

GTAKE

# GK900<sup>SERIES</sup>

HIGH PERFORMANCE  
**AC DRIVES**



Think Without Boundary

GTAKE

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# Company Profile »

Annual Sales Quantity

500000+

Exporting Countries

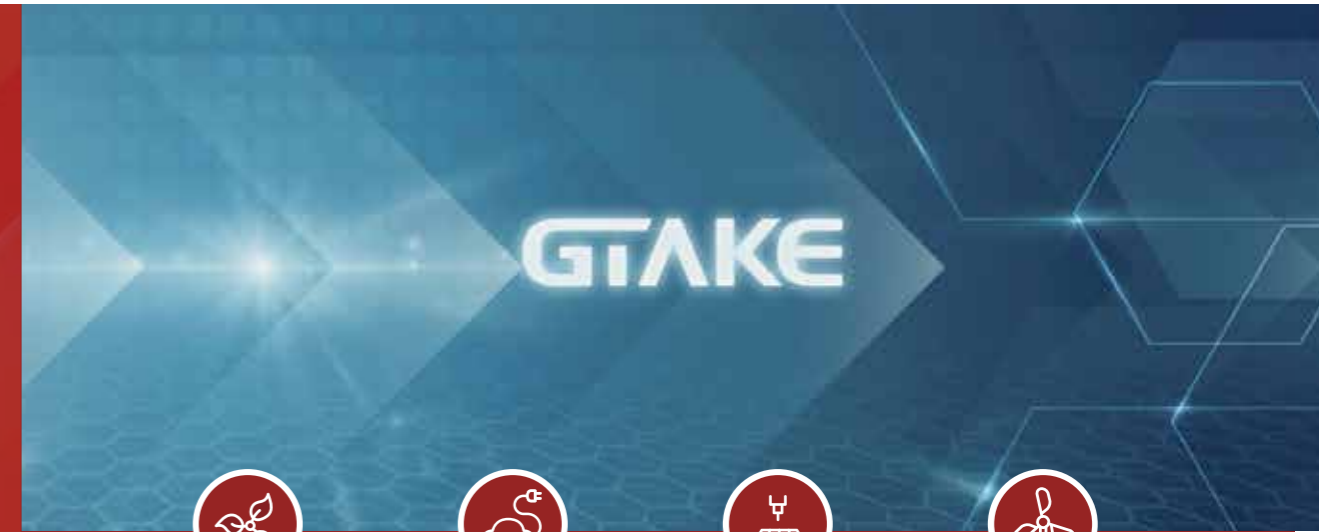
81

National Patents

107

Jiangsu Gtake Electric Co., Ltd. (referred to as "Gtake 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. GTAKE 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, smartification, energy saving and emission reduction. Currently, GTAKE Electric main business involves four sectors: EV motor controllers, industrial AC drives and servo drives, testing equipment for automotive power system and high-precision bi-directional power supply systems.

GTAKE Electric has passed IATF16949: 2016, ISO9001: 2015 Quality Management System, and has won honorable titles such as *High and New Tech Enterprises*, *Jiangsu Specialized & Innovative 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 units of GTAKE EV motor controller products have been operating on various applications such as heavy trucks, construction 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, GTAKE products cover wide applications, including crane & hoist, lift, papermaking, printing & packaging, water supply, machine tool, wire processing, battery manufacturing, etc. GTAKE products have been exported to more than 80 countries and regions across the world. In the field of automotive power system testing and power battery testing, GTAKE provides customers with in-depth customized system solutions and is favored by a large number of OEMs and battery pack manufacturers.



Till May 2023, GTAKE has more than 650 employees, among whom 300 are R&D and technical engineers, working at R&D centers both in Shenzhen and Nanjing. We have won 107 national patents, 8 titles of provincial high-tech product, and have established more than 50 offices and service centers all over China.

