



Automation for a Changing World

Delta Elevator Drive ED Series



www.delta.com.tw/ia

 **DELTA**
Smarter. Greener. Together.

Delta Elevator Drive - ED Series

Delta introduces its innovative new elevator control solution: the ED Series Elevator Drive. Based on years of elevator control experience with Delta's first generation VFD-VL series elevator drive, the ED series provides outstanding features and performance.

The Delta ED series is UL/CE certified ensuring the best operation reliability. Designed to high safety standards and for high durability, the ED series is an excellent solution for elevator operation in critical environments. It provides versatile and flexible control functions, and an especially smooth start and stop. Smooth operation is critical for providing passengers and goods a safe and comfortable ride. Delta's ED series delivers the best operation efficiency for both passenger and cargo elevators

Delta's sales and services channels are located worldwide in 74 countries. Our professional technical teams are always ready to provide you with rapid sales and after-sales assistance, which saves on both money and time. Delta's ED series elevator drive is your most reliable solution for elevator control.



ED

E

= Elevator
Excellent
Economic
Environment friendly

D

= Durable
Design
Drive
Deliver

Features

- Supports both asynchronous and synchronous motors
- Performs auto-tuning with loads
- Auto-adjust starting torque, load compensation, manual control
- Precise time sequence for elevator motion (start/stop)
- Compact size for easy installation in the elevator control cabinet with more space availability
- Dual-output protection for reliable rides
- Supports 1-phase 230VAC Uninterrupted Power System (UPS)
- Built-in LED keypad, also offers optional pull-out type LCD keypad upon purchase
- USB port and standard computer software for easy tuning



Features

Simple Instructions

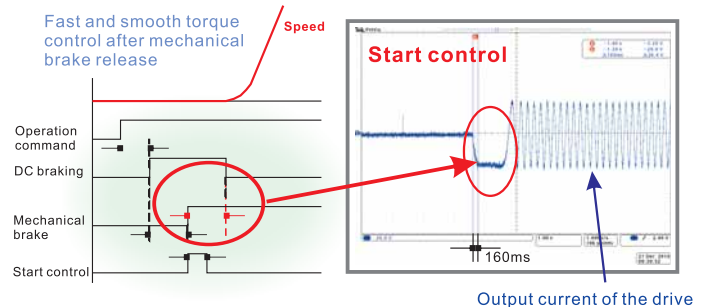
- **Auto-tuning with load**
 - Ability to perform auto-tuning with load when elevator structure is completed
 - Supports all types of encoders
 - Precisely measures the motor parameters and PG offset angle
 - Load balance without adding additional loads, safe and convenient
- **Auto-homing mode reduces maintenance costs**
- **Built-in LED digital keypad. Pull-out type digital keypad is available upon purchase**
- **USB port facilitates program upload/download for easy tuning process**
- **Compact control box design strengthens the drive structure**

- Thin body design, with a minimum thickness of only 146mm



Ride Comfort

- **High density current for scheduling, precisely controls the elevator's start/stop**

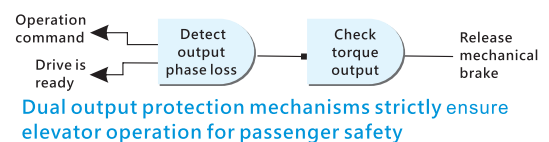


- **Independent parameter settings for DC current injection at start and slip compensation gain in motoring and generator mode. Increases elevator commissioning flexibility**

Safety Ensured

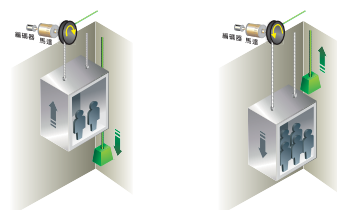
- **Dual output protection for reliable ride**

- Auto-detect output phase loss to ensure proper motor operation
- Auto-check torque output before the mechanical brake is released



