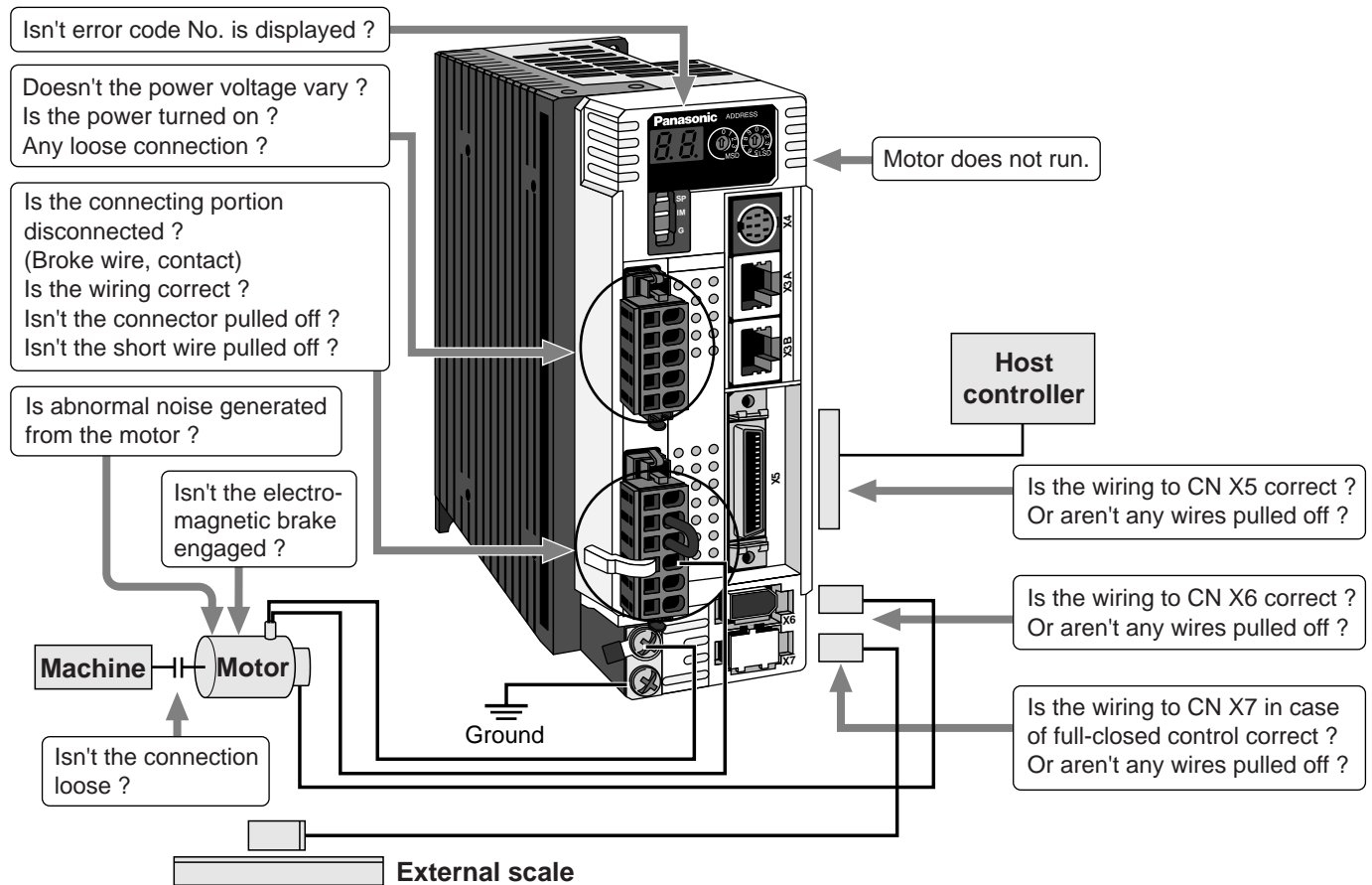


[When in Trouble]

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When in Trouble

What to Check ?



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, according to P.133, "Timing Chart (When error occurs)" of Operation Setting, and 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 turning on the alarm clear input for 120ms or longer.
 - When overload protection is triggered, you can clear it by turning on the alarm clear signal 10 sec or longer after the error occurs. You can clear the time characteristics by turning off the connection between L1C and L2C or r and t of the control power supply of the driver.
 - You can clear the above error by operating the console.
(Refer to P.99, "Alarm Clear Mode" of Setting.)
 - You can also clear the above error by operating the "PANATERM®".

<Remarks>

- When the protective function with a prefix of "*" in the protective function table is triggered, you cannot clear with alarm clear input. For resumption, shut off the power to remove the cause of the error and re-enter the power.
- Following errors will not be stored in the error history.