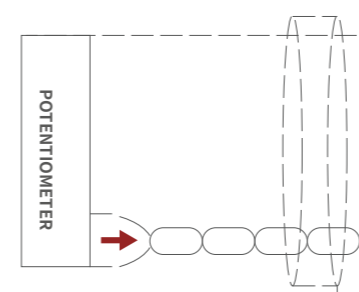
# Appearance Features »



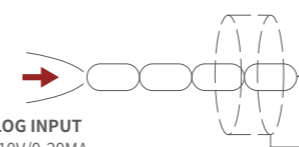
- 01 Both external LED and LCD control panels are available, PC commissioning tool by PC is supported
- 02 Three encoder signal inputs can be supported simultaneously, complete closed-loop control for spindles available
- 03 Abundant option board selections, including communication boards, encoder boards, and IO boards
- 04 Encoder types can be identified automatically, real-time position display is supported
- 05 Support incremental, UWW, resolver and other types
- 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 extending the lifespan and reliability of the drive
- 11 A variety of EMC solutions

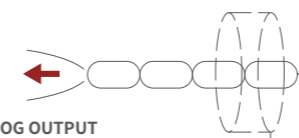
## WIRING DIAGRAM



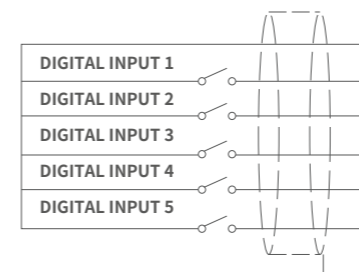
**ANALOG INPUT**  
DC:0-10V/0-20mA



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



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



**OPEN COLLECTOR INPUT 1**

**OPEN COLLECTOR INPUT 2**

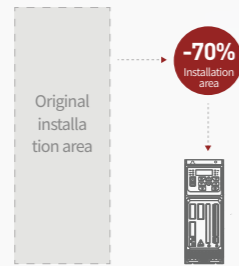
**HIGH-SPEED PULSE INPUT**

TERMINAL SYMBOL	TERMINAL NAME	SPECIFICATIONS
<b>STANDARD IO CARD-ANALOG INPUT/OUTPUT</b>		
+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	
<b>STANDARD IO CARD-DIGITAL INPUT/OUTPUT</b>		
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
<b>STANDARD IO CARD-RELAY OUTPUT</b>		
RA	Relay output	RA-RB: NC
RB		RA-RC: NO
RC		Contact capacity: 250VAC/3A, 30VDC/3A
<b>STANDARD IO CARD-COMMON TERMINAL</b>		
+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 >>

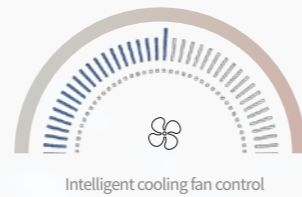
## Book-type design

Compact book-type design, save installation space, reducing up to 70% of installation 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

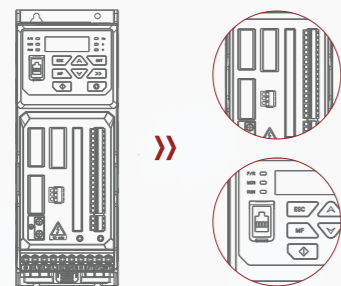
## STO safety protection

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



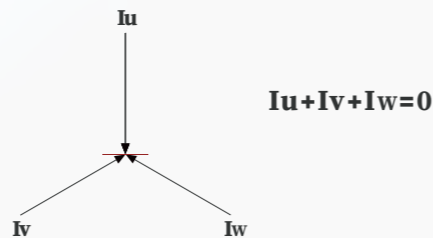
## High extensibility

With abundant IOs, communication and encoder options



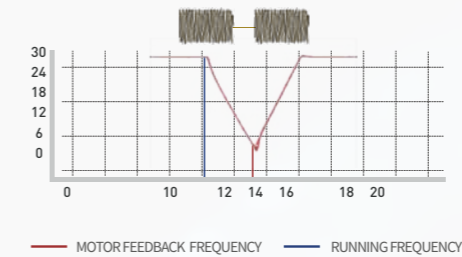
## Leakage detection

Support leakage detection, ensuring personnel safety and system reliability



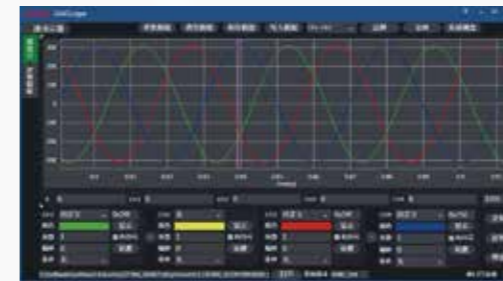
## Flying start

Flying start for ACIM and PMSM in SVC mode



## Commissioning tool

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



## 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, so that the output current can be the smallest under the same load

