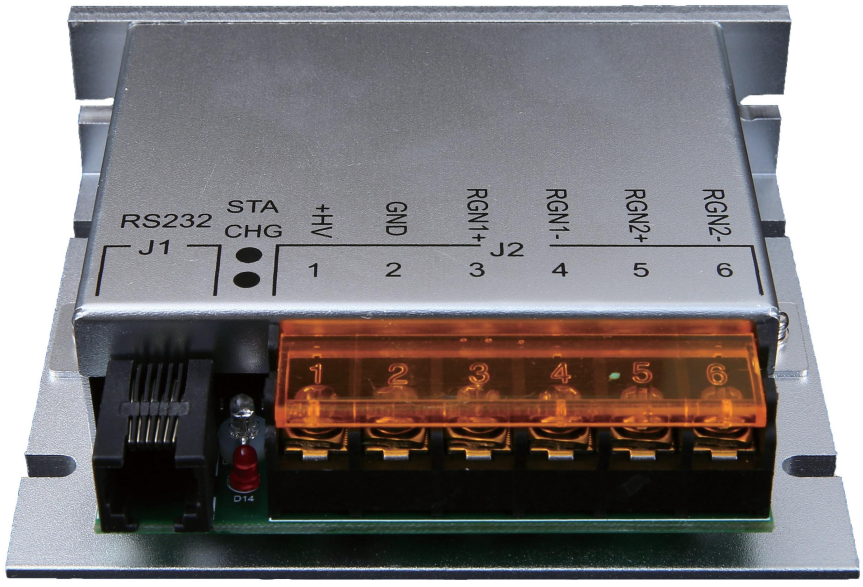
Braking unit instructions



Brake unit model description

DB - 01 - 5P5

Brake unit

DB:brake unit

Nominal voltage

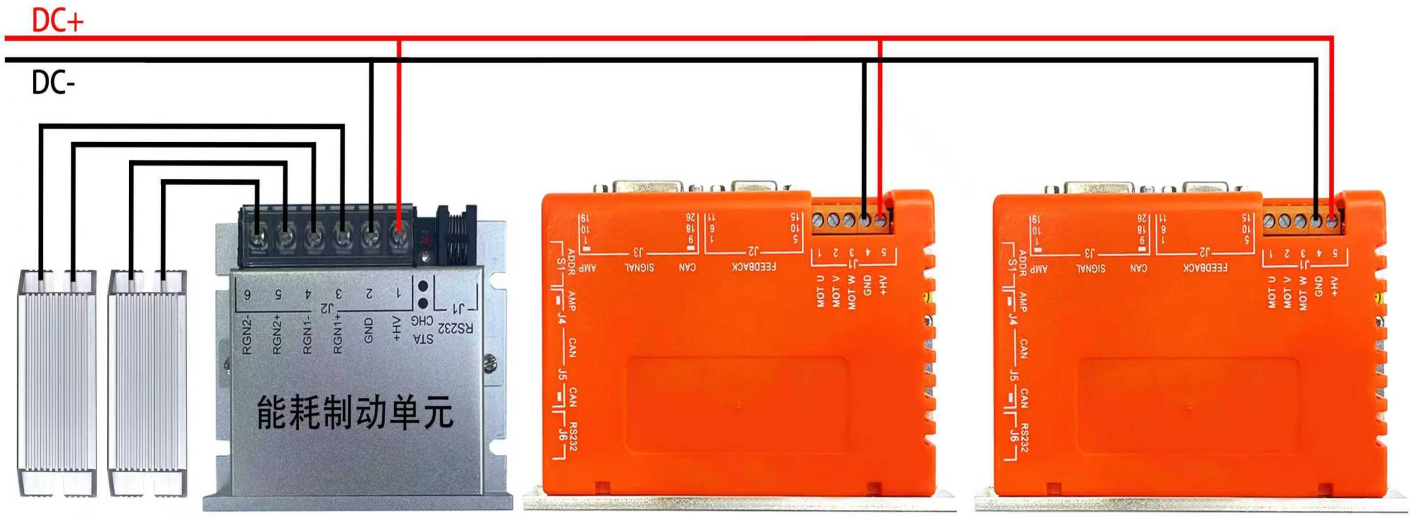
01: 18V~90VDC
02: 18V~180VDC

Rated power

5P5:0~5.5KW

brake unit model summary

model	voltage	Power
DB-01-5P5	18~90VDC	0~5.5KW
DB-02-5P5	18~180VDC	0~5.5KW



I. Braking Unit Principle:

The energy dissipation of a braking unit refers to the conversion of excess electrical energy into thermal energy via resistors during motor deceleration or braking.

