

TBL-i III Series

AC Servo Motors/Drivers

Highly Accurate · High speed Servo System

Best suited for Mounters, Semiconductor manufacturing equipment,
Printing machines, Injection molding machines, etc.

High resolution
Optical encoder
Type

A sensational debut with the
smallest size in the industry

The realization of
downsized motors

TBL-i II Series

AC servo Motors

Best suited for Mounters, Semiconductor manufacturing equipment, Printing machines, Injection molding machines, etc.

30W~750W

The smallest and lightest in the industry

Super-compact design achieved by downsizing our existing motors by 25%(in case of 750W motors).

- Equipped with 17 bit high resolution(130thousand pulse)Absolute/Incremental encoder
- High speed setting
- Fewer wires

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Sensors

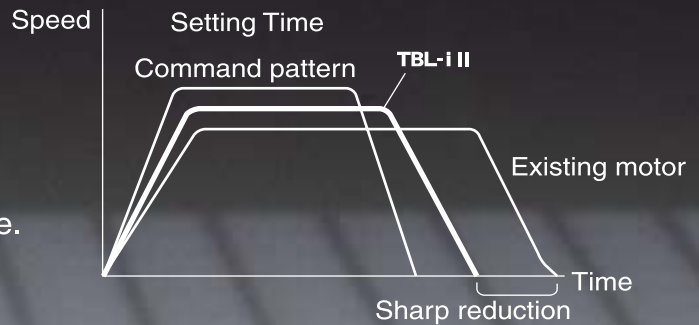
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■ Main Features

- Super-Compact Size
25% downsizing of 750W motors compared with our conventional motors
- Comes with 17bit encoder as standard equipment.(17bit ABS, 17bit INC)
*Models with built-in encoder (2000C/T,2048C/T,14cores, fewer wires)as an option are also available.
- Satisfies overseas industrial standards.
Possible to conform with UL,CE standards

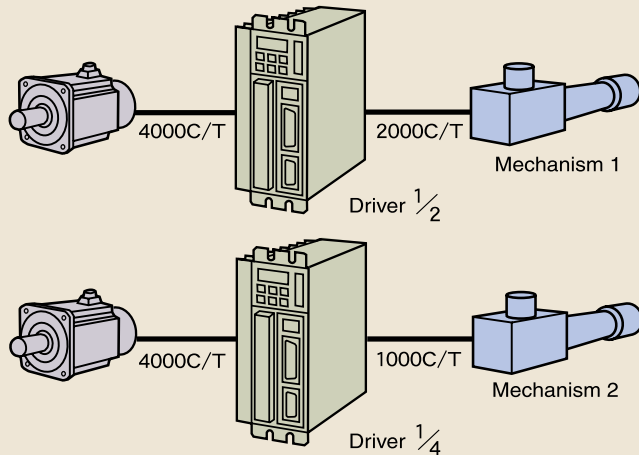
■ The Reduction of Setting Time

- Reduces the setting time for positioning by 50% by enhancing control algorithm



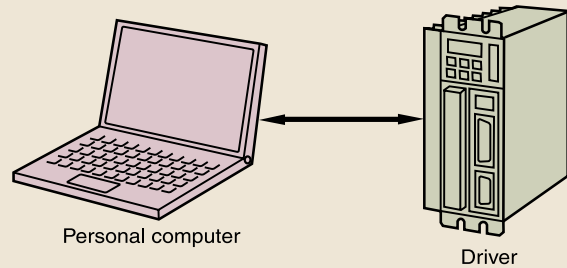
A pulse resolution change function

● Possible to easily divide pulses of encoder signals by changing parameters



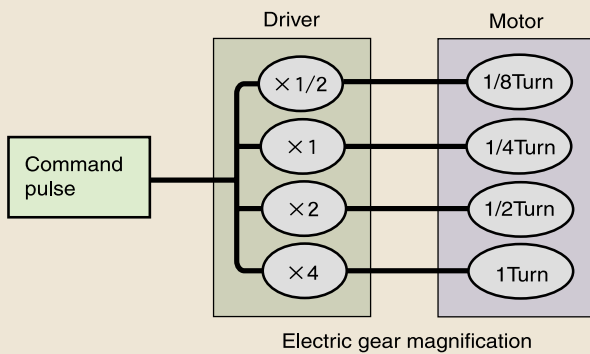
Personal Computer Interface

● Entry and saving of parameters can be performed by personal computer.



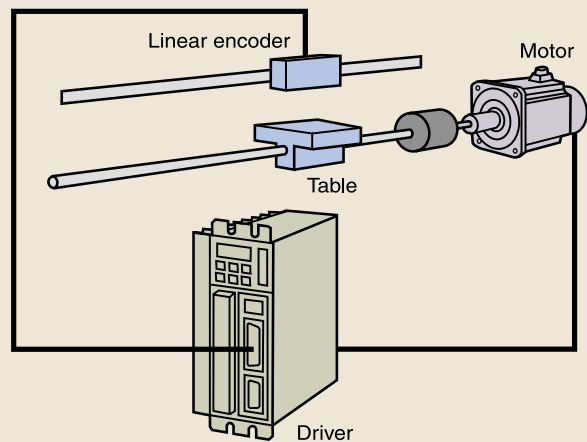
An electronic gear function

● Setting the rotation per one positioning command pulse at a desired value can be performed by electronic gear.
The rotation angle can be changed without changing the mechanism.



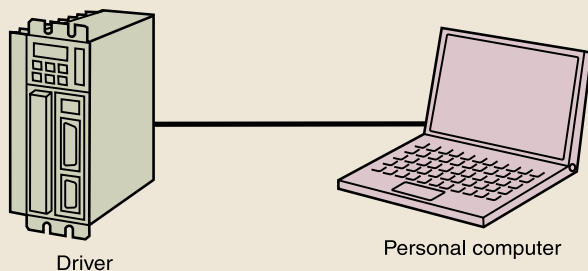
Signal input from external encoders

● Position can be controlled by signals from an encoder (like a linear encoder) external to a motor.



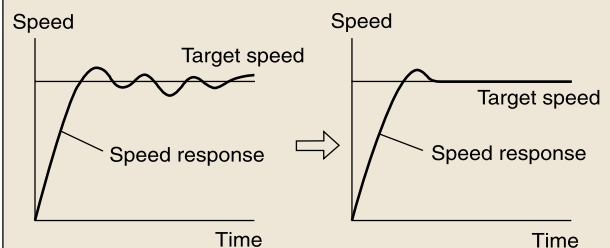
An alarm trace function

● Memorizes the past alarm history, which can be displayed on a panel of a driver or by personal computer. This will be helpful in trouble shooting.



An auto-tuning function

● The optimal servo-gain can automatically be provided by estimating load inertia.
● The sensitivity of the real-time auto-tuning can be changed in accordance with eight levels of machine rigidity, enabling the unit to accommodate an even wider range of machinery.

