YASKAWA
Energy In Motion™

SGDH	External Regen Specifications

Power returns to the SGDH servo amplifier when the servomotor is driven in the generator mode. This is called regenerative power. The regenerative power is absorbed by charging the bus smoothing capacitor in the SGDH. The regenerative resistor consumes the regenerative power when such power exceeds the chargeable energy of the capacitor. SGDH with capacities of 0.5 to 5 kW have built-in regenerative resistor with limited power capacities. SGDH servos with capacities of 6 kW or more do not have built-in regenerative resistors so a regenerative resistor must be connected externally. Please refer to section 5.6 of the *Sigma II Series Servo System User's Manual* for more details.
Applications with high load to motor inertia mismatches may require additional regenerative capacity in addition to the built-in amount. To add an external regenerative resistor to the SGDH, simply connect a resistor or resistor network beteeen terminals B1 and B2. For SGDH servos with capacities of 0.5 to 5 kW, be sure to remove the jumper wire between terminals B2 and B3. User parameter Pn600 must be set to identify the external regenerative resistor's power capacity.

The external regenerative equivalent resistance should be: (V=380 for 200V unit, or 760 for 400V unit)

$\mathbf{R_{min} < R < (V\text{^}2 / P_{rg})}$ where P_{rg} is the needed regenerative power in watts, V is the DC regen ON level

The maximum allowable power capacity of the external regeneration resistor is the rated power capacity of the SGDH. The minimum allowable resistances for SGDH amplifiers are listed below. The external regenerative resistor must be equalto or greater than this value.

Model #	R_{min} (Ω)
200V:	
SGDH-A3AE - 04AE	40
SGDH-08AE-S	40
SGDH-15AE-S	20
SGDH-05AE – 10AE	40
SGDH-15AE	20
SGDH-20AE – 30AE	12
SGDH-50AE	8
SGDH-60AE	5.8
SGDH-75AE - 1EAE	2.9
100V:	
SGDH-A3BE – 02BE	40
400V:	
SGDH-05DE-15DE	73
SGDH-20DE, 30DE	44
SGDH-50DE	28
SGDH-60DE, 75DE	18
SGDH-1ADE, 1EDE	14.2

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When power resistors are used at the rated load ratios the resistors operating temperature rises to between 200ºC and 300ºC. The resistors must be used at below the rated values. Check with the manufacturer for resistor load characteristics. Use resistors at no more that 20% of the rated load ratio with natural convection cooling, and no more that 50% of the rated load ratio with forced air cooling. For example, if a JUSP-RA04 is used in its factory configuration of 6.25 Ohms, The allowable capacity is 176W (20% of 880W) with natural convection cooling. In forced-air cooling it is 440W (50% of 800W). User parameter Pn600 must be set to the allowable capacity for the regen circuit in the SGDH to operate properly.

When shipped from the factory, Yaskawa Electric Regeneration Unit JUSP-RA04 is pre-wired for the SGDH-60AE, JUSP-RA05AE is pre-wired for the SGDH-75AE, SGDH-1AAE and SGDH-1EAE, JUSP-RA18 is pre-wired for the SGDH-60DE and SGDH-75DE, and JUSP-RA19 for the SGDH-1ADE and SGDH-1EDE.

Yaskawa's External Regeneration Units P/N JUSP-RA04, -RA05, -RA18, and -RA19 may also be rewired to achieve the needed equivalent resistances and power capacities. The rewiring procedure includes the removal of jumpers J1 and J2, and use of spare screw terminals P1 and P2. The examples below describe the modification of JUSP-RA04 to provide 440 watts of regenerative power capacity at 12.5Ω, 880W at 6.25Ω, and of the JUSP-RA05 to provide 1760W at 3.12Ω. Please note that these power capacities are before derating. Refer to the above paragraphs for the proper derating level.

Yaskawa's External Regenerative Resistor P/N RH500N25ohmK (25Ω, 300 watts) may also be used in single or multiple units in either series or parallel combinations to achieve the needed equivalent resistances and power capacities.

