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Inspire the Next

Application Note:

SJ-P1 series

Dynamic Braking

Please also refer to the
Inverter Instruction Manual

AN210501 Rev A

Hitachi Industrial Equipment & Solutions America, LLC

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Hitachi SJ-P1 Series Dynamic Braking



Overview

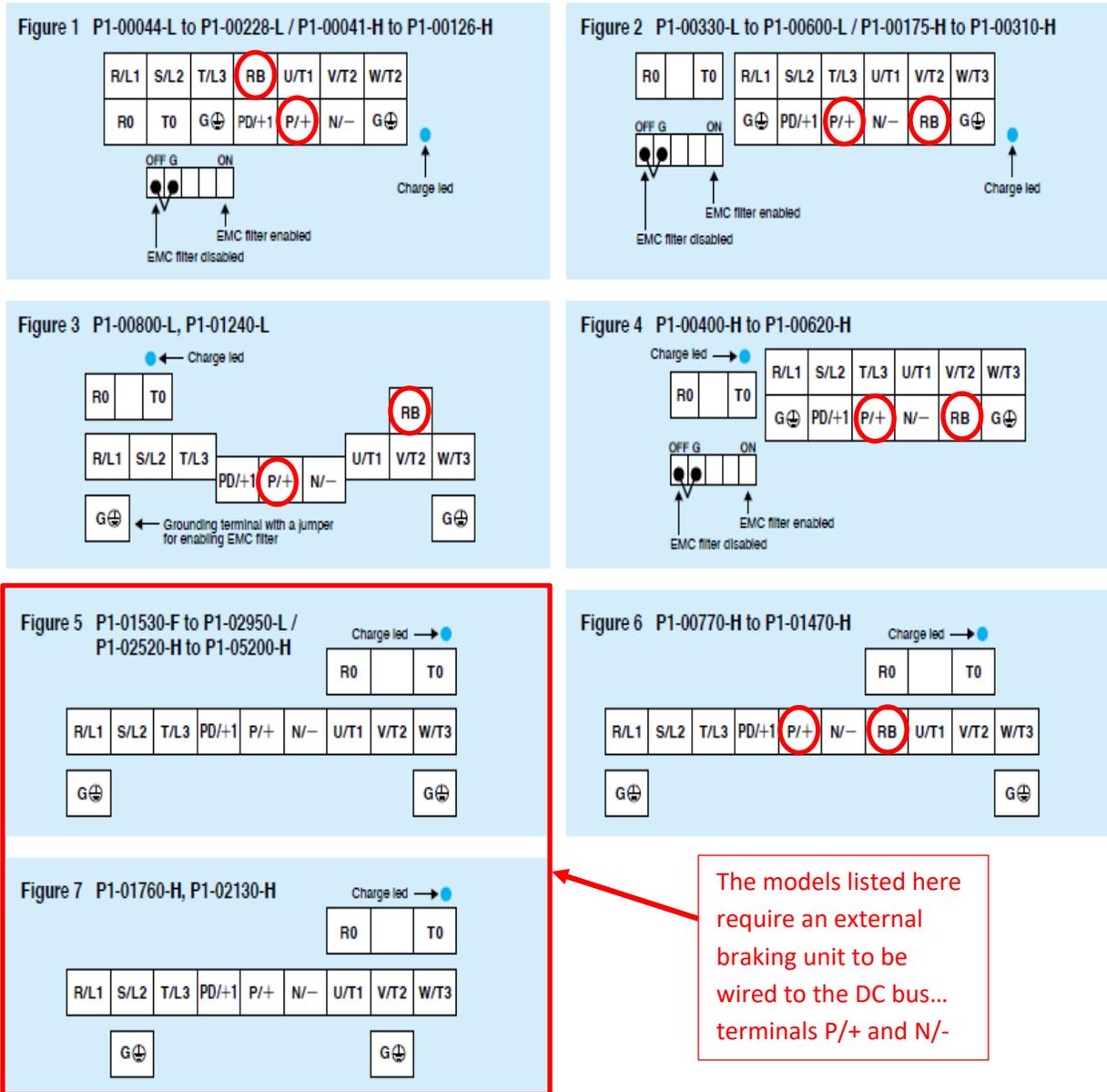
The SJ series type P1 inverters, up to 22KW in 200V class and up to 37KW in 400V class, are equipped with an internal IGBT module for dynamic braking control. The larger models require an optional external braking unit, that is wired directly to the DC Bus and the braking resistor wires directly to the external brake unit. Dynamic braking allows for stopping a higher inertia load or stopping a load more quickly than simply using the deceleration time and capacity of DC bus capacitors. This application note will cover the wiring and programming of the dynamic brake feature. Please consult your local electrical inspector for regulations and proper installation. This application note does not supersede or nullifies any cautions, electrical code regulations or warnings included in the product manual.

When selecting the dynamic braking resistor for a specific application, please see the Hitachi Dynamic Brake Calculator selection tool, located on the Hitachi website.