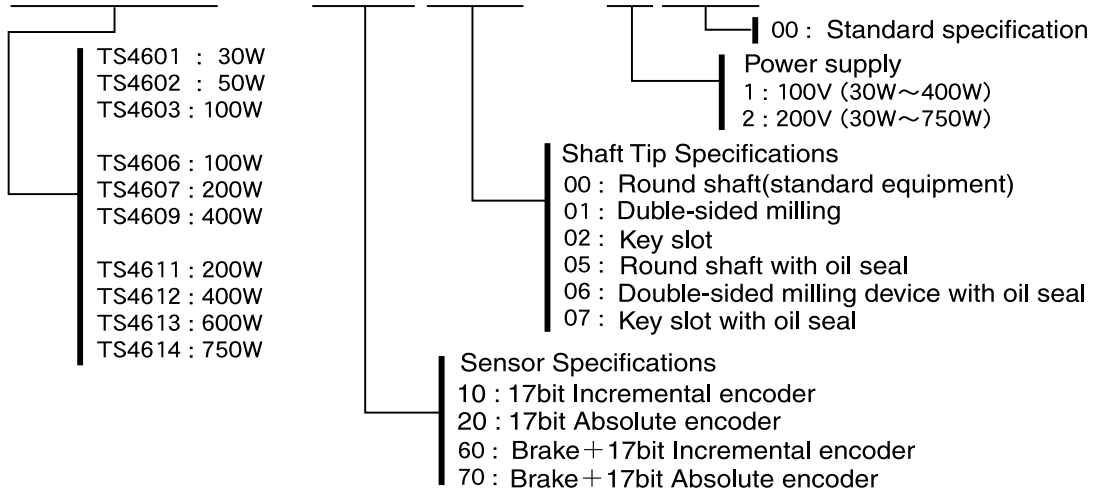


Specifications

Mounting Flange [mm]	Model	Voltage [V]	Output [W]	Rated Torque [N·m] {kgf·cm}	Maximum Torque [N·m] {kgf·cm}	Rated Current [Arms] (AC100V/ AC200V)	Rated Rotation Speed [r/min]	Maximum Rotation Speed [r/min]	Rotor Inertia [GD ² /4] [kg·m ²] {gf·cm·s ² }	Approximate Mass [kg]
□40	TS4601	100/200	30	0.095 {0.97}	0.29 {2.9}	0.6/0.3	3000	5000	0.01 × 10 ⁻⁴ {0.01}	0.2
	TS4602	100/200	50	0.159 {1.62}	0.48 {4.9}	1.1/0.5			0.02 × 10 ⁻⁴ {0.02}	0.3
	TS4603	100/200	100	0.318 {3.25}	0.95 {9.7}	1.8/1.0			0.03 × 10 ⁻⁴ {0.03}	0.4
□60	TS4606	100/200	100	0.318 {3.25}	0.95 {9.7}	1.6/0.8	3000	5000	0.09 × 10 ⁻⁴ {0.09}	0.7
	TS4607	100/200	200	0.64 {6.5}	1.91 {19.5}	3.4/1.7			0.18 × 10 ⁻⁴ {0.18}	0.9
	TS4609	100/200	400	1.27 {13}	3.82 {39}	5.5/3.3			0.34 × 10 ⁻⁴ {0.34}	1.3
□80	TS4611	100/200	200	0.64 {6.5}	1.91 {19.5}	2.9/1.5	3000	5000	0.30 × 10 ⁻⁴ {0.30}	1.1
	TS4612	200	400	1.27 {13}	3.82 {39}	2.7			0.56 × 10 ⁻⁴ {0.57}	1.6
	TS4613	200	600	1.91 {19.5}	5.73 {58.5}	4.3			0.88 × 10 ⁻⁴ {0.90}	2.1
	TS4614	200	750	2.39 {24}	7.16 {73}	4.8			1.08 × 10 ⁻⁴ {1.10}	2.5

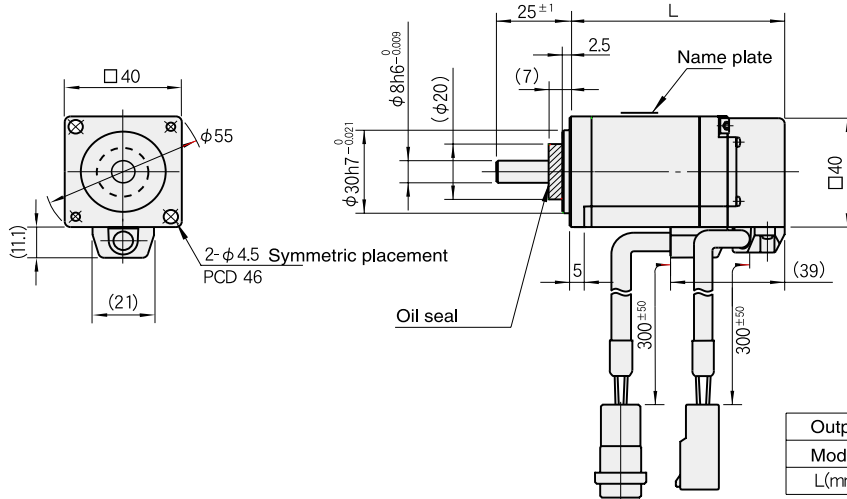
Model Numbers

TS □ □ □ □ N □ □ □ □ E □ □ □



Outline (Standard Type)

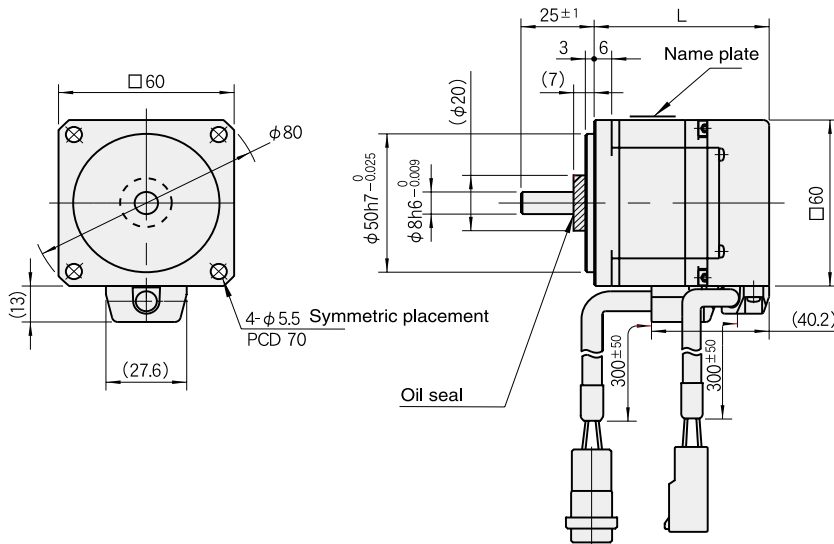
40-mm Square (30W, 50W, 100W)



L: Variable dimension table

Output	30W	50W	100W
Model	TS4601	TS4602	TS4603
L(mm)	53	59	73

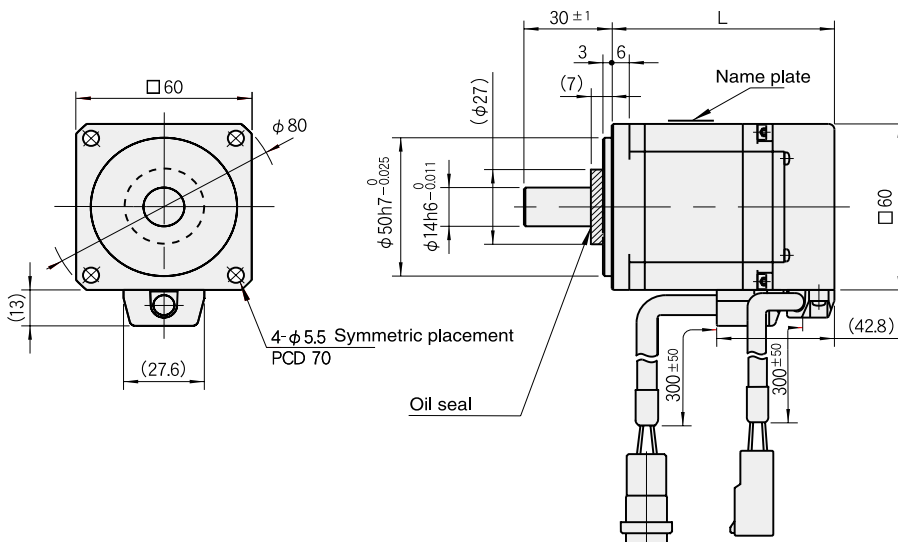
60-mm Square (100W)



L: Variable dimension table

Output	100W
Model	TS4606
L(mm)	59

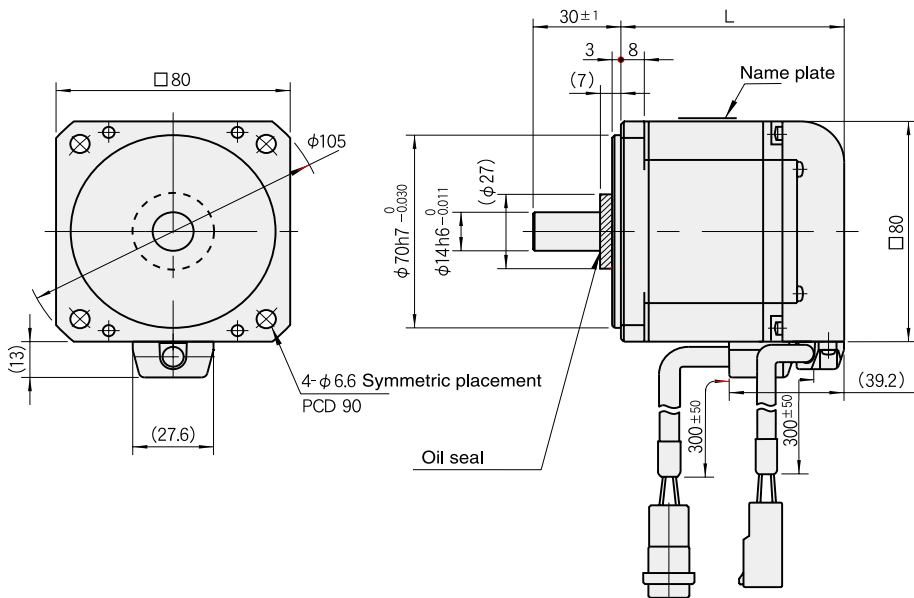
60-mm Square (200W, 400W)