1.Function of the Braking Unit

In motor systems with drive control, when the motor operates in generator mode (e.g., during deceleration, lowering heavy loads, or handling inertial loads), it converts mechanical energy into electrical energy and feeds it back to the drive's DC bus. If this energy cannot be absorbed by other equipment, the DC bus voltage rises, potentially causing system overvoltage damage. The braking unit monitors the bus voltage and dissipates excess electrical energy as heat through the braking resistor when the voltage exceeds the set value.

2.Physical Process of Energy Dissipation

Energy Source: Regenerative electrical energy generated during motor braking.

Dissipation Method: Electrical energy is converted into heat (joule heating) via the braking resistor, calculated by the formula:

$$E = \frac{V^2}{R} \cdot t$$

Among them:

- E: Energy consumed (Joules, J)
- V: DC bus voltage (volts, V)
- R: Brake resistance value (ohms, Ω)
- t: Braking time (seconds, s)

3. Factors Affecting Energy Consumption

3-1. Load Inertia: Greater load inertia generates more regenerative energy during deceleration.

3-2. Braking Frequency: Frequent starts, stops, or decelerations increase the operating time of the braking unit.

3-3. Braking Resistor Power Rating: The resistor's rated power determines the maximum energy it can dissipate in a short period.

3-4. System Efficiency: Factors like resistor heat dissipation capacity and ambient temperature affect actual energy consumption efficiency.

4. Practical Application Issues

Overheating Risk: Prolonged high-power braking may cause resistor overheating, requiring a heat dissipation system or intermittent operation.

Energy Waste: Braking energy is dissipated as heat without recovery (can be optimized using energy feedback devices).

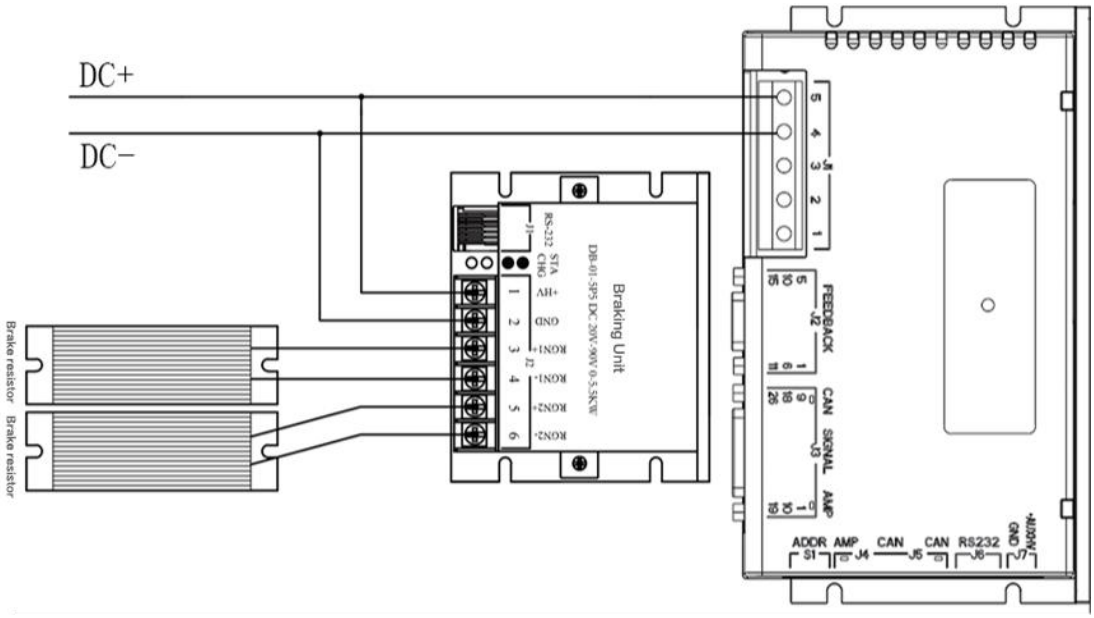
Selection Requirements: Appropriate braking units and resistors must be chosen based on load characteristics, braking power, duty cycle, and other parameters.

