SANMOTION

SERVO SYSTEMS

R

ADVANCED MODEL

AC200V　750W-15kW

SANYO DENKI

SANMOTION R
SERVO SYSTEMS

ADVANCED MODEL

Input voltage AC200 V

Servo amplifier

Amp.capacity 50A · 100A · 150A · 300A

Q1 Servo motor · Q2 Servo motor · Q4 Servo motor

Flange size 86mm · 100mm · 120mm · 130mm · 180mm · 220mm

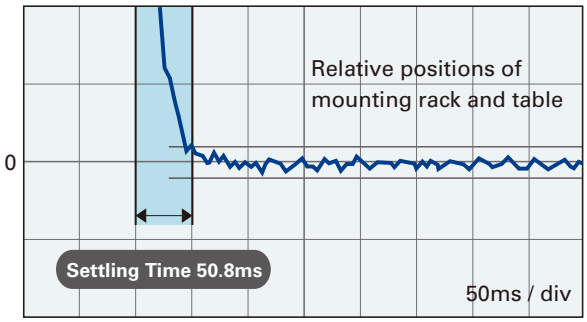
Rated output 750W · 1.0kW · 1.5kW · 2.0kW · 2.5kW · 3.0kW · 3.5kW · 4.0kW · 4.5kW · 5.0kW · 5.5kW · 7.0kW · 7.5kW · 11.0kW · 15.0kW

ECO PRODUCTS

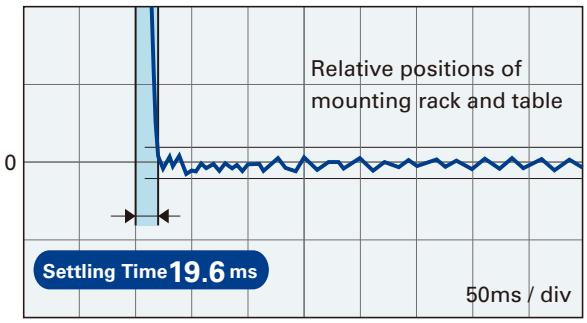
Index

50% Shorter Position Settling Time ※

The vibrations of the low rigidity machine stand resonance is minimized, and shortens positioning settling time.
The amplifier is suitable for chip mounters and equipment needs high speed positioning.
※ Compared with our conventional product "SANMOTION R".



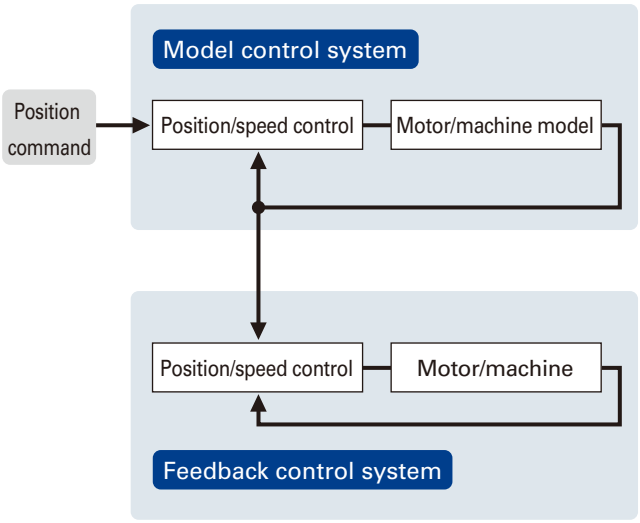
Our conventional product



SANMOTION R ADVANCED MODEL

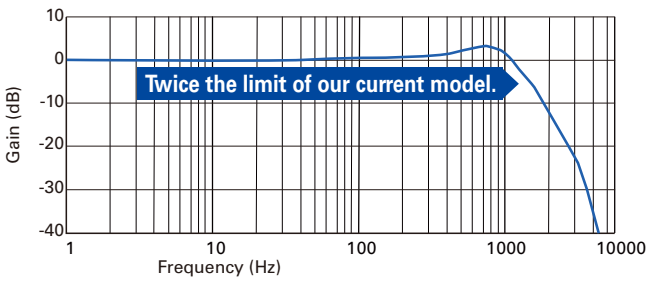
Features Model-based Following Control

Model-based tracking control enables an improved target response curve, enhanced disturbance suppression, and greater robustness.



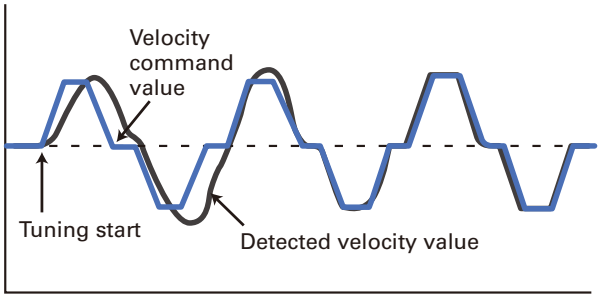
Doubled Frequency Response Limit

The frequency response limit has been increased to 1200 Hz, twice the limit of our current model.
※ Compared with our conventional product "SANMOTION R".



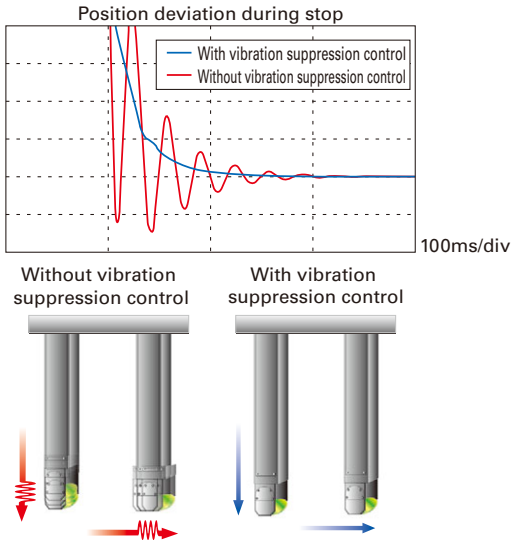
Auto-Tuning

Servo amplifier automatically optimizes servo gain and filter frequency in realtime.



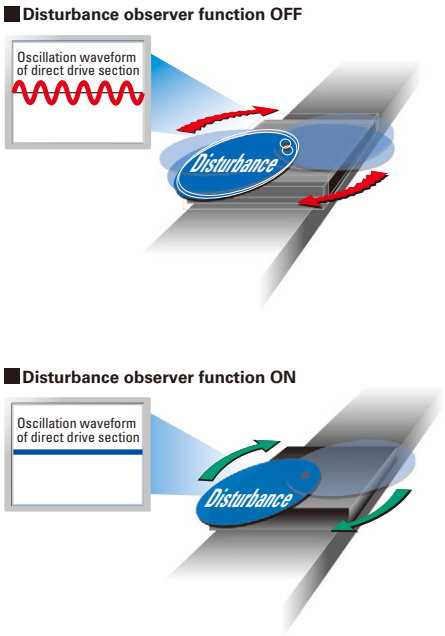
Feed-forward vibration suppression control

With feed-forward vibration suppression control, vibrations at the processing point and base of a machine can be suppressed through simple tuning procedures. Vibration control frequencies are selectable.



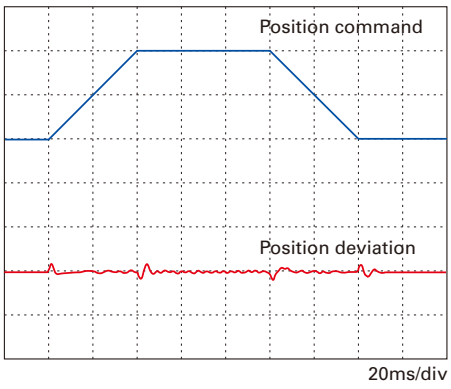
Disturbance Suppression

It is possible to control impacts from other axes in case of multiaxial constitution, by using the new disturbance observer with extended applicable frequency.



Command Follow-up Control

Performance of the positioning doubled in comparison with current models by adoption of new positioning control algorithm and new speed control algorithm. And position deviation ≒ 0 is achieved.



Resonance Suppression

A 4th-order notch filter reduces phase delay to suppress mechanical resonance and improve velocity response of equipment.

High Resolution

Support for encoders up to 17 bit (131,072 divisions) is available for high resolution control. An optional 20 bit encoder (1,048,576 divisions) is also available.

Now Available with EtherCAT Interface

EtherCAT is a 100Mbps high-speed fieldbus system, which helps shorten Takt time. It is compatible with Ethernet, and its high versatility enables the creation of a system compatible with a variety of devices. Servo amplifier firmware can be updated via EtherCAT. It is also certified through EtherCAT conformance testing conducted by a third party organization.

EtherCAT® Conformance tested

Safety Model newly added to lineup

Since this new model safely shutdown motor torque, safety system is more easily installed on the equipments. This safety function is defined in the "IEC61800-5-2: Safe Torque Off" and "IEC60204-1:Stop Category 0". In addition, this model has aquired "IEC61508, SIL2/ IEC62061,SILCL2" and "ISO13849-1:Cat.3,PL=d".

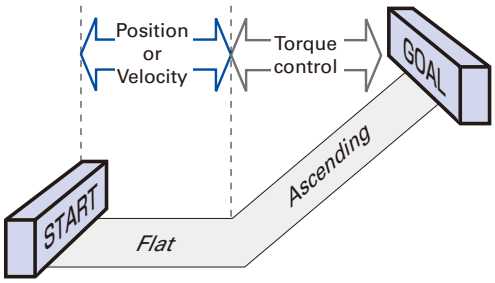
Protection IP67

Protection code is IP67 for all models

*Shaft feedthrough, cable end and cooling fan are excluded

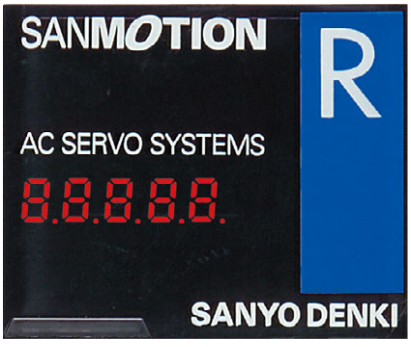
All-in-One Control

Configurable parameters allow you to switch between control modes for torque, position or velocity.



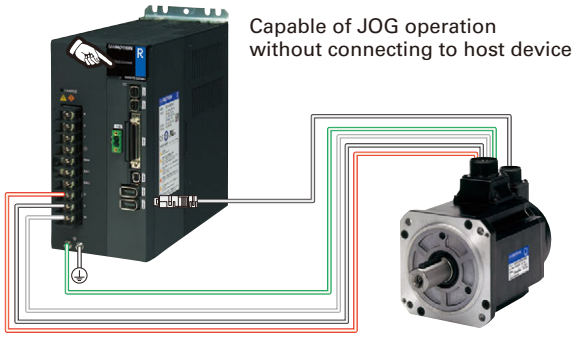
5-digit LED Display, Built-in Operator

The built-in operator allows you to change parameters and monitor the amplifier status and alarm trace.



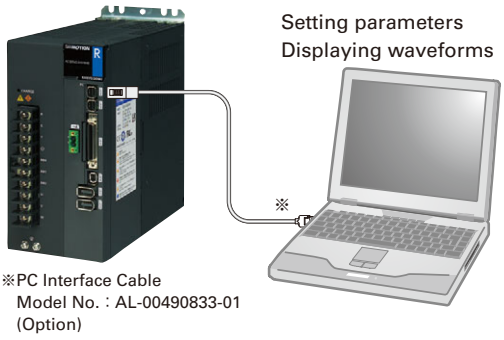
Test Function (JOG)

On-board JOG operation function is available for testing motor and amplifier connection without the need to connect to host device.



Setup Software

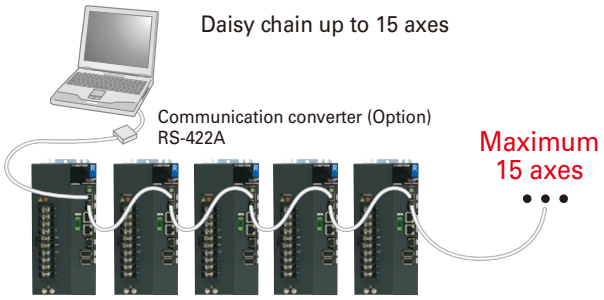
The setup software allows you to set parameters, view graphical displays of monitored position, velocity or torque waveforms.



Multiaxial Monitor Function

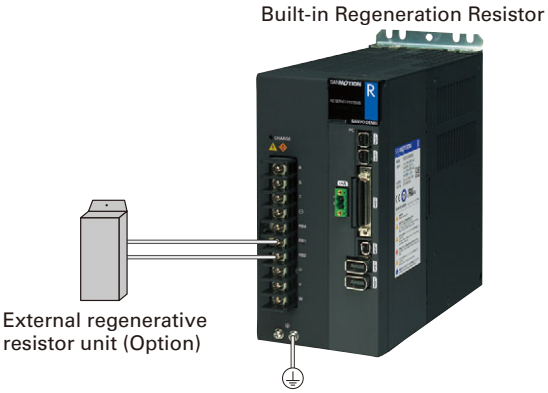
The setup software allows up to 15 axes to be monitored. To enable monitoring of multiple axes, an optional communication converter and amplifier communication cable are available.

*Analog/Pulse input type only



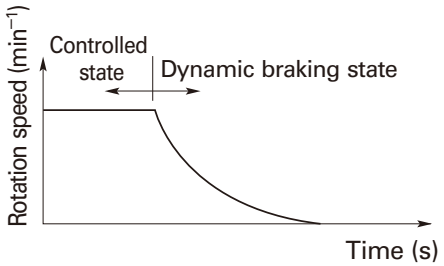
Built-in Regeneration Resistor

It is possible to choose whether to equip regenerative resistance or not. If the regenerative resistance capability is insufficient, it is possible to use an external regenerative resistance unit.



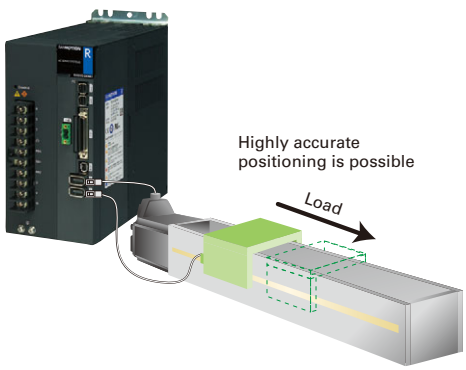
Built-in Dynamic Brake

A built-in dynamic brake provides emergency stop capability. The six kinds of motion sequences for the dynamic brake can be selected by parameter setting.



Fully-closed loop control

Fully-closed control is possible using a linear scale mounted on the device together with high resolution encoder information.



Servo Motor Standard Model Number List

Power Voltage	Encoder models	Rated Output	Motor Flange Size	Holding Brake	Model No.
200V	Wire-saving incremental encoder (PP031/PP038/PP062)	1kW	100mm sq.	–	Q1AA10100DXS00
				yes (DC24V)	Q1AA10100DCS00
		1.5kW		–	Q1AA10150DXS00
				yes (DC24V)	Q1AA10150DCS00
		2kW		–	Q1AA10200DXS00
				yes (DC24V)	Q1AA10200DCS00
		2.5kW		–	Q1AA10250DXS00
				yes (DC24V)	Q1AA10250DCS00
		1kW	120mm sq.	–	Q1AA12100DXS00
				yes (DC24V)	Q1AA12100DCS00
		2kW		–	Q1AA12200DXS00
				yes (DC24V)	Q1AA12200DCS00
		3kW		–	Q1AA12300DXS00
				yes (DC24V)	Q1AA12300DCS00
		3kW	130mm sq.	–	Q1AA13300DXS00
				yes (DC24V)	Q1AA13300DCS00
		4kW		–	Q1AA13400DXS00
				yes (DC24V)	Q1AA13400DCS00
		5kW		–	Q1AA13500DXS00
				yes (DC24V)	Q1AA13500DCS00
		4.5kW	180mm sq.	–	Q1AA18450MXS00
				yes (DC24V)	Q1AA18450MCS00
		7.5kW		–	Q1AA18750HXS00
				yes (DC24V)	Q1AA18750HCS00
		750W	86mm sq.	–	Q2AA08075DXS00
				yes (DC24V)	Q2AA08075DCS00
		1kW		–	Q2AA08100DXS00
				yes (DC24V)	Q2AA08100DCS00
		1kW	100mm sq.	–	Q2AA10100HXS00
				yes (DC24V)	Q2AA10100HCS00
		1.5kW		–	Q2AA10150HXS00
				yes (DC24V)	Q2AA10150HCS00
		1kW	130mm sq.	–	Q2AA13100HXS00
				yes (DC24V)	Q2AA13100HCS00
		1.5kW		–	Q2AA13150HXS00
				yes (DC24V)	Q2AA13150HCS00
		2kW		–	Q2AA13200HXS00
				yes (DC24V)	Q2AA13200HCS00
		2kW	180mm sq.	–	Q2AA18200HXS00
				yes (DC24V)	Q2AA18200HCS00
		3.5kW		–	Q2AA18350HXS00
				yes (DC24V)	Q2AA18350HCS00
		4.5kW		–	Q2AA18450HXS00
				yes (DC24V)	Q2AA18450HCS00
		5.5kW		–	Q2AA18550RXS00
				yes (DC24V)	Q2AA18550RCS00
		5.5kW	220mm sq.	–	Q2AA22550BXS00
				yes (DC24V)	Q2AA22550BCS00
		7kW		–	Q2AA22700SXS00
				yes (DC24V)	Q2AA22700SCS00
		5.5kW	180mm sq.	–	Q2AA18550HXS00
				yes (DC24V)	Q2AA18550HCS00
		7.5kW		–	Q2AA18750LXS00
				yes (DC24V)	Q2AA18750LCS00
		11kW	220mm sq.	–	Q2AA2211KVXS00
				yes (DC24V)	Q2AA2211KVCS00
		15kW		–	Q2AA2215KVXS00
				yes (DC24V)	Q2AA2215KVCS00
		11kW	180mm sq.	–	Q4AA1811KBXS00
		15kW		–	Q4AA1815KBXS00

