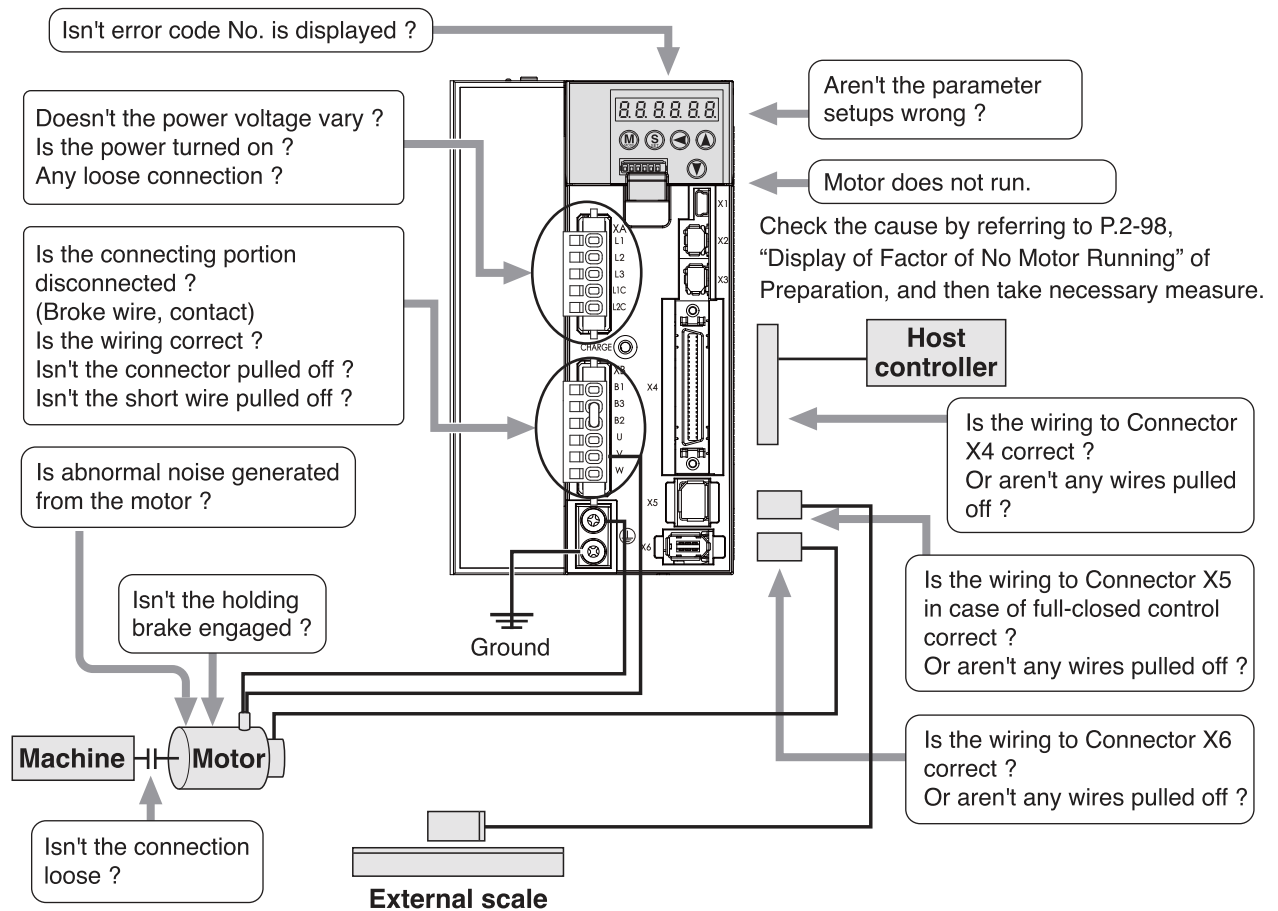


6

When in Trouble

1. When in Trouble

What to Check ?



6

When in Trouble

1. When in Trouble

Protective Function (What is Error Code ?)

