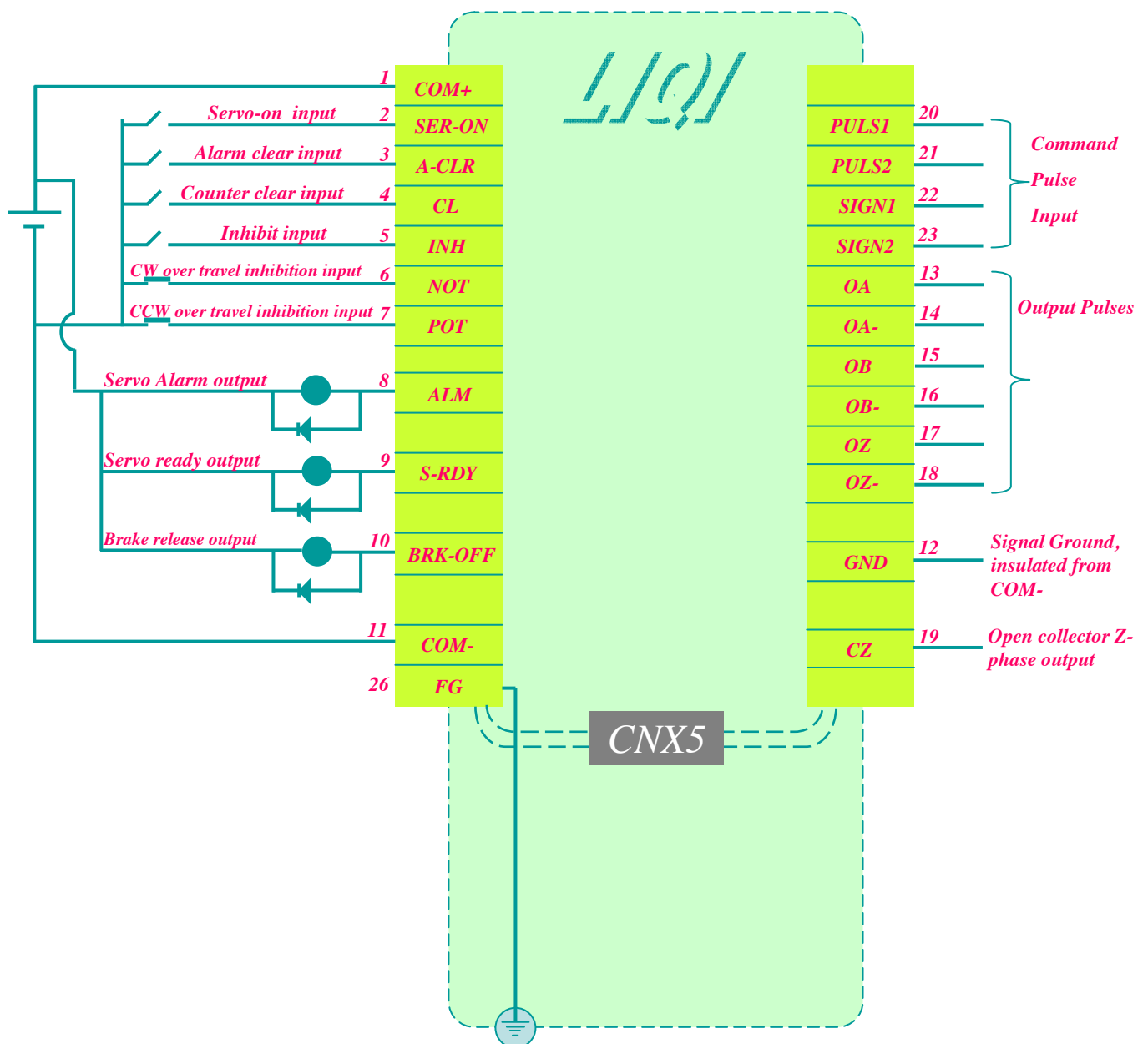


Panasonic *LIQI*

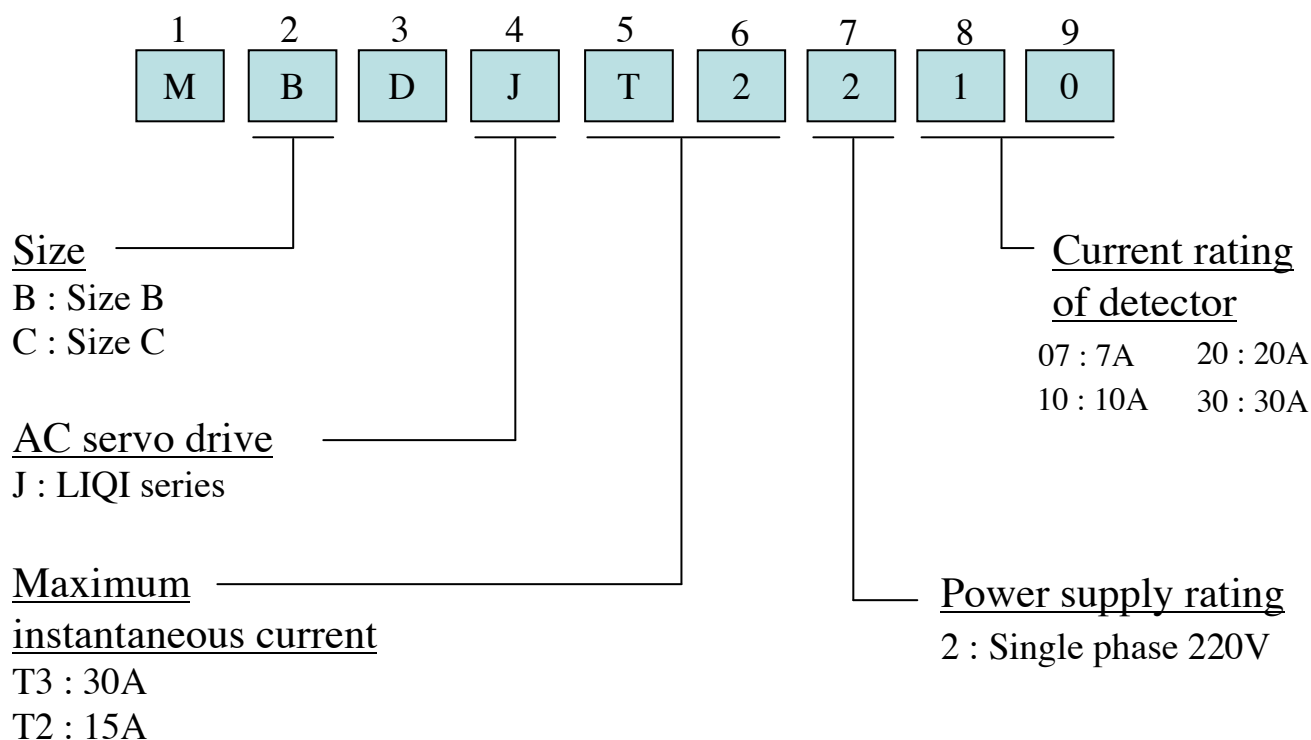




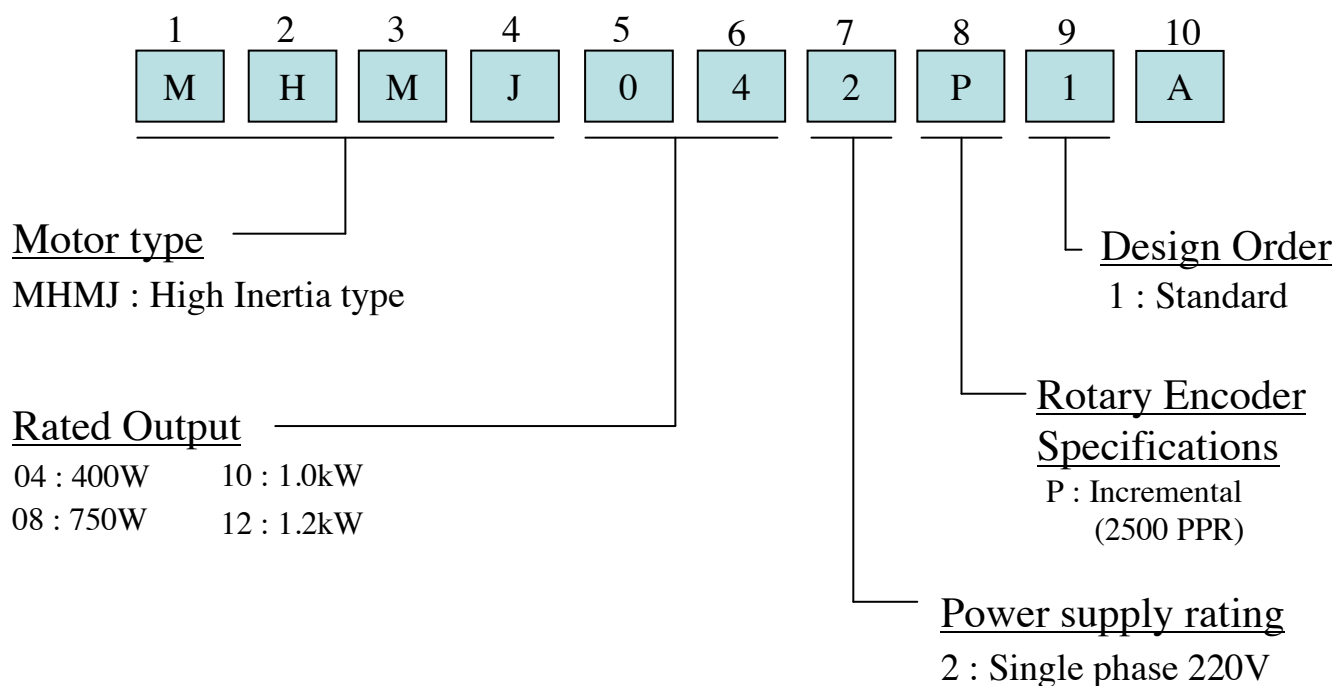
Interface wiring diagram



Model Designation Code (Driver)



Model Designation Code (Motor)



Basic Features

- *Input power range : AC 220V (200V ~ 253V)*
- *Motor rating :*

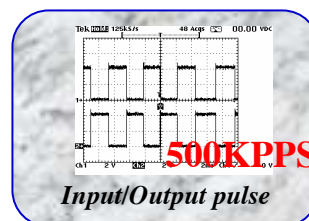
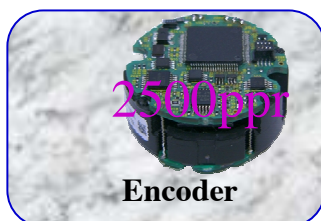
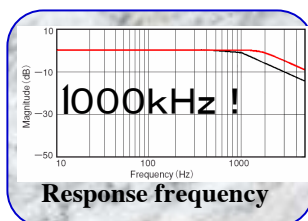
*MHMD***J1* : 200W/1.0kW*

*MHMJ***P1* : 400W/750W/1.0kW / 1.2kW*

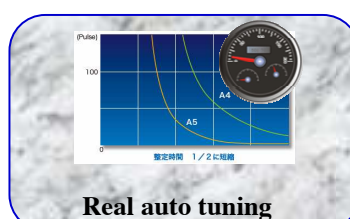
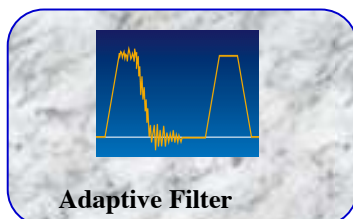
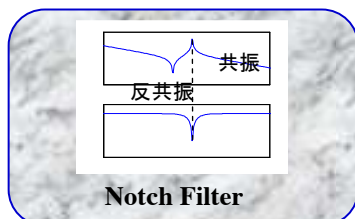
- *Control mode : Position command*
- *Response frequency : 1kHz*
- *Pulse command up to 500kHz*
- *Advanced PANATERM software*
- *Real time auto gain tuning*
- *USB interface for PANATERM software*
- *Gain setting through RSW or software*
- *Vibration filters and notch filters for smooth operation*
- *IP65 protection*
- *Ambient temperature : 0° to 50° C*

MINAS-LIQI can

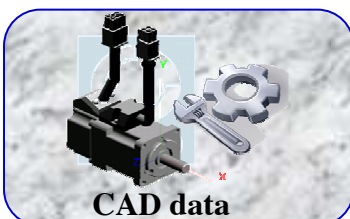
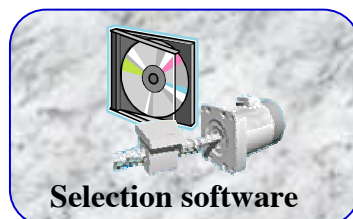
