

ARTENGO

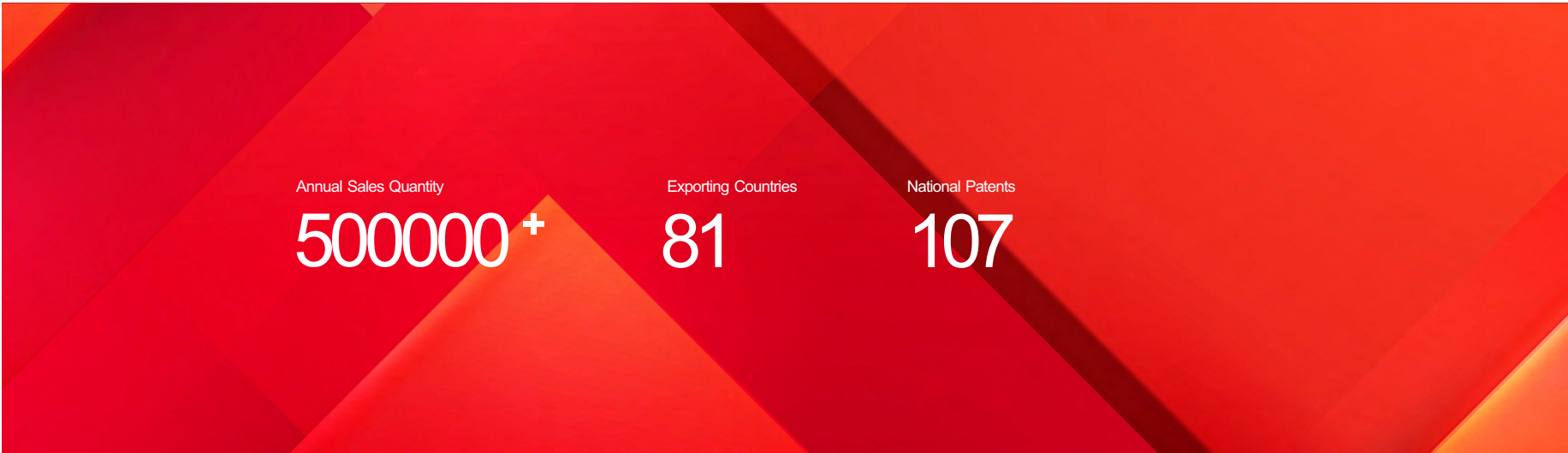
Artengo Electronic Inverter

AT-900 SERIES G TYPE HIGH PERFORMANCE AC DRIVES



Think Without Boundary

Company Profile »



Artengo Electric Co., Ltd. (referred to as " Artengo Electric "), since its establishment in 2009, based on the sophisticated power electronic and motor control technology, has been committed to the R&D, production and sales of industrial automation control & transmission products. Artengo Electric is devoted to providing optimal services, dedicated and competitive solutions to medium & high-end equipment manufacturers, ceaselessly making its contributions to industrial systems in digitization, intelligentization, energy saving and emission reduction. Currently, ARTENGO Electric main business involves four sectors: EV motor controllers, industrial AC drives and servo drives, testing equipment for automotive powertrain and high-precision bi-directional power supply systems.

ARTENGO Electric has passed IATF16949 :2016 and ISO9001 :2015 Quality Management System, and won honorable titles such as High and New Tech Enterprises, Jiangsu Specialized & Sophisticated SMEs, Jiangsu Provincial Enterprise Technology Centers, Jiangsu Provincial Private Technology Enterprises, Jiangsu Innovative and Entrepreneurial Talent Enterprise and such other qualifications.

As of 2022, up to 500,000 ARTENGO EV motor controllers have been operating on various applications such as heavy trucks, engineering machinery, passenger buses, logistics vehicles, electric forklifts, and high-speed electric motorcycles, etc., providing customers with mature & professional "N+N" solutions. In the field of industrial automation, ARTENGO products cover wide applications, including crane & hoist, lift, papermaking, printing & packaging, water supply, machine tool, wire processing, battery manufacturing, etc. ARTENGO products have been exported to more than 80 countries and regions across the world. In the field of automotive powertrain testing and power battery testing, ARTENGO provides customers with in-depth customized system solutions, which are favored by a large number of OEMs and battery pack manufacturers.

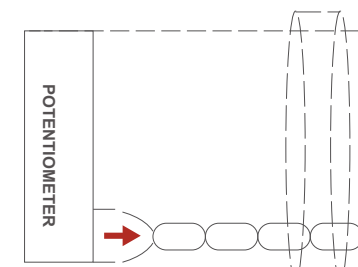


Till May 2023 ,ARTENGO has more than 650 employees, half of whom are R&D and technical engineers, working at Shenzhen and Nanjing R&D centers. We have won 107 national patents, 8 provincial high-tech product titles, and have established more than 50 offices and service centers all over China.

