W series replacement manual

OMNUC G SERIES

R88M－G□（AC Servomotors）

R88D－GT□（AC Servo Drives）

From **OMNUC W** SERIES

■ Introduction

This material is an explanatory material to replace it from "OMNUC W series" to "OMNUC G series".

■ Attention

"OMNUC G series" And, please peruse the following user's manuals and this material to use peripherals safely and correctly before it uses it.

1)"OMNUC W series" User's manual (catalog number: I531)

2) User's manual of controller being used now

3)"OMNUC G series" User's manual (catalog number: I562)

Please use it after examining the specification of specification of the machine that uses it now and "OMNUC G series" enough when you replace it.

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Chapter1. Overview

1-1.Functional Differences between OMNUC G Series and OMNUC W Series

■ Speed Frequency Responsiveness

W Series	G Series
400Hz	1KHz

■ Type of Servomotor Output Capacity According to the Servo Drive Input Power

3,000r/min Cylindrical Type

Input Power	W Series	G Series
Single-phase AC100V/115V	30w / 50w / 100w / 200w	50w / 100w / 200w / 400w
Single-phase AC200V/230V	30w / 50w / 100w / 200w / 400w	50w / 100w / 200w / 400w
Three-phase AC200V/230V	750w / 1.0kw / 1.5kw / 2.0kw / 3.0kw / 4.0kw / 5.0kw	750w / 1.0kw / 1.5kw / 2.0kw / 3.0kw / 4.0kw / 5.0kw

3,000r/min Flat Type

Input Power	W Series	G Series
Single-phase AC100V/115V	100w / 200w	50w / 100w / 200w / 400w
Single-phase AC200V/230V	100w / 200w / 400w	50w / 100w / 200w / 400w
Three-phase AC200V/230V	750w / 1.5kw	−

1,000r/min Type

Input Power	W Series	G Series
Three-phase AC200V/230V	300w / 600w / 900w / 1.2kw / 2.0kw / 3.0kw / 4.0kw / 5.5kw	900w / 2.0kw / 3.0kw / 4.5kw / 6.0kw

1,500r/min Type ⇔ 2,000r/min Type

Input Power	W Series(1,500r/min)	G Series(2,000r/min)
Three-phase AC200V/230V	450w / 850w / 1.3kw / 1.8kw / 2.9kw / 4.4kw / 5.5kw / 7.5kw / 11.0kw / 15.0kw	1.0kw / 1.5kw / 2.0kw / 3.0kw / 4.0kw / 5.0kw / 7.5kw (1,500r/min)

■ Control Functions

Control Function	W Series	G Series
Speed Control	Speed control via analogue input （Speed command voltage）. Setting range of command voltage: 150 to 3,000【Unit:0.01V/Rated rotation speed】	Speed control via analogue input (Speed command voltage). Setting range of command voltage: 10 to 2,000【Unit:(r/min)/V】
Position Control	Position control via pulse string input signal. Pulse types are selected among forward/reverse pulses, feed pulse/direction signal, 90°phase difference signal (phase A/phase B),(1, 2, 4 multiplication),and their respective positive and negative logics. Maximum response pulse frequency ·Open collector input:200kpps ·Line driver input:500kpps Note : When live driver 90° phase difference signal input: 1 multiplication : 500kpps 2 multiplication : 400kpps 4 multiplication : :200kpps	Position control via pulse string input signal. Pulse types are selected among forward/reverse pulses, feed pulse/direction signal, 90°phase difference signal (phase A/phase B)(4 multiplication). Maximum response pulse frequency ·Open collector input:200kpps ·Line driver input:500kpps (Line driver interface wiring:2Mpps)

Control Function	W Series	G Series
Torque Control	Torque control via analogue input (Torque command voltage) Setting range of command voltage: 10 to 100【Unit:0.1V/Rated torque】	Torque control via analogue input (Torque command voltage) Setting range of command voltage : 10 to 100【Unit:0.1V/Rated torque】
Internally Set Speed Control	Speed control by switching Speeds1 to 3 + rotation direction set with the parameters. (3 speeds×2(Forward/Reverse) of internal speed setting are available.)	Speed control of Speeds 1 to 8 set with the parameters. (8 speeds of internal speed setting are available.)
Internally Set Speed Control + Speed Control	Speed control via internally set speeds and analogue input signal (Speed command voltage) is available. (3 speeds × rotation direction switching of internal speed setting are available.)	Speed control via internally set speeds and analogue input signal (Speed command voltage) is available. When in speed control via analogue input signal (Speed command voltage), only 3 speeds (Forward/Reverse switching unavailable) of the internal speed can be used.
Internally Set Speed Control + Position Control	Position control via pulse string input and speed control using internally set speeds is available. (3 speeds × rotation direction switching of internal speed setting are available.)	Position control via pulse string input and speed control using internally set speeds is available. (8 speeds of internal speed setting are available.)
Internally Set Speed Control + Torque Control	Torque control via analogue input (Torque command voltage) and speed control using internally set speeds is available. (3 speeds × rotation direction switching of internal speed setting are available.)	Torque control via internally set speeds and analogue input (Torque command voltage) is available. (8 speeds of internal speed setting are available.)
Position Control + Speed Control	Position control and speed control can be switched. Speed control is selected when the Control Mode Switching Signal (TVSEL) is turned ON and position control is selected when it is turned OFF.	Position control and speed control can be switched. Speed control is selected when the Control Mode Switching Signal (TVSEL) is turned ON and position control is selected when it is turned OFF.
Position Control + Torque Control	Position control and torque control can be switched. Torque control is selected when the Control Mode Switching Signal (TVSEL) is turned ON and position control is selected when it is turned OFF.	Position control and torque control can be switched. Torque control is selected when the Control Mode Switching Signal (TVSEL) is turned ON and position control is selected when it is turned OFF.
Torque Control + Speed Control	Torque control and speed control can be switched. Speed control is selected when the Torque/Speed Control Mode Switching Signal (TVSEL) is turned ON and torque control is selected when it is turned OFF. Command voltage, and the ratio of Servomotor rotation speed and output torque can be set with the parameters.	Torque control and speed control can be switched. Speed control is selected when the Control Mode Switching Signal (TVSEL) is turned OFF and torque control is selected when it is turned ON. Command voltage, and the ratio of Servomotor rotation speed and output torque can be set with the parameters.

Chapter1.Overview

Control Function	W Series	G Series
Speed Control with Position Lock Function	Control mode with the position lock added to speed control. when the Position Lock Command (PLOCK) is input, speed control is shifted to position control, and minute rotation due to the temperature drift at Servo On does not occur. Set the rotation speed at which position lock is performed with the parameters. If the Position Lock Command (PLOCK) is turned ON during the Servomotor rotation, the motor decelerates at the value set in the Soft Start Deceleration Time (Cn-23) until the Position Lock Rotation Speed (Cn-OF), and the Position Loop (Emergency Stop) occurs when the deceleration drops below the Position Lock Rotation Speed (Cn-OF).	For the G Series, the Speed Zero Designation Input (VZERO) can be used for this function instead. When the Speed Zero Designation Input (VZERO) is turned OFF in speed control, the speed designation becomes zero. When inputting the Speed Zero Designation Input, Servo Lock status is retained, not position lock of the Position Loop. When the Speed Zero Designation Input (VZERO) is turned OFF during the Servomotor rotation, the motor decelerates to stop at the value set with the parameters.
Position Control (Pulse Prohibit Input Enabled)	In position control, control can be performed so that the designation pulses are not taken in while the Pulse Prohibit Input (IPG) is turned ON.	In position control, control can be performed so that the designation pulses are not taken in while the Pulse Prohibit Input (IPG) is turned OFF.

■ Monitor Functions

The Servo Drive's operation status is displayed on the Parameter Unit.

Monitor Content	Explanation	W Series	G Series
Speed Feedback	Displays the Servomotor's rotation speed.	r/min	r/min
Speed Command	Displays command values for the Speed Loop. When in position control via the pulse string input, 0 is displayed.	r/min	×
Torque Command	Displays command values for the Current Loop.	%(rated torque=100%)	%(rated torque=100%)
Number of Pulses from Phase-Z	Displays the rotation position from phase-Z.	Pulses (converted by 4 multiplication)	×
Electrical Angle	Displays the Servomotor's electrical angle.	degree	×
Internal Status	Displays the I/O data in the Servo Drive.	Input/Output (displayed in bits)	Input/Output (status display))
Command Pulse Speed	Displays the converted value of the command pulse frequency.	r/min	×
Position Deviation (Deviation Counter)	Displays accumulated pulses in the deviation counter.	command units	pulses
Accumulated Load Rate	Displays the effective torque.	% (rated torque=100%,10 sec cycle)	×
Regeneration Load Rate	Displays the regeneration absorption power of the regeneration resistor.	%	%
Input Pulse Counter	Displays the count of input pulses.	command units (displayed in hexadecimal)	pulses
Feedback Pulse Counter	Displays the count of feedback pulses.	pulses (converted by 4 ultiplication, displayed in hexadecimal)	pulses

■ JOG Operation

The Servomotor's forward / reverses operating range via the Parameter Unit.

W Series	G Series
0~5,000r/min	0~500r/min

■ Command Offset Automatic Adjustment

Analogue input voltage offset of the torque command and speed command is adjusted automatically.

W Series	G Series
Adjustable on the front panel and with the Parameter Unit. Can be implemented at Servo OFF status.	Adjustable only with the front keys. (Cannot be set with the Parameter Unit.) Can be implemented at Servo ON status.

■ Electronic Gear Function

The Servomotor is rotated for the number of pulses obtained by multiplying the command pulses by the electronic gear ratio.

W Series	G Series
The electronic gear ratio is set with the parameters. (Numerator:G1,Denominator:G2) The setting range : When G1,G2= 1 to 65,535 : $0.01 \leqq (G1/G2) \leqq 100$ G1 = Feedback pulses (4 multiplication)/rotation G2 = Command pulse amount/rotation	The electronic gear ratio is set with the parameters. (Numerator : G1, Numerator multiplier : n, Denominator : G2) When the numerator $G1 \neq 0 : (G1 \times 2^n)/G2$ $G1 \times 2^n =$ Feedback pulses (4 multiplication)/rotation G2 = Command pulses per rotation When the numerator G1=0 : Encoder resolution/G2 G2 = Command pulses per rotation

■ Analogue Monitor

Function to reduce the positioning time.

W Series	G Series
Any 2 circuits of the following can be allocated to the monitor output connector output (CN4) ① Motor rotation speed (Speed monitor): 1V/1,000r/min or 1V/250r/min ,1V/125r/min ② Speed command:1V/1,000r/min ③ Torque command:1V/rated torque ④ Position deviation: 0.05v/command units or 0.05v/100 command units. ⑤ Command pulse frequency:1V/1,000r/min	Any one circuit of the following can be allocated to the speed monitor output pin (SP). ① Motor rotation speed (Speed monitor): 6V/47r/min , /188r/min , /750r/min , /3000r/min ,1.5V/3000r/min ② Speed command: 6V/47r/min , /188r/min , /750r/min , /3000r/min , 1.5V/3000r/min Any one circuit of the following can be allocated to the torque monitor output pin (IM). ③ Torque command 3V/rated torque , /200% torque , /400% torque ④ Position deviation: 3V/31pulses , /125 pulses , /500 pulses , /2000 pulses , 3V/8000 pulses
Offset adjustment:±127×17mV Scaling adjustment:±127×0.4%	None

■ Encoder Dividing Function

The number of pulses can be set for the encoder signals output from the Servo Drive,

	W Series	G Series
INC	3000r/min 750w or less, and flat type Servomotors :16 to 2,048(pulses/rotation) 3000r/min 1.0kw or more, and 1,000r/min Servomotors : 16 to 16,384(pulses/rotation)	When Pn45=0, (Pn44:Pulse output dividing numerator)×4 WhenPn45≠0, (Pn44/Pn45)× Encoder resolution
ABS	16 to 16,384(pulses/rotation)	Pn44:Pulse output dividing numerator Pn45:Pulse output dividing denominator

■ Soft Start Function【Speed control, Internal setting】

Starts and stops the Servomotor at the acceleration/deceleration time set with the parameters.

	W Series	G Series
Acceleration/Deceleration Time Setting	0 to 10,000 (ms / max.. rotation speed)	0 to 5,000 (2ms / 1000r/min)
S shape	No setting	0 to 500 (2ms)

■ Position Acceleration/Deceleration (Pulse Smoothing) Function【Position Control】

This function helps smoothly follow high-frequency commands by adding acceleration/deceleration to command pulses.

W Series	G Series
0 to 64.00 ms	Setting in 7 steps

■ Warning Output

W Series	G Series
Outputs overload warning and regeneration overload warning.	Outputs overload warning; regeneration overload, battery power dropping and fan lock warning.

■ Positioning Completed Output

W Series	G Series
Outputs position deviation amount within the set range. 2-step positioning completion width can be set.	Select one of the following setting conditions. ① Outputs position deviation amount within the set range. ② Outputs position deviation amount within the set range when there's no position command. ③ Outputs position deviation amount within the set range when there's no position command and also the Zero Speed Detection Signal is turned ON. ④ Outputs position deviation amount within the set range when there's no position command. Then ON status is retained until the next position command signal is input.

■ Reverse Rotation Mode

Forward/Reverse commands can be switched via the parameter settings.

W Series	G Series
Sets with one parameter (reverse rotation mode) regardless of the control mode.	Different setting parameters are used depending on the control mode. Command pulse rotation direction setting (in position control), speed command input reverse (in speed control) and torque command input reverse (in torque control) settings.

■ Break Interlock Output Mode

Outputs the timing signal interlocking the Servomotor energized status and rotation speed, and holding break.

W Series	G Series
Sets with the following three parameters. ・ Delay time from BKIR out signal OFF to Servo OFF. ・ Servomotor rotation speed at which BKIR output signal is turned OFF. ・ Wait time from Servo OFF to BKIR output signal OFF.	Sets with the following two parameters. ・ Delay time from BKIR output signal OFF to Servo OFF. ・ Wait time from Servo OFF to BKIR output signal OFF.

■ Output Signal Function Selection

W Series	G Series
・ Positioning completed 1 ・ Positioning completed 2 ・ Speed conformity ・ Servomotor rotation detection ・ Servo ready ・ Current limit detection ・ Speed limit detection ・ Break interlock ・ Warning output ・ Command pulse factor enabled Select and output three of the above output signals.. Multiple number of outputs can be allocated to the same pin No.	・ During torque limit ・ Zero speed detection ・ Warning signal ・ Over-regeneration warning ・ Overload warning ・ Battery power drop warning ・ Fan lock warning ・ Speed conformity Select and output two of the above eight output signals. There are fixed allocations for Positioning completed, Servo ready, Break interlock output。

■ Over Travel Sequence

	W Series	G Series
When Drive Prohibited	Select any of the following: ① DB operation during deceleration ・ Free DB status after stopping ・ Deviation counter content clear ② Free-running stop during deceleration ・ Free status after stopping ・ Deviation counter content clear ③ Emergency stop during deceleration ・ Free status after stopping ・ Deviation counter content clear ④ Emergency stop during deceleration ・ Servo Lock status after stopping ・ Deviation counter content clear	Select any of the following: ① DB operation during deceleration ・ Torque command = 0 in the drive prohibition direction after stopping ・ Deviation counter retained ② Torque command = 0 in the drive prohibition direction during deceleration ・ Torque command = 0 in the drive prohibition direction after stopping ・ Deviation counter retained Emergency stop during deceleration ・ Torque command = 0 in the drive prohibition direction after stopping.・ Deviation counter retained
When an Alarm Occurs	Select any of the following. ① DB operation during deceleration ・ DB status after stopping ・ Deviation counter content clear ② DB stopping during deceleration ・ Free status after stopping ・ Deviation counter content clear Free-running stop during deceleration ・ Free status after stopping ・ Deviation counter content clear	Select any of the following. ① DB operation during deceleration ・ DB status after stopping ・ Deviation counter retained ② Free-running stop during deceleration ・ DB status after stopping ・ Deviation counter retained ③ DB stop during deceleration ・ Free status after stopping ・ Deviation counter retained ④ Free-running stop during deceleration ・ Free status after stopping ・ Deviation counter retained

	W Series	G Series
When Servo OFF	Select any of the following. ① DB operation during deceleration ・ DB status after stopping ・ Deviation counter content clear ② DB stopping during deceleration ・ Free status after stopping ・ Deviation counter content clear ③ Free-running stop during deceleration ・ Free status after stopping ・ Deviation counter content clear	Select any of the following. ① DB operation during deceleration ・ DB status after stopping ・ Deviation counter content clear ② Free-running stop during deceleration ・ DB status after stopping ・ Deviation counter content clear ③ DB operation during deceleration ・ Free status after stopping ・ Deviation counter content clear ④ Free-running stop during deceleration ・ Free status after stopping ・ Deviation counter content clear ⑤ DB operation during deceleration ・ DB status after stopping ・ Deviation counter content retained ⑥ Free-running stop during deceleration ・ DB status after stopping ・ Deviation counter content retained ⑦ DB operation during deceleration ・ Free status after stopping ・ Deviation counter content retained ⑧ Free-running stop during deceleration ・ Free status after stopping ・ Deviation counter content retained ⑨ Emergency stop during deceleration ・ DB status after stopping ・ Deviation counter content clear ⑩ Emergency stop during deceleration ・ Free status after stopping ・ Deviation counter content clear
When Main Power OFF	The same as "When Servo OFF".	The same as "When Servo OFF".

■ Feed Forward Function (Position Control)

This function helps reduce positioning time by reducing accumulated pulses in the deviation counter.

W Series	G Series
Feed forward amount:0~100% Feed forward command filter:0~64.00ms	Speed feed forward:-200.0%~200.0% Feed forward filter time constant :0~64.00ms

■ Computer Monitor

Parameter settings can be made via a computer.

W Series	G Series
Wmon win CX-Drive	CX-Drive

■ Harmonics Current Suppression Measure

	W Series	G Series
30w to 5.0kw	DC reactor(DC reactor connection terminal included)	AC reactor(installed on the power line)
6.0kw or more	AC reactor(installed on the power line)	

1-2.Functions Not Available with the OMNUC G Series

■ Password Setting Function

W Series is equipped with a function to prohibit parameter rewrite by password setting.

■ Parameter Initialization

W Series can restore the settings to the default values with the Parameter Unit and front panel key operations.

G Series can do the same only with the computer setting tool (Cx-Drive).

■ Servomotor Origin Search

W Series is equipped with a function to rotate and stop the Servomotor at the origin pulse (phase Z) position of the encoder via the Parameter Unit and front panel key operations.

■ Bias Function

W Series is equipped with a function to reduce positioning time by adding bias rotation speed to speed commands when the deviation counter value exceeds the bias addition width.

■ Analogue Monitor Output Offset Adjustment / Scaling Function

W Series can perform offset adjustment of analogue monitor output and scale setting individually.

■ Option Unit

W Series is capable of using the Servo Drive as a slave unit of the network by mounting the DeviceNet option unit (R88A-NCW152-DRT) or MECHATROLINK-Ⅱ option unit (FNY-NS115) on the Servo Drive.

1-3.Names of Parts of the OMNUC G Series Servo Drives

■ Servo Drive Part Names
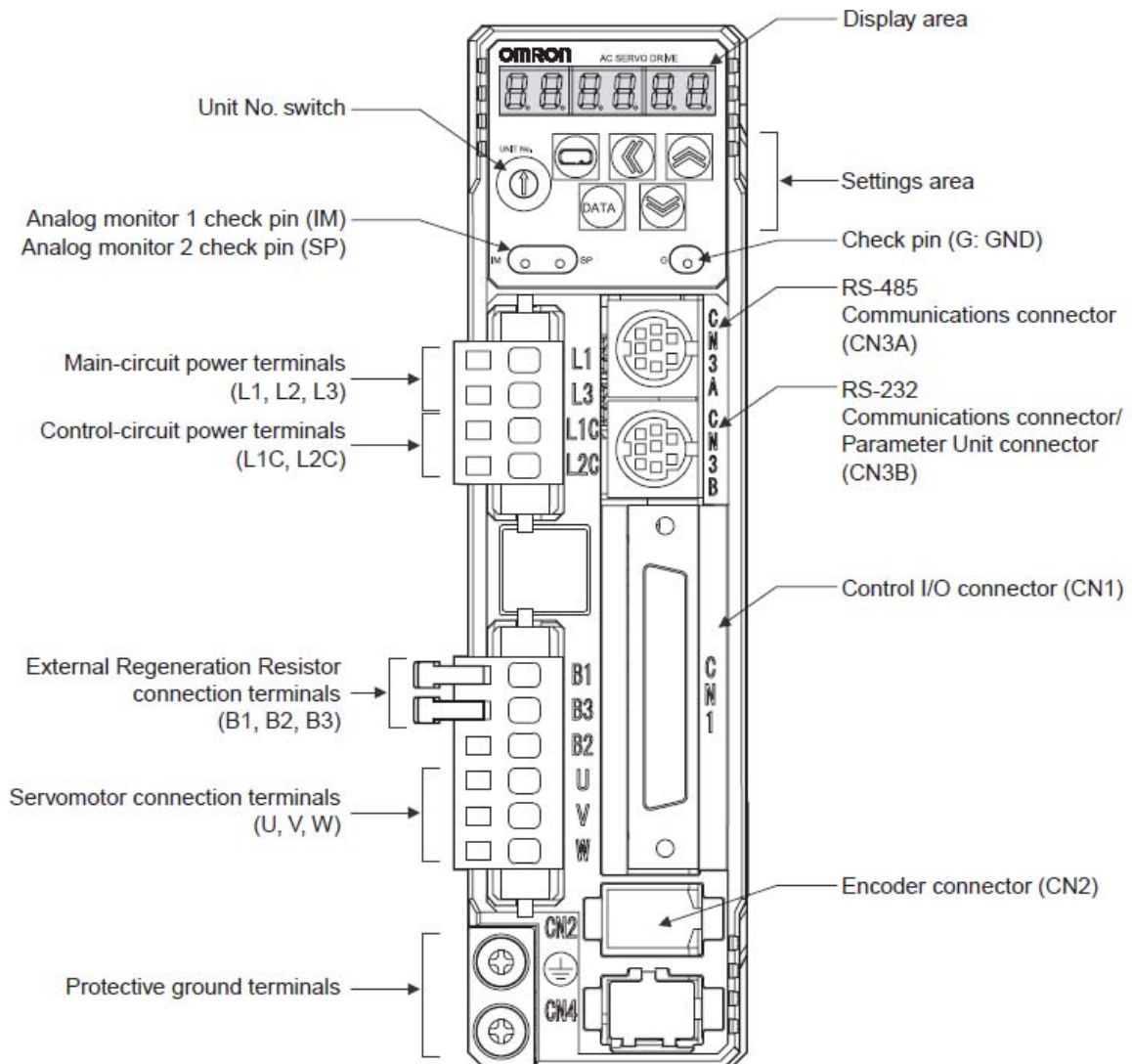
■ Servo Drive Part Functions

① Display Area

Shows the Servo Drive status, alarm code No. and parameters on the 6-digit 7-segment LED display.

② Check Pins

The actual Servomotor speed, command speed, torque, and accumulated pulses can be measured based on

the analogue voltage level by using an oscilloscope.

The type of output signal and output voltage level are set in the SP Selection (Pn07) and the IM Selection (Pn08).

③ Unit No. Switch

Unit No. in serial communications is set to a value from 0 to F.

The number is used to identify which Serve Drive the computer is accessing in RS232/485 communications between multiple Serve Drives and a

computer.

1-4.Names of Parts of the OMNUC W Series Servo Drives

Battery holder

Holds the backup battery for when a Servomotor with an absolute encoder is used.

(With top cover opened)

Analog Monitor Output Connector (CN5)

Rotation speed, torque command values, etc., are output in analog voltage. A special cable is used.

Battery Connector (CN8)

Connects the backup battery for the absolute encoder.

omron R88D-WT01H
AC SERVO DRIVER
200V   100W

Top cover (See note.)

Display Area

Displays Servo Driver status, alarm signals, parameters, etc., in five digits, 7-segment LED.

Settings Area

Used for setting parameters and monitoring Servo Driver status.

MODE/SET   DATA/«

Charge indicator

CHARGE   POWER

Power indicator

Lit when the control power is being supplied.

Lit when the main-circuit is powered. Even after the power is turned OFF, it remains lit as long as an electric charge remains in the main-circuit capacitor, so do not touch the Servo Driver's terminals during this period.

Option Unit Connector (CN10)

Used for connecting a DeviceNet Option Unit.

Parameter Unit Connector (CN3)

Used for connecting the Parameter Unit or for communicating with a computer.

Note: On the R88D-WT60H (6 kW), this connector is located to the left of the Display and Settings Areas.

CN3

L1
L2
⊕1
⊕2
⊖

Main-circuit power terminals

These are the input terminals for the main-circuit power supply.

CN1

L1C
L2C
B1
B2

Control-circuit power terminals

These are the connection terminals for the control-circuit power supply and the external regenerative energy resistance.

Control I/O Connector (CN1)

Used for control I/O signals.

U
V
W

Servomotor connection terminals

These are the connection terminals for the Servomotor power lines.

CN2

Encoder Connector (CN2)

Connects the encoder provided with the Servomotor.

Protective ground terminals

These are the ground terminals for preventing electric shock. Ground to 100 Ω or less.

