

Automation for a Changing World

## **Delta Active Front End AFE2000 Series**



[www.delta.com.tw/ia](http://www.delta.com.tw/ia)

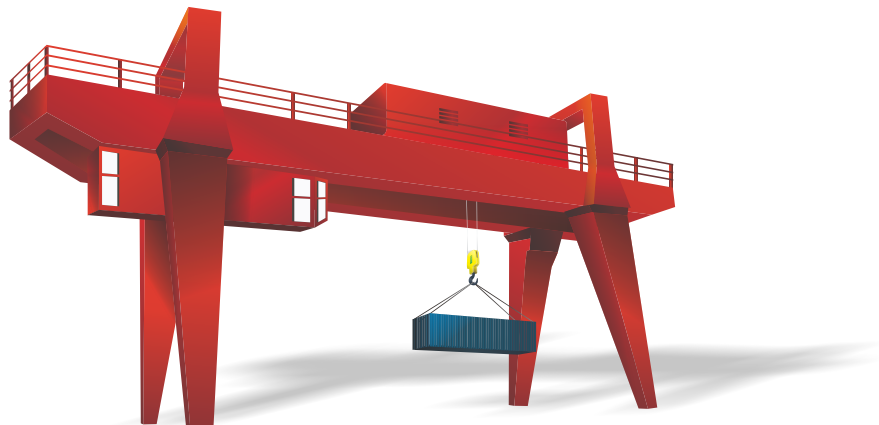
 **DELTA**  
Smarter. Greener. Together.

## Features

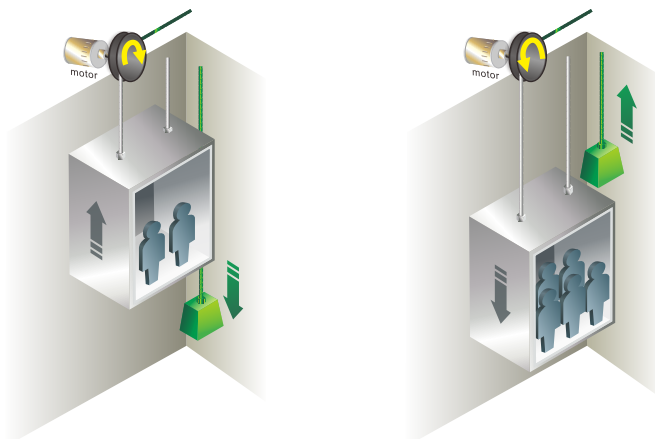
- Replaces traditional brake resistor to reduce heat energy.
- Clear energy savings: more than 95% of the regenerative energy is converted into electricity and supplied back to the mains.
- Full-load operation: input-side current THD lower than 5% and power factor up to 99%.
- AC motor drives with AFE2000: supports 4-quadrant operation with variable frequencies and adjustable system.
- Constant DC bus voltage: unaffected by mains voltage fluctuations.