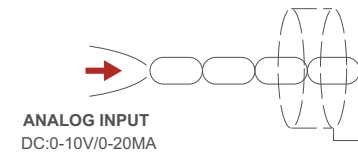
Appearance Features »



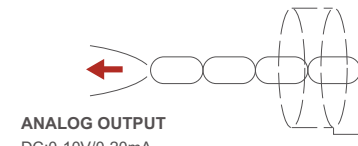
- 01 LED and LCD control panel available and support PC commissioning tool
- 02 Support three encoder signal inputs and closed-loop control for spindles
- 03 Abundant option board selections, including communication boards, encoder boards, and IO boards
- 04 Automatically identify the encoder types and support real-time position display
- 05 Support incremental, UVW, resolver and other types of encoders
- 06 Built-in STO (Safe Torque OFF) function
- 07 Support RS485, CAN, Profinet, EtherCAT, Modbus-Tcp, Mechatrolink-III, Profibus-DP, CANopen and so on.
- 08 3C3 conformal coating
- 09 Flexible fan control function
- 10 Straight-through independent air duct design, enabling PCB to be well protected, effectively improving the lifespan and reliability of the drive
- 11 A variety of EMC solutions



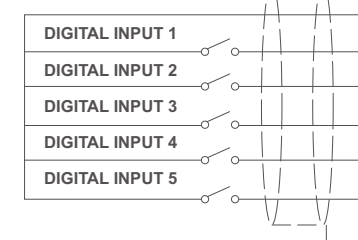
ANALOG INPUT
DC:0-10V/0-20mA



ANALOG INPUT
DC:0-10V/0-20mA



ANALOG OUTPUT
DC:0-10V/0-20mA



OPEN COLLECTOR INPUT 1

OPEN COLLECTOR INPUT 2

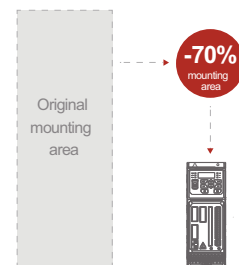
HIGH-SPEED PULSE INPUT

TERMINAL SYMBOL	TERMINAL NAME	SPECIFICATIONS
DEFAULT IO BOARD-ANALOG INPUT/OUTPUT		
+10V	Analog input reference voltage	10.3V ±3% Maximum output current 10mA The resistance of external potentiometer should be larger than 1kΩ
AI1	Analog input 1	0~20mA: input impedance: 500Ω, maximum input current:25mA 0~10V: input impedance:22kΩ, maximum input voltage :12.5V Switch S1 on control board for jumping between 0~20mA and 0~10V, factory default: 0~10V
GND	Analog ground	Isolated from COM interiorly
⊕	Ground terminal PE	
AI2	Analog input 2	0~20mA: input impedance: 500Ω, maximum input current: 25mA 0~10V: input impedance: 22kΩ, maximum input voltage: 12.5V Switch S3 on control board for jumping between 0~20mA and 0~10V, factory default: 0~10V
GND	Analog ground	Isolated from COM interiorly
⊕	Ground terminal PE	
AO1	Analog output 1	0~20mA: impedance: 200Ω~500Ω 0~10V: impedance ≥ 10kΩ Switch S2 on control board for jumping between 0~20mA and 0~10V, factory default: 0~10V
GND	Analog ground	Isolated from COM interiorly
⊕	Ground terminal PE	
DEFAULT IO BOARD-DIGITAL INPUT/OUTPUT		
COM	+24V ground	Isolated from GND interiorly
X1	Digital input 1	Input: 24VDC, 10mA Range of frequency: 0~200Hz Range of voltage: 10V~30V
X2	Digital input 2	
X3	Digital input 3	
X4	Digital input 4	
X5/DI	Digital input/pulse input	Pulse input: 0.1Hz~100kHz Range of voltage: 10-30V
⊕	Ground terminal PE	
+24V	+24V	24V±10% Isolated from GND interiorly, Maximum load: 200mA
DO1	Open collector output	Range of voltage: 0-24V Range of current: 0-50mA
HDO	Open collector output/ Pulse output	Same as DO1 Pulse output: 0-50kHz
COM	Reference GND of HDO	
CME	Reference GND of DO1	Reference GND of DO1
DEFAULT IO BOARD-RELAY OUTPUT		
RA	Relay output	RA-RB: NC
RB		RA-RC: NO
RC		Contact capacity: 250VAC/3A, 30VDC/3A
DEFAULT IO BOARD-COMMON TERMINAL		
+24V	+24V ground	24V± 10% Isolated from GND interiorly
PLC	Digital input Common terminal	For switching high & low levels, short-circuited with +24V via jumper S4 as default, i.e. low value of digital input activated External power input
COM	+24V ground	Isolated from GND interiorly

Product Upgrade »

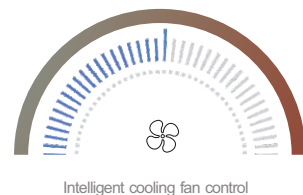
Book-type design

Compact book-type design, reducing up to 70% of mounting space maximally



Intelligent cooling fan control

Intelligent cooling fan control function enables the drive to fit for different application requirements



