

TBL- \dot{i} Series **AC Servo Motor**

Ultra-compact AC Servo Motor

[Responding to low-voltage commands]

[High-accuracy feedback sensor built in]

Easy use and advanced functions are now yours!



TBL-*i* Series

AC Servo Motor

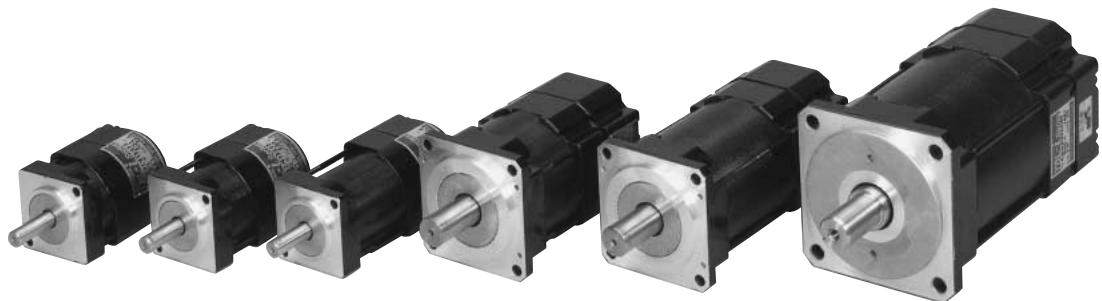
Introducing a New Super Compact AC Servo Motor.

Description

The new **TBL-*i*** Series from Tamagawa Seiki Co.,Ltd. is a super compact AC servo motor developed in line with our goal of a more compact motor. On average, **TBL-*i*** Series motors are about 1/3 the size of conventional TBL-S Series motors in terms of volume. Also, rotor inertia has been optimally designed in anticipation of actual usage loads, giving these motors an optimum power rating given their motor capacity.

Features

- Compact size
- High speed rotation
 - High speed rotation possible to a maximum rotation speed of 5,000 rev/min (Rated rotation speed is 3,000 rev/min)
- Models with built-in absolute encoder and brushless resolver as an optional sensor are also available.
- Minimal-wiring encoder only 9 Wires is formerly are used for the wiring of the encoder. (EN60034-1,EN60034-5)
- Models carrying an absolute encoder (11/24 bit, 17/33 bit) or brushless resolver as an option sensor are available. (Please contact us for details.)



