

RS Series Function Setting

1. Position mode

(1) Pulse control

A. Parameter setting

- P01.00 = 0 Control mode: position mode
- P02.01 = 1 Servo enable
- P03.00 = 0 Position command source: Pulse command
- P01.01 = 0 Motor initial running direction: Forward
- P01.01 = 1 Motor initial running direction: Reverse

B. Motor running parameter setting

- P03.01 = 0 Control mode: Pulse + Direction
- P03.06 = 10000 Set the motor subdivision

note: The subdivision setting has high and low bits, see the user manual for details

C. Motor running instructions

The motor runs according to the pulse sent by the plc or the control card.

(2) Step amount (Fixed-length control)

A. Parameter setting

- P01.00 = 0 Control mode: position mode
- P02.01 = 1 Servo enable
- P03.00 = 1 Position command source: Step amount

B. Motor running parameter setting

- P03.28/P03.29 = 10000 Motor fixed-length running stroke, positive and negative represent the direction
- P03.30 = 1000 Motor fixed-length running speed
- P03.31 = 200 Motor running acceleration time constant
- P03.32 = 200 Motor running deceleration time constant

C. Motor running instructions

The input function of the digital IO parameter of group P02 is selected as "13-step-by-step positional trigger". When the logic selection of this terminal is valid, the motor runs the position command stroke set by the parameter P0328/P0329. When the terminal logic selection is invalid, the servo motor is locked.

(3) Multi-segment position command

A. Parameter setting

P01.00 = 0 Control mode: position mode

P02.01 = 1 Servo enable

P03.00 = 2 Position command source: Multi-segment position command

B. Motor running parameter setting

P09.00 = 0 Multi-segment position running mode: Single

P09.01 = 1 Set the number of end segments of the motor (set the position control table of up to 16 segments in sequence)

P09.03 = 0 Motor waiting time unit: millisecond

P09.04 = 0 Displacement instruction type selection: Relative

P09.12 = 10000 Set motor running 1st position command

P09.14 = 100 Set the motor running speed

P09.15 = 100 Set the motor running acceleration and deceleration time

P09.16 = 100 Set the wait time in section 1

C. Motor running instructions

- P09.00 = 0 Multi-segment position running mode: Single

In the enabled state, the input function of the digital IO parameters of group P02 is selected as "21-Position table start". When the terminal logic selection is valid, the motor completely runs the total number of segments of the multi-segment position command set by P09.01 once, and completes one round of running.

- P09.00 = 1 Multi-segment position running mode: Repeat

In the enabled state, the input function of the digital IO parameter of group P02 is selected as "21-Position table start". When the terminal logic selection is valid, the motor completely runs the total number of segments of the multi-segment position command set by P09.01 once, and the completion is completed. After one round of operation, re-enable the multi-segment position command, and the drive starts to run sequentially from the first segment. When the terminal logic selection is invalid, the motor stops.

- P09.00 = 2 Multi-segment position running mode: IN port control

In the enabled state, the input function selection of the digital IO parameters of group P02 is "21-Position table start", and the terminal logic selection is valid, and the terminal functions selected under the digital IO parameters are 14~17 (FunIN.13~FunIN.16: Multi-segment position command switching), and determine the valid logic of the IN terminal, select whether the terminal logic is valid or not, generate the corresponding displacement segment number, and the motor starts to run according to the segment number.

The details are as follows:

Coding	Name	Function name	Function																														
FunIN.14	CMD1	Multi-segment operation command switching 1	The multi-segment segment number is a 4-digit binary number, and the corresponding relationship between CMD1 ~ CMD4 and the segment number is as follows: <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>CMD4</th> <th>CMD3</th> <th>CMD2</th> <th>CMD1</th> <th>段号</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td colspan="5" style="text-align: center;">.....</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>15</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>16</td> </tr> </tbody> </table> The logic of the IN terminal is level valid, the CMD value is 1 when the input level is valid, otherwise it is 0	CMD4	CMD3	CMD2	CMD1	段号	0	0	0	0	1	0	0	0	1	2					1	1	1	0	15	1	1	1	1	16
CMD4	CMD3	CMD2		CMD1	段号																												
0	0	0		0	1																												
0	0	0		1	2																												
.....																																	
1	1	1	0	15																													
1	1	1	1	16																													
FunIN.15	CMD2	Multi-segment operation command switching 2																															
FunIN.16	CMD3	Multi-segment operation command switching 3																															
FunIN.17	CMD4	Multi-segment operation command switching 4																															