Default configuration with C3 filter

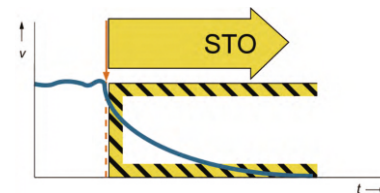
All drives of GK900 conform to the standard EN61800-3



En61800 -3

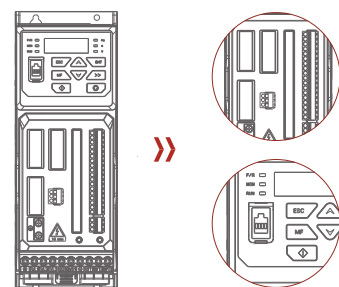
STO protection

Equipped with the STO function, potential danger to personnel could be avoided to the greatest extent during the maintenance of the equipment



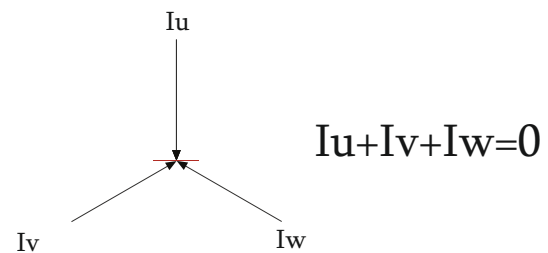
High extensibility

With abundant IOs, communication and encoder options



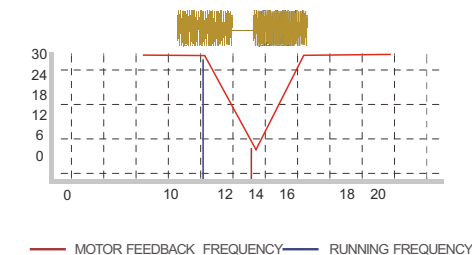
Leakage detection

Support current leakage detection, ensuring personnel safety and system reliability



Flying start

Flying start for ACIM and PMSM in SVC mode



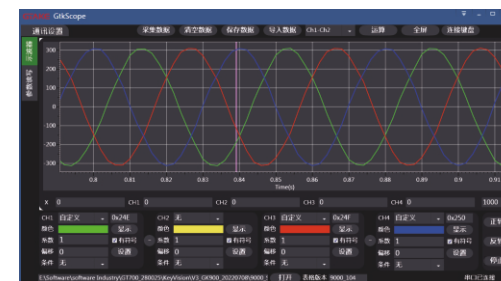
Energy -saving control

ACIM:Automatically adjust the excitation current according to different loads. The current is smaller while the efficiency is higher at light load

PMSM: MTPA control, real-time calculation of the best current angle, realizing minimum output current under the same load

Commissioning tool

Support real-time online parameter modification/ monitoring . Oscilloscope simulating function supports 4 channels to display physical quantity waveforms in real time. It supports trigger mode, automatically capturing fault waveforms, and supports channel computing functions, helping data analysis



Encoder features

Support three-channel encoder signal inputs, applicable to full closed-loop control in CNC , up to 2MHz pulse input, and support pulse adaptive filtering, with stronger anti-interference capability

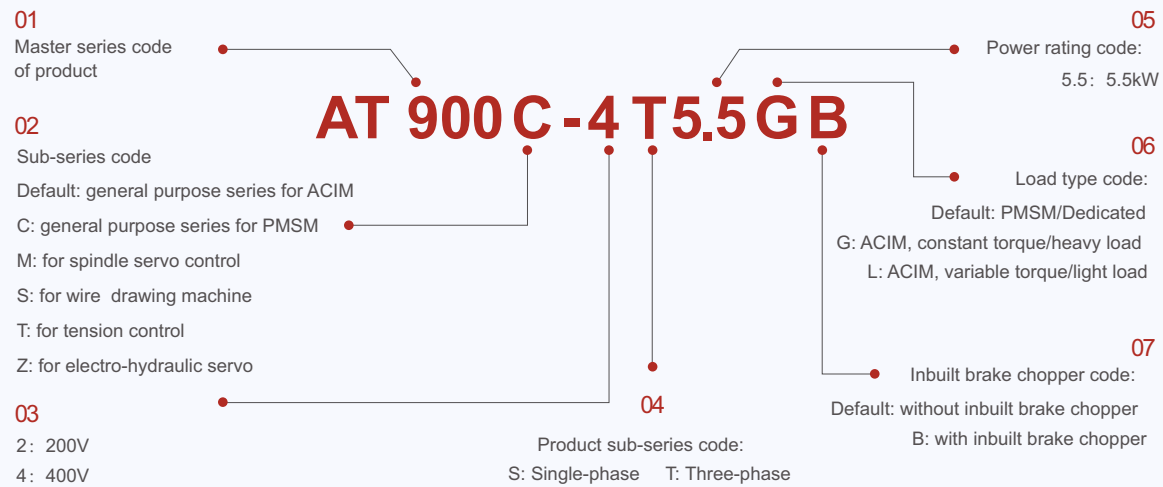
Multi-communication protocols

Support 485, CAN, Profinet, EtherCAT, Modbus -Tcp, Mechatrolink-III, Profibus-DP, CANopen, etc



Basic Information »

