



Automation for a Changing World

Delta Power Regenerative Unit REG2000 Series



www.deltaww.com

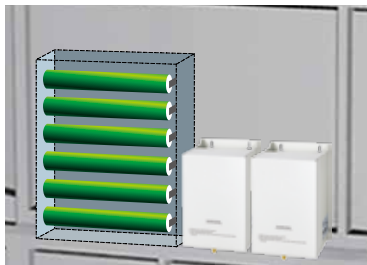
 **DELTA**
Smarter. Greener. Together.

Features

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

Traditional solution

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

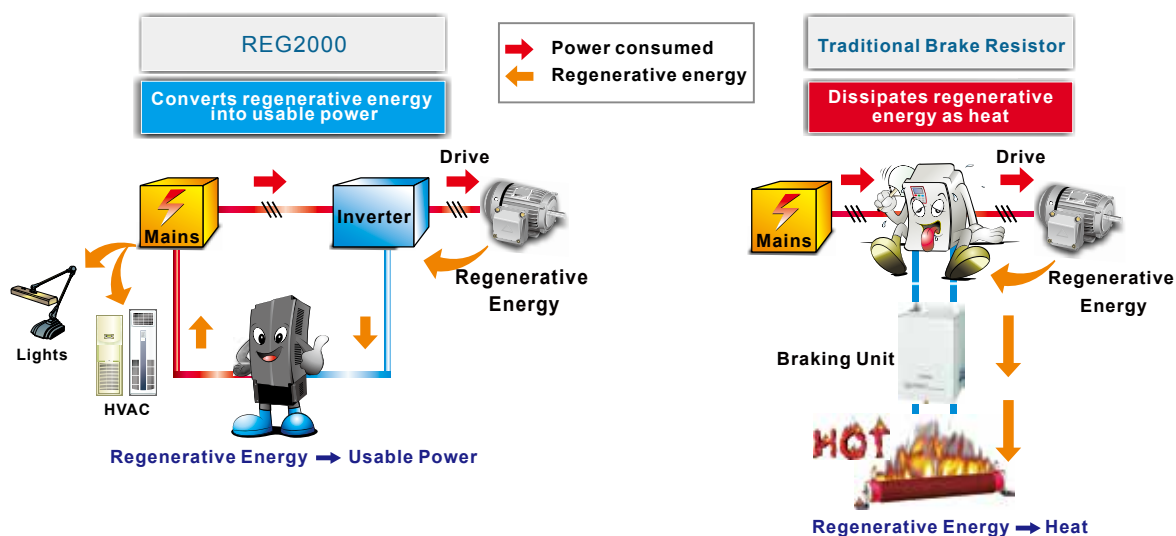


Delta solution

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

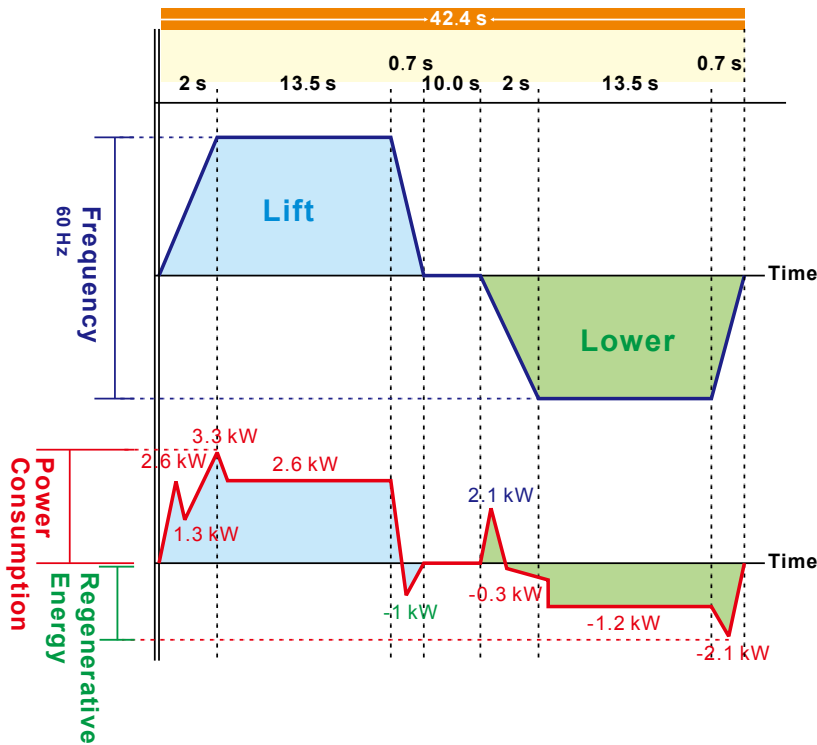


Industrial Laundries



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: 5.5 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 : $\frac{28.89}{5} = 5.778$ 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 days x NTD 3.5 = **NTD 5,461** (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:

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

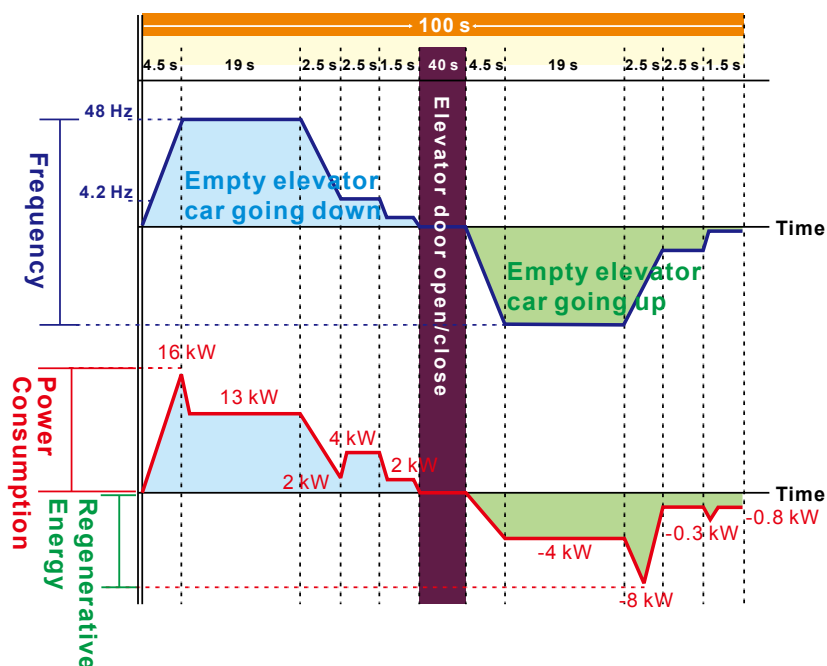
Performance using Delta's REG2000:

- 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 days x NTD 3.5 = **NTD 8,895** (app. USD 280)



Specifications





230 V

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 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

0V		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			516~780V _{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			323~528V _{AC}								
			Frequency tolerance			47~63Hz								
		Net weight			7.5±0.5Kg			17.0±0.5 Kg			26.5±0.5Kg		29.0±0.5 Kg	29.5±0.5Kg