## Applications

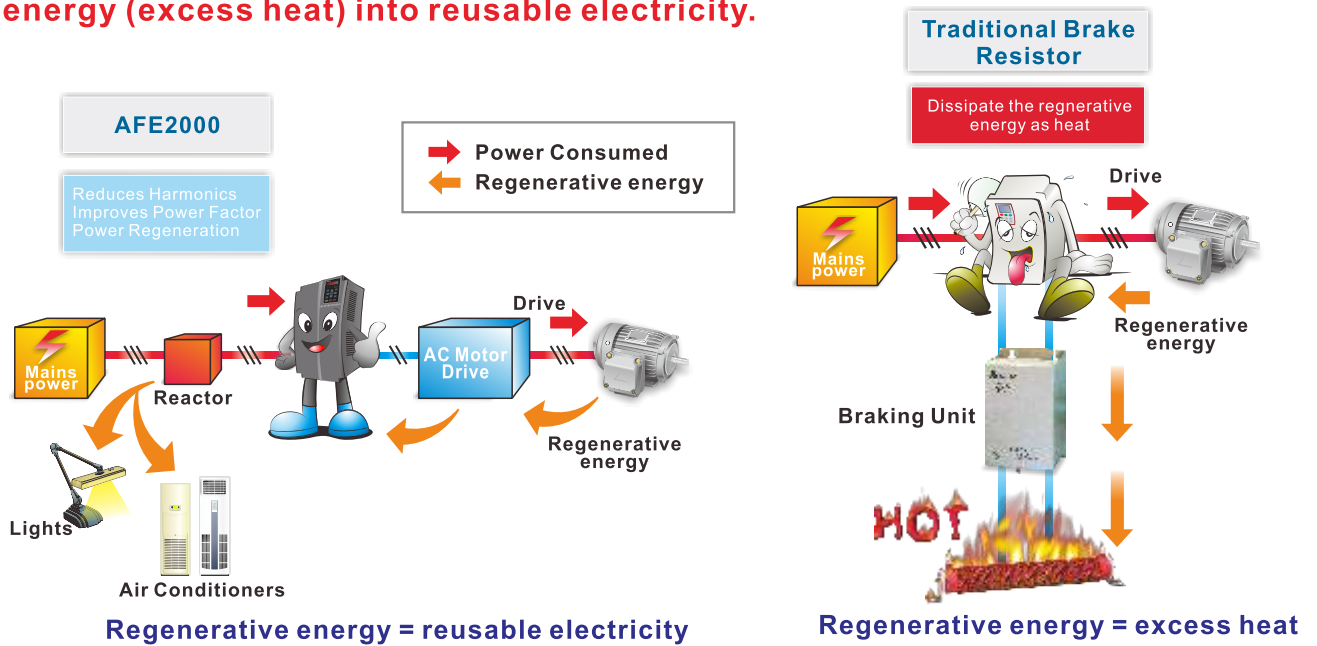
- Large-inertia loads, such as centrifuge equipment, dewatering machines and roving machines.
  - 4-quadrant loads including elevators, cranes and pumpjacks (oil extraction machines)
  - Quick braking, such as machine tools, bag making machines, auto storage and retrieval systems, and lathes
  - Long-term energy feedback, such as wind power, water power, steel printing and paper making machinery (winding equipment).
  - Improves power quality for industries such as semiconductor and panel industries
- ▶ When a crane is unloading large goods or cargos, its motor is in generator mode and produces excess energy. AFE2000 can be installed as a replacement for the traditional brake resistor.



- ▶ When an elevator is traveling upward with a light load or downward with a heavy load, its motor is in generator mode and produces excess energy. AFE2000 can be installed to convert excess energy into reusable electricity for other devices and equipment used.

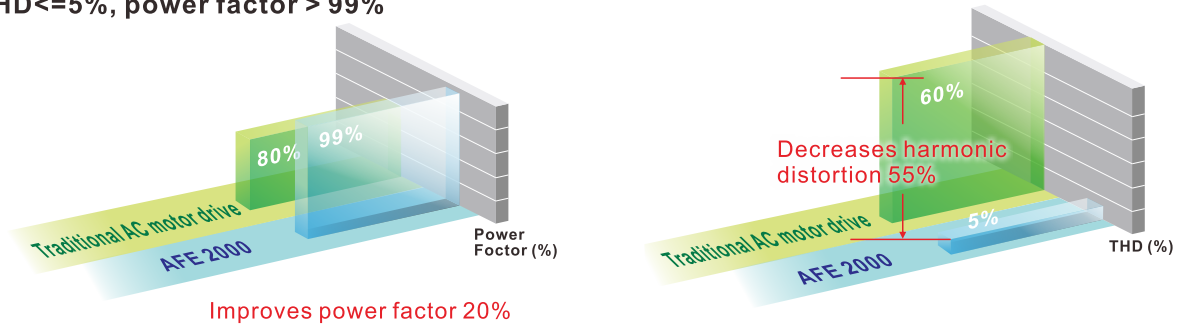


● **Replace traditional brake resistors with the AFE2000 to convert regenerative energy (excess heat) into reusable electricity.**

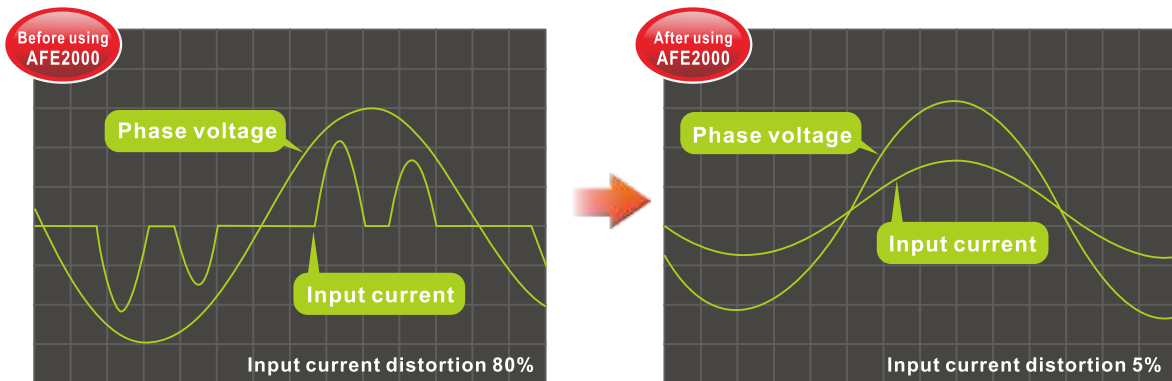


● **Improves power factor and decreases harmonic distortion.**

- ▶ THD <= 5%, power factor > 99%



- ▶ Improve power factor, lower harmonic distortion, and decrease energy consumption to reduce energy costs and protect the environment.



