All series of servo system

DS3E/DS3L/DS3-PTA/DS2 series
**Motion control** is real-time control the speed, position of mechanical components, make them move as setting track and parameters.

- Fieldbus PLC XDC series instead of pulse output mode, used fieldbus communication, 3Mbps baud rate, improved the system speed. The wiring is easy and shared.
- Use XINJE industry fieldbus protocol, support all the XINJE fieldbus products.

**Fieldbus motion control features**

- Pulse output mode
  - PLC outputs the pulse, servo drive receives the pulse, it will lose the pulse and with cumulative error if there is interference.

- Pulse cumulative error
  - Pulse output mode: acceleration has mutation
  - Fieldbus mode: acceleration has no mutation

- S acceleration curve makes the process softer

- Easy and sharable wiring
  - One channel needs pulse output, pulse direction, signal I/O, servo alarm, servo enable, encoder feedback port, the wiring is complicated.
  - One fieldbus channel can connect 20-axis, and two extra pulse channels, save the wiring.

- Powerful teaching function
  - No need to make program, it only needs to modify the register value online to make it move. It can real-time modify the target position, speed, synchronous speed ratio in motion process.

- Synchronous motion control
  - Multi-axis synchronous move or synchronize with high speed counter.
  - Application
    - It is applied to the system with electronic CAM such as dyeing, printing, paper, steel rolling, synchronous cutting.

- Better precision in high-speed condition
  - XDC series PLC communicate with DS3E series servo drive via fieldbus, the data and sign bit also transfer via fieldbus.
  - The data is two-way transmission between PLC and servo drive. PLC can send servo position, speed information, and read servo position feedback information.
ordering information for motion fieldbus

**DS3E series fieldbus servo drive**

Connect to CN1 port of servo drive to perform fieldbus function.

**DS3L series pulse type servo drive**

Outstanding performance

Higher response, stronger rigidity, more accurate positioning

DS3E and DS3L series servo drive has advanced intelligent control system which has better anti-interference ability, stronger rigidity and shorter positioning time.

**DS3-PTA series high precision type servo drive**

Support motion fieldbus function

Higher response, stronger rigidity, more accurate positioning

Smoother and faster response speed

High resolution encoder perform high precision positioning

131072 pulses per circle (17 bits) absolute encoder supports high precision positioning and stable low speed running.

**DS2 series basic type servo drive**

Good performance

- Up to 400Hz high response frequency
- High precision positioning, improve the equipment efficiency

Communication function

- Two communication ports - Support RS232 and RS485 (cannot use at the same time)
- Monitor servo parameter, set servo position and torque through RS232/485 communication

Safe and reliable

- IGBT can withstand high voltage 1200V, wide voltage input range, outstanding noise immunity ability, suitable for bad electromagnetic environment.
- Complete protection: over voltage, under voltage, over current, over load, over speed, etc.

Rich functions

- Support position/speed/torque mode
- Any two modes can smoothly switch
- Can leave out the controller, support internal positioning, internal speed, internal torque, analog speed, analog torque mode
- Support various commands: A8 phase pulse, CW/CCW, pulse and direction, analog voltage

Flexible setting

- 2 channels high speed pulse input, max frequency 500KHz
- 2 channels 12 bits high precision -10~10V analog input
- 3 channels position, 3 channels SO output are user-defined
- 1 channel Z phase original point signal transistor output
- Encoder feedback output: differential signal (for collector signal, please purchase accessory – differential circuit board)

Easy operating interface

- Commonly used pulse input signal, I/O signal, European terminals, welding free
- Display the servo state through operate panel, there are 16 monitor parameters and error message, easy to debug

The matched motor has complete specifications, fit for different needs

- Middle inertia servo motor can improve the mechanical stability
- Small inertia servo motor can perform high speed acceleration and deceleration
DS series servo drive application

Applications

- **Combination control of position, speed and torque**
- **Interrupt phase control**

Functions:
The control modes of DS series servo include position, speed, and torque. The diagram shows the liquid filling machine. The belt will stop when the products are detected. The position control motor ensures the positioning of the belt. The motor is running to fill the liquid. The liquid is full when each certain torque is reached. The torque control motor ensures the liquid height in the bottle. The speed control motor runs forward or backward to press the liquid into the hydraulic cylinder.

Any two modes can switch smoothly, the torque can be limited in position or speed mode.