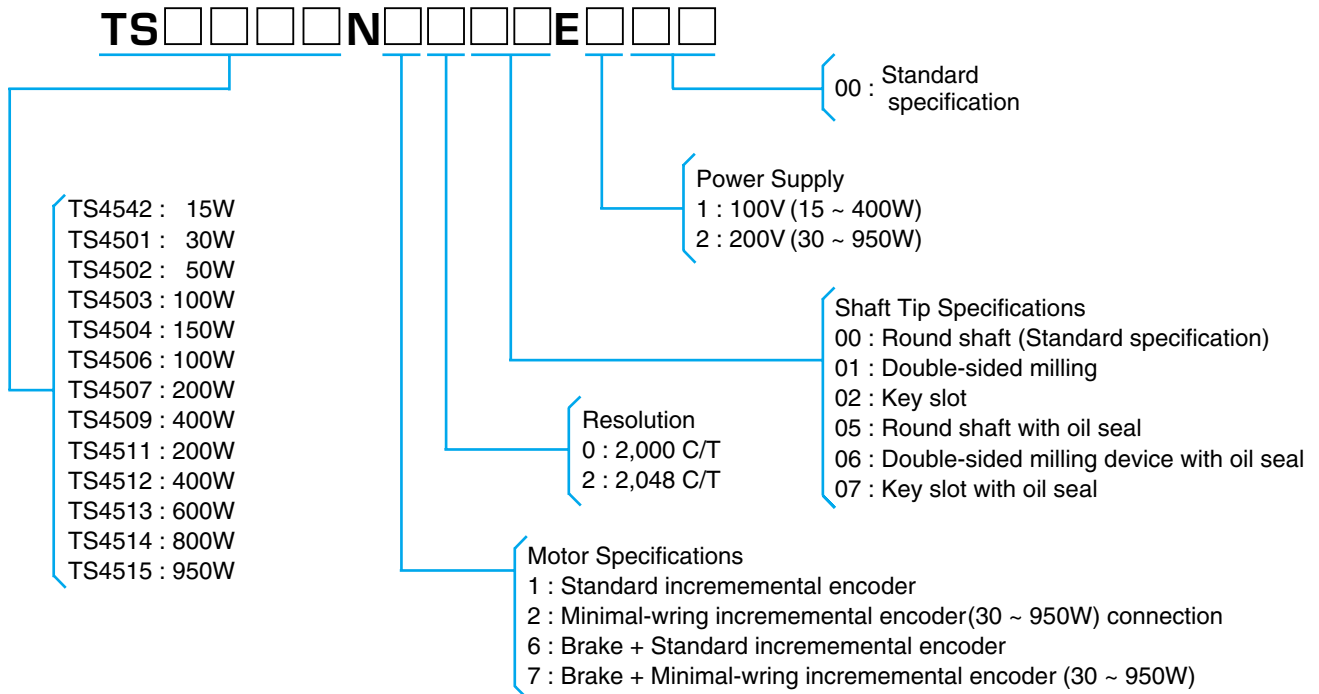
Specifications

Mounting Flange	[mm]	□28		□40		
		Model	TS4542	TS4501	TS4502	TS4503
Voltage	[V]	100	100/200	100/200	100/200	200
Output	[W]	15	30	50	100	150
Rated Torque	[N·m] (kgf·cm)	0.048 (0.47)	0.095 (0.97)	0.159 (1.62)	0.318 (3.25)	0.477 (4.87)
Maximum Torque	[N·m] (kgf·cm)	0.14 (1.47)	0.28 (2.9)	0.48 (4.9)	0.95 (9.7)	1.43 (14.6)
Rated Current	[Arms] [AC100V/AC200V]	0.4	0.6/0.3	0.9/0.5	1.5/0.9	1.35
Rated Rotation Speed	[r/min.]	3,000	3,000			
Maximum Rotation Speed	[r/min.]	5,000	5,000			
Rotor Inertia	[GD ² /4] kg·m ² (gf·cm·s ²)	0.006 × 10 ⁻⁴ (0.006)	0.013 × 10 ⁻⁴ (0.013)	0.023 × 10 ⁻⁴ (0.023)	0.042 × 10 ⁻⁴ (0.043)	0.062 × 10 ⁻⁴ (0.063)
Approximate Mass	(kg)	0.25	0.3	0.4	0.5	0.6
Sensor		2,048C/T		Incremental encoder		

*Please ask for a separate specification sheet for models having sensors brakes or other options.

Description of Model Numbers

TBL-i Series model numbers are assigned as described here.

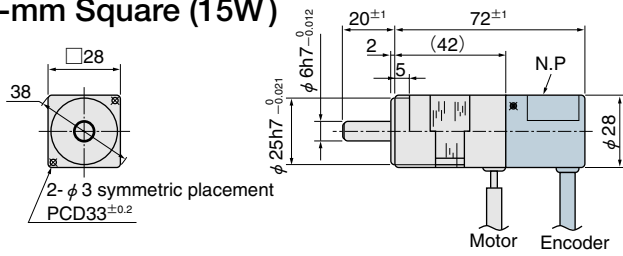


	□60			□80				
	TS4506	TS4507	TS4509	TS4511	TS4512	TS4513	TS4514	TS4515
	100/200	100/200	100/200	200	200	200	200	200
	100	200	400	200	400	600	800	950
	0.318 (3.25)	0.64 (6.5)	1.27 (13)	0.64 (6.5)	1.27 (13)	1.91 (19.5)	2.55 (26)	3.02 (30.8)
	0.95 (9.7)	1.91 (19.5)	3.82 (39)	1.91 (19.5)	3.82 (39)	5.73 (58.5)	7.64 (78)	9.06 (92.4)
	1.4/0.8	3.2/1.4	5.2/3.2	1.6	3.2	4.2	4.6	4.4
	3,000			3,000				
	5,000			5,000				
	0.11 × 10 ⁻⁴ (0.11)	0.20 × 10 ⁻⁴ (0.20)	0.36 × 10 ⁻⁴ (0.37)	0.39 × 10 ⁻⁴ (0.40)	0.70 × 10 ⁻⁴ (0.72)	1.00 × 10 ⁻⁴ (1.02)	1.30 × 10 ⁻⁴ (1.33)	1.62 × 10 ⁻⁴ (1.65)
	0.8	1.1	1.6	1.4	2.0	2.6	3.2	3.8

