

The logo for STEP, consisting of the letters 'STEP' in a bold, white, sans-serif font, followed by a registered trademark symbol (®). The logo is positioned in the top right corner of the page, set against a dark blue background that is part of a larger architectural image of a modern building interior with a grid ceiling and glass walls.

STEP[®]

The product name 'iAStar Elevator Inverter / Integrated Inverter' is centered in the middle of the page. The 'i' is in a red, lowercase, italicized font, while 'AStar' is in a bold, black, sans-serif font. The rest of the text is in a bold, black, sans-serif font. The background is a high-angle, perspective view of a modern building's interior, featuring a ceiling with a grid of square lights and glass walls that reflect the ceiling and each other, creating a complex, multi-layered geometric pattern.

iAStar Elevator Inverter / Integrated Inverter

V2.0

Shanghai Sigriner STEP Electric Co., Ltd.

Company Introduction

Shanghai STEP Electric Corporation-National High-tech Enterprise, National Innovative Enterprise, Shanghai IPR Model Enterprise, Shanghai Patent Model Enterprise and Shanghai Technology Center was founded in 1995 and the registered trademark is **STEP**. STEP Tenet is customer satisfaction, employee pride, community benefit. In December of 2010, STEP's first offering of A-share to the public at Shenzhen Stock Exchange. Stock Name is STEP and Stock Code is 002527.

As utilization of the STEP global strategy, R&D centers and manufacturing centers have been established both in China and Germany. STEP Group, based in Electric Corporation, owns Shanghai Sigriner STEP Electric Co.,Ltd., Shanghai STEP Elevator Components Co.,Ltd., Shanghai STEP Electric Wire & Cable Co., Ltd., Shanghai STEP Software Technology Co.,Ltd., Yixin (Shanghai) International Trade Co., Ltd. and two overseas companies: STEP Sigriner Elektronik GmbH and Hong Kong STEP International Electric Holdings Co., Ltd..

STEP was equipped with a national station for Postdoctoral Research Project. The company was also responsible for edition and revision of 7 national technical standards, gaining 77 patents (patentability of 23 inventions) and 29 software copyrights. The industrialization of inverter project has received financial support of the national key technology innovation fund and was listed in the National Torch Program; Vector-type inverter and control system have been identified as National Key New Products and been honored with Shanghai Science &Technology Invention Award, and servo drive system was an appointed product for independent innovation in Shanghai.

STEP specializes in industrial automation, energy efficiency and green energy resource. The products are widely applied in equipment manufacture, energy saving and renovation project, mainly concerned with elevator, harbor crane, hoisting, rubber & plastic, mining, metallurgy cement, solar power/wind power generation, CNC, package, municipal administration, etc. The products mainly include high/medium/low voltage inverter, integrated controller, SVC, servo drive; elevator control system, elevator parts, elevator wire and cables; STEP Software Technology Co., Ltd. is committed to providing customized intelligent management software products such as E-order, networking (including remote monitoring), maintenance services; Yixin International deals in relevant import and export businesses.



Inverter Factory



R&D Center



SMT

STEP Spirit: Face the world; pursue the best, stay always ahead of the line.

STEP Mission: Provide the best controller, driver and energy-saving products for our customers, serve the society, and benefit the employees.

STEP Vision: To be a world leading high-tech enterprise in electrical industry.



Research Building



With Creative Science and Technology
You Will Find Such Is the World



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Elevator Drive Control Solution



S3 Series
Elevator Inverter



S8 Series
Elevator Integrated Controller



S2
Elevator Door Inverter



AS320 Series
Elevator Inverter



AS380 Series
Elevator Integrated
Controller



AS350 Series
Freight Elevator
Integrated Controller



AS330 Series
Escalator Integrated
Controller

AS320 Series Elevator Inverter

Feature

- Realizing synchronous motor control with incremental ABZ encoder, to ensure a superior startup comfort feeling by no-load sensor startup compensation technology.
- Dynamic PWM carrier modulation technology, reducing motor noise effectively.
- If motor parameters are set accurately, asynchronous motor can adjust by itself without encoder either. If the exact parameters can not be accessed at job site, it is also possible to make inverter get accurate motor parameters automatically with simple self-learning mode of static motor instead of complicated work such as car lifting.
- Hardware is the 6th generation of new module, which could withstand the high temperature of 175°C, and with low switch loss.

AS380 Series Elevator Integrated Controller

Feature

- Synchronous motor can adjust phase angle by itself without encoder, and it can work well when commissioning if wiring and motor parameter setting are set correctly and integrated controller could get the phase angle of the encoder by self-learning when the lift is running.
- Realizing synchronous motor control with incremental ABZ encoder, greatly reducing the cost of encoder, to ensure a superior startup comfort feeling by no-load sensor startup compensation technology.
- Creating a revolutionary way of elevator commissioning—engineer can adjust the elevator directly and monitor the elevator running status inside the car with hand-held operator so as to commission the elevator functions like leveling, comfort feeling, etc more user-friendly.
- Using hand-held operator to check whether the hall call board of each floor works properly or not; Thus the operator can easily find out at which floor the hall call board is damaged. However, in the past; maintenance staffs have to arrive at each floor to check which hall call board is damaged.
- As the functional replacement of SM-02 car control board, the car-top control board and in-car control board can greatly reduce the amounts of wires connected to car-top inspection box and branch cables without the necessity of leading the car-bottom over-full-load signals, door-opening/closed limit signal and safety edge signal to the car operation panel.
- Under the condition of standard function, the traveling cable is only 28core+1 PE, greatly reducing the cost of cable.
- The hoistway switch cable is only 19core at the speed of less than 2.5m/s.
- There only need to be a main contactor and three small contactors in the control cabinet, greatly reducing the cost of control cabinet and wiring of control cabinet.



AS320 Series Elevator Inverter



Technical Characteristics

- New no-load sensor startup compensation technology, making elevator start up comfortably without installing weighting device.
- Realizing synchronous motor control with incremental ABZ encoder.
- New PWM dead-zone compensation technology, reducing motor noise and loss effectively.
- Dynamic PWM carrier modulation technology, reducing motor noise effectively.
- Synchronous motor can adjust phase angle by itself without encoder.
- If motor parameters are set accurately, asynchronous motor can adjust by itself without encoder either.
If the exact parameters can not be accessed at job site, it is also possible to make inverter get accurate motor parameter automatically with simple self-learning mode of static motor instead of complicated work such as car lifting.
- Hardware uses the 6th generation of new module, which could withstand the high temperature of 175°C, and with low switch loss.