- Various protective functions are equipped in the driver. When these are triggered, the motor will stall due to error, the driver will turn the Servo-Alarm output (ALM) to off (open).
- Error status and their measures
 - During the error status, the error code No. will be displayed on the front panel LED, and you cannot turn Servo-ON.
 - You can clear the error status by Alarm clear input(A-CLR) in 120ms or longer.
 - When overload protection is triggered, you can clear it by Alarm clear input (A-CLR) in 10sec or longer after the error occurs. (*1 Table below) You can clear the Overload protection time characteristics (refer to P.6-14) by turning off the control power supply between L1C and L2C (100V, 200V) , 24V and 0V (400V) of the driver.
 - You can clear the above error by operating the front panel keys and setup support software "PANATERM". Refer to P.2-109 "Alarm Clear Screen" of Preparation.
 - Be sure to clear the alarm during stop after removing the cause of the error and securing safety.

Note

- The figure above shows connections on velocity, position, torque and full-closed mode driver.
- Only for position control type is not provided with X2 X3 and X5.

Related page

- P.2-86 ... "How to Use the Front Panel" • P.3-30 "Inputs and outputs on connector X4"
- P.7-26 "Outline of Setup support software "PANATERM"

1. When in Trouble

Protective Function (What is Error Code ?)

<List of error code No.>

Error code		Protective function	Attribute			Detail page
Main	Sub		History	Can be cleared	Immediate stop	
11	0	Control power supply under-voltage protection		○		6-4
12	0	Over-voltage protection	○	○		
13	0	Main power supply under-voltage protection (between P and N)		○		6-4
	1	Main power supply under-voltage protection (AC interception detection)		○		
14	0	Over-current protection	○			6-5
	1	IPM error protection	○			
15	0	Over-heat protection	○		○	6-6
16	0	Over-load protection	○	○ ¹		
18	0	Over-regeneration load protection	○		○	6-7
	1	Over-regeneration Tr error protection	○			
21	0	Encoder communication disconnect error protection	○			6-7
	1	Encoder communication error protection	○			
23	0	Encoder communication data error protection	○			6-8
24	0	Position deviation excess protection	○	○	○	
	1	Velocity deviation excess protection	○	○	○	
25	0	Hybrid deviation excess error protection	○		○	6-8
26	0	Over-speed protection	○	○	○	
	1	2nd over-speed protection	○	○		
27	0	Command pulse input frequency error protection	○	○	○	6-8
	2	Command pulse multiplier error protection	○	○	○	
28	0	Limit of pulse replay error protection	○	○	○	6-9
29	0	Deviation counter overflow protection	○	○		
30	0	Safety detection		○		6-10
33	0	IF overlaps allocation error 1 protection	○			
	1	IF overlaps allocation error 2 protection	○			
	2	IF input function number error 1 protection	○			
	3	IF input function number error 2 protection	○			
	4	IF output function number error 1 protection	○			
	5	IF output function number error 2 protection	○			
	6	CL fitting error protection	○			
7	INH fitting error protection	○				
34	0	Software limit protection	○	○		6-10
36	0 to 2	EEPROM parameter error protection				
37	0 to 2	EEPROM check code error protection				
38	0	Over-travel inhibit input protection		○		
39	0	Analog input1 excess protection	○	○	○	6-11
	1	Analog input2 excess protection	○	○	○	
	2	Analog input3 excess protection	○	○	○	
40	0	Absolute system down error protection	○	○		6-11
41	0	Absolute counter over error protection	○			
42	0	Absolute over-speed error protection	○	○		6-12
43	0	Initialization failure	○			
44	0	Absolute single turn counter error protection	○			
45	0	Absolute multi-turn counter error protection	○			
47	0	Absolute status error protection	○			6-12
48	0	Encoder Z-phase error protection	○			
49	0	Encoder CS signal error protection	○			
50	0	Feedback scale connection error protection	○			
	1	Feedback scale communication error protection	○			
51	0	Feedback scale status 0 error protection	○			6-12
	1	Feedback scale status 1 error protection	○			
	2	Feedback scale status 2 error protection	○			
	3	Feedback scale status 3 error protection	○			
	4	Feedback scale status 4 error protection	○			
	5	Feedback scale status 5 error protection	○			
55	0	A-phase connection error protection	○			6-13
	1	B-phase connection error protection	○			
	2	Z-phase connection error protection	○			
87	0	Compulsory alarm input protection		○		6-13
95	0 to 4	Motor automatic recognition error protection				
99	0	Other error	○			
Other number		Other error	○			

Note

History...The error will be stored in the error history.

