Aspiring always to be an environmentally friendly and trustworthy company
New small and low inertial AC servo motor with high resolution 25bits absolute encoders are become available now!

AC Servo Motor
TBL-i6 Series

**Small size**
Compact compared to the existing series and achieving miniaturization of equipment

**Low cogging, Low vibration**
Low vibration realized by optimization of magnetic design

**Low Inertia**
Rotor inertia is lower and high frequency operation is more prompt.

**Can be equipped with silent brake**

---

**Specifications**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[mm]</td>
<td>[V]</td>
<td></td>
<td></td>
<td>Rated Torque</td>
<td>Momentary Max. Torque</td>
<td></td>
<td>Max. No Brake</td>
<td>With Brake</td>
</tr>
<tr>
<td>□40</td>
<td>230</td>
<td>100</td>
<td>0.318</td>
<td>1.11</td>
<td>0.8</td>
<td>2.6</td>
<td>3000</td>
<td>0.028</td>
</tr>
<tr>
<td>□60</td>
<td>230</td>
<td>200</td>
<td>0.64</td>
<td>2.24</td>
<td>1.5</td>
<td>4.9</td>
<td>3000</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>400</td>
<td>1.27</td>
<td>4.46</td>
<td>2.1</td>
<td>7.1</td>
<td>3000</td>
<td>0.20</td>
</tr>
<tr>
<td>□80</td>
<td>230</td>
<td>750</td>
<td>2.39</td>
<td>8.36</td>
<td>4.1</td>
<td>14.1</td>
<td>3000</td>
<td>0.74</td>
</tr>
</tbody>
</table>

*Combination with our driver.*
New products

Outline

- **40mm**
  - TSM4154 (No Brake Type)
  - The outline is a 23 bits absolute encoder type.
  - (unit: mm)
  - [Diagram of 40mm]

- **60mm**
  - TSM4252 (No Brake Type)
  - TSM4254 (No Brake Type)
  - [Diagram of 60mm]

- **80mm**
  - TSM4354 (No Brake Type)
  - [Diagram of 80mm]

Applications

- **Chip Mounter**
- **Pick-up Robot**
- **Packaging Machine**
High Resolution
25bits Rotary Encoder

High resolution of 25bits per rotation
Capable of advanced position/speed control with 25 bits resolution (approx. 33,000,000 division)

High robustness
High noise resistance by using feedback system in interpolation circuit

Operating/Storage temperature range:
Up to 105°C
Usable in higher temperature compared to conventional models (~85°C)

Energy saving
Power consumption is drastically reduced compared to conventional models

---

**Electrical Spec.**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>TS5720N8410</th>
<th>TS5722N10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-turn</td>
<td>25bit</td>
<td></td>
</tr>
<tr>
<td>Multi-turn</td>
<td>16bit</td>
<td></td>
</tr>
<tr>
<td>Output phase</td>
<td>Pure binary code</td>
<td></td>
</tr>
<tr>
<td>Supply voltage</td>
<td>DC+5V±5%</td>
<td></td>
</tr>
<tr>
<td>Consumption current</td>
<td>Nomal operation: 50mA TYP.</td>
<td>Battery operation: 30 μA TYP.</td>
</tr>
<tr>
<td>Output form</td>
<td>Line driver</td>
<td></td>
</tr>
<tr>
<td>Maximum allowable rotation</td>
<td>8,500min⁻¹</td>
<td></td>
</tr>
<tr>
<td>Serial data transfer cycle</td>
<td>35 μ sec~63 μ sec</td>
<td></td>
</tr>
<tr>
<td>Data code</td>
<td>Base band NRZ</td>
<td></td>
</tr>
</tbody>
</table>

