



Digitized Automation for a Changing World

Delta Power Regenerative Unit REG2000 Series



www.deltaww.com

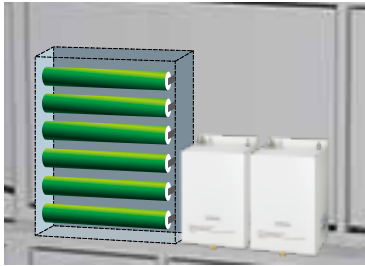
 **DELTA**
Smarter. Greener. Together.

Features

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

Traditional solution

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

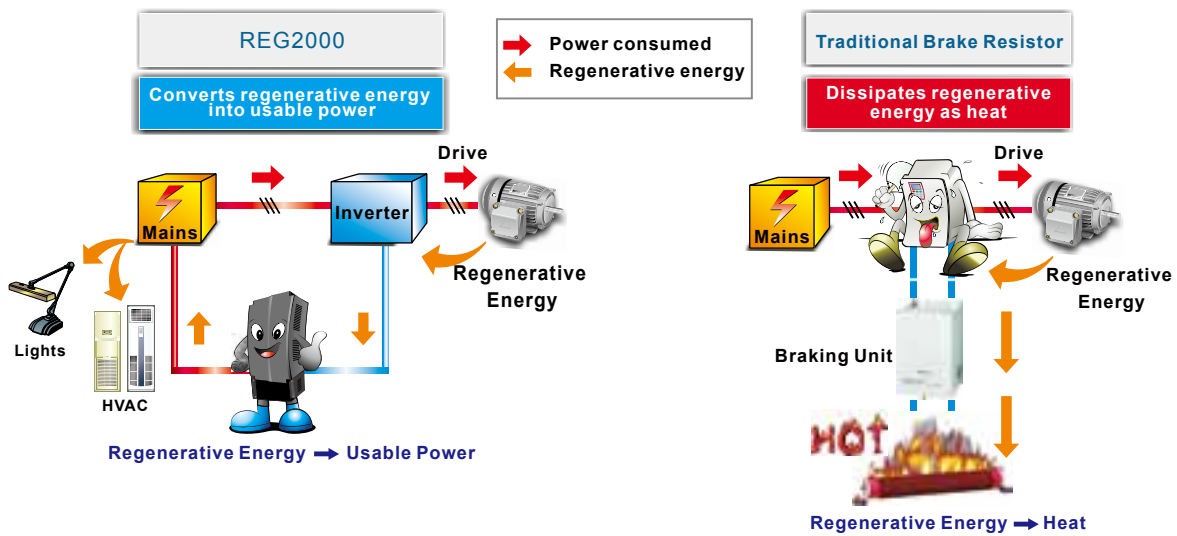


Delta solution

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

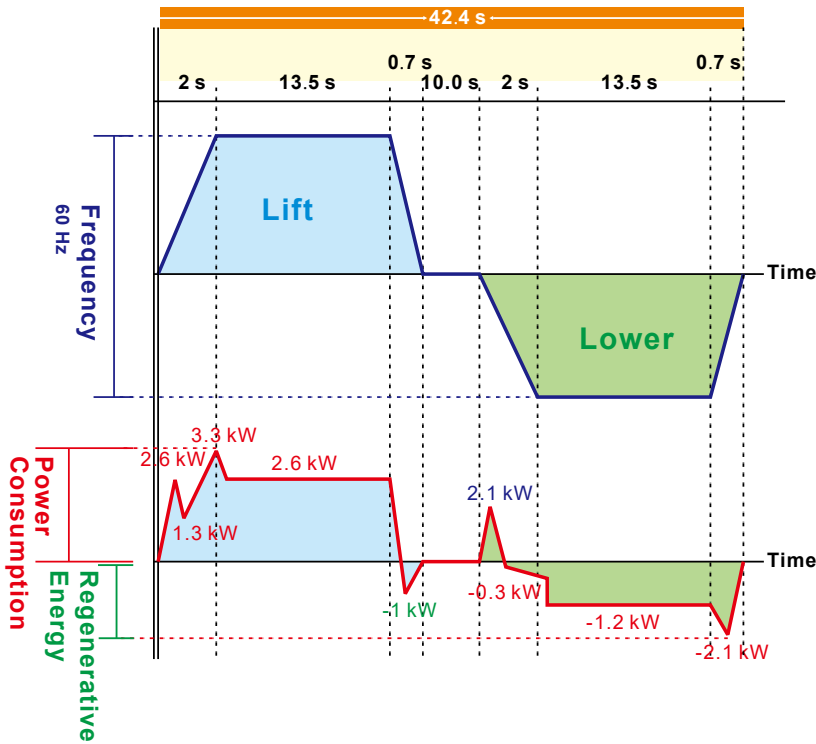


Industrial Laundries



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 1 kWh is NTD 3.5.