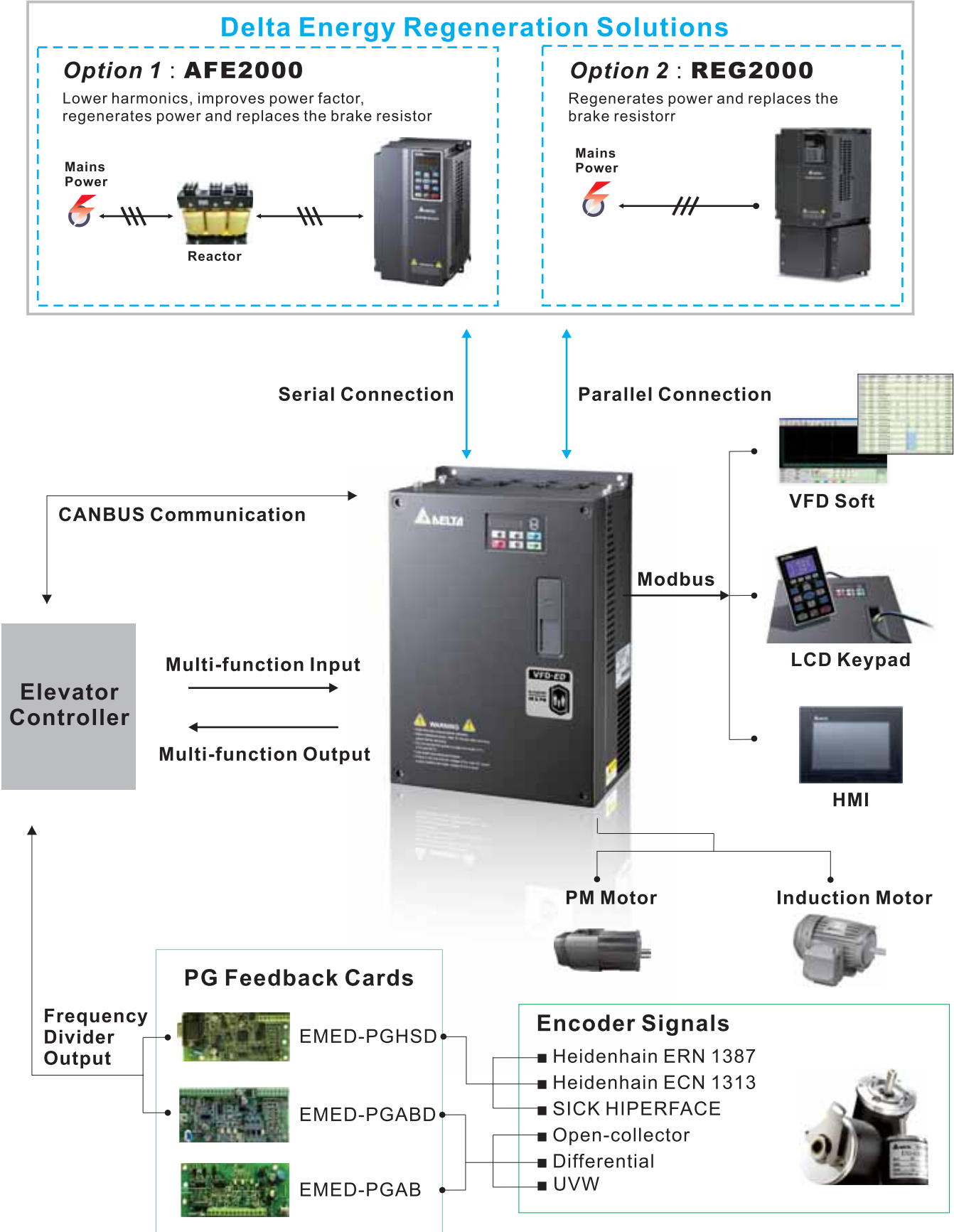
- **Emergency Operation**

- Supports single-phase 230VAC Uninterrupted Power System (UPS). Light-load direction search function is triggered automatically when power failure occurs

