HSV-16 Full-Digital AC Servo Driving Unit

Introduction

HSV-16 All-Digital AC Servo Driving Unit is a new product of HCNC following models HSV-9, HSV-11, and HSV-16. The driving unit integrates the power and driving module compared to the HSV-11. It features compact structure, convenient use, and high dependability. HSV-16 is designed with the latest technology such as a special digital signal processor (DSP) for control, a large field programmable gate array (FPGA) and an intelligent power module (IPM). It is easy to operate and maintain, has high dependability and a small size.

Features

- Easy to use and flexible control:
  The work mode and internal parameters can be modified by changing servo parameters.
- Complete status display:
  A series of status display lights are provided for convenience to observe relevant status parameters in debugging, operating and diagnosis as well.
- Wide speed ratio (depends on motor and feedback apparatus)
  The maximum rotation speed can be set at 3000 rpm and the minimum at 0.5 rpm, a ratio of 1:6000
- Small volume for easy connection.

Control modes

- Position control mode (pulse interface): Three types of pulse instructions can be set with internal parameters (orthogonal pulse, pulse and direction, plus and negative pulse).
- Speed control mode (analog interface): In speed control mode set with an internal parameter, it can receive an analog speed signal in the range +/-10 v.
- JOG control mode: Motor can be driven by keyboard operation (without external instructions), letting users test the fit and connection of the servo driving system.
- Internal speed control mode: HSV-16 serial servo driving module can set speed internally.

HSV-16 digital servo drive unit technical specification

Working current Specification

	Continual current（A/30m） (virtual value)	Max short time current (A/1 m)
HSV-16-020	6.9	10.4
HSV-16-030	9.3	13.9
HSV-16-050	16.8	25.2

HSV-16- 075	24.2	36.3
HSV-16--100	33.6	50.5

Technical Specifications

Control power	Single-phase AC220V -50-+20% 50/60HZ	Input strong electricity power	Three-phaseAC220V -50-+20% 50/60HZ
User environment	Temperature	Working: 0 to 55 C Storage: -20 to 80 C	
	Humidity	<90% non-condensing	
	Vibration	<0.5G(4.9m/s) 1060HZ (non-continuous running)	
Control modes	1. Position control 2. Speed control 3.Torque control 4. JOG control 5. Internal speed control		
Brake		Internal/external	
Characteristics	Speed frequency response	300HZ or higher	
	Speed vibration ratio	(+-(load 0-100%);+-0.02(power -5-10%)) (value corresponds to rating speed)	
	Speed ratio	1:6000	
	Input pulse frequency	<=500kHz	
Control input	1. Servo enable 2. Alarm clear 3. Reset the warp counter 4. Instruction pulse disable 5. CCW driving disable 6.CW driving disable		
Control output	1. Output of servo ready 2. Output of servo alarm 3. Output of spindle orientation finish 4. Output of speed reach		
Position control	Input mode	1.double phase A/B orthogonal pulse 2.pulse plus direction 3.CCW/CW pulse	
	Electronic gear	1-32767/1-32767	
	Feedback pulse	Maximum 25000 pulse/rev	
Function of acceleration and deceleration		Set by parameter with 1-10000ms(0-2000rpm or 2000-0 rpm)	
Monitoring function		Rotation speed, current position, accumulation of in situation pulse, position warp, motor torque, motor current, rotor position, instruction pulse frequency operation state, terminal signal of input/output, and others	
Protection function		Over speed, over voltage of main power, under voltage, over current, overload, encoder abnormality, under voltage of control power, over temperature, excessive position error	
Operation		6 LED number tubes, 5 keys	

Load inertia	Less than five times motor inertia

Interface definition

Power interface TB1

Terminal No.	Terminal marking	Signal name	Function
1	AC220	Control power （single phase）	Control loop power input terminal AC220V/50Hz
2	AC220		
3	R	Main loop power （single phase/3 phase）	Main loop power input terminal AC220V/50Hz ATTENTION: **DO NOT** connect to motor output terminal U, V, W Single phase applicable for occasional low power, not recommended for common application.
4	S		
5	T		
6	PE	System GND	GND terminal GND resistance＜100Ω Servo motor output and power input GND together.
7	P	External brake point	In case external brake resistance is required, these two points are used for the connection. For internal brake disconnect these two points. **NOTE: DO NOT short-circuit these two points, it will damage the machine!!**
8	BK		
9	U	Servo motor output	Servo motor output terminal Do connect to motor U, V, W correspondingly.
10	V		
11	W		
12	PE	System GND	GND terminal GND resistance＜100Ω Servo motor output and power input share this public ground connection.

XS1 Serial Interface:

Terminal No	Terminal Mark	Name of Signal	Function
2	TXD	Data receive	Data send connection controller or host (RXD)
3	RXD	Data send	Data receive connection controller or host (TXD)
5	GND	Signal GND	Data signal GND

XS4 I/O Control Terminal

Terminal No	Terminal Mark	Name of Signal	Function
1	EN	Servo enable	Input terminal of enabled servo EN ON: enable drive to operate EN OFF: drive is closed and operation stopped, motor is in free status NOTE 1: Motor must be static when the status is switched from EN OFF to EN ON NOTE 2: Instruction is not input until at least 50ms after EN ON is opened NOTE 3: The function can be blocked by setting parameter STA-6 or externallly setting switch ON
2	A-CL	Alarm clearance	Input terminal of alarm clearance ACL ON: clean system alarm ACL OFF: keep system alarm
3	CLEE	Clearing error counter	Input terminal of clearing difference counter CLEE ON: Clearing error counter for position control
4	INH	Instruction pulse disable	Input terminal of Disable instruction pulse INH ON: Disable instruction pulse INH OFF: Enabling instruction pulse
5	L-CCW	CCW driving disable	Input terminal of L-CCW(anticlockwise) driving disable OFF: Enabling CCW driving ON: Disable CCW driving NOTE 1: The torque of CCW direction is kept at zero when the switch is “ON” (used in the limit mechanism) NOTE 2: The function can be blocked by setting parameter STA-8 or externally setting switch ON
6	L-CW	CW driving disable	Input terminal of L-CW (clockwise) driving disable OFF: Enable CW driving ON: Disable CW driving NOTE 1: The torque of CCW direction is kept at zero when the switch is “ON” (used in limit mechanism) NOTE 2: The function can be blocked by setting parameter STA-8 or externally setting switch ON
7	COM	Power input -	Power of input terminal: used in driving optoelectronic coupler of input terminal DC24V, Current >=24mA
8	24V	Power input +	
9	MC1	Fault catenation	Output terminal of fault catenation
10	MC2		Output of relay is often opened, but closed when the servo is in fault
11	Reserved		

12	GET	Output of finishing orientation	Output terminal of finishing orientation: Output is ON when position error counter is on setting range
		Output of speed reached	Output terminal of speed reached Output is ON when the speed difference is more than or equal to the setting speed
13	READY	Servo is ready for output	Servo is ready for output termination SRDY ON: Control and main power is normal; Driving unit has no alarm, ON is ready for output SRDY OFF: Main power is abnormal or driving unit has alarm, OFF is ready for output
14	ALM	Output of servo alarm	Output terminal of servo alarm ALM OFF: Servo driving unit is without alarm, OFF is output ALM On: Servo driving unit is with alarm, ON is output
15	OH1	Motor over-heat	Input terminal for detecting motor over-heat: Connect with motor over-heat detection sensor
16	OH2		

Instruction terminal XS3

Terminal Number	Terminal Marking	Signal name	Function
1	-CB	Encoder -B phase output	Encoder-B phase output terminal
2	+CB	Encoder+B phase output	Encoder+B phase output Servo motor Photoelectric encoder B phase pulse output
3	-CA	Encoder -A phase output	Encoder -A phase output terminal
4	+CA	Encoder +A phase output	Encoder +A phase output terminal Servo motor photoelectric encoder A phase pulse output
14	-CZ	Encoder -Z phase output	Encoder -Z phase output terminal
15	+CZ	Encoder +Z phase output	Encoder +Z phase output terminal Servo motor photoelectric encoder Z phase pulse output
5,18	-CP	Instruction pulse PLUS input	External instruction pulse input terminal NOTE 1: set pulse input mode via parameter 22 • Instruction pulse + mode • CCW/CW instruction pulse mode • 2 phase instruction pulse mode
6,19	+CP		
7,20	-DIR	Instruction pulse SIGN input	
8,21	+DIR		
9	SM	Velocity feedback monitor signal	Velocity feedback monitor terminal, Analog output

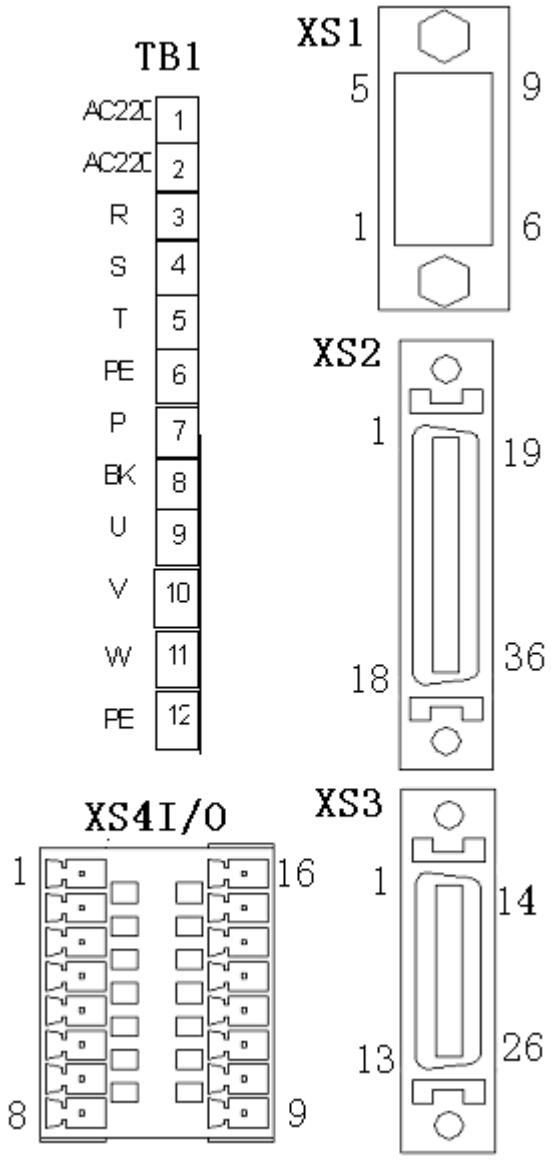
10	IM	Torque/current monitor signal	Torque/current monitor terminal Analog output
11, 24	AN+	Analog input positive terminal	Analog input instruction positive terminal
12, 13	AN-	Analog input negative terminal	Analog input instruction negative terminal
25, 26	GN	Analog GND	Analog GND terminal
22, 23	5V	Power output+	Control circuit 5V power & reference GND
16, 17	GD	Power output-	

Encoder signal terminal XS2

Tmn No.	Tmn mark	Signal name	Function
1, 2	5V2	Encoder power feedback	Encoder power feedback, servo will provide voltage compensation automatic according to it.
21, 22 23, 24	+5V	Power output +	Servo motor photoelectric encoder adopts +5V power; if the cable is long, it should be connected with several cables in parallel.
3, 4 5, 6	0V	Power output -	
17, 35	-A	Encoder –A input	Connected to servo motor photoelectric encoder –A phase
18, 36	+A	Encoder +A input	Connected to servo motor photoelectric encoder +A phase
15, 33	-B	Encoder –B input	Connected to servo motor photoelectric encoder –B phase
16, 34	+B	Encoder +B input	Connected to servo motor photoelectric encoder +B phase
13, 31	-Z	Encoder –Z input	Connected to servo motor photoelectric encoder –Z phase
14, 32	+Z	Encoder +Z input	Connected to servo motor photoelectric encoder +Z phase
11, 29	-U	Encoder – U input	Connected to servo motor photoelectric encoder –U phase
12, 30	+U	Encoder +U input	Connected to servo motor photoelectric encoder +U phase
9, 27	-V	Encoder –V input	Connected to servo motor photoelectric encoder –V phase
10, 28	+V	Encoder +V input	Connected to servo motor photoelectric encoder +V phase
7, 25	-W	Encoder –W input	Connected to servo motor photoelectric encoder –W phase
8, 26	+W	Encoder +W input	Connected to servo motor photoelectric encoder +W phase
19, 20	FG	Shield layer	Connected to motor shell

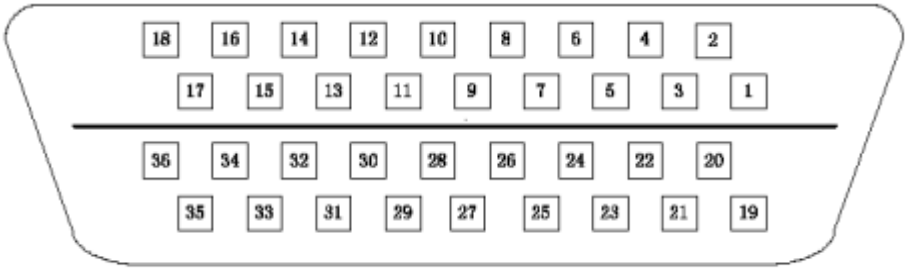
Terminal distribution

Diagram 3.2 illustrates the servo drive terminal distribution, in which TB1 represents terminal line, XS1, XS2, XS3 represent plugs and XS4 is terminal line.

