



Digitized Automation for a Changing World

# Delta Power Regenerative Unit REG2000 Series



[www.deltaww.com](http://www.deltaww.com)

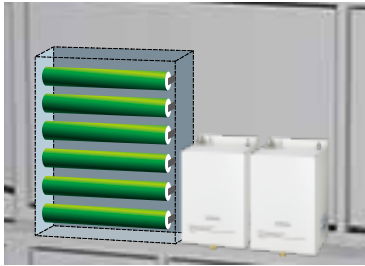


# Features

- Compact design with reactor included, easy to wire and easy to install

### Traditional solution

AC motor drive (55kW / 400V) + Brake Unit + Brake Resistor

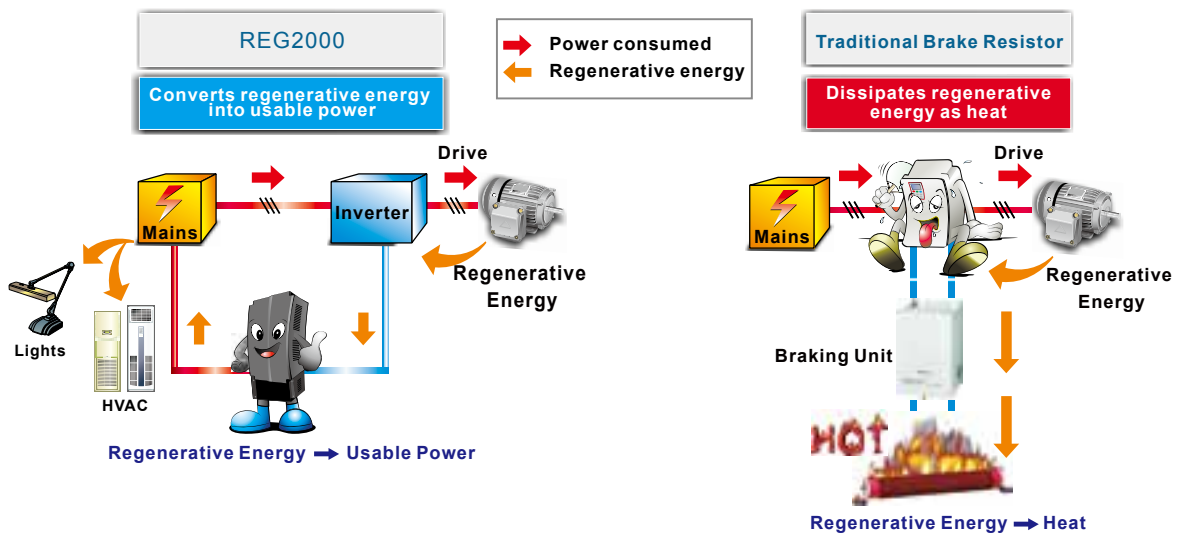


### Delta solution

AC motor drive (55kW / 400V) + Delta REG2000



- Outstanding energy-saving results with more than 95% power regeneration efficiency
- Lessens traditional brake resistors to reduce unnecessary heat generation



- Improves motor braking capability up to 150% from 125% of braking resistors
- Supports RS-485 (Modbus) communication for real-time monitoring and regenerated energy collection
- High application flexibility, compatible with all kinds of AC motor drives and servo systems in the market
- No need to set parameters for general applications; easy installation to any existing equipment
- Supports 4 parallel connections\* for power expansion in various applications

\* This should run at 20% derating

# Applications

- **Large-inertia load applications:** centrifuge equipment, industrial laundries, heavy duty conveyors, roving machines, gantry machine tools and more
- **4-quadrant load applications:** elevators, cranes and hoists, pumpjacks and more
- **Quick braking applications:** machine tools, bag making machines, auto storage and retrieval systems, press machines and more
- **Long-term energy feedback applications:** printing machines, escalators and more



