

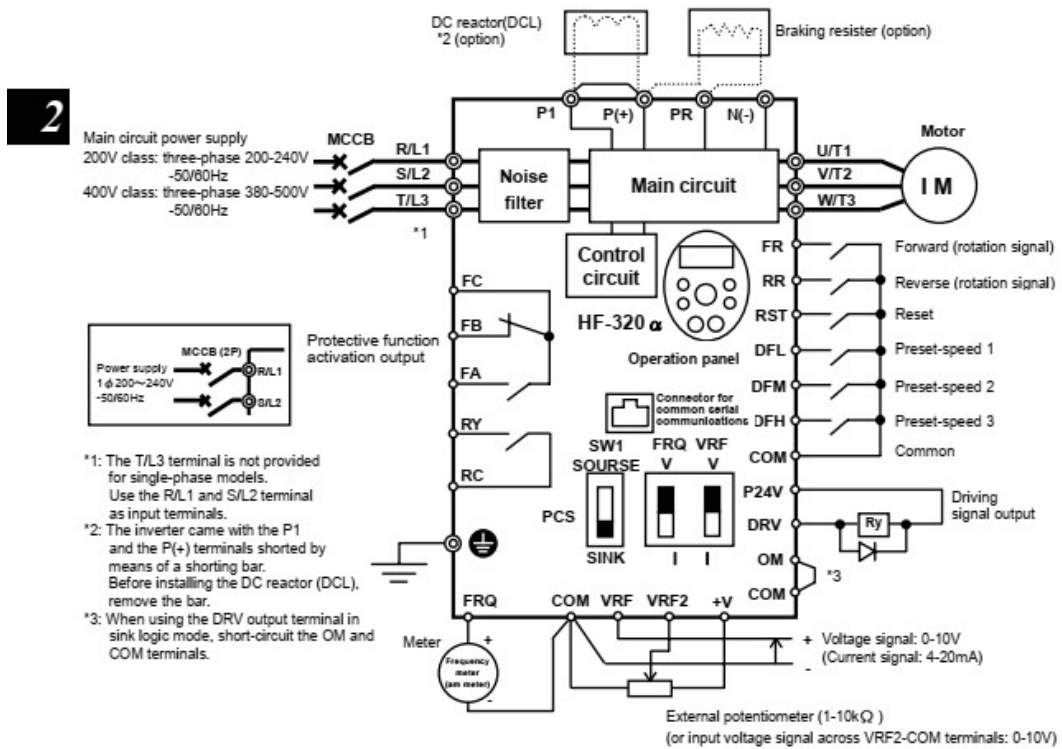
HƯỚNG DẪN SỬ DỤNG HF-320A INVERTER

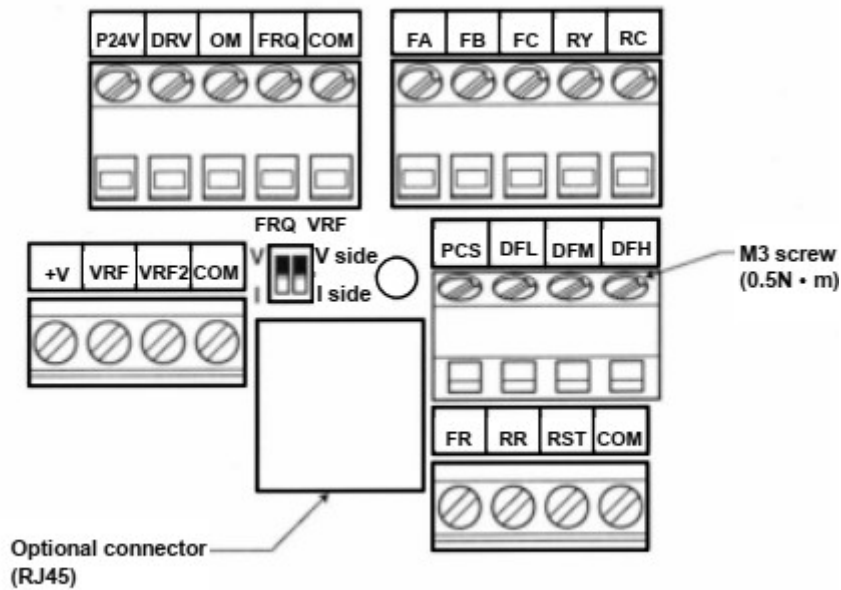
1. SƠ ĐỒ ĐẦU NỐI:

2.2.1 Standard connection diagram 1

This diagram shows a standard wiring of the main circuit.

