



Automation for a Changing World

Delta Power Regenerative Unit REG2000 Series



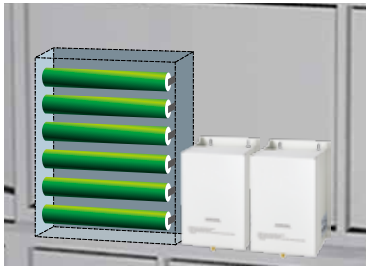
www.deltaww.com

 **DELTA**
Smarter. Greener. Together.

Features

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

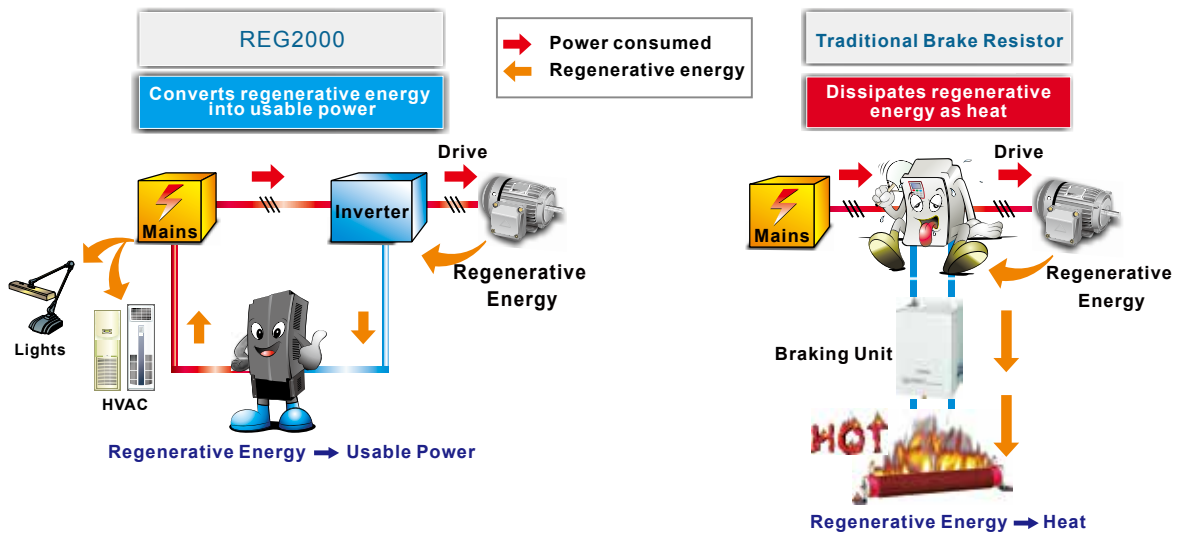
Traditional solution
AC motor drive (55kW / 400V) + Brake Unit + Brake Resistor



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



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



- Improves motor braking capability from 125% (when using brake resistor) to 150%
- Supports RS-485 (MODBUS) communication to allow real-time monitoring of kWh and cost
- High application flexibility, compatible with all kinds of AC motor drives and servo systems in the market
- Supports parallel connection* to expand total capacity for different application needs
- Optional communication cards*: MODBUS TCP, EtherNet/IP, CANopen, PROFIBUS DP and DeviceNet

*Please contact Delta for more information.

Applications

- **Large-inertia load applications:** centrifuge equipment, industrial laundries, roving machines and more
- **4-quadrant load applications:** elevators, cranes, 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