Escalators



Elevators



Winding / Unwinding Equipment



Cranes & Hoists



Centrifuge Equipment



Press Machines

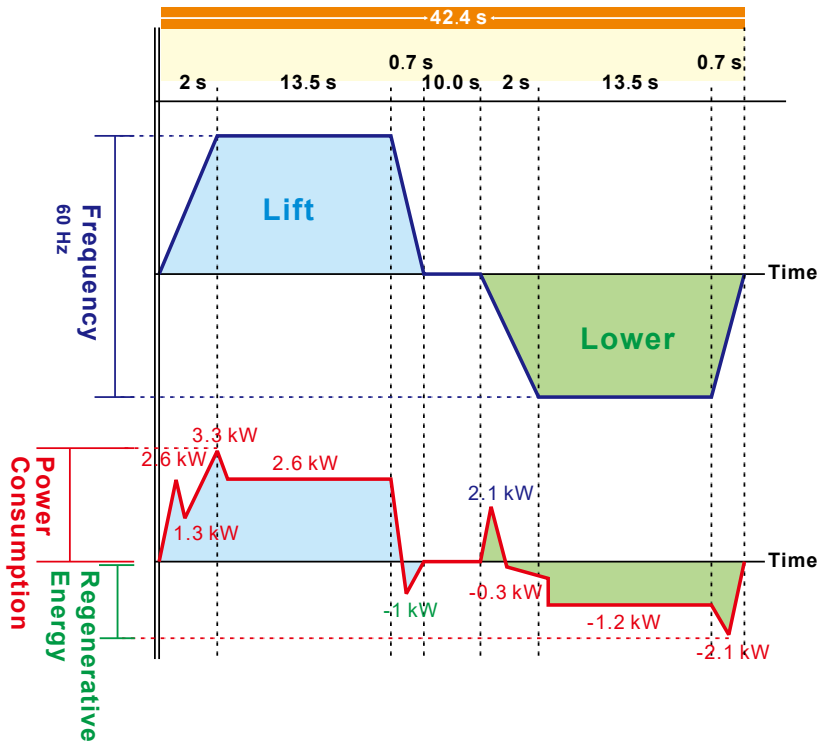


Industrial Laundries



Machine Tools

# Applications



## ■ Hoist

This hoist system works 12 hours a day and 265 days a year. Each cycle takes 42.4 seconds and the cost for 1kWh is NTD 3.5.

Hoist system: 5.5kW motor + REG2000  
 Hoist capacity: 10 tons  
 Hoist speed: 3.6 m/min  
 Loads: 3 tons  
 Cycle: 5 times

REG2000	+Whr	87.088
	-Whr	-28.89
Brake Resistor	+Whr	86.033
	-Whr	0

- Average savings per cycle:  $\frac{28.89}{5} = 5.778$  Whr

- Operation time per cycle: 42.4 sec

- Operation/day:

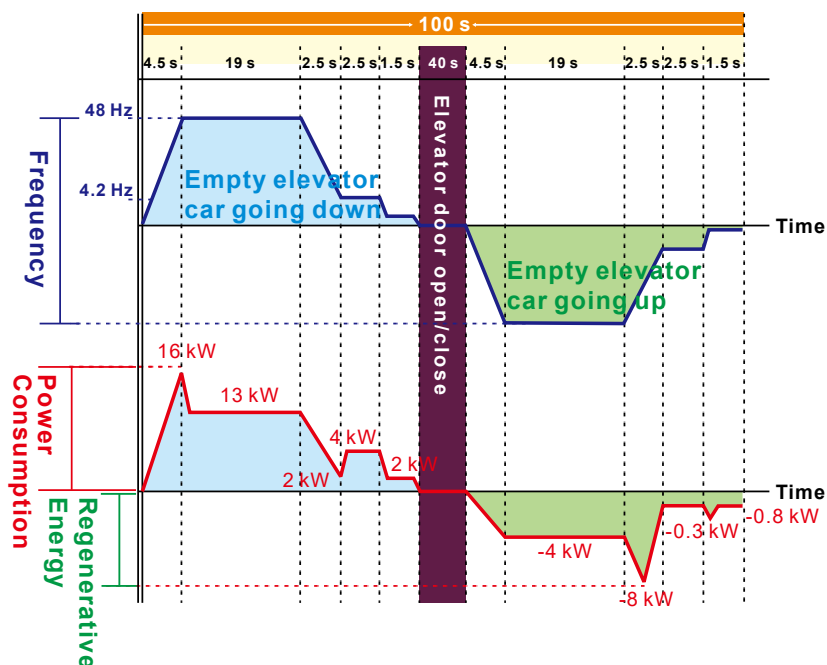
$$\frac{12 \text{ (hr)} \times 60 \text{ (min)} \times 60 \text{ (sec)}}{42.4 \text{ (sec)}} = 1,019 \text{ cycles}$$

### Performance using Delta's REG2000:

- Energy savings:  $\frac{28}{87} \times 100\% = 32\%$

- Annual savings:

$$\frac{5.778}{1000} \text{ (kWhr/cycle)} \times 1,019 \text{ (cycle/day)} \times 265 \text{ days} \times \text{NTD } 3.5 = \text{NTD } 5,461 \text{ (USD } 183)$$



## ■ Elevator

This elevator system works 12 hours a day and 265 days a year. Each cycle takes 100 seconds and the cost for 1kwh is NTD 3.5.

Elevator system: 22kW motor + REG2000  
 Elevator capacity: 2 tons  
 Elevator speed: 60 m/min  
 Height: B1~4F  
 Loads: empty car  
 Cycle: 5 times

REG2000	+Whr	360.7
	-Whr	111.1
Brake Resistor	+Whr	354.2
	-Whr	0

- Average savings per cycle:  $\frac{111}{5} = 22.2$  Whr

- Operation time per cycle: 100 sec

- Operation cycle per day:

$$\frac{12 \text{ (hr)} \times 60 \text{ (min)} \times 60 \text{ (sec)}}{100 \text{ (sec)}} = 432 \text{ cycles}$$