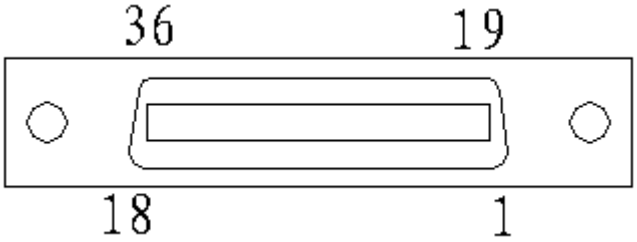


3.2 Servo drive interface terminal distribution

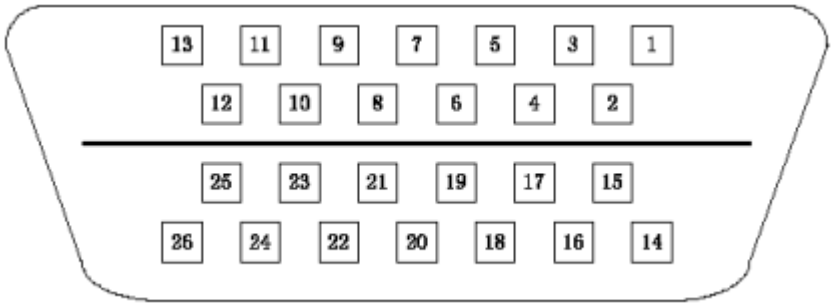
For plugs XS2 and XS3: the corresponding pin and its welded fins' pin order are as following:



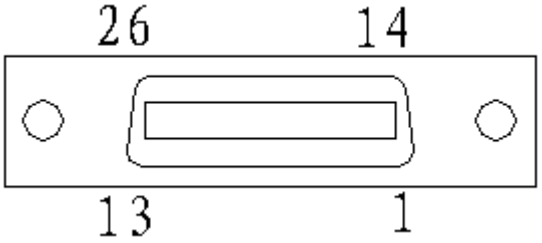
3.2 A1 XS2 coded disk pins' welded fin (face the pins' welded fin view)



3.2 A2 XS2 coded disk pin (face the pin view)

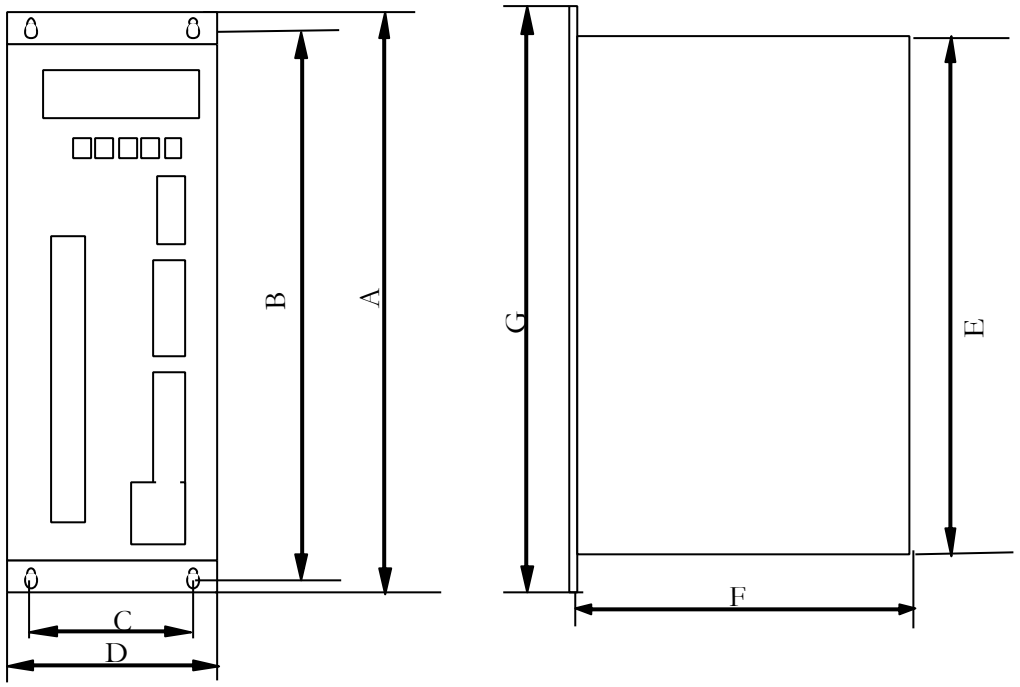


3.2 B1 XS3 instruction pins' welded fin (face the pins' welded fin view)



3.2 B2 XS3 instruction interface pin (face the pin view)

Installation dimension



Unit (mm)

Dimension / Modes	A	B	C	D	E	F	G
20A	**258**	**239**	**53**	**81**	**222**	**165**	**258**
30A	**258**	**239**	**53**	**81**	**222**	**165**	**258**
50A	**258**	**239**	**70**	**98**	**222**	**179**	**258**
75A	**258**	**239**	**78**	**125.5**	**223**	**208**	**258**
100A	**260**	**245**	**80**	**130**	**226**	**206**	**260**

Order Information

Mode description

HSV - 16 - XXX - YYY

16 types full-digital AC servo	Specification: 020, 030, 050, 075, 100

HSV-18D Full-Digital AC Servo Driving Unit

Introduction

HSV-18D All-Digital AC Servo Driving Unit is HCNC's new product. It uses AC 380V power input, has a compact size, is convenient to use and is highly dependable.

HSV-18D is designed with the latest technology, including a digital signal processor (DSP) for control, a very large field programmable gate array (FPGA), and an intelligent power module (IPM). It is easy to operate and maintain and has a small size and high high dependability. The wide range of power specifications of 025, 050, 075 offers users many options.

Features

- Easy and flexible control: The work mode and internal parameter can be modified via operation panel or communication modes to meet different requirements.
- Complete status display: A series of status display is provided for the convenient to observe relevant status parameters in debugging, operating and diagnosis.
- Many interfaces for flexible control: Pulse instruction interface, analog voltage instruction interface, motor coded disk feedback interface, serial communication interface and programmable I/O interface.
- DC generator voltage is DC 530V, suitable for high revolution/power requirements.
- Dual-coded disk interface for linear encoder (or similar position feedback method) to build a full-closed loop control system.

Control modes

- Position control mode (pulse interface):
- Set three types of pulse instructions with internal parameter (orthogonal pulse; pulse and direction; positive and negative pulse).
- Speed control mode (analog interface): It can be set as speed control mode with an internal parameter and receive analog signal between +/- 10 v.
- Torque control (analog interface): HSV-18D servo can be set via internal parameter which receives an analog signal between +/- 10 v.
- JOG control mode: Motor is driven with keyboard operation (i.e., without an external instruction)

letting users test the fit and connection of their servo drive system.

- Internal speed control mode: This mode offers users the means to test servo connections and installations.

Working current

Specification	Continual current (A)	Max short time current (A)
HSV-18D-025	8.2	16.4
HSV-18D-050	16.4	32.8
HSV-18D-075	23.5	47.1

Technical specification

<table>
<tr><td colspan="2">Control power</td><td>Single phase AC220V
-15～+10%　50/60Hz</td><td>Main loop power</td><td>Three-phase AC380V
-15%～+10%　50/60Hz</td></tr>
<tr><td colspan="2">Control modes</td><td colspan="3">1. Position control 2. Speed control 3.Torque control 4. JOG control
5. internal speed control</td></tr>
<tr><td rowspan="4"></td><td>Speed frequency response</td><td colspan="3">300Hz and higher</td></tr>
<tr><td>Speed vibration ratio</td><td colspan="3">＜±0.1(load 0 to 100%);＜±0.02 (power –15% to +10%)
(value corresponds with rating speed)</td></tr>
<tr><td>Timing ratio</td><td colspan="3">1:6000</td></tr>
<tr><td>Pulse frequency</td><td colspan="3">≤500kHz</td></tr>
<tr><td colspan="2">Control input</td><td colspan="3">1. Servo enable 2. Alarm clear 3. Reset the error counter 4. Instruction pulse disable 5. CCW driving disable 6.CW driving disable</td></tr>
<tr><td colspan="2">Control output</td><td colspan="3">1. Servo Ready Output
2. Servo Alarm Output
3. Position reached and Speed reached Outputs</td></tr>
<tr><td colspan="2" rowspan="3">Position control</td><td>Input mode</td><td colspan="2">1. Two phase A/B orthogonal pulse
2. Pulse positive direction
3. CCW/CW pulse</td></tr>
<tr><td>Electronic gear</td><td colspan="2">1～32767/1～32767 ratio</td></tr>
<tr><td>Feedback pulse</td><td colspan="2">Maximum 2o000 pulse/R</td></tr>
<tr><td colspan="2">Acceleration and Deceleration Function</td><td colspan="3">Parameter setting 1～32000ms(0～2000r/min or 2000～0r/min)</td></tr>
<tr><td colspan="2">Monitoring function</td><td colspan="3">Rotate speed, current position, accumulation of in situation pulse, position error, torque of motor, current of motor, position of rotor, instruction pulse frequency operation state, terminal signal of input/output and others</td></tr>
<tr><td colspan="2">Protection function</td><td colspan="3">Over speed, over voltage of main power, under voltage, over current, overload, abnormity of encoder, under voltage of control power, over heat, excessive error of position and others</td></tr>
<tr><td colspan="2">Operation</td><td colspan="3">6 bit LED digital displays; 5 pushbuttons</td></tr>
<tr><td colspan="2">Load inertia</td><td colspan="3">Less than five times motor inertia</td></tr>
</table>

HSV-18D interfaces definition

1. XT1 heavy current I/O terminal

Terminal No	Terminal marking	Signal name	Function
1	P	External brake resistance	Embedded brake resistance of 70Ω/500W. For internal brake disconnect these two points. For external brake resistance, connect to P and BK. Internal and external brake resistances are parallel connected. **NOTE: P & BK should NEVER be short-circuited, otherwise it will damage equipment**
2	BK		
3	R	Main loop power	Main loop power input terminal: Three phase AC380V/ 50HZ **ATT: Do not connect to motor's U, V, W.**
4	S		
5	T		
6	U	Servo drive three phase output	Connect to motor U, V, W correspondingly.
7	V		
8	W		
9	PE	System GND	GND terminal, GND resistance＜4Ω Servo motor output and power input share this public connection

2. XS6 control power input terminal

Terminal Number	Terminal marking	Signal name	Function
1	AC220	Control phase（single phase）	Control loop power input terminal AC220V/50Hz/40W
3	AC220		

3. XS1 series interface

Terminal No	Terminal mark	Signal name	Function
2	TX	Data send	Connect to controller or host (RX) serial data receive to achieve serial communication
3	RX	Data receive	Connect to controller or host (TX) serial data send to achieve serial communication
5	GND	Signal GND	Data signal GND

4. XS4 instruction I/O interfaces (switch value I/O signal is DC24V NPN type)

Terminal No	Terminal mark	Signal name	Function

1	GET	Position reached output	Position reached output switch value output terminal: In position control mode, when position error counter's remaining pulse is less than/equal to the preset value (motion parameter PA-11), then position reached output is ON, otherwise OFF.
		Velocity reached output	Velocity reached switch value input terminal. In velocity control mode, if error between motor's instruction and actual velocity is less than/equal to the preset value (motion parameter PA-11), then velocity reached output is ON, otherwise OFF.
2	READY	Servo ready output	Servo ready switch value output terminal SRDY ON: control power and main power OK No warning for servo unit, servo ready output is on after ENABLE is ON. SRDY OFF: main power not switched on or servo unit has warning/no enable signal, servo ready output OFF.
3	ALM	Servo alarm output	Servo alarm switch value output terminal ALM ON: servo has alarm, servo alarm output is ON ALM OFF: No servo alarm, servo alarm output is OFF.
4	DOUTPUT7	Reserved	
5	DOUTPUT8	Reserved	
6	DINPUT8	Reserved	
7	AN_TP+	Reserved	
8	AN_TP-	Reserved	
9	AN_TN+	Reserved	
10	AN_TN-	Reserved	
11,12	GNDAM	Analog GND	Analog instruction input signal GND
13	CP+	Instruction pulse PLUS input	External instruction pulse input terminal NOTE 1: set pulse input mode via PA 22 • Instruction pulse + mode • CCW/CW instruction pulse mode • 2 phase instruction pulse mode
14	CP-		
15	DIR+	Instruction pulse SIGN input	
16	DIR-		
17	ENA+	No. 1 photoelectric encoder A+ phase output	Servo motor's photoelectric encoder A phase pulse output
18	ENA-	No. 1 photoelectric encoder A- phase output	

19	THL	Positive direction torque limit	THL positive direction torque limit switch-value input terminal: OFF: No limit to positive direction torque, PA-15 is not in function in this case, torque is only limited by motion parameter PA-5. ON: Enable positive direction torque, PA-15 is in function. NOTE 1: Function can be shielded via control parameter STA-8 or keep it NORMAL OFF.
20	INH	Instruction pulse disable	Position instruction pulse disable switch value input terminal INH ON: instruction pulse input disable INH OFF: instruction pulse input able
21	TLL	Negative direction torque limit	TLL negative direction torque limit switch value input terminal OFF: No limit to negative direction torque, PA-16 is not in function in this case, torque is only limited by motion parameter PA-5. ON: Enable negative direction torque, PA-16 is in function. NOTE 1: Function can be shielded via control parameter STA-9 or keep it NORMAL OFF.
22	CLEE	Clear position error counter	Position Error counter clearance switch value input terminal CLEE ON: In position control, clear error counter
23	DINPUT7	Reserved	
24	ALM_RST	Alarm reset	Alarm reset switch value input terminal ALM_RST ON: system alarm reset ALM_RST OFF: keep system alarm
25	EN	Servo enable	Servo enable switch value input terminal EN ON: allow servo work EN OFF: Servo is off, stop working, motor is idle. NOTE 1: motor must be static before switch from EN OFF to EN ON. NOTE 2: Wait after at least 50ms to input command after switched to EN ON NOTE 3: this function can be shielded via control parameter STA-6 or keep it NORMAL ON.
26,27, 28	COM	Public terminals	XS4 terminal switch value I/O signal public terminal **NOTE:** COM signal must be connected to XS4 terminal switch value I/O external DC24V power GND signal; otherwise servo may not work properly.
29	AN+	Analog input positive terminal	Analog input instruction positive terminal
30	GNDDM	DS GND	Pulse input DS GND
31	AN-	Analog input negative terminal	Analog input instruction negative terminal

32	ZPLS_OUT	Z pulse output	Collector Z phase pulse output
33	ENZ-	No.1 photoelectric encoder Z- phase output	Servo motor photoelectric encoder Z phase pulse output
34	ENZ+	No.1 photoelectric encoder Z+ phase output	
35	ENB-	No.1 photoelectric encoder B- phase output	Servo motor photoelectric encoder B phase pulse output
36	ENB+	No.1 photoelectric encoder B+ phase output	

5. XS3 No.1 photoelectric encoder interface

Terminal No.	Terminal marks	Signal name	Function
1	A+	Encoder A+ input	Connected to servo motor photoelectric encoder A+ phase
2	A-	Encoder A- input	Connected to servo motor photoelectric encoder A- phase
3	B+	Encoder B+ input	Connected to servo motor photoelectric encoder B+ phase
4	B-	Encoder B- input	Connected to servo motor photoelectric encoder B- phase
5	Z+	Encoder Z+ input	Connected to servo motor photoelectric encoder Z+ phase
6	Z-	Encoder Z- input	Connected to servo motor photoelectric encoder Z- phase
7	U+	Encoder U+ input	Connected to servo motor photoelectric encoder U+ phase
8	U-	Encoder U- input	Connected to servo motor photoelectric encoder U- phase
9	V+	Encoder V+ input	Connected to servo motor photoelectric encoder V+ phase
10	V-	Encoder V- input	Connected to servo motor photoelectric encoder V- phase
11	W+	Encoder W+ input	Connected to servo motor photoelectric encoder W+ phase
12	W-	Encoder W- input	Connected to servo motor photoelectric encoder W- phase
13	OH1	Motor over-heat	Motor over-heat detection input terminal Connected to motor over-heat detect sensor
26	OH2		
14,15	PE	Shield GND	Connected to motor shell

16,17, 18,19	+5V_ENC	No.1 photoelectric encoder +5V power output terminal	Servo motor photoelectric encoder adopts +5Vpower
23,24, 25	GNDPG	No.1 photoelectric encoder +5V power GND	
20,21, 22	+5V_MI	No.1 photoelectric encoder +5V feedback input terminal	Encoder power feedback, servo drive will make voltage compensation automatic accordingly.