---

**Mechanical Spec.**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>TS5720N8410</th>
<th>TS5722N10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting torque(at 20°C)</td>
<td>9.8×10⁻⁸N•m Max</td>
<td>6.5×10⁻⁸N•m Max</td>
</tr>
<tr>
<td>Moment or inertia</td>
<td>6.5×10⁻⁹kg•m² TYP.</td>
<td>1.0×10⁻⁹kg•m² TYP.</td>
</tr>
<tr>
<td>Maximum allowable rotation</td>
<td>6,000min⁻¹</td>
<td></td>
</tr>
<tr>
<td>Maximum angle acceleration</td>
<td>80,000rad/sec²</td>
<td></td>
</tr>
<tr>
<td>Mass</td>
<td>0.3kg Max</td>
<td>0.06kg Max</td>
</tr>
</tbody>
</table>

---

**Environment**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>TS5720N8410</th>
<th>TS5722N10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protective structure</td>
<td>IP40</td>
<td>Not enclosed</td>
</tr>
<tr>
<td>Operating Temp. range</td>
<td>-10～+105°C</td>
<td></td>
</tr>
<tr>
<td>Strage Temp. range</td>
<td>-20～+105°C</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>90%RH Max</td>
<td></td>
</tr>
<tr>
<td>Shock</td>
<td>1,960m/s² , 11msec</td>
<td></td>
</tr>
<tr>
<td>Vibration</td>
<td>1.5mm, 5～58Hz, 98m/s², 58～2,000Hz</td>
<td></td>
</tr>
</tbody>
</table>
**Explosion-proof test evaluation system**

**Testing flammability of fuel tank peripheral equipment**

This system, which was introduced in FY 2017, tests whether equipment around the fuel tank will ignite or explode in the event it is exposed to fuel in an airborne aircraft. The main subjects of the test are sensors and actuators that are often installed around the tank.

**The first test system of its kind in Japan**

This test system is the first of its kind in Japan to comply with the U.S. commercial aircraft equipment standard (RTCA-DO160G Sec. 24), and the first in the world to be able to automatically control all processes.

It is also capable of supporting the MIL (MIL-STD-810) test, which is the U.S. military standard for the procurement of supplies. As MIL is widely used as a standard for consumer products, it can be applied to product testing in various fields, not only those related to aerospace.

**Test procedure**

The test product is placed in a cylindrical chamber with an inner diameter of 1.5 m and a depth of 2.0 m, and a simulated aviation fuel (normal hexane) is sprayed while changing the air pressure and temperature in a sealed state. While recording the test with a high-speed camera, a visual observation can also be made from a tempered glass window. The manipulator can also be used to manipulate test specimens.

**Replicates altitudes up to 30,000m**

The testable pressure range is 101.3 kPa to 4 kPa, which replicates an environment equivalent to an altitude of 100,000 ft (30,480 m), the level at which satellites orbit. The temperature range is 10 °C to 260 °C, and a rapid change from room temperature to 150 °C within 90 minutes can be replicated by the system. All of these operations can be set automatically.

**Consideration is also given to the environment**

Consideration is given to the location of S-BIRD near residential areas by equipping the test system with a large silencer that reduces the noise of the explosion to less than 65 dB and automatic processing equipment that decomposes unburned gas to make it harmless.

**Development and manufacturing by local company**

Design and manufacturing were outsourced to Hanyuda Co., Ltd. in Nagano City, and were developed under the supervision of a quality inspector commissioned by the FAA (U.S. Federal Aviation Administration). Hanyuda is a long-established pressure vessel manufacturer specializing in the manufacturing of high pressure mushroom sterilizers. In formulating specifications, Tamagawa Seiki also gave advice as a member of the working group.
Notice of Opening Nishi-Kanto Office

Our Hachioji Office and Kanagawa Office merged to form the newly opened Nishi-Kanto Office.

