

2.2.5 Connection of stand-alone option units

The inverter accepts a variety of stand-alone option units as required. Incorrect connection will cause inverter damage or accident. Connect and operate the option unit carefully in accordance with the corresponding option unit manual.

(1) Connection of the dedicated external brake resistor (FR-ABR)

The built-in brake resistor is connected across terminals P <+> and PR. Fit the external dedicated brake resistor (FR-ABR) instead when the built-in brake resistor does not have enough thermal capability for high-duty operation. Remove the jumper from across terminals PR-PX and connect the dedicated brake resistor (FR-ABR) across terminals P-PR <+ -PR>.

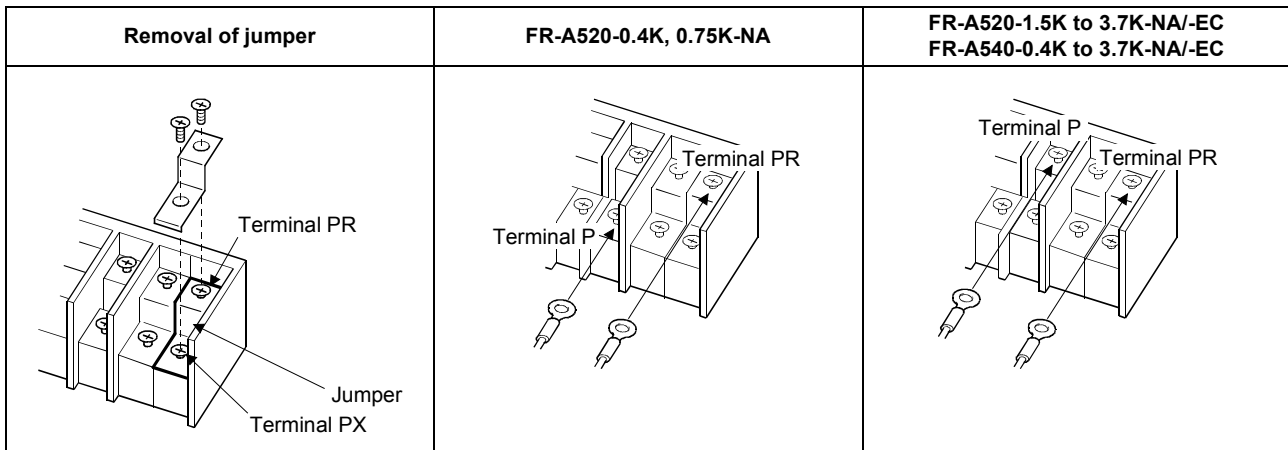
Set "1" in Pr. 30 "regenerative function selection" and "10%" in Pr. 70 "special regenerative brake duty." (Refer to page 85)

(For the positions of terminals P and PR, refer to the terminal block arrangement (page 17 and 18).)

Note: 1. The brake resistor connected should only be the dedicated brake resistor.
 2. The jumper across terminals PR-PX (7.5K or less) must be disconnected before connecting the dedicated brake resistor. A failure to do so may damage the inverter.

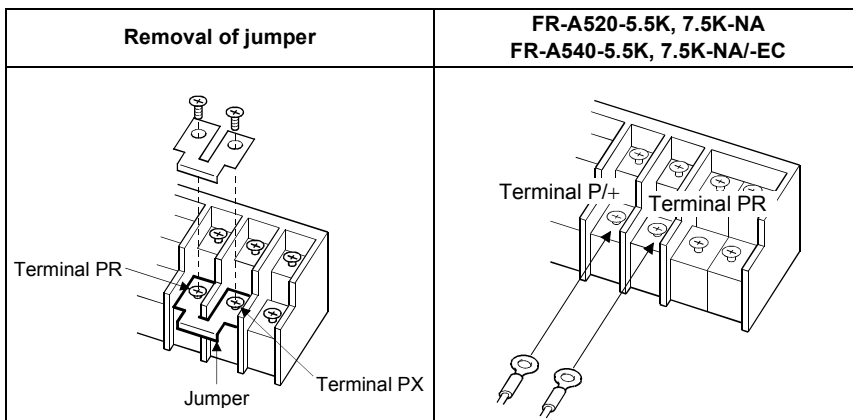
• **ModelFR-A520-0.4K to 3.7K-NA, FR-A540-0.4K to 3.7K-NA/-EC**

- 1) Remove the screws in terminals PR and PX and remove the jumper.
 - 2) Connect the brake resistor across terminals P-PR <+ -PR>.
- (The jumper should remain disconnected.)