- ▶ The AFE2000 is your best choice for the following international standards:

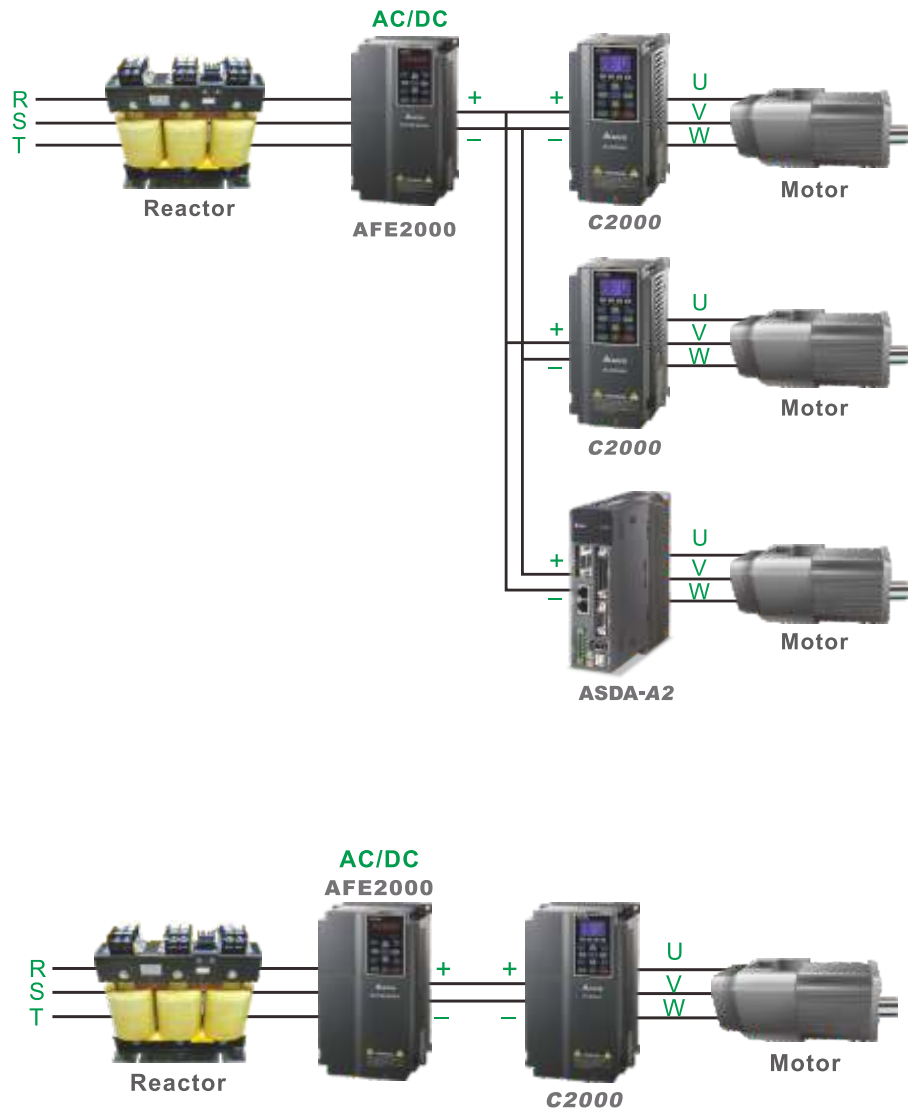
- IEEE519-1992
- IEC/EN61000-3-12
- IEC/EN61000-3-4
- IEC/EN61000-3-2





## Multiple Solutions

The AFE2000 series is an energy-saving green product that offers a regenerative energy solution and at the same time improves overall power quality while reducing total electricity costs.



This figure is for demonstration purposes only, please refer to standard wiring diagrams for wiring details.