1. Perform quick and stable machine operation



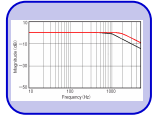
2. Minimize vibration & noise



3 Offer serviceable accessory



1. High Response



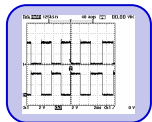
500Hz Response frequency



2500 ppr encoder resolution

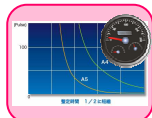


Low cogging torque

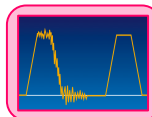


The I/O pulses 500kHz

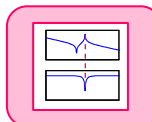
2. Intelligent



Highly functional Real-time Auto-Gain tuning



Manual/Auto Damping filters



Manual/Auto Notch filters

3. Compact



New Structure



Innovative Core



Innovation Encoder

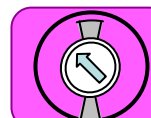
4. Easy



Set up support software "PANATERM"



Motor Selection Software



RSW on front panel for Stiffness setting

3. Product Line-up

Rated Voltage	Size	Part Number	Rated Output	Motor
1φ AC220-240V	Type B	MBDJT2207	50W	MSMD5AZJ1*
			100W	MSMD012J1*
			200W	MSMD022J1*
		MBDJT2210		MHMD022J1*
			400W	MSMD042J1*
				MHMJ042P1*
	Type C	MCDJT3220	750W	MSMD082J1*
				MHMJ082P1*
		MCDJT3230	1000W	MHMD102J1*
			1200W	MHMD102P1*

