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Trip information and measures

13.1 Description of trip and alarm information and measures

If a trip occurs, make failure diagnosis according to the table below before contacting your Toshiba distributor.

Confirm the parameters are set as intended. PCM002Z is useful to do it.

■ Term description

Trip	Output of the inverter is turned OFF for protection of the inverter or external equipment. A fault signal is assigned to the terminals [FL] in the default setting. It can be assigned to the other output terminals, refer to [7. 2. 2].
Alarm	Indicates a condition that the inverter or external equipment may be damaged if continued. Some of alarms can be assigned to output terminals. Refer to [7. 2. 2]. Alarm messages are indicated with blinking into the display.
Pre-alarm	A condition close to the trip level. Some of pre-alarms can be assigned to output terminals. Refer to [7. 2. 2]. Pre-alarm messages are indicated with blinking into the display during run, respectively.
Message	Informs a status of the inverter and setting error. It is not an alarm.

■ Trip information

Trip message	Error code	Trip name	Detection factor	Measures
E	17 (0x0011)	Emergency off	Emergency off is input. 1) When a run command is other than the operation panel, [STOP/RESET] key was pressed twice. 2) A signal was input to the input terminal in which emergency off is assigned. 3) Emergency off is input from communication.	- Reset after solving problems. - Clear the emergency off signal.
E-11	43 (0x002B)	Brake answer error *	The system does not reply even after the setting time in <F630: Brake answer wait time> elapsed. *It can be enabled/disabled by <F630>.	- Check the system. - Make sure the parameter setting, refer to [6. 30. 15]. Set <F630>="0.0" to disable this detection.
E-12	44 (0x002C)	PG error	1) PG is disconnected. 2) Error exists in PG wiring. 3) PG voltage is improper.	- Check the PG wiring. - Check if the PG settings are correct. <F376: PG select>, <F379: PG option voltage>

Trip message	Error code	Trip name	Detection factor	Measures
E-13	45 (0x002D)	Abnormal speed error	1) When <Pt: V/f Pattern> = "0" to "9", an over speed condition occurred. Over speed condition: In case F623≠0.0, F624≠0.0, the condition which estimated frequency is not inside of "output frequency - <F624>" to "output frequency + <F623>" continues <F622> times. 2) When <Pt: V/f Pattern> = "10" to "11", over speed continued by PG failure, etc. Over speed condition: In case F623≠0.0, F624≠0.0, the condition which measured frequency is not inside of "output frequency - <F624>" to "output frequency + <F623>" continues <F622> times. 3) Due to overvoltage limit operation, the output frequency exceeded <FH: Maximum frequency> +12 Hz or <FH> + <vL: Base frequency 1> x 0.1. 4) When <Pt: V/f Pattern> = "3" to "6", or "9" to "12", speed control gain is so small that motor speed is overshoot. 5) When <Pt: V/f pattern 1> = "6", the motor was operated without the PM motor connected.	1) 3) - Check whether a problem exists in input voltage. - When the regenerative energy is large, install a braking resistor (option). 2) Check the PG wiring and setting. 4) Increase(adjust) <F459> setting. 5) Connect the PM motor or set <Pt: V/f pattern> = "0".
E-18	50 (0x0032)	Analog input disconnecting *	The input level of the terminal [II] became the setting value or less of <F633: II analog input disconnection detection level> *It can be enabled/disabled by <F633>.	- Check that the signal line connected to the terminal [II] is not disconnected. - Make sure the parameter setting, refer to [6. 30. 16].
E-19	51 (0x0033)	CPU communication error	Communication error between control CPU.	Turn off the power and then turn it on again. If the error occurs again, contact your Toshiba distributor.
E-20	52 (0x0034)	Over torque boost	- The setting value of the <F402: Automatic torque boost> is very high. - Impedance on the motor is low.	Set the motor parameters according to the motor characteristic, and perform auto-tuning. <vL: Base frequency 1>, <vLv: Base frequency voltage>, <F405: Motor rated capacity>, <F415: Motor rated current>, <F417: Motor rated speed>, <F400: Offline auto-tuning>, etc.
E-21	53 (0x0035)	CPU1 fault B	Control CPU fault.	Internal fault in inverter. If the trip occur again after power reset, contact your Toshiba distributor.
E-22	54 (0x0036)	Embedded Ethernet fault	Fault in the embedded Ethernet.	Internal fault in inverter. If the trip occur again after power reset, contact your Toshiba distributor.
E-23	55 (0x0037)	Option fault (slot A)	1) Two ETB013Zs (I/O extension 1) are inserted in slot A and B, or in slot A and C. 2) Three ETB014s (I/O extension 2) are inserted in slot A, B and C. 3) Abnormality on option connection. 4) Ambient temperature is out of operating temperature range. 5) Fault in the option attached on slot A, or lost the embedded Ethernet function.	1) Remove one of them 2) Remove one of them 3) Make sure the option is inserted into slot A properly. 4) Turn off the inverter power and make it cool down. 5) If the trip occur again after power reset, contact your Toshiba distributor.