Control power supply under-voltage protection	(Error code No. 11)
Main power supply under-voltage protection	(Error code No. 13)
EEPROM parameter error protection	(Error code No. 36)
EEPROM check code error protection	(Error code No. 37)
Emergency stop input error protection	(Error code No. 39)
External scale auto recognition error protection	(Error code No. 93)
Motor auto recognition error protection	(Error code No. 95)

Warning Function

- In MINAS-A4P Series, a warning is given before a protection function works and you can check the machine status such as overload in advance.

When a warning has been given, a warning code below blinks slowly on the 7-segment LED at the front panel.

Warning code number	Warning name	Description
16	Overload warning	The load has been 85% or more of the overload protection level.
18	Over-regeneration load warning	The load has been 85% or more of the over-regenerative load protection level.
40	Battery warning	Voltage of a battery for absolute encoder has been approximately 3.2 V or less.
88	Fan lock warning	A fan has stopped for 1s or more.
89	External scale alarm	An external scale temperature has been 65fC or more or signal intensity is insufficient (mounting must be adjusted). This is enabled only for the full-closed control.

- When an overload warning or over-regeneration load warning has been given, referring to the counter-measures taken by relevant protection function.
- When a battery warning has been given, replace the battery for absolute encoder with a new one. When the battery has been replaced, perform Alarm Clear to the servo driver once to clear the battery alarm.

Protective Function (Detail of Error Code)

Protective function	Error code No.	Causes	Measures
Control power supply under-voltage protection	11	Voltage between P and N of the converter portion of the control power supply has fallen below the specified value. 1)Power supply voltage is low. Instantaneous power failure has occurred 2)Lack of power capacity...Power supply voltage has fallen down due to inrush current at the main power-on. 3)Failure of servo driver (failure of the circuit)	Measure the voltage between lines of connector (L1C and L2C) and terminal block (r and t). 1)Increase the power capacity. Change the power supply. 2)Increase the power capacity. 3)Replace the driver with a new one.
Over-voltage protection	12	Voltage between P and N of the converter portion of the control power supply has exceeded the specified value 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. 2)Disconnection of the regeneration discharge resistor 3)External regeneration discharge resistor is not appropriate and could not absorb the regeneration energy. 4)Failure of servo driver (failure of the circuit)	Measure the voltage between lines of connector (L1, L2 and L3). 1)Enter correct voltage. Remove a phase-advancing capacitor. 2)Measure the resistance of the external resistor connected between terminal P and B of the driver. Replace the external resistor if the value is ∞. 3)Change to the one with specified resistance and wattage. 4)Replace the driver with a new one.
Main power supply under-voltage protection	13	Instantaneous power failure has occurred between L1 and L3 for longer period than the preset time with SV.Pr6D (Main power-off detection time) while SV.Pr65 (Undervoltage error response at 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. 1)Power supply voltage is low. Instantaneous power failure has occurred 2)Instantaneous power failure has occurred. 3)Lack of power capacity...Power supply voltage has fallen down due to inrush current at the main power-on. 4)Phase lack...3-phase input driver has been operated with single phase input. 5)Failure of servo driver (failure of the circuit)	Measure the voltage between lines of connector (L1, L2 and L3). 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. 2)Set up the longer time to SV.Pr6D (Main power off detecting time). Set up each phase of the power correctly. 3)Increase the power capacity. For the capacity, refer to P.32, "Driver and List of Applicable Peripheral Equipments" of Preparation. 4)Connect each phase of the power supply (L1, L2 and L3) correctly. For single phase, 100V and 200V driver, use L1 and L3. 5)Replace the driver with a new one.