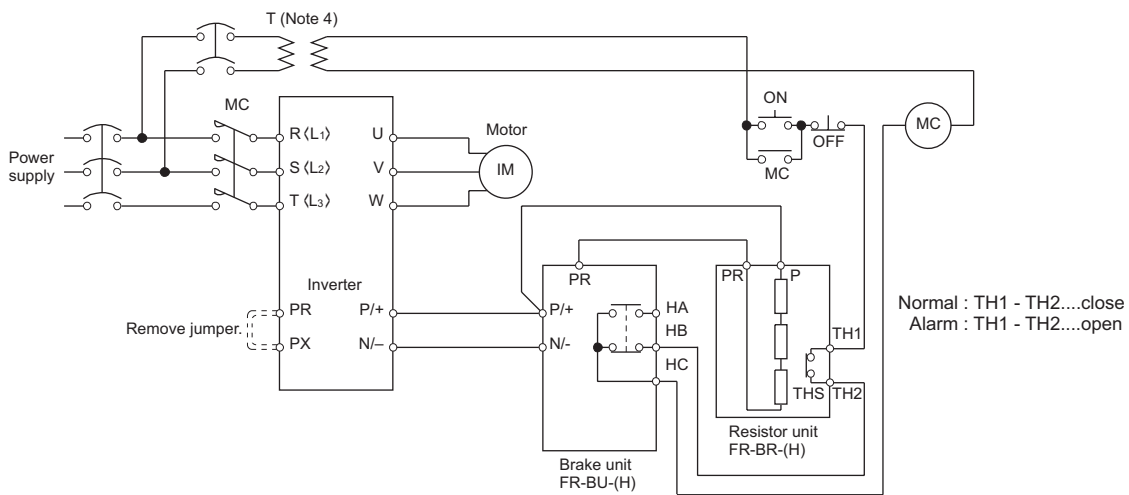
• **ModelFR-A520-5.5K, 7.5K-NA, FR-A540-5.5K, 7.5K-NA/-EC**

- 1) Remove the screws in terminals PR and PX and remove the jumper.
 - 2) Connect the brake resistor across terminals P-PR <+ -PR>.
- (The jumper should remain disconnected.)



(2) Connection of the brake unit (FR-BU)

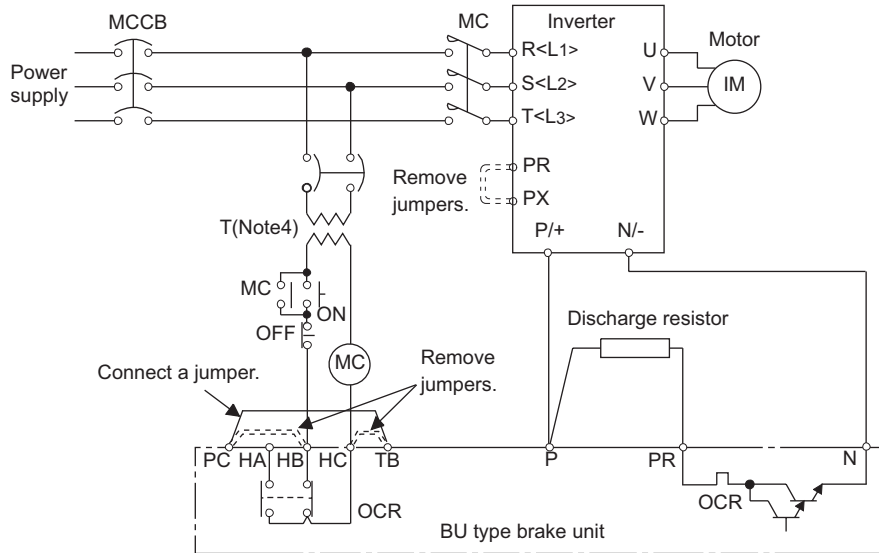
Connect the optional FR-BU brake unit as shown below to improve the braking capability during deceleration.



- Note: 1. Connect the inverter terminals (P, N) <+, -> and FR-BU brake unit terminals so that their terminal signals match with each other. (Incorrect connection will damage the inverter.) For model 7.5K or less, the jumper across terminals PR-PX must be removed.
2. The wiring distance between the inverter, brake unit and resistor unit should be within 5m (16.40 feet). If twisted wires are used, the distance should be within 10m (32.81 feet).
3. When the transistor in the brake unit fails, the brake transistor becomes extremely hot and it has a chance to get fire. Therefore, install a magnetic contactor on the inverter's power supply side to shut off a current in case of failure.
4. When the power supply is 400V class, install a step-down transformer.