Trip message	Error code	Trip name	Detection factor	Measures
E-24	56 (0x0038)	Option fault (slot B)	1) Two ETB013Zs (I/O extension 1) are inserted in slot B and C. 2) <F376: PG select> is set to one of 1,3,6,11,13,16, without feedback option (VEC□□□Z) in slot B. 3) Abnormality on option connection. 4) Ambient temperature is out of operating temperature range. 5) Fault in the option attached on slot B.	1) Remove one of them. 2) - Check <F376> setting. - Check a feedback option is inserted in slot B. 3) Make sure the option is inserted into slot B properly. 4) Turn off the inverter power and make it cool down. 5) If the trip occur again after power reset, contact your Toshiba distributor.
E-25	57 (0x0039)	Option fault (slot C)	1) Abnormality on option connection. 2) Ambient temperature is out of operating temperature range. 3) Fault in the option attached on slot C.	1) Make sure the option is inserted into slot C properly. 2) Turn off the inverter power and make it cool down. 3) If the trip occur again after power reset, contact your Toshiba distributor.
E-26	58 (0x003A)	CPU2 fault	Control CPU fault.	Internal fault in inverter. If the trip occur again after power reset, contact your Toshiba distributor.
E-29	61 (0x003D)	Control power option failure *	1) Abnormal voltage on control backup power supply between terminals [+SU] - [CC]. 2) The setting of <F647: Control power option failure detection> is improper. *It can be enabled/disabled by <F647>.	1) Input voltage between terminals [+SU] - [CC] drops to 20V or less. Check the power supply. 2) Make sure the parameter setting, refer to [6. 30. 20]. Set <F647>="0" to disable this detection.
E-31	63 (0x003F)	Rush current suppression relay fault	1) Fault on the rush current suppression relay. 2) The power was turned ON/OFF frequently.	1) Internal fault in inverter. Contact your Toshiba distributor. 2) Instead of turning ON/OFF with the power supply, turn ON/OFF with a run command.
E-32	64 (0x0040)	PTC failure*	1) PTC protection activated. 2) PTC abnormality of cable disconnection. 3) Wrong function assignment on analog input terminals. *It can be enabled/disabled by <F645>.	1) Check motor temperature. 2) Check PTC and the cable. 3) Make sure the parameter setting, refer to [6. 30. 19]
E-37	69 (0x0045)	Servo lock error	1) The lock up torque or more external load is applied to the motor. 2) Setting of motor parameters is improper.	1) Reduce the load to apply the servo lock. 2) Set the motor parameters according to the motor characteristic, and perform auto-tuning. <vL: Base frequency 1>, <vLv: Base frequency voltage>, <F405: Motor rated capacity>, <F415: Motor rated current>, <F417: Motor rated speed>, <F400: Offline auto-tuning>, etc.
E-38	70 (0x0046)	Communication time-out of Braking unit PB7-4132K	1) The cable linked VF-AS3 to Braking unit PB7-4132K is disconnected. 2) Bad location of the cable linked VF-AS3 to the braking unit. 3) Braking unit PB7-4132K is failed. * E-38 is not detected during MOFF alarm	1) Check the cable linked VF-AS3 to the braking unit. 2) Correct the cable path, see "Braking unit option instruction manual" (E6582168). 3) If the trip occurs again after power reset, contact your Toshiba distributor.
E-39	71 (0x0047)	PM control error	During auto-tuning or initial position, the motor current became very high.	Measure inductance with a LCR meter, etc., and set to the parameter directly.

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E-42	74 (0x004A)	Cooling fan fault*	1) Cooling fan speed decreased. 2) Cooling fan degradation or abnormality. *It can be enabled/disabled by <F620>.	1) Check the fan vents. 2) The cooling fan needs to be replaced. Contact your Toshiba distributor.
E-43	75 (0x004B)	Communication time-out* (embedded Ethernet)	Embedded Ethernet communication timed out. *It can be enabled/disabled by <C607>.	Check the Ethernet communication equipment and wiring. Refer to "Embedded Ethernet function manual" (E6582125) for details.
E-44	76 (0x004C)	Battery of panel failure	Calendar function is activated, and under one of these cases. 1) A battery is not in. 2) The battery level is low. 3) Time is not synchronized inside the inverter.	1) Put a battery. 2) Replace the battery. 3) Reset the inverter with operation panel installed
E-45	77 (0x004D)	GD2 auto-tuning error	1) The value of F459 is not fixed. 2) Estimated value of F459 is out of parameter range. 3) The command frequency of the moment of inertia auto-tuning exceeds . 4) Moment of inertia auto-tuning is close to , or the moment of inertia of the load is too small to secure a sufficient speed step width. 5) Upper limit frequency Hz is set lower than $(\langle F481 \rangle + \langle F482 \rangle) / 100 * \langle vL \rangle$.	1) Modify the value of F481, F482 and do the tuning again. 2) Modify F480 to 0, and set the appropriate value of F459 manually. 3) Reduce <F481>. 4) Decrease <F481>. If the inertia moment of the load is too small, set <F480> = "0" and set <F459> to an appropriate value. 5) Modify the value of , <F481> or <F482> so that is lower than $(\langle F481 \rangle + \langle F482 \rangle) / 100 * \langle vL \rangle$.
E-46	78 (0x004E)	Preparation signal cut during position control	1) Position preparation signal (LI:178/179) was turned OFF during position control. 2) When A527=2 or 12, near point dog start signal (LI:186/187) was turned OFF during 0 point recovery.	1) Check position preparation signal is kept until position control is completed. 2) Check near point dog start signal is kept until 0 point recovery is completed.
E-47	79 (0x004F)	Position detection upper limit excess	1) When A522=1, The current position exceeded the upper limit. 2) The ratio of the electronic gear (A524/A525) exceeds the limitation.	1) Check the limit range parameters (A518, A519, A520 and A521). 2) Check the ratio of (A524/A525) is in the range of 1/20 to 50.
E-48	80 (0x0050)	Braking unit PB7-4132K internal fault	An internal error occurred in Braking unit PB7-4132K.	If the trip occurs again after power reset, contact your Toshiba distributor.
E-99	88 (0x0058)	Trip for test *	Trip for test occurred. *It is caused by <F699>.	Reset if no problem is found. Refer to [6. 30. 24].
EEP1	18 (0x0012)	EEPROM fault 1	Fault occurred during internal data writing.	If the trip occurs again after power reset, contact your Toshiba distributor.
EEP2	19 (0x0013)	EEPROM fault 2	1) While setting <tyP: Default setting>, the power was turned OFF or momentary power failure occurred. 2) Fault occurred during internal data writing.	1) Set <tyP> again. If the fault occurs again, contact your Toshiba distributor. 2) If the trip occurs again after power reset, contact your Toshiba distributor.
EEP3	20 (0x0014)	EEPROM fault 3	Fault occurred during internal data reading.	If the trip occurs again after power reset, contact your Toshiba distributor.
EF2	34 (0x0022)	Grounding fault *	1) Grounding fault occurred in the output wiring or the motor. 2) Fault can occur depends on motor, in case of rapid acceleration/deceleration. *It can be disabled by parameter, refer to [6. 30. 10].	1) Check grounding fault in the wiring on the output side and the motor. 2) Increase the acceleration/deceleration time. <ACC/dEC acceleration/ deceleration time 1>
EPHI	8 (0x0008)	Input phase loss *	1) Input side phase has failed. *It can be enabled/disabled by <F608>.	1) Check phase failure in the wiring on the input side.