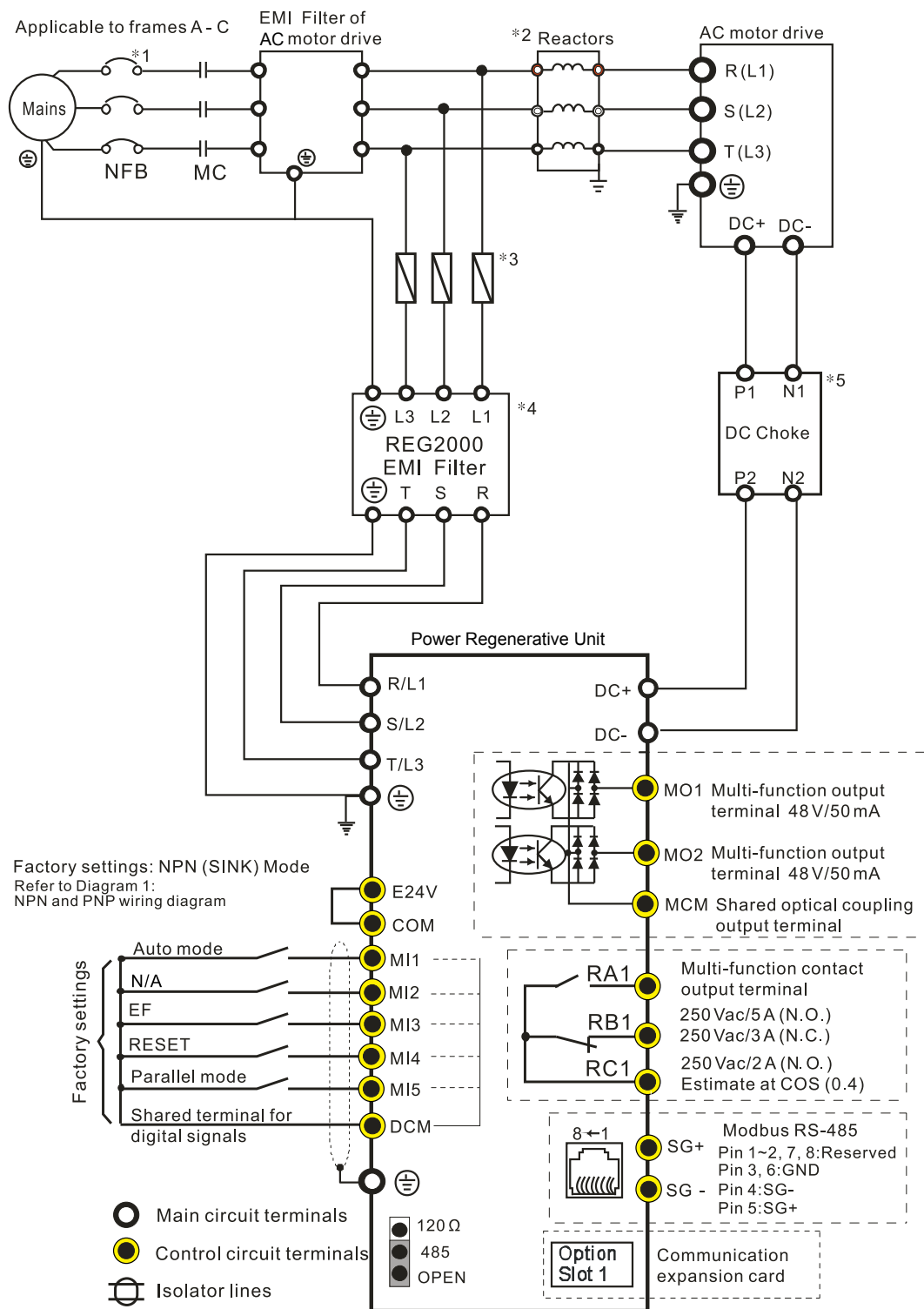
Common Characteristics

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} 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 100 m 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

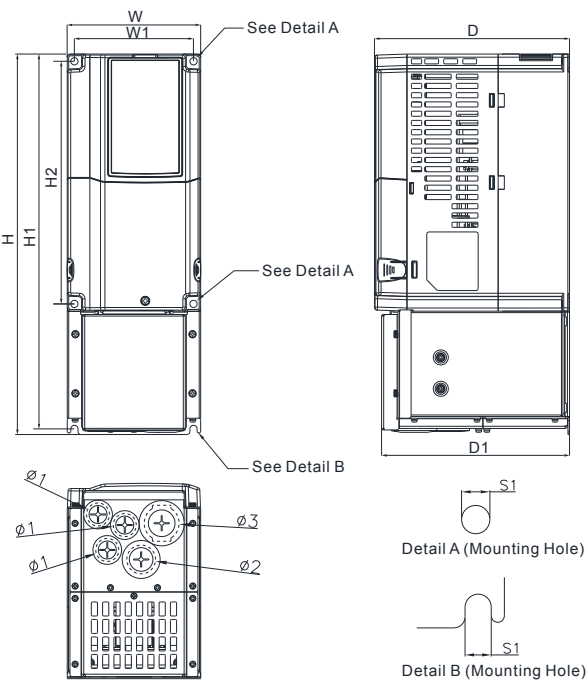


Note:

- *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



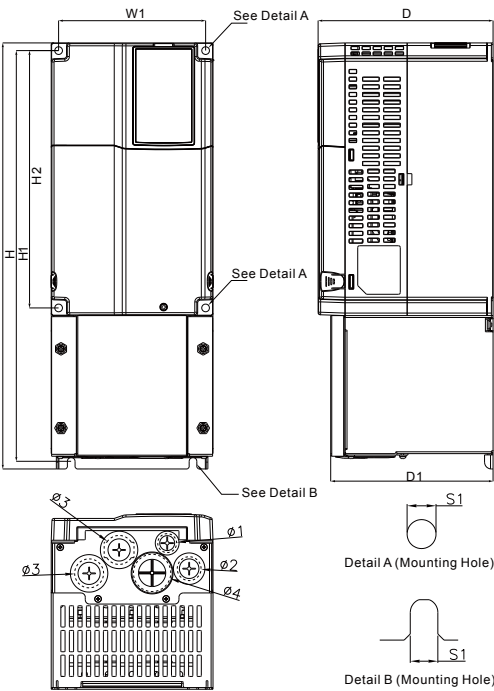
MODEL

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



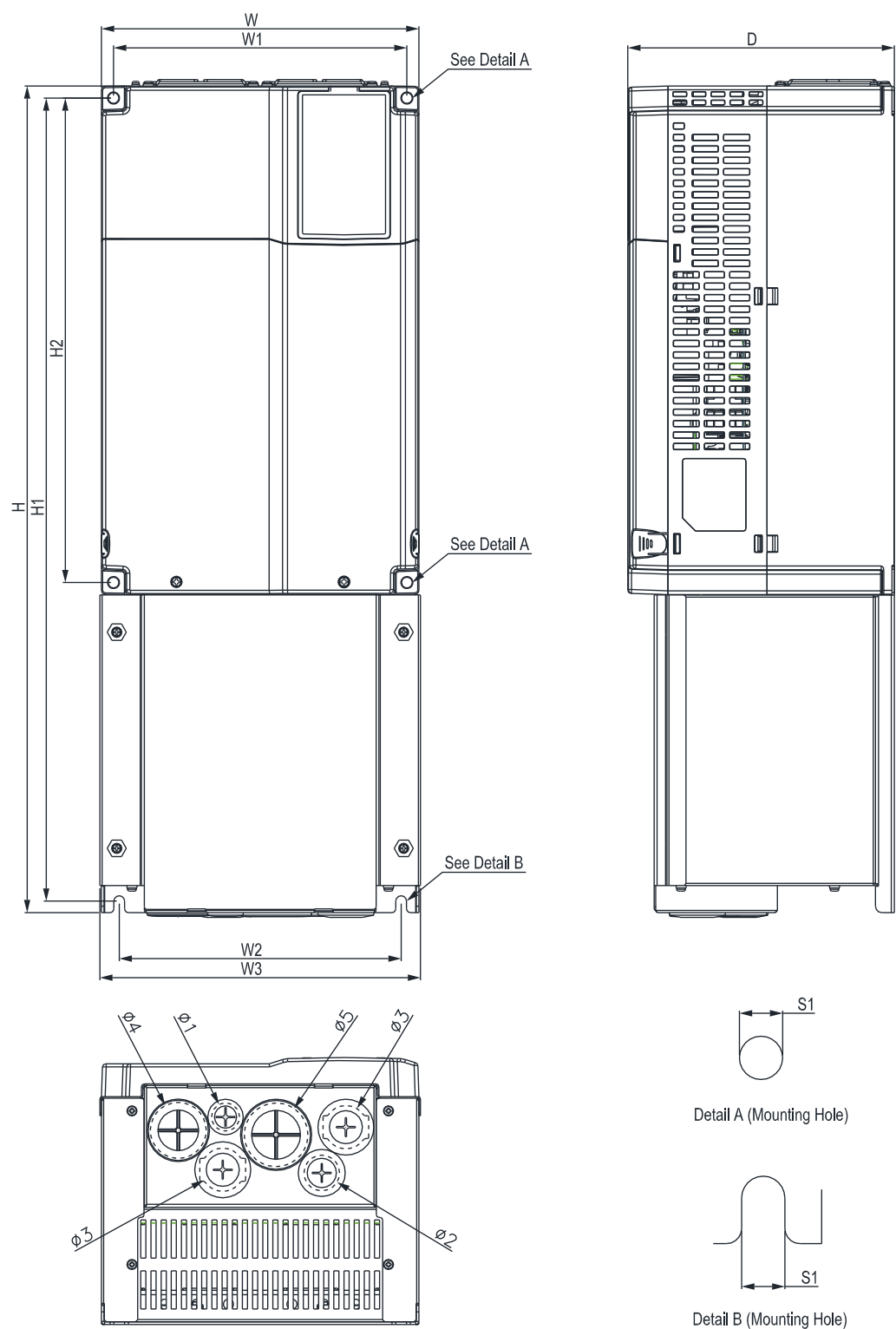
MODEL

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

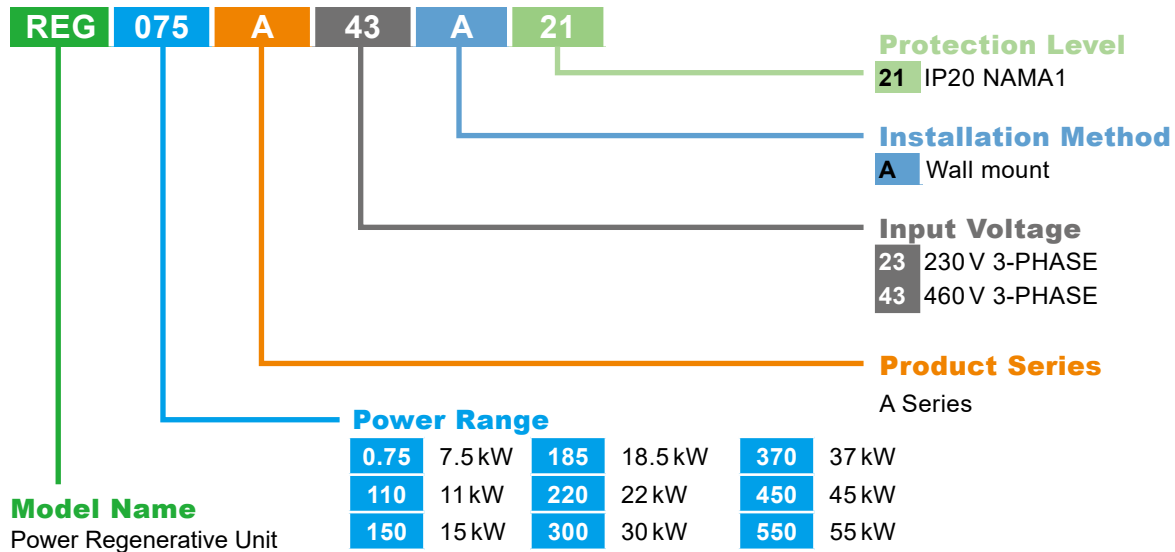


MODEL
REG300A23A-21
REG370A23A-21
REG370A43A-21
REG450A43A-21
REG550A43A-21

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		
REG370A23A-21			REG370A43A-21	RG-EF550A4	6.0±0.5