(3) Connection of the brake unit (BU type)

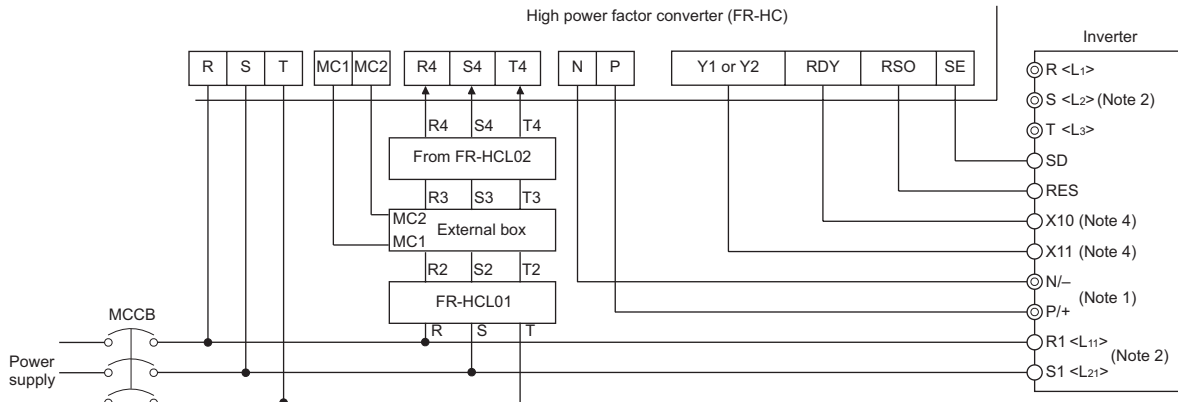
Connect the BU type brake unit correctly as shown below. Incorrect connection will damage the inverter. Remove jumpers across terminals HB-PC and TB-HC, then fit a jumper across terminals PC-TB.



- Note: 1. For models 7.5K or less, remove the jumper across terminals PR-PX.
 2. The wiring distance between the inverter, brake unit and discharge resistor should be within 2m (6.56 feet).
 If twisted wires are used, the distance should be within 5m (16.40 feet).
 3. When the transistor in the brake unit fails, the brake transistor becomes extremely hot and it has a chance to get fire. Therefore, install a magnetic contactor on the inverter's power supply side to shut off current in case of failure.
 4. When the power supply is 400V class, install a step-down transformer.

(4) Connection of the FR-HC type high power factor converter (FR-HC)

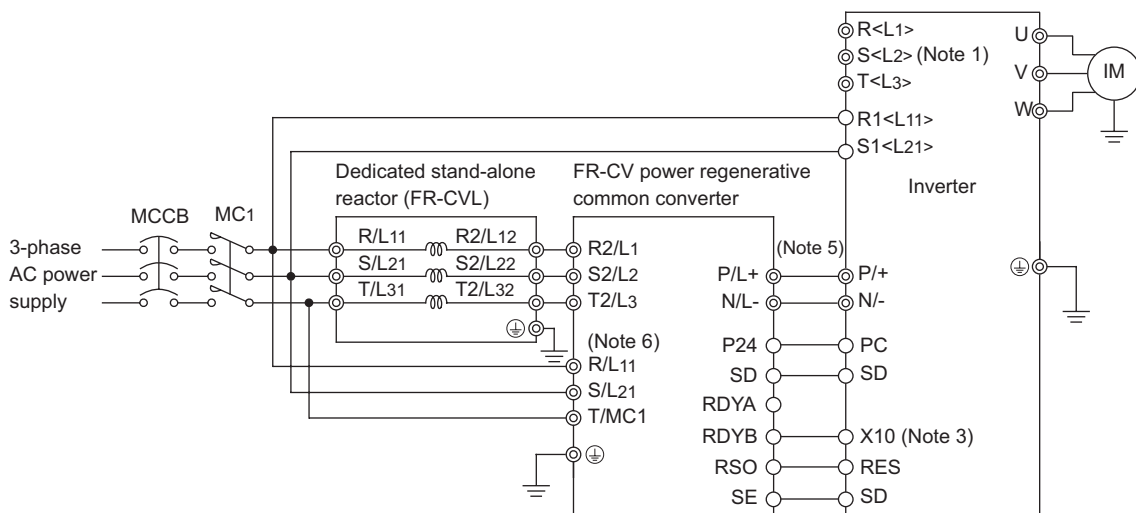
When connecting the high power factor converter (FR-HC) to suppress power supply harmonics, perform wiring securely as shown below. Wrong connection will damage the high power factor converter and inverter. After making sure that the wiring is correct, set "2" in Pr. 30 "regenerative function selection".