## High-speed Fieldbus

- Provides various communication network cards and fieldbus cards
- Built-in RS-485 modbus protocol
- **CANopen** (DS301)



- Advanced network functions



- MODBUS TCP



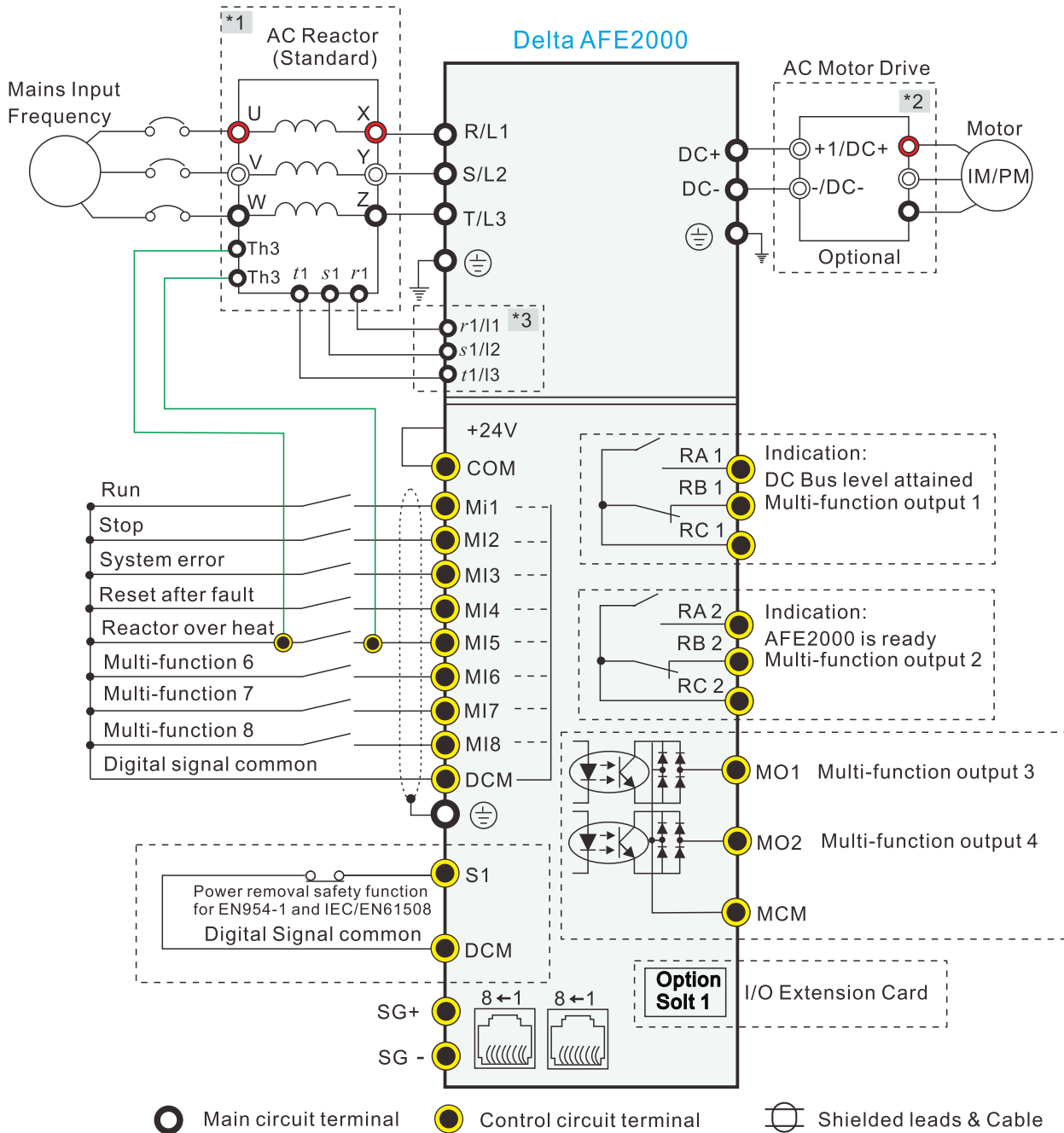
## Specifications

230V	Model AFE-__A23A	075	150	220	370
	Applicable power (kW)	7.5	15	22	37
Rated input voltage (V)	170~250Vac				
Rated input current (A)	35	70	95	150	
Voltage control	300~370Vdc				
Overload capacity	150% 60sec				
Frequency tolerance	±5%				
Power factor at input side	0.95 to above 0.99				
Harmonic (%)	Less than 5% (at rated current)				
Enclosure type	IP20/NEMA1			IP00/UL Open Type	
Cooling method	Fan cooling				
Installation environment	For indoors and altitudes of 0~1000m (3280.60 feet), keep away from direct sunlight, corrosive gases, liquids and dust. For altitudes above 1000m (3280.60 feet), please decrease 3% of rated current for every 500m (1640.40 feet) increase. The maximum altitude is 2500m (8202.00 ft)				
Ambient temperature	-10°C~+50°C				
Storage/ transportation temperature	-25~+65°C				
Ambient humidity	Lower than 90%RH (non-condensing)				
Vibration	5.9m/ S <sup>2</sup> (0.6G) less than 10~55Hz (JIS C0040)				