When in Trouble

Protective function	Error code No.	Causes	Measures
* Over-current protection	14	<p>Current through the converter portion has exceeded the specified value.</p> <ol style="list-style-type: none"> 1) Failure of servo driver (failure of the circuit, IGBT or other components) 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) Melting of the relays for dynamic brake due to frequent Servo-ON/OFF operation 7) The motor is not applicable to the driver. 	<ol style="list-style-type: none"> 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 driver. Prohibit the run/stop operation with Servo-ON/OFF. 7) Check the name plate and capacity of the motor and driver, and replace with motor applicable to the driver.
* Over-heat protection	15	<p>Temperature of the heat sink or power device has been risen over the specified temperature.</p> <ol style="list-style-type: none"> 1) Ambient temperature has risen over the specified temperature. 2) Over-load 	<ol style="list-style-type: none"> 1) Improve the ambient temperature and cooling condition. 2) Increase the capacity of the driver and motor. Set up longer acceleration/deceleration time. Lower the load.
Over-load protection	16	<p>Torque command value has exceeded the over-load level set with SV.Pr72 (Overload 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 (SV.Pr20) 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. 7) SV.Pr72 setup has been low. 	<p>Check that the torque (current) does not oscillates nor fluctuate up and down very much on the graphic screen of the PANATERM®. Check the over-load alarm display and load factor with the PANATERM®.</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. Connect the black (W phase), white (V phase) and red (U phase) cables in sequence from the bottom at the CN X2 connector. 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. 7) Set up SV.Pr72 to 0. (Set up to max. value of 115% of the driver)
* Over-regeneration load protection	18	<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 on the monitor screen of the PANATERM®. Do not use in the continuous regenerative brake application.</p> <ol style="list-style-type: none"> 1) Improve the regenerative processing capability, e.g., increase the motor and driver capacity, put external regenerative resistor, etc. 2) Reduce the regenerative energy at deceleration, e.g., lower the motor rotation speed, make the deceleration time longer, etc. 3) If SV.Pr6C (External regenerative resistor set up) is "0" and an internal regenerative resistor is used, and if SV.Pr6C is "3" and an external regenerative resistor is not used, use the external regenerative resistor and try to set SV.Pr6C to "1". If the external regenerative resistor is used and SV.Pr6C is set to "1", secure any external over-regeneration load protection measures and try to set SV.Pr6C to "2".
<p><Remarks> Install an external protection such as thermal fuse without fail when you set up SV.Pr6C to 2. Otherwise, regenerative resistor loses the protection and it may be heated up extremely and may burn out.</p>			

Protective function	Error code No.	Causes	Measures
* Encoder communication error protection	21	Communication between the encoder 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 encoder as per the wiring diagram. Correct the miswiring of the connector pins. Note that the encoder cable to be connected to CN X6. (Check that the encoder cable is not connected to the connector CN X7 for external scale connection by mistake.)
* Encoder communication data error protection	23	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 DC5V±5% (4.75 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...Refer to P.38, "Wiring to the Connector, CN X6" of Preparation.
Position deviation excess protection	24	Deviation pulses have exceeded the setup of SV.Pr70 (Position deviation error level). 1)The motor movement has not followed the command. 2)Setup value of SV.Pr70 (Position deviation error level) is small.	<ol style="list-style-type: none"> 1)Check that the motor follows to the position command. Check that the output torque has not saturated in torque monitor. Make a gain adjustment. Set up maximum value to SV.Pr5E (1st torque limit) and SV.Pr5F (2nd torque limit). Make a 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 SV.Pr70, or set up 0 (invalid).
* Hybrid deviation excess error protection	25	Position of load by the external scale and position of the motor by the encoder slips larger than the setup pulses with SV.Pr7B (Setup of hybrid deviation excess) at full-closed control.	<ul style="list-style-type: none"> Check the connection between the motor and the load. Check the looseness, slippage and backlash. 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 (SV.Pr78, 79 and 7A) and reversal of external scale direction (SV.Pr7C) are correctly set.
Over-speed protection	26	The motor rotational speed has exceeded the setup value of SV.Pr73 (Over-speed level setup)	<ul style="list-style-type: none"> Do not give an excessive speed command. Make a gain adjustment when an overshoot has occurred due to a poor gain adjustment.
* External scale communication data error protection	28	Communication error has occurred in data from the encoder. The data could be received normally, but an error occurred in the data due to noise.	<ul style="list-style-type: none"> Separate the encoder cable and the motor cable if they are bound together. Connect the shield to FG...refer to wiring diagram.
Deviation counter overflow protection	29	Deviation counter value has exceeded 2^{27} (134217728).	<ul style="list-style-type: none"> Check that the motor runs as per the position command. Check that the output torque has not saturated in torque monitor. Make a gain adjustment. Set up longer acceleration/deceleration time. Lower the load and speed.
Software limit protection	34	The motor exceeded an allowable motor operation range specified by SV.Pr26 (software limit setup) against the position command input range. 1)Gain has not matched up. 2)Setup value of SV.Pr26 (Software limit setup) is small.	<p>Refer to P.170, "Software Limit Function" before using this.</p> <ol style="list-style-type: none"> 1)Check the gain (balance of position loop gain and velocity loop gain) and the inertia ratio. 2)Setup a larger value to SV.Pr26. Otherwise, set SV.Pr26 to "0" and disable the software limit protection.

<Remarks>

When the protective function with a prefix of "*" in the protective function table is triggered, you cannot clear with alarm clear input.