5. Summary

Energy consumption in braking units is an essential aspect of motor control systems. By rationally designing braking resistor parameters and optimizing braking strategies, energy consumption can be reduced while improving system efficiency. During selection and application, comprehensive consideration of load characteristics and environmental conditions is required.

Brake unit wiring & module wiring diagram

1	J1 The RS232 connection line and the host computer are connected to adjust the data of the braking unit
2	STA CHG status light
3	J2 a. +HV Connect the positive end of the bus b. GND Connect the negative end of the bus c. RGN1+/RGN1- junction resistor. RGN2+/RGN2 can be connected when multiple resistors are needed



Cautions：

1）The brake unit and the servo driver can share the RS23 debugging cable.

2）Please select the specification of the brake resistor according to the motor power.

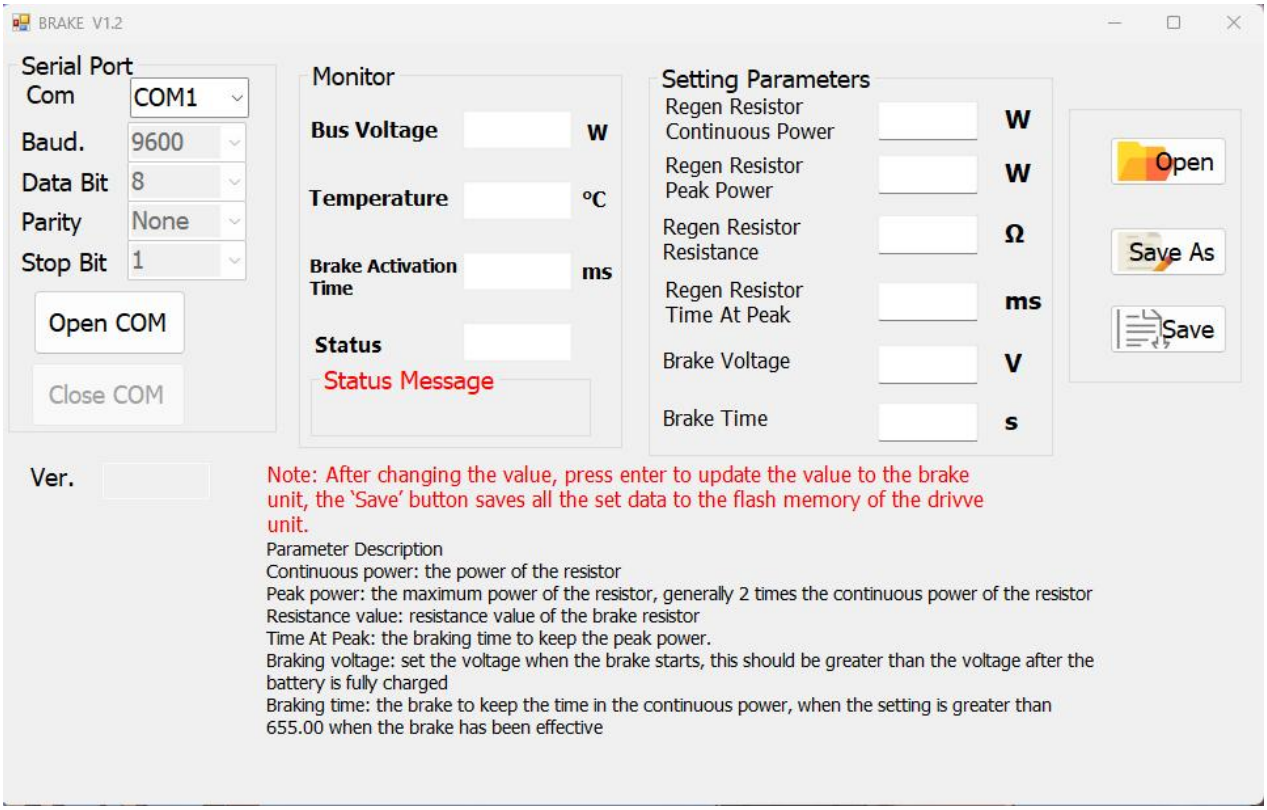
3）When a power supply supplies multiple motors, only one brake unit needs to be connected at the power supply end.