460V	Model AFE-__A43A	075	150	220	370	450	750
	Applicable power (kW)	7.5	15	22	37	45	75
Rated input voltage (V)	325~500Vac						
Rated input current (A)	20	35	50	75	95	160	
Voltage control	600~740Vdc						
Overload capacity	150% 60sec						
Frequency tolerance	±5%						
Power factor at input side	0.95 to above 0.99						
Harmonic (%)	Less than 5% (at rated current)						
Enclosure type	IP20/NEMA1			IP00/UL Open Type			
Cooling method	Fan cooling						
Installation environment	For indoors and altitudes of 0~1000m (3280.60 feet), keep away from direct sunlight, corrosive gases, liquids and dust. For altitudes above 1000m (3280.60 feet), please decrease 3% of rated current for every 500m (1640.40 feet) increase. The maximum altitude is 2500m (8202.00 ft)						
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# Standard Wiring

## ■ One-to-One Installation (One AFE2000 + One AC motor drive)

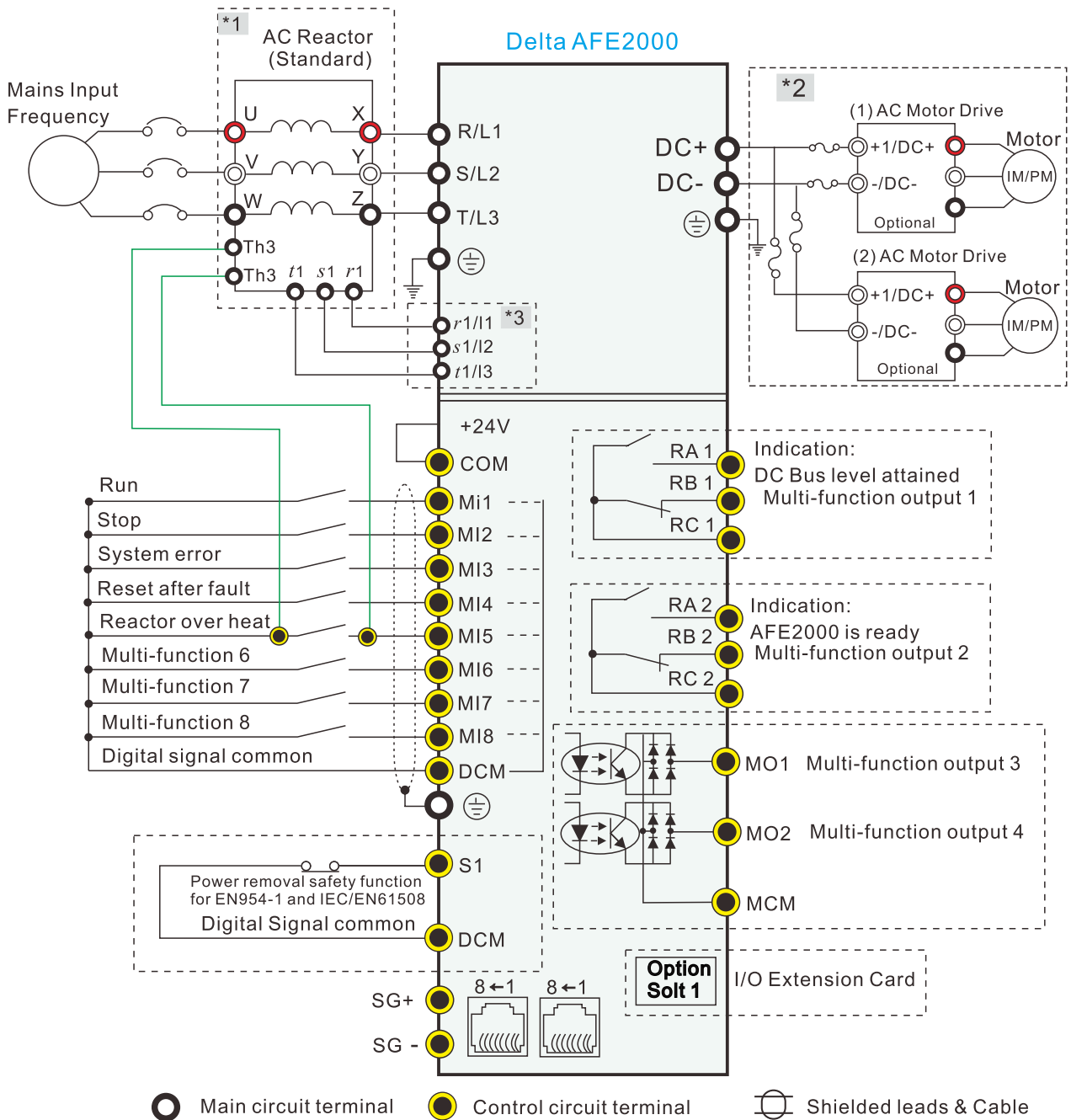


\*1 Delta's AC reactor (optional accessory) is equipped with a thermal protection function. The TH3 terminal will switch ON and transmit a warning to the AFE2000 when the reactor temperature exceeds 120 °C.