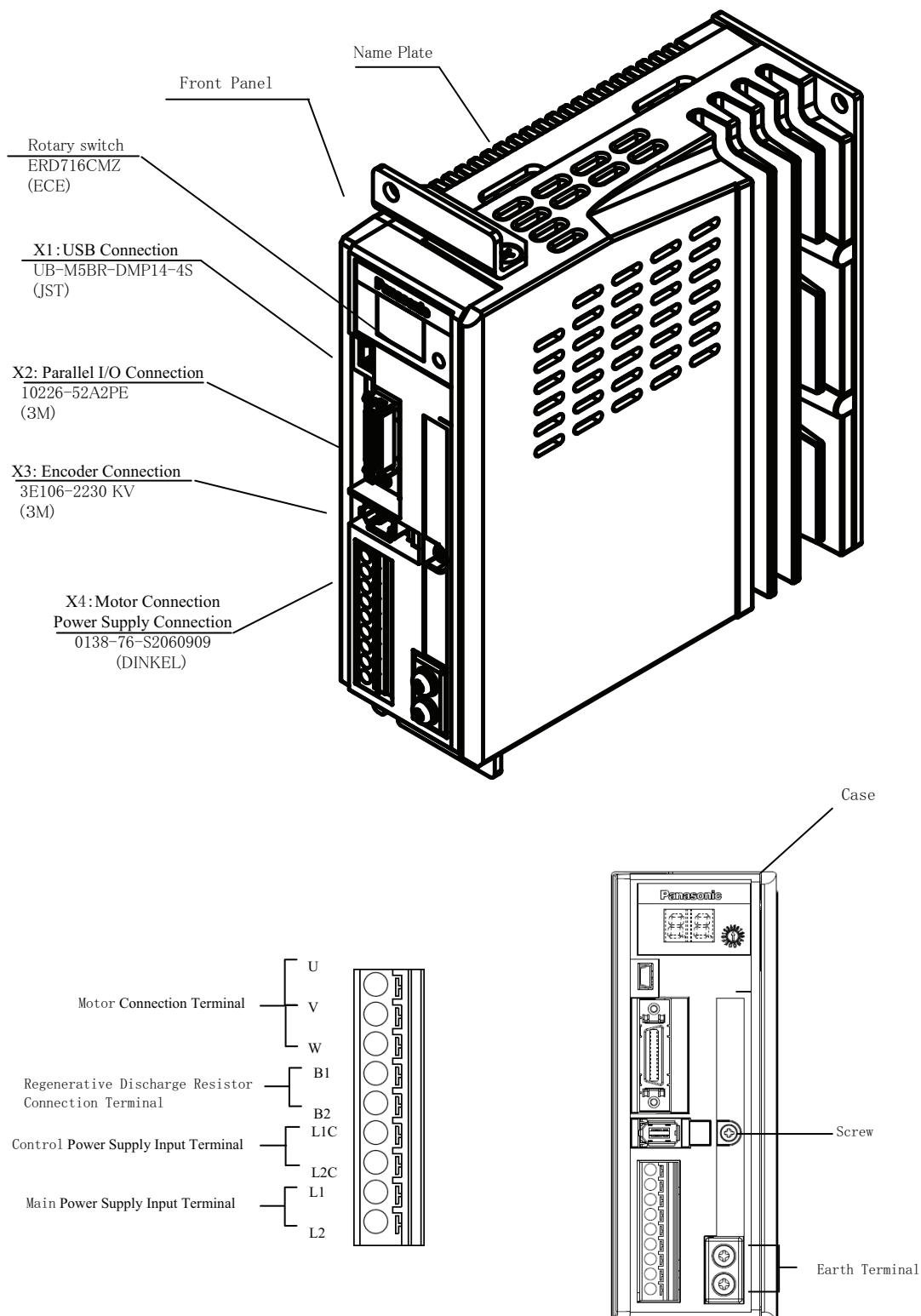
4. General Specifications

Basic Dimensions	Input power supply	200V line	Main circuit power	B	Single-phase 220 – 240 V ^{+5%} _{-10%} 50/60 Hz
				C	Single-phase 220 – 240 V ^{+5%} _{-10%} 50/60 Hz
			Control circuit power	B	Single-phase 220 – 240 V ^{+5%} _{-10%} 50/60 Hz
				C	Single-phase 220 – 240 V ^{+5%} _{-10%} 50/60 Hz
	Insular resistance				Endure the conditions of 1500V,1Minsensitive electric current20Ma between primary-earth
	Operation conditions	Temperature		Operation temperature: 0 – 50 degrees C Storage temperature: -20 – 65 degrees C (Max .temperature guarantee: 80°C for 72 hours)	
		Humidity		Operation and storage humidity 20~85%RH or less (no condensation)	
		Height above the sea		Height above the sea level: 1,000 meters or less	
		Vibration		5.88 m/s ² or less, 10 – 60 Hz (Continuous operation at resonance point is not allowed)	
	Control method				IGBT PWM method, sinusoidal drive
	Encoder feedback				2500p/r (resolution:10000) 5-serial incremental encoder
	Control signal	Input		Multi-function input 6, Function of each multi-function input is assigned by the parameter.	
		Output		Multi-function output 3 Function of each multi-function output is assigned by the parameter.	
	Pulse signal	Input		Opt coupler input 1 Both open collector and line driver interface can be connected. Line receiver input 1 High speed line driver interface can be connected.	
		Output		4 outputs Line driver output for Encoder pulses (A/B/Z signal) or external feedback pulses (EXA/EXB/EXZ signal) Open collector output also available for Z or EXZ signal	
	Communication	USB		USB interface to connect to computers for parameter setting or status monitoring.	
	Front Panel				2-digit 7-segment LED, 2-digit RSW
	Regeneration				External regen resistor only
	Dynamic Brake				Built-in
	Control Mode				position control