## Encoder features

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

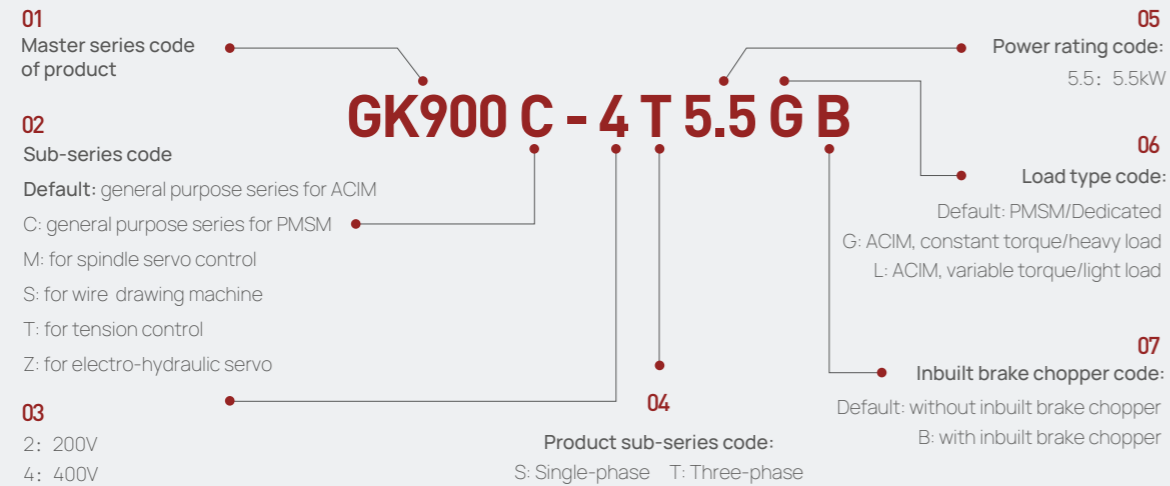
## Multi-communication protocols

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% 1min ;
	120% 1 min ;
	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	$< 10\text{ms}$ (sensor-less vector control 1 & 2)
	$< 5\text{ms}$ (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	$\pm 1$ 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 $\wedge / \vee$
	Digital setting + terminal UP/DOWN
	Communication
	Analog setting (AI1/AI2/AI3/AI4)
	Terminal pulse setting
Motor start-up methods	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 stop methods	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 brake capacity	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 displayed & hidden, various master & auxiliary frequency reference and switchover, reliable speed search started, a variety of Accel/Decel curves programmable, mechanical brake control, mechanical brake control, 16-step speed control programmable (2-step supports flexible frequency reference), count function, three faults recorded, 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

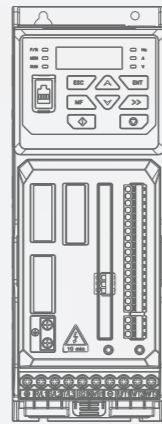
### ENVIRONMENT

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 <sup>2</sup> (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/Installation	Book-type
IP grade	IP20/IP00
Cooling method	Forced air cooling