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EPHO	9 (0x0009)	Output phase loss *	1) Output side phase has failed. 2) Output current is quite small (less than 8%) to motor rated current. 3) Motor is rotating. *It can be enabled/disabled by <F605>.	1) Check phase failure in the wiring on the output side. When using a PM motor (<F915> = "3", "4"), "EPHO" may occur regardless of the <F605> setting. 2) Set <F605> to 0 3) Activate RUN command after motor has stopped.
Err2	21 (0x0015)	RAM fault	Control RAM fault.	Internal fault in inverter. If the trip occurs again after power reset, contact your Toshiba distributor.
Err3	22 (0x0016)	ROM fault	Control ROM fault.	
Err4	23 (0x0017)	CPU1 fault A	Control CPU fault.	
Err5	24 (0x0018)	Communication time-out* (RS485)	RS485 communication timed out. *It can be enabled/disabled by parameter, refer to [6. 38. 1].	Check the communication equipment and wiring on RS485 communication. Refer to [6. 38. 1] for details.
Err6	25 (0x0019)	Gate array fault	Fault in the gate array.	Internal fault in inverter. If the trip occurs again after power reset, contact your Toshiba distributor.
Err7	26 (0x001A)	Current detector fault	Fault in the output current detector.	
Err8	27 (0x001B)	Communication time-out (option)	Communication option timed out.	Check the communication equipment and wiring on communication option. Refer to each communication option manual.
Err9	28 (0x001C)	Panel disconnection during run*	While running with a run command from the operation panel and extension panel, the cable connecting the inverter and panel are disconnected. *It can be enabled/disabled by <F731>.	Check the connection on the inverter and panel.
Etn	40 (0x0028)	Auto-tuning error	1) The motor parameter does not match the motor characteristic. 2) Executed auto-tuning while the motor is rotating. 3) The output frequency does not increase within few minutes.	1) Set the motor parameters according to the motor characteristic. <vL: Base frequency 1>, <vLv: Base frequency voltage>, <F405: Motor rated capacity>, <F415: Motor rated current>, <F417: Motor rated speed>, etc. 2) Check that the motor is stopped, and perform auto-tuning again. 3) Check that the motor is not stopped while the output frequency is rising on the system.
Etn1	84 (0x0054)	Auto-tuning error 1	1) The motor is not connected. 2) Something other than the motor is connected. 3) In the induction motor, an improper value, a synchronized motor speed value or a value close to it is set in <F417: Motor rated speed>.	1) and 2) Check that the motor is connected. 3) Set <F417> according to the motor rating.
Etn2	85 (0x0055)	Auto-tuning error 2	The motor parameter does not match the motor characteristic.	Set the motor parameters according to the motor characteristic. <vL: Base frequency 1>, <vLv: Base frequency voltage>, <F405: Motor rated capacity>, <F415: Motor rated current>, <F417: Motor rated speed>, etc.

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Etn3	86 (0x0056)	Auto-tuning error 3	1) The setting on <vL: Base frequency 1> or <F417: Motor rated speed> does not match the motor rating. 2) Power is not supplied.	1) Set <vL: Base frequency 1> or <F417: Motor rated speed> according to the motor rating. 2) Supply the power.
EtyP	41 (0x0029)	Inverter type error	1) Printed circuit board was replaced. 2) Data abnormality inside inverter.	1) Set <tyP: Default setting> = "6: Initialize typeform". 2) Internal fault in inverter. If the trip occurs again after power reset, contact your Toshiba distributor.
OC1	1 (0x0001)	Overcurrent (during acceleration)	1) The acceleration time is short. 2) <Pt: V/f Pattern> does not match the machinery. 3) Momentary power failure occurred, and tried to start the rotating motor. 4) Tried to run the special motor (impedance small). 5) Tried to run a low inductance motor like a high-speed motor. 6) When <Pt> = "11", polarity of PG is opposite. 7) When <F614: Pulse width of short circuit detection at start> = "0", and <F613>=2, or 3, inverter output short circuit. 8) It may result in grounding fault. 9) Leakage current influence due to long motor cable	1) Increase the acceleration time. <ACC: Acceleration time 1>, etc. 2) Set <Pt: V/f Pattern> according to the machinery. 3) Set <F301: Auto-restart>. Depending on the characteristic of machinery, <F302: Regenerative power ride-through> = "1" is also effective. 4) When <Pt> is set to "0", "1", "2", or "7", lower <vb: Manual torque boost 1>. For settings other than "0", "1", "2", or "7", perform auto-tuning with <F400: Offline auto-tuning>. <F402: Automatic torque boost> is set matching the motor. 5) Change the inverter to large capacity. 6) Check the motor and the motor cable for grounding faults. 7) Refer to section [2. 4. 3] for leakage current measure. 8) Refer to the measure for "EF2". 9) Decrease <F300: Carrier frequency>.
OC2	2 (0x0002)	Overcurrent (during deceleration)	1) The deceleration time is short. 2) Tried to run a low inductance motor like a high-speed motor. 3) When <Pt> = "11", polarity of PG is opposite. 4) When <F614: Pulse width of short circuit detection at start> = "0", and <F613>=2, or 3 inverter output short circuit. 5) It may result in grounding fault. 6) Leakage current influence due to long motor cable	1) Increase the deceleration time. <dEC: Deceleration time 1>, etc. 2) Change the inverter to large capacity. 3) Check the motor and the motor cable for grounding faults. 4) Refer to section [2. 4. 3] for leakage current measure. 5) Refer to the measure for "EF2". 6) Decrease <F300: Carrier frequency>.
OC3	3 (0x0003)	Overcurrent (during constant speed running)	1) The load changed rapidly. 2) Error occurred in your system (something got stuck, etc.). 3) Tried to run a low inductance motor like a high-speed motor. 4) When <Pt> = "11", polarity of PG is opposite. 5) When <F614: Pulse width of short circuit detection at start> = "0", and <F613>=2, or 3 inverter output short circuit. 6) It may result in grounding fault. 7) Leakage current influence due to long motor cable 8) It may result in exciting forcing.	1) Suppress load fluctuation. 2) Check whether a problem exists in your system. 3) Change the inverter to large capacity. 4) Check the motor and the motor cable for grounding faults. 5) Refer to section [2. 4. 3] for leakage current measure. 6) Refer to the measure for "EF2". 7) Decrease <F300: Carrier frequency>. 8) Decrease <F456: exciting forcing level>. When using Sine wave filter, decrease <F457: Exciting forcing control gain>, refer to E6582465.