### Performance using Delta's REG2000:

- Energy savings:  $\frac{111}{361} \times 100\% \approx 31\%$

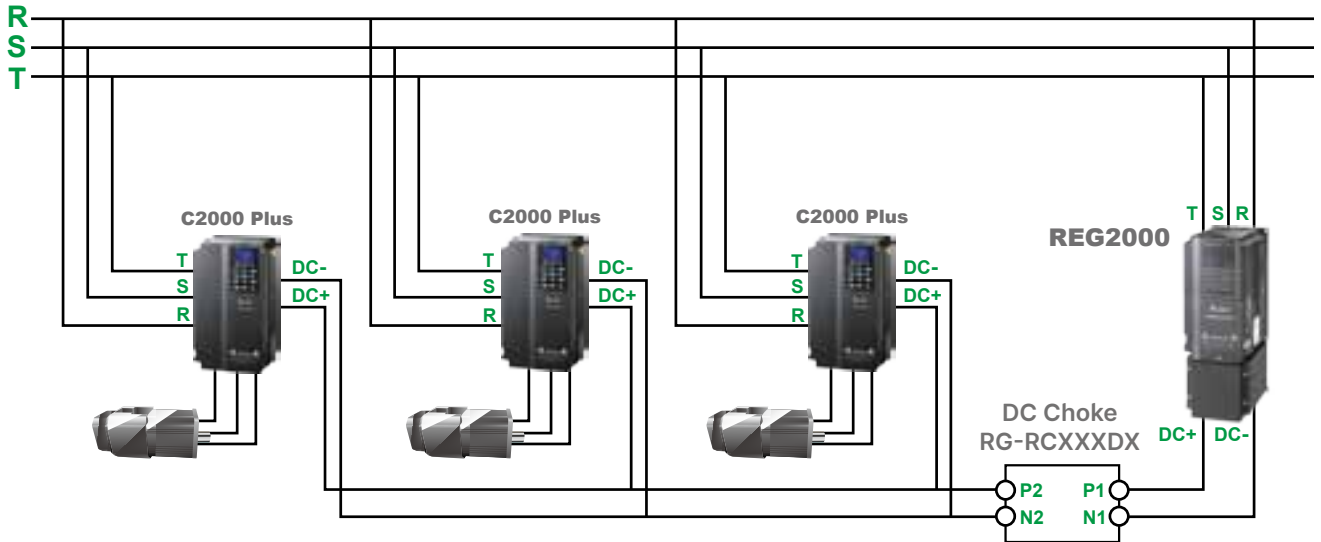
- Annual savings:

$$\frac{22.2}{1000} \text{ (kWhr/cycle)} \times 432 \text{ (cycle/day)} \times 265 \text{ days} \times \text{NTD } 3.5 = \text{NTD } 8,895 \text{ (app. USD } 280)$$

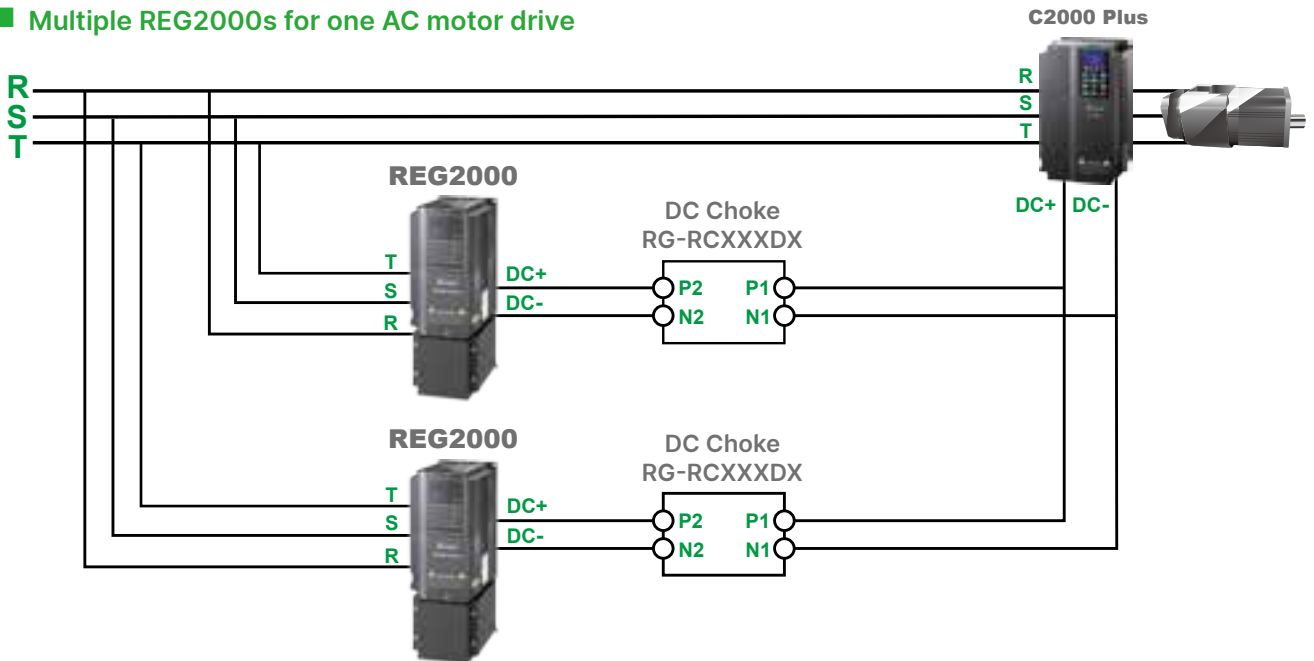
# Flexible Deployment

Diverse deployments of REG2000 for various field applications, saving installation space and cost