Power Voltage	Encoder models	Rated Output	Motor Flange Size	Holding Brake	Model No.
200V	Battery backup method absolute encoder (PA035C)	1kW	100mm sq.	–	Q1AA10100DXP00
				yes (DC24V)	Q1AA10100DCP00
		1.5kW		–	Q1AA10150DXP00
				yes (DC24V)	Q1AA10150DCP00
		2kW		–	Q1AA10200DXP00
				yes (DC24V)	Q1AA10200DCP00
		2.5kW		–	Q1AA10250DXP00
				yes (DC24V)	Q1AA10250DCP00
		1kW	120mm sq.	–	Q1AA12100DXP00
				yes (DC24V)	Q1AA12100DCP00
		2kW		–	Q1AA12200DXP00
				yes (DC24V)	Q1AA12200DCP00
		3kW		–	Q1AA12300DXP00
				yes (DC24V)	Q1AA12300DCP00
		3kW	130mm sq.	–	Q1AA13300DXP00
				yes (DC24V)	Q1AA13300DCP00
		4kW		–	Q1AA13400DXP00
				yes (DC24V)	Q1AA13400DCP00
		5kW		–	Q1AA13500DXP00
				yes (DC24V)	Q1AA13500DCP00
		4.5kW	180mm sq.	–	Q1AA18450MXP00
				yes (DC24V)	Q1AA18450MCP00
		7.5kW		–	Q1AA18750HXP00
				yes (DC24V)	Q1AA18750HCP00
		750W	86mm sq.	–	Q2AA08075DXP00
				yes (DC24V)	Q2AA08075DCP00
		1kW		–	Q2AA08100DXP00
				yes (DC24V)	Q2AA08100DCP00
		1kW	100mm sq.	–	Q2AA10100HXP00
				yes (DC24V)	Q2AA10100HCP00
		1.5kW		–	Q2AA10150HXP00
				yes (DC24V)	Q2AA10150HCP00
		1kW	130mm sq.	–	Q2AA13100HXP00
				yes (DC24V)	Q2AA13100HCP00
		1.5kW		–	Q2AA13150HXP00
				yes (DC24V)	Q2AA13150HCP00
		2kW		–	Q2AA13200HXP00
				yes (DC24V)	Q2AA13200HCP00
		2kW	180mm sq.	–	Q2AA18200HXP00
				yes (DC24V)	Q2AA18200HCP00
		3.5kW		–	Q2AA18350HXP00
				yes (DC24V)	Q2AA18350HCP00
		4.5kW		–	Q2AA18450HXP00
				yes (DC24V)	Q2AA18450HCP00
		5.5kW		–	Q2AA18550RXP00
				yes (DC24V)	Q2AA18550RCP00
		5.5kW	220mm sq.	–	Q2AA22550BXP00
				yes (DC24V)	Q2AA22550BCP00
		7kW		–	Q2AA22700SXP00
				yes (DC24V)	Q2AA22700SCP00
		5.5kW	180mm sq.	–	Q2AA18550HXP00
				yes (DC24V)	Q2AA18550HCP00
		7.5kW		–	Q2AA18750LXP00
				yes (DC24V)	Q2AA18750LCP00
		11kW	220mm sq.	–	Q2AA2211KVXP00
				yes (DC24V)	Q2AA2211KVCP00
		15kW		–	Q2AA2215KVXP00
				yes (DC24V)	Q2AA2215KVCP00
		11kW	180mm sq.	–	Q4AA1811KBXP00
		15kW		–	Q4AA1815KBXP00

Servo Motor Standard Model Number List

Power Voltage	Encoder models	Rated Output	Motor Flange Size	Holding Brake	Model No.
200V	Absolute encoder without battery (RA035C)	1kW	100mm sq.	–	Q1AA10100DXW00
				yes (DC24V)	Q1AA10100DCW00
		1.5kW		–	Q1AA10150DXW00
				yes (DC24V)	Q1AA10150DCW00
		2kW		–	Q1AA10200DXW00
				yes (DC24V)	Q1AA10200DCW00
		2.5kW		–	Q1AA10250DXW00
				yes (DC24V)	Q1AA10250DCW00
		1kW	120mm sq.	–	Q1AA12100DXW00
				yes (DC24V)	Q1AA12100DCW00
		2kW		–	Q1AA12200DXW00
				yes (DC24V)	Q1AA12200DCW00
		3kW		–	Q1AA12300DXW00
				yes (DC24V)	Q1AA12300DCW00
		3kW	130mm sq.	–	Q1AA13300DXW00
				yes (DC24V)	Q1AA13300DCW00
		4kW		–	Q1AA13400DXW00
				yes (DC24V)	Q1AA13400DCW00
		5kW		–	Q1AA13500DXW00
				yes (DC24V)	Q1AA13500DCW00
		4.5kW	180mm sq.	–	Q1AA18450MXW00
				yes (DC24V)	Q1AA18450MCW00
		7.5kW		–	Q1AA18750HXW00
				yes (DC24V)	Q1AA18750HCW00
		1kW	100mm sq.	–	Q2AA10100HXW00
				yes (DC24V)	Q2AA10100HCW00
		1.5kW		–	Q2AA10150HXW00
				yes (DC24V)	Q2AA10150HCW00
		1kW	130mm sq.	–	Q2AA13100HXW00
				yes (DC24V)	Q2AA13100HCW00
		1.5kW		–	Q2AA13150HXW00
				yes (DC24V)	Q2AA13150HCW00
		2kW		–	Q2AA13200HXW00
				yes (DC24V)	Q2AA13200HCW00
		2kW	180mm sq.	–	Q2AA18200HXW00
				yes (DC24V)	Q2AA18200HCW00
		3.5kW		–	Q2AA18350HXW00
				yes (DC24V)	Q2AA18350HCW00
		4.5kW		–	Q2AA18450HXW00
				yes (DC24V)	Q2AA18450HCW00
		5.5kW		–	Q2AA18550RXW00
				yes (DC24V)	Q2AA18550RCW00
		5.5kW	220mm sq.	–	Q2AA22550BXW00
				yes (DC24V)	Q2AA22550BCW00
		7kW		–	Q2AA22700SXW00
				yes (DC24V)	Q2AA22700SCW00
		5.5kW	180mm sq.	–	Q2AA18550HXW00
				yes (DC24V)	Q2AA18550HCW00
		7.5kW		–	Q2AA18750LXW00
				yes (DC24V)	Q2AA18750LCW00
		11kW	220mm sq.	–	Q2AA2211KVXW00
				yes (DC24V)	Q2AA2211KVCW00
		15kW		–	Q2AA2215KVXW00
				yes (DC24V)	Q2AA2215KVCW00
		11kW	180mm sq.	–	Q4AA1811KBXW00
		15kW		–	Q4AA1815KBXW00

Servo Amplifier Standard Model Number List

Type	Main Power	Control Power	Encoder Type	Selectable Output	Internal Registration Resistor	Safe Torque Off function	Amplifier Capacity	Model No.
Analog / Pulse input type	AC200V system AC200 to 230V 3-phase	AC200V system AC200 to 230V 1-phase	Serial encoder	NPN	with	—	50A	RS2A05A0AA0
							100A	RS2A10A0AA0
							150A	RS2A15A0AA0
					—		50A	RS2A05A0AL0
							100A	RS2A10A0AL0
							150A	RS2A15A0AL0
							300A	RS2A30A0AL0
					with	yes	50A	RS2A05A0AA2
							100A	RS2A10A0AA2
							150A	RS2A15A0AA2
					—		50A	RS2A05A0AL2
							100A	RS2A10A0AL2
							150A	RS2A15A0AL2
							300A	RS2A30A0AL2
				PNP	with	—	50A	RS2A05A0BA0
							100A	RS2A10A0BA0
							150A	RS2A15A0BA0
					—		50A	RS2A05A0BL0
							100A	RS2A10A0BL0
							150A	RS2A15A0BL0
							300A	RS2A30A0BL0
					with	yes	50A	RS2A05A0BA2
							100A	RS2A10A0BA2
							150A	RS2A15A0BA2
					—		50A	RS2A05A0BL2
							100A	RS2A10A0BL2
							150A	RS2A15A0BL2
							300A	RS2A30A0BL2
EtherCAT interface type	AC200V system AC200 to 230V 3-phase	AC200V system AC200 to 230V 1-phase	Serial encoder	Photo relay output	with	—	50A	RS2A05A0KA0
							100A	RS2A10A0KA0
							150A	RS2A15A0KA0
					—		50A	RS2A05A0KL0
							100A	RS2A10A0KL0
							150A	RS2A15A0KL0
							300A	RS2A30A0KL0
					with	yes (with delay circuit)	50A	RS2A05A0KA4
							100A	RS2A10A0KA4
							150A	RS2A15A0KA4
					—		50A	RS2A05A0KL4
							100A	RS2A10A0KL4
							150A	RS2A15A0KL4
							300A	RS2A30A0KL4

Model Number Nomenclature

Example: The model number below is for the servo motor (Q2: medium inertia) with a 130mm flange size, 2.0kW rated output, 3500 min-1 maximum rotation speed, brake (DC24V), and absolute encoder (131072 divisions/revolution), and when CE mark compliance is selected.

Q 2 AA 13 200 H C P 00 E

- **Q** — Q Series
- **2** — Motor type
  - 1 ··· Low-inertia
  - 2 ··· Medium-inertia
  - 4 ··· Low-inertia (high volume)
- **AA** — Supply Voltage
  - AA ··· AC200V
- **13** — Flange Size
  - 08 ··· 86mm
  - 10 ··· 100mm
  - 12 ··· 120mm
  - 13 ··· 130mm
  - 18 ··· 180mm
  - 22 ··· 220mm
- **200** — Rated Output

075 ··· 750W	450 ··· 4.5kW
100 ··· 1.0kW	500 ··· 5.0kW
150 ··· 1.5kW	550 ··· 5.5kW
200 ··· 2.0kW	700 ··· 7.0kW
250 ··· 2.5kW	750 ··· 7.5kW
300 ··· 3.0kW	11K ··· 11.0kW
350 ··· 3.5kW	15K ··· 15.0kW
400 ··· 4.0kW	

- **H** — Maximum Rotation Speed

S ··· 1000min^{-1}	H ··· 3000・3500min^{-1}
M ··· 1500min^{-1}	L ··· 3000min^{-1}
B ··· 2000min^{-1}	D ··· 4500・5000min^{-1}
R ··· 2500min^{-1}	V ··· 2000min^{-1}

- **C** — Holding Brake
  - X ··· Without Brake
  - B ··· With Brake (DC90V)
  - C ··· With Brake (DC24V)
- **P** — Encoder Type
  - Serial Encoder
    - P ··· Battery backup method absolute encoder [PA035C]
    - H ··· Absolute encoder for incremental System [PA035S]
    - W ··· Absolute encoder without battery [RA035C]
  - Pulse Encoder
    - S ··· Wire-saving incremental encoder [PP031T/PP038/PP062]
- **00** — Specification
  - 00 ··· Standard
- **E** — Standard Identification
  - E ··· CE
  - U ··· UL
  - M ··· CE and UL

Encoder Specification

Pulse encoder

Model			Standard		Supported Range		Remark
			Encoder Pulse Count	Resolution	Encoder Pulse Count	Resolution	
PP031T PP038 PP062	Optical Detection System	Incremental Type	2000P/R	8000	2048P/R・5000P/R 8192P/R・10000P/R 20000P/R・25000P/R	8192 20000 32768 40000 80000 100000	Wire-saving incremental encoder

Serial encoder

Model			Resolution		Remark
			Single Rotation	Multiple Rotations	
PA035C	Optical Detection System	Absolute Type	131072(17bit)	65536(16bit)	Battery backup method absolute encoder
PA035S	Optical Detection System	Absolute Type	131072(17bit)	—	Absolute encoder for incremental System
RA035C	Resolver System	Absolute Type	131072(17bit)	65536(16bit)	Absolute encoder without battery

Please contact our Sales Division for assistance.

Conformance to Overseas Standards

Our standard servo amplifier has attained the international standards (UL, c-UL and EN Standards).
You can also employ servo motors that have attained the international standards (UL and EN Standards).

Model Number Nomenclature

Example: RS2 Series Servo Amplifier models, Input voltage AC200V, Amplifier capacity15A, With built-in regenerative resistance/with DB resistance, With safety furction.

RS2 A 05 A 0 A A 2

- **RS2** — RS2 Series
- **A** — Input voltage
  A ··· AC200V
- **05** — Amplifier capacity
  05 ··· 50A
  10 ··· 100A
  15 ··· 150A
  30 ··· 300A
- **A** — Motor type
  A ··· Rotary motor
- **0** — Motor Encoder Type

	EN1 (Motor encoder)	EN2 (External pulse encoder)
0	Serial encoder	—
2	Serial encoder	Pulse encoder
8	Pulse encoder	—
A	Pulse encoder	Pulse encoder

2 or A is selectable for a servo amplifier for a fully-closed system. Please specify 2 or A according to the motor encoder to be used. 0 or 8 is only for a semi-closed system and is not selectable for a fully-closed system. Please note that a servo amplifier for a fully-closed system can be used for a semi-closed system.

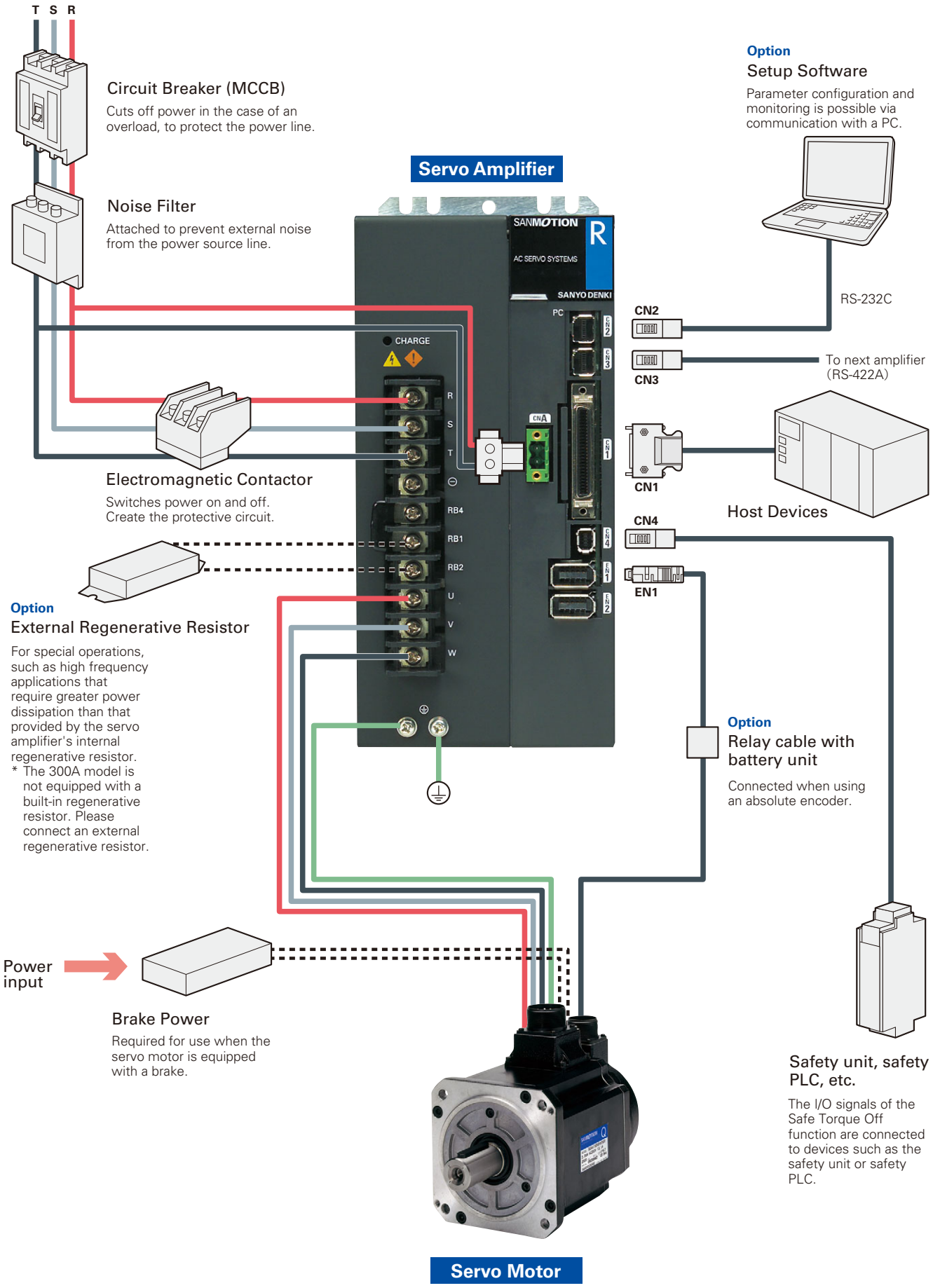
- **A** — Interface type
  A···Analog pulse control, NPN (Sink) output
  B···Analog pulse control, PNP (Source) output
  K···EtherCAT interface

  PNP Generic output : PNP (Source) output :
  It takes external 24VDC as common power supply and outputs 24VDC when generic output is ON.
- **A** — Option 1
  A ···With built-in regenerative resistance/ with DB resistance
  L ···Without built-in regenerative resistance/ with DB resistance
  300A amplifier capacity is only available for the model without a built-in regenerative resistor.
- **2** — Option 2

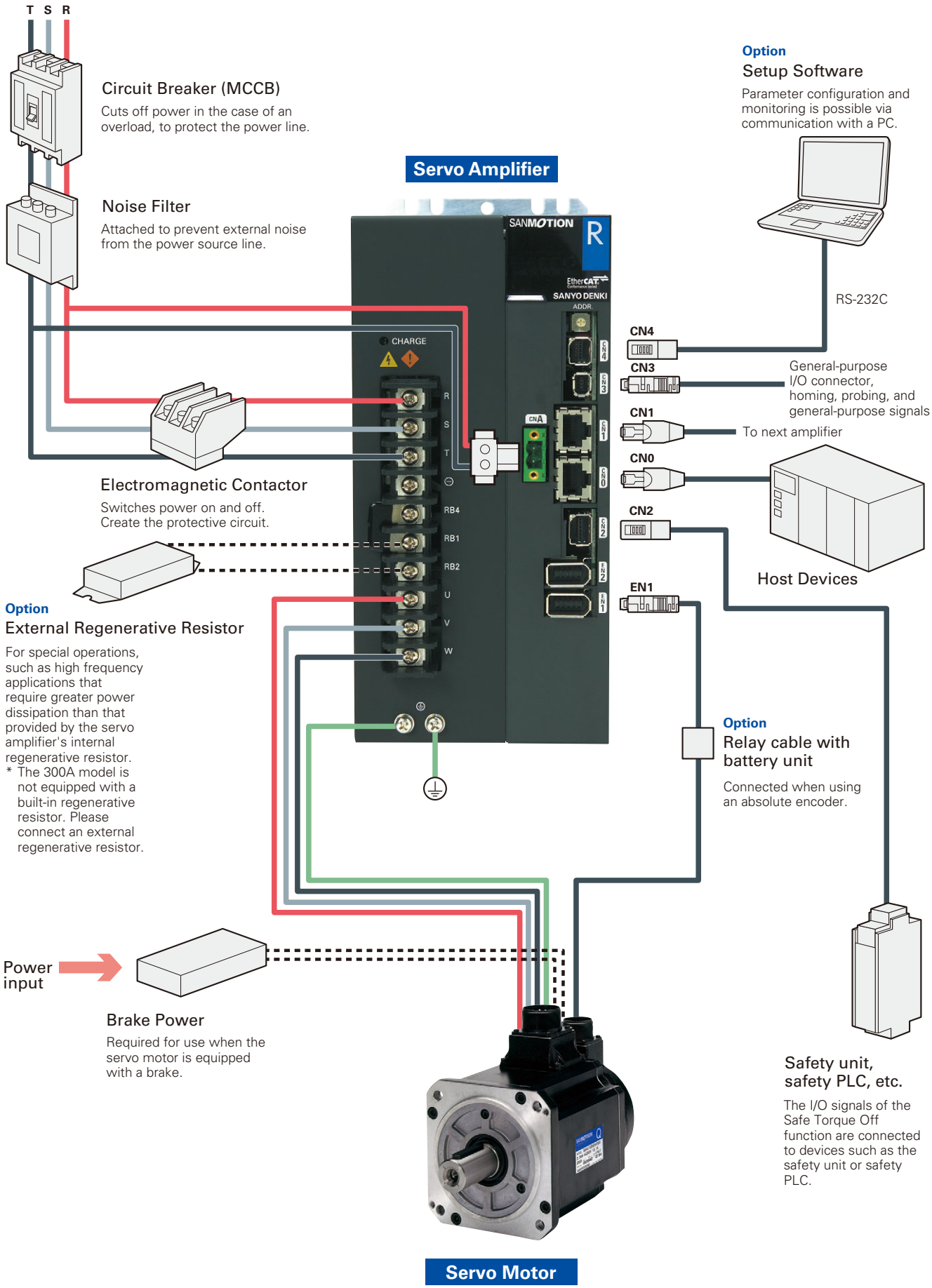
	Speed / Torque command input	Safe Torque Off function
0	Available	None
2	Available	Available (without delay circuit)
4	Available	Available (with delay circuit)

* The motor parameters need to be set for the amplifier for use.
Use the setup software.