Note: When the multi-segment position operation mode is set to IN switching operation, please configure the 4 IN terminals of the drive (the number of IN terminals required can be set according to the actual number of running stages) as functions 14 ~ 17 (FunIN.13 ~ FunIN.16: multi-segment position command switching), and confirm the valid logic of IN terminal.

(4) Communication control

Note: This function includes communication control motor jog (speed mode) and point (fixed-length mode) movement.

Before the motor runs, the start signal needs to be written.

A. Parameter setting

- P01.00 = 0 Control mode: position mode
- P02.01 = 1 Servo enable
- P03.00 = 3 Position command source: Debug position instruction

B. Motor running parameter setting

- P04.60 = 50000 Set the number of pulses of the communication command
- P04.62 = 1000 Set the motor running speed
- P04.63 = 200 Set the motor acceleration time
- P04.64 = 200 Set the motor acceleration time
- P12.10 = 6 Command waiting to be triggered

C. Motor running instructions

The start-stop command of running is written in P12.10, and the motor will run according to the running curve determined by the command stroke, speed and acceleration/deceleration time constant set by P04.60~P04.64.

- P12.10 = 0 Motor deceleration stop
- P12.10 = 1 The motor runs forward with a fixed-length according to the number of pulses in the parameter address of P04.60
- P12.10 = 2 The motor runs reverse with a fixed-length according to the number of pulses in the parameter address of P04.60

- P12.10 = 3 The motor jogs forward at the speed of P04.62
- P12.10 = 4 The motor jogs reverse at the speed of P04.62
- P12.10 = 5 Motor emergency stop
- P12.10 = 6 Command waiting to be triggered

D. Motion test mode

Motor running parameter setting

- P04.65 = 0 Motion test active: Reciprocating
- P04.66 = 0 Start direction: Positive
- P04.67 Setting motion times
- P12.12 = 200 Demonstration operation delay time

Motor running instruction

- P12.13 = 0 The motor stops the operation of the demo mode
- P12.13 = 1 The motor starts the operation of the demo mode
- P12.13 = 2 Meaningless

In the motion test mode, the motor starts in the reciprocating or unidirectional direction (P04.65=0/1), and starts in the positive or negative direction (P04.66=0/1), run the times set by P04.67. After completing the set running command each time, after delaying the delay time set by P12.12, it will start again and run in this cycle.

(5) Communication trigger control

Note: This function only controls the movement of the motor point (fixed-length mode) through communication.

Write the high 16-bit register (P03.58) of the stroke/position through the upper computer communication to realize the start of the motor.

A. Parameter setting

- P01.00 = 0 Control mode: position mode
- P02.01 = 1 Servo enable
- P03.00 = 4 Position command source: Communication

B. Motor running parameter setting

- P03.53 = 0 Communication control position command type: Incremental position mode
- P03.54 = 100 Motor acceleration time
- P03.55 = 100 Motor deceleration time
- P03.56 = 500 Motor running speed
- P03.57/03.58 = 10000 Communication control position command

C. Motor running instructions

Write the running relative stroke or absolute position parameter P03.58 through communication (P03.57 is displayed on the LED display panel of the

drive, and the position command stroke is composed of the two registers P03.57/P03.58 as a signed 32-bit integer Numerical value, in which P03.57 is the lower 16-bit value, and P03.58 is the upper 16-bit value. The trigger mode of communication control is to write the value of P03.58 (higher 16-bit) through communication to start the operation.

