TBL-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

Tamagawa **TAMAGAWA SEIKI CO., LTD.**

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

■ Contents

■ Main Features

■ The Reduction of Setting Time

■ **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

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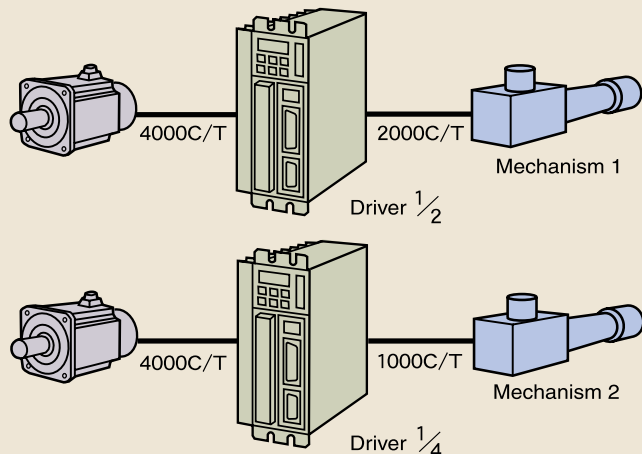
Speed

Setting Time

Command pattern

TBL- i II

Existing motor

Time

Sharp reduction
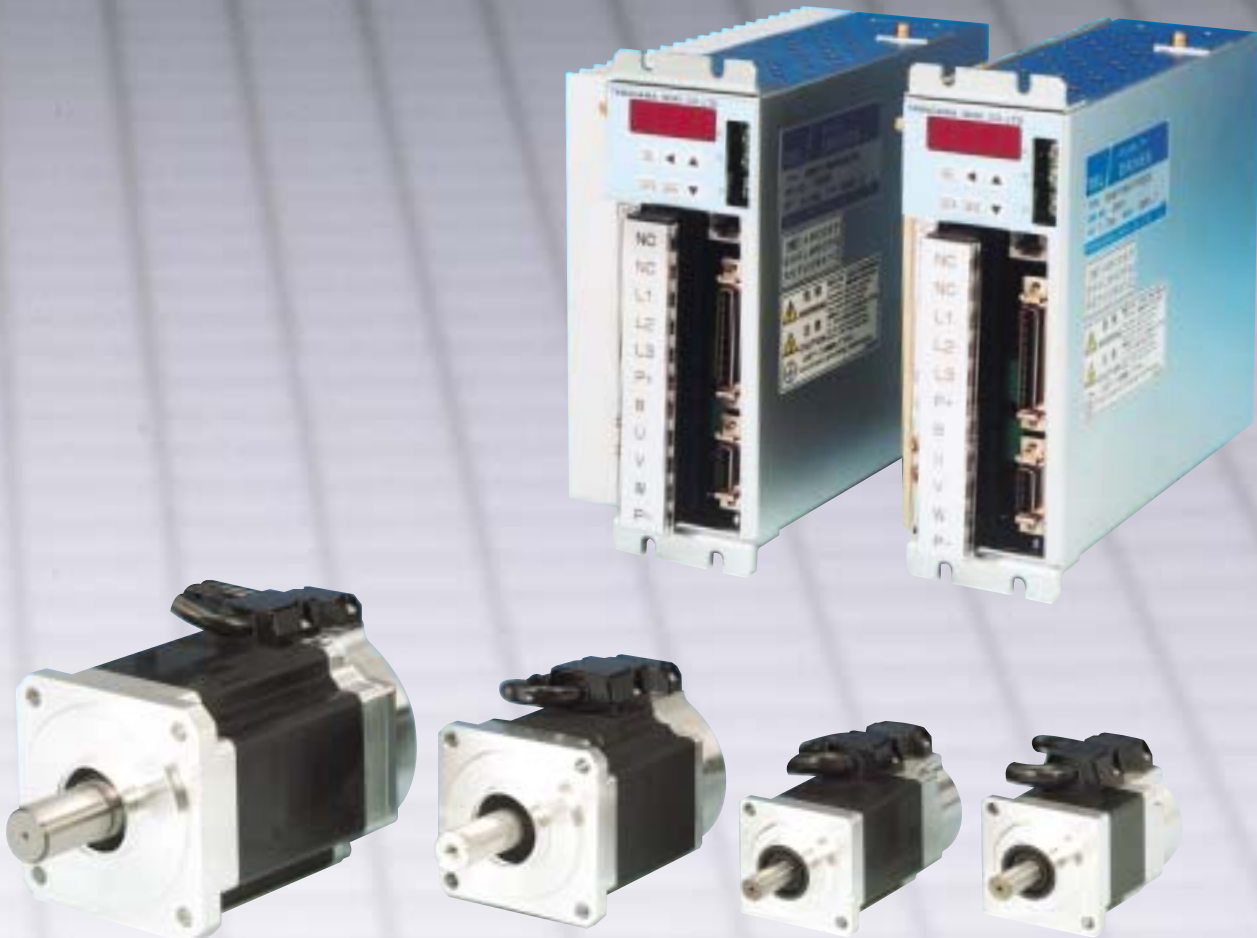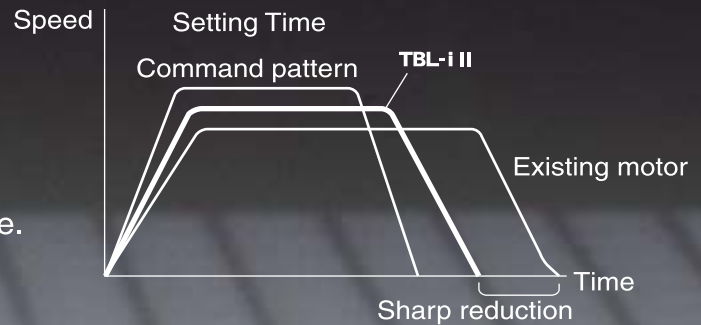
■ AC Servo System

A pulse resolution change function

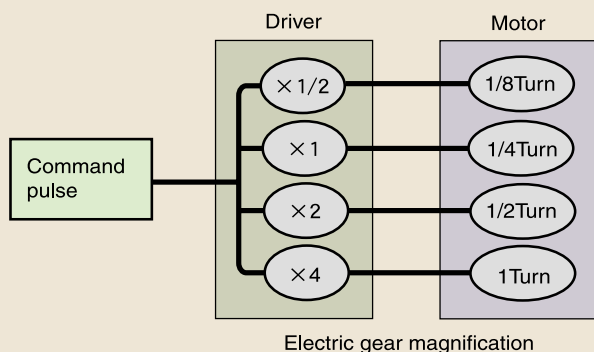● Possible to easily divide pulses of encoder signals by changing parameters