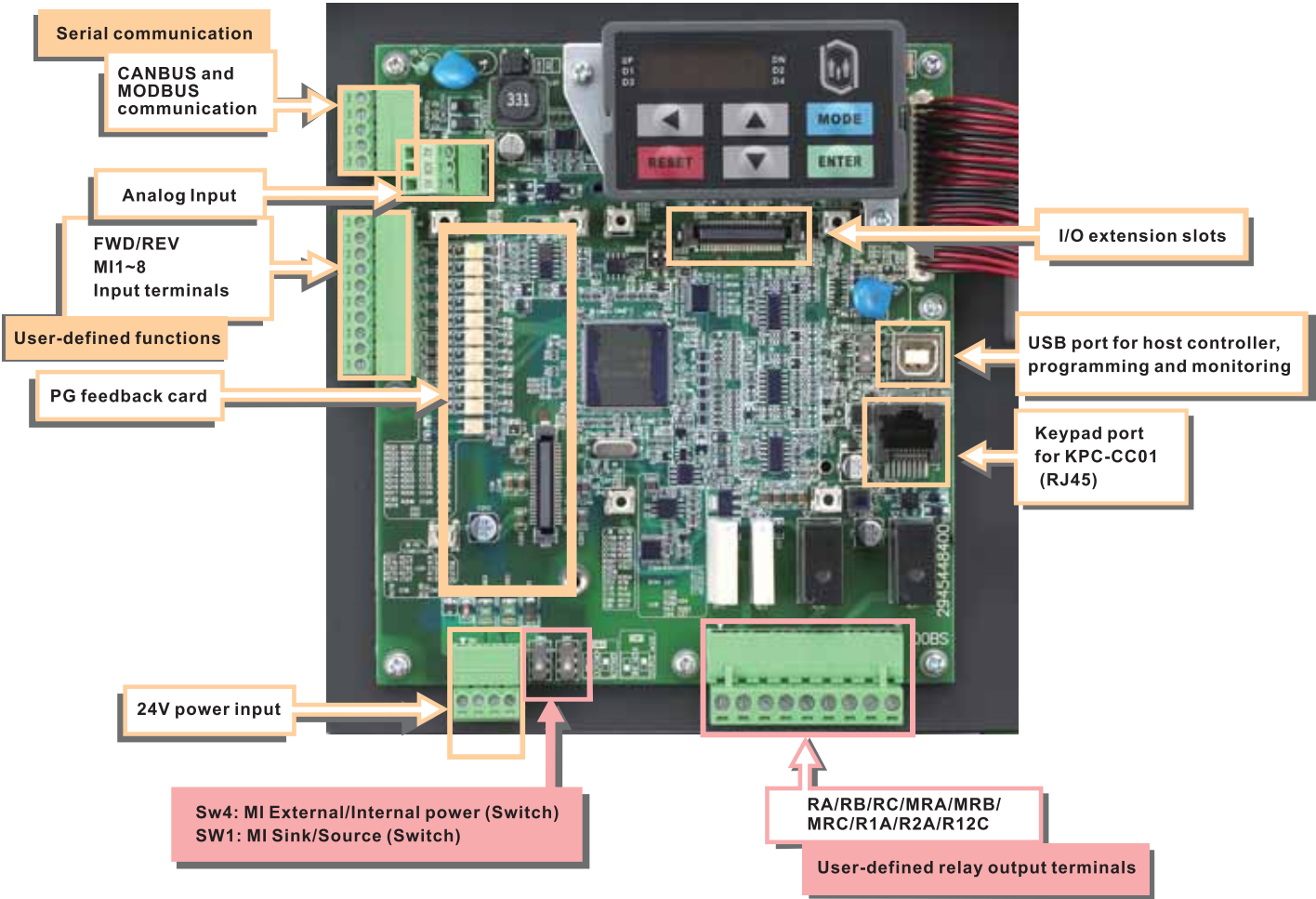


The light-load direction search function is triggered when power failure occurs and brings the elevator to the nearest floor immediately