Tension Controls



Hoists



Centrifuge Equipment



Press Machines

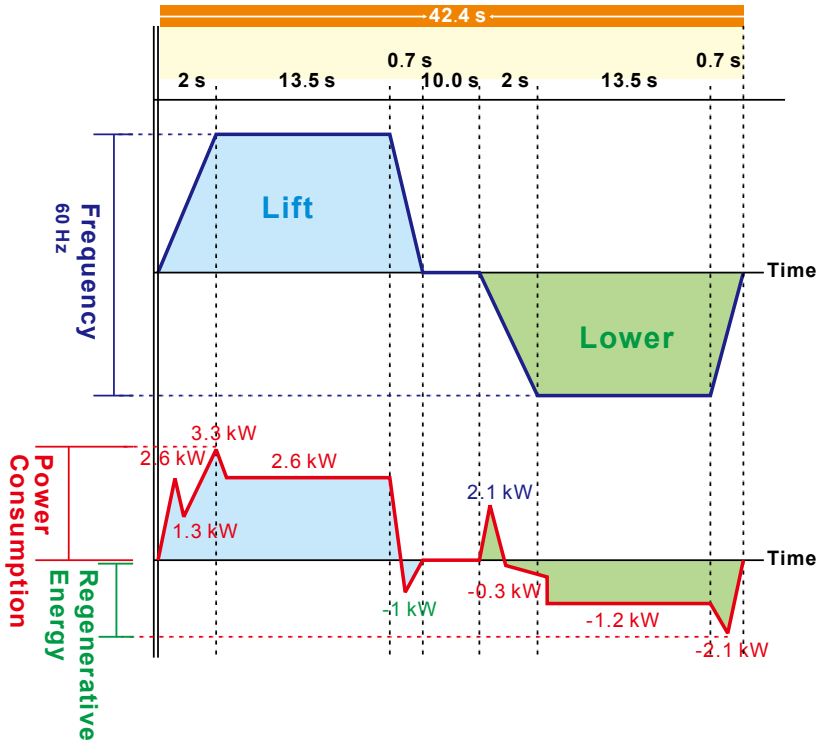


Industrial Laundries



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: 5.5kW 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:

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

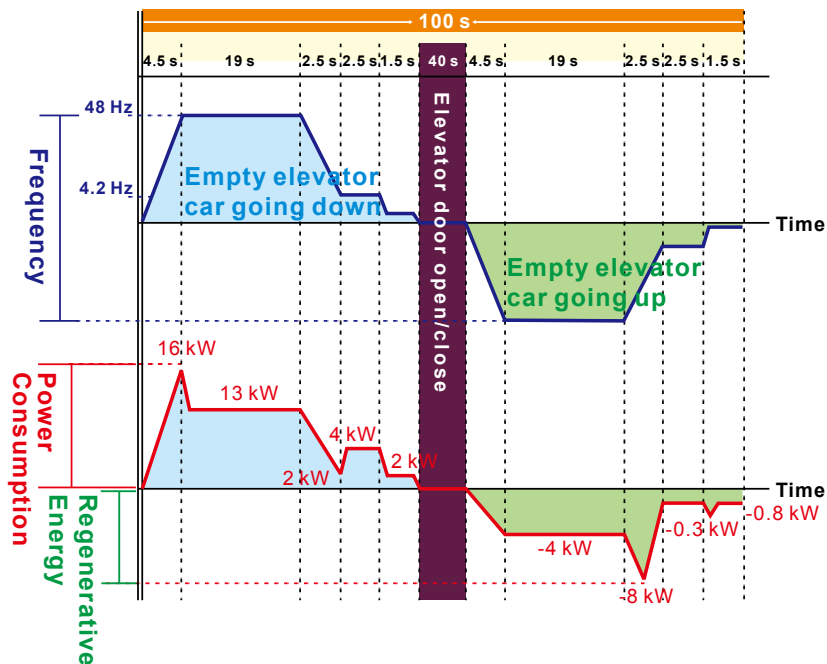
Performance using Delta's REG2000:

- 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 1 kWh is NTD 3.5.

Elevator system: 22 kW motor + REG2000

Elevator capacity: 2 tons

Elevator speed: 60m/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:

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





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

Specifications

230 V		A			B			C	
Frame		075	110	150	185	220	300	370	
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 200 V~240 V (-15% ~ +10%), 50/60 Hz							
	Operation voltage	170~265 V _{AC}							
	Frequency tolerance	47~63 Hz							
Net weight		7.5±0.5 Kg			16.5±0.5 Kg			25.5±0.5 Kg	28.0±0.5 Kg

460 V		A			B			C		
Frame		075	110	150	185	220	300	370	450	550
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 380 V - 480 V (-15%~+10%), 50/60 Hz								
	Operation voltage	323~528 V _{AC}								
	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