			REG450A43A-21		
			REG550A43A-21		

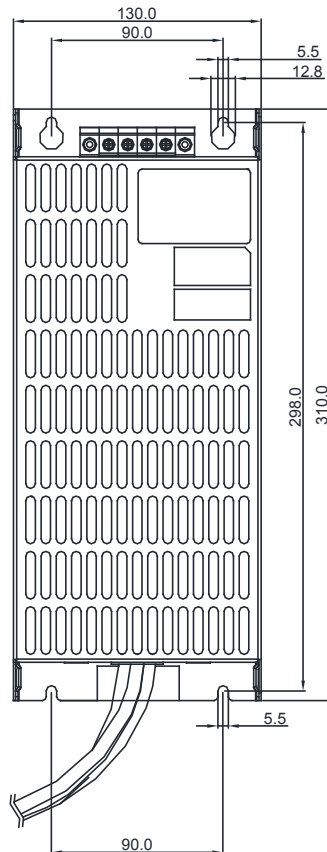
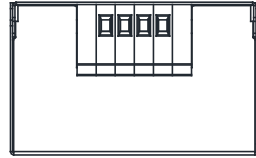
Model	AWG Size		Torque (±10%)
	Max.	Min.	
REG2000 / EMI Filter Frame A			
RG-EF110A2	8 AWG (8.4 mm ²)	8 AWG (8.4 mm ²)	M4 14~16 kg-cm
RG-EF150A4		10 AWG (5.3 mm ²)	
REG2000 / EMI Filter Frame B			
RG-EF220A2	4 AWG (21.2 mm ²)	4 AWG (21.2 mm ²)	M5 30~34 kg-cm
RG-EF300A4		6 AWG (13.3 mm ²)	
REG2000 / EMI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