Can be cleared...To cancel the error, use the alarm clear input (A-CLR).

If the alarm clear input is not effective, turn off power, remove the cause of the error and then turn on power again.

Immediate stop...Instantaneous controlled stop upon occurrence of an error.

(Setting of "Pr.5.10 Sequence at alarm" is also required.)

Note

• Only for position control type is not provided with X2, X3, X5 and analog input.

6

When in Trouble

1. When in Trouble

Protective function (Detail of error code)

Protective function	Error code No.		Causes	Measures
	Main	Sub		
Control power supply under-voltage protection	11	0	<p>Voltage between P and N of the converter portion of the control power supply has fallen below the specified value.</p> <p>100 V version: approx. 70 VDC (approx. 50 VAC) 200 V version: approx. 145 VDC (approx. 100 VAC) 400 V version: approx. 15 VDC</p> <p>1) Power supply voltage is low. Instantaneous power failure has occurred</p> <p>2) Lack of power capacity...Power supply voltage has fallen down due to inrush current at the main power-on.</p> <p>3) Failure of servo driver (failure of the circuit)</p>	<p>Measure the voltage between lines of connector and terminal block.</p> <p>100V, 200V driver: L1C - L2C 400V driver: 24V - 0V</p> <p>1) Increase the power capacity. Change the power supply.</p> <p>2) Increase the power capacity.</p> <p>3) Replace the driver with a new one.</p>
Over-voltage protection	12	0	<p>Voltage between P and N of the converter portion of the control power supply has exceeded the specified value</p> <p>100 V version: approx. 200 VDC (approx. 140 VAC) 200 V version: approx. 400 VDC (approx. 280 VAC) 400 V version: approx. 800 VDC (approx. 560 VAC)</p> <p>1) Power supply voltage has exceeded the permissible input voltage. Voltage surge due to the phase-advancing capacitor or UPS (Uninterruptible Power Supply) have occurred.</p> <p>2) Disconnection of the regeneration discharge resistor</p> <p>3) External regeneration discharge resistor is not appropriate and could not absorb the regeneration energy.</p> <p>4) Failure of servo driver (failure of the circuit)</p>	<p>Measure the voltage between lines of connector (L1, L2 and L3).</p> <p>1) Enter correct voltage. Remove a phase-advancing capacitor.</p> <p>2) Measure the resistance of the external resistor connected between terminal B1 - B2 of the driver. Replace the external resistor if the value is ∞.</p> <p>3) Change to the one with specified resistance and wattage.</p> <p>4) Replace the driver with a new one.</p>
Main power supply under-voltage protection (PN)	13	0	<p>Instantaneous power failure has occurred between L1 and L3 for longer period than the preset time with Pr5.09 (Main power off detecting time) while Pr5.08 (LV trip selection at the main power-off) is set to 1. Or the voltage between P and N of the converter portion of the main power supply has fallen below the specified value during Servo-ON.</p> <p>100 V version: approx. 80 VDC (approx. 55 VAC) 200 V version: approx. 110 VDC (approx. 75 VAC) 400 V version: approx. 180 VDC (approx. 125 VAC)</p> <p>1) Power supply voltage is low. Instantaneous power failure has occurred</p> <p>2) Instantaneous power failure has occurred.</p> <p>3) Lack of power capacity...Power supply voltage has fallen down due to inrush current at the main power-on.</p> <p>4) Phase lack...3-phase input driver has been operated with single phase input.</p> <p>5) Failure of servo driver (failure of the circuit)</p>	<p>Measure the voltage between lines of connector (L1, L2 and L3).</p> <p>1) Increase the power capacity. Change the power supply. Remove the causes of the shutdown of the magnetic contactor or the main power supply, then re-enter the power.</p> <p>2) Set up the longer time to Pr5.09 (Main power off detecting time). Set up each phase of the power correctly.</p> <p>3) Increase the power capacity. For the capacity, refer to P.2-10, "Driver and List of Applicable Peripheral Equipments" of Preparation.</p> <p>4) Connect each phase of the power supply (L1, L2 and L3) correctly. For single phase, 100V and 200V driver, use L1 and L3.</p> <p>5) Replace the driver with a new one.</p>
Main power supply under-voltage protection (AC)		1		