6. XS2 second coded disk interface

Terminal Number	Terminal Mark	Name of Signal	Function
19,20	+5VPI	Position sensor power feedback	Table position sensor power feedback, servo drive will make voltage compensation automatic accordingly.
7,8	+5VPO	Position sensor +5V power output	Table position sensor adopts +5V power
9,10	GNDPP	Position sensor GND output	
1,2	PA-	Position feedback A- input	Connected to table position feedback A- phase
11,12	PA+	Position feedback A+ input	Connected to table position feedback A+ phase
3,4	PB-	Position feedback B- input	Connected to table position feedback B- phase
13,14	PB+	Position feedback B- input	Connected to table position feedback B+ phase
5,6	PZ-	Position feedback Z- input	Connected to table position feedback Z- phase
15,16	PZ+	Position feedback Z+ input	Connected to table position feedback Z+ phase
17, 18	PE	Shield GND	Connected to motor shell

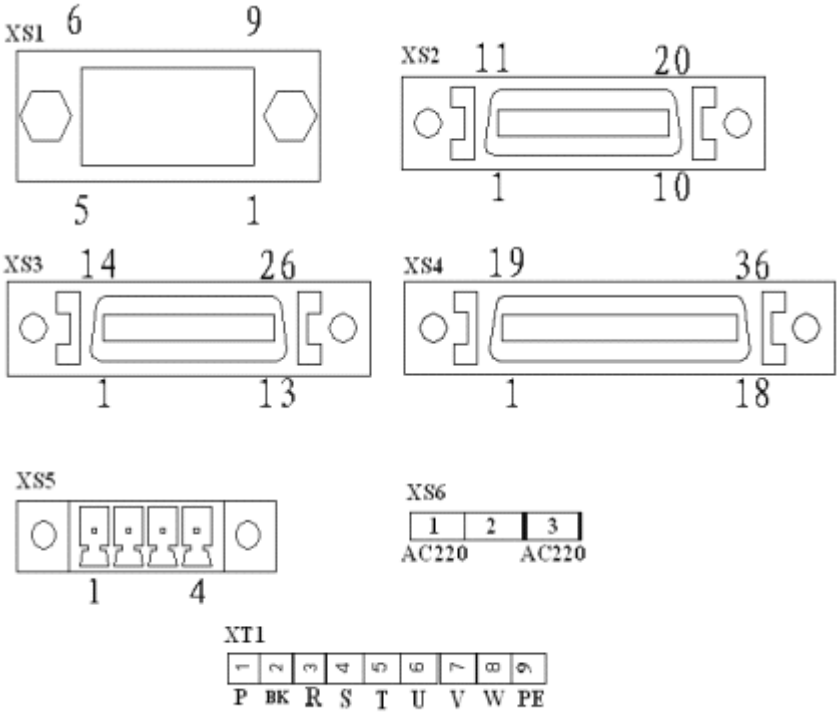
7. XS5 I/O terminals

Terminal Number	Terminal Mark	Name of Signal	Function
1	MC1	Failure interlock	Failure interlock relay touch-point output terminal Relay normal-on output, it switches off when servo has failures
2	MC2		

3	COM	Public terminal	If the brake is being used, COM signal must be connected to XS4 terminal switch value I/O external DC24V power's GND signal, otherwise servo may not work properly.
4	BREAK	Brake output	When heavy current is supplied and ENABLE is on, BREAK output is ON, otherwise it's OFF.

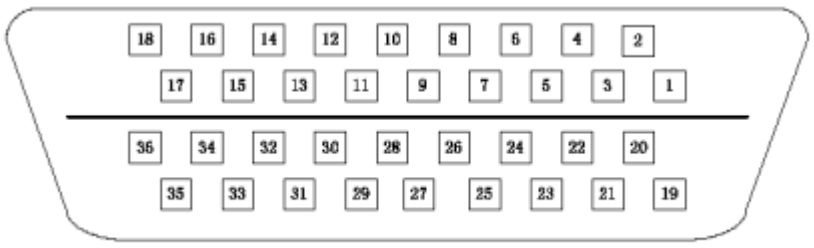
Terminal distribution

The following diagram illustrates the servo drive terminal distribution, in which XT1 represents terminal line, XS1 is DB9 socket, XS2, XS3 and XS4 are high-density sockets, and XS5, XS6 are connection terminals.

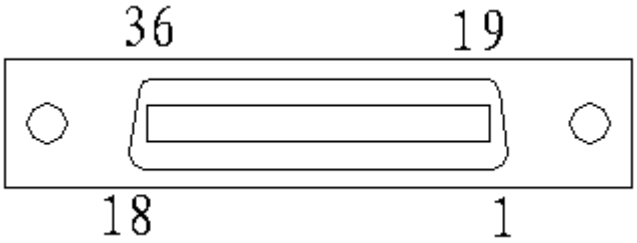


Servo drive interfaces' terminal distribution diagram

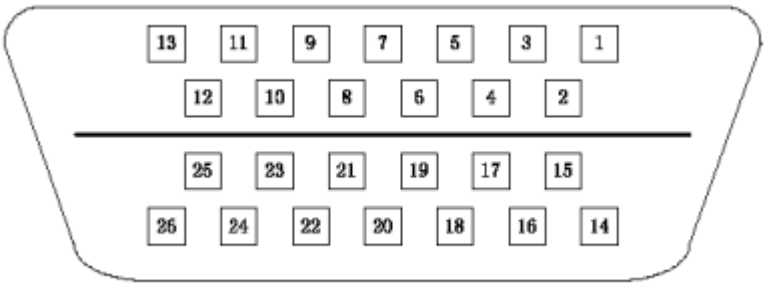
Socket XS2, XS3, XS4's corresponding pin and its welded-fin's PIN order:



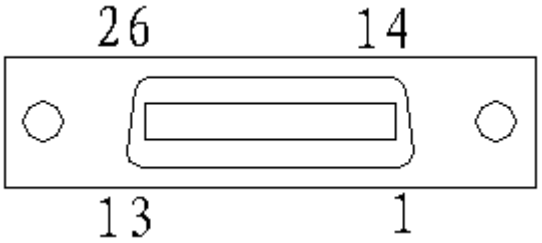
XS4 instruction I/O interface pin's welded-fin (view facing welded-fin)



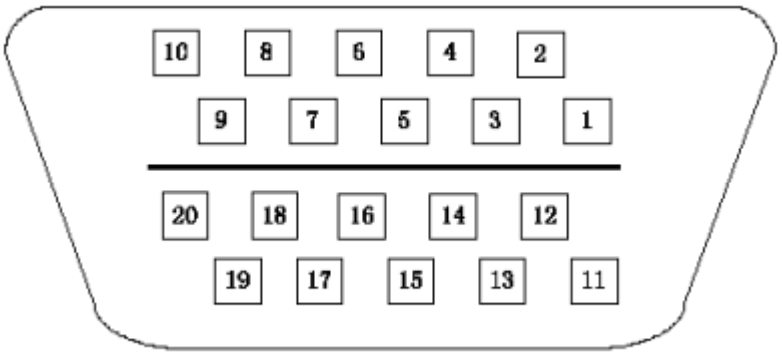
XS4 instruction I/O interface pin (view facing the pin)



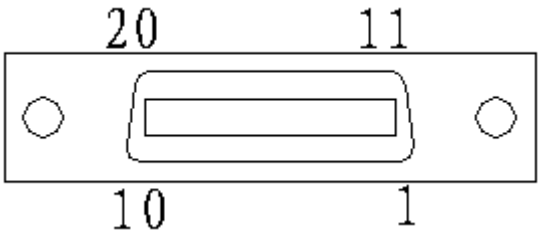
XS3 No.1 photoelectric encoder pins' welded-fin (view facing welded-fin)



XS3 No.1 photoelectric encoder pins (view facing the pin)



XS2 No.1 photoelectric encoder pins welded-fin (view facing welded-fin)



XS2 No.2 photoelectric encoder pins (view facing the pin)

Brake resistance connection & application

HSV-18D servo drive's brake current is DC660V, Max. brake current is shown in the following table. The embedded 70Ω/500W brake resistance allows at most 10 times overload (1 second continuous). External brake resistance is required when the drive unit's load or inertia is too large. The brake time is shorter when load/inertia is bigger, thus the resistance value is smaller and its power is bigger, however, the maximum brake current shall not exceed the drive's maximum brake current.

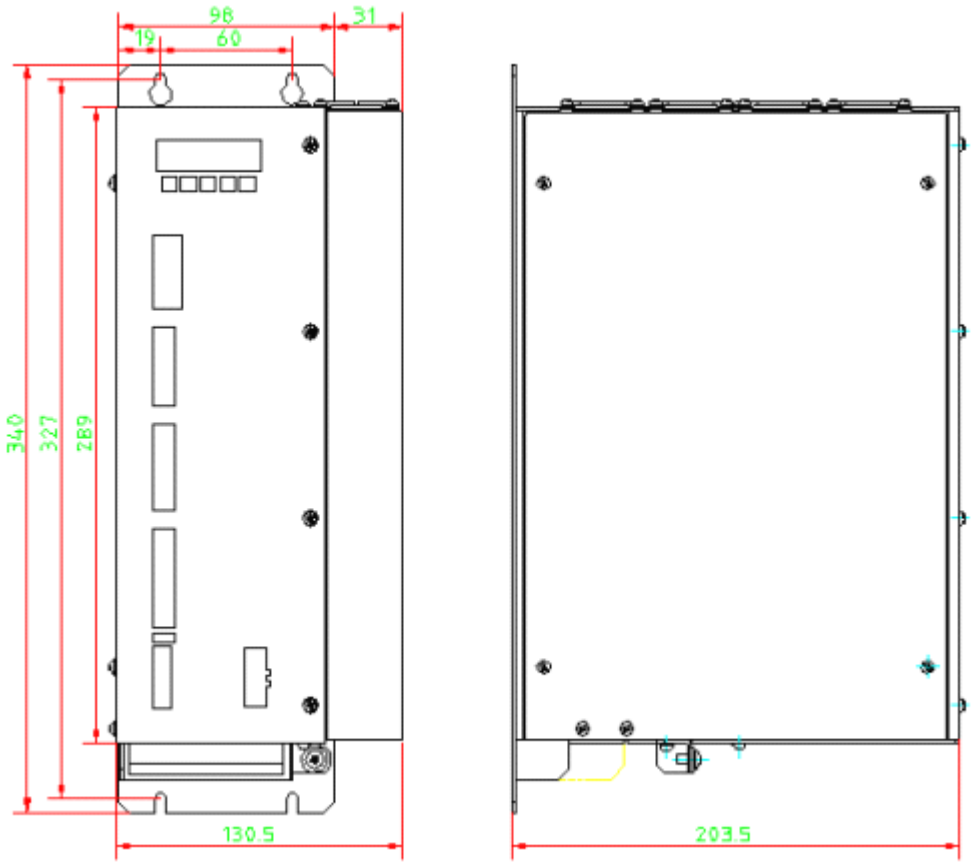
Cut off P and BK terminal of drive's XT1 heavy current I/O if internal brake resistance is used. The default setting of the drive is internal brake resistance.

Parallel connect P and BK terminal of drive's XT1 heavy current I/O to external brake resistance if it's being used. The suggested value of the external brake resistance is as in the following table:

HSV-18D's suggested value of the external brake resistance

Specification	Max. brake current (A)	External brake resistance (recommended value)
HSV-18D-025	15	Only internal brake resistance recommended
HSV-18D-050	25	Resistance value: 51Ω power :≥800W
		Resistance value: 68Ω power:≥600W
HSV-18D-075	40	Resistance value: 24Ω Power:≥1500W
		Resistance value: 27Ω Power:≥1500W

HSV-18D-025, 050, 075 installation dimension



NOTE: Use M4 screw for connection

Order information

HSV-18D's description

HSV-18D-XXX

18 type full-digital AC servo drive	Specification: 020、050、075、

HSV-18S Full-Digital AC Spindle Driving Unit

Introduction

HSV-18S All-Digital AC spindle Driving Unit is a new product of HCNC. It has a AC380V power input, a compact structure, is easy to use and has high dependability.

The HSV-18S is designed with the latest technology, such as a special digital signal processor (DSP) for control, massive field programmable gate array (FPGA), and intelligent power module (IPM). It is easy to operate and repair, has high dependability and a small size. The wide range of power specifications of 025A, 050A, 075A offers users multiple options.

Features

- Easy and flexible control:
  The work mode and internal parameters of the spindle can be modified via the operation panel or communication modes to meet different requirements.
- Complete status display:
  A series of status displays is provided to observe the relevant status parameters in debugging, operating, and for diagnosis.
- Many interfaces for flexible control:
  Pulse instruction interface, analog voltage instruction interface, motor coded disk feedback interface, serial communication interface and programmable I/O interface.
- Spindle position function
- Constant velocity and high reliability for tapping operations

Control modes

- Position control mode (pulse interface):
  Set three types of pulse instructions with internal parameters (orthogonal pulse, pulse and direction, positive and negative pulse)
- Speed control mode (analog interface):
  Set the speed control mode with internal parameters and receive analog signals (+/- 10 V)
- JOG control mode:
  Drive unit is driven with keyboard operation without external instruction letting users test the fit and connection of the spindle driving system.
- Internal speed control mode

Users can test the spindle connection/installation.