Model Explanation



Specifications

POWER INPUT

Rated input voltage	400V level: three phase 380V~440V
Frequency	50Hz/60Hz
Voltage range	Continuous voltage fluctuation $\pm 10\%$, short-time fluctuation $-15\% \sim +10\%$ i.e. 400V : 323V~484V; Voltage out-of-balance rate <3%, distortion rate as per the requirements of IEC61800-2
Allowable frequency fluctuation	$\pm 5\%$
Rated input current	See selection table

POWER OUTPUT

Applicable motor (kW)	See selection table
Output voltage (V)	3-phase: 0~ rated input voltage, error < $\pm 3\%$
Output frequency (Hz)	0.00 ~600.00Hz; unit: 0.01Hz
Overload capacity	150 %1 min - heavy load
	180 %10 second
	200 %0.5 second

CONTROL CHARACTERISTICS

V/f patterns	V/f control
	Sensor-less vector control 1
	Sensor-less vector control 2
	Closed-loop vector control (including position control)
Range of speed regulation	1:100)V/f control, sensor-less vector control 1(
	1:200 (sensor-less vector control 2(
	1:1000 (closed-loop vector control)

CONTROL CHARACTERISTICS

Speed accuracy	$\pm 0.5\%$)V/f control)
	$\pm 0.2\%$ (sensor-less vector control 1 & 2(
	$\pm 0.02\%$ (closed-loop vector control)
Speed fluctuation	$\pm 0.3\%$ (sensor-less vector control 1 & 2($\pm 0.1\%$ (closed-loop vector control)
Torque response	>10ms (sensor-less vector control 1 & 2(
	>5ms (closed-loop vector control)
Torque control accuracy	$\pm 7.5\%$ (sensor-less vector control 2(
	$\pm 5\%$ (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(
	0Hz: 200% (closed-loop vector control)
Positioning accuracy	± 1 line pulse

BASIC FUNCTIONS

Start frequency	0.00 ~600.00Hz
Accel/Decel time	0 ~60000s
Switching frequency	0.8 ~16kHz
Frequency setting	Digital setting + control panel ^ / v
	Digital setting + terminal UP/DOWN
	Communication
	Analog setting (AI1/AI2/AI3/AI4(
Motor start-up methods	Terminal pulse setting
	Started from start frequency
	DC injection braking start Flying start
Motor stop methods	Ramp to stop
	Coast to stop
	Ramp to stop + DC brake
Dynamic braking capacity	Brake choppers for GK900-4T75 and below are inbuilt or can be inbuilt.
	Brake chopper activated voltage: 400V class: 650V~750V Lasting time: 0.0~100.0s
	DC injection braking start frequency: 0.00~600.00Hz DC injection braking current: 0.0~100.0% DC injection braking time: 0.00~30.00s



Specifications

Specifications

BASIC FUNCTIONS

Input terminals	5 digital inputs, one of which can be used for high-speed pulse input. Compatible with active open collectors NPN, PNP and dry contact input. 2 analog inputs, voltage/current programmable.
Output terminals	1 high-speed pulse output terminal, 0~50kHz square signal; can output set frequency, output frequency and so forth 1 digital output terminal 2 relay output terminals
	1 analog output terminal, voltage/current programmable; can output set frequency, output frequency and so forth

FEATURED FUNCTIONS

Parameter copy, parameter backup, common DC bus, switchover between two motors parameters, flexible parameter display & hiding, various master & auxiliary frequency reference and switchover, reliable speed search start, a variety of Accel/Decel curves programmable, mechanical brake control, 16-step speed control programmable (2-step supports flexible frequency reference), count function, three fault records, over excitation brake, over voltage stall protection programmable, under voltage stall protection programmable, restart upon power loss, skip frequency, frequency binding, four kinds of Accel/Decel time, motor thermal protection, flexible fan control, process PID control, simple PLC, multi-functional key programmable, droop control, asynchronous and synchronous motor tune, field-weakening control, high-precision torque control, V/f separated control, torque control at sensor-less vector control, torque control at closed-loop vector control, two encoder signal inputs (support incremental, UVW hybrid and resolver, etc.), flexible deceleration ratio control, zero-speed clamping, angular positioning, simple feed forward control, pulse train position control

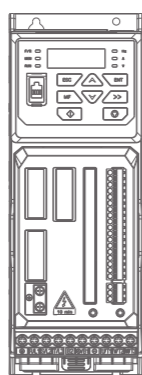
ENVIRONMENT

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 . The rated output current should be derated 1% for every 1 C when the ambient temperature is 40 C ~50 C
Relative humidity	5~95%, no condensation
Vibration	Less than 5.9m/s ² (0.6g)
Storage temperature	-40 C ~ +70 C

OTHERS

Efficiency at rated Amps	7.5kW and below: ≥93 % 11 ~45kW: ≥ 95 % 55kW and above: ≥98%
Installation	Book-type
IP grade	IP20/IP00
Cooling method	Forced air cooling