Chapter 2. Replacement list

2-1.AC Servomotors/Servo Drives Replacement Lists

■ 3,000r/min Servomotors

Input Power	W Series			G Series		
	Servomotor Capacity	Servo Drive Model R88D-	Servomotor Model R88M-	Servomotor Capacity	Servo Drive Model R88D-	Servomotor Model R88M-
Single phase 100 V /115 V AC	30w	-WTA3HL	-W03030L/S	50w	-GTA5L	-G05030H/T
	50w	-WTA5HL	-W05030L/S	50w	-GTA5L	-G05030H/T
	100w	-WT01HL	-W10030L/S	100w	-GT01L	-G10030L/S
	200w	-WT02HL	-W20030L/S	200w	-GT02L	-G20030L/S
Single phase 200 V /230 V AC	30w	-WTA3H	-W03030H/T	50w	-GT01H	-G05030H/T
	50w	-WTA5H	-W05030H/T	50w	-GT01H	-G05030H/T
	100w	-WT01H	-W10030H/T	100w	-GT01H	-G10030H/T
	200w	-WT02H	-W20030H/T	200w	-GT02H	-G20030H/T
	400w	-WT04H	-W40030H/T	400w	-GT04H	-G40030H/T
	750w	-WT08H	-W75030H/T	750w	-GT08H	-G75030H/T
Three phase 200 V /230 V AC	750w	-WT08H	-W75030H/T	750w	-GT08H	-G75030H/T
	1.0kw	-WT10H	-W1K030H/T	1.0kw	-GT15H	-G1K030T
	1.5kw	-WT15H	-W1k530H/T	1.5kw	-GT15H	-G1k530T
	2.0kw	-WT20H	-W2K030H/T	2.0kw	-GT20H	-G2K030T
	3.0kw	-WT30H	-W3K030H/T	3.0kw	-GT30H	-G3K030T
	4.0kw	-WT50H	-W4K030H/T	4.0kw	-GT50H	-G4K030T
	5.0kw	-WT50H	-W5K030H/T	5.0kw	-GT50H	-W5K030T

■ 1,000r/min Servomotors

Input Power	W Series			G Series		
	Servomotor Capacity	Servo Drive Model R88D-	Servomotor Model R88M-	Servomotor Capacity	Servo Drive Model R88D-	Servomotor Model R88M-
Three phase 200 V / 230 V AC	300w	-WT05H	-W30010H/T	900w	-GT15H	-G90010T
	600w	-WT08H	-W60010H/T	900w	-GT15H	-G90010T
	900w	-WT10H	-W90010H/T	900w	-GT15H	-G90010T
	1.2kw	-WT15H	-W1K210H/T	2.0kw	-GT30H	-G2K010T
	2..0kw	-WT20H	-W2K010H/T	2.0kw	-GT30H	-G2K010T
	3.0kw	-WT30H	-W3K010H/T	3.0kw	-GT50H	-G3K010T
	4.0kw	-WT50H	-W4K010H/T	4.5kw	-GT50H	-G4K510T
	5.5kw	-WT60H	-W5K510H/T	6.0kw	-GT75H	-G6K010T

■ 1,500r/min Servomotors

Input Power	W Series			G Series		
	Servomotor Capacity	Servo Drive Model R88D −	Servomotor Model R88M −	Servomotor Capacity	Servo Drive Model R88D −	Servomotor Model R88M −
Three phase 200 V / 230 V AC	450w	−WT05H	−W45015T	1.0kw	−GT10H	−G1K020T
	850w	−WT10H	−W85015T	1.5kw	−GT15H	−G1K520T
	1.3kw	−WT15H	−W1K315T	2.0kw	−GT20H	−G2K020T
	1.8kw	−WT20H	−W1K815T	3.0kw	−GT30H	−G3K020T
	2..9kw	−WT30H	−W2K915T	4.0kw	−GT50H	−G4K020T
	4.4kw	−WT50H	−W4K415T	5.0kw	−GT50H	−G5K015T
	5.5kw	−WT60H	−W5K515T	7.5kw	−GT75H	−G7K515T
	7.5kw	−WT75H	−W7K515T	7.5kw	−GT75H	−G7K515T
	11.kw	−WT150H	−W11K015T	No models for replacement		
	15kw	−WT150H	−W15K015T			

■ 3,000r/min Flat Type Servomotors

Input Power	W Series			G Series		
	Servomotor Capacity	Servo Drive Model R88D −	Servomotor Model R88M −	Servomotor Capacity	Servo Drive Model R88D −	Servomotor Model R88M −
Single phase 100 V /115 V AC	100w	−WT01HL	−WP10030L/S	100w	−GT01L	−GP10030L/S
	200w	−WT02HL	−WP20030L/S	200w	−GT02L	−GP20030L/S
Single phase 200 V /230 V AC	100w	−WT01H	−WP10030H/T	100w	−GT01H	−GP10030H/T
	200w	−WT02H	−WP20030H/T	200w	−GT02H	−GP20030H/T
	400w	−WT04H	−WP40030H/T	400w	−GT04H	−GP40030H/T
	750w	−WT08H	−WP75030H/T	No models for replacement		
Three phase 200 V /230 V AC	750w	−WT08H	−WP75030H/T			
	1.5kw	−WT15H	−WP1K030H/T			

Chapter 2 Replacement list

2-2.Precautions When Replacing the AC Servomotors

■ 3,000r/min Servomotors

Input Power	W Series		G Series		Precautions (Changes after replacement)
Single phase 100 V /115 V AC	30w	R88M-W03030L/S	50w	R88M-G05030H/T	Larger shaft diameter
	50w	R88M-W05030L/S	50w	R88M-G05030H/T	Larger shaft diameter
	100w	R88M-W10030L/S	100w	R88M-G10030L/S	
	200w	R88M-W20030L/S	200w	R88M-G20030L/S	Smaller shaft diameter
Single phase 200 V /230 V AC	30w	R88M-W03030H/T	50w	R88M-G05030H/T	Larger shaft diameter
	50w	R88M-W05030H/T	50w	R88M-G05030H/T	
	100w	R88M-W10030H/T	100w	R88M-G10030H/T	
	200w	R88M-W20030H/T	200w	R88M-G20030H/T	Smaller shaft diameter
	400w	R88M-W40030H/T	400w	R88M-G40030H/T	
	750w	R88M-W75030H/T	750w	R88M-G75030H/T	Larger shaft diameter Longer effective shaft length
Three phase 200 V /230 V AC	750w	R88M-W75030H/T	750w	R88M-G75030H/T	Larger shaft diameter Longer effective shaft length
	1.0kw	R88M-W1K030H/T	1.0kw	R88M-G1K030T	Different mounting hole positions Smaller inner diameter Longer effective shaft length Smaller shaft diameter
	1.5kw	R88M-W1k530H/T	1.5kw	R88M-G1k530T	Longer effective shaft length Smaller shaft diameter
	2.0kw	R88M-W2K030H/T	2.0kw	R88M-G2K030T	Longer effective shaft length Smaller shaft diameter
	3.0kw	R88M-W3K030H/T	3.0kw	R88M-G3K030T	Shorter effective shaft length Smaller shaft diameter
	4.0kw	R88M-W4K030H/T	4.0kw	R88M-G4K030T	Smaller shaft diameter
	5.0kw	R88M-W5K030H/T	5.0kw	R88M-W5K030T	Smaller shaft diameter

■ 1,000r/min Servomotors

Input Power	W Series		G Series		Precautions (Changes after replacement)
Three phase 200 V /230 V AC	300w	R88M-W30010H/T	900w	R88M-G90010T	Longer effective shaft length Larger shaft diameter
	600w	R88M-W60010H/T	900w	R88M-G90010T	Longer effective shaft length Larger shaft diameter
	900w	R88M-W90010H/T	900w	R88M-G90010T	Longer effective shaft length
	1.2kw	R88M-W1K210H/T	2.0kw	R88M-G2K010T	
	2..0kw	R88M-W2K010H/T	2.0kw	R88M-G2K010T	
	3.0kw	R88M-W3K010H/T	3.0kw	R88M-G3K010T	
	4.0kw	R88M-W4K010H/T	4.5kw	R88M-G4K510T	
	5.0kw	R88M-W5K010H/T	6.0kw	R88M-G6K010T	

■ 1,500r/min Servomotors

Input Power	W Series		G Series		Precautions (Changes after replacement)
Three phase 200 V /230 V AC	450w	R88M−W45015T	1.0kw	R88M−G1K020T	Larger shaft diameter Longer effective shaft length
	850w	R88M−W85015T	1.5kw	R88M−G1K520T	Larger shaft diameter Longer effective shaft length
	1.3kw	R88M−W1K315T	2.0kw	R88M−G2K020T	Longer effective shaft length
	1.8kw	R88M−W1K815T	3.0kw	R88M−G3K020T	Different mounting hole positions Smaller inner diameter Shorter effective shaft length Smaller shaft diameter
	2..9kw	R88M−W2K915T	4.0kw	R88M−G4K020T	Different mounting hole positions Smaller inner diameter Shorter effective shaft length Smaller shaft diameter
	4.4kw	R88M−W4K415T	5.0kw	R88M−G5K020T	Shorter effective shaft length Rated torque lowered by approx..15%
	5.5kw	R88M−W5K515T	7.5kw	R88M−G7K515T	
	7.5kw	R88M−W7K515T	7.5kw	R88M−G7K515T	
	11kw	R88M−W11K015T	—	–	No models for replacement
	15kw	R88M−W15K015T	—	–	No models for replacement

■ 3,000r/min Flat Type Servomotors

Input Power	W Series		G Series		Precautions (Changes after replacement)
Single phase 100 V /115 V AC	100w	R88M−WP10030L/S	100w	R88M−GP10030L/S	
	200w	R88M−WP20030L/S	200w	R88M−GP20030L/S	Smaller motor shaft diameter
Single phase 200 V /230 V AC	100w	R88M−WP10030H/T	100w	R88M−GP10030H/T	
	200w	R88M−WP20030H/T	200w	R88M−GP20030H/T	Smaller motor shaft diameter
	400w	R88M−WP40030H/T	400w	R88M−GP40030H/T	
	750w	R88M−WP75030H/T	–	–	No models for replacement
Three phase 200 V /230 V AC	750w	R88M−WP75030H/T	–	–	No models for replacement
	1.5kw	R88M−WP1K030H/T	—	–	No models for replacement

Chapter 2 Replacement list

2-3.Precautions When Replacing the AC Servo Drives

When replacing the W Series with the G Series, mounting hole positions need to be changed because of different mounting dimensions.

Input Power	W Series	G Series	Precautions (Changes after replacement)
Single phase 100 V /115 V AC	R88D-WTA3HL	R88D-GTA5L	Larger by 2mm in depth
	R88D-WTA5HL	R88D-GTA5L	Larger by 2mm in depth
	R88D-WT01HL	R88D-GT01L	Larger by 2mm in depth
	R88D-WT02HL	R88D-GT02L	Larger by 2mm in depth
Single phase 200 V /230 V AC	R88D-WTA3H	R88D-GT01H	Larger by 2mm in depth
	R88D-WTA5H	R88D-GT01H	Larger by 2mm in depth
	R88D-WT01H	R88D-GT01H	Larger by 2mm in depth
	R88D-WT02H	R88D-GT02H	Larger by 2mm in depth
	R88D-WT04H	R88D-GT04H	Larger by 2mm in depth
	R88D-WT08H	R88D-GT08H	
Three phase 200 V /230 V AC	R88D-WT05H	R88D-GT10H	
	R88D-WT05H	R88D-GT15H	
	R88M-WT08H	R88D-GT08H	
	R88D-WT08H	R88D-GT15H	
	R88D-WT10H	R88D-GT15H	
	R88D-WT15H	R88D-GT15H	
	R88D-WT15H	R88D-GT20H	Larger by 38mm in height and 20mm in depth
	R88D-WT15H	R88D-GT30H	Larger by 20mm in width, 90mm in height and 20mm in depth
	R88D-WT20H	R88D-GT20H	Larger by 20mm in depth
	R88D-WT20H	R88D-GT30H	Larger by 20mm in width and 20mm in depth
	R88D-WT30H	R88D-GT30H	Larger by 20mm in width and 20mm in depth
	R88D-WT30H	R88D-GT50H	Larger by 20mm in width and 20mm in depth
	R88D-WT50H	R88D-GT50H	
	R88D-WT50H	R88D-GT50H	
	R88D-WT60H	R88D-GT75H	※NB
	R88D-WT75H	R88D-GT75H	※NB

※NB :

Models R88D-WT60H/-WT75H are a wall installation type, but models R88D-GT75H are a front panel installation type only. Dimensional comparison of the above table is just based on the outside dimensions of the products. When actually replacing the products, further consideration is required for the installation.

2-4.Compatibility of Peripheral Devices

■ Servo Relay Unit Cables (for Servo Drives)

Specifications	Cable Model for the W Series	Cable Model for the G Series	Compatibility/ Usability
For NC Unit	XW2Z-□00J-B4	XW2Z-□00J-B25	×
For CJ1M-CPU2□	XW2Z-□00J-B4	XW2Z-□00J-B31	×
For FQM1-MMA22	XW2Z-□00J-B13	XW2Z-□00J-B27	×
For FQM1-MMP22	XW2Z-□00J-B9	XW2Z-□00J-B26	×

■ Servo Relay Unit Cables (for Position Control Units)

Specifications	Relay Unit Model	Cable Model for the W Series	Cable Model for the G Series	Compatibility/ Usability
For CQM1-CPU43-V1/ CQM1H-PLB21	XW2B-20J6-3B	XW2Z-□□0J-A3	XW2Z-□□0J-A3	〇
For CS1W-NC113/ C200HW-NC113	XW2B-20J6-1B	XW2Z-□□0J-A6	XW2Z-□□0J-A6	〇
For CS1W-NC213/413 For C200HW-NC213/413	XW2B-40J6-2B	XW2Z-□□0J-A7	XW2Z-□□0J-A7	〇
For CS1W-NC133	XW2B-20J6-1B	XW2Z-□□0J-A10	XW2Z-□□0J-A10	〇
For CS1W-NC233/433	XW2B-40J6-2B	XW2Z-□□0J-A11	XW2Z-□□0J-A11	〇
For CJ1W-NC113	XW2B-20J6-1B	XW2Z-□□0J-A14	XW2Z-□□0J-A14	〇
For CJ1W-NC213/413	XW2B-40J6-2B	XW2Z-□□0J-A15	XW2Z-□□0J-A15	〇
For CJ1W-NC133	XW2B-20J6-1B	XW2Z-□□0J-A18	XW2Z-□□0J-A18	〇
For CJ1W-NC233/433	XW2B-40J6-2B	XW2Z-□□0J-A19	XW2Z-□□0J-A19	〇
For CS1W-HCP22-V1（1 axis）	XW2B-20J6-3B	XW2Z-□□0J-A22	Not available	×
For CS1W-HCP22-V1（2 axes）	XW2B-40J6-3B	XW2Z-□□0J-A23	Not available	×
For 3F88M-DRT141	XW2B-20J6-1B	XW2Z-□□0J-A24	Not available	×
For CJ1M-CPU2□	XW2B-20J6-8A XW2B-40J6-9A	XW2Z-□□0J-A27	XW2Z-□□0J-A33	×
For FQM1-MMA22	ZW2B-80J7-5B	XW2Z-□□0J-A30	–	※ NB
	ZW2B-80J7-12B	–	XW2Z-□□0J-A30	※ NB
For FQM1-MMP22	ZW2B-80J7-5B	XW2Z-□□0J-A30	–	※ NB
	ZW2B-80J7-12B	–	XW2Z-□□0J-A30	※ NB

※ NB: As for the model FQM1-MM□22, the cable is a common type, but the relay unit is different.

■ Control Cables

Specifications	Cable Model for the W Series	Cable Model for the G Series	Precautions (Changes after replacement)
Motion Control Unit Cables （1 axis)	R88A-CPW00□M1	R88A-CPG00□M1	
Motion Control Unit Cables (2 axes)	R88A-CPW00□M2	R88A-CPG00□M2	
General-purpose Control Cable	R88A-CPW00□S	R88A-CPG00□S	The connector is compatible, but a twist pair of signal lines is different.
Connector Terminal Block Cable	R88A-CTW00□N	XW2Z-□00J-B24	The connector and the pin arrangement are compatible, but a twist pair of signal lines is different.

Chapter 2 Replacement list

■ **AC Servomotors with a Decelerator**

● 3,000r/min Servomotors with a Standard Type Decelerator（30W －750W）

Capacity	Deceleration Ratio	W Series Servomotors with a Decelerator Model	Decelerators Model for the G Series Servomotors	Precautions (Changes after replacement)
30W	1/5	R88M-W03030□-□G05BJ	R88G-HPG11A05100BJ	Smaller mounting dimensions Smaller shaft diameter
	1/9	R88M-W03030□-□G09BJ	R88G-HPG11A09050BJ	Smaller mounting dimensions Smaller shaft diameter
	1/21	R88M-W03030□-□G21BJ	R88G-HPG14A21100BJ	Larger shaft diameter
	1/33	R88M-W03030□-□G33BJ	R88G-HPG14A33050BJ	Larger shaft diameter
50W	1/5	R88M-W05030□-□G05BJ	R88G-HPG11A05100BJ	Smaller mounting dimensions Smaller shaft diameter
	1/9	R88M-W05030□-□G09BJ	R88G-HPG11A09050BJ	Smaller mounting dimensions Smaller shaft diameter
	1/21	R88M-W05030□-□G21BJ	R88G-HPG14A21100BJ	Smaller mounting dimensions
	1/33	R88M-W05030□-□G33BJ	R88G-HPG14A33050BJ	Smaller mounting dimensions
100W	1/5	R88M-W10030□-□G05BJ	R88G-HPG11A05100BJ	Smaller mounting dimensions Smaller shaft diameter
	1/9	R88M-W10030□-□G11BJ	R88G-HPG14A11100BJ	Smaller mounting dimensions
	1/21	R88M-W10030□-□G21BJ	R88G-HPG14A21100BJ	Smaller mounting dimensions Smaller shaft diameter
	1/33	R88M-W10030□-□G33BJ	R88G-HPG20A33100BJ	Larger shaft diameter
200W	1/5	R88M-W20030□-□G05BJ	R88G-HPG14A05200BJ	Smaller mounting dimensions Smaller shaft diameter
	1/9	R88M-W20030□-□G11BJ	R88G-HPG14A11200BJ	Smaller mounting dimensions Smaller shaft diameter
	1/21	R88M-W20030□-□G21BJ	R88G-HPG20A21200BJ	Smaller mounting dimensions
	1/33	R88M-W20030□-□G33BJ	R88G-HPG20A33200BJ	Smaller mounting dimensions
400W	1/5	R88M-W40030□-□G05BJ	R88G-HPG14A05400BJ	Smaller mounting dimensions Smaller shaft diameter
	1/9	R88M-W40030□-□G09BJ	R88G-HPG20A11400BJ	Smaller mounting dimensions
	1/21	R88M-W40030□-□G21BJ	R88G-HPG20A21400BJ	Smaller mounting dimensions Smaller shaft diameter
	1/33	R88M-W40030□-□G33BJ	R88G-HPG32A33400BJ	Larger shaft diameter
750W	1/5	R88M-W75030□-□G05BJ	R88G-HPG20A05750BJ	Smaller mounting dimensions
	1/9	R88M-W75030□-□G11BJ	R88G-HPG20A11750BJ	Smaller mounting dimensions Smaller shaft diameter
	1/21	R88M-W75030□-□G21BJ	R88G-HPG32A21750BJ	Smaller mounting dimensions
	1/33	R88M-W75030□-□G33BJ	R88G-HPG32A33750BJ	Smaller mounting dimensions

● 3,000r/min Servomotors with an Economical Type Decelerator

Capacity	Deceleration Ratio	W Series Servomotors with a Decelerator Model	Decelerators Model for the G Series Servomotors	Precautions (Changes after replacement)
100W	1/5	R88M-W10030□-□G05CJ	R88G-VRSF05B100CJ	
	1/9	R88M-W10030□-□G09CJ	R88G-VRSF09B100CJ	
	1/15	R88M-W10030□-□G15CJ	R88G-VRSF15B100CJ	
	1/25	R88M-W10030□-□G25CJ	R88G-VRSF25B100CJ	Different Decelerator mounting hole positions Different Decelerator mounting inner diameter Different Decelerator shaft diameter Different Decelerator shaft length
200W	1/5	R88M-W20030□-□G05CJ	R88G-VRSF05B200CJ	
	1/9	R88M-W20030□-□G09CJ	R88G-VRSF09C200CJ	
	1/15	R88M-W20030□-□G15CJ	R88G-VRSF15C200CJ	
	1/25	R88M-W20030□-□G25CJ	R88G-VRSF25C200CJ	
400W	1/5	R88M-W40030□-□G05CJ	R88G-VRSF05C400CJ	
	1/9	R88M-W40030□-□G09CJ	R88G-VRSF09C400CJ	
	1/15	R88M-W40030□-□G15CJ	R88G-VRSF15C400CJ	
	1/25	R88M-W40030□-□G25CJ	R88G-VRSF25C400CJ	Different Decelerator mounting hole positions Different Decelerator mounting inner diameter Different Decelerator shaft diameter Different Decelerator shaft length
750W	1/5	R88M-W75030□-□G05CJ	R88G-VRSF05C750CJ	
	1/9	R88M-W75030□-□G09CJ	R88G-VRSF09D750CJ	
	1/15	R88M-W75030□-□G15CJ	R88G-VRSF15D750CJ	
	1/25	R88M-W75030□-□G25CJ	R88G-VRSF25D750CJ	Different Decelerator mounting hole positions Different Decelerator mounting inner diameter Different Decelerator shaft diameter Different Decelerator shaft length

Chapter 2 Replacement list

● 3,000r/min Flat Type Servomotors with a Standard Type Decelerator

Capacity	Deceleration Ratio	W Series Servomotors with a Decelerator Model	Decelerators Model for the G Series Servomotors	Precautions (Changes after replacement)
100W	1/5	R88M-WP10030□-□G05BJ	R88G-HPG11A05100PBJ	Smaller mounting dimensions / Smaller shaft diameter
	1/9	R88M-WP10030□-□G11BJ	R88G-HPG14A11100PBJ	Smaller mounting dimensions
	1/21	R88M-WP10030□-□G21BJ	R88G-HPG14A21100PBJ	Smaller mounting dimensions / Smaller shaft length
	1/33	R88M-WP10030□-□G33BJ	R88G-HPG20A33100PBJ	Larger shaft diameter
200W	1/5	R88M-WP20030□-□G05BJ	R88G-HPG20A05200PBJ	Smaller mounting dimensions / Smaller shaft diameter
	1/9	R88M-WP20030□-□G11BJ	R88G-HPG20A11200PBJ	Larger shaft diameter
	1/21	R88M-WP20030□-□G21BJ	R88G-HPG20A21200PBJ	Smaller mounting dimensions
	1/33	R88M-WP20030□-□G33BJ	R88G-HPG20A33200PBJ	Smaller mounting dimensions
400W	1/5	R88M-WP40030□-□G05BJ	R88G-HPG20A05400PBJ	Larger shaft diameter
	1/9	R88M-WP40030□-□G09BJ	R88G-HPG20A11400PBJ	Smaller mounting dimensions
	1/21	R88M-WP40030□-□G21BJ	R88G-HPG20A21400PBJ	Smaller mounting dimensions / Smaller shaft diameter
	1/33	R88M-WP40030□-□G33BJ	R88G-HPG32A33400PBJ	Larger shaft diameter
750W	All	R88M-WP75030□-□G□BJ		No Servomotors for replacement

● 3,000r/min Servomotors with an Economical Type Decelerator

Capacity	Deceleration Ratio	W Series Servomotors with a Decelerator Model	Decelerators Model for the G Series Servomotors	Precautions (Changes after replacement)
100W	1/5	R88M-WP10030□-□G05CJ	R88G-VRSF05B100PCJ	
	1/9	R88M-WP10030□-□G09CJ	R88G-VRSF09B100PCJ	
	1/15	R88M-WP10030□-□G15CJ	R88G-VRSF15B100PCJ	
	1/25	R88M-WP10030□-□G25CJ	R88G-VRSF25B100PCJ	Different Decelerator mounting hole positions / Different Decelerator mounting inner diameter / Different Decelerator shaft diameter / Different Decelerator shaft length
200W	1/5	R88M-WP20030□-□G05CJ	R88G-VRSF05B200PCJ	
	1/9	R88M-WP20030□-□G09CJ	R88G-VRSF09C200PCJ	
	1/15	R88M-WP20030□-□G15CJ	R88G-VRSF15C200PCJ	
	1/25	R88M-WP20030□-□G25CJ	R88G-VRSF25C200PCJ	
400W	1/5	R88M-WP40030□-□G05CJ	R88G-VRSF05C400PCJ	
	1/9	R88M-WP40030□-□G09CJ	R88G-VRSF09C400PCJ	
	1/15	R88M-WP40030□-□G15CJ	R88G-VRSF15C400PCJ	
	1/25	R88M-WP40030□-□G25CJ	R88G-VRSF25C400PCJ	Different Decelerator mounting hole positions / Different Decelerator mounting inner diameter / Different Decelerator shaft diameter / Different Decelerator shaft length
750W	All	R88M-WP75030□-□G□CJ		No Servomotors for replacement

● 3,000r/min Servomotors with a Standard Type Decelerator (1.0kW to 5.0kW)

● 1,000r/min Servomotors with a Standard Type Decelerator (300W to 3.0kW)

● 1,500r/min Servomotors with a Standard Type Decelerator (450W to 4.4kW)

Decelerators for the G Series Servomotors have not been released.

For the customers who place emphasis on the compatibility with the W Series, "MC Drive IB Series Decelerators manufactured by Sumitomo Heavy Industries, Ltd." can be purchased at OMRON FIELD ENGINEERING Co., Ltd.

Use the Decelerator after installing it to the G Series Servomotor.

【 For Inquiries and Consultation 】

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Chapter 3.Method of replacing

3-1.Servomotor Replacement Procedure

(1)Servomotor Replacement Procedure

Some of the W Series Servomotors and G Series Servomotors differ in the (shaft) inner diameters and the hole positions for the machine installation. When replacing these Servomotors, you're required to make new holes for the installation on the machine side, or additionally prepare machine attachment parts. (Refer to *Chapter 6 Reference Data* for preparation.)

(2)Precautions When Replacing the Servomotors

When replacing the Servomotors, note the following three precautions regarding:

・ Change of the Servomotor shaft length.

・ Change of the Servomotor capacity and shaft diameter.

・ Change of the axial load position.