Standard connection diagram-sink (common:COM)





2. MỘT SỐ THÔNG SỐ CẦN LƯU Ý:

- Cn0d: lựa chọn tín hiệu điều khiển:
 - + 0 – External board.
 - + 1 – Operation panel.
- Fn0d: lựa chọn tín hiệu tần số:

(1) Setting the frequency using the potentiometer on the inverter main unit ($F_{n0d}=0$)

Set the frequency with the notches on the potentiometer.



Move clockwise for the higher frequencies.

The potentiometer has hysteresis. So the set value may slightly change when the inverter is turned off, and then turned back on.

(2) Setting the frequency using the operation panel ($F_{n0d}=3$)

Set the frequency with the operation panel..

▲ : Moves the frequency up

▼ : Moves the frequency down

(3) Setting the frequency using the operation panel ($F\Omega d=1$ or 2)

■ Frequency setting

1) Setting the frequency using external potentiometer

★Potentiometer
Setting frequency using the potentiometer (1-10k Ω , 14W)
For more detailed information on adjustments, see 6.5.

* The input terminal VRF can be used in the same way.
 $F\Omega d=1$: VRF effective, $F\Omega d=2$: VRF2 effective
For more details, see 6.5.

2) Setting the frequency using input voltage (0~10V)

★Voltage signal
Setting frequency using voltage signals (0~10V).
For more detailed information on adjustments, see 6.5.

* The input terminal VRF2 can be used in the same way.
 $F\Omega d=1$: VRF effective, $F\Omega d=2$: VRF2 effective
For more details, see 6.5.

Note: Be sure to turn the VRF slide switch to the V (voltage) position.

3) Setting the frequency using current input (4~20mA)

★Current Signal
Current signal Setting frequency using current signals (4~20mA).For
more detailed information on adjustments, see 6.5.

* Setting of parameters also allow 0-20mAdc.
Note: Be sure to turn the VRF slide switch to the I (current) position.

F_r	0008	Forward/reverse run selection (Operation panel)	-	-	0: Forward run 1: Reverse run 2: Forward run (F/R switching possible) 3: Reverse run (F/R switching possible)	0
$R\mathcal{L}\mathcal{L}$	0009	Acceleration time 1	S	0.1/0.1	0.0-3200	10.0
$d\mathcal{E}\mathcal{L}$	0010	Deceleration time 1	S	0.1/0.1	0.0-3200	10.0
F_H	0011	Maximum frequency	Hz	0.1/0.01	30.0-500.0	60.0
U_L	0012	Upper limit frequency	Hz	0.1/0.01	0.5- F_H	60.0
L_L	0013	Lower limit frequency	Hz	0.1/0.01	0.0- U_L	0.0
v_L	0014	Base frequency 1	Hz	0.1/0.01	25-500.0	60.0
$v_L v$	0409	Base frequency voltage 1	V	1/0.1	50-330 (200V class) 50-660 (400V class)	200/ 400

$F110$	0110	Always-active function selection	-	-	0-64 (ST)	1
$F111$	0111	Input terminal selection 1 (FR)	-	-	0-64 (FR)	2
$F112$	0112	Input terminal selection 2 (RR)	-	-	0-64 (RR)	3

Code	Failure code	Failure description	Unit	Setting	Range	Remarks
F415	0415	Motor rated current	A	0.1/0.1	0.1-100.0	* 1
F416	0416	Motor no-load current	%	1/1	10-90	* 1
F417	0417	Motor rated speed	min-1	1/1	100-32000	* 1

3. BẢNG MÃ LỖI:

13. Before making a service call - Trip information and remedies

13.1 Trip causes/warnings and remedies

When a problem arises, diagnose it in accordance with the following table.

If it is found that replacement of parts is required or the problem cannot be solved by any remedy described in the table, contact your dealer.