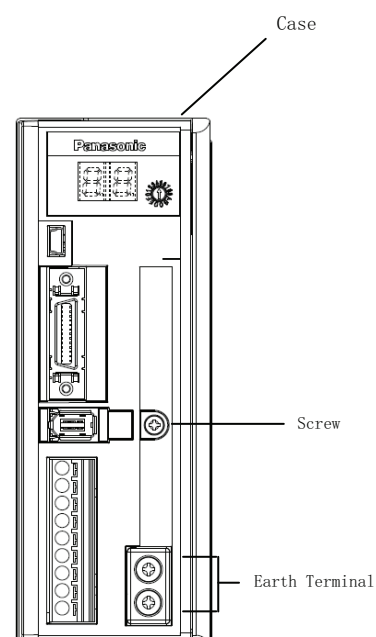
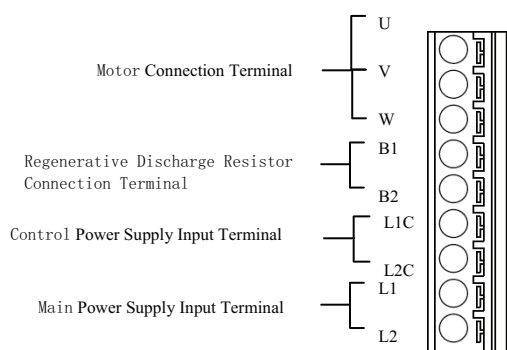
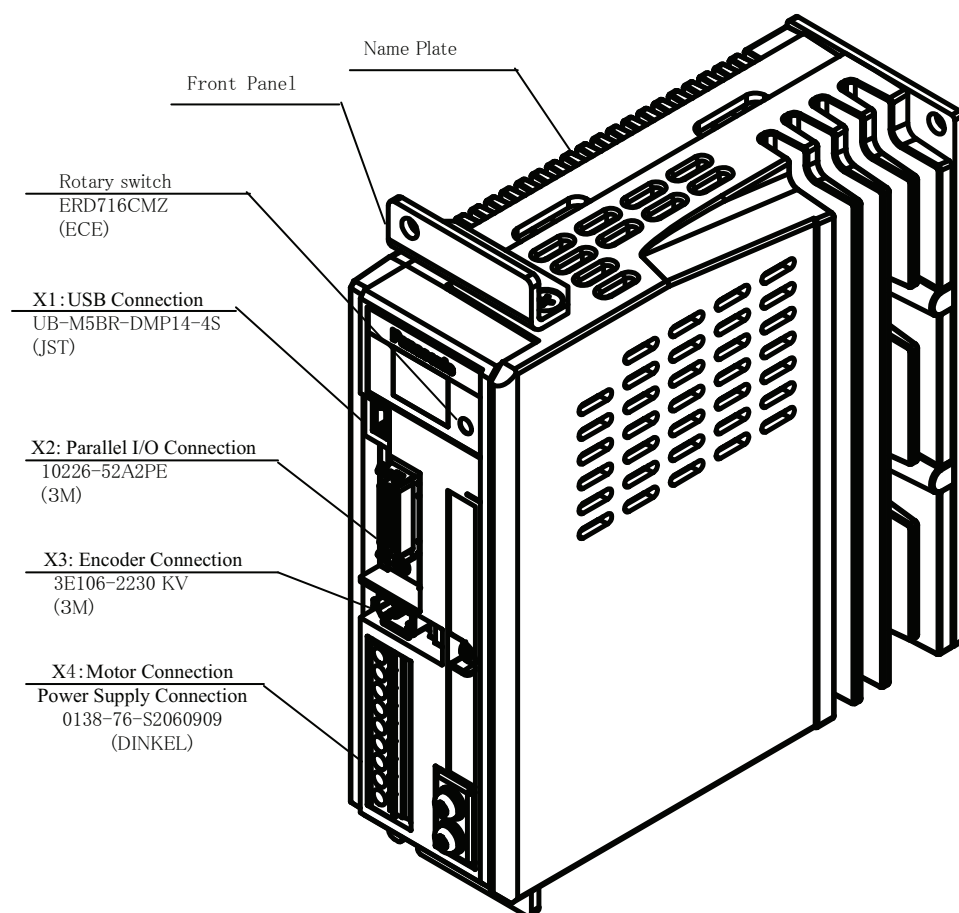
Function	Position Control		Digital Input		Deviation counter clear, Command pulse inhibition, Command scaling switch, Anti-vibration switch		
			Digital Output		In-position		
			Pulse Input	Max. Command Pulse Frequency		500kpps (Optocoupler interface)	
				Command pulse input mode		Differential input. Selectable by parameter. ([1]Positive/Negative pulse [2]A/B quadrature [3]Pulse/Direction)	
				Command pulse scaling (Electronic gear)		Applicable scaling ratio: 1/1000 – 1000 Any value of 1 – 20 ²⁰ can be set for both numerator (which corresponds to encoder resolution) and denominator (which corresponds to command pulse resolution per motor revolution), but the combination has to be within the range shown above.	
				Smoothing Filter		1 st order filter or FIR filter selectable for command input	
			Anti-vibration Control		Available		
	Common		Auto-tuning		Operation command from the controller, with the inner workings command of the amplifier, according to identifying real-time load inertia, stiffness is setted automatically.		
			Scaling of feedback pulse		Any number of pulses can be set up. (maximum setting number is encoder resolution)		
			Protective Function	Hardware error	Overvoltage, undervoltage, over speed, overload, overheat, over current, encoder error, etc.		
				Software error	Following error fault, command pulse scaling error, EEPROM error, etc.		
			Alarm data trace back		Tracing back of alarm data is available		

5. Appearance and Part Names

220V Size B



220V Size C



6. Configuration of Connectors

6-1 USB Connector X1

By connecting to a computer or a controller via USB interface, the following operations are available

- parameter reference / change
- parameter save / load
- monitoring of status
- checking alarm status or alarm history

Name	Symbol	Connector Pin No.	Description
USB signal	VBUS	1	Communicate with a computer or a controller
	D-	2	
	D+	3	
For manufacturer use	—	4	Do not connect
Signal ground	GND	5	Signal ground

6-2 I/O Connector X2

Common Digital Inputs

Name	Symbol	Connect or Pin	Description	Interface Circuit
Multi-function input 1	SI1	2	- The function changes according to the parameter settings. See below.	i-1
Multi-function input 2	SI2	3		
Multi-function input 3	SI3	4		
Multi-function input 4	SI4	5		
Multi-function input 5	SI5	6		
Multi-function input 6	SI6	7		

Functions allocatable to Multi-function inputs

Function	Symbol	Connector Pin No.	Description
Servo ON	SRV-ON	2	-Tuning ON become the status of Servo on (Motor energized) and Shut off the energization to the motor.
Positive over-travel limit	POT	7	-This is Feed forward operation prohibition input Please connect as the connection point is open, when machine's movable part is over the travel range for feed forward. -In case that Input is OFF, the feed forward torque does not happen.
Negative over-travel limit	NOT	6	-This is Negative Direction operation prohibits. -Please connect as the connection point is open, when the machine's movable part is over the travel range for negative direction. -In case that this input is OFF, the negative direction torque does not happen.
Deviation counter clear	CL	4	-This is the deviation Counter and the full close deviation counter's Clear input (CL).
Anti-vibration switch 1	VS-SEL1	-	-This is vibration suppression switch input.
Anti-vibration switch 2	VS-SEL2	-	
Gain switch	GAIN	-	-This is gain switch input.
Alarm clear	A-CLR	3	-Alarm condition is released.
Command scaling switch	DIV1	-	- Switch the command pulse electric gear numerator. By the combination of DIV1, DIV2, Maximum 4 switch is possible.
	DIV2	-	
Command pulse inhibition	INH	5	-This is command pulse input prohibit input(INH).
Torque command sign input	TL-SEL	-	-Set up the torque limiting method input.
Forced alarm input	E-STOP	-	-alarm status input switch.

- initial setting use

Input signal	Applicable parameter	Default setting ():10decimal notation	Default setup	
			Title of signal	Logic
SI1 input	Pr4.00	00000003h (3)	SRV-ON	a-contact
SI2 input	Pr4.01	00000004h (4)	A-CLR	a-contact
SI3 input	Pr4.02	00000007h (7)	CL	a-contact
SI4 input	Pr4.03	00000088h (136)	INH	b-contact
SI5 input	Pr4.04	00000082h (130)	NOT	b-contact
SI6 input	Pr4.05	00000081h (129)	POT	b-contact

* 「-」 : No function assigned

* Operation of a-contact and b-contact :

a-contact : Input signal disconnected from COM-function disabled (OFF state)

Input signal connected to COM-function enabled (ON state)

b-contact :Input signal disconnected from COM-function enabled (ON state)

Input signal connected to COM function disabled (OFF state)

-Change signal layout use

Classification	No.	Parameter Title	Set range	Unit	Function
4	00	SI1 input selection	0~00FFFFFFh	-	Assign function to SI1 input. this parameter is presented in hexadecimal. 000000**h 「**」 with the function number.
4	01	SI2 input selection	0~00FFFFFFh	-	Assign functions to SI2 to SI6 inputs. These parameters are presented in hexadecimals. Setup procedure is the same as described for Pr.4.00.
4	02	SI3 input selection	0~00FFFFFFh	-	
4	03	SI4 input selection	0~00FFFFFFh	-	
4	04	SI5 input selection	0~00FFFFFFh	-	
4	05	SI6 input selection	0~00FFFFFFh	-	

Function number

Title	Symbol	Setup value	
		a-contact	b-contact
Invalid	-	00h	(Do not setup.)
Positive direction over-travel Inhibition input	POT	01h	81h
Negative direction over-travel Inhibition input	NOT	02h	82h
Servo-ON input	SRV-ON	03h	83h
Alarm clear input	A-CLR	04h	(Do not setup.)
(Do not setup.)	-	05h	85h
Gain switching input	GAIN	06h	86h
Deviation counter clear input	CL	07h	(Do not setup.)
Command pulse inhibition input	INH	08h	88h
Torque limit switching input	TL-SEL	09h	89h
Damping control switching input 1	VS-SEL1	0Ah	8Ah
Damping control switching input 2	VS-SEL2	0Bh	8Bh
Electronic gear switching input 1	DIV1	0Ch	8Ch
Electronic gear switching input 2	DIV2	0Dh	8Dh
(Do not setup.)	-	0Eh~13h	8Eh~93h
Forced alarm input	E-STOP	14h	94h
(Do not setup.)	-	15h	95h

Attention :

· Do not setup to value other than that specified in the table.