Indicator status

Green flicker	normal	
Red Always On	Under braking	
Red flash 1 time	Overheating	Brake temperature is too high due to prolonged braking. Heat dissipation from the unit should be increased
Red flash 2 time	Overvoltage	Inability to effectively drain the voltage. Appropriate resistor selection or brake unit hardware problem
Red flash 3 time	Undervoltage	The voltage is too low. Check supply voltage
Red flash 4 time	Short-circuit	Excessive current. Appropriate resistor selection or brake unit hardware problem
Red flash 5 time	Overloaded	The braking time enters beyond the setting time of I2T. Increase the time of I2T appropriately
Red flash 6 time	Data error	Setting parameter error

Parameter testing

Open the debug software as shown below



(1) OpenCOM open serial port (9600,8,n,1)

(2) CloseCOM closes the serial port

(3) Monitor the parameters. Here it is possible to monitor the actual voltage, the temperature of the braking module, the braking time and other information.

(4) setup parameter

1) Sustained power. Input the rated power of the brake resistor

2) Peak power. Peak power of the input brake resistor

3) I2T. Set the time to brake

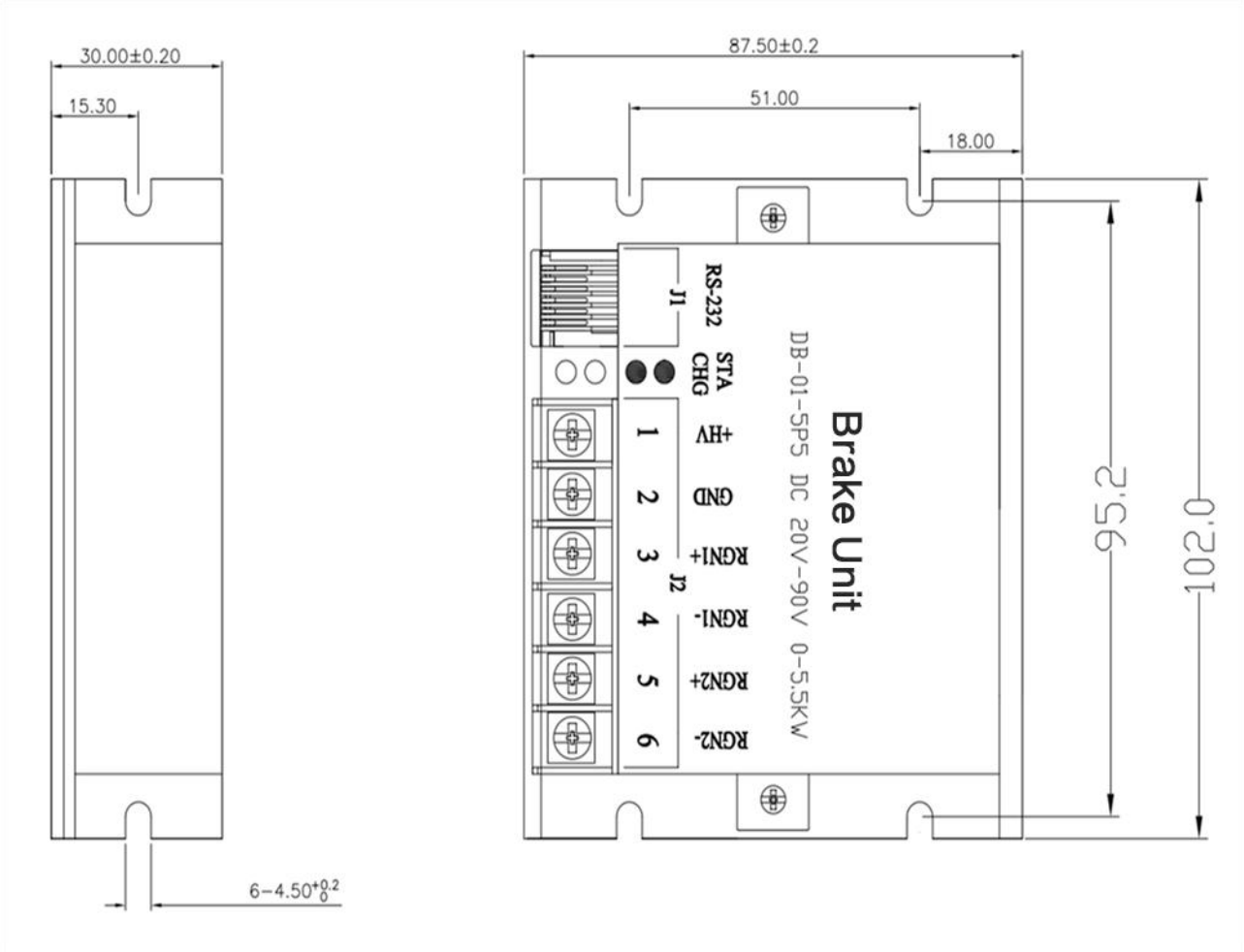
4) Brake voltage. Set the voltage at the start of braking.