SELECTION TABLE



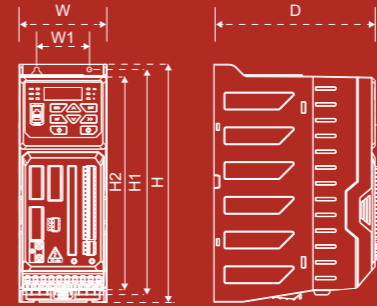
CABINET NO.	MODEL	POWER RATING	OUTPUT CURRENT	INPUT CURRENT	APPLICABLE MOTOR	HDC	AIR FLOW	BRAKE CHOPPER	DC REACTOR
		(kW)	(A)	(A)	(kW)	(W)	(m ³ /h)		
S01	AT900-4T0.75GB	0.75	2.5	3.5	0.75	23	29	Inbuilt	/
	AT900-4T1.5GB	1.5	3.8	5.0	1.5	49	29		
	AT900-4T2.2GB	2.2	5.5	6.0	2.2	72	29		
	AT900-4T3.7GB	3.7	9.0	10.5	3.7	116	29		
S02	AT900-4T5.5GB	5.5	13	14.6	5.5	170	55		
	AT900-4T7.5GB	7.5	18	20.5	7.5	261	77		
	AT900-4T11GB	11	24	29	11	337	102		
S03	AT900-4T15GB	15	32	35	15	417	140		
	AT900-4T18.5GB	18.5	37	44	18.5	500	140		
S04	AT900-4T22GB	22	45	50	22	632	140		
	AT900-4T30G(B)*	30	60	65	30	737	240	Inbuilt optional	
AT900-4T37G(B)*	37	75	80	37	979	240			
S05	AT900-4T45G(B)* *	45	91	83	45	1363	253		
	AT900-4T55G(B)*	55	112	102	55	1789	253		
S06	AT900-4T75G(B)*	75	150	143	75	2050	506		
	AT900-4T90G	90	176	160	90	2056	506		
S07	AT900-4T110G	110	210	192	110	2838	506		
	AT900-4T132G	132	253	232	132	3359	1060		
S08	AT900-4T160G	160	304	285	160	3787	1060		
	AT900-4T185G	185	350	326	185	4124	1060		
S09	AT900-4T200G	200	380	354	200	4701	1060		
	AT900-4T220G	220	430	403	220	5133	1060		
S10	AT900-4T250G	250	470	441	250	5625	1590	Externally mounted	Inbuilt
	AT900-4T280G	280	520	489	280	6598	1590		
S10	AT900-4T315G	315	590	571	315	7215	1590		
	AT900-4T355G	355	650	624	355	8384	1590		
	AT900-4T400G	400	725	699	400	8473	1590		
	AT900-4T450G	450	820	790	450	8876	1590		

*means brake chopper is optionally inbuilt. Take 30kW as an example, the model without brake chopper is AT900-4T30, while with brake chopper is AT900-4T30B.

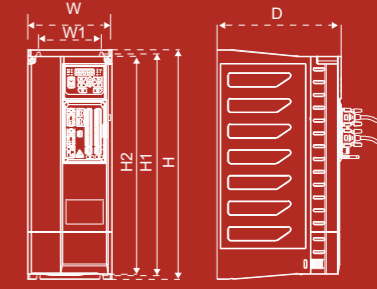
CABINET NO.	MODEL	POWER RATING	OUTPUT CURRENT	INPUT CURRENT	APPLICABLE MOTOR	HDC	AIR FLOW	BRAKE CHOPPER	DC REACTOR
		(kW)	(A)	(A)	(kW)	(W)	(m ³ /h)		
		Light-duty Application					/		
S01	AT900-4T1.5LB	1.5	3.8	5.0	1.5	23	29	Inbuilt	/
	AT900-4T2.2LB	2.2	5.5	6.0	2.2	49	29		
	AT900-4T3.7LB	3.7	8.0	9.3	3.7	72	29		
	AT900-4T5.5LB	5.5	11	12.3	5.5	116	29		
S02	AT900-4T7.5LB	7.5	17	19.3	7.5	170	55		
	AT900-4T11LB	11	23	27.8	11	261	77		
	AT900-4T15LB	15	30	32.8	15	337	102		
S03	AT900-4T18.5LB	18.5	37	44	18.5	417	140		
	AT900-4T22LB	22	45	50	22	500	140		
	AT900-4T30LB	30	58	62.8	30	632	140		
S04	AT900-4T37L(B)	37	75	80	37	737	240	Inbuilt optional	
	AT900-4T45L(B)	45	88	93	45	979	240		
S05	AT900-4T55L(B)	55	112	102	55	1363	253		
	AT900-4T75L(B)	75	139	133	75	1789	253		
S06	AT900-4T90L(B)	90	176	160	90	2050	506	Externally mounted	Inbuilt
	AT900-4T110L	110	210	192	110	2056	506		
S07	AT900-4T132L	132	250	232	132	2838	506		
	AT900-4T160L	160	304	285	160	3359	1060		
S08	AT900-4T185L	185	350	326	185	3787	1060		
	T900-4T200L	200	380	354	200	4124	1060		
S09	AT900-4T220L	220	426	403	220	4701	1060		
	AT900-4T250L	250	465	441	250	5133	1060		
	AT900-4T280L	280	520	489	280	5625	1590		
S10	AT900-4T315L	315	585	566	315	6598	1590		
	AT900-4T355L	355	650	624	355	7215	1590		
	AT900-4T400L	400	725	699	400	8384	1590		
S10	AT900-4T450L	450	820	790	450	8473	1590		
	AT900-4T500L	500	860	828	500	8876	1590		

*means brake chopper is optionally inbuilt. Take 30kW as an example, the model without brake chopper is GK900-4T30, while with brake chopper is GK900-4T30B.