ⅰ）Precautions for the Servomotor Shaft Length Change

Servomotor's shaft length changes when replacing the W Series Servomotors with the G Series Servomotors. Refer to the Servomotor's "Shaft End Position Change Amount" in the table below and make an adjustment of length using a coupling or others.
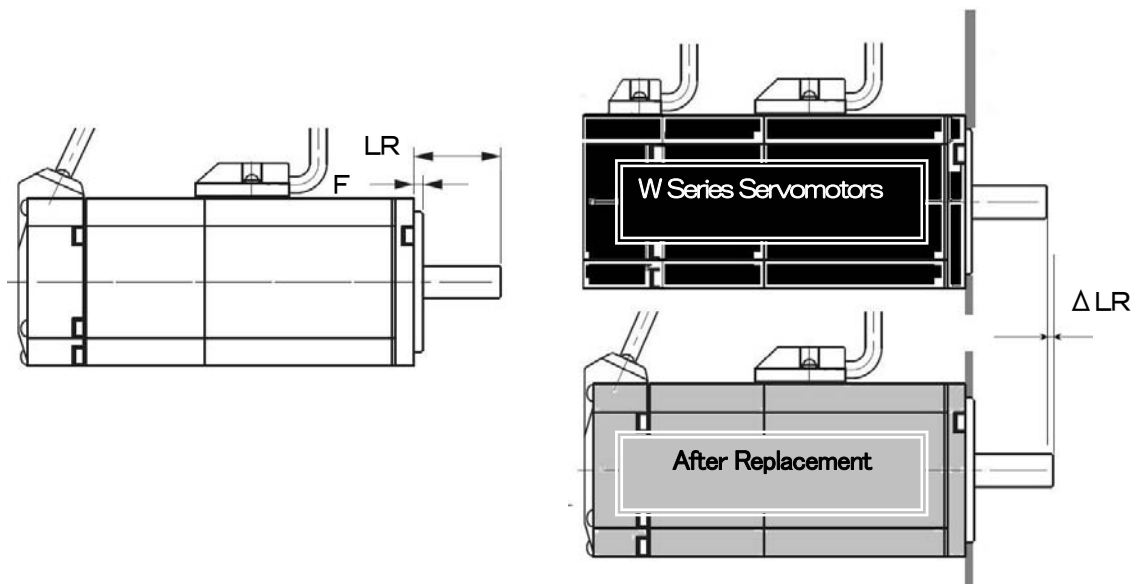
● 3,000r/min Servomotors(Cylindrical Type, Small Capacity)

W Series				G Series				Shaft End Position Change Amt. ΔLR
Capacity	Servomotor Model	LR dim.	F dim.	Capacity	Servomotor Model	LR dim.	F dim.	
30w	R88M－W03030□	25	2.5	50w	R88M－G05030H/T	25	3.0	0
50w	R88M－W05030□	25	2.5	50w	R88M－G05030H/T	25	3.0	0
100w	R88M－W10030□	25	2.5	100w	R88M－G10030□	25	3.0	0
200w	R88M－W20030□	30	3.0	200w	R88M－G20030□	30	3.0	0
400w	R88M－W40030H/T	30	3.0	400w	R88M－G40030□	30	3.0	0
750w	R88M－W75030H/T	40	3.0	750w	R88M－G75030□	35	3.0	−5.0

[Units：mm]

■ 3,000r/min Servomotors (Medium Capacity)

W Series				G Series				Shaft End
Capacity	Servomotor Model	LR dim.	F dim.	Capacity	Servomotor Model	LR dim.	F dim.	Position Change Amt. ΔLR
1.0kw	R88M－W1K030H/T	45	3.0	1.0kw	R88M－G1K030T	55	3.0	10.0
1.5kw	R88M－W1k530H/T	45	3.0	1.5kw	R88M－G1k530T	55	3.0	10.0
2.0kw	R88M－W2K030H/T	45	3.0	2.0kw	R88M－G2K030T	55	3.0	10.0
3.0kw	R88M－W3K030H/T	63	6.0	3.0kw	R88M－G3K030T	55	3.0	−8.0
4.0kw	R88M－W4K030H/T	63	6.0	4.0kw	R88M－G4K030T	65	6.0	2.0
5.0kw	R88M－W5K030H/T	63	6.0	5.0kw	R88M－G5K030T	65	6.0	2.0

[Units：mm]

■ 1,000r/min Servomotors

W Series				G Series				Shaft End
Capacity	Servomotor Model	LR dim.	F dim.	Capacity	Servomotor Model	LR dim.	F dim.	Position Change Amt. ΔLR
300w	R88M－W30010H/T	58	6.0	900w	R88M－G90010T	70	6.0	12.0
600w	R88M－W60010H/T	58	6.0	900w	R88M－G90010T	70	6.0	12.0
900w	R88M－W90010H/T	58	6.0	900w	R88M－G90010T	70	6.0	12.0
1.2kw	R88M－W1K210H/T	79	3.2	2.0kw	R88M－G2K010T	80	3.2	1.0
2.0kw	R88M－W2K010H/T	79	3.2	2.0kw	R88M－G2K010T	80	3.2	1.0
3.0kw	R88M－W3K010H/T	79	3.2	3.0kw	R88M－G3K010T	80	3.2	1.0
4.0kw	R88M－W4K010H/T	113	3.2	4.5kw	R88M－G4K510T	113	3.2	0
5.0kw	R88M－W5K010H/T	113	3.2	6.0kw	R88M－G6K010T	113	3.2	0

[Units：mm]

■ 1,500r/min Servomotors

W Series				G Series				Shaft End
Capacity	Servomotor Model	LR dim.	F dim.	Capacity	Servomotor Model	LR dim.	F dim.	Position Change Amt. ΔLR
450w	R88M－W45015T	58	6.0	1.0kw	R88M－G1K020T	55	6.0	−3.0
850w	R88M－W85015T	58	6.0	1.5kw	R88M－G1K520T	55	6.0	−3.0
1.3kw	R88M－W1K315T	58	6.0	2.0kw	R88M－G1K520T	55	6.0	−3.0
1.8kw	R88M－W1K815T	79	3.2	3.0kw	R88M－G3K020T	65	6.0	−14.0
2..9kw	R88M－W2K915T	79	3.2	4.0kw	R88M－G4K020T	65	3.2	−14.0
4.4kw	R88M－W4K415T	79	3.2	5.0kw	R88M－G5K015T	70	3.2	−9.0
5.5kw	R88M－W5K515T	113	3.2	7.5kw	R88M－G7K515T	113	3.2	0
7.5kw	R88M－W7K515T	113	3.2	7.5kw	R88M－G7K515T	113	3.2	0
11.kw	R88M－W11K015T	116	4.0	No models for replacement				
15kw	R88M－W15K015T	116	4.0					

[Units：mm]

Chapter 3.Method of replacing

■ 3,000r/min Flat Type Servomotors

W Series				G Series				Shaft End Position Change Amt. ΔLR
Capacity	Servomotor Model R88M −	LR dim.	F dim.	Capacity	Servomotor Model R88M −	LR dim.	F dim.	
100w	R88M −WP10030H/T	25	3.0	100w	R88M −GP10030H/T	25	3.0	0
200w	R88M −WP20030H/T	30	3.0	200w	R88M −GP20030H/T	30	5.0	0
400w	R88M −WP40030H/T	30	3.0	400w	R88M −GP40030H/T	30	5.0	0
750w	R88M −WP75030H/T	40	3.5	No models for replacement				
1.5kw	R88M −WP1K030H/T	40	3.5					

[Units:mm]

ii) Precautions for the Servomotor Capacity and Shaft Diameter Changes
Some of the W Series Servomotors and the G Series Servomotors differ in the shaft diameter.

■ 3,000r/min Servomotors(Cylindrical Type, Small Capacity)

W Series			G Series			Shaft Dia. ChangeAmt. ΔS
Capacity	Servomotor Model R88M −	φS	Capacity	Servomotor Model R88M −	φS	
30w	R88M −W03030□	6h6	50w	R88M−G05030H/T	8h6	+2.0
50w	R88M −W05030□	6h6	50w	R88M−G05030H/T	8h6	+2.0
100w	R88M −W10030□	8h6	100w	R88M−G10030□	8h6	+2.0
200w	R88M −W20030□	14h6	200w	R88M −G20030□	11h6	−3.0
400w	R88M −W40030H/T	14h6	400w	R88M −G40030H/T	14h6	±0
750w	R88M −W75030H/T	16h6	750w	R88M −G75030H/T	19h6	+3.0
1.0kw	R88M −W1K030H/T	24h6	1.0kw	R88M −G1K030T	19h6	−5.0
1.5kw	R88M −W1k530H/T	24h6	1.5kw	R88M −G1k530T	19h6	−5.0
2.0kw	R88M −W2K030H/T	24h6	2.0kw	R88M −G2K030T	19h6	−5.0
3.0kw	R88M −W3K030H/T	28h6	3.0kw	R88M −G3K030T	22h6	−6.0
4.0kw	R88M −W4K030H/T	28h6	4.0kw	R88M −G4K030T	24h6	−4.0
5.0kw	R88M −W5K030H/T	28h6	5.0kw	R88M −G5K030T	24h6	−4.0

[Units:mm]

■ 1,000r/min Servomotors

W Series			G Series			Shaft Dia. ChangeAmt. ΔS
Capacity	Servomotor Model R88M −	φS	Capacity	Servomotor Model R88M −	φS	
300w	R88M − W30010H/T	19h6	900w	R88M − G90010T	22h6	+3.0
600w	R88M − W60010H/T	19h6	900w	R88M − G90010T	22h6	+3.0
900w	R88M − W90010H/T	22h6	900w	R88M − G90010T	22h6	±0
1.2kw	R88M − W1K210H/T	35 + 0.01	2.0kw	R88M − G2K010T	35h6	±0
2.0kw	R88M − W2K010H/T	35 + 0.01	2.0kw	R88M − G2K010T	35h6	±0
3.0kw	R88M − W3K010H/T	35 + 0.01	3.0kw	R88M − G3K010T	35h6	±0
4.0kw	R88M − W4K010H/T	42h6	4.5kw	R88M − G4K510T	42h6	±0
5.0kw	R88M − W5K010H/T	42h6	6.0kw	R88M − G6K010T	42h6	±0

[Units:mm]

■ 1,500r/min Servomotors

W Series			G Series			Shaft Dia.
Capacity	Servomotor Model	φS	Capacity	Servomotor Model	φS	Change Amt. ΔS
450w	R88M－W45015T	19h6	1.0kw	R88M－G1K020T	22h6	−3.0
850w	R88M－W85015T	19h6	1.5kw	R88M－G1K520T	22h6	−3.0
1.3kw	R88M－W1K315T	22h6	2.0kw	R88M－G1K520T	22h6	±0
1.8kw	R88M－W1K815T	35＋0.01	3.0kw	R88M－G3K020T	24h6	−11.0
2.9kw	R88M－W2K915T	35＋0.01	4.0kw	R88M－G4K020T	28h6	−7.0
4.4kw	R88M－W4K415T	35＋0.01	5.0kw	R88M－G5K015T	35h6	±0
5.5kw	R88M－W5K515T	42h6	7.5kw	R88M－G7K515T	42h6	±0
7.5kw	R88M－W7K515T	42h6	7.5kw	R88M－G7K515T	42h6	±0
11.kw	R88M－W11K015T	42h6	No models for replacement		
15kw	R88M－W15K015T	55＋0.030			

[Units:mm]

■ 3,000r/min Flat Type Servomotors

W Series			G Series			Shaft Dia.
Capacity	Servomotor Model R88M－	φS	Capacity	Servomotor Model R88M－	φS	Change Amt. ΔS
100w	R88M－WP10030H/T	8h6	100w	R88M－GP10030H/T	8h6	0
200w	R88M－WP20030H/T	14h6	200w	R88M－GP20030H/T	11h6	−3.0
400w	R88M－WP40030H/T	14h6	400w	R88M－GP40030H/T	14h6	0
750w	R88M－WP75030H/T	16h6	No models for replacement		
1.5kw	R88M－WP1K030H/T	19h6			

[Units:mm]

iii）Precautions for the Axial Load Position Change

When replacing the W Series Servomotors with the G Series Servomotors, the allowable radial load and thrust load change.

If the shaft end position changes, the applying point of the radial load, in particular, changes.

W Series		G Series	
Servomotor Series	Allowable Radial Load Applying Position	Servomotor Series	Allowable Radial Load Applying Position
3,000rpm Small Capacity Cylindrical Type	5mm from the shaft end	3,000rpm Small Capacity Cylindrical Type	Shaft center
3,000rpm Medium Capacity Type	Shaft end	3,000rpm Medium Capacity Type	Shaft center
1,000rpm Type	Shaft end	1,000rpm Type	Shaft center
1,500rpm Type	Shaft end	1,500rpm Type	Shaft center
3,000rpm Flat Type	5mm from the shaft end	3,000rpm Flat Type	Shaft center

Chapter 3.Method of replacing

3-2.Servo Drive Replacement Procedure

When replacing the Servo Drives, note the following six precautions regarding:
- Operation start-up
- Making mounting holes
- Changing Servo Drive's parameter settings
- Difference of the control I/O interface
- Difference of the mounting dimensions
- Regeneration absorption amount

ⅰ) Precautions for Operation Start-up

At operation start-up, note the following precautions.
- Make sure that wiring is correct before turning ON the power.
- Before connecting to the mechanical system, check the Servomotor rotation speed and direction under no-load status by performing JOG operation.
- Some of the Servo Drive parameters are enabled only by turning OFF the power and turning it ON again, and some require writing operation into EEP-ROM.

ⅱ) Precautions for Making Mounting Holes

When making holes in the control panel, be sure not to let cutting bits or other objects get inside the machinery. If it is difficult to make holes in the control panel, manufacture attachment parts on which the G Series Servo Drive can be mounted by using the mounting holes for the W Series Servo Drive.

ⅲ) Precautions for Changing Serve Drive's Parameter Settings

When replacing the W Series Servo Drives, the parameter settings of the G Series Servo Drive need to be changed from the default settings. The following are the relations of the parameter settings between the W Series and G Series.

W Series		G Series		Position	Speed	Torque
Pn No.	Parameter Name	Pn No.	Parameter Name			
000.0	Reverse Rotation	41	Command Pulse Rotation Direction Switch	○		
		51	Command Speed Rotation Direction Switch		○	
		5D	Torque Output Direction Switch			○
000.1	Control Mode Selection	02	Control Mode Selection	○	○	○
001.0	Select Stop If an Alarm Occurs When Servomotor Is OFF	68	Stop Selection for Alarm Generation	○	○	○
		69	Stop Selection with Servo OFF	○	○	○
001.1	Select Stop When Prohibited Drive Is Input	66	Stop Selection for Drive Prohibition Input	○	○	○
002.0	Torque Command Input Change	03	Torque Limit Selection	○	○	
002.1	Speed Command Input Change	5B	Torque Command/Speed Limit Selection			○
002.2	Operation Switch When Using Absolute Encoder	0B	Operation Switch When Using Absolute Encoder	○	○	○
100	Speed Loop Gain	11	Speed Loop Gain	○	○	○
101	Speed Loop Integration Time Constant	12	Speed Loop Integration Time Constant	○	○	○
102	Position Loop Gain	10	Position Loop Gain		○	
103	Inertia Raito	20	Inertia Ratio	○	○	○
104	Speed Loop Gain 2	19	Speed Loop Gain 2	○	○	○
105	Speed Loop Integration Time Constant 2	1A	Speed Loop Integration Time Constant 2	○	○	○
106	Position Loop Gain 2	18	Position Loop Gain 2		○	

W Series		G Series		Position	Speed	Torque
Pn No.	Parameter Name	Pn No.	Parameter Name			
109	Feed-forward Amount	15	Feed-forward Amount	O		
10A	Feed-forward Command Filter	16	Feed-forward Command Filter	O		
10B.2	Automatic Gain Switching Selection	31	Gain Switch 1 Setting	O	O	O
110.0	Selects On-line Autotuning	21	Realtime Autotuning Mode Selection	O	O	O
110.1	Selects Speed Feedback Compensation Function	13	Speed Feedback Filter Time Constant	O	O	O
111	Speed Feedback Compensation Gain	13	Speed Feedback Filter Time Constant	O	O	O
124	Automatic Gain Switching Timer	32	Gain Switch 1 Time	O	O	O
125	Automatic Gain Switching Width (Position Deviation)	33	Gain Switch 1 Level Setting	O	O	O
200.0	Command Pulse Mode	42	Command Pulse Mode	O		
200.1	Deviation Counter Reset	4E	Deviation Counter Reset Condition Setting	O		
200.2	Deviation Counter Reset If an Alarm Occurs When the Servomotor Is OFF	69	Stop Selection with Servo FF (retained at alarm generation)	O		
200.3	Pulse Command Filter Selection	40	Command Pulse Input Selection	O		
201	Encoder Divider Rate	44	Encoder Divider Numerator Setting	O	O	O
		45	Encoder Divider Denominator Setting	O	O	O
202	Electronic Gear Ratio G1 (Numerator)	48	Electronic Gear Ratio Numerator 1	O		
		4A	Electronic Gear Ratio Numerator Exponent	O		
203	Electronic Gear Ratio G2 (Denominator)	4B	Electronic Gear Ratio Denominator	O		
204	Position Command Filter Time Constant 1 (Primary Filter)	4C	Position Command Filter Time Constant Setting	O		
217	Command Pulse Factor	49	Electronic Gear Ratio Numerator 2	O		
300	Speed Command Scale	50	Speed Command Scale		O	O
301	No. 1 Internal Speed Setting	53	No. 1 Internally Set Speed		O	
302	No. 2 Internal Speed Setting	54	No. 2 Internally Set Speed		O	
303	No. 3 Internal Speed Setting	55	No. 3 Internally Set Speed		O	
304	Jog Speed	3D	Jog Speed	O	O	O
305	Soft Start Acceleration Time	58	Soft Start Acceleration Time		O	
306	Soft Start Deceleration Time	59	Soft Start Deceleration Time		O	
306	Soft Start Deceleration Time	59	Soft Start Deceleration Time		O	
307	Speed Command Filter Time Constant	57	Speed Command Filter Time Constant		O	O
308	Speed Feedback Filter Time Constant	13	Speed Feedback Filter Time Constant		O	
400	Torque Command Scale	5C	Torque Command Scale			O
401	Torque Command Filter Time Constant	14	Torque Command Filter Time Constant	O	O	O
402	Forward Torque Limit	5E	No. 1 Torque Limit	O	O	O
403	Reverse Torque Limit	5F	No. 2 Torque Limit	O	O	
404	Forward Rotation External Current Limit	5E	No. 1 Torque Limit	O	O	O
405	Reverse Rotation External Current Limit	5E	No. 1 Torque Limit	O	O	O
406	Emergency Stop Torque	6E	Emergency Stop Torque	O	O	O
407	Speed Limit	56	No. 4 Internally Set Speed (Speed Limit)			O

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W Series		G Series		Position	Speed	Torque
Pn No.	Parameter Name	Pn No.	Parameter Name			
408.0	Selects Notch Filter 1	1D	Notch Filter 1 Frequency	O	O	O
408.2	Selects Notch Filter 2	28	Notch Filter 2 Frequency	O	O	O
409	Notch Filter 1 Frequency	1D	Notch Filter 1 Frequency	O	O	O
40A	Notch Filter 1 Q Value	1E	Notch Filter 1 Width	O	O	O
40b	Notch Filter 2 Frequency	28	Notch Filter 2 Frequency	O	O	O
40C	Notch Filter 2 Q Value	29	Notch Filter 2 Width	O	O	O
		2A	Notch Filter 2 Depth	O	O	O
500	Positioning Completion Range 1	60	Positioning Completion Range	O		
502	Rotation Speed for Motor Rotation Detection	62	Rotation Speed for Motor Rotation Detection	O	O	O
503	Speed Conformity Signal Output Width	61	Zero Speed Detection	O	O	O
505	Deviation Counter Overflow Level	70	Deviation Counter Overflow Level	O		
506	Brake Timing 1	6B	Brake Timing during Operation	O	O	O
508	Brake Timing 2	6A	Brake Timing when Stopped	O	O	O
509	Momentary Hold Time	6D	Momentary Hold Time	O	O	O

ⅳ) Precautions for the Difference of Control I/O Interface

The following is the difference of control I/O interface between the W Series and G Series.

W Series I/O	Precautions
Power supply for the open collector command	Command pulse power supply is not built in the G Series. Use +24VCW/+24VCCW, if necessary.
Sequence input (40 to 46)	For the W Series, six inputs can be selected via the parameter settings and can be allocated to the connector. However, there are fixed allocations for the G Series.
+24V power input	For the W Series, 24V DC is used for the control power supply input. For the G Series, 12V to 24V DC can be used.
Deviation counter reset input	Line driver input for the W Series, but 12V to 24V DC input for the G Series.
Sequence output (25 to 30)	For the W Series, three outputs can be selected via the parameter settings and can be allocated to the connector. However, there are fixed allocations for some outputs of the G Series.
Alarm code output	The G Series does not have an ALO output.

· Power Supply for the Open Collector Command(PCON)
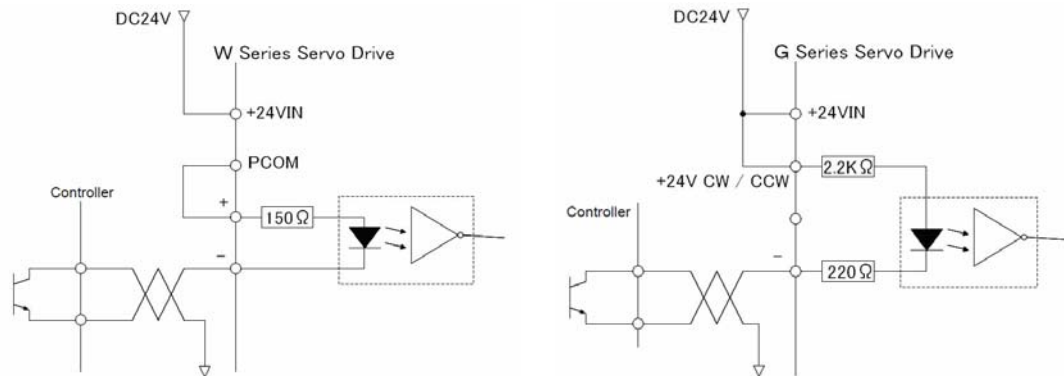
Command pulse power supply is not built in the G Series. However, with +24V CW/CCW input, 24V DC power can be used as command pulse power supply.

· Sequence Input

For the W Series, six inputs can be selected via the parameter settings and can be allocated to the connector. However, there are fixed allocations for the G Series. The following is the relations of the sequence input between the W Series and G Series.

W Series			G Series		
Symbol	Name	Control Mode	Symbol	Name	Control Mode
RUN	RUN Command	All	RUN	RUN Command	All
MING	Gain Reduction	Position·Speed· Internally Set Speed	MING	Gain Switch Input	All
POT	Forward Drive Prohibit Input	All	POT	Forward Drive Prohibit Input	All
NOT	Reverse Drive Prohibit Input	All	NOT	Reverse Drive Prohibit Input	All
RESET	Alarm Rest Input	All	RESET	Alarm Reset Input	All
PCL	Forward Current Limit Input	All	TLSEL	Torque Limit Switch Input	All
NCL	Reverse Current Limit Input	All			
RDIR	Rotation Direction Command Input	Internally Set Speed		Not available with the G Series.	
SPD1	Speed Selection Command 1 Input	Internally Set Speed	VSEL1	Internally Set Speed Selection 1	Speed
SPD2	Speed Selection Command 2 Input	Internally Set Speed	VESL2	Internally Set Speed Selection 2	Speed
TVSEL	Control Mode Switch Input	Switch Control	TVSEL	Control Mode Switch Input	Switch Control
PLOCK	Position Lock Command Input	Speed	VZERO	Zero Speed Designation Input	Speed·Torque
IPG	Pulse Input Prohibited	Position	IPG	Pulse Input Prohibited	Position
GSEL	Gain Switch Input	Position·Speed· Internally Set Speed	GSEL	Gain Switch Input	All
PSEL	Command Pulse Magnification Switch	Position	GESEL	Electronic Gear Switch	Position

Chapter 3.Method of replacing

- +24V Input

【 W Series Servo Drive 】   【 G Series Servo Drive 】

For the W Series, 24V DC is used for the control power supply input. For the G Series, 12V to 24V DC can be used.

- Deviation Counter Reset Input

【 W Series Servo Drive 】   【 G Series Servo Drive 】
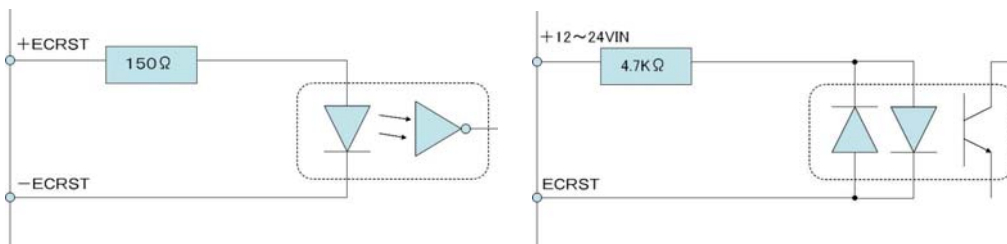
Line driver input for the W Series, but 12V to 24V DC input for the G Series.

- Sequence Output

For the W Series, three outputs can be selected via the parameter settings and can be allocated to the connector. However, there are fixed allocations for the G Series. The following are the relations of the sequence output between the W Series and G Series.
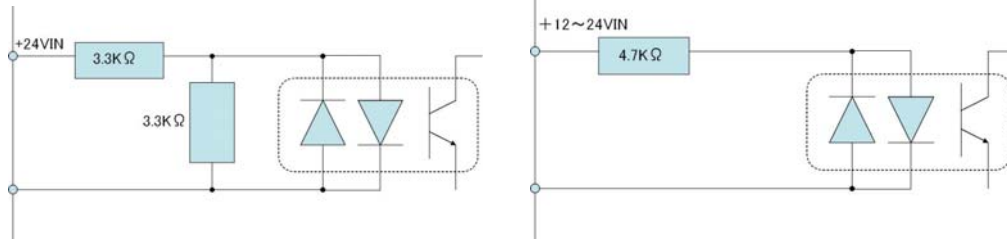
W Series			G Series		
Symbol	Name	Control Mode	Symbol	Name	Control Mode
/ALM	Alarm Output	All	/ALM	Alarm Output	All
ALMCOM			ALMCOM		
INP1	Positioning Completed Output 1	Position	INP	Positioning Completed Output	Position
INP1COM			INPCOM		
VCMP	Speed Conformity Output	Speed	VCMP	Speed Conformity Output	Speed
VCMPCOM			VCMPCOM		
TGON	Servomotor Rotation Detection Output	All	TGON	Servomotor Rotation Speed Detection Output	All
TGONCOM			TGONCOM		
READY	Servo Ready Output	All	READY	Servo Ready Output	All
READYCOM			READYCOM		
CLIMT	Current Limit Detection Output	All	CLIMT	Output During Torque Limit	All
CLIMTCOM			CLIMTCOM		
BKIR	Brake Interlock Output	All	BKIR	Brake Interlock Output	All
BKIRCOM			BKIRCOM		
/WARN	Warning Output	All	/WARN	Warning Output	All
/WARNCOM			/WARNCOM		

ⅴ) Precautions for the Difference of the Mounting Dimensions

When replacing the W Series Servo Drives with the G Series Servo Drives, mounting whole positions need to be changed because of the different dimensions as follows.