## ■ One REG2000 for multiple AC motor drives



## ■ Multiple REG2000s for one AC motor drive



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







# Specifications

230 V		A			B			C
Frame								
Model number REG__A23A-21		075	110	150	185	220	370	
Power rating (kW)		7.5	11	15	18.5	22	37	
DC bus	Rated input current (A <sub>DC</sub> )	24.0	39.0	46.0	59.8	73.2	122	
	Activation range of voltage	270~390 V <sub>DC</sub> (adjustable setting via Pr.01-08)						
Mains	Rated output current (A <sub>AC</sub> )	20	32	38	49	60	100	
	Voltage / frequency rating	3-phase AC 200V~240V (-15% ~ +10%), 50/60Hz						
	Operation voltage	170~265 V <sub>AC</sub>						
	Frequency tolerance	47~63 Hz						
Net weight		7.5±0.5 Kg			16.5±0.5 Kg		28.0±0.5 Kg	

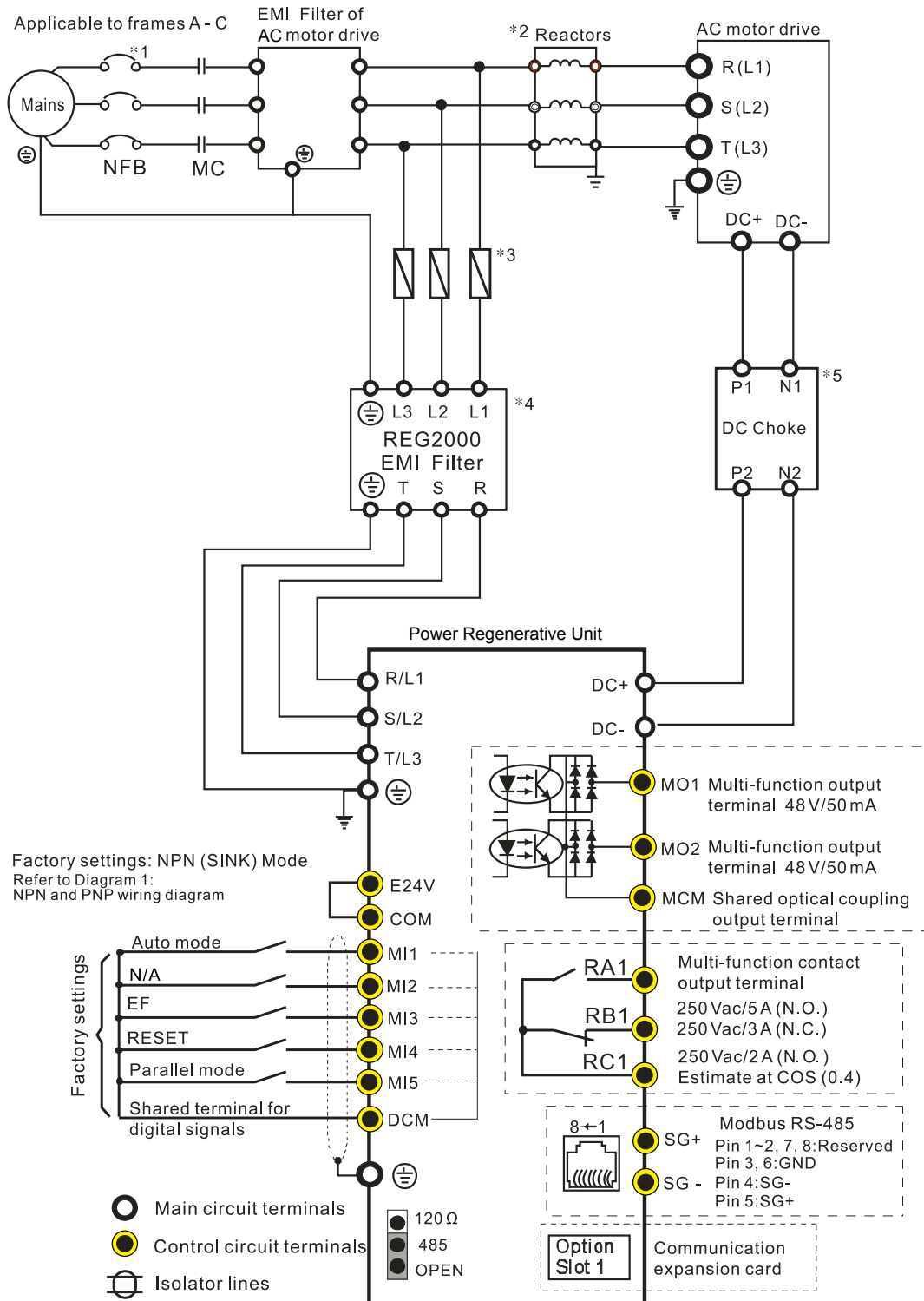
460 V		A			B			C			
Frame											
Model number REG__A43A-21		075	110	150	185	220	300	370	450	550	
Power rating (kW)		7.5	11	15	18.5	22	30	37	45	55	
DC bus	Rated input current (A <sub>DC</sub> )	12.8	20.7	24.4	30.5	39.0	52.5	59.8	73.0	91.5	
	Activation range of voltage	516~780 V <sub>DC</sub> (adjustable setting via Pr.01-08)									
Mains	Rated output current (A <sub>AC</sub> )	10.5	17	20	25	32	43	49	60	75	
	Voltage / frequency rating	3-phase AC 380V - 480V ( -15%~+10%), 50/60Hz									
	Operation voltage	323~528 V <sub>AC</sub>									
	Frequency tolerance	47~63 Hz									
Net weight		7.5±0.5 Kg			17.0±0.5 Kg			26.5±0.5 Kg		29.0±0.5 Kg	29.5±0.5 Kg

