Model R85 VISCOMETER

Featuring integrated Auto Lock function

TOKI SANGYO

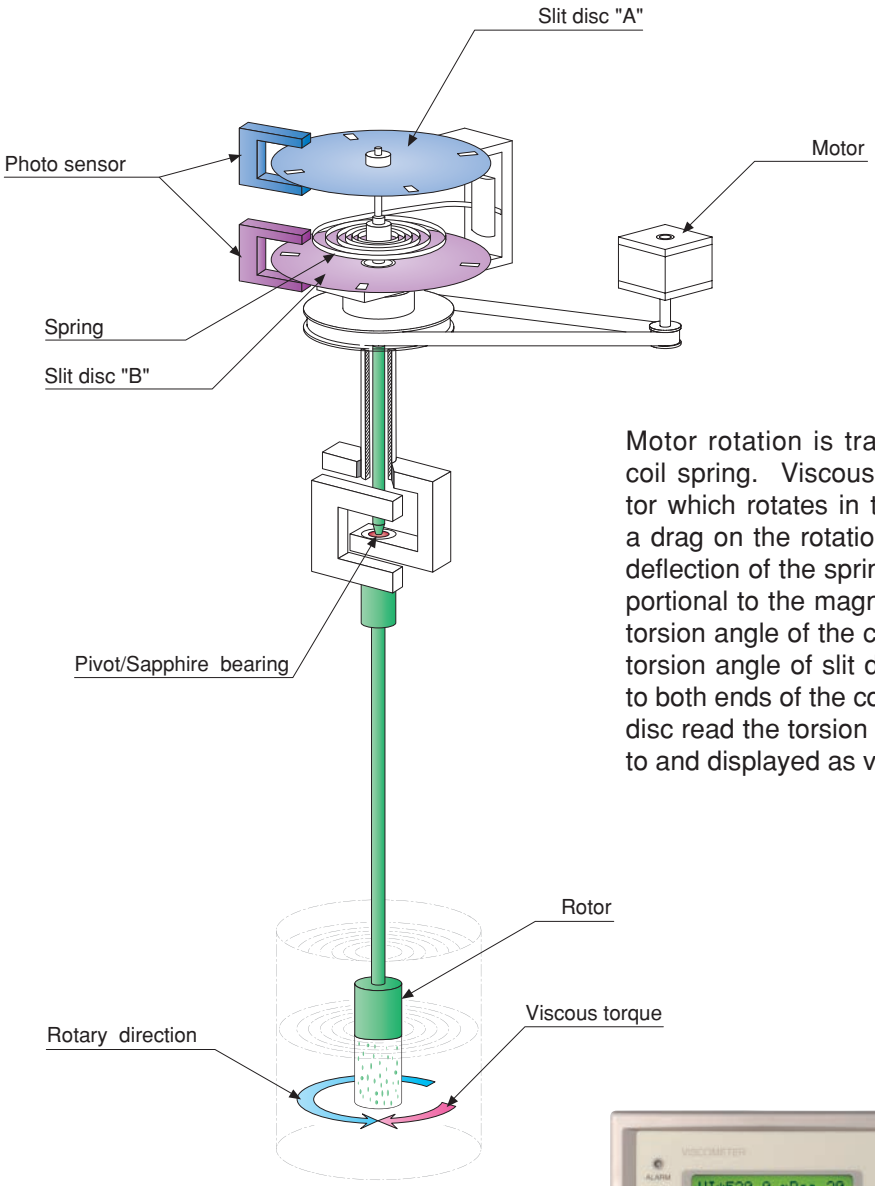
Ease of use is an important consideration in obtaining accurate workplace viscosity measurements. The new R85 is a sister model our of popular R-100 Series viscometer which was the first viscometer on the market to offer the Auto Lock feature as standard equipment. The Model R85 viscometer features additional enhancements for easier operation and a compact design. Like the R-100, the R85 offers the Auto Lock function as standard equipment which provides superior and reliable spindle protection, allowing even first time users to make viscosity measurements with confidence. The R85 comes in two models – a cylindrical spindle model with a 500ml beaker (RB-85) and a cone/plate model which enables measurement of very small, 1ml, sample sizes (RE-85). The R85 viscometer series is available in 9 models, based on measurement range, so the customer can select the model best suited for his needs.

Reliable Auto Lock mechanism for measurement safety.

