# SB200 Series Braking Unit
# Installation Manual


**Shanghai Sanyu Industry Co., Ltd.**

# Foreword

Thank you for choosing SANYU design and produce brake unit. This product made by SANYU is based on years of experience in professional production and sale, and designed for feed back the regenerative consumption of motor to the brake resistor when the motor decelerates, enhances the brake capability of the inverter, ensures the motor to stop in a short time in the setting time.

For any problem when using this product, please contact your local dealer authorized by this company or directly contact this company, our professionals are happy to serve you.

The end-users should hold this manual, and keep it well for future maintenance & care, and other application occasions. For any problem within the warranty period, please fill out the warranty card and fax it to the our authorized dealer.

The contents of this manual are subject to change without prior notice. To obtain the latest information, please visit our website.

# Content

# Chapter 1 Inspection and safety precautions

SANYU brake unit have been tested and inspected before leaving factory. After purchasing, please check if its package is damaged due to careless transportation, and if the specifications and model of the product are consistent with your order requirements. For any problem, please contact your local authorized SANYU dealer or directly contact this company.

## 1-1. Inspection after unpacking

※ Check if that packing container contains this unit, one manual and one warranty card.

※ Check the nameplate on the side of the frequency inverter to ensure that the product you have received is right the one you ordered.

### 1-1-1. Instructions on nameplate

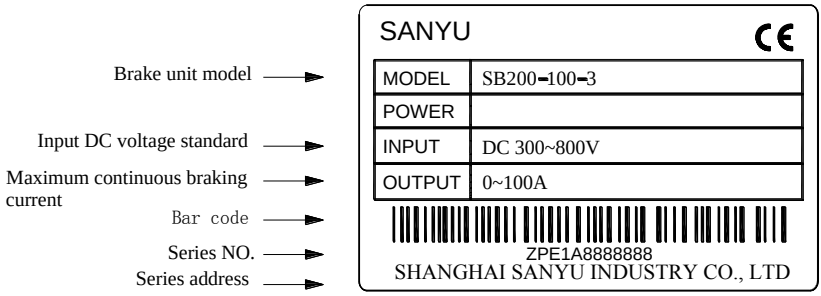



Figure 1-1:Nameplate Description

### 1-1-2. Model instruction

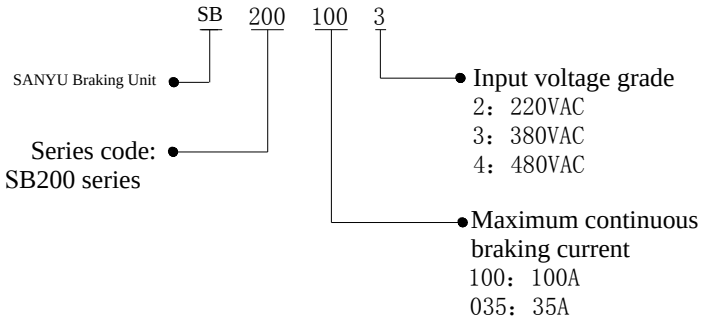



Figure 1-2:Model Description

## 1-2. Safety precautions

Safety precautions in this manual are divided into the following two categories:

Danger: the dangers caused by failure to perform required operation, may result in serious injury or even death;

Caution:the dangers caused by failure to perform required operation, may result in moderate injury or minor injury, and equipment damage;

| Safety type | Security considerations |
|---|---|
| **Dangerous** | ● Only well-trained personnel are allowed to use this unit.<br>● Fix the screw when connecting, or the loose connection will lead fire or creepage.<br>● Grounding terminal should be reliable grounding braking unit, or get an electric shock risk.<br>● Do not touch the brake unit, the internal spares and printing board after the brake unit is connected, otherwise it will lead to electric shock. There is high voltage direct current inside.<br>●Don't let the cable damage from weight hanging and over load, or get an electric shock risk.<br>● The unit and brake resistor should be installed on the medium with flame retardancy (such as metal), away from combustible material, otherwise may cause fire.<br>● Please check the wiring is correct before operation. Please confirm whether the input DC voltage and brake unit voltage same level; Whether Input terminal (+, -) and pick up on the resistance terminal (RB1, RB2's much-publicised) connection position is correct; And check the peripheral circuit of the connected to the drive for short circuit phenomenon, whether the line is fastening, otherwise cause damage of drive.<br>● Please check whether master-slave choice and voltage grade Settings are correct.<br>● During the running, do not touch any spares inside.<br>● The repairs and maintenance task can be performed only when the inverter bus voltage is lower than 36V Power off more than ten minutes.Otherwise, the residual charge from capacitor would cause personal injury! |
| **Attention** | ● Do not use any brake unit and brake resistor lack of or with damaged spares.<br>● Do not touch the internal spares for there are CMOS spares on the control card of the brake unit. Otherwise it will damage the spares.<br>● When many pieces brake units installed in parallel when used in the same case, please install the fan or other cooling device.<br>● Ensure the right setting of brake unit and brake resistor.<br>● Do not make voltage resistance test on the brake unit, or it will lead semiconductor spares damaged in the main circuit of the brake unit.<br>● Braking resistor should be temperature protection and other protection, if the brake resistance keep hot which caused by the failure of the |