· Do not assign specific function to 2 or more signals.

Duplicated assignment will cause Err33.0 I/F input multiple assignment error 1 or 33.1 I/F

Input multiple assignment error 2.

*1 Servo-on input signal(SRV-ON) must be used to enable servo-on.

*2 When using control mode switching input(C-MODE), set the signal to all control modes.

If the signal is set to only 1 or 2 control modes, Err33.2 I/F input function number error 1 or Err33.3 I/F input function number 2 will be generated.

· The control input pin set to invalid state does not affect any operation.

· Function(servo-on input, alarm clear, etc.) to be used in multiple control modes must be assigned to the same pin with correct logical arrangement. Incorrect setting will cause Err33.0 I/F input multiple assignment error 1 or Err33.1 I/F input multiple assignment error 2.

*3 Deviation counter clear input(CL) can be assigned only to SI7 input.

Wrong assignment will cause Err33.6 Counter clear assignment error.

*4 Command pulse inhibit input(INH)can be assigned only to SI10 input.

Wrong assignment will cause Err33.7 Command pulse input inhibit input.

Input signals (command pulse train) and their functions

Suitable interface can be chosen from two kind of interface based on the specification of command pulses.

Pulse train interface with line driver

Name	Symbol	Connector Pin No.	Description	Circuit
Command pulse input 1	PULSH1	20	- Input terminal for the position command pulse. It can be selected by setting corresponding parameters. - Disabled in such control modes as the speed control or the torque control, which does not require position commands. - The maximum allowable input frequency is 500kpps.	Di-1
	PULSH2	21		
Command direction input 1	SIGNH1	22		
	SIGNH2	23		

Output signals (Common) and their functions

Name	Symbol	Connector Pin No.	Description	Circuit
Multi-function output 1	SO1	8	- The function changes according to the parameter settings. See below.	o-1
Multi-function output 2	SO2	9		
Multi-function output 3	SO3	10		

Functions allocatable to Multi-function outputs

Name	Symbol	Pin	Description
Servo alarm	ALM	8	- Digital output to indicate alarm status.
Servo ready	S-RDY	10	- AMP turn on electricity signal
Motor holding break release	BRK-OFF	-	- Digital output to provide the timing signal to control the motor holding brake.
Zero speed	ZSP	-	- Digital output to indicate the zero speed status.
Torque limited	TLC	-	- Digital output to indicate the torque is limited.
In-	INP	9	- Digital output to indicate the in-position status.(INP)
In-position 2	INP2	-	- Digital output to indicate the in-position status.(INP2)
Warning output 1	WARN1	-	- Digital output to indicate the warning output signal status. Set by Pr4.31 "warning output 1"
Warning output 2	WARN2	-	- Digital output to indicate the warning output signal status. Set by Pr4.32 "warning output 2"
position command output	P-CMD	-	- Digital output to indicate position command
Alarm attribute output	ALM-ATB	-	- Digital output to Alarm which can be cleared.
Main Power output	P-ON	-	- Digital output to voltage which exceed to the level voltage of Servo on.

- initial setting use

Input signal	Applicable parameter	Default setting ():10decimal notation	Default setup	
			Title of signal	Logic
SO1 output	Pr4.00	00000003h (3)	SRV-ON	a-contact
SO2 output	Pr4.01	00000004h (4)	A-CLR	a-contact
SO3 output	Pr4.02	00000007h (7)	CL	a-contact

-Change signal layout use

Classification	No.	Parameter Title	Set range	Unit	Function
4	10	SO1 output selection	0~00FFFFFFh	-	Assign function to SO1 output. this parameter is presented in hexadecimal. 000000**h 「**」 with the function number.
4	11	SO2 output selection	0~00FFFFFFh	-	Assign functions to SO2 to SO3 outputs.
4	12	SO3 output selection	0~00FFFFFFh	-	These parameters are presented in hexadecimal. Setup procedure is the same as described for Pr.4.00.

Function number

Title	symbol	Setup value
		a-contact
Invalid	-	00h
Servo-Ready output	ALM	01h
External brake release signal	S-RDY	02h
Positioning complete output	BRK-OFF	03h
At-speed output	INP	04h
(Do not setup.)	-	05h
Zero-speed detection output signal	TLC	06h
Speed coincidence output	ZSP	07h
(Do not setup.)	-	08h
Alarm output 1	WARN1	09h
Alarm output 2	WARN2	0Ah
Positional command ON/OFF output	P-CMD	0Bh
Positioning complete 2	INP2	0Ch
(Do not setup.)	-	0Dh
Alarm attribute output	ALM-ATB	0Eh
(Do not setup.)	-	0Fh
Main power supply injection output	P-ON	10h

Attention :

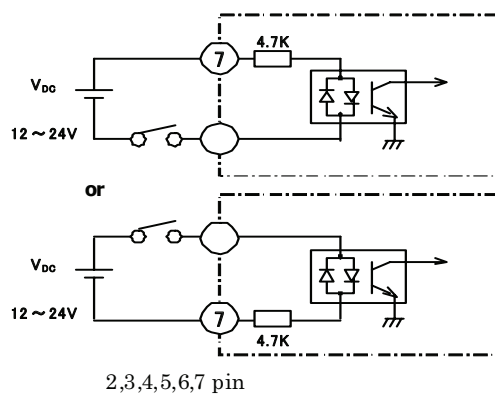
- Same function can be assigned to 2 or more output signals.
- Control output pin set to invalid always has the output transistor turned OFF.
- Do not change the setup value shown in the table.

Others

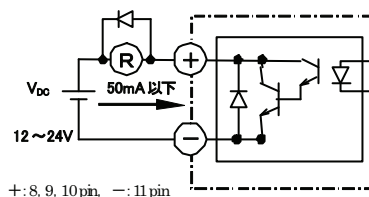
Name	Symbol	Connector Pin No.	Description	Circuit
Power supply input	COM+	1	- Connect to the + terminal of an external DC power supply (12 to 24 V) - Use a 12 V (±5%) to 24 V (±5%) power supply	—
	COM-	11	- Connect to the — terminal of an external DC power supply (12 to 24 V) - The capacity of power supply varies depending on the input and output circuit configuration. 0.5A or more is recommended.	—
Frame ground	FG	Shell 26	- Internally connected to the earth terminal.	—
Signal ground	GND	12	- Signal ground - Internally insulated from the control signal power supply (COM-).	—
Reserved	-	24/25	- Don't connect, please	—

Input and output signal interface

i - 1



o - 1

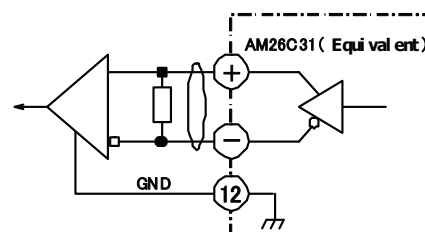


Note) If you want to directly driver a relay, In parallel with the relay.

Please install the diode in the direction shown above.