Analog/Pulse Input Type Servo Amplifier



EtherCAT interface type servo amplifier



Servo Amplifier Specifications

Control function	Position control/Speed control/Torque control (Parameter changeover)	
Control system	IGBT：PWM control Sinusoidal drive	
Main Circuit Power Note1)	Three-phase : AC200 to 230V+10, -15%, 50/60Hz±3Hz Single-phase (Amplifier Capacity 50A only) : AC200 to 230V+10, -15%, 50/60Hz±3Hz	
Controlling circuit Note1)	Single-phase : AC200 to 230V+10, -15%, 50/60Hz±3Hz	
Environment	Ambient temperature	0 to 55℃
	Storage temperature	−20 to +65℃
	Operation/Storage humidity	Below 90%RH (no condensation)
	Elevation	Below 2000m sea level
	Vibration	4.9m/s^2 Frequency range 10 to 55Hz tested for 2H in each direction X.Y.Z
	Shock	19.6m/s^2
Structure	Built-in tray type power supply	

Note1)
Power source voltage should be within the specified range AC200V
Power input type:
Specified power supply range = AC170V to AC253V

Performance

Speed control range	1:5000 (Internal speed command)
Frequency characteristics	1200Hz (In case of high frequency sampling mode) *Varies depending on the model.

Built-in functions

Protection functions	Over current, Current detection error, Overload, Regeneration error, Amplifier overheating, External overheating, Over voltage, Main circuit power low voltage, Main circuit power supply open phase, Control power supply low voltage, Encoder error, Over speed, Speed control error, Speed feedback error, Excessive position, Position command pulse error, Built-in memory error, Parameter error
LED display	Status display, Monitor display, Alarm display, Parameter setting, Adjustment mode
Dynamic brake circuit	Built-in
Regeneration process circuit	Built-in
Monitor	Speed monitor (VMON) 2.0V±10% (at 1000min^{-1})
	Current monitor (IMO) 2.0V±10% (at 100%)

Safety standard

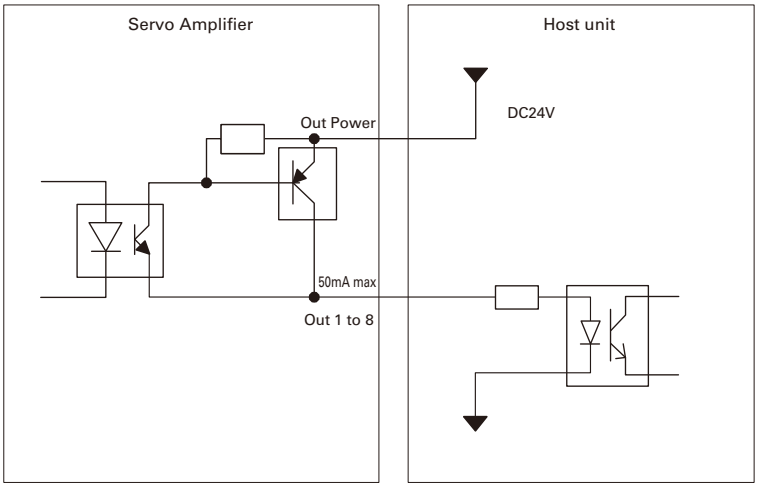
Servo amplifier type	Safety standards		
All models	UL ratings	UL508C	
	EN standards	Low-voltage directive	・EN61800−5−1
		EMC directive	・EN55011 G1 ClassA ・EN61000−6−2 ・EN61800−3
Model with safety function	Function safety standards	・IEC61508, SIL2 ・IEC62061, SILCL2	・ISO13849−1, Cat. 3, PL=d ・EN954−1, Cat. 3

EtherCAT interface specifications

Physical layer	IEC61158-2 IEEE802.3u 100BASE-TX
Data link layer	IEC61158-3,-4 Type12
Application layer	IEC61158-5,-6 Type12
Device profile	IEC61800-7 Profile type1(CiA402) ・CoE (CANopen over EtherCAT) ・FoE (File access over EtherCAT)
Communication port	RJ45 connector (2 ports)
Baud rate	100 Mbps (Full duplex)
Max. No. of nodes	65535 nodes
Transmission distance/topology	Max. 100 m (between nodes)/Daisy-chain
Cable	Twisted-pair CAT5e (straight or cross)
Communication object	SDO (Service Data Object) PDO (Process Data Object)
PDO length	Output：Max.64Byte, Input：Max.64Byte Total: Max. 128 Bytes
Synchronization function	SYNC0 Event Synchronization Mode (DC Mode),Synchronous with SM2 Event Mode, Asynchronous Mode
Operation mode	Profile Position Mode, Profile Velocity Mode, Profile Torque Mode, Homing Mode, Cycle Sync Position Mode, Cycle Sync Velocity Mode, Cycle Sync Torque Mode
LED indicator	Port 0/1 link display, RUN display, error display
General Input/Output	2 inputs, 2 outputs （4 total）

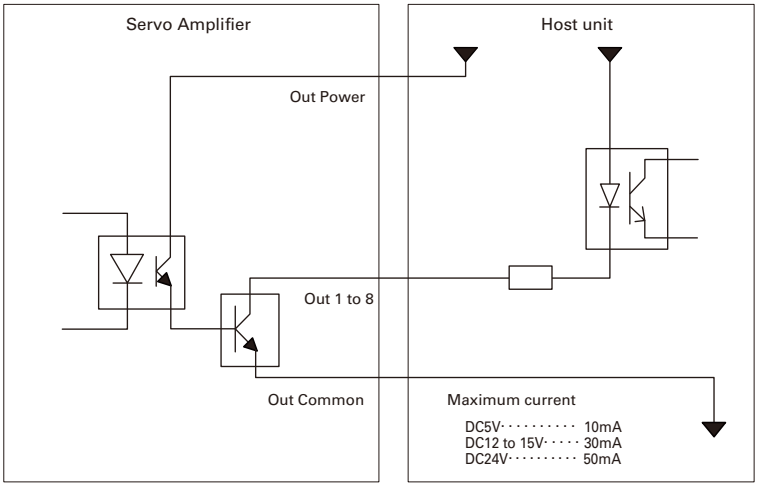
PNP/NPN output specifications

PNP output



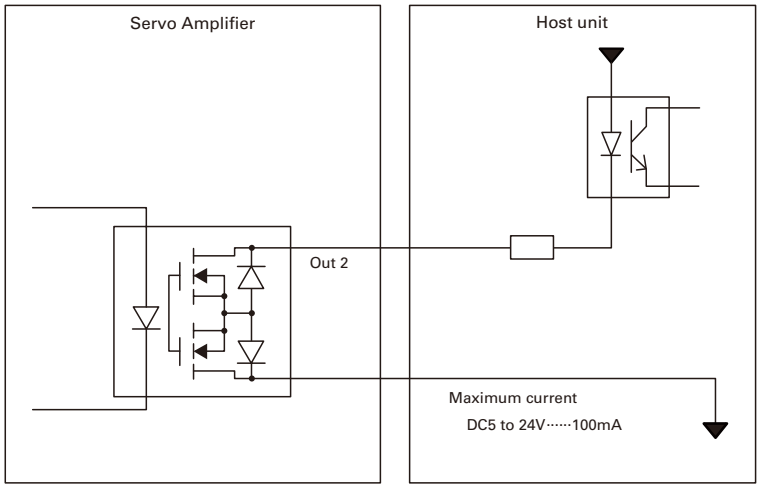
The output port counts are differentdepending on the specification.

NPN output



The output port counts are differentdepending on the specification.

Photo relay output



Specification

Servo Amplifier + **Q1 Servo Motor** High Power Rate (Low Inertia)

input voltage AC200V Power supply range AC170V to AC253V

Servo Amplifier Model				RS2A05A□		RS2A10A□
Servo Motor Model and Flange Size				Q1AA10100D 《100》	Q1AA10150D 《100》	Q1AA10200D 《100》
	Status	Symbol	Unit			
Rated Output	★	P_R	kW	1	1.5	2
Rated Speed	★	N_R	min^{-1}	3000		
Maximum Speed	★	N_{max}	min^{-1}	5000	4500	5000
Rated Torque	★	T_R	N·m	3.19	4.79	6.37
Continuous Torque at Stall	★	T_S	N·m	3.92	4.9	7.36
Peak Torque at Stall	★	T_P	N·m	10.5	14.7	19.6
Rated Armature Current	★	I_R	Arms	6.5	8.2	15.9
Armature Current at Stall	★	I_S	Arms	7.8	8.2	18
Peak Armature Current Stall	★	I_P	Arms	24.5	26.5	55
Torque Constant	☆	K_T	N·m／Arms	0.55	0.705	0.47
Voltage Constant Per Phase	☆	$K_{E\phi}$	mV／min^{-1}	19.3	24.6	16.4
Phase Resistance	☆	R_ϕ	Ω	0.34	0.272	0.086
Rated Power Rate	★	Q_R	kW／s	78.9	143	189
Electrical Time Constant	☆	te	ms	7.6	11.4	12.1
Mechanical Time Constant (Not including Encoder)	☆	tm	ms	0.43	0.26	0.25
Roter Moment of Inertia Note)		J_M	$\times 10^{-4}$kg·m^2(GD^2／4)	1.29	1.61	2.15
Mass Note)		WE	kg	5.4	6.5	8.7
Brake Static Friction Torque		TB	N·m	3.92	9.8	9.8
Brake Rated Voltage		VB	V	DC90V／DC24V ± 10%		
Brake Rated Current		IB	A	0.2／0.61	0.2／0.83	0.2／0.83
Roter Moment of Inertia (Brake)		JB	$\times 10^{-4}$kg·m^2(GD^2／4)	0.15	0.4	0.4
Brake Mass		W	kg	1.3	1.5	1.5
Servo Motor Operating Temp, Rel.Humidity				Operating Temperature: 0 to 40℃, Relative Humidity: 90% maximum, no condensation		
Servo amplifier power supply capacity (rating)			kVA	2.5	3.0	4.0

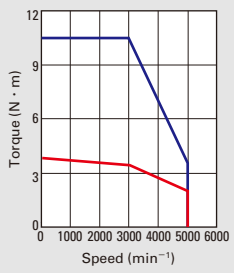
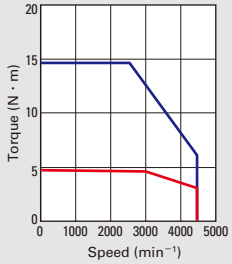
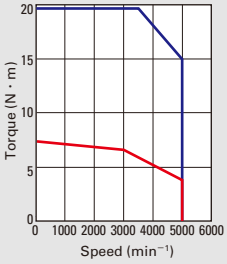
Note) including Wire-saving incremental encoder

★ :Indicates a typical value after warm-up and thermal stabilization, together with a standard amplifier.

☆ :Indicates a typical value when the winding temperature is 20℃ .

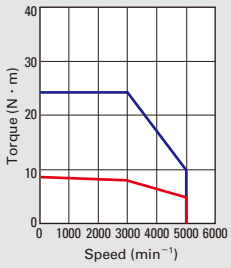
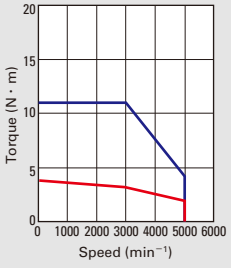
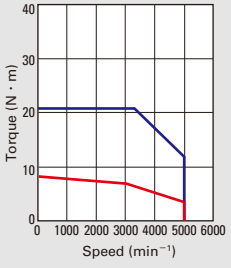
Speed-Torque Characteristics

Servo motor Model No./Flange Size/Rated Output

Q1AA10100D／100mm／1kW	Q1AA10150D／100mm／1.5kW	Q1AA10200D／100mm／2kW
		

RS2A10A□	RS2A05A□	RS2A10A□	Servo Amplifier Model			
Q1AA10250D 《100》	Q1AA12100D 《120》	Q1AA12200D 《120》	Servo Motor Model and Flange Size			
			Unit	Symbol	Status	
2.5	1	2	kW	P_R	★	Rated Output
3000			min^{-1}	N_R	★	Rated Speed
5000			min^{-1}	N_{max}	★	Maximum Speed
7.97	3.19	6.37	N·m	T_R	★	Rated Torque
8.82	3.92	7.36	N·m	T_S	★	Continuous Torque at Stall
24.4	11	21	N·m	T_P	★	Peak Torque at Stall
16.6	6.2	14.3	Arms	I_R	★	Rated Armature Current
17.2	7.5	16.2	Arms	I_S	★	Armature Current at Stall
55	24.5	53	Arms	I_P	★	Peak Armature Current Stall
0.587	0.587	0.5	N·m／Arms	K_T	☆	Torque Constant
20.5	20.2	17.6	mV／min^{-1}	$K_{E\phi}$	☆	Voltage Constant Per Phase
0.104	0.19	0.06	Ω	R_ϕ	☆	Phase Resistance
240	45.2	93	kW／s	Q_R	★	Rated Power Rate
13	13	20	ms	te	☆	Electrical Time Constant
0.24	0.38	0.31	ms	tm	☆	Mechanical Time Constant (Not including Encoder)
2.65	2.25	4.37	$\times 10^{-4}$kg·m^2(GD^2／4)	J_M		Roter Moment of Inertia Note)
9.4	5.4	8.7	kg	WE		Mass Note)
9.8	9.0	9.0	N·m	TB		Brake Static Friction Torque
DC90V ／ DC24V ± 10%			V	VB		Brake Rated Voltage
0.2 ／ 0.83	0.25 ／ 0.86		A	IB		Brake Rated Current
0.4	0.5	0.5	$\times 10^{-4}$kg·m^2(GD^2／4)	JB		Roter Moment of Inertia (Brake)
1.5	1.5	1.5	kg	W		Brake Mass
Operating Temperature: 0 to 40℃, Relative Humidity: 90% maximum, no condensation						Servo Motor Operating Temp, Rel.Humidity
4.2	2.5	4.0	kVA			Servo amplifier power supply capacity (rating)

Servo motor Model No./Flange Size/Rated Output

Q1AA10250D ／ 100mm ／ 2.5kW	Q1AA12100D ／ 120mm ／ 1kW	Q1AA12200D ／ 120mm ／ 2kW
		

Specification

Servo Amplifier + Q1 Servo Motor

High Power Rate (Low Inertia)

input voltage AC200V Power supply range AC170V to AC253V

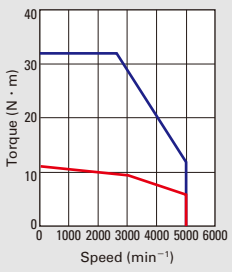
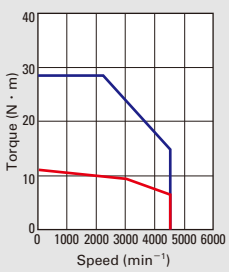
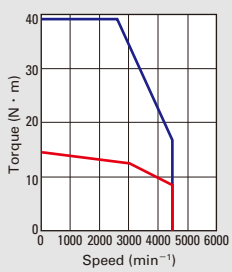
Servo Amplifier Model				RS2A10A□		RS2A15A□
Servo Motor Model and Flange Size				Q1AA12300D 《120》	Q1AA13300D 《130》	Q1AA13400D 《130》
	Status	Symbol	Unit			
Rated Output	★	P_R	kW	3		4
Rated Speed	★	N_R	min^{-1}	3000		
Maximum Speed	★	N_{max}	min^{-1}	5000	4500	
Rated Torque	★	T_R	N·m	9.6	9.5	12.7
Continuous Torque at Stall	★	T_S	N·m	11	10.8	14.7
Peak Torque at Stall	★	T_P	N·m	31	28.4	39.2
Rated Armature Current	★	I_R	Arms	16.2	16.7	23.4
Armature Current at Stall	★	I_S	Arms	17.3	17.6	26.4
Peak Armature Current Stall	★	I_P	Arms	55	55	83
Torque Constant	☆	K_T	N·m／Arms	0.73	0.693	0.612
Voltage Constant Per Phase	☆	$K_{E\phi}$	mV／min^{-1}	25.4	24.2	21.4
Phase Resistance	☆	R_ϕ	Ω	0.082	0.087	0.048
Rated Power Rate	★	Q_R	kW／s	143	184	251
Electrical Time Constant	☆	te	ms	13.9	17.9	19.2
Mechanical Time Constant (Not including Encoder)	☆	tm	ms	0.3	0.27	0.25
Roter Moment of Inertia Note)		J_M	$\times 10^{-4}$kg·m^2(GD^2／4)	6.4	4.92	6.43
Mass Note)		WE	kg	11.4		14.4
Brake Static Friction Torque		TB	N·m	11.8		19.6
Brake Rated Voltage		VB	V	DC90V／DC24V ± 10%		
Brake Rated Current		IB	A	0.28／1.0		0.25／0.95
Roter Moment of Inertia (Brake)		JB	$\times 10^{-4}$kg·m^2(GD^2／4)	0.5		0.58
Brake Mass		W	kg	1.7		2.2
Servo Motor Operating Temp, Rel.Humidity				Operating Temperature: 0 to 40℃, Relative Humidity: 90% maximum, no condensation		
Servo amplifier power supply capacity (rating)			kVA	5.0	5.0	6.7

Note) including Wire-saving incremental encoder

★ :Indicates a typical value after warm-up and thermal stabilization, together with a standard amplifier.

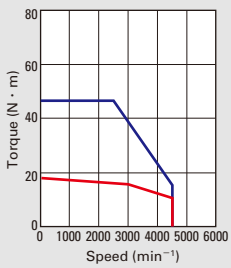
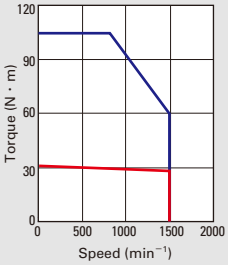
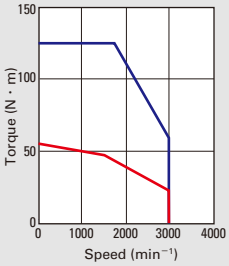
☆ :Indicates a typical value when the winding temperature is 20℃ .