4000C/T   2000C/T   Mechanism 1

Driver $\frac{1}{2}$

4000C/T   1000C/T   Mechanism 2

Driver $\frac{1}{4}$

Personal Computer Interface

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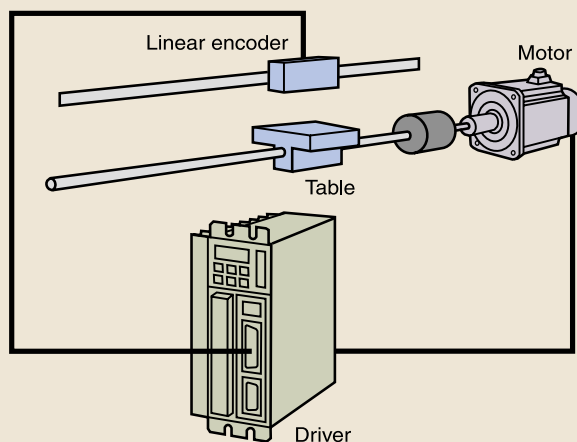
Personal computer

Driver
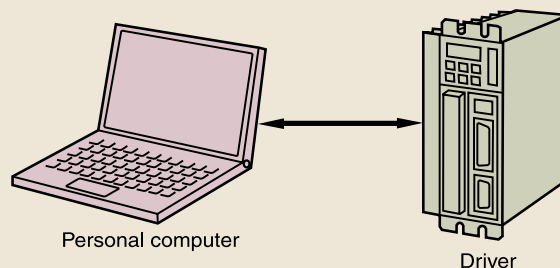
An electronic gear function

● 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.

Driver   Motor

Command pulse

×1/2   1/8Turn
×1   1/4Turn
×2   1/2Turn
×4   1Turn

Electric gear magnification

Signal input from external encoders

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

Linear encoder   Motor

Table

Driver

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.

Driver   Personal computer
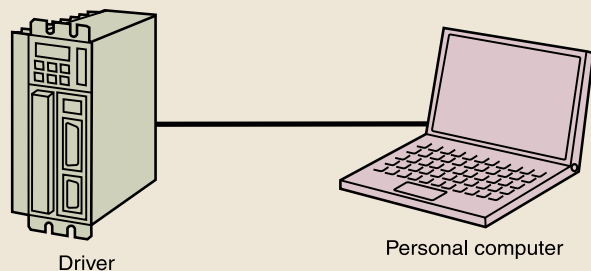
An auto-tuning function

● 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.

Speed   Speed
          Target speed   Target speed

          Speed response   Speed response

          Time   Time
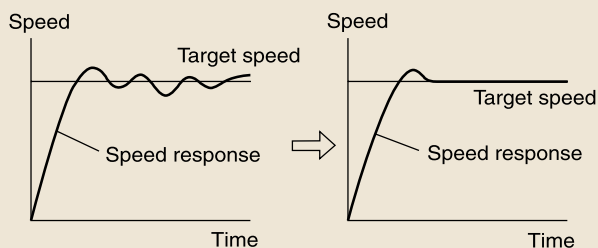
Specifications

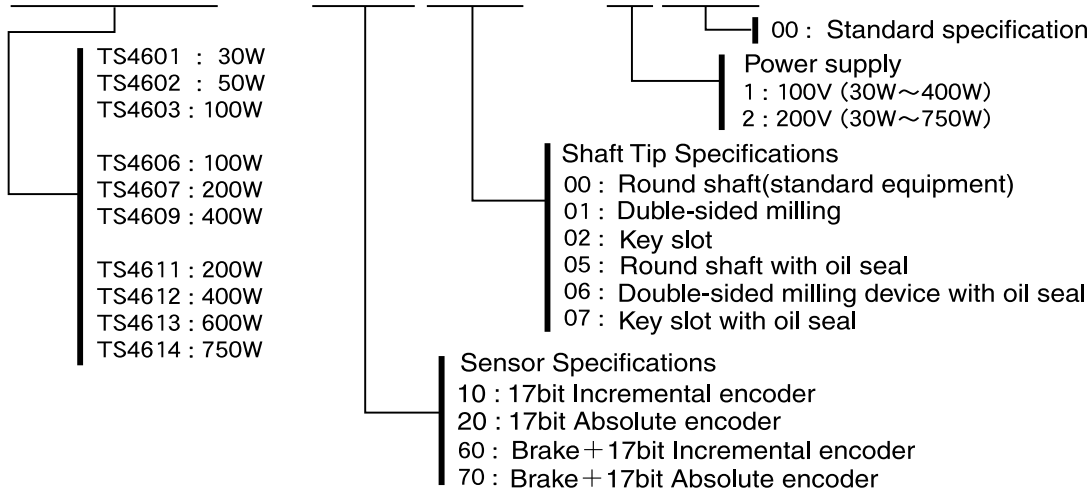| Mounting Flange [mm]	Model	Voltage [V]	Output [W]	Rated Torque [N·m] {kgf·cm}	Maximum Torque [N·m] {kgf·cm}	Rated Current [Arms] (AC100V/ AC200V)	Rated Rotation Speed [r/min]	Maximum Rotation Speed [r/min]	Rotor Inertia [GD^2/4] [kg·m^2] {gf·cm·s^2}	Approximate Mass [kg]
□40	TS4601	100/200	30	0.095 {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□□□

00 : Standard specification

Power supply
1 : 100V (30W～400W)
2 : 200V (30W～750W)

Shaft Tip Specifications
00 : Round shaft(standard equipment)
01 : Duble-sided milling
02 : Key slot
05 : Round shaft with oil seal
06 : Double-sided milling device with oil seal
07 : Key slot with oil seal

Sensor Specifications
10 : 17bit Incremental encoder
20 : 17bit Absolute encoder
60 : Brake＋17bit Incremental encoder
70 : Brake＋17bit Absolute encoder