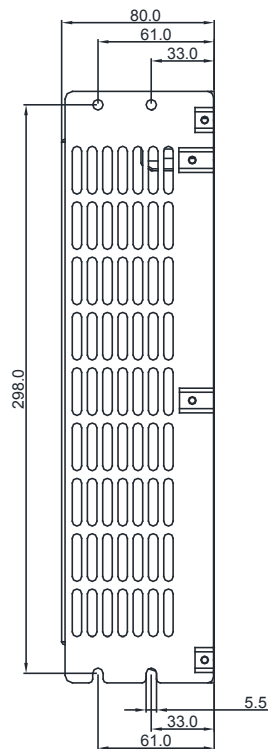
※ RG-EF110A2 and RG-EF220A2 must use cable with temperature resistance of 90°C.

Dimensions - EMI Filter

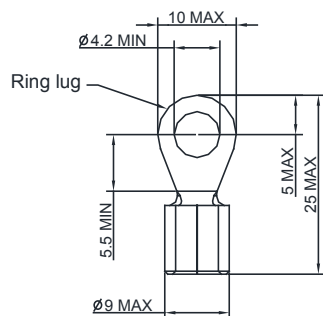
Frame A (RG-EF110A2 / RG-EF150A4)



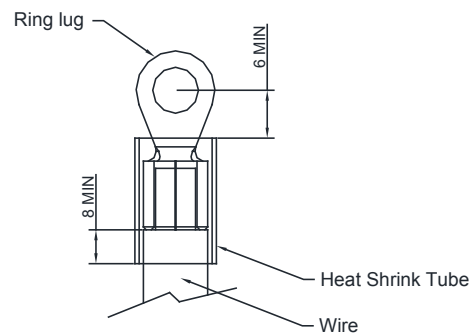
Wire length: 300~350 mm
Wire gauge: 8 AWG