Speed-Torque Characteristics

Servo motor Model No./Flange Size/Rated Output		
Q1AA12300D／120mm／3kW	Q1AA13300D／130mm／3kW	Q1AA13400D／130mm／4kW
		

RS2A15A□		RS2A30A□	Servo Amplifier Model			
Q1AA13500D 《130》	Q1AA18450M 《180》	Q1AA18750H 《180》	Servo Motor Model and Flange Size			
			Unit	Symbol	Status	
5	4.5	7.5	kW	P_R	★	Rated Output
3000	1500		min^{-1}	N_R	★	Rated Speed
4500	1500	3000	min^{-1}	N_{max}	★	Maximum Speed
15.7	28.5	48	N·m	T_R	★	Rated Torque
18.1	31.6	55	N·m	T_S	★	Continuous Torque at Stall
47.6	105	125	N·m	T_P	★	Peak Torque at Stall
25.8	20	55	Arms	I_R	★	Rated Armature Current
27.5	22.2	60	Arms	I_S	★	Armature Current at Stall
83	83	155	Arms	I_P	★	Peak Armature Current Stall
0.724	1.71	0.91	N·m／Arms	K_T	☆	Torque Constant
25.3	59.6	31.7	mV／min^{-1}	$K_{E\phi}$	☆	Voltage Constant Per Phase
0.0461	0.129	0.021	Ω	R_ϕ	☆	Phase Resistance
291	295	443	kW／s	Q_R	★	Rated Power Rate
20.8	25	23	ms	te	☆	Electrical Time Constant
0.22	0.36	0.40	ms	tm	☆	Mechanical Time Constant (Not including Encoder)
8.47	27.5	52	$\times 10^{-4}$kg·m^2(GD^2／4)	J_M		Roter Moment of Inertia Note)
16	21.7	47	kg	WE		Mass Note)
19.6	32	54.9	N·m	TB		Brake Static Friction Torque
DC90V／DC24V ± 10%			V	VB		Brake Rated Voltage
0.25／0.95	0.37／1.4		A	IB		Brake Rated Current
0.58	5.5	5.5	$\times 10^{-4}$kg·m^2(GD^2／4)	JB		Roter Moment of Inertia (Brake)
2.2	5	6	kg	W		Brake Mass
Operating Temperature: 0 to 40℃, Relative Humidity: 90% maximum, no condensation						Servo Motor Operating Temp, Rel.Humidity
8.3	7.4	12.6	kVA			Servo amplifier power supply capacity (rating)

Servo motor Model No./Flange Size/Rated Output

Q1AA13500D／130mm／5kW	Q1AA18450M／180mm／4.5kW	Q1AA18750H／180mm／7.5kW
		

Specification

Servo Amplifier + **Q2 Servo Motor** High Efficiency and Low Ripple (Midium Inertia)

input voltage AC200V Power supply range AC170V to AC253V

Servo Amplifier Model				RS2A05A□		
Servo Motor Model and Flange Size				Q2AA08075D 《86》	Q2AA08100D 《86》	Q2AA10100H 《100》
	Status	Symbol	Unit			
Rated Output	★	P_R	kW	0.75	1	1
Rated Speed	★	N_R	min^{-1}	3000		2000
Maximum Speed	★	N_{max}	min^{-1}	5000		3500
Rated Torque	★	T_R	N·m	2.387	3.18	5
Continuous Torque at Stall	★	T_S	N·m	2.941	3.92	6
Peak Torque at Stall	★	T_P	N·m	9	12.5	16.6
Rated Armature Current	★	I_R	Arms	5.9	6.0	6.8
Armature Current at Stall	★	I_S	Arms	7	6.9	8.1
Peak Armature Current Stall	★	I_P	Arms	23.7	25	24.5
Torque Constant	☆	K_T	N·m／Arms	0.441	0.59	0.814
Voltage Constant Per Phase	☆	$K_{E\phi}$	mV／min^{-1}	15.4	20.5	28.4
Phase Resistance	☆	R_ϕ	Ω	0.358	0.410	0.477
Rated Power Rate	★	Q_R	kW／s	27.5	37	46.0
Electrical Time Constant	☆	te	ms	3.6	4.1	4.8
Mechanical Time Constant (Not including Encoder)	☆	tm	ms	1.1	0.96	1.2
Roter Moment of Inertia Note)		J_M	$\times 10^{-4}$kg·m^2(GD^2／4)	2.07	2.7	5.44
Mass Note)		WE	kg	3.9	5.1	5.4
Brake Static Friction Torque		TB	N·m	2.94	2.94	9.8
Brake Rated Voltage		VB	V	DC90V／DC24V ± 10%		
Brake Rated Current		IB	A	0.08/0.33	0.08／0.33	0.20／0.75
Roter Moment of Inertia (Brake)		JB	$\times 10^{-4}$kg·m^2(GD^2／4)	0.343	0.343	0.4
Brake Mass		W	kg	0.8	0.8	1.5
Servo Motor Operating Temp, Rel.Humidity				Operating Temperature: 0 to 40℃, Relative Humidity: 90% maximum, no condensation		
Servo amplifier power supply capacity (rating)			kVA	2	2.5	2.5

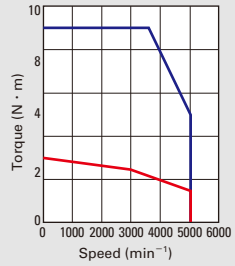
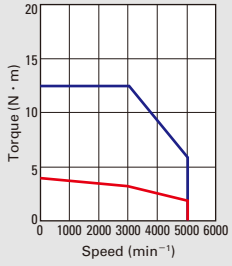
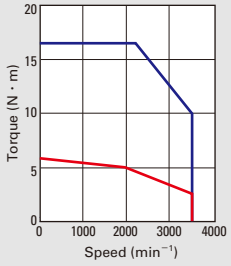
Note) including Wire-saving incremental encoder

★ :Indicates a typical value after warm-up and thermal stabilization, together with a standard amplifier.

☆ :Indicates a typical value when the winding temperature is 20℃ .

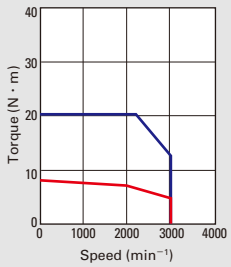
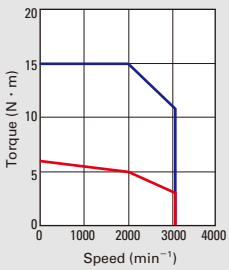
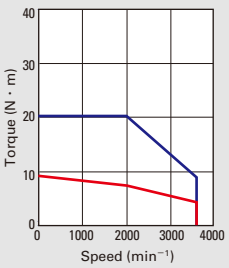
Speed-Torque Characteristics

Servo motor Model No./Flange Size/Rated Output

Q2AA08075D／86mm／0.75kW	Q2AA08100D／86mm／1kW	Q2AA10100H／100mm／1kW
		

RS2A05A□			Servo Amplifier Model			
Q2AA10150H 《100》	Q2AA13100H 《130》	Q2AA13150H 《130》	Servo Motor Model and Flange Size			
			Unit	Symbol	Status	
1.5	1.0	1.5	kW	P_R	★	Rated Output
2000			min^{-1}	N_R	★	Rated Speed
3000	3000	3500	min^{-1}	N_{max}	★	Maximum Speed
7.2	5	7.5	N·m	T_R	★	Rated Torque
8	6	9	N·m	T_S	★	Continuous Torque at Stall
20.5	15	20.3	N·m	T_P	★	Peak Torque at Stall
8.6	7	8.7	Arms	I_R	★	Rated Armature Current
9.4	8.3	10.2	Arms	I_S	★	Armature Current at Stall
25.5	23.7	26.5	Arms	I_P	★	Peak Armature Current Stall
0.94	0.803	0.981	N·m／Arms	K_T	☆	Torque Constant
32.7	28.0	34.2	mV／min^{-1}	$K_{E\phi}$	☆	Voltage Constant Per Phase
0.34	0.276	0.266	Ω	R_ϕ	☆	Phase Resistance
65	46	71	kW／s	Q_R	★	Rated Power Rate
6	12	12	ms	te	☆	Electrical Time Constant
0.93	0.69	0.66	ms	tm	☆	Mechanical Time Constant (Not including Encoder)
8	5.4	7.94	$\times 10^{-4}$kg·m^2(GD^2／4)	J_M		Roter Moment of Inertia Note)
6.5	6.5	7.8	kg	WE		Mass Note)
9.8	9	9	N·m	TB		Brake Static Friction Torque
DC90V ／ DC24V ± 10%			V	VB		Brake Rated Voltage
0.20 ／ 0.75	0.25 ／ 0.86		A	IB		Brake Rated Current
0.4	0.5	0.5	$\times 10^{-4}$kg·m^2(GD^2／4)	JB		Roter Moment of Inertia (Brake)
1.5			kg	W		Brake Mass
Operating Temperature: 0 to 40℃, Relative Humidity: 90% maximum, no condensation						Servo Motor Operating Temp, Rel.Humidity
3.0	2.5	3.0	kVA			Servo amplifier power supply capacity (rating)

Servo motor Model No./Flange Size/Rated Output

Q2AA10150H ／ 100mm ／ 1.5kW	Q2AA13100H ／ 130mm ／ 1.0kW	Q2AA13150H ／ 130mm ／ 1.5kW
		

Specification

Servo Amplifier + **Q2 Servo Motor** High Efficiency and Low Ripple (Midium Inertia)

input voltage AC200V Power supply range AC170V to AC253V

Servo Amplifier Model				RS2A10A□		
Servo Motor Model and Flange Size				Q2AA13200H 《130》	Q2AA18200H 《180》	Q2AA18350H 《180》
	Status	Symbol	Unit			
Rated Output	★	P_R	kW	2	2	3.5
Rated Speed	★	N_R	min^{-1}	2000		
Maximum Speed	★	N_{max}	min^{-1}	3500		
Rated Torque	★	T_R	N·m	9.55	9.5	16.7
Continuous Torque at Stall	★	T_S	N·m	12	12	21.1
Peak Torque at Stall	★	T_P	N·m	30.5	31.0	55
Rated Armature Current	★	I_R	Arms	13.1	15	22.6
Armature Current at Stall	★	I_S	Arms	16.3	18	28
Peak Armature Current Stall	★	I_P	Arms	48	55	83
Torque Constant	☆	K_T	N·m／Arms	0.822	0.75	0.840
Voltage Constant Per Phase	☆	$K_{E\phi}$	mV／min^{-1}	29.0	25.9	29.3
Phase Resistance	☆	R_ϕ	Ω	0.119	0.075	0.048
Rated Power Rate	★	Q_R	kW／s	78	45.7	73
Electrical Time Constant	☆	te	ms	14	14.7	15
Mechanical Time Constant (Not including Encoder)	☆	tm	ms	0.63	0.82	0.77
Roter Moment of Inertia Note)		J_M	$\times 10^{-4}$kg·m^2(GD^2／4)	12	20	38
Mass Note)		WE	kg	9.8	13.6	17.7
Brake Static Friction Torque		TB	N·m	12	32	32
Brake Rated Voltage		VB	V	DC90V／DC24V ± 10%		
Brake Rated Current		IB	A	0.28／1.0	0.37／1.4	
Roter Moment of Inertia (Brake)		JB	$\times 10^{-4}$kg·m^2(GD^2／4)	0.5	5.5	
Brake Mass		W	kg	1.7	5	5
Servo Motor Operating Temp, Rel.Humidity				Operating Temperature: 0 to 40℃, Relative Humidity: 90% maximum, no condensation		
Servo amplifier power supply capacity (rating)			kVA	5.0	5.0	6.9

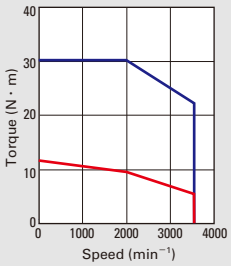
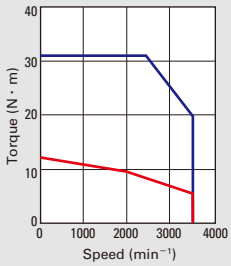
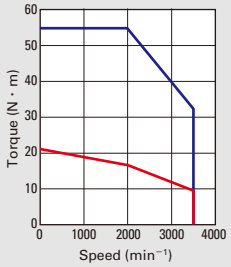
Note) including Wire-saving incremental encoder

★ :Indicates a typical value after warm-up and thermal stabilization, together with a standard amplifier.

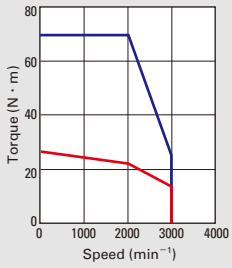
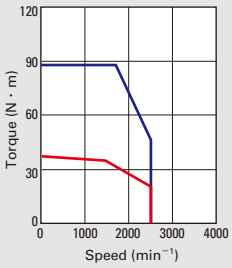
☆ :Indicates a typical value when the winding temperature is 20℃ .

Speed-Torque Characteristics

Servo motor Model No./Flange Size/Rated Output

Q2AA13200H／130mm／2kW	Q2AA18200H／180mm／2kW	Q2AA18350H／180mm／3.5kW
		

RS2A10A□		Servo Amplifier Model			
Q2AA18450H 《180》	Q2AA18550R 《180》	Servo Motor Model and Flange Size			
		Unit	Symbol	Status	
4.5	5.5	kW	P_R	★	Rated Output
2000	1500	min^{-1}	N_R	★	Rated Speed
3000	2500	min^{-1}	N_{max}	★	Maximum Speed
21.5	35	N·m	T_R	★	Rated Torque
27.1	37.3	N·m	T_S	★	Continuous Torque at Stall
70	88	N·m	T_P	★	Peak Torque at Stall
24	32.2	Arms	I_R	★	Rated Armature Current
29	33.7	Arms	I_S	★	Armature Current at Stall
81	83	Arms	I_P	★	Peak Armature Current Stall
1.04	1.24	N·m／Arms	K_T	☆	Torque Constant
36.4	43.2	mV／min^{-1}	$K_{E\phi}$	☆	Voltage Constant Per Phase
0.044	0.039	Ω	R_ϕ	☆	Phase Resistance
84.0	180	kW／s	Q_R	★	Rated Power Rate
18	21	ms	te	☆	Electrical Time Constant
0.67	0.53	ms	tm	☆	Mechanical Time Constant (Not including Encoder)
55	69	$\times 10^{-4}kg \cdot m^2(GD^2/4)$	J_M		Roter Moment of Inertia Note)
20	30	kg	WE		Mass Note)
32	54.9	N·m	TB		Brake Static Friction Torque
DC90V／DC24V ± 10%		V	VB		Brake Rated Voltage
0.37／1.4		A	IB		Brake Rated Current
5.5		$\times 10^{-4}kg \cdot m^2(GD^2/4)$	JB		Roter Moment of Inertia (Brake)
5	6	kg	W		Brake Mass
Operating Temperature: 0 to 40℃ , Relative Humidity: 90% maximum, no condensation					Servo Motor Operating Temp, Rel.Humidity
7.4	8.4	kVA			Servo amplifier power supply capacity (rating)

Servo motor Model No./Flange Size/Rated Output	
Q2AA18450H／180mm／4.5kW	Q2AA18550R／180mm／5.5kW
	

Specification

Servo Amplifier + **Q2 Servo Motor** High Efficiency and Low Ripple (Midium Inertia)

input voltage AC200V Power supply range AC170V to AC253V

Servo Amplifier Model				RS2A15A□		RS2A30A□
Servo Motor Model and Flange Size				Q2AA22550B 《220》	Q2AA22700S 《220》	Q2AA18550H 《180》
	Status	Symbol	Unit			
Rated Output	★	P_R	kW	5.5	7	5.5
Rated Speed	★	N_R	min^{-1}	1500	1000	1500
Maximum Speed	★	N_{max}	min^{-1}	2000	1000	3000
Rated Torque	★	T_R	N·m	35	67	35
Continuous Torque at Stall	★	T_S	N·m	42	70	37.3
Peak Torque at Stall	★	T_P	N·m	90	150	95
Rated Armature Current	★	I_R	Arms	30	34	47
Armature Current at Stall	★	I_S	Arms	35.1	34	47
Peak Armature Current Stall	★	I_P	Arms	79.7	83	155
Torque Constant	☆	K_T	N·m／Arms	1.32	2.13	0.830
Voltage Constant Per Phase	☆	$K_{E\phi}$	mV／min^{-1}	46	74.5	29.0
Phase Resistance	☆	R_ϕ	Ω	0.0464	0.057	0.018
Rated Power Rate	★	Q_R	kW／s	128.5	243	170
Electrical Time Constant	☆	te	ms	24	30	17
Mechanical Time Constant (Not including Encoder)	☆	tm	ms	0.76	0.7	0.57
Roter Moment of Inertia Note)		J_M	$\times 10^{-4}$kg·m^2(GD^2／4)	95.3	185	73
Mass Note)		WE	kg	34.8	46	31
Brake Static Friction Torque		TB	N·m	90	90	54.9
Brake Rated Voltage		VB	V	DC90V／DC24V ± 10%		
Brake Rated Current		IB	A	0.36／1.3	0.44／1.7	0.37／1.4
Roter Moment of Inertia (Brake)		JB	$\times 10^{-4}$kg·m^2(GD^2／4)	9.9	24	5.5
Brake Mass		W	kg	5.9	10.4	6
Servo Motor Operating Temp, Rel.Humidity				Operating Temperature: 0 to 40℃, Relative Humidity: 90% maximum, no condensation		
Servo amplifier power supply capacity (rating)			kVA	10.1	12.2	10.1

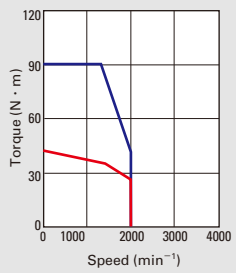
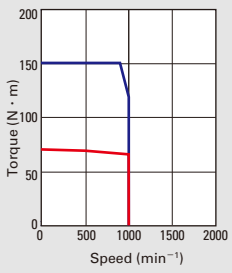
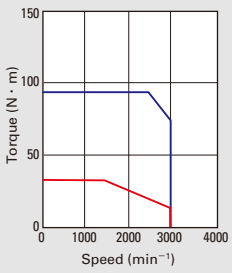
Note) including Wire-saving incremental encoder

★ :Indicates a typical value after warm-up and thermal stabilization, together with a standard amplifier.

☆ :Indicates a typical value when the winding temperature is 20℃ .

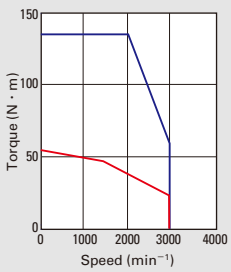
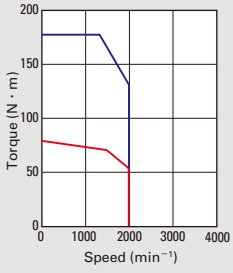
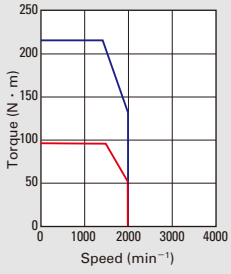
Speed-Torque Characteristics

Servo motor Model No./Flange Size/Rated Output

Q2AA22550B／220mm／5.5kW	Q2AA22700S／220mm／7kW	Q2AA18550H／180mm／5.5kW
		

RS2A30A□			Servo Amplifier Model			
Q2AA18750L 《180》	Q2AA2211KV 《220》	Q2AA2215KV 《220》	Servo Motor Model and Flange Size			
			Unit	Symbol	Status	
7.5	11	15	kW	P_R	★	Rated Output
1500			min^{-1}	N_R	★	Rated Speed
3000	2000		min^{-1}	N_{max}	★	Maximum Speed
48	70	95.5	N·m	T_R	★	Rated Torque
54.9	80	95.5	N·m	T_S	★	Continuous Torque at Stall
139	176	215	N·m	T_P	★	Peak Torque at Stall
52	60	66	Arms	I_R	★	Rated Armature Current
57	66	66	Arms	I_S	★	Armature Current at Stall
160	155	157	Arms	I_P	★	Peak Armature Current Stall
1.03	1.29	1.54	N·m／Arms	K_T	☆	Torque Constant
36.0	45.1	53.6	mV／min^{-1}	$K_{E\phi}$	☆	Voltage Constant Per Phase
0.017	0.015	0.016	Ω	R_ϕ	☆	Phase Resistance
240	260	360	kW／s	Q_R	★	Rated Power Rate
20	33	33	ms	te	☆	Electrical Time Constant
0.46	0.50	0.52	ms	tm	☆	Mechanical Time Constant (Not including Encoder)
95	186	255	$\times 10^{-4}kg \cdot m^2(GD^2/4)$	J_M		Roter Moment of Inertia Note)
40	58	70	kg	WE		Mass Note)
54.9	90	90	N·m	TB		Brake Static Friction Torque
DC90V ／ DC24V ± 10%			V	VB		Brake Rated Voltage
0.37 ／ 1.4	0.44 ／ 1.7		A	IB		Brake Rated Current
5.5	24		$\times 10^{-4}kg \cdot m^2(GD^2/4)$	JB		Roter Moment of Inertia (Brake)
6	11		kg	W		Brake Mass
Operating Temperature: 0 to 40℃, Relative Humidity: 90% maximum, no condensation						Servo Motor Operating Temp, Rel.Humidity
12.6	15.7	21.4	kVA			Servo amplifier power supply capacity (rating)