Trip message	Error code	Trip name	Detection factor	Measures
OCA1	5 (0x0005)	Overcurrent (U-phase arm)	Fault on IGBT in U-phase.	Internal fault in inverter. Contact your Toshiba distributor.
OCA2	6 (0x0006)	Overcurrent (V-phase arm)	Fault on IGBT in V-phase.	
OCA3	7 (0x0007)	Overcurrent (W-phase arm)	Fault on IGBT in W-phase.	
OCL	4 (0x0004)	Overcurrent (load side at startup)	1) Short circuit occurred on the output side. 2) The motor and output side wiring have defective insulation. 3) Impedance on the motor is low.	1) Check the wiring on the output side. 2) Check the insulation on the output side. 3) Set <F613: Short circuit detection at start> to "2" or "3".
OCr	36 (0x0024)	Overcurrent (Braking resistor) (For VFAS3-4220PC~4750PC, 4160KPC~4280KPC)	1) When "Enabled" is set in <F304: Dynamic braking, OLr trip>: • A braking resistor or the optional braking unit is not connected. • The braking resistor connection is disconnected. • A braking resistor with a resistance value under the minimum allowable resistance value is connected. 2) Short circuit occurred between [PB] and [PC/-]. 3) IGBT fault on the dynamic braking drive circuit control.	1) Check if an adequate braking resistor or the braking unit is connected. When a braking resistor is not necessary, set "Disabled" in <F304>. 2) Check for problems on impedance of the braking resistor, wiring, etc. 3) Fault in internal inverter. Contact your Toshiba distributor. * This trip can not be reset. For trip clear, turn off the power and then turn it on again.
OH	16 (0x0010)	Overheat	1) Cooling fan is end of life or failure. 2) High or low ambient temperature out of the specified range. 3) The cooling fan vent is blocked. 4) Other heating elements are in close proximity. 5) Heavy load. 6) Temperature sensor failure (In case of occurring just after power on or reset under room temperature)	1) If the fan does not work during run, contact your Toshiba distributor to replace the fan. 2) Use at an ambient temperature within the specified range. 3) Secure enough space for air flow around the inverter. 4) Move the heating elements away from inverter. 5) Reduce the load. Adjust <F300: Carrier frequency>, <F316: Carrier frequency control> to decrease loss inside inverter, refer to [6. 14] for details. 6) Contact your Toshiba distributor.
OH2	46 (0x002E)	External thermal trip *	A signal of external thermal trip is input. *It is caused by digital input function "46/47: External thermal trip", refer to [7. 2. 1].	Check that the motor is not overloaded. Check the sensor or its wiring.
OL1	13 (0x000D)	Overload (Inverter)	1) Sudden acceleration occurs and the acceleration time is short. 2) <Pt: V/f Pattern> does not match the system. 3) Momentary power failure occurred, and tried to start the rotating motor. 4) The DC braking amount is large. 5) The load is large for the inverter capacity.	1) Increase the acceleration time. <ACC: Acceleration time 1>, etc. 2) Set <Pt: V/f Pattern> according to the system. 3) Set <F301: Auto-restart>. Depending on the characteristic of machinery, <F302: Regenerative power ride-through> = "1" is also effective. 4) Set <F251: DC braking current> small and <F252: DC braking time> short. 5) Change the inverter to large capacity.

Trip message	Error code	Trip name	Detection factor	Measures
OL2	14 (0x000E)	Overload (Motor) *	1) The motor is locked up. 2) Operation continues in low-speed range. 3) The motor is overloaded. 4) The setting of the electronic thermal does not match the motor characteristic. 5) <Pt: V/f Pattern> does not match the system. *It can be enabled/disabled by parameters, refer to [5. 2. 5].	1) Check the motor or load. 2), 3), and 4) Set the electronic thermal according to the motor. <OLM: Motor overload protection characteristic>, <tHrA: Motor overload protection current 1>, etc. 5) Set <Pt: V/f Pattern> according to the system.
OL3	62 (0x003E)	Overload (IGBT)	1) While operating the low-speed range (15 Hz or less) with high carrier frequency, overload occurred. 2) Momentary power failure occurred, and tried to start the rotating motor. 3) It may result in exciting forcing.	1) - Reduce the load. - Set <F300: Carrier frequency> to lower. Or set <F316: Carrier frequency control> to "Valid decrease". - Increase the output frequency. - Reduce the level of <F601: Stall prevention level 1> or <F185: Stall prevention level 2>. 2) Set <F301: Auto-restart>. Depending on the characteristic of machinery, <F302: Regenerative power ride-through> = "1" is also effective. 3) Decrease <F456: exciting forcing level> gradually.
OLr	15 (0x000F)	Overload (Braking resistor) *	1) The braking rate is large. 2) The deceleration time is short. *It can be enabled/disabled by parameters, refer to [6. 15. 4].	- Increase the deceleration time. <dEC: Deceleration time 1>, etc. - Change the braking resistor (option) to a large capacity, and set <F309: Braking resistor capacity>.
OP1	10 (0x000A)	Overvoltage (during acceleration)	1) Input voltage is high and showed abnormal fluctuation. 2) Connection is made as the following system. - Power supply capacity is 500 kVA or more. - The power factor improvement capacitor was opened/closed. - Equipment is connected that uses thyristor on the same system. 3) Momentary power failure occurred, and tried to start the rotating motor.	1) Use within the power supply voltage range. When no problem is found in the input voltage, install an input AC reactor (option). 2) Install an input AC reactor (option). 3) Set <F301: Auto-restart>. Depending on the characteristic of machinery, <F302: Regenerative power ride-through> = "1" is also effective.
OP2	11 (0x000B)	Overvoltage (during deceleration)	1) The deceleration time is short and the regenerative energy is large. 2) <F305: Overvoltage limit operation> is set to "1: Disabled". 3) Input voltage is high and showed abnormal fluctuation. 4) Connection is made as the following system. - Power supply capacity is 500 kVA or more. - The power factor improvement capacitor was opened/closed. - Equipment is connected that uses thyristor on the same system.	1) - Increase the deceleration time. <dEC: Deceleration time 1>, etc. - When the regenerative energy is large, install a braking resistor. 2) Change <F305> = "0", "2", and "3" to enable the Overvoltage limit operation. When the deceleration time is limited, install a braking resistor (option). 3) Use within the power supply voltage range. When no problem is found in the input voltage, install an input AC reactor (option). 4) Install an input AC reactor (option).