The Nishi-Kanto Office is located in Sagamihara City in Kanagawa Prefecture, and is a conveniently located office, 3 minutes’ walk from Fuchinobe Station on the JR Yokohama Line. Nearby is JAXA Sagamihara Campus, and when you get off the train at Fuchinobe Station, the first thing you will see is a sign for the asteroid explorer “Hayabusa”. Sagamihara City is home to Sagamihara Campus of Aoyama Gakuin University, which won the 2020 Hakone Ekiden. It is a city with a large student population. When the long-awaited Linear Chuo Shinkansen commences its service in 2027, the nearest stop on route “Hashimoto Station” can be reached in about 10 minutes. There is great anticipation for the day it becomes a place in which one can move to the Iida region in less than an hour.

Our new office has a total of 16 staff members, and is in charge of our power product business in Tokyo, Kanagawa, Yamanashi, Shizuoka, and Nagano. Although the staff’s range of responsibilities has increased, the experience of our veteran staff and the vitality of our young blood have created a new sales style, providing satisfaction to customers, and working hard as a united team to become an office with a strong presence.

We encourage you all to come and visit us at our Nishi-Kanto Office when you are in the Kanto area.

Notice of Change to Laboratory Names

The names of Tamagawa Seiki’s laboratories have been changed as follows since November 21 of last year.

<table>
<thead>
<tr>
<th>After</th>
<th>Before</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sensortronics Laboratory</strong></td>
<td><strong>Motiontronics Laboratory</strong></td>
</tr>
<tr>
<td>Product group: Rotary encoders, Resolvers, Railway sensors, etc.</td>
<td></td>
</tr>
<tr>
<td>Location: Second Plant</td>
<td></td>
</tr>
<tr>
<td><strong>Motortronics Laboratory</strong></td>
<td><strong>Motion Control Laboratory</strong></td>
</tr>
<tr>
<td>Product group: Servo motors, Servo drivers, MEMS gyros, etc.</td>
<td></td>
</tr>
<tr>
<td>Location: Second Fukuchi Factory, Second Hachinohe Factory, Second Plant</td>
<td></td>
</tr>
</tbody>
</table>
First, I'll extract the text from the document:

### Information 03

**Winner of New Product Development Award from ABB Headquarters**

On November 28, 2019, Supplier Day was held in grand fashion at ABB’s headquarters with 300 people in attendance.

The Tamagawa Seiki Group was awarded the honor of receiving the illustrious “New Product Development Award”. This award is given to suppliers who have made a dedicated contribution to new development projects, with only the Tamagawa Seiki Group selected for this honor.

At present, three next-generation robot projects are in progress with ABB’s headquarters. As well as the cooperative robot project, it is anticipated that our motors will be used for the renewal of small, medium, and large robots. The technical demands are high in each project, and it was thanks to the long-term support from those involved in each of our divisions that led to receiving the award.

While we were able to receive this wonderful award on this occasion, it is linked to the warm and patient support that our customers have given us. We will continue to march on day by day to be able to gain even greater level of trust from our customers.

### Information 04

#### Information on Exhibitions

**Small Satellite Conference 2019**

Sat. August 3 to Thu. August 8

At an international conference on small satellites held at Utah State University in the United States, we exhibited reaction wheels, fiber optical gyros (FOG) and inertial reference units (IRU), step motors, and resolvers and so forth that are operating in space.

**DSEI JAPAN '19**

Mon. November 18 to Wed. November 20

Japan’s first comprehensive defense and security related exhibition was held at Makuhari Messe. We exhibited aircraft, space, and defense-related products, as well as surveillance camera systems and gyro.

**International Robot Exhibition 2019**

Wed. December 18 to Sat. December 21

Our new products, the TBL-6 Series AC Servo Motor and a 25bits Rotary Encoder, as well as a Torque Servo Module show model were exhibited at the exhibition, receiving reviews from many visitors.
The cover of this edition

Automation Clock “Hachinohe”
Made by Mr. Minoru Takahashi
Automation clock “Hachinohe” is placed in Hachinohe Portal Museum “hacchi”. Eight dolls in the motif of Hachinohe’s specialties such as sea cat, squid and Senbei-ju move to the music at certain time. It is a work that represents the character of Hachinohe from a warmer feel of wood and technique to move charming dolls and gear wheels delicately.

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