# **Integrated Servo Motor UCS57**

### **Introduction**

UCS57 is a new generation of high performance digital integrated servo drive motor, which is a series of low voltage AC servo products integrated with AC servo motor and drive developed by our company based on many years of successful experience of low voltage AC servo and integrated products. This product adopts the latest 32 bit DSP chip and optimized control algorithm technology, and provides a cost-effective drive for device manufacturers.

UCS57 has compact structure and small volume. The connection between drive and motor is saved, and the electromagnetic interference between lines is reduced because of the integration of drive and motor. UCS57 has adopted a better anti-vibration and low heating technology, which effectively solves the problems such as heat and noise.

#### **Features**

- Working voltage: DC input voltage 24VDC to 36VDC
- Integrated compact size for saving mounting space & setup time, and reducing electrical interference
- Acceptable differential and single end pulse/direction instructions
- Over voltage, over-current, and position-error protection
- Common gear ratio and direction can be set by external dialing
- less tracking error by two-phase PID parameter adjustment
- Run more smoothly with built-in speed / position smooth function

### **Applications**

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Suitable for all kinds of small and medium-sized automation equipment and instruments, such as inkjet printer, small and medium-sized engraving machine, electronic processing equipment, automatic grabbing equipment, special CNC machine, packaging equipment and so on. It is preferred in devices with low noise and high speed.

# **Specifications**

## Electrical Specifications

Parameter	Min	Typical	Max	Unit
Continuous Current	0	-	6	А
Input Voltage	24	36	36	Vdc
Logic Signal Current	7	10	16	mA
Pulse Voltage	5	5	24	V
Pulse Input Frequency	0	-	200/500	kHz
Isolation Resistance	100	-	-	MΩ

# Motor Specifications

Parameter	Unit	UCS57-90	UCS57-130	UCS57-180
Rated Power	W	90	130	180
Rated Torque	N.M	0.3	0.45	0.6
Peak Torque	N.M	0.8	1.1	1.5
Rated Speed	rpm	3000	3000	3000
Rated Current	А	3.6	5.4	7.5



#### **Operating Environment**

Cooling	Natural Cooling or Forced Cooling		
	Environment	Avoid dust, oil fog and corrosive gases	
Operating	Temperature	0°℃—40°℃	
Environment	Humidity	40-90%RH	
	vibration	10~55Hz/0.15mm	
Storage Temperature	-20+80°C		
Weight	1.5kg		

# **Connectors and Pin Assignment**

#### **Power Connector**

Pin	Name	Description
1	+VDC	Power Supply Input (Positive), 24-36VDC recommended.
2	GND	Power Ground (Negative)



#### **Control Signal Connector**

Pin	Name	Description
1	PUL+	Pulse Signal: In single pulse (pulse/direction) mode, this input represents pulse signal, active at each rising or falling edge (Software configurable). In double pulse mode (software
2	PUL-	configurable), this input represents clockwise (CW) pulse, active both at each high level and low level.
3	DIR+	Direction Signal: In single pulse mode, this signal has low/high voltage levels, representing two directions of motor rotation. In double, pulse, mode, (software, configurable), this signal is
4	DIR-	counter-clock (CCW) pulse, active both at high level and low level.
5	ENA+	Enable Signal: This signal is used for enabling/disabling the driver.
6	ENA-	and low level for disabling the driver.
7	PED+	In-position Signal: OC output signal, activated when actual motor position reaches to target position. By default, the impedance
8	PED-	between PED+ and PED- is low for normal operation and becomes high when the target position is reached.
9	ALM+	Alarm Signal: OC output signal, activated when one of the following protection is activated: over-voltage and over current array By default the impedance between ALM and ALM is low
10	ALM-	for normal operation and becomes high when any protection is activated.

Note: When the motor alarm, it will change the state of the alarm output. The "Pend" port is normally closed state and after the alarm is normally open state; the "ALM" port is normally open state and after the alarm is normally closed state. The user can access the "Pend" or "ALM" port according to the alarm input type of the controller or control card, and trigger the controller or control card alarm when the drive alarm, so as to make the processing stop.