Hoist system: 5.5 kW 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 : $\frac{28.89}{5} = 5.778 \text{ Whr}$

- 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 1 kWh is NTD 3.5.

Elevator system: 22 kW 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 : $\frac{111}{5} = 22.2 \text{ Whr}$

- Operation time per cycle: 100 sec

- Operation cycle per day:

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

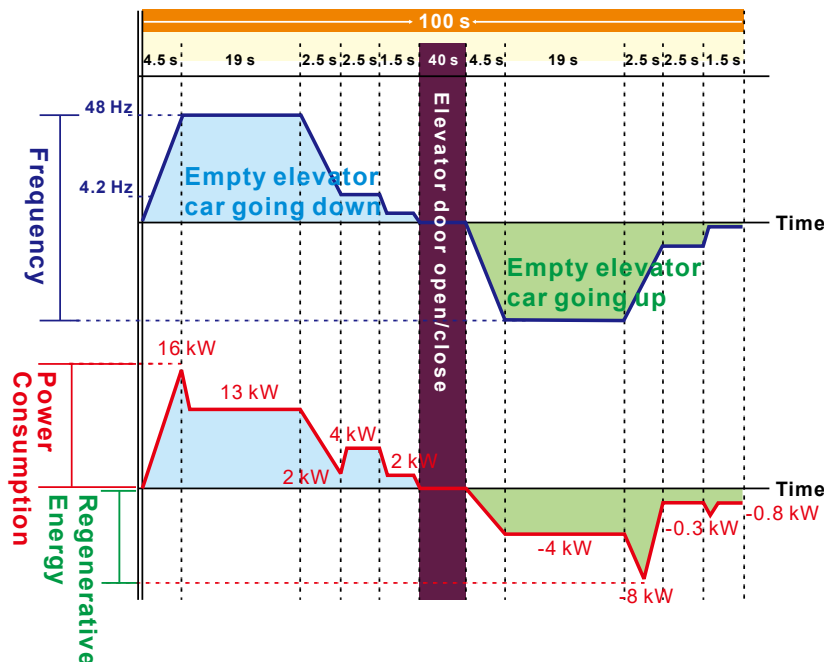
Performance using Delta's REG2000:

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

- Annual savings:

$$\frac{22.2}{1000} \text{ (kWhr/cycle)} \times 432 \text{ (cycle/day)} \times$$

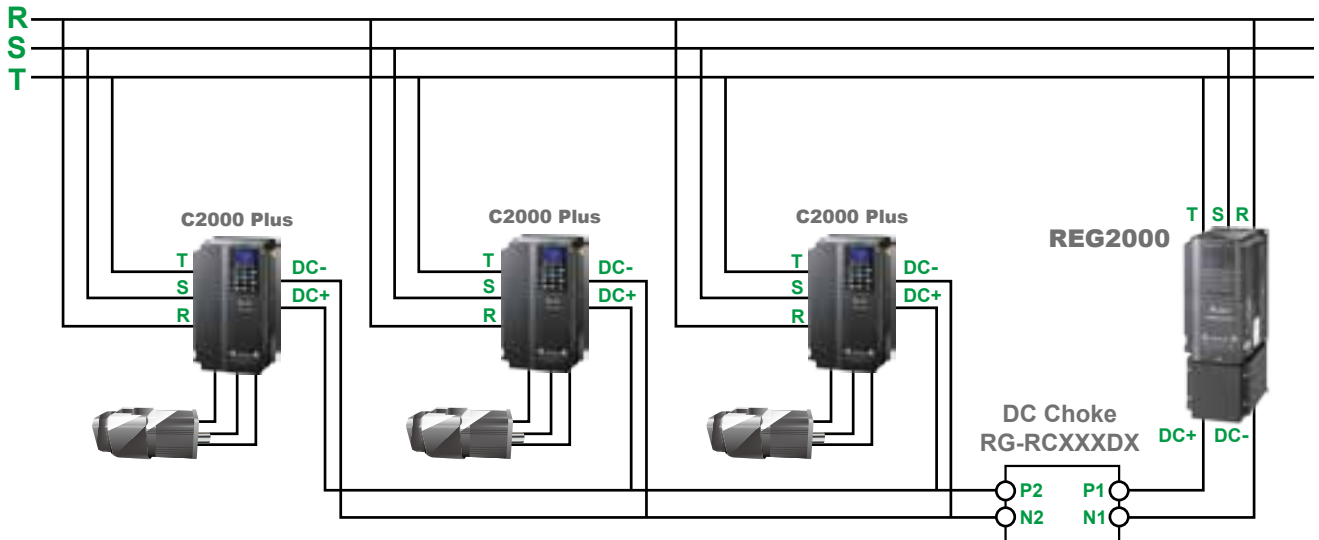
$$265 \text{ days} \times \text{NTD } 3.5 = \text{NTD } 8,895 \text{ (app. USD } 280)$$



