

VISCOMETER

Model **TVB-10W**

responding swiftly to your needs



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etting the standard in digital viscometers with simplicity in design for unmatched durability.



“Ease-of-use” and “worry-free operation” are the key concepts underlying development of the TVB-10W digital viscometer. At the instrument’s core is an ingenious “torsion wire and magnetic bearing” mechanism which greatly improves durability and enables the TVB-10W to main-

tain its high initial repeatability with stability of measurement. The Model TVB-10W has established itself as a product benchmark with features that include digital display, auto-stop function, and one-touch rotor mounting which allow even first time users to handle the unit with ease.

Features

Pivotless mechanism (torsion wire + magnetic bearing)

The contactless torsion wire and magnetic bearing mechanism employed eliminates parts wear.

The product provides high accuracy and stable measurement and will maintain its excellent initial repeatability over time. The instrument is also designed for worry-free operation by first time users.

Zero-span setting function

Calibration allows viscometer to be used at accuracies higher than catalog values

and compensates for unit-to-unit variances.

Digital display

Digital display for viscosity readings without error.

Remote control function

To start and stop the main unit can be operated by outer signal (dry contact).

And Using out put signal (open collector), the situation of viscometer can be confirmed by buzzer and lamp.

One touch rotor mounting

The instrument’s rod insertion method al-

lows easy rotor mounting and removal.

Display switching

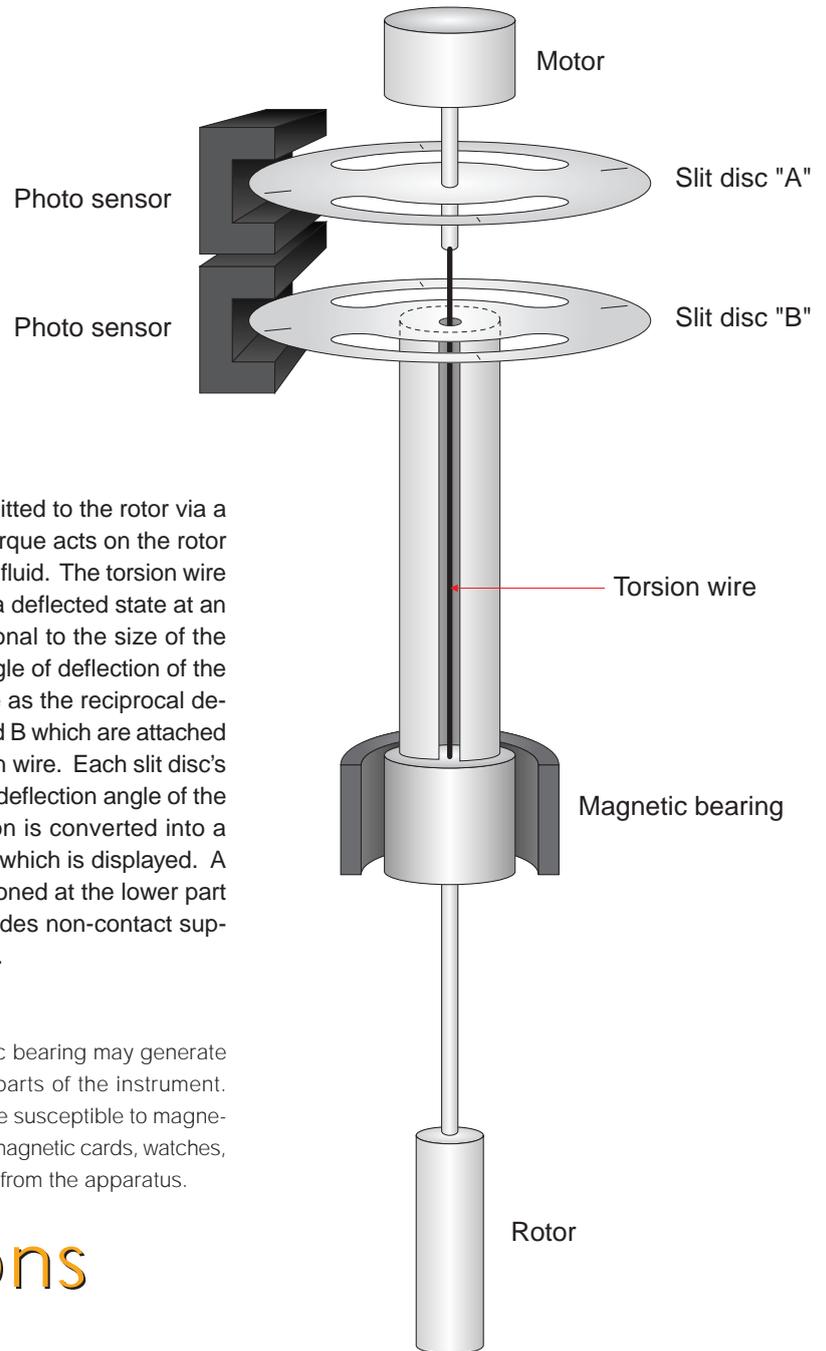
Display can be switched between viscosity values and indicator values (%) when the UNIT key is depressed during measurement.