(6) Fixed-length/Jog control (IO control)

A. Parameter setting

P01.00 = 0 Control mode: position mode
P02.01 = 1 Servo enable
P03.00 = 5 IO control

B. Motor running parameter setting

- Point (fixed-length mode) control:
 - P03.53 = 0 Communication control position command type: Incremental position mode
 - P04.20 = 200 Motor fixed-length speed
 - P04.22 = 200 Motor acceleration time constant
 - P04.23 = 200 Motor deceleration time constant
 - P04.24/04.25 = 10000 Position mode fixed length stroke
- Jog (speed mode) control
 - P03.53 = 0 Communication control position command type: Incremental position mode
 - P04.20 = 200 Motor jog forward speed
 - P04.21 = 200 Motor jog reverse speed
 - P04.22 = 200 Motor acceleration time constant
 - P04.23 = 200 Motor deceleration time constant

C. Motor running instructions

The digital IO parameter input terminal function selects **USER4** (fixed-length forward rotation) and **USER5** (fixed-length reverse rotation). When the terminal logic selection is valid, the motor is fixed-length forward or reverse.

Digital IO parameter input terminal function selection **USER2** (jog forward), **USER3** (jog reverse), when the terminal logic selection is valid, the motor jog forward or reverse.

Digital IO parameter input terminal function selection **USER1** (jog start and stop), IN19 speed command reverse (jog), when the terminal logic selection USER1 is valid, the motor rotates forward, when the two terminal logic selection is valid at the same time, the motor reverses. Remarks: (pulse + direction)

(7) Homing function

A. Parameter setting

P01.00 = 0 Control mode: position mode

P02.01 = 1 Servo enable

B. Motor running parameter setting

P03.42 = 500 High speed search origin switch signal speed

P03.43 = 200 Low speed search origin switch signal speed

The following parameters are the input signal type for setting the origin signal (Homing mode).

P03.41 = 0 Return to the origin in the forward direction: the deceleration point, the origin is the origin switch (homing forward)

P03.41 = 1 Back to origin in reverse direction: deceleration point, origin as origin switch (homing reverse)

P03.41 = 2 Positive return to origin: the deceleration point and the origin are the positive limit switch (positive limit return to zero)

P03.41 = 3 Reverse back to origin: deceleration point, origin is the reverse limit switch (reverse limit return to zero)

P03.41 = 4 Forward return to origin: deceleration point, origin is the mechanical limit position (forward torque return to zero)

P03.41 = 5 Back to the origin in the reverse direction: the deceleration point, the origin is the mechanical limit position (reverse torque back to zero)

Encoder zero position return to zero:

take the absolute encoder zero position as the origin, and return to zero through the encoder position (the encoder position 0 is equivalent to the Z signal).

P03.41 = 14 Homing forward

P03.41 = 15 Homing reverse

P03.42 = 500 Homing speed

Note: Start-up homing can be triggered by IO and given by communication, which is the same as the standard mode.

C. Motor running instructions

● Forward/reverse return to zero

Digital IO parameter input terminal function selects "22 - Return to origin input", when the terminal logic selection is valid, the motor starts to search for the origin forward or reverse rotation at high speed.

The digital IO parameter input terminal function selects "23-Origin signal input". When the terminal logic selection is valid, the motor starts to search for the origin forward or reverse at low speed, and finally stops when the origin is found.

● Forward/reverse limit return to zero

Digital IO parameter input terminal function selects "22 - Return to origin

input", when the terminal logic selection is valid, the motor starts to search for the origin forward or reverse rotation at high speed.

The digital IO parameter input terminal function selects "5-Positive limit"/"6-Negative limit", when the terminal logic selection is valid, the motor starts to search for forward or reverse rotation of the origin at low speed, and finally uses the position where the positive/negative limit is located. The position is the origin to stop the rotation.