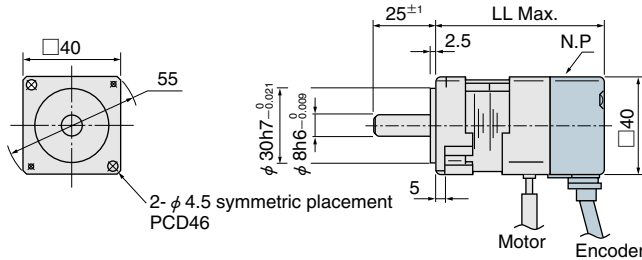
2,000C/T,2,048C/T (Option : absolute encoder, brushless resolver)

Outline (Standard Type)

● 28-mm Square (15W)

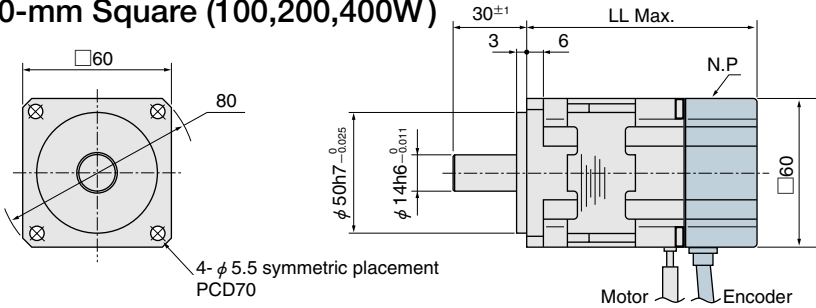


● 40-mm Square (30,50,100,150W)



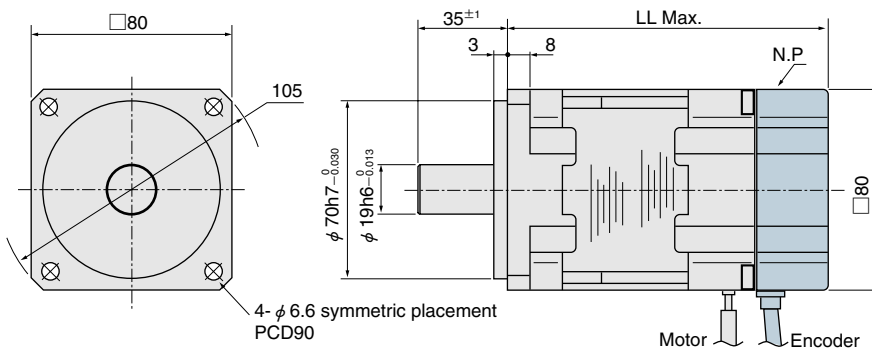
Output	Model	LL(mm)
30W	TS4501	62.5
50W	TS4502	71.5
100W	TS4503	89.5
150W	TS4504	107.5

● 60-mm Square (100,200,400W)



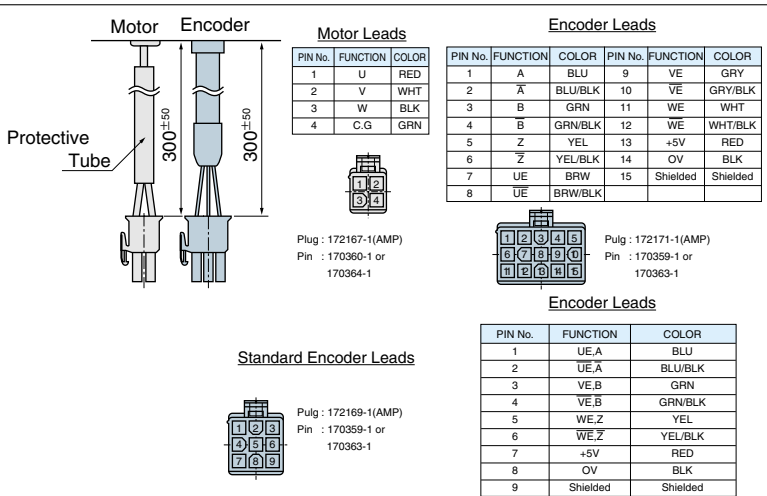
Output	Model	LL(mm)
100W	TS4506	83
200W	TS4507	97
400W	TS4509	125