Input Power	W Series	G Series	Δ Dimensional Difference (mm)			Precautions (Changes after replacement)
			Width	Height	Depth	
Single phase AC100V /115V	R88D-WTA3HL	R88D-GTA5L	15	10	−2	Larger by 2mm in depth
	R88D-WTA5HL	R88D-GTA5L	15	10	−2	Larger by 2mm in depth
	R88D-WT01HL	R88D-GT01L	15	10	−2	Larger by 2mm in depth
	R88D-WT02HL	R88D-GT02L	20	10	−2	Larger by 2mm in depth
Single phase AC200V /230V	R88D-WTA3H	R88D-GT01H	15	10	−2	Larger by 2mm in depth
	R88D-WTA5H	R88D-GT01H	15	10	−2	Larger by 2mm in depth
	R88D-WT01H	R88D-GT01H	15	10	−2	Larger by 2mm in depth
	R88D-WT02H	R88D-GT02H	15	10	−2	Larger by 2mm in depth
	R88D-WT04H	R88D-GT04H	20	10	−2	Larger by 2mm in depth
	R88D-WT08H	R88D-GT08H	25	10	8	
Three phase AC200V /230V	R88D-WT05H	R88D-GT10H	5	10	8	
	R88D-WT05H	R88D-GT15H	5	10	8	
	R88D-WT08H	R88D-GT08H	25	10	8	
	R88D-WT08H	R88D-GT15H	5	10	8	
	R88D-WT10H	R88D-GT15H	5	10	8	
	R88D-WT15H	R88D-GT15H	25	10	8	
	R88D-WT15H	R88D-GT20H	25	−38	−20	Larger by 38mm in height and 20mm in depth
	R88D-WT15H	R88D-GT30H	−20	−90	−20	Larger by 20mm in width、90mm in height and 20mm in depth
	R88D-WT20H	R88D-GT20H	25	52	−20	Larger by 20mm in depth
	R88D-WT20H	R88D-GT30H	−20	0	−20	Larger by 20mm in width and 20mm in depth
	R88D-WT30H	R88D-GT30H	−20	0	−20	Larger by 20mm in width and 20mm in depth
	R88D-WT30H	R88D-GT50H	−20	0	−20	Larger by 20mm in width and 20mm in depth
	R88D-WT50H	R88D-GT50H	5	0	30	
	R88D-WT50H	R88D-GT50H	5	0	30	
	R88D-WT60H	R88D-GT75H	−18	100	−105	※ NB
	R88D-WT75H	R88D-GT75H	−18	100	−105	※ NB

※ NB : Models R88D-WT60H/-WT75H are a wall installation type, but models R88D-GT75H are a front panel installation type only. Dimensional comparison of the above table is just based on the outside dimensions of the products. When actually replacing the products, further consideration is required for the installation.
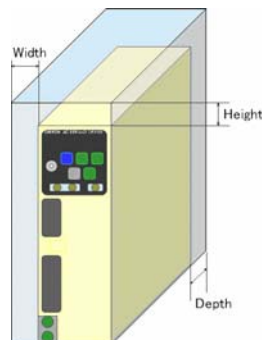
vi）Precautions for the Regeneration Absorption Amount

When replacing the W Series Servo Drives with the G Series Servo Drives, regeneration absorption amount may be reduced. Calculate the regeneration energy. If the amount exceeds the G Series regeneration absorption capability, improve the regeneration processing capability by using an external regeneration resistor or taking other measures.

Input Power	W Series				G Series			
	Model	①	②	③	Model	①	②	③
Single phase AC100V /115V	R88D–WTA3HL	7.8	—	—	R88D–GTA5L	12	—	—
	R88D–WTA5HL	15.7	—	—	R88D–GTA5L	12	—	—
	R88D–WT01HL	15.7	—	—	R88D–GT01L	12	—	—
	R88D–WT02HL	15.7	—	—	R88D–GT02L	18	—	—
Single phase AC200V /230V	R88D–WTA3H	18.5	—	—	R88D–GT01H	16	—	—
	R88D–WTA5H	18.5	—	—	R88D–GT01H	16	—	—
	R88D–WT01H	37.1	—	—	R88D–GT01H	16	—	—
	R88D–WT02H	37.1	—	—	R88D–GT02H	16	—	—
	R88D–WT04H	37.1	—	—	R88D–GT04H	25	12	50
	R88D–WT08H	—	12	50	R88D–GT08H	43	—	—
Three phase AC200V /230V	R88D–WT05H	—	12	50	R88D–GT10H	70	—	—
	R88D–WT05H	—	12	50	R88D–GT15H	70	—	—
	R88D–WT08H	—	12	50	R88D–GT08H	43	12	100
	R88D–WT08H	—	12	50	R88D–GT15H	70	20	30
	R88D–WT10H	—	12	50	R88D–GT15H	70	20	30
	R88D–WT15H	—	14	30	R88D–GT15H	70	20	30
	R88D–WT15H	—	14	30	R88D–GT20H	70	40	15
	R88D–WT15H	—	14	30	R88D–GT30H	70	40	15
	R88D–WT20H	—	28	25	R88D–GT20H	70	40	15
	R88D–WT20H	—	28	25	R88D–GT30H	70	40	15
	R88D–WT30H	—	28	12.5	R88D–GT30H	70	40	15
	R88D–WT30H	—	28	12.5	R88D–GT50H	105	80	10
	R88D–WT50H	—	56	8	R88D–GT50H	105	80	10
	R88D–WT50H	—	56	8	R88D–GT50H	105	80	10
	R88D–WT60H	—	—	—	R88D–GT75H	**250**	–	–
	R88D–WT75H	—	—	—	R88D–GT75H	250	–	–

① Regeneration energy that can be absorbed by the internal capacitor（J）

② Average regeneration amount that can be absorbed by the internal regeneration resistor（W）

③ Resistance value of the internal regeneration resistor（Ω）

3-3.Cable Replacement Procedure

When replacing the cables, note the following two precautions.

- ・ The W Series Cables and G Series Cables are not compatible with each other.
- ・ The Servo relay units cannot be used for some of the G Series.

■ Example of Using a Conversion Cable for the Replacement

Here's an example of making a conversion cable for the replacement in case you cannot change the Controller or cables now in use.

The Controller now in use

W Series Control Cable

W Series Servo Drive

W Series Power Cable

W Series Encoder Cable

W Series Servomotor

The Controller now in use

Conversion Cable Ⓐ

W Series Control Cable

G Series Servo Drive

Conversion Cable Ⓑ

W Series Power Cable

W Series Encoder Cable

Conversion Cable Ⓒ

G Series Servomotor
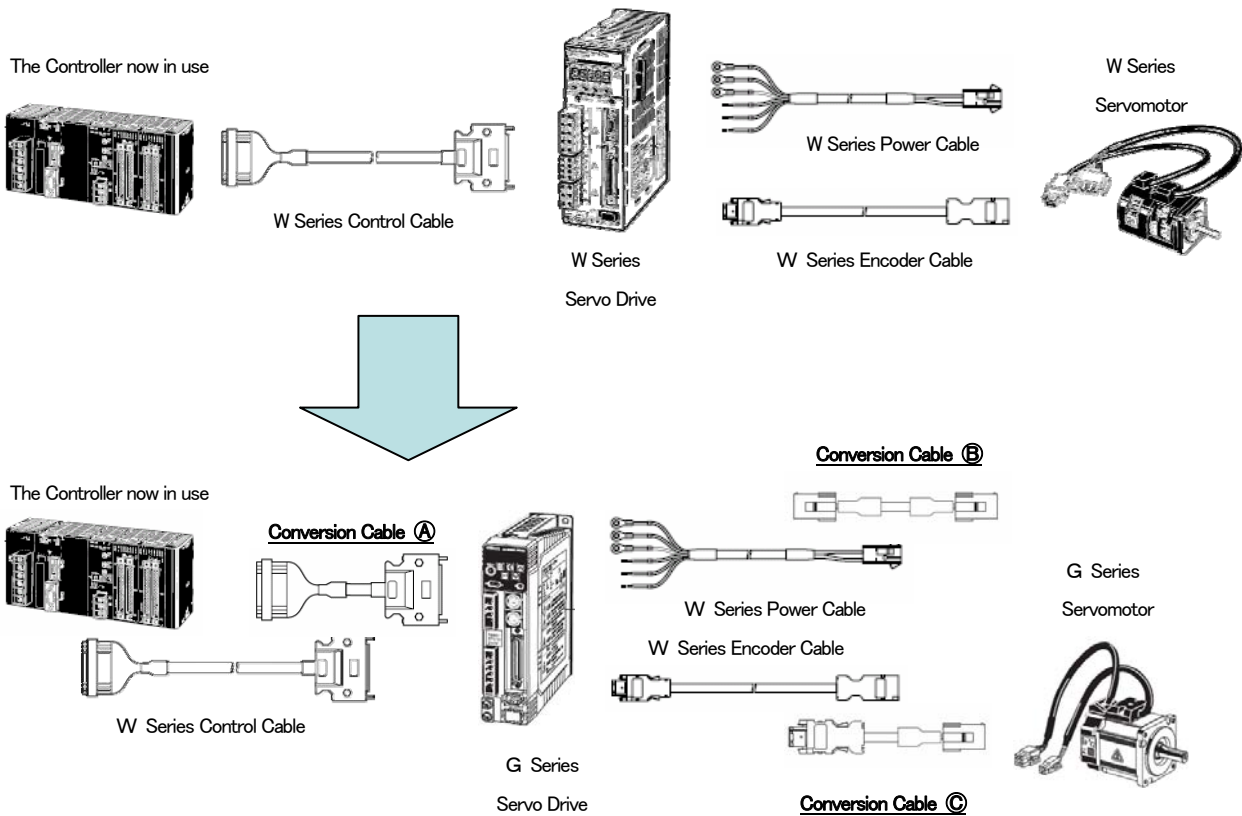
Ⓐ-1.Control Signal Conversion Cable Example【For Position Control】

G Series Servo Drive			W Series Servo Drive	
Symbol	Pin No.		Pin No.	Symbol
+CW／PULS／FA	3		7	+CW／PULS／FA
-CW／PULS／FA	4		8	-CW／PULS／FA
+CCW／SIGN／FB	5		11	+CCW／SIGN／FB
-CCW／SIGN／FB	6		12	-CCW／SIGN／FB
+24VIN	7		47	+24VIN
NOT	8		43	NOT
POT	9		42	POT
BKIR COM	10		28	BKIR COM ※1
BKIR	11		27	BKIR ※1
+A	21		33	+A
-A	22		34	-A
+Z	23		19	+Z
-Z	24		20	-Z
GSEL	27		41	MING ※1
GESEL	28		45	PSEL ※1
RUN	29		40	RUN ※1
ECRST	30		14	-ECRST ※2
RESRT	31		44	RESRT ※1
IPG	33		46	IPG ※1
READY COM	34		30	READY COM ※1
READY	35		29	READY ※1
ALMCOM	36		32	ALMCOM ※1
／ALM	37		31	／ALM ※1
INPCOM／TGONCOM	38		26	INPCOM ※1
INP／TGON	39		25	INP ※1
-B	48		35	-B
+B	49		36	+B
FG	Shell		Shell	FG

Connector plug： 0150-3000VE

Connector case： 10350-52A0-008

Manufacturer： Sumitomo 3M

Receptacle： 10250-0200EL

Manufacturer： Sumitomo 3M

※1 W Series Servo Drive pin No.40~46 inputs and No.25~30 outputs are changed by the parameter settings.

　　After checking with the W Series parameters and the host controller, change the wiring according to the operational situation.

※2 The W Series Servo Drives and G Series Servo Drives differ in the input specifications of the deviation counter.

　　Check the output specifications of the host controller when performing the wiring.

Ⓐ-2.Control Signal Conversion Cable Example【For Speed/Torque Control】

G Series Servo Drive			W Series Servo Drive	
Symbol	Pin No.		Pin No.	Symbol
+24VIN	7		47	+24VIN
NOT	8		43	NOT
POT	9		42	POT
BKIR COM	10		28	BKIR COM ※1
BKIR	11		27	BKIR ※1
OUTM1(VCMP)	12		27	VCMP ※1
SENGND	13		2	SENGND
REF／TREF／VLIM	14		5	REF
AGND	15		6	AGND
PCL／TREF	16		9	TREF
AGND	17		10	AGND
SEN	20		4	SEN
+ A	21		33	+ A
− A	22		34	− A
+ Z	23		19	+ Z
− Z	24		20	− Z
VZERO	26		40〜46	PROCK ※1
GSEL	27		40〜46	MING ※1
VSEL3	28		40〜46	RDIR ※1
RUN	29		40	RUN
VSEL2	30		40〜46	SPD2 ※1
RESRT	31		44	RESRT
TVSEL	32		40〜46	TVSEL ※1
VSEL1	33		33	SPD1 ※1
READY COM	34		30	READY COM ※1
READY	35		29	READY ※1
ALMCOM	36		32	ALMCOM
/ALM	37		31	/ALM
TGONCOM	38		26	TGONCOM ※1
TGON	39		25	TGON※1
COM	41		28	VCMPCOM ※1
BAT	42		21	BAT
BATGND	43		22	BATGND
− B	48		35	− B
+ B	49		36	+ B
FG	Shell		Shell	FG

Connector plug: 10150-3000VE

Connector case: 10350-52A0-008

Manufacturer: Sumitomo 3M

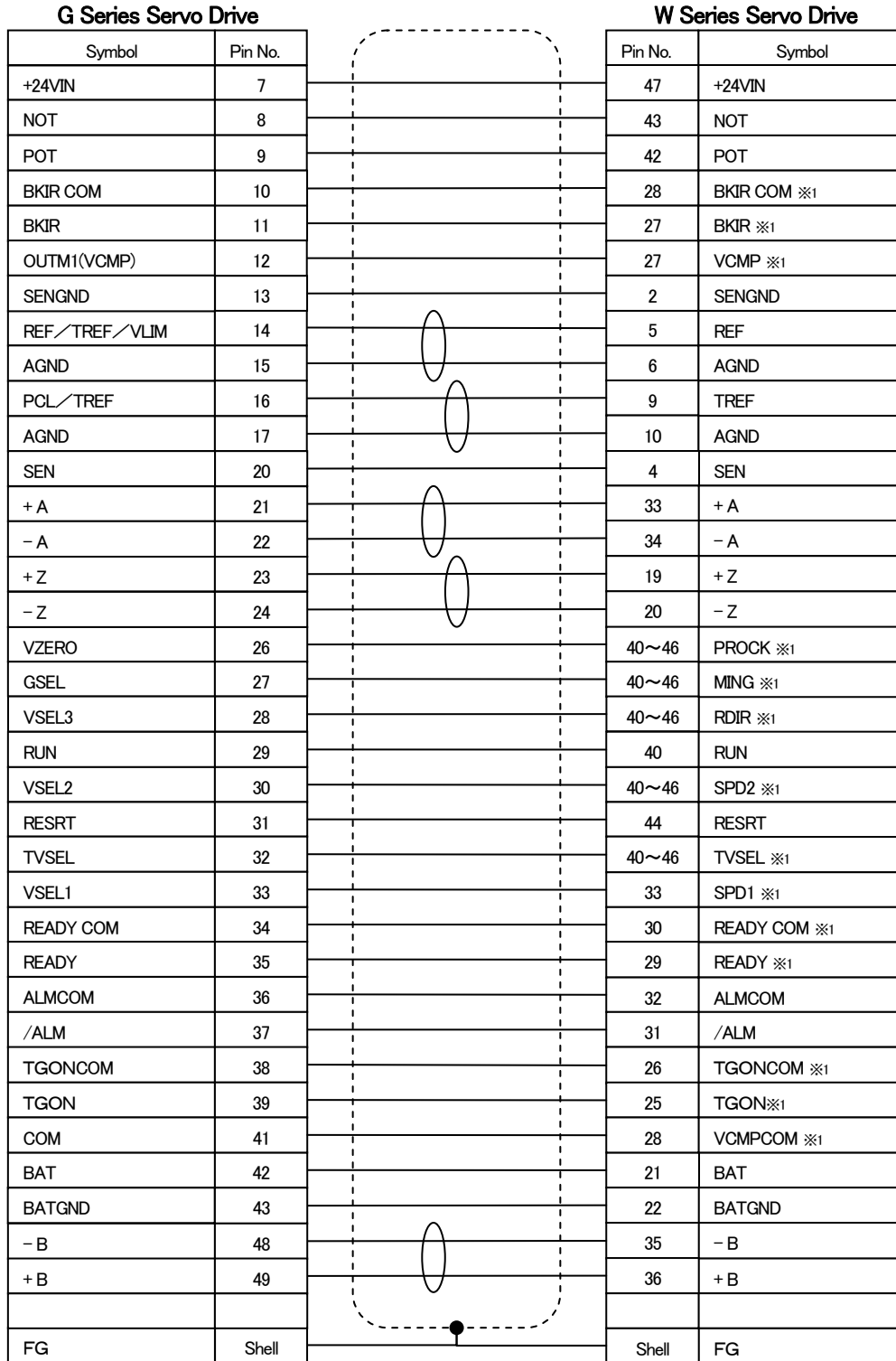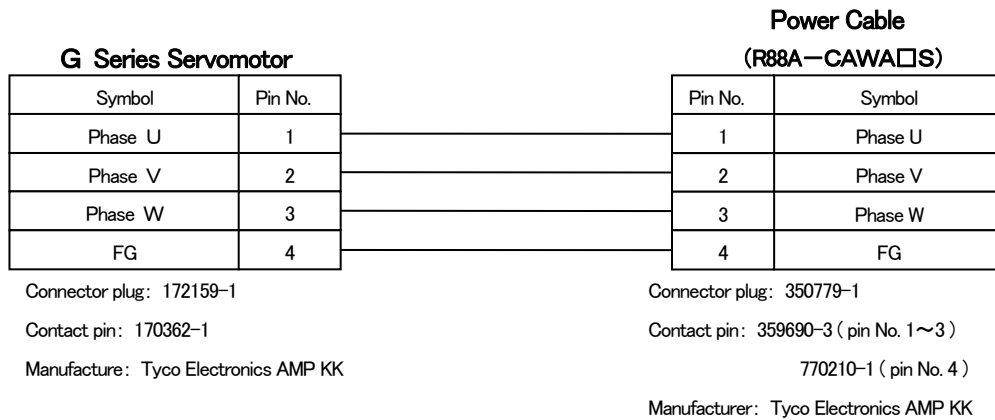Receptacle: 10250-0200EL

Manufacturer: Sumitomo 3M

※1 W Series Servo Drive pin No.40〜46 inputs and No.25〜30 outputs are changed by the parameter settings.

After checking with the W Series parameters and the host controller, change the wiring according to the operational situation.

Chapter 3.Method of replacing

Ⓑ-1.Servomotor Power Conversion Cable Example
【 Without a Brake, 3,000r/min 50 to 750w Flat Type Servomotors 】

G Series Servomotor

Symbol	Pin No.
Phase U	1
Phase V	2
Phase W	3
FG	4

Connector plug： 172159-1

Contact pin： 170362-1

Manufacture： Tyco Electronics AMP KK

Power Cable
（R88A-CAWA□S）

Pin No.	Symbol
1	Phase U
2	Phase V
3	Phase W
4	FG

Connector plug： 350779-1

Contact pin： 359690-3（pin No. 1～3）

770210-1（pin No. 4）

Manufacturer： Tyco Electronics AMP KK

Ⓑ-2.Servomotor Conversion Cable Example
【 With a Brake, 3,000r/min 50 to 750w Flat Type Servomotors 】

G Series Servomotor

Symbol	Pin No.
Phase U	1
Phase V	2
Phase W	3
FG	4

Connector plug： 172159-1

Contact pin： 170362-1

Manufacturer： Tyco Electronics AMP KK

Symbol	Pin No.
Brake	A
Brake	B

Connector plug： 172157-1

Contact pin： 170362-1

Manufacturer： Tyco Electronics AMP KK

Power Cable
（R88A-CAWA□B）

Pin No.	Symbol
1	Phase U
2	Phase V
3	Phase W
4	FG
5	Brake
6	Brake

Connector plug： 350715-1

Contact pin： 359690-3（pin No. 1～3,5,6）

770210-1（pin No. 4）

Manufacturer： Tyco Electronics AMP KK

Ⓑ-3.Servomotor Power Conversion Cable Example

【 Without a Brake, 3,000r/min 1.0k to 2.0Kw, 1000r/min 300 to 900w, 500r/min 450 to 1.3Kw Servomotors 】

G Series Servomotor

Symbol	Pin No.
Phase U	A
Phase V	B
Phase W	C
FG	D

Plug: N/MS3106B20-4S

Cable clamp: MS3057-12A

Manufacturer: DDK Ltd.

Power Cable
(R88A-CAWC□S)

Pin No.	Symbol
A	Phase U
B	Phase V
C	Phase W
D	FG

Receptacle: DMS3101A18-10P

Cable clamp: MS3057-10A

Manufacturer: DDK Ltd.
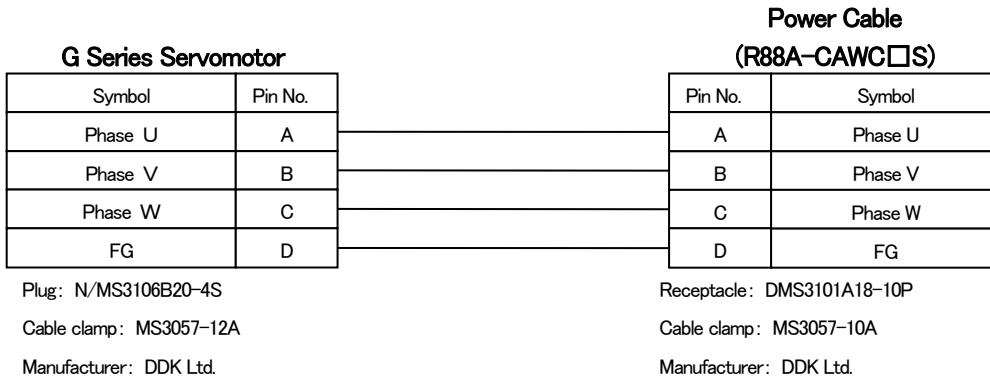
Ⓑ-4. Servomotor Conversion Cable Example

【 With a Brake, 3,000r/min 1.0k to 2.0Kw, 1000r/min 300 to 900w, 1500r/min 450 to 1.3Kw Servomotors 】

G Series Servomotor

Symbol	Pin No.
NC	A
Phase W	B
NC	C
FG	D
FG	E
Phase U	F
Brake	G
Brake	H
Phase V	I

Plug: N/MS3106B20-18S

Cable Clamp: MS3057-12A

Manufacturer: DDK Ltd.

Power Cable
(R88A-CAWC□B)

Pin No.	Symbol
C	Phase W
D	FG
A	Phase U
F	Brake
E	Brake
B	Phase V

Receptacle: DMS3101A20-15P

Cable clamp: MS3057-12A

Manufacturer: DDK Ltd.

Ⓑ-5.Servomotor Power Conversion Cable Example
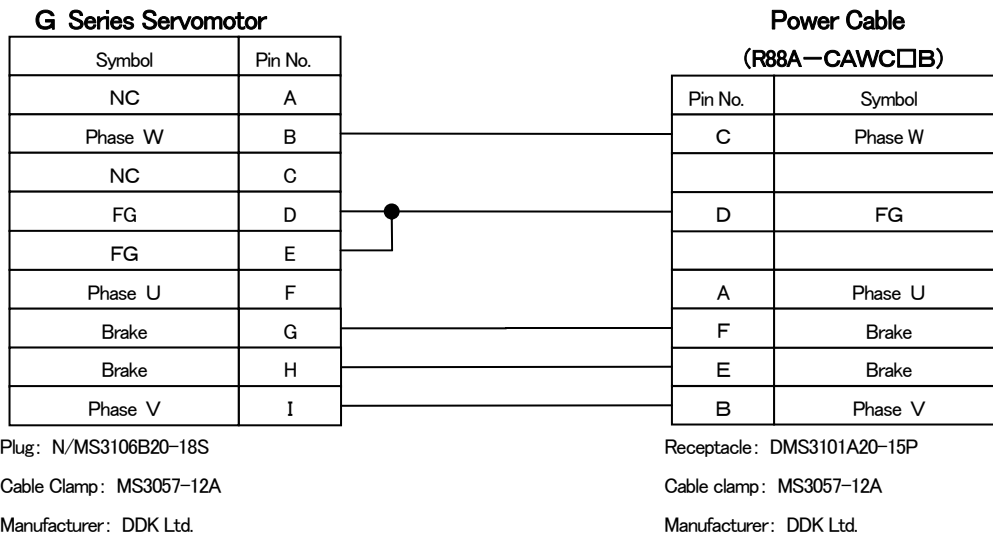
【 Without a Brake, 3,000r/min 3.0k to 5.0Kw, 1000r/min 1.2K to 3.0Kw,1500r/min 1.8 to 4.4Kw Servomotors 】

The W Series Servomotor Power Cables are compatible with the G Series Servomotor Power Cables, and can be used for the replacement.

G Series Power Cable
R88A—CAGD□□□S

Pin No.	Symbol
A	Phase U
B	Phase V
C	Phase W
D	FG

Plug: N/MS3106B22-22S

Cable clamp: MS3057-12A

Manufacturer: DDK Ltd.

W Series Power Cable
R88A—CAWD□□□S

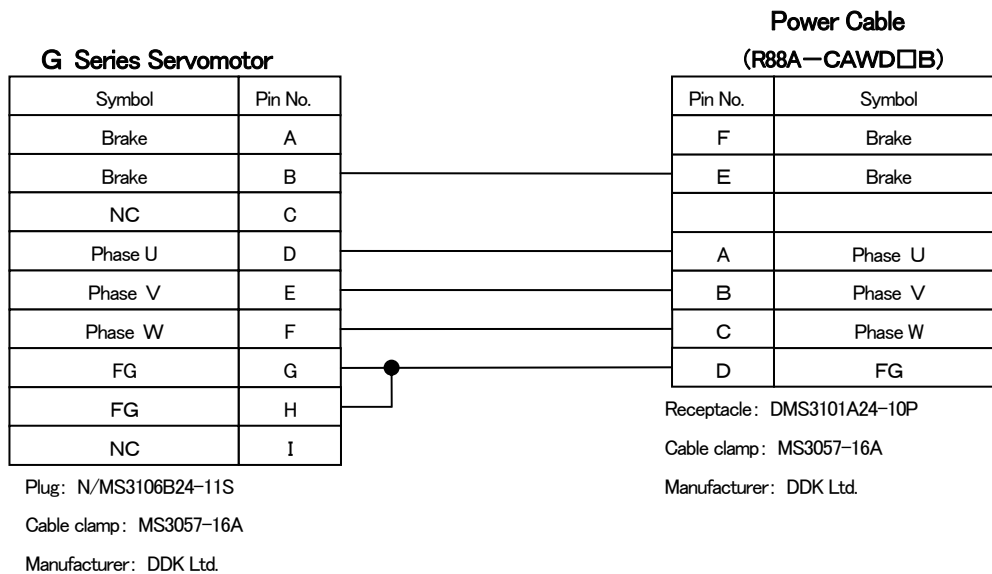| Pin No.	Symbol
A	Phase U
B	Phase V
C	Phase W
D	FG

Plug: MS3106B22-22S

Cable clamp: MS3057-12A

Manufacturer: DDK Ltd.