- Forward/reverse torque return to zero

The digital IO parameter input terminal function selects "22 - Return to origin input", when the terminal logic selection is valid, the motor starts to search for forward or reverse rotation at the origin at low speed (P03.43). When the load driven by the motor reaches the set torque (P05.08/P05.09) and reaches the torque holding time, and finally stops the rotation at the position where the load driven by the motor reaches the set torque and reaches the torque holding time as the origin.

2. Speed mode

(1) Digital given

A. Parameter setting

P01.00 = 1 Control mode: Speed mode

P04.00 = 0 Speed command source: Numbers given

B. Motor running parameter setting

P04.01 = 1000 Motor running speed, positive and negative represent direction

P04.05 = 200 Speed command acceleration time constant

P04.06 = 200 Speed command deceleration time constant

C. Motor running instructions

P02.01 = 1 Servo enable

The motor starts to run when the servo is enabled, and the driver controls whether the motor runs or not by controlling the enable signal to start or stop.

(2) Multi-segment speed command

A. Parameter setting

P01.00 = 1 Control mode: Speed mode

P04.00 = 1 Speed command source: Speed table

B. Motor running parameter setting

P10.00 = 1 Multi-segment speed running mode: Cyclic operation

P10.01 = 16 Set the required number of segments for multi-segment speed command

P10.02 = 0 Motor running time unit: s

C. Motor running instructions

a. Motor start-stop

P02.01 = 1 Servo enable

The motor starts to run when the servo is enabled, and the driver controls whether the motor runs or not by controlling the enable signal to start or stop.

b. Motor direction

P10.00 = 0 Multi-segment speed running mode: Single operation

In the enabled state, the function of the digital IO parameter input terminal selects "19-speed command reverse". When the terminal logic selection is invalid, the motor direction is positive; when the terminal logic selection is valid, the motor direction is reversed.

c. Motor acceleration and deceleration time

P10.03 = 100 Motor running acceleration time

P10.04 = 100 Motor running deceleration time

Go down in sequence to set 7 segments of acceleration and deceleration time.

P10.20 = 100 Multi-stage speed command section 1 speed command

P10.21 = 100 Section 1 instruction running time

P10.22 = 1 Select one of the 7 acceleration/deceleration times

Go down in sequence to set 16 speed commands.

Completely run the total number of multi-segment position commands set by P10.01 once, and complete one round of operation.

● P10.00 = 1 Multi-segment speed running mode: Cyclic operation

After setting parameters P10.01 and P10.02 respectively according to the total number of execution segments and execution time unit, set the command value, running time and acceleration/deceleration time and other parameters of the corresponding segment as required. The module will run according to the setting of the command running time and acceleration/deceleration time of each segment, the drive will run from the 1st segment to the Nth segment in the speed segment, and automatically jump to the 1st segment to run cyclically after running the last segment.

● P10.00 = 2 Multi-segment speed running mode: IN port control

When the multi-segment position operation mode is set to IN switching operation, please configure the 4 IN terminals of the driver as functions 14~17 (FunIN.14 ~ FunIN.17 : multi-segment operation command switching), and confirm the valid logic of IN terminal. The logic of the terminal selects whether the arrangement and combination are valid to generate the corresponding displacement segment number, and the motor starts to run according to the segment number.

The details are as follows:

Coding	Name	Function name	Function																																		
FunIN.14	CMD1	Multi-segment operation command switching 1	The multi-segment segment number is a 4-digit binary number, and the corresponding relationship between CMD1 ~ CMD4 and the segment number is as follows: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>CMD4</th> <th>CMD3</th> <th>CMD2</th> <th>CMD1</th> <th>Segment number</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td colspan="5" style="text-align: center;">.....</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>15</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>16</td> </tr> </tbody> </table>					CMD4	CMD3	CMD2	CMD1	Segment number	0	0	0	0	1	0	0	0	1	2					1	1	1	0	15	1	1	1	1	16
CMD4	CMD3	CMD2						CMD1	Segment number																												
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FunIN.15	CMD2	Multi-segment operation command switching 2																																			
FunIN.16	CMD3	Multi-segment operation command switching 3																																			
FunIN.17	CMD4	Multi-segment operation command switching 4																																			

Note : When the multi-segment position operation mode is set to IN switching operation, please configure the 4 IN terminals of the driver as functions 14 ~ 17 (FunIN.14 ~ FunIN.17 : multi-segment operation command switching), and confirm the valid logic of IN terminal.