Servo motor Model No./Flange Size/Rated Output

Q2AA18750L ／ 180mm ／ 7.5kW	Q2AA2211KV ／ 220mm ／ 11kW	Q2AA2215KV ／ 220mm ／ 15kW
		

Specification

Servo Amplifier + **Q4 Servo Motor** High Power Rate (Low Inertia)

input voltage AC200V Power supply range AC170V to AC253V

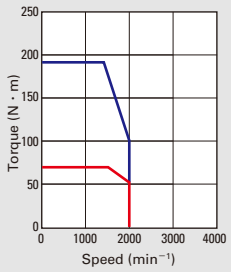
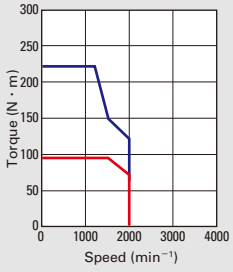
Servo Amplifier Model				RS2A30A□	
Servo Motor Model and Flange Size				Q4AA1811KB 《180》	Q4AA1815KB 《180》
	Status	Symbol	Unit		
Rated Output	★	P_R	kW	11	15
Rated Speed	★	N_R	min^{-1}	1500	
Maximum Speed	★	N_{max}	min^{-1}	2000	
Rated Torque	★	T_R	N·m	70	95.5
Continuous Torque at Stall	★	T_S	N·m	70	95.5
Peak Torque at Stall	★	T_P	N·m	190	220
Rated Armature Current	★	I_R	Arms	54	61
Armature Current at Stall	★	I_S	Arms	53	59
Peak Armature Current Stall	★	I_P	Arms	155	155
Torque Constant	☆	K_T	N·m／Arms	1.42	1.75
Voltage Constant Per Phase	☆	$K_{E\phi}$	mV／min^{-1}	49.7	61.1
Phase Resistance	☆	R_ϕ	Ω	0.025	0.032
Rated Power Rate	★	Q_R	kW／s	780	1100
Electrical Time Constant	☆	te	ms	31	32
Mechanical Time Constant (Not including Encoder)	☆	tm	ms	0.23	0.27
Roter Moment of Inertia Note)		J_M	$\times 10^{-4}$kg·m^2(GD^2／4)	63	85
Mass Note)		WE	kg	60	75
Brake Static Friction Torque		TB	N·m	—	
Brake Rated Voltage		VB	V	—	
Brake Rated Current		IB	A	—	
Roter Moment of Inertia (Brake)		JB	$\times 10^{-4}$kg·m^2(GD^2／4)	—	
Brake Mass		W	kg	—	
Servo Motor Operating Temp, Rel.Humidity				Operating Temperature: 0 to 40℃, Relative Humidity: 90% maximum, no condensation	
Cooling Fan		P_F	W	39/33 AC200V±10% 1-phase 50/60Hz	
Servo amplifier power supply capacity (rating)			kVA	15.7	21.4

Note) including Wire-saving incremental encoder

★ :Indicates a typical value after warm-up and thermal stabilization, together with a standard amplifier.

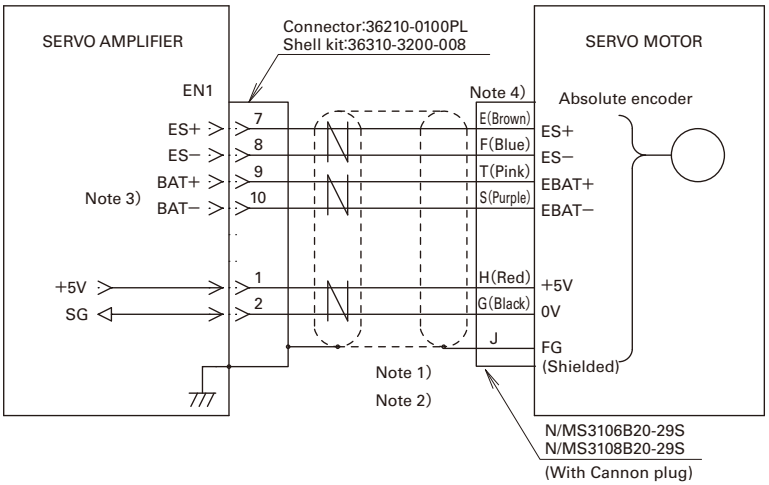
☆ :Indicates a typical value when the winding temperature is 20℃ .

Speed-Torque Characteristics

Servo motor Model No./Flange Size/Rated Output	
Q4AA1811KB ／ 180mm ／ 11kW	Q4AA1815KB ／ 180mm ／ 15kW
	

Serial Encoder

- Battery backup type absolute encoder [PA035C]
- Absolute encoder for incremental system [PA035S]
- Batteryless absolute encoder [RA035C]



Note 1) Use a twisted-pair shielded cable.
Note 2) The maximum cable lengths under the conductor size of the power supply cable (5V,SG).

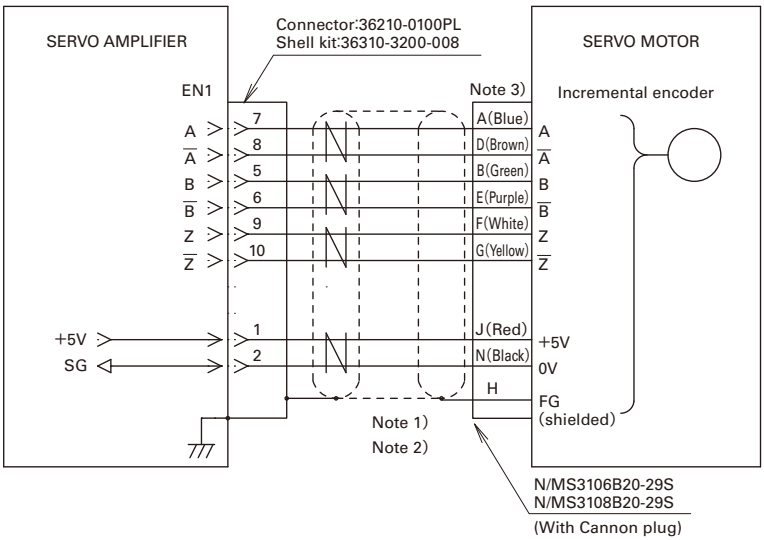
Conductor size		Conductor resistance	Length
AWG	SQ (mm²)	(Ω/km) ※20℃	(m)
26	0.15	150 or less	5
24	0.2	100 or less	10
22	0.3	60 or less	15
20	0.5	40 or less	25
18	0.75	25 or less	40

Conductor resistance is different by conductor specifications.

Note 3) When the Absolute encoder for incremental system or absolute encoder without battery is used, battery lines (EBAT+, EBAT-) are not required.
Note 4) Letters indicate cannon plug pins. Lead wire colors are indicated in parentheses.

Pulse Encoder

- Wire-saving incremental encoder



Note 1) Use a twisted-pair shielded cable.
Note 2) The maximum cable lengths under the conductor size of the power supply cable (5V,SG).

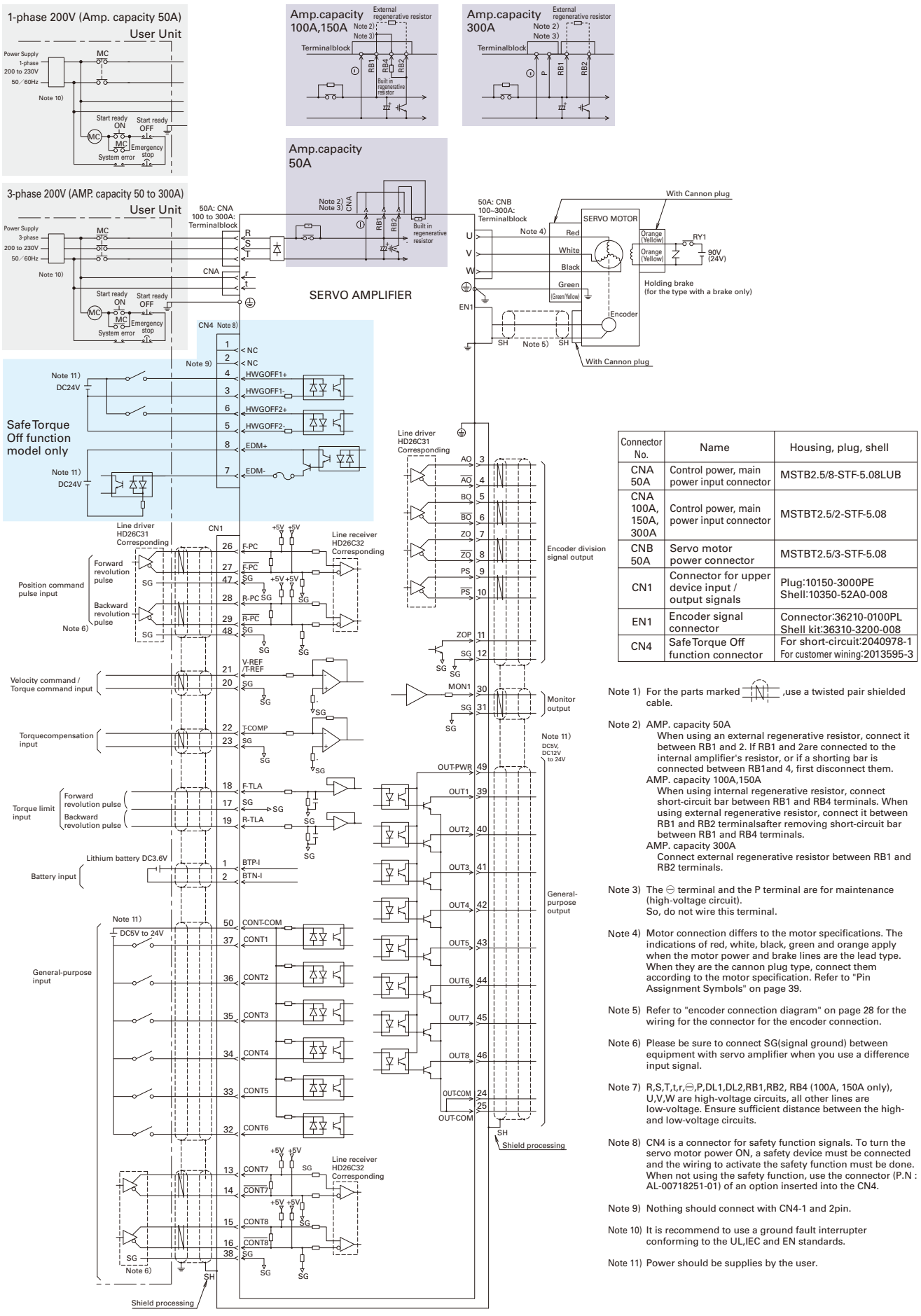
Conductor size		Conductor resistance	Length
AWG	SQ (mm²)	(Ω/km) ※20℃	(m)
26	0.15	150 or less	5
24	0.2	100 or less	10
22	0.3	60 or less	15
20	0.5	40 or less	25
18	0.75	25 or less	40

Conductor resistance is different by conductor specifications.

Note 3) Letters indicate cannon plug pins. Lead wire colors are indicated in parentheses.

Analog/Pulse input type

Main Power : AC 200V／Control Power : AC 200V



Connector No.	Name	Housing, plug, shell
CNA 50A	Control power, main power input connector	MSTB2.5/8-STF-5.08LUB
CNA 100A, 150A, 300A	Control power, main power input connector	MSTBT2.5/2-STF-5.08
CNB 50A	Servo motor power connector	MSTBT2.5/3-STF-5.08
CN1	Connector for upper device input / output signals	Plug:10150-3000PE Shell:10350-52A0-008
EN1	Encoder signal connector	Connector:36210-0100PL Shell kit:36310-3200-008
CN4	Safe Torque Off function connector	For short-circuit:2040978-1 For customer wining:2013595-3

Note 1) For the parts marked ,use a twisted pair shielded cable.

Note 2) AMP. capacity 50A
When using an external regenerative resistor, connect it between RB1 and 2. If RB1 and 2are connected to the internal amplifier's resistor, or if a shorting bar is connected between RB1and 4, first disconnect them.
AMP. capacity 100A,150A
When using internal regenerative resistor, connect short-circuit bar between RB1 and RB4 terminals. When using external regenerative resistor, connect it between RB1 and RB2 terminalsafter removing short-circuit bar between RB1 and RB4 terminals.
AMP. capacity 300A
Connect external regenerative resistor between RB1 and RB2 terminals.

Note 3) The ⊖ terminal and the P terminal are for maintenance (high-voltage circuit).
So, do not wire this terminal.

Note 4) Motor connection differs to the motor specifications. The indications of red, white, black, green and orange apply when the motor power and brake lines are the lead type. When they are the cannon plug type, connect them according to the motor specification. Refer to "Pin Assignment Symbols" on page 39.

Note 5) Refer to "encoder connection diagram" on page 28 for the wiring for the connector for the encoder connection.

Note 6) Please be sure to connect SG(signal ground) between equipment with servo amplifier when you use a difference input signal.

Note 7) R,S,T,t,r,⊖,P,DL1,DL2,RB1,RB2, RB4 (100A, 150A only), U,V,W are high-voltage circuits, all other lines are low-voltage. Ensure sufficient distance between the high- and low-voltage circuits.

Note 8) CN4 is a connector for safety function signals. To turn the servo motor power ON, a safety device must be connected and the wiring to activate the safety function must be done. When not using the safety function, use the connector (P.N : AL-00718251-01) of an option inserted into the CN4.

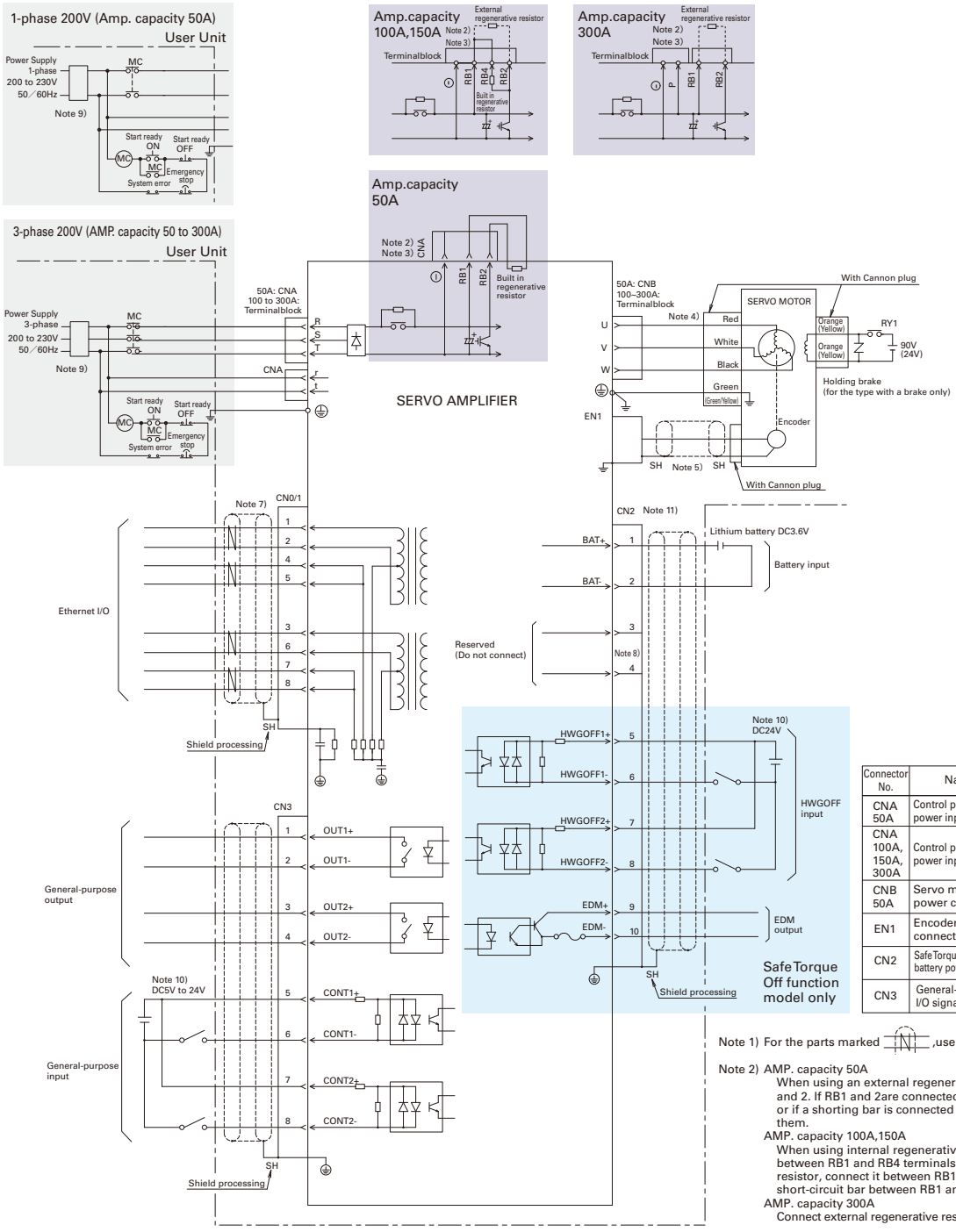
Note 9) Nothing should connect with CN4-1 and 2pin.

Note 10) It is recommend to use a ground fault interrupter conforming to the UL,IEC and EN standards.

Note 11) Power should be supplies by the user.

EtherCAT interface type

Main Power : AC 200V／Control Power : AC 200V



Connector No.	Name	Housing, plug, shell
CNA 50A	Control power, main power input connector	MSTB2.5/8-STF-5.08LUB
CNA 100A, 150A, 300A	Control power, main power input connector	MSTBT2.5/2-STF-5.08
CNB 50A	Servo motor power connector	MSTBT2.5/3-STF-5.08
EN1	Encoder signal connector	Connector:36210-0100PL Shell kit:36310-3200-008
CN2	Safe Torque Off function, battery power connector	MUF-PK10K-X
CN3	General-purpose I/O signal connector	2013595-3

Note 1) For the parts marked , use a twisted pair shielded cable.

Note 2) AMP. capacity 50A
When using an external regenerative resistor, connect it between RB1 and 2. If RB1 and 2are connected to the internal amplifier's resistor, or if a shorting bar is connected between RB1and 4, first disconnect them.
AMP. capacity 100A,150A
When using internal regenerative resistor, connect short-circuit bar between RB1 and RB4 terminals. When using external regenerative resistor, connect it between RB1 and RB2 terminalsafter removing short-circuit bar between RB1 and RB4 terminals.
AMP. capacity 300A
Connect external regenerative resistor between RB1 and RB2 terminals.

Note 3) The ⊖ terminal and the P terminal are for maintenance (high voltage circuit).
So, do not wire this terminal.

Note 4) Motor connection differs to the motor specifications. The indications of red, white, black, green and orange apply when the motor power and brake lines are the lead type. when they are the cannon plug type, connect them according to the motor specification. Refer to "Pin Assignment Symbols" on page 39.

Note 5) Refer to "encoder connection diagram" on page 28 for the wiring for the connector for the encoder connection.

Note 6) R,S,T,t,r,⊖,,P,DL1,DL2,RB1,RB2, RB4 (100A, 150A only), U,V,W are high-voltage circuits, all other lines are low-voltage. Ensure sufficient distance between the high- and low-voltage circuits.

Note 7) Use a TIA category 5e or better shielded twisted pair (STP) cable.

Note 8) Nothing should connect with CN2-3 and 4pin.