TS4601 : 30W
TS4602 : 50W
TS4603 : 100W

TS4606 : 100W
TS4607 : 200W
TS4609 : 400W

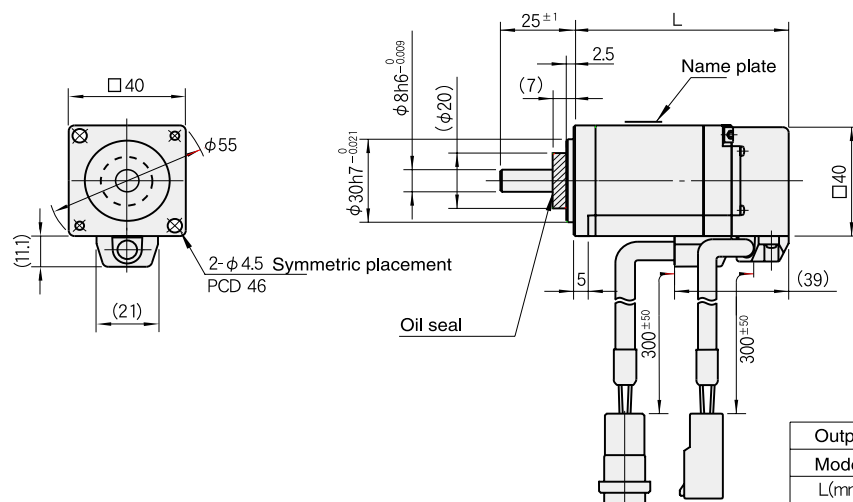TS4611 : 200W
TS4612 : 400W
TS4613 : 600W
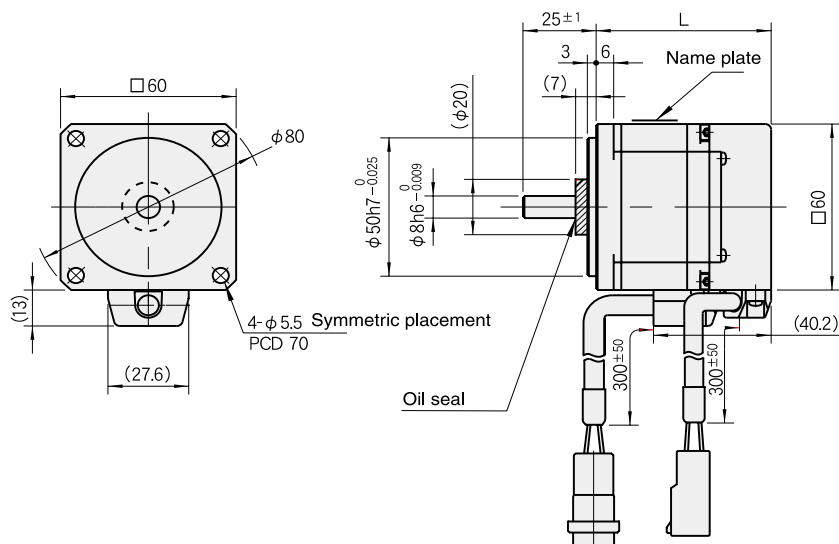TS4614 : 750W

Outline (Standard Type)

●40-mm Square (30W, 50W, 100W)

L:Variable dimension table

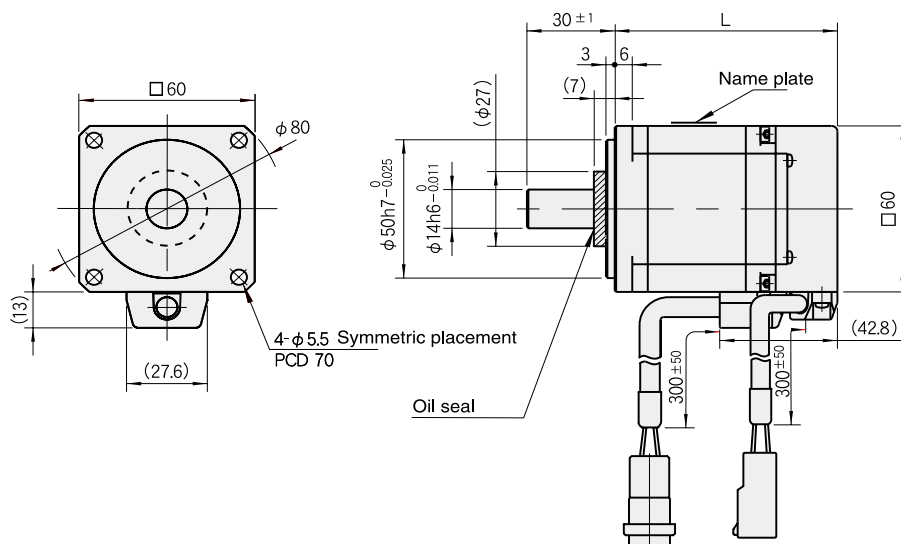| Output	30W	50W	100W
Model	TS4601	TS4602	TS4603
L(mm)	53	59	73

●60-mm Square (100W)

L:Variable dimension table

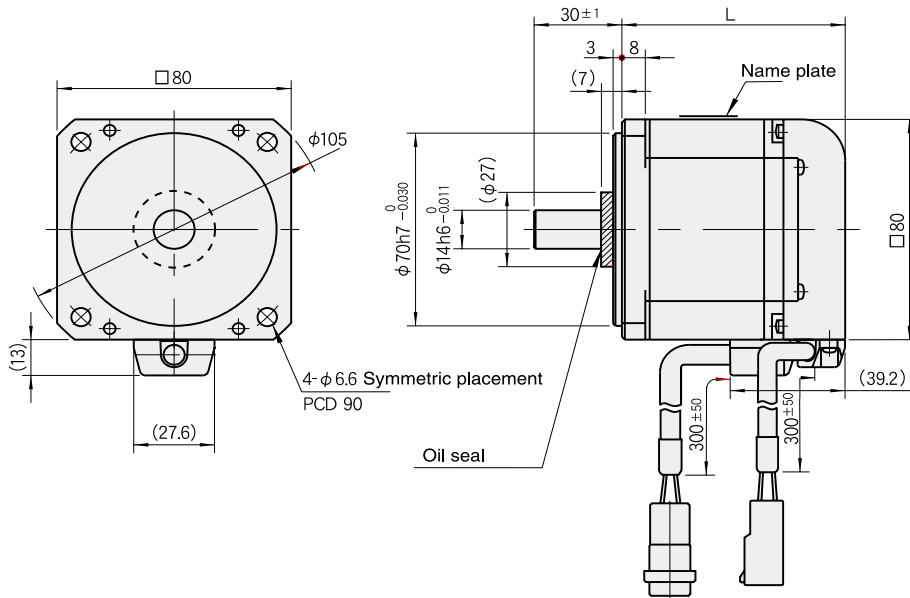| Output	100W
Model	TS4606
L(mm)	59

●60-mm Square (200W, 400W)

L:Variable dimension table

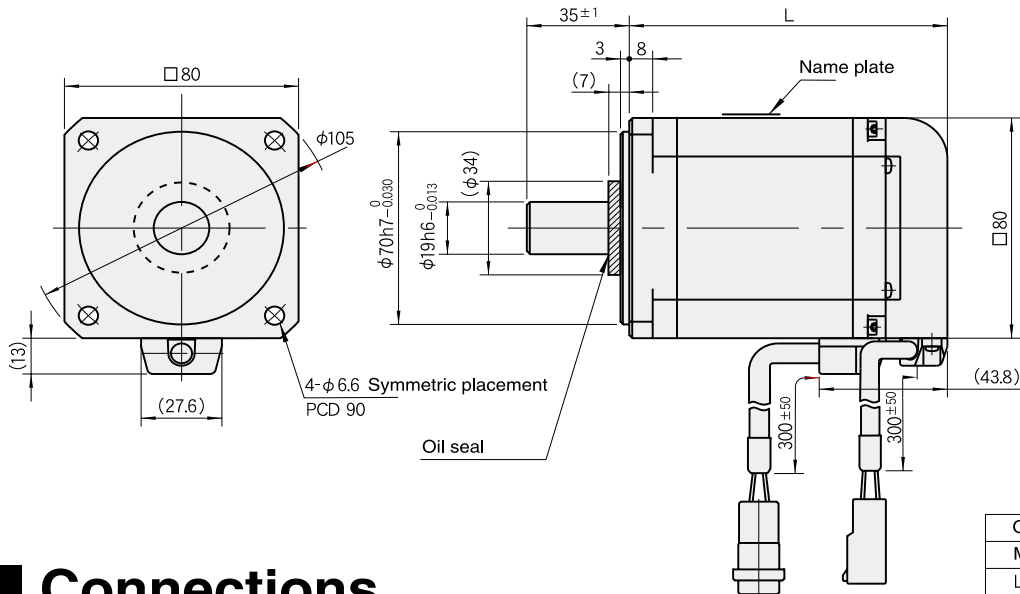| Output	200W	400W
Model	TS4607	TS4609
L(mm)	76	98

