**Auto-tuning Function**

The WJ200 inverter has auto-tuning function to get suitable motor control performance by measuring the motor constants automatically. Auto-tuning is effective only sensorless vector control.

Auto-tuning with motor stop (H001=01)

Motor does not rotate while auto-tuning. If rotating motor could give harm to your application, use this mode. But the motor constant I0 (no-load current) and J (inertia) are not measured and remain unchanged. (I0 can be monitored in 50Hz of V/f operation.)

Auto-tuning with motor rotation (H001=02)

Motor rotates according to a special operation pattern while auto-tuning. However, the torque during auto-tuning is not sufficient, which may cause a problem in the load (for example, a lift may slide down). See below instruction 7)-d).

When using auto-tuning function, follow the instructions below.

1) When using a motor which constants are unknown, execute offline auto-tuning to obtain the constants.

2) When the motor constant selection (H002/H202) is Hitachi std. motor (01), the initial values in H020/H220 to H024/H224 are Hitachi standard motor's values. If Hitachi std. motor is used, full performance is achieved without auto-tuning in most cases.

3) The motor constant data is corresponding to one-phase of Y (star) connection for 50Hz.

4) Set base frequency (A003) and AVR voltage (A082) according to the motor specifications. If the motor voltage is other than the alternatives, set V/f gain (A045) according to below formula.

“motor voltage (A082)” × “output voltage gain (A045)” = “motor rated voltage”

5) Proper motor constants are obtained only when the same size or one size lower motor is used. If other size of motor is connected, proper values may not be obtained or auto-tuning operation may not be completed. In this case, press STOP/RESET key, then error code will be displayed.

6) Be sure to disable DC braking setting (A051=00) and simple positioning selection (P012=00), otherwise motor constants are not measured properly.

7) Be sure to deactivate ATR terminal (52:Enable torque cmd. input), otherwise motor constants are not measured properly.

8) If auto-tuning with motor rotation (H001=02) is used, check the followings points.

a) The motor rotates up to 80% of base frequency. Check if it is no problem for the application.

b) The motor should not be driven by any other external force.

c) All the brakes should be released.

d) During auto-tuning, insufficient torque may cause a problem in the load (for example, a lift may slide down). In this case, remove the motor from the machine or other load, and perform auto-tuning with the motor alone. The measured inertia J is based on the motor alone. To apply the data, add the moment of inertia of the load machine to the measured J data after converting the moment of inertia to the motor shaft data.

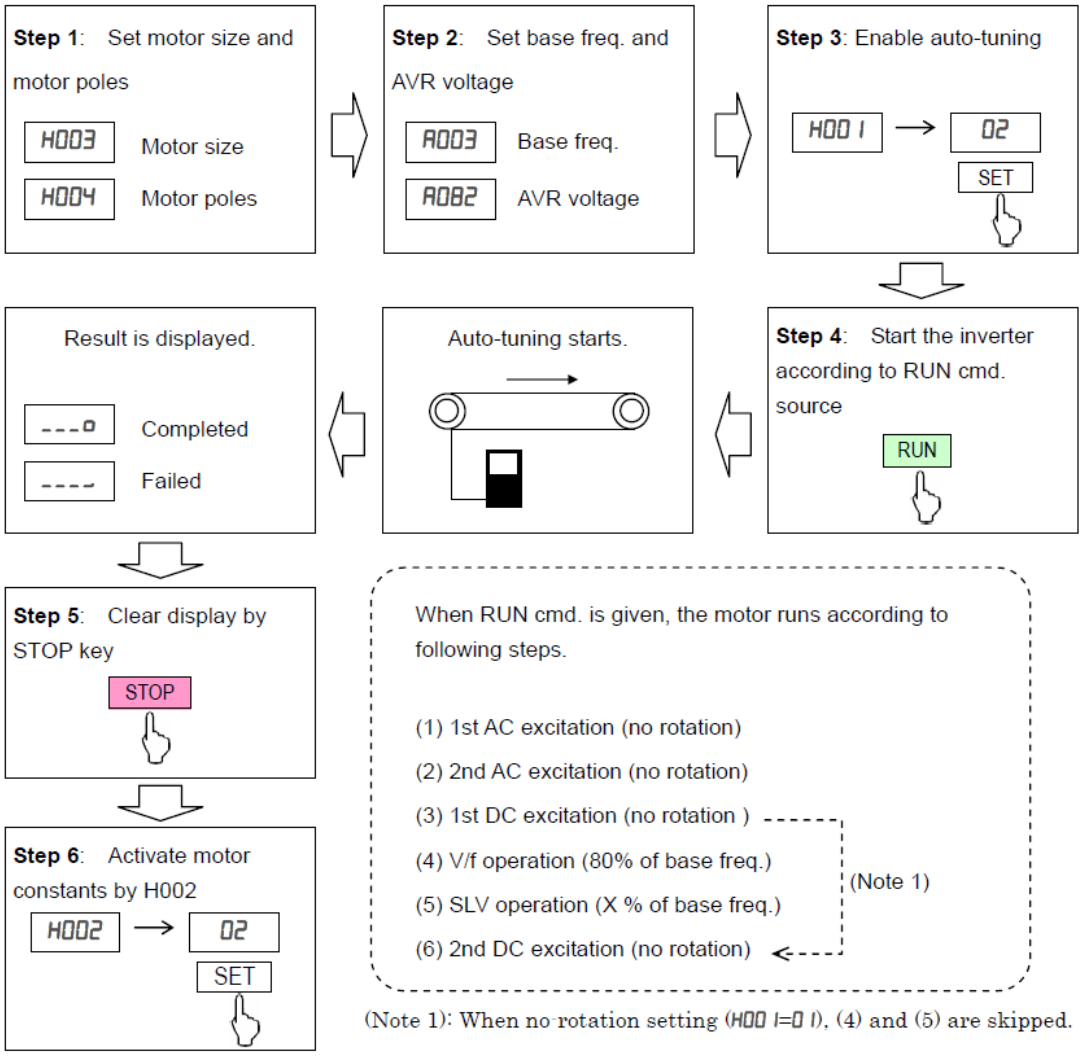
e) If the application is with limitation (e.g. lift or boring machine), the allowable rotation limit may be exceeded in auto-tuning, and the machine may be damaged.

9) Even when “01 (auto-tuning without motor rotation)” is selected, the motor could rotate slightly during auto-tuning.

10)When performing the auto-tuning with one lower size of motor, enable the overload restriction function, and set the overload restriction level to 150% of the rated current of the motor.

11)When deceleration over-voltage suppress integral time (b134) is small, auto-tuning may result

**Off-line auto-tuning procedure (with motor rotation)**




(Note 1): When no rotation setting (H001=01), (4) and (5) are skipped.

(Note 2) After auto-tuning is completed, be sure to set 01 in H002/H202, otherwise measured data is not effective.

(Note 3) Speed "X" of above (5) depends on accel/deceleration time. (T: Larger time of accel or deceleration time)
$0 < T < 50$ [s] : X=40%
$50 \leq T < 100$ [s] : X=20%
$100 \leq T$ [s] : X=10%

(Note 4) If auto-tuning is failed, try to execute again.

(Note 5) If the inverter trips during the auto-tuning, the auto-tuning is interrupted. After removing the cause of trip, retry auto-tuning from the beginning.

(Note 6) If inverter is stopped during auto-tuning by stop command (by STOP key or deactivate RUN input), measured constants could remain. Be sure to execute auto-tuning again.

(Note 7) If auto-tuning is attempted in free V/f setting, auto-tuning will fail with error display.