Features

1. **Auto Lock mechanism**
   This function automatically locks the rotor to protect the pivot shaft when measurement is finished. The mechanism allows easy attachment and removal of the rotor while protecting the bearing from damage, making it very easy to operate, even for first time users.
2. **Zero Span setting function**
   Calibration corrects for viscometer-to-viscometer variances - resulting in high accuracies which exceed catalog values.
3. **Preheat / Auto Stop functions**
   The Model R85 also features preheat and auto stop functions.
   The preheat feature operates also as an auto start function.
   Automatic viscometer operation can thus be obtained by combining the preheat and auto stop functions and the user can set startup and stop times at his discretion.
4. **Data interchangeability**
   Measurement data of the R85 viscometer conforms to JIS and ISO standards and is compatible with other Toki Sangyo cylindrical spindle and cone/plate viscometers.
5. **Power interlock function**
   The power interlock function ensures continued power until locking of the bearing is complete even when the viscometer is switched OFF during operation.
6. **Rotation slow up/slow down**
   Rotation speed changes are very smooth which prevents shock from being transmitted to the viscometer during measurement start, changes in speed, and measurement stop.
7. **Alarm warnings and display**
   Warning icons are displayed and an alarm is sounded when measurement data falls below 10% or exceeds 100%.
8. **Data recording**
   A calendar function is incorporated in the R85 viscometer. In addition to measurement data recording, date, viscometer model, and other information can be printed out with a special printer.

Principle of Operation



Motor rotation is transmitted to the rotor through a coil spring. Viscous frictional torque acts on the rotor which rotates in the immersed fluid. This causes a drag on the rotation of the cylindrical spindle and a deflection of the spring. The angle of deviation is proportional to the magnitude of the viscous torque. The torsion angle of the coil spring is the same as the joint torsion angle of slit discs A and B which are attached to both ends of the coil spring. Photo sensors for each disc read the torsion angles and this data is converted to and displayed as viscosity.

Specifications

Accuracy	less than ± 2.0 % of full scale
Repeatability	less than ± 0.2 % of full scale
Viscosity display	Specify 1 of the following ranges (mPa · s) ① % ② S I unit: mPa·s, Pa·s, kPa·s ③ CGS unit: cP , P, kP
Display	Date,Time,Rotor speed,Shear rate,Shear stress, Selected temperature
Output signal	Digital output RS232C
Ambient temperature range	0 ~ 40 ℃
Ambient humidity range	less than 90 % RH(non-condensation)
Wetted parts	SUS304/303 stainless steel
Power input	AC100 ~ 240 V ± 10 %,50/60 Hz,with specialized adaptor
Power consumption	less than 50 VA
Mass	approx. 6.0 kg (include. stand)

Configuration

Model RB-85

Viscometer main unit with stand _____ 1 set
Rotor set (4 pc or 6 pc set) _____ 1 set
AC adaptor _____ 1 pc
Main unit storage case _____ 1 pc

(including No.1 option rotor)

Model RE-85

Viscometer main unit with stand_____ 1 set
Standard cone rotor (1°34' x R24)_____ 1 set
AC adaptor _____ 1 pc
Main unit storage case _____ 1 pc

Option

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	Maximum100 mm
Table speed	measuring time 20 mm/min fasten time 140 mm/min
Power	AC 100 V ~ 120 V 50/60Hz
Power consumption	10 VA
Dimensions	136(W) × 236(D) × 245(H) mm
Mass.	Approx.2.5 kg

Printer CBM-270

Printing method	line thermal serial dot
Print digits	32 digits
Print width	approx.48mm
Dimensions	106(W) × 184(D) × 110(H)
Mass.	approx.600 g(excl.roll paper) AC adaptor : approx.350 g
Power	AC 100 V ± 10 %, 50/60 Hz
Power consumption	approx.15 VA in printing time(max.20 VA)

Thermal paper

Paper width	58 mm
Roll diameter	φ 83 mm
Roll length	approx.72 m

Cone rotor

Cone Rotor	Sample Volume	Shear Rate	Viscosity Measurement Range
1° 34 ' × R12	0.2 ml	3.83N	8 times standard rotor
0.8° × R24	0.6 ml	7.5N	1/2 of standard rotor
0.8° × R12	0.1 ml	7.5N	4 times standard rotor
3° × R24	2.0 ml	2.0N	2 times standard rotor
3° × R17.65	0.8 ml	2.0N	5 times standard rotor
3° × R14	0.4 ml	2.0N	10 times standard rotor
3° × R12	0.3 ml	2.0N	15 times standard rotor
3° × R9.7	0.2 ml	2.0N	30 times standard rotor
SPP	0.5 ml	2.0N	30 times standard rotor

N denotes rotor rotation speed (rpm)

Upper measurement limit tables (mPa•s)