# SELECTION TABLE



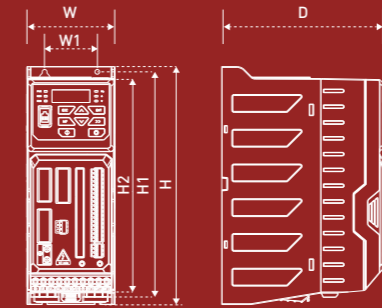
CABINET NO.	MODEL	POWER RATING	OUTPUT CURRENT	INPUT CURRENT	APPLICABLE MOTOR	HDC	AIR FLOW	BRAKE CHOPPER	DC REACTOR
		(kW)	(A)	(A)	(kW)	(W)	(m³/h)		
		Heavy-duty Application							
S01	GK900-4T0.75GB	0.75	2.5	3.5	0.75	23	29	Inbuilt	/
	GK900-4T1.5GB	1.5	3.8	5.0	1.5	49	29		
	GK900-4T2.2GB	2.2	5.5	6.0	2.2	72	29		
	GK900-4T3.7GB	3.7	9.0	10.5	3.7	116	29		
S02	GK900-4T5.5GB	5.5	13	14.6	5.5	170	55		
	GK900-4T7.5GB	7.5	18	20.5	7.5	261	77		
	GK900-4T11GB	11	24	29	11	337	102		
S03	GK900-4T15GB	15	32	35	15	417	140		
	GK900-4T18.5GB	18.5	37	44	18.5	500	140		
	GK900-4T22GB	22	45	50	22	632	140		
S04	GK900-4T30G(B)*	30	60	65	30	737	240	Inbuilt optional	
	GK900-4T37G(B)*	37	75	80	37	979	240		
S05	GK900-4T45G(B)* *	45	91	83	45	1363	253		
	GK900-4T55G(B)*	55	112	102	55	1789	253		
S06	GK900-4T75G(B)*	75	150	143	75	2050	506		
	GK900-4T90G	90	176	160	90	2056	506		
	GK900-4T110G	110	210	192	110	2838	506		
S07	GK900-4T132G	132	253	232	132	3359	1060		
	GK900-4T160G	160	304	285	160	3787	1060		
S08	GK900-4T185G	185	350	326	185	4124	1060		
	GK900-4T200G	200	380	354	200	4701	1060		
	GK900-4T220G	220	430	403	220	5133	1060		
S09	GK900-4T250G	250	470	441	250	5625	1590		
	GK900-4T280G	280	520	489	280	6598	1590		
S10	GK900-4T315G	315	590	571	315	7215	1590		
	GK900-4T355G	355	650	624	355	8384	1590		
	GK900-4T400G	400	725	699	400	8473	1590		
	GK900-4T450G	450	820	790	450	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.

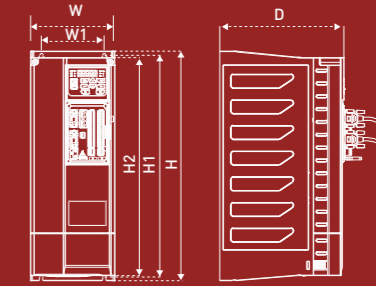
CABINET NO.	MODEL	POWER RATING	OUTPUT CURRENT	INPUT CURRENT	APPLICABLE MOTOR	HDC	AIR FLOW	BRAKE CHOPPER	DC REACTOR
		(kW)	(A)	(A)	(kW)	(W)	(m³/h)		
		Light-duty Application					/		
S01	GK900-4T1.5LB	1.5	3.8	5.0	1.5	23	29	Inbuilt	/
	GK900-4T2.2LB	2.2	5.5	6.0	2.2	49	29		
	GK900-4T3.7LB	3.7	8.0	9.3	3.7	72	29		
	GK900-4T5.5LB	5.5	11	12.3	5.5	116	29		
S02	GK900-4T7.5LB	7.5	17	19.3	7.5	170	55		
	GK900-4T11LB	11	23	27.8	11	261	77		
	GK900-4T15LB	15	30	32.8	15	337	102		
S03	GK900-4T18.5LB	18.5	37	44	18.5	417	140		
	GK900-4T22LB	22	45	50	22	500	140		
	GK900-4T30LB	30	58	62.8	30	632	140		
S04	GK900-4T37L(B)	37	75	80	37	737	240	Inbuilt optional	
	GK900-4T45L(B)	45	88	93	45	979	240		
S05	GK900-4T55L(B)	55	112	102	55	1363	253		
	GK900-4T75L(B)	75	139	133	75	1789	253		
S06	GK900-4T90L(B)	90	176	160	90	2050	506	Externally mounted	Inbuilt
	GK900-4T110L	110	210	192	110	2056	506		
	GK900-4T132L	132	250	232	132	2838	506		
S07	GK900-4T160L	160	304	285	160	3359	1060		
	GK900-4T185L	185	350	326	185	3787	1060		
S08	GK900-4T200L	200	380	354	200	4124	1060		
	GK900-4T220L	220	426	403	220	4701	1060		
	GK900-4T250L	250	465	441	250	5133	1060		
S09	GK900-4T280L	280	520	489	280	5625	1590		
	GK900-4T315L	315	585	566	315	6598	1590		
S10	GK900-4T355L	355	650	624	355	7215	1590		
	GK900-4T400L	400	725	699	400	8384	1590		
	GK900-4T450L	450	820	790	450	8473	1590		
	GK900-4T500L	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.