Data interchangeability

Model TVB-10W data is interchangeable with Model B viscometer data and conforms to JIS and ISO standards.



Principle of operation



Motor rotation is transmitted to the rotor via a torsion wire. Viscous torque acts on the rotor turning in the measured fluid. The torsion wire rotates with the wire in a deflected state at an angle which is proportional to the size of the viscous torque. The angle of deflection of the torsion wire is the same as the reciprocal deflection of slit discs A and B which are attached to the ends of the torsion wire. Each slit disc's photo sensor reads the deflection angle of the disc and this information is converted into a viscosity measurement which is displayed. A magnetic bearing positioned at the lower part of the torsion wire provides non-contact support of the rotor spindle.

[Caution]

The viscometer's magnetic bearing may generate magnetic forces around parts of the instrument. Thus objects which may be susceptible to magnetism such as floppy discs, magnetic cards, watches, etc., should be kept away from the apparatus.

Specifications

Main unit specifications:

Accuracy	less than $\pm 1\%$ of full scale*Note 1
Repeatability	less than $\pm 0.2\%$ of full scale
Viscosity display	%/mPa·s/Pa·s/kPa·s(cP/P switching possible)
Input signal	Measuring start signal (dry contact)
Output signal	On measuring, Buzzer, Measuring stop (Auto stop mode) Open collector
Ambient temperature	0~40°C
Ambient humidity	less than 90% RH(non-condensation)
Wetted parts	SUS304 (some SUS303) stainless steel
Power	AC100~230V $\pm 10\%$ 50/60Hz
Power consumption	less than 30VA
Dimensions	105(W) x 250(D) x 290(H) mm
Weight	approx. 8 kg (including stand)

* Note 1: when uses M1-M4 rotor, H2-H4 rotor

Viscosity measurement range

Model	Measurement range (full-scale torque)	Viscosity measurement range
TVB-10MW	67.4 $\mu\text{N}\cdot\text{m}$	15 ~ 2,000,000 mPa·s*Note 2
TVB-10HW	718.7 $\mu\text{N}\cdot\text{m}$	200 ~ 8,000,000 mPa·s*Note 3
TVB-10RW	1437.4 $\mu\text{N}\cdot\text{m}$	200 ~ 16,000,000 mPa·s*Note 3
TVB-10UW	5749.6 $\mu\text{N}\cdot\text{m}$	400 ~ 64,000,000 mPa·s*Note 4

* Note 2: In case of L adaptor (option), lower limit from 1mPa·s.

* Note 3: In case of H1 rotor (option), lower limit from 100 mPa·s.

* Note 4: In case of H1 rotor (option), lower limit from 200 mPa·s.



Configurations

Item	TVB-10MW	TVB-10HW	TVB-10RW	TVB-10UW
Instrument configuration				
Viscometer main unit				
Rotor set	M rotor, 4 pc. set (M1 ~ M4)	H rotor, 6 pc. set (H2 ~ H7)	H rotor, 6 pc. set (H2 ~ H7)	H rotor, 6 pc. set (H2 ~ H7)
Guard	M guard	H guard	H guard	H guard
Stand				
Storage case				
Rotor storage case				
Option	L adaptor	H1 rotor	H1 rotor	H1 rotor
Conventional models replaced:	BM, B8M, BL, B8L	BH, B8H	B8R	B8U



M rotor set



H rotor set



Roller stand



Storage case

Options



L adaptor



H1 rotor



Small sample adaptor

Mounting this adaptor to the viscometer allows viscosity measurement of small sample volumes.

- (1) Sample volumes of 8~13 ml
- (2) High accuracy with fast temperature regulation
- (3) Calculation of shear rate, shear stress - ideal for rheological analysis



T-bar stage

Useful to measure the viscosity of thixotropic and yield value sample. The sample on the stage can be measured by moving up to vertical. The stage can be moved sequent connection with an output signal.