- Note: 1. Do not insert MCCB between terminals P-N <+ - -> (P/+ -P<+ - P>, N/- - N <- -N>).
2. Remove the jumpers across terminals R-R1 and S-S1 <L1-R1 and L2-S1> of the inverter, and connect the control circuit power supply across terminals R1-S1 <L11·L21>. The power input terminals R, S, T <L1, L2, L3> must be open. Incorrect connection will damage the inverter. Opposite polarity of terminals N <->, P <+> will also damage the inverter.
3. The voltage phases of terminals R, S, T <L1, L2, L3> and terminals R4, S4, T4 must be matched before connection.
4. Use Pr. 180 to Pr. 186 (input terminal function selection) to assign the terminals used for the X10 and X11 signals.
Use the X11 signal when using the computer link plug-in option (FR-A5NR). (Refer to page 85)
5. When the FR-HC is connected, use sink logic (factory setting). For source logic, the FR-HC cannot be connected. (For the EC version, select the sink logic.)

(5) Connection of the power regeneration common converter (FR-CV)

When connecting the FR-CV type power regeneration common converter, connect the inverter terminals (P/+, N/-) and FR-CV type power regeneration common converter terminals as shown below so that their signals match with each other. After making sure that the wiring is correct, set "2" in Pr. 30 "regenerative function selection". For details, refer to the instruction manual of the FR-CV type power regeneration common converter.



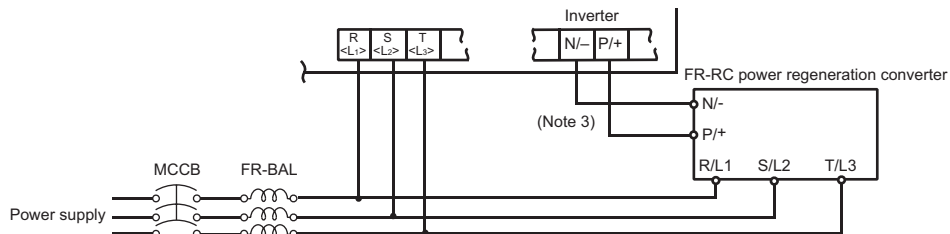
- Note: 1. Remove the jumpers across the R-R1 <L1-L11> and S-S1 <L2-L21> terminals of the inverter, and connect the control circuit power supply across terminals R1-S1 <L11-L21>. The power input terminals R, S, T <L1, L2, L3> must be open. Accidental connection will damage the inverter. Opposite polarity of terminals N/-, P/+ will damage the inverter.
2. The voltage phases of terminals R/L11, S/L21, T/MC1 and terminals R2/L1, S2/L2, T2/L3 must be matched before connection.
3. Use Pr. 180 to Pr. 186 (input terminal function selection) to assign the terminals used for the X10 signal. (Refer to page 155.)
4. When the FR-CV is connected, use sink logic (factory setting). For source logic, the FR-CV cannot be connected. (For the EC version, select the sink logic.)
5. Do not insert MCCB between terminals P-N <+ - -> (P/L+ -P <P/L+ - +>, N/L- - N <N/L- - ->)
6. Make sure terminals R/L11, S/L21, T/MC1 are connected to the power supply. Running the inverter without connecting the terminals will damage the power regeneration common converter.

(6) Connection of the power regeneration converter (FR-RC)

(For power coordination, always install the power factor improving reactor (FR-BAL).)

When connecting the FR-RC type power regeneration converter, connect the inverter terminals (P/+, N/-) and FR-RC type power regeneration converter terminals as shown below so that their signals match with each other. After making sure that the wiring is correct, set "0" in Pr. 30 "regenerative function selection".

For details, refer to the FR-RC type power regeneration converter manual.

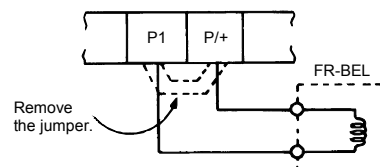


- Note: 1. For models 7.5K or less, the jumper across terminals PR-PX must be removed.
2. How to connect the FR-BAL power factor improving AC reactor (option)
 When using two or more inverters in the same system, small impedance between the inverters will cause a regenerative current from the power regeneration converter to leak into the other inverters, resulting in overcurrent alarm of the other inverters. To prevent this, install a power factor improving AC reactor on the power supply side for all the inverters.
3. Do not insert MCCB between terminals P-N <+ - -> (P/+ -P/+ <+ - P/+>, N/- - N/- <- - N/->).

(7) Connection of the power factor improving DC reactor (option)

Connect the FR-BEL power factor improving DC reactor between terminals P1-P <P1- +>. In this case, the jumper connected across terminals P1-P <P1- +> must be removed. Otherwise, the reactor will not function.

<Connection method>



- Note: 1. The wiring distance should be within 5m (16.40 feet).
2. The size of the cables used should be equal to or larger than that of the power supply cables (R, S, T) <L1, L2, L3>.