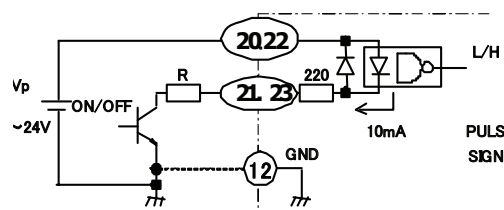
$V_{CEsat}=1.2V$

D o - 1

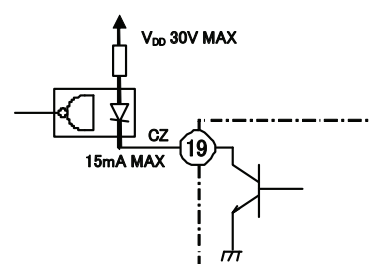


D i - 1

For open collector



D o - 2



6-3 Encoder Connector X3

Description	Connector Pin No.	Symbol
Encoder power supply output	1	E5V
	2	E0V (*Remark 1)
—	3	—
	4	—
Encoder Signal input/out put (Serial Signal)	5	PS
	6	/PS
Frame ground	shell	FG

* Remark 1) The E0V of the encoder power supply output is connected with the control circuit ground of the connector X3 .

6-4 Motor and Power Connector X4

Size B,C of 200V System

	Terminal Symbol	Terminal Name	Description				
X4	U(red)	Motor connection	Connect each phase of the motor winding. U: U phase V: V phase W: W phase				
	V(gray)						
	W(black)						
	B1(gray)	Regen. resistor connection	If the drive gets over regeneration alarm, connect an external regen resistor (prepared by customer) between B1 and B2.				
	B2(gray)						
	L1C(red)	Control power supply input	220V	Single phase 220~240 V	+ 5%	, 50/60Hz input	
	L2C(red)				- 10%		
	L1(black)	Main power supply input	220V	Single phase 220~240 V	+ 5%	, 50/60Hz input	
	L2(black)				- 10%		
		Earth	Earth terminal for grounding。				

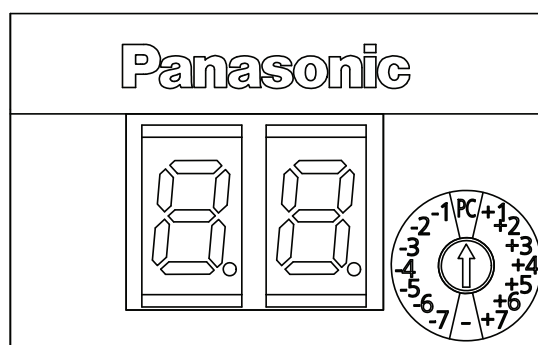
Please select the ferrule length between 12mm ~ 15mm. Short ferrule pins can not be fixed during the insertion.
Ferrule pin of DNH4 -112 made in DINKEL (4mm diameter) is recommended.

※Tighten the fixing screws to the case at screw torque of 0.4~0.6N· m or less.

※While not use the ferrule pin, ensure that all the cables into the connector, to avoid short circuits.

6-5 Front panel

■ Configuration of Front panel



■ Rotary switch(RSW)

By manipulating the RSW, Pr.0.03(selection of stiffness at real-time auto-gain tuning) was corrected by setting the RSW, and can be changed from the front panel gain control.

RSW setting	The stiffness correction	Example) Pr0. 03=8		Parameter Pr0.03 is changed
		Stiffness after correction	LED Display	
PC	± 0	8	Pc	Possible
+1	+1	9	9	Impossible
+2	+2	10	10	
+3	+3	11	11	
+4	+4	12	12	
+5	+5	13	13	
+6	+6	14	14	
+7	+7	15	15	
-	± 0	8	8	
-7	-7	1	1	
-6	-6	2	2	
-5	-5	3	3	
-4	-4	4	4	
-3	-3	5	5	
-2	-2	6	6	
-1	-1	7	7	

■ Operation method

When power is turned on after the show check pattern, and displays the following normal.
If you operate the RSW, LED displays a real-time stiffness after adjustment for the RSW.
However, in the event that an alarm occurs, alarm codes (main and sub) display.

- During warnings occur, the display will flash slowly.
- When an error occurs, the display switches to cause an error with flashing numbers.
- Rotary Switches is a length of 4mm and a width of 1mm ,so flat-blade screwdriver to set the rotary switch that is less than 4mm in width and thickness of 1mm or less.

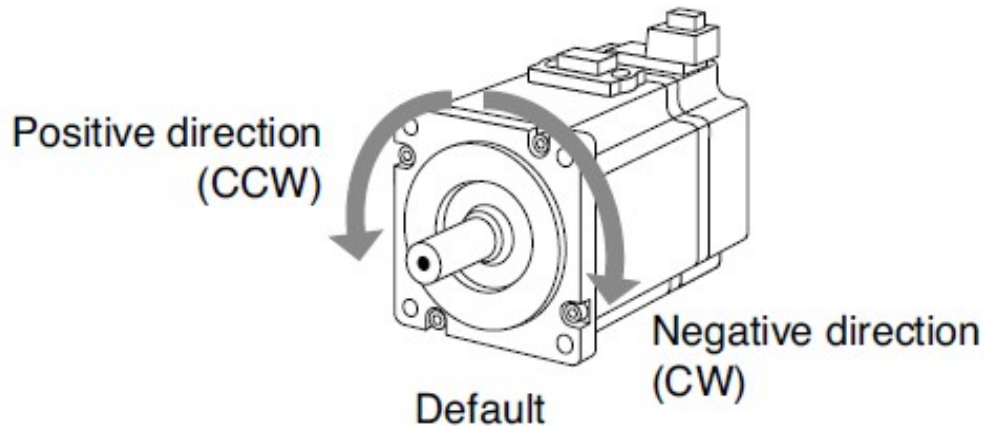
Class (0)

Pr0.00	Rotational direction setup	Range	Default	Unit
		0 - 1	1	-

Setup the relation between the direction of command and direction of motor rotation

0 : Motor runs in CW in response to positive direction command

[1] : Motor runs in CCW in response to positive direction command



Pr0.02	Real-time auto tuning setup	Range	Default	Unit
		0 - 6	1	-

You can set up the action mode of the real-time auto-gain tuning.

Setup Value	Mode	Varying degree of load inertia in motion
0	Invalid	Real-time auto-gain tuning function is disabled.
[1]	Standard	Basic mode. Do not use unbalanced load, friction compensation or gain switching.
2	Positioning	Main application is positioning.
3	Vertical axis	With additional features to the positioning mode - use this mode to positively and effectively compensate for unbalanced load to the vertical axis or minimize variations in setting time
4	Friction Compensation	With additional features to the vertical axis mode
5	Load char. Measurement	Estimate the load characteristics without changing current parameter setting.
6	Customized	Functions of real-time auto-gain tuning can be customized to meet the requirements

*** for more detail please refer Panasonic A5 manual**

Pr0.03	Selection of machine stiffness at real-time auto tuning setup	Range	Default	Unit
		0 - 31	1	-
Pr0.04	Inertia Ratio	Range	Default	Unit
		0 - 10000	250	%
Pr0.06*	Command pulse rotational direction setup	Range	Default	Unit
		0 - 1	0	-
Pr0.07*	Command pulse input mode setup	Range	Default	Unit
		0 - 3	1	-
0 or 2 : 2-phase input (AB phase) 1 : CW - CCW 3 : Pulse + Direction				
Pr0.08*	Command pulse counts per motor revolution	Range	Default	Unit
		0 - 20 Bit	10000	Pulses
Pr0.09	1 st Numerator of electronic gear	Range	Default	Unit
		0 - 2 ³⁰	0	-
Pr0.10	Denominator of electronic gear	Range	Default	Unit
		0 - 2 ³⁰	10000	-
Pr0.11*	Output pulse counts per motor revolution	Range	Default	Unit
		0 - 262144	2500	Pulses
Pr0.12*	Reversal of pulse output logic	Range	Default	Unit
		0 - 3	0	-
[0] or 2 : Non reversal 1 or 3 : Reversal				
Pr0.13	1 st Torque limit	Range	Default	Unit
		0 - 500	300	%