**More applications:**
- Liquid filling machine, packing machine, screw tightening machine, butt-welding machine.

Functions:
The servo runs uncertain distance in internal position mode. It will run certain distance when detected the external sensor signal. The output signal will start the next process after positioning end. The laser printer will go to the next positioning process when the photoelectric switch touches the workpiece. The printer will print after positioning end. High-speed interruption will deal with the photoelectric switch signal and ensure the printer position.

**No need any controller to positioning, high positioning precision**

**More applications:**
- Laser printer, pipe cutting machine, etc.

Functions:
Feeding-roller runs certain distance, cutting-film roller follows it to run certain angle, sending-film roller runs certain distance. The servo ensures the consistency of three rollers height and the stability of running speed. The smoothness of speed control, position control, and torque control can be adjusted through filter parameter. It also can adjust the smoothness of the whole motions and avoid skid.

Any two modes can switch smoothly, the torque can be limited in position or speed mode.

**More applications:**
- Die cutting machine, feeding machine

Servo external device connection diagram

- **Power supply**
  - Three-phase 220VAC
  - Three-phase 380VAC

- **Circuit breaker**
  - Please connect circuit breaker to protect the machine

- **Noise filter**
  - To suppress the noise from power supply

- **Fuse**
  - Make sure to use the fuse to protect the machine

- **Electromagnetic contactor**
  - To cut off the servo power supply when alarming

- **Display setting**
  - Display the monitor and alarm information, set the parameters through the button.

Safety notes:
1. Check the power supply of R/S/T and wiring is correct.
2. Make sure the servo motor output U/V/W phase order is correct.
3. Please cut off the P and D when using external regenerative circuit. The regenerative resistor must connect between P and C. If using internal regenerative resistor, please short connect P and D then cut off P and C.

Note: Please take off the short piece between P+ and D and set related parameters.

The diagram takes DS2-21F5-AS as an example.
servo drive and motor model

DS3E-20P7-PFA

Configuration type
1) 3 phase 380V AC (fit for 1.5KW, 5.5KW and up)
2) 3 phase 220V AC (1.5KW and below can use single phase 220V AC)
3) 1 phase pulse
4) 1 phase SR485 (RS485 type, 3 wires)

Series name
DS3

Type name
PFA

Power type
3.0KW

Output power
2.6KW

Display configuration type
NEW

Series number
11

Encoder type
Encoder feedback (differential output mode), analog input, can accept AB

F 3P0

Encoder feedback
P 4P5

(phase pulse)

Series name
MS

Motor model
- 80 ST E - M 024 30 A Z S - 2 0P7-S

Display configuration type
- 11P0

Series number
11

Encoder type
T – 17-bit absolute value encoder, N – 20-bit absolute value encoder

F 3P0

Encoder feedback
P 4P5

(phase pulse)

Series name
DS2

Motor model
- 2 1P5 - AS

Display configuration type
- 2P3

Series number
2

Encoder type
No encoder feedback, no analog input, no RS485, can accept AB

F 3P0

Encoder feedback
P 4P5

(phase pulse)

Series name
MS

Motor model
- 80 ST E - M 024 30 A Z S - 2 0P7-S

Display configuration type
- 11P0

Series number
11

Encoder type
Incremental encoder

F 3P0

Encoder feedback
P 4P5

(phase pulse)

Series name
DS

Motor model
- 2 1P5 - AS

Display configuration type
- 2P3

Series number
2

Encoder type
Encoder feedback (differential output mode), analog input, can accept AB

F 3P0

Encoder feedback
P 4P5

(phase pulse)

Series name
MS

Motor model
- 80 ST E - M 024 30 A Z S - 2 0P7-S

Display configuration type
- 11P0

Series number
11

Encoder type
T – 17-bit absolute value encoder, N – 20-bit absolute value encoder

F 3P0

Encoder feedback
P 4P5

(phase pulse)
## Servo system

### Servo motor parameters

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Max. Input Current</th>
<th>Max. Output Torque</th>
<th>Max. Output Speed</th>
<th>Max. Input Power</th>
<th>Inertia</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000W</td>
<td>380V</td>
<td>10.9A</td>
<td>2.2N.m</td>
<td>3540rpm</td>
<td>2.2KW</td>
<td>0.27kgm</td>
<td>1024</td>
</tr>
<tr>
<td>2000W</td>
<td>400V</td>
<td>13.3A</td>
<td>4.4N.m</td>
<td>5000rpm</td>
<td>4.4KW</td>
<td>0.54kgm</td>
<td>2048</td>
</tr>
<tr>
<td>3000W</td>
<td>415V</td>
<td>16.5A</td>
<td>6.6N.m</td>
<td>6000rpm</td>
<td>6.6KW</td>
<td>0.81kgm</td>
<td>4096</td>
</tr>
</tbody>
</table>