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



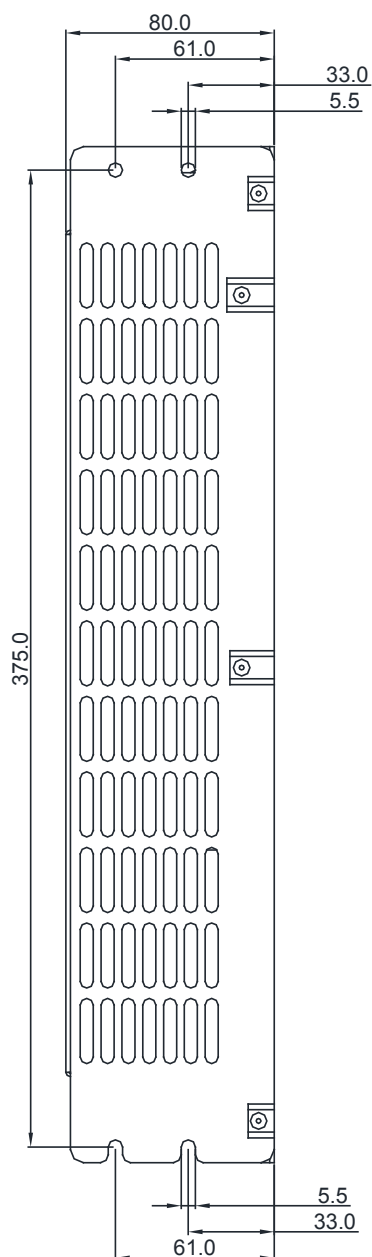
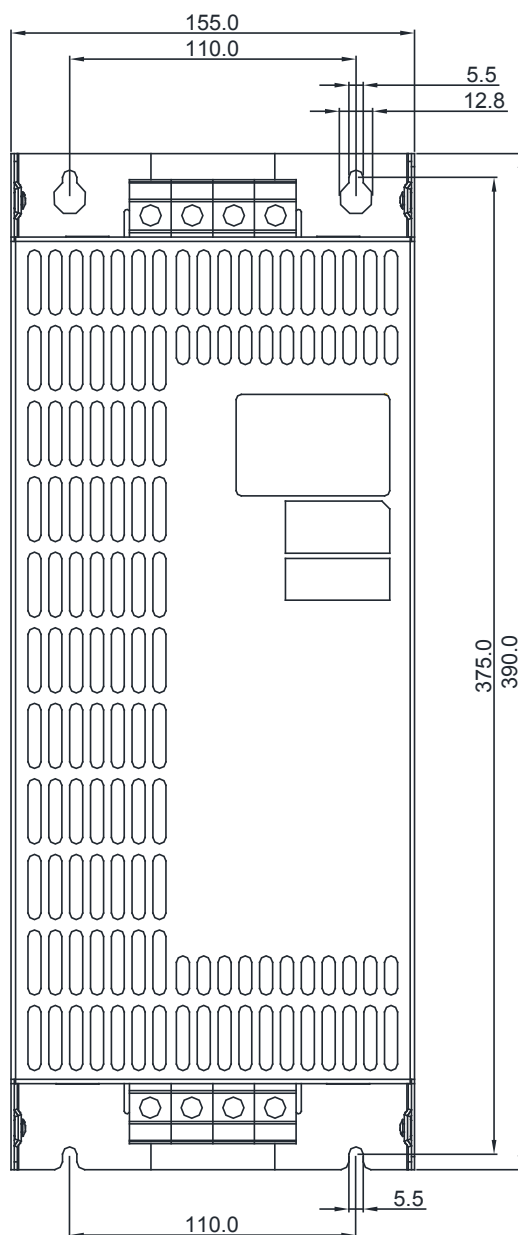
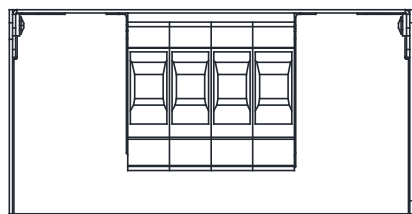
※ For insulation of over 600V ampacity,
apply heat shrink tube on the metal part of
terminal to comply with UL standard.



