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FRECON

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FRECON



FR500D Series

Special Purpose Inverter for Elevator



FRECON ELECTRIC (SHENZHEN) CO.,LTD.

FR500D Series summary

FR500D series inverter is designed according to the carrying characteristics of elevator. It adopts high performance vector control technology, can control both asynchronous motor and synchronous motor. For asynchronous motor open-loop vector control, it combined with innovative sensor start/stop compensation technology without weighting to ensure the comfort when elevator start/stop without weighting device.



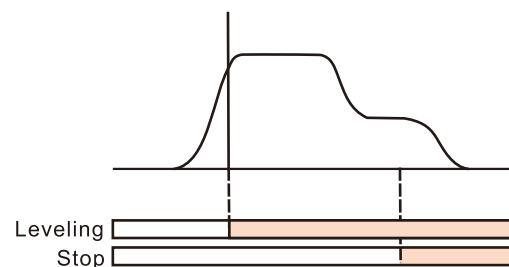
Innovative features

- ▶ Applicable to both asynchronous/synchronous motor



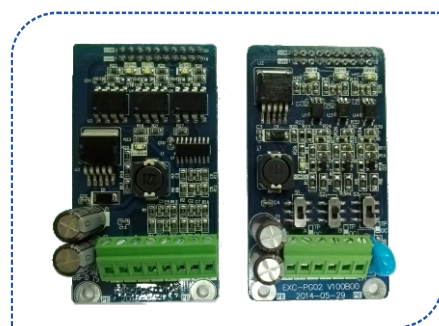
Asynchronous motor Synchronous motor

- ▶ Innovative no sense weighting start/stop compensation technology to ensure the comfort when elevator starts/stops without weighting device
- ▶ Unique short floor function with shortest time to ensure the operation efficiency

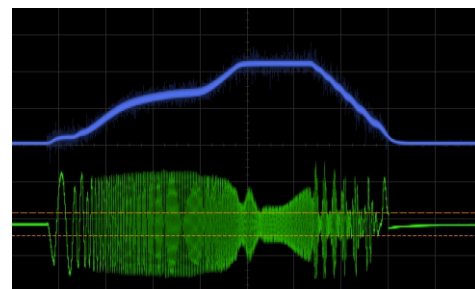


Short floor operation example

- ▶ High performance vector control and rich encoder interface
- High performance current vector control, high starting torque
- Kinds of motor encoder PG card



- ▶ High torque at low frequency

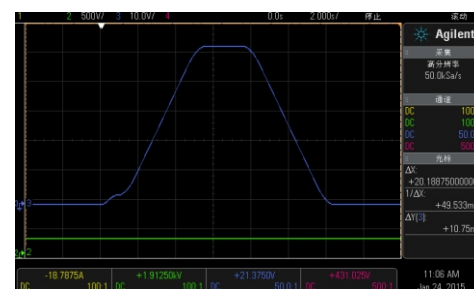


Unique vector control technology, starting torque 0.5Hz/150%

- ▶ Dedicated braking output control for smooth stat and best elevator leveling control

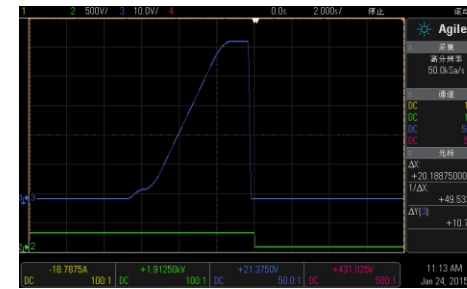


- ▶ Dedicated inspection running mode for the safety

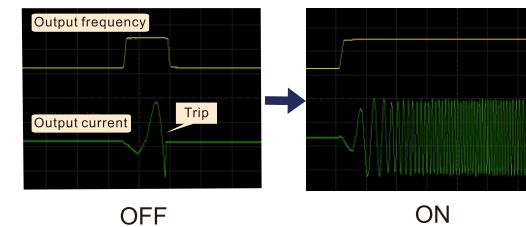


- ▶ Emergency operation mode supported by UPS power. When power off, it can be operated by 220V single phase UPS power. Automatic speed control to prevent motor stall when voltage is not enough. Effective use of UPS voltage light load direction search function

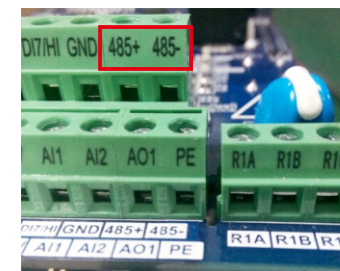
- ▶ If forward or reverse command is canceled under inspection mode, inverter stop immediately



- ▶ High speed current limiting function
- FR500D will not trip and continue to run even when instantaneous over current due to the load change