● 80-mm Square (200,400,600,800,950W)



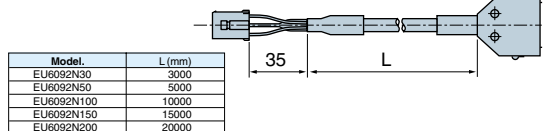
Output	Model	LL(mm)
200W	TS4511	95
400W	TS4512	112
600W	TS4513	129
800W	TS4514	146
950W	TS4515	163

■ Cable Detail

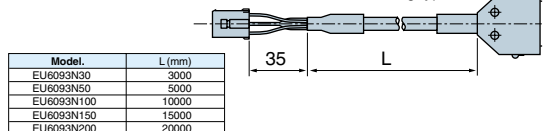


■ Options

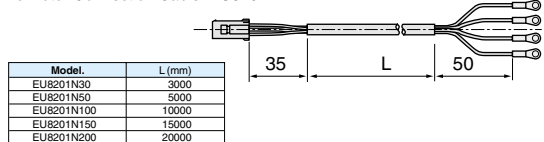
● Encoder Connection Cable, EU6092 for standard type



● Encoder Connection Cable, EU6093 for minimal-wiring type



● Motor Connection Cable EU8201



Outline (with Brake)

● **28-mm Square (15W)**

2-φ3 symmetric placement
PCD33±0.2

Brake Motor Encoder

● **40-mm Square (30,50,100,150W)**

2-φ4.5 symmetric placement
PCD46

Brake Motor Encoder

Output	Model	LL(mm)
30W	TS4501	93.5
50W	TS4502	102.5
100W	TS4503	120.5
150W	TS4504	138.5

● **60-mm Square (100,200,400W)**

4-φ5.5 symmetric placement
PCD70

Brake Motor Encoder

Output	Model	LL(mm)
100W	TS4506	112.5
200W	TS4507	126.5
400W	TS4509	154.5

● **80-mm Square (200,400,600,800,950W)**

4-φ6.6 symmetric placement
PCD90

Brake Motor Encoder

Output	Model	LL(mm)
200W	TS4511	126
400W	TS4512	143
600W	TS4513	160
800W	TS4514	177
950W	TS4515	194

■ Cable Detail

Brake Motor Encoder

Protective Tube

300±50

Brake Leads

PIN No.	FUNCTION	COLOR
1	BK	YEL
2	BK	YEL

Pulg : 172165-1(AMP)
Pin : 170359-1 or 170363-1

Motor Leads

PIN No.	FUNCTION	COLOR
1	U	RED
2	V	WHT
3	W	BLK
4	C.G.	GRN

Pulg : 172167-1(AMP)
Pin : 170360-1 or 170364-1

Encoder Leads

PIN No.	FUNCTION	COLOR	PIN No.	FUNCTION	COLOR
1	A	BLU	9	VE	GRY
2	A	BLU/BLK	10	VE	GRY/BLK
3	B	GRN	11	WE	WHT
4	B	GRN/BLK	12	WE	WHT/BLK
5	Z	YEL	13	+5V	RED
6	Z	YEL/BLK	14	OV	BLK
7	UE	BRW	15	Shielded	Shielded
8	UE	BRW/BLK			

Pulg : 172171-1(AMP)
Pin : 170359-1 or 170363-1

Encoder Leads

PIN No.	FUNCTION	COLOR
1	UE,A	BLU
2	UE,A	BLU/BLK
3	VE,B	GRN
4	VE,B	GRN/BLK
5	WE,Z	YEL
6	WE,Z	YEL/BLK
7	+5V	RED
8	OV	BLK
9	Shielded	Shielded