[Trip information]

Error code	Failure code	Problem	Possible causes	Remedies
<i>OC1</i> <i>OC1P</i>	0001 0025	Overcurrent during acceleration Overcurrent flowing in element during acceleration	<ul style="list-style-type: none"> The acceleration time <i>ACC</i> is too short. The V/F setting is improper. A restart signal is input to the rotating motor after a momentary stop, etc. A special motor (e.g. motor with a small impedance) is used. 	<ul style="list-style-type: none"> Increase the acceleration time <i>ACC</i>. Check the V/F parameter. Use <i>F301</i> (auto-restart) and <i>F302</i> (ride-through control). Increase the carrier frequency <i>F300</i>. Set the carrier frequency control mode selection parameter <i>f316</i> to 1 or 3 (carrier frequency decreased automatically).
<i>OC2</i> <i>OC2P</i>	0002 0026	Overcurrent during deceleration Overcurrent flowing in element during deceleration	<ul style="list-style-type: none"> The deceleration time <i>dEC</i> is too short. 	<ul style="list-style-type: none"> Increase the deceleration time <i>dEC</i>. Set the carrier frequency control mode selection parameter <i>f316</i> to 1 or 3 (carrier frequency decreased automatically).
<i>OC3</i> <i>OC3P</i>	0003 0027	Overcurrent during constant speed operation Overcurrent flowing in element during operation	<ul style="list-style-type: none"> The load fluctuates abruptly. The load is in an abnormal condition. 	<ul style="list-style-type: none"> Reduce the load fluctuation. Check the load (operated machine). Set the carrier frequency control mode selection parameter <i>f316</i> to 1 or 3 (carrier frequency decreased automatically).
<i>OC1P</i> <i>OC2P</i> <i>OC3P</i>	0025 0026 0027	Ground fault trip Arm overcurrent at start-up (for 11 and 15 kW models only)	<ul style="list-style-type: none"> A current leaked from an output cable or the motor to ground. A main circuit element is defective. 	<ul style="list-style-type: none"> Check cables, connectors, and so on for ground faults. Make a service call.
<i>OCL</i>	0004	Overcurrent (An overcurrent on the load side at start-up)	<ul style="list-style-type: none"> The insulation of the output main circuit or motor is defective. The motor has too small impedance. A 11 or 15 kW model was started, although a current is leaked from an output cable or the motor to ground. 	<ul style="list-style-type: none"> Check the cables and wires for defective insulation. When using a 11 or 15 kW model, check cables, connectors, and so on for ground faults.
<i>OCRA</i>	0005	Arm overcurrent at start-up	<ul style="list-style-type: none"> A main circuit element is defective. 	<ul style="list-style-type: none"> Make a service call.
* <i>EPH1</i>	0008	Input phase failure	<ul style="list-style-type: none"> A phase failure occurred in the input line of the main circuit. The capacitor in the main circuit lacks capacitance. 	<ul style="list-style-type: none"> Check the main circuit input line for phase failure. Enable <i>F608</i> (input phase failure detection). Check the capacitor in the main circuit for exhaustion.
* <i>EPH0</i>	0009	Output phase failure	<ul style="list-style-type: none"> A phase failure occurred in the output line of the main circuit. 	<ul style="list-style-type: none"> Check the main circuit output line, motor, etc. for phase failure. Enable <i>F605</i> (Output phase failure detection).

* You can select a trip ON/OFF by parameters.