1. When in Trouble

Protective function (Detail of error code)

Protective function	Error code No.		Causes	Measures
	Main	Sub		
* Over-current protection	14	0	Current through the converter portion has exceeded the specified value. 1) Failure of servo driver (failure of the circuit, IGBT or other components)	1) Turn to Servo-ON, while disconnecting the motor. If error occurs immediately, replace with a new driver. 2) Check that the motor wire (U, V and W) is not shorted, and check the branched out wire out of the connector. Make a correct wiring connection. 3) Measure the insulation resistance between motor wires, U, V and W and earth wire. In case of poor insulation, replace the motor. 4) Check the balance of resistor between each motor line, and if unbalance is found, replace the motor. 5) Check the loose connectors. If they are, or pulled out, fix them securely. 6) Replace the servo driver. Do not use Servo-ON/Servo-OFF as a means of starting/stopping the operation. 7) Enter the pulses 100ms or longer after Servo-ON. 8) Replace the driver.
* IPM error protection [IPM: Intelligent Power Module]		1	2) Short of the motor wire (U, V and W) 3) Earth fault of the motor wire 4) Burnout of the motor 5) Poor contact of the motor wire. 6) Welding of contact of dynamic braking relay due to frequent servo ON/OFF operations. 7) Timing of pulse input is same as or earlier than Servo-ON. 8) Blowout of thermal fuse due to overheating dynamic brake circuit. (Only F and G frames)	
* Over-heat protection	15	0	Temperature of the heat sink or power device has been risen over the specified temperature. 1) Ambient temperature has risen over the specified temperature. 2) Over-load	

Note

- When protective function marked with * in the protective function table is activated, it cannot be disabled by the alarm clear input (A-CLR). To return to the normal operation, turn off power, remove the cause, and then turn on power again.

Related page

- P.2-12 "System Configuration and Wiring" • P.4-45 "Details of parameter"

1. When in Trouble

Protective function (Detail of error code)

Protective function	Error code No.		Causes	Measures
	Main	Sub		
Over-load protection	16	0	<p>Torque command value has exceeded the over-load level set with Pr5.12 (Setup of over-load level) and resulted in overload protection according to the time characteristics (described later)</p> <ol style="list-style-type: none"> 1) Load was heavy and actual torque has exceeded the rated torque and kept running for a long time. 2) Oscillation and hunching action due to poor adjustment. Motor vibration, abnormal noise. Inertia ratio (Pr0.04) setup error. 3) Miswiring, disconnection of the motor. 4) Machine has collided or the load has gotten heavy. Machine has been distorted. 5) Electromagnetic brake has been kept engaged. 6) While wiring multiple axes, miswiring has occurred by connecting the motor cable to other axis. 	<p>Check that the torque (current) does not oscillates nor fluctuate up and down very much on the analog output and via communication. Check the over-load alarm display and load factor with the analog output and via communication..</p> <ol style="list-style-type: none"> 1) Increase the capacity of the driver and motor. Set up longer acceleration/ deceleration time. Lower the load. 2) Make a re-adjustment. 3) Make a wiring as per the wiring diagram. Replace the cables. 4) Remove the cause of distortion. Lower the load. 5) Measure the voltage between brake terminals. Release the brake 6) Make a correct wiring by matching the correct motor and encoder wires.
<p>• The over-load protection time characteristics are described on P.6-14.</p>				
<p>Caution ⚠ Once this error occurs, it cannot be cleared at least for 10 sec.</p>				
* Over-regeneration load protection	18	0	<p>Regenerative energy has exceeded the capacity of regenerative resistor.</p> <ol style="list-style-type: none"> 1) Due to the regenerative energy during deceleration caused by a large load inertia, converter voltage has risen, and the voltage is risen further due to the lack of capacity of absorbing this energy of the regeneration discharge resistor. 2) Regenerative energy has not been absorbed in the specified time due to a high motor rotational speed. 3) Active limit of the external regenerative resistor has been limited to 10% duty. 	<p>Check the load factor of the regenerative resistor from the front panel or via communication.</p> <p>Do not use in the continuous regenerative brake application.</p> <ol style="list-style-type: none"> 1) Check the running pattern (velocity monitor). Check the load factor of the regenerative resistor and over-regeneration warning display. Increase the capacity of the driver and the motor, and loosen the deceleration time. Use the external regenerative resistor. 2) Check the running pattern (speed monitor). Check the load factor of the regenerative resistor. Increase the capacity of the driver and the motor, and loosen the deceleration time. Lower the motor rotational speed. Use an external regenerative resistor. 3) Set up Pr0.16 to 2.
<p>Caution ⚠ Install an external protection such as thermal fuse without fail when you set up Pr0.16 to 2. Otherwise, regenerative resistor loses the protection and it may be heated up extremely and may burn out.</p>				