When in Trouble

Protective function	Error code No.	Causes	Measures
* External scale communication error protection	35	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. • Secure the power supply voltage DC $5V \pm 5\%$ (4.75 to 5.25 V) for the external scale ... pay attention especially when the external scale connection cables are long.
* EEPROM parameter error protection	36	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.
* EEPROM check code error protection	37	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.
Emergency stop input error protection	39	When the emergency stop input (EMG-STP: CN X5 Pin 2) has turned off, the system trips regarding it as an error.	<ul style="list-style-type: none"> • Check the switch power supply and cable connected to the emergency stop input for error. • Check that the emergency stop input (CN X5 Pin 2) turns on. • Check that the rising time of the control signal cable (DC 12 to 24 V) at the power supply on is not slower than that of the servo driver.
Absolute system down error protection	40	Voltage of the built-in capacitor has fallen below the specified value because the power supply or battery for the 17-bit absolute encoder has been down.	After connecting the power supply for the battery, clear the absolute encoder. (Refer to P.138, "Setup (Initialization) of Absolute Encoder" of Operation Setting.) You cannot clear the alarm unless you clear the absolute encoder.
* Absolute counter over error protection	41	Multi-turn counter of the 17-bit absolute encoder has exceeded the specified value.	<ul style="list-style-type: none"> • Set up an appropriate value to SV.Pr0B (Absolute encoder set up) . • Limit the travel from the machine home position within 32767 revolutions.
Absolute over-speed error protection	42	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.	<ul style="list-style-type: none"> • Check the supply voltage at the encoder side ($5V \pm 5\%$) • Check the connecting condition of the connector, CN X6. • You cannot clear the alarm unless you clear the absolute encoder.
* Absolute single turn counter error protection	44	Single turn counter error of 17-bit absolute encoder has been detected. Single turn counter error of 2500[P/r] , 5-wire serial encoder has been detected.	Replace the motor.
* Absolute multi-turn counter error protection	45	Multi turn counter error of 17-bit absolute encoder has been detected. Multi turn counter error of 2500[P/r] , 5-wire serial encoder has been detected.	Replace the motor.
Absolute status error protection	47	17-bit absolute 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	48	Missing pulse of Z-phase of 2500[P/r] , 5-wire serial encoder has been detected	The encoder might be a failure. Replace the motor.
* Encoder CS signal error protection	49	CS signal logic error of 2500[P/r] , 5-wire serial encoder has been detected	The encoder might be a failure. Replace the motor.

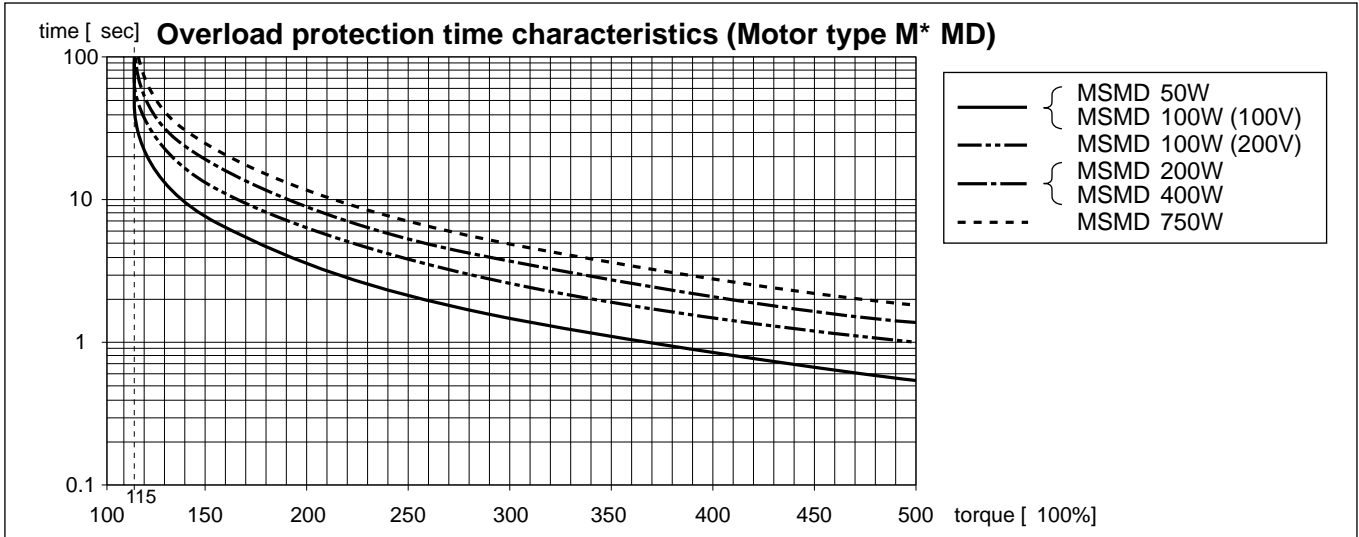
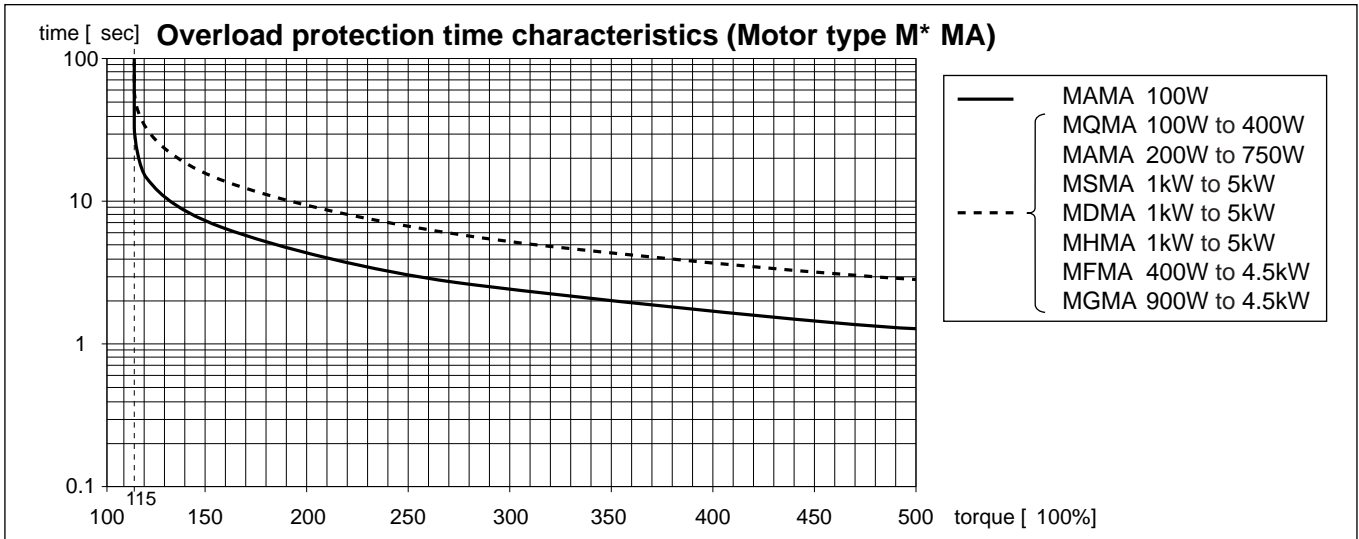
<Remarks>