| | |
|---|---|
| | brake unit. fever, necessary to isolate itself, does not automatically isolation caused any accident not be burdened by SANYU.<br>● Please refer to the content in the manual when analyze and manage the fault of the brake unit. Any modification to the brake unit is not allowed otherwise the life harm and property loses will not be burdened by SANYU.<br>● This product is the accessories of the inverter, if it is used improperly which would not only do damage to itself but also to the inverter. Please pay much attention to this.<br>● Only the well-trained personnel are allowed to use this unit, and such personnel must read through the parts of this manual relating to the safety, installation, operation and maintenance before using the unit. The safe operation of this unit depends on correct transport, installation, operation and maintenance. |

**Note:** When brake unit work with SANYU inverter, SANYU will responsible for quality, If the brake unit work for other project, Please make your own insurance related domestic property insurance, in order to get better compensation from insurance company.

# Chapter 2 Technical specifications and installation

## 2-1. Technical specifications

| Type | Starting braking voltage (V) | Maximum continuous braking current(A) |
|---|---|---|
| SB200-035-2 | 350 | 35 |
| SB200-050-2 | 350 | 50 |
| SB200-075-2 | 350 | 75 |
| SB200-100-2 | 350 | 100 |
| SB200-035-3 | 670 | 35 |
| SB200-050-3 | 670 | 50 |
| SB200-075-3 | 670 | 75 |
| SB200-100-3 | 670 | 100 |
| SB200-035-4 | 760 | 35 |
| SB200-050-4 | 760 | 50 |
| SB200-075-4 | 760 | 75 |
| SB200-100-4 | 760 | 100 |

## 2-2. Main circuit terminal screw specifications

| Brake unit model | Main loop screw specifications | Tightening torque (Nm) |
|---|---|---|
| SB200-035-2 | M5 | 2~2.5 |
| SB200-050-2 | M5 | 2~2.5 |
| SB200-075-2 | M5 | 2~2.5 |
| SB200-100-2 | M5 | 2~2.5 |
| SB200-035-3 | M5 | 2~2.5 |
| SB200-050-3 | M5 | 2~2.5 |
| SB200-075-3 | M5 | 2~2.5 |
| SB200-100-3 | M5 | 2~2.5 |
| SB200-035-4 | M5 | 2~2.5 |
| SB200-050-4 | M5 | 2~2.5 |
| SB200-075-4 | M5 | 2~2.5 |
| SB200-100-4 | M5 | 2~2.5 |

## 2-3. Installation

**2-3-1 Conditions for Use**

Hanging Brake unit should be installed inside the house where is ventilative.

### 2-3-2 Ambient condition

1. Ambient temperature -10℃~50℃. more than 40 ℃, according more than 1℃ ,proportion of 3% derating. not suggest more than 50℃.

2. Prevent electromagnetic interference, far away from disturbance sources;

3. Prevent dropping dust, powder, cotton fiber or fine metal powder from entering it.

4. Prevent oil, salt and corrosive gas from entering it.

5. Avoid vibration.

6. Avoid high temperature and moisture and avoid being wetted due to raining, with the humidity below 90%RH (not dewing).

7. Prohibit the use in the dangerous environment where inflammable or combustible or explosive gas, liquid or solid exists.