L: Variable dimension table

Output	200W	400W
Model	TS4607	TS4609
L(mm)	76	98

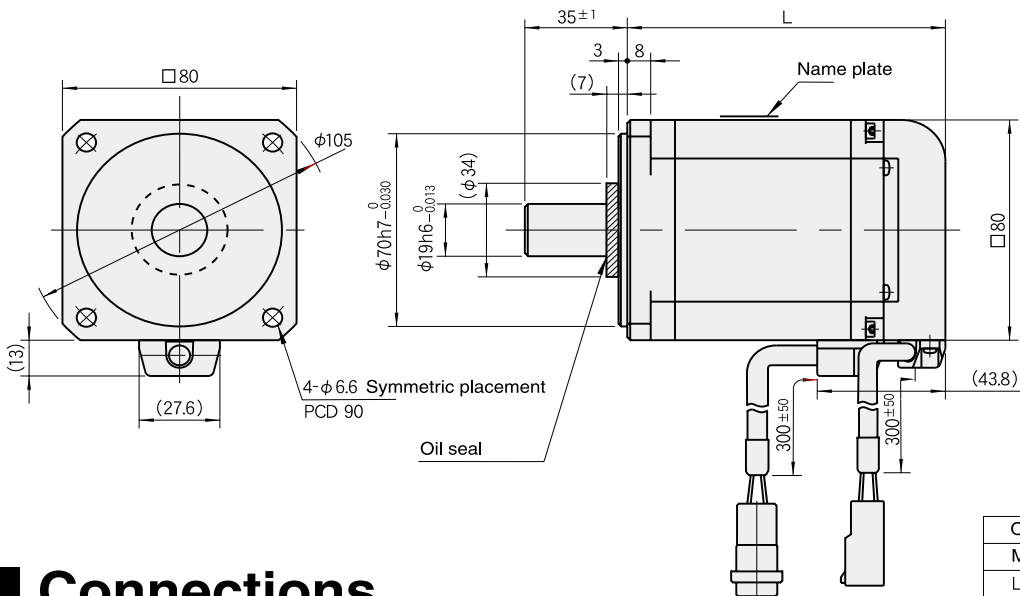
● 80-mm Square (200W, 400W)



L: Variable dimension table

Output	200W	400W
Model	TS4611	TS4612
L(mm)	64	76

● 80-mm Square (600W, 750W)

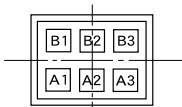


L: Variable dimension table

Output	600W	750W
Model	TS4613	TS4614
L(mm)	99	108

■ Connections

● Motor



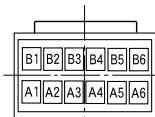
Tab housing
: 178964-3
Tab contact
: 175289-2(AMP)

MOTOR CONNECTION

PIN No.	FUNCTION	COLOR
A1	U	RED
A2	V	WHT
A3	W	BLK
B1	C.G	GRN/YEL
B2		
B3		

● Sensor

(1) 17bit Incremental type



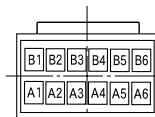
Tab housing
: 1-1318115-6
Tab contact
: 1318112-1(AMP)

ENCODER CONNECTION

PIN No.	FUNCTION	COLOR
A1		
A2		
A3	SD	BLU
A4		
A5	Vcc	RED
A6		
B1		
B2		
B3	SD	BLU/BLK
B4		
B5	GND	BLK
B6	SHLD	SHLD

● Sensor

(2) 17bit Abs type



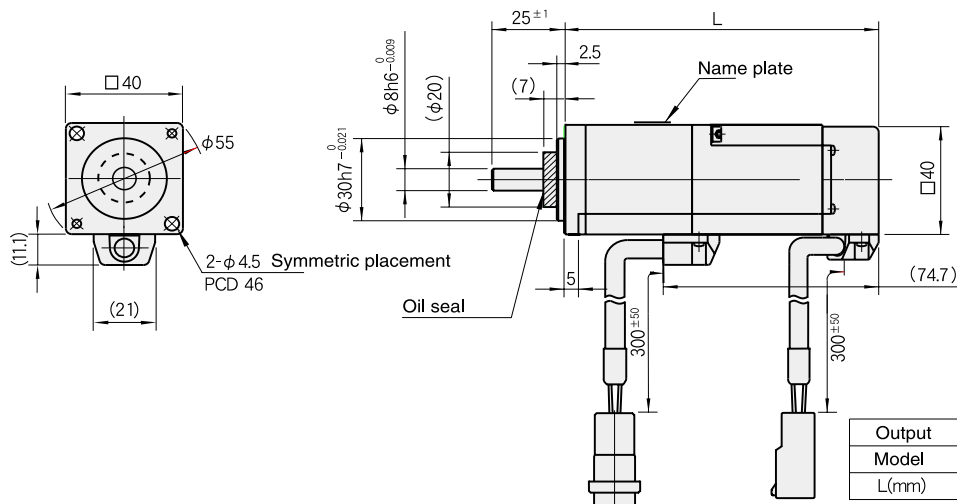
Tab housing
: 1-1318115-6
Tab contact
: 1318112-1(AMP)

ENCODER CONNECTION

PIN No.	FUNCTION	COLOR
A1		
A2		
A3	SD	BLU
A4	VB	BRW
A5	Vcc	RED
A6		
B1		
B2		
B3	SD	BLU/BLK
B4	GND	BRW/BLK
B5	GND	BLK
B6	SHLD	SHLD

Outline (with Brake)

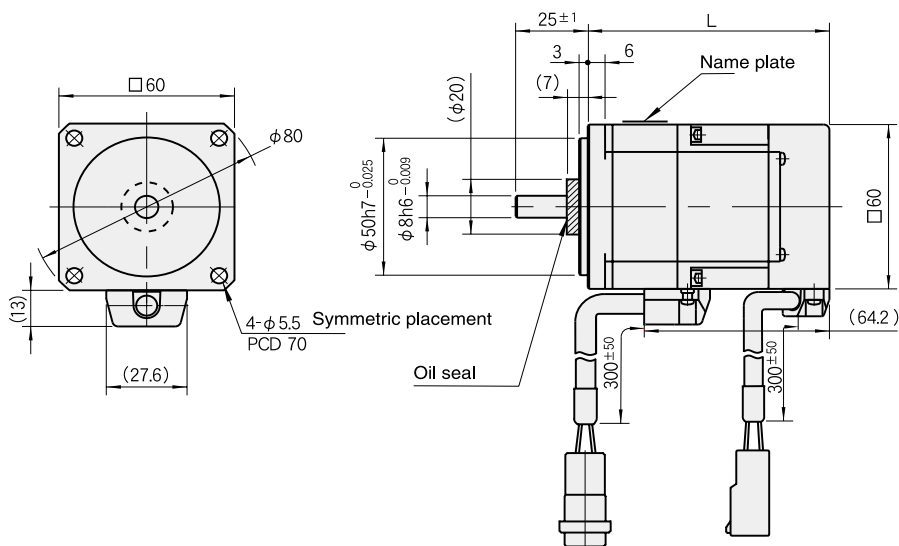
40-mm Square (30W, 50W, 100W)