System Structure

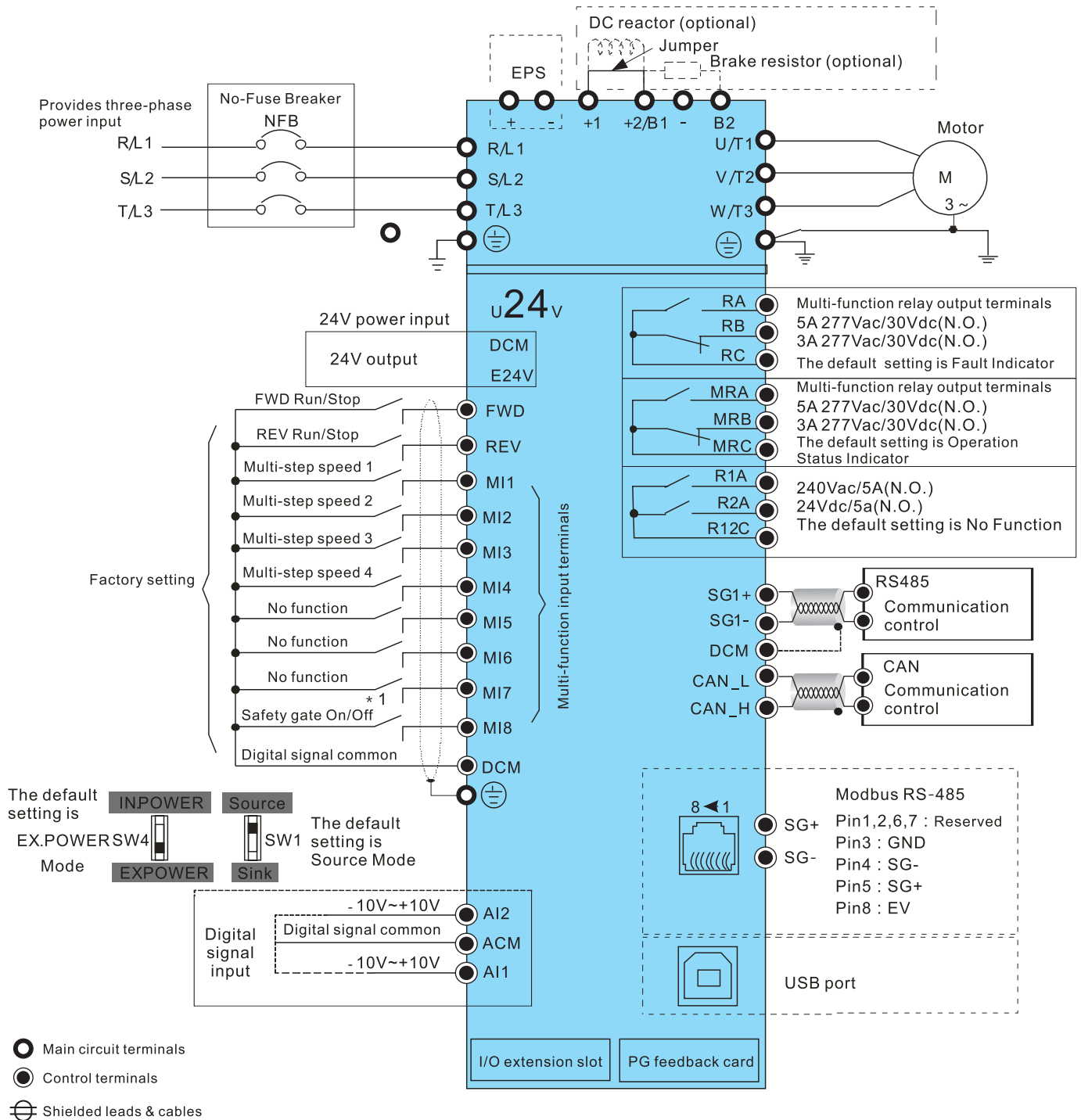


Control Terminals

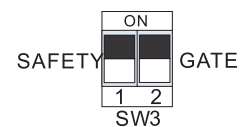


Name	Quantity	Terminal
Multi-function digital input(MI)	2 sets (FWD/REV) 8 sets (User-define))	1. FWD: Forward run/Stop 2. REV: Reverse run/Stop 3. MI1~MI8 user-defined functions 4. Input impedances: app. 3.75kΩ 5. Input voltage range: 0~24VDC
Multi-function relay output	2 sets (N.O./N.C.) 2 sets (N.O.)	1. User-defined functions 2. Resistive load 5A(N.O.)/3A(N.C.) 250VAC 5A(N.O.)/3A(N.C.) 30VDC 3. Inductive load (COS 0.4) 2.0A(N.O.)/1.2A(N.C.) 250VAC 2.0A(N.O.)/1.2A(N.C.) 30VDC
Serial communication	2 sets	1. CAN communication 2. MODBUS communication
USB port	1sets	1. PC monitoring/control and programming
Analog Input	2 sets	1. Input voltage: +10V ~ -10V 2. Input impedance: 20k 3. Resolution: 12bit

Wiring



*1 When SW3 is switched ON, the Safety Gate function is enabled.