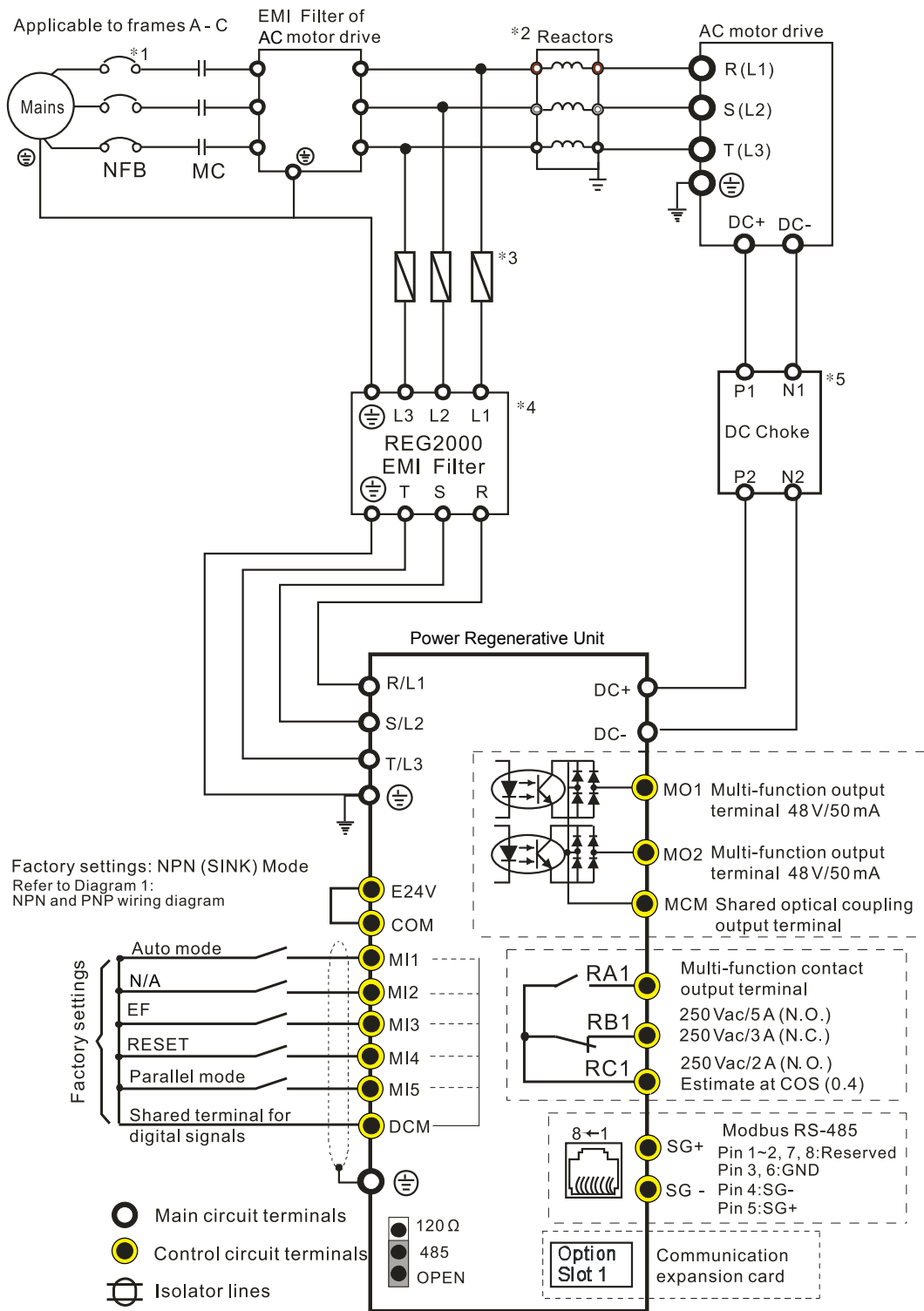
Common Characteristics

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 _{DC} 6 mA
	Generic output signal	2 sets of signal terminals 48 V _{DC} 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 Power Regeneration Unit is installed at altitude 0~1000 m, follow normal operation restriction. If it is install at altitude 1000~3000 m, decrease 2% of rated current or lower 0.5°C of temperature for every 100m increase in altitude. Maximum altitude for Corner Grounded is 2000 m.
	Operation temperature	-10~40°C
	Storage temperature	-25~+70°C
	Rated humidity	Blow 90% RH (Non-condense)
	Vibration	[Frame A & B] 2~13.2 Hz, 1.0 mm / 13.2~55 Hz, 0.7~1.5 G / 55~512 Hz, 1.5 G (IEC 60068-2-6) [Frame C] 2~13.2 Hz, 1.0 mm / 13.2~55 Hz, 0.7~1.0 G / 55~512 Hz, 1.0 G (IEC 60068-2-6)
Certifications	   	

* KC mark will be applied in 2017.