8. Brake unit can not installation near Air inlet.

## 2-4. Shape dimensions and installation dimensions

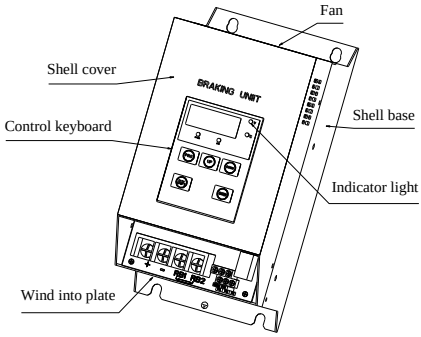



Figure 2-1. The brake unit sketch

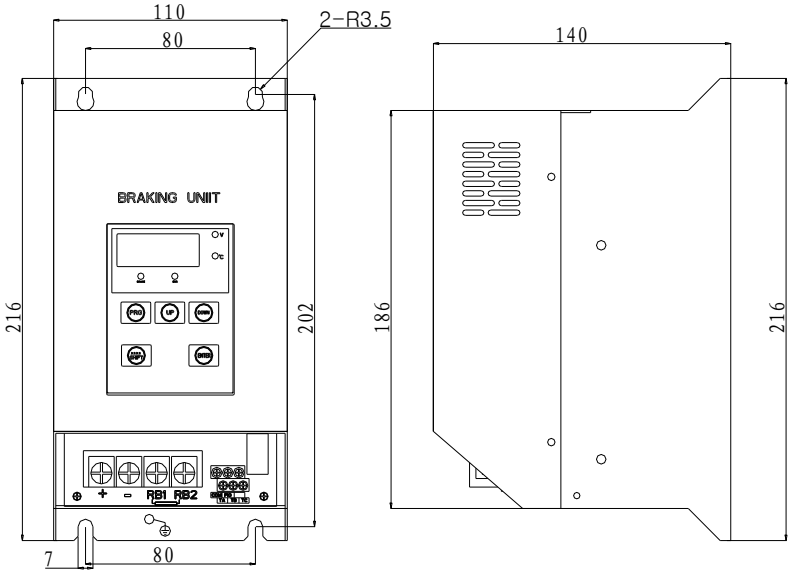



Figure 2-2. Brake unit Installation dimensions

## 2-5. Wiring diagram

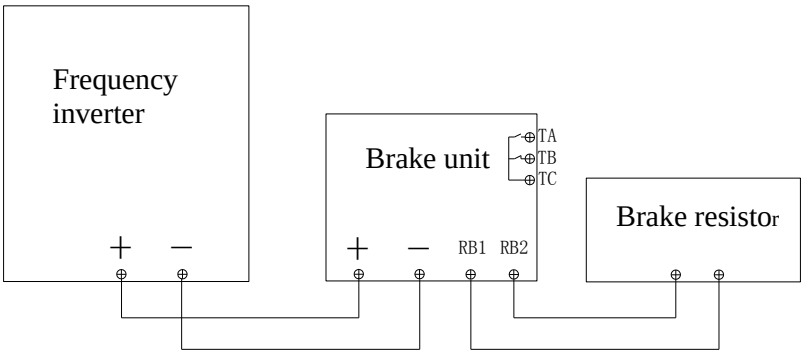



Figure 2-3. Single brake unit wiring diagram

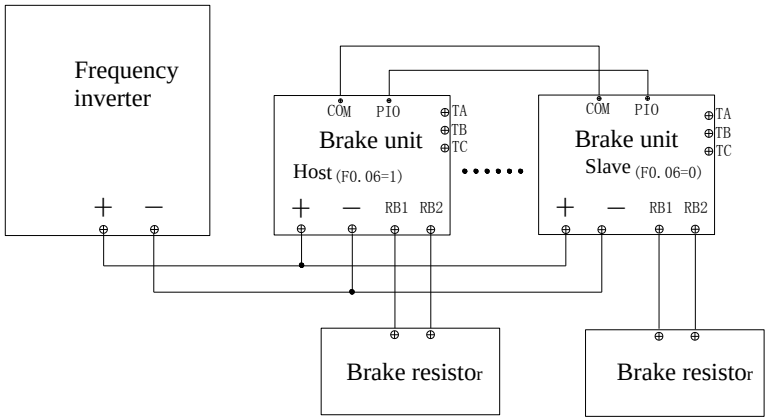



Figure 2-4. Figure more than one brake unit parallel connection diagram

**NOTE:**

1. The distance of the connection between the inverter and brake unit should less than 5m. And shall be added heat conductors.

2. The distance of the connection between the brake resistor and brake unit should as short as possible less than 10m.

3. +/P+、-/P- is the DC BUS in the inverter "+""-", P is positive, N is negative.

4. out put of relay TA/TB/TC，TA-TC normally open，TB-TC normally close. Relay drive ability. ：normally close3A/AC 250V，normally open.5A/AC 250V.

5. Wrong connection of main circuit will cause damage of brake unit and frequency inverter.

6. Please do not touch the brake unit when it is working, avoid scald.

**2-5-1. Brake,termial unit main circuit terminal and Making circuit terminal**

1、Main circuit terminal

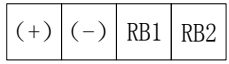



Figure 2-5. Brake unit main circuit termial

| Terminal mark | Function instruction |
|---|---|
| (+) | Connect the positive terminal of the inverter DC BUS. |
| (-) | Connect the Negative terminal of the inverter DC BUS. |
| RB1、RB2 | External connect brake resistor terminal |
| PE | Brake unit ground terminal |

2. Control circuit terminal

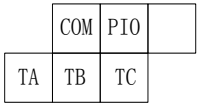



Figure 2-6. Control circuit terminal

| Terminal mark | Function instruction |
|---|---|
| COM | Brake unit control circuit ground |
| PIO | When brake units work in parallel use input or output terminal,when many sets of brake unit used in parallel, send control signal through the terminal that braking unit can run simultaneously. |
| TA/TB/TC | Fault output terminals, when braking unit failure, fault alarm signal output. TA - TC for normally open, TB - TC is normally closed |