- ▶ Standard with serial interface RS485
- Communication protocol corresponding to MODBUS-RTU, send out speed command or data collection through PC or PLC



Built-in 485+485- terminal

- ▶ Easy to use and maintenance
 - ◆ Built-in elevator unique menu
 - ◆ LED keypad as standard, general Ethernet cable as the operator extension line
 - ◆ LCD keypad as optional part

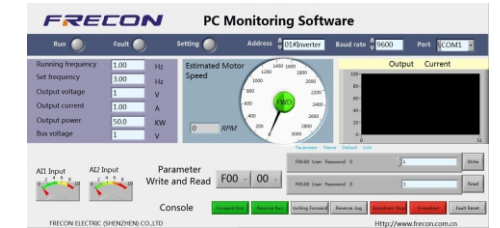


Seven-segment display
With potentiometer



LCD keypad

- ▶ Convenient debugging
 - ◆ Powerful background software



- ◆ Short-cut menu
- Common parameters setting rapidly to save customer's time to read manual
- ◆ Unique upload and download module which is convenient for parameter commissioning
- Restore factory parameters, backup user parameters
- ◆ Design special application macro according to industry demand



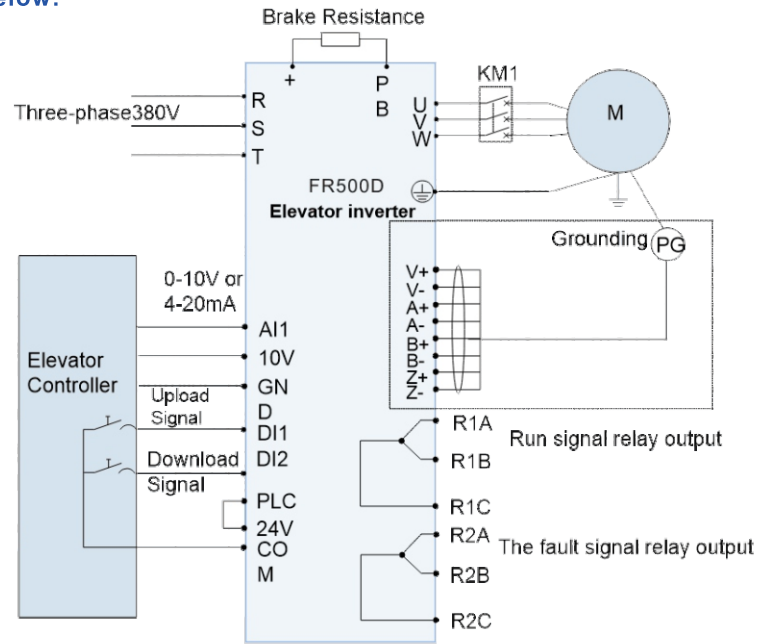
Wiring mode

FR500D supports two kinds of speed given: Analog speed given and multi-stage speed given

Analog speed given

Life controller sends out speed command curve, inverter get speed given command through the analog signal

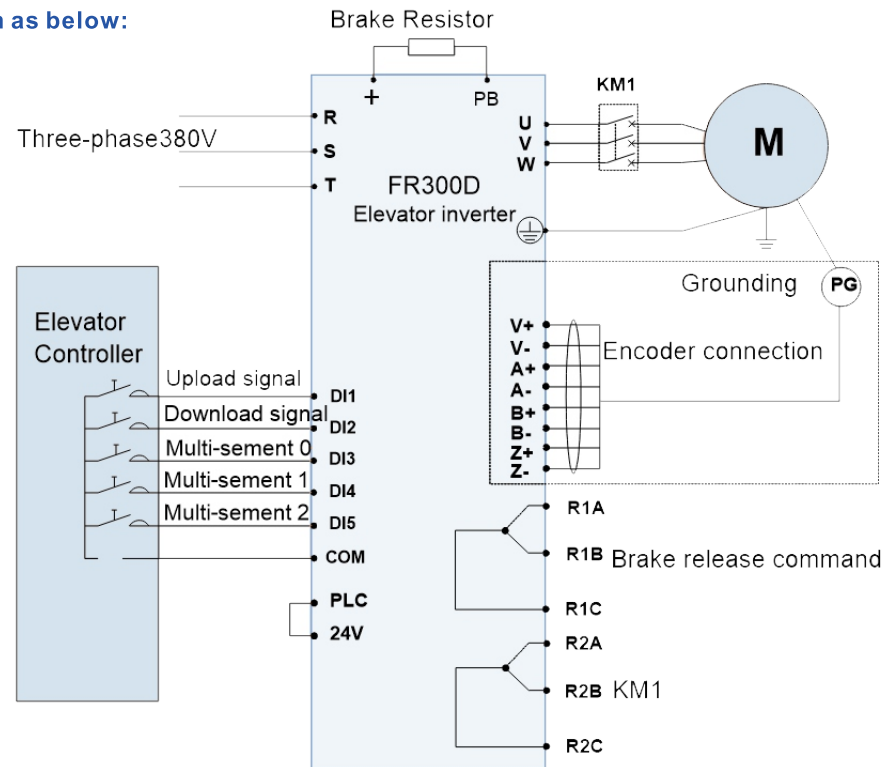
Wiring diagram as below:



Multi-stage speed given

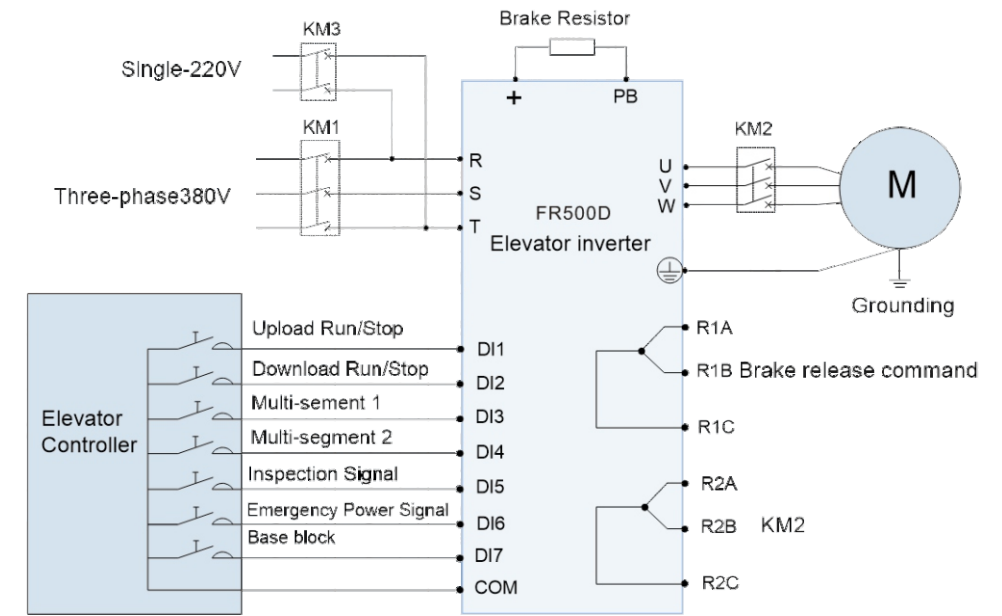
Elevator controller provide speed command, after receiving the command, inverter will automatically calculate S curve acceleration and deceleration speed

Wiring diagram as below:



Built-in Emergency leveling mode

In the using of elevator, if the power is cut suddenly, passengers may be kept in the cage. FR500D series inverters can support emergency UPS power running, Both the main circuit of FR500D and the working are powered by 220V UPS.



Braking resistor selection table

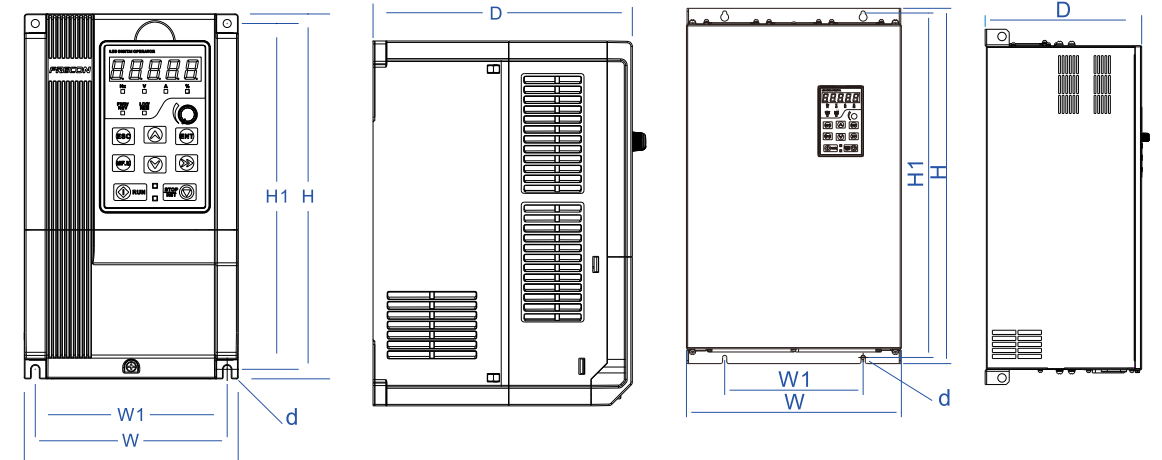
Model No. (FR500D-4T-)	Applicable Motor (KW)	Recommend the resistance value (Ω)	Recommended total power resistance (KW)
4.0B	4	80	1.2
5.5B	5.5	70	1.6
7.5B	7.5	64	2
011B	44	40	3.2
015B	15	36	4
018B	18.5	34	5
022B	22	20	6.4
030B	30	15	8
037B	37	12	10
045B	45	9	15
055B	55	8	18
075B	75	6	25