L: Variable dimension table

Output	30W	50W	100W
Model	TS4601	TS4602	TS4603
L(mm)	89	95	109

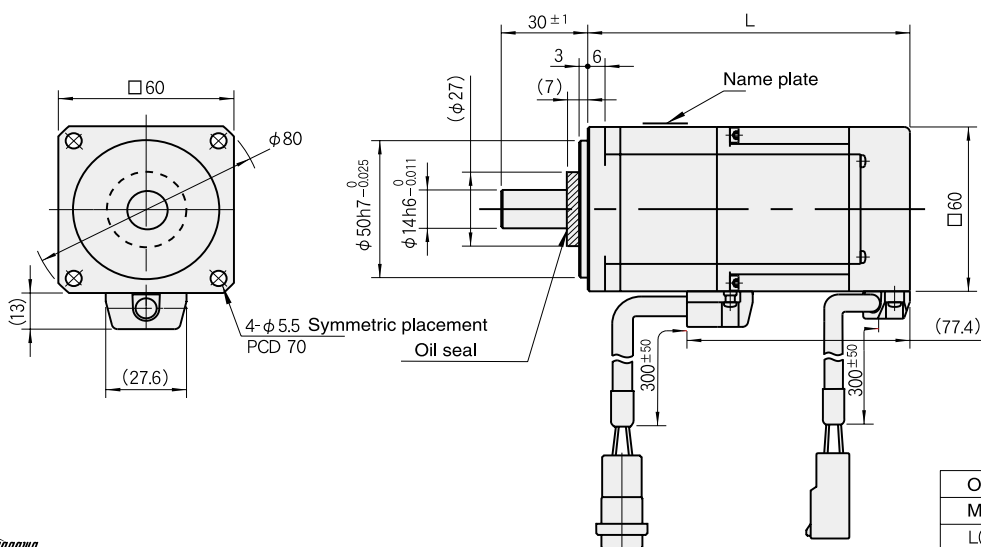
60-mm Square (100W)



L: Variable dimension table

Output	100W
Model	TS4606
L(mm)	83

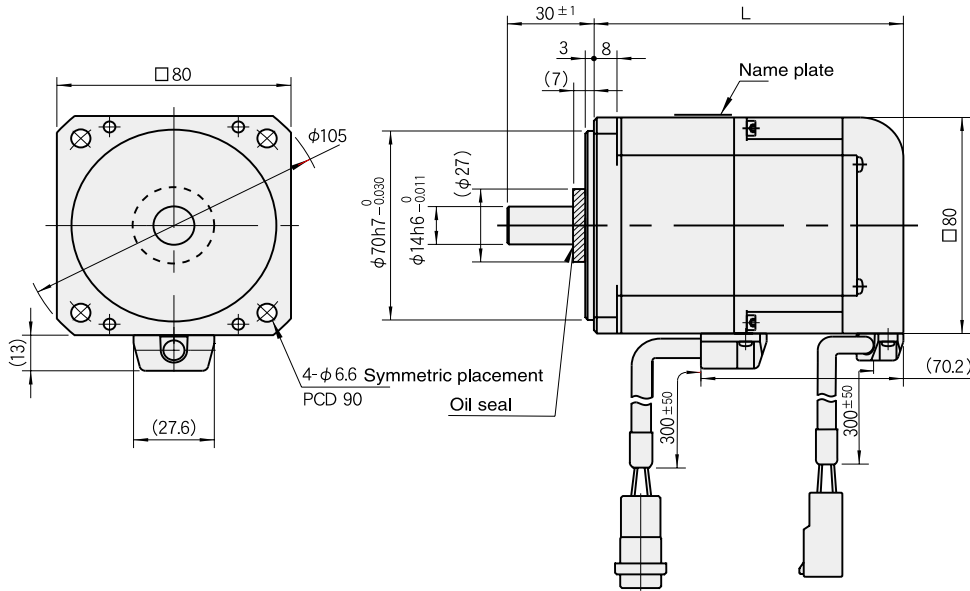
60-mm Square (200W, 400W)



L: Variable dimension table

Output	200W	400W
Model	TS4607	TS4609
L(mm)	111	132

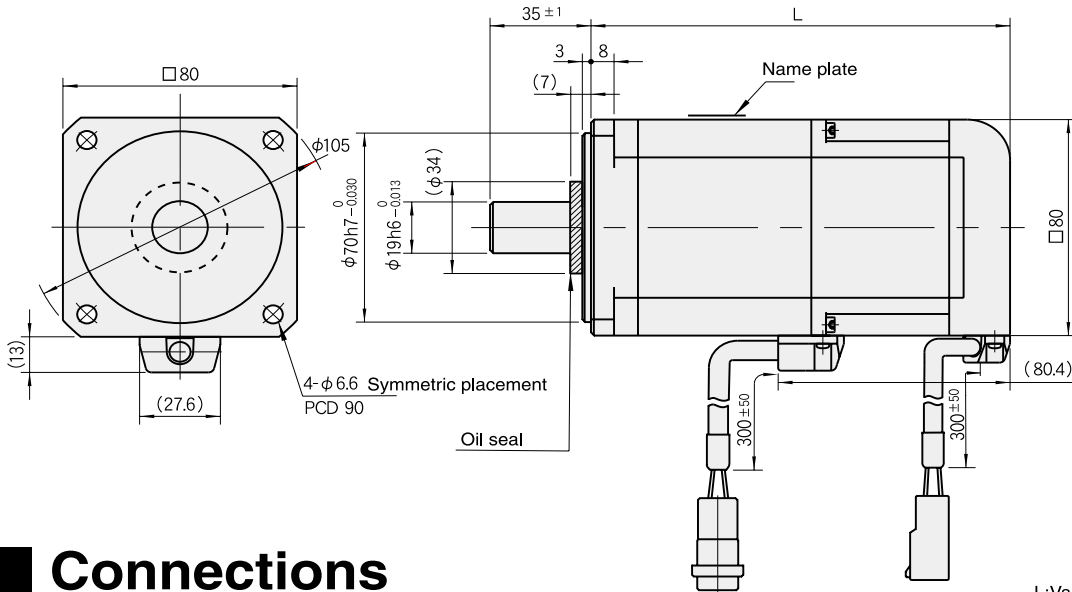
● 80-mm Square (200W, 400W)



L: Variable dimension table

Output	200W	400W
Model	TS4611	TS4612
L(mm)	95	107

● 80-mm Square (600W, 750W)

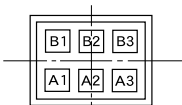


L: Variable dimension table

Output	600W	750W
Model	TS4613	TS4614
L(mm)	136	145

■ Connections

● Motor



Tab housing
: 178964-3

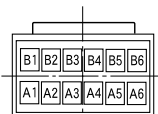
Tab housing
: 175289-2(AMP)

MOTOR & BRAKE CONNECTION

PIN No.	FUNCTION	COLOR
A1	U	RED
A2	V	WHT
A3	W	BLK
B1	C.G	GRN/YEL
B2	BK	YEL
B3	BK	BLU

● Sensor

(1) 17bit Incremental type



Tab housing
: 1-1318115-6

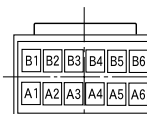
Tab contact
: 1318112-1(AMP)

ENCODER CONNECTION

PIN No.	FUNCTION	COLOR
A1	---	---
A2	---	---
A3	SD	BLU
A4	---	---
A5	Vcc	RED
A6	---	---
B1	---	---
B2	---	---
B3	SD	BLU/BLK
B4	---	---
B5	GND	BLK
B6	SHLD	SHLD

● Sensor

(2) 17bit Abs type



Tab housing
: 1-1318115-6

Tab contact
: 1318112-1(AMP)

ENCODER CONNECTION

PIN No.	FUNCTION	COLOR
A1	---	---
A2	---	---
A3	SD	BLU
A4	VB	BRW
A5	Vcc	RED
A6	---	---
B1	---	---
B2	---	---
B3	SD	BLU/BLK
B4	GND	BRW/BLK
B5	GND	BLK
B6	SHLD	SHLD

AC Servo Driver TA8110 Series

TBL-i II Series Utilizing high speed DSP and soft ware, this digital control driver can be used in combination with the TBL-i II Series.

■ Features

- Servo driver utilizing high speed DSP
- A broad line up
 - A wide variety of motors from 30W to 750W, conforming to 17bit incremental (or absolute) encoder.
- Allows setting of different parameters
 - Setting made by using push button switches on the panel
- Comes with a restore circuit and a dynamic brake as standard equipment.
- Supports many functions
 - Low oscillation control is possible even for low rigidity mechanisms by using a control filter function.
 - A function of easily dividing encoder signals
 - An electronic gear function
 - A feed forward function, etc.
- Comes with an external encoder input circuit for position control as standard equipment.
- A 17bit encoder makes this unit well suited for control systems requiring high response.