Specification Data

Inverter type AS320-	Rated capacity(kVA)	Rated output current(A)	Adaptive motor(kW)
2S01P1	2.3	6.0	1.1
2S02P2	4.6	12	2.2
2S03P7	6.9	18	3.7
4T02P2	4.7	6.2	2.2
4T03P7	6.9	9	3.7
4T05P5	8.5	13	5.5
4T07P5	14	18	7.5

Inverter type AS320-	Rated capacity(kVA)	Rated output current(A)	Adaptive motor(kW)
4T0011	18	27	11
4T0015	24	34	15
4T18P5	29	41	18.5
4T0022	34	48	22
4T0030	50	65	30
4T0037	61	80	37
4T0045	74	97	45
4T0055	98	128	55
4T0075	130	165	75

Technical Index

Item		Technical Index
Maximum output voltage(V)		200V: single phase 220 ~ 240 (corresponding input voltage) 400V: 3-phase 380/400/415/440/460V(corresponding input voltage)
Input power supply	Phase number, voltage, frequency	3-phase 380/400/415/440/460V 50/60Hz
	Allowable voltage variation	-15% ~ +10%
	Allowable frequency variation	-5% ~ +5%
	Reduced bearing capacity of instantaneous voltage	AC300V above, continuous running When de-rating from rated input status to below AC300V, perform undervoltage protection after 15ms continuous running
Controlling characteristics	Controlling way	With PG card vector control, voltage vector, V/F, open-loop vector, torque control
	Starting moment	150% 0Hz (with PG card vector control), 120% 0.5Hz (voltage vector V/F), 150% 0.5Hz (open-loop vector)
	Speed controlling range	1:1000 (with PG vector control), 1: 200 (without PG vector control)
	Precision of speed control	±0.02% (with PG vector control 25±10℃), ±0.2% (without PG vector control 25±10℃)

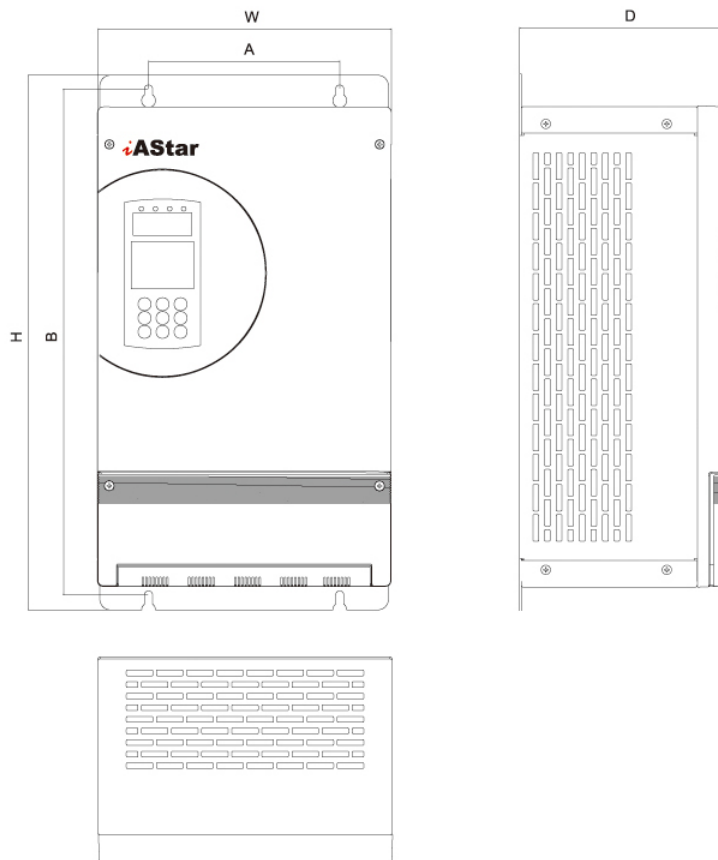


	Item	Technical Index
Controlling characteristics	Moment limit	Yes (with parameter setting)
	Moment precision	±5%
	Frequency controlling range	0 ~ 120Hz
	Frequency precision (temp. variation)	±0.01% (digital command -10~+45°C), ±0.1%(analog command 25±10°C)
	Frequency setting resolution	±0.01Hz (digital command), ±0.06Hz/120Hz (analog command 11bit + no symbol)
	Output frequency resolution (calculation resolution)	0.01Hz
	Overloading capacity	Zero speed is 150%, when < 3Hz, 160%, when > 3Hz, 200%
	Braking moment	150%(connecting external braking resistor), built-in braking unit
	Time of ACC/DEC	0.01 ~ 600s
	Carrier frequency	2k ~ 11k Hz
	Speed setting	Digital setting; analog setting; panel setting
	LV bus running	During power cutoff, batteries are relied on to enable elevator to run at low speed to nearly floor.
PG card interface signal	PG card power supply	5V, 12V, 300mA
	PG card type	SIN/COS, Endat, ABZ incremental, Resolver
	PG card frequency dividing output	OA, OB orthogonality, frequency dividing coefficient 1 ~ 128
Control I/O signal	Analog voltage input	2-way, -10 ~ +10VDC, precision of 0.1%
	Analog voltage output	2-way, -10 ~ +10VDC, precision of 0.1%
	Optoelectronic isolated input	8-way. Input function can be defined
	Open collector output	4-way. Output function can be defined
	Programmable relay output	2-way. NO, NC dual-contact, contact capacity: resistor type, 5A 250VAC or 5A 30VDC; Output function can be defined
	RS485 communication interface	1-way
	RS232 communication interface	1-way, used for operating device or PC

	Item	Technical Index
Protection function	Motor overloading protection	Protective curve of motor through parameter setting
	Inverter overloading	When < 3Hz, 160%, 5s; when > 3Hz, 185%, 10s
	Short protection	In case of overcurrent caused by short of any 2 phases at output side, protect the inverter
	Input open-phase protection during running	During running, in case of input open-phase, cut off output to protect the inverter
	Output open-phase protection during running	During running, in case of output open-phase, cut off output to protect the inverter
	Overvoltage threshold	Bus voltage 410V (200V series), 810V (400V series)
	Undervoltage threshold	Bus voltage 180V (200V series), 380V (400V series)
	Instantaneous power outage compensation	Protection above 15ms
	Radiator fan overheating	Protect by thermo-sensitive resistor
	Stall out prevention	Stall out protection that speed offset is greater than 30% of rated speed during running
	Pulse encoder trouble	PG disconnection
	Braking unit protection	Check that braking unit is abnormal automatically, protect
	Module protection	Overcurrent, short, overheating protection
	Current sensor protection	Self-check at power on
	Speed reverse protection	Inspect with encoder
	I ² t protection	Inspect with 3-phase inspection
	Input overvoltage protection	400V grade is greater than 725V, 200V grade is greater than 360V, inspect after stop
	Output grounding protection	Any phase is shorted to ground during running, cut off output to protect inverter
	Output unbalance protection	Unbalance of output 3-phase current is detected during running, cut off output to protect inverter
	Short protection for braking resistor	Inspect at braking
Encoder interruption	Evaluate interruption degree of encoder and alarm	
EEPROM trouble	Self-check at power on	
Display	LCD in Chinese	Various levels of menus

