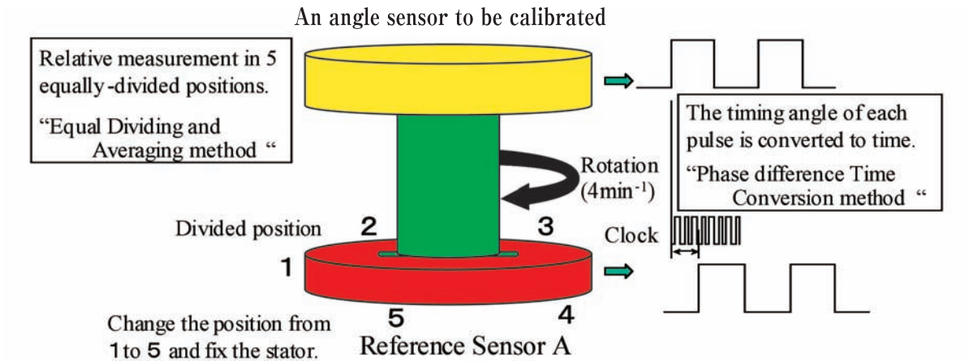
Principle of Angle Calibration

An object angle sensor to be calibrated and the reference sensor are attached on the same axis, and rotated at fixed speed, and the time is converted into angle, which is called the "Phase difference Time Conversion method". The two angle sensors are calibrated by the "Equal Dividing and Averaging method", in which the relative positions of these two sensors are changed and the relative measurements are averaged. Using these methods, we can separate the deflection of the object angle sensor.



Singlsyn

Smartsyn

Nobeyama Radio Observatory

Headquarters/First plant

Encoder

Resolver for space use

High-precision multi-polar, multi-speed synchro

☆Tamagawa Seiki calibrates the accuracy of an angle sensor and issues calibration certificates.
☆Tamagawa Seiki provides high precision angle sensor with a calibration certificate.
*The angle calibration certificate with JCSS (MRA) symbol is effective in the world.

Inquiries about Calibration

Technical-Quality-Management Fundamental technology Section, Tamagawa Seiki Co., Ltd.

Head office: 1879 Ohyasumi Iida Nagano pref. 395-8515 Japan

TEL:+81-265-21-1833 FAX:+81-265-21-1907 Contact Name: Kojima

E-mail **kakudo-kosei@tamagawa-seiki.co.jp**

You can also make inquiries to our sales offices or distributers near you.

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

'09.8 All specifications are subject to change without notice.
T12-1670 500. 2009.8

JCSS 0227

ISO/IEC17025 certified

JCSS Calibration Laboratory

MRA compliant

Angle Calibration

TAMAGAWA SEIKI CO., LTD.

Tamagawa Seiki was recognized by the calibration organization by JCSS. Authorization criteria is ISO/IEC 17025. JCSS is managed by IAJapan who is a signatory to the international Laboratory Accreditation Cooperation(ILAC)and Asia Pacific Laboratory Accreditation Cooperation(APLAC). Technical-Quality-Management section is recognized by the calibration organaization by JCSS. It is internationally effective to the Mutual Recognition Arrangement(MRA). JCSS0227 is the authorization number of this Technical-Quality-Management section.

ANGLE CALIBRATION

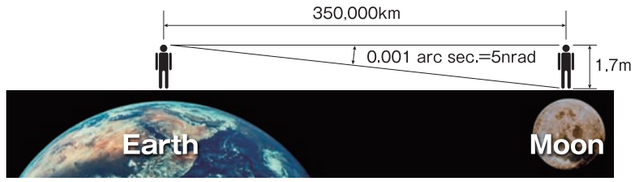
Guidance on Angle Calibration Services

Tamagawa Seiki was assessed and accredited as an Accredited Calibration Laboratory by Japan Calibration Service System (JCSS) and started calibration services for the first time among private enterprises in Japan in the calibration field of Angle.
Accredited angle calibration laboratories calibrate the angle of the object instruments on the basis of the specified procedures and issue certificates to assure the traceability to the national standard. The certificate is also effective in the world.
The accuracy of Japanese angle measurement standard is considered the highest level in the world. The angle measurement standard of the National Institute of Advanced Industrial Science and Technology (AIST) in Tsukuba-city, Ibaraki has been playing the role of national standard where Tamagawa Seiki's angle calibration services are directly traceable to.
Our angel calibrator can calibrate the measuring objects with high precision by stabilized uniform rotation even though the objects are in large size and large starting torque. It has the highest resolution of 0.001 arc seconds and extended uncertainty (σ =2) 0.067 arc seconds. This 0.001 arc seconds denotes the angle of billionth part of 360-degree, and it is a super high precision angle that is equivalent to the elevation angle when seeing a man standing on the moon away from the earth.
Tamagawa Seiki was also authorized through the internationally-accepted Mutual Recognition Arrangement(MRA). So the calibration certificates issued by Tamagawa Seiki are internationally acceptable, and Tamagawa Seiki has become possible to accept the calibration requests from overseas.

Angle calibrator

Items	Specifications	Notes
Measure Point	36000 Point Max	
Uncertainty(σ=2)	0.067 arc sec.	Highest capacity
Resolution	0.001 arc sec.	
Rotation speed	0.1～60 min^{-1}	
Temperature	20℃	
Encoder weight	50kg Max	
Encoder size	ϕ400mm Max	
Rotation torque	0.3Nm Max	
Signal for measure	A.Zphase TTL Level	
Attachment tool	Prepared by the user	Except for RON905
Coupling	Prepared by the user	Except for K15

Specifications for angle calibrator and calibration angle sensor



The meaning of 0.001 arc sec.

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About Angle Calibration Business

We accept your calibration request for angle sensors

Please contact us when you need to measure the accuracy of your angle sensor correctly. We calibrate the angle sensor and issue a certificate with JCSS accreditation symbol.

Applications of an angle sensor with a calibration certificate

(1) Use it as a reference sensor of angle calibrator.
(2) Install it in an angle calibrator and calibrate the equipment.
(3) Perform the accuracy compensation based on calibrated values after incorporating it into your system.

We sell calibration certificate-attached angle sensors, which are traceable to the national standard

We can attach calibration certificates to our angle sensors.
We provide rotary encoders and resolvers with high precision specifications.

It is authorized internationally through Mutual Recognition Arrangement(MRA)

Our calibration services and the sales of certificate-attached angle sensors are acceptable in the world.

Outline of calibration work and calibration certificate

Calibration work is carried out rotating the axis slowly through the attachment tool. In order to consider the misalignment of attachment and the influence of coupling, measurement is performed two or more times in six attachment places. The calibration certificate includes a table and a graph representation which show the average deflection at six attachment places data as the deflection of the angle sensor. Moreover, the uncertainty of measurement is numerically expressed, and the ambiguity contained in a calibration result is defined numerically.

Please Note: For the customers who request angle calibration from overseas

When you request calibration of the following products from overseas, we need to apply for METI export license under the Japanese export control regulations before we make a contract. So please cooperate with us to prepare the documents.

☆Object products
(1) Absolute encoders with a resolution that exceeds 265,000 C/T.
(2) Absolute encoder with the absolute value of conversion error that is less than 2.5 seconds.
(3) Please consult us about resolvers.
Note) Incremental encoders are not involved.

☆About the export procedures for return of the products
(1) A contract of calibration request becomes effective after the export license of the Japanese government is obtained. It sometimes takes some days to get the permission. Please note that we can not materialize the contract if the export is not approved.
(2) The date of delivery will be replied after getting the export license. Please be reminded that you should have a margin for time of delivery.