Ⓑ-6.Servomotor Conversion Cable Example

【 With a Brake, 3,000r/min 3.0k to 5.0Kw, 1000r/min 1.2K to 3.0Kw,1500r/min 1.8 to4.4Kw Servomotors 】

G Series Servomotor

Symbol	Pin No.
Brake	A
Brake	B
NC	C
Phase U	D
Phase V	E
Phase W	F
FG	G
FG	H
NC	I

Plug: N/MS3106B24-11S

Cable clamp: MS3057-16A

Manufacturer: DDK Ltd.

Power Cable
(R88A—CAWD□B)

Pin No.	Symbol
F	Brake
E	Brake
A	Phase U
B	Phase V
C	Phase W
D	FG

Receptacle: DMS3101A24-10P

Cable clamp: MS3057-16A

Manufacturer: DDK Ltd.

Ⓑ-7.Servomotor Power Conversion Cable Example 【 Without a Brake, 1000r/min 4.0Kw Servomotor 】

G Series Servomotor

Symbol	Pin No.
Phase U	A
Phase V	B
Phase W	C
FG	D

Plug: N/MS3106B22-22S

Cable clamp: MS3057-12A

Manufacturer: DDK Ltd.

Power Cable (R88A-CAWE□S)

Pin No.	Symbol
A	Phase U
B	Phase V
C	Phase W
D	FG

Receptacle: MS3101A32-17P

Cable clamp: MS3057-20A

Manufacturer: DDK Ltd.

Ⓑ-8.Servomotor Conversion Cable Example

【 With a Brake, 1000r/min 4.0Kw Servomotor 】

G Series Servomotor

Symbol	Pin No.
Brake	A
Brake	B
NC	C
Phase U	D
Phase V	E
Phase W	F
FG	G
FG	H
NC	I

Plug: N/MS3106B24-11S

Cable clamp: MS3057-16A

Manufacturer: DDK Ltd.

Brake Cable (R88A-CAWE□B)

Pin No.	Symbol
A	Brake
B	Brake

Receptacle: MS3102A10SL-3P

Manufacturer: DDK Ltd.

Power Cable (R88A-CAWE□S)

Pin No.	Symbol
A	Phase U
B	Phase V
C	Phase W
D	FG

Receptacle: DMS3101A32-17P

Cable clamp: MS3057-20A

Manufacturer: DDK Ltd.

Chapter 3.Method of replacing

Ⓑ-9.Servomotor Power Conversion Cable Example

【 Without a Brake, 1000r/min 5.0Kw, 1500r/min 5.5K to 7.5Kw Servomotors 】

The W Series Servomotor Power Cables are compatible with the G Series Servomotor Power Cables, and can be used for the replacement.

G Series Power Cable
R88A−CAGD□□□S

Pin No.	Symbol
A	Phase U
B	Phase V
C	Phase W
D	FG

Plug ： N/MS3106B32−17S

Cable clamp ： MS3057−20A

Manufacturer ： DDK Ltd.

W Series Power Cable
R88A−CAWD□□□S

Pin No.	Symbol
A	Phase U
B	Phase V
C	Phase W
D	FG

Receptacle ： MS3101A32−17S

Cable clamp ： MS3057−20A

Manufacturer ： DDK Ltd.

Ⓑ-10.Servomotor Conversion Cable Example 【 With a Brake, 1000r/min 5.0Kw, 1500r/min 5.5K to 7.5Kw Servomotors 】

The W Series Servomotor Power Cables are compatible with the G Series Servomotor Power Cables, and can be used for the replacement. Only the following brake cable needs to be prepared.

G Series Servomotor

Symbol	Pin No.
Brake	A
Brake	B

Brake Cable
(R88A−CAWE□B)

Pin No.	Symbol
A	Brake
B	Brake

Plug： N/MS3106B14S−2S

Cable clamp： MS3057−6A

Manufacturer： DDK Ltd.
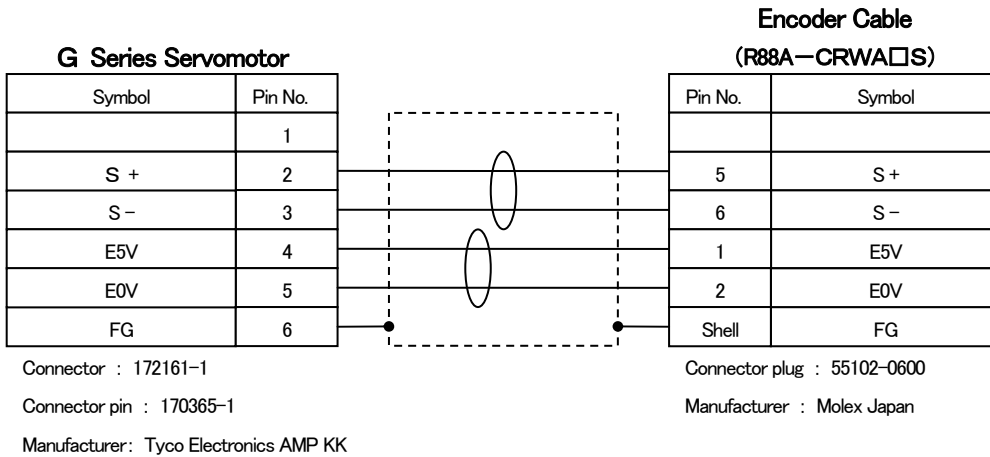
Receptacle： MS3102A10SL−3P

Manufacturer： DDK Ltd.

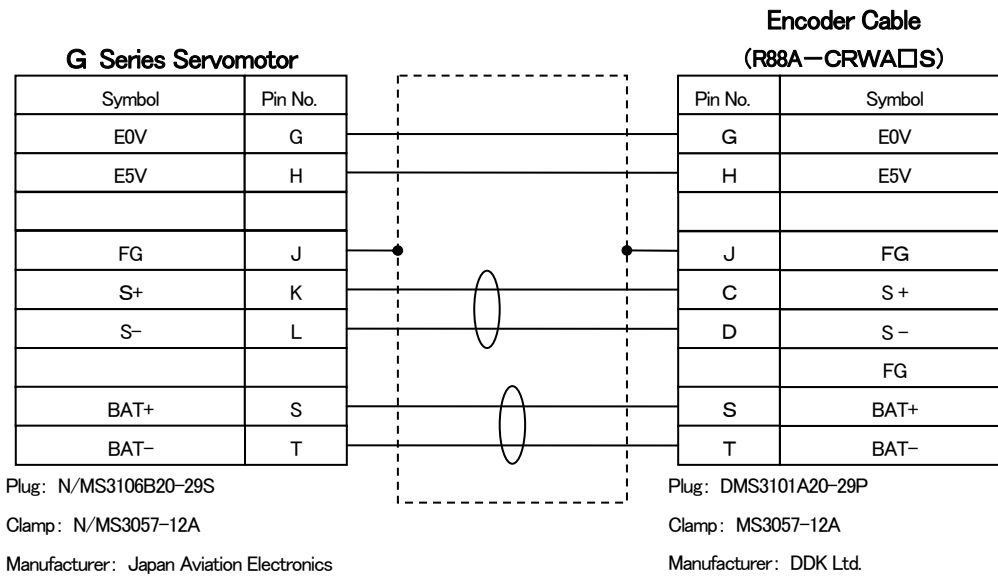## Ⓒ-1.Encoder Conversion Cable Example 【 ABS 3,000r/min 50 to 750w, Flat Type Servomotors 】

G Series Servomotor

Encoder Cable
(R88A－CRWA□S)

Symbol	Pin No.		Pin No.	Symbol
BAT +	1		3	BAT+
BAT －	2		4	BAT−
FG	3		Shell	FG
S +	4		5	S +
S －	5		6	S －
	6			FG
E5V	7		1	E5V
E0V	8		2	E0V

Connector : 172161−1

Connector pin : 170365−1

Manufacturer : Tyco Electronics AMP KK

Connector plug : 55102−0600

Manufacturer : Molex Japan
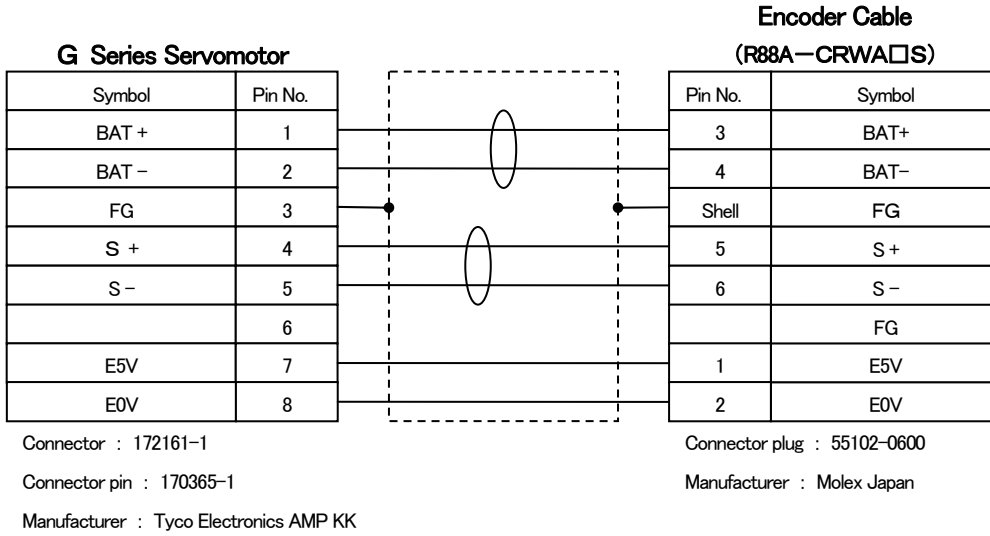
Ⓒ-2.Encoder Conversion Cable Example 【 INC 3,000r/min 50 to 750w, Flat Type Servomotors 】

G Series Servomotor

Encoder Cable
(R88A－CRWA□S)

Symbol	Pin No.		Pin No.	Symbol
	1			
S +	2		5	S +
S －	3		6	S －
E5V	4		1	E5V
E0V	5		2	E0V
FG	6		Shell	FG

Connector : 172161−1

Connector pin : 170365−1

Manufacturer: Tyco Electronics AMP KK

Connector plug : 55102−0600

Manufacturer : Molex Japan

Ⓒ-3. Encoder Conversion Cable Example 【 Medium Capacity Type Servomotors 】

G Series Servomotor

Encoder Cable
（R88A－CRWA□S）

Symbol	Pin No.		Pin No.	Symbol
E0V	G		G	E0V
E5V	H		H	E5V
FG	J		J	FG
S+	K		C	S＋
S−	L		D	S −
				FG
BAT+	S		S	BAT+
BAT−	T		T	BAT−

Plug： N/MS3106B20−29S

Clamp： N/MS3057−12A

Manufacturer： Japan Aviation Electronics

Plug： DMS3101A20−29P

Clamp： MS3057−12A

Manufacturer： DDK Ltd.

■ Replacement Cable Usage Examples（Categorized by the Servomotor Capacity）

● 3,000r/min Servomotors

	W Series	G Series	Power Cables		Encoder Cables	
	R88M −	R88M −	Without a Brake	With a Brake	ABS	INC
30w	−W03030L/S	−G05030H/T	Ⓑ−1	Ⓑ−2	Ⓒ−1	Ⓒ−2
50w	−W05030L/S	−G05030H/T	Ⓑ−1	Ⓑ−2	Ⓒ−1	Ⓒ−2
100w	−W10030L/S	−G10030L/S	Ⓑ−1	Ⓑ−2	Ⓒ−1	Ⓒ−2
200w	−W20030L/S	−G20030L/S	Ⓑ−1	Ⓑ−2	Ⓒ−1	Ⓒ−2
30w	−W03030H/T	−G05030H/T	Ⓑ−1	Ⓑ−2	Ⓒ−1	Ⓒ−2
50w	−W05030H/T	−G05030H/T	Ⓑ−1	Ⓑ−2	Ⓒ−1	Ⓒ−2
100w	−W10030H/T	−G10030H/T	Ⓑ−1	Ⓑ−2	Ⓒ−1	Ⓒ−2
200w	−W20030H/T	−G20030H/T	Ⓑ−1	Ⓑ−2	Ⓒ−1	Ⓒ−2
400w	−W40030H/T	−G40030H/T	Ⓑ−1	Ⓑ−2	Ⓒ−1	Ⓒ−2
750w	−W75030H/T	−G75030H/T	Ⓑ−1	Ⓑ−2	Ⓒ−1	Ⓒ−2
1.0Kw	−W1K030H/T	−G1K030T	Ⓑ−3	Ⓑ−4	Ⓒ−3	−
1.5Kw	−W1K530H/T	−G1K530T	Ⓑ−3	Ⓑ−4	Ⓒ−3	−
2.0Kw	−W2K030H/T	−G2K030T	Ⓑ−3	Ⓑ−4	Ⓒ−3	−
3.0Kw	−W3K030H/T	−G3K030T	Ⓑ−5	Ⓑ−6	Ⓒ−3	−
4.0Kw	−W4K030H/T	−G4K030T	Ⓑ−5	Ⓑ−6	Ⓒ−3	−
5.0Kw	−W5K030H/T	−G5K030T	Ⓑ−5	Ⓑ−6	Ⓒ−3	−

● 1,000r/min Servomotors

	W Series R88M −	G Series R88M −	Power Cables		Encoder Cables
			Without a Brake	With a Brake	
300w	−W30010H/T	−G90010T	Ⓑ−3	Ⓑ−4	Ⓒ−3
600w	−W60010H/T	−G90010T	Ⓑ−3	Ⓑ−4	Ⓒ−3
900w	−W90010H/T	−G90010T	Ⓑ−3	Ⓑ−4	Ⓒ−3
1.2Kw	−W1K210H/T	−G2K010T	Ⓑ−5	Ⓑ−6	Ⓒ−3
2.0Kw	−W2K010H/T	−G2K010T	Ⓑ−5	Ⓑ−6	Ⓒ−3
3.0Kw	−W3K010H/T	−G3K010T	Ⓑ−5	Ⓑ−6	Ⓒ−3
4.0Kw	−W4K010H/T	−G4K510T	Ⓑ−7	Ⓑ−8	Ⓒ−3
5.0Kw	−W5K010H/T	−G6K010T	Ⓑ−9	Ⓑ−11	Ⓒ−3

● 1,500r/min Servomotors

	W Series R88M −	G Series R88M −	Power Cables		Encoder Cables
			Without a Brake	With a Brake	
450w	−W45015T	−G1K020T	Ⓑ−3	Ⓑ−4	Ⓒ−3
850w	−W85015T	−G1K520T	Ⓑ−3	Ⓑ−4	Ⓒ−3
1.3Kw	−W1K315T	−G2K020T	Ⓑ−3	Ⓑ−4	Ⓒ−3
1.8Kw	−W1K815T	−G3K020T	Ⓑ−5	Ⓑ−6	Ⓒ−3
2.9Kw	−W2K915T	−G4K020T	Ⓑ−5	Ⓑ−6	Ⓒ−3
4.4Kw	−W4K415T	−G5K020T	Ⓑ−5	Ⓑ−6	Ⓒ−3
5.5Kw	−W5K515T	−G7K515T	Ⓑ−9	Ⓑ−10	Ⓒ−3
7.5Kw	−W7K515T	−G7K515T	Ⓑ−9	Ⓑ−10	Ⓒ−3
11.0Kw	−W11K015T	−			
15.0Kw	−W15K015T	−			

Chapter 4.Parameter specification comparison

4-1.Comparing Function Selection Parameters

W Series				G Series			
PRM No.	Parameter Name	Setting Range	Control Mode	PRM No.	Parameter Name	Setting Range	Control Mode
000.0	Reverse Rotation	0,1	All	41	Command Pulse Rotation Direction Switch	0,1	Position
				51	Command Speed Rotation Direction Switch	0,1	Speed
				5D	Torque Output Direction Switch	0,1	Torque
000.1	Control Mode Selection	0 to B	All	02	Control Mode Selection	0 to 6	All
				05	Command Speed Selection	1 to 5	Speed
000.2	Unit No. Setting	0 to F	All	00	Unit No. Setting	0 to F	All
001.0	Select Stop If an Alarm Occurs When Servomotor is OFF	0 to 2	All	68	Stop Selection for Alarm Generation	0 to 3	All
				69	Stop Selection with Servo OFF	0 to 9	All
001.1	Select Stop When Prohibited Drive Is Input	0 to 3	Position Speed	66	Stop Selection for Drive Prohibition Input	0 to 2	All
001.2	Select AC/DC Power Input	0,1	All	/	Not available with the G Series.		
001.3	Select Warning Code Output	0,1	All	/	Not available with the G Series.		
002.0	Torque Command Input Change		Position Speed	03	Torque Limit Selection	0 to 3	Position Speed
002.1	Speed Command Input Change	0.1	Torque	5B	Torque Command/Speed Limit Selection	0.1	Torque
002.2	Operation Switch When Using Absolute Encoder	0,1	All	0B	Operation Switch When Using Absolute Encoder	0 to 2	All
003.0	Analogue Monitor 1(AM) Allocation	0 to 7	All	08	IM Selection	0 to 5 11,12	All
003.1	Analogue Monitor 2(NM) Allocation	0 to 7	All	07	SP Selection	0 to 12	All

Please note that the W Series and the G Series differ in the parameter setting ranges and data.

4-2.Comparing Gain Related Parameters

W Series					G Series				
PRM No.	Parameter Name	Units	Setting Range	Control Mode	PRM No.	Parameter Name	Units	Setting Range	Control Mode
100	Speed Loop Gain	Hz	1 to 2000	Position Speed	11	Speed Loop Gain	Hz	1 to 3500	All
101	Speed Loop Integration Time Constant	×0.01ms	15 to 51200	Position Speed	12	Speed Loop Integration Time Constant	ms	1 to 1000	All
102	Position Loop Gain	1/s	1 to 2000	Position	10	Position Loop Gain	1/s	0 to 3000	Position
103	Inertia Ratio	%	0 to 20000	Position Speed	20	Inertia Ration	%	0 to 10000	All
104	Speed Loop Gain 2	Hz	1 to 2000	Position Speed	19	Speed Loop Gain 2	Hz	1 to 3500	All
105	Speed Loop Integration Time Constant 2	×0.01ms	15 to 51200	Position Speed	1A	Speed Loop Integration Time Constant 2	ms	1 to 1000	All
106	Position Loop Gain 2	1/s	1 to 2000	Position	18	Position Loop Gain 2	1/s	0 to 3000	Position
107	Bias Rotational Speed	r/min	1 to 2000	Position	/	Not available with the G Series.			
108	Bias Addition Band	Command Units	0 to 250	Position	/	Not available with the G Series.			
109	Feed-forward Amount	%	0 to 100	Position	15	Feed-forward Amount	×0.1%	−2000 to 2000	Position
10A	Feed-forward Command Filter	×0.01ms	0 to 6400	Position	16	Feed-forward Command Filter	×0.01ms	0 to 6400	Position

W Series				G Series			
PRM No.	Parameter Name	Setting Range	Control Mode	PRM No.	Parameter Name	Setting Range	Control Mode
10B.0	P Control Switching Conditions	0 to 4	Position Speed	/	Not available with the G Series.		
10B.1	Speed Control Loop Switching	0,1	Position Speed	/	Not available with the G Series.		
10B.2	Automatic Gain Switching Selection	0 to 3	Position	31	Gain Switch 1 Setting	0 to 10	All

Chapter 4.Parameter specification comparison

W Series					G Series				
PRM No.	Parameter Name	Units	Setting Range	Control Mode	PRM No.	Parameter Name	Units	Setting Range	Control Mode
10C	P Control Switching (Torque Command)	%	0 to 800	Position Speed	/	Not available with the G Series.			
10D	P Control Switching (Speed Command)	r/min	0 to 10000	Position Speed	/	Not available with the G Series.			
10E	P Control Switching (Acceleration Command)	10r/min	0 to 3000	Position Speed	/	Not available with the G Series.			
10F	P Control Switching (Deviation Pulse)	Command Units	0 to 10000	Position	/	Not available with the G Series.			

W Series				G Series			
PRM No.	Parameter Name	Setting Range	Control Mode	PRM No.	Parameter Name	Setting Range	Control Mode
110.0	Selects Online Autotuning	0 to 2	Position Speed	21	Realtime Autotuning Mode Selection	0 to 7	All
110.1	Selects Speed Feedback Compensation Function	0,1	Position Speed	13	Speed Feedback Filter Time Constant	0 to 5	All
110.2	Selects Adhesive Friction Compensation Function	0 to 2	Position Speed	–			

W Series					G Series				
PRM No.	Parameter Name	Units	Setting Range	Control Mode	PRM No.	Parameter Name	Units	Setting Range	Control Mode
111	Speed Feedback Compensation Gain	%	1 to 500	Position Speed	13	Speed Feedback Filter Time Constant	–	0 to 5	All
124	Automatic Gain Switching Timer	ms	1 to 10000	Position	32	Gain Switch 1 Time	$\times 166\mu$s	0 to 10000	All
125	Automatic Gain Switching Width (Position Deviation)	Command Units	1 to 250	Position	33	Gain Switch 1 Level Setting	–	0 to 20000	All

4-3.Comparing Position Control Related Parameters

W Series				G Series			
PRM No.	Parameter Name	Setting Range	Control Mode	PRM No.	Parameter Name	Setting Range	Control Mode
200.0	Command Pulse Mode	0 to 9	Position	42	Command Pulse Mode	0 to 3	Position
200.1	Deviation Counter Reset	0 to 3	Position	4E	Deviation Counter Reset Condition Setting	0 to 2	Position
200.2	Deviation Counter Reset If an Alarm Occurs When the Servomotor Is OFF	0 to 2	Position	69	Stop Selection with Servo OFF (Retained when an alarm occurs)	0 to 9	Position
200.3	Pulse Command Filter Selection	0 to 1	Position	/	Not available with the G Series.		

W Series					G Series				
PRM No.	Parameter Name	Units	Setting Range	Control Mode	PRM No.	Parameter Name	Units	Setting Range	Control Mode
201	Encoder Divider Rate	Pulse/ rotation	16 to 16384	All	44	Encoder Divider Numerator Setting	–	1 to 32767	All
					45	Encoder Divider Denominator Setting	–	0 to 32767	All
202	Electronic Gear Ratio G1 (Numerator)	–	1 to 65535	Position	48	Electronic Gear Ratio Numerator 1	–	0 to 10000	Position
					4A	Electronic Gear Ratio Numerator Exponent	–	0 to 17	Position
203	Electronic Gear Ratio G2 (Denominator)	–	1 to 65535	Position	4B	Electronic Gear Ratio Denominator	–	0 to 10000	Position
204	Position Command Filter Time Constant 1 (Primary Filter)	0.01ms	0 to 6400	Position	4C	Position Command Filter Time Constant Setting	–	0 to 7	Position
205	Absolute Encoder Multi-turn Limit Setting	Rotation	0 to 65535	All	/	Not available with the G Series.			
207.0	Selects Position Command Filter		0.1	Position	/	Not available with the G Series.			
207.1	Speed Command Input Switching (In Position Control)		0,1	Position	/	Not available with the G Series.			
208	Position Command Filter Time Constant 2 (Linear Acceleration and Deceleration)	0.01ms	0 to 6400	Position	/	Not available with the G Series.			
217	Command Pulse Factor	Times	0 to 99	Position	49	Electronic Gear Ratio Numerator 2	–	0 to 10000	Position
218.0	Command Pulse Factor Switching Selection		0,1	Position	/	Not available with the G Series.			