Item		Technical Index
Environment	Ambient temperature	-10 ~ +45°C
	Humidity	Below 95%RH (without condensate)
	Storage temperature	-20 ~ +60°C (short-time temperature during transportation)
	Location	Indoor (no corrosive gas or dust)
	Altitude	Below 1000m
Structure	IP	IP20
	Cooling way	Forced air cooling
Installation manner		Inside the cabinet

Installation Dimension and Weight



Installation Dimensions and Weight List

Inverter type AS320-	A (mm)	B (mm)	H (mm)	W (mm)	D (mm)	Installation diameter Φ (mm)	Installation			Tightening torque (Nm)	Mass (kg)						
							Bolt	Nut	Washer								
2S01P1	100	288.5	300	160	166	5.0	4M4	4M4	4 Φ 4	2	4.5						
2S02P2																	
2S03P7																	
4T02P2																	
4T03P7																	
4T05P5																	
4T07P5	165.5	357	379	222	192	7.0	4M6	4M6	4 Φ 6	3	8.2						
4T0011																	
4T0015	165.5	392	414	232	192						9.0	4M8	4M8	4 Φ 8	6	10.3	
4T18P5																	
4T0022																	
4T0030	200	512	530	330	290											10.0	4M12
4T0037																	
4T0045	200	587	610	330	310	14	4M12	4M12	4 Φ 12	14							
4T0055																	
4T0075											320	718	750	430	351		



AS380 Series Elevator Integrated Controller



5.5kW



11kW



22kW

Technical Characteristics

- Perfect integration of control and drive of elevator. The whole device features compact structure and small size, fewer connections, which is characterized as high reliability and easy-to-use property and cost-efficiency.
- Double 32-bit embedded microprocessor completes the elevator operation and motor drive control.
- Redundant safety design, double safety protection for control processor and drive processor to achieve the maximum safety guarantee for elevator travel.
- Design of anti-interference ability to exceed the highest level in compliance with industrial standard.
- Complete CAN Bus communication, simple wiring, better performance of data transfer and more reliable.
- Advanced direct landing technology for higher efficiency during traveling.
- Diversified and advanced elevator operation functions can fully meet the needs of every customer.
- Advanced group control functions not only for conventional group control with max. 8 lifts, but for destination dispatch system.
- Advanced vector control technology can perfectly adjust the motor speed to get a better comfort feeling.
- Adapt to both synchronous motor and asynchronous motor.
- Innovative no-load sensor startup compensation technology can ensure a comfort feeling at the starting moment without need of installing the weighting device.
- Incremental ABZ encoder can realize the control of synchronous motor and no-load sensor startup compensation technology can ensure a comfort feeling at the starting moment.
- New PWM dead zone compensation technology can effectively reduce the motor noise and loss of machine.

- Dynamic PWM carrier modulation technology can effectively reduce the motor noise.
- No need of self-tuning for synchronous motor to get the phase angle of encoder.
- If motor parameters are set accurately, asynchronous motor can adjust by itself without encoder either. If the exact parameters can not be accessed at job site, it is also possible to make inverter get accurate motor parameters automatically with simple self-learning mode of static motor instead of complicated work such as car lifting.
- Hardware is the 6th generation of new module, which could withstand the high temperature of 175°C, and with low switch loss.

Specification Data

Controller type AS380-	Rated capacity(kVA)	Rated output current(A)	Matching Motor(kW)
2S01P1	2.3	6.0	1.1
2S02P2	4.6	12	2.2
2S03P7	6.9	18	3.7
4T02P2	4.7	6.2	2.2
4T03P7	6.9	9	3.7
4T05P5	8.5	13	5.5
4T07P5	14	18	7.5
4T0011	18	27	11
4T0015	24	34	15
4T18P5	29	41	18.5
4T0022	34	48	22
4T0030	50	65	30
4T0037	61	80	37
4T0045	74	97	45
4T0055	98	128	55
4T0075	130	165	75



Technical Index

Item		Technical Index
Max output voltage(V)		200V: single-phase 220~240(matching input voltage) 400V: three-phase 380/400/415/440/460V(matching input voltage)
Input power supply	Phase number voltage frequency	200V: single-phase 220~240V, 50/60Hz 400V: three-phase 380/400/415/440/460V, 50/60Hz
	Voltage range allowed	-15%~+10%
	Frequency range allowed	-5%~+5%
	Endurance capacity of instantaneous voltage drop	200V: keep running at AC150V or above; Activate under-voltage protection after 15ms from the moment when it drops from rated input condition to somewhere lower than AC150V. 400V: keep running at AC300V or above; Activate under-voltage protection after 15ms from the moment when it drops from rated input condition to somewhere lower than AC300V.
Basic characteristics	Max accessible floor	2~64 floors for single elevator
	Elevator running speed	≤4.00m/s
	Units under Group control	≤8
	Communication mode	CAN bus serial communication
Drive characteristics	Control mode	PG card vector control
	Startup torque	150% 0Hz(PG card vector control)
	Speed control scope	1:100(PG card vector control)
	Speed control precision	±0.02%(PG card vector control 25±10℃)
	Torque limit	Yes(set with parameter)
	Torque precision	±5%
	Frequency control scope	0 ~ 120Hz
	Frequency precision (temperature fluctuation)	±0.1%
	Frequency setting resolution	±0.06Hz/120Hz
	Output frequency resolution (calculation of resolution)	0.01Hz