■ Basic Specifications

Driver Model	TA8110N * * *
Control Model	Position, Speed and Current control (by selecting parameter)
Motor Drive System	Transistor PWM, sine wave drive
Angle Sensor	17bit absolute/incremental encoder (line driver output)
Operating Temperature and Humidity	0 ~ 50°C 90% RH max. (without condensation)
Construction	Base mount type

■ Model-Specific Specifications (classified by N number) [I/F Voltage: 5V Sensor: 17bit encoder]

N Number Models	N311	N312	N313	N314	N321	N322	N323	N324
AC Power Input	AC100/115V ± 10% 50/60Hz				AC200/230V ± 10% 50/60Hz (Single Phase/3phase)			
Rated Output Current (Arms)	1	2	4	6	1	2	4	6
Instantaneous Maximum Current (Arms)	3.39	5.66	11.3	17.0	3.39	5.66	11.3	17.0
Motor Output (reference)	(50W)	(100W)	(200W)	(400W)	(100W)	(200W)	(600W)	(750W)

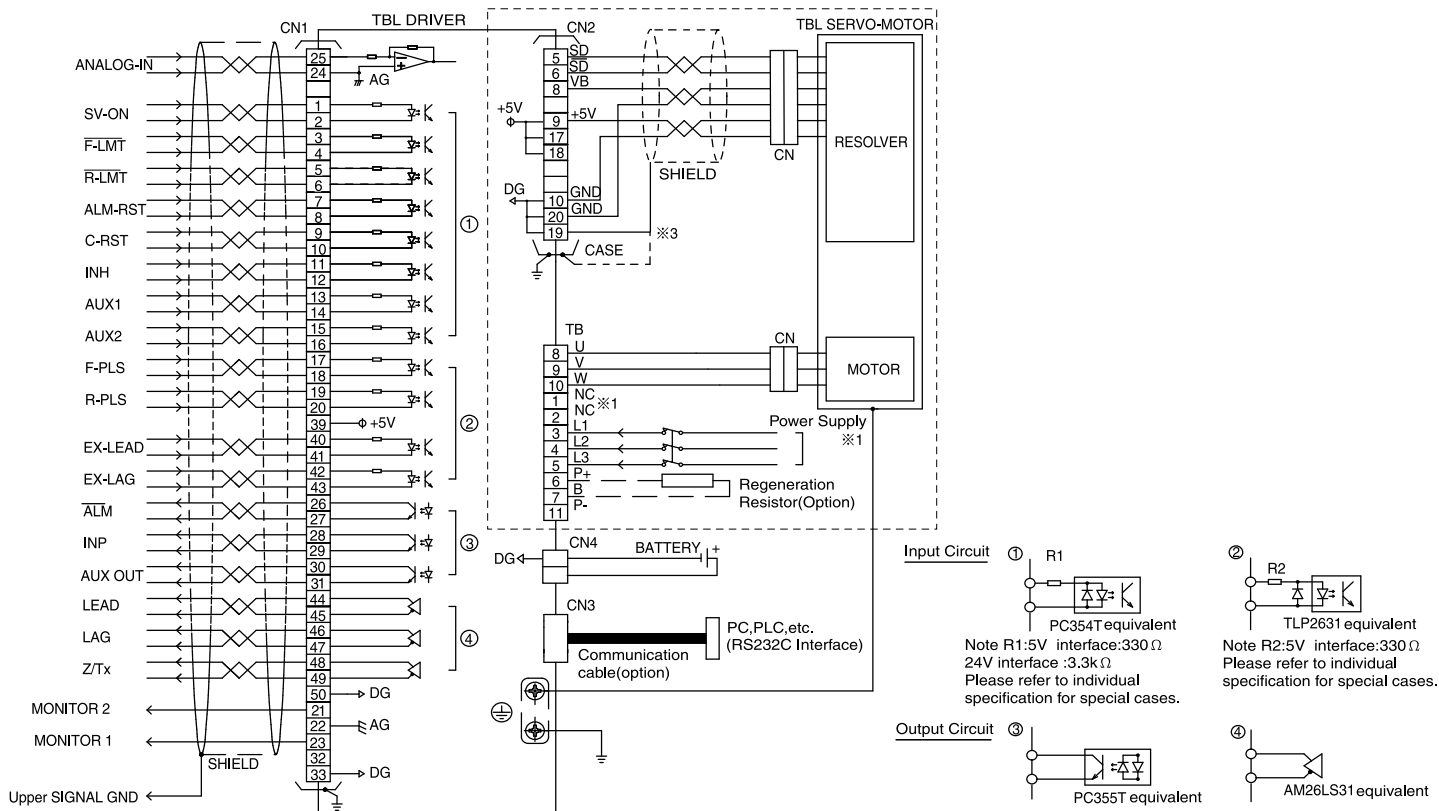
■ Model-Specific Specifications (classified by N number) [I/F Voltage: 24V (5V command pulse) Sensor: 17bit encoder]

N Number Models	N331	N332	N333	N334	N341	N342	N343	N344
AC Power Input	AC100/115V ± 10% 50/60Hz				AC200/230V ± 10% 50/60Hz (Single Phase/3phase)			
Rated Output Current (Arms)	1	2	4	6	1	2	4	6
Instantaneous Maximum Current (Arms)	3.39	5.66	11.3	17.0	3.39	5.66	11.3	17.0
Motor Output (reference)	(50W)	(100W)	(200W)	(400W)	(100W)	(200W)	(600W)	(750W)

Functions and Features

FUNCTIONS	Protective functions	Hardware Error	Excess-speed, power element error (excess current), Sensor error, drive power supply error, EEPROM error, CPU error, etc.
		Software Error	Overload, differential counter overflow, etc.
	Display and Setting		4-digit LED display, 6 setting buttons Display control mode, alarm and control signal input status.
	Parameter Settings		The following parameters can be set on the front setting board. · Control mode · Speed limit · Acceleration limit · Position loop gain · Current limit · Encoder division setting · Speed loop gain · In-position range · Electronic gear ratio · Speed loop integral gain · Analog command scale · Excess speed alarm bell · Feed forward amount · Analog command scale offset · Overload alarm bell · Resonance filter · Zero clamp voltage
	Positioning Accuracy		± 1 pulse or less (command standard)
	Speed Control Range		1:5000
	Auto-Tuning		Built in. Performed by changing modes
	Electronic Gear		Position control is performed by comparing the command pulse multiplied by N/M with the sensor resolution. N, M=1 ~ 9999
	Gain-switch Function		Possible to switch control gain by position deviation and speed deviation. Switching by signal input is also possible.
	External Encoder Input		Full closed position control is possible by feeding back a load shaft encoder.
	Acceleration Limit		Controls acceleration/deceleration below setting value when speed control mode is on.
	Zero clamp Function		Speed / Current command is set to "0" when analog command is below setting value.
Recommended Load Inertia		JL ≤ 30LM	
Rotation Direction		Both directions. CCW rotation viewed from a motor shaft end is standard.	
Regeneration Function		Regeneration circuit is built in. External resistor(option)	
Dynamic Brake		Built in. Operating conditions are set by parameters.	

External Connections



※1 Do not connect anything to the terminal 1 and 2 (Non-connection)

※2 Supply voltage and I/F voltage vary depending on N number models. Combinations are shown below.