● 80-mm Square (200W, 400W)

L:Variable dimension table

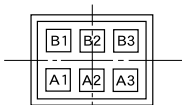| Output	200W	400W
Model	TS4611	TS4612
L(mm)	64	76

● 80-mm Square (600W, 750W)

L:Variable dimension table

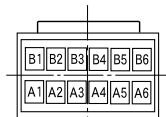| Output	600W	750W
Model	TS4613	TS4614
L(mm)	99	108

■ Connections

●Motor

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

MOTOR CONNECTION

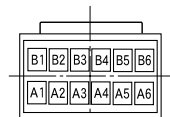| PIN No.	FUNCTION	COLOR
A1	U	RED
A2	V	WHT
A3	W	BLK
B1	C.G	GRN／YEL
B2	——	——
B3	——	——

●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	$\overline{SD}$	BLU／BLK
B4	——	——
B5	GND	BLK
B6	SHILD	SHILD

●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	$\overline{SD}$	BLU／BLK
B4	GND	BRW／BLK
B5	GND	BLK
B6	SHILD	SHILD

■ Outline (with Brake)

● 40-mm Square (30W, 50W, 100W)
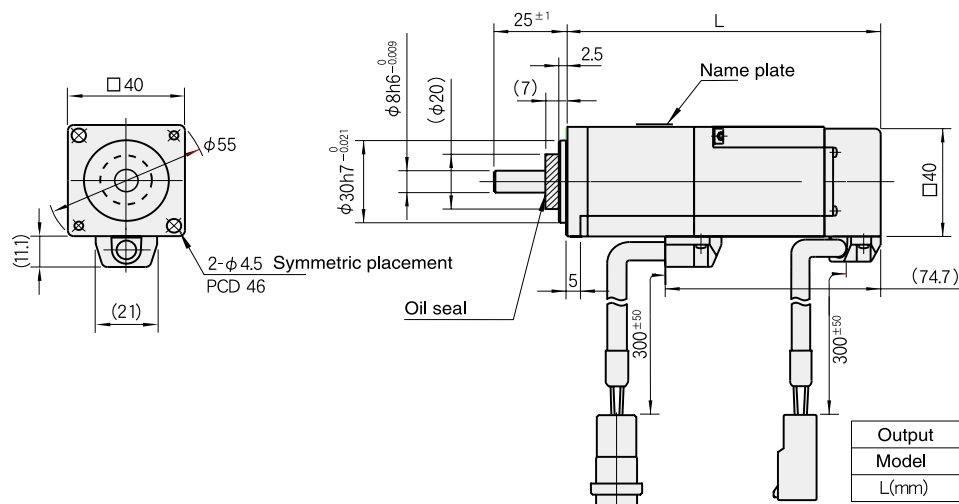
L:Variable dimension table

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

● 60-mm Square (100W)
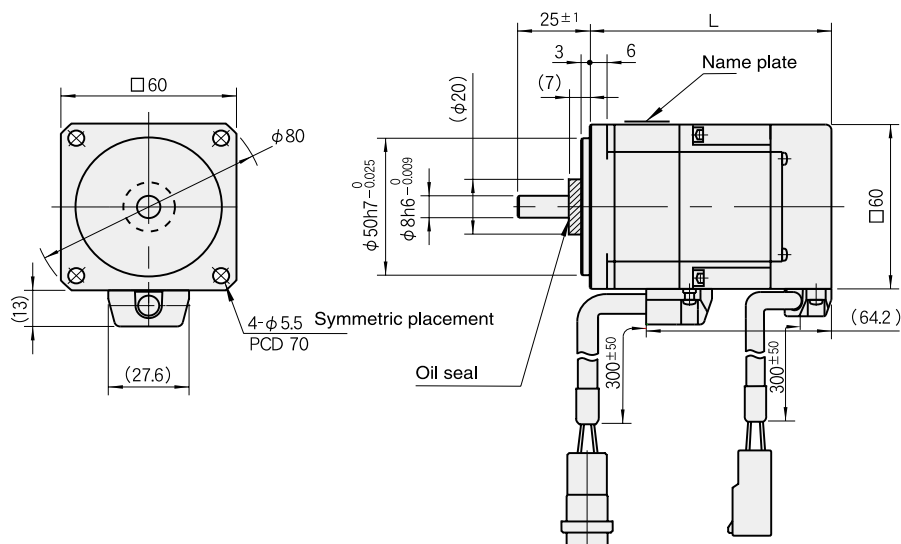
L:Variable dimension table