Model RB-85 viscometer

RB-85L

Full scale torque
67.37 μ N・m
Measurement range
10 ～ 2,000,000 mPa・s
Measurement range
1 ～ 2,000,000 mPa・s
(in case of L adaptor)

rpm / ローター	60	30	12	6	3	1.5	0.6	0.3
Lアダプタ※	10	20	50	100	200	400	1,000	2,000
No.1	100	200	500	1,000	2,000	4,000	10,000	20,000
No.2	500	1,000	2,500	5,000	10,000	20,000	50,000	100,000
No.3	2,000	4,000	10,000	20,000	40,000	80,000	200,000	400,000
No.4	10,000	20,000	50,000	100,000	200,000	400,000	1,000,000	2,000,000

RB-85H

Full scale torque
718.7 μ N・m
Measurement range
100 ～ 8,000,000 mPa・s
(including option rotor No.1)

rpm / ローター	100	50	20	10	5	4	2.5	2	1	0.5
No.1※	100	200	500	1,000	2,000	2,500	4,000	5,000	10,000	20,000
No.2	400	800	2,000	4,000	8,000	10,000	16,000	20,000	40,000	80,000
No.3	1,000	2,000	5,000	10,000	20,000	25,000	40,000	50,000	100,000	200,000
No.4	2,000	4,000	10,000	20,000	40,000	50,000	80,000	100,000	200,000	400,000
No.5	4,000	8,000	20,000	40,000	80,000	100,000	160,000	200,000	400,000	800,000
No.6	10,000	20,000	50,000	100,000	200,000	250,000	400,000	500,000	1,000,000	2,000,000
No.7	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

RB-85R

Full scale torque
1,437.4 μ N・m
Measurement range
100 ～ 16,000,000 mPa・s
(including option rotor No.1)

rpm / ローター	100	50	20	10	5	4	2.5	2	1	0.5
No.1※	200	400	1,000	2,000	4,000	5,000	8,000	10,000	20,000	40,000
No.2	800	1,600	4,000	8,000	16,000	20,000	32,000	40,000	80,000	160,000
No.3	2,000	4,000	10,000	20,000	40,000	50,000	80,000	100,000	200,000	400,000
No.4	4,000	8,000	20,000	40,000	80,000	100,000	160,000	200,000	400,000	800,000
No.5	8,000	16,000	40,000	80,000	160,000	200,000	320,000	400,000	800,000	1,600,000
No.6	20,000	40,000	100,000	200,000	4000,000	500,000	800,000	1,000,000	2,000,000	4,000,000
No.7	80,000	160,000	400,000	800,000	1,600,000	2,000,000	3,200,000	4,000,000	8,000,000	16,000,000

RB-85S

Full scale torque
2,156.1 μ N・m
Measurement range
150 ～ 24,000,000 mPa・s
(includung option rotor No.1)

rpm / ローター	100	50	20	10	5	4	2.5	2	1	0.5
No.1※	300	600	1,500	3,000	6,000	7,500	12,000	15,000	30,000	60,000
No.2	1,200	2,400	6,000	12,000	24,000	30,000	48,000	60,000	120,000	240.000
No.3	3,000	6,000	15,000	30,000	60,000	75,000	120,000	150,000	300,000	600,000
No.4	6,000	12,000	30,000	60,000	120,000	150,000	240,000	300,000	600,000	1,200,000
No.5	12,000	24,000	60,000	120,000	240,000	300,000	480,000	600,000	1,200,000	2,400,000
No.6	30,000	60,000	150,000	300,000	600,000	750,000	1,200,000	1,500,000	3,000,000	6,000,000
No.7	120,000	240,000	600,000	1,200,000	2,400,000	3,000,000	4,800,000	6,000,000	12,000,000	24,000,000

RB-85U

Full scale torque
5,749.6 μ N・m
Measurement range
400 ～ 64,000,000 mPa・s
(includung option rotor No.1)

rpm / ローター	100	50	20	10	5	4	2.5	2	1	0.5
No.1※	800	1,600	4,000	8,000	16,000	20,000	32,000	40,000	80,000	160,000
No.2	3,200	6,400	16,000	32,000	64,000	80,000	128,000	160,000	320,000	640,000
No.3	8,000	16,000	40,000	80,000	160,000	200,000	320,000	400,000	800,000	1,600,000
No.4	16,000	32,000	80,000	160,000	320,000	400,000	640,000	800,000	1,600,000	3,200,000
No.5	32,000	64,000	160,000	320,000	640,000	800,000	1,280,000	1,600,000	3,200,000	6,400,000
No.6	80,000	160,000	400,000	800,000	1,600,000	2,000,000	3,200,000	4,000,000	8,000,000	16,000,000
No.7	320,000	640,000	1,600,000	3,200,000	6,400,000	8,000,000	12,800,000	16,000,000	32,000,000	64,000,000

Accurate measurement values might not be obtained in the area of the table indicated by shading or portion of the area indicated by shading as these areas are subject to turbulent flow(Taylor flow).