# Common Characteristics

Control Characteristics	Control method	SVPWM	
	Brake torque	80% rated output current when regenerating continuously ; 100% rated output current when regenerating for 1 minute at 25% ED	
	Overload capacity	150% rated output current when regenerating for 10 seconds at 10% ED	
	Generic input signal	5 sets of signal terminals 24 V <sub>DC</sub> 6 mA	
	Generic output signal	2 sets of signal terminals 48 V <sub>DC</sub> 50 mA; 1 set of signal terminal for relay output	
	Cooling method	Forced air cooling (Fan cooling)	
Environment	Enclosure	IP20 / NEMA 1	
	Environment for operation, storage and transportation	If the Power Regeneration Unit is installed at altitude 0~1000m, follow normal operation restrictions. If it is installed at altitude 1000~3000m, decrease 2% of rated current or lower 0.5°C of temperature for every 100m increase in altitude. Maximum altitude for Corner Grounded is 2000m.	
	Operation temperature	-10~40°C	
	Storage temperature	-25~+70°C	
	Rated humidity	Blow 90% RH (Non-condense)	
	Vibration	[Frame A & B] 2~13.2Hz, 1.0 mm / 13.2~55Hz, 0.7~1.5 G / 55~512 Hz, 1.5 G (IEC 60068-2-6) [Frame C] 2~13.2Hz, 1.0 mm / 13.2~55Hz, 0.7~1.0 G / 55~512 Hz, 1.0 G (IEC 60068-2-6)	
Certifications	   		

# Wiring

Applicable to frames A~C

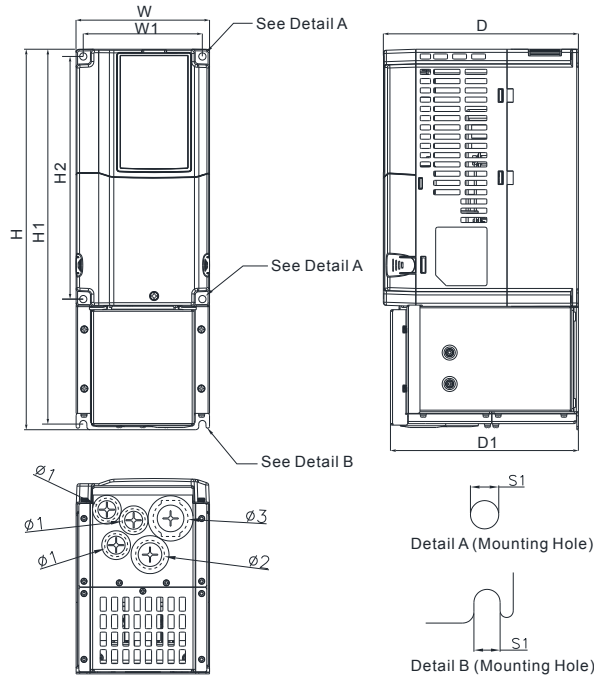


## Note:

- \*1. The NFB can be selected based on the selection guide of the drive.
- \*2. If a reactor is connected to the drive, install the reactor here (optional).
- \*3. Please refer to the user manual for selection of fuses.
- \*4. Please refer to the user manual for selection of a REG2000 EMI filter.
- \*5. DC choke is included in the package, please install following the instruction shown in the diagram.