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Error code	Failure code	Problem	Possible causes	Remedies
<i>OP1</i>	000A	Overvoltage during acceleration	<ul style="list-style-type: none"> The input voltage fluctuates abnormally. (1) The power supply has a capacity of 200kVA or more. (2) A power factor improvement capacitor is opened or closed. (3) A system using a thyrister is connected to the same power distribution line. A restart signal is input to the rotating motor after a momentary stop, etc. 	<ul style="list-style-type: none"> Insert a suitable input reactor. Use <i>F301</i> (auto-restart) and <i>F302</i> (ride-through control).
<i>OP2</i>	000B	Overvoltage during deceleration	<ul style="list-style-type: none"> The deceleration time <i>dEC</i> is too short. (Regenerative energy is too large.) <i>F304</i> (dynamic braking resistor) is off. <i>F305</i> (overvoltage limit operation) is off. The input voltage fluctuates abnormally. (1) The power supply has a capacity of 200kVA or more. (2) A power factor improvement capacitor is opened and closed. (3) A system using a thyrister is connected to the same power distribution line. 	<ul style="list-style-type: none"> Increase the deceleration time <i>dEC</i>. Install a dynamic braking resistor. Enable <i>F304</i> (dynamic braking resistor). Enable <i>F305</i> (overvoltage limit operation). Insert a suitable input reactor.
<i>OP3</i>	000C	Overvoltage during constant-speed operation	<ul style="list-style-type: none"> The input voltage fluctuates abnormally. (1) The power supply has a capacity of 200kVA or more. (2) A power factor improvement capacitor is opened or closed. (3) A system using a thyrister is connected to the same power distribution line. The motor is in a regenerative state because the load causes the motor to run at a frequency higher than the inverter output frequency. 	<ul style="list-style-type: none"> Insert a suitable input reactor. Install a dynamic braking resistor.
<i>OL1</i>	000D	Inverter overload	<ul style="list-style-type: none"> The acceleration time <i>ACC</i> is too short. The DC braking amount is too large. The V/F setting is improper. A restart signal is input to the rotating motor after a momentary stop, etc. The load is too large. 	<ul style="list-style-type: none"> Increase the acceleration time <i>ACC</i>. Reduce the DC braking amount <i>F251</i> and the DC braking time <i>F252</i>. Check the V/F parameter setting. Use <i>F301</i> (auto-restart) and <i>F302</i> (ride-through control). Use an inverter with a larger rating.
<i>OL2</i>	000E	Motor overload	<ul style="list-style-type: none"> The V/F setting is improper. The motor is locked up. Low-speed operation is performed continuously. An excessive load is applied to the motor during operation. 	<ul style="list-style-type: none"> Check the V/F parameter setting. Check the load (operated machine). Adjust <i>OLn</i> to the overload that the motor can withstand during operation in a low speed range.
<i>OLr</i>	000F	Dynamic braking resistor overload trip	<ul style="list-style-type: none"> The deceleration time is too short. Dynamic braking is too large. 	<ul style="list-style-type: none"> Increase the deceleration time <i>dEC</i>. Increase the capacity of dynamic braking resistor (wattage) and adjust DBR capacity parameter <i>F308</i>.
* <i>Ot</i>	0020	Over-torque trip	<ul style="list-style-type: none"> Over-torque reaches to a detection level during operation. 	<ul style="list-style-type: none"> Enable <i>F615</i> (over-torque trip selection). Check system error.
<i>OH</i>	0010	Overheat	<ul style="list-style-type: none"> The cooling fan does not rotate. The ambient temperature is too high. The vent is blocked up. A heat generating device is installed close to the inverter. The thermistor in the unit is broken. 	<ul style="list-style-type: none"> Restart the operation by resetting the inverter after it has cooled down enough. The fan requires replacement if it does not rotate during operation. Secure sufficient space around the inverter. Do not place any heat generating device near the inverter. Make a service call.