Largest up and down stroke	: Maximum 100 mm
Table speed	: measuring time 20 mm/min fasten time 140 mm/min
Power	: AC100 V ~ 120 V
Power consumption	: 10 VA
Dimensions	: 136(W) × 236(D) × 245(H)
Weight	: Approx. 2.5 kg



Upper Measurement Limit Tables (mPa·s)

TVB-10MW

Model TVB-10MW is ideal for high accuracy measurement of low viscosities. L adaptor combination enables measurement of viscosities below 15 mPa·s.

Speed (rpm)								
Rotor	60	30	12	6	3	1.5	0.6	0.3
L/Adp	10	20	50	100	200	400	1,000	2,000
M1	100	200	500	1,000	2,000	4,000	10,000	20,000
M2	500	1,000	2,500	5,000	10,000	20,000	50,000	100,000
M3	2,000	4,000	10,000	20,000	40,000	80,000	200,000	400,000
M4	10,000	20,000	50,000	100,000	200,000	400,000	1,000,000	2,000,000

TVB-10HW

Model TVB-10HW is suitable for measurement of high viscosities. Accessory 6-pc. rotor set and variations in rotation speed enable measurement in the ranges indicated in this table.

Speed (rpm)										
Rotor	100	50	20	10	5	4	2.5	2	1	0.5
H1	100	200	500	1,000	2,000	2,500	4,000	5,000	10,000	20,000
H2	400	800	2,000	4,000	8,000	10,000	16,000	20,000	40,000	80,000
H3	1,000	2,000	5,000	10,000	20,000	25,000	40,000	50,000	100,000	200,000
H4	2,000	4,000	10,000	20,000	40,000	50,000	80,000	100,000	200,000	400,000
H5	4,000	8,000	20,000	40,000	80,000	100,000	160,000	200,000	400,000	800,000
H6	10,000	20,000	50,000	100,000	200,000	250,000	400,000	500,000	1,000,000	2,000,000
H7	40,000	80,000	200,000	400,000	800,000	1,000,000	1,600,000	2,000,000	4,000,000	8,000,000

TVB-10RW

Model TVB-10RW offers twice the torque of Model TVB-10HW for double the measurement range as indicated in this table.

Speed (rpm)								
Rotor	100	350	20	10	5	2.5	1	0.5
H1	200	400	1,000	2,000	4,000	8,000	20,000	40,000
H2	800	1,600	4,000	8,000	16,000	32,000	80,000	160,000
H3	2,000	4,000	10,000	20,000	40,000	80,000	200,000	400,000
H4	4,000	8,000	20,000	40,000	80,000	160,000	400,000	800,000
H5	8,000	16,000	40,000	80,000	160,000	320,000	800,000	1,600,000
H6	20,000	40,000	100,000	200,000	400,000	800,000	2,000,000	4,000,000
H7	80,000	160,000	400,000	800,000	1,600,000	3,200,000	8,000,000	16,000,000

TVB-10UW

Model TVB-10UW offers an eight-fold increase in torque over the TVB-10HW for an eight-fold increase in measurement range as indicated in this table.

Speed (rpm)								
Rotor	100	350	20	10	5	2.5	1	0.5
H1	800	1,600	4,000	8,000	16,000	32,000	80,000	160,000
H2	3,200	6,400	16,000	32,000	64,000	128,000	320,000	640,000
H3	8,000	16,000	40,000	80,000	160,000	320,000	800,000	1,600,000
H4	16,000	32,000	80,000	160,000	320,000	640,000	1,600,000	3,200,000
H5	32,000	64,000	100,000	200,000	400,000	800,000	2,000,000	4,000,000
H6	80,000	160,000	400,000	800,000	1,600,000	3,200,000	8,000,000	16,000,000
H7	320,000	640,000	1,600,000	3,200,000	6,400,000	12,800,000	32,000,000	64,000,000

denotes option

Accurate measurement values might not be obtained in the entire area indicated by dark shading  or portions of the area indicated by light shading  as these areas are subject to turbulent flow.



VISCOMETER



Reflecting our motto, "providing our customers what they want in the format they desire", our development effort is focused on the diverse needs of customers and underscores our ceaseless drive in improving the reliability of viscosity measurement as well as the level of our measurement expertise. As a dedicated manufacturer of rheological equipment, our viscometers are endowed with TOKI SANGYO's wealth of knowhow and depth of experience - products which our customers can use with the highest degree of confidence.

www.tokisangyo.com

These products carry the CE mark of compliance.

Product specifications and design are subject to change or modification without notice.

⚠ Warning: do not operate equipment in flame or explosion-hazardous location

⚠ Caution relating to safety: manual should be thoroughly read before use and equipment should be operated and handled in the prescribed correct manner.

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