Technical Parameters

Item	Specification
Input Power	Rated Input Voltage (V) : Three phase 380 V (-15%~+30%)
	Rated Input Frequency (Hz) : 50Hz/60Hz, ± 0.5%
Output Power	Maximum Output Voltage (V) : 0 ~ Rated input voltage , Error<±3%
	Maximum Output Frequency (Hz) : 0.00 ~ 600.00 Hz , Units: 0.01Hz
Control Characteristic	Control mode V/f control Sensor-less vector control 1&2 Closed loop vector control
	Speed range 1:50 (V/f control) 1:100 (sensor-less vector control 1&2) 1:1000 (Closed loop vector control)
	Speed accuracy ±0.5% (V/f control) ±0.2% (sensor-less vector control 1 & 2) ±0.1% (Closed loop vector control)
	Speed fluctuation ±0.3% (sensor-less vector control 1 & 2) ±0.1% (Closed loop vector control)
	Torque response < 10ms (sensor-less vector control 1 & 2) < 5ms (Closed loop vector control)
	Starting torque 0.5Hz: 180% (V/f control, sensor-less vector control 1) 0.25Hz: 180% (sensor-less vector control 2) 0.0Hz: 180% (Closed loop vector control)
Basic functions	Carrier frequency 0.7kHz ~ 16kHz
	Overload capability 150% Rated Current 60s, 180% Rated Current 10s, 200% Rated Current 1s.
	Acceleration and deceleration Curve Line or curve acceleration and deceleration mode. Four kinds of acceleration and deceleration time , Ramp Time Range :0.0 ~ 6000.0s
	DC brake DC brake start frequency: 0.00 ~ 600.00Hz DC brake time: 0.0s ~ 10.0s DC brake current : 0.0% ~ 150.0%
Run	Input terminal 7 Switch input terminals, one way to make high-speed pulse input. Support NPN and PNP 3-channel analog inputs, including 2-way 0 ~ 10V / 0 ~ 20mA voltage and current options, a way to support -10 ~ +10 V input
	Output terminal 2-way switch output terminal, which supports a maximum road speed 100kHz pulse output. 2 relay output terminals. 2 analog output terminal, and optional voltage and current.
Protection function	Provide fault protection dozen : Over current , Overvoltage , Under voltage , Over temperature , Overload Etc Protection.
Environment	Place of operation Indoors, no direct sunlight, free from dust, corrosive gases, flammable gases, oil mist, water vapor, water drop and salt, etc.
	Altitude 0 ~ 2000m De-rate 1% for every 100m when the altitude is above 1000 meters
	Ambient temperature -10°C ~ 40°C (De-rate from 40°C ~ 50°C)
Others	Installation Wall-mounted or Flange mounting
	IP grade IP20
	Cooling method Fan cooled

Product Installation Dimension

F1-1~F1-5 Structure Dimension Diagram



Size of the Case	External and installation dimensions (mm)						Weight (Kg)
	W	W1	H	H1	D	Installation Aperture	
R1	116.6	106.6	186.6	176.6	175	4.5	2.5
R2	146	131	249	236	187	5.5	3.9
R3	198	183	300	287	195	5.5	6.2
R4	250	200	432	411	227	7	13.8
R5	300	200	485	466	226	7	15
R6	310	200	620	601	280	9.5	26

Electric Specification

Model No.	Power Capacity (kVA)	Rated Input Current (A)	Rated Output Current (A)	Applicable motor		Size
				kW	HP	
3-Phase : 380V, 50/60Hz Range : -15%~+30%						
FR500D-4T-2.2B-H	4	5.8	5.5	2.2	3	R1
FR500D-4T-4.0B-H	6	11	9.5	4	5	
FR500D-4T-5.5B-H	8.9	14.6	13	5.5	7.5	R2
FR500D-4T-7.5B-H	11	20.5	17	7.5	10	
FR500D-4T-011B-H	17	26	25	11	15	R3
FR500D-4T-015B-H	21	35	32	15	20	
FR500D-4T-018B-H	24	38.5	37	18.5	25	
FR500D-4T-022B-H	30	46.5	45	22	30	R4
FR500D-4T-030B-H	40	62	60	30	40	
FR500D-4T-037(B)-H	57	76	75	37	50	R5
FR500D-4T-045(B)-H	69	92	91	45	60	
FR500D-4T-055(B)-H	85	113	112	55	70	
FR500D-4T-075(B)-H	114	157	150	75	100	R6
FR500D-4T-090(B)-H	134	186	176	90	125	