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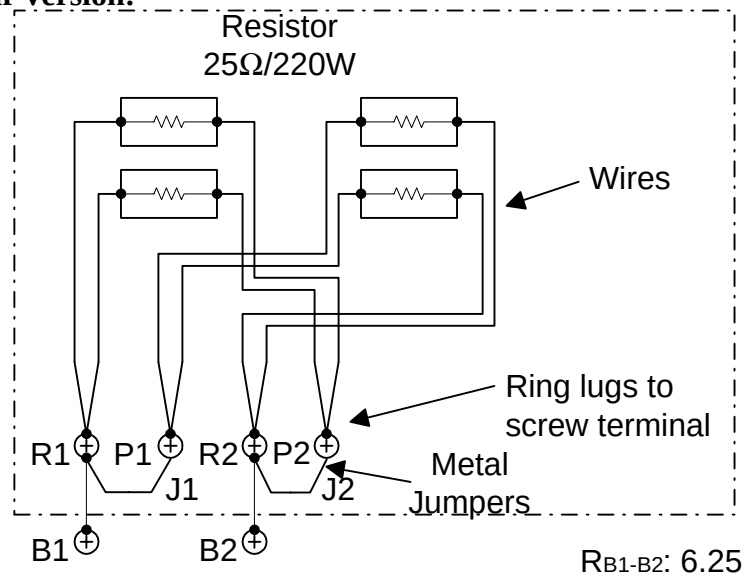
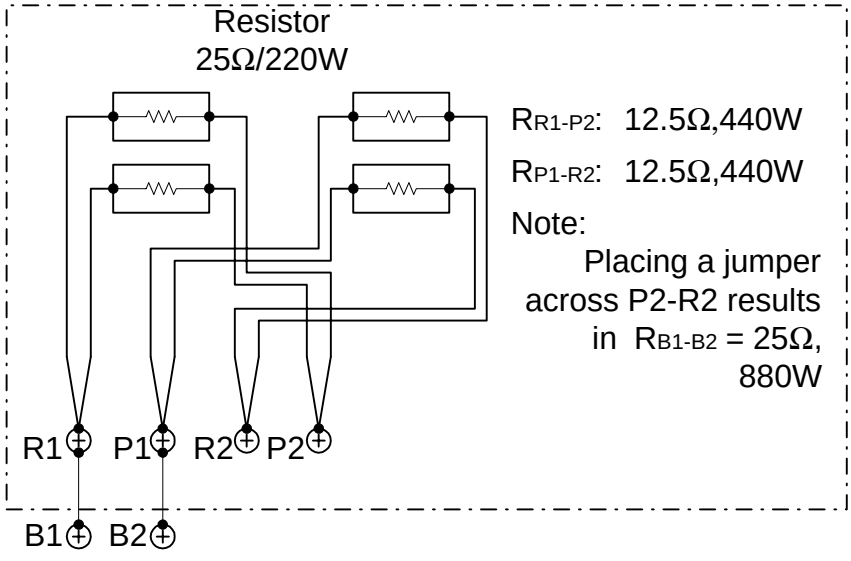
JUSP-RA04

Standard Off-the-Shelf Version:



R_{B1-B2}: 6.25Ω, 880W

Without Jumpers:



R_{R1-P2}: 12.5Ω,440W

R_{P1-R2}: 12.5Ω,440W

Note:
Placing a jumper across P2-R2 results in R_{B1-B2} = 25Ω, 880W

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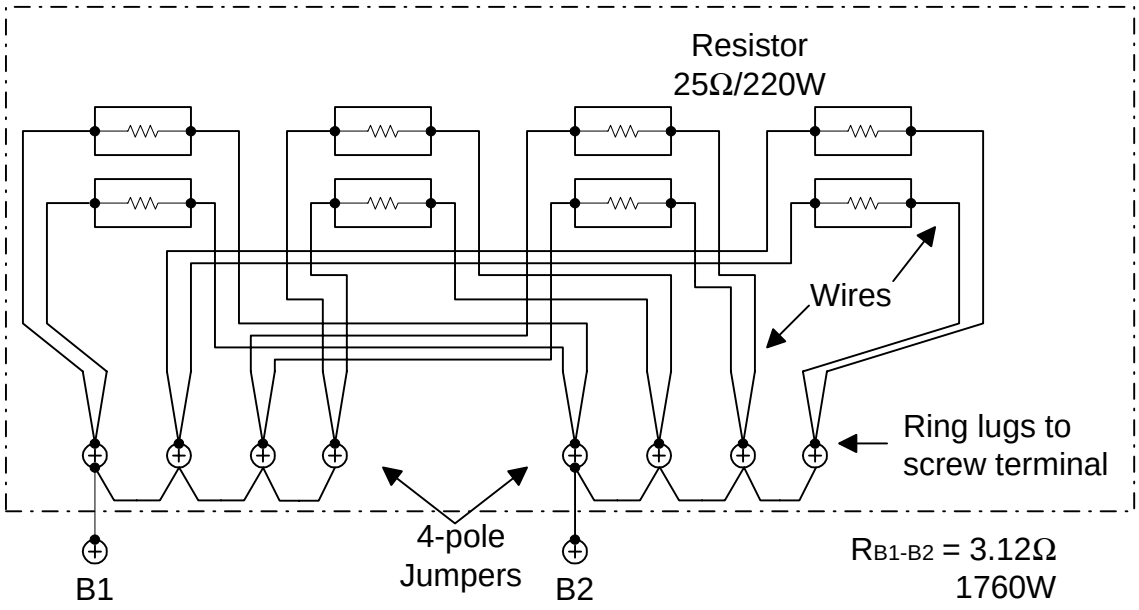
JUSP-RA05



- Without the jumpers, this is essentially the same as wiring two JUSP-RA04 units.