# Dimensions

## Frame A



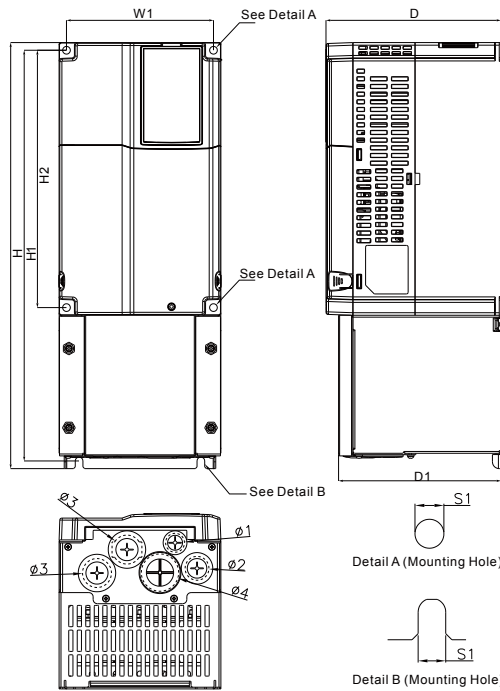
### MODEL

- REG075A23A-21
- REG110A23A-21
- REG075A43A-21
- REG110A43A-21
- REG150A43A-21

Unit : mm[inch]

Frame		W	H	D	W1	H1	H2	D1	S1	Ø1	Ø2	Ø3
A1	mm	130.0	370.0	190.0	116.0	357.5	236.0	183.0	7.0	22.2	28.0	34.0
	inch	5.12	14.56	7.48	4.57	14.07	9.29	7.20	0.28	0.87	1.10	1.34

## Frame B



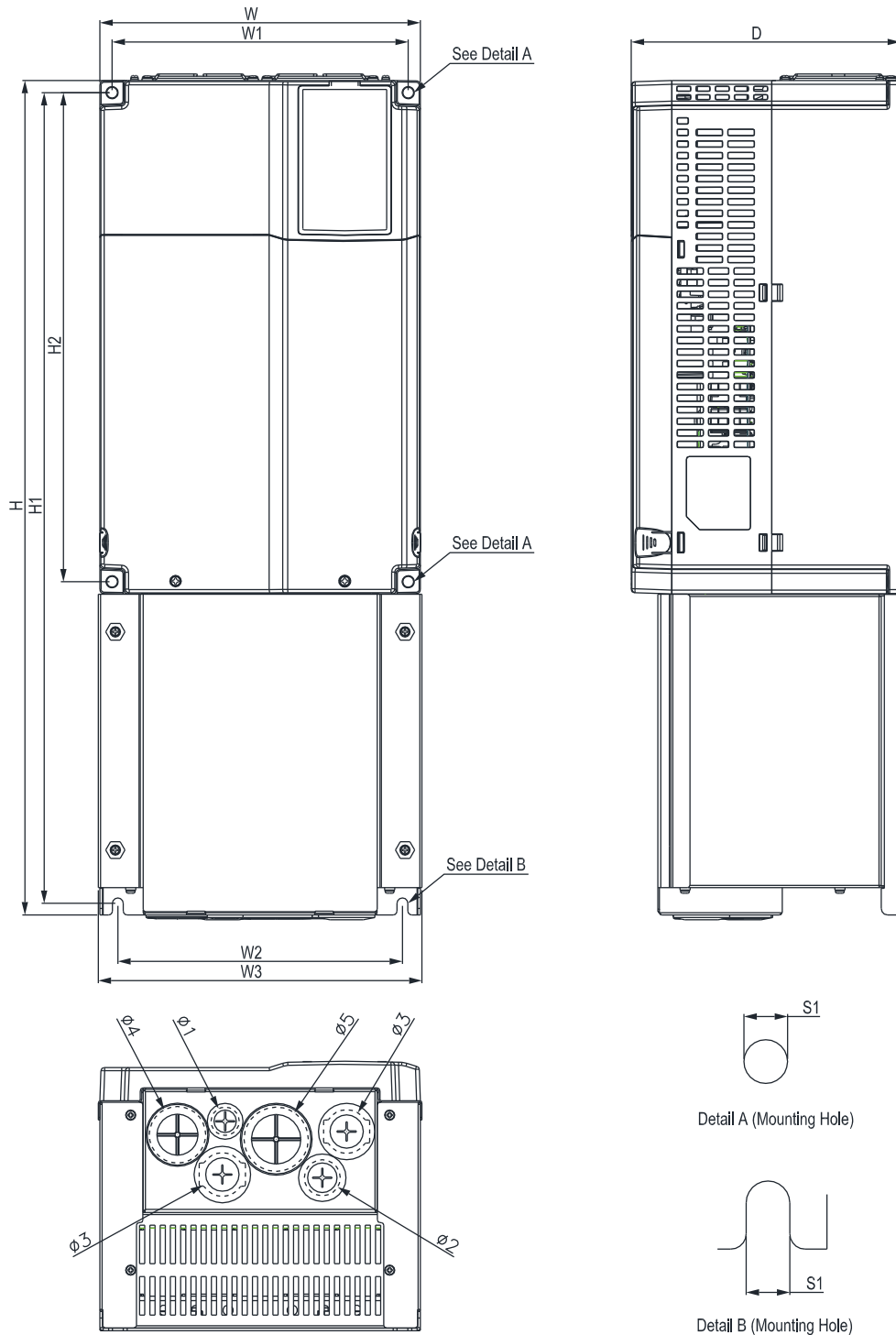
### MODEL

- REG150A23A-21
- REG185A23A-21
- REG220A23A-21
- REG185A43A-21
- REG220A43A-21
- REG300A43A-21

Unit : mm[inch]