※3 Connecting a sensor shield to DG is recommended. However, there are cases connecting to CN2-CASE may boost noise strength

Power can be supplied to a single phase source or a 3 phase source. (Connect to L1 and L3 when a single phase source is used)

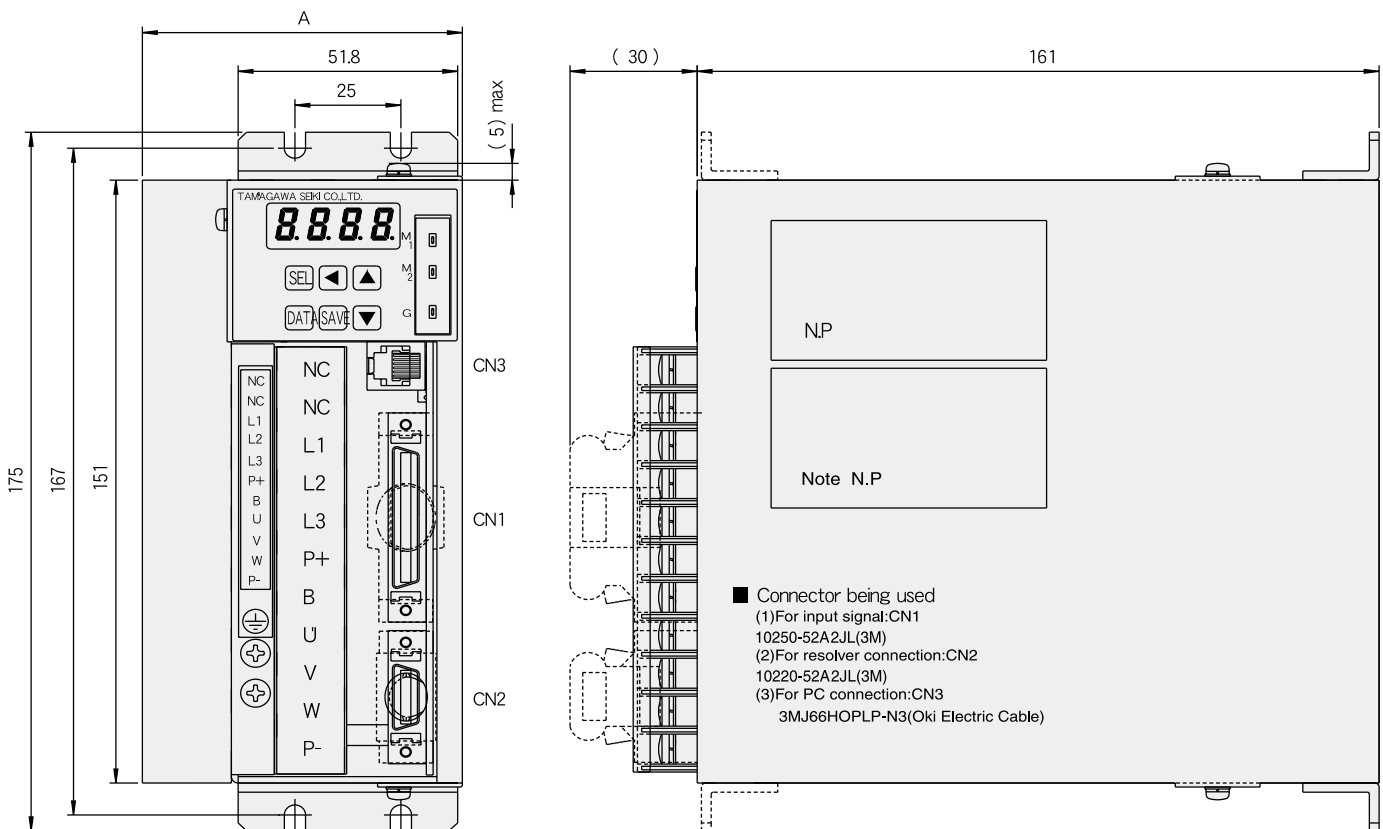
TAB110N3※ □ Special mechanical specifications
 Rated Current. For details, please refer to individual specification.
 I/F Voltage Supply voltage
 1 : I/F Voltage 5V Supply voltage AC100V
 2 : I/F Voltage 5V Supply voltage AC200V
 3 : I/F Voltage 24V Supply voltage AC100V
 4 : I/F Voltage 24V Supply voltage AC200V

Input/Output Signals

I/O	Name	Description		
INPUT SIGNALS	SV-ON	"1": Servo operation on, "0": Servo off"		
	F-LMT	Stops rotation toward CCW when "0".	"1" :photo coupler ON "0" :photo coupler OFF	
	R-LMT	Stops rotation toward CW when "0". Possible to change logic		
	ALM-RST	Alarm reset when "1".		
	C-RST	Differential counter reset when "1".		
	INH	Acceptance of command pulse inhibited when "1".		
	AUX1	Auxiliary command input		
	AUX2	Auxiliary command input		
	F-PLS	CCW Pulse command	Pulse command	f ≤ 500kHz
	R-PLS	CW Pulse command	Rotation command	
	ANALOG-IN	Analog command input(± 10V)		
EX-LEAD	Connect gain signals to LEAD and loss signals to LAG when a		f ≤ 500kHz	
EX-LAG	LEAD/LAG signal input motor of a load shaft encoder is CCW rotation.			
OUTPUT SIGNALS	ALM	"0" when alarm is generated,"1" when normal.	"1":photo coupler ON	
	INP	"1" when position deviation is less than setting value.	"0:photo coupler OFF (50mA max)	
	AUX OUT	Auxiliary signal output		
	LEAD	Outputs by dividing accordingly pulses from motor encoder.	Line driver output	
	LAG	Resolution setting (SEOUT=2~8192C/T) or outputs by dividing pulses from external encoder by N/8192. N=1~8192		
Z	Outputs "Z" signal from motor encoder or from external encoder.			
MONITOR-1	Monitors ①motor current ②motor rotation speed feedback,etc.			
MONITOR-2	Contents of monitoring and scales are set by parameters.			

Outline

Model	A(mm)	Model	A(mm)
TA8110 N3*1	58.5mm	TA8110 N3*3	75.5mm
TA8110 N3*2		TA8110 N3*4	



Note : Front installation is also possible by moving the installation bracket.
Allowed deviation from given dimensions: ± 1

List of Standard Models Model numbers for this driver are assigned as described here.

TA8110N□□□□E□□□

Series Name

Rated Output
Current

- 1 : 1Arms
- 2 : 2Arms
- 3 : 4Arms
- 4 : 6Arms

Special Hardware
& Specifications:
Generally not
specified

I/F Voltage, Input Power Supply

- 1 : 5V, AC100V/AC115V
- 2 : 5V, AC200V/AC230V
- 3 : 24V, AC100V/AC115V
- 4 : 24V, AC200V/230V

Sensor Specifications

- N3□□□□E1□□ : 17bit Absolute encoder
- N3□□□□E2□□ : 17bit Incremental encoder

Model of Standard Motor

- 31 : TS4601 (30W-200V)
- 32 : TS4602 (50W-200V)
- 33 : TS4603 (100W-200V)
- 36 : TS4606 (100W-200V)
- 37 : TS4607 (200W-200V)
- 39 : TS4609 (400W-200V)
- 41 : TS4611 (200W-200V)
- 42 : TS4612 (400W-200V)
- 43 : TS4613 (600W-200V)
- 44 : TS4614 (750W-200V)
- 51 : TS4601 (30W-100V)
- 52 : TS4602 (50W-100V)
- 53 : TS4603 (100W-100V)
- 56 : TS4606 (100W-100V)
- 57 : TS4607 (200W-100V)
- 46 : TS4611 (200W-100V)
- 59 : TS4609 (400W-100V)

*Not applicable to special specifications or special motors.

List of *TBL-i* Series Motor Compatible Driver Combinations

● 200V 17bit Incremental encoder

AC Servo Motor Output	AC Servo Motor Model 200V Type		Compatible driver Model	
	Without Brake	With Brake	5V Input Signal	24V Input Signal
30W	TS4601N10**E200	TS4601N60**E200	TA8110N321E231	TA8110N341E231
50W	TS4602N10**E200	TS4602N60**E200	TA8110N321E232	TA8110N341E232
100W	TS4603N10**E200	TS4603N60**E200	TA8110N321E233	TA8110N341E233
	TS4606N10**E200	TS4606N60**E200	TA8110N321E236	TA8110N341E236
200W	TS4607N10**E200	TS4607N60**E200	TA8110N322E237	TA8110N342E237
	TS4611N10**E200	TS4611N60**E200	TA8110N322E241	TA8110N342E241
400W	TS4609N10**E200	TS4609N60**E200	TA8110N323E239	TA8110N343E239
	TS4612N10**E200	TS4612N60**E200	TA8110N323E242	TA8110N343E242
600W	TS4613N10**E200	TS4613N60**E200	TA8110N324E243	TA8110N344E243
750W	TS4614N10**E200	TS4614N60**E200	TA8110N324E244	TA8110N344E244