Pulg : 172169-1(AMP)
Pin : 170359-1 or 170363-1

TBL-i Series

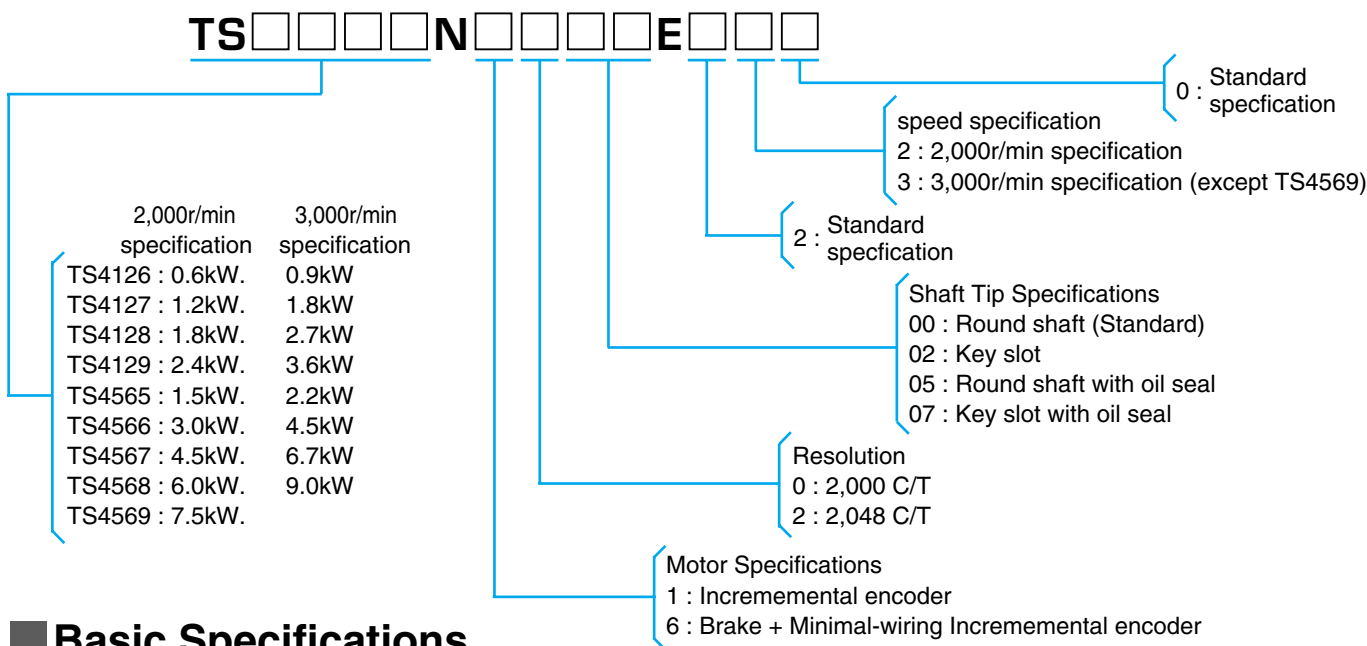
AC Servo Motor

Large, high-performance and reliable AC servo motor

- **Features**
 - Compact size.
 - Coming in two speed specifications (2,000r/min-3,000r/min) to be selected from as your operation speed.
 - Models carrying an absolute encoder (11/24bit,17/33bit) or Brushless resolver as an option sensor are available.
 - The standard specifications satisfy IP65. (excluding the motor shaft penetration area)

Description of Model Numbers

TBL-i Series model numbers are assigned as described here.