* You can select a trip ON/OFF by parameters.
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Error code	Failure code	Problem	Possible causes	Remedies
<i>OH2</i>	002E	External thermal trip	<ul style="list-style-type: none"> An external thermal trip is input. 	<ul style="list-style-type: none"> Check the external thermal input.
<i>E</i>	0011	Emergency stop	<ul style="list-style-type: none"> During automatic operation or remote operation, a stop command is entered from the operation panel or a remote input device. 	<ul style="list-style-type: none"> Reset the inverter.
<i>EEP1</i>	0012	EEPROM fault 1	<ul style="list-style-type: none"> A data writing error occurs. 	<ul style="list-style-type: none"> Turn off the inverter, then turn it again. If it does not recover from the error, make a service call.
<i>EEP2</i>	0013	EEPROM fault 2	<ul style="list-style-type: none"> Power supply is cut off during ξYP operation and data writing is aborted. 	<ul style="list-style-type: none"> Turn the power off temporarily and turn it back on, and then try ξYP operation again.
<i>EEP3</i>	0014	EEPROM fault 3	<ul style="list-style-type: none"> A data reading error occurred. 	<ul style="list-style-type: none"> Turn off the inverter, then turn it again. If it does not recover from the error, make a service call.
<i>Err2</i>	0015	Main unit RAM fault	<ul style="list-style-type: none"> The control RAM is defective. 	<ul style="list-style-type: none"> Make a service call.
<i>Err3</i>	0016	Main unit ROM fault	<ul style="list-style-type: none"> The control ROM is defective. 	<ul style="list-style-type: none"> Make a service call.
<i>Err4</i>	0017	CPU fault 1	<ul style="list-style-type: none"> The control CPU is defective. 	<ul style="list-style-type: none"> Make a service call.
<i>Err5</i>	0018	Remote control error	<ul style="list-style-type: none"> An error arises during remote operation. 	<ul style="list-style-type: none"> Check the remote control device, cables, etc.
<i>Err7</i>	001A	Current detector fault	<ul style="list-style-type: none"> The current detector is defective. 	<ul style="list-style-type: none"> Make a service call.
<i>Err8</i>	001B	Optional circuit board format error	<ul style="list-style-type: none"> An optional circuit board in a different format is installed. 	<ul style="list-style-type: none"> Check again to be sure that the circuit board is connected correctly, and then reset the power supply. Replace the circuit board with a correctly formatted one.
* <i>UC</i>	001D	Low-current operation Trip	<ul style="list-style-type: none"> The output current decreased to a low-current detection level during operation. 	<ul style="list-style-type: none"> Enable <i>F610</i> (low-current detection). Check the suitable detection level for the system (<i>F611</i>, <i>F612</i>). Make a service call if the setting is correct.
* <i>UP1</i>	001E	Undervoltage trip (main circuit)	<ul style="list-style-type: none"> The input voltage (in the main circuit) is too low. 	<ul style="list-style-type: none"> Check the input voltage. Enable <i>F627</i> (undervoltage trip selection). To cope with a momentary stop due to undervoltage, enable <i>F302</i> (ride-through control) and <i>F301</i> (auto-restart).
<i>EF2</i>	0022	Ground fault trip	<ul style="list-style-type: none"> A ground fault occurs in the output cable or the motor. 	<ul style="list-style-type: none"> Check the cable and the motor for ground faults.
<i>EEn1</i>	0054	Auto-tuning error	<ul style="list-style-type: none"> Check the motor parameter <i>F401</i> to <i>F494</i>. The motor with the capacity of 2 classes or less than the inverter is used. The output cable is too thin. The motor is rotating. The inverter is used for loads other than those of three-phase induction motors. 	
<i>E4YP</i>	0029	Inverter type error	<ul style="list-style-type: none"> Circuit board is changed. (Or main circuit/drive circuit board) 	<ul style="list-style-type: none"> Make a service call.
* <i>E-18</i>	0032	Brea in analog signal cable	<ul style="list-style-type: none"> The signal input via VRF is below the analog signal detection level set with <i>F633</i>. 	<ul style="list-style-type: none"> Check the cables for breaks. And check the setting of input signal or setting value of <i>F633</i>.
<i>E-19</i>	0033	CPU communications error	<ul style="list-style-type: none"> A communications error occurs between control CPUs. 	<ul style="list-style-type: none"> Make a service call.
<i>E-20</i>	0034	Excessive torque boosted	<ul style="list-style-type: none"> The torque boost parameter αb is set too high. The motor has too small impedance. 	<ul style="list-style-type: none"> Decrease the setting of the torque boost parameter αb. If no improvement results, contact your dealer.
<i>E-21</i>	0035	CPU fault 2	<ul style="list-style-type: none"> The control CPU is defective. 	<ul style="list-style-type: none"> Make a service call.
<i>SOUE</i>	002F	Step-out (For PM motor only)	<ul style="list-style-type: none"> The motor shaft is locked. One output phase is open. An impact load is applied. 	<ul style="list-style-type: none"> Unlock the motor shaft. Check the interconnect cables between the inverter and the motor.

* You can select a trip ON/OFF by parameters.

[Alarm information] Each message in the table is displayed to give a warning but does not cause the inverter to trip.