# Chapter 3 Operate keyboard

## 3-1. Operate keyboard instruction

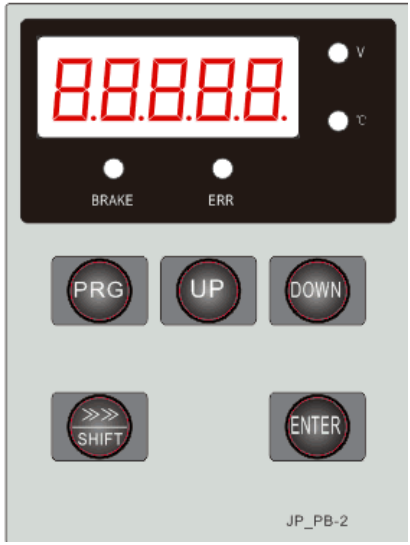



Figure 3-1:Operate keyboard display

## 3-2. Keyboard light instruction

| Light indicator | | Name |
|---|---|---|
| Status light | V | Brake unit input voltage |
| | ℃ | On :IGBT temperature |
| | BRAKE | On :Brake unit on brake status .<br>Dull : Brake unit on status standby |
| | ERR | Off :Fault indicator light |

## 3-3. Operation panel button

| Mark | Name | Function |
|---|---|---|
|  | Parameter setting / ESC key | * Enter the first level menu parameters changes state.<br>* Exit function data modify.<br>* Sub menu or function menu exit to the status display menu item. |
|  | Shift key | * Under the standby display interface and brake interface, can choose according to loop parameters; When modifying parameters, can choose the parameter changes |
|  | Increasing key | *Date and function Increasing key. |
|  | Descending key | * Date and function descending key. |

| | | |
|---|---|---|
| ENTER | Confirm key | *Step by step into the menu screen, set parameter confirmation. |

## 3-4. Keyboard display letters and Numbers corresponding to the table

| | Display letter | according letter | display letter | Corresponding to letter | display letter | Corresponding to letter |
|---|---|---|---|---|---|---|
| Digital display area | 0 | 0 | 1 | 1 | 2 | 2 |
| | 3 | 3 | 4 | 4 | 5 | 5 |
| | 6 | 6 | 7 | 7 | 8 | 8 |
| | 9 | 9 | d | d | E | E |
| | F | F | r | r | y | y |
| | . | . | _ | - | | |

## 3-5.Parameter setting sample

**3-5-1.function code check and repair instruction.**

**S**B200 Operation panel adopts three-level menu structure of the parameter Settings, and so on. Three-level menu are: parameter set (menu) - function code (level 2) - function code value (level 3) menu. Operation process as shown.

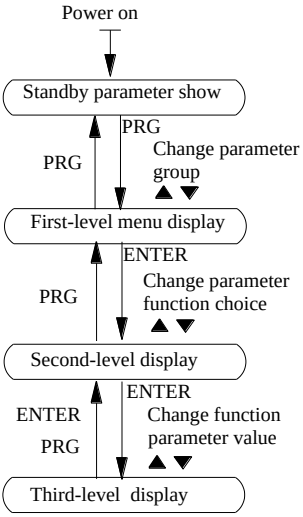


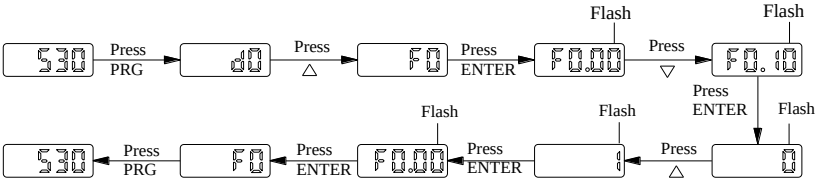

Figure 3-2:Operation flow chart

Explanation: the three-level menu operation, can press.PRG key or the ENTER key to return to the secondary menu. The difference between them is: press ENTER to save setting parameters then returning to the secondary menu, and automatically move to the next function code; While press.PRG return to the secondary menu, not storage

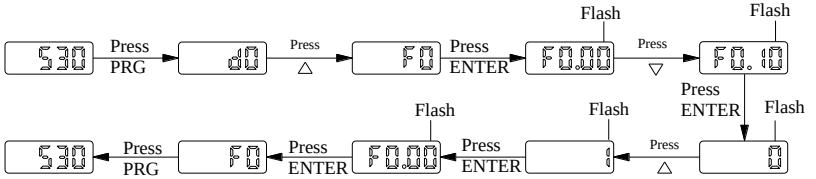
parameters, and return to the current function code.

Case 1: brake start voltage to modify parameters (380V) grade, assume that the brake unit input voltage is 530 VDC.

F0.00 from 670V to 660V




Example 2. Restore factory parameters




In the third level menu state, if the parameter does not have a flashing bit, it indicates that the function code can not be modified, possible reasons below:

1) This function code is unmodifiable. Such as the actual detection parameters, operating parameters., etc.

2) The function code can not be modified in the running state, it needs to be stopped before being modified.

**3-5-2.How to view the status parameters**

In the shutdown or operating state, through the Shift key "SHIFT", can monitor temperature and brake unit input voltage respectively.

# Chapter 4 Function parameter description

## 4-1. Menu grouping

**Note:**

"★": In braking state, the set value of this parameter can not be changed.

"●": The actual detection value, can not be changed;

"☆": In stop or running state, can be changed;

d Group is a monitoring function parameter, F group is the basic function parameters, y1 group is fault history query.