● 100V 17bit Incremental encoder

AC Servo Motor Output	AC Servo Motor Model 100V Type		Compatible driver Model	
	Without Brake	With Brake	5V Input Signal	24V Input Signal
30W	TS4601N10**E100	TS4601N60**E100	TA8110N311E251	TA8110N331E251
50W	TS4602N10**E100	TS4602N60**E100	TA8110N311E252	TA8110N331E252
100W	TS4603N10**E100	TS4603N60**E100	TA8110N312E253	TA8110N332E253
	TS4606N10**E100	TS4606N60**E100	TA8110N312E256	TA8110N332E256
200W	TS4607N10**E100	TS4607N60**E100	TA8110N313E257	TA8110N333E257
	TS4611N10**E100	TS4611N60**E100	TA8110N313E246	TA8110N333E246
400W	TS4609N10**E100	TS4609N60**E100	TA8110N314E259	TA8110N334E259

● 200V 17bit Absolute encoder

AC Servo Motor Output	AC Servo Motor Model 200V Type		Compatible driver Model	
	Without Brake	With Brake	5V Input Signal	24V Input Signal
30W	TS4601N20**E200	TS4601N70**E200	TA8110N321E131	TA8110N341E131
50W	TS4602N20**E200	TS4602N70**E200	TA8110N321E132	TA8110N341E132
100W	TS4603N20**E200	TS4603N70**E200	TA8110N321E133	TA8110N341E133
	TS4606N20**E200	TS4606N70**E200	TA8110N321E136	TA8110N341E136
200W	TS4607N20**E200	TS4607N70**E200	TA8110N322E137	TA8110N342E137
	TS4611N20**E200	TS4611N70**E200	TA8110N322E141	TA8110N342E141
400W	TS4609N20**E200	TS4609N70**E200	TA8110N323E139	TA8110N343E139
	TS4612N20**E200	TS4612N70**E200	TA8110N323E142	TA8110N343E142
600W	TS4613N20**E200	TS4613N70**E200	TA8110N324E143	TA8110N344E143
750W	TS4614N20**E200	TS4614N70**E200	TA8110N324E144	TA8110N344E144

● 100V 17bit Absolute encoder

AC Servo Motor Output	AC Servo Motor Model 100V Type		Compatible driver Model	
	Without Brake	With Brake	5V Input Signal	24V Input Signal
30W	TS4601N20**E100	TS4601N70**E100	TA8110N311E151	TA8110N331E151
50W	TS4602N20**E100	TS4602N70**E100	TA8110N311E152	TA8110N331E152
100W	TS4603N20**E100	TS4603N70**E100	TA8110N312E153	TA8110N332E153
	TS4606N20**E100	TS4606N70**E100	TA8110N312E156	TA8110N332E156
200W	TS4607N20**E100	TS4607N70**E100	TA8110N313E157	TA8110N333E157
	TS4611N20**E100	TS4611N70**E100	TA8110N313E146	TA8110N333E146
400W	TS4609N20**E100	TS4609N70**E100	TA8110N314E159	TA8110N334E159

System Component

No-fuse circuit breaker

Used to protect the power supply line.

Noise filter(NF)

Used to reduce noise from the power supply line.

Magnetic contactor(MC)

Used to turn on/off the Servo driver's main power supply.

Power factor enhancing reactor

Regeneration resistance unit

Ground

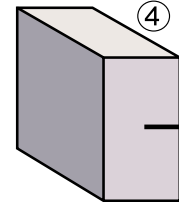
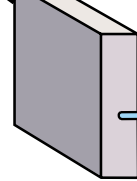
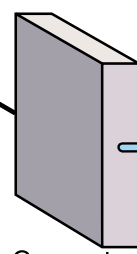
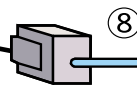
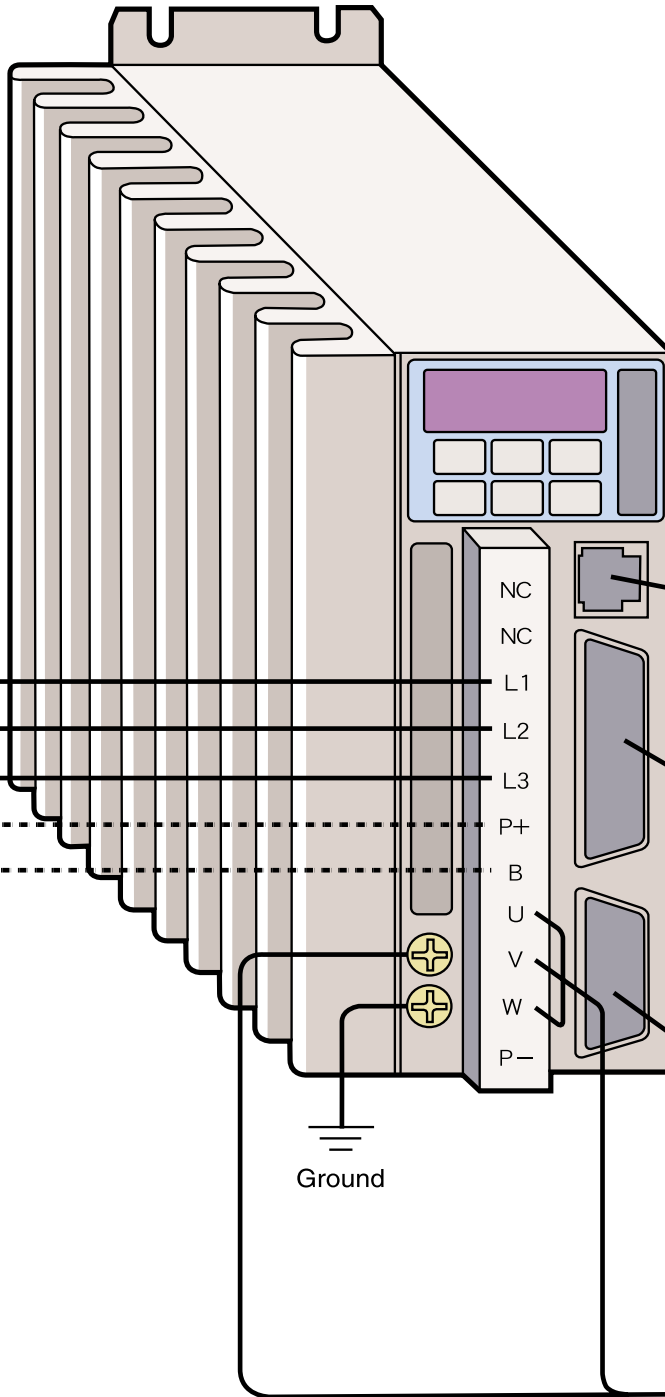
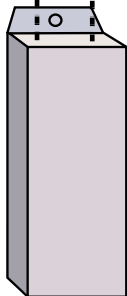
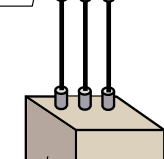
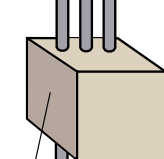
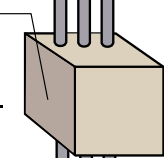
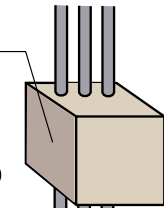
Motor cable

