

# USER INSTRUCTION FOR PROGRAMMING INVERTER MITSUBISHI FR-D740-EC

**Rev-01 APRILE 2014**

The inverter assembled in the control panel is already programmed to work correctly, but doing the motor auto-tuning is always required as described at pages 3.

Sometimes, to improve performance, it is necessary to change the value of some parameters for adapting it to the specific motor.

All parameters are changed and modified using the inverter keypad.

As a precaution, it is important to know that inside the inverter there are some very high capacitors: therefore, after main input voltage cut-off, it is necessary waiting a few minutes before touch wires and connectors concerned the power supply input and output circuits. A yellow light near connectors inside the inverter check the capacitors charge:  
**until yellow light is on, avoid any contact with the power supply input and output circuits.**

## **PARAMETERS CHANGE**

At power on the inverter shows “0.00”, and MON and EXT leds are on. This indication means that the inverter is in steady state and ready to work.

### **PHASE A: entry in programming mode**

- Press PU/EXT button. MON and PU leds remain on.
- Press MODE button. Display shows P0, and only PU led is on.

### **PHASE B: parameter visualization**

- Find interested parameter rotating the knob in clockwise direction to go to the following parameters P1, P2, P.. .
- When interested parameter is visualized, pressing SET button the value of parameter is shown.

### **PHASE C: changing the value**

- Modify the value of parameter rotating the knob (clockwise direction to increase the value).
- To memorize the new value press SET button. As saving confirm the display shows alternately parameter and value.
- For not memorizing and leaving the previous value of parameter, press three times MODE button. The display returns to show parameter P.. .

### **PHASE D: new parameter visualization**

- To see the subsequent parameter press two times SET button: first time the display shows again the value of modified parameter, second time the display shows the next parameter P.. .
- Use the knob in clockwise or anticlockwise direction to find a not subsequent parameter: the display returns to show parameters number P.. .

### **PHASE E: return in operation**

- Press PU/EXT button. EXT led is switched on.
- Press two times MODE button. MON and EXT leds remain on and display shows “0.00”

In case of wrong operation sequence, execute a main input voltage cut-off to reset the inverter, and restart from the beginning.

**IT IS ALWAYS NECESSARY RETURN IN STEADY STATE MODE BEFORE USE THE CONTROL PANEL.**

## **PARAMETER MODIFY EXAMPLE**

To modify parameter 7 (acceleration time) from 2.2 seconds to 3.0 seconds follow the instruction below:

- Press PU/EXT button and MODE button (to entry in programming mode).
- Rotate the knob until P7.
- Press SET button (to see memorized value 2.2).
- Rotate the knob until set value 3.0.
- Press SET button (to store the value).
- Press PU button and two times MODE button (to return in steady state mode).

## **AUTO-TUNING PROCEDURE**

Check the data on motor nameplate and update the following values:

- Parameter P80 for motor rated power [kW]
- Parameter P9 for motor rated current [A]
- Positioning the cabin at the top floor
- Enter in "MAINTENANCE MODE" by control panel switch
- Modify parameter P96 from value 13 to value 11; when display shows alternately P96 and 11, press SET button: display shows 11
- Activate a maintenance down command without releasing it and press RUN button.  
Important: release the maintenance command only when inverter has finished the auto-tuning procedure indicated by value 13 on the display (20-30 seconds are needed)
- Press STOP button and release the down maintenance command
- Press PU button and two times MODE button
- Come back to "NORMAL MODE" by control panel switch

## **LIST OF PARAMETERS PROGRAMMABLE BY CUSTOMER**

Annexed with the electrical diagram, a list of the programmable parameters is supplied. Of these parameters, only someone could be modify without compromise the proper operation of elevator. For this reason we present the parameters list programmable by customer:

- P4 : NOMINAL SPEED (HIGH SPEED) [Hz]

It is already calibrated according to the required elevator speed.  
Only for "short floor" or difficulty during stop, try to decrease its value.

- P5 : LEVELLING SPEED (LOW SPEED) [Hz]

It is already calibrated according to the elevator speed.  
Do not decrease the factory set value (some torque decrease could be generated).  
Increase this value of a few Hz if cabin does not succeed to reach the floor level.

- P26 : INSPECTION SPEED [Hz]

It is already calibrated according to the elevator speed, paying attention not exceeding 0,63 m/s according to EN 81.