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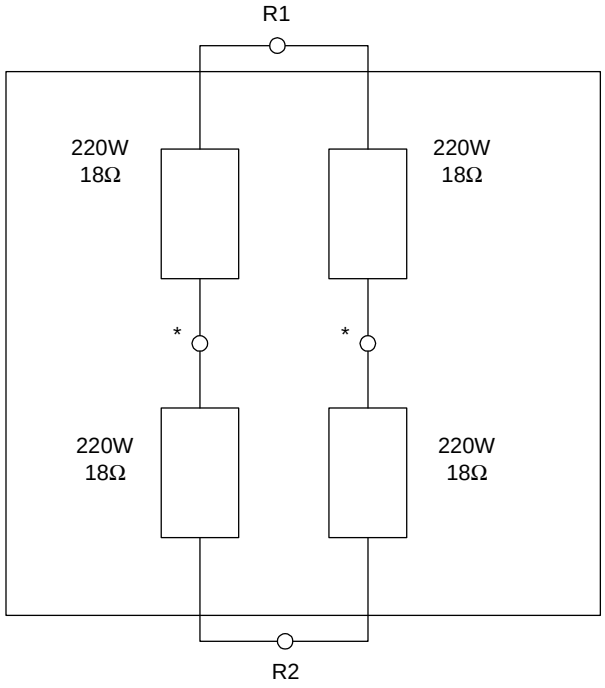
JUSP-RA18



*: These use terminal in parts hidden by the terminal block cover. These terminals should not be connected to from the outside.

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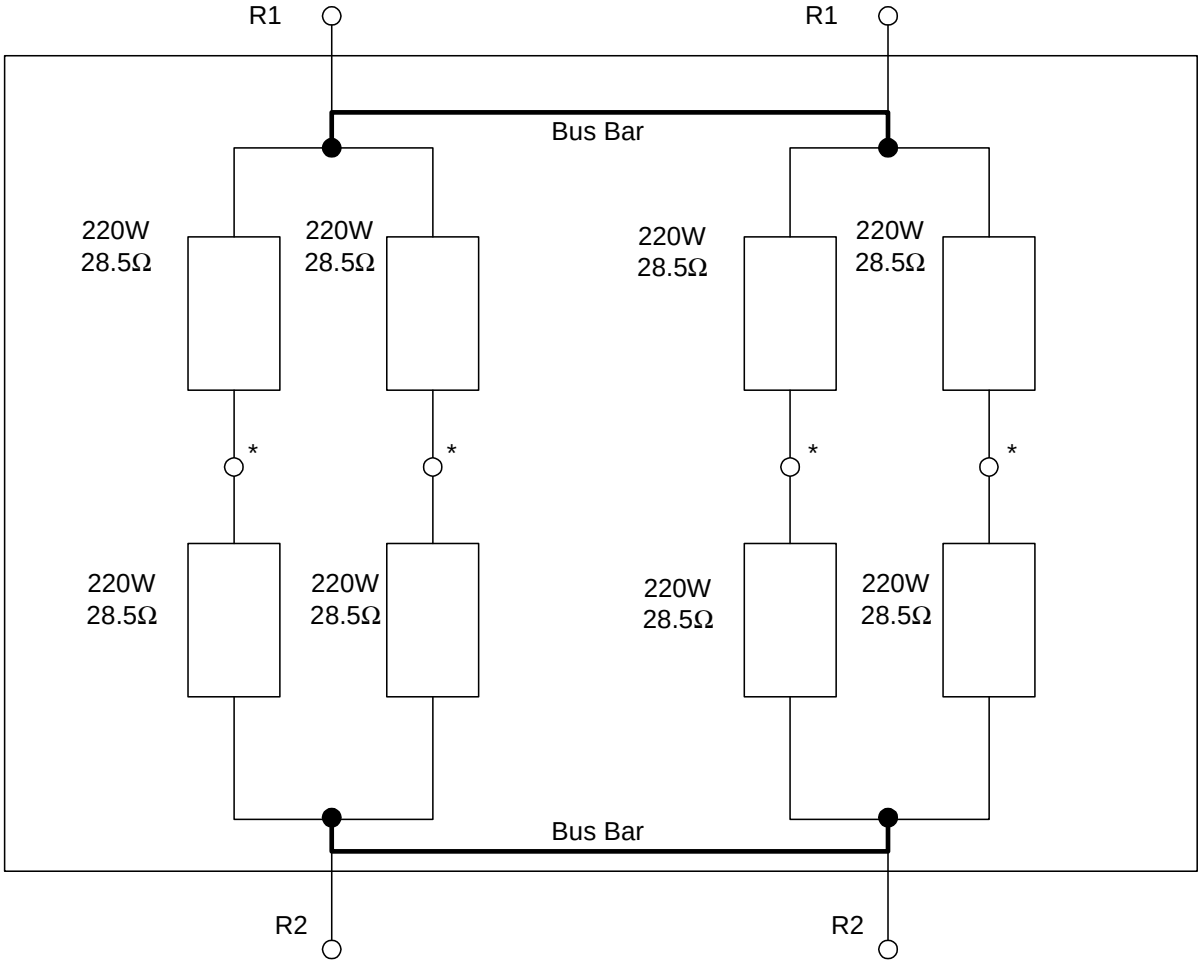
JUSP-RA19



*: These use terminal in parts hidden by the terminal block cover. These terminals should not be connected to from the outside.