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OP3	12 (0x000C)	Overvoltage (during constant speed running)	1) Input voltage is high and showed abnormal fluctuation. 2) Connection is made as the following system. • Power supply capacity is 500 kVA or more. • The power factor improvement capacitor was opened/closed. • Equipment is connected that uses thyristor on the same system. 3) A power supply system is grounded at the other point than neutral point (e.g. when the power supply has delta connection with single phase grounding). 4) The motor was rotated with the force on the load side, and it became to regenerative status.	1) Use within the power supply voltage range. When no problem is found in the input voltage, install an input AC reactor (option). 2) Install an input AC reactor (option). 3) Disconnect the grounding capacitor, refer to [2. 3. 4]. 4) Install a braking resistor (option).
Ot	32 (0x0020)	Overtorque *	The load torque reached the overtorque level during run. *It can be enabled/disabled by parameters.	• Check the load side. • Make sure the parameter setting related in overtorque detection function, refer to [6. 30. 1].
Ot2	65 (0x0041)	Overtorque 2*	1) The output current during power running reached <F601: Stall prevention level 1> or more, and the setting time in <F452: Stall detection time during power running> elapsed. 2) The power running torque during power running reached <F441: Power running torque limit level 1> or more, and the setting time in <F452: Stall detection time during power running> elapsed. *It can be enabled/disabled by parameters, refer to [6. 24. 3].	• Reduce the load. • Increase the detection level of <F601> or <F441>.
OtC3	72 (0x0048)	Overtorque/ Overcurrent *	Overtorque or overcurrent on the shock monitoring function was detected. *It can be enabled/disabled by parameters.	• Check the load. • Make sure the parameter setting related in shock monitoring function <F590> to <F598>, refer to [6. 29].
PrF	59 (0x003B)	STO circuit fault	1) Input level discrepancy between [STOA] and [STOB]. 2) Fault in Safe Torque Off (STO) circuit	1) Check the wiring, your device and screw tightening on [STOA]/[STOB] terminals 2) Internal fault in inverter. If the trip occurs again after power reset, contact your Toshiba distributor.
SOUT	47 (0x002F)	PM step-out *	1) The load changed rapidly. 2) Sudden acceleration/deceleration occurs. 3) The motor shaft is locked up. 4) Output side phase has failed. *It can be enabled/disabled by <F911>, refer to [6. 39].	1) and 2) Increase the acceleration/ deceleration time. <ACC: Acceleration time1>, <dEC: Deceleration time 1>, etc. 3) Check the motor and release the lock. 4) Check the wiring on the output side.
UC	29 (0x001D)	Undercurrent *	The output current declined to the undercurrent detection level during run. *It can be enabled/disabled by <F610>.	• Check the load. • Make sure the parameter setting related in under current detection function, refer to [6. 30. 7].

Trip message	Error code	Trip name	Detection factor	Measures
UP1	30 (0x001E)	Undervoltage (Power circuit) *	The input voltage (power circuit) declined. *It can be enabled/disabled by parameters, refer to [6. 30. 14].	- Check the input voltage. - Make sure the parameter setting related in undervoltage trip function, refer to [6. 30. 14]. - To avoid trip in momentary power failure, set <F627> = "0: Disabled", and set <F301: Auto-restart> and <F302: Regenerative power ride-through level> to "1".
Ut	60 (0x003C)	Undertorque *	The load torque reached the undertorque level during run. *It can be enabled/disabled by <F651>.	- Check the load side. - Make sure the parameter setting related in undertorque detection function, refer to [6. 30. 25].
UtC3	73 (0x0049)	Undertorque/ Undercurrent *	Undertorque or undercurrent on the shock monitoring function was detected. *It can be enabled/disabled by parameters.	- Check the load. - Make sure the parameter setting related in shock monitoring function <F590> to <F598>, refer to [6. 29].

■ Alarm information

Alarm message	Alarm name	Detection factor	Measures
A-09	Panel disconnection alarm	The cable connecting the inverter and panel are disconnected during run with a run command from the operation panel and extension panel.	Check the connection on the inverter and panel.
A-17	Key failure alarm	[RUN] or [STOP/RESET] key on the operation panel is pressed and hold for 20 seconds or more. - The operation panel key has failed.	Check the operation panel. If the failure occurs again, contact your Toshiba distributor.
A-18	Analog input disconnection alarm	The input level of the terminal [II] became the setting value or less of <F633: II analog input disconnection detection level> .	- Check that the signal line connected to the terminal [II] is not disconnected. - Check that the <F633> setting is correct.
A-29	Control power supply option alarm	- Control power supply voltage between [+SU] and [CC] is low. - The setting of <F647: Control power option error detection> is in-correct.	- Check the voltage of the control power supply input between [+ SU] and [CC]. 20Vdc or more is required. - If you do not use the control power option, set <F647> = "0". * The "A-29" alarm automatically recovers when the control power supply voltage becomes normal.
A-43	Communication alarm (embedded Ethernet)	Condition very close to the communication time out trip.	Perform the same measures with communication time out "E-43".
COFF	Control power option alarm	- Undervoltage on the control power supply input between [+SU] and [CC]. - The setting of <F647: Control power option failure detection> is improper.	- Check the voltage on the control power supply input between [+SU] and [CC]. 20 Vdc or more is required. - When the control power supply option is not used, set <F647> = "0". * When "COFF" occurs, turn the power OFF once, and reset.
MOFF	Undervoltage alarm	The input voltage (power circuit) declined or is not supplied.	Check the input voltage. If no problem is found, internal error may be the issue. Contact your Toshiba distributor.