	Item	Technical Index
Drive characteristics	No-load startup compensation	When the elevator load is unknown, suitable torque will, as per the ready-to-travel direction of elevator, be applied on motor so as to ensure smooth start of elevator, minimize the slipping and improve comfort at starting moment
	Overload capacity	Zero speed 150%, <3Hz is 160%, >3Hz is 200%
	Brake torque	150% (external braking resistor), integrated braking unit
	Acceleration Deceleration time	0.01~600s
	Carrier frequency	2k~11k Hz
	Battery operation	In case of blackout, the battery instantaneously supplies power to elevator for leveling at low speed
PG card interface port	PG card output	5V, 12V, 300mA
	PG card type	SIN/COS, Endat, ABZ incremental, Resolver
	PG card signal frequency dividing output	OA, OB orthogonal, frequency dividing coefficient 1~128
Control I/O signal	Opt-coupler input Control power supply	Isolated 24V DC
	Relay output control power supply	Isolated 24V DC
	Low-voltage opt-coupler isolated input	20 channel. Switching capacity. Opt-coupler control signal is isolated 24V DC input signal
	High-voltage opt-coupler isolated input	3 channel. Switching capacity
	Relay output 1	4 channel. Normal open contact, single-pole and single-throw, contact capacity: resistive load, 3A 250VAC or 3A 30VDC
	Relay output 2	3 channel. Normal open contact, single-pole and single-throw, contact capacity: resistive load, 6A 250VAC
	CAN communication port	3 channel(duplex or group control, communication between car and outside, community monitoring)
	Analog quantity input port	1channel. single pole or differential input, input voltage scope -10V~+10V, precision 0.1%
Protection function	Motor overload protection	Able to use parameter setting for the protection curve of motor
	Overload of frequency converter	<3Hz is 160%, 5 seconds, >3Hz is 185%, 10 seconds
	Short-circuit protection	Provide protection to elevator integrated drive controller when overcurrent occurs to any tow phases at output side.
	Input open phase protection	In case that open phase inputted during operation, cut off output to protect the drive controller
	Output open phase protection	In case that open phase outputted during operation, cut off output to protect the drive controller
	Overvoltage threshold	Bus-bar voltage 410V(200V series), 810V(400V series)

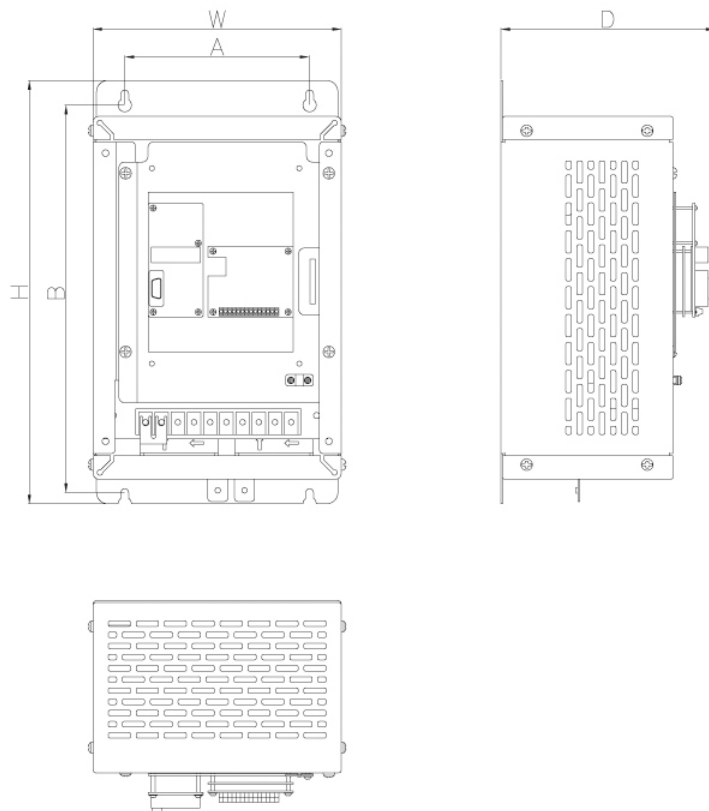
Products of Company



	Item	Technical Index
Protection function	Under-voltage threshold	Bus-bar voltage 180V(200V series), 380V(400V series)
	Instantaneous blackout compensation	15ms above protection
	Heat sink overheat	Protection through the thermistor
	antistall	Antisall protection launched when running speed deviation more than 30% of the rated speed
	Impulse encoder failure	PG disconnection
	Brake protection	Protection launched when automatically detecting the abnormal condition of brake
	Module protection	Protection against over-current, short-circuit, overheating
	Current sensor protection	Self-inspection when power connection
	Speed reversal protection	Inspection through encoder
	I ² t protection	Inspection through three-phase current
	Protection against input overvoltage	400V level >725V, 200V level >360V, stop and inspect
	Output grounding protection	Any phase grounding short-circuited during operation, cut off input and protect the frequency converter.
	Protection against output imbalance	Found three phase current output imbalance. Cut off output and protect frequency converter
	Short-circuit protection for brake resistor	Inspection when braking
	Encoder interference	Evaluate the degree of interference of encoder and alarm
	Over-speed protection	Protection launched when exceeding rated speed by 100%
	Low-speed protection	Protection launched when the elevator running speed is far lower than the rated speed du to some reasons including failures
	Running time governor protection	Protection launched when floor passing time exceed the required time
	Leveling switch fault protection	Protection launched when leveling switch is at fault
EEPROM fault	Self-inspection when power connection	
Display	LCD in Chinese and English	Menus at each level
Environment	Surrounding temperature	-10~+45℃
	humidity	Below 95%RH(no condensation)
	Storage temperature	-20~+60℃(temperature allowable during short-term transport)

Item		Technical Index
Environment	Application place	Indoor(no corrosive gas、 dust and the like)
	altitude	Below 1000m
Structure	Protection grade	IP20
	Cooling mode	Force air-cooling
Installation mode		In-cabinet installation

Installation Dimension and Weight



Installation Dimensions and Weight List

Controller type AS380-	A (mm)	B (mm)	H (mm)	W (mm)	D (mm)	Mounting hole diameterΦ (mm)	installation			Fastening torque (Nm)	Mass (kg)					
							bolt	nut	washer							
2S01P1	100	253	265	151	166	5.0	4M4	4M4	4Φ4	2	4.5					
2S02P2																
2S03P7																
4T02P2																
4T03P7																
4T05P5																
4T07P5	165.5	357	379	222	192	7.0	4M6	4M6	4Φ6	3	8.2					
4T0011																
4T0015	165.5	392	414	232	192						9.0	4M8	4M8	4Φ8	6	10.3
4T18P5																
4T0022																
4T0030	200	512	530	330	290											10.0
4T0037																
4T0045	200	587	610	330	310	14	4M12	4M12	4Φ12	14						
4T0055																
4T0075																
4T0075	320	718	750	430	373					10.0					50	