\*2 For one-to-many installation, it is recommended to install a fuse at the DC input side of the drive. Please calculate and select a suitable fuse for your drive:  $\text{Fuse type} = (\text{Rated input current of drive} / 0.78) \times 1.5$

\*3 For installing a non-Delta brand AC reactor, please connect the reactor to the power input terminals (R/L1, S/L2, T/L3).

■ One-to-Many Installation (One AFE2000 + Multiple AC motor drives)



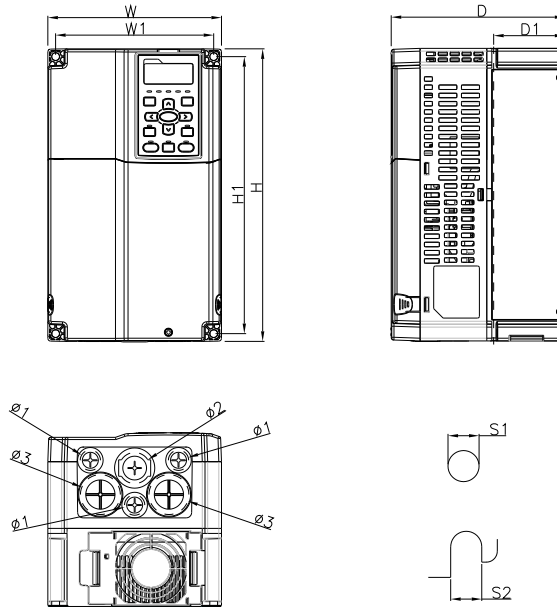
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\*2 For one-to-many installation, it is recommended to install a fuse at the DC input side of the drive. Please calculate and select a suitable fuse for your drive: Fuse type= (Rated input current of drive / 0.78) x 1.5

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# Dimensions

## ■ Frame B



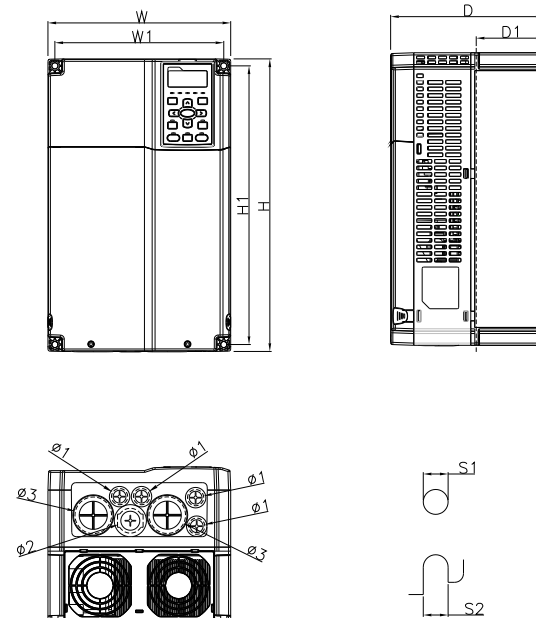
### MODEL

AFE075A23A  
AFE075A43A  
AFE150A43A

D1\* : Flange mounting

Frame		W	H	D	W1	H1	D1*	S1	S2	Φ1	Φ2	Φ3
B1	mm	190.0	320.0	190.0	173.0	303.0	77.9	8.5	8.5	22.2	34.0	43.8
	inch	7.48	12.60	7.48	6.81	11.93	3.07	0.33	0.33	0.87	1.34	1.72