When the protective function with a prefix of "*" in the protective function table is triggered, you cannot clear with alarm clear input.

Protective function	Error code No.	Causes	Measures
*External scale status 0 error protection	50	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 shut off the power to reset.
*External scale status 1 error protection	51	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	52	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	53	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	54	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	55	Bit 5 of the external scale error code (ALMC) has been turned to 1. Check the specifications of the external scale.	
Homing error protection	68	An error occurred during homing. An invalid over-travel inhibit input signal was input. A parameters necessary for homing operation is not set or an invalid value is set.	<ul style="list-style-type: none"> • Check the switch, limit sensor, cable and power supply connected to the over-travel inhibit input (CCWL/CWL: CN X5 Pin 19/20) for error. • Check the parameter settings for homing. • For details, refer to "Homing Operation" in "Operation Setting" on page 114.
Undefined data error protection	69	A parameters necessary for an instructed step operation and jog operation is not set or an invalid value is set.	Check the settings of positioning parameter and step parameter. For details, refer to "Step Operation" in "Operation Setting" on page 107 and "Jog Operation" on page 112.
* Present position overflow error protection	70	A current position (–2147483647 to 2147483647) overflowed when 16.Pr51 (wraparound accepted) is "0".	Do not give an unsuitable operation command to make the current position exceed "–2147483647 to 2147483647". Especially, pay attention to an incremental operation, jog operation and home offset operation.
Drive prohibition detection error protection	71	Over-travel inhibit input in an operating direction was detected in a step operation and jog operation after homing completes. Both of CCW over-travel inhibit input (CCWL: CN X5 Pin 19) and CW over-travel inhibit input (CWL: CN X5 Pin 20) were in the OPEN state.	<ul style="list-style-type: none"> • Check the switch, limit sensor, cable and power supply connected to the over-travel inhibit input (CCWL/CWL) for error. • Check the operation command and the mount of limit sensor. • Check that a direction of home offset operation is not the same as that of over-travel inhibit input.
* Maximum movement limit error protection	72	A motor command position exceeded a maximum travel limit range in a step operation and jog operation after homing completes.	<ul style="list-style-type: none"> • Do not give an unsuitable operation command to make the command position exceed the maximum travel limit range. Especially, pay attention to an incremental operation, jog operation and home offset operation. • Check a set value of 32.Pr01 (setting of maximum travel in positive direction) and 32.Pr02 (setting of maximum travel in negative direction)
* ID setting error protection	82	The ID set value exceeds a range between 0 and 31.	Check the setting of the rotary switch on the front panel.
* External scale auto recognition error protection	93	An unsupported external scale is connected.	Replace it with a supported external scale.
* Motor auto recognition error protection	95	The motor and the driver has not been matched.	Replace the motor which matches to the driver.
* Other error	Other No. hh HH ??	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.