Frame		W	H	D	W1	H1	H2	D1	S1	Ø1	Ø2	Ø3	Ø4
B1	mm	190.0	500.0	205.0	172.5	482.0	302.0	190.5	9.0	22.2	28.0	34.0	43.8
	inch	7.48	19.68	8.09	6.79	18.98	11.89	7.50	0.35	0.87	1.10	1.34	1.72

# Frame C



## MODEL

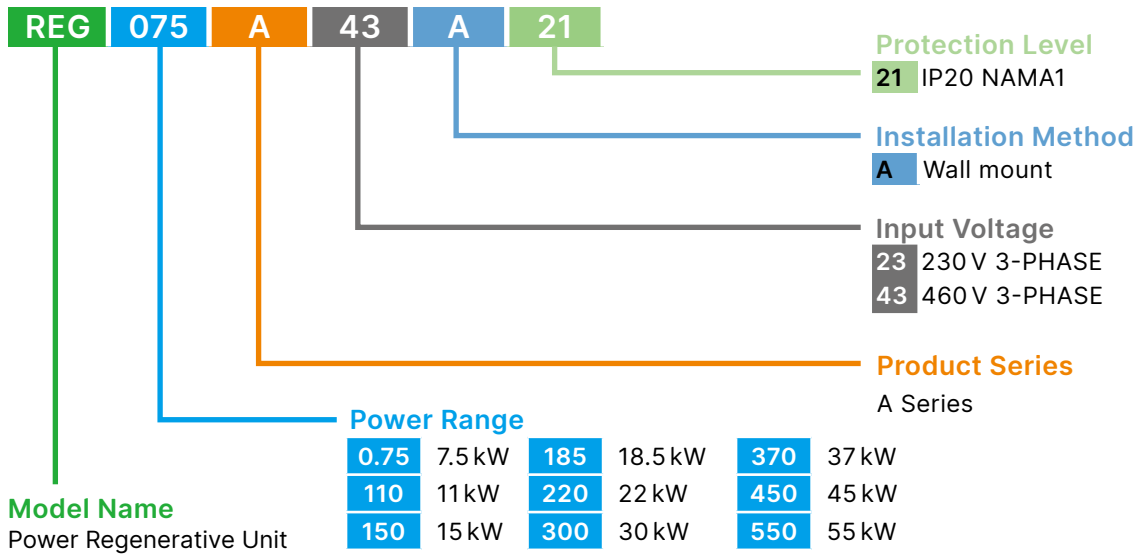
- REG370A23A-21
- REG370A43A-21
- REG450A43A-21
- REG550A43A-21

Unit : mm [inch]

Frame		W	H	D	W1	W2	W3	H1	H2	S1	$\phi 1$	$\phi 2$	$\phi 3$	$\phi 4$	$\phi 5$
C1	mm	250.0	650.0	210.0	231.0	220.0	252.5	631.5	381.0	8.5	22.2	28.0	34.0	44.0	50.1
	inch	9.84	25.59	8.27	9.09	8.74	9.94	24.86	15.00	0.33	0.87	1.10	1.34	1.73	1.97



# Model Name



# EMI Filter Specifications

230 V	REG EMI Filter	Weight (kg)	460 V	REG EMI Filter	Weight (kg)
REG075A23A-21	RG-EF110A2	3.2±0.5	REG075A43A-21	RG-EF150A4	3.2±0.5
REG110A23A-21			REG110A43A-21		
REG150A23A-21	RG-EF220A2	4.8±0.5	REG150A43A-21		
REG185A23A-21			REG185A43A-21		
REG220A23A-21			REG220A43A-21		
REG370A23A-21	RG-EF370A2	6.0±0.5	REG300A43A-21	RG-EF300A4	4.8±0.5
			REG370A43A-21		
			REG450A43A-21		
			REG550A43A-21	RG-EF550A4	6.0±0.5

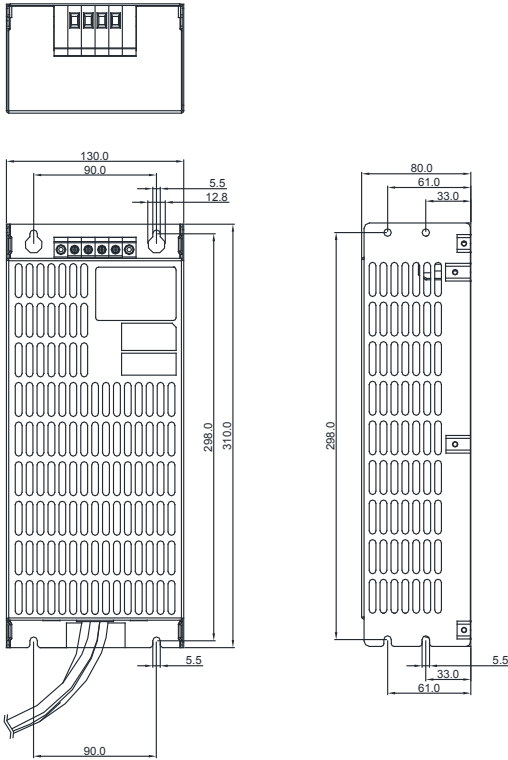
Model	AWG Size		Torque ( ± 10%)
	Max.	Min.	
<b>REG2000 / EMI Filter Frame A</b>			
RG-EF110A2	8 AWG (8.4 mm <sup>2</sup> )	8 AWG (8.4 mm <sup>2</sup> )	M4 14~16 kg-cm
RG-EF150A4		10 AWG (5.3 mm <sup>2</sup> )	
<b>REG2000 / EMI Filter Frame B</b>			
RG-EF220A2	4 AWG (21.2 mm <sup>2</sup> )	4 AWG (21.2 mm <sup>2</sup> )	M5 30~34 kg-cm
RG-EF300A4		6 AWG (13.3 mm <sup>2</sup> )	
<b>REG2000 / EMI Filter Frame C</b>			
RG-EF370A2	1/0 AWG (53.5 mm <sup>2</sup> )	1/0 AWG (53.5 mm <sup>2</sup> )	M6 60~69 kg-cm
RG-EF550A4		2 AWG (33.6 mm <sup>2</sup> )	