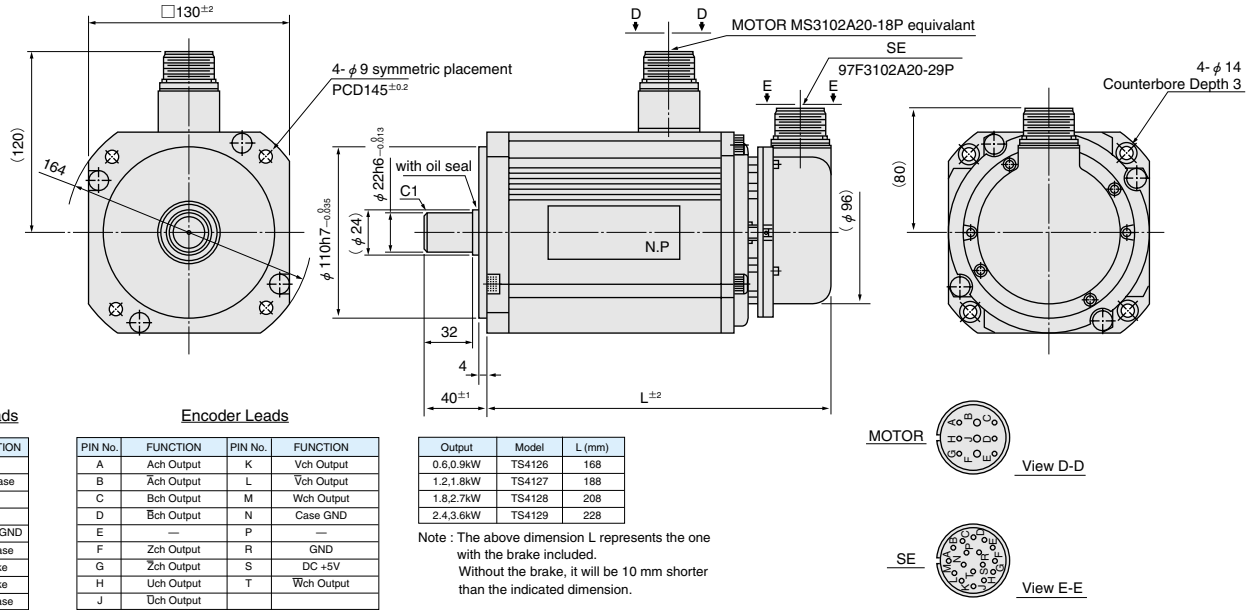


Basic Specifications

Mounting Flange [mm]	□ 130							
Model	TS4126		TS4127		TS4128		TS4129	
Voltage [V]	200							
Output [kW]	0.6	0.9	1.2	1.8	1.8	2.7	2.4	3.6
Rated Torque [N·m] (kgf·cm)	2.84 (29)		5.68 (58)		8.53 (87)		11.47 (117)	
Maximum Torque [N·m] (kgf·cm)	8.53 (87)		17.05 (174)		25.58 (261)		34.40 (351)	
Rated Current [Arms] (AC200V)	4.4	6.5	8.3	12.0	11.9	17.8	15.4	23.4
Rated Rotation Speed [r/min.]	2,000	3,000	2,000	3,000	2,000	3,000	2,000	3,000
Maximum Rotation Speed [r/min.]	3,000	4,500	3,000	4,500	3,000	4,500	3,000	4,500
Rotor Inertia [GD ² /4] kg·m ² (gf·cm·s ²)	3.23 x 10 ⁻⁴ (3.3)		6.37 x 10 ⁻⁴ (6.5)		9.60 x 10 ⁻⁴ (9.8)		12.74 x 10 ⁻⁴ (13.0)	
Approximate Mass [kg]	8.5		9.5		10.5		11.5	
Sensor	Incremental Encoder							

*Please ask for a separate specification sheet for models having sensors brakes or other options.

Outline ●130mm Square (0.6,0.9,1.2,1.8,2.4,2.7,3.6kW)



Motor Leads

PIN No.	FUNCTION
A	—
B	W phase
C	—
D	—
E	Frame GND
F	U phase
G	Brake
H	Brake
I	V phase