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

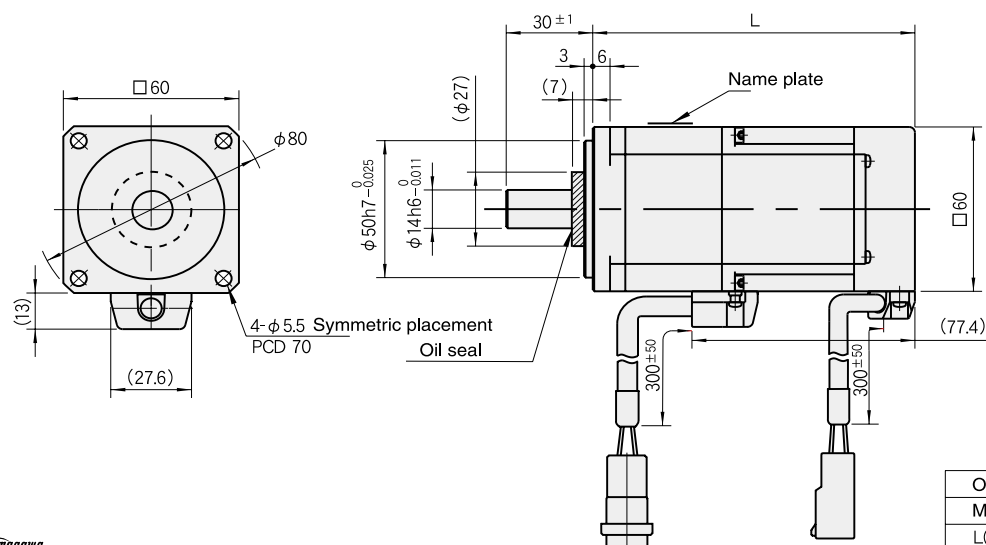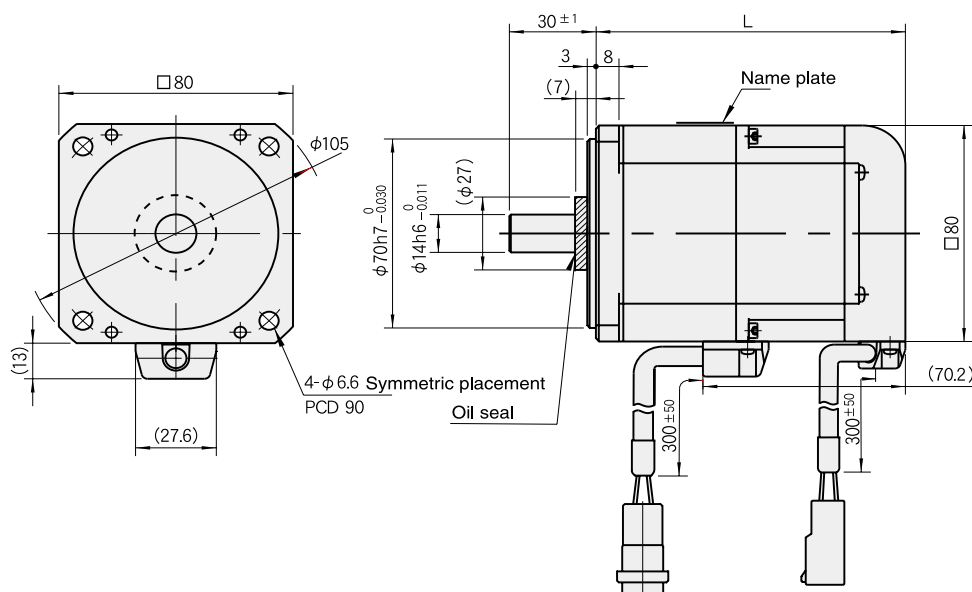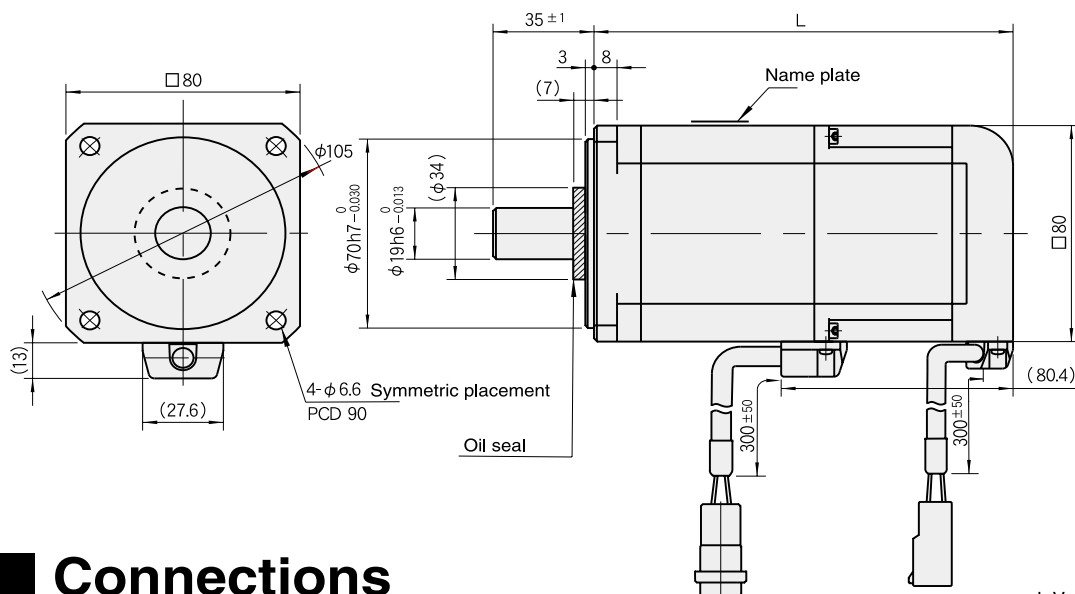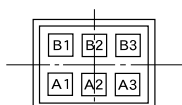## ● 80-mm Square (600W, 750W)

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)17 bit 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	$\overline{SD}$	BLU／BLK
B4	—	—
B5	GND	BLK
B6	SHILD	SHILD

● Sensor
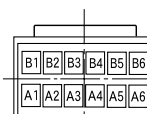
(2)17 bit Abs type

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	$\overline{SD}$	BLU／BLK
B4	GND	BRW／BLK
B5	GND	BLK
B6	SHILD	SHILD

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℃ 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(5Vcommand pulse) Sensor:17bit encoder]