**4-1-1.d0 Monitor function group**

| Parameter Function Code | Parameter name | The smallest unit |
|---|---|---|
| d0.00 | Braking unit input voltage / Inverter bus voltage | V |
| Braking unit input voltage value | | |
| d0.01 | Module temperature | ℃ |
| Inverter module heatsink temperature detection value | | |
| d0.02 | Software version | - |
| Display current brake unit software version number | | |

**4-1-2. Basic function group**

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| F0.00 | Braking start voltage | 300V～2500V | Model confirmed | ☆ |
| This parameter is used to set the starting braking voltage of the braking unit.<br>220V voltage level, default braking voltage is 350V;<br>380V voltage level, default braking voltage is 670V;<br>480V voltage level, default braking voltage is 760V; | | | | |
| F0.01 | Braking hysteresis voltage | 0V～100V | 20V | ☆ |
| This parameter is used to set the hysteresis voltage during braking.<br>Generally when setting braking start voltage and braking stop voltage, there must be a hysteresis loop. Such as settings F0.00=670V，F0.01=20V，when the bus voltage d0.00 is higher than F0.00, start braking. When the bus voltage d0.00 is lower than (F0.00-F0.01), stop braking. When the original state is in braking state, and the value of d0.00 is within F0.00 ~ (F0.00-F0.01), the braking state is maintained. | | | | |
| F0.02 | Default brake voltage selection | 0～2 | 1 | ★ |
| This parameter is used to set the default braking voltage for different voltage levels.<br>When setting to 0, corresponding to 220V voltage level, the default braking voltage is 350V;<br>When setting to 1, corresponding to 380V voltage level, the default braking voltage is 670V;<br>When setting to 2, corresponding to 480V voltage level, the default braking voltage is 760V; | | | | |

| | | | | |
|---|---|---|---|---|
| F0.03 | Braking rate | 0%～100% | 100% | ☆ |

This parameter is used to select the braking rate.

When braking rate is set to 100%, it shows that the braking is fully open, at this time the braking effect is the best, with the fastest voltage drop, but the brake resistor temperature rises quickly.

When the braking rate is set to 0%, it shows that the braking is turned off, at this time even if it reaches the braking condition, the braking does not work.

| | | | | |
|---|---|---|---|---|
| F0.04 | Voltage modulation factor | 0%～200% | 100% | ☆ |

This parameter can be used to adjust the d0.00 bus voltage detection value.

That is d0.00＝DC BUS input voltage =d0.00*F0.04.

| | | | | |
|---|---|---|---|---|
| F0.05 | Relay output function selection | 0～4 | 0 | ☆ |

Relay function instructions below:

| Setting value | Function | Description |
|---|---|---|
| 0 | No output | The relay outputs no action. |
| 1 | In Braking | In braking state, the relay outputs ON signal. |
| 2 | Braking feedback fault (IGBT short circuit) | In braking process, it feedback IGBT short-circuit fault, the relay output ON signal. |
| 3 | Over-temperature alarm | When the module temperature exceeds 85 ℃, the over-temperature alarm signal is generated, the relay outputs ON signal. |
| 4 | Fault output | When brake feedback fault or over-temperature fault occurs, the relay output ON signal. |

| | | | | | |
|---|---|---|---|---|---|
| F0.06 | Master and slave selection | Slave | 0 | 1 | ★ |
| | | aster | 1 | | |

This parameter is used for the parallel function, setting the braking unit as master or slave. If you do not use the parallel function, the system single-set default unit host.

| | | | | |
|---|---|---|---|---|
| F0.07 | Temperature hysteresis value | 0～50 | 3 | ☆ |

This parameter is used to set the hysteresis value of the temperature. The default temperature alarm value for the brake unit is 85 ℃. If the temperature hysteresis value is set to 3 ℃, when there is not over temperature fault, if only the temperature exceeds 85 ℃, it alrms. If over temperature fault occurs, the alarm is canceled only when the temperature drops below 82 ℃.

| | | | | |
|---|---|---|---|---|
| F0.08 | Total power-on time | 0~50000h | - | ● |

Display the total power-on time of braking unit since it is out of factory.

| | | | | | |
|---|---|---|---|---|---|
| F0.09 | Total running time | 0~50000h | | - | ● |
| F0.10 | Parameter initialization | No operation | 0 | 0 | ★ |
| | | The parameters restored to factory value | 1 | | |
| | | Clear record information | 2 | | |

1: Restore to the factory setting (F0.10 = 1), most of the brake unit parameters are restored to factory setting, except default braking voltage level (F0.02), fault record information, total power-on time, total running time.

2: Clear the record information (F0.10 = 2) Clear the fault record information, total power-on time, total running time of the braking unit.