- P7 : ACCELERATION TIME [s]

A slow acceleration and a motor current reduction during acceleration are obtained increasing this value.

- P8 : DECELERATION TIME [s]

A slow deceleration is obtained increasing this value, but in this case an increasing of deceleration space is required.

- P9 : MOTOR RATED CURRENT

It is necessary to set the right value for correctly regulating the motor thermal protection current.

- P11 : DC INJECTION BRAKE OPERATION TIME

Usually it is not necessary to modify it; eventually it is possible to decrease it.

- P12 : DC INJECTION BRAKE OPERATION VOLTAGE

Reducing this value a more soft stop is obtained. Do not exceed 10% to avoid motor and inverter overheating.

- P22 : STALL PREVENTION OPERATION LEVEL (TORQUE LIMIT LEVEL)

Usually it is not necessary to modify it; eventually increase it to 200 % if there are noises during acceleration.

- P82 : NO LOAD MOTOR CURRENT

Usually it is not necessary to modify it; eventually increase it one ampere per time if motor does not succeed to move the full load cabin at start or at floor levelling.

- P244 : COOLING FAN CONTROL

0 = cooling fan is always active

1 = cooling fan is activated only during inverter operation.

In any case the cooling fan is activated also if the inverter temperature rises over a threshold limit.

- P245 : RATED SLIP FREQUENCY

Usually it is set to 8% but for ELEMOL motor type CTF or CFT (MONTANARI gear) must be set to value 9999.

## **OUTPUT FREQUENCY, VOLTAGE, CURRENT AND FAULTS VISUALIZATION**

As a default mode the display shows the output frequency. Pressing SET button one or more times it is possible to visualize in sequence: output current [A], output voltage [V], and again output frequency [Hz]. The value type is indicated by the leds named A, V, Hz located on the right of display digit.

The inverter is predisposed for stops the elevator if some fault occurs during travels.

Faults are visualized through a code type E.--- and with ALARM led on.

To reset a fault press STOP/RESET button.

To identify the possible causes of the occurred fault see the following fault codes table.

## **FAULTS HISTORY**

To visualize the last four occurred errors:

- Press PU/EXT button
- Press two times MODE button (display visualizes: E--)
- Rotate the knob of one position in clockwise direction to visualize the last error (E0 is visualized if no errors are stored)
- Rotate the knob one position per time in clockwise direction to visualize the other three errors stored (the dot after letter "E" indicates the last occurred error)

**Warnings**

When the protective function is activated, the output is not shut off.

Operation Panel Indication	OL	<b>OL</b>	FR-PU04 FR-PU07	OL
<b>Name</b>	Stall prevention (overcurrent)			
<b>Description</b>	During acceleration	When the output current of the inverter exceeds the stall prevention operation level (Pr. 22 "Stall prevention operation level", etc.), this function stops the increase in frequency until the overload current decreases to prevent the inverter from resulting in overcurrent trip. When the overload current has reduced below stall prevention operation level, this function increases the frequency again.		
	During constant-speed operation	When the output current of the inverter exceeds the stall prevention operation level (Pr. 22 "Stall prevention operation level", etc.), this function reduces frequency until the overload current decreases to prevent the inverter from resulting in overcurrent trip. When the overload current has reduced below stall prevention operation level, this function increases the frequency up to the set value.		
	During deceleration	When the output current of the inverter exceeds the stall prevention operation level (Pr. 22 "Stall prevention operation level", etc.), this function stops the decrease in frequency until the overload current decreases to prevent the inverter from resulting in overcurrent trip. When the overload current has decreased below stall prevention operation level, this function decreases the frequency again.		
<b>Check point</b>	1) Check that the Pr. 0 "Torque boost" setting is not too large. 2) Check that the Pr. 7 "Acceleration time" and Pr. 8 "Deceleration time" settings are not too small. 3) Check that the load is not too heavy. 4) Are there any failure in peripheral devices? 5) Check that the Pr. 13 "Starting frequency" is not too large. 6) Check that the Pr. 22 "Stall prevention operation level" is appropriate.			
<b>Corrective action</b>	1) Increase or decrease the Pr. 0 "Torque boost setting" 1% by 1% and check the motor status. (Refer to section 6.2.1.) 2) Set a larger value in Pr. 7 "Acceleration time" and Pr. 8 "Deceleration time". (Refer to section 6.6.1.) 3) Reduce the load weight. 4) Try advanced magnetic flux vector control and general-purpose magnetic flux vector control. 5) Change the Pr. 14 "Load pattern selection" setting. 6) Set stall prevention operation current in Pr. 22 "Stall prevention operation level". (The initial value is 150%.) The acceleration/deceleration time may change. Increase the stall prevention operation level with Pr. 22 "Stall prevention operation level", or disable stall prevention with Pr. 156 "Stall prevention operation selection". (Operation at OL occurrence can be selected using Pr. 156.)			