Specifications

■ Model Name

VFD 110 ED 23 A

- Version type
- Input Voltage 21 : 230V 1-phase
23 : 230V 3-phase
43 : 460V 3-phase
- ED Series
- Max. Applicable Motor Power (kW)
- Variable Frequency Drive

230V		Frame			B			C			D			E	
		Model VFD__ED23/21_			022*	037*	040	055	075	110	150	185	220	300	370
		Applicable Motor Output(kW)			2.2	3.7	4.0	5.5	7.5	11	15	18.5	22	30	37
		Applicable Motor Power (HP)			3	5	5	7.5	10	15	20	25	30	40	50
Output	Rated Output Capacity (kVA)			4.8	6.8	7.9	9.6	12	17.9	23.1	30.7	34.7	52.6	64.1	
	Rated Current for General Application(A)			12.0	17	20.0	24.0	30.0	45.0	58.0	77.0	87.0	132.0	161.0	
	Rated Current for Elevator (A)			13.7	19.6	22.8	27.4	34.3	51.4	66.3	88.0	99.4	151.0	184.0	
	Max.Output Votage(V)			3-phase corresponding input voltage											
	Range of Output Frequency (Hz)			0.00~400Hz											
	Max. Carrier Frequency (Hz)			12kHz										6kHz	
Input	Input Current (A)			26	37.4	25	30	38	56	72	95	107	163	200	
	Rated Voltage/ Frequency			1-phase 200~240V 50/60Hz		3-phase power supply 200~240V 50/60Hz									
	Operating Voltage Alteration			±10% (180~264V)											
	Allowable Power Frequency Alteration			±5% (47~63Hz)											
	Cooling Method			Fan cooling											
		Weight			6	6	6	8	10	10	13	13	13	36	36

* VFD022ED21A/037ED21A are 1-phase models

460V	Frame	B	C					D		E			
	Model VFD-__ _ED43_	040	055	075	110	150	185	220	300	370	450	550	750
	Applicable Motor Ouput(kW)	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75
	Applicable Motor Power (HP)	5	7.5	10	15	20	25	30	40	50	60	75	100
Output	Rated Output Capacity (kVA)	9.2	10.4	13.5	18.3	24	30.3	36	46.2	63.7	80	96.4	116.3
	Rated Current for General Application(A)	11.5	13	17	23	30	38	45	58	80	100	121	146
	Rated Current for Elevator (A)	13.1	14.9	19.4	26.3	34.3	43.4	51.4	66.3	92	114	138	167
	Max. Output Voltage(V)	3-phase corresponding input voltage											
	Range of Output Frequency (Hz)	0.00~400Hz											
	Max. Carrier Frequency (Hz)	15kHz							9kHz		6kHz		
Input	Input Current (A)	17	18	22	28	37	47	56	72	99	123	150	180
	Rated Voltage/ Frequency	3-phase power supply 380~480V · 50/60Hz											
	Operating Voltage Alteration	±10% (342~528V)											
	Allowable Power Frequency Alteration	±5% (47~63Hz)											
	Cooling Method	Fan cooling											
	Weight	6	8	10	10	10	10	13	14.5	36	36	50	50