Brake power supply

PC Communication cable

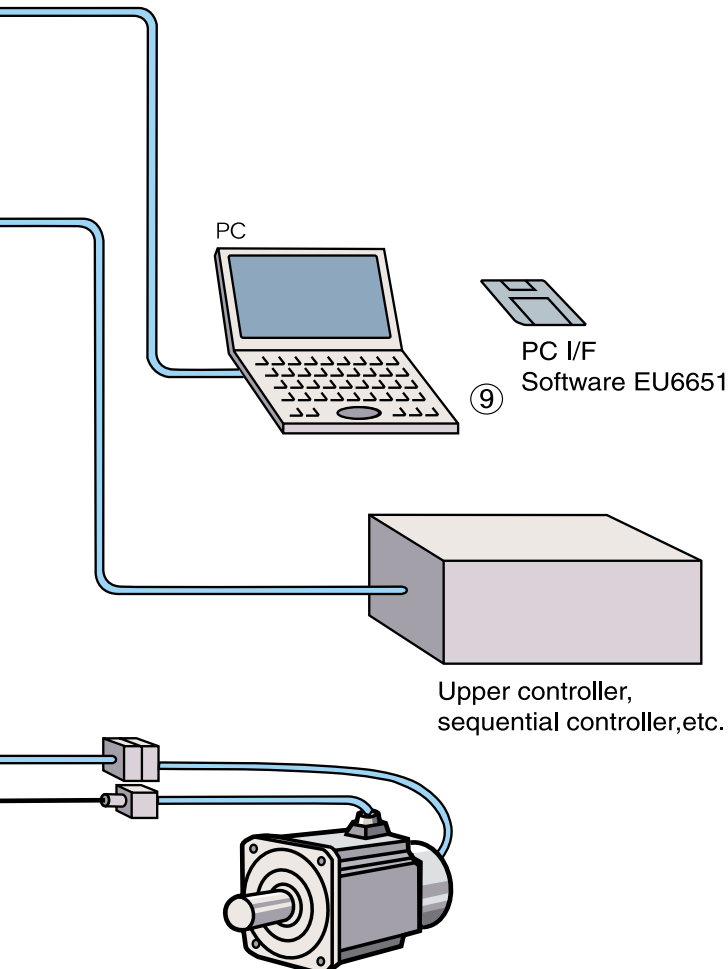
Connector for external equipment or I/O connector (10250-52A2JL(3M))

Sensor cable



	Name	Model	Note
①	Noise filter	SUP-PIOH-EIPR-* (made by Okaya Denki Sangyo)	※1 Recommended product
②	Power factor enhancing reactor	FR-BAL-0.75K (made by Mitsubishi Electric)	※1 Recommended product
③	Regeneration resistance unit	EU6656N1	80W-47Ω type
④	Motor cable	EU9250N30	Lead $l = 3.0\text{m}$
		EU9250N50	Lead $l = 5.0\text{m}$
		EU9250N100	Lead $l = 10.0\text{m}$
		EU9250N150	Lead $l = 15.0\text{m}$
⑤	Sensor cable	EU9251N30	Lead $l = 3.0\text{m}$
		EU9251N50	Lead $l = 5.0\text{m}$
		EU9251N100	Lead $l = 10.0\text{m}$
		EU9251N150	Lead $l = 15.0\text{m}$
⑥	Input connector I/O connector only : CN1	19250-52A2JL(3M)	Without a lead
⑥,⑦	Connector set (CN1,CN2)	EU6657N1	Without a lead
⑧	PC Communication cable	EU6517N2	Lead $l = 2.0\text{m}$
⑨	PC I/F Software	EU6651	Possible to download from our home page

Note : * 1 To order the recommended products, customers should contact the relevant manufacturer directly.

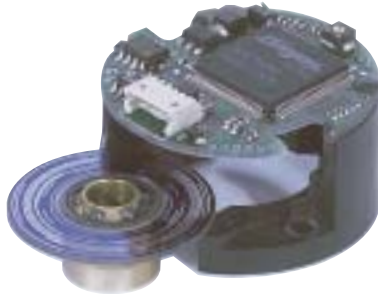


Patent pending

Smart Inc
Smart Inc

TS5668N20

SI35 Series



Application

- For small to middle wattage motors
- Robots
- Machine tools
- Injection machines

Features

- Full absolute signal output
- 17bit/turn(At 100s⁻¹ Max)
- Two-way serial communication type(NRZ)
- E² PROM memory is open for users.
8bit × 80address=640bit Max
- Fail-check operation
- Small model(φ 35)

Patent pending

Smart Abs
Smart Abs®

TS5669N220

SA35 Series



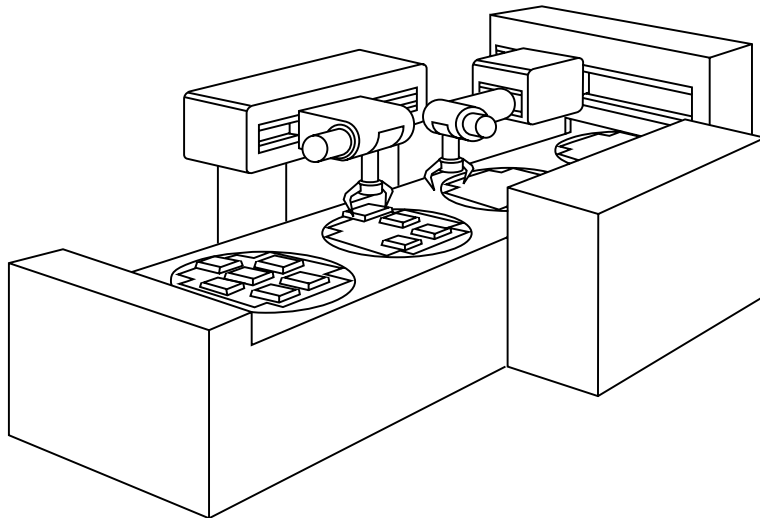
Application

- For small to middle wattage motors
- Robots
- Machine tools
- Injection machines

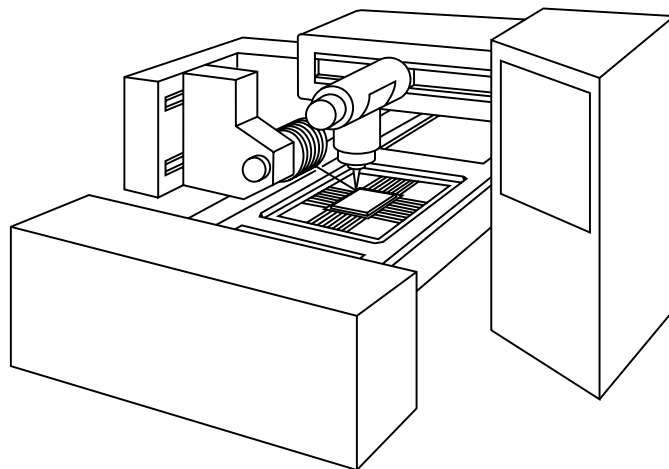
Features

- Full absolute signal output
- 17bit/turn. 16bit turns(At 100s⁻¹ Max)
- Two-way serial communication type(NRZ)
- E² PROM memory is open for users.
8bit × 80address=640bit Max
- Fail-Check Operation
- Even during power outage, multi-turn data are backed up by external battery.

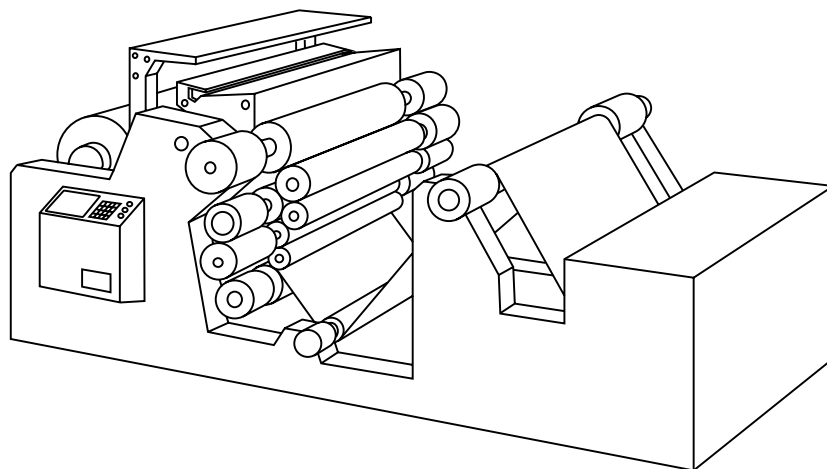
● Mounters



● Semiconductor manufacturing equipment



● Printing machines





TAMAGAWA TRADING CO.,LTD.

A COMPANY OF TAMAGAWA SEIKI CO.,LTD.

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WARRANTY

Tamagawa Seiki warrants that this product is free from defects in material or workmanship under normal use and service for a period of one year from the date of shipment from its factory. This warranty, however, excludes incidental and consequential damages caused by careless use of the product by the user. Even after the warranty period, Tamagawa Seiki offers repair service, with charge, in order to maintain the quality of the product. The MTBF (mean time between failures) of our product is quite long; yet, the predictable failure rate is not zero. The user is advised, therefore, that multiple safety means be incorporated in your system or product so as to prevent any consequential troubles resulting from the failure of our product.



● URL <http://www.tamagawa-seiki.co.jp>

ALL specifications are subject to change without notice.

02.2

T12-1608. 2,000. 2002.2