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JINAN SHIJIN GROUP CO.
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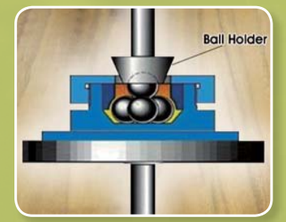
Regional Agent:

TIME GROUP INC.
www.timegroup.com

Ver 1.0

FRICTION AND WEAR TESTING MACHINE



JINAN SHIJIN GROUP CO.
www.shijin.cn

Enterprise Introduction

Time Group Inc. is a high-tech testing equipment manufacturer, which was founded in 1984. At present, Time owns more than 200 million dollars of capitals and 40 branches both at home and abroad. With the effort of 2000 Time staff members, Time gained 130 million dollars of turnover in 2008. In addition, the reputation of Top 500 of China machinery industry also further certified the strength of Time Group Inc.

In 2003, the strategic combination of Time Group Inc. and Jinan Shijin Group Co., (the biggest testing machine manufacturer in China) leads the development of China testing machine industry to a higher international level.

JINAN SHIJIN Group Co. was established in 1952. Equipped with 800 sets of processing machines and a professional expert team of testing machines, Shijin realizes yearly productivity of 6000 sets of testing machines. Based on 56 years' history of manufacturing testing machines in China, focusing on R&D, Shijin launched 6 sets of newly designed testing machines (WDW-100E, WDW-200E, WAW-1000D, YE-S2000C, MM-W1A, and MR-S10B) into the international market in 2007 and 2008 respectively. Keeping on innovating and offering the best solutions with greater speed and lower cost are always the tenets of Time and Shijin.

ISO 9001

TÜV CE Certification

ISO Product conformity certificate

Company Honor

Technology:

TIME SHIJIN Group have about 60 years experience in manufacturing testing machines, and we bring up a team of elite who is dedicating in testing machine industry both in researching and developing.

We have more than 60 professional technicians, include 3 experts who is taking national allowance from State Department.

After recombination with TIME Group Inc. we achieved the real technical resource share, and TIME SHIJIN Group become an enterprise which is devoting to technology innovation.

Manufacturing:

Since year 1952, the company is performing technology development every year. Now, we have different producing machine 1259 units; grand processing machine tools 4 units. Achieved the production of each machine parts of testing machine; include machine screw, oil cylinder, oil piston and so on. Strictly ensure the accuracy of whole testing machine.

TIME GROUP INC.
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CONTENTS

MM-W1A Vertical Universal Friction & Wear Testing Machine

Brief Introduction:

MM-W1A is a Multi-Specimen Friction and Wear Testing Machine. It is designed for simulating, evaluating and testing almost all kinds of oil (high-class serial hydraulic oil, lubricant, combustion oil and gear oil) and materials (metal, plastic, coating, rubber, ceramic etc.).

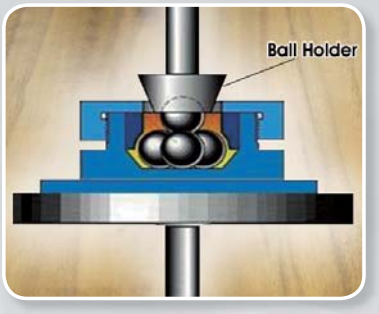
It is widely used in tribology field, petrol chemical industry, mechanical, energy resource, metallurgy, space flight, engineering areas, college and institute etc..

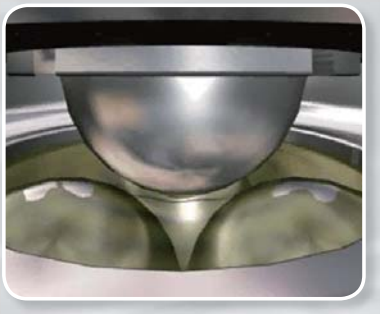
Standards:

This machine meets SH/T 0189-1992 Lubricant Anti-wear Performance Evaluation Method (Four-ball Tester Method) and conforms to ASTM D4172 - 94 and ASTM D 5183 - 95.