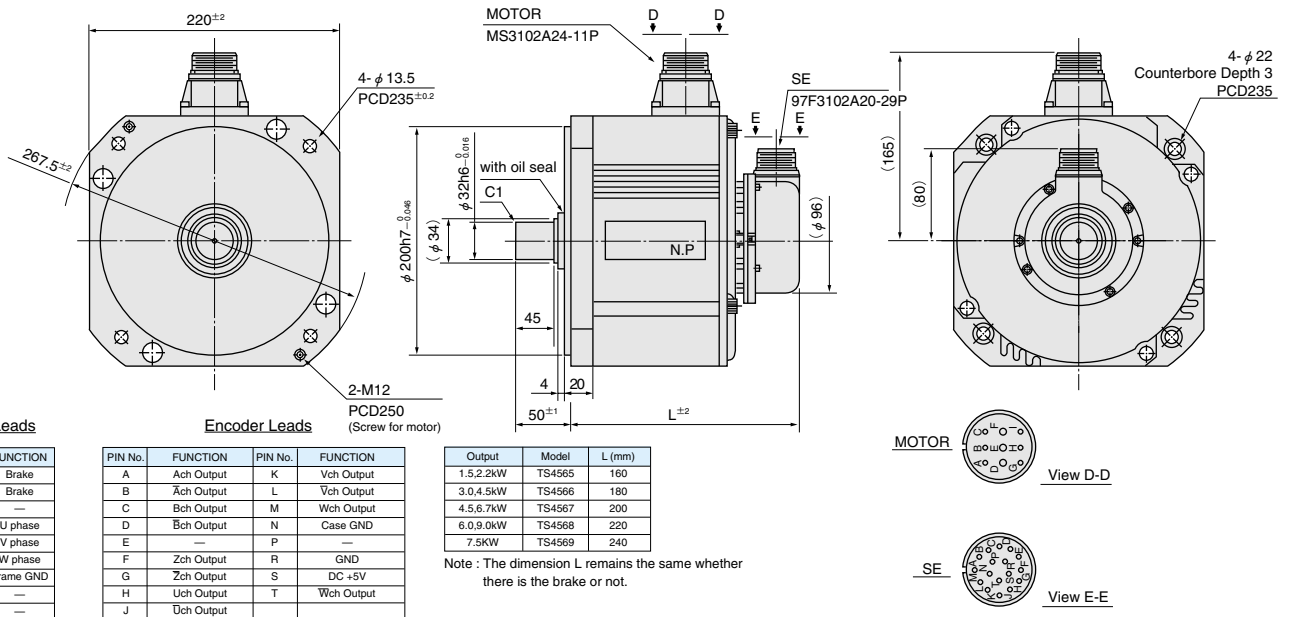
Encoder Leads

PIN No.	FUNCTION	PIN No.	FUNCTION
A	Äch Output	K	Vch Output
B	Äch Output	L	Vch Output
C	Bch Output	M	Wch Output
D	Bch Output	N	Case GND
E	—	P	—
F	Zch Output	R	GND
G	Zch Output	S	DC +5V
H	Uch Output	T	Wch Output
J	Uch Output	—	—

Output	Model	L (mm)
0.6,0.9kW	TS4126	168
1.2,1.8kW	TS4127	188
1.8,2.7kW	TS4128	208
2.4,3.6kW	TS4129	228

Note: The above dimension L represents the one with the brake included. Without the brake, it will be 10 mm shorter than the indicated dimension.

●220mm Square (1.5,2.2,3.0,4.5,6.0,6.7,7.5,9.0kW)



Motor Leads

PIN No.	FUNCTION
A	Brake
B	Brake
C	—
D	U phase
E	V phase
F	W phase
G	Frame GND
H	—
I	—

Encoder Leads

PIN No.	FUNCTION	PIN No.	FUNCTION
A	Äch Output	K	Vch Output
B	Äch Output	L	Vch Output
C	Bch Output	M	Wch Output
D	Bch Output	N	Case GND
E	—	P	—
F	Zch Output	R	GND
G	Zch Output	S	DC +5V
H	Uch Output	T	Wch Output
J	Uch Output	—	—

Output	Model	L (mm)
1.5,2.2kW	TS4565	160
3.0,4.5kW	TS4566	180
4.5,6.7kW	TS4567	200
6.0,9.0kW	TS4568	220
7.5kW	TS4569	240

Note: The dimension L remains the same whether there is the brake or not.