Chapter 4.Parameter specification comparison

4-4.Comparing Speed Related Parameters

W Series					G Series				
PRM No.	Parameter Name	Units	Setting Range	Control Mode	PRM No.	Parameter Name	Units	Setting Range	Control Mode
300	Speed Command Scale	0.01V/ Rated rotation speed	150 to 3000	All	50	Speed Command Scale	(r/min)/V	10 to 2000	Speed Torque
301	No. 1 Internal Speed Setting	r/min	0 to 10000	Speed	53	No. 1 Internally Set Speed	r/min	−20000 to 20000	Speed
302	No. 2 Internal Speed Setting	r/min			54	No. 2 Internally Set Speed			
303	No. 3 Internal Speed Setting	r/min			55	No. 3 Internally Set Speed			
304	Jog Speed	r/min	0 to 10000	All	3D	Jog Speed	r/min	0 to 500	All
305	Soft Start Acceleration Time	ms	0 to 10000	All	58	Soft Start Acceleration Time	2ms/ (1000r/min)	0 to 5000	Speed
306	Soft Start Deceleration Time	ms	0 to 10000	Speed	59	Soft Start Deceleration Time	2ms/ (1000r/min)	0 to 5000	Speed
307	Speed Command Filter Time Constant	0.01ms	0 to 65535	All	57	Speed Command Filter Time Constant	0.01ms	0 to 6400	Speed Torque
308	Speed Feedback Filter Timer Constant	0.01ms	0 to 65535	All	13	Speed Feedback Filter Time Constant	—	0 to 5	All

4-5.Comparing Torque Related Parameters

W Series					G Series				
PRM No.	Parameter Name	Units	Setting Range	Control Mode	PRM No.	Parameter Name	Units	Setting Range	Control Mode
400	Torque Command Scale	0.1V/ Rated torque	10 to 100	All	5C	Torque Command Scale	0.1V/ Rated torque	10 to 100	Torque
401	Torque Command Filter Time Constant	×0.01ms	0 to 65535	All	14	Torque Command Filter Time Constant	×0.01ms	0 to 2500	All
402	Forward Torque Limit	%	0 to 800	All	5E	No. 1 Torque Limit	%	0 to 500	All
403	Reverse Torque Limit	%	0 to 800	All	5F	No. 2 Torque Limit	%	0 to 500	Position Speed
404	Forward Rotation External Current Limit	%	0 to 800	All	5E	No. 1 Torque Limit	%	0 to 500	All
405	Reverse Rotation External Current Limit	%	0 to 800	All					
406	Emergency Stop Torque	%	0 to 800	Position Speed	6E	Emergency Stop Torque	%	0 to 500	All
407	Speed Limit	r/min	0 to 10000	Torque	56	No. 4 Internally Set Speed (Speed Limit)	r/min	−20000 to 20000	Torque

W Series				G Series			
PRM No.	Parameter Name	Setting Range	Control Mode	PRM No.	Parameter Name	Setting Range	Control Mode
408.0	Selects Notch Filter 1	0,1	All	1D	Notch Filter 1 Frequency (Disabled when the setting is 1500.)	100 to 1500	All
408.2	Selects Notch Filter 2	0,1	Position	28	Notch Filter 2 Frequency (Disabled when the setting is 1500.)	100 to 1500	All

W Series					G Series				
PRM No.	Parameter Name	Units	Setting Range	Control Mode	PRM No.	Parameter Name	Units	Setting Range	Control Mode
409	Notch Filter 1 Frequency	Hz	50 to 2000	All	1D	Notch Filter 1 Frequency	Hz	100 to 1500	All
40A	Notch Filter 1 Q Value	×0.01	50 to 400	All	1E	Notch Filter 1 Width	−	0 to 4	All
40b	Notch Filter 2 Frequency	Hz	50 to 2000	All	28	Notch Filter 2 Frequency	Hz	100 to 1500	All
40C	Notch Filter 2 Q Value	×0.01	50 to 400	All	29	Notch Filter 2 Width	−	0 to 4	All
					2A	Notch Filter 2 Depth	−	0 to 99	All

Chapter 4.Parameter specification comparison

4-6.Comparing Sequence Related Parameters

W Series					G Series				
PRM No.	Parameter Name	Units	Setting Range	Control Mode	PRM No.	Parameter Name	Units	Setting Range	Control Mode
500	Positioning Completion Range 1	Command Units	0 to 250	Position	60	Positioning Completion Range	Pulse	0 to 32767	Position
501	Position Lock Rotation Speed	R/min	0 to 10000	Position	╱	Not available with the G Series.			
502	Rotation Speed for Motor Rotation Detection	R/min	0 to 10000	All	62	Rotation Speed For Motor Rotation Detection	R/min	10 to 20000	All
503	Speed Conformity Signal Output Width	R/min	0 to 100	Speed	61	Zero Speed Detection	R/min	10 to 20000	All
504	Positioning Completion Range 2	Command Units	1 to 250	Position	╱	Not available with the G Series.			
505	Deviation Counter Overflow Level	×256 Command Units	1 to 32767	Position	70	Deviation Counter Overflow Level	256× Resolution	0 to 32767	Position
506	Brake Timing 1	10ms	0 to 50	All	6B	Brake Timing during Operation	2ms	0 to 100	All
507	Brake Command Speed	r/min	0 to 10000	All	-	Fixed to approx. 30r/min for the G Series			
508	Brake Timing 2	10ms	10 to 100	All	6A	Brake Timing when Stopped	2ms	0 to 100	All
509	Momentary Hold Time	ms	20 to 1000	All	6D	Momentary Hold Time	2ms	35 to 1000	All

W Series				G Series			
PRM No.	Parameter Name	Setting Range	Control Mode	PRM No.	Parameter Name	Setting Range	Control Mode
50A.0	Input Signal Allocation Mode	0,1	All	-	Not available with the G Series.		
50A.1	RUN Signal Input Terminal Allocation	0 to F	All	-	Fixed allocation to pin 29 for CN1		All
50A.2	MING Signal Input Terminal Allocation	0 to F	Position Speed	03	Torque Limit Selection	0 to 3	Position Speed
				30	Gain Switching Input Operating Mode Selection	0,1	
50A.3	POT Signal Input Terminal Allocation	0 to F	All	04	Drive Prohibit Input Selection Fixed allocation to pin 9 and 8 for CN1	0 to 2	All
50B.0	NOT Signal Input Terminal Allocation	0 to F	All				
50B.1	RESET Signal Input Terminal Allocation	0 to F	All	-	Fixed allocation to pin 31 for CN1		All
50B.2	PCL Signal Input Terminal Allocation	0 to F	All	03	Torque Limit Selection	0 to 3	Position Speed
50B.3	NCL Signal Input Terminal Allocation	0 to F	All				
50C.0	RDIR Signal Input Terminal Allocation	0 to F	Speed	—	Not available with the G Series.		
50C.1	SPD1 Signal Input Terminal Allocation	0 to F	Speed	-	Fixed allocation to pin 33 for CN1		Speed
50C.2	SPD2 Signal Input Terminal Allocation	0 to F	Speed	-	Fixed allocation to pin 30 for CN1		Speed
50C.3	TVSEL Signal Input Terminal Allocation	0 to F	Switch Control	-	Fixed allocation to pin 32 for CN1		Switch Control

	W Series				G Series		
PRM No.	Parameter Name	Setting Range	Control Mode	PRM No.	Parameter Name	Setting Range	Control Mode
50D.0	PLOCK Signal Input Terminal Allocation	0 to F	Speed	06	Zero Speed Designation/Speed Command Direction Switch Fixed allocation to pin 26 for CN1 (Reverse Logic)		Speed Torque
50D.1	IPG Signal Input Terminal Allocation	0 to F	Position	43	Command Pulse Prohibited Input Setting Fixed allocation to pin 33 for CN1 (Reverse Logic)	0,1	Position
50D2	GSEL Signal Input Terminal Allocation	0 to F	Position Speed	–	Fixed allocation to pin 27 for CN1 (Reverse Logic)		All
50E.0	INP1 Signal Output Terminal Allocation	0 to F	Position	–	Fixed allocation to pin 39 for CN1		Position
50E.1	VCMP Signal Output Terminal Allocation	0 to F	Speed	09	General-purpose Output 2 Selection	0 to 8	All
				0A	General-purpose Output 1 Selection	0 to 8	
50E.2	TGON Signal Output Terminal Allocation	0 to F	All		Fixed allocation to pin 39 for CN1		Speed Torque
50E.3	READY Signal Output Terminal Allocation	0 to F	All	–	Fixed allocation to pin 35 for CN1		All
50F.0	CLIMT Signal Output Terminal Allocation	0 to F	All	09	General-purpose Output 2 Selection	0 to 8	All
				0A	General-purpose Output 1 Selection	0 to 8	
50F.1	VLIMT Signal Output Terminal Allocation	0 to F	Torque	/	Not available with the G Series.		
50F.2	BKIR Signal Output Terminal Allocation	0 to F	All	–	Fixed allocation to pin 11 for CN1		All
50F.3	WARN Signal Output Terminal Allocation	0 to F	All	09	General-purpose Output 2 Selection	0 to 8	All
				0A	General-purpose Output 1 Selection	0 to 8	All
510.0	INP2 Signal Output Terminal Allocation	0 to F	Position	/	Not available with the G Series.		
510.2	PSON Signal Output Terminal Allocation	0 to F	Position	/	Not available with the G Series.		
512.0	Output Signal Reverse for CN1 Pins 25, 26	0 to F	All	/	Not available with the G Series.		
512.1	Output Signal Reverse for CN1 Pins 27, 28	0 to F	All	/	Not available with the G Series.		
512.2	Output Signal Reverse for CN1 Pins 29, 30	0 to F	Position	/	Not available with the G Series.		
513.0	PSEL Signal Input Terminal Allocation	0 to F	Position	–	Fixed allocation to pin 28 for CN1		Position

	W Series					G Series			
PRM No.	Parameter Name	Units	Setting Range	Control Mode	PRM No.	Parameter Name	Units	Setting Range	Control Mode
51E	Deviation Counter Overflow Warning Level	%	0 to 100	Position	/	Not available with the G Series.			
600	Regeneration Resistor Capacity	×10 w	0 to (Depends on Model)	All	/	Not available with the G Series.			

Chapter 4.Parameter specification comparison

4-7.Comparing System Check Modes

W Series		G Series		
Function No.	Function Name	Mode	No.	Function Name
000	Alarm History Display	Monitor	Un_Err	Alarm History
001	Rigidity Setting During Online Autotuning	Parameter	Pn_22	Real time Autotuning Machine Rigidity Selection
002	JOG Operation	Auxiliary Function	Fn_JoG	JOG
003	Servomotor Origin Search	–		Not available with the G Series.
005	User Parameter Initialization	–		Not available with the G Series.
006	Alarm History Data Clear	–		Not available with the G Series.
007	Store Online Autotuning Results	–		Not available with the G Series.
008	Absolute Encoder Setup	Auxiliary Function	Fn_Enc	
009	Speed/Torque Command Offset Automatic Adjustment	Auxiliary Function	Fn_oFS	
00A	Speed Command Offset Manual Adjustment	Parameter	Pn_52	Speed Command Offset Adjustment
00B	Torque Command Offset Manual Adjustment	–		Not available with the G Series.
00C	Analogue Monitor Output Offset Manual Adjustment	–		Not available with the G Series.
00D	Analogue Monitor Output Scaling	–		Not available with the G Series.
00E	Servomotor Current Detection Offset Automatic Adjustment	–		Not available with the G Series.
00F	Servomotor Current Detection Offset Manual Adjustment	–		Not available with the G Series.
010	Password Setting	–		Not available with the G Series.
011	Servomotor Parameter Check	–		Not available with the G Series.
012	Version Check	–	Un_no	Soft Version
013	Absolute Encoder Multi-turn Setting Change	–		Not available with the G Series.
014	Option Unit Detection Results Clear	–		Not available with the G Series.

4-8.Newly Added Parameters for the G Series

PRM No.	Parameter Name	Units	Setting Range	Control Mode	Functional Description
01	Default Display	–	0 to 17	All	Selects data to be shown on the 7-segment LED display of the front panel at the initial status of power ON.
0C	RS-232 Baud Rate Setting	–	0 to 5	All	Sets the communications speed of RS232 port.
0D	RS-485 Baud Rate Setting	–	0 to 5	All	Sets the communications speed of RS485 port.
1B	Speed Feedback Filter Time Constant 2	–	0 to 5	All	Sets in 6 stages the time constant of LPF (low pass filter) after speed detection when gain 2 is enabled.
1C	Torque Command Filter Time Constant 2	×0.01ms	0 to 5	All	Adjusts the time constant of the first-order lag filter of the torque command when gain 2 is enabled.
23	Adaptive Filter Selection		0 to 2	Position Speed	Selects whether to enable or disable the adaptive filter.
24	Vibration Filter Selection		0 to 2	Position	Selects whether to enable or disable vibration filter 1 and 2.
25	Autotuning Operation Setting	–	0 to 7	All	Selects the autotuning operation pattern.
26	Overrun Limit Setting	0.1 Rotation	0.1	Position	Sets the Servomotor's allowable operating range for the position command input range.
27	Instantaneous Speed Observer Setting	–	0,1	Position Speed	Sets the instantaneous speed observer.
2B	Vibration Frequency 1	0.1Hz	0 to 2000	Position	Sets vibration frequency 1 for damping control.
2C	Vibration Filter 1 Setting	0.1Hz	−200 to 2000	Position	Sets vibration filter 1 for damping control.
2D	Vibration Frequency 2	0.1Hz	0 to 2000	Position	Sets vibration frequency 2 for damping control.
2E	Vibration Filter 2 Setting	0.1Hz	−200 to 2000	Position	Sets vibration filter 2 for damping control.
2F	Adaptive Filter Table Number Display	–	0 to 64	Position Speed	Displays the table No. for the adaptive filter frequency.
34	Gain Switch 1 Hysteresis Setting	—	0 to 20000	All	Sets the hysteresis width for above and below the judgment level set in the Gain Switch 1 Level Setting (Pn33).
35	Position Loop Gain Switching Time	166μs	0 to 10000	Position	Sets the phased switching time only for the position loop gain at gain switching with the gain 1 and 2 switching enabled.
36	Gain Switch 2 Setting	–	0 to 5	Speed Torque	Selects the condition for switching gain 1 and 2 in speed control mode.
37	Gain Switch 2 Time	166μs	0 to 10000	Speed Torque	Sets the delay time when returning from gain 2 to gain 1.
38	Gain Switch 2 Level Setting	–	0 to 20000	Speed Torque	Sets the judgment level for switching gain 1 and gain 2.
39	Gain Switch 2 Hysteresis Setting	–	0 to 20000	Speed Torque	Sets the hysteresis width for above and below the judgment level set in the Gain Switch 2 Level Setting (Pn38).
40	Command Pulse Input Selection	–	0,1	Position	Selects whether to use the photo coupler input or line driver only input for the command pulse input.
46	Encoder Output Direction Switch	–	0,1	All	Sets phase B logic for the pulse output (−B、+B).
5A	S-curve Acceleration／Deceleration Time Setting	2ms	0 to 500	Speed	Enables smooth operation by applying simulated s-curve acceleration／deceleration to the speed command.

PRM No.	Parameter Name	Units	Setting Range	Control Mode	Functional Description
5F	No. 2 Torque Limit	%	0 to 500	Position Speed	Sets the value to limit Servomotor's maximum torque.
63	Positioning Completion Condition Setting	–	0 to 3	Position	Sets the operation for the position completion output (INP).
65	Undervoltage Alarm Selection	–	0,1	All	Selects whether to activate the Main Power Undervoltage (Alarm code No. 13) when the main power shutoff lasts for the Momentary Hold Time (Pn6D) during Servo ON.
67	Stop Selection with Main Power OF	–	0 to 9	All	Sets the operation to occur after the main power shutoff if the Undervoltage Alarm Selection (Pn65) is set to 0.
6C	Regeneration Resistor Selection	–	0 to 3	All	Sets whether to continue using the regeneration resistor or install an external regeneration resistor.
71	Speed Command/Torque Command Input Overflow Level Setting	× 0.1V	0 to 100	Speed Torque	Sets the overflow level for Speed Command Input (REF) or Torque Command Input (TREF) using voltage after offset adjustment.
72	Overload Detection Level Setting	%	0 to 500	All	Sets the overload detection level.
73	Overspeed Detection Level Setting	r / min	0 to 20000	All	Sets the overspeed detection level.
74	No. 5 Internally Set Speed	r/min	−20000 to 20000	Speed	Sets No. 5 internally set rotation speed.
75	No. 6 Internally Set Speed	r/min	−20000 to 20000	Speed	Sets No. 6 internally set rotation speed.
76	No. 7 Internally Set Speed	r/min	−20000 to 20000	Speed	Sets No. 7 internally set rotation speed.
77	No. 8 Internally Set Speed	r/min	−20000 to 20000	Speed	Sets No. 8 internally set rotation speed.

Chapter 5. Control I/O specification comparison

5-1.Comparing Servo Drive Control Inputs Specifications

Control Inputs Comparison List

Symbol	W Series			G Series		
	Pin No.	Name	Control Mode	Pin No.	Name	Control Mode
REF	5	Speed Command Input	All	14	Speed Command Input	Speed
AGND	6	Speed Command Input Ground		15	Analogue Input Ground	
TREF	9	Torque Command Input	All	14,16	Torque Command Input	Torque
AGND	10	Torque Command Input Ground		15,17	Analogue Input Ground	
PCOM	3,13,18	Open Collector Command Power Supply	All		Not available with the G Series.	
+PULS /CW/A	7	Reverse Pulse/Feed Pulse /90° Phase Difference Signal (Phase A)	Position	3	Reverse Pulse/Feed Pulse /90° Phase Difference Signal (Phase A)	Position
−PULS /CW/A	8			4		
+SIGN /CCW/B	11	Forward Pulse/Directional Signal /90° Phase Difference Signal (Phase B)		5	Forward Pulse/Directional Signal /90° Phase Difference Signal (Phase B)	
−SIGN /CCW/B	12			6		
+ECRST	15	Deviation Counter Reset Input	Position	30	Deviation Counter Reset Input	Position
−ECRST	14				Different input common for the G Series＊Note	
SEN	4	Sensor ON Input	All 【ABS】	20	Sensor ON Input	All 【ABS】
SENGND	2			13		
BAT	21	Backup Battery Input	All 【ABS】	42	Backup Battery Input	All 【ABS】
BATGND	22			43		
+24VIN	47	+24V Power Supply Input For Control DC	All	7	12 to 24V DC Power Supply Input	All
RUN	40 to 46	RUN Command【40】	All	29	RUN Command	All
MING		Gain Reduction【41】	Position· Speed· Internally Set Speed	27	Gain Switch	All
POT		Forward Drive Prohibit Input【42】	All	9	Forward Drive Prohibit Input	All
NOT		Reverse Drive Prohibit Input【43】	All	8	Reverse Drive Prohibit Input	All
RESET		Alarm Reset Input【44】	All	31	Alarm Reset Input	All
PCL (TLSEL)		Forward Rotation Current Limit Input【45】	All	27	Torque Limit Switch ＊Note	All
NCL (TLSEL)		Reverse Rotation Current Limit Input【46】	All			
RDIR		Rotation Direction Command Input【41】	Internally Set Speed		Not available with the G Series.	

＊Note : Different from the W Series in logic and functions. Use caution when replacing the products.

Symbol	W Series			G Series		
	Pin No.	Name	Control Mode	Pin No.	Name	Control Mode
SPD1 (VSEL1)		Speed Selection Command 1 Input【45】	Internally Set Speed	33	Internally Set Speed Selection 1	Speed
SPD2 (VSEL2)		Speed Selection Command 2 Input【46】	Internally Set Speed	30	Internally Set Speed Selection 2	Speed
TVSEL		Control Mode Switch Input【41】	Switch Control	32	Control Mode Switch Input	Switch Control
PLOCK (VZERO)		Position Lock Command Input【41】	Speed	26	Zero Speed Designation Input＊Note	Speed・Torque
IPG		Pulse Prohibit Input【41】	Position	33	Pulse Prohibit Input＊Note	Position
GSEL		Gain Switching Input	Position・Speed・Internally Set Speed	27	Gain Switch	All
PSEL (GESEL)		Command Pulse Factor Switching	Position	28	Electronic Gear Switch＊Note	Position

＊Note : Different from the W Series in logic and functions. Use caution when replacing the products.

■ Speed Command Input(REF)

W Series	G Series
Input Impedance : approx.14kΩ Maximum Input Voltage : ±12V	Input Impedance : approx. 20kΩ Maximum Input Voltage : ±10V
Pin No.5:Speed Command Input (REF) Pin No.6:Speed Command Input Ground(AGND)	Pin No.14:Speed Command Input(REF) Pin No.15:Analogue Input Ground (AGND)

·In Speed Control
   The Speed Command Input The rotation speed scale to the REF voltage can be changed via Pn300 (Speed Command Scale).
 ·In Torque Control
   This signal will be used for the analogue speed limit input by setting 1 in Pn002.1 (Speed Command Input Change of Function Selection Application Switch 2). The speed limit value scale to the speed command input can be changed via Pn300 (Speed Command Scale). The polarity of the REF voltage can be disregarded. (An absolute value is taken in.) Limits the speed by the smaller limit value of either Pn407 (Speed Limit) or the REF voltage.
 ·In Position Control
   This signal will be used for the speed feed forward input by setting 1 in Pn207.1 (Speed Command Input Switching). The speed command corresponding to the REF voltage is added to the speed loop.
	·In Speed Control
	   The Speed Command Input.
	   The rotation speed per 1V can be set via Pn50 (Speed Command Scale).
	 ·In Torque Control
	   This signal will be used for the analogue speed limit input by setting 1 in Pn5B (Torque Command Selection) when 2 (Torque Control) is selected in Pn02 (Control Mode Selection).
	 The speed limit value scale to the speed command input can be changed via Pn50 (Speed Command Scale).
	 This signal will be used for the analogue torque command input by setting 0 in Pn5B (Torque Command Selection) when 2 (Torque Control) is selected in Pn02 (Control Mode Selection).

■ Torque Command Input(TREF)

W Series	G Series
Input Impedance : approx.14kΩ Maximum Input Voltage : ±12V	Input Impedance : approx. 20kΩ Maximum Input Voltage : ±10V
Pin No.9:Torque Command Input(TREF) Pin No.10:Torque Command Input Ground(AGND)	Pin No.14 or 16:Torque Command Input(TREF) Pin No.15 or 17:Analogue Input Ground(AGND)

·In Torque Control
 	
  The Torque Command Input. The output torque scale to the TREF voltage can be changed via Pn400 (Torque Command Scale).
	·In Torque Control
	
	  Pin No.14 will be used for the analogue command input by setting 0 in Pn5B (Torque Command Selection) when 2 (Torque Control) is selected in Pn02 (Control Mode Selection). When 1 is set in Pn5B (Torque Command Selection), pin No.16 will be used for the analogue torque command input and pin No.14 for the speed control input. When 0 is set in Pn5B (Torque Command Selection), pin No.16 input will be disabled.

· In Position Control / Speed Control
 	
  This signal will be used for the analogue torque limit input (setting value 1 or 3) or torque feed forward input (setting value 2) by setting Pn002.0 (Torque Command Input Change of Function Selection Application Switch 2). The torque limit value to the TREF voltage or the feed forward torque scale can be changed via Pn400 (Torque Command Scale).
 	
【 When Pn002.0=1:Analogue Torque Limit Input 】
  The output torque is limited by the same value both for forward and reverse rotation regardless of the polarity of the TREF voltage. (An absolute value is take in.) (∗)
 	
【 When Pn002.0=2:Torque Feed Forward Input 】
  The torque corresponding to the TREF voltage is added to the current loop. (The polarity of the TREF voltage is enabled.)
 	
(∗) The torque limit functions include the analogue torque limit by the TREF voltage, Pn402 (Forward Torque Limit), Pn403 (Reverse Torque Limit), Pn404 (Forward Rotation External Current Limit) and Pn405 (Reverse Rotation External Current Limit), and the output torque is limited by the smallest of the respective limit values. The analogue torque limit (Pn002.0 = 1), Pn402 and Pn403 are the limit values enabled all the time.
	· In Position Control / Speed Control
	
	  Pin No.16 will be used for the analogue torque limit input toward CCW by setting Pn02 (Control Mode Selection, setting value 4 or 5) and Pn03 (Torque Limit Selection, setting value 0). The torque toward CCW is limited by adding positive voltage (0 to +10V). (Approx.+3V/Rated torque)
	The analogue torque limit input toward CW is allocated to pin No.18. The torque toward CW is limited by adding negative voltage (0 to −10V). (Approx. −3V/Rated torque)

■ Feed Pulse/Directional Signal, Reverse Pulse/Forward Pulse,
　　90°Phase Difference Signal（Phase A/Phase B）(PULS/SIGN,CW/CCW,A/B)

W Series	G Series
Line Driver Input Current　10mA-3V Open Collector Input　7 to 15mA Input Maximum Frequency 　Line Driver:500Kpps 　Open Collector:200Kpps ·90° Phase Difference 2 Multiplication Input 　Line Driver:400Kpps 　Open Collector:200Kpps ·90° Phase Difference 4 Multiplication Input 　Line Driver:200Kpps 　Open Collector:200Kpps	Line Driver Input Current 10mA-3V Open Collector Input 10mA Input Maximum Frequency 　Line Driver:500Kpps 　Open Collector:200Kpps ·Line Driver Interface Input 　Line Driver:2Mpps
Pin No.7:+PULS/+CW/+A Pin No.8:−PULS/−CW/−A Pin No.11:+SIGN/+CCW/+B Pin No.12:−SIGN/−CCW/−B	Pin No.1:+24V PULS/CW/A Pin No.2:+24V SIGN/CCW/B Pin No.3:+PULS/+CW/+A Pin No.4:−PULS/−CW/−A Pin No.5:+SIGN/+CCW/+B Pin No.6:−SIGN/−CCW/−B Pin No.44:+CWLD Pin No.45:−CWLD Pin No.46:+CCWLD Pin No.47:−CCWLD
Functions are switched by setting Pn200 (Command Pulse Mode of Position Control Setting 1). Pn200.0=0:Feed Pulse/Directional Signal:Positive Logic Pn200.0=1:Forward Pulse/Reverse Pulse:Positive Logic Pn200.0=2:90° Phase Difference Signal (Phase A/B) 　　　　　　　(1 Multiplication):Positive Logic Pn200.0=3:90° Phase Difference Signal (Phase A/B) 　　　　　　　(2 Multiplication) : Positive Logic Pn200.0=4:90° Phase Difference Signal (Phase A/B) 　　　　　　　(4 Multiplication) : Positive Logic Pn200.0=5:Feed Pulse/ Directional Signal:Negative Logic Pn200.0=6:Forward Pulse/Reverse Pulse : Negative Logic Pn200.0=7:90° Phase Difference Signal (Phase A/B) 　　　　　　　(1 Multiplication) : Negative Logic Pn200.0=8:90° Phase Difference Signal (Phase A/B) 　　　　　　　(2 Multiplication) : Negative Logic Pn200.0=9:90° Phase Difference Signal (Phase A/B) 　　　　　　　(4 Multiplication) : Negative Logic	The input interface is selected by setting Pn40 (Command Pulse Input Selection). 　Pn40 = 0:I/F for both Open Collector and Line Driver 　Pn40 = 1:I/F for Line Driver only Functions are switched by setting Pn42 (Command Pulse Mode). 　Feed Pulse/Directional Signal 　Forward Pulse/Reverse Pulse 　90° Phase Difference Signal (Phase A/B)(4 Multiplication)

Chapter 5. Control I/O specification comparison

■ Deviation Counter Reset Input(ECRST)

W Series	G Series
Input Impedance : approx.150Ω Line Driver Input Current : 10mA-3V Open Collector Input : 7 to 15mA	Input Impedance : approx. 4.7kΩ External Power Supply : 12V DC± 5% to 24V DC± 5%
Pin No.15:Deviation Counter Reset + Input(+ECRST) Pin No.14:Deviation Counter Reset − Input(−ECRST)	Pin No.30:Deviation Counter Reset Input(ECRST) Pin No.7:12 to 24V DC Power Input(+24VIN)
When the Deviation Counter Reset is input, the deviation counter data is reset and the position loop is disabled. The status signal (High level, Low level) or differential signal (Low → High, High → Low) can be set in Pn200.1(Deviation Counter Reset of Position Control Setting 1) This signal must be input for 20μs or more. If it is input for less than 20μs, the counter may not be reset.	When the Deviation Counter Reset is input, the deviation counter data is reset and the position loop is disabled. The status signal (short-circuited for 10μs or more) or differential signal (open⇒ short-circuited for 50μs or more) can be set in Pn4E (Deviation Counter Reset Condition Setting). Functions of pin No.30 for CN1 are switched by Pn02 (Control Mode Selection) setting and the control mode being used.