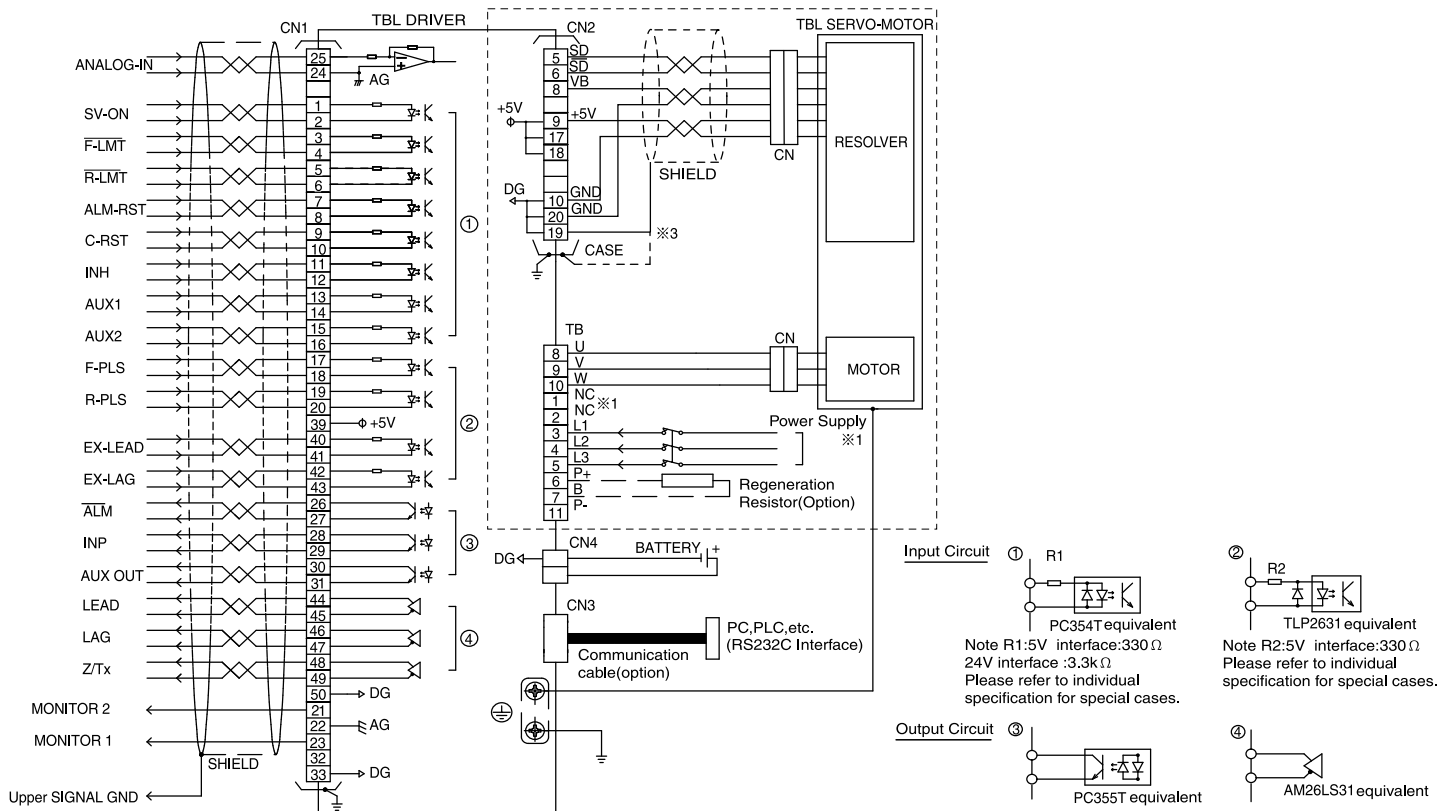| N Number Models	N331	N332	N333	N334	N341	N342	N343	N344
AC Power Input	AC100/115V±10% 50/60Hz				AC200/230V±10% 50/60Hz (Single Phase/3phase)			
Rated Output Current (Arms)	1	2	4	6	1	2	4	6
Instantaneous Maximum Current (Arms)	3.39	5.66	11.3	17.0	3.39	5.66	11.3	17.0
Motor Output(reference)	(50W)	(100W)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

■ Functions and Features

<table>
<tr><td rowspan="13">FUNCTIONS</td><td rowspan="2">Protective functions</td><td>Hardware Error</td><td>Excess-speed, power element error (excess current), Sensor error, drive power supply error, EEPROM error, CPU error,etc.</td></tr>
<tr><td>Software Error</td><td>Overload, differential counter overflow,etc.</td></tr>
<tr><td colspan="2">Display and Setting</td><td>4-digit LED display, 6 setting　buttons
Display control mode, alarm and control signal input status.</td></tr>
<tr><td colspan="2">Parameter Settings</td><td>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</td></tr>
<tr><td colspan="2">Positioning Accuracy</td><td>±1 pulse or less (command standard)</td></tr>
<tr><td colspan="2">Speed Control Range</td><td>1:5000</td></tr>
<tr><td colspan="2">Auto-Tuning</td><td>Built in. Performed by changing modes</td></tr>
<tr><td colspan="2">Electronic Gear</td><td>Position control is performed by comparing the command pulse multiplied by N/M with the sensor resolution.
N,M=1～9999</td></tr>
<tr><td colspan="2">Gain-switch Function</td><td>Possible to switch control gain by position deviation and speed deviation. Switching by signal input is also possible.</td></tr>
<tr><td colspan="2">External Encoder Input</td><td>Full closed position control is possible by feeding back a load shaft encoder.</td></tr>
<tr><td colspan="2">Acceleration Limit</td><td>Controls acceleration/deceleration below setting value when speed control mode is on.</td></tr>
<tr><td colspan="2">Zero clamp Function</td><td>Speed / Current command is set to "0" when analog command is below setting value.</td></tr>
<tr><td colspan="2">Recommended Load Inertia</td><td>JL=≦30LM</td></tr>
<tr><td colspan="2">Rotation Direction</td><td>Both directions. CCW rotation viewed from a motor shaft end is standard.</td></tr>
</table>

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)

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)

※2　Supply voltage and I/F voltage vary depending on N number models. Combinations are shown below.
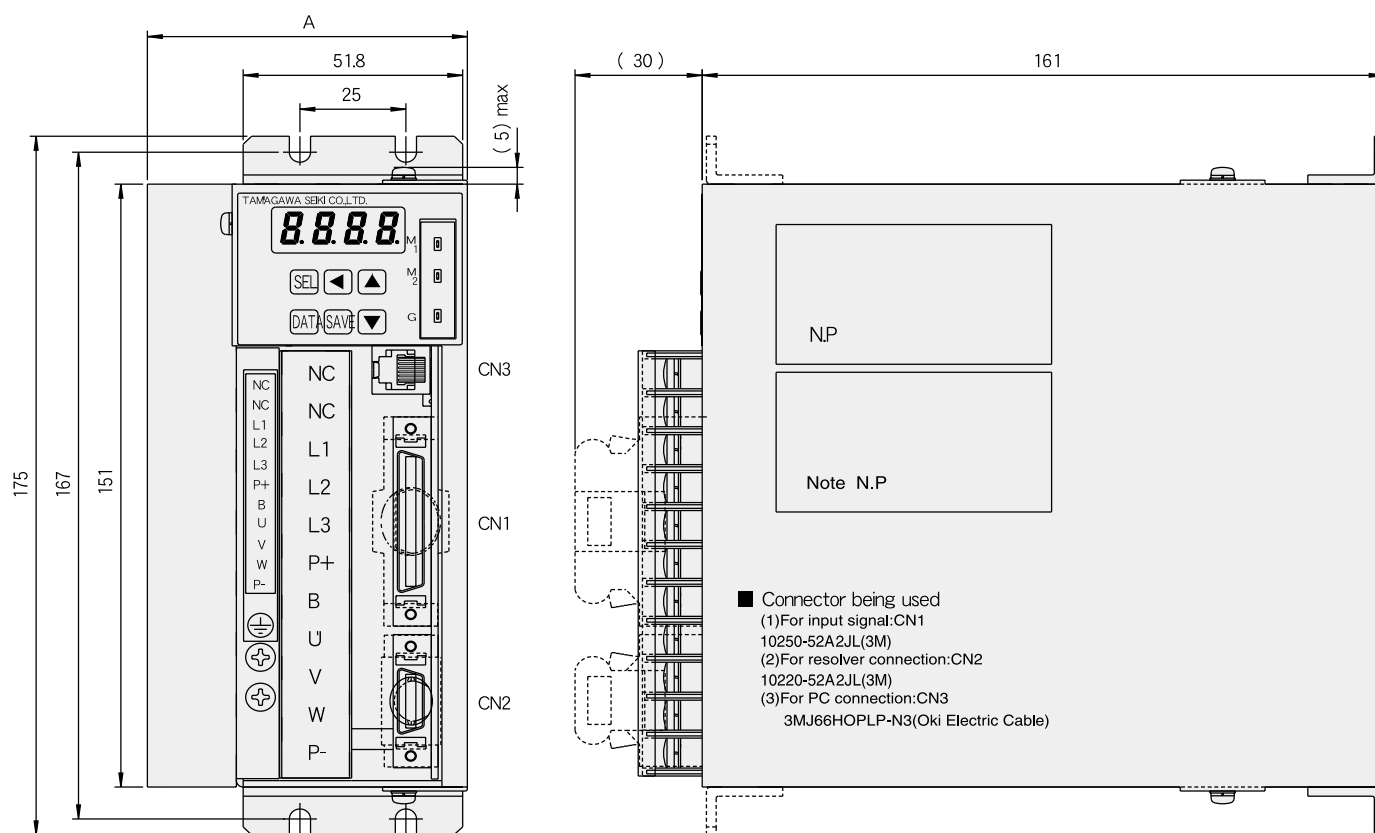
TA8110N3※※□
　└ Special mechanical specifications
　└ Rated Current. For details, please refer to individual specification.
　└ I/F Voltage　　　Supply voltage
　1 : I/F Voltage　5V Supply voltage AC100V
　2 : I/F Voltage　5V Supply voltage AC200V
　3 : I/F Voltage　24V Supply voltage AC100V
　4 : I/F Voltage　24V Supply voltage AC200V