Technical Specification

Working current

Specification	Continual current (A)	Max short time current (A)	Max. adaptive motor power (kW)
HSV-18S-025	8.2	16.4	3.0 kW
HSV-18S-050	21.8	32.8	7.5 kW
HSV-18S-075	31.4	47.1	9 kW

HSV-18S technical specification

Control power	Single phase AC220V -15～+10%　50/60Hz	Main loop power	Three-phase AC380V -15%～+10%　50/60Hz
Control modes	1. Position control 2. Speed control 3. JOG control 4. internal speed control		
Speed range	1 rpm ～10000 rpm		
Control input	1. Servo enable 2. Alarm clear 3. Reset the error counter 4. CCW/CW driving enable 5. ± torque limit 6. Spindle position start		
Control output	1. Output of spindle ready 2. Output of spindle alarm 3. Output of spindle position reached/speed reached 4. Zero speed reached output.		
Feedback	photoelectric coded disk bus number:1000p/r, 1024p/r, 2000p/r, 2500p/r		
Constant velocity precision	Rotation vibration: less than 5 rpm（load switches from 0% to 100%）		
Monitoring function	Rotation speed, current position, pulse total, position error, motor torque, motor current.		
Protection function	Over speed, over voltage of main power, under voltage, over current, overload, abnormity of encoder, under voltage of control power, over heat, excessive position error and others		
Operation	6 bit LED digital displays, 5 pushbuttons		

HSV-18S interfaces definition

1. XT1 heavy current I/O terminal

Terminal No	Terminal mark	Signal name	Function
1	P	External brake resistance	Embedded brake resistance of 70Ω/500W. For internal brake disconnect these two points. For external brake resistance, connect P and BK. Internal and external brake resistances are parallel connected. **NOTE: P and BK should never be short-circuited, otherwise machine damage will result!**
2	BK		
3	R	Main loop power	Main loop power input terminal:

4	S		Three phase AC380V/ 50HZ **NOTE: Do not connect to motor's U, V, W.**
5	T		
6	U	Spindle three phase output	Connect to motor U, V, W correspondingly.
7	V		
8	W		
9	PE	System GND	GND terminal, GND resistance ＜4Ω Spindle motor output and power input share the public connection

2. XS6 control power input terminal

Terminal No.	Terminal mark	Signal name	Function
1	AC220	Control phase（single phase）	Control loop power input terminal: AC220V/50Hz/40W
3	AC220		

3. XS1 series interface

Terminal No.	Terminal markings	Signal name	Function
2	TX	Data send	Connect to controller or host (RX) serial data receive to achieve serial communication
3	RX	Data receive	Connect to controller or host (TX) serial data send to achieve serial communication
5	GND	Signal GND	Data signal GND

4. XS4 instruction I/O interfaces (switch value I/O signal is DC24V NPN type)

Terminal No	Terminal mark	Signal name	Function
1	ZSP	Zero speed reached output	Zero speed reached output switch value output terminal: When actual velocity reaches the preset zero speed range (motion parameter PA-29), zero speed reached output is ON
2	READY	Spindle ready output	Spindle ready switch value output terminal: SRDY ON: Control power and main power OK No warning for servo unit, servo ready output is on after ENABLE is ON. SRDY OFF: main power not switched on or servo unit has warning/no enable signal, servo ready output OFF.

3	ALM	Spindle alarm output	Spindle alarm switch value output terminal ALM ON: servo has alarm, servo alarm output is ON ALM OFF: No servo alarm, servo alarm output is OFF.
4	GET	Velocity reached output	Velocity reached switch value input terminal. When error between actual speed and set speed (parameter is less than or equal to speed tolerance range (parameter PA-11), speed reached output is ON.
5	ORN_FIN	Spindle position reached output	Spindle position reached switch value output terminal. When error between actual position and set position (parameter PA-39) is less than or equal to spindle position reached range (parameter PA-37), spindle position reached output is ON, when position input signal is cancelled, the status is cancelled correspondingly.
6	DINPUT8	Reserved	
7	AN_TP+	Reserved	
8	AN_TP-	Reserved	
9	AN_TN+	Reserved	
10	AN_TN-	Reserved	
11,12	GNDAM	Analog GND	Analog instruction input signal GND
13	CP+	Instruction pulse PLUS input	External instruction pulse input terminal NOTE 1: set pulse input mode via PA 22 • Instruction pulse + mode • CCW/CW instruction pulse mode • 2 phase instruction pulse mode
14	CP-		
15	DIR+	Instruction pulse SIGN input	
16	DIR-		
17	ENA+	No. 1 photoelectric encoder A+ phase output	Spindle motor's photoelectric encoder A phase pulse output
18	ENA-	No. 1 photoelectric encoder A- phase output	
19	THL	Reserved	
20	REW	Reverse rotate	REW: Reverse rotate switch value input terminal
21	TLL	Reserved	
22	FWD	Forward rotate	FWD: forward rotate switch value input terminal
23	ORN	Spindle position start	Spindle position start switch value input terminal ORN ON: Spindle position start ORN OFF: Spindle position cancel
24	ALM_RST	Alarm reset	Alarm reset switch value input terminal ALM_RST ON: system alarm reset ALM_RST OFF: keep system alarm

25	EN	Servo enable	Spindle enable switch value input terminal EN ON: allow drive work EN OFF: Drive is off, stop working, motor is idle. NOTE1: motor must be static before switch from EN OFF to EN ON. NOTE 2: Wait after at least 50ms to input command after switched to EN ON NOTE 3: this function can be shielded via control parameter STA-6 or keep it NORMAL ON.
26,27,28	COM	Public terminal	XS4 terminal switch value I/O signal public terminal **NOTE:** COM signal must be connected to XS4 terminal switch value I/O external DC24V power GND signal; otherwise servo may not work properly.
29	AN+	Analog input positive terminal	Analog input instruction positive terminal
30	GNDDM	DS GND	Pulse input DS GND
31	AN-	Analog input negative terminal	Analog input instruction negative terminal
32	ZPLS_OUT	Z pulse output	Collector Z phase pulse output
33	ENZ-	No.1 photoelectric encoder Z- phase output	Spindle motor photoelectric encoder Z phase pulse output
34	ENZ+	No.1 photoelectric encoder Z+ phase output	
35	ENB-	No.1 photoelectric encoder B- phase output	Spindle motor photoelectric encoder B phase pulse output
36	ENB+	No.1 photoelectric encoder B+ phase output	

5. XS3 No.1 photoelectric encoder interface

Terminal No.	Terminal marks	Signal name	Function
1	A+	Encoder A+ input	Connected to spindle motor photoelectric encoder A+ phase
2	A-	Encoder A- input	Connected to spindle motor photoelectric encoder A- phase
3	B+	Encoder B+ input	Connected to spindle motor photoelectric encoder B+ phase
4	B-	Encoder B- input	Connected to spindle motor photoelectric encoder B- phase
5	Z+	Encoder Z+ input	Connected to spindle motor photoelectric encoder Z+ phase

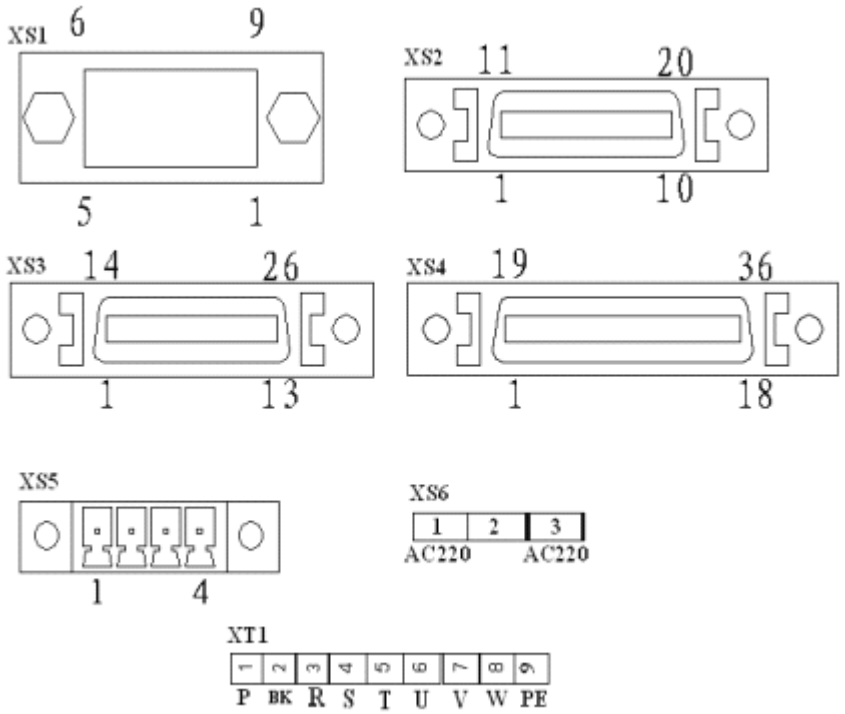
6	Z-	Encoder Z- input	Connected to spindle motor photoelectric encoder Z- phase
13	OH1	Motor over-heat	Motor over-heat detection input terminal Connected to motor over-heat detect sensor
26	OH2		
14,15	PE	PE	Shield GND
16,17, 18,19	+5V_ENC	No.1 photoelectric encoder +5V power output terminal	Spindle motor photoelectric encoder uses +5V power
23,24, 25	GNDPG	No.1 photoelectric encoder +5V power GND	
20,21, 22	+5V_MI	No.1 photoelectric encoder +5V feedback input terminal	Encoder power feedback, spindle drive will make automatic voltage compensation.

6. XS5 I/O terminals

Terminal Number	Terminal Mark	Name of Signal	Function
1	MC1	Failure interlock	Failure interlock relay touch-point output terminal Relay normal-on output; it switches off when spindle has failed
2	MC2		
3	Reserved		
4	Reserved		

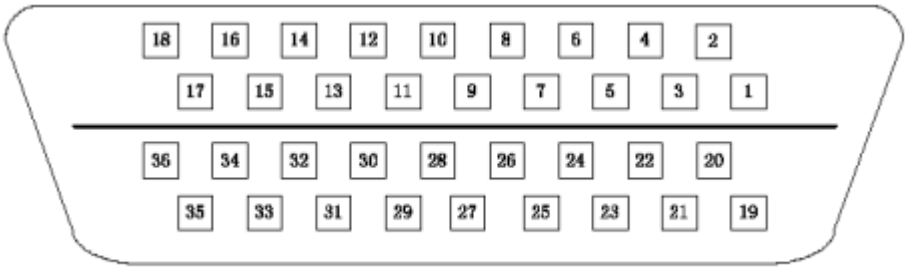
Terminal distribution

The following diagram illustrates the servo drive terminal distribution, in which XT1 represents terminal line, XS1 is DB9 socket, XS2, XS3 and XS4 are high-density socket, and XS5, XS6 are connection terminal.

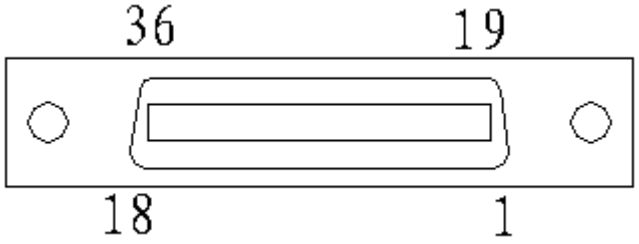


AC spindle drive interfaces' terminal distribution diagram

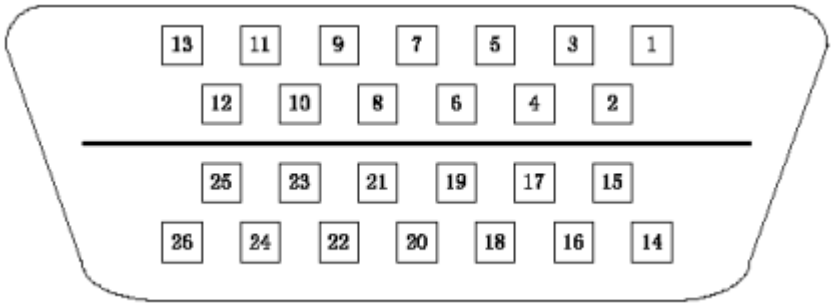
Socket XS3, XS4's corresponding pin & its welded-fin's PIN order:



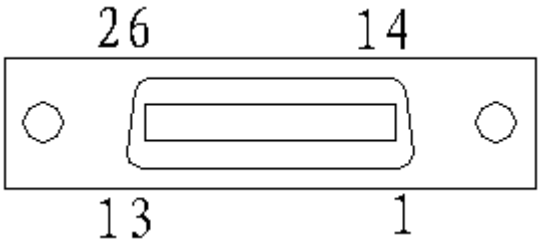
XS4 instruction I/O interface pin's welded-fin (view facing welded-fin)



XS4 instruction I/O interface pin (view facing the pin)



XS3 No.1 photoelectric encoder pins' welded-fin (view facing welded-fin)



XS3 No.1 photoelectric encoder pins (view facing the pin)

Brake resistance's connection and application

HSV-18S AC spindle drive's brake current is DC 660V. The maximum brake current is shown in the following table. The embedded 70Ω/500W brake resistance allows 10 times overload (1 second continuous). External brake resistance is required when drive unit's load or inertia is large. The brake time is shorter when load/inertia is bigger, thus the resistance value is smaller and its power is bigger. However, the maximum brake current can not exceed the drive's maximum brake current.

Cut off P and BK terminal of drive's XT1 heavy current I/O if internal brake resistance is used. The default setting of the drive is internal brake resistance.