## ■ Frame C



### MODEL

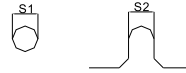
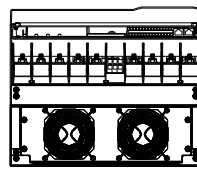
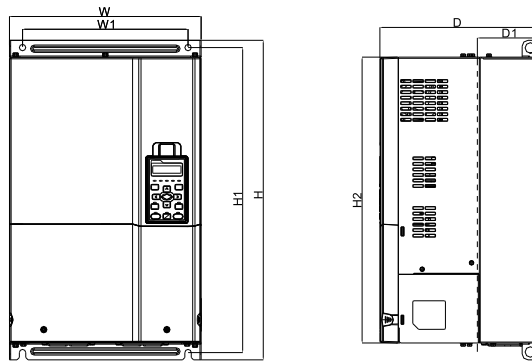
AFE150A23A  
AFE220A23A  
AFE220A43A

D1\* : Flange mounting

Frame		W	H	D	W1	H1	D1*	S1	S2	Φ1	Φ2	Φ3
C1	mm	250.0	400.0	210.0	231.0	381.0	92.9	8.5	8.5	22.2	34.0	50.0
	inch	9.84	15.75	8.27	9.09	15.00	3.66	0.33	0.33	0.87	1.34	1.97



■ Frame D



**MODEL**

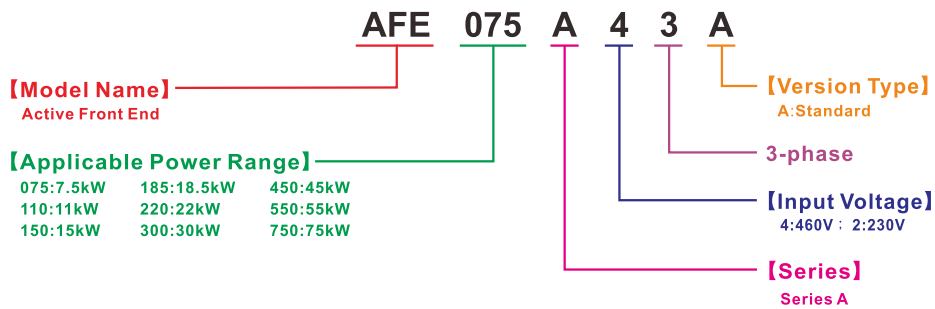
AFE370A23A  
 AFE370A43A  
 AFE450A43A  
 AFE750A43A

D1\* : Flange mounting

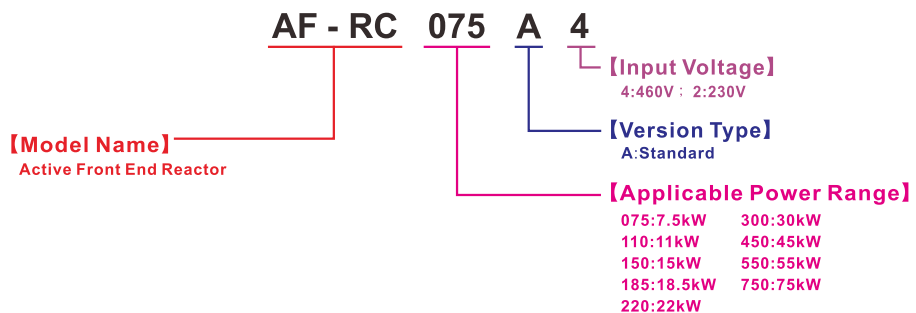
Frame		W	H	D	W1	H1	H2	D1*	S1	S2
B1	mm	330.0	550.0	275.0	285.0	525.0	492.0	107.2	11.0	11.0
	inch	12.99	21.65	10.83	11.22	20.67	19.37	4.22	0.43	0.43