AS350 Freight Elevator Integrated Controller

Technical Characteristics



5.5kW



11kW

- Perfect integration of control and drive of freight elevator. The whole device features compact structure and small size, fewer connections, which is characterized as high reliability and easy-to-use property and cost-efficiency.
- Double 32-bit embedded microprocessor completes the freight elevator operation and motor drive control.
- Redundant safety design, double safety protection to control processor and drive processor to achieve the maximum safety guarantee for freight elevator travel.
- Design of anti-interference ability to exceed the highest level in compliance with industrial standard.
- CAN bus communication in the car, simple wiring, better performance of data transfer and more reliable; REN Bus communication is used for landing call, with easy use and competitive cost.
REN bus: A serial bus which is research and developed by STEP used in landing call of elevator with serial control, connecting to the landing call board. There is no need to set floor address, and no need to use twisted-pair in communication wire. Only 4 core ordinary wire (0.5mm²) can achieve excellent communication effect, with easy use and competitive cost.
- Advanced direct landing technology for higher efficiency during traveling.
- Diversified and advanced freight elevator operation functions can fully meet the needs of every customer.
- Advanced vector control technology can perfectly adjust the motor speed to get a better comfort feeling.
- Innovative no-load sensor startup compensation technology can ensure a comfort feeling at the starting moment without need of installing the weighting device.
- Incremental ABZ encoder can realize the control of synchronous motor and no-load sensor startup compensation technology can ensure a comfort feeling at the starting moment.
- New PWM dead-zone compensation technology can effectively reduce the motor noise and loss of machine.

- Dynamic PWM carrier modulation technology can effectively reduce the motor noise.
- If motor parameters are set accurately, asynchronous motor can adjust by itself without encoder either. If the exact parameters can not be accessed at job site, it is also possible to make inverter get accurate motor parameters automatically with simple self-learning mode of static motor instead of complicated work such as car lifting.
- Hardware is the 6th generation of new module, which could withstand the high temperature of 175°C, and with low switch loss.

Specification Data

Controller type AS350-	Rated capacity(kVA)	Rated output current (A)	Matching Motor (kW)
2S01P1	2.3	6.0	1.1
2S02P2	4.6	12	2.2
2S03P7	6.9	18	3.7
4T02P2	4.7	6.2	2.2
4T03P7	6.9	9	3.7
4T05P5	8.5	13	5.5
4T07P5	14	18	7.5
4T0011	18	27	11
4T0015	24	34	15
4T18P5	29	41	18.5
4T0022	34	48	22
4T0030	50	65	30
4T0037	61	80	37
4T0045	74	97	45
4T0055	98	128	55
4T0075	130	165	75

Technical Index

Item		Technical Index
Max. output voltage (V)		200V: single-phase 220~240 (matching input voltage) 400V: three-phase 380/400/415/440/460V (matching input voltage)
Input power supply	Number of phase, voltage and frequency	200V: single-phase 220~240V, 50/60Hz 400V: three-phase 380/400/415/440/460V, 50/60Hz
	Admissible voltage fluctuation range	-15%~+10%
	Admissible frequency fluctuation range	-5%~+5%
	Instantaneous voltage drop capacity	200V: continue running when it is above AC150V; when dropping from nominal input status to AC150V, undervoltage protection after continuous operation of 15ms. 400V: continue running when it is above AC300V; when dropping from nominal input status to AC300, undervoltage protection after continuous operation of 15ms.
Basic characteristics	Max. floors	2~6 for single elevator
	Elevator speed	≤1.00m/s
	Communication mode	Serial communication
Drive characteristics	Control mode	With PG card vector control
	Startup moment	150% 0Hz (with PG card vector control)
	Speed control range	1:1000 (with PG card vector control)
	Speed control precision	±0.02% (with PG card vector control 25±10°C)
	Moment limit	Yes (setup by parameters)
	Moment precision	±5%
	Frequency control range	0~120Hz
	Frequency precision (Temp. fluctuation)	±0.1%
	Frequency setup resolution	±0.06Hz/120Hz
	Output frequency resolution (Calculate resolution)	0.01Hz
Non-load startup compensation	When lift load is unknown, impose suitable torque to the motor according to its operation direction to start it up smoothly and minimize the slipping and increase comfortable sensation during start-up.	

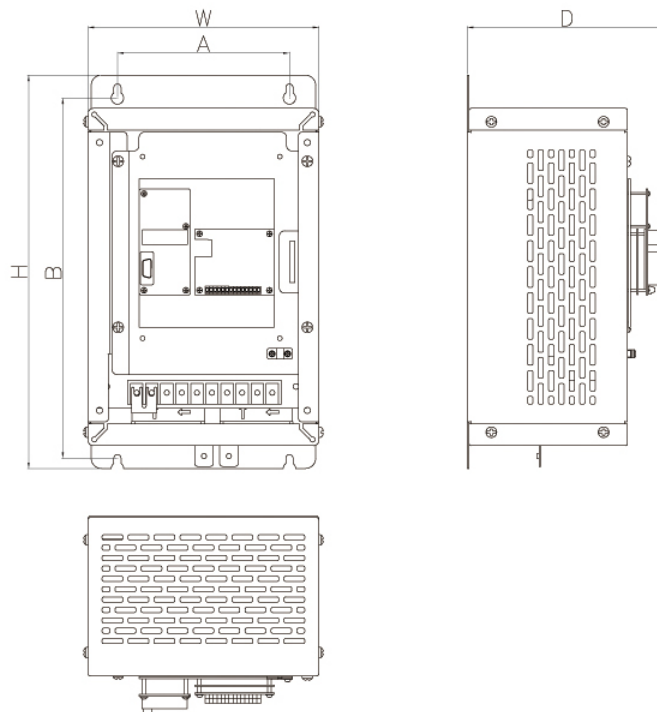


	Item	Technical Index
Drive characteristics	Overload capacity	Zero=150%, <3Hz=160%, >3Hz=200%
	Brake moment	150% (external braking resistor), internal braking units
	Acceleration/deceleration time	0.01~600s
	Carrier frequency	2k~11k Hz
	Battery operation	Elevator powered by battery runs in low speed to the closest floor when power cuts.
PG card interface signal	PG card output power	5V, 12V, 300mA
	Type of PG cards	SIN/COS, Endat, ABZ incremental, Resolver
	PG card signal frequency division output	OA, OB in quadrature, frequency division factor 1~128
Control I/O signal	OC input control power	Insulation 24V DC
	Relay output control power	Insulation 24V DC
	Low voltage OC insulation input	20 ways. Switching value. OC control signal: insulation 24VDC power input signal.
	High voltage OC insulation input	3 ways. Switching value.
	Relay output 1	4 ways. normally open contact, SPST, contact capacity: resistive, 3A 250VAC or 3A 30VDC
	Relay output 2	3 ways. normally open contact, SPST, contact capacity: resistive, 6A 250VAC
	CAN communication interface	2 ways (parallel connection, lift car communication)
	RENbus communication interface	1 way (outcall communication)
	Analog signal input	1 way single end or difference input, input voltage range: -10V~+10V, precision 0.1%
Protection function	Motor overload protection	Use parameters to set up motor protection curve
	Transducer overload	<3Hz=160%, 5 sec, >3Hz=185%, 10 sec.
	Short circuit protection	If overcurrent is caused by short circuit in any two phases at output side, protect drive controller.
	Input open-phase protection in operation	If input open phase during operation, shut down output to protect drive controller.
	Output open-phase protection in operation	If input open phase during operation, shut down output to protect drive controller.