General Specifications

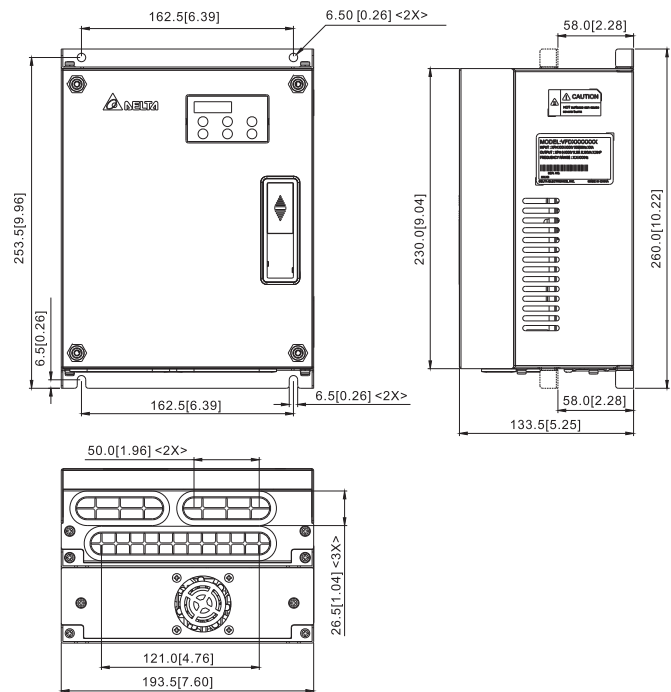
Control characteristics	Control Method	1: V/F, 2: VF+PG, 3: SVC, 4: FOC+PG, 5: TQC+PG, 6: FOC+PM
	Starting Torque	The starting torque can reach up to 150% or more at the frequency of 0.5 Hz. The control mode for FOC + PGC and FOC + PM is 0 Hz.
	Speed Control Range	1:100 (external PG up to 1:1000)
	Speed Control Precision	+/-0.5% (up to +/-0.02% with external PG card)
	Speed Response Bandwidth	5Hz (vector control up to 40 Hz)
	Maximum Output Frequency (Hz)	0.00 to 400 Hz
	Frequency Output Accuracy	Digital command 0.005%, analog command 0.5%
	Frequency Setting Resolution	Digital command 0.01 Hz, Analog command: 1/4096 (12 bit) of maximum output frequency
	Torque Limit	Max. 200% of torque current
	Torque Accuracy	±5%
	Acceleration/Deceleration Time	0.00~600.00 Sec
	V/F Curve	4 point adjustable V/F curve
	Frequency Setting Signal	+/-10V
	Brake Torque	Approximately 20%
Protection features	Motor Protection	Electronic thermal relay protection
	Over-Current Protection	200% of current clamp for rated current, 250% of over-current protection for rated current
	Ground Current Protection	Ground current protection level is 50% of rated current of the AC motor drive
	Overload Capacity	150% of rated output current for 60 seconds, 200% for 3 seconds
	Over-Voltage Protection	Over-voltage level: Vdc>400/800 V ; Low-voltage level: Vdc<200/400 V
	Over-Voltage Protection for Input Power	Metal Oxide Varistor (MOV)
	Over-Temperature Protection	Built-in temperature sensor
Environment	Protection Level	NEMA 1/IP20
	Operation Temperature	-10°C ~40°C, Derating up to 50°C
	Storage Temperature	-20°C ~60°C
	Humidity	Below 90% RH (no condensation)
	Vibration	1.0G below 20Hz, 0.6 G when 20~60Hz
	Cooling System	Fan cooling (When IED is ON the fan turns ON; when IED is OFF the fan turns OFF)
	Installation Height	Below the altitude of 1,000 m (non-corrosive gases and liquids, dust-free)
International Certification		  CE Mark Safety Approved UL/UL US Safety Approved

Dimensions

■ Frame : B

Models

VFD022ED21A
VFD037ED21A
VFD040ED23A
VFD040ED43A

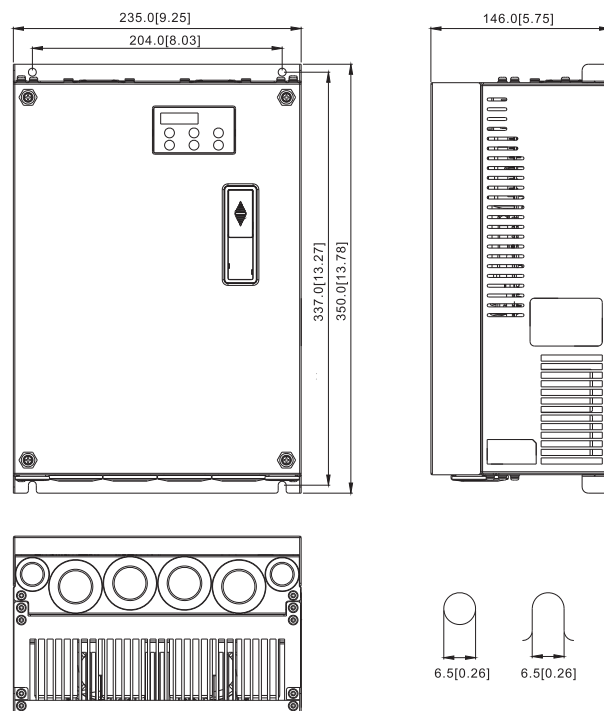


Unit : mm[inch]