Note ⚠

- When protective function marked with * in the protective function table is activated, it cannot be disabled by the alarm clear input (A-CLR). To return to the normal operation, turn off power, remove the cause, and then turn on power again.

Related page ⚠

- P.4-6... "Details of parameter"

1. When in Trouble

Protective function (Detail of error code)

Protective function	Error code No.		Causes	Measures
	Main	Sub		
* Regenerative transistor error protection	18	1	Regenerative driver transistor on the servo driver is defective.	Replace the driver.
* Encoder communication disconnection error protection	21	0	Communication between the encoder and the driver has been interrupted in certain times, and disconnection detecting function has been triggered.	Make a wiring connection of the encoder as per the wiring diagram. Correct the miswiring of the connector pins.
* Encoder communication error protection		1	Communication error has occurred in data from the encoder. Mainly data error due to noise. Encoder cables are connected, but communication data has some errors.	<ul style="list-style-type: none"> Secure the power supply for the encoder of DC4.90V to 5.25V)...pay an attention especially when the encoder cables are long. Separate the encoder cable and the motor cable if they are bound together. Connect the shield to FG.
* Encoder communication data error protection	23	0	Data communication between the encoder is normal, but contents of data are not correct. Mainly data error due to noise. Encoder cables are connected, but communication data has some errors.	
Position deviation excess protection	24	0	Deviation pulses have exceeded the setup of Pr0.14. 1) The motor movement has not followed the command. 2) Setup value of Pr0.14 (Position deviation excess setup) is small.	1) Check that the motor follows to the position command pulses. Check that the output torque has not saturated in torque monitor. Make a gain adjustment. Set up maximum value to Pr0.13 and Pr5.22. Make an encoder wiring as per the wiring diagram. Set up the longer acceleration/deceleration time. Lower the load and speed. 2) Set up a larger value to Pr0.14.
Velocity deviation excess protection		1	The difference between the internal positional command speed and actual speed (speed deviation) exceeds the setup value of Pr6.02. Note) If the internal positional command speed is forcibly set to 0 due to instantaneous stop caused by the command pulse inhibit input (INH) or CW/CCW over-travel inhibit input, the speed deviation rapidly increases at this moment. Pr6.02 setup value should have sufficient margin because the speed deviation also largely increases on the rising edge of the internal positional command speed.	<ul style="list-style-type: none"> Increase the setup value of Pr6.02. Lengthen the acceleration/deceleration time of internal positional command speed, or improve the follow-up characteristic by adjusting the gain. Disable the excess speed deviation detection (Pr6.02 = 0).