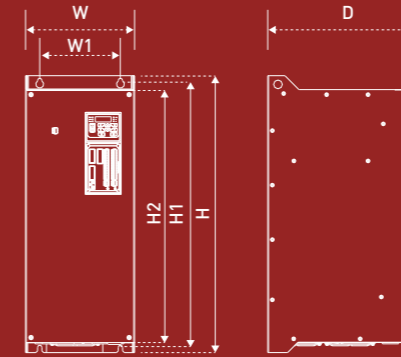
## GK900 Drive Dimensions »



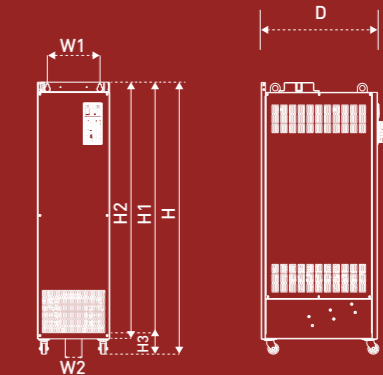
S01-S02



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



## OPTIONAL BOARDS

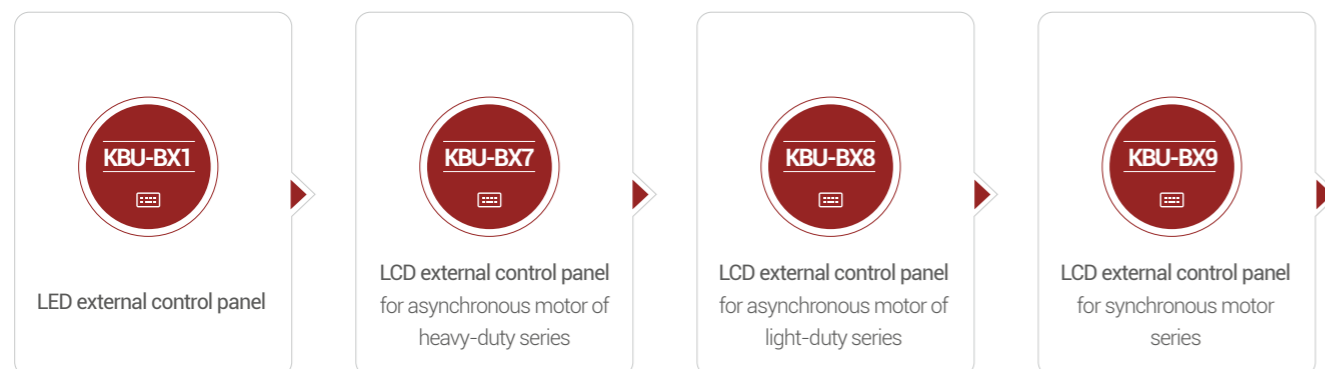
Type	Model	Description
Standard IO card	EPC-TM31	5 digital inputs (one of which supports high-speed input), 2 analog inputs, 2 digital outputs (one of which supports high-speed output), 1 analog output, and 1 relay output.
Extension IO cards	EPC-TM32	5 digital inputs, 2 analog inputs, 2 STO inputs, 1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

Type	Model	Description
Communication expansion cards	EPC-CM31	485 communication card-dual RJ45 interface
	EPC-CM31A	CAN communication card-dual RJ45 interface
	EPC-CM31B	485 communication card-3 pin terminal block
	EPC-CM32	CAN communication card-dual RJ45 interface
	EPC-CM32A	CAN communication card-3pin terminal block
	EPC-CM33	MIIII communication card-dual RJ45 interface
	EPC-CM34	EtherCAT communication card-dual RJ45 interface
	EPC-CM35	Profinet communication card-dual RJ45 interface
	EPC-CM36	CANopen communication card dual RJ45 interface
	EPC-CM37	Modbus_Tcp communication card