Alarm message	Alarm name	Detection factor	Measures
PrA	STO activated	1) Open state (no voltage) on [STOA] and [STOB] terminals. 2) Slide switch [SW1] is set to "PLC". 3) Low input voltage on [STOA]/[STOB] terminals. 4) Control terminal block is not installed properly.	1) Close [STOA] - [STOB] - [PLC], if STO function is not used. (Shorting bar is available at default). 2) Supply 24V power to [PLC] terminal. Check the output voltage of the 24V supply unit. 3) Check 24V load connected with [PLC]/[P24] terminals. - The maximum load is 200mA. - Check the polarity of the surge absorption diode connected between the [P24] and [FP] terminals. Check output voltage of external supply unit. 4) Install the control terminal block correctly. * If "PrA" occurs during run, turn off RUN command once.
tUn1	Brake learning error	1) The load is heavy. 2) Parameter setting is improper. 3) Braking operation is abnormal.	1) Perform learning with no load or light load in approx. 3 % or less rating. 2) Set the motor parameters and learning related parameters in advance. 3) Check the brake.
tUn2	Light-load high-speed learning setting error	Error exists in learning operation.	Refer to [6. 17] and perform learning operation.
tUn3	Light-load high-speed learning error	Setting of the motor parameter is improper.	Set the motor parameters according to the motor.

■ Pre-alarm information

Pre-alarm message	Detection factor	Measures
Overcurrent alarm	When a current flows at or higher than the over current stall prevention level.	Perform the same measures with overcurrent "OC1", "OC2", and "OC3".
Overheat alarm	- When the overheat protection pre-alarm level is reached. - The PTC detection temperature reached the PTC pre-alarm level.	Perform the same measures with overheat "OH". Perform the same measures as those for PTC failure "E-32".
Motor overload alarm/ Inverter overload alarm	- When the cumulative amount of overload reaches 50% or more of the overload trip value. - When the main circuit element temperature reaches the overload pre-alarm level.	Perform the same measures with overload "OL1", "OL2", and "OL3".
Overvoltage alarm	- When a voltage is generated at or higher than the over voltage stall prevention level. - When a voltage is generated at or higher than the over voltage stall prevention level. - Even if it is lower than the over voltage stall prevention level, when a voltage is generated at sharp increase.	Perform the same measures with overvoltage "OP1", "OP2", and "OP3".
Communication alarm (RS485, option)	Condition very close to the communication time out trip.	Perform the same measures with communication time out "Err5" and "Err8".

■ Message information

Message	Title	Description	Remarks
9999	Invalid set up by customized display function	Invalid value is set in <F710: Standard mode display> or <F720: Standard mode display of extension panel>.	Correct the <F710> or <F720> value, refer to [5. 4. 3].
A-01	V/f 5-point setting error 1	When <Pt:V/f Pattern> = "7: V/f 5-point setting", two or more from <vL>, <F190>, <F192>, <F194>, <F196> and <F198> are set to the same value other than 0.0 Hz.	Set different value on each parameter.
A-02	V/f 5-point setting error 2	Inclination of V/f is large.	- Set V/f 5-point and <vLv>/<vL> for the V/f inclination to be gentle. - Increase the value of <vL>, or decrease the value of <vLv>.
A-05	Base frequency setting error	Tries to run in frequency over 10 times of the base frequency.	- Check that the base frequency setting is correct. <vL: Base frequency 1>, etc. - Operate in frequency within 10 times of the base frequency.
ASIA	Setting for Asia	Setting for Asia is selected in the setup menu.	-
Atn	During auto tuning	Auto-tuning in progress.	A message that indicates auto-tuning in progress. No problem if the message disappears after several seconds.
CHn	Setting for China	Setting for China is selected in the setup menu.	-
CLr	Reset command acceptable	The following was operated after trip is occurring. 1) Pressed [STOP] key once. 2) Set the reset terminal ON. (During trip resetting operation)	Reset is performed with the following operation. 1) Press [STOP] key again. 2) Set the reset terminal OFF.
dAtA	No message into LED display through communication	"30 (LED settings through communication)" is set in <F720: Standard mode display of extension panel> without any message.	Change the setting of the parameter <F720>, refer to [5. 4. 3] or set the message according to "RS485 Communication Function Instruction Manual" (E6582143)".
db	During DC braking	DC braking in progress.	-
dbOn	During motor shaft fixing	Motor shaft fixing in progress.	A message indicates the motor fixing control in progress. When standby is turned OFF, the control stops.
E1	Panel display one digit overflow	The display digit on the operation panel overflowed by one digit.	-
E2	Panel display two digits overflow	The display digit on the operation panel overflowed by two digits.	-
E3	Panel display three digits overflow	The display digit on the operation panel overflowed by three digits.	-
EASy	Easy mode	Switched to [Easy mode].	-
End	Last of data	The last data item in <History function>.	-
EOFF	Emergency off command acceptable	When a run command is other than the operation panel, [STOP/RESET] key was pressed once.	To apply emergency off, press [STOP] key again. If emergency off does not occur, press other keys.
Err1	Frequency point setting error	The setting on point 1 and point 2 of the frequency command is close.	Set apart point 1 and point 2 of the frequency command.

Message	Title	Description	Remarks
EU	Setting for Europe	Setting for Europe is selected in the setup menu.	-
FAIL	Password failure	Entered number in <F739: Password verification> does not match <F738: Password setting>.	-
FlrE	During Fire speed run/Forced run	Fire speed run/Forced run is in progress. ("FlrE" and the output frequency are alternately indicated)	A message indicates fire speed run/forced run in progress. It stops when turning the power OFF.
FJOG	Fwd JOG	Forward jog run in progress.	-
HEAd	Head of data	The first data item in <History function>.	-
HI	Upper limit of setting value	The upper limit of the setting value.	-
Init	During Initializing	- Set <tyP: Default setting> = "3" or "13" and initialization is in progress. - Region setting in progress with the setup menu.	No problem if the display shows "0.0" after several seconds.
JP	Setting for Japan	Setting for Japan is selected in the setup menu.	-
LO	Lower limit of setting value	The lower limit of the setting value.	-
LStP	During run sleep	Run sleep in progress.	-
n---	No detailed information of past trip	While "nErr" and a value are alternately indicated, [OK] key is pressed and detailed information are read.	Normal display.
nErr	No error	No trip records in the past trip history on [Monitor mode].	-
OFF	Standby OFF	The input terminal with assigned standby is OFF.	-
PASS	Password coincidence	Entered number in <F739: Password verification> matched <F738: Password setting>.	-
rJOG	Rev JOG	Reverse jog run in progress.	-
rtry	During Retry/Speed search	Retry/speed search in progress.	-
SEt	Region setting acceptable	- Message at first power on. - Message after setting <SEt> = "0".	Set a region to use in the setup menu.
Srvo	During servo lock	Servo lock in progress.	-
Std	Setting mode	Switched to [Setting mode].	-
StOP	During deceleration stop at power failure	Deceleration stop at power failure in progress.	A message indicates deceleration stop during power failure. The stop state is kept until the run command is turned OFF.
tUn	During learning	Learning the brake sequence or light-load high-speed operation in progress. ("tUn1" and the output frequency are alternately indicated)	-
U---	Waiting for search	Waiting for search condition in <Changed parameters search & edit>.	-
U--F	During forward search	Forward search in progress in <Changed parameters search & edit>.	-