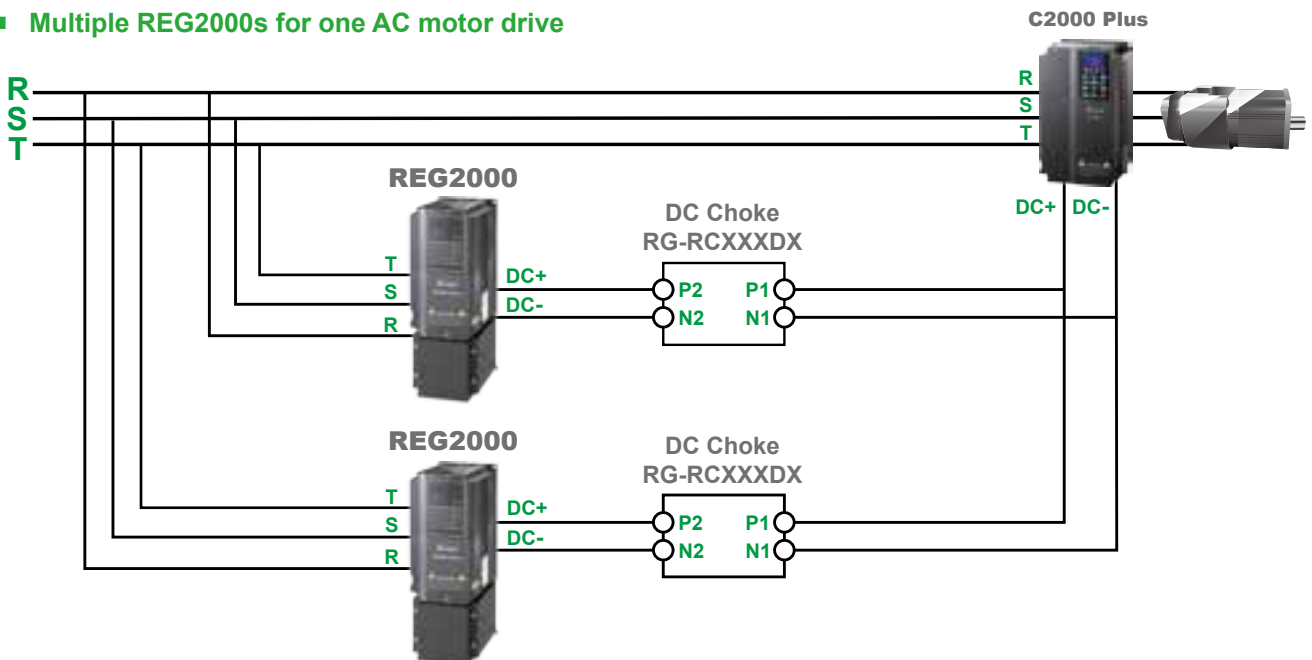
Flexible Deployment

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





230V

Frame		A			B			C	
Model number REG___A23A-21		075	110	150	185	220	300	370	
Power rating (kW)		7.5	11	15	18.5	22	30	37	
DC bus	Rated input current (A _{DC})	24.0	39.0	46.0	59.8	73.2	97.6	122	
	Activation range of voltage	270~390 V _{DC} (adjustable setting via Pr.01-08)							
Mains	Rated output current (A _{AC})	20	32	38	49	60	80	100	
	Voltage / frequency rating	3-phase AC 200V~240V (-15% ~ +10%), 50/60Hz							
	Operation voltage	170~265 V _{AC}							
	Frequency tolerance	47~63Hz							
Net weight		7.5±0.5Kg			16.5±0.5Kg			25.5±0.5Kg	28.0±0.5Kg