	Item	Technical Index
Protection function	Overvoltage threshold	Bus voltage 410V(200V series) and 810V(400Vseries)
	Undervoltage threshold	Bus voltage 180V(200Vseries) and 380V(400Vseries)
	Instantaneous power cut compensation	Protect above 15ms
	Cooling plate overheat	Pass thermistor protection
	Prevent speed loss	Protection against speed loss (30% over rated speed) during operation.
	Impulse Encoder fault	PG disconnection
	Brake unit protection	Self check the brake unit fault for protection
	Module protection	Overcurrent, short circuit and overheat protection
	Current sensor protection	Self-check while power on
	Speed reversion protection	Pass encoder inspection
	I ² t protection	Pass three phase current inspection
	Protection against high input voltage	400V: >725V, 200V: >360V, inspection after stop
	Output earthing protection	When any one pair of earthing is short during operation, shut down output to protect inverter.
	Unbalance output protection	When three-phase current is measured unbalance, shut down output to protect inverter.
	Brake resistance short circuit protection	Inspection while braking
	Encoder interference	Evaluate encoder interference degree and alarm
	Overspeed protection	100% protection against overspeed.
	Low speed protection	Protection against low speed caused by fault.
	Operation time limiter protection	Protection against overtime passing each floor during operation
	leveling switch fault protection	Protection caused by leveling switch fault
EEPROM fault	Self-check while power on	
Display	LCD (Chinese and English)	All menus

	Item	Technical Index
Environment	Ambient temp.	-10~+45℃
	Humidity	Below 95%RH (without condensation)
	Storage temp.	-20~+60℃ (short-term temp. in transport)
	Place to use	Indoor (without corrosive gas and dust)
	Elevation	<1000m
Structure	Protection grade	IP20
	Cooling mode	Forced wind cooling
	Installation mode	Cabinet

Installation Dimension and Weight



Installation Dimensions and Weight List

Controller type AS350-	A (mm)	B (mm)	H (mm)	W (mm)	D (mm)	Installation hole diameter Φ(mm)	Installation			Tightening torque (Nm)	Mass (kg)					
							Bolt	Nut	Washer							
2S01P1	100	253	265	151	166	5.0	4M4	4M4	4Φ4	2	4.5					
2S02P2																
2S03P7																
4T02P2																
4T03P7																
4T05P5																
4T07P5	165.5	357	379	222	192	7.0	4M6	4M6	4Φ6	3	8.2					
4T0011																
4T0015	165.5	392	414	232	192						9.0	4M8	4M8	4Φ8	6	10.3
4T18P5																
4T0022																
4T0030	200	512	530	330	290											10.0
4T0037																
4T0045	200	587	610	330	310	14	4M12	4M12	4Φ12	14						
4T0055																
4T0075											330	718	750	430	373	

AS330 Escalator Integrated Controller



11kW



15kW

Technical Characteristics

- Perfect integration of control and drive of escalator. The whole device features compact structure and small size, fewer connections, which is characterized as high reliability and easy-to-use property and cost-efficiency.
- Double 32-bit embedded microprocessor completes the escalator operation and motor drive control.
- Redundant safety design, double safety protection to control processor and drive processor to achieve the maximum safety guarantee for escalator travel.
- Design of anti-interference ability to exceed the highest level in compliance with industrial standard.
- CAN Bus communication in the car, simple wiring, better performance of data transfer and more reliable; REN Bus communication is used for landing call, with easy use and competitive cost.
- Smart running speed control changes with the passenger flows, which realizes the most energy saving operation.
- Diversified and advanced escalator operation functions can fully meet the needs of every customer.
- Frequency conversion and working frequency redundant control include many patterns such as full frequency conversion, bypass frequency conversion control, and Y- Δ control, which satisfy the requirements of different customers to the utmost, reducing the breakdown time.
- Bypass frequency conversion technology; Frequency conversion control is used at the time of escalator standby, acceleration and deceleration. Working frequency control is used at the time of stable operation. It realizes energy-saving downshift of escalator frequency conversion.

- New PWM dead zone compensation technology can effectively reduce the motor noise and loss of machine.
- Dynamic PWM carrier modulation technology can effectively reduce the motor noise.
- Hardware is the 6th generation of new module, which could withstand the high temperature of 175°C, and with low switch loss.

Specification Data

Controller type AS330-	Rated Capacity(kVA)	Rated Output Current(A)	Matching Motor(kW)
4T05P5	8.5	13	5.5
4T07P5	14	18	7.5
4T0011	18	27	11
4T0015	24	34	15
4T18P5	29	41	18.5
4T0022	34	48	22
4T0030	50	65	30
4T0037	61	80	37

Technical Index

Item		Technical Index
Max Output Voltage, V		400V: 3-Phase 380/400/415/440/460V(corresponds to input voltage)
Input power supply	Phase number, voltage, frequency	400V: 3-Phase 380/400/415/440/460V, 50/60Hz(corresponds to input voltage)
	Allowable voltage fluctuations	-15%~+10%
	Allowable Frequency Deviation	-5%~+5%
	Acceptable instantaneous voltage drop	400V: keep running at AC300V or above; activate under-voltage protection after 15 ms from the moment when it drops from rated voltage to below AC300V.