*** for more detail please refer Panasonic A5 manual**

Pr0.14	Position Deviation excess setup	Range	Default	Unit
		0 - 134,217,728	1000000	Command unit

Pr0.15*	Absolute encoder setup	Range	Default	Unit
		0 - 2	1	Pulses

0 : Use as an absolute encoder

[1] : Use as an incremental encoder

2 : Use as an absolute encoder, but ignore multi-turn count over

Pr0.16	External regenerative resistor setup	Range	Default	Unit
		0 - 3	-	-

*** for more detail please refer Panasonic A5 manual**

Class (1)

Pr1.00	1 st Gain of position loop	Range	Default	Unit
		0 - 30000	115	0.1/s

Pr1.01	1 st Gain of velocity loop	Range	Default	Unit
		0 - 32767	90	0.1Hz

Pr1.02	1 st Time constant of velocity loop integration	Range	Default	Unit
		0 - 10000	600	0.1ms

Pr1.03	1 st Filter of speed detection	Range	Default	Unit
		0 - 5	0	-

Pr1.04	1 st time constant of torque filter	Range	Default	Unit
		0 - 2500	300	0.01ms

Pr1.05	2 nd Gain of position loop	Range	Default	Unit
		0 - 30000	115	0.1/s

Pr1.06	2 nd Gain of velocity loop	Range	Default	Unit
		0 - 32767	90	0.1Hz

Pr1.07	2 nd Time constant of velocity loop integration	Range	Default	Unit
		0 - 10000	600	0.1ms

Pr1.08	2 nd Filter of speed detection	Range	Default	Unit
		0 - 5	0	-

Pr1.09	2 nd time constant of torque filter	Range	Default	Unit
		0 - 2500	300	0.01ms

Pr1.10	Velocity feed forward gain	Range	Default	Unit
		0 - 1000	300	0.10%

*** for more detail please refer Panasonic A5 manual**

Pr1.11	Velocity feed forward filter	Range	Default	Unit
		0 - 6400	50	0.01ms
Pr1.12	Torque feed forward gain	Range	Default	Unit
		0 - 1000	0	0.10%
Pr1.13	Torque feed forward filter	Range	Default	Unit
		0 - 6400	0	0.01ms
Pr1.14	2 nd Gain setup	Range	Default	Unit
		0 - 1	1	-
Pr1.15	Mode of position control switching	Range	Default	Unit
		0 - 10	0	-
Pr1.16	Delay time of position control switching	Range	Default	Unit
		0 - 10000	50	0.1ms
Pr1.17	Level of position control switching	Range	Default	Unit
		0 - 20000	50	-
Pr1.18	Hysteresis at position control switching	Range	Default	Unit
		0 - 20000	33	-
Pr1.19	Position gain switching time	Range	Default	Unit
		0 - 10000	33	0.1ms

*** for more detail please refer Panasonic A5 manual**

Class (2)

Pr2.00	Adaptive filter mode setup	Range	Default	Unit
		0 - 4	0	-

Pr2.01	1 st Notch frequency	Range	Default	Unit
		50 - 5000	5000	Hz

Pr2.02	1 st Notch width selection	Range	Default	Unit
		0 - 20	2	-

Pr2.03	1 st Notch depth selection	Range	Default	Unit
		0 - 99	0	-

Pr2.04	2 nd Notch frequency	Range	Default	Unit
		50 - 5000	5000	Hz

Pr2.05	2 nd Notch width selection	Range	Default	Unit
		0 - 20	2	-

Pr2.06	2 nd Notch depth selection	Range	Default	Unit
		0 - 99	0	-

Pr2.07	3 rd Notch frequency	Range	Default	Unit
		50 - 5000	5000	Hz

Pr2.08	3 rd Notch width selection	Range	Default	Unit
		0 - 20	2	-

Pr2.09	3 rd Notch depth selection	Range	Default	Unit
		0 - 99	0	-

Pr2.10	4 th Notch frequency	Range	Default	Unit
		50 - 5000	5000	Hz

*** for more detail please refer Panasonic A5 manual**

Pr2.11	4 th Notch width selection	Range	Default	Unit
		0 - 20	2	-
Pr2.12	4 th Notch depth selection	Range	Default	Unit
		0 - 99	0	-
Pr2.13	Selection of damping filter switching	Range	Default	Unit
		0 - 3	0	-
Pr2.14	1 st Damping frequency	Range	Default	Unit
		0 - 2000	0	0.1Hz
Pr2.16	2 nd Damping frequency	Range	Default	Unit
		0 - 2000	0	0.1Hz
Pr2.18	3 rd Damping frequency	Range	Default	Unit
		0 - 2000	0	0.1Hz
Pr2.20	4 th Damping frequency	Range	Default	Unit
		0 - 2000	0	0.1Hz
Pr2.15	1 st Damping filter setup	Range	Default	Unit
		0 - 1000	0	0.1Hz
Pr2.17	2 nd Damping filter setup	Range	Default	Unit
		0 - 1000	0	0.1Hz
Pr2.19	3 rd Damping filter setup	Range	Default	Unit
		0 - 1000	0	0.1Hz
Pr2.21	4 th Damping filter setup	Range	Default	Unit
		0 - 1000	0	0.1Hz

*** for more detail please refer Panasonic A5 manual**

Pr2.22	Positional command smoothing filter	Range	Default	Unit
		0 - 10000	0	0.1ms

Pr2.23	Positional command FIR filter	Range	Default	Unit
		0 - 10000	0	0.1ms

Class (4)

Pr4.00	SI1 input selection	Range	Default	Unit
		0 - 16777225	3	-

Pr4.01	SI2 input selection	Range	Default	Unit
		0 - 16777225	4	-

Pr4.02	SI3 input selection	Range	Default	Unit
		0 - 16777225	7	-

Pr4.03	SI4 input selection	Range	Default	Unit
		0 - 16777225	136	-

Pr4.04	SI5 input selection	Range	Default	Unit
		0 - 16777225	130	-

Pr4.05	SI6 input selection	Range	Default	Unit
		0 - 16777225	129	-

Pr4.10	SO1 output selection	Range	Default	Unit
		0 - 16777225	1	-

Pr4.11	SO2 output selection	Range	Default	Unit
		0 - 16777225	4	-

Pr4.12	SO3 output selection	Range	Default	Unit
		0 - 16777225	2	-

*** for more detail please refer Panasonic A5 manual**

Assign functions to SI1 to SI6 inputs

These parameters are presented in hexadecimal

Setup procedure described below

000000**h [**] with function number

Function Number for SI

Title	Symbol	Setup value	
		a-contact	b-contact
Invalid	-	00h	Do not setup.
Positive direction over-travel inhibition input	POT	01h	81h
Negative direction over-travel inhibition input	NOT	02h	82h
Servo-ON input * 1	SRV-ON	03h	83h
Alarm clear input	A-CLR	04h	Do not setup.
Reserve	-	05h	85h
Gain switching input	GAIN	06h	86h
Deviation counter clear input * 2	CL	07h	Do not setup.
Command pulse inhibition input * 3	INH	08h	88h
Torque limit switching input	TL-SEL	09h	89h
Damping control switching input 1	VS-SEL1	0Ah	8Ah
Damping control switching input 2	VS-SEL2	0Bh	8Bh
Electronic gear switching input 1	DIV1	0Ch	8Ch
Electronic gear switching input 2	DIV2	0Dh	8Dh
Reserve	-	0Eh~13H	8Eh~9Eh
Forced alarm input	E-STOP	14h	94h
Reserve	-	15h	95h