## Model Name

### AFE2000



### Reactor

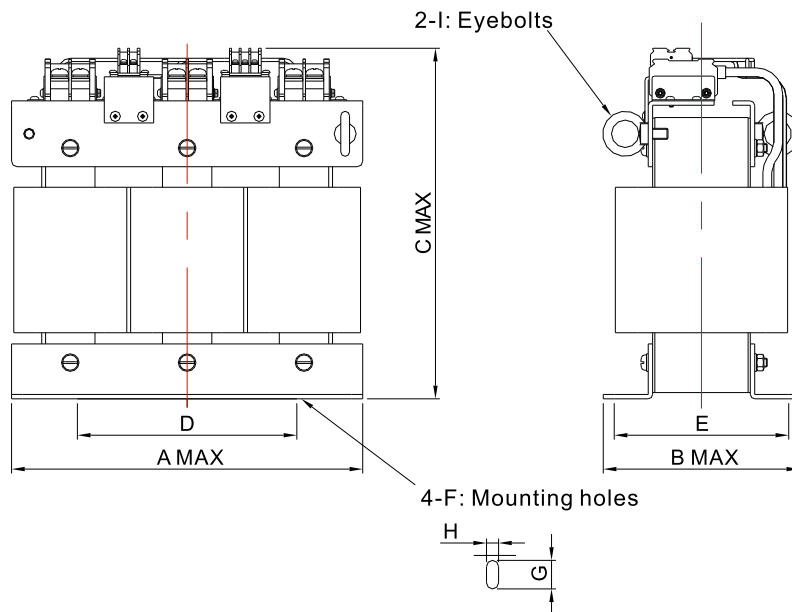


## Standard Reactors

230V					
kW	Frame	Applicable Model AFE-___A23A	Reactor Model	Inductance(mH)	Rated Current (Arms)
7.5	B	075	AF-RC075A2	2.1	35
15	C	150	AF-RC150A2	1.05	70
22		220	AF-RC220A2	0.77	95
37	D	370	AF-RC370A2	0.5	150

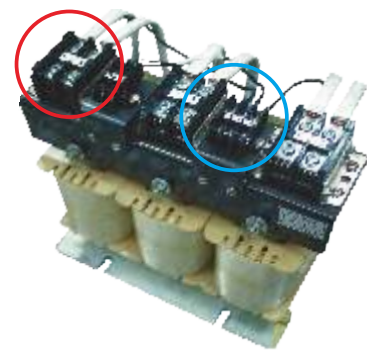
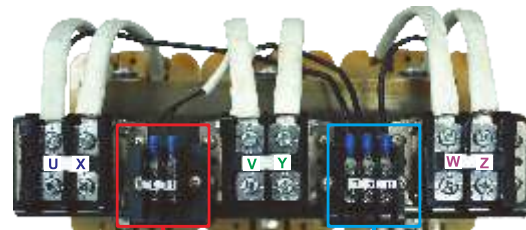
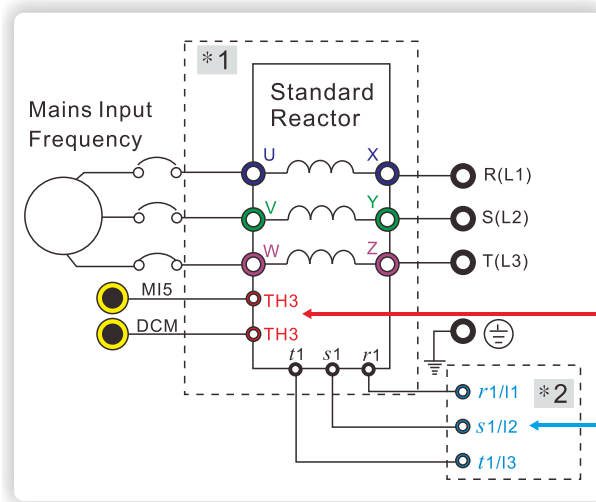
460V					
kW	Frame	Applicable Model AFE-___A43A	Reactor Model	Inductance(mH)	Rated Current (Arms)
7.5	B	075	AF-RC075A4	7.32	20
15		150	AF-RC150A4	4.18	35
22	C	220	AF-RC220A4	2.92	50
37	D	370	AF-RC370A4	1.96	75
45		450	AF-RC450A4	1.54	95
75		750	AF-RC750A4	0.92	160

## Standard Reactor Diagram



Unit : mm(inch)

Model	A	B	C	D	E	F	G	H	I	Approx. Mass kg
AF-RC075A2	305	159	280	150	125	M10	11	22	M10	28
AF-RC150A2	355	180	328	200	139	M10	11	26	M10	52
AF-RC220A2	355	200	328	200	159	M10	11	26	M10	62
AF-RC370A2	385	210	385	200	168	M12	13	25	M10	87
AF-RC150A4	355	180	328	200	139	M10	11	26	M10	52
AF-RC220A4	355	200	328	200	159	M10	11	26	M10	62
AF-RC370A4	385	210	385	200	168	M12	13	25	M10	87
AF-RC450A4	385	230	385	200	188	M12	13	25	M10	105
AF-RC750A4	420	240	440	250	200	M12	13	25	M12	137
AF-RC075A4	305	159	280	150	125	M10	11	22	M10	28



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\*2 For installing a non-Delta brand AC reactor, please connect the reactor to the power input terminals (R/L1, S/L2, T/L3).

## Delta AC Motor Drives for AFE2000

### Delta Motor Drives



### Delta Servo Drives: ASDA-A+, ASDA-A2, ASDA-B2



Smarter. Greener. Together.



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