**4-1-3. Fault history query**

| Code | Parameter name | Setting range | Factory setting | Change |
|---|---|---|---|---|
| y1.00 | Type of the first fault | 0～2 | - | ● |
| y1.01 | Type of the second fault | 0～2 | - | ● |
| y1.02 | Type of the third(at last) fault | 0～2 | - | ● |

Record the type of the last three faults of SB200, 0 for no fault. Please refer to the related instructions for the possible causes and solutions for each fault code.

Failure type table:

| No. | Failure type |
|---|---|
| 0 | No fault |
| 1 | Braking feedback fault (IGBT short circuit) |
| 2 | Over temperature fault |

| | | | |
|---|---|---|---|
| y1.03 | Bus voltage of the third fault | Bus voltage of the last fault | ● |
| y1.04 | Temperature of the third fault | Temperature of the last fault | ● |
| y1.05 | Braking rate of the third fault | Braking rate of the last fault | ● |
| y1.06 | Power on time of the third fault | Power on time of the last fault | ● |
| y1.07 | Running time of the third fault | Running time of the last fault | ● |
| y1.08 | Bus voltage of the second fault | Bus voltage of the previous fault | ● |
| y1.09 | Temperature of the second fault | Temperature of the previous fault | ● |
| y1.10 | Braking rate of the second fault | Braking rate of the previous fault | ● |
| y1.11 | Power on time of the second fault | Power on time of the previous fault | ● |
| y1.12 | Running time of the second fault | Running time of the previous fault | ● |
| y1.13 | Bus voltage of the first fault | Bus voltage before the previous fault | ● |
| y1.14 | Temperature of the first fault | Temperature before the previous fault | ● |
| y1.15 | Braking rate of the first fault | Braking rate before the previous fault | ● |
| y1.16 | Power on time of the first fault | Power on time before the previous fault | ● |
| y1.17 | Running time of the first fault | Running time before the previous fault | ● |

# Chapter 5 Braking unit and resistor selection

## 5-1 The selection of braking unit

**5-1-1.The brake voltage selection are based on the following two criterions**

(1) Selecting the corresponding voltage level of the braking unit according to the inverter input voltage level.

(2) Selecting the corresponding braking unit power according to the braking power required.

The selection principle of braking unit power is that the braking unit power is greater than the braking power. In the case of unspecified braking power,the following method can be used to estimate:

Pb=P*Td*K

Pb-----Braking power

P-----Motor Power

K----- Mechanical energy conversion efficiency, the general value: 0.7

Td---- Braking torque and rated motor torque ratio

The values of Td are not the same in different systems, as shown in the following table

| Common applications | Elevators, hoists, cranes | Winding up and winding down | Large inertia devices that require fast stopping | Common inertial load |
|---|---|---|---|---|
| Td value | 100% | 120% | 120% | 80% |

**5-1-2.Braking resistance selection**

The regenerative energy of motor is almost entirely consumed in the braking resistor while braking. As per the formula:

U*U/R=Pb

U----- Braking voltage for stable braking system

(They are not the same for different systems, for 220VAC system usually take 380V; for 380VAC system,generally take 700V, 480VAC systems take 800V)

Note: When the calculated R is less than the minimum resistance at each voltage level, multiple braking units are required.

**5-1-3.Braking resistor power selection**

Theoretically the braking resistor power and braking power are the same, but taking the derating of 70% into account. According to the formula:

0.7*Pr=Pb*ED

Pr-----Braking resistor power

ED----- Braking frequency, that is, the braking process accounted for the proportion of the entire work process

| Common application | ED Value |
|---|---|
| Winding up and winding down | 20%～30% |
| Casual braking load | 5% |
| Elevator | 20%～30% |

| | |
|---|---|
| Hoisting machine, centrifugal machine | 50%～60% |
| injection molding machine | 5%～10% |
| General occasion | 10% |

In the table above, the recommended braking unit and braking resistor values can meet the various application conditions of the inverter with ED = 0 to 100%, but the power of braking resistor will depend on different application conditions.

**5-1-4.Inverter input voltage level specification and selection reference**

1. This table for inverter 220V,, braking unit DC operating point 350V, braking frequency 10%, braking torque 100%.

| Inverter power (kW) | Braking unit | | Braking resistor (100% braking torque) | |
|---|---|---|---|---|
| | Specification | Quantity(PC) | Specification | Quantity(PC) |
| 15 | SB200-035-2 | 1 | ≥10Ω/2kW | 1 |
| 18.5 | SB200-050-2 | 1 | ≥8Ω/2kW | 1 |
| 22 | SB200-050-2 | 1 | ≥8Ω/3kW | 1 |
| 30 | SB200-075-2 | 1 | ≥6Ω/3kW | 1 |
| 37 | SB200-100-2 | 1 | ≥4Ω/4kW | 1 |
| 45 | SB200-100-2 | 1 | ≥4Ω/5kW | 1 |
| 55 | SB200-100-2 | 1 | ≥4Ω/6kW | 1 |
| 75 | SB200-100-2 | 2 | ≥4Ω/4kW | 2 |
| 93 | SB200-100-2 | 2 | ≥4Ω/5kW | 2 |
| 110 | SB200-100-2 | 3 | ≥4Ω/4kW | 3 |
| 132 | SB200-100-2 | 3 | ≥4Ω/5kW | 3 |
| 160 | SB200-100-2 | 3 | ≥4Ω/6kW | 3 |