*** for more detail please refer Panasonic A5 manual**

Function Number for SO

Title	Symbol	Setup value
Invalid	-	00h
Alarm Output	ALM	01h
Servo-Ready output	S-RDY	02h
External brake release signal	BRK-OFF	03h
Positioning complete output	INP	04h
Reserve	-	05h
Torque in-limit signal output	TLC	06h
Zero-speed detection output signal	ZSP	07h
Reserve	-	08h
Alarm output 1	WARN1	09h
Alarm output 2	WARN2	0Ah
Positional command ON/OFF output	P-CMD	0Bh
Positioning complete 2	INP2	0Ch
Reserve	-	0Dh
Alarm attribute output	ALM-ATB	0Eh
Reserve	-	0Fh
Main power supply injection output	P-ON	10h

Pr4.31	In-position range	Range	Default	Unit
		0 - 262144	10	-

Pr4.32	Position complete output setup	Range	Default	Unit
		0 - 3	0	-

Pr4.33	INP hold time	Range	Default	Unit
		0 - 30000	0	1ms

Pr4.34	Zero speed	Range	Default	Unit
		10 - 20000	50	r/min

Pr4.36	At speed (arrival)	Range	Default	Unit
		10 - 20000	1000	r/min

*** for more detail please refer Panasonic A5 manual**

Pr4.37	Mechanical brake action at stalling setup	Range	Default	Unit
		0 - 10000	0	1ms

Pr4.38	Mechanical brake action at running setup	Range	Default	Unit
		0 - 10000	0	1ms

Pr4.39	Brake release speed setup	Range	Default	Unit
		30 - 3000	30	r/min

Pr4.40	Warning output 1 selection	Range	Default	Unit
		0 - 11	0	-

Pr4.41	Warning output 2 selection	Range	Default	Unit
		0 - 11	0	-

Setup Value	Alarm	Content
[0]	---	Ored of all alarms.
1	Overload protection	Load factor is 85% or more the protection level.
2	Over-regeneration alarm	Regenerative factor is 85% or more the protection level.
3	Battery alarm	Battery voltage is 3.2V or lower.
4	Fan alarm	Fan has stopped for 1 sec.
5	Encoder communication Alarm	The number of successive encoder communication errors exceeds the specified value.
6	Encoder overheat alarm	The encoder detects overheat alarm.
7	Oscillation detection alarm	Oscillation or vibration is detected.
8	Lifetime detection alarm	Life expectancy of capacitor or fan become short.
9		

Pr4.42	2 nd in position range	Range	Default	Unit
		0 - 262144	10	-

*** for more detail please refer Panasonic A5 manual**

Class (5)

Pr5.00	2 nd Numerator of electronic gear	Range	Default	Unit
		0 - 1073741824	0	-

Pr5.01	3 rd Numerator of electronic gear	Range	Default	Unit
		0 - 1073741824	0	-

Pr5.02	4 th Numerator of electronic gear	Range	Default	Unit
		0 - 1073741824	0	-

Pr5.03	Denominator of pulse output division	Range	Default	Unit
		0 - 262144	0	-

Pr5.04	Over-travel inhibit input setup	Range	Default	Unit
		0 - 2	1	-

Setup Value	Operation
0	POT → Inhibit of positive direction travel
	NOT → Inhibit of negative direction travel
[1]	Disable POT, NOT
2	POT or NOT inputs activates Err38.0 Run inhibit input protection

Pr5.05	Sequence at over-travel inhibit	Range	Default	Unit
		0 - 2	0	-

Pr5.06	Sequence at servo-off	Range	Default	Unit
		0 - 9	0	-

Pr5.07	Sequence at main power off	Range	Default	Unit
		0 - 9	0	-

*** for more detail please refer Panasonic A5 manual**

Pr5.10	Sequence at alarm	Range	Default	Unit
		0 - 7	0	-
Pr5.11	Torque setup for quick stop	Range	Default	Unit
		0 - 500	0	%
Pr5.12	Over-load level setup	Range	Default	Unit
		0 - 500	0	%
Pr5.13	Over-speed level setup	Range	Default	Unit
		0 - 20000	1	r/min
Pr5.14	Motor working range setup	Range	Default	Unit
		0 - 1000	10	0.1 Revo.
Pr5.15	I/F reading filter	Range	Default	Unit
		0 - 3	0	-
Pr5.16	Alarm clear input setup	Range	Default	Unit
		0 - 1	1	-
Pr5.17	Counter clear input mode	Range	Default	Unit
		0 - 4	3	-
Pr5.18	Invalidation of command pulse inhibit input	Range	Default	Unit
		0 - 1	1	-
Pr5.19	Command pulse inhibit input reading setup	Range	Default	Unit
		0 - 4	0	-
Pr5.20	Position unit selection	Range	Default	Unit
		0 - 1	0	-

*** for more detail please refer Panasonic A5 manual**

Pr5.21	Selection of torque limit	Range	Default	Unit
		1 - 3	1	-

You can set up the torque limiting method

Setup Value	Positive direction	Negative direction
[1]	1 st Torque limit	
2	1 st Torque limit	2 nd Torque limit
3	TL-SEL Off : 1 st Torque limit	
	TL-SEL On : 2 nd Torque limit	

Pr5.22	2 nd Torque limit	Range	Default	Unit
		0 - 500	300	-

Pr5.32	Command pulse input maximum setup	Range	Default	Unit
		250 - 4000	4000	k pulse/s

Pr5.33	Pulse regenerative output limit setup	Range	Default	Unit
		0 - 1	0	-

*** for more detail please refer Panasonic A5 manual**

Class (6)

Pr6.02	Velocity deviation excess setup	Range	Default	Unit
		0 - 20000	0	r/min

Pr6.05	Position 3 rd gain valid time	Range	Default	Unit
		0.0 - 1000.0	0.0	ms

Pr6.06	Position 3rd gain scaling factor	Range	Default	Unit
		50 - 1000	100	%

Pr6.07	Torque command additional value	Range	Default	Unit
		-100 - 100	0	%

Pr6.08	Positive direction torque compensation value	Range	Default	Unit
		-100 - 100	0	%

Pr6.09	Negative direction torque compensation value	Range	Default	Unit
		-100 - 100	0	%

Pr6.14	Quick stop time at alarm	Range	Default	Unit
		0 - 1000	200	ms

Pr6.15	2 nd over speed level setup	Range	Default	Unit
		0 - 20000	0	r/min

Pr6.18	Power-up wait time	Range	Default	Unit
		0.0 - 10.0	0.0	s

Pr6.27	Warning latch time selection	Range	Default	Unit
		0 - 10	5	s

*** for more detail please refer Panasonic A5 manual**

Pr6.31	Real-time auto tuning estimation speed	Range	Default	Unit
		0 - 3	1	-

0 : No change

1 : Almost constant

2 : Slower change

3 : Faster change

Pr6.37	Oscillation detection level	Range	Default	Unit
		0.0 - 100.0	0.0	%

Pr6.38	Warning mask setup	Range	Default	Unit
		-32768 - 32768	4	-

*** for more detail please refer Panasonic A5 manual**