460V

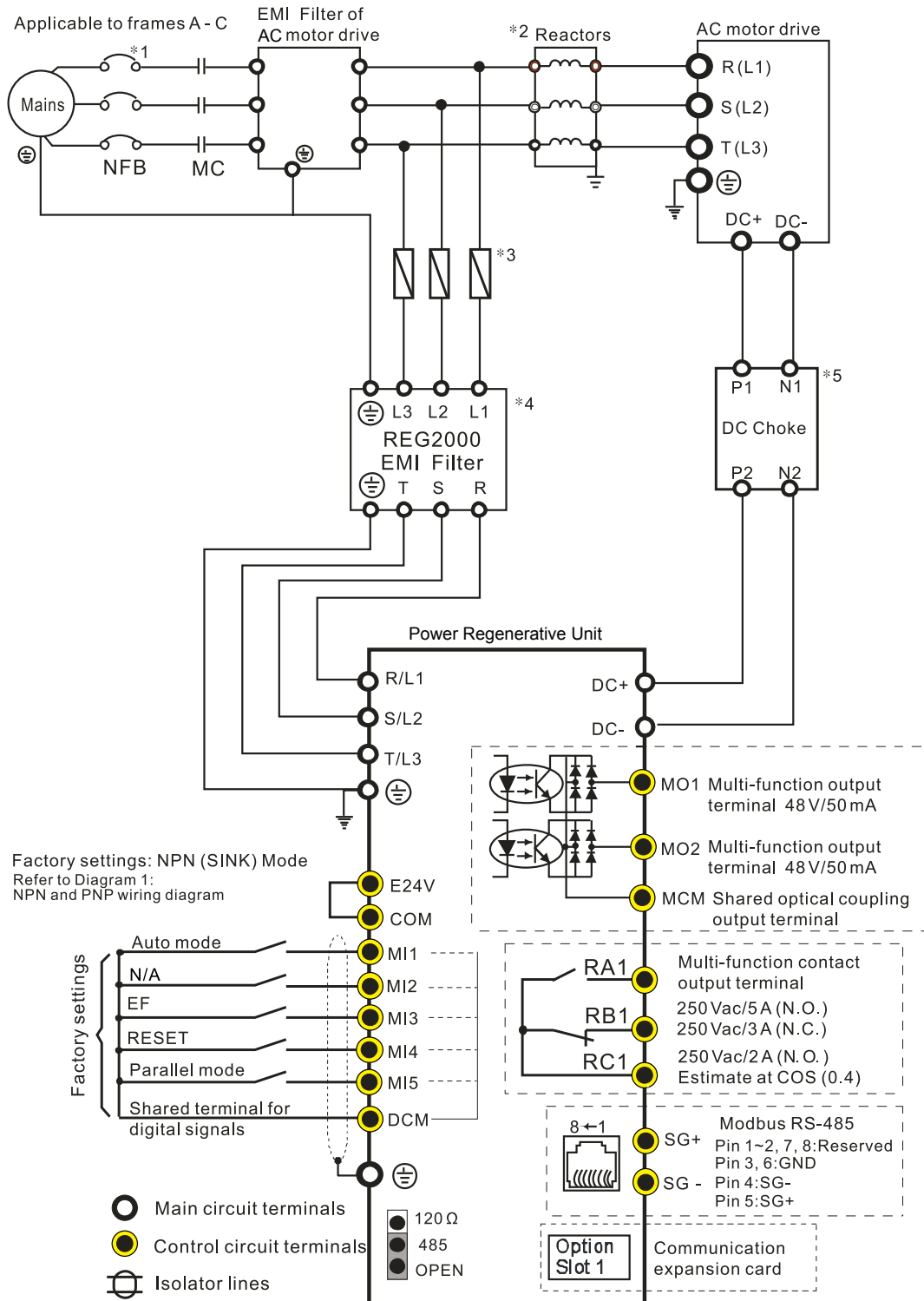
Frame		A			B			C		
Model number REG___A43A-21		075	110	150	185	220	300	370	450	550
Power rating (kW)		7.5	11	15	18.5	22	30	37	45	55
DC bus	Rated input current (A _{DC})	12.8	20.7	24.4	30.5	39.0	52.5	59.8	73.0	91.5
	Activation range of voltage	516~780 V _{DC} (adjustable setting via Pr.01-08)								
Mains	Rated output current (A _{AC})	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 _{AC}								
	Frequency tolerance	47~63Hz								
Net weight		7.5±0.5Kg			17.0±0.5Kg			26.5±0.5Kg	29.0±0.5Kg	29.5±0.5Kg

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 _{DC} 6 mA
	Generic output signal	2 sets of signal terminals 48 V _{DC} 50mA; 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, 1.0mm / 13.2~55Hz, 0.7~1.5G / 55~512Hz, 1.5G (IEC 60068-2-6) [Frame C] 2~13.2Hz, 1.0mm / 13.2~55Hz, 0.7~1.0G / 55~512Hz, 1.0G (IEC 60068-2-6)
Certifications	   	