#### **RS232** Communication Connector

Pin	Name	Description
1	+5V	+5V power output (Note: Do not connect it to PC's serial port)
2	TXD	RS232 transmit
3	GND	Ground
4	RXD	RS232 receive
5	NC	Not connected



#### State indication

The green LED is a power indicator. When the drive is connected to the power, the LED is always bright. And the LED will be extinguished when the drive is switched off. The red LED is a fault indicator. When a fault occurs, the indicator is cyclically flashing, and when the fault is cleared by the user, the red LED will be extinguished. The red LED flashing different represent different situations, as shown in the following table:

Number	Red light flashing	Description
1	Flashing interval of 1 s	Lost step
2	Always bright	Motor over current
3	Flashing interval of 2 s	Excessive input voltage

#### Control signal interface circuit

The interface circuit of the UCS57 integrated servo motor adopts optical coupling signal isolation, the connection method is differential connection, and the anti-interference performance is good.



Common cathode connection



#### Common anode connection

### **DIP Switch Settings**

The UCS57 drive uses a 4-bit DIP switch to set the subdivision precision and the rotation direction of the motor. Use the following table for their pulses/rev setting via the DIP switch.

#### Pulses/Rev Setting(S1-S4)

SW1	SW2	SW3	SW4	Pulses/Rev (S1-S4)
on	on	on	on	400
off	on	on	on	800
on	off	on	on	1600
off	off	on	on	3200
on	on	off	on	6400
off	on	off	on	12800
on	off	off	on	25600
off	off	off	on	51200
on	on	on	off	1000
off	on	on	off	2000
on	off	on	off	4000
off	off	on	off	5000
on	on	off	off	8000
off	on	off	off	10000
on	off	off	off	20000
off	off	off	off	40000



#### Introduction of matching servo debug software

If you want to modify the parameters, you must debug through Chuangwei motor servo parameter configuration software. The online steps are as follows:

A: The computer must install the RS232 driver.

B: Connect the USB cable to the computer and check the serial number.

C: Open the debug software to select the serial port and click "online".

D: Modify parameters after online, and then click "write parameters" to wait for the "parameter write success" in the status bar, that is write completion.

Parameter description					
Number	Name	Set point	Valid range		
1	Current loop low speed ratio	500	0-1000		
2	Current loop low speed integral	100	0-1000		
3	Current loop high speed ratio	500	0-1000		
4	Current loop high speed integral	100	0-1000		
5	Speed loop low speed ratio	50	0-1000		
6	Speed loop low speed integral	10000	0-10000		
7	Speed loop low speed differential	0	0-1000		
8	Speed loop low speed ratio feed-forward	0	0-1000		
9	Speed loop low speed acceleration feed-forward	0	0-1000		
10	Speed loop high speed ratio	50	0-1000		
11	Speed loop high speed integral constant	10000	0-10000		
12	Speed loop high speed differential	0	0-1000		
13	Speed loop high speed ratio feed-forward	20	0-1000		
14	Speed loop high speed acceleration feed-forward	100	0-1000		
15	Electronic gear ratio molecule	800	0-51200		



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16	Electronic gear ratio denominator	4000	0-51200
17	Position loop low speed ratio	100	0-1000
18	Position loop low speed integral	0	0-1000
19	Position loop high speed ratio	100	0-1000
20	Position loop high speed integral	0	0-1000
21	Initial lock current	500	0-1000
22	Running direction	0	0-1
23	Maximum position deviation	2000	0-5000
24	Alarm output,0 stands normally open and 1 stands normally closed	0-Normal ly open	0-1
25	Torque output filter enable	0	0-1
26	Pulse mode rising edge or falling edge	0-Rising edge	0-1
27	Pulse input smoothing filter coefficient	0-Filter enable	0-1
28	Maximum torque output	500	0-1000
29	Encoder line number	4000	0-10000
30	Control mode selection	1	0-1

Note1: The parameter of this graph is the default parameter. For easy debugging, you can read the parameters first and then change the data written to the chip based on the read parameters.

Note2: Debugging the software, you should contact the technician to prevent excessive parameters and cause burn out motor drive.

### **Mechanical Specifications**





### Mechanical Specification of UCS57-90





Mechanical Specification of UCS57-130



Mechanical Specification of UCS57-180