Wiring

Applicable to frames A~C

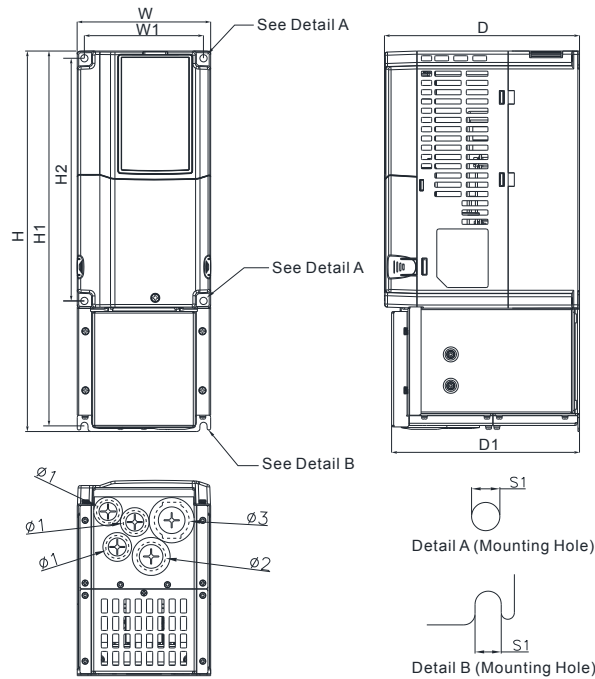


Note:

- *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



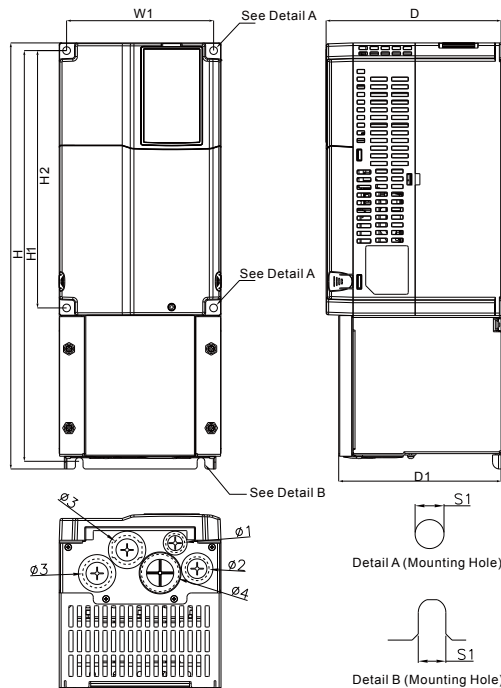
MODEL

- 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



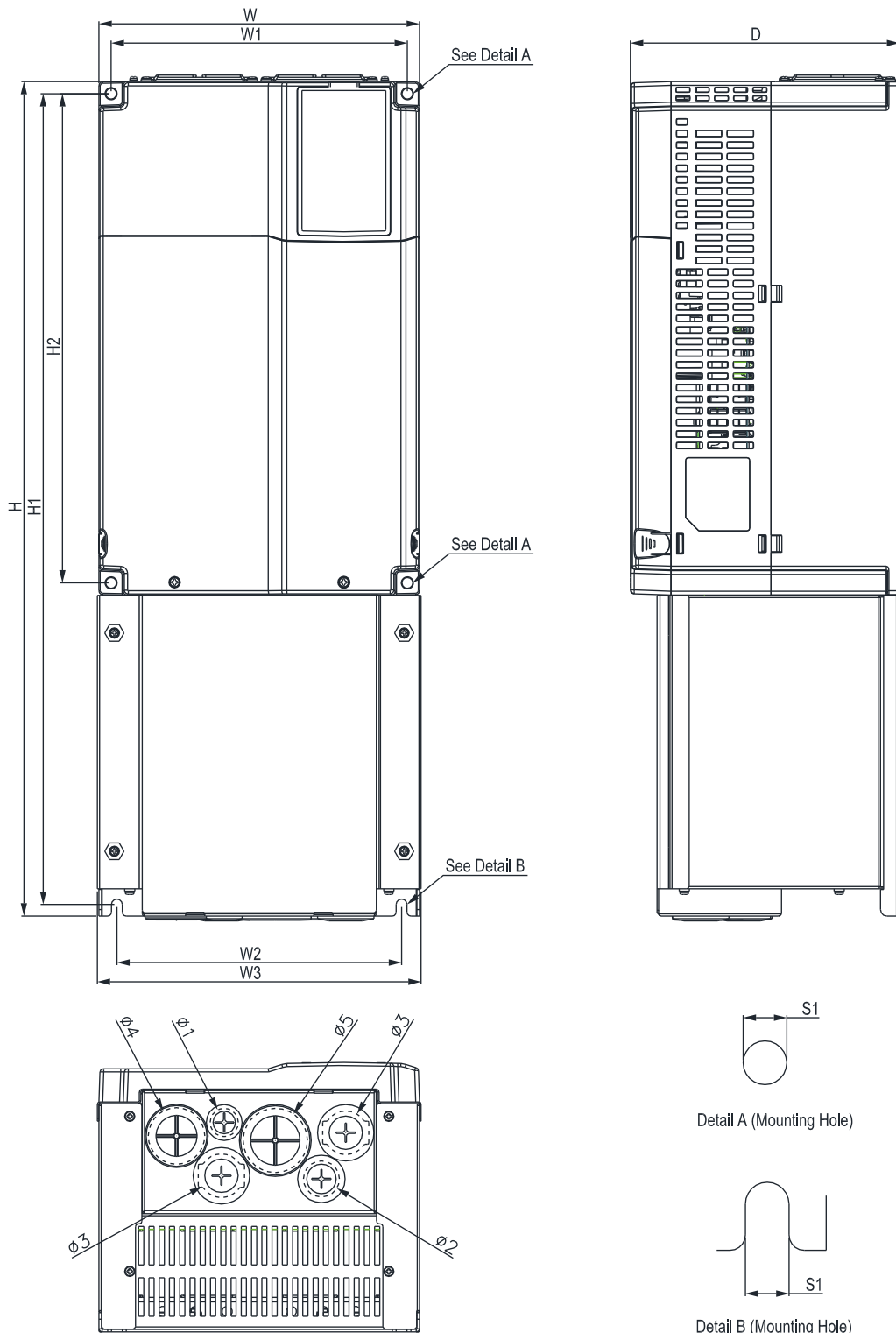
MODEL

- 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



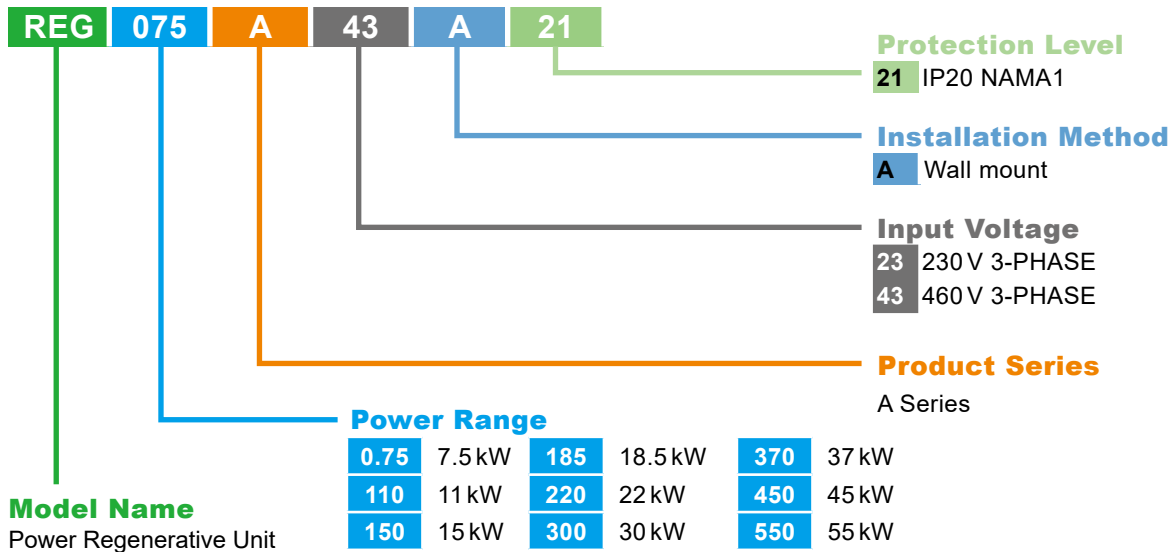
MODEL

- REG300A23A-21
- REG370A23A-21
- REG370A43A-21
- REG450A43A-21
- REG550A43A-21

Unit : mm[inch]