(3) Communication control

A. Parameter setting

- P01.00 = 1 Control mode: Speed mode
- P02.01 = 1 Servo enable
- P04.00 = 2 Speed command source: Debugging

B. Motor running parameter setting

- P04.60/04.61 = 50000 The number of instruction pulses that control operation by communication
- P04.62 = 1000 Motor running speed
- P04.63 = 200 Motor acceleration time constant
- P04.64 = 200 Motor deceleration time constant

C. Motor running instructions

The start-stop command of running is written in P12.10, and the motor will run according to the running curve determined by the command stroke, speed and acceleration/deceleration time constant set by P04.60~P04.64.

- P12.10 = 0 Motor deceleration stop
- P12.10 = 1 The motor runs forward with a fixed-length according to the number of pulses in the parameter address of P04.60
- P12.10 = 2 The motor runs reverse with a fixed-length according to the number of pulses in the parameter address of P04.60
- P12.10 = 3 The motor jogs forward at the speed of P04.62
- P12.10 = 4 The motor jogs reverse at the speed of P04.62
- P12.10 = 5 Motor emergency stop
- P12.10 = 6 Command waiting to be triggered

Motor running parameter setting

- P04.65 = 0 Motion test active: Reciprocating
- P04.66 = 0 Start direction: Positive

P04.67 Setting motion times
P12.12 = 200 Demonstration operation delay time

Motor running instruction

P12.13 = 0 The motor stops the operation of the demo mode
P12.13 = 1 The motor starts the operation of the demo mode
P12.13 = 2 Meaningless

In the motion test mode, the motor starts in the reciprocating or unidirectional direction (P04.65=0/1), and starts in the positive or negative direction (P04.66=0/1), run the times set by P04.67. After completing the set running command each time, after delaying the delay time set by P12.12, it will start again and run in this cycle.

(4) IO control

A. Parameter setting

P01.00 = 1 Control mode: Speed mode
P02.01 = 1 Servo enable
P04.00 = 3 Speed command source: IO

B. Motor running parameter setting

P04.16 = 200 Motor jog forward running speed
P04.17 = 200 Motor jog reverse running speed
P04.18 = 100 Motor jog running acceleration time constant
P04.19 = 100 Motor jog running deceleration time constant

C. Motor running instructions

● Start-stop + direction mode

In the motor enable state, the digital IO parameter input terminal function selects "24-USER1", when the terminal logic selection is valid, the motor starts to run forward. When the USER1 terminal logic selection is valid, the digital IO parameter input terminal function selects "19-speed command reverse", when the terminal logic selection is valid, the motor reverses. If only the IN19 terminal logic selection is valid, the motor will not run.

● Forward + reverse mode

When the motor is enabled, the digital IO parameter input terminal function selects "25-USER2", when the terminal logic selection is valid, the motor starts to rotate forward. Digital IO parameter input terminal function selection "26-USER3", when the terminal logic selection is valid, the motor reverses. Note: When both terminal logic selections are valid, the motor will not run.

(5) Analog control

A. Parameter setting

- P01.00 = 1 Control mode: Speed mode
P02.01 = 1 Servo enable
P04.00 = 4 Speed command source: Analog control

B. Motor running parameter setting

- P04.02 = 0 Select analog channel 1
P02.72 Displays the current sampling value of analog input channel AN1
P02.74 Display the current voltage value of analog input channel AN1
P02.78 = 3000 Set the corresponding motor speed when the analog input voltage is 10V.
P02.79 = 1000 Set the corresponding motor torque when the analog input voltage is 10V.