1. When in Trouble

Protective function (Detail of error code)

Protective function	Error code No.		Causes	Measures
	Main	Sub		
* Hybrid deviation excess error protection	25	0	<ul style="list-style-type: none"> Position of load by the external scale and position of the motor by the encoder slips larger than the setup pulses with Pr3.28 (Setup of hybrid deviation excess) at full-closed control. During full closed control, numerator of command division/multiplication is changed or switched over. 	<ul style="list-style-type: none"> Check the connection between the motor and the load. Check the connection between the external scale and the driver. Check that the variation of the motor position (encoder feedback value) and the load position (external scale feedback value) is the same sign when you move the load. Check that the numerator and denominator of the external scale division (Pr3.24 and 3.25) and reversal of external scale direction (Pr3.26) are correctly set. Do not change command division/multiplication during full closed control.
Over-speed protection	26	0	The motor rotational speed has exceeded the setup value of Pr5.13.	<ul style="list-style-type: none"> Do not give an excessive speed command. Check the command pulse input frequency and division/multiplication ratio. Make a gain adjustment when an overshoot has occurred due to a poor gain adjustment. Make a wiring connection of the encoder as per the wiring diagram.
2nd Over-speed protection		1	The motor rotational speed has exceeded the setup value of Pr6.15.	
Command pulse input frequency error protection	27	0	The frequency of command pulse input is more than 1.2 times the setting in Pr5.32.	Check the command pulse input for frequency.
Electronic gear error protection		2	Division and multiplication ratio which are set up with the command pulse counts per single turn and the 1st and the 4th numerator/denominator of the electronic gear are not appropriate. The command pulses per 0.167 ms multiplied by the command division and multiplication ratio exceeds 3000 Mpps. The command pulse input fluctuates. Noises mixed with the command pulse input cause counting error.	<ul style="list-style-type: none"> Set the command division and multiplication ratio to a value as small as possible e.g. between 1/1000 and 1000. Check the setup value of electronic gear. If possible, use the line driver I/F. Set Pr5.32 (setting of max. command pulse input) to a value less than 1000 and enable digital filter.
Pulse regeneration limit protection	28	0	The output frequency of pulse regeneration has exceeded the limit.	<ul style="list-style-type: none"> Check the setup values of Pr0.11 and 5.03. To disable the detection, set Pr5.33 to 0.

1. When in Trouble

Protective function (Detail of error code)

Protective function	Error code No.		Causes	Measures
	Main	Sub		
Deviation counter overflow protection	29	0	Positional deviation of encoder pulse reference has exceeded 2 ²⁹ (536870912).	<ul style="list-style-type: none"> • Check that the motor runs as per the position command pulses. • Check that the output torque has not saturated in torque monitor. • Make a gain adjustment. • Set up maximum value to Pr0.13 and Pr5.22. • Make a wiring connection of the encoder as per the wiring diagram.
Safety input protection	30	0	Input photocoupler of both or one of safety input 1 and 2 is OFF.	Check wiring of safety input 1 and 2.
* I/F input duplicated allocation error 1 protection	33	0	Input signals (SI1, SI2, SI3, SI4, SI5) are assigned with two functions.	Allocate correct function to each connector pin.
* I/F input duplicated allocation error 2 protection		1	Input signals (SI6, SI7, SI8, SI9, SI10) are assigned with two functions.	
* I/F input function number error 1 protection		2	Input signals (SI1, SI2, SI3, SI4, SI5) are assigned with undefined number.	
* I/F input function number error 2 protection		3	Input signals (SI6, SI7, SI8, SI9, SI10) are assigned with undefined number.	
* I/F output function number error 1 protection		4	Output signals (SO1, SO2, SO3) are assigned with undefined number.	
* I/F output function number error 2 protection		5	Output signals (SO4, SO5, SO6) are assigned with undefined number.	

Note

- When protective function marked with * in the protective function table is activated, it cannot be disabled by the alarm clear input (A-CLR). To return to the normal operation, turn off power, remove the cause, and then turn on power again.
- Only for position control type is not provided with X3 and analog input.