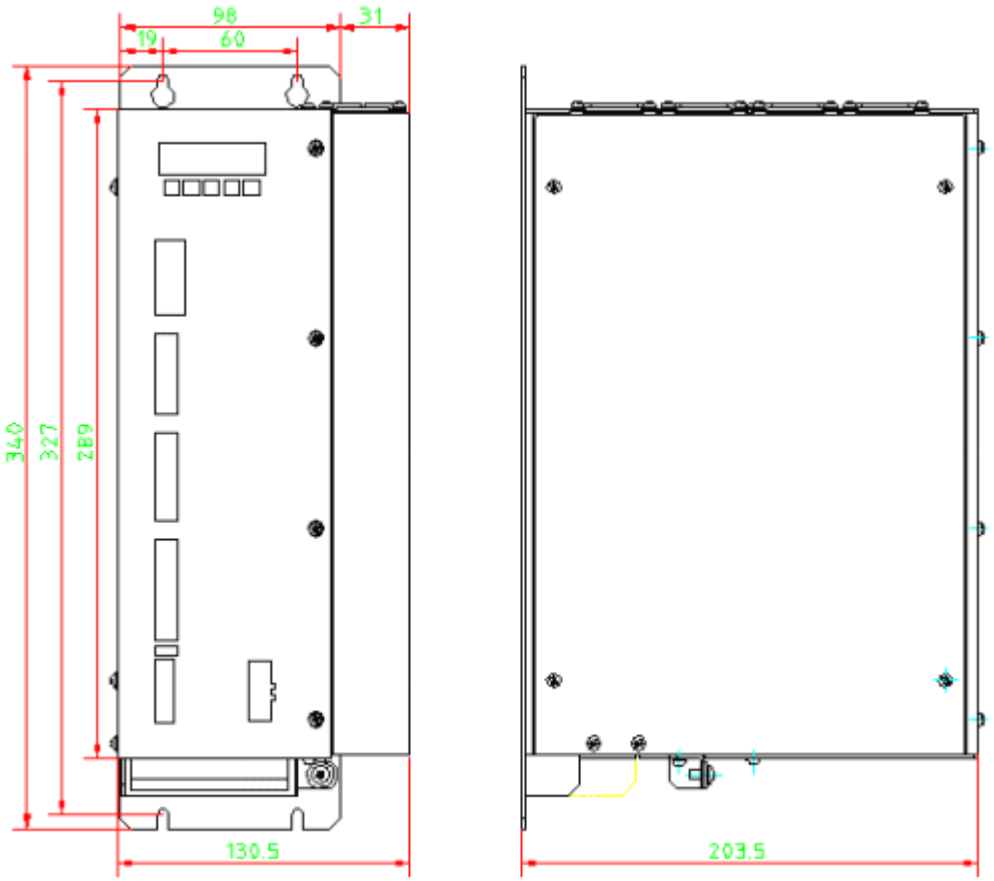
Parallel connect P and BK terminal of drive's XT1 heavy current I/O to external brake resistance if it's being used. The suggested value of the external brake resistance is as in the following table:

Recommended external brake resistance value

Specification	Max. brake current (A)	External brake resistance (recommended value)
HSV-18S-025	15	Only internal brake resistance recommended
HSV-18S-050	25	Resistance value: 51Ω power ≥800W
		Resistance value: 68Ω power ≥600W
HSV-18S-075	40	Resistance value: 24Ω Power ≥1500W

		Resistance value: 27Ω Power ≥1500W

HSV-18S-025, 050, 075 installation dimensions



NOTE: Use M4 screw for connection

Order information

HSV-18S modes description

HSV - 18S - XXX - YYY

18 type full-digital AC spindle drive	Specification: 020, 050, 075

GK6 series AC permasyn servo motor

Introduction

The AC servo drive, composed of the GK6 series motor and its corresponding servo drive unit, is widely used in machine tools, textile, printing, building, radar, and artillery motion control systems. The motor is self-cooling and the defense grade is IP64-IP67. The GK6 series motor consists of stator, rotor, high precision feedback components (such as photoelectric encoder, rotational transformer) and uses a high-performance rare-earth permanent magnet to form the air gap magnetic field.

The GK6 motor is a permanent magnet three phase synchronous servomotor controlled by pulse modulation transducer with good motion performance and a wide speed range. The motor is equipped with a temperature sensor in the stator.

GK6 series AC permasyn servo motor characteristics

- Torque:1.1 Nm~42 Nm
- Sine-wave AC servo motor
- Rated speed 1200, 1500, 2000, 3000 rpm
- Compact structure
- Photoelectric encoder: 2500 p/rev bus
- Low rotor inertia/swift response
- Brake power: DC24 V
- Rare-earth permanent magnet
- Over-heat protection
- Anti-demagnetization
- Various motor base dimensions
- Fully sealed design

Technical specifications

Motor type	AC servo motor（permasyn motor）
Magnet Isolation grade Feedback system Temperature protection	● Super high coercive force rare-earth permanent synchronous magnet ● Grade F, when environment temperature is +40℃, the temperature of stator winding can rise to ΔT=100K ● Standard type: photo electric encoder (with signal U, V, W) ● Spare type: circumrotational transformer ● Thermal resistor of PCT positive temperature coefficient, when T=20 C, R≤250Ω
Install mode Enclosure grade Coolant Paint	● IMB5 optional: IMV1, IMV3 ● DIN IP64 optional: DIN IP6F ● Natural cooling ● Standard: grey unglazed lacquer; option: customer's request
Bearings Radial axle sealing	● Double sided deep grove sealed ball bearing ● Sealing ring of driving terminal loaded axle

Axle extention	● Standard type: naled axle, without key ● Optional: keyways or as requested by customer
Vibration grade and rotation precision	N grade Optional: R grade, S grade N grade Optional: R grade, S grade
Noise Specifications	GK603 ≤ 55 dB(A); GK604 ≤ 55 dB(A); GK605 ≤ 60 dB(A); GK606 ≤ 65 dB(A); GK607 ≤ 65 dB(A); GK608 ≤ 70 dB(A); GK610 ≤ 70 dB(A); GK613 ≤ 70 dB(A); GK618 ≤ 76 dB(A);
Option	Maintenance-free permasyn security brake（German） High precision planetary gear decelerator

Motor specification

Standard data（adaptive with 3 phase 220V input drive）

Modes	Rated velocity r/min	Static torque M_0 Nm	Phase current I_0 A	Moment of inertia $10^{-4}Kgm^2$	Weight Kg	Adaptive drive/ load ratio
GK6032-6AC31	2000 3000	1.1	1.2 1.8	0.63	2.9	HSV-16-020/8.6 HSV-16-020/5.7
GK6040-6AC31 GK6040-6AF31 GK6040-6AK31	2000 3000 6000	1.6	2.1 3.2 6.4	1.87	3.7	HSV-16-020/4.9 HSV-16-020/3.2 HSV-16-020/1.6
GK6041-6AC31 GK6041-6AF31 GK6041-6AK31	2000 3000 6000	2.5	2.8 4.2 8.5	2.67	4.3	HSV-16-020/3.7 HSV-16-020/2.4 HSV-16-030/1.6
GK6042-6AC31 GK6042-6AF31 GK6042-6AK31	2000 3000 6000	3.2	3.0 4.5 9	3.47	5.0	HSV-16-020/3.4 HSV-16-020/2.3 HSV-16-030/1.5
GK6051-6AC31 GK6051-6AF31	2000 3000	2	2.4 3.5	1.73	4.5	HSV-16-020/4.3 HSV-16-020/2.9
GK6052-6AC31 GK6052-6AF31	2000 3000	3	3.0 4.5	3.0	5.5	HSV-16-020/3.4 HSV-16-020/2.3
GK6053-6AC31 GK6053-6AF31	2000 3000	4	4.0 5.0	4.27	6.5	HSV-16-020/2.6 HSV-16-020/2.0
GK6054-6AC31 GK6054-6AF31	2000 3000	5	5.0 6.0	5.55	7.5	HSV-16-020/2.0 HSV-16-020/1.7
GK6055-6AC31 GK6055-6AF31	2000 3000	6	6.0 8.0	6.83	8.5	HSV-16-020/1.7 HSV-16-030/1.7
GK6060-6AC31 GK6060-6AF31	2000 3000	3	2.5 3.8	4.4	8.5	HSV-16-020/4.1 HSV-16-020/2.7

GK6061-6AC31 GK6061-6AF31	2000 3000	6	5.5 8.3	8.7	10.6	HSV-16-020/1.8 HSV-16-030/1.6
GK6062-6AC31 GK6062-6AF31	2000 3000	7.5	6.2 9.3	12.9	12.8	HSV-16-020/1.6 HSV-16-050/2.7
GK6063-6AC31 GK6063-6AF31	2000 3000	11	9.0 13.5	17	14.5	HSV-16-030/1.5 HSV-16-050/1.8
GK6064-6AC31 GK6064-6AF31	2000 3000	4.5	3.7 5.5	6.7	9.5	HSV-16-020/2.8 HSV-16-020/1.8
GK6070-6AC31 GK6070-6AF31	2000 3000	3	2.5 3.8	4.4	8.5	HSV-16-020/4.1 HSV-16-020/2.7

Modes	Rated velocity r/min	Static torque M_0 Nm	Phase current I_0 A	Moment of inertia $10^{-4}Kgm^2$	Weight Kg	Adaptive drive/ load ratio
GK6071-6AC31 GK6071-6AF31	2000 3000	6	5.5 8.3	8.7	10.6	HSV-16-020/1.8 HSV-16-030/1.6
GK6072-6AC31 GK6072-6AF31	2000 3000	7.5	6.2 9.3	12.9	12.8	HSV-16-020/1.6 HSV-16-050/2.7
GK6073-6AC31 GK6073-6AF31	2000 3000	11	9.0 13.5	17	14.5	HSV-16-050/2.8 HSV-16-050/1.8
GK6074-6AC31 GK6074-6AF31	2000 3000	4.5	3.7 5.5	6.7	9.5	HSV-16-020/2.8 HSV-16-020/1.8
GK6080-6AC31 GK6080-6AF31	2000 3000	16	16 24	26.7	16.5	HSV-16-050/1.5 HSV-16-075/1.5
GK6081-6AA31 GK6081-6AC31 GK6081-6AF31	1200 2000 3000	21	12.2 20 30	35.7	19.5	HSV-16-050/2.0 HSV-16-075/1.8 HSV-16-100/1.6
GK6083-6AA31 GK6083-6AC31	1200 2000	27	16.2 26.5	44.6	22.5	HSV-16-050/1.5 HSV-16-100/1.9
GK6085-6AA31 GK6085-6AC31	1200 2000	33	19.8 33	53.5	25.5	HSV-16-075/1.8 HSV-16-100/1.5
GK6087-6AA31 GK6087-6AC31	1200 2000	37	22.2 37	62.4	28.5	HSV-16-075/1.6
GK6089-6AA31 GK6089-6AC31	1200 2000	42	25.2 42	71.3	31.5	HSV-16-100/1.9
GK6100-8AC31 GK6100-8AF31	2000 3000	18	17.5 24.5	57.2	21	HSV-16-075/2.0 HSV-16-100/2.0
GK6101-8AA31 GK6101-8AC31 GK6101-8AF31	1200 2000 3000	27	15.3 24.5 35	89.5	26	HSV-16-050/1.6 HSV-16-100/2.0
GK6103-8AA31 GK6103-8AC31	1200 2000	36	20.4 35	121.5	30	HSV-16-075/1.7
GK6105-8AA31 GK6105-8AC31	1200 2000	45	27 45	153.5	34	HSV-16-100/1.8
GK6107-8AA31 GK6107-8AC31	1200 2000	55	33 55	185.5	38	HSV-16-100/1.5
GK6109-8AA31 GK6109-8AC31	1200 2000	70	42 70	233.5	45	

Standard data (adaptive with 3 phase 380V input drive)

Modes	Rated velocity r/min	Static torque M_0 Nm	Phase current I_0 A	Moment of inertia $10^{-4}Kgm^2$	Weight Kg	Adaptive drive/ load ratio
GK6083-6AA61	1200	27	8.1	44.6	22.5	HSV-18D-25/2
GK6083-6AC61	2000		13.3			HSV-18D-50/2.4
GK6083-6AF61	3000		20			HSV-18D-75/2.3
GK6085-6AA61	1200	33	9.9	53.5	25.5	HSV-18D-50/3.3
GK6085-6AC61	2000		16.5			HSV-18D-50/2
GK6085-6AF61	3000		24.8			HSV-18D-75/1.9
GK6087-6AA61	1200	37	11.1	62.4	28.5	HSV-18D-50/2.9
GK6087-6AC61	2000		18.5			HSV-18D-75/2.5
GK6087-6AF61	3000		27.8			
GK6089-6AA61	1200	42	12.6	71.3	31.5	HSV-18D-50/2.6
GK6089-6AC61	2000		21			HSV-18D-75/2.2
GK6089-6AF61	3000		31.5			
GK6100-8AA61	1200	18	4.7	57.2	21	HSV-18D-25/3.4
GK6100-8AB61	1500		5.9			HSV-18D-25/2.7
GK6100-8AC61	2000		7.8			HSV-18D-25/2.1
GK6100-8AF61	3000		11.7			HSV-18D-50/2.8
GK6101-8AA61	1200	27	7.0	89.5	26	HSV-18D-25/2.3
GK6101-8AB61	1500		8.8			HSV-18D-50/3.7
GK6101-8AC61	2000		11.7			HSV-18D-50/2.8
GK6101-8AF61	3000		17.5			HSV-18D-75/2.6
GK6103-8AA61	1200	36	9.4	121.5	30	HSV-18D-50/3.4
GK6103-8AB61	1500		11.8			HSV-18D-50/2.7
GK6103-8AC61	2000		15.7			HSV-18D-50/2
GK6103-8AF61	3000		23.5			HSV-18D-75/2
GK6105-8AA61	1200	45	11.7	153.5	34	HSV-18D-50/2.8
GK6105-8AB61	1500		14.5			HSV-18D-50/2.2
GK6105-8AC61	2000		19.5			HSV-18D-75/2.4
GK6105-8AF61	3000		30.6			
GK6107-8AA61	1200	55	14.3	185.5	38	HSV-18D-50/2.2
GK6107-8AB61	1500		17.9			HSV-18D-75/2.6
GK6107-8AC61	2000		23.8			HSV-18D-75/1.9
GK6107-8AF61	3000		35.7			
GK6109-8AA61	1200	70	18.5	233.5	45	HSV-18D-75/2.5
GK6109-8AB61	1500		23.1			HSV-18D-75/2
GK6109-8AC61	2000		28.2			
GK6109-8AF61	3000		42.3			