## Product introduction

### DS3E, DS3L, DS3-PTA, DS2 series servo drive comparison table

<table>
<thead>
<tr>
<th>Feature Type</th>
<th>DS3E/DS3L/DS3-PTA series</th>
<th>DS3E/DS3L/DS3-PTA series</th>
<th>DS2 series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power range</td>
<td>0.10kW - 2.00kW</td>
<td>0.10kW - 2.00kW</td>
<td>0.20kW - 1.10kW</td>
</tr>
<tr>
<td>Encoder feedback</td>
<td>250ppr incremental encoder</td>
<td>250ppr incremental encoder</td>
<td>17-bit absolute value encoder</td>
</tr>
<tr>
<td>Digital output</td>
<td>3-phase 600V/100V, 24V/100V, CANopen communication, direct current feed Servo drive</td>
<td>3-phase 600V/100V, 24V/100V, CANopen communication, direct current feed Servo drive</td>
<td>3-phase 600V/100V, 24V/100V, CANopen communication, direct current feed Servo drive</td>
</tr>
<tr>
<td>Analog input</td>
<td>4.096V capacitance input, internal PWM, 6-bit A/D</td>
<td>4.096V capacitance input, internal PWM, 6-bit A/D</td>
<td>4.096V capacitance input, internal PWM, 6-bit A/D</td>
</tr>
<tr>
<td>Digital input</td>
<td>4-channel 32-bit input</td>
<td>4-channel 32-bit input</td>
<td>4-channel 32-bit input</td>
</tr>
<tr>
<td>Display input</td>
<td>4-channel 32-bit input</td>
<td>4-channel 32-bit input</td>
<td>4-channel 32-bit input</td>
</tr>
<tr>
<td>Digital output</td>
<td>4-channels 32-bit output</td>
<td>4-channels 32-bit output</td>
<td>4-channels 32-bit output</td>
</tr>
<tr>
<td>Frequency range</td>
<td>10-500Hz</td>
<td>10-500Hz</td>
<td>10-500Hz</td>
</tr>
<tr>
<td>Interface</td>
<td>CANopen, Modbus RTU, fieldbus, CANopen, Modbus RTU, fieldbus, CANopen, Modbus RTU, fieldbus</td>
<td>CANopen, Modbus RTU, fieldbus, CANopen, Modbus RTU, fieldbus, CANopen, Modbus RTU, fieldbus</td>
<td>CANopen, Modbus RTU, fieldbus, CANopen, Modbus RTU, fieldbus, CANopen, Modbus RTU, fieldbus</td>
</tr>
<tr>
<td>Communication</td>
<td>CANopen, Modbus RTU, fieldbus, CANopen, Modbus RTU, fieldbus, CANopen, Modbus RTU, fieldbus</td>
<td>CANopen, Modbus RTU, fieldbus, CANopen, Modbus RTU, fieldbus, CANopen, Modbus RTU, fieldbus</td>
<td>CANopen, Modbus RTU, fieldbus, CANopen, Modbus RTU, fieldbus, CANopen, Modbus RTU, fieldbus</td>
</tr>
<tr>
<td>Encoder</td>
<td>12-bit incremental encoder, 17-bit absolute value encoder, CANopen encoder feedback</td>
<td>12-bit incremental encoder, 17-bit absolute value encoder, CANopen encoder feedback</td>
<td>12-bit incremental encoder, 17-bit absolute value encoder, CANopen encoder feedback</td>
</tr>
<tr>
<td>Encoder error</td>
<td>1%, 2%, 4%, 8%</td>
<td>1%, 2%, 4%, 8%</td>
<td>1%, 2%, 4%, 8%</td>
</tr>
<tr>
<td>Encoder resolution</td>
<td>1024</td>
<td>1024</td>
<td>1024</td>
</tr>
<tr>
<td>Encoder ppr</td>
<td>1024</td>
<td>1024</td>
<td>1024</td>
</tr>
<tr>
<td>Encoder resolution</td>
<td>1024</td>
<td>1024</td>
<td>1024</td>
</tr>
<tr>
<td>Encoder ppr</td>
<td>1024</td>
<td>1024</td>
<td>1024</td>
</tr>
<tr>
<td>Encoder resolution</td>
<td>1024</td>
<td>1024</td>
<td>1024</td>
</tr>
</tbody>
</table>
**Compatible table of servo motor and drive**