■ Frame : C

Models

VFD055ED23A
VFD075ED23A
VFD110ED23A
VFD055ED43A
VFD075ED43A
VFD110ED43A
VFD150ED43A
VFD185ED43A

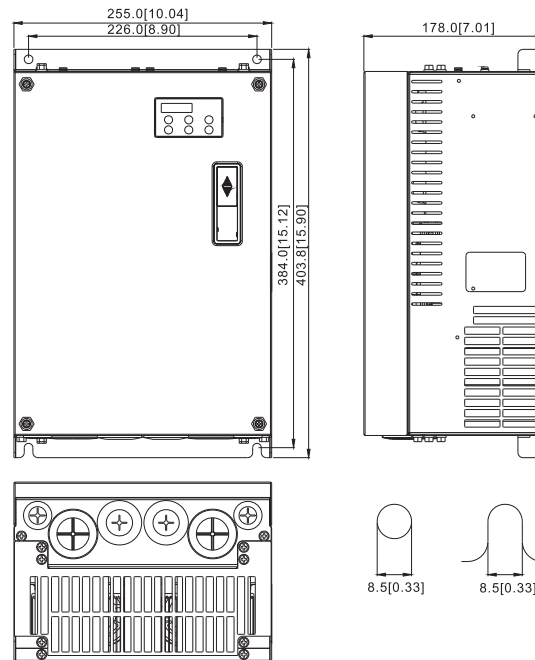


Unit : mm[inch]

■ Frame : D

Models

VFD150ED23A
VFD185ED23A
VFD220ED23A
VFD220ED43A
VFD300ED43A

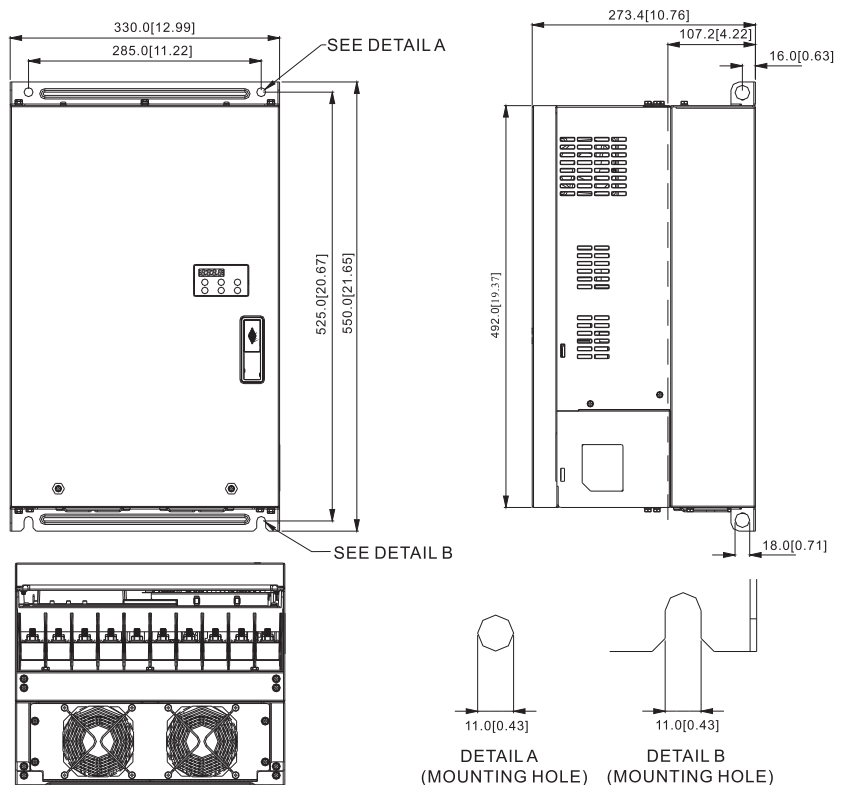


Unit : mm[inch]