When in Trouble

• Time characteristics of Err16 (Overload protection)



• Software Limit Function

1) Outline

You can make an alarm stop of the motor with software limit protection (Error code No.34) when the motor travels exceeding the movable range which is set up with SV.Pr26 (Software limit set up) against the position command input range.

You can prevent the work from colliding to the machine end caused by motor oscillation.

2) Applicable range

This function works under the following conditions.

Conditions under which the software limit works	
Control mode	<ul style="list-style-type: none"> • Either at position control mode or full-closed control mode SV.Pr02 = 0 : Position control SV.Pr02 = 6 : Full-closed control
Others	(1) operating Normal auto tuning (2) After the last clearance of the position command input range (0 clearance), the movable range of the motor is within 2147483647 for both CCW and CW direction. (3) at Servo-ON (2) when SV.Pr26 (Software limit setup) is other than 0. Once the motor gets out of the (2) condition, the software limit protection will be invalidated until the later mentioned "5) Condition under which the position command input range is cleared" is satisfied. The position command input range will be 0-cleared when the motor gets out of the conditions of (3) and (4).

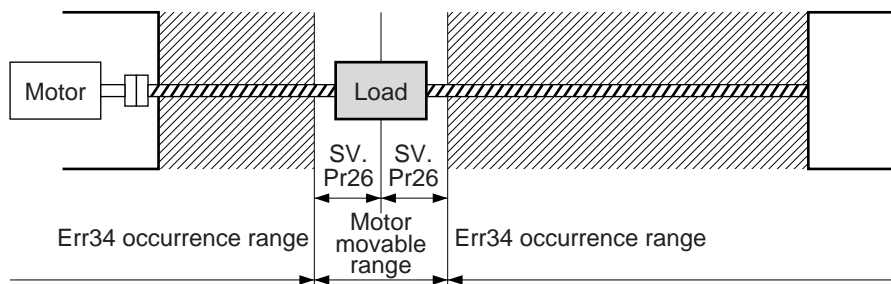
3) Cautions

- This function is not a protection against the abnormal position command.
- When this software limit protection is activated, the motor decelerates and stops according to SV.Pr68 (Error response action).
The work (load) may collide to the machine end and be damaged depending on the load during this deceleration, hence set up the range of SV.Pr26 including the deceleration movement.
- This software limit protection will be invalidated during the trial run and frequency characteristics functioning of the PANATERM®.

4) Example of movement

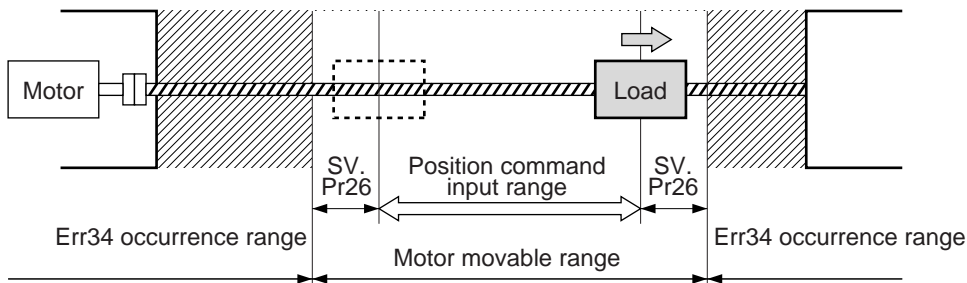
(1) When no position command is entered (Servo-ON status),

The motor movable range will be the travel range which is set at both sides of the motor with SV.Pr26 since no position command is entered. When the load enters to the Err34 occurrence range (oblique line range), software limit protection will be activated.



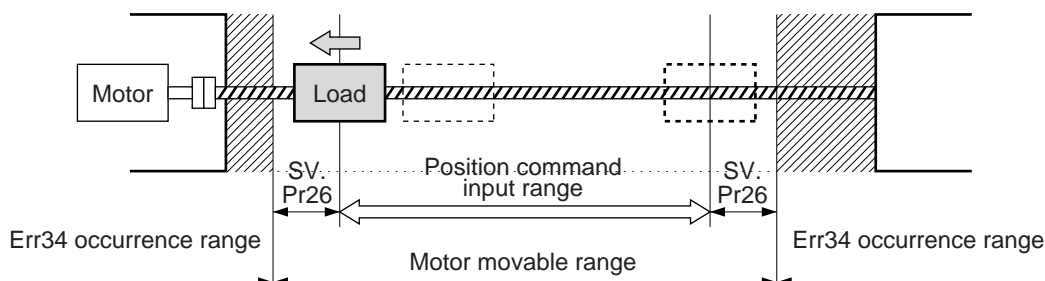
(2) When the load moves to the right (at Servo-ON),

When the position command to the right direction is entered, the motor movable range will be expanded by entered position command, and the movable range will be the position command input range + SV.Pr26 setups in both sides.