Modes	Rated velocity rpm	Static torque M_0 Nm	Phase current I_0 A	Moment of inertia $10^{-4}Kgm^2$	Weight Kg	Adaptive drive/ load ratio
GK6130-8SW61	500	75	7.5	451	53	HSV-18D-25/2.1
GK6130-8SV61	750		11			HSV-18D-50/2.9
GK6130-8SE61	1000		15			HSV-18D-50/2.1
GK6130-8SA61	1200		18			HSV-18D-75/2.6
GK6130-8SB61	1500		23			HSV-18D-75/2
GK6130-8SC61	2000		30			
GK6131-8SW61	500	90	9	509	60	HSV-18D-50/3.6
GK6131-8SV61	750		14			HSV-18D-50/2.3
GK6131-8SE61	1000		18			HSV-18D-75/2.6
GK6131-8SA61	1200		22			HSV-18D-75/2.1
GK6131-8SB61	1500		27			
GK6131-8SC61	2000		36			
GK6132-8SW61	500	120	12	664	79	HSV-18D-50/2.7
GK6132-8SV61	750		18			HSV-18D-75/2.6
GK6132-8SE61	1000		24			HSV-18D-75/1.9
GK6132-8SA61	1200		29			
GK6132-8SB61	1500		36			
GK6132-8SC61	2000		48			
GK6133-8SW61	500	150	15	819	98	HSV-18D-50/2
GK6133-8SV61	750		23			HSV-18D-75/2
GK6133-8SE61	1000		30			
GK6133-8SA61	1200		36			
GK6133-8SB61	1500		46			
GK6133-8SC61	2000		60			
GK6135-8SW61	500	180	18	975	117	HSV-18D-75/2.6
GK6135-8SV61	750		27			
GK6135-8SE61	1000		36			
GK6135-8SA61	1200		43			
GK6135-8SB61	1500		54			
GK6135-8SC61	2000		72			
GK6137-8SW61	500	210	21	1130	135	HSV-18D-75/2.2
GK6137-8SV61	750		32			
GK6137-8SE61	1000		42			
GK6137-8SA61	1200		50			
GK6137-8SB61	1500		64			
GK6139-8SW61	500	270	26	1590	160	
GK6139-8SV61	750		39			
GK6139-8SE61	1000		52			
GK6139-8SA61	1200		62			
GK6139-8SB61	1500		78			

Motor socket PIN table

4P power socket

PIN	1	2	3	4
Signal	GND	U	V	W

6-pin power socket

PIN	1	2	3	4	Left one	Right one
Signal	GND	U	V	W	Brake +	Brake -

7P power socket (with brake)

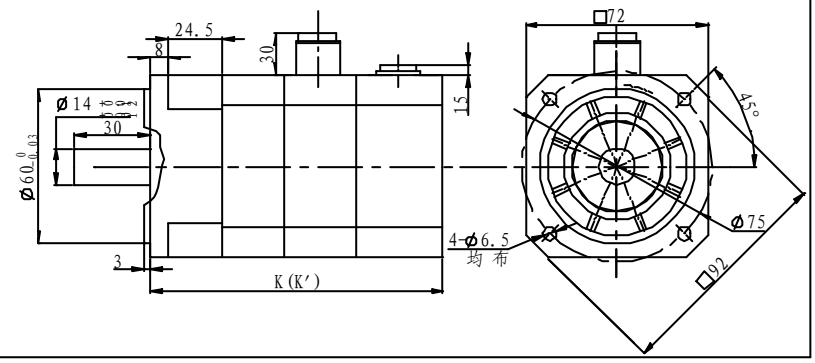
PIN	1	2	3	4	5	6	7
Signal	GND	U	V	W	Empty	Brake +	Brake -

17P encoder signal socket

PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Signal	GND	A	A-	B	B-	U	U-	V	V-	W	W-	+5V	0V	Empty	Empty	Z	Z-

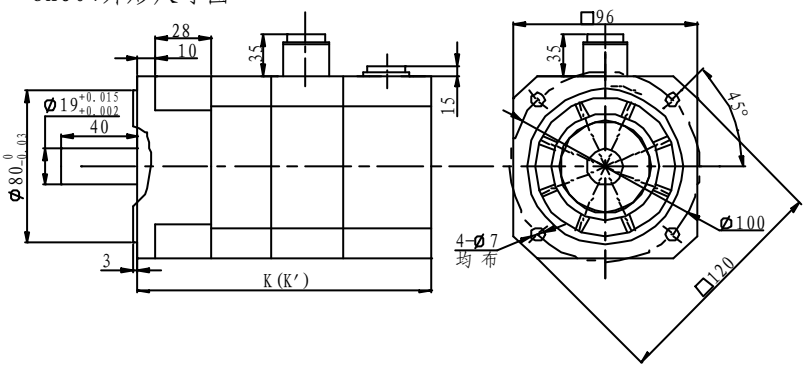
Servo motor dimension

GK603外形尺寸图



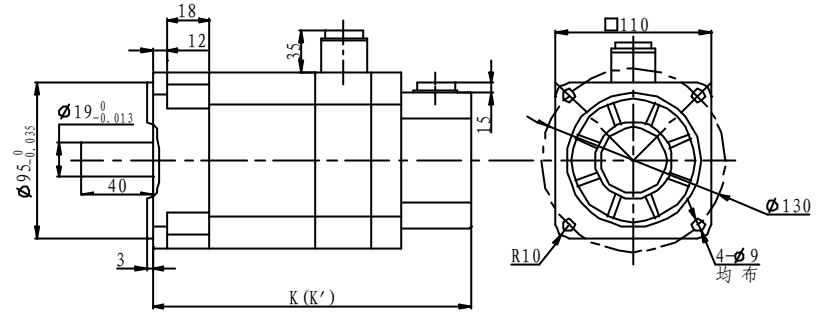
型 号	K	K′ (带制动器)
GK6032	179	179

GK604外形尺寸图



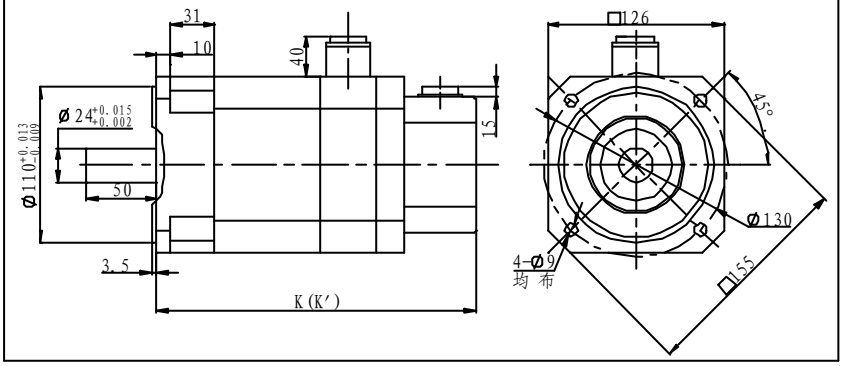
型 号	K	K′ (带制动器)
GK6040	179.5	179.5
GK6041	195.5	195.5
GK6042	211.5	211.5
GK6043	219.5	219.5
GK6044	243.5	243.5

GK605外形尺寸图



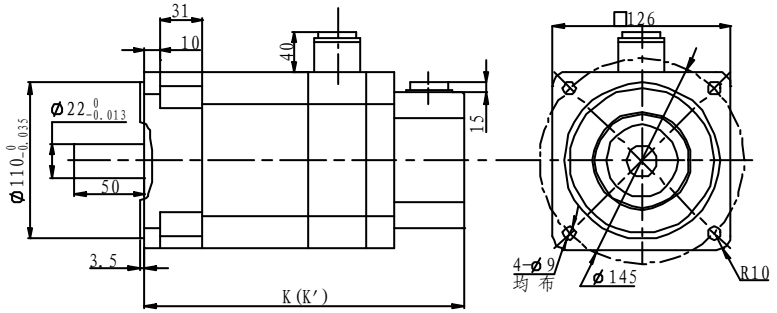
型 号	K	K′ (带制动器)
GK6051	154	154
GK6052	169	169
GK6053	184	184
GK6054	199	199
GK6055	214	214

GK606外形尺寸图



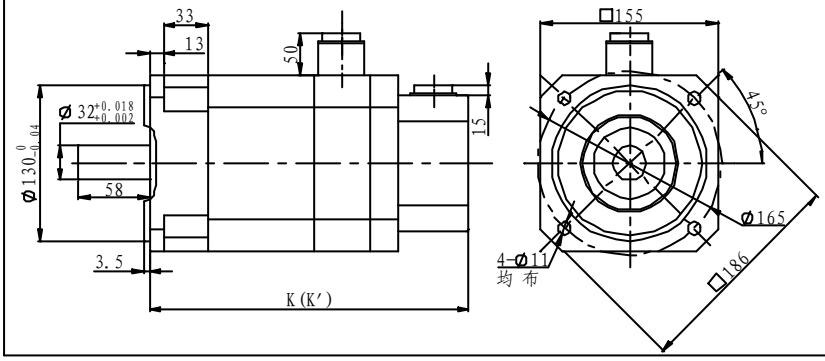
型 号	K	K′ (带制动器)
GK6060	173	188
GK6061	198	213
GK6062	223	238
GK6063	248	263
GK6064	186	201

GK607外形尺寸图



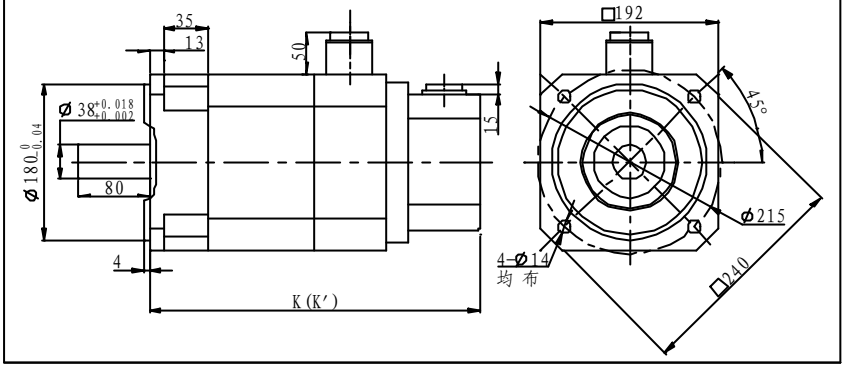
型号	K	K′ (带制动器)
GK6070	173	188
GK6071	198	213
GK6072	223	238
GK6073	248	263
GK6074	186	201

GK608外形尺寸图



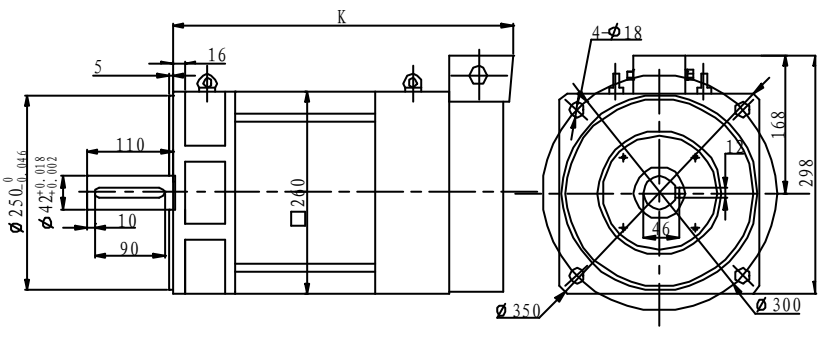
型号	K	K′ (带制动器)
GK6080	260	260
GK6081	285	285
GK6083	310	310
GK6085	335	335
GK6087	360	360
GK6089	385	385

GK610外形尺寸图



型号	K	K′ (带制动器)
GK6100	242	242
GK6101	268	268
GK6103	294	294
GK6105	320	320
GK6107	346	346
GK6109	385	385

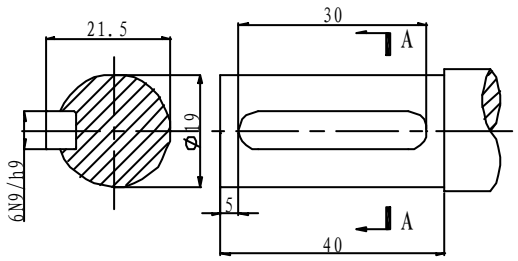
GK613外形尺寸图



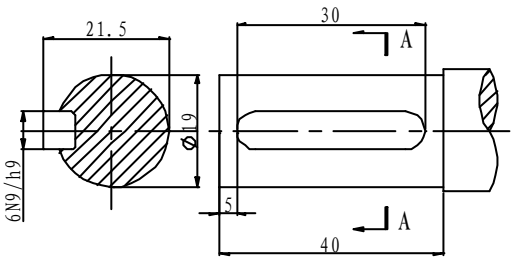
型号	K
GK6130	430
GK6131	445
GK6132	485
GK6133	525
GK6135	565
GK6137	605

Axis extension & keyway recommendation:

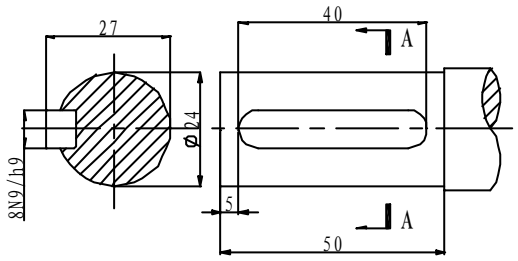
GK604带键轴伸图



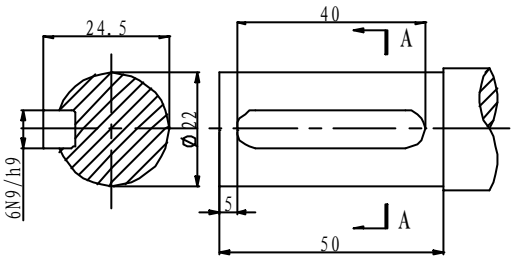
GK605带键轴伸图



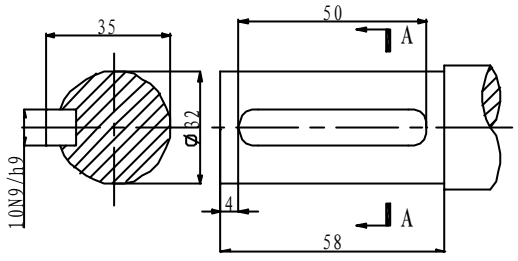
GK606带键轴伸图



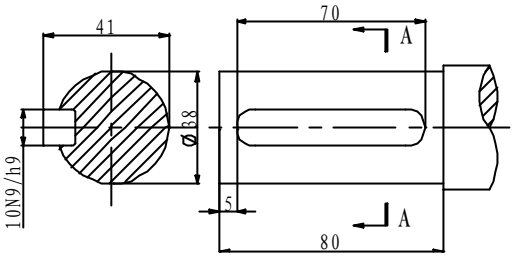
GK607带键轴伸图



GK608带键轴伸图



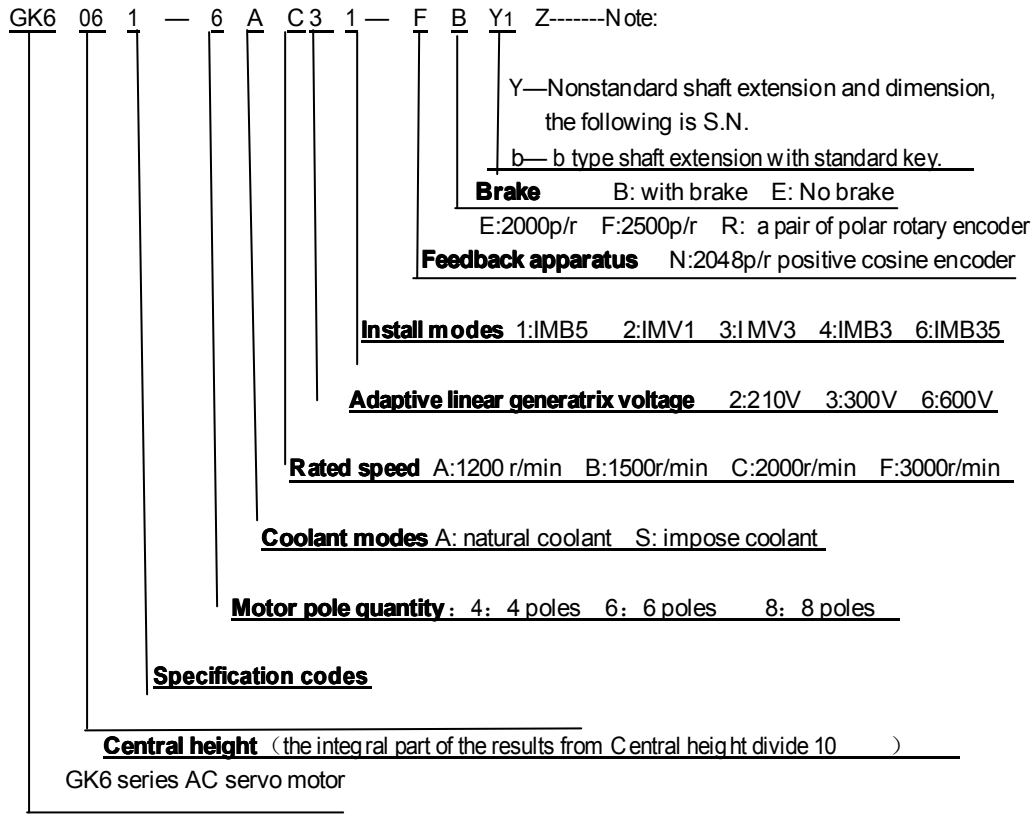
GK610带键轴伸图



Axis extension central hole recommendation

Modes	GK603	GK604	GK605	GK606	GK607	GK608	GK610	GK613	GK618
Central hole	M5	M6	M6	M8	M8	M10	M12	M16	M24
Screw height	12	12	12	14	14	18	22	26	34

Modes Discription



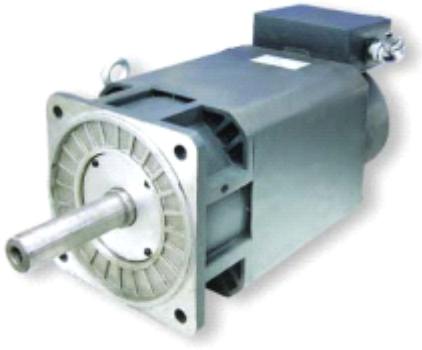
7. GM7 Series AC Servo Spindle Motor

GM7 Series AC Servo Spindle Motor

Introduction

The AC servo spindle motor of GM7 series, works well with top, middle and low end domestic and overseas AC servo spindle driving modules. It has excellent characteristics compared to the common AC frequency converter motors that are widely used by NC machine tools, machine builders, injection molding machines, textile equipment, light industrial machinery and other applications where AC servo spindle units are needed.

The GM7 series motor consists of stator, rotor, high precision feedback components (i.e., photoelectric encoder, rotational transformer) and uses high-performance rare-earth permanent magnets for the magnetic field air gap.



Features

- Compact structure, small size, light weight, and high power density
- Low vibration, low noise, high rotational precision, fixed

- Torque and range of power timing
- Small rotor inertia and fast response speed
- Even air gap, high precision balance and small torque variation
- All airproof design and DIN IP54 enclosure grade
- Special insulated structure, long life and high dependability
- High ratio of performance and price

Technical Standard

Type of motor	All-digital AC servo frequency conversation motor (squirrel-cage induction motor)
Insulatation grade	Grade F
Feedback	Incremental square wave; sine wave encoder
Temperature protection	Thermal resistor of PCT positive temperature coefficient
Installation form Protection grade Cooling Paint	IMB5 IBM35 DIN IP54 Optional: DIN IP55 Grey unglazed lacquer Optional: according to the customers' request
Bearings Radial axle sealing Axle extentions	Two-sided sealed deep grove ball bearings Sealing ring of driving terminal loaded axle
Vibration grade Circumrotating	Grade: N Optional: R
Noise	Motor base of 100 and 132: <= 70dB (A)
	Motor base of 160: <= 72dB (A)
	Motor base of 110: <= 76dB (A)
	Motor base of 225: <= 77dB (A)

GM7 specification

Technical data

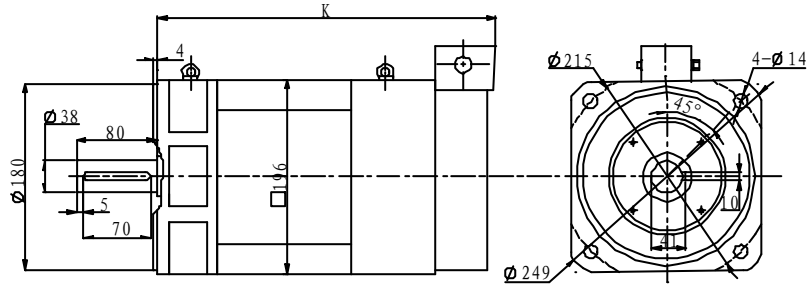
Modes	Rated power kW	Rated torque Nm	Rated current A	rated speed rpm	Max. speed rpm	turning inertia kgm^2	W.T Kg	Adaptive HSV-18S drive modes
GM7100-4SB61	2.2	14	6	1500	6000/9000	0.015	25	HSV-18S-25/2.7
GM7101-4SB61	3.7	23.6	10	1500	6000/9000	0.02	35	HSV-18S-50/3.2
GM7102-4SB61	3.0	19.1	8	1500	6000/9000	0.015	25	HSV-18S-25/2.0

GM7103-4SA61	3.7	35.3	10	1000	6000/9000			HSV-18S-50/3.2
GM7103-4SB61	5.5	35	13	1500	6000/9000	0.02	35	HSV-18S-50/2.5
GM7103-4SC61	7.5	35.8	18.8	2000	6000/9000			HSV-18S-75/2.5
GM7105-4SB61	7.5	47.8	18.8	1500	6000/8000	0.032	55	HSV-18S-75/2.5
GM7107-4SA61	6.3	60.2	19.4	1000	6000/8000			HSV-18S-75/2.4
GM7107-4SB61	9	57.3	23.5	1500	6000/8000	0.032	55	HSV-18S-75/2.0
GM7107-4SC61	10.5	50.1	26	2000	6000/8000			
GM7109-4SB61	11	70	25	1500	6000/8000	0.037	64	
GM7130-4SB61	5．5	35	13	1500	6000/8000	0.042	78	HSV-18S-50/2.5
GM7131-4SB61	11	70	24	1500	6000/8000	0.076	93	
GM7132-4SB61	7.5	47.8	18.8	1500	6000/8000	0.042	78	HSV-18S-75/2.5
GM7133-4SA61	12	114.6	30	1000	6000/8000			
GM7133-4SB61	15	95.5	34	1500	6000/8000	0.076	93	
GM7133-4SC61	20	95.5	45	2000	6000/8000			
GM7135-4SB61	18.5	117.8	42	1500	6000/8000	0.109	133	
GM7137-4SA61	17	162.3	43	1000	6000/8000			
GM7137-4SB61	22	140.1	57	1500	6000/8000	0.109	133	
GM7137-4SC61	28	133.7	50	2000	6000/8000			
GM7181-4SW61	12	229.2	30	500	6500			
GM7181-4SA61	22	210.1	55	1000	6500	0.3	310	
GM7181-4SB61	30	191	72	1500	6500			
GM7183-4SW61	16	305.6	37	500	6500			
GM7183-4SA61	28	267.4	71	1000	6500	0.37	336	
GM7183-4SB61	37	235.5	82	1500	6500			
Modes	Rated power kW	Rated torque Nm	Rated current A	rated speed rpm	Max. speed rpm	turning inertia kgm^2	W.T Kg	
GM7185-4SW61	22	420	76	500	5000			
GM7185-4SA61	39	372	90	1000	5000	0.15	390	
GM7185-4SB61	51	325	120	1500	5000	0.15	390	
GM7187-4SW61	30	565	105	500	5000			
GM7187-4SA61	51	487	118	1000	5000	0.67	460	
GM7187-4SB61	65	414	135	1500	5000			

GM7189-4SW61	36	688	79	500	5000	0.77	499	
GM7189-4SA61	60	573	132	1000	5000			
GM7189-4SB61	75	478	165	1500	5000			
GM7221-4SA61	71	678	164	1000	4500	1.48	650	
GM7221-4SB61	100	636	188	1500	4500			

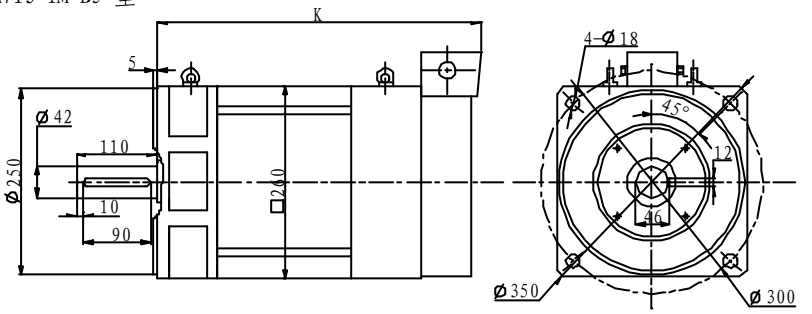
Motor dimension

GM710 IM B5 型



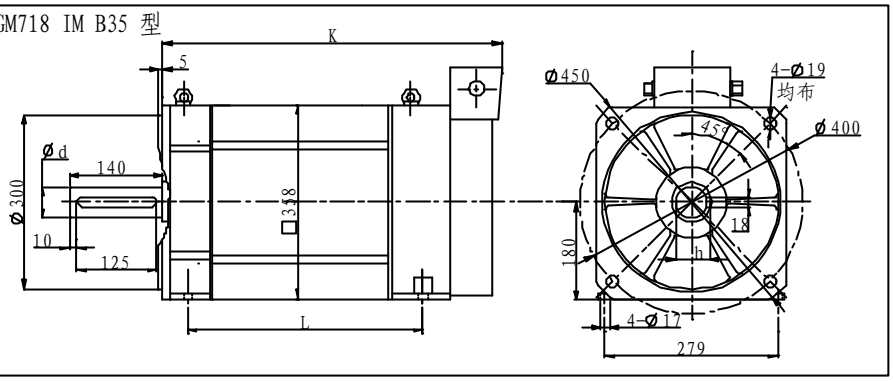
型号	K
GM7100	360
GM7101	405
GM7102	360
GM7103	405
GM7105	500
GM7107	500
GM7109	540

GM713 IM B5 型



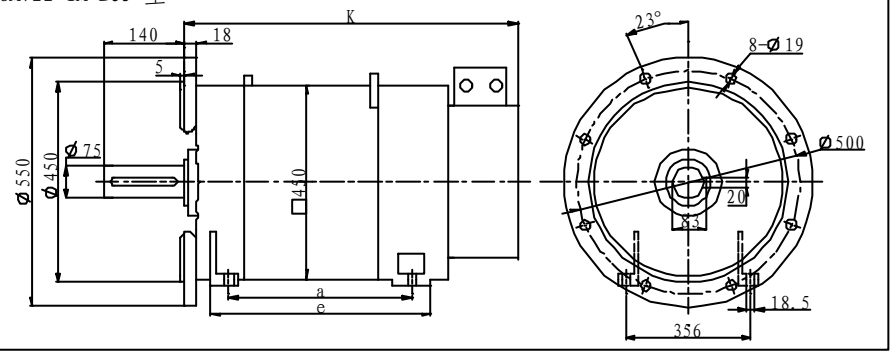
型号	K
GM7130	430
GM7131	510
GM7132	430
GM7133	510
GM7135	595
GM7137	595

GM718 IM B35 型



型号	K	L	d	h
GM7181	730	325	60	64
GM7183	765	360	60	64
GM7185	835	430	60	64
GM7187	925	520	65	69
GM7189	975	570	65	69

GM722 IM B35 型



型号	K	a	e
GM7221	960	445	540
GM7223	960	445	540

Century Star Order information

Order No.	Item	Specification	Remarks
HNC-21MF-08-F32	Century Star Milling CNC System (universal) 8.4' color LCD	Interface: Pulse, analog Memory: 32MB CF Card: 64MB	Standard configuration: 3 axes + Spindle Interface Input: 40 Output: 32
HNC-21MD-08-F32	Century Star Milling CNC System (pulse interface) 8.4' color LCD	Interface: pulse Memory: 32MB CF Card: 64MB	Standard configuration: 3 axes + Spindle Interface Input: 40 Output: 32
HNC-21TF-08-F32	Century Star Turning CNC System (universal) 8.4' color LCD	Interface: Series, pulse, analog Memory: 32MB CF Card:64MB	Standard configuration: 2 axes + Spindle Interface Input: 40 Output: 32
HNC-21TD-08-F32	Century Star Turning CNC System (pulse interface) 8.4' color LCD	Interface: pulse Memory: 32MB CF Card : 64MB	Standard configuration: 2 axes + Spindle Interface Input: 40 Output: 32
HNC-22MF-08-F32	Century Star Milling CNC System (universal) 10.4" color LCD	Interface: pulse, analog Memory: 32MB CF Card : 64MB	Standard configuration: 3 axes+Spindle Interface Input: 40 Output: 32
HNC-22MD-08-F32	Century Star Milling CNC System (pulse interface) 10.4" color LCD	Interface: pulse Memory: 32MB CF Card : 64MB	Standard configuration: 3 axes+Spindle Interface Input: 40 Output: 32
HNC-22TF-08-F32	Century Star Turning CNC System (universal) 10.4" color LCD	Interface: pulse, analog Memory: 32MB CF Card : 64MB	Standard configuration: 2 axes + Spindle Interface: Input: 40 Output: 32
HNC-22TD-08-F32	Century Star Turning CNC System (pulse interface) 10.4" color LCD	Interface: Pulse Memor: 32MB CF Card : 64MB	Standard configuration: 2 axes + Spindle Interface: Input: 40 Output: 32