Frame		W	H	D	W1	W2	W3	H1	H2	S1	Ø1	Ø2	Ø3	Ø4	Ø5
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

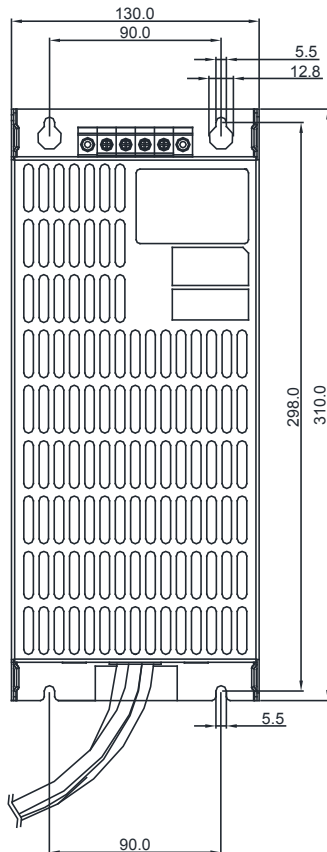
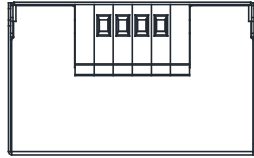
230 V	REG EMI Filter	Weight (kg)	460 V	REG EMI Filter	Weight (kg)
REG075A23A-21	RG-EF110A2	3.2±0.5	REG075A43A-21	RG-EF150A4	3.2±0.5
REG110A23A-21			REG110A43A-21		
REG150A23A-21	RG-EF220A2	4.8±0.5	REG150A43A-21		
REG185A23A-21			REG185A43A-21	RG-EF300A4	4.8±0.5
REG220A23A-21			REG220A43A-21		
REG300A23A-21	RG-EF370A2	6.0±0.5	REG300A43A-21	RG-EF550A4	6.0±0.5
REG370A23A-21			REG370A43A-21		
			REG450A43A-21		
			REG550A43A-21		

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

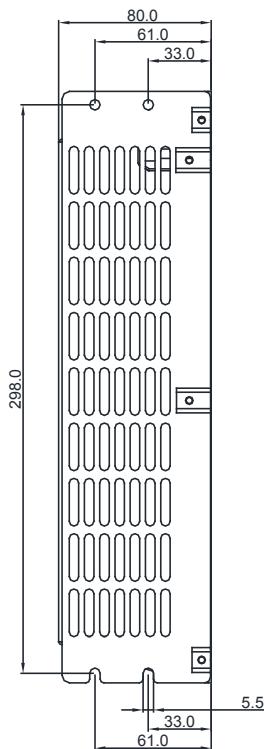
※ Use only copper cable with ampacity of 600V and temperature resistance of 75°C or 90°C.
 ※ RG-EF110A2 and RG-EF220A2 must use cable with temperature resistance of 90°C.

Dimensions - EMI Filter

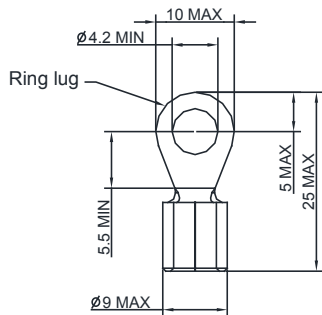
Frame A (RG-EF110A2 / RG-EF150A4)



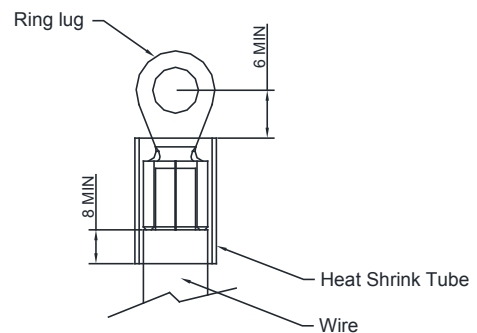
Wire length: 300~350 mm
Wire gauge: 8 AWG



※ Requires an additional terminal for 8 AWG cable.
Suggested to apply O terminal for wiring according to application requirement.