■ Sensor ON Input(SEN)

W Series	G Series
Input Impedance : approx. 100Ω Input Voltage : 5V DC-1mA Signal Level High Level : 4V min. Low Level : 0.8V max.	Input Impedance : approx. 100Ω Input Voltage : 5V DC-1mA Signal Level High Level : 4V min. Low Level : 0.8V max.
Pin No.4:Sensor ON Input (SEN) Pin No.2:Sensor ON Input Ground(SENGND)	Pin No.20:Sensor ON Input(SEN) Pin No.13:Sensor ON Input Ground(SENGND)
When the SEN signal is turned ON (Low → High), multi-turn amount of the absolute encoder and initial incremental pulse will be sent. When the SEN signal is OFF, the Servomotor will not be energized even if the RUN command is input. The RUN command input will be enabled when the SEN signal is turned ON and the encoder is put in normal operation.	When the SEN signal is turned ON (Low → High), multi-turn amount of the absolute encoder and initial incremental pulse will be sent. When the SEN signal is OFF, the Servomotor will not be energized even if the RUN command is input. The RUN command input will be enabled when the SEN signal is turned ON and the encoder is put in normal operation.

■ Backup Battery Input (BAT)

W Series	G Series
Battery Voltage:2.8 to 4.5V Battery:Lithium Batteries by Toshiba Battery Co., Ltd. ER6V 3.6V 2000mAh	Battery Voltage:3.0 to 3.8V Battery:Lithium Batteries by Toshiba Battery Co., Ltd. ER6V 3.6V 1000mAh
Pin No.21:Backup Battery + Input(BAT) Pin No.22:Backup Battery − Input(BATGND)	Pin No.42:Backup Battery + Input(BAT) Pin No.43:Backup Battery − Input(BATGND)
Connection terminals for the backup battery when there's power interruption for the absolute encoder. Do not connect anything to the terminals because normally the backup battery unit is used and the battery is connected to CN8 (Battery Connector). NEVER use both connections (pins and CN8) at the same time. Doing so may lead to malfunction.	Connection terminals for the backup battery when there's power interruption for the absolute encoder. Do not connect anything to the terminals when the backup battery unit is used and the battery is connected to the absolute encoder battery cable holder. NEVER use both connections (pins and cable holder) at the same time. Doing so may lead to malfunction.

■ RUN Command Input(RUN)

W Series	G Series
Input Impedance : approx. 3.3kΩ External Power Supply : 24V DC ± 1V	Input Impedance : approx. 4.7kΩ External Power Supply : 12V DC ± 5% to 24V DC ± 5%
Pin No.40:RUN Command Input (RUN) ※　Allocated by default settings. Allocation to input terminals (CN1-40 to 46) can be changed by setting 1 in Pn50A0 (Input Signal Allocation Mode). RUN signal allocation can be made in Pn50A1.	Pin No.29:RUN Command Input(RUN)
This is the input to turn ON the main circuit power drive circuit of the Servo Drive. Without this signal input (Servo OFF status), you cannot operate the Servomotor.　(Except for jog operation)	This is the input to turn ON the main circuit power drive circuit of the Servo Drive. Without this signal input (Servo OFF status), you cannot operate the Servomotor. (Except for jog operation)

■ Gain Reduction Input(MING)

W Series	G Series
Input Impedance : approx. 3.3kΩ External Power Supply : 24V DC ± 1V	Input Impedance : approx. 4.7kΩ External Power Supply : 12V DC ± 5% to 24V DC ± 5%
Pin No.41:Gain Reduction Input(MING) ※　Allocated by default settings. MING signal allocation can be made in Pn50A.2.	Pin No.27:Gain Switch(GSEL) ※　GSEL is allocated by the following settings. Pn03 (Torque Limit Selection):0 to 2 Pn30 (Gain Switching Input Operating Mode Selection:0
The speed loop control is switched from PI control to P control when the MING input is turned ON.	The speed loop control is switched from PI control to P control when the GSEL input is turned ON.

■ Forward Rotation Current Limit Input(PCL)・Reverse Rotation Current Limit Input(NCL)

W Series	G Series
Input Impedance : approx. 3.3kΩ External Power Supply : 24V DC ± 1V	Input Impedance : approx. 4.7kΩ External Power Supply : 12V DC ± 5% to 24V DC ± 5%
Pin No.45:Forward Rotation Current Limit Input(PCL) Pin No.46:Reverse Rotation Current Limit Input(NCL) ※　Allocated by default settings. PCL signal allocation can be made in Pn50b.2 and NCL signal allocation in Pn50b.3. By default setting allocation, functions of pin No.45 and 46 for CN1 are switched by Pn000.1 (Control Mode Selection) setting and the control mode being used. (PCL, NCL or SPD1, SPD2)	Pin No.27:Torque Limit Switch(TLSEL) ※　TLSEL signal is allocated to the input terminal (CN1-27) by setting 3 in Pn03 (Torque Limit Selection).
This is the output current (output torque) limit input for forward and reverse rotation. The output torque for each direction is limited by Pn404 (Forward Rotation External Current Limit) and Pn405 (Reverse Rotation External Current Limit) during the input. When the torque limit functions other than Pn404/Pn405 are enabled, the output torque is limited by the smallest value.	This is the switching input of the Servomotor's maximum output torque (output current) limit. Limited by the set values of Pn5E (No.1 Torque Limit) when this input is open and by Pn5F (No.2 Torque Limit) when it is closed.

Chapter 5. Control I/O specification comparison

■ Reverse Drive Prohibit Input(NOT)・ Forward Drive Prohibit Input(POT)

W Series				G Series			
Input Impedance : approx. 3.3kΩ External Power Supply : 24V DC ± 1V				Input Impedance : approx. 4.7kΩ External Power Supply : 12V DC ± 5% to 24V DC ± 5%			
Pin No.43:Reverse Drive Prohibit Input(NOT) Pin No.42:Forward Drive Prohibit Input(POT) ※　Allocated by default settings. The signals are set to "Always Disabled" (Status in which Drive Prohibit is not activated). These settings can be changed in Pn50A.3/Pn50b.0.				Pin No.8:Reverse Drive Prohibit Input(NOT) Pin No.9:Forward Drive Prohibit Input(POT) ※ The default settings of the signals are "Always Disabled" (Status in which Drive Prohibit is not activated). These settings can be changed in Pn04.			
This is the Drive Prohibit (over travel) Input for forward and reverse rotation. The Servomotor can rotate in the direction specified during the input. In Drive Prohibit status, the Servomotor will stop according to the settings in Pn001.0 and Pn001.1. In Drive Prohibit status, the Servo Drive will not be put into the alarm status.				This is the Drive Prohibit (over travel) Input for forward and reverse rotation. The Servomotor can rotate in the direction specified during the input. In Drive Prohibit status, the Servomotor will stop according to the setting in Pn66.			
Pn001.1	Pn001.0	Deceleration Method	Stop Status	Pn66	Deceleration Method	Stop Status	Deviation Counter
0	0,1	DB Deceleration	Servo Free	0	DB Deceleration	Drive Prohibit Direction Torque Command = 0	Retained
0	2	Free-running Deceleration	Servo Free	1	Free		Retained
1	—	Deceleration According to the Emergency Stop Torque (Pn406)	Servo Free	2	Deceleration According to the Emergency Stop Torque (Pn6E)	Drive Prohibit Direction Torque Command = 0	Clear
2	—		Servo Lock				

■ Alarm Reset Input (RESET)

W Series	G Series
Input Impedance : approx. 3.3kΩ External Power Supply : 24V DC ± 1V	Input Impedance : approx. 4.7kΩ External Power Supply : 12V DC ± 5% to 24V DC ± 5%
Pin No.44:Alarm Reset Input(RESET) ※　Allocated by default settings. RESET signal allocation can be made in Pn50b.1.	Pin No.31:Alarm Reset Input(RESET)
This is the external reset signal input for the Servo alarm. (Reset when it is input.)	This is the external reset signal input for the Servo alarm. (Reset when it is input.) The alarm status will be reset when the input continues for 120ms or more. The deviation counter will be reset as well at alarm reset.

■ Rotation Direction Command Input(RDIR)

W Series	G Series
Input Impedance : approx. 3.3kΩ External Power Supply : 24V DC ± 1V	For the G Series, if this signal is allocated to pin No.26 : Speed Command Rotation Direction Switch (PNSEL), Zero Speed Designation Input (VZERO) cannot be used and the Servomotor will start rotating at Servo ON, which is not desirable in internal speed control. It is recommended that speed patterns be increased by using Internal Speed Selection 3 (VSEL) when replacing products for the internal speed control. Refer to the functions of Speed Selection Command 1 (SPD1)/Speed Selection Command 2 (SPD2) for the details.
Pin No.41:Rotation Direction Command Input(RDIR) Allocated by the default settings. RDIR signal allocation can be made in Pn50C.0. By default setting allocation, functions of pin No.41 for CN1 are switched by Pn000.1 (Control Mode Selection) setting and the control mode being used. (Any one of MING, PLOCK, TVSEL, RDIR and IPG)	
Commands the rotation direction when operating with the Internally Set Speeds (No.1 to 3 Internally Set Speeds). Forward rotation command is issued when this signal is OFF and reverse rotation command is issued when it is ON.	

■ Speed Selection Command 1 Input(SPD1)/ Speed Selection Command 2 Input(SPD2)

W Series				G Series				
Input Impedance : approx. 3.3kΩ External Power Supply : 24V DC ± 1V				Input Impedance : approx. 4.7kΩ External Power Supply : 12V DC ± 5% to 24V DC ± 5%				
Pin No.45:Speed Selection Command 1 Input(SPD1) Pin No.46:Speed Selection Command 2 Input(SPD2) Allocated by default settings. SPD1 signal allocation can be made in Pn50C.1 and SPD2 signal allocation in Pn50C.2. When 1 is set in Pn50A0, the control mode is switched via the TVSEL signal. By default setting allocation, functions of pin No.45, 46 for CN1 are switched by Pn000.1 (Control Mode Selection) settings and the control mode being used. (PCL, NCL or SPD1, SPD2)				Pin No.33:Internally Set Speed Selection 1(VSEL1) Pin No.30:Internally Set Speed Selection 2(VSEL2) Pin No.28:Internally Set Speed Selection 3(VSEL3) Functions of pin No.33, 30, 28 for CN1 are switched by Pn02 (Control Mode Selection) setting and the control mode being used.				
SPD1	OFF	OFF	ON	ON	VSEL1	OFF	OFF	ON	ON
SPD2	OFF	ON	OFF	ON	VSEL2	OFF	ON	OFF	ON
	Stop by the Speed Loop	No.1 Internally Set Speed Pn301	No.3 Internally Set Speed Pn303	No.2 Internally Set Speed Pn302	VSEL3 OFF	No.1 Internally Set Speed Pn53	No.3 Internally Set Speed Pn55	No.2 Internally Set Speed Pn54	No.4 Internally Set Speed Pn56
					VSEL3 ON	No.5 Internally Set Speed Pn74	No.7 Internally Set Speed Pn76	No.6 Internally Set Speed Pn75	No.8 Internally Set Speed Pn77

■ Control Mode Switch Input(TVSEL)

W Series			G Series		
Input Impedance : approx. 3.3kΩ			Input Impedance : approx. 4.7kΩ		
External Power Supply : 24V DC ± 1V			External Power Supply : 12V DC ± 5% to 24V DC ± 5%		
Pin No.41:Control Mode Switch Input(TVSEL) Allocated by default settings. TVSEL signal allocation can be made in Pn50C.3. By default setting allocation, functions of pin No.41 for CN1 are switched by Pn000.1 (Control Mode Selection) setting and the control mode being used.(Any one of MING, PLOCK, TVSEL, RDIR and IPG)			Pin No.32:Control Mode Switch Input(TVSEL)		
Enabled when 4 to 9 is set in Pn000.1. Control mode is switched as follows:			Enabled when 3 to 5 is set in Pn02. Control mode is switched as follows:		
Pn000.1	TVSEL:OFF	TVSEL:ON			
4	Internally Set Speed Control	Speed Control			
5	Internally Set Speed Control	Position Control			
6	Internally Set Speed Control	Torque Control	Pn02	TVSEL:OFF	TVSEL:ON
7	Position Control	Speed Control	3	Position Control	Speed Control
8	Position Control	Torque Control	4	Position Control	Torque Control
9	Torque Control	Speed Control	5	Speed Control	Torque Control

■ Position Lock Command Input(PLOCK)

W Series	G Series
Input Impedance : approx. 3.3kΩ	Input Impedance : approx. 4.7kΩ
External Power Supply : 24V DC ± 1V	External Power Supply : 12V DC ± 5% to 24V DC ± 5%
Pin No.41:Position Lock Command Input(PLOCK) Allocated by default settings. Input terminal (pin No.40 to 46 for CN1) allocation can be changed by setting 1 in Pn50A.0 (Input Signal Allocation Mode). PLOCK signal allocation can be made in Pn50d.0. By default setting allocation, functions of pin No.41 for CN1 are switched by Pn000.1 (Control Mode Selection) setting and the control mode being used. (Any one of MING, PLOCK, TVSEL, RDIR and IPG)	Pin No.26:Zero Speed Designation Input(VZERO) By setting 1 in Pn06 (Zero Speed Designation/Speed Command Direction Switch), VZERO signal is allocated. VZERO signal has reverse logic compared to PLOCK signal and the Servomotor stops when the signal input is turned OFF. (Speed command is zero) Functions of pin No.26 for CN1 are switched by Pn02 (Control Mode Selection) setting and the control mode being used.
When the Position Lock Command is input and the Servomotor rotation speed drops to or below the value set in Pn501 (Position Lock Rotation Speed), speed control mode will be switched to position control mode, and the Servomotor will be put in the position lock status and will stop completely.	When the zero speed designation input is open, speed command is regarded as zero. The Servomotor will not be put in the position lock status when it stops.

■ Pulse Prohibit Input(IPG)

W Series	G Series
Input Impedance : approx. 3.3kΩ External Power Supply : 24V DC ± 1V	Input Impedance : approx. 4.7kΩ External Power Supply : 12V DC ± 5% to 24V DC ± 5%
Pin No.41:Pulse Prohibit Input(IPG) ※　Allocated by default settings. Input terminal (pin No.40 to 46 for CN1) allocation can be changed by setting 1 in Pn50A.0 (Input Signal Allocation Mode). PLOCK signal allocation can be made in Pn50d.1 By default setting allocation, functions of pin No.41 for CN1 are switched by Pn000.1 (Control Mode Selection) setting and the control mode being used. (Any one of MING, PLOCK, TVSEL, RDIR and IPG)	Pin No.33:Pulse Prohibit Input(IPG) ※　By setting 1 in Pn43 (Command Pulse Prohibited Input Setting), IPG signal is allocated. IPG signal has reverse logic, which is different from the W Series, and the pulse prohibit status will occur (command pulse is disabled) when the signal input is OFF. Functions of pin No.33 for CN1 are switched by Pn02(Control Mode Selection) setting and the control mode being used.
Inputting pulse prohibit disables the command pulse input and stops the Servomotor. (Position lock status)	When the pulse prohibit is open, the command pulse input is disabled and the Servomotor is stopped. (Position lock status)

■ Gain Switching Input(GSEL)

W Series	G Series
Input Impedance : approx. 3.3kΩ External Power Supply : 24V DC ± 1V	Input Impedance : approx. 4.7kΩ External Power Supply : 12V DC ± 5% to 24V DC ± 5%
Pin No. is not allocated by default settings.:Gain Switching Input(GSEL) ※　No allocation by default settings. GSEL signal allocation can be made in Pn50d.1.	Pin No.27:Gain Switch(GSEL) ※　GSEL is allocated according to the following settings. Pn03 (Torque Limit Selection) : 0 to 2 Pn30 (Gain Switching Input Operating Mode Selection) : 1 Pn31 (Gain Switch 1 Setting) : 2 Pn36 (Gain Switch 2 Setting) : 2
Gain Switching Input When GSEL signal is OFF, ・Pn100 (Speed Loop Gain) ・Pn101 (Speed Loop Integration Time Constant) ・Pn102 (Position Loop Gain) are used to control. When GSEL signal is ON, ・Pn104 (Speed Loop Gain 2) ・Pn105 (Speed Loop Integration Time Constant 2) ・Pn106 (Position Loop Gain 2) are used to control.	Gain Switching Input When GSEL signal is OFF, ・Pn10 (Position Loop Gain) ・Pn11 (Speed Loop Gain) ・Pn12 (Speed Loop Integration Time Constant) ・Pn13 (Speed Feedback Filter Time Constant) ・Pn14 (Torque Command Filter Time Constant) are used to control. When GSEL signal is ON, ・Pn18 (Position Loop Gain 2) ・Pn19 (Speed Loop Gain 2) ・Pn1A (Speed Loop Integration Time Constant 2) ・Pn1B (Speed Feedback Filter Time Constant 2) ・Pn1C (Torque Command Filter Time Constant 2) are used to control.

Chapter 5. Control I/O specification comparison

■ Command Pulse Factor Switching Input(PSEL)

W Series	G Series
Input Impedance : approx. 3.3kΩ External Power Supply : 24V DC ± 1V	Input Impedance : approx. 4.7kΩ External Power Supply : 12V DC ± 5% to 24V DC ± 5%
Pin No. is not allocated by default settings.: Command Pulse Factor Switching Input(PSEL) ※　No allocation by default settings. PSEL signal allocation can be made in Pn503.0. To use the command pulse factor switching function, set 1 in Pn218.0 (Command Pulse Factor Switching　Selection) and also set an appropriate factor in Pn217.	Pin No.28:Electronic Gear Switch(GESEL) ※　By setting 0 to 2 in Pn03 (Torque Limit Selection), IPG signal is allocated. IPG signal has reverse logic, which is different from the W Series, and the pulse prohibit status will occur (command pulse is disabled) when the signal input is OFF. Functions of pin No.28 for CN1 are switched by Pn02 (Control Mode Selection) setting and the control mode being used.
Command Pulse Factor Switching Input When PSEL signal is OFF, the Servomotor is rotated according to the command pulse. When PSEL signal is ON, the Servomotor is rotated by the command pulse multiplied by the factor set in Pn217 (Command Pulse Factor). PSON (Command Pulse Factor Enabled) output will turn ON, indicating that the command pulse factor has been switched.	Electronic Gear Switch Input When GESEL signal is OFF, the Servomotor is rotated according to Pn48 (Electronic Gear Ratio Numerator 1). When GESEL signal is ON, the Servomotor is rotated according to Pn49 (Electronic Gear Ratio Numerator 2).

5-2.Comparing Servo Drive Control Outputs Specifications

Control Outputs Comparison List

Symbol	W Series			G Series		
	Pin No.	Name	Control Mode	Pin No.	Name	Control Mode
GND	1	Ground Common	All	25	Phase Z Output Common	All
+A	33	Encoder Phase A + Output	All	21	Encoder Phase A + Output	All
−A	34	Encoder Phase A − Output		22	Encoder Phase A − Output	
+B	36	Encoder Phase B + Output		49	Encoder Phase B + Output	
−B	35	Encoder Phase B − Output		48	Encoder Phase B − Output	
+Z	19	Encoder Phase Z + Output		23	Encoder Phase Z + Output	
−Z	20	Encoder Phase Z − Output		24	Encoder Phase Z − Output	
+ABS	48	Absolute Encoder Signal + Output	All 【ABS】		Not available with the G Series.	
−ABS	49	Absolute Encoder Signal − Output				
ALO1	37	Alarm Code Output 1	All		Not available with the G Series.	
ALO2	38	Alarm Code Output 2				
ALO3	39	Alarm Code Output 3				
/ALM	31	Alarm Output	All	37	Alarm Output	All
ALMCOM	32			36		
INP1	25 to 30	Positioning Completed Output 1	Position	39	Positioning Completed Output (INP・INPCOM)	Position
INP1COM						
INP2		Positioning Completed Output 2	Position	38		
INP2COM						
VCMP		Speed Conformity Output	Speed	12(40)	Speed Conformity Output	Speed・Torque
VCMPCOM				41		
TGON		Servomotor Rotation Detection Output	All	39	Servomotor Rotation Speed Detection Output	All
TGONCOM				38		
READY		Servo Ready Output	All	35	Servo Ready Output	All
READYCOM				34		
CLIMT		Current Limit Detection Output	All	12(40)	Output During Torque Limit	All
CLIMTCOM				41		
VLIMT		Speed Limit Detection Output	Torque		Not available with the G Series.	
VLIMTCOM						
BKIR		Brake Interlock Output	All	11	Brake Interlock Output	All
BKIRCOM				10		
/WARN		Warning Output	All	12(40)	Warning Output	All
/WARNCOM				41		
PSON		Command Pulse Factor Enabled Output	Position		Not available with the G Series.	
PSONCOM						
FG	Shell	Frame Ground	All	Shell	Frame Ground	All

＊Note : Different from the W Series in logic and functions. Use caution when replacing the products.

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■ Encoder Output(Phase A・Phase B・Phase Z)

W Series	G Series
Line Driver Output AN75ALS174 or the equivalent	Line Driver Output AM26LS31or the equivalent
Pin No.33:+A　　Pin No.34:−A Pin No.36:+B　　Pin No.35:−B Pin No.19:+Z　　Pin No.20:−Z	Pin No.21:+A　　Pin No.22:−A Pin No.48:+B　　Pin No.49:−B Pin No.23:+Z　　Pin No.24:−Z
Outputs the phase difference pulse provided by dividing the Servomotor encoder signal according to the Encoder Divider Rate (Pn201). The output mode is the line driver output, which is in compliance with EIA RS−422A. The absolute date will be output from phase A as serial data by inputting SEN signal (Low → High). Next it will be output as initial incremental pulse phase A and phase B (90 ° phase difference pulse). After that, output operation the same as the usual incremental encoder (90 ° phase difference pulse) will be performed. The usual incremental encoder signal (phase A and phase B) will be output approximately 400ms after the SEN signal input. Phase Z is synchronous with phase A.	Outputs the phase difference pulse provided by dividing the Servomotor encoder signal according to the Encoder Divider Settings (Pn44/Pn45). The output mode is the line driver output. (RS422 or the equivalent) The absolute data will be output from phase A as serial data by inputting SEN signal (Low → High). Next it will be output as initial incremental pulse phase A and phase B (90°phase difference pulse). After that, output operation the same as the usual incremental encoder (90°phase difference pulse) will be performed. The usual incremental encoder signal (phase A and phase B) will be output approximately 400ms after the SEN signal input. If the encoder resolution x (Pn44/Pn45) is a multiple of 4, phase Z will be output synchronizing with phase A. But if not a multiple of 4, it will be output as the encoder resolution, which is narrower in width than phase A and is not synchronous with phase A.

Note: As to the difference of absolute date, refer to *the Difference of Absolute System* on page 0-00.

■ Absolute Encoder Output(ABS)

W Series	G Series
Pin No.48:+ABS　　Pin No.49:−ABS	Not available with the G Series.

■ Alarm Code Output(ALO1・ALO2・ALO3)

W Series	G Series
Pin No.37:Alarm Code Output 1(ALO1) Pin No.38:Alarm Code Output 2(ALO2) Pin No.39:Alarm Code Output 3(ALO3)	Not available with the G Series.

■ Alarm Output(/ALM)

W Series	G Series
Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less	Maximum Operating Voltage:30V DC or less Maximum Output Current :50mA or less
Pin No.31:Alarm Output(/ALM) Pin No.32:Alarm Output Ground(ALMCOM)	Pin No.37:Alarm Output(/ALM) Pin No.36:Alarm Output Ground(ALMCOM)
When an error is detected by the Servo Drive, the output will be turned OFF, and above-mentioned alarm codes will be output　This alarm output is OFF at power-ON and it will turn ON　after the Servo Drive initialization is complete.	When an error is detected by the Servo Drive, the output will be turned OFF. This alarm output is OFF at power-ON and it will turn ON after the Servo Drive initialization is complete.

■ Positioning Completed Output 1,2(INP1、INP2)

W Series	G Series
Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less	Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less
Pin No.25:Positioning Completed Output1(INP1) Pin No.26:Positioning Completed Output 1 Common (INP1COM) No default allocation for Positioning Completed Signal Output 2(INP2). ※ Allocated by default settings. INP1 signal allocation can be made in Pn50E.0 and INP2 signal allocation in Pn510.0.	Pin No.38:Positioning Completed Output(INP) Pin No.39:Positioning Completed Output Common (INPCOM) Functions of pin No.38 and 39 are switched by Pn02 (Control Mode Selection) setting and the control mode being used.
When accumulated pulses in the deviation counter are equal to or less than Pn500 (Positioning Completion Range 1), INP1 will turn ON. When they are equal to or less than Pn504 (Positioning Completion Range 2), INP2 will turn ON. When allocation is made in control mode other than position control mode, they are always OFF.	When accumulated pulses in the deviation counter are equal to or less than the set value of the Positioning Completion Range (Pn60), INP will turn ON. The output method can be set in the Positioning Completion Condition Setting (Pn63). Only 1 circuit is prepared for INP signal for the G Series.

■ Speed Conformity Output(VCMP)

W Series	G Series
Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less	Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less
Pin No.25:Speed Conformity Output(VCMP) Pin No.26:Speed Conformity Output Common (VCMPCOM) ※ Allocated by default settings. VCMP signal allocation can be made in Pn50E.1.	Pin No.12(40):Speed Conformity Output(VCMP) Pin No.41:Speed Conformity Output Common (VCMPCOM) Allocation is made when 8 is set in Pn0A (General-purpose Output 1 Selection) for pin No.12, or set in Pn09 (General-purpose Output 2 Selection) for pin No.40.
When the difference between the Servomotor rotation speed and command speed is equal to or less than Pn503 (Speed Conformity Signal Output Width), this output will turn ON. In control mode other than speed control mode, it is always OFF.	When the difference between the command speed before acceleration/deceleration and the Servomotor rotation speed is within the range of Pn61 (Zero Speed Detection), this output will turn ON. Enabled in speed control mode and torque control mode.