2.This table for inverter 380V, braking unit DC operating point 670V, braking frequency 10%, braking torque 100%.

| Inverter power (kW) | Braking unit | | Braking resistor (100% braking torque) | |
|---|---|---|---|---|
| | Specification | Quantity(PC) | Specification | Quantity(PC) |
| 18.5 | SB200-035-3 | 1 | ≥30Ω/2kW | 1 |
| 22 | SB200-035-3 | 1 | ≥25Ω/3kW | 1 |
| 30 | SB200-050-3 | 1 | ≥18Ω/4kW | 1 |
| 37 | SB200-050-3 | 1 | ≥15Ω/4kW | 1 |
| 45 | SB200-050-3 | 1 | ≥15Ω/5kW | 1 |
| 55 | SB200-075-3 | 1 | ≥11Ω/6kW | 1 |
| 75 | SB200-100-3 | 1 | ≥8Ω/8kW | 1 |
| 93 | SB200-100-3 | 1 | ≥8Ω/10kW | 1 |

| | | | | |
|---|---|---|---|---|
| 110 | SB200-75-3 | 2 | ≥11Ω/6kW | 2 |
| 132 | SB200-75-3 | 2 | ≥11Ω/7kW | 2 |
| 160 | SB200-100-3 | 2 | ≥8Ω/9kW | 2 |
| 187 | SB200-100-3 | 2 | ≥8Ω/10kW | 2 |
| 200 | SB200-100-3 | 2 | ≥8Ω/11kW | 2 |
| 220 | SB200-100-3 | 3 | ≥8Ω/8kW | 3 |
| 250 | SB200-100-3 | 3 | ≥8Ω/9kW | 3 |
| 280 | SB200-100-3 | 3 | ≥8Ω/10kW | 3 |

This table for reference as: inverter 460V, braking unit DC operating point 670V, braking frequency 10%, braking torque 100%.

| **Inverter power (kW)** | **Braking unit** | | **Braking resistor (100% braking torque)** | |
|---|---|---|---|---|
| | **Specification** | **Quantity(PC)** | **Specification** | **Quantity(PC)** |
| 18.5 | SB200-035-4 | 1 | ≥35Ω/2kW | 1 |
| 22 | SB200-035-4 | 1 | ≥30Ω/3kW | 1 |
| 30 | SB200-035-4 | 1 | ≥25Ω/4kW | 1 |
| 37 | SB200-050-4 | 1 | ≥17Ω/4kW | 1 |
| 45 | SB200-050-4 | 1 | ≥17Ω/5kW | 1 |
| 55 | SB200-075-4 | 1 | ≥13Ω/6kW | 1 |
| 75 | SB200-075-4 | 1 | ≥13Ω/8kW | 1 |
| 93 | SB200-100-4 | 1 | ≥9Ω/9kW | 1 |
| 110 | SB200-100-4 | 1 | ≥9Ω/12kW | 1 |
| 132 | SB200-075-4 | 2 | ≥13Ω/7kW | 2 |
| 160 | SB200-100-4 | 2 | ≥9Ω*/9kW | 2 |
| 187 | SB200-100-4 | 2 | ≥9Ω/10kW | 2 |
| 200 | SB200-100-4 | 2 | ≥9Ω/11kW | 2 |
| 220 | SB200-100-4 | 2 | ≥9Ω/12kW | 2 |
| 250 | SB200-100-4 | 3 | ≥9Ω/9kW | 3 |
| 280 | SB200-100-4 | 3 | ≥9Ω/10kW | 3 |
| 315 | SB200-100-4 | 3 | ≥9Ω/11kW | 3 |

# Chapter 6 Abnormal diagnosis and treatment

SB200 braking unit has 2 types of protection, once the fault occurs, the protection function act, braking unit stops working, and display the fault type on the braking unit display panel. Users can follow the tips in this section to check firstly, analys the reason of fault, and find a solution.

If fault occurs during debugging, refer to the troubleshooting and protection functions list in Table 6-1 to confirm fault type and troubleshooting method. If you can not find the troubleshooting method during the debugging process, please contact SANYU technical service personnel.