Operation Panel Indication	oL	<b>oL</b>	FR-PU04 FR-PU07	oL
<b>Name</b>	Stall prevention (overvoltage)			
<b>Description</b>	During deceleration	<ul style="list-style-type: none"> <li>• If the regenerative energy of the motor becomes excessive and exceeds the regenerative energy consumption capability, this function stops the decrease in frequency to prevent over voltage shut-off. As soon as the regenerative energy has decreased, deceleration resumes.</li> <li>• If the regenerative energy of the motor becomes excessive when regeneration avoidance function is selected (Pr. 882 = 1), this function increases the speed to prevent over voltage shut-off. (Refer to section 6.19.4).</li> </ul>		
<b>Check point</b>	<ul style="list-style-type: none"> <li>• Check for sudden speed reduction.</li> <li>• Check that regeneration avoidance function (Pr. 882, Pr. 883, Pr. 885, Pr. 886) is used. (Refer to section 6.19.4.)</li> </ul>			
<b>Corrective action</b>	The deceleration time may change. Increase the deceleration time using Pr. 8 "Deceleration time".			

Operation Panel Indication	PS	<i>PS</i>	FR-PU04 FR-PU07	PS
Name	PU Stop			
Description	Stop with the STOP/RESET key of the PU is set in Pr. 75 "Reset selection/disconnected PU detection/PU stop selection". (For Pr. 75, refer to section 6.16.1.)			
Check point	Check for a stop made by pressing the STOP/RESET key of the operation panel.			
Corrective action	Turn the start signal off and release with PU/EXT key.			

Operation Panel Indication	RB	<i>rb</i>	FR-PU04 FR-PU07	RB
Name	Regenerative brake prealarm			
Description	<p>Appears if the regenerative brake duty reaches or exceeds 85% of the Pr. 70 "Special regenerative brake duty" value. When the setting of Pr. 70 "Special regenerative brake duty" is the initial value (Pr. 70 = 0), this warning does not occur.</p> <p>If the regenerative brake duty reaches 100%, a regenerative overvoltage (E. OV□) occurs. The RBP signal can be simultaneously output with the [RB] display. For the terminal used for the RBP signal output, assign the function by setting "7 (positive logic) or 107 (negative logic)" in any of Pr. 190, Pr. 192 or Pr. 197 "Output terminal function selection". (Refer to section 6.9.5.)</p>			
Check point	<ul style="list-style-type: none"> <li>• Check that the brake resistor duty is not high.</li> <li>• Check that the Pr. 30 "Regenerative function selection" and Pr. 70 "Special regenerative brake duty" values are correct.</li> </ul>			
Corrective action	<ul style="list-style-type: none"> <li>• Increase the deceleration time (Pr. 8).</li> <li>• Check the Pr. 30 "Regenerative function selection" and Pr. 70 "Special regenerative brake duty" values.</li> </ul>			

Operation Panel Indication	TH	<i>TH</i>	FR-PU04 FR-PU07	TH
Name	Electronic thermal relay function prealarm			
Description	<p>Appears if the cumulative value of the Pr. 9 "Electronic thermal O/L relay" reaches or exceeds 85% of the preset level. If it reaches 100% of the Pr. 9 "Electronic thermal O/L relay" setting, a motor overload trip (E. THM) occurs. The THP signal can be simultaneously output with the [TH] display. For the terminal used for THP signal output, assign the function by setting "8 (positive logic) or 108 (negative logic)" in any of Pr. 190, Pr. 192 or Pr. 197 "Output terminal function selection". (Refer to section 6.9.5.)</p>			
Check point	<p>1) Check for large load or sudden acceleration.</p> <p>2) Is the Pr. 9 "Electronic thermal O/L relay" setting is appropriate? (Refer to section 6.7.1.)</p>			
Corrective action	<p>1) Reduce the load weight or the number of operation times.</p> <p>2) Set an appropriate value in Pr. 9 "Electronic thermal O/L relay". (Refer to section 6.7.1.)</p>			