■ Servo Ready Output(READY)

W Series	G Series
Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less	Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less
Pin No.29:Servo Ready Output (READY) Pin No.30:Servo Ready Output Common(READYCOM) ※ Allocated by default settings. READY signal allocation can be made in Pn50E.3.	Pin No.35:Servo Ready Output(READY) Pin No.34:Servo Ready Output Common(READYCOM)
If there's no error after the main circuit power is turned ON, this output will turn ON. When ABS encoder is in use and SEN signal is OFF, READY is also OFF.	This is the output to indicate the status in which the Servo Drive can be energized. This output will turn ON when the control power supply and main power supply are established without an alarm.

Chapter 5. Control I/O specification comparison

■ Servomotor Rotation Detection Output(TGON)

W Series	G Series
Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less	Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less
Pin No.27:Servomotor Rotation Detection Output(TGON) Pin No.28:Servomotor Rotation Detection Output Common (TGONCOM) ※　Allocated by default settings. TGON signal allocation can be made in Pn50E.2.	Pin No.39:Servomotor Rotation Detection Output (TGON) Pin No.38:Servomotor Rotation Detection Output Common (TGONCOM) Functions of pin No.28 for CN1 are switched by Pn02 (Control Mode Selection) setting and the control mode being used.
When the Servomotor rotation speed exceeds Pn502 (Rotation Speed For Motor Rotation Detection), this output will turn ON.	When the Servomotor rotation speed exceeds Pn62 (Rotation Speed For Motor Rotation Detection), this output will turn ON.

■ Current Limit Detection Output(CLIMT)

W Series	G Series
Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less	Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less
Pin No. is not allocated by default settings.:(CLIMT) ※　No allocation by default settings. CLIMT signal allocation can be made in Pn50F.0.	Pin No.12(40):Torque Limit Output(TLIMT) Pin No.41:Torque Limit Output Common(TLIMTCOM) Allocation is made when 0 is set in Pn0A (General-purpose Output 1 Selection) for pin No.12, or set in Pn09 (General -purpose Output 2 Selection) for pin No.40.
This output will turn ON if any of the following conditions is met. ・ The output torque has reached the limit values set in Pn402 (Forward Torque Limit) and Pn403 (Reverse Torque Limit). ・ The output torque has reached the limit values set in Pn404 (Forward Rotation External Current Limit) and Pn405 (Reverse Rotation External Current Limit) when PCL/NCL (Forward/Reverse Current Limits) are ON. ・ The output torque has reached TREF (Analogue Torque Limit) when 1 is set in Pn002.0 (Torque Command Input Change). ・ The output torque has reached TREF (Analogue Torque Limit) when 3 is set in Pn002.0 (Torque Command Input Change) and PCL/NCL (Forward /Reverse Current Limits) are ON.	This output will turn ON if the torque command is limited by the torque limit (any of the following conditions) at Servo lock. ・ The output torque has reached PCL or NCL (Analogue Torque Limit) when 0 is set in Pn03 (Torque Limit Selection). ・ The output torque has reached the limit values set in Pn5E (No.1 Torque Limit) and Pn5F (No.2 Torque Limit) when 1 is set in Pn03 (Torque Limit Selection). ・ The output torque has reached the limit value set in Pn5E (No.1 Torque Limit) when 2 is set in Pn03 (Torque Limit Selection) and TLSEL (Torque Limit Switch) is OFF. ・ The output torque has reached the limit value set in Pn5F (No.2 Torque Limit) when 2 is set in Pn03 (Torque Limit Selection) and TLSEL (Torque Limit Switch) is ON.

■ Speed Limit Detection Output(VLIMT)

W Series	G Series
Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less	
Pin No. is not allocated by default settings.:(VLIMT) ※　No allocation by default settings. VLIMT signal allocation can be made in Pn50F.1.	Not available with the G Series.

■ Brake Interlock Output(BKIR)

W Series	G Series
Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less	Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less
Pin No. is not allocated by default settings.:(BKIR) ※　No allocation by default settings. BKIR signal allocation can be made in Pn50F.2.	Pin No.11 : Brake Interlock Output (BKIR) Pin No.10 : Brake Interlock Output Common 　　(BKIRCOM)
Outputs an external brake timing signal by setting in Pn506 (Brake Timing 1), Pn507 (Brake Command Speed) and Pn508 (Brake Timing 2).	Outputs an external brake timing signal by setting in Pn6A (Brake Timing When Stopped) and Pn6B (Brake Timing During Operation).

■ Warning Output(/WARN)

W Series	G Series
Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less	Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less
Pin No. is not allocated by default settings.:(BKIR) ※　No allocation by default settings. WARN signal allocation can be made in Pn50F.3.	Pin No.12(40):Warning Output(/WARN) Pin No.41:Warning Output Common(/WARNCOM) Allocation can be made when 2 to 6 is set in Pn0A (General-purpose Output 1 Selection) for pin No.12, or set in Pn09 (General-purpose Output 2 Selection) for pin No.40.
This output will turn ON when any of the following conditions is met. ・　The Servomotor output torque (effective values) has exceeded 115% 　　of the rated torque. ・　Regenerative energy has exceeded the allowable amount of the 　　internal regeneration resistor. ・　Regenerative energy has exceeded Pn600 (Regeneration Resistor 　　Capacity) when the external regeneration resistor is in use.	When the setting is 2 : ・　This output will turn ON if any of the following occurs; 　　regenerative overload warning, overload, absolute encoder battery 　　voltage drop or fan lock . When the setting is 3 (regenerative overload warning) : ・　85% of the alarm generation level of regenerative overload protection 　　has been exceeded. When the setting is 4 (overload warning) : ・　85% of the alarm generation level of overload protection has been 　　exceeded. When the setting is 5 (absolute encoder battery voltage drop warning) : ・　Absolute encoder battery voltage has dropped to approx. 3.2V or 　　lower. When the setting is 6 (fan lock warning) : ・　The fan has stopped for 1 second or more.

■ Command Pulse Factor Enabled Output(PSON)

W Series	G Series
Maximum Operating Voltage:30V DC or less Maximum Output Current:50mA or less	
Pin No. is not allocated by default settings.:(PSON) ※　No allocation by default settings. PSON signal allocation can be made in Pn510.2.	Not available with the G Series.

5-3.Comparing Analogue Monitor Outputs Specifications

Analogue Monitor Outputs Comparison List

W Series			G Series		
Output Voltage:±8V Max.　　Precision:±15%			Output Voltage:±10V Max.		
Symbol	Name	Functions	Symbol	Name	Functions
NM	Analogue Monitor 2	Speed Monitor 1V/1000r/min	SP	Analogue Monitor 2	Speed Monitor 1V/500r/min
AM	Analogue Monitor 1	Current Monitor 1V/Rated Torque	IM	Analogue Monitor 1	Current Monitor 3V/Rated Torque
GND	Analogue Monitor Ground		G	Analogue Monitor Ground	

The above are the functions by default settings.

Each function can be changed via user parameters as shown below.

For the W Series, set values of output functions are shared by NM and AM.

For the G Series, functions of set values for SP and IM are different.

W Series		G Series		
Pn003.0 Pn003.1 Set Value	Functions	SP Pn07 Set Value	IM Pn08 Set Value	Functions
0	Speed Monitor 1V/1000r/min	0	—	Speed Monitor 6V/47r/min
6	Speed Monitor 1V/250r/min	1	—	Speed Monitor 6V/188r/min
7	Speed Monitor 1V/125r/min	2	—	Speed Monitor 6V/750r/min
		3	—	Speed Monitor 6V/3000r/min
		4	—	Speed Monitor1.5V/3000r/min
1	Speed Command 1V/1000r/min	5	—	Speed Command 6V/47r/min
		6	—	Speed Command 6V/188r/min
		7	—	Speed Command 6V/750r/min
		8	—	Speed Command 6V/3000r/min
5	Command Pulse Frequency　1V/1000r/min	9	—	Speed Command 1.5V/3000r/min
2	Current Monitor 1V/Rated Torque	–	0	Current Monitor　3V/Rated Torque
		–	11	Current Monitor　1.5V/Rated Torque
		–	12	Current Monitor 0.75V/Rated Torque
3	Position Deviation 0.05V/1 Command Units	–	1	Position Deviation　3V/31Pulses
4	Position Deviation 0.05V/100 Command Units	–	2	Position Deviation 3V/125Pulses
		–	3	Position Deviation　3V/500Pulses
		–	4	Position Deviation　3V/2000Pulses
		–	5	Position Deviation　3V/8000Pulses

Chap6. Reference Data

6-1. Comparison of AC Servomotors Specifications

■ 3,000-r/min Servomotors

[Servomotor features]

W-series R88M-	G-series R88M-	Applicable inertia [kg/m²]		Rated torque* [N/m]		Momentary maximum torque [N/m]		Allowable radial load [N]		Allowable thrust load [N]	
		W	G	W	G	W	G	W	G	W	G
-W03030L/S	-G05030H/T	4.98 E-05	7.50 E-05	0.10	0.16	0.286	0.45	68	68	54	58
-W05030L/S	-G05030H/T	6.60 E-05	7.50 E-05	0.16	0.16	0.477	0.45	68	68	54	58
-W10030L/S	-G10030L/S	1.09 E-04	1.53 E-04	0.32	0.32	0.955	0.93	78	68	54	58
-W20030L/S	-G20030L/S	3.18 E-04	4.20 E-04	0.64	0.64	1.91	1.78	245	245	74	98
-W03030H/T	-G05030H/T	4.98 E-05	7.50 E-05	0.10	0.16	0.286	0.45	68	68	54	58
-W05030H/T	-G05030H/T	6.60 E-05	7.50 E-05	0.16	0.16	0.477	0.45	68	68	54	58
-W10030H/T	-G10030H/T	1.09 E-04	1.53 E-04	0.33	0.32	0.955	0.90	78	68	54	58
-W20030H/T	-G20030H/T	3.18 E-04	4.20 E-04	0.64	0.64	1.91	1.78	245	245	74	98
-W40030H/T	-G40030H/T	5.19 E-04	7.80 E-04	1.27	1.27	3.82	3.67	245	245	74	98
-W75030H/T	-G75030H/T	1.34 E-03	1.74 E-03	2.39	2.39	7.16	7.05	392	392	147	147
-W1K030H/T	-G1K030T	1.74 E-03	2.53 E-03	3.18	3.18	9.54	9.10	686	392	196	147
-W1k530H/T	-G1K530T	2.47 E-03	3.88 E-03	4.90	4.77	14.7	12.8	686	490	196	196
-W2K030H/T	-G2K030T	3.19 E-03	5.19 E-03	6.39	6.36	19.1	18.4	686	490	196	196
-W3K030H/T	-G3K030T	7.00 E-03	1.01 E-02	9.80	9.54	29.4	27.0	980	490	392	196
-W4K030H/T	-G4K030T	9.60 E-03	1.90 E-02	12.6	12.6	37.8	36.3	1176	784	392	343
-W5K030H/T	-G5K030T	1.23 E-02	2.67 E-02	15.8	15.8	47.6	45.1	1176	784	392	434

[Conversion of W-series applicable inertia] 30 to 400w: multiplier 30, 750 w: multiplier 20, 1.0k to 5.0kw: multiplier 10

[Conversion: of G-series applicable inertia] 50 to 400w: multiplier 30, 750 w: multiplier 20, 1.0k to 5.0kw: multiplier 15

[Servomotor dimensions]

W-series R88M-	G-series R88M-	Diagonal （C） [mm]		Mounting hole （φD1） [mm]		Inside diameter （φD2） [mm]		Shaft diameter （φS） [mm]		Effective shaft length （LR－F） [mm]	
		W	G	W	G	W	G	W	G	W	G
－W03030L/S	－G05030H/T	40	40	46	46	30	30	6	8	22.5	22.0
－W05030L/S	－G05030H/T	40	40	46	46	30	30	6	8	22.5	22.0
－W10030L/S	－G10030L/S	40	40	46	46	30	30	8	8	22.5	22.0
－W20030L/S	－G20030L/S	60	60	70	70	50	50	14	11	27.0	27.0
－W03030H/T	－G05030H/T	40	40	46	46	30	30	6	8	22.5	22.0
－W05030H/T	－G05030H/T	40	40	46	46	30	30	6	8	22.5	22.0
－W10030H/T	－G10030H/T	40	40	46	46	30	30	8	8	22.5	22.0
－W20030H/T	－G20030H/T	60	60	70	70	50	50	14	11	27.0	27.0
－W40030H/T	－G40030H/T	60	60	70	70	50	50	14	14	27.0	27.0
－W75030H/T	－G75030H/T	80	80	90	90	70	70	16	19	37.0	32.0
－W1K030H/T	－G1K030T	100	90	115	100	95	80	24	19	40.0	52.0
－W1k530H/T	－G1K530T	100	100	115	115	95	95	24	19	40.0	52.0
－W2K030H/T	－G2K030T	100	100	115	115	95	95	24	19	40.0	52.0
－W3K030H/T	－G3K030T	130	120	145	145	110	110	28	22	55.0	52.0
－W4K030H/T	－G4K030T	130	130	145	145	110	110	28	24	55.0	59.0
－W5K030H/T	－G5K030T	130	130	145	145	110	110	28	24	55.0	59.0

■ 1,000-r/min Servomotors

[Servomotor features]

W-series R88M-	G-series R88M-	Applicable inertia [kg/m²]		Rated torque* [N/m]		Momentary maximum torque [N/m]		Allowable radial load [N]		Allowable thrust load [N]	
		W	G	W	G	W	G	W	G	W	G
-W30010H/T	-G90010T	7.24 E-03	1.12 E-02	2.84	8.62	7.17	1.84	490	686	98	196
-W60010H/T	-G90010T	1.39 E-02	1.12 E-02	5.68	8.62	14.1	1.84	490	686	98	196
-W90010H/T	-G900010T	2.05 E-02	1.12 E-02	8.62	8.62	19.3	1.84	686	686	343	196
-W1K210H/T	-G2K010T	3.17 E-02	3.55 E-02	11.5	19.1	28.0	41.5	1176	1176	490	490
-W2K010H/T	-G2K010T	4.60 E-02	3.55 E-02	19.1	19.1	44.0	41.5	1470	1176	490	490
-W3K010H/T	-G3K010T	6.75 E-02	5.57 E-02	28.4	28.4	63.7	60.0	1470	1470	490	490
-W4K010H/T	-G4K510T	8.90 E-02	8.09 E-02	38.2	42.9	107	101	1764	1470	588	490
-W5K510H/T	-G6K010T	1.25 E-01	9.90 E-02	52.6	57.2	137	130	1764	1764	588	588

[Conversion of W-series applicable inertia] multiplier 10

[Conversion of W-series applicable inertia] multiplier 10

[Servomotor dimensions]

W-series R88M-	G-series R88M-	Diagonal (C) [mm]		Mounting hole (φD1) [mm]		Inside diameter (φD2) [mm]		Shaft diameter (φS) [mm]		Effective shaft length (LR-F) [mm]	
		W	G	W	G	W	G	W	G	W	G
-W30010H/T	-G90010T	130	130	145	145	110	110	19	22	40	64
-W60010H/T	-G90010T	130	130	145	145	110	110	19	22	40	64
-W90010H/T	-G90010T	130	130	145	145	110	110	22	22	40	64
-W1K210H/T	-G2K010T	180	176	200	200	114.3	114.3	35	35	75.8	76.8
-W2K010H/T	-G2K010T	180	176	200	200	114.3	114.3	35	35	75.8	76.8
-W3K010H/T	-G3K010T	180	176	200	200	114.3	114.3	35	35	75.8	76.8
-W4K010H/T	-G4K510T	180	176	200	200	114.3	114.3	42	42	109.8	109.8
-W5K510H/T	-G6K010T	180	176	200	200	114.3	114.3	42	42	109.8	109.8

■1,500-r/min Servomotors

[Servomotor features]

W-series R88M-	G-series R88M-	Applicable inertia [kg/m²]		Rated torque* [N/m]		Momentary maximum torque [N/m]		Allowable radial load [N]		Allowable thrust load [N]	
		W	G	W	G	W	G	W	G	W	G
-W45015T	-G1K020T	7.24 E-03	6.17 E-03	2.84	4.80	8.92	13.5	490	490	98	196
-W85015T	-G1K520T	1.39 E-02	1.12 E-02	5.39	7.15	13.8	19.6	490	490	98	196
-W1K315T	-G2K020T	2.05 E-02	1.52 E-02	8.34	9.54	23.3	26.5	686	490	343	196
-W1K815T	-G3K020T	3.17 E-02	2.23 E-02	11.5	14.3	28.7	41.2	1176	784	490	343
-W2K915T	-G4K020T	4.60 E-02	4.25 E-02	18.6	18.8	45.1	54.9	1470	784	490	343
-W4K415T	-G5K020T	6.75 E-02	6.07 E-02	28.4	23.8	71.1	70.6	1470	784	490	343
-W5K515T	-G7K515T	8.90 E-02	8.90 E-02	35.0	48.0	87.6	111	1764	1176	588	490
-W7K515T	-G7K515T	8.75 E-02	8.90 E-02	48.0	48.0	119	111	1764	1176	588	490
-W11K015T	—	1.40 E-01		70.0		175		1764		588	
-W15K015T	—	1.57 E-01		95.4		224		4998		2156	

[Conversion of W-series applicable inertia] 450w to 5.5kw: multiplier 10, 7.5kw: multiplier 7, 11.0k to15.0kw: multiplier 5

[Conversion of G-series applicable inertia] multiplier 10

[Servomotor dimensions]

W-series R88M-	G-series R88M-	Diagonal (C) [mm]		Mounting hole (φD1) [mm]		Inside diameter (φD2) [mm]		Shaft diameter (φS) [mm]		Effective shaft length (LR-F) [mm]	
		W	G	W	G	W	G	W	G	W	G
-W45015T	-G1K020T	130	130	145	145	110	110	19	22	40	49
-W85015T	-G1K520T	130	130	145	145	110	110	19	22	40	49
-W1K315T	-G2K020T	130	130	145	145	110	110	22	22	40	49
-W1K815T	-G3K020T	180	130	200	145	114.3	110	35	24	75.8	59
-W2K915T	-G4K020T	180	150	200	165	114.3	130	35	28	75.8	61.8
-W4K415T	-G5K020T	180	176	200	200	114.3	114.3	35	35	75.8	66.8
-W5K515T	-G7K515T	180	176	200	200	114.3	114.3	42	42	109.8	109.8
-W7K515T	-G7K515T	180	176	200	200	114.3	114.3	42	42	109.8	109.8
-W11K015T	—	220		235		200		42		112	
-W15K015T	—	220		235		200		55		112	

■3,000-r/min Flat-style Servomotors

[Servomotor features]

W-series R88M-	G-series R88M-	Applicable inertia [kg/m²]		Rated torque* [N/m]		Momentary maximum torque [N/m]		Allowable radial load [N]		Allowable thrust load [N]	
		W	G	W	G	W	G	W	G	W	G
WP10030L/S	-GP10030L/S	1.22 E-04	2.00 E-04	0.32	0.32	0.96	0.84	78	68	49	58
WP20030L/S	-GP20030L/S	2.89 E-04	7.00 E-04	0.64	0.64	1.91	1.8	245	245	68	98
-WP10030H/T	-GP10030H/T	1.22 E-04	2.00 E-04	0.32	0.32	0.96	0.86	78	68	49	58
-WP20030H/T	-GP20030H/T	2.89 E-04	7.00 E-04	0.64	0.64	1.91	1.8	245	245	68	98
-WP40030H/T	-GP40030H/T	4.96 E-04	1.30 E-03	1.27	1.3	3.82	3.65	245	245	68	98
-WP75030H/T	-	2.10 E-03		2.39		7.16		392		147	
-WP1K030H/T	-	4.02 E-03		4.77		13.3		490		147	

[Conversion of W-series applicable inertia] 100W: multiplier 25, 200 to 400W: multiplier 15, 750W to 1.5kw: multiplier 10

[Conversion of G-series applicable inertia] multiplier 20

[Servomotor dimensions]

W-series R88M-	G-series R88M-	Diagonal (C) [mm]		Mounting hole (φD1) [mm]		Inside diameter (φD2) [mm]		Shaft diameter (φS) [mm]		Effective shaft length (LR-F) [mm]	
		W	G	W	G	W	G	W	G	W	G
-WP10030L/S	-GP10030L/S	60	60	70	70	50	50	8	8	22	22
-WP20030L/S	-GP20030L/S	80	80	90	90	70	70	14	11	27	25
-WP10030H/T	-GP10030H/T	60	60	70	70	50	50	8	8	22	22
-WP20030H/T	-GP20030H/T	80	80	90	90	70	70	14	11	27	25
-WP40030H/T	-GP40030H/T	80	80	90	90	70	70	14	14	27	25
-WP75030H/T	-	120		145		110		16		36.5	
-WP1K030H/T	-	120		145		110		19		36.5	

6-2. Comparison of AC Servo Drive Specifications

Input power supply	W-series R88D-	G-series R88D-	Width [mm]		Height [mm]		Length [mm]		Length (with Connector) [mm]	
			W	G	W	G	W	G	W	G
Single-phase 100/115 V AC	-WTA3HL	-GTA5L	55	40	160	150	130	130	205	205
	-WTA5HL	-GTA5L	55	40	160	150	130	130	205	205
	-WT01HL	-GT01L	55	40	160	150	130	130	205	205
	-WT02HL	-GT02L	75	55	160	150	130	130	205	205
Single-phase 200/230 V AC	-WTA3H	-GT01H	55	40	160	150	130	130	205	205
	-WTA5H	-GT01H	55	40	160	150	130	130	205	205
	-WT01H	-GT01H	55	40	160	150	130	130	205	205
	-WT02H	-GT02H	55	40	160	150	130	130	205	205
	-WT04H	-GT04H	75	55	160	150	130	130	205	205
	-WT08H	-GT08H	90	65	160	150	180	170	255	245
Three-phase 200/230V AC	-WT08H	-GT15H	90	85	160	150	180	170	255	245
	-WT05H	-GT10H	90	85	160	150	180	170	255	245
	-WT05H	-GT15H	90	85	160	150	180	170	255	245
	-WT10H	-GT15H	90	85	160	150	180	170	255	245
	-WT15H	-GT15H	110	85	160	150	180	170	255	245
	-WT15H	-GT20H	110	85	160	198	180	200	255	275
	-WT15H	-GT30H	110	85	160	198	180	200	255	275
	-WT20H	-GT20H	110	85	250	198	180	200	255	275
	-WT20H	-GT30H	110	85	250	198	180	200	255	275
	-WT30H	-GT30H	110	85	250	198	180	200	255	275
	-WT30H	-GT50H	110	130	250	250	180	200	255	275
	-WT50H	-GT50H	135	130	250	250	230	200	305	275
	-WT50H	-GT50H	135	130	250	250	230	200	305	275
	-WT60H	-GT75H	180	248	350	250	235	344	235	419
	-WT75H	-GT75H	180	248	350	250	235	344	235	419

■ Note : R88C-WT60H/-WT75H is wall mounting.   R88D-GT75H is front panel mounting only. The table above shows outer ratio only. Consider mounting method at Replace.

6-3. Comparison of Encoder Specifications

■ 3,000-r/min Servomotors max 750W,　Flat-style Servomotors

		W-series	G-series
INC	Encoder method	Optical encoder	Optical encoder
	Number of output pulses	A, B phase : 2,048 pulses / revolution Z phase : 1 pulse / revolution	A, B phase : 2500 pulses / revolution Z phase : 1pulse / revolution
	Power supply voltage	5 V DC±5%	5 V DC±5%
	Power supply current	120 mA	180 mA
	Output signals	+S, −S	+S, −S
	Output impedance	Conforming to EIA RS−422A.	Conforming to RS−485.
ABS	Encoder method	Optical encoder	Optical encoder
	Number of output pulses	A, B phase:16,384 pulses / revolution Z phase: 1 pulse / revolution	A, B phase:32,768 pulses / revolution Z phase : 1 pulse / revolution
	Maximum rotational speed	−32,768 to +32,767 rotations or　0 to 65,534 rotations	−32,768 to +32,767 rotations or 0 to 65,534 rotations
	Power supply voltage	5 V DC±5%	5 V DC±5%
	Power supply current	180 mA	180 mA
	Applicable battery voltage	3.6 V DC	3.6 V DC
	Output signals	+S, −S	+S, −S
	Output impedance	Conforming to EIA RS−422A.	Conforming to RS−485.

■ **3,000-r/min Servomotors min 1.0kW, 1,000-r/min Servomotors, 1,500-r/min Servomotors**

<table>
<tr><th colspan="2"></th><th>U-series</th><th>G-series</th></tr>
<tr><td rowspan="6">INC</td><td>**Encoder method**</td><td>Optical encoder</td><td rowspan="6">G-series ABS only.</td></tr>
<tr><td>**Number of output pulses**</td><td>A, B phase:32,768 pulses / revolution
Z phase: 1 pulse / revolution</td></tr>
<tr><td>**Power supply voltage**</td><td>5 V DC±5%</td></tr>
<tr><td>**Power supply current**</td><td>120 mA</td></tr>
<tr><td>**Output signals**</td><td>+S, −S</td></tr>
<tr><td>**Output impedance**</td><td>Conforming to EIA RS-422A.</td></tr>
<tr><td rowspan="8">ABS</td><td>**Encoder method**</td><td>Optical encoder</td><td>Optical encoder</td></tr>
<tr><td>**Number of output pulses**</td><td>A, B phase:32,768 pulses / revolution
Z phase: 1 pulse/revolution</td><td>A, B phase:32,768 pulses / revolution
Z phase: 1 pulse/revolution</td></tr>
<tr><td>**Maximum rotational speed**</td><td>−32,768 to +32,767 rotations or 0 to 65,534 rotations</td><td>−32,768 to +32,767 rotations or 0 to 65,534 rotations</td></tr>
<tr><td>**Power supply voltage**</td><td>5 V DC±5%</td><td>5 V DC±5%</td></tr>
<tr><td>**Power supply current**</td><td>180 mA</td><td>110 mA</td></tr>
<tr><td>**Applicable battery voltage**</td><td>3.6 V DC</td><td>3.6 V DC</td></tr>
<tr><td>**Output signals**</td><td>+S, −S</td><td>+S, −S</td></tr>
<tr><td>**Output impedance**</td><td>Conforming to EIA RS-422A</td><td>Conforming to RS-485.</td></tr>
</table>

■ **3,000-r/min Servomotors min 1.0kW, 1,000-r/min Servomotors, 1,500-r/min Servomotors**