Table 6-1 List of braking unit fault diagnosis and protection functions

| No. | Failure code | Failure type | Possible causes | Solutions |
|---|---|---|---|---|
| 1 | Err.01 | Braking feedback fault (IGBT short circuit) | 1、Braking unit output circuit short out<br>2、The internal wiring of the brake unit loosen.<br>3, Drive circuit is abnormal<br>4, Inverter module abnormal | 1, Exclude peripheral faults<br>2, Plug all the cables well<br>3, Seek technical support<br>4, Seek technical support |
| 2 | Err.02 | Module is overheating | 1, Air duct get blockage<br>2, Fan damage<br>3, Ambient temperature is too high<br>4, Module thermistor damage<br>5, Inverter module damage | 1, Clean air duct<br>2, Replace fan<br>3, Reduce ambient temperature<br>4, Replace thermistor<br>5, Replace inverter module |

# Chapter 7 Maintenance and inspection

## 7-1. Inspection and maintenance

Brake unit in normal use, in addition to daily inspection, it still needs regular inspection. Please refer to the table below for preventive measures.

| Inspection date | | Inspection part | Inspection item | Inspection matter | Inspection method | Judgement criteria |
|---|---|---|---|---|---|---|
| Routine | Periodic | | | | | |
| √ | | Display | LED display | If there is abnormal on display | Vision | Confirm as status of use |
| √ | √ | cooling system | Fan | If there is abnormal sound or vibration | Vision, hearing | No abnormality |
| √ | | Case | Surroundings | Temperature humidity, dust, harmful gases | Vision, smell, feeling | According to the technical specifications of environmental standards |
| √ | | Input and output terminals | Voltage | If there is abnormal on input voltage | Measure (+), (-) terminals | According to the standard specifications |
| | √ | Main circuit | Full view | If there are loose fasteners, overheating traces, discharge phenomenon, too much dust, blocked air duct | Visual, fastening, wipe | No abnormality |
| | | | Conductor, conductive row | If it is loose | Visual | No abnormality |
| | | | Terminals | If bolts or screws are loose | Fastening | No abnormality |

"√" indicates the need for routine or periodic inspections. In the inspection, operator can not remove or shook the device for no reason, especially can not unplug connector, otherwise it will not work properly or enter the fault display state and lead to component failure or even the main switch IGBT module damage.

## 7-2. Replacement for vulnerable components of braking unit

To ensure the reliable operation of the brake unit, in addition to regular maintenanc, for the long-term mechanical wear inside the device - all cooling fans and printed circuit boards and others should be replaced regularly.

For general continuous use, the replacement could be implemented as per the provisions in the following table, but also should take account of specific circumstances, like the operating environment, load conditions and the status of the brake unit ans so on.

| Component name | Standard replacement year number |
|---|---|
| Cooling fan | 1～3 years |
| Printed circuit board | 5～8 years |

## 7-3.Storage and keep

If the braking unit is not used immediately after purchase (temporary or long-term storage), the following should be done:

(1) It should be placed in the standard temperature range and no tide, no dust, no metal dust, and well ventilated place.

(2) It is not good to implement pressure test, it will lead to reduce the life of braking unit.

(3) Long-term storage will lead to the degradation of electrolytic capacitors, it must ensure that within 2 years, running through power, power-on time at least 5 hours, the input voltage must be raised slowly to the rated voltage by adjustable power supply.

# Chapter 8 Warranty

The product quality shall comply with the following provisions (overseas market):

1. Warranty terms

1-1. The product from the ex-factory date, the warranty period of 18 months( except non-standard products), It is based on factory records.

1-2. The product from the ex-factory date. if the product appear quality problem within the normal operating range. we provide free warranty under 18 months.

1-3. The product from the ex-factory date, enjoy lifelong compensable service.

If there is a contract, we will according to the priority principle of the contract.

2. Exceptions clause

If belongs to the quality problems caused by following reasons products, we provide compensable service even though under the warranty. we will charge a maintenance fee.

2-1. The user is not in accordance with the "products manual" is used method of operation

caused the failure.

2-2. Users without permission to alteration or repair caused by product failure.

2-3. Users beyond the standard specifications require the use of the inverter caused by product failure.

2-4. Users to buy and then fell loss or damage caused by improper handling.

2-5.Because the user use adverse environment (such as: Humid environment, Acid and alkaline corrosion gas and so on) lead to product failure.

2-6. Due to the fault cause of earthquake, fire, lightning, wind or water disaster, abnormal

voltage irresistible natural disasters.

2-7. Damaged during shipping ,but users are not rejected goods.

3. The following conditions, manufacturers have the right not to be warranty.

3-1. No product nameplate or product nameplate blurred beyond recognition.

3-2. Not according to the purchase contract agreement to pay the money.

3-3. For installation, wiring, operation, maintenance and other users can not describe the objective reality to the company's technical service center.

4. About the repair fee, according to our company latest price list as a standard.

5. When the products is broken, please complete the form and warranty card, shipping with the failure machine to our company.

# Product information feedback

Dear user:

Thank you for your interest in and purchasing SANYU products! In order to better serve you, we want to be able to timely get your personal information and the related information of the purchased SANYU products so as to understand your further demands for our SANYU products, we would appreciate your valuable feedback. For your convenience, please visit our website www.sanyuacdrive.com and then click "Technologies and Services"and "Download" columns to submit your feedback information.

1) Download the update product manuals you need
2) View the technical information on products, such as operation instructions, specifications and features, FAQ, etc.
3) Share application cases.
4) Technical advisory and online feedback
5) Feedback the product and demand information via e-mail
6) Inquire the latest products and access to various types of warranty and extend additional services.

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