Message	Title	Description	Remarks
Undo	All key unlocked	When "Locked" is set in <F737: Panel keys lockout>, pressed [OK] key for five seconds or more.	The key operation on the operation panel is temporarily valid.
U--r	During reverse search	Reverse search in progress in <Changed parameters search & edit>.	-
USA	Setting for North America	Setting for North America is selected in the setup menu.	-
Connecting	Connection abnormality between operation panel and control CPU	Connection is not correct Communication abnormality	• Check connection between operation panel and inverter body • Check extended cable if using it • Multi-drop connection is not supported for operation panel • Check parameter setting (F801 to F809)

13.2 How to reset trip



Important

- Reset the inverter that has tripped after eliminating the cause of the trip. If it is not eliminated, the inverter will trip again even after reset. Pay enough attention.

The inverter can be reset with the following four methods after a trip occurs.

(1) Panel operation

You can reset from the operation panel even if terminal run or communication run is performed when a trip occurs.

The following is the reset procedure.

- Press the [STOP/RESET] key during trip indication.
"CLr" blinks in the main area, and "Trip reset? (STOP-Key)" is indicated in the bottom side.
 - The backlight is red.
(It is white when the setting of the backlight is changed.)



- When you press the [STOP/RESET] key again while "CLr" is blinking, the trip is reset. The message once disappears, and back to the status after power on. The backlight returns to white.

(2) Digital input terminal (external signal)

Turn on [RES] terminal and then turn off it again.

The inverter is reset when it is turned off.

In the default setting, the function "8: Reset 1" is assigned to [RES] terminal.

You can assign reset function to the other terminal, refer to [7. 2. 1].

(3) Communication

For details, refer to "RS485 Communication Function Instruction Manual" (E6582143).

(4) Turning off power

Turn OFF the power and then turn it ON again.

When the power is off, some contents of the monitor at the time of the trip are lost.

To retain the contents of the monitor at the time of the trip, set <F602: Trip record retention> to "1: Retain at power off." Even after the inverter is reset with power off, the stored trip message is indicated.

For details, refer to [6. 30. 3].



Important

- The inverter can be reset with power off, however, note that the equipment and the motor are damaged if the power is turned off frequently.

■ When the inverter cannot be reset immediately after the trip

- 1) For overload (inverter) "OL1", overload (motor) "OL2" and overload (braking resistor) "OLr", virtual cooling time is provided. During this time, the inverter cannot be reset by external signal or from the operation panel.

The reference virtual cooling time is as follows.

- "OL1": approximately 30 seconds after the occurrence of a trip
- "OL2": approximately 120 seconds after the occurrence of a trip
- "OLr": approximately 20 seconds after the occurrence of a trip

For overload (IGBT) "OL3", there is no virtual cooling time.

- 2) In case of overheat "OH", the inverter checks the temperature within. Wait until the temperature in the inverter falls sufficiently before resetting the inverter.

- 3) In case of overvoltage "OP1", "OP2" and "OP3", wait until the power circuit voltage decrease under the setting value of <F626: Overvoltage limit operation level>.

- 4) The inverter cannot be reset while the emergency off signal is being input to the input terminal.

- 5) The inverter cannot be reset while a pre-alarm occurs.

A trip cannot be reset while any of the following seven pre-alarms occurs.

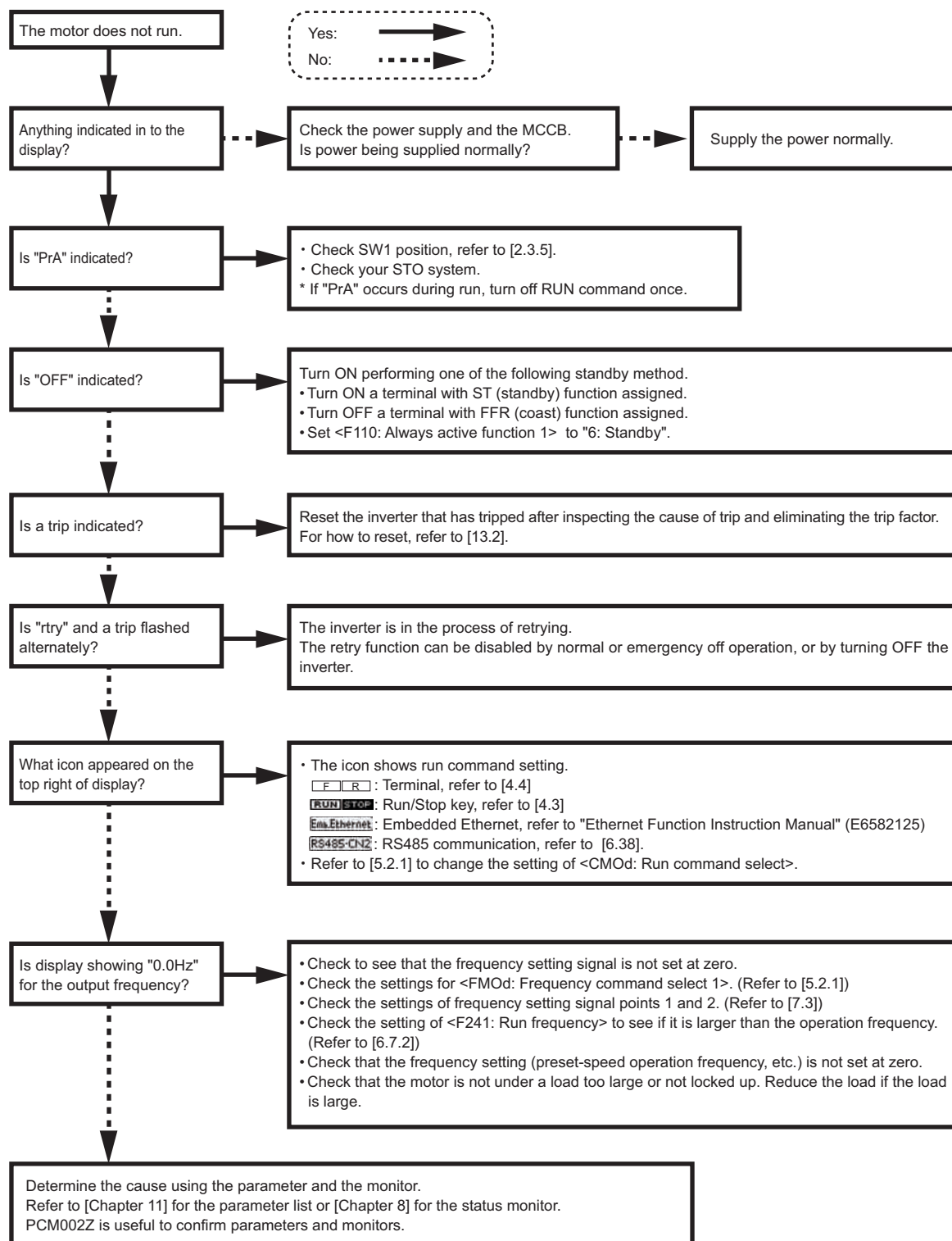
- Inverter overload alarm → Refer to 1).
- Motor overload alarm → Refer to 1).
- Power circuit element overload alarm → Refer to 1).
- Braking resistor overload alarm → Refer to 1).
- Overheat alarm → Refer to 2).
- Power circuit overvoltage alarm → Refer to 3).
- PTC alarm → Refer to [13. 1] "E-32" trip. If PTC is not used, set <F637>=1, <F638>=1, <F645>=1.