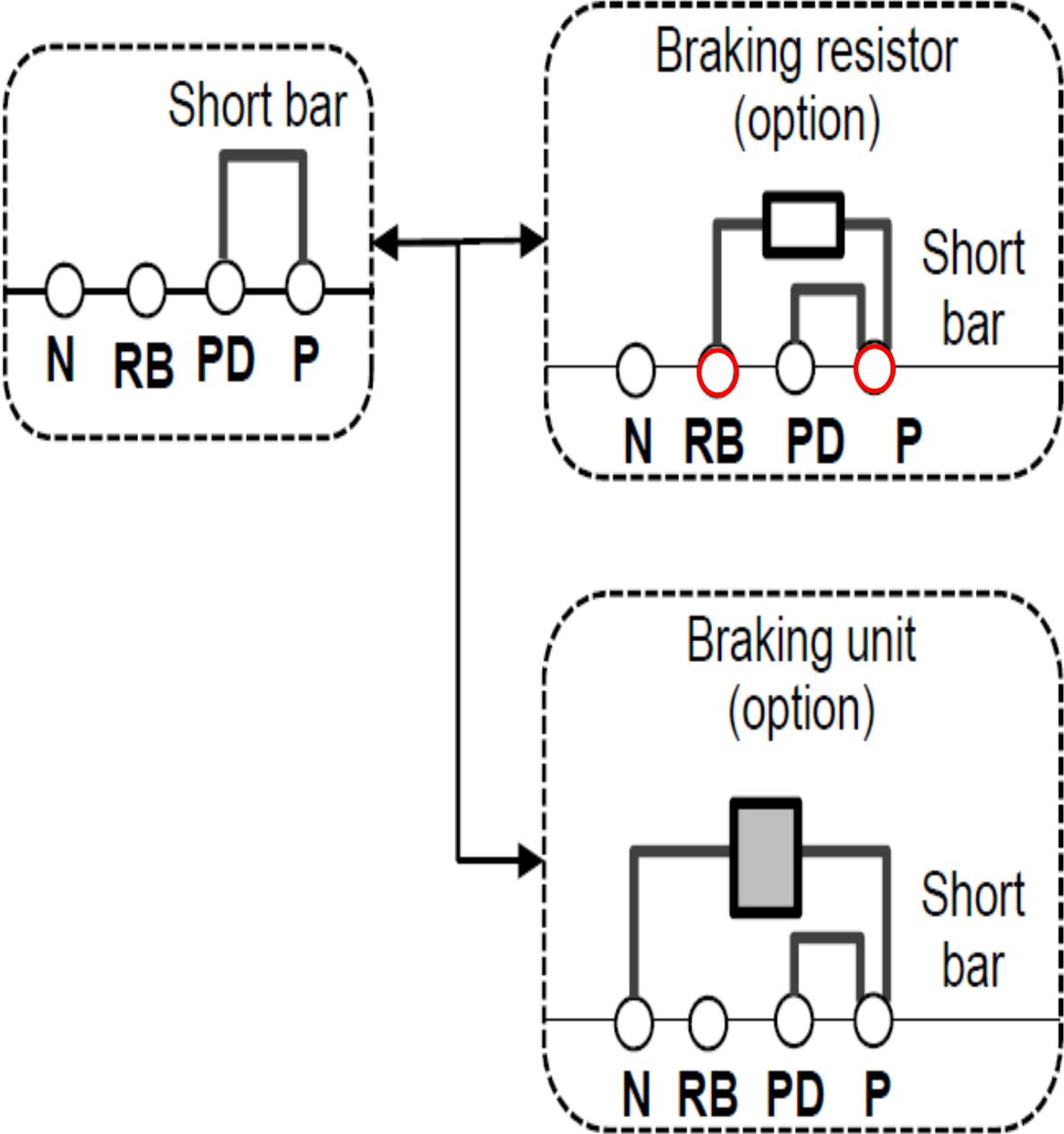
Wiring the SJ series type P1 With the Braking Resistor