1. When in Trouble

Protective function (Detail of error code)

Protective function	Error code No.		Causes	Measures
	Main	Sub		
* CL assignment error	33	6	Counter clear function is assigned to a signal number other than SI7.	Allocate correct function to each connector pin.
* INH assignment error		7	Command pulse inhibit input function is assigned to a signal number other than SI10.	
Software limit protection	34	0	When a position command within the specified input range is given, the motor operates outside its working range specified in Pr5.14. 1) Gain is not appropriate. 2) Pr5.14 setup value is low.	1) Check the gain (balance between position loop gain and speed loop gain) and inertia ratio. 2) Increase the setup value of Pr5.14. Or, Set Pr5.14 to 0 to disable the protective function.
* EEPROM parameter error protection	36	0	Data in parameter storage area has been damaged when reading the data from EEPROM at power-on.	<ul style="list-style-type: none"> Set up all parameters again. If the error persists, replace the driver (it may be a failure.) Return the product to the dealer or manufacturer.
		1		
		2		
* EEPROM check code error protection	37	0	Data for writing confirmation to EEPROM has been damaged when reading the data from EEPROM at power-on.	Replace the driver. (it may be a failure). Return the product to a dealer or manufacturer.
		1		
		2		
* Over-travel inhibit input protection	38	0	With Pr5.04, over-travel inhibit input setup = 0, both positive and negative over-travel inhibit inputs (POT/NOT) have been ON. With Pr5.04 = 2, positive or negative over-travel inhibit input has turned ON.	Check that there are not any errors in switches, wires or power supply which are connected to positive direction/ negative direction over-travel inhibit input. Check that the rising time of the control power supply (DC12 to 24V) is not slow.
Analog input 1 (AI1) excess protection	39	0	Higher voltage has been applied to the analog input 1 than the value that has been set by Pr4.24.	<ul style="list-style-type: none"> Set up Pr4.24 correctly. Check the connecting condition of the connector X4. Set up Pr4.24 to 0 and invalidate the protective function.
Analog input 2 (AI2) excess protection		1	Higher voltage has been applied to the analog input 2 than the value that has been set by Pr4.27.	<ul style="list-style-type: none"> Set up Pr4.27 correctly. Check the connecting condition of the connector X4. Set up Pr4.27 to 0 and invalidate the protective function.
Analog input 3 (AI3) excess protection		2	Higher voltage has been applied to the analog input 3 than the value that has been set by Pr4.30.	<ul style="list-style-type: none"> Set up Pr4.30 correctly. Check the connecting condition of the connector X4. Set up Pr4.30 to 0 and invalidate the protective function.

Note

- Only for position control type is not provided with analog input.

1. When in Trouble

Protective function (Detail of error code)

Protective function	Error code No.		Causes	Measures
	Main	Sub		
Absolute system down error protection	40	0	Voltage of the built-in capacitor has fallen below the specified value because the power supply or battery for the absolute encoder has been down. Caution ⚠ Once this error occurs, the alarm cannot be cleared until the absolute encoder is reset.	After connecting the power supply for the battery, clear the absolute encoder.
* Absolute counter over error protection	41	0	Multi-turn counter of the absolute encoder has exceeded the specified value.	<ul style="list-style-type: none"> Set Pr0.15 to 2 to ignore the multi-turn counter over. Limit the travel from the machine origin within 32767 revolutions.
Absolute over-speed error protection	42	0	The motor speed has exceeded the specified value when only the supply from the battery has been supplied to 17-bit encoder during the power failure. Caution ⚠ Once this error occurs, the alarm cannot be cleared until the absolute encoder is reset.	<ul style="list-style-type: none"> Check the supply voltage at the encoder side (5V±5%) Check the connecting condition of the connector X2.
* Encoder initialization error protection *1	43	0	Encoder initialization error was detected.	Replace the motor.
* Absolute single turn counter error protection *1	44	0	Absolut: single turn counter error protection incremental: single turn counter error protection	Replace the motor.
* Absolute multi-turn counter error protection *1	45	0	Absolut: multi-turn counter error protection incremental: single turn counter error protection	Replace the motor.
* Absolute status error protection *1	47	0	Encoder has been running at faster speed than the specified value at power-on.	Arrange so as the motor does not run at power-on.
* Encoder Z-phase error protection*1	48	0	Missing pulse of Z-phase of serial incremental encoder has been detected. The encoder might be a failure.	Replace the motor.