Extended cards for encoders	EPC-PG31	Non-isolated dual closed-loop PG card, two differential inputs A/B/Z signals, and two-channel differential PA/PB pulse reference, 1 group of A/B/Z differential division frequency output, 1 motor temperature sampling, and can directly support UVW encoder, with a maximum input 2MHz. Dual DB connector is s adopted.
	EPC-PG32	Single-channel isolated PG card, supports 1 differential A/B/Z input, two-channel 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 card, supports 1 12V digital A/B/Z input, two-channel 12V digital PA/PB pulse reference, 1A/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 card, supports 1 differential A/B/Z input, two 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 card, supports 1 rotary decoding, two-channel differential pulse reference, 1 A/B/Z open collector division frequency output or 1 A/B/Z differential division frequency output, 1 motor temperature sampling. Dual-port D-sub connectors are adopted.
	EPC-PG34	SINCOS decoding card, supports 1 SINCOS decoding, two-channel differential 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 card, supports protocol formats such as SSI, ENDAT, BISS and so on. Dual-port D-sub connectors are adopted.

Type	Model	Description
Encoder acquisition card	EPC-PG36	Single closed-loop PG card, 1 differential input of A/B/Z signals and two-channel differential PA/PB pulse reference, 1 A/B/Z differential division frequency output, 1 motor temperature collection, with a maximum input 2MHz, 18 pin terminal blocks.
	EPC-PG37	Single-channel isolated PG card, 1 A/B/Z signals of differential inputs and two-channel differential PA/PB pulse reference, 1 A/B/Z differential division frequency output, 1 motor temperature sampling, with a maximum input 2MHz, 18 pin terminal blocks are adopted.
	EPC-PG37A	Single-channel isolated PG card, one 12V A/B/Z signals of differential inputs and two-channel 12V digital PA/PB pulse reference, 1 A/B/Z differential division frequency output, 1 motor temperature sampling, with a maximum input 500kHz, 18 pin terminal blocks are adopted.
	EPC-PG37B	Single-channel isolated PG card, supports 1 differential A/B/Z input, two 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.
	EPC-PG38	Rotary decoding and SINCOS decoding card, 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	Support 1 group of isolated differential A/B/Z input, two-channel isolated differential PA/PB pulse reference, 1 group of non-isolated A/B/Z differential frequency division output, 1 motor temperature sampling, with a maximum input 500kHz. Dual-port D-sub connectors are adopted.

#### EXTERNAL CONTROL PANEL



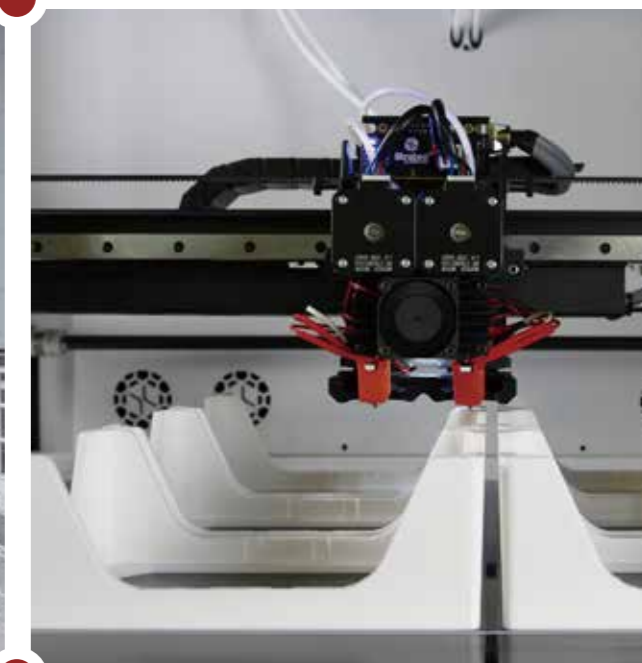
#### EXTERNAL CONTROL PANEL CABLE



INDUSTRY APPLICATIONS



INDUSTRY APPLICATIONS



Crane & Hoist Industry | Electro - hydraulic Servos | Test Applications

Woodwork Machinery | Rubber & Plastic Machinery

Printing & Packaging | Fan & Pump | Cable Industry | Special Welding | Textile Machinery

Metal Pipe Machinery | Steel Rope Machinery



## Quality Assurance »

GTAKE 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 control system.

To ensure the reliability, stability and consistency, all GTAKE products are inspected and tested strictly before delivery. We have been committed to continuously improving the product quality, aiming to bring better purchasing experience for customers.