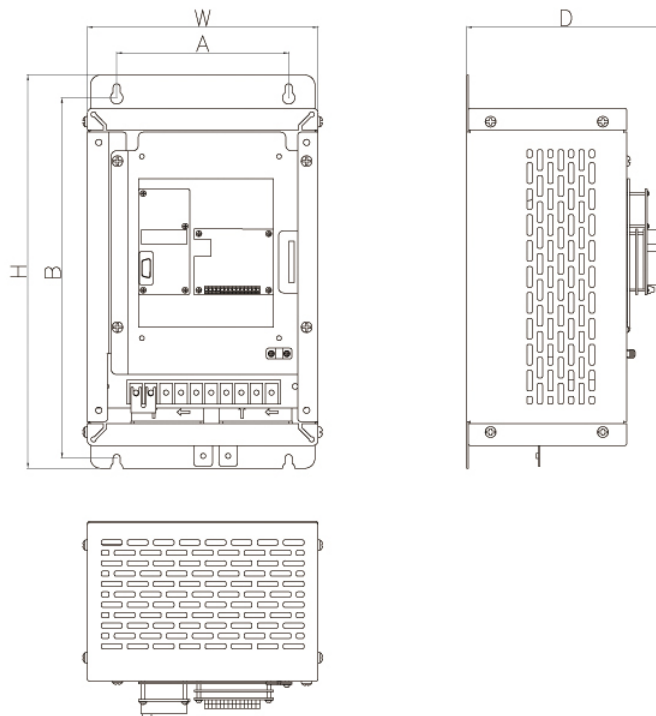
Item		Technical Index
Drive characteristics	Control Mode	vector V/F control mode
	Starting torque	120%/0.5Hz
	Speed control range	1:100
	Speed control accuracy	±0.5%
	Torque Limited	Yes (Parameter Setting)
	Torque Accuracy	±5%
	Frequency control range	0~120Hz
	Frequency Accuracy (Temperature fluctuation)	±0.1%
	Frequency setting resolution	±0.06Hz/120Hz
	Output frequency resolution (computer resolution)	0.01Hz
	Overload capacity	zero speed is 150% , <3Hz is 160%, >3Hz is 200%
	Brake torque	150%(external braking resistor), integrated braking unit
	Acceleration/Deceleration time	0.01 ~ 600s
	Carrier frequency	2k ~ 10k Hz
Control I/O signal	Optoelectronic input control supply	Isolated 24V DC
	Relay output control supply	Isolated 24V DC
	Low-voltage optoelectronic isolated input	20-channel switching capacity. Optoelectronic control signal is isolated 24V DC input signal.
	high-voltage optoelectronic isolated input	1-channel switching capacity
	relay output-1	9-channel; Normal open contact; SPST; contact capacity: resistive load, 3A 250VAC or 3A 30VDC
	relay output-2	3-channel; Normal close contact, SPDT; contact capacity: resistive load, 6A 250VAC
	CAN communication interface	1 channel (safety switch monitoring)
	Analog Input	1 channel, single or differential input, input voltage range -10V~+10V, accuracy 0.1%

	Item	Technical Index
Protection function	Motor overload protection	Parameter setting motor protection curve
	Inverter Overload	<3Hz: 160%,5 seconds, >3Hz: 185%,10 seconds
	Short circuit protection	Provide protection to escalator integrated drive controller when overcurrent occurs to any two phases at output side
	Input open phase protection	In case of open phase of input during operating, it cuts off output to protect escalator integrated drive controller.
	Output open phase protection	In case of open phase of output during operating, it cuts off output to protect escalator integrated drive controller.
	Overvoltage threshold	810V(400V Series)
	Undervoltage threshold	380V(400V Series)
	Instantaneous power failure compensation	Protection for over 15ms
	Overheat of heat sink	Protected by thermistor
	Braking unit protection	Automatically detects abnormal conditions of braking unit and activate protection.
	Module Protection	Overcurrent, Short circuit and overheat protection
	Current Sensor Protection	Self checking after energized
	Speed Reverse Protection	Check up Photoelectric switch
	I ² t protection	Check up trough 3 phase current
	Input overvoltage protection	400V: more than725V, stop and check
	Output grounding protection	Any phase get grounding short connected during operation, switch off the output to protect the inverter
	Output unbalance protection	3 phase current checked to be unbalanced, switch off the output, protect the inverter.
	Brake Resistor Short Circuit Protection	Check up at time of brake
	Anti-reversion protection	Check out the escalator reversion running and activate protection
	Overspeed protection	Activate protection when overspeed to 115% of rated speed.
Underspeed protection	Activate protection in case that real traveling speed of escalator is 80% lower than the rated speed due to some reasons including failures.	
Handrail speedchecking protection	Check out the handrail speed inconsistency, activate the protection	



Item		Technical Index
Protection function	Stair Loss protection	Check out the stair loss during operation, and activate protection
	EEPROM fault	Self checking after energized
Display	LCD in Chinese and English	Menus at each level
Environment	Ambient temperature	-10~+45℃
	Humidity	Below 95% RH (no dew)
	Storage temperature	-20~+60℃(temperature allowable during short-term transport)
	Application place	Indoor (no corrosive gas, dust and so on)
	Altitude	Below 1000m
Structure	Protection class	IP20
	Cooling mode	Forced air cooling
Installation mode		In-cabinet installation

Installation Dimension and Weight



Installation Dimensions and Weight List

Controller type AS330-	A (mm)	B (mm)	H (mm)	W (mm)	D (mm)	Mounting Hole diameterΦ(mm)	Mounting			Fastening Torque (Nm)	Mass (kg)
							Bolt	Nut	Gasket		
4T05P5	100	253	265	151	166	5.0	4M4	4M4	4Φ4	2	4.5
4T07P5	165.5	357	379	222	192	7.0	4M6	4M6	4Φ6	3	8.2
4T0011											
4T0015											
4T18P5											
4T0022	165.5	392	414	232	192	9.0	4M8	4M8	4Φ8	6	10.3
4T0030											
4T0037	200	512	530	330	290	9.0	4M8	4M8	4Φ8	9	30
4T0037											

S2 Elevator Door Inverter

Technical Characteristics



S2 20P4A2/A3 Embedded panel operator

- Applies vector control and V/F control technology according to the performance requirements of elevator door-system control, with PI adjustment setting function; frequency resolution of 0.01 Hz, for better performance of speed adjustment of door motor and more positioning accuracy.
- Intelligent power module (IPM) hardware design coupled with modern control technology enable inverter works more stable and reliable.
- Broad voltage input range and automatic voltage adjustment function for adaptation of inverter to various kinds of severe environment.
- With adjustable torque compensation function, doors and windows of different weights can be used; smooth action of door opening/closing ensures safety of passenger coming in and going out of elevator.
- Door inverter has 60 function setting parameters, which includes function setting, motor parameter, curve parameter of door opening and closing, PI parameter, control parameter and error inquiry etc.