(3) When the load moves to the left (at Servo-ON),

When the position command to the left direction, the motor movable range will be expanded further.



5) Condition under which the position command input range is cleared

The position command input range will be 0-cleared under the following conditions.

- When the power is turned on.
- When the homing is completed.
- At the starting and the finishing of the normal auto-gain tuning.

Troubleshooting

Motor Does Not Run

Motor Stops During an Operation

Classification	Causes		Countermeasures
Parameter	Error in control mode setting	The setting of the control mode in the console or the monitor mode of "PANATERM" may be wrong.	Set SV.Pr02 (Control mode) again.
	Error in torque limit setting	The torque limit may be smaller than correct torque necessary for an operation.	Check the setting of SV.Pr5E (1st torque limit) and SV.Pr5F (2nd torque limit).
	Error in operation parameter setting	A parameter necessary for an operation may not be set. (If any parameter is not set, the error code No. 68 or 69 is shown.)	Check the parameters of travel, speed acceleration/deceleration time necessary for homing operation or step operation in 16.Pr.
	Setting out of a maximum travel range of target position	An operation command may exceed the maximum travel range in a positive direction and/or negative direction.	Check the set value of 32.Pr01/02.
	Error in a parameter used by a manufacturer.	The setting of parameter used by a manufacturer may be changed from a default setting.	Initialize all the parameters once and set them again.
Wiring	Main power supply (L1, L2 and/or L3) of CN X1 and/or control power supply (L1C and/or L2C) does not turn on. Otherwise, a voltage value is wrong.	Voltage of the main power supply and/or control power supply may not be correct. The error code No. 11, 12 and/or 13 may occur.	Check the wiring and voltage of the main power supply (L1, L2 and/or L3) of CN X1 and/or the control power supply (L1C and/or L2C).
	Servo-on input (SRV-ON) of CN X5 is opened.	The 7-segment LED on the front panel may show [--] . The servo-on signal may be in the [--] state in the monitor mode of the console or "PANATERM".	Check and wire the input signal so that the SRV-ON input can be connected to COM-.
	CW/CCW over-travel inhibit input (CWL/CCWL) of CN X5 is in the ON state.	The CW/CCW over-travel inhibit input (CWL/CCWL) of CN X5 may be in the ON state. ("Enable/disable" and logic are set by SV.Pr53/54.) The CW/CCW over-travel inhibit input may be in the [--] state in the monitor mode of the console or "PANATERM".	Check the wiring of CW/CCW over-travel inhibit input and check the set value in SV.Pr53/54.
	Strobe input (STB) of CN X5 is opened.	The strobe input (STB) of CN X5 may remain opened. The strobe input signal may be in the [--] state in the monitor mode of the console or "PANATERM".	Check and wire the input signal so that the strobe input can be connected to COM-.
	Emergency stop input (EMG-STP) of CN X5 is opened.	The emergency stop input (EMG-STP) of CN X5 may be opened. (The error code No. 39 is shown.)	Check and wire the input signal so that EMG-STP can be connected to COM-.
	Error in the point specifying input (P1IN to P32IN) of CN X5.	The point specifying input (P1IN to P32IN) of CN X5 may not be input correctly. (Logic can be set by SV.Pr58.) The state of P1IN to P32IN may not be displayed correctly in the monitor mode of the console or "PANATERM".	Check the wiring of P1IN to P32IN.
	Error in input timing of the strobe input (STB) and the point specifying input (P1IN to P32IN) of CN X5. A stop instruction is	Waiting time from the input of the point specifying input (P1IN to P32IN) of CN X5 to the input of the strobe input (STB) of CN X5 may not be 10 ms or more. (If the waiting time is less than 10 ms, a target point may be unstable.)	Insert waiting time of 10 ms or more.
	input by the multi function input 1/2 (EX-IN1/EX-IN2) of CN X5. Homing not completed	The deceleration-and-stop, emergency stop and temporary stop, which are assigned to the multi function input 1/2 (EX-IN1/EX-IN2) of CN X5, may turn on. (Function selection and logic can be set by SV.Pr5A/5C and SV.Pr59/5B, respectively.)	Check the setting and wiring of the multi function input 1/2.
Others	During the execution of an operation command, the next operation command starts. The motor shaft drags. The motor does not	Homing may not be completed. The point output may be "0" in the monitor mode of the console or "PANATERM".	Complete the homing. Refer to page 114.
	run.	During the execution of an operation command (a transistor of the motor operation state output BUSY of CN X5 turns OFF), you may start the next operation command.	Check that the transistor of the motor operation state output turns ON and then start the next operation command.
		The motor shaft drags. The motor does not run. 1)After turning the power supply off and separating it from the machine, the motor shaft may not be rotated manually. 2)For the motor equipped with electromagnetic brake, the motor shaft may not be rotated manually if DC 24 V is applied to the brake.	If the motor shaft cannot be rotated, ask the local shop to repair the motor.