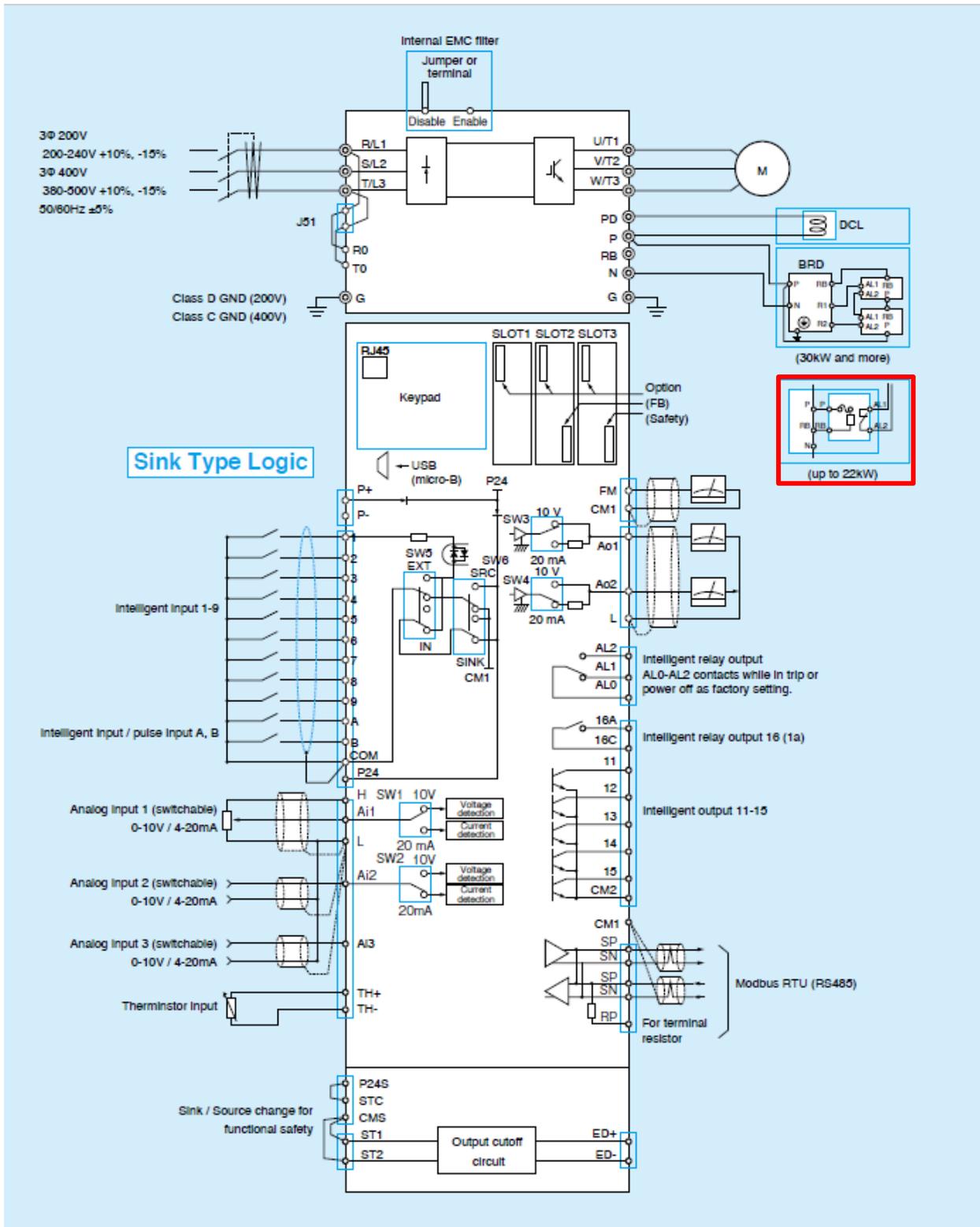
The SJ-P1 series inverter, up to 22KW in 200V class and up to 37KW in 400V class, include an internal IGBT module for the dynamic brake switching. The Braking resistor should be wired between the RB and P+ terminals on models equipped with this internal braking circuit. Please see the terminal arrangement for the P1 series, highlighted in red below.

• Terminal Arrangement



The jumper between the PD and P+ terminals should remain connected unless a DC Link Choke is connected. The Dynamic braking resistor will be connected between the RB and P+ terminals. If an external braking unit is required, it should be wired directly onto the DC Bus terminals P/+ and N/-. The resistor will then wire directly into the brake unit.





Programming the SJ-P1 series Inverter Braking Resistor

Please follow the steps below for programming the SJ-P1 for dynamic braking control.

1. Set parameter **bA-60** (Dynamic brake use ratio) to the brake usage ratio. The range is 0-10% and to use the maximum output set to 10%.
2. Set parameter **bA-61** (Dynamic brake activation selection) to function 01 to have the dynamic braking circuit active only while the drive motor is running. Set the parameter to function 02 for the braking circuit to be active while the motor is running and while it is stopped. (Consult your local electrical code if selecting the 02 parameter setting)
3. Parameter **bA-62** (Dynamic brake activation level) allows adjustment of the DC Bus level for the dynamic braking circuit to be activated.
4. Parameter **bA-63** (Dynamic brake resistor value) default value is minimum resistance and depends on the inverter model. Please do not adjust unless you have a complete understanding of the Dynamic brake control circuit.

Dynamic Braking Resistor Error Codes

When the use rate of the inverter's braking resistor operation circuit exceeds the usage rate set in bA-60, the drive will shut off the output and display an E006- Braking Resistor Overload Error.

Possible causes: Please check parameter bA-60 and adjust accordingly. The braking resistor may not be properly sized for the application. The inertia of the load is too large for the braking resistor. The load could be affected/rotated by an external force. The braking circuit repetition cycle is high. Please see the SJ-P1 User's Guide for complete troubleshooting information.

Please contact Hitachi Industrial Equipment & Solutions America LLC for questions or concerns with the SJ-P1 series inverters or the Dynamic Braking Feature.

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