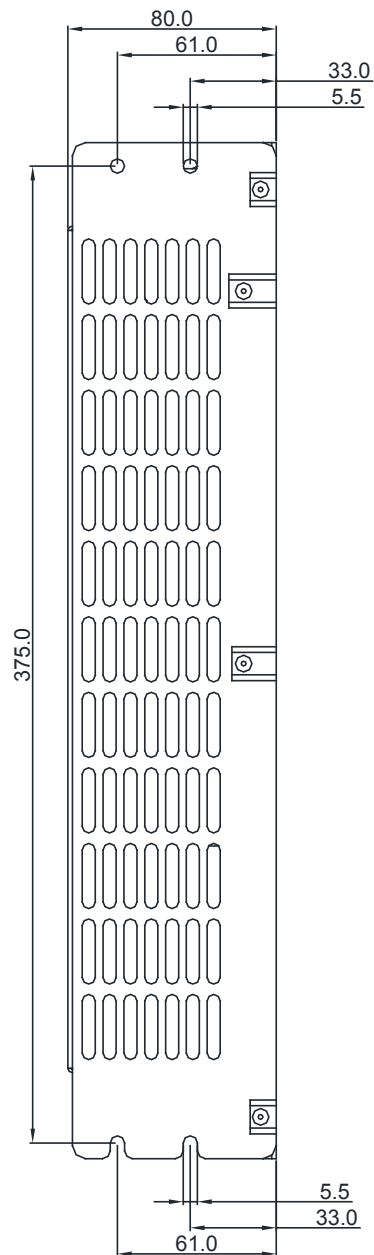
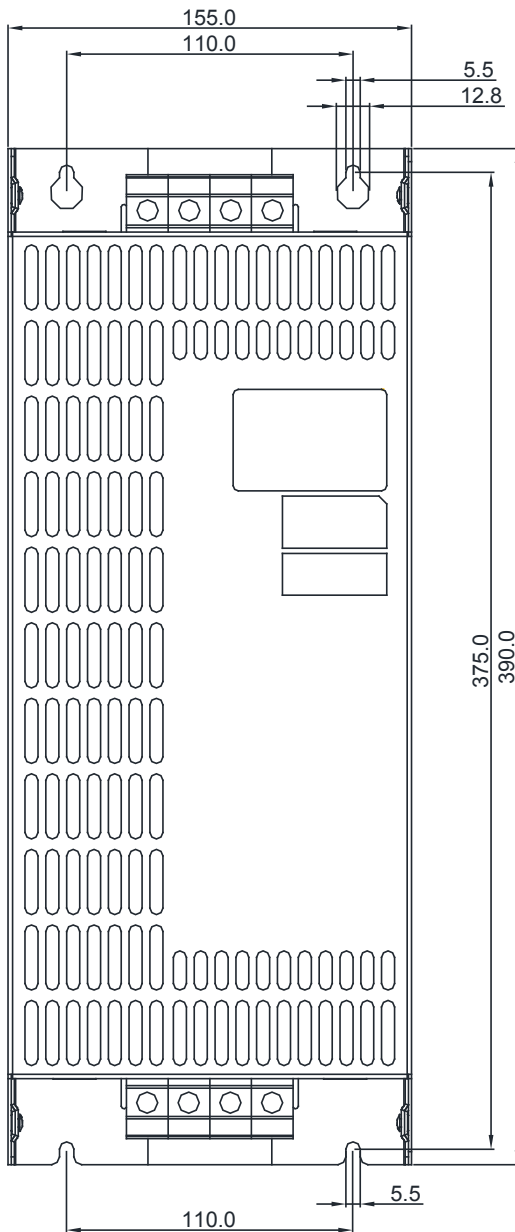
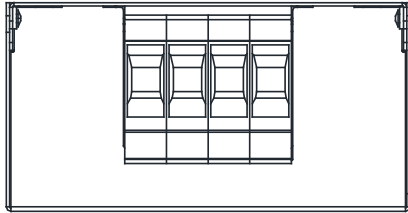
※ For insulation of over 600V ampacity, apply heat shrink tube on the metal part of terminal to comply with UL standard.