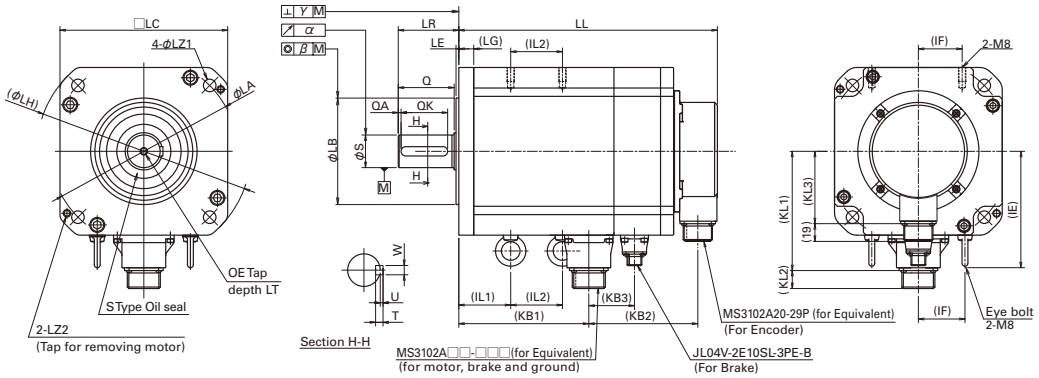
Note 9) It is recommend to use a ground fault interrupter conforming to the UL,IEC and EN standards. Do not wire the S phase for a single-phase power amplifier.

Note 10) Power should be supplies by the user.

Note 11) CN2 is a Safe Torque Off function connector. If it is not connected to the safety device to enable the Safe Torque Off function to work, the servo does not turn on (the motor is not energized).

100mm sq. to 220mm sq.

Q1 Servo Motor Series: High Power Rate (Low Inertia)
Q2 Servo Motor Series: High Efficiency / Low Ripple (Medium Inertia)



Q1 Servo Motor Series: High Power Rate (Low Inertia)

	Incremental					Connector Note 1											
	Without brake		With brake			Motor, Ground	Brake Note 1 (only when mounted)										
MODEL	LL	KB2	LL	KB2	KB3	MS3102A	JL04V-2E	LG	KL1	KL2	KL3	LA	LB	LE	LH	LC	LZ1	LZ2
Q1AA10100 △□◇	184	80	219	116	51	20-15P	10SL-3PE-B	10	78	19	63	115	0 95-0.035	3	130	100	9	-
Q1AA10150 △□◇	209		244															
Q1AA10200 △□◇	234		269															
Q1AA10250 △□◇	259		294															
Q1AA12100 △□◇	168	72	204	108	45	24-11P	10SL-3PE-B	12	93	21	67	135	0 110-0.035	3	162	120	9	-
Q1AA12200 △□◇	205		241															
Q1AA12300 △□◇	242		278															
Q1AA13300 △□◇	205	67	254	117	-	24-11P		12	98	21	80	145	0 110-0.035	4	165	130	9	M6
Q1AA13400 △□◇	232		281															
Q1AA13500 △□◇	269		318															
Q1AA18450 △□◇	288	67	338					16	123	21	80	200	0 114.3-0.035	3	230	180	13.5	M8
Q1AA18750 △□◇	384	72	434	122	54	32-17P	10SL-3PE-B	19	144	22								

MODEL	LR	S	Q	QA	QK	W	T	U	KB1	α	β	γ	QE	LT	IE	IF	IL1	IL2
Q1AA10100 △□◇	45	0 22-0.013	40	3	32	0 6-0.030	6	2.5	84	0.02	0.08	0.08	M6	20	-	-	-	-
Q1AA10150 △□◇									109									
Q1AA10200 △□◇									134									
Q1AA10250 △□◇									159									
Q1AA12100 △□◇	45	0 22-0.013	40	3	32	0 6-0.030	6	2.5	76	0.02	0.08	0.08	M6	20	-	-	-	-
Q1AA12200 △□◇									113									
Q1AA12300 △□◇	55	0 28-0.013	50	3	42	0 8-0.036	7	3	150				M8	25				
Q1AA13300 △□◇	55	0 28-0.013	50	3	42	0 8-0.036	7	3	117	0.02	0.08	0.08	M8	25	-	-	-	-
Q1AA13400 △□◇									144									
Q1AA13500 △□◇									181									
Q1AA18450 △□◇	65	0 35-0.016	60	3	50	0 10-0.036	8	3	200	0.02	0.08	0.08	M8	25	124	50	93	50
Q1AA18750 △□◇	79	0 42-0.016	75	3	67	0 12-0.043	8	3	291				M10	25	124	50	85	145

Note 1) Waterproof specification IP67 requires that the connector to be attached ; for IP67 compliance, use a waterproof connector for the mating plug.
Note 2) All brake connectors are JL04V-2E10SL-3PE-B for CE compliant DC24V brakes.
Please inquire for the dimensions with the absolute encoder.

Q2 Servo Motor Series: High Efficiency / Low Ripple (Medium Inertia)

	Incremental					Connector Note 1											
	Without brake		With brake			Motor, Ground	Brake Note 2 (only when mounted)										
MODEL	LL	KB2	LL	KB2	KB3	MS3102A	JL04V-2E	LG	KL1	KL2	KL3	LA	LB	LE	LH	LC	LZ1	LZ2
Q2AA10100 △□◇	196	77	231	113	51	20-15P	10SL-3PE-B	10	78	19	67	115	0 95-0.035	3	130	100	9	-
Q2AA10150 △□◇	226		261															
Q2AA13100 △□◇	152	67	188	103	-	24-11P		12	98	21	80	145	0 110-0.035	4	165	130	9	M6
Q2AA13150 △□◇	169		205															
Q2AA13200 △□◇	186		226	107	-													
Q2AA18200 △□◇	171		221	117	-	24-11P		16	123	21	80	200	0 114.3-0.035	3	230	180	13.5	M8
Q2AA18350 △□◇	203		253															
Q2AA18450 △□◇	218		268															
Q2AA18550 △□◇	282	72	332	122	54	32-17P	10SL-3PE-B	19	144	22	80	200	0 114.3-0.035	3	230	180	13.5	M8
Q2AA18750 △□◇	332		382															
Q2AA22550 △□◇	252	83	309	141	82	24-11P		19	141	21	80	235	0 200-0.046	4	270	220	13.5	M10
Q2AA22700 △□◇	310		368															
Q2AA2211K △□◇	335	73	393	61	131	32-17P		19	162	22	80	235	0 200-0.046	4	270	220	13.5	M10
Q2AA2215K △□◇	394		452															

MODEL	LR	S	Q	QA	QK	W	T	U	KB1	α	β	γ	QE	LT	IE	IF	IL1	IL2
Q2AA10100 △□◇	45	0 22-0.013	40	3	32	0 6-0.030	6	2.5	98	0.02	0.08	0.08	M6	20	-	-	-	-
Q2AA10150 △□◇									128									
Q2AA13100 △□◇	55	0 22-0.013	50	3	42	0 6-0.030	6	2.5	64	0.02	0.08	0.08	M6	20	-	-	-	-
Q2AA13150 △□◇									81									
Q2AA13200 △□◇		0 28-0.013				0 8-0.036	7	3	98				M8	25				
Q2AA18200 △□◇	65	0 35-0.016	60	3	50	0 10-0.036	8	3	83	0.02	0.08	0.08	M8	25	-	-	-	-
Q2AA18350 △□◇									115						124	50	61	20
Q2AA18450 △□◇									130									35
Q2AA18550 △□◇	79	0 42-0.016	75	3	67	0 12-0.043	8	3	189	0.02	0.08	0.08	M10	25	124	50	85	50
Q2AA18750 △□◇									239									100
Q2AA22550 △□◇	79	0 55-0.019	75	3	67	0 16-0.043	10	4	149	0.03	0.08	0.10	M10	25	142	60	55	50
Q2AA22700 △□◇									207									110
Q2AA2211K △□◇	79	0 55-0.019	75	3	67	0 16-0.043	10	4	241	0.03	0.08	0.10	M10	25	142	60	69	120
Q2AA2215K △□◇									300									180

Note 1) Waterproof specification IP67 requires that the connector to be attached ; for IP67 compliance, use a waterproof connector for the mating plug.
Note 2) All brake connectors are JL04V-2E10SL-3PE-B for CE compliant DC24V brakes.
Please inquire for the dimensions with the absolute encoder.

Electric wire diameters

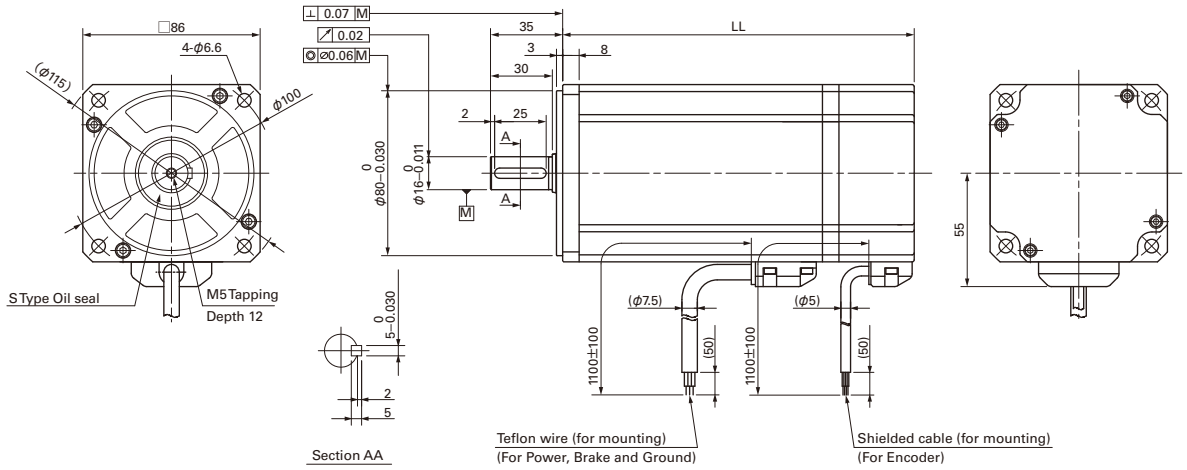
Voltage	MODEL	Maximum continuous armature current	Power receptacle		Maximum wire size of connector		Receptacle permissable current	Combined Amplifier		Recommended motor power wire size (U, V, W) *Note 1	
			Shell Size	Contact Size	MS Type	JL04V Type		Type	Wire size of main power supply (R, S, T)		
		Arms			mm²	mm²	Arms			mm²	AWG No.
200V Type	Q1AA10100D	7.8	20-15P	#12	3.5	3.5	20	RS1A05	AWG12	3.5	#12
	Q1AA10150D	8.2									
	Q1AA10200D	18						RS1A10	AWG10	3.5	#12
	Q1AA10250D	17.2									
	Q1AA12100D	7.5	24-11P	#8	8	5.5	40	RS1A05	AWG12	3.5	#12
	Q1AA12200D	16.2						RS1A10	AWG10	5.5	#10
	Q1AA12300D	17.3									
	Q1AA13300D	17.6	24-11P	#8	8	5.5	40	RS1A10	AWG10	5.5	#10
	Q1AA13400D	26.4						RS1A15	AWG8	5.5	#10
	Q1AA13500D	27.5									
	Q1AA18450M	24.8									
	Q1AA18750H	60	32-17P	#4	22	22	70	RS1A30	AWG6	14	#6
	Q2AA10100H	8.1	20-15P	#12	3.5	3.5	20	RS1A05	AWG12	3.5	#12
	Q2AA10150H	9.4									
	Q2AA13100H	8.3	24-11P	#8	8	5.5	40	RS1A05	AWG12	3.5	#12
	Q2AA13150H	10.2									
	Q2AA13200H	16.3						RS1A10	AWG10	5.5	#10
	Q2AA18200H	18									
	Q2AA18350H	28						RS1A15	AWG8	5.5	#10
	Q2AA18450H	29									
	Q2AA18550R	33.7	32-17P	#4	22	22	70	RS1A15	AWG8	8	#8
	Q2AA18550H	47						RS1A30	AWG6	14	#6
	Q2AA18750L	57									
	Q2AA22550B	35.1	24-11P	#8	8	5.5	40	RS1A15	AWG8	5.5	#10
	Q2AA22700S	34									
	Q2AA2211KV	66	32-17P	#4	22	22	70	RS1A30	AWG6	14	#6
	Q2AA2215KV	66									
	Q4AA1811KB	53	32-17P	#4	22	22	70	RS1A30	AWG6	14	#6
	Q4AA1815KB	59									

*Note1 : Use of heat-resistant vinyl wire (HIV) is recommended.

Servo Motor Dimensions (Unit : mm)

86mm sq.

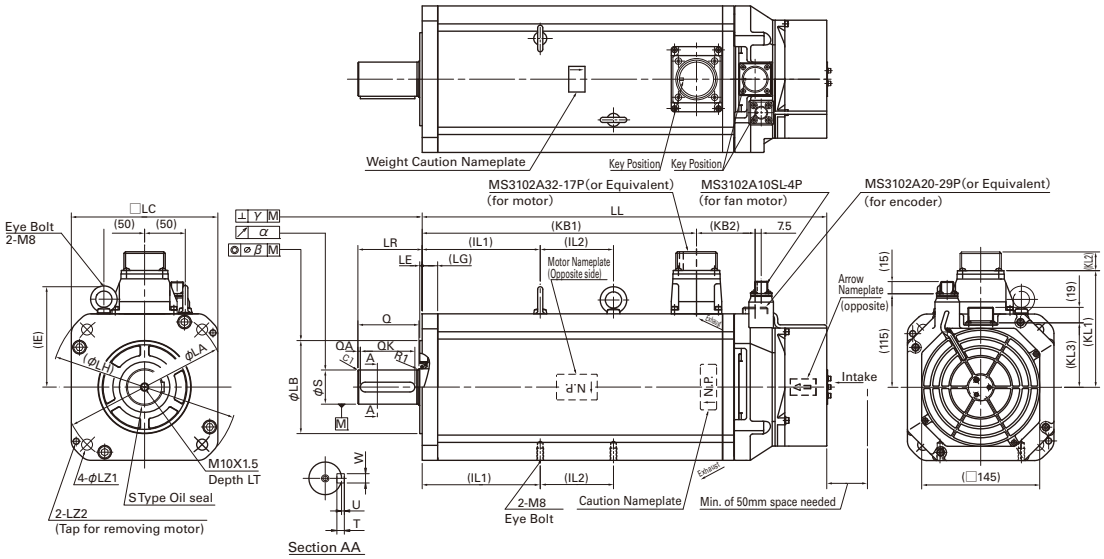
Q2 Servo Motor Series: High Efficiency / Low Ripple (Medium Inertia)



	Incremental	
	Without brake	With brake
MODEL	LL	LL
Q2AA08075△□◇	146	182
Q2AA08100△□◇	163	199

180mm sq.

Q4 Servo Motor Series: High Power Rate (Low Inertia / High Torque)



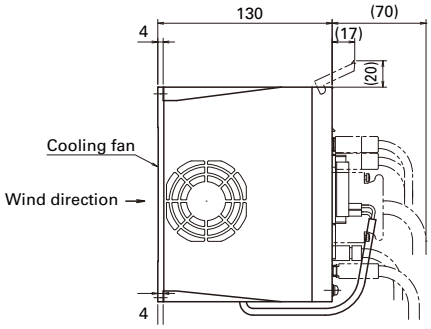
	Incremental	Connector Note 1)																												
	Without brake	Motor, Ground																												
MODEL	LL	KB2	MS3102A	LG	KL1	KL2	KL3	LA	LB	LE	LH	LC	LZ1	LZ2	LR	S	Q	QA	QK	W	T	U	KB1	α	β	γ	QE	LT	IE	IF	IL1	IL2
Q4AA1811K△□◇	497	72	32-17P	19	144	22	79	200	0 φ114.3-0.035	3	230	180	13.5	M8	79	0 42-0.016	75	3	67	0 12-0.043	8	3	337	0.03	0.08	0.10	M10	25	124	50	145	90
Q4AA1815K△□◇	587															0 55-0.019				0 16-0.043	10	4	427								155	170

Please inquire for the dimensions with the absolute encoder.

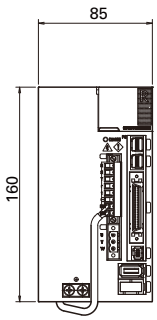
Servo Amplifier Dimensions (Unit : mm)

50A

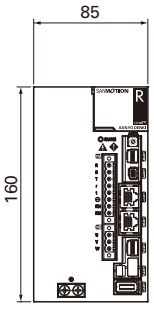
Mass：1.65kg



Analog / Pulse input type



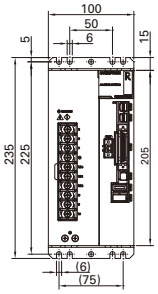
EtherCAT interface type



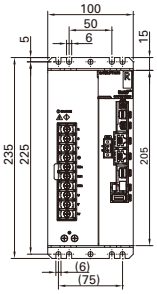
100A

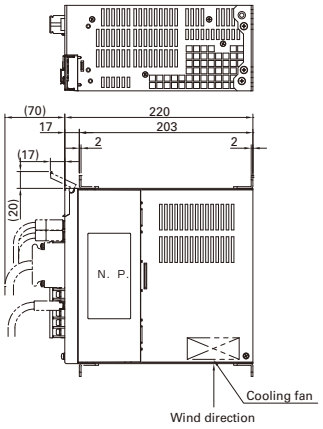
Mass：5.0kg

Analog / Pulse input type



EtherCAT interface type

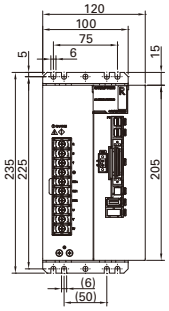




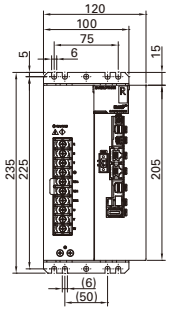
150A

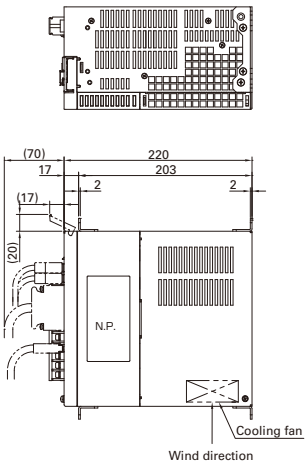
Mass：5.3kg

Analog / Pulse input type



EtherCAT interface type

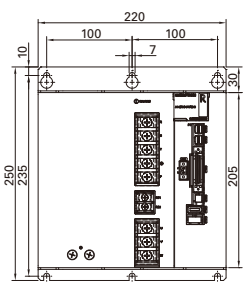




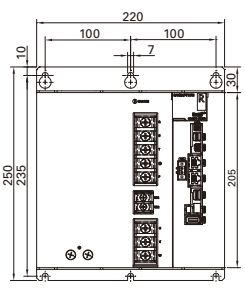
300A

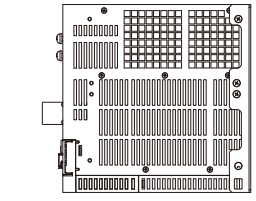
Mass：9.6kg

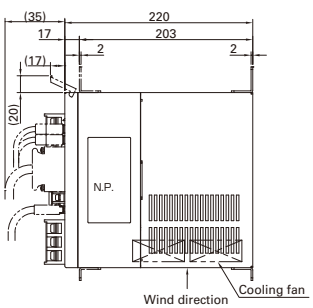
Analog / Pulse input type



EtherCAT interface type

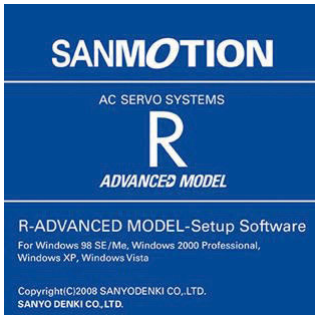






Setup Software

This software allows you to set servo system parameters from a PC. It also allows you easily to start up or test run the servo system. The software can be downloaded from Production Information on our website. URL : http://www.sanyodenki.co.jp



Start-up Screen

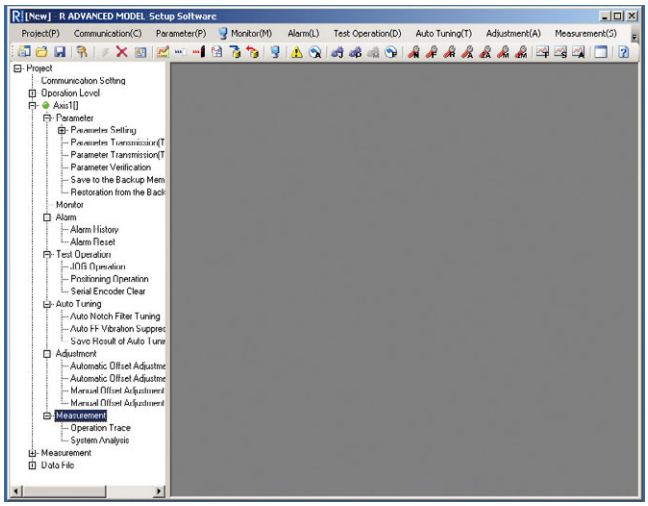
Setup Software Title
R ADVANCED MODEL-Setup Software

Main Functions
Servo amplifier parameter setting
Servo amplifier status display
Alarm display and reset
Test run execution
Auto-tuning of vibration control frequency, etc.
Analog command offset adjustment

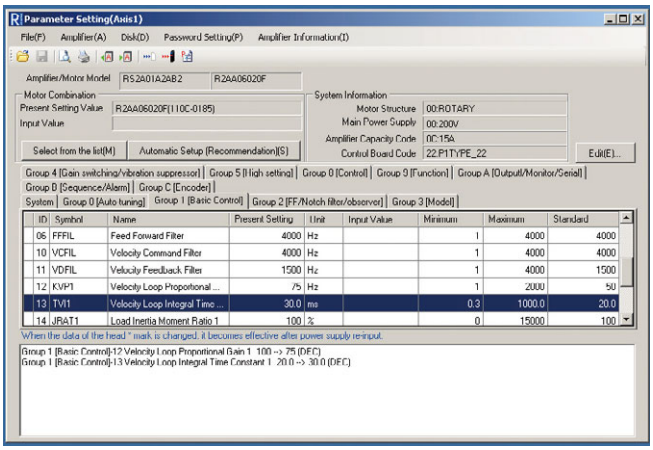
※Use the optional PC connection cable (model number: AL-00689703-01) to connect the servo amplifier and the RS-232C port on the PC.