HCNC-21/22 function options

HNT-0021-2001	Internet function	Internet interface, software
HNT-0021-2003	The third axis function	3 coordinated axes (lathe)

HNT-0021-2004	The fourth axis function	4 axes coordinated
HNT-0021-2005	I/O external	20 /16
HNT-0021-2006	I/O external	20/16
HNT-0021-5001	Blueprint programming	Milling blueprint programming
HNT-0021-5002	Background programming	Background programming
HNT-0021-5003	Coordinate programming	Coordinate programming
HNT-0021-5004	DNC software	DNC transportation
HNT-0021-1001	Custom-made screen	

HNC-18i/19i CNC controller

HNC-18i/TD	*Century Star* Turning System (pulse interface) 5.7" monchrome LCD	Interface: Pulse Memory: 32MB Program: 400K CF Card: Optional	Standard configuration: 2 axes+Spindle Interface Input: 32 Output: 24
HNC-18i/MD	*Century Star* Milling System (pulse interface) 5.7" monchrome LCD	Interface: Pulse Memory: 32MB Program: 400K CF Card: Optional	Standard configuration: 3 axes+Spindle Interface Input: 32 Output: 24
HNC-19i/TD	*Century Star* Turning System (pulse interface) 5.7" color LCD	Interface: Pulse Memory: 32MB Program: 400K CF Card: Optional	Standard configuration: 2 axes+Spindle Interface Input: 32 Output: 24
HNC-19i/MD	*Century Star* Milling System (pulse interface) 5.7" color LCD	Interface: pulse Memory: 32MB Program: 400K CF Card: optional	Standard configuration: 3 axes+Spindle Interface Input: 32 Output: 24

HNC-18i/19i function option

HNT-0018-2001	Internet function	Internet Interface, software
HNT-0018-2003	Third axis function	3-coordinated axis (Lathe)
HNT-0018-2008	Pitch error compensation	
HNT-0018-5003	Coordinate programming	Coordinate programming

HNT-0018-5004	DNC software	DNC
HNT-0018-1001	Custom-made screen	

HNC-18i/19i Manuals

HTD-0018-1001	Century Star Milling system operation manual
HTD-0018-1002	Century Star Milling system programming manual
HTD-0018-1003	Century Star Turning system operation manual
HTD-0018-1004	Century Star Turning system programming manual
HTD-0018-1005	Century Star CNC system connection manual
HTD-0018-1006	Century Star PLC manual

Storage option

CF-128MB	CF Card	128 MB
CF-256MB	CF Card	256 MB
CF-512MB	CF Card	512 MB
CF-1GB	CF Card	1 GB
CF-2GB	CF Card	2 GB

Component option

S-145	24V Power switch	145 W	
	Control transformer	1070 W	
	Control transformer	750 W	
	Lowpass filter	220 V, 6 A	
HWL-1000	Handwheel pulse generator		
HWL-1002	Handheld unit	Self-made	Includes handwheel pulse generator
HWL-1003	Handheld unit	Die	Includes handwheel pulse generator
HWL-2101	HNC-21 accessorial operation panel	die, right side	Includes handwheel pulse generator
HWL-2102	HNC-21 accessorial operation panel	die, down side	Includes handwheel pulse generator
HWL-2101N	HNC-21 accessorial operation panel (empty)	die, right side	Custom-made screen : $800 USD
HWL-2102N	HNC-21 accessorial operation panel (empty)	die, down side	Custom-made screen : $800 USD
HPG-1000	Spindle encoder		
HFD-1100	Interface adapting unit	former DNC unit	external keyboard cable, external series cable
HFD-1101	Floppy disk unit	1.44MB	External floppy cable,

			external keyboard cable, external series cable
HIO-3101	Input adapt terminal	20 route PNP and NPN	HNC-21/22
HIO-3201	Output adapt terminal	16 route PNP and NPN	HNC-21/22
HIO-3202	Relay terminal	8 route NPN Output and10 route relay	HNC-21/22
HIO-3103	Input switch terminal	4 route NPN	
HIO-3104	Input switch terminal	4 route PNP	
HIO-3204	relay switch terminal	3 route relay	

HNT-0018-2001	Internet function	Internet Interface, software
HNT-0018-2003	Third axis function	3 coordinated axes (Lathe)
HNT-0018-2008	Pitch error compensation	
HNT-0018-5003	Coordinated programming	Coordinated programming
HNT-0018-5004	DNC software	DNC
HNT-0018-1001	Custom-made screen	

HTD-0018-1001	Century Star Milling system operation manual	
HTD-0018-1002	Century Star Milling system programming manual	
HTD-0018-1003	Century Star turning system operation manual	
HTD-0018-1004	Century Star turning system programming manual	
HTD-0018-1005	Century Star CNC system connection manual	
HTD-0018-1006	Century Star PLC manual	

Cable option

S.N	Type	Name （function）	Length
1	HCB-0021-1001-XXX	HNC-21 power cable	3,5,7,10,15,20 m
2	HCB-0021-2001	Century Star external floppy	fixed length 300 mm
3	HCB-0021-2002	Century Star external internet cable	fixed length 300 mm
4	HCB-0021-2003	Century Star keyboard external cable	fixed length 300 mm
5	HCB-0021-2004	Century Star external series cable	fixed length 300 mm
6	HCB-0021-2005	Handheld unit connecting cable	fixed length
7	HCB-0021-3002-XXX	Century Star Internet communication cable	3,5,7,10,15,20 m
8	HCB-0021-3004-XXX	Century Star series communication cable	3,5,7,10,15,20 m
9	HCB-0021-3005-XXX	HNC-21 Spindle instruction cable	3,5,7,10,15,20 m
10	HCB-0021-3015-XXX	HNC-21 Spindle analog instruction cable	3,5,7,10,15,20 m

11	HCB-0021-3006-XXX	HNC-21 feeding axis instruction cable	3,5,7,10,15,20 m
13	HCB-0021-3017-XXX	HNC-21/HSV-16D instruction cable	3,5,7,10,15,20 m
14	HCB-0021-3027-XXX	HNC-21/HSV-20D instruction cable	3,5,7,10,15,20 m
15	HCB-0021-3028-XXX	Hnc-21/HSV-20S instruction cable	3,5,7,10,15,20 m
16	HCB-0021-3008-XXX	HNC-21 on-off value Input cable	3,5,7,10,15,20 m
17	HCB-0021-3009-XXX	HNC-21 on-off value Output cable	3,5,7,10,15,20 m
18	HCB-0021-3019-XXX	HNC-21 on-off value relay terminal Output cable	3,5,7,10,15,20 m
9	HCB-0018-3005-XXX	HNC-18 Spindle instruction cable	3,5,7,10,15,20 m
0	HCB-0018-3015-XXX	HNC-18 Spindle encoder cable	3,5,7,10,15,20 m
13	HCB-0018-3017-XXX	HNC-18/HSV-16D instruction cable	3,5,7,10,15,20 m
14	HCB-0018-3027-XXX	HNC-18/HSV-20D instruction cable	3,5,7,10,15,20 m
16	HCB-0018-3008-XXX	HNC-18on-off value Input cable	3,5,7,10,15,20 m
17	HCB-0018-3009-XXX	HNC-18 on-off value Output cable	3,5,7,10,15,20 m
6	HCB-0018-2005	Handheld unit connecting cable	fixed length
19	HCB-9011-3004-XXX	HSV-11~GK6 motor coded wheel cable	3,5,7,10,15,20 m
20	HCB-9011-3005-XXX	HSV-16D~GK6 motor coded wheel cable	3,5,7,10,15,20 m
21	HCB-9011-3006-XXX	HSV-20D~GK7 motor coded wheel cable	3,5,7,10,15,20 m
22	HCB-9011-3007-XXX	HSV-20S~GM7 motor coded wheel cable	3,5,7,10,15,20 m
23	HCB-9011-4003-XXX-S□-P□M	HSV-11~GK6 motor power cable	3,5,7,10,15,20 m
24	HCB-9011-4004-XXX-S□-P□M	HSV-16D~GK6 motor power cable	3,5,7,10,15,20 m
25	HCB-9011-4005-XXX-S□-P□M	HSV-20D~GK7 motor power cable	3,5,7,10,15,20 m
26	HCB-9011-4006-XXX-S□-P□M	HSV-20S~GM7 motor power cable	3,5,7,10,15,20 m
27	HCB-9011-4013-XXX-S□-P□M	HSV-11~GK6 motor power cable (with brake)	3,5,7,10,15,20 m
28	HCB-9011-4014-XXX-S□-P□M	HSV-16D~GK6 motor power cable (with brake)	3,5,7,10,15,20 m
29	HCB-9011-4015-XXX-S□-P□M	HSV-20D~GK7 motor power cable (with brake)	3,5,7,10,15,20 m
30	HCB-9011-4016-XXX-S□-P□M	HSV-20S~GM7 motor power cable (with brake)	3,5,7,10,15,20 m

Notice:

1. --XXX stands for the length of the cable (unit: meter), the standard length are 3 m, 5 m, 7 m, 10 m, 15 m, 20 m, it also can be made according to the requirements of the customers. E.g.:

-005 for 5 m, -010 for 1 0m

Sample order of lathe (CJK6132)

Basic configuration

S.N	Item	Order No.	Function	Qty
1	Huazhong Century Star Turning system	HNC-21TD-32-F32	Huazhong Century Star Turning system: 1. IPC: ■ 8.4″color LCD； ■ 486 CPU: ■ 32MB RAM, 32MB electronic disk ■ 3 group keyboard 2. Turning software； 3. Pulse servo control interface (2 axis) 4. Spindle control interface module（0-10V output） 5. PLC input control module（photoelectric isolated 40 channel） 6. PLC output control module（photoelectric isolated 32 channel）	1
		HSV-16D-020	AC servo drive unit	2
		GK6064-6AB31-FE	Servo motor, 4.5 Nm	1
		GK6062-6AB31-FE	Servo motor, 7.5 Nm	1
2	Technical data	HNT-0021-4003	Turning operation manual	1
		HNT-0021-4004	Turning programming manual	1

Optional configuration（customer-made available）

NOTE: XXX is cable length, unit: meter

S.N	Item	Order No.	Function	Qty
1	Cable	HCB-9011-3005-XXX	HSV-16D-GK6 motor coded disk cable	2
		HCB-9011-4004-XXX	HSV-16D-GK6 motor power cable	2
		HCB-0021-3017-XXX	HNC-21/HSV-16D instruction cable	2
		HCB-0021-1001-XXX	HNC-21 power cable	1
		HCB-0021-3008-XXX	HNC-21 switch value Input cable	1
		HCB-0021-3009-XXX	HNC-21 switch value output cable	1
2	Component option	HWL-1001	Handheld unit	1
		HFD-1101	Floppy unit	1
		HIO-3101	Input adapt terminal（20）	1
		HIO-3202	Output adapt terminal（10）	1
3	Technical	HNT-0021-4005	Connection manual	1

	data	HNT-0021-4006	PLV programming manual	1
			16 series servo manual	1
4	Function option	HNT-0021-2001	Network function	1
		AC380V-220V/2KVA	Servo transformer	1
		S-145-24	AC air switch	1
5	Others		Lowpass filter 6A 250V	1
			Spindle encoder, 1024 bus	1

Sample order of milling machine (XKA714)

Basic configuration

Item	Order No.	Function	Qty
Huazhong Century Star Milling System	HNC-22MD-32-F32 HNC-21MD-32-F32）	Huazhong Century Star Milling System: 1. IPC: a) 8.4″color LCD； b) 486 CPU: c) 32MB RAM, 32MB electronic disk d) 3 group keyboard 2. Milling software； 3. Pulse servo control interface (3 axes) 4. Spindle control interface module （0-10V output） 5. PLC input control module (photoelectric isolated 40 channel） 6. PLC output control module (photoelectric isolated 32 channel)	1
	HSV-18D-025	18 series AC servo drive	3
	GK6063-6AC61-FE	High-voltage servo motor, 11Nm	2
	GK6063-6AC61-FB	High-voltage servo motor, 11Nm, with brake	1
Technical data	HNT-0021-4001 HNT-0021-4002	Milling operation manual Milling programming manual	1 1

Optional configuration (customer-made available）

NOTE: XXX is cable length, unit: meter

Item	Order No.	Function	Qty
Cable	HCB-9011-3016-XXX	HSV-18D-GK6 motor coded disk cable	3
	HCB-9011-4025-XXX	HSV-18D-GK6 motor power cable	3
	HCB-0021-3037-XXX	HNC-21/HSV-16D instruction cable	3
	HCB-0021-1001-XXX	HNC-21 power cable	1

	HCB-0021-3008-XXX	HNC-21 switch value Input cable	1
	HCB-0021-3009-XXX	HNC-21 switch value output cable	1
Component option	HWL-1002	Handheld unit	1
	HFD-1101	Floppy unit	1
	HIO-3101	Input adapt terminal（20）	1
	HIO-3102	Output adapt terminal（10）	1
Technical data	HNT-0021-1005	Connection manual	1
	HNT-0021-1006	PLV programming manual	1
		18 series servo manual	1
Function option	HNT-0021-2001	Network function	1
	WDSK-7.5	Three-phase AC reactor, 7.5KVA	1
	S-100-24	DC power switch	1
Others	HSV-18S-050	High-voltage servo spindle drive	1
	GM7103-4SB61	High-voltage servo spindle motor 5.5kW, Rated speed 1500rpm Max. speed 6000rpm	
Servo spindle options	HCB-9011-3007-XXX	HSV-18-GM7 spindle motor coded disk cable	1
	HCB-9011-4006-XXX	HSV-18-GM7 servo motor power cable	1
	HCB-0021-3037-XXX	Century star-HSV-18 instruction cable	1
	HNT-0021-4009	18 series servo spindle drive manual	1