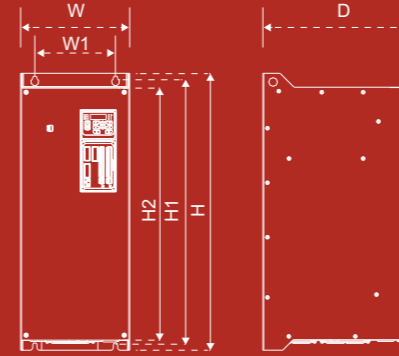
AT 900 Drive Dimensions »



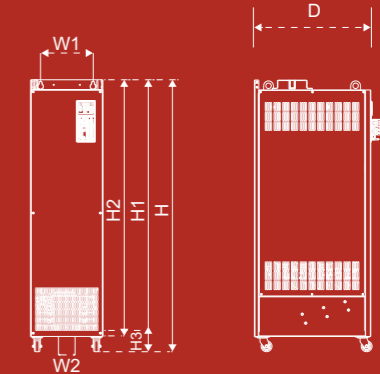
S01 - S02



S03 - S04



S05 - S08



S09 - S10

Cabinet No.	W	H	D	W1	W2	H1	H2	H3	Mounting holes
S01	84	226	153	50	/	216	204	/	4.5
S02	93	285	183	55	/	272	285	/	5.5
S03	135	356	217	111	/	350	/	/	5.5
S04	158	430	232	118	/	415	/	/	6.5
S05	230	545	300	175	/	525	490	/	10
S06	250	635	350	185	/	612	580	/	10
S07	285	715	390	220	/	692	660	/	10
S08	300	885	460	230	/	862	830	/	10
S09	330	1245	533	240	96	1122	1175	109	13
S10	330	1365	533	240	96	1242	1295	109	13

(unit : mm)

OPTIONAL BOARDS



OPTION BOARDS

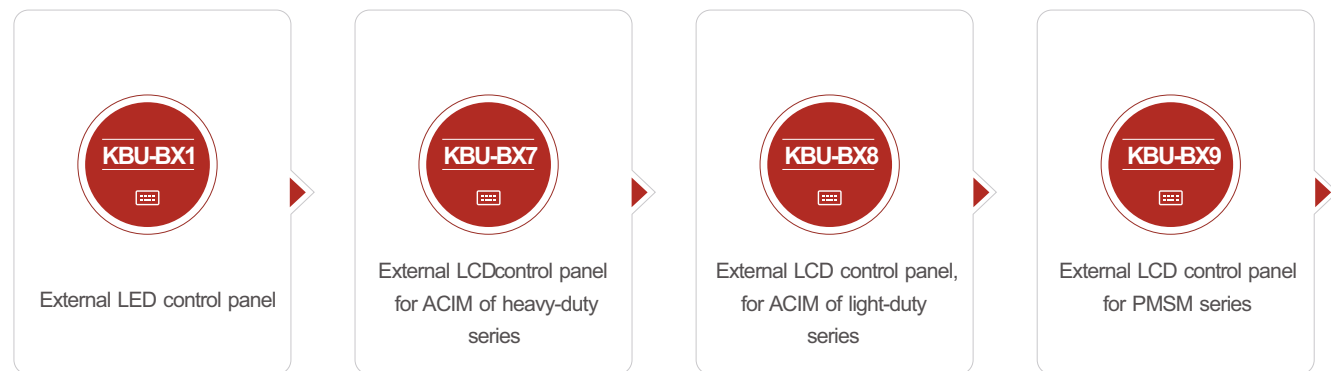
Type	Model	Description
Default IO board	EPC-TM31	Supports 5 digital inputs (one of which supports high-speed input), 2 analog inputs, 2 digital outputs (one of which supports high-speed output), 1 analog output, and 1 relay output.
Extension IO board	EPC-TM32	Supports 5 digital inputs, 2 analog inputs, 2 STO inputs, 1 leakage current detection input, 3 digital outputs, 1 analog output, and 1 relay output.