□220									
TS4565		TS4566		TS4567		TS4568		TS4569	
200		200		200		200		200	
1.5	2.2	3.0	4.5	4.5	6.7	6.0	9.0	7.5	
7.15 (73)		14.31 (146)		21.46 (219)		28.62 (292)		35.77 (365)	
21.46 (219)		42.92 (438)		64.39 (657)		85.85 (876)		107.31 (1,095)	
10.0	13.0	19.2	25.3	28.4	37.7	37.5	49.3	46.5	
2,000	3,000	2,000	3,000	2,000	3,000	2,000	3,000	2,000	
3,000	4,000	3,000	4,000	3,000	4,000	3,000	4,000	3,000	
29.4 x 10 ⁻⁴ (30.0)		58.8 x 10 ⁻⁴ (60.0)		88.2 x 10 ⁻⁴ (90.0)		117.6 x 10 ⁻⁴ (120.0)		147.0 x 10 ⁻⁴ (150.0)	
24.0		26.0		27.5		29.0		31.0	

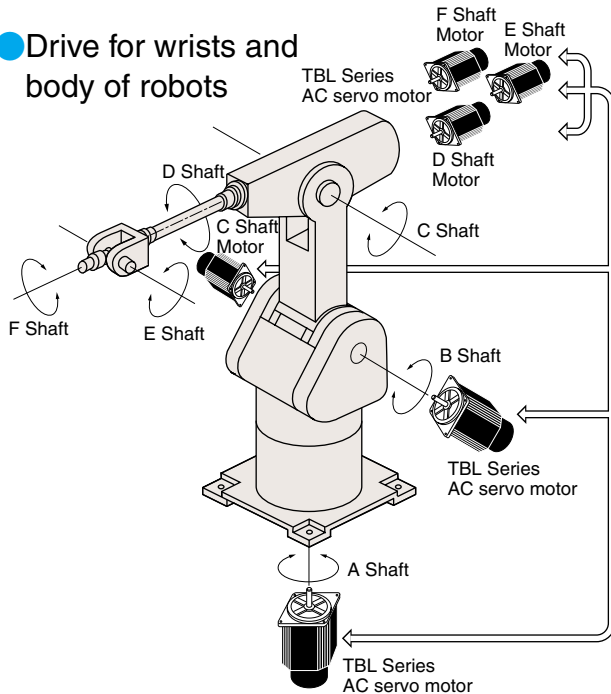
2,000C/T,2,048C/T (Option : absolute encoder, brushless resolver)

APPLICATIONS

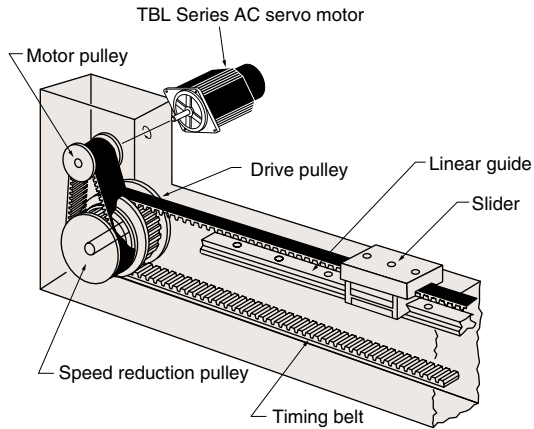
A wide variety of applications

- Robot
- Uniaxial actuator
- NC machine tool
- Automatic welding machine
- Press machine
- Electrical discharge machine
- Packaging machine
- Measuring machine
- Winding machine
- Semiconductor production unit
- High-speed chip moulder
- Bonding machine
- Medical instruments
- Antenna drive
- Other

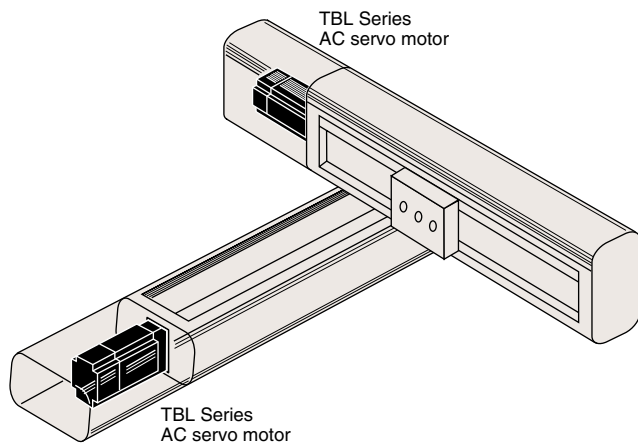
Drive for wrists and body of robots



Application to belt drive mechanism



Application to X - Y robot



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



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.

All specifications are subject to change without notice.

ISO 14001 Certificate on Head office

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

'00.7

T12-1594N2. 2,000. 2000.7