<table>
<thead>
<tr>
<th>Motor model</th>
<th>Motor code</th>
<th>Suitable drive</th>
<th>Voltage level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS3-43P0-PFA</td>
<td>20P7-PQA</td>
<td>single/3 phase</td>
<td>220V</td>
</tr>
<tr>
<td>DS3E-20P2-PFA</td>
<td>2151/2151</td>
<td>single/3 phase</td>
<td>220V</td>
</tr>
<tr>
<td>DS3E-43P0-PFA</td>
<td>1052/1052</td>
<td>single/3 phase</td>
<td>220V</td>
</tr>
<tr>
<td>DS3E-20P2-PFA/L</td>
<td>1052</td>
<td>single/3 phase</td>
<td>220V</td>
</tr>
<tr>
<td>DS3E-43P0-PFA/L</td>
<td>1052</td>
<td>single/3 phase</td>
<td>220V</td>
</tr>
</tbody>
</table>

**DS2 servo drive dimension (unit: mm)**

<table>
<thead>
<tr>
<th>Motor model</th>
<th>Motor code</th>
<th>Suitable drive</th>
<th>Voltage level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS2-21P5-AS/AS6</td>
<td>20P2/4/7-PFA</td>
<td>single/3 phase</td>
<td>220V</td>
</tr>
<tr>
<td>DS2-21P5-AS/AS6</td>
<td>20P2/4/7-PFA</td>
<td>single/3 phase</td>
<td>220V</td>
</tr>
<tr>
<td>DS2-21P5-AS/AS6</td>
<td>20P2/4/7-PFA</td>
<td>single/3 phase</td>
<td>220V</td>
</tr>
<tr>
<td>DS2-21P5-AS/AS6</td>
<td>20P2/4/7-PFA</td>
<td>single/3 phase</td>
<td>220V</td>
</tr>
</tbody>
</table>

**Servo motor dimension (unit: mm)**

<table>
<thead>
<tr>
<th>Motor model</th>
<th>Motor code</th>
<th>Suitable drive</th>
<th>Voltage level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS2-43P0-AS/AS6</td>
<td>20P2/4/7-PFA</td>
<td>single/3 phase</td>
<td>220V</td>
</tr>
<tr>
<td>DS2-43P0-AS/AS6</td>
<td>20P2/4/7-PFA</td>
<td>single/3 phase</td>
<td>220V</td>
</tr>
<tr>
<td>DS2-43P0-AS/AS6</td>
<td>20P2/4/7-PFA</td>
<td>single/3 phase</td>
<td>220V</td>
</tr>
<tr>
<td>DS2-43P0-AS/AS6</td>
<td>20P2/4/7-PFA</td>
<td>single/3 phase</td>
<td>220V</td>
</tr>
</tbody>
</table>
### Product introduction

**180 series motor**

<table>
<thead>
<tr>
<th>Motor model</th>
<th>Ø95h7</th>
<th>MS-180T-1800P</th>
<th>210P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MS-180T-1800P</td>
<td>210P</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS-180T-1800P</td>
<td>210P</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS-180T-1800P</td>
<td>210P</td>
</tr>
</tbody>
</table>

**180 series motor**

<table>
<thead>
<tr>
<th>Motor model</th>
<th>Ø95h7</th>
<th>MS-180T-1800P</th>
<th>210P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MS-180T-1800P</td>
<td>210P</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS-180T-1800P</td>
<td>210P</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS-180T-1800P</td>
<td>210P</td>
</tr>
</tbody>
</table>

**220 series motor**

<table>
<thead>
<tr>
<th>Motor model</th>
<th>Ø110h7</th>
<th>MS-220T-1800P</th>
<th>210P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MS-220T-1800P</td>
<td>210P</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS-220T-1800P</td>
<td>210P</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS-220T-1800P</td>
<td>210P</td>
</tr>
</tbody>
</table>

### Accessories

#### Fast terminal
- Easily and flexible wiring mode
- Limited decides on installation height table
- Available from low voltage power supply to convert