Operation Panel Indication	MT	<i>MT</i>	FR-PU04 FR-PU07	—
Name	Maintenance signal output			
Description	<p>Indicates that the cumulative energization time of the inverter has reached a given time. When the setting of Pr. 504 "Maintenance timer alarm output" set time is the initial value (Pr. 504 = 9999), this warning does not occur.</p>			
Check point	<p>The Pr. 503 "Maintenance timer" setting is larger than the Pr. 504 "Maintenance timer alarm output set time" setting. (Refer to section 6.20.3.)</p>			
Corrective action	<p>Setting "0" in Pr. 503 "Maintenance timer" erases the signal.</p>			

Operation Panel Indication	UV	<i>UV</i>	FR-PU04 FR-PU07	—
Name	Undervoltage			
Description	If the power supply voltage of the inverter decreases, the control circuit will not perform normal functions. In addition, the motor torque will be insufficient and/or heat generation will increase. To prevent this, if the power supply voltage decreases below about 230VAC, this function stops the inverter output and displays. An alarm is reset when the voltage returns to normal.			
Check point	Check that the power supply voltage is normal.			
Corrective action	Check that the power supply voltage is normal.			

Operation Panel Indication	SA	<i>SA</i>	FR-PU04 FR-PU07	—
Name	Safety stop			
Description	Appears when safety stop function is activated (during output shutoff).			
Check point	Check if the shorting wire between S1 and SC or between S2 and SC is disconnected when not using the safety stop function.			
Corrective action	<ul style="list-style-type: none"> <li>• When not using the safety stop function, short across terminals S1 and SC and across S2 and SC with shorting wire for the inverter to run.</li> <li>• If SA is indicated when across S1 and SC and across S2 and SC are both shorted while using the safety stop function (drive enabled), internal failure might be the cause.</li> <li>• Check the wiring of terminals S1, S2 and SC and contact your sales representative if the wiring has no fault.</li> </ul>			

**Alarm**

When an alarm occurs, the output is not shut off. You can also output an alarm signal by making parameter setting. (Set "98" in any of Pr. 190, Pr. 192 or Pr. 197 "Output terminal function selection". Refer to section 6.9.5).

Operation Panel Indication	FN	<i>F<sub>n</sub></i>	FR-PU04 FR-PU07	FN
Name	Fan fault			
Description	For the inverter that contains a cooling fan, "FN" appears on the operation panel when the cooling fan stops due to an alarm or different operation from the setting of Pr. 244 "Cooling fan operation selection".			
Check point	Check the cooling fan for an alarm.			
Corrective action	Replace the cooling fan.			

**Fault**

When a fault occurs, the inverter trips and a fault signal is output.

<b>Operation Panel Indication</b>	E.OC1	<b>E.OC1</b>	FR-PU04 FR-PU07	<b>OC During Acc</b>
<b>Name</b>	Overcurrent shut-off during acceleration			
<b>Description</b>	When the inverter output current reaches or exceeds approximately 200% of the rated current during acceleration, the protective circuit is activated and the inverter trips.			
<b>Check point</b>	1) Check for sudden acceleration. 2) Check that the downward acceleration time is not long in vertical lift application. 3) Check for output short circuit/ground fault. 4) Check that stall prevention operation is correct. 5) Check that regeneration is not performed frequently. (Check that the output voltage becomes larger than the V/f reference value at regeneration and overcurrent occurs due to the high voltage.)			
<b>Corrective action</b>	1) Increase the acceleration time. (Shorten the downward acceleration time in vertical lift application.) 2) When "E.OC1" is always lit at starting, disconnect the motor once and start the inverter. If "E.OC1" is still lit, contact your sales representative. 3) Check the wiring to make sure that output short circuit/ground fault does not occur. 4) Perform a correct stall prevention operation. (Refer to section 6.2.4). 5) Set base voltage (rated voltage of the motor, etc.) in Pr. 19 "Base frequency voltage". (Refer to section 6.4.1.)			