5) Open it. Open the saved data

6) Write. When the data is modified or opened, press "Write data" to write the parameters to flash.

7) Save as. Save the set data to your computer.

Brake unit size diagram



Brake resistor model description

300W - 8R

power
300W:300W 60W、80W、100W、300W、500W 600W、780W、1000W、1200W可选

resistance value
8R:8R 2R、4R、8R、15R、30R、42R、 50R、60R、70R、100R

Brake resistance model summary

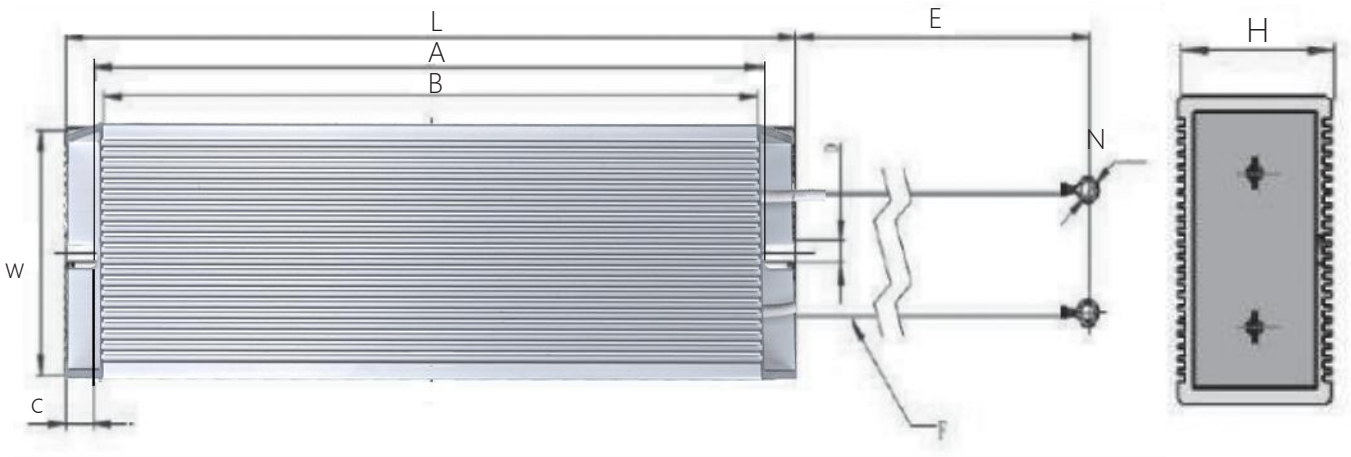
Model	Power	Resistance value
100W 8R	100W	8R
300W 2R	300W	2R
300W 4R	300W	4R
300W 8R	300W	8R
600W2R	600W	2R
600W4R	600W	4R
1000W 4R	1000W	4R
1500W 2R	1500W	2R

Resistance selection and size

Power (W)	Resistance value (Ω)	Bottom length (L)	Breadth (W)	Altitude (H)	Length of front (B)	Pitch row (A)	Groove width (D)	Length of cable (E)
300	2	215	60	30	175	195	5.5	300
300	4	215	60	30	175	195	5.5	300
300	8	215	60	30	175	195	5.5	300
600	4	300	60	30	260	280	5.5	300
600	8	300	60	30	260	280	5.5	300
1000	4	330	60	30	290	310	5.5	300

Selection of braking resistor values

Set the braking voltage(V)	Minimum resistance(R)
Less than 72V	2R
Greater than 72V Less than 155V	4R
Greater than 155V Less than 180V	8R



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Revision record

Date	Version number	Revised content	
		Modify location	Modify content
20250210	V0.1	/	New edition