#### Power supply connection
- Limited decides on installation height table
- Available from low voltage power supply to convert

#### Encoder cable
- Limited decides on installation height table
- Available from low voltage power supply to convert

#### RS232 communication cable
- Limited decides on installation height table
- Available from low voltage power supply to convert

### regenerative resistor table

<table>
<thead>
<tr>
<th>Servo drive model</th>
<th>Internal regenerative resistor</th>
<th>Recommended external regenerative resistor</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS2-20P/AS3-AS4</td>
<td>No internal regenerative resistor</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 0, DS3 set P0-24 to 0. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
<tr>
<td>DS2-40P/AS6</td>
<td>No internal regenerative resistor</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 0, DS3 set P0-24 to 0. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
<tr>
<td>DS3-43P0/AS8</td>
<td>Internal regenerative resistor 100Ω 150W, short connect P+ and D</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 1, DS3 set P0-24 to 1. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
<tr>
<td>DS3-20P/AS3-AS4</td>
<td>Internal regenerative resistor 150Ω 150W, short connect P+ and D</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 1, DS3 set P0-24 to 1. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
<tr>
<td>DS2-21P/AS4-AS6</td>
<td>Internal regenerative resistor 150Ω 150W, short connect P+ and D</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 1, DS3 set P0-24 to 1. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
<tr>
<td>DS2-41P/AS4/AS6</td>
<td>Internal regenerative resistor 150Ω 150W, short connect P+ and D</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 1, DS3 set P0-24 to 1. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
<tr>
<td>DS3E-20P/AS4</td>
<td>Internal regenerative resistor 150Ω 150W, short connect P+ and D</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 1, DS3 set P0-24 to 1. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
<tr>
<td>DS3E-22P/AS4</td>
<td>Internal regenerative resistor 150Ω 150W, short connect P+ and D</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 1, DS3 set P0-24 to 1. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
</tbody>
</table>

### Servo system

- Encoder cable
- Encoder cable
- Encoder cable
- Encoder cable
- Encoder cable
- Encoder cable

#### Regenerative resistor
- Connect to servo drive 21P/21P, perform feedback function.

#### ABZ signal transformation
- The two modes can switch to each other.

#### Accessories
- Easily and flexible wiring mode
- Limited decides on installation height table
- Available from low voltage power supply to convert

#### Encoder cable
- Easily and flexible wiring mode
- Limited decides on installation height table
- Available from low voltage power supply to convert

#### RS232 communication cable
- Easily and flexible wiring mode
- Limited decides on installation height table
- Available from low voltage power supply to convert

#### regenerative resistor table

<table>
<thead>
<tr>
<th>Servo drive model</th>
<th>Internal regenerative resistor</th>
<th>Recommended external regenerative resistor</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS2-20P/AS3-AS4</td>
<td>No internal regenerative resistor</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 0, DS3 set P0-24 to 0. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
<tr>
<td>DS2-40P/AS6</td>
<td>No internal regenerative resistor</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 0, DS3 set P0-24 to 0. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
<tr>
<td>DS3-43P0/AS8</td>
<td>Internal regenerative resistor 100Ω 150W, short connect P+ and D</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 1, DS3 set P0-24 to 1. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
<tr>
<td>DS3-20P/AS3-AS4</td>
<td>Internal regenerative resistor 150Ω 150W, short connect P+ and D</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 1, DS3 set P0-24 to 1. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
<tr>
<td>DS2-21P/AS4-AS6</td>
<td>Internal regenerative resistor 150Ω 150W, short connect P+ and D</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 1, DS3 set P0-24 to 1. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
<tr>
<td>DS2-41P/AS4/AS6</td>
<td>Internal regenerative resistor 150Ω 150W, short connect P+ and D</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 1, DS3 set P0-24 to 1. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
<tr>
<td>DS3E-20P/AS4</td>
<td>Internal regenerative resistor 150Ω 150W, short connect P+ and D</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 1, DS3 set P0-24 to 1. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
<tr>
<td>DS3E-22P/AS4</td>
<td>Internal regenerative resistor 150Ω 150W, short connect P+ and D</td>
<td>Connect the regenerative resistor between P+ and C, move the short connector between P+ and D, DS2 set P0-10 to 1, DS3 set P0-24 to 1. External regenerative resistor is 350 to 1000, up to 1500W. External regenerative resistor needs to buy.</td>
</tr>
</tbody>
</table>