C. Motor running instructions

- Start-stop + direction mode

In the motor enable state, the digital IO parameter input terminal function selects "24-USER1", when the terminal logic selection is valid, the motor starts to rotate forward. When the USER1 terminal logic selection is valid, the digital IO parameter terminal function selects "19-speed cmd direction", when the terminal logic selection is valid, the motor reverses. If only the IN19 terminal logic selection is valid, the motor will not run.

- Forward + reverse mode

In the motor enable state, the digital IO parameter terminal function selects "25-USER2", when the terminal logic selection is valid, the motor starts to rotate forward. Digital IO parameter terminal function selection "26-USER3", when the terminal logic selection is valid, the motor reverses. **Note: When both terminal logic selections are valid, the motor will not run.**

3. Torque mode

(1) Torque operating mode 1

A. Parameter setting

- P01.00 = 2 Control mode: Torque mode
P05.00 = 0 Torque command source A: Digital
P05.01 = 0 Torque command source B: Digital
P05.26 = 0 Mode select: Torque operating mode 1

B. Motor running parameter setting

In torque operating mode 1, P05.08/P05.09 directly limit the torque of the motor, which is the maximum torque in this working mode, and the setting of parameter P05.03 takes effect on its basis.

For example, the value set by P05.03 is greater than the value of P05.08/P05.09, and the motor runs according to the torque set by P05.08/P05.09. If the value set by P05.03 is smaller than the value of P05.08/P05.09, the motor will run according to the torque set by P05.03. The positive and negative sign of parameter P05.03 (motor running direction) is directly effective.

P05.08 = 3000	Torque value for forward rotation of the motor
P05.09 = 3000	Torque value for reverse rotation of the motor
P05.03 = 500	Torque value of torque mode operation, positive and negative represent the direction
P05.12 = 0	Speed limit source: Inside digital setting
P05.21 = 100	Torque running acceleration time constant
P05.22 = 100	Torque running deceleration time constant
P05.14 = 3000	Torque control forward speed limit value
P05.15 = 3000	Torque control reverse speed limit value

C. Motor running instructions

P02.01 = 1 Servo enable

The motor starts to run when the servo is enabled, and the driver controls whether the motor runs or not by controlling the enable signal to start or stop.

(2) Torque operating mode 2

A. Parameter setting

P01.00 = 2	Control mode: Torque mode
P02.01 = 1	Servo enable
P05.00 = 0	Torque command source A: Digital
P05.01 = 0	Torque command source B: Digital
P05.26 = 1	Mode select: Torque operating mode 2

B. Motor running parameter setting

P05.12 = 0	Speed limit source: Inside digital setting
P05.08 = 3000	Torque value for forward rotation of the motor
P05.09 = 3000	Torque value for reverse rotation of the motor
P05.03 = 500	Torque value of torque mode operation, positive and negative represent the direction
P05.14 = 3000	Torque control forward speed limit value
P05.15 = 3000	Torque control reverse speed limit value
P05.21 = 100	Torque running acceleration time constant
P05.22 = 100	Torque running deceleration time constant
P05.23 = 500	Torque holding time
P05.24 = 0	After the torque holding time is reached, the motor will be offline. When set to 1, the motor will lock the shaft.

C. Motor running instructions

- Startup mode 1

When the motor is enabled, the digital IO parameter input terminal function selects "24-USER1" (torque forward rotation), when the terminal logic selection is valid, the motor starts to rotate forward. Digital IO parameter input terminal function selection "25-USER2" (torque reverse), when the terminal logic selection is valid, the motor reverses.

- Startup mode 2

Parameter setting:

P05.02 = 3 Torque command source: Communication

P05.20 = 500 Write motor running torque value through communication

Motor running instructions:

P05.25 = 0 Motor torque running and stop (after the motor is offline, write this parameter to the motor to lock the axis again)

P05.25 = 1 Motor start torque reverse operation (the command cannot be responded to in the offline state)

P05.25 = 2 Motor start torque reverse operation (the command cannot be responded to in the offline state)