■ Frame : E

Models

VFD300ED23A
VFD370ED23A
VFD370ED43A
VFD450ED43A
VFD550ED43A
VFD750ED43A



Unit : mm[inch]

Accessories

PG Card (EMED-PGAB)

Supports Open-collector, Line driver and UVW encoder signal



Terminals	Descriptions
VP	Output power of encoder Output voltage: +5V/+12V (+5V/+12V determined by SW1) Maximum output current: 200mA
0V	Power source common for encoder
A, /A, B, /B, Z, /Z	Incremental encoder signal input Line driver input complies to the RS422 standard Single-phase input of +12 V open collector signal (can be set by SW2) Maximum input frequency: 100kHz
U, /U, V, /V, W, /W	Hall sensor signal input Maximum input frequency: 50kHz
SW1 SW2	Encoder voltage: +5V/12V Input encoder signal: Open-collector or Line Driver

PG Card (EMED-PGHSD)

Supports Heidenhain ERN1387/ECN1313, SICK HIPERFACE



Terminals	Descriptions
Vin	Port for voltage input (for adjusting the value of voltage amplitude from push-pull pulse output) Maximum input voltage: 24VDC
GND	Common ground for Vin and output signal
A/O, B/O	Signal for push-pull pulse output Maximum output current: 30mA Maximum output frequency: 100kHz
AO, /AO, BO, /BO	Signal for differential pulse output Maximum output current: 30mA Maximum output frequency: 100kHz
D-SUB Connector (J3)	Encoder signal input Supports Heidenhain ERN1387 encoder. Heidenhain EnDat2.1 SICK HIPERFACE
SW1 SW2	Encoder voltage: +5V/12V Input encoder signal: Open-collector or Line Driver

PG Card (EMED-PGABD)

Supports Open-collector, Differential, UVW signal and Frequency divider output



Terminals	Descriptions
AO, /AO, BO, /BO	Line driver frequency divider output signal
A/O, B/O	Frequency divider output signal for push-pull voltage Factory setting output amplitude is approximately +24V. The preset internal power can be switched off via SW3 and supply new power from Vin-GND terminal (to output the value of voltage amplitude)
Vin	User-defined external input voltage for adjusting A/O, B/O voltage amplitude
GND	Common ground with the host controller
VP	Relay power output Note: user can set output voltage amplitude with SW1
0V	Power source common for encoder
A, $\bar{A}$, B, $\bar{B}$, Z, $\bar{Z}$	Incremental encoder differential signal input Note: Use SW2 for differential input (single-end open collector signal), from A, B, Z input terminals
U, $\bar{U}$, V, $\bar{V}$, W, $\bar{W}$	Absolute encoder differential signal input (UVW 3-bits)
SW1 SW2 SW3	Encoder voltage: +5V/12V Input encoder signal: Open-collector or Line Driver Output encoder signal: IN.P or EX.P



Accessories

KPC-CC01



- < High illuminated LCD display
- < MODBUS RS-485
- < Supporting languages:
 - English
 - Traditional Chinese
 - Simplified Chinese

Ordering Information

Frame	Applicable Models	
	230V	460V
B 	VFD022ED21A VFD037ED21A VFD040ED23A	VFD040ED43A
C 	VFD055ED23A VFD075ED23A VFD110ED23A	VFD055ED43A VFD075ED43A VFD110ED43A VFD150ED43A VFD185ED43A
D 	VFD150ED23A VFD185ED23A VFD220ED23A	VFD220ED43A VFD300ED43A
E 	VFD300ED23A VFD370ED23A	VFD370ED43A VFD450ED43A VFD550ED43A VFD750ED43A

Global Operations

ASIA (Taiwan)



Taoyuan Technology Center (Green Building)



Taoyuan Plant 1



Tainan Plant (Diamond-rated Green Building)

ASIA (China)



Wujiang Plant 3



Delta Electronics

Sales Channels of Delta Industrial Automation are Located Worldwide in 74 Countries



ASIA (Japan)



Tokyo Office

ASIA (India)



Rudrapur Plant
(Green Building)

EUROPE



Amsterdam, Netherlands

AMERICA



Research Triangle Park

▲ Factories 2 ■ Branch Offices 64 ● R&D Centers 4 ■ Distributors 584





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