
ED510-2R2C-2	IFT-E016A-1	IFT-E016A-1
ED510-0R7C-4	IFT-E006A-1	IFT-E006A-1
ED510-1R5C-4	IFT-E006A-1	IFT-E006A-1
ED510-2R2C-4	IFT-E006A-1	IFT-E006A-1
ED510-04C-4	IFT-E016A-1	IFT-E016A-1
ED510-5R5C-4	IFT-E016A-1	IFT-E016A-1
ED510-7R5CC-4	IFT-E032A-1	IFT-E032A-1
ED510-011C-4	IFT-E032A-1	IFT-E032A-1
ED510-015C-4	IFT-E045A-1	IFT-E045A-1
ED510-18R5C-4	IFT-E045A-1	IFT-E045A-1
ED510-022C-4	IFT-E065A-1	IFT-E065A-1
ED510-030C-4	IFT-E065A-1	IFT-E065A-1
ED510-037C-4	IFT-E0100A-1	IFT-E0100A-1
ED510-045C-4	IFT-E0100A-1	IFT-E0100A-1
ED510-055C-4	IFT-E0150A-1	IFT-E0150A-1
ED510-075C-4	IFT-E0150A-1	IFT-E0150A-1
ED510-090C-4	IFT-E0240A-1	IFT-E0240A-1
ED510-110C-4	IFT-E0240A-1	IFT-E0240A-1
ED510-132C-4	IFT-E0240A-1	IFT-E0240A-1
ED510-160C-4	IFT-E0400A-1	IFT-E0400A-1
ED510-185C-4	IFT-E0400A-1	IFT-E0400A-1
ED510-200C-4	IFT-E0600A-1	IFT-E0600A-1
ED510-220C-4	IFT-E0600A-1	IFT-E0600A-1
ED510-250C-4	IFT-E0600A-1	IFT-E0600A-1
ED510-280C-4	IFT-E0600A-1	IFT-E0600A-1
ED510-315C-4	IFT-E0800A-1	IFT-E0800A-1
ED510-350C-4	IFT-E0800A-1	IFT-E0800A-1
ED510-400C-4	IFT-E0800A-1	IFT-E0800A-1
ED510-500C-4	IFT-E01000A-1	IFT-E01000A-1



## HANDLING INSTRUCTIONS



- Only qualified people are allowed to operate on the drive device/system. Ignoring the instructions in “warning” may cause serious physical injury or death or property loss.
- Connect the input power lines tightly and permanently. And ground the device with proper techniques.
- Even when the inverter is stopped, dangerous voltage is present at the terminals:
  - o power Terminals: R, S, T
  - o Motor Connection Terminals: U, V, W
- Stop the drive and disconnect it from the power line. Wait for 10 minutes to let the drive discharge and then begin the installation.
- Minimum cross-sectional areas of the grounding conductor should be at least 10m<sup>2</sup> or you can select larger one between the cross-sectional area of the power cord conductors and the cross-sectional area of the grounding conductor according to the following table:

the cross-sectional areas of power cord conductors m <sup>2</sup>	the cross-sectional areas of grounding conductors m <sup>2</sup>
$S \leq 16$	S
$16 < S \leq 35$	16
$35 < S$	S/2



- Lift the inverter by its base other than the keypad or the cover. The dropping of the main part may cause physical injury.
- The inverter should be fixed on a non-flammable wall such as metal and away from heat and flammable materials to avoid the fire.
- If more than two drives are installed in a cabinet, the temperature should be lower than 40°C by means of a cooling fan. Overheat may cause fire or damage to the drive.

## ENVIRONMENTAL REQUIREMENTS

### Temperature and Humidity

The ambient temperature is among -10°C to 40°C and the inverter has to derate by 4% for every additional 1°C if the ambient temperature exceeds 40°C. The temperature cap is 50°C.

Relative humidity of the air;  $\leq 90\%$ , No condensation is allowed.

### Altitude

The inverter can run at the rated power if the installation site is less than 1000m (including 1000m) above the sea level. But it has to derate if the altitude exceeds 1000m.

## OTHER ENVIRONMENTAL REQUIREMENTS

The inverter can not bear fierce impact or shock. So the oscillation range should be less than 5.88m/s<sup>2</sup> (0.6g)

The inverter should keep away from the electromagnetic radiation source.

The inverter should keep away from water and condensation.

The inverter should keep away from contaminative air, such as corrosive gas, oil mist and conductive dust.

The inverter should keep away from direct sunlight, oil mist, steam and vibration environment.



**We believe in “ Supply quality products in the best price”**

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