Type	Model	Description
Communication boards	EPC-CM31A	CAN communication board-dual RJ45 interface-compatible with GK610 pin definition
	EPC-CM31B	485 communication board-3 PIN terminal block
	EPC-CM32	CAN communication board-dual RJ45 interface
	EPC-CM32A	CAN communication board-3 PIN terminal block
	EPC-CM33	MIIII communication board-dual RJ45 interface
	EPC-CM34	EtherCAT communication board-dual RJ45 interface
	EPC-CM35	Profinet communication board-dual RJ45 interface
	EPC-CM36	CANopen communication board-dual RJ45 interface

Encoder option boards	EPC-PG31	Non-isolated dual closed-loop PG board, supports 2 differential A/B/Z signal inputs, and 1 differential PA/PB pulse reference, 1 A/B/Z differential division frequency output, 1 motor temperature sampling, and can directly support UVW encoder, with a maximum input 2MHz. Dual-port D-sub connectors are adopted.
	EPC-PG32	Single-channel isolated PG board, supports 1 differential A/B/Z input, 1 differential PA/PB pulse reference, 1 A/B/Z open collector division frequency output, 1 motor temperature sampling, with a maximum input 500kHz. Dual-port D-sub connectors are adopted.
	EPC-PG32A	Single-channel isolated PG board, supports 1 12V digital A/B/Z input, 1 12V digital PA/PB pulse reference, 1 A/B/Z open collector division frequency output, 1 motor temperature sampling, with a maximum input 500kHz. Dual-port D-sub connectors are adopted.
	EPC-PG32B	Single-channel isolated PG board, supports 1 differential A/B/Z input, 1 24V digital PA/PB pulse reference, 1 A/B/Z open collector division frequency output, 1 motor temperature sampling, with a maximum input 500kHz. Dual-port D-sub connectors are adopted.
	EPC-PG33	Rotary decoding PG board, supports 1 rotary decoding, 1 differential PA/PB pulse reference, 1 A/B/Z open collector division frequency output or 1 A/B/Z differential division frequency output, 1 motor temperature sampling, with a maximum input 300kHz. Dual-port D-sub connectors are adopted.
	EPC-PG34	SINCOS decoding board, supports 1 SINCOS decoding, 1 differential PA/PB pulse reference, 1 A/B/Z differential division frequency output, and 1 motor temperature sampling. Dual-port D-sub connectors are adopted.
	EPC-PG35	Absolute encoder board, supports protocol formats such as SSI, ENDAT, BISS and so on. Dual-port D-sub connectors are adopted.

Type	Model	Description
Encoder option boards	EPC-PG36	Single-channel isolated PG board, supports 1 differential A/B/Z signal input, 1 differential PA/PB pulse reference, 1 A/B/Z differential division frequency output, with a maximum input 500kHz, 18-pin terminal blocks are adopted, replacing PG39 Dual-port D-sub connectors.
	EPC-PG37	Single-channel isolated PG board, supports 1 differential A/B/Z input and 1 differential PA/PB pulse reference, 1 A/B/Z open collector division frequency output, 1 motor temperature sampling, with a maximum input 500kHz, 18-pin terminal blocks are adopted, replacing PG32 Dual-port D-sub connectors.
	EPC-PG37A	Single-channel isolated PG board, supports 1 12V digital A/B/Z input and 1 12V digital PA/PB pulse reference, 1 A/B/Z open collector division frequency output, 1 motor temperature sampling, with a maximum input 500kHz, 18-pin terminal blocks are adopted, replacing PG32A Dual-port D-sub connectors.
	EPC-PG37B	Single-channel isolated PG board, supports 1 differential A/B/Z input, 1 24V digital PA/PB pulse reference, 1 A/B/Z open collector division frequency output, 1 motor temperature sampling, with a maximum input 500kHz, 18-pin terminal blocks are adopted, replacing PG32B Dual-port D-sub connectors.
	EPC-PG38	Rotary decoding and SINCOS decoding board, supports 1 rotary decoding, 1 SINCOS decoding, 1 A/B/Z open collector division frequency output, and 1 motor temperature sampling. Dual-port D-sub connectors are adopted.
	EPC-PG39	Single-channel isolated PG board, supports 1 differential A/B/Z input, 1 differential PA/PB pulse reference, 1 A/B/Z differential frequency division output, 1 motor temperature sampling, with a maximum input 500kHz. Dual-port D-sub connectors are adopted, replacing PG31 in single closed-loop applications.