Model RE-85 viscometer

RE-85L

Full scale torque
67.37 μ N・m

Measurement range
0.6 ～ 1,200 mPa・s

(in case of using standard cone)

ロータ \ rpm	100	50	20	10	5	4	2.5	2	1	0.5
1° 34′ × R24	6.076	12.15	30.38	60.76	121.5	151.9	243.0	303.8	607.6	1,215
48′ × R24※	3.103	6.205	15.51	31.03	62.05	77.56	124.1	155.1	310.3	620.5
3′ × R17.65※	29.25	58.50	146.3	292.5	585.0	731.3	1,170	1,463	2,925	5,850
3′ × R14※	58.61	117.2	293.1	586.1	1,172	1,465	2,345	2,931	5,861	11,720
3′ × R12※	93.08	186.2	465.4	930.8	1,862	2,327	3,723	4,654	9,308	18,620
3′ × R9.7※	176.2	352.4	881.1	1,762	3,524	4,406	7,049	8,811	17,620	35,240

RE-85H

Full scale torque
718.7 μ N・m

Measurement range
6.4 ～ 12,800 mPa・s

(in case of using standard cone)

ロータ \ rpm	100	50	20	10	5	4	2.5	2	1	0.5
1° 34′ × R24	64.82	129.6	324.1	648.2	1,296	1,620	2,593	3,241	6,482	12,960
48′ × R24※	33.10	66.19	165.5	331.0	661.9	827.4	1,324	1,655	3,310	6,619
3′ × R17.65※	312.1	624.1	1,560	3,121	6,241	7,801	12,480	15,600	31,210	62,410
3′ × R14※	625.3	1,251	3,126	6,253	12,510	15,630	25,010	31,260	62,530	125,100
3′ × R12※	992.9	1,986	4,965	9,929	19,860	24,820	39,720	49,650	99,290	198,600
3′ × R9.7※	1,880	3,760	9,400	18,800	37,600	47,000	75,200	94,000	188,000	376,000

RE-85R

Full scale torque
1,437.4 μ N・m

Measurement range
12.8 ～ 25,600 mPa・s

(in case of using standard cone)

ロータ \ rpm	100	50	20	10	5	4	2.5	2	1	0.5
1° 34′ × R24	129.6	259.3	648.2	1,296	2,593	3,241	5,185	6,482	12,960	25,930
48′ × R24※	66.19	132.4	331.0	661.9	1,324	1,655	2,648	3,310	6,619	13,240
3′ × R17.65※	624.1	1,248	3,121	6,241	12,480	15,600	24,960	31,210	62,410	124,800
3′ × R14※	1,251	2,501	6,253	12,510	25,010	31,260	50,020	62,530	125,100	250,100
3′ × R12※	1,986	3,972	9,929	19,860	39,720	49,650	79,430	99,290	198,600	397,200
3′ × R9.7※	3,760	7,520	18,800	37,600	75,200	94,000	150,400	188,000	376,000	752,000

RE-85U

Full scale torque
5,749.6 μ N・m

Measurement range
51.9 ～ 102,400 mPa・s

(in case of using standard cone)

ロータ \ rpm	100	50	20	10	5	4	2.5	2	1	0.5
1° 34′ × R24	518.5	1,037	2,593	5,185	10,370	12,960	20,740	25,930	51,850	103,700
48′ × R24※	264.8	529.6	1,324	2,648	5,296	6,619	10,590	13,240	26,480	52,960
3′ × R17.65※	2,496	4,993	12,480	24,960	49,930	62,410	99,860	124,800	249,600	499,300
3′ × R14※	5,002	10,000	25,010	50,020	100,000	125,100	200,100	250,100	500,200	1,000,000
3′ × R12※	7,943	15,890	39,720	79,430	158,900	198,600	317,700	397,200	794,300	1,589,000
3′ × R9.7※	15,040	30,080	75,200	150,400	300,800	376,000	601,600	752,000	1,504,000	3,008,000

Viscosity measurement ranges in this brochure,are based on Newtonian viscosity fluid.
※ denotes option.

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

※ 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.

TOKI SANGYO CO.,LTD.

Headquarters	32-6 Shinbashi, 5-chome, Minato-ku, Tokyo, JAPAN	TEL.+81-3-3434-5501 ／FAX.+81-3-3433-4044	tokyo@tokisangyo.co.jp
Osaka sales office	2-15 Kawaramachi, 3-chome, Chuo-ku, Osaka, JAPAN	TEL.+81-6-6228-1991 ／FAX.+81-6-6228-1454	osaka@tokisangyo.co.jp
Nagoya sales office	1-20 Sengen, 1-chome, Nishi-ku, Nagoya, JAPAN	TEL.+81-52-522-8277 ／FAX.+81-52-522-7510	nagoya@tokisangyo.co.jp

0705/0705-42-1-1E