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



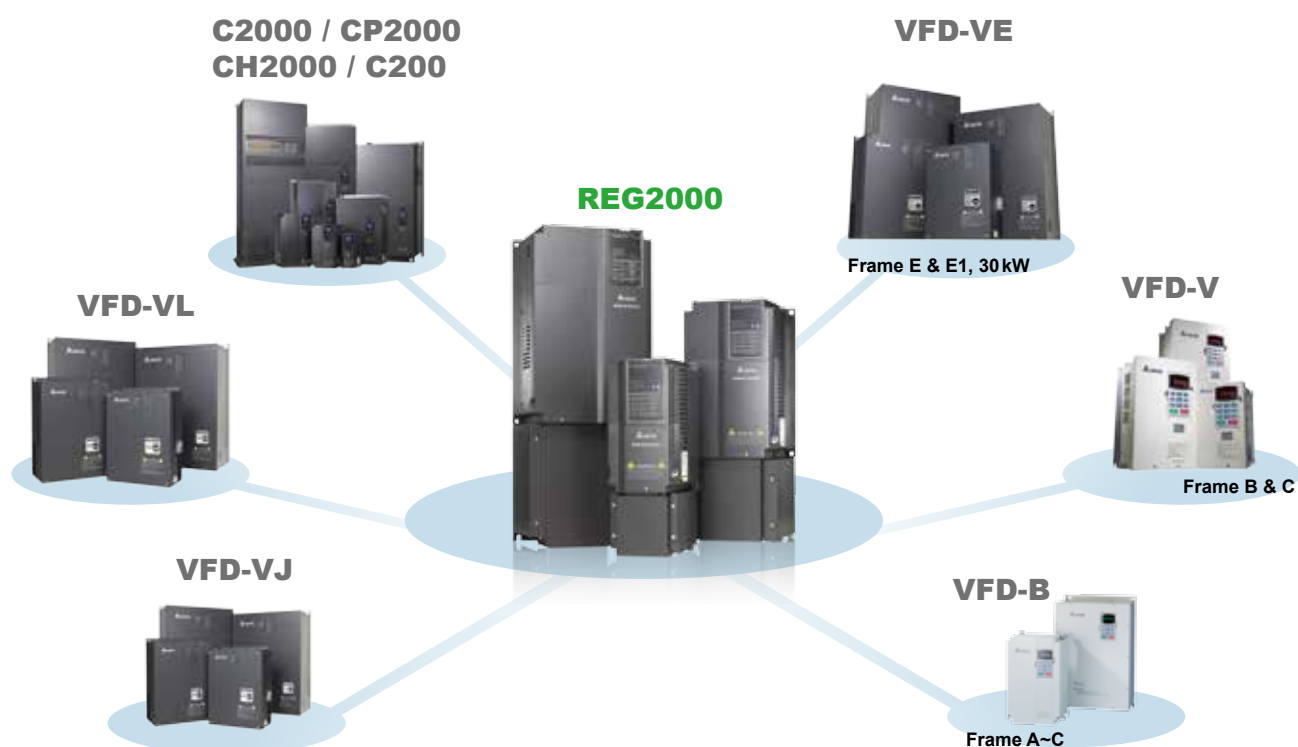
- RJ45 (socket), RS-485 interface

▪ 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.



Smarter. Greener. Together.

Industrial Automation Headquarters

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

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

Delta Electronics (Japan), Inc.

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

Delta Electronics (Korea), Inc.

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

Delta Energy Systems (Singapore) Pte Ltd.

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

Delta Electronics (India) Pvt. Ltd.

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

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 : 662-709-2827

Delta Energy Systems (Australia) Pty Ltd.

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

Americas

Delta Electronics (Americas) Ltd.

Raleigh Office
P.O. Box 12173, 5101 Davis Drive,
Research Triangle Park, NC 27709, U.S.A.
TEL: 1-919-767-3813 / FAX: 1-919-767-3969

Delta Greentech (Brasil) S/A

São Paulo Office
Rua Itapeva, 26 – 3º Andar - Bela Vista
CEP: 01332-000 – São Paulo – SP - Brasil
TEL: 55-11-3530-8642 / 55-11-3530-8640

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

Mexico Office
Vía Dr. Gustavo Baz No. 2160, Colonia La Loma,
54060 Tlalnepantla Estado de Mexico
TEL: 52-55-2628-3015 #3050/3052

EMEA

Delta Electronics (Netherlands) BV

Eindhoven Office
De Witbogt 20, 5652 AG Eindhoven, The Netherlands
MAIL: Sales.IA.EMEA@deltaww.com
MAIL: Sales.IA.Benelux@deltaww.com

Delta Electronics (France) S.A.

ZI du bois Chaland 2 15 rue des Pyrénées,
Lisses 91056 Evry Cedex, France
MAIL: Sales.IA.FR@deltaww.com

Delta Electronics Solutions (Spain) S.L.U

Ctra. De Villaverde a Vallecas, 265 1º Dcha Ed.
Hormigueros – P.I. de Vallecas 28031 Madrid
C/Llull, 321-329 (Edifici CINC) | 22@Barcelona, 08019 Barcelona
MAIL: Sales.IA.Iberia@deltaww.com

Delta Electronics (Italy) Srl

Ufficio di Milano Via Senigallia 18/2 20161 Milano (MI)
Piazza Grazioli 18 00186 Roma, Italy
MAIL: Sales.IA.Italy@deltaww.com

Delta Electronics (Germany) GmbH

Coesterweg 45, D-59494 Soest, Germany
MAIL: Sales.IA.DACH@deltaww.com

Delta Energy Systems LLC (CIS)

Vereyskaya Plaza II, office 112 Vereyskaya str.
17 121357 Moscow, Russia
MAIL: Sales.IA.RU@deltaww.com

Delta Greentech Ltd. (Turkiye)

Serifali Mevkii Barboros Bulvari Soylesi Sok
No 19 34775, Y.Dudullu-Umraniye/Istanbul
MAIL: Sales.IA.Turkey@delta-emea.com

Delta Energy Systems AG (Dubai BR)

P.O. Box 185668, Gate 7, 3rd Floor, Hamarain Centre,
Dubai, United Arab Emirates
MAIL: Sales.IA.MEA@deltaww.com