Supported OS
Windows　98/SE/Me/2000/XP/Vista

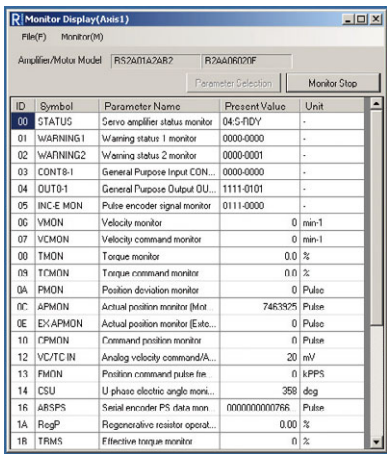
※See our website for details of supported versions.



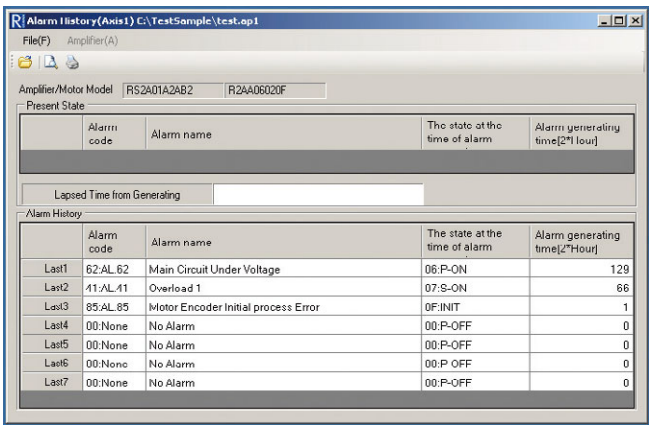
Main Screen



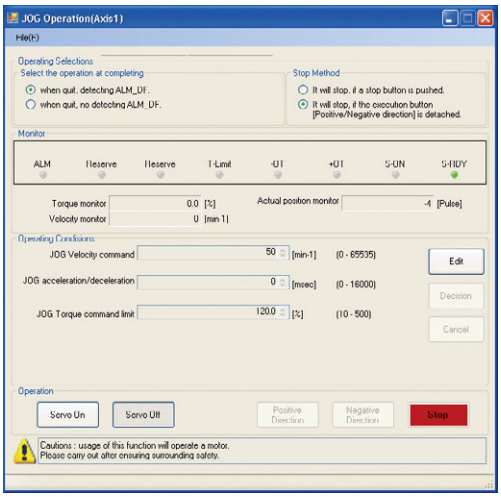
Configuration parameters
Enables parameter loading, saving, etc., via PC connection



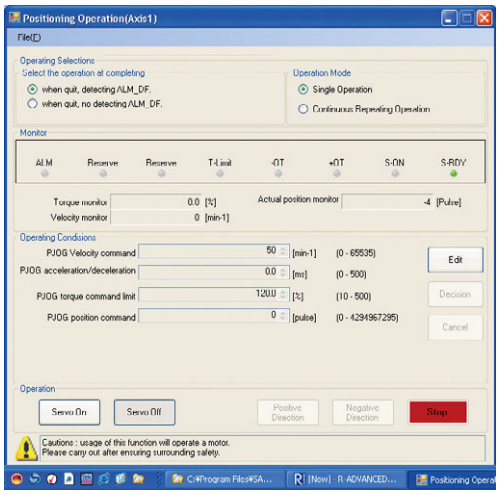
Monitor Display
Observe Operation and Input/Output signal status



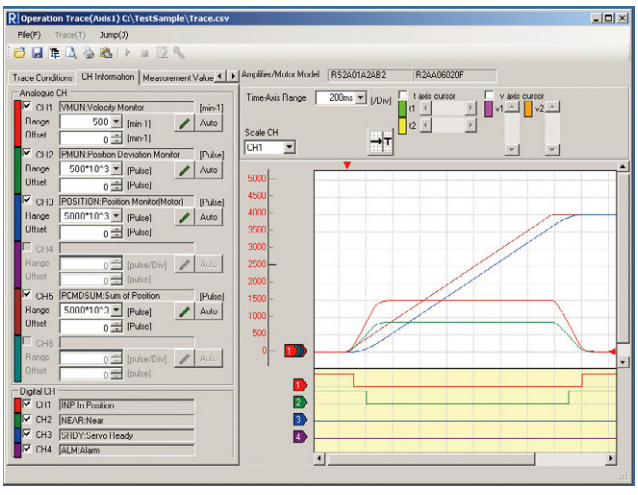
Alarm Record Display
Current and past alarm occurrence can be checked.



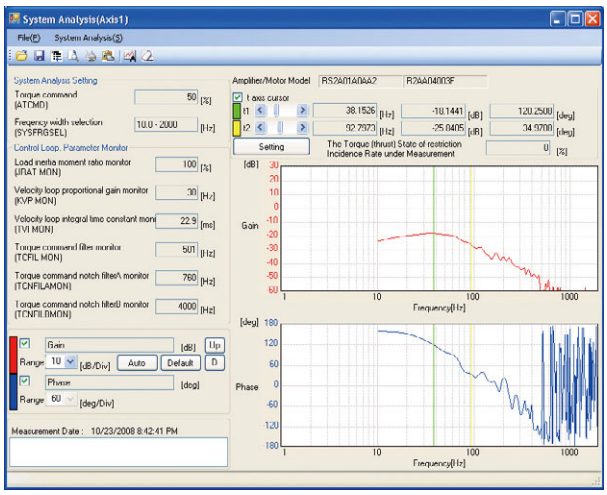
JOG Operation
Simplifies motor operation and the issuing of speed commands from a PC



Positioning Control Operation
The position can be moved by setting the feed velocity and the pulse number of the servo motor.



Operation Trace
Graphically displays servo motor speed, current, and internal status



System Analysis
Analyzes servo system frequency characteristics

Connectors for Servo Amplifier Analog/Pulse input type

50A

Single Connectors

Connector number	Intended use	Model number	Manufacturer mode	Manufacturer
CN1	To connect host equipment	AL-00385594	10150-3000PE 10350-52A0-008	Sumitomo 3M Limited
EN1, EN2	To connect encoder	AL-00632607	36210-0100PL 36310-3200-008	
CNA	For input power supply, regenerative resistor connection	AL-00686902-01	MSTBT2.5/8-STF-5.08LUB	Phoenix Contact.K.K
CNB	For servo motor connection	AL-Y0004079-01	MSTBT2.5/3-STF-5.08	
CN4 Note 1)	To connect safety device (For short-circuiting)	AL-00718251-01	2040978-1	Tyco Electronics Japan G.K.
CN4	To connect safety device (For wiring)	AL-00718252-01	2013595-3	

Note 1) When wiring for CN4 is not performed, make sure to insert safety device connector (for short-circuiting) to CN4 on servo amplifier.

Connector sets (No safe-torque-off function)

Connector number	Intended use	Model number	Applicable servo amplifier model number	Remarks
CN1,EN1,CNA,CNB	Standard	AL-00723282	RS2***A0*L0/RS2***A8*L0	Without regenerative resistance
CN1,EN1,CNB		AL-00723284	RS2***A0*A0/RS2***A8*A0	With regenerative resistance
CN1,EN1,EN2,CNA,CNB	For fully closed control system	AL-00723286	RS2***A2*L0/RS2***AA*L0	Without regenerative resistance
CN1,EN1,EN2,CNB		AL-00723288	RS2***A2*A0/RS2***AA*A0	With regenerative resistance
CN1,EN1	A set for low-voltage	AL-00723290	RS2***A0**0/RS2***A8**0	—
CNA,CNB	A set for high-voltage	AL-00696037	RS2***A**L0	Without regenerative resistance

Connector sets (With safe-torque-off function)

Connector number	Intended use	Model number	Applicable servo amplifier model number	Remarks
CN1,EN1,CNA,CNB,CN4	Standard	AL-00723155	RS2***A0*L2/RS2***A8*L2	Without regenerative resistance
CN1,EN1,CNB,CN4		AL-00723156	RS2***A0*A2/RS2***A8*A2	With regenerative resistance
CN1,EN1,EN2,CNA,CNB,CN4	For fully closed control system	AL-00723157	RS2***A2*L2/RS2***AA*L2	Without regenerative resistance
CN1,EN1,EN2,CNB,CN4		AL-00723158	RS2***A2*A2/RS2***AA*A2	With regenerative resistance
CN1,EN1,CN4	A set for low-voltage	AL-00723159	RS2***A0**2/RS2***A8**2	—

✓ CN4 of the connector set is for safety device connection (wiring) with model number AL-00718252-01.

100, 150, 300A

Single Connectors

Connector number	Intended use	Model number	Manufacturer mode	Manufacturer
CN1	To connect host equipment	AL-00385594	10150-3000PE 10350-52A0-008	Sumitomo 3M Limited
EN1, EN2	To connect encoder	AL-00632607	36210-0100PL 36310-3200-008	
CNA	To input control power	AL-Y0005159-01	MSTBT2.5/2-STF-5.08	Phoenix Contact.K.K
CN4 Note 1)	To connect safety device (For short-circuiting)	AL-00718251-01	2040978-1	Tyco Electronics Japan G.K.
CN4	To connect safety device (For wiring)	AL-00718252-01	2013595-3	

Note 1) When wiring for CN4 is not performed, make sure to insert safety device connector (for short-circuiting) to CN4 on servo amplifier.

Connector sets (No safe-torque-off function)

Connector number	Intended use	Model number	Applicable servo amplifier model number
CN1,EN1,CNA	Standard	AL-00751448	RS2***A0A*0/RS2***A8A*0
CN1,EN1,EN2,CNA	For fully closed control system	AL-00751450	RS2***A2A*0/RS2***AAA*0
CN1,EN1	A set for low-voltage	AL-00723290	RS2***A0A*0/RS2***A8A*0

Connector sets (With safe-torque-off function)

Connector number	Intended use	Model number	Applicable servo amplifier model number
CN1,EN1,CNA,CN4	Standard	AL-00751452	RS2***A0A*2/RS2***A8A*2
CN1,EN1,EN2,CNA,CN4	For fully closed control system	AL-00751454	RS2***A2A*2/RS2***AAA*2
CN1,EN1,CN4	A set for low-voltage	AL-00723159	RS2***A0A*2/RS2***A8A*2

Connector for Servo Amplifier　EtherCAT interface type

50A

Single Connectors

Connector number	Intended use	Model number	Manufacturer mode	Manufacturer
CN0,CN1	Ethernet For host unit connection	Not provided by our company. Please use shielded type modular plug (RJ-45) corresponding to the CAT5e standard.		
EN1,EN2	For encoder connection	AL-00632607	36210-0100PL 36310-3200-008	Sumitomo 3M Limited
CNA	For input power supply, regenerative resistor connection	AL-00686902-01	MSTBT2.5/8-STF-5.08LUB	Phoenix Contact.K.K
CNB	For servo motor connection	AL-Y0004079-01	MSTBT2.5/3-STF-5.08	Phoenix Contact.K.K
CN2	For safety device connection	AL-Y0004290-02	MUF-PK10K-X	J.S.T Mfg Co.,Ltd.
CN3	For general I/O	AL-00718252-01	2013595-3	Tyco Electronics Japan G.K.

Connector sets

Connector number	Intended use	Model number	Applicable servo amplifier model number	Remarks
CNA,CNB,EN1,CN2,CN3	Standard	AL-00734194	RS2***A0KL*/RS2***A8KL*	Without regenerative resistance
CNB,EN1,CN2,CN3		AL-00734196	RS2***A0KA*/RS2***A8KA*	With regenerative resistance
CNA,CNB,EN1,EN2,CN2,CN3	For fully closed control system	AL-00734195	RS2***A2KL*/RS2***AAKL*	Without regenerative resistance
CNB,EN1,EN2,CN2,CN3		AL-00734197	RS2***A2KA*/RS2***AAKA*	With regenerative resistance

100, 150, 300A

Single Connectors

Connector number	Intended use	Model number	Manufacturer mode	Manufacturer
CN0,CN1	Ethernet For host unit connection	Not provided by our company. Please use shielded type modular plug (RJ-45) corresponding to the CAT5e standard.		
EN1, EN2	For encoder connection	AL-00632607	36210-0100PL 36310-3200-008	Sumitomo 3M Limited
CNA	To input control power	AL-Y0005159-01	MSTBT2.5/2-STF-5.08	J.S.T Mfg Co.,Ltd.
CN2	For safety device connection	AL-Y0004290-02	MUF-PK10K-X	Tyco Electronics Japan G.K.
CN3	For general I/O	AL-00718252-01	2013595-3	

Connector sets

Connector number	Intended use	Model number	Applicable servo amplifier model number
CNA,EN1,CN2,CN3	Standard	AL-00756240	RS2***A0K**/RS2***A8K**
CNA,EN1,EN2,CN2,CN3	For fully closed control system	AL-00756242	RS2***A2K**/RS2***AAK**
EN1,CN2,CN3	A set for low-voltage	AL-00756244	RS2***A0K**/RS2***A8K**
EN1,EN2,CN2,CN3	For fully closed control system A set for low-voltage	AL-00756246	RS2***A2K**/RS2***AAK**

Servo Motor Encoder Connectors

Motor Model No.	Encoder receptacle	Encoder Plug Standard Specifications (Cable Clamp)		TUV-Conforming Plug (Cable Clamp) for Encoder Waterproof Specification		Layout Symbol
		Straight	Angle	Straight	Angle	Reduced Wiring Incremental Encoder Absolute Encoder
All Q1,Q2,Q4 Models	MS3102A20-29P	MS3106B20-29S (MS3057-12A) 【MS06B20-29S-12】	MS3108B20-29S (MS3057-12A) 【MS08B20-29S-12】	JA06A20-29S-J1-EB (JL04-2022CK(14))	JA08A20-29S-J1-EB (JL04-2022CK(14))	Depends on the encoder hookup diagram shown in the motor dimensional drawing or instruction manual

【 】indicates the SANYO DENKI part numbers (Plug & Cable Clamp)

Cooling Fan Connectors

Motor Model No.	Cooling fan receptacle	Standard plug (Cable Clamp) for Cooling Fan		Waterproof plug (Cable Clamp) for Cooling Fan			Pin Layout Symbol		
		Straight	Angle	Straight	Angle		AC200V ± 10% Single phase 50/60Hz		
All Q4 Models	MS3102A10SL-4P	MS3106B10SL-4S (MS3057-4A) 【MS06B10SL-4S-4】	MS3108B10SL-4S (MS3057-4A) 【MS08B10SL-4S-4】	JA06A10SL-4S-J1		The conduit is supplied by customer	A	B	

Please see the catalogs and instruction manuals of the connector manufacturer's (Japan Aviation Electronics Industry Limited) for details, including the instructions for the connector and the precautions.