Note

- When protective function marked with * in the protective function table is activated, it cannot be disabled by the alarm clear input (A-CLR). To return to the normal operation, turn off power, remove the cause, and then turn on power again.

1. When in Trouble

Protective function (Detail of error code)

Protective function	Error code No.		Causes	Measures
	Main	Sub		
* Encoder CS signal error protection*1	49	0	CS signal logic error of serial incremental encoder has been detected. The encoder might be a failure.	Replace the motor.
* Feedback scale wiring error protection	50	0	Communication between the external scale and the driver has been interrupted in certain times, and disconnection detecting function has been triggered.	<ul style="list-style-type: none"> • Make a wiring connection of the external scale as per the wiring diagram. • Correct the miswiring of the connector pins.
* External communication data error protection		1	Communication error has occurred in data from the external scale. Mainly data error due to noise. External scale cables are connected, but communication data has some error.	<ul style="list-style-type: none"> • Secure the power supply for the external scale of DC5±5% (4.75 to 5.25V)...pay attention especially when the external scale cables are long. • Separate the external scale cable and the motor cable if they are bound together. • Connect the shield to FG...refer to wiring diagram.
* External scale status 0 error protection *1	51	0	Bit 0 of the external scale error code (ALMC) has been turned to 1. Check the specifications of the external scale.	Remove the causes of the error, then clear the external scale error from the front panel. And then, shut off the power to reset.
* External scale status 1 error protection *1		1	Bit 1 of the external scale error code (ALMC) has been turned to 1. Check the specifications of the external scale.	
* External scale status 2 error protection *1		2	Bit 2 of the external scale error code (ALMC) has been turned to 1. Check the specifications of the external scale.	
* External scale status 3 error protection *1		3	Bit 3 of the external scale error code (ALMC) has been turned to 1. Check the specifications of the external scale.	
* External scale status 4 error protection *1		4	Bit 4 of the external scale error code (ALMC) has been turned to 1. Check the specifications of the external scale.	
* External scale status 5 error protection *1		5	Bit 5 of the external scale error code (ALMC) has been turned to 1. Check the specifications of the external scale.	

Note

- When protective function marked with * in the protective function table is activated, it cannot be disabled by the alarm clear input (A-CLR). To return to the normal operation, turn off power, remove the cause, and then turn on power again.
- Only for position control type is not provided with X5.

1. When in Trouble

Protective function (Detail of error code)

Protective function	Error code No.		Causes	Measures
	Main	Sub		
* A-phase wiring error protection	55	0	A-phase wiring in the external scale is defective, e.g. discontinued.	Check the A-phase wiring connection.
* B-phase wiring error protection		1	B-phase wiring in the external scale is defective, e.g. discontinued.	Check the B-phase wiring connection.
* Z-phase wiring error protection		2	Z-phase wiring in the external scale is defective, e.g. discontinued.	Check the Z-phase wiring connection.
Forced alarm input protection	87	0	Forced alarm input (E-STOP) is applied.	Check the wiring of forced alarm input (E-STOP).
* Motor automatic recognition error protection	95	0 to 4	The motor and the driver has not been matched.	Replace the motor which matches to the driver.
* Other error	99	0	Excessive noise or the like is detected as an abnormal signal. This type of error will occur if the alarm clear is attempted while the safety input 1/safety input 2 is not in normal state (input photocoupler is ON).	<ul style="list-style-type: none"> • Turn off the power once, then re-enter. • If error repeats, this might be a failure. Stop using the products, and replace the motor and the driver. Return the products to the dealer or manufacturer. • Adjust the condition of the safety input 1/ safety input 2 and then start the alarm clear.
		Other No.	Control circuit has malfunctioned due to excess noise or other causes. Some error has occurred inside of the driver while triggering self-diagnosis function of the driver.	<ul style="list-style-type: none"> • Turn off the power once, then re-enter. • If error repeats, this might be a failure. Stop using the products, and replace the motor and the driver. Return the products to the dealer or manufacturer.