EXTERNAL CONTROL PANEL

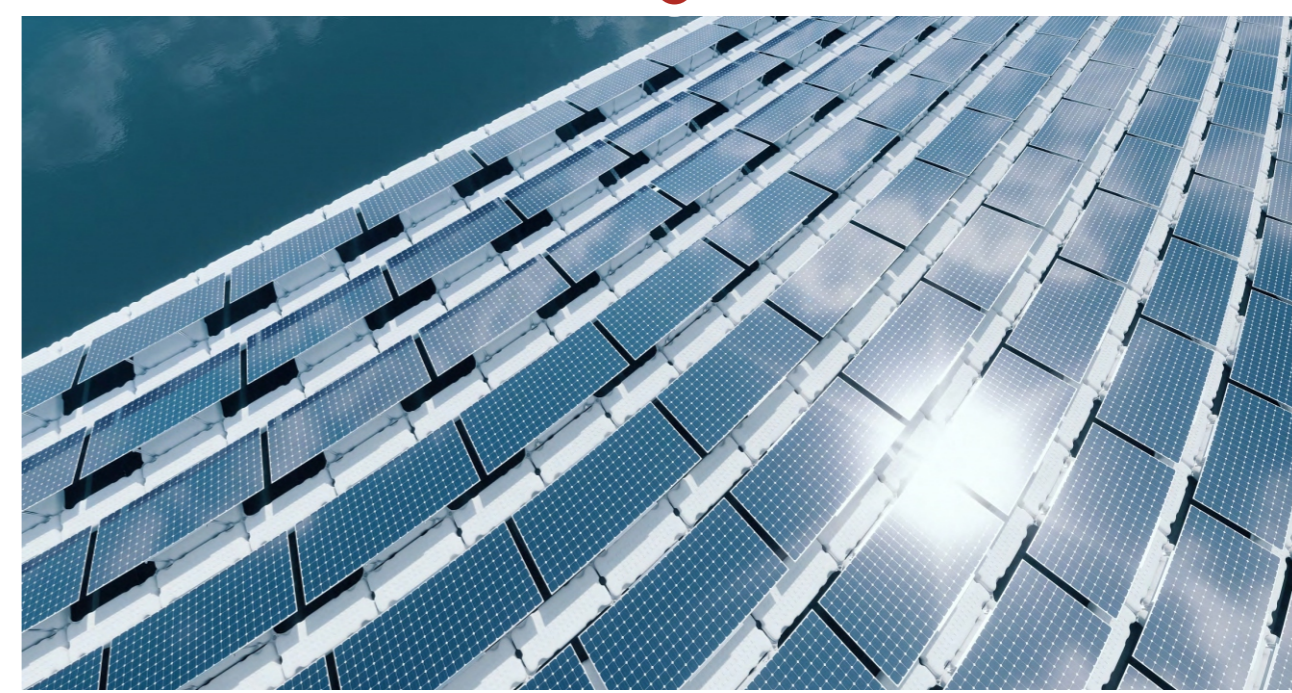
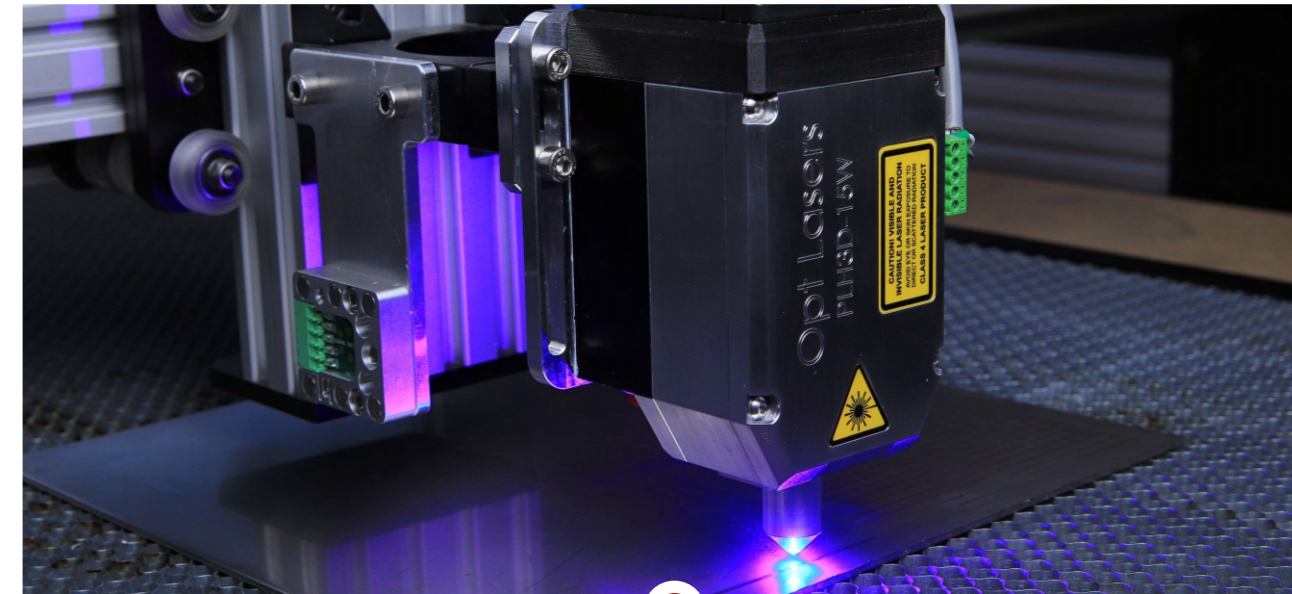


EXTERNAL CONTROL PANEL CABLE



INDUSTRY APPLICATIONS





Crane & Hoist Industry | CNC Machines | Pulp and Paper Making | Electro - hydraulic Servos
Woodwork Machinery | Rubber & Plastic Machinery
Printing & Packaging | Fan & Pump | Cable Industry | Special Welding | Textile Machinery
Metal Pipe Machinery | Steel Rope Machinery



ENTERPRISE CERTIFICATE

Quality Assurance »

ARTENGO attaches great importance to the quality control in design, production, testing and packaging, and strictly follows the requirements of IATF16949 :2016 and ISO9001 :2015 quality management system.

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