Wiring

Applicable to frames A~C

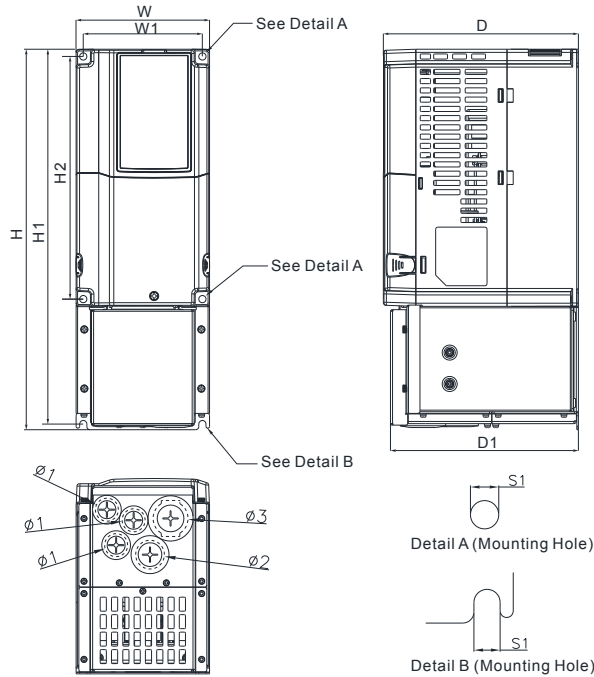


Note:

- *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



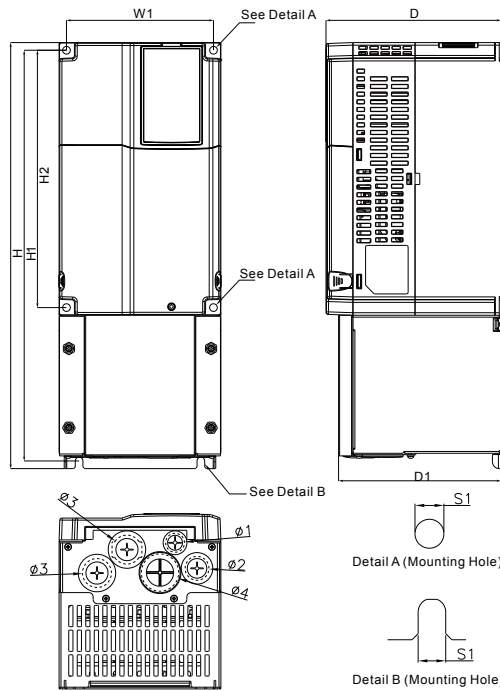
MODEL

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



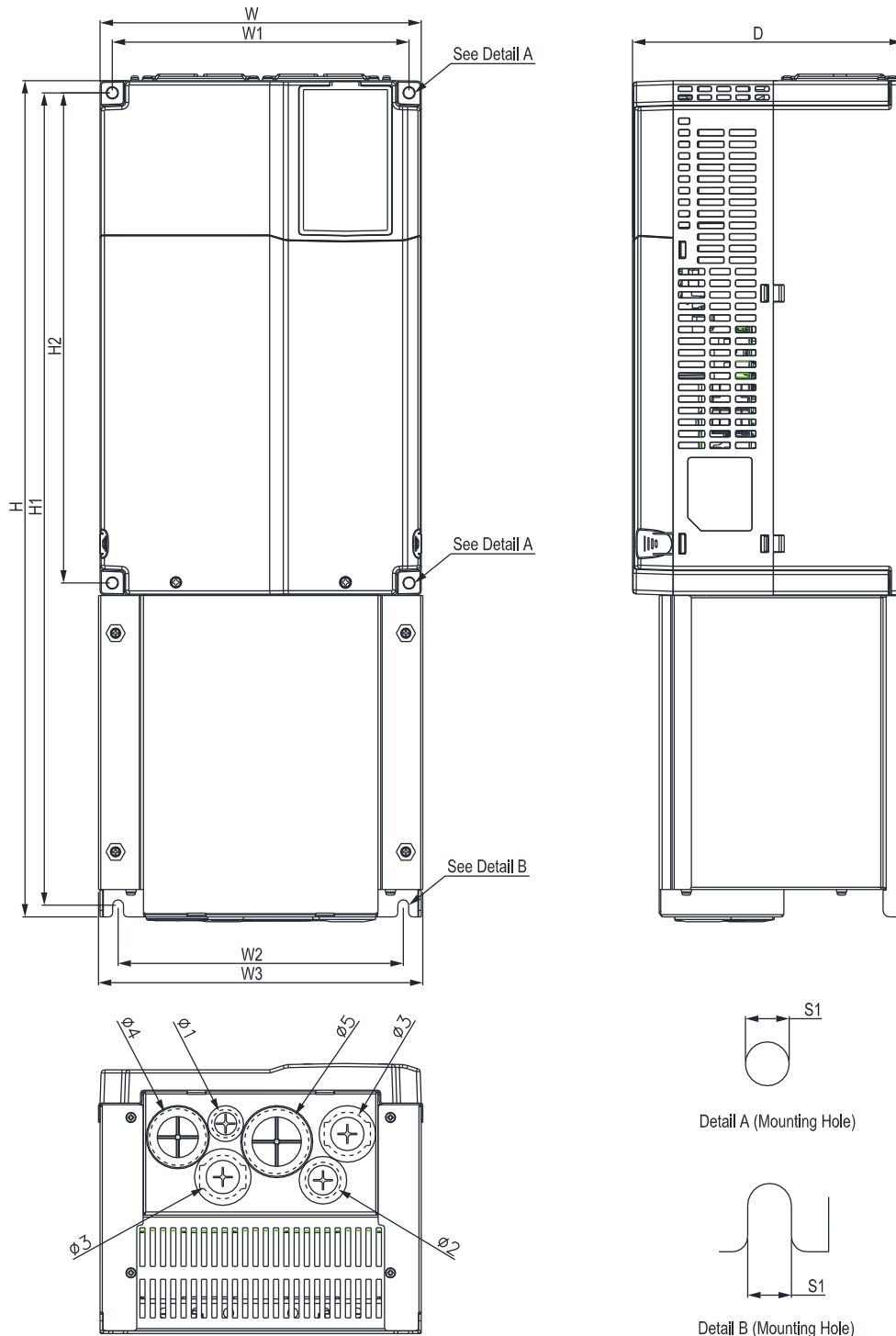
MODEL

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



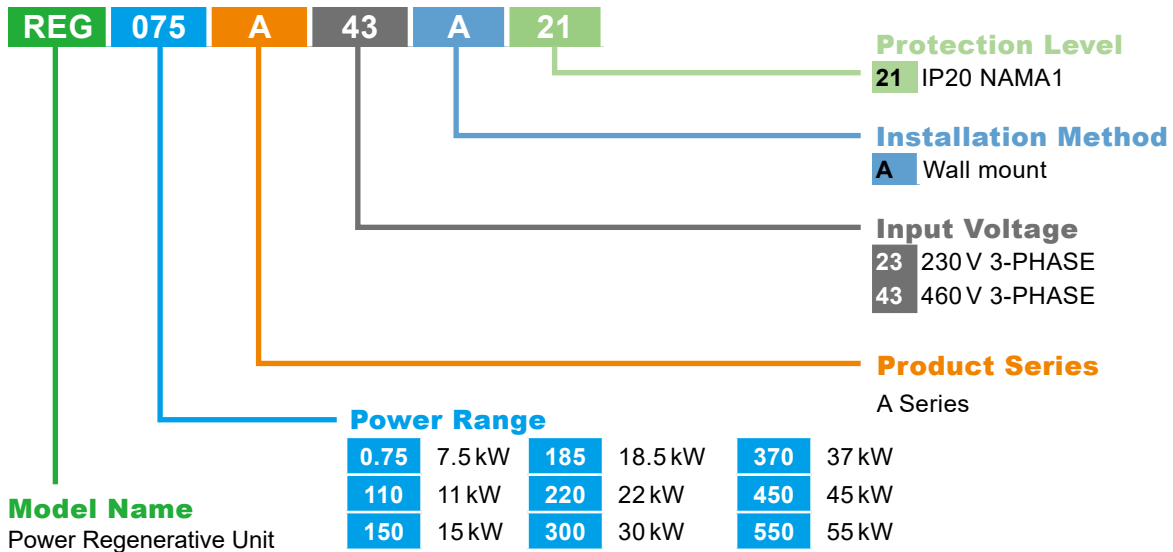
MODEL

REG300A23A-21
 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	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	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		
REG300A23A-21	RG-EF370A2	6.0±0.5	REG300A43A-21	RG-EF300A4	4.8±0.5
REG370A23A-21			REG370A43A-21		
			REG450A43A-21	RG-EF550A4	6.0±0.5
			REG550A43A-21		