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

■ Input/Output Signals

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

■ Connector being used
(1)For input signal:CN1
10250-52A2JL(3M)
(2)For resolver connection:CN2
10220-52A2JL(3M)
(3)For PC connection:CN3
3MJ66HOPLP-N3(Oki Electric Cable)

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-iII 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

No-fuse circuit breaker

Used to protect the power supply line.

①

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.

②

Power factor enhancing reactor

NC
NC
L1
L2
L3
P+
B
U
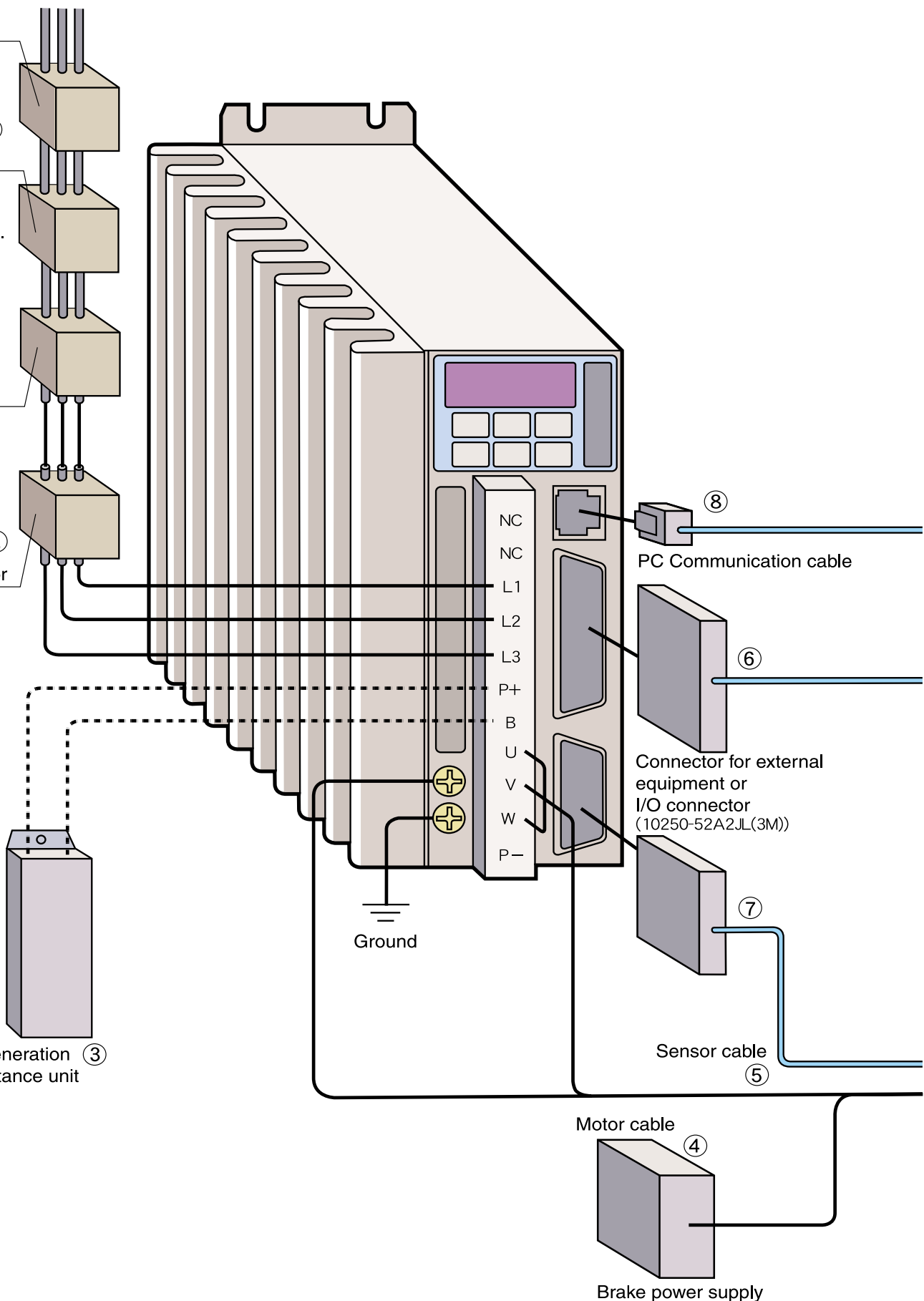V
W
P−

Ground

Regeneration resistance unit ③

⑧

PC Communication cable

⑥

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

⑦

Sensor cable

⑤

Motor cable

④

Brake power supply

	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＝3.0m
		EU9250N50	Lead　ℓ＝5.0m
		EU9250N100	Lead　ℓ＝10.0m
		EU9250N150	Lead　ℓ＝15.0m
⑤	Sensor cable	EU9251N30	Lead　ℓ＝3.0m
		EU9251N50	Lead　ℓ＝5.0m
		EU9251N100	Lead　ℓ＝10.0m
		EU9251N150	Lead　ℓ＝15.0m
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＝2.0m
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.