Dimensions - EMI Filter

Frame B / C (RG-EF220A2 / RG-EF370A2 / RG-EF300A4 / RG-EF550A4)

Unit : mm [inch]



Accessories

▪ KPC-CC01



- Highly illuminated LCD display
- Supports MODBUS RS-485
- Languages: Traditional Chinese, Simplified Chinese, English

▪ KPC-CE01



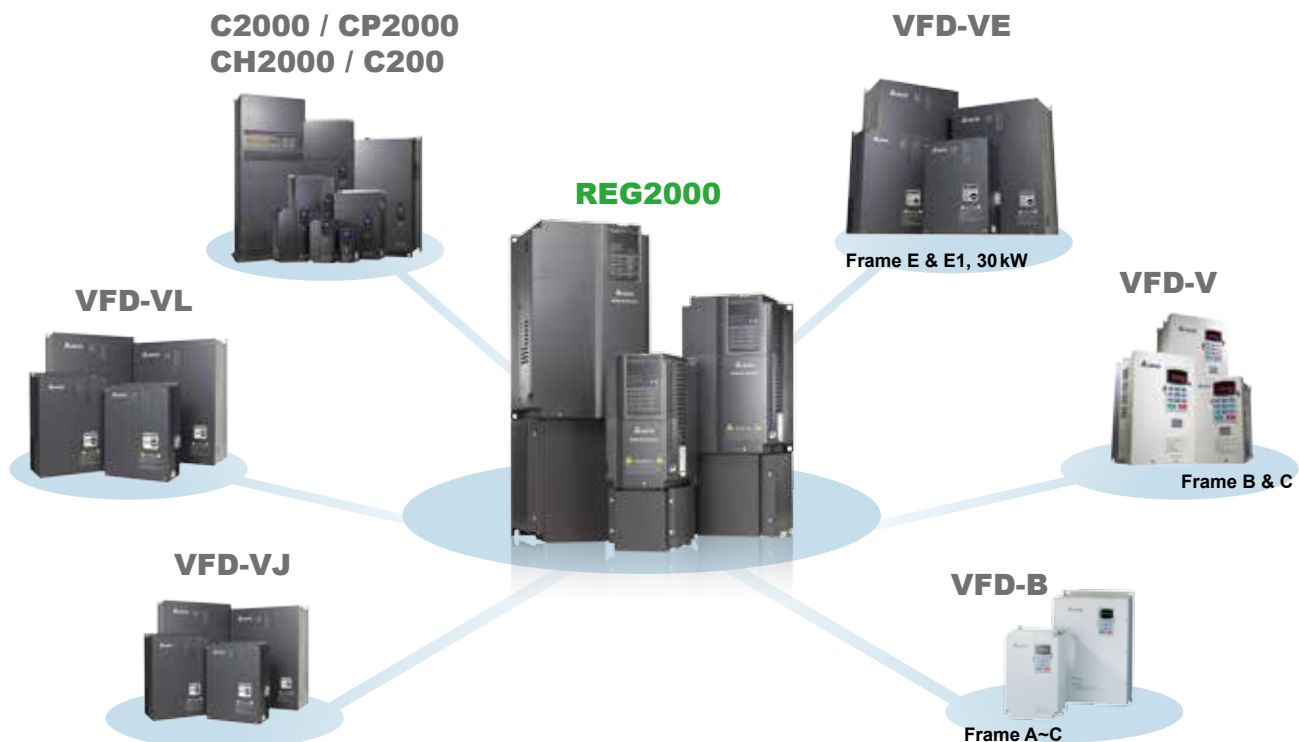
- RJ45 (socket), RS-485 interface

▪ Digital keypad accessories: RJ45 extension leads and CMC-EIP01 cables

Applicable Models: CBC-K3FT, CBC-K5FT, CBC-K7FT, CBC-K10F, CBC-K16FT

Title	Part No.	Explanation
1	CBC-K3FT	RJ45 extension lead, 3 feet (approximately 0.9m)
2	CBC-K5FT	RJ45 extension lead, 5 feet (approximately 1.5m)
3	CBC-K7FT	RJ45 extension lead, 7 feet (approximately 2.1m)
4	CBC-K10FT	RJ45 extension lead, 10 feet (approximately 3m)
5	CBC-K16FT	RJ45 extension lead, 16 feet (approximately 4.9m)

Delta AC Motor Drives Selections for REG2000 Application



※ Please contact Delta for more AC motor drives for REG2000.



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