※ Use only copper cable with ampacity of 600 V and temperature resistance of 75°C or 90°C.  
 ※ RG-EF110A2 and RG-EF220A2 must use cable with temperature resistance of 90°C.

# Dimensions - EMI Filter

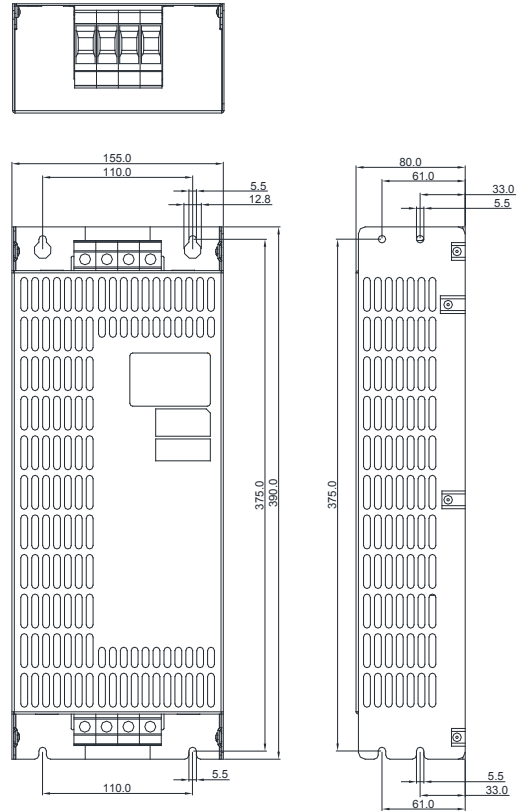
## Frame A

- RG-EF110A2
- RG-EF150A4



## Frame B / C

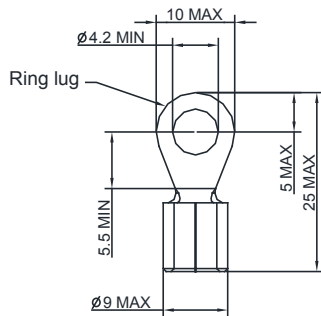
- RG-EF220A2
- RG-EF370A2
- RG-EF300A4
- RG-EF550A4



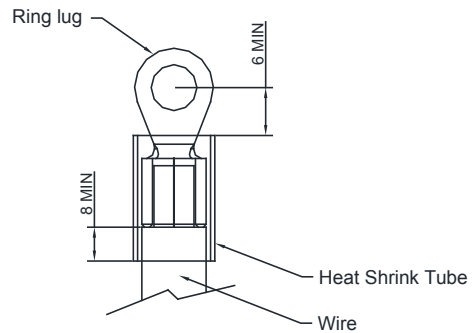
Unit : mm [inch]

※ Requires an additional terminal for 8 AWG cable.

Suggested to apply O terminal for wiring according to application requirement.



※ For insulation of over 600 V ampacity, apply heat shrink tube on the metal part of terminal to comply with UL standard.



## Accessories

### ▪ KPC-CC01



- Highly illuminated LCD display
- Languages: Traditional Chinese, Simplified Chinese, English
- RJ45 Port

### ▪ KPC-CE01



- 5-digit 7-segment LED Display
- RJ45 Port

### ▪ Digital keypad accessories: RJ45 extension leads

Title	Part No.	Length	
		mm	inch
1	UC-CMC003-01A	300	11.8
2	UC-CMC005-01A	500	19.6
3	UC-CMC010-01A	1000	39
4	UC-CMC015-01A	1500	59
5	UC-CMC020-01A	2000	78.7
6	UC-CMC030-01A	3000	118.1
7	UC-CMC050-01A	5000	196.8
8	UC-CMC100-01A	10000	393.7
9	UC-CMC200-01A	20000	787.4

## Delta AC Motor Drives for the REG2000

### ▪ Delta AC Motor Drives:



### ▪ Delta Servo Drives: ASDA-A2, ASDA-B2, ASDA-A3, ASDA-B3



Smarter. Greener. Together.

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