Testing Condition:

Item	Method A	Method B
Test Temperature	75±2℃	75±2℃
Speed of spindle	1200±60r/min	1200±60r/min
Testing time	60±1min	60±1min
Axial testing force	147N (15kgf)	392N (40kgf)
Axial testing force zero point inductance	±1.96N (±0.2kgf)	±1.96N (±0.2kgf)
Standard steel-ball specimen	ϕ12.7mm	ϕ12.7mm

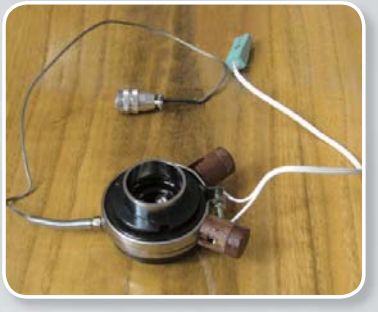




Four-ball Friction Pair

Pin-on-Disc Friction Pair

Ring on Ring Friction Pair



High Temperature Oil Box

Speification:

1. Test force	
1.1 Axial test force working range	0～1000N;
1.2 Error of indicating value lower than 200N	not bigger than ±2N
Error of indicating value upper than 200N	not bigger than 1%
1.3 Discriminability of test force	not bigger than 1.5N
1.4 Relative error of long time auto hold indicating value	not bigger than±1% FS
1.5 Return zero error of digital display device of test force indicating value	not bigger than±0.2%FS
2. Friction Moment	
2.1 Measuring maximum friction moment	2.5N.m
2.2 Relative error of friction moment indicating value	not bigger than ±2%
2.3 Friction force weighing transducer	50N
2.4 Friction force arm distance	50mm
2.5 Discriminability of friction moment indicating value	not bigger than 25N.mm
2.6 Return zero error of digital display device of friction moment indicating value	not bigger than±0.2%FS
3. Range of spindle stepless speed variation	
3.1 Stepless speed variation	1～2000r/min
3.2 Special deceleration system	0.05～20r/min
3.3 For over100r/min, error of spindle speed	not bigger than ±5r/min
For below 100r/min, error of spindle speed	not bigger than ±1r/min
4. Testing media	oil, water, muddy water, abrasive material
5. Heating System	
5.1 Heater working range	room temperature～260 ℃
5.2 Disc type heater	Φ65, 220V, 250W
5.3 Jacketing heater	Φ70×34, 220V, 300W
5.4 Jacketing heater	Φ65, 220V, 250W
5.5 Platinum thermo resistance	1group each (long & short)
5.6 Temperature measuring control accuracy	±2 ℃
6. Conicity of spindle of testing machine	1:7
7. Max.distance between spindle and lower disc	≥75mm
8. Spindle control mode	
8.1 Manual control	
8.2 Time control	
8.3 Revolution Control	
8.4 Friction moment control	
9. Time display & control range	0s～9999min
10. Revolution display & control range	0～9999999
11. Output maximum moment of main motor	4.8N.m
12. Overall dimension (L×W×H)	600×682×1560mm
13. Net weight	about 450kg

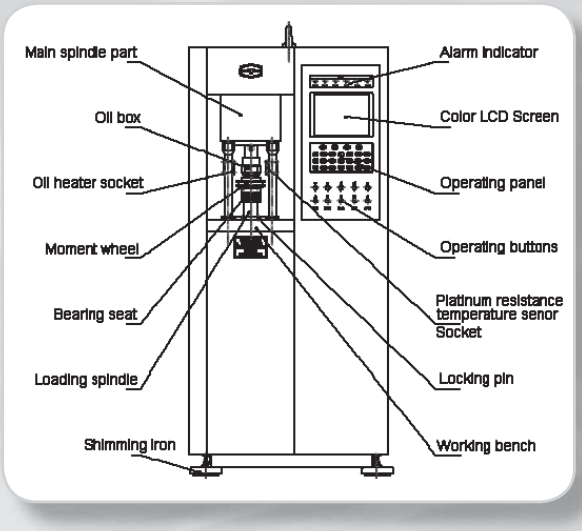
MR-S