【 】indicates the SANYO DENKI part numbers (Plug & Cable Clamp)

Motor Connectors

Voltage	Motor Model No.	Motor power receptacle	Brake receptacle Standard specifications, TUV specifications: DC90V (*Note 1 TUV: DC24V only)	Standard power plug (Cable Clamp)		TUV-Standard Plug Waterproof Specification (Cable Clamp)	
				Straight	Angle	Straight	Angle
200V Type	Q1AA10100D	JL04V-2E20-15PE-B	JL04V-2E-10SL-3PE-B	MS3106B20-15S (MS3057-12A) 【MS06B20-15S-12】	MS3108B20-15S (MS3057-12A) 【MS08B20-15S-12】	JL04V-6A20-15SE-EB (JL04-2022CK) 【332706X5】	JL04V-8A20-15SE-EB (JL04-2022CK) 【332707X5】
	Q1AA10150D						
	Q1AA10200D						
	Q1AA10250D						
	Q1AA12100D	JL04V-2E24-11PE-B	JL04V-2E-10SL-3PE-B	MS3106B24-11S (MS3057-16A) 【MS06B24-11S-16】	MS3108B24-11S (MS3057-16A) 【MS08B24-11S-16】	JL04V-6A24-11SE-EB (JL04-2428CK) 【332706X10】	JL04V-8A24-11SE-EB (JL04-2428CK) 【332707X10】
	Q1AA12200D						
	Q1AA12300D						
	Q1AA13300D	JL04V-2E24-11PE-B	*Note 1 (JL04V-2E-10SL-3PE-B)	MS3106B24-11S (MS3057-16A) 【MS06B24-11S-16】	MS3108B24-11S (MS3057-16A) 【MS08B24-11S-16】	JL04V-6A24-11SE-EB (JL04-2428CK) 【332706X10】	JL04V-8A24-11SE-EB (JL04-2428CK) 【332707X10】
	Q1AA13400D						
	Q1AA13500D						
	Q1AA18450M						
	Q1AA18750H	JL04V-2E32-17PE-B	JL04V-2E-10SL-3PE-B	MS3106B32-17S (MS3057-20A) 【MS06B32-17S-20】	MS3108B32-17S (MS3057-20A) 【MS08B32-17S-20】	JL04V-6A32-17SE-EB (JL04-32CK) 【332706X11】	
	Q2AA10100H	JL04V-2E20-15PE-B	JL04V-2E-10SL-3PE-B	MS3106B20-15S (MS3057-12A) 【MS06B20-15S-12】	MS3108B20-15S (MS3057-12A) 【MS08B20-15S-12】	JL04V-6A20-15SE-EB (JL04-2022CK) 【332706X5】	JL04V-8A20-15SE-EB (JL04-2022CK) 【332707X5】
	Q2AA10150H						
	Q2AA13100H	JL04V-2E24-11PE-B	*Note 1 (JL04V-2E-10SL-3PE-B)	MS3106B24-11S (MS3057-16A) 【MS06B24-11S-16】	MS3108B24-11S (MS3057-16A) 【MS08B24-11S-16】	JL04V-6A24-11SE-EB (JL04-2428CK) 【332706X10】	JL04V-8A24-11SE-EB (JL04-2428CK) 【332707X10】
	Q2AA13150H						
	Q2AA13200H						
	Q2AA18200H						
	Q2AA18350H						
	Q2AA18450H						
	Q2AA18550R	JL04V-2E32-17PE-B	JL04V-2E-10SL-3PE-B	MS3106B32-17S (MS3057-20A) 【MS06B32-17S-20】	MS3108B32-17S (MS3057-20A) 【MS08B32-17S-20】	JL04V-6A32-17SE-EB (JL04-32CK) 【332706X11】	
	Q2AA18550H						
	Q2AA18750L						
	Q2AA22550B	JL04V-2E24-11PE-B	JL04V-2E-10SL-3PE-B	MS3106B24-11S (MS3057-16A) 【MS06B24-11S-16】	MS3108B24-11S (MS3057-16A) 【MS08B24-11S-16】	JL04V-6A24-11SE-EB (JL04-2428CK) 【332706X10】	JL04V-8A24-11SE-EB (JL04-2428CK) 【332707X10】
	Q2AA22700S						
	Q2AA2211KV	JL04V-2E32-17PE-B	JL04V-2E-10SL-3PE-B	MS3106B32-17S (MS3057-20A) 【MS06B32-17S-20】	MS3108B32-17S (MS3057-20A) 【MS08B32-17S-20】	JL04V-6A32-17SE-EB (JL04-32CK) 【332706X11】	
	Q2AA2215KV						
	Q4AA1811KB	JL04V-2E32-17PE-B		MS3106B32-17S (MS3057-20A) 【MS06B32-17S-20】	MS3108B32-17S (MS3057-20A) 【MS08B32-17S-20】	JL04V-6A32-17SE-EB (JL04-32CK) 【332706X11】	
	Q4AA1815KB						

Voltage	Motor Model No.	TUV-Standard Plug for Brake Waterproof Specification (Cable Clamp)		Pin Layout Symbol				
		Straight	Angle	U phase	V phase	W phase	Ground	Brake
200V Type	Q1AA10100D	JL04V-6A10SL-3SE-EB (JL04-1012CK) 【332706X1】	JL04V-8A10SL-3SE-EB (JL04-1012CK) 【332707X1】	A	B	C	D	A , B
	Q1AA10150D							
	Q1AA10200D							
	Q1AA10250D							
	Q1AA12100D	JL04V-6A10SL-3SE-EB (JL04-1012CK) 【332706X1】	JL04V-8A10SL-3SE-EB (JL04-1012CK) 【332707X1】	D	E	F	G , H	A , B
	Q1AA12200D							
	Q1AA12300D							
	Q1AA13300D	*Note 1	*Note 1	D	E	F	G , H	A , B
	Q1AA13400D							
	Q1AA13500D							
	Q1AA18450M							
	Q1AA18750H	JL04V-6A10SL-3SE-EB (JL04-1012CK) 【332706X1】	JL04V-8A10SL-3SE-EB (JL04-1012CK) 【332707X1】	A	B	C	D	A , B
	Q2AA10100H	JL04V-6A10SL-3SE-EB (JL04-1012CK) 【332706X1】	JL04V-8A10SL-3SE-EB (JL04-1012CK) 【332707X1】	A	B	C	D	A , B
	Q2AA10150H							
	Q2AA13100H	*Note 1	*Note 1	D	E	F	G , H	A , B
	Q2AA13150H							
	Q2AA13200H							
	Q2AA18200H							
	Q2AA18350H							
	Q2AA18450H							
	Q2AA18550R	JL04V-6A10SL-3SE-EB (JL04-1012CK) 【332706X1】	JL04V-8A10SL-3SE-EB (JL04-1012CK) 【332707X1】	A	B	C	D	A , B
	Q2AA18550H							
	Q2AA18750L							
	Q2AA22550B	JL04V-6A10SL-3SE-EB (JL04-1012CK) 【332706X1】	JL04V-8A10SL-3SE-EB (JL04-1012CK) 【332707X1】	D	E	F	G , H	A , B
	Q2AA22700S							
	Q2AA2211KV	JL04V-6A10SL-3SE-EB (JL04-1012CK) 【332706X1】	JL04V-8A10SL-3SE-EB (JL04-1012CK) 【332707X1】	A	B	C	D	A , B
	Q2AA2215KV							
	Q4AA1811KB			A	B	C	D	
	Q4AA1815KB							

Please see the catalogs and instruction manuals of the connector manufacturer's (Japan Aviation Electronics Industry Limited) for details, including the instructions for the connector and the precautions.

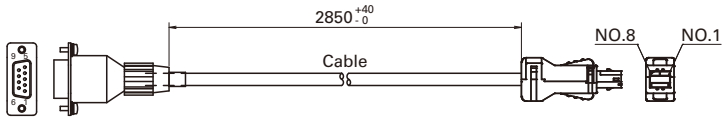
*Note 1: Both power and brake connectors are required for all motors equipped with TUV compliant DC24V brakes. 【 】indicates the SANYO DENKI part numbers (Plug & Cable Clamp)

Setup software, Serial Communication Relation

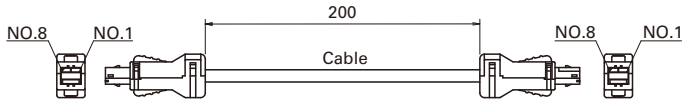
Name	Item		Our model No.
1) Cable for personal computer communications	Between personal computer and servo amplifier	Analog / Pulse input type : CN2 EtherCAT interface type : CN4	AL-00689703-01
2) Amplifier communication cable (0.2m)[Note 1)]	Servo Amplifier (CN2) ⇔ Servo Amplifier (CN3)		AL-00695974-01
3) Amplifier communication cable (3.0m)[Note 1)]			AL-00695974-02
4) Communication converter[Note 1)]	RS232C ⇔ RS-422		SAU-024-01
5) Connector with terminating resistor[Note 1)]	RS-422 Terminating resistor for communication		AL-00695977-01

Dimentions (Unit : mm)

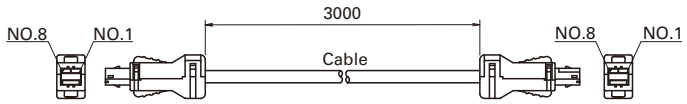
1) Cable for personal computer communications (Model No. : AL-00689703-01)



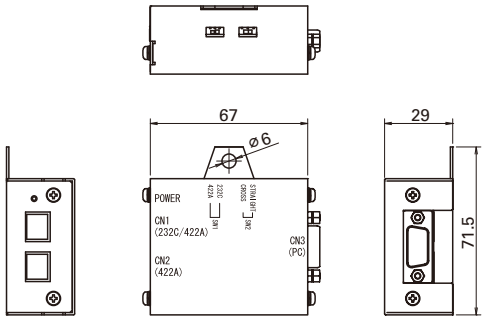
2) Amplifier communication cable (0.2m) (Model No. : AL-00695974-01) Note 1)



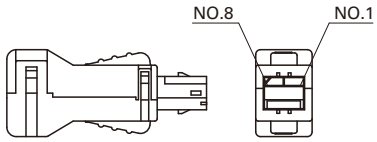
3) Amplifier communication cable (3.0m) (Model No. : AL-00695974-02) Note 1)



4) Communication converter (Model No. : SAU-024-01) Note 1)



5) Connector with terminating resistor (Model No. : AL-00695977-01) 注1)



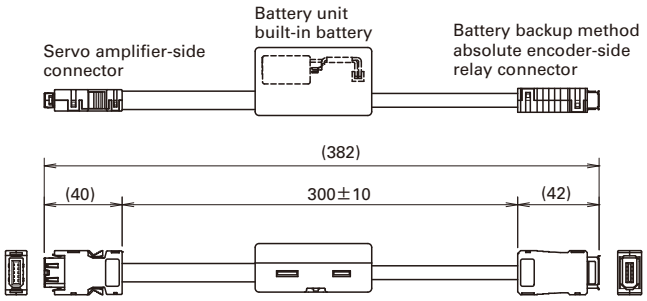
Note 1) Optional connector dedicated for analog/pulse input type.

Battery for Battery Backup Method Absolute Encoder Relation

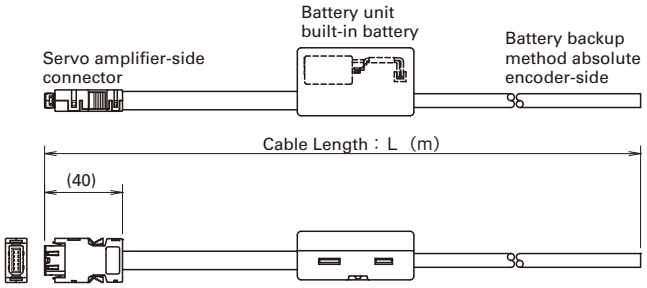
Name	Item	Our model No.
1) Encoder relay cable with battery unit, with connectors on both ends	–	AL-00731792-01
2) Encoder relay cable with battery unit, with connectors on one ends	–	AL-00697960- □□
3) Replacement batteries	Lithium battery : ER3VLY Toshiba Consumer Marketing Ltd.	AL-00697958-01

Dimentions (Unit : mm)

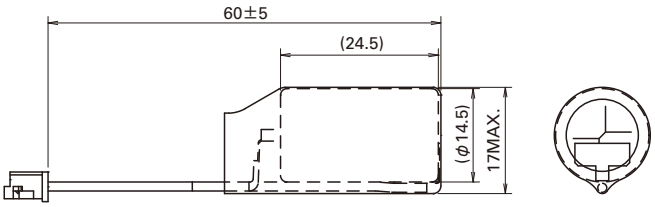
1) Encoder relay cable with battery unit, with connectors on both ends (Model No. : AL-00731792-01)



2) Encoder relay cable with battery unit, with connectors on one ends (Model No. : AL-00697960-□□)



3) Replacement batteries (Model No. : AL-00697958-01)



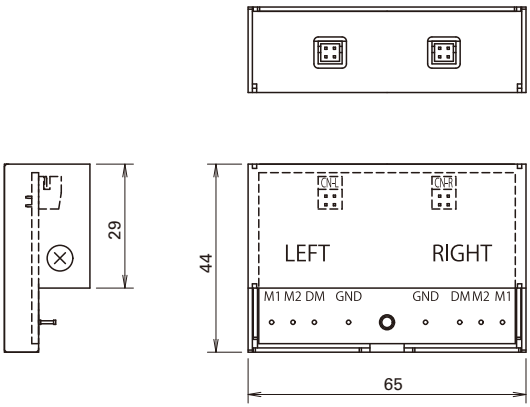
	Our model No.	L [m]
1	AL-00697960-01	3
2	AL-00697960-02	5
3	AL-00697960-03	10
4	AL-00697960-04	15
5	AL-00697960-05	20
6	AL-00697960-06	25

Analog Monitor Relation

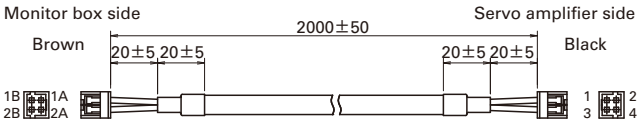
Name	Item	Our model No.
1) Monitor Box	Monitor box body 2 dedicated cables	Q-MON-3
2) Dedicated cable	2 dedicated cables	AL-00690525-01

Dimentions (Unit : mm)

1) Monitor Box (Model No. : Q-MON-3)

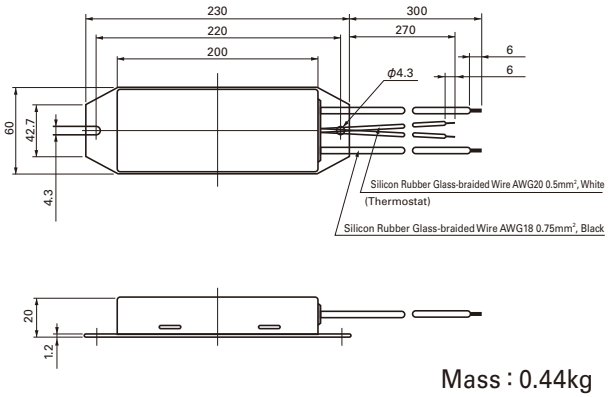


2) Dedicated Cable (Model No. : AL-00690525-01)



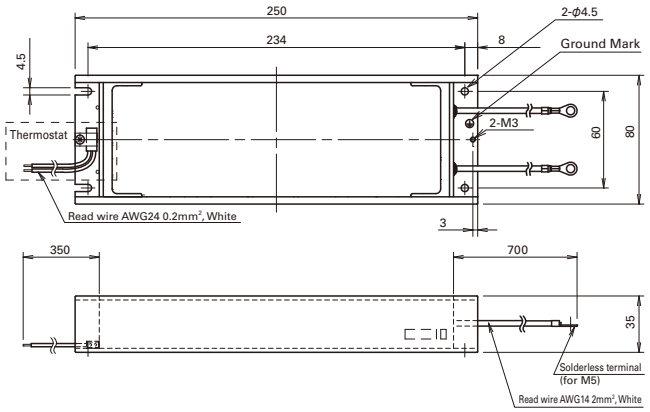
Note 1) 2 units of the dedicated cables per above 2) (PN# AL-00690525-01) are attached to Monitor Box (PN#Q-MON-3).

External Regenerative Resistor Dimensions (Unit: mm)



Mass : 0.44kg

	Model No.	Thermostat
1	REGIST-220W20B	Normal close
2	REGIST-220W50B	Normal close
3	REGIST-220W100B	Normal close



Mass : 1.5kg

	Model No.	Thermostat
1	REGIST-500CW20B	Normal close
2	REGIST-500CW10B	Normal close

Inquiry Check Sheet

For more information regarding any products or services described here in, please contact your nearest office listed on the back of this catalog.

To SANYO DENKI Co.,LTD.　　Date：

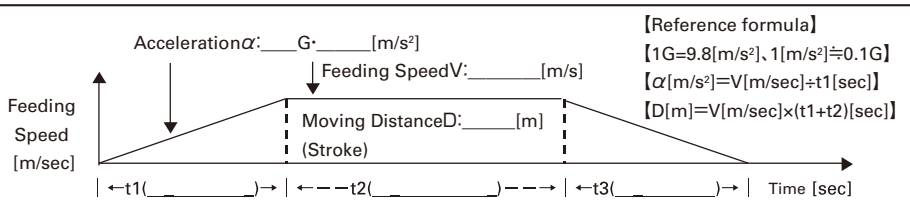
Company:

Department:

Name:

Tel:　　FAX:

E-mail:

	Item	Contents
❶	Name of target equipment	Equipment name, category (transport, processing, test, other)
❷	Name of servo axis	Axis name, axial mechanism (horizontal/vertical), brake mechanism (yes/no)
❸	Current condition of above axis	Manufacturer Name (　) Series Name (　) Motor Capacity (　) Hydraulic, Mechanical, or New System (　)
❹	Positioning accuracy	±　mm·±　μm
❺	Operation pattern	 【Reference formula】 【1G=9.8[m/s²]、1[m/s²]≒0.1G】 【α[m/s²]=V[m/sec]÷t1[sec]】 【D[m]=V[m/sec]×(t1+t2)[sec]】
❻	Mechanism	Ball-screw/screw-rotation type (horizontal/vertical), ball-screw/nut-rotation type (horizontal/vertical), rack and pinion (horizontal/vertical), belt/chain (horizontal/vertical), rotary table, roll feed, other
❼	Mechanical structure	WT(table mass) kg　WL(work mass) kg　WA(mass of other drive parts) kg WR(rack mass) kg　WB(belt/chain mass) kg　WC(counterbalance mass) kg Fa(external force axial direction) N　Fb(ball-screw preload) N　T(roll pushing force) N Dr1(drive-side roll diameter) mm　Dr2(follower-side roll diameter) mm Lr1(drive-side roll length) mm　Lr2(follower-side roll length) mm　G(reduction ratio) JG(speed-reducer inertia) kg·m²　JC(coupling inertia) kg·m² JN(nut inertia) kg·m²　JO(other motor-axis conversion inertia) kg·m² Db(ball-screw diameter) mm　Lb(ball-screw axial length) mm　Pb(ball -screw lead) mm Dp(pinion/pulley diameter) mm　Lp(pinion axial length) mm　tp(pully thickness) mm Dt(table diameter) mm　Dh(table-support dianeter) mm　LW(load shift from axis) mm Ds(table shaft diameter) mm　Ls(table shaft length) mm ρ(specific gravity of ball-screw/pinion/pulley/table-shaft material) kg·cm³ μ(friction coefficient between sheet and shiliding-surface/support-section/roll)　ρ1(specific gravity of roll-1 material) kg／cm³ ρ2(specific gravity of roll-2 material) kg／cm³　κ(internal friction coefficient of preload nut) η(mechanical efficiency)　JL(load inertia of motor-axis conversion) kg·m² TF(friction torque of motor axis conversion) N·m　Tu(imbalance torque of motor axis conversion) N·m
❽	Speed reducer	Customer-provided (　／　)·Sanyo denki standard(planet/spur/no-backlash-planet　／　) other(　／　)
❾	Encoder type	Encoder type specified (yes / no) Yes:(Wiring saving incremental encoder, battery backup absolute encoder, absolute encoder for incremental system, battery-less absolute encoder) Resolution(　)
❿	Input format	Position , velocity , torque , other (　)
⓫	Host equipment (controller)	Sequencer , laptop , customer-developed product , Sanyo dennki-provided , other (　)
⓬	Usage environment and other requirements	Cutting , clean-room use , anti-dust measures , other (　)
⓭	Estimated production	Single product: (　) units/mouth (　) units/year
⓮	Development schedule	Prototype period: (　)Year (　) Month Production period: (　)Year (　) Month
⓯	Various measures	Related documentation (already submitted; send later by mail) Visit/PR desired (yes / no) Meeting desired (yes / no)
⓰	Miscellaneous (questions, pending problems, unresolved issues, etc.)	

MEMO

MEMO

MEMO

■ ECO PRODUCTS

ECO PRODUCTS are designed with the goal of lessening nevironmental impact, from product development to disposal.

■ Precautions For Adoption

⚠ Cautions

Failure to follow the precautions on the right may cause moderate injury and property damage, or in some circumstances,could lead to a serious accident.
Always follow all listed precautions.

⚠ Cautions

- Read the accompanying Instruction Manual carefully prior to using the product.
- If applying to medical devices and other equipment affecting people's lives, please contact us beforehand and take appropriate safety measures.
- If applying to equipment that can have significant effects on society and the general public, please contact us beforehand.
- Do not use this product in an environment where vibration is present, such as in a moving vehicle or shipping vessel.
- Do not perform any retrofitting, re-engineering, or modification to this equipment.
- The SERVO SYSTEMS presented in this catalog are meant to be used for general industrial applications. If using for special applications related to aviation and space, nuclear power, electric power, submarine repeaters, etc., please contact us beforehand.

*For any question or inquiry regarding the above, contact our Sales Department.

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*Remarks : Specifications Are Subject To Change Without Notice.
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