Products of Company



S2 20P4A1 External handheld operator

- Among the curve parameter group of door opening and closing, relevant parameters of 6 period-speed frequency and acceleration/ deceleration etc. can be modified to optimize the operation curve of door motors for stable operation of elevator doors, reduction of noise and maintenance cost.
- Separate adjustment setting of sustained torque of door opening and closing, selectable PI adjustment function for more positioning accuracy of door motor operation.
- With self-learning function of door/width parameters which ensures better precise operation of elevator door system.
- Adapts to encoder control and no-encoder terminal control mode, supports OC, push/pull difference encoder wiring.
- Varieties of safety protection functions, function setting of anti-clamping and locked rotor protection of door motors etc.
- CAN communication ensures fast, safe and reliable data transfer.
- Compact structure of door inverter which needs less space, simple and convenient for wiring and commissioning.
- Superb operation functions, Customer's various need has been fully taken into account in the design period of inverters, serving the customers with safety, practical functions and convenience, which enables customers to commissioning on the site easily.
- User can choose initial parameters compatible to the door system with no need of commissioning on the site.

Technical Index

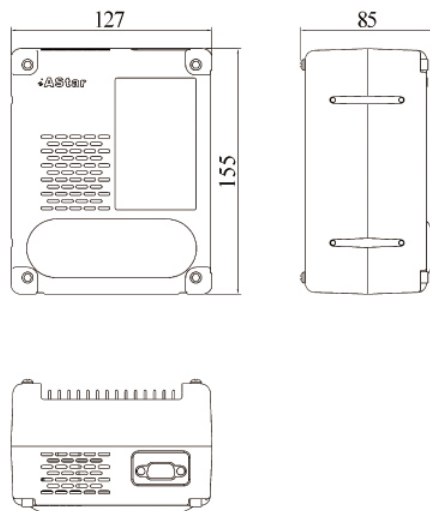
Item		Technical Index
Input	Voltage	Single-phase, 220VAC(±10%)
	Frequency	50~60Hz(±5%)
Output	Capacity [kVA]	1.0 kVA
	Output current [A]	2.0 A
	Frequency	0~50Hz
	Voltage	0~220VAC

Item		Technical Index
Motor-power	HP	0.5
	kW	≤0.4 kW
Control	Control mode	Vector control, V/F control
	Frequency precision	0.01% of max. output frequency
	Overload capacity	120% of rated current, 1 min.; 200% of rated current, 0.5 sec. (property and time are inversely related)
	Torque compensation	Manual torque compensation(0~40%)
Operation-function	Operation command	Keyboard/Terminals/CAN Bus
	Parameter configuration	Operator/PC
	Startup signal	Door opening/closing/closing(slowly)
Operation-error	Error correction	Automatic error correction in valid status of protection
Output-signal	Output signal in operation	Error signal; Door-closing locked rotor signal; Signal of door-opening/closing on position
Input-terminals	Close the door (A1/A2/A3)	Opto-isolated input
	Close the door (A1/A2/A3)	
	Close the door (slowly) (A1/A2/A3)	
	Open the door on position (A2/A3)	
	Close the door on position (A2/A3)	
	Open the door, decelerated (A2/A3)	
	Close the door, decelerated (A2/A3)	
	Multi-function terminals (A2/A3)	
Output-Terminal	Door-open relay 1	Relay-output, 5A 250VAC/3A 30VDC
	Door-open relay 2	
	Door-close locked rotor relay 3	
	Error-Relay 4	



Item		Technical Index
Encoder1	A, B, 0V, +24V (supports type A1 and A2)	Input interface: Push-Pull, OC
Encoder2	A, B, 0V, +12V (supports only type A3)	Input interface: Push-Pull, OC
Encoder3	A+, A-, B+, B-, 0V, +5V (supports only Type A1)	Input terminal: Difference
Communication port		CAN port
Protection function	Inverter protection	IPM hardware error, A/D switch, over-voltage($V_{dc} \geq 400V$), under-voltage($V_{dc} \leq 180V$), overheating of inverters, over-current $\geq 1.2I_e$, duration of 60s; $\geq 2I_e$ duration of 0.5s, concrete duration in reverse relation to current), motor over-load(see'over-current'), circuit in Encoder separated, EEROM, damage on terminals etc. 10 protection functionens
	Voltage drop	Less than 15 ms: continuous operation
Display	Operation information	Output current, DC-BUS-voltage, output, input terminal status
	Error information	Display of inverter error information in valid protection function status
Weight		1.5kg
Cooling method		Natural cooling

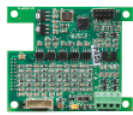
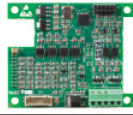


Installation Dimensions



External Hand-held Operator



PG-Card

PG-card name	PG-card number		Applicable encoder	Product picture
	No frequency dividing	Frequency dividing		
SIN/COS	AS.T024	AS.L06/H	Heidenhain 1387 Pulse 2048	
EnDat (difference output)	AS.L06/M	AS.L06/N	Heidenhain encoder ECN1313 Or ECN413, Pulse 2048	
EnDat (set open output)	AS.L06/D	AS.L06/L		
ABZ incremental (12V)	AS.T025	AS.L06/G	Normal incremental, Pulse ≥400	
ABZ incremental (5V)	AS.T041	AS.L06/F		
Resolver		AS.L06/E	Rotary transformer	



Configuration for Inverter Brake Resistor

Series	Power (kW)	Resistor configuration(Ω)				
		Min. Value	Max. Value	Recommended Value	Recommended configuration (synchronous)	Recommended configuration (asynchronous)
400V-class elevator inverter	2.2	56	210	100	100Ω/1000W *1	100Ω/1000W *1
	3.7	56	144	80	80Ω/1600W *1	80Ω/1200W *1
	5.5	56	100	70	70Ω/2000W *1	70Ω/1600W *1
	7.5	56	72	64	64Ω/2500W *1	64Ω/2000W *1
	11	34	48	40	80Ω/2000W *2	80Ω/1600W *2
	15	34	41	36	72Ω/2500W *2	72Ω/2000W *2
	18.5	17	31	24	72Ω/2000W *3	72Ω/1600W *3
	22	17	27	20	80Ω/2000W *4	80Ω/1600W *4
	30	11	20	15	60Ω/2500W *4	60Ω/2000W *4
	37	8	16	12	50Ω/3000W *4	50Ω/2500W *4
	45	5	10	9	36Ω/4500W*4	36Ω/3750W*4
	55	5	8	8	40Ω/4400W*5	40Ω/3600W*5
	75	5	6	6	30Ω/6000W*5	30Ω/5000W*5
200V-class elevator inverter	1.1	26	72	64	64Ω/1000W *1	64Ω/1000W *1
	2.2	13	58	50	50Ω/1000W *1	50Ω/1000W *1
	3.7	13	39	30	30Ω/1600W *1	30Ω/1200W *1



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