<b>Operation Panel Indication</b>	E.OC2	<b>E.OC2</b>	FR-PU04 FR-PU07	<b>OC During Dec</b>
<b>Name</b>	Overcurrent shut-off during constant speed			
<b>Description</b>	When the inverter output current reaches or exceeds approximately 200% of the rated current during constant speed operation, the protective circuit is activated and the inverter trips.			
<b>Check point</b>	1) Check for sudden load change. 2) Check for output short circuit/ground fault. 3) Check that stall prevention operation is correct.			
<b>Corrective action</b>	1) Keep load stable. 2) Check the wiring to make sure that output short circuit/ground fault does not occur. 3) Perform a correct stall prevention operation. (Refer to section 6.2.4).			

<b>Operation Panel Indication</b>	E.OC3	<b>E.OC3</b>	FR-PU04 FR-PU07	<b>OC During Dec</b>
<b>Name</b>	Overcurrent shut-off during deceleration or stop			
<b>Description</b>	When the inverter output current reaches or exceeds approximately 200% of the rated inverter current during deceleration (other than acceleration or constant speed), the protective circuit is activated and the inverter trips.			
<b>Check point</b>	1) Check for sudden speed reduction. 2) Check for output short circuit/ground fault. 3) Check for too fast operation of the motor's mechanical brake. 4) Check that stall prevention operation setting is correct.			
<b>Corrective action</b>	1) Increase the deceleration time. 2) Check the wiring to make sure that output short circuit/ground fault does not occur. 3) Check the mechanical brake operation. 4) Check that stall prevention operation setting is correct. (Refer to section 6.2.4.)			

Operation Panel Indication	E.OV1	<i>E.Ov1</i>	FR-PU04 FR-PU07	OV During Acc
Name	Regenerative overvoltage shut-off during acceleration			
Description	If regenerative energy causes the inverter's internal main circuit DC voltage to reach or exceed the specified value, the protective circuit is activated and the inverter trips. The circuit may also be activated by a surge voltage produced in the power supply system.			
Check point	1) Check for too slow acceleration (e.g. during downward acceleration in vertical lift load). 2) Check that the Pr. 22 "Stall prevention operation level" is not too low.			
Corrective action	1) • Decrease the acceleration time. • Check that regeneration avoidance function (Pr. 882, Pr. 883, Pr. 885, Pr. 886) is used. (Refer to section 6.19.4) 2) Set a correct value in Pr. 22 "Stall prevention operation level".			

Operation Panel Indication	E.OV2	<i>E.Ov2</i>	FR-PU04 FR-PU07	U>>N = konst
Name	Regenerative overvoltage shut-off during constant speed			
Description	If regenerative energy causes the inverter's internal main circuit DC voltage to reach or exceed the specified value, the protective circuit is activated to stop the inverter output. The circuit may also be activated by a surge voltage produced in the power supply system.			
Check point	1) Check for sudden load change. 2) Check that the Pr. 22 "Stall prevention operation level" is not too low.			
Corrective action	1) • Keep load stable. • Check that regeneration avoidance function (Pr. 882, Pr. 883, Pr. 885, Pr. 886) is used. (Refer to section 6.19.4) • Use the brake resistor, brake unit or power regeneration common converter (FR-CV) as required. 2) Set a correct value in Pr. 22 "Stall prevention operation level".			

Operation Panel Indication	E.OV3	<i>E.Ov3</i>	FR-PU04 FR-PU07	OV During Dec
Name	Regenerative overvoltage shut-off during deceleration or stop			
Description	If regenerative energy causes the inverter's internal main circuit DC voltage to reach or exceed the specified value, the protective circuit is activated to stop the inverter output. The circuit may also be activated by a surge voltage produced in the power supply system.			
Check point	Check for sudden speed reduction.			
Corrective action	• Increase the deceleration time. (Set the deceleration time which matches the inertia moment of the load) • Use regeneration avoidance function (Pr. 882, Pr. 883, Pr. 885, Pr. 886). (Refer to section 6.19.4.) • Use the brake unit or power regeneration common converter (FR-CV) as required.			

Operation Panel Indication	E.THT	<i>E.THT</i>	FR-PU04 FR-PU07	Inv. Overload
Name	Inverter overload shut-off (electronic thermal relay function) ①			
Description	If the temperature of the output transistor element exceeds the protection level under the condition that a current not less than the rated inverter current flows and overcurrent trip does not occur (200% or less), the electronic thermal relay activates to stop the inverter output. (Overload capacity 150% for 60s, 200% for 0.5s)			
Check point	<ul style="list-style-type: none"> <li>• Check that acceleration/deceleration time is not too short.</li> <li>• Check that torque boost setting is not too large (small).</li> <li>• Check that load pattern selection setting is appropriate for the load pattern of the using machine.</li> <li>• Check the motor for use under overload.</li> <li>• Check for too high ambient temperature.</li> </ul>			
Corrective action	<ul style="list-style-type: none"> <li>• Increase acceleration/deceleration time.</li> <li>• Adjust the torque boost setting.</li> <li>• Set the load pattern selection setting according to the load pattern of the using machine.</li> <li>• Reduce the load weight.</li> <li>• Set the ambient temperature to within the specifications.</li> </ul>			

① Resetting the inverter initializes the internal thermal integrated data of the electronic thermal relay function.

Operation Panel Indication	E.THM	<i>E.THM</i>	FR-PU04 FR-PU07	Motor Overload
Name	Motor overload shut-off (electronic thermal relay function) ①			
Description	The electronic thermal relay function in the inverter detects motor overheat due to overload or reduced cooling capability during constant-speed operation and pre-alarm (TH display) is output when the I <sup>2</sup> t value reaches 85% of the Pr. 9 "Electronic thermal O/L relay" setting and the protection circuit is activated to stop the inverter output when the I <sup>2</sup> t value reaches the specified value. When running a special motor such as a multi-pole motor or multiple motors, provide a thermal relay on the inverter output side since such motor(s) cannot be protected by the electronic thermal relay function.			
Check point	<ol style="list-style-type: none"> <li>1) Check the motor for use under overload.</li> <li>2) Check that the setting of Pr. 71 "Applied motor" for motor selection is correct. (Refer to section .)</li> <li>3) Check that the setting of Pr. 71 "Applied motor" for motor selection is correct. (Refer to section 6.2.4.)</li> </ol>			
Corrective action	<ol style="list-style-type: none"> <li>1) Reduce the load weight.</li> <li>2) For a constant-torque motor, set the constant-torque motor in Pr. 71 "Applied motor".</li> <li>3) Check that stall prevention operation setting is correct. (Refer to section 6.2.4.)</li> </ol>			

① Resetting the inverter initializes the internal thermal integrated data of the electronic thermal relay function.

Operation Panel Indication	E.FIN	<i>E F I n</i>	FR-PU04 FR-PU07	H/Sink O/Temp
Name	Fin overheat			
Description	If the heatsink overheats, the temperature sensor is actuated to stop the inverter output. The FIN signal can be output when the temperature becomes approximately 85% of the heatsink overheat protection operation temperature. For the terminal used for the FIN signal output, assign the function by setting "26" (source logic) or "126" (sink logic) in any of Pr. 190, Pr. 192 or Pr. 197 "Output terminal function selection". (Refer to section 6.9.5).			
Check point	1) Check for too high ambient temperature. 2) Check for heatsink clogging. 3) Check that the cooling fan is stopped. (Check that "FN" is not displayed on the operation panel.)			
Corrective action	1) Set the ambient temperature to within the specifications. 2) Clean the heatsink. 3) Replace the cooling fan.			

Operation Panel Indication	E.ILF	<i>E I L F</i>	FR-PU04 FR-PU07	Fault 14 Input phase loss
Name	Input phase loss ①			
Description	Inverter trips when function valid setting (=1) is selected in Pr. 872 Input phase loss protection selection and one phase of the three phase power input is lost. (Refer to section 6.12.2). It may function if phase-to-phase voltage of the three-phase power input becomes largely unbalanced.			
Check point	<ul style="list-style-type: none"> <li>• Check for a brake in the cable for the three-phase power supply input.</li> <li>• Check that phase-to-phase voltage of the three-phase power input is not largely unbalanced.</li> </ul>			
Corrective action	<ul style="list-style-type: none"> <li>• Wire the cables properly.</li> <li>• Repair a brake portion in the cable.</li> <li>• Check the Pr. 872 "Input phase failure protection selection" setting.</li> <li>• Set Pr. 872 = "0" (without input phase loss protection) when three-phase input voltage is largely unbalanced.</li> </ul>			

① Available only for three-phase power input specification model.

Operation Panel Indication	E.OLT	<i>E O L T</i>	FR-PU04 FR-PU07	Stall Prev STP (OL shown during stall prevention operation)
Name	Stall prevention			
Description	If the output frequency has fallen to 1Hz by stall prevention operation and remains for 3s, a fault (E.OLT) appears and trips the inverter. "OL" appears while stall prevention is being activated. E.OLT may not occur if stall prevention (OL) is activated during output phase loss.			
Check point	Check the motor for use under overload. (Refer to section 6.2.4).			
Corrective action	<ul style="list-style-type: none"> <li>• Reduce the load weight.</li> <li>• Check the Pr. 22 "Stall prevention operation level" setting.</li> </ul>			

Operation Panel Indication	E.BE	<i>E. bE</i>	FR-PU04 FR-PU07	Br. Cct. Fault
Name	Brake transistor alarm detection/internal circuit error			
Description	When a brake transistor alarm has occurred due to the large regenerative energy from the motor etc., the brake transistor alarm is detected and the inverter trips. <b>In this case, the Inverter must be powered off immediately.</b>			
Check point	<ul style="list-style-type: none"> <li>• Reduce the load inertia.</li> <li>• Check that the frequency of using the brake is proper.</li> <li>• Check that the brake resistor selected is correct.</li> </ul>			
Corrective action	Replace the inverter.			

Operation Panel Indication	E.GF	<i>E. GF</i>	FR-PU04 FR-PU07	Ground Fault
Name	Output side earth (ground) fault overcurrent protection			
Description	The inverter trips if an earth (ground) fault overcurrent flows at start due to an earth (ground) fault that occurred on the inverter's output side (load side). Whether this protective function is used or not is set with Pr. 249 "Earth (ground) fault detection at start".			
Check point	Check for an earth fault in the motor and connection cable.			
Corrective action	Remedy the earth fault portion.			

Operation Panel Indication	E.LF	<i>E. LF</i>	FR-PU04 FR-PU07	E.LF
Name	Output phase loss			
Description	If one of the three phases (U, V, W) on the inverter's output side (load side) is lost during inverter operation (except during DC injection brake operation and when output frequency is under 1Hz), inverter stops the output. Whether the protective function is used or not is set with Pr. 251 "Output phase loss protection selection".			
Check point	<ul style="list-style-type: none"> <li>• Check the wiring (Check that the motor is normal.)</li> <li>• Check that the capacity of the motor used is not smaller than that of the inverter.</li> </ul>			
Corrective action	<ul style="list-style-type: none"> <li>• Wire the cables properly.</li> <li>• Check the Pr. 251 "Output phase failure protection selection" setting.</li> </ul>			

Operation Panel Indication	E.OHT	<i>E.OHT</i>	FR-PU04 FR-PU07	OH Fault
Name	External thermal relay operation			
Description	If the external thermal relay provided for motor overheat protection or the internally mounted temperature relay in the motor, etc. switches on (contacts open), the inverter output is stopped. Functions when "7" (OH signal) is set to any of Pr. 178 to Pr. 182 "Input terminal function selection". This protective function does not function in the initial status (OH signal is not assigned).			
Check point	<ul style="list-style-type: none"> <li>• Check for motor overheating.</li> <li>• Check that the value of "7" (OH signal) is set correctly in any of Pr. 178 to Pr. 182 "Input terminal function selection".</li> </ul>			
Corrective action	<ul style="list-style-type: none"> <li>• Reduce the load and frequency of operation.</li> <li>• Even if the relay contacts are reset automatically, the inverter will not restart unless it is reset.</li> </ul>			

Operation Panel Indication	E.PTC	E.PTC	FR-PU04	Fault 14
			FR-PU07	PTC activated
Name	PTC thermistor operation			
Description	Inverter trips when resistance of PTC thermistor connected between terminal 2 and terminal 10 is more than the value set in Pr. 561. This protective function does not function when Pr. 561 setting is initial value (Pr. 561 = "9999").			
Check point	<ul style="list-style-type: none"> <li>• Check the connection of the PTC thermistor.</li> <li>• Check the Pr. 561 setting.</li> <li>• Check the motor for operation under overload.</li> </ul>			
Corrective action	<ul style="list-style-type: none"> <li>• Reduce the load weight.</li> </ul>			

Operation Panel Indication	E.PE	E. PE	FR-PU04	Corrupt Memry
			FR-PU07	
Name	Parameter storage device alarm (control circuit board)			
Description	Appears when a fault occurred in the stored parameters. (EEPROM fault).			
Check point	Check for too many number of parameter write times.			
Corrective action	<p>Please contact your sales representative.</p> <p>When performing parameter write frequently for communication purposes, set "1" in Pr. 342 to enable RAM write. Note that powering off returns the inverter to the status before RAM write.</p>			

Operation Panel Indication	E.PUE	E.PUE	FR-PU04	PU Leave Out
			FR-PU07	
Name	PU disconnection			
Description	This function stops the inverter output if communication between the inverter and PU (FR-PU04/FR-PU07) is suspended, e.g. the parameter unit is disconnected, when "2", "3", "16" or "17" was set in Pr. 75 "Reset selection/disconnected PU detection/PU stop selection". This function stops the inverter output when communication errors occurred consecutively for more than permissible number of retries when a value other than "9999" is set in Pr. 121 "Number of PU communication retries" during the RS485 communication with the PU connector (use Pr. 502 "Stop mode selection at communication error" to change). This function also stops the inverter output if communication is broken within the period of time set in Pr. 122 "PU communication check time interval" during the RS485 communication with the PU connector.			
Check point	<ul style="list-style-type: none"> <li>• Check that the parameter unit (FR-PU04/FR-PU07) is fitted tightly.</li> <li>• Check the Pr. 75 setting.</li> <li>• Check that RS485 communication data is correct. And check that the settings of communication parameter at inverter match settings of the computer.</li> <li>• Check that data is transmitted from the computer within a time set in Pr. 122.</li> </ul>			
Corrective action	<p>Connect the parameter unit (FR-PU04/FR-PU07) securely.</p> <p>Check the communication data and communication settings.</p> <p>Increase the Pr. 122 setting or set "9999" (no communication check).</p>			

Operation Panel Indication	E.RET	<i>E RET</i>	FR-PU04 FR-PU07	Retry No Over
Name	Retry count excess			
Description	If operation cannot be resumed properly within the number of retries set, this function trips the inverter. Functions only when Pr. 67 "Number of retries at fault occurrence" is set. When the initial value (Pr. 67 = 0) is set, this protective function does not function.			
Check point	Find the cause of fault occurrence.			
Corrective action	Eliminate the cause of the error preceding this error indication.			

Operation Panel Indication	E. 5	<i>E 5</i>	FR-PU04 FR-PU07	Fault 5
	E.CPU	<i>E CPU</i>		CPU Fault
Name	CPU fault			
Description	Stops the inverter output if the communication fault of the built-in CPU occurs.			
Check point	Check for devices producing excess electrical noises around the inverter.			
Corrective action	<ul style="list-style-type: none"> <li>Take measures against noises if there are devices producing excess electrical noises around the inverter.</li> <li>Please contact your sales representative.</li> </ul>			

Operation Panel Indication	E.CDO	<i>E CDO</i>	FR-PU04	Fault 14
			FR-PU07	OC detect level
Name	Output current detection value exceeded			
Description	This function is activated when the output current exceeds the Pr. 150 "Output current detection level" setting.			
Check point	Check the settings of Pr. 150 "Output current detection level", Pr. 151 "Output current detection signal delay time", Pr. 166 "Output current detection signal retention time", Pr. 167 "Output current detection operation selection". (Refer to 6.9.7).			

Operation Panel Indication	E.IOH	<i>E IOH</i>	FR-PU04	Fault 14
			FR-PU07	Inrush overheat
Name	Inrush current limit circuit fault			
Description	This function is activated when the resistor of the inrush current limit circuit overheats. The inrush current limit circuit fault.			
Check point	Check that frequent power ON/OFF is not repeated.			
Corrective action	Configure a circuit where frequent power ON/OFF is not repeated. If the problem still persists after taking the above measure, please contact your sales representative.			