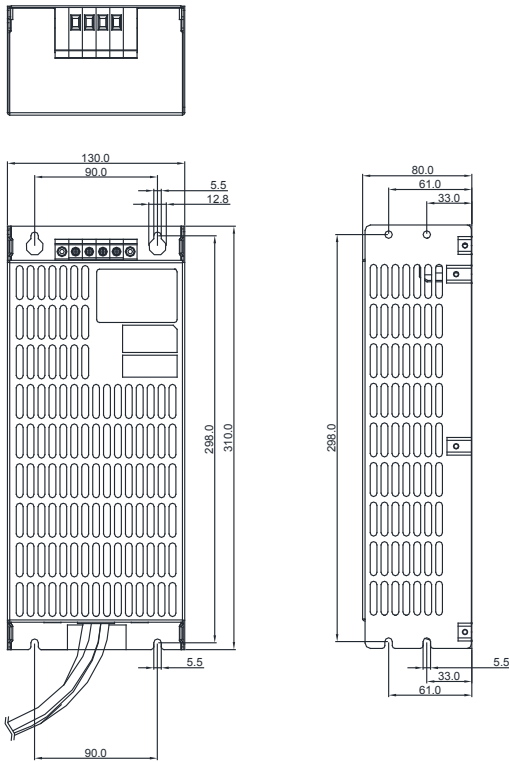
Model	AWG Size		Torque (±10%)
	Max.	Min.	
REG2000 / EMI Filter Frame A			
RG-EF110A2	8 AWG (8.4mm ²)	8 AWG (8.4mm ²)	M4 14~16 kg-cm
RG-EF150A4		10 AWG (5.3mm ²)	
REG2000 / EMI Filter Frame B			
RG-EF220A2	4 AWG (21.2mm ²)	4 AWG (21.2mm ²)	M5 30~34 kg-cm
RG-EF300A4		6 AWG (13.3mm ²)	
REG2000 / EMI Filter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

※ 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

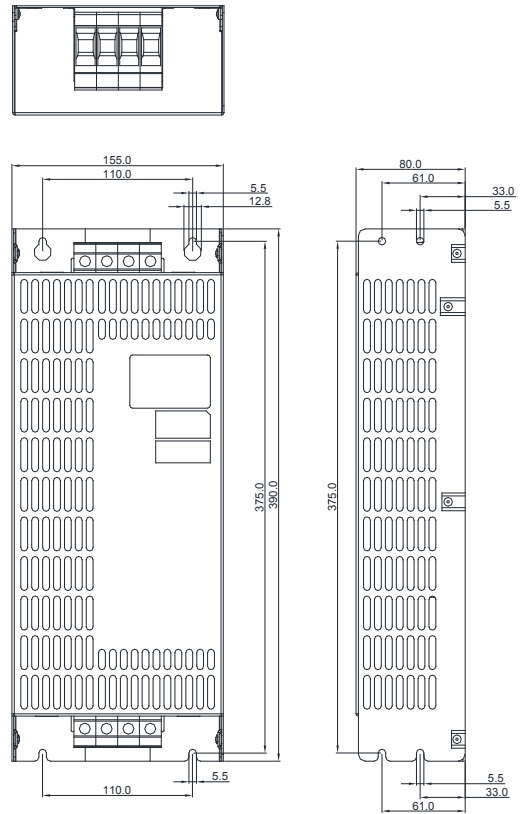
- RG-EF110A2
- RG-EF150A4



Wire length: 300~350 mm
Wire gauge: 8 AWG

Frame B / C

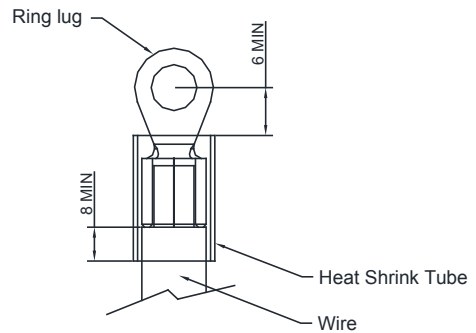
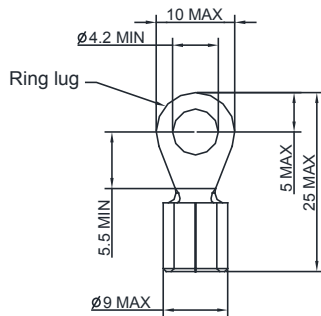
- RG-EF220A2
- RG-EF370A2
- RG-EF300A4
- RG-EF550A4



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.

Industrial Automation Headquarters

Taiwan: Delta Electronics, Inc.

Taoyuan Technology Center
No.18, Xinglong Rd., Taoyuan District,
Taoyuan City 33068, Taiwan
TEL: +886-3-362-6301 / FAX: +886-3-371-6301

Asia

China: Delta Electronics (Shanghai) Co., Ltd.

No.182 Minyu Rd., Pudong Shanghai, P.R.C.
Post code : 201209
TEL: +86-21-6872-3988 / FAX: +86-21-6872-3996
Customer Service: 400-820-9595

Japan: Delta Electronics (Japan), Inc.