PC

PC I/F
Software EU6651
⑨

Upper controller,
sequential controller,etc.
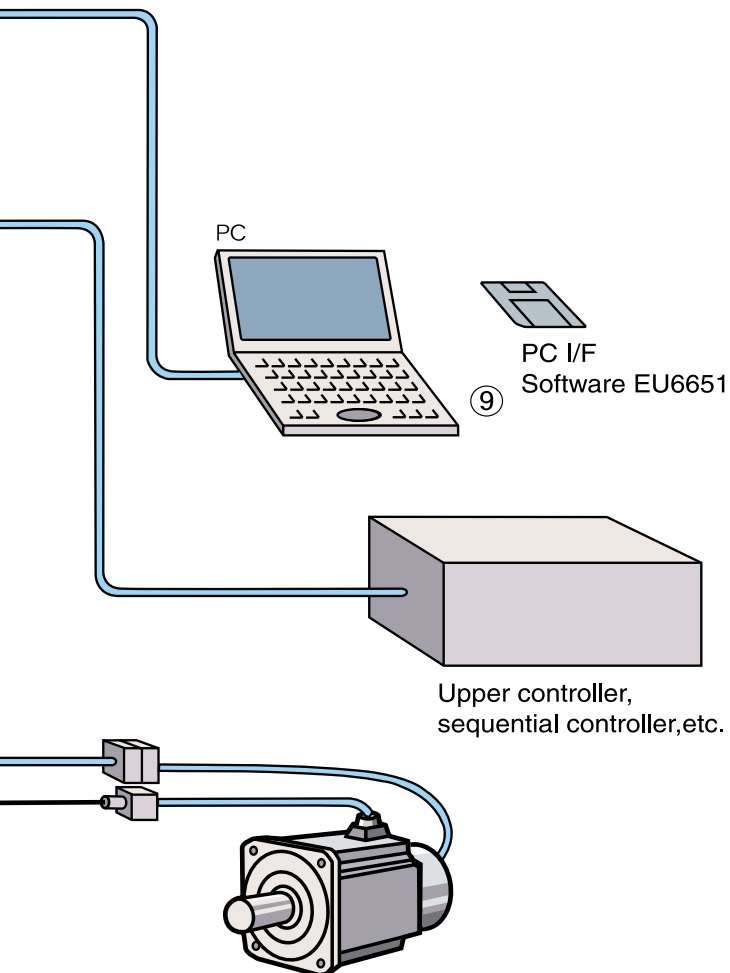
Smart Inc

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)
● E^2 PROM memory is open for users.
    8bit×80address=640bit Max
● Fail-check operation
● Small model(ϕ 35)

Smart Abs

Smart Abs

SmartAbs®

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)
● E^2 PROM memory is open for users.
    8bit×80address=640bit Max
● Fail-Check Operation
● Even during power outage, multi-turn
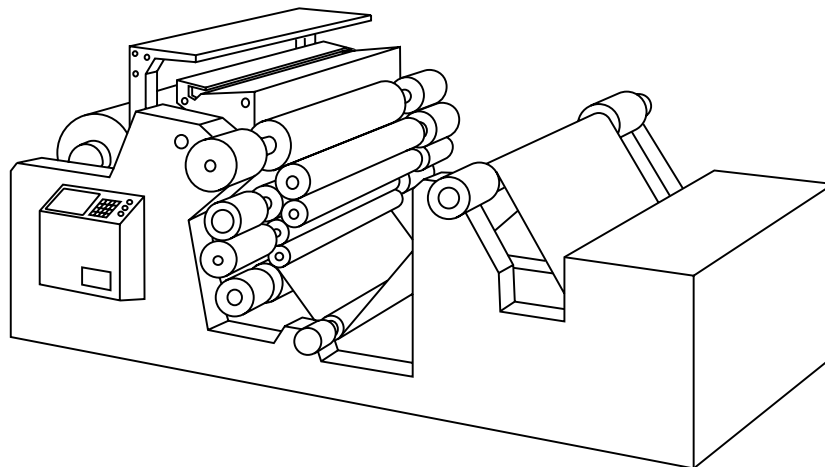   data are backed up by external battery.

● Mounters
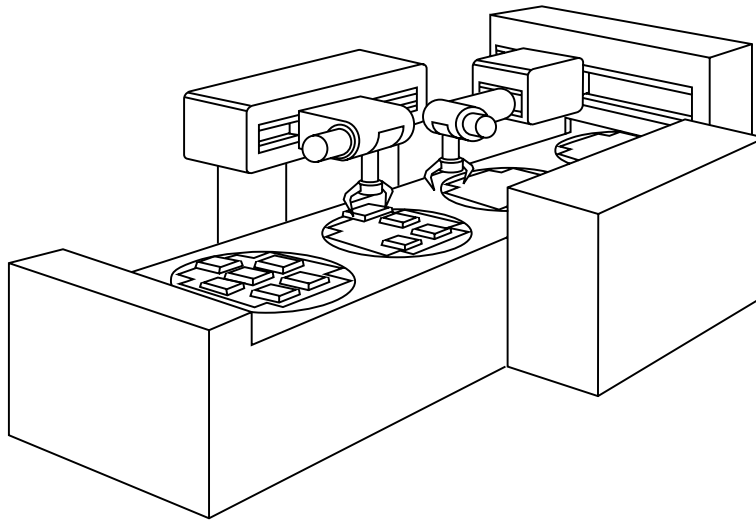
● Semiconductor manufacturing equipment
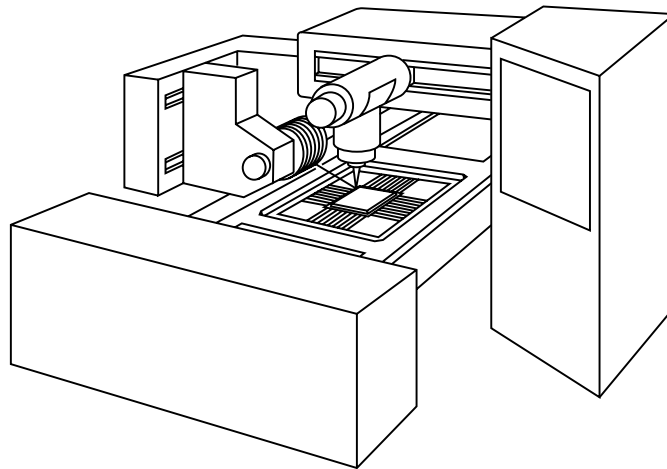
● Printing machines

Tamagawa

TAMAGAWA TRADING CO.,LTD.
A COMPANY OF TAMAGAWA SEIKI CO.,LTD.

HEAD OFFICE:
1879 OHYASUMI, IIDA, NAGANO PREF, 395-8515, JAPAN
PHONE : 0265-21-1840
FAX : 0265-21-1864

TOKYO OFFICE:
3-19-9 SHINKAMATA, OHTA-KU, TOKYO 144-0054, JAPAN
PHONE : 03-3738-3132
FAX : 03-3738-3175

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● URL http://www.tamagawa-seiki.co.jp

ALL specifications are subject to change without notice.

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