Point Deviates

Positioning Accuracy is Poor

Classification	Causes	Countermeasures
Parameter	The setting of the parameter for positioning operation is wrong.	Adjust the target position parameter at each point. Check the setting of an operation mode (relative travel/absolute travel).
	The setting of positioning completion range is large.	Decrease the set value of the positioning completion range (SV.Pr60) to the extent that chattering does not occur.
	Position loop gain is small.	Check the position deviation in the monitor mode of the console or "PANATERM®". Increase the set value of SV.Pr10 to the extent that oscillation does not occur and check it.
Wiring	Each input signal of CN X5 is chattering. 1) Servo-ON signal 2) CW/CCW over-travel inhibit input 3) Multi function input 1/2 (when a stop command is set) 4) Strobe signal input 5) Point specifying input	Check the wiring and connection between each signal of the connector CN X5 and COM-.
Installation	Load inertia is large.	Check the overshoot when stopping with a graphic function of "PANATERM®". If this problem is not resolved by gain adjustment, increase the motor and driver capacity.

Home Position Slips

Classification	Causes	Countermeasures
Parameter	The homing speed is slow, if any of the homing types below is used. 16.Pr36 = 1: Home sensor (based on the front end) 4: Limit sensor	Review the set value of the homing speed (16.Pr30/31).
Wiring	Chattering of home sensor (Z-LS) input.	Check home sensor input signal of the controller with oscilloscope. Review the wiring near to proximity dog and make a noise measure or reduce noise.
	Noise is on the encoder line.	Reduce noise (installation of noise filter or ferrite core), shield treatment of I/F cables, use of a twisted pair or separation of power and signal lines.

Abnormal Motor Noise or Vibration

Classification	Causes	Countermeasures
Adjustment	Gain setup is large.	Lower the gain by setting up lower values to SV.Pr11 and 19, of velocity loop gain and SV.Pr10 and 18 of position loop gain.
Installation	Resonance of the machine and the motor.	Re-adjust SV.Pr14 and 1C (Torque filter). Check if the machine resonance exists or not with frequency characteristics analyzing function of the PANATERM®. Set up the notch frequency to SV.Pr1D or SV.Pr28 if resonance exists.
	Motor bearing	Check the noise and vibration near the bearing of the motor while running the motor with no load. Replace the motor to check. Request for repair.
	Electro-magnetic sound, gear noise, rubbing noise at brake engagement, hub noise or rubbing noise of encoder	Check the noise of the motor while running the motor with no load. Replace the motor to check. Request for repair.

Troubleshooting

Overshoot/Undershoot

Overheating of the Motor (Motor Burn-Out)

Classification	Causes	Countermeasures
Adjustment	Gain adjustment is not proper.	Check with graphic function of PANATERM® or velocity monitor (SP) or torque monitor (IM). Make a correct gain adjustment. Refer to P.142 of Adjustment.
Installation	Load inertia is large.	Check with graphic function of PANATERM® or velocity monitor (SP) or torque monitor (IM). Make an appropriate adjustment. Increase the motor and driver capacity and lower the inertia ratio. Use a gear reducer.
	Looseness or slip of the machine	Review the mounting to the machine.
	Ambient temperature, environment	Lower the temperature with cooling fan if the ambient temperature exceeds the predications.
	Stall of cooling fan, dirt of fan ventilation duct	Check the cooling fans of the driver and the machine. Replace the driver fan or request for repair.
	Mismatching of the driver and the motor	Check the name plates of the driver and the motor. Select a correct combination of them referring to the instruction manual or catalogue.
	Failure of motor bearing	Check that the motor does not generate rumbling noise while turning it by hand after shutting off the power. Replace the motor and request for repair if the noise is heard.
	Electromagnetic brake is kept engaged (left unreleased).	Check the voltage at brake terminals. Apply the power (DC24V) to release the brake.
	Motor failure (oil, water or others)	Avoid the installation place where the motor is subject to high temperature, humidity, oil, dust or iron particles.
	Motor has been turned by external force while dynamic brake has been engaged.	Check the running pattern, working condition and operating status, and inhibit the operation under the condition of the left.

Parameter Returns to Previous Setup

Classification	Causes	Countermeasures
Parameter	No writing to EEPROM has been carried out before turning off the power.	Refer to P.96, "How to Operate-EEPROM Writing" of Preparation.

Display of "Communication port or driver cannot be detected" Appears on the Screen While Using the PANATERM®.

Classification	Causes	Countermeasures
Wiring	Communication cable (for RS232C) is connected to the connector, CN X3.	Connect the communication cable (for RS232C) to connector, CN X4.