Industrial Automation Sales Department
2-1-14 Shibadaimon, Minato-ku
Tokyo, Japan 105-0012
TEL: +81-3-5733-1155 / FAX: +81-3-5733-1255

Korea: Delta Electronics (Korea), Inc.

1511, 219, Gasan Digital 1-Ro., Geumcheon-gu,
Seoul, 08501 South Korea
TEL: +82-2-515-5305 / FAX: +82-2-515-5302

Singapore: Delta Energy Systems (Singapore) Pte Ltd.

4 Kaki Bukit Avenue 1, #05-04, Singapore 417939
TEL: +65-6747-5155 / FAX: +65-6744-9228

India: Delta Electronics (India) Pvt. Ltd.

Plot No.43, Sector 35, HSIIDC Gurgaon,
PIN 122001, Haryana, India
TEL: +91-124-4874900 / FAX: +91-124-4874945

Thailand: Delta Electronics (Thailand) PCL.

909 Soi 9, Moo 4, Bangpoo Industrial Estate (E.P.Z),
Pattana 1 Rd., T.Phraksa, A.Muang,
Samutprakarn 10280, Thailand
TEL: +66-2709-2800 / FAX: +66-2709-2827

Australia: Delta Electronics (Australia) Pty Ltd.

Unit 20-21/45 Normanby Rd., Notting Hill Vic 3168, Australia
TEL: +61-3-9543-3720

Americas

USA: Delta Electronics (Americas) Ltd.

5101 Davis Drive, Research Triangle Park, NC 27709, U.S.A.
TEL: +1-919-767-3813 / FAX: +1-919-767-3969

Brazil: Delta Electronics Brazil

Rua Itapeva, 26 - 3º, andar Edifício Itapeva,
One - Bela Vista 01332-000 - São Paulo - SP - Brazil
TEL: +55-12-3932-2300 / FAX: +55-12-3932-237

Mexico: Delta Electronics International Mexico S.A. de C.V.

Gustavo Baz No. 309 Edificio E PB 103
Colonia La Loma, CP 54060
Tlalnepantla, Estado de México
TEL: +52-55-3603-9200

EMEA

EMEA Headquarters: Delta Electronics (Netherlands) B.V.

Sales: Sales.IA.EMEA@deltaww.com
Marketing: Marketing.IA.EMEA@deltaww.com
Technical Support: iatechnicalsupport@deltaww.com
Customer Support: Customer-Support@deltaww.com
Service: Service.IA.emea@deltaww.com
TEL: +31(0)40 800 3900

BENELUX: Delta Electronics (Netherlands) B.V.

De Witbogt 20, 5652 AG Eindhoven, The Netherlands
Mail: Sales.IA.Benelux@deltaww.com
TEL: +31(0)40 800 3900

DACH: Delta Electronics (Netherlands) B.V.

Coesterweg 45, D-59494 Soest, Germany
Mail: Sales.IA.DACH@deltaww.com
TEL: +49(0)2921 987 0

France: Delta Electronics (France) S.A.

ZI du bois Challand 2, 15 rue des Pyrénées,
Lisses, 91090 Evry Cedex, France
Mail: Sales.IA.FR@deltaww.com
TEL: +33(0)1 69 77 82 60

Iberia: Delta Electronics Solutions (Spain) S.L.U

Ctra. De Villaverde a Vallecas, 265 1º Dcha Ed.
Hormigueras – P.I. de Vallecas 28031 Madrid
TEL: +34(0)91 223 74 20

Carrer Llacuna 166, 08018 Barcelona, Spain

Mail: Sales.IA.Iberia@deltaww.com

Italy: Delta Electronics (Italy) S.r.l.

Via Meda 2-22060 Novedrate(CO)
Piazza Grazioli 18 00186 Roma Italy
Mail: Sales.IA.Italy@deltaww.com
TEL: +39 039 8900365

Russia: Delta Energy System LLC

Vereyskaya Plaza II, office 112 Vereyskaya str.
17 121357 Moscow Russia
Mail: Sales.IA.RU@deltaww.com
TEL: +7 495 644 3240

Turkey: Delta Greentech Elektronik San. Ltd. Sti. (Turkey)

Şerifali Mah. Hendem Cad. Kule Sok. No:16-A
34775 Ümraniye – İstanbul
Mail: Sales.IA.Turkey@deltaww.com
TEL: + 90 216 499 9910

MEA: Eltek Dubai (Eltek MEA DMCC)

OFFICE 2504, 25th Floor, Saba Tower 1,
Jumeirah Lakes Towers, Dubai, UAE
Mail: Sales.IA.MEA@deltaww.com
TEL: +971(0)4 2690148