Error code	Problem	Possible causes	Remedies
<i>OFF</i> <i>NOFF</i>	ST terminal OFF Undervoltage in main circuit	<ul style="list-style-type: none"> The ST-COM circuit is opened. The supply voltage between R, S and T is under voltage. 	<ul style="list-style-type: none"> Close the ST-COM circuit. Measure the main circuit supply voltage. If the voltage is at a normal level, the inverter requires repairing.
<i>reTY</i>	Retry in process	<ul style="list-style-type: none"> The inverter is in the process of retry. A momentary stop occurred. 	<ul style="list-style-type: none"> The inverter is normal if it restarts after several tens of seconds. The inverter restarts automatically. Be careful of the machine because it may suddenly restart.
<i>Err 1</i>	Frequency point setting error alarm	<ul style="list-style-type: none"> The frequency setting signals at points 1 and 2 are set too close to each other. 	<ul style="list-style-type: none"> Set the frequency setting signals at points 1 and 2 apart from each other.
<i>CLr</i>	Clear command acceptable	<ul style="list-style-type: none"> This message is displayed when pressing the STOP key while an error code is displayed. 	<ul style="list-style-type: none"> Press the STOP key again to clear the trip.
<i>EOFF</i>	Emergency stop command acceptable	<ul style="list-style-type: none"> The operation panel is used to stop the operation in automatic control or remote control mode. 	<ul style="list-style-type: none"> Press the STOP key for an emergency stop. To cancel the emergency stop, press any other key.
<i>Hll</i> <i>LO</i>	Setting error alarm / An error code and data are displayed alternately twice each.	<ul style="list-style-type: none"> An error is found in a setting when data is reading or writing. 	<ul style="list-style-type: none"> Check whether the setting is made correctly.
<i>HEAd/</i> <i>End</i>	Display of first/last data items	<ul style="list-style-type: none"> The first and last data item in the <i>RUN</i> data group is displayed. 	<ul style="list-style-type: none"> Press MON key to exit the data group.
<i>db</i>	DC braking	<ul style="list-style-type: none"> DC braking in process 	<ul style="list-style-type: none"> The message goes off in several tens of seconds if no problem occurs. (Note)
<i>dbon</i>	Shaft fixing control	<ul style="list-style-type: none"> Motor shaft fixing control is in process. 	<ul style="list-style-type: none"> Normal if the message disappears when a stop command is entered (or the operation command is canceled).
<i>E1</i> <i>E2</i> <i>E3</i>	Flowing out of excess number of digits	<ul style="list-style-type: none"> The number of digits such as frequencies is more than 4. (The upper digits have a priority.) 	<ul style="list-style-type: none"> Lower the frequency free unit magnification <i>F 702</i>.
<i>STOP</i>	Momentary power failure slowdown stop prohibition function activated.	<ul style="list-style-type: none"> The slowdown stop prohibition function set with <i>F 302</i> (momentary power failure ride-through operation) is activated. 	<ul style="list-style-type: none"> To restart operation, reset the inverter or input an operation signal again.
<i>L5tP</i>	Auto-stop because of continuous operation at the lower-limit frequency	<ul style="list-style-type: none"> The automatic stop function selected with <i>F 256</i> was activated. 	<ul style="list-style-type: none"> To deactivate the automatic stop function, increase the frequency command above the lower-limit frequency (LL) + 0.2 Hz or turn off the operation command.
<i>init</i>	Parameters in the process of initialization	<ul style="list-style-type: none"> Parameters are being initialized to default values. 	<ul style="list-style-type: none"> Normal if the message disappears after a while (several seconds to several tens of seconds).
<i>E-11</i>	Operation panel key fault	<ul style="list-style-type: none"> The RUN or STOP key is held down for more than 20 seconds. The RUN or STOP key is faulty. 	<ul style="list-style-type: none"> Check the operation panel.
<i>Ret 1</i>	Auto-tuning	<ul style="list-style-type: none"> Auto-tuning in process 	<ul style="list-style-type: none"> Normal if the message disappears after a few seconds.

Note) When the ON/OFF function is selected for DC braking (DB), using the input terminal selection parameter, you can judge the inverter to be normal if "db" disappears when opening the circuit between the terminal and COM.