Memo

- In case of occurring 2 kinds of fault such as blind "OL1" behind "OL3", indicated fault (ex. OL3) cannot be cleared during the cooling period of blind fault (ex. OL1).

13.3 If motor does not run without any trip message

When the motor does not run, follow these steps to track down the cause.



13.4 How to determine causes of other problems

The following table provides a listing of other problems, their possible causes and measures.

Problems	Causes	Measures
The motor runs in the wrong direction.	- The phase sequence of the output terminals [U/T1], [V/T2] and [W/T3] is wrong.	- Invert the phases of the output terminals [U/T1], [V/T2] and [W/T3].
	- The Fwd/Rev run signals are input inversely in terminal run.	- Invert the Fwd/Rev run signal terminals of the external input device. (Refer to [7. 2])
	- The setting of <Fr: Panel Fwd/Rev run select> is incorrect in panel run.	- Change <Fr> setting.
The motor runs but its frequency does not change.	- The load is large.	- Reduce the load.
	- The overload stall function is activated.	- Disable the overload stall function OFF in <OLM: Motor overload protection characteristic>, and reduce the load (Refer to [5. 2. 5]).
	- <FH: Maximum frequency> and <UL: Upper limit frequency> are set too low.	- Increase the setting values of these parameters.
	- The value of analog signal in the frequency command is small.	- Check the value of the signal, circuit, wiring, etc.
		- Check the characteristics (point 1 and point 2 setting) of the analog signal. (Refer to [7. 3])
The motor does not accelerate or decelerate smoothly.	- If the motor runs at a low speed, the torque boost value is too large.	- Check if an overcurrent alarm or overload alarm has occurred and adjust <vb: Manual torque boost 1> and <ACC: Acceleration time 1>. (Refer to [5. 3. 6] and [5. 2. 4])
	- <ACC: Acceleration time 1> or <dEC: Deceleration time 1> is set too short.	- Increase the value of each parameter.
A too large current flows into the motor.	- The load is large.	- Reduce the load.
	- If the motor runs at a low speed, the torque boost value is too large.	- Check if the value of <vb: Manual torque boost 1> is too large. (Refer to [5. 3. 6])
The motor runs at a higher or lower speed than the specified one.	- The motor has an improper voltage rating.	- Use a motor with a proper voltage rating.
	- The motor terminal voltage is too low.	- Check the setting value of <vLv: Base frequency voltage 1>. (Refer to [5. 2. 2])
		- Change the wire size to larger.
	- The reduction gear ratio, etc., are not set properly.	- Adjust the reduction gear ratio, etc.
	- The frequency command is not set correctly.	- Check the value and range of the frequency command.
		- Adjust <vL: Base frequency 1> to the motor. (Refer to [5. 2. 2])

Problems	Causes	Measures
The motor speed fluctuates during run.	- The load is large or small, and load fluctuation is large.	- Reduce the load fluctuation.
	- The inverter or motor used does not have a rating large enough to drive the load.	- Change the inverter and motor to large capacity.
	- The frequency command fluctuates.	- Check if the frequency command such as the analog signal changes.
	- Vector control is not performed properly when <Pt: V/f Pattern> is set to "3" or "9".	- Check the settings and conditions of the motor parameters and vector control. (Refer to [5. 3. 4])
Parameter settings cannot be changed.	- <F700: Parameter reading&writing access lockout> is set to "1" to "4" (Locked).	- Set <F700> to "0: Unlocked".
	- The password is set with <F738: Password setting>.	- Input the password to <F739: Password verification> to clear. (Refer to [6. 34. 1])
	- Input terminal functions: "200" to "203" (Parameter writing/reading locked) are assigned to one of the digital input terminals, and the input terminal is ON.	- Turn off the applicable input terminal.
	- For reasons of safety, some parameters cannot be changed during run.	- Refer to [6. 34. 1].

The following is how to deal with parameter setting-related problems.

Problems	Measures
Inverter does not operate as you expected.	- Confirm the parameters are set as intended.
You forget parameters which have been reset.	- You can search for all changed parameters and set. For details, refer to "Changed parameters search & edit <GrU>" in [4. 2. 1].
You want to return all changed parameters to their respective default settings.	- You can return all parameters to default settings. For details, refer to [5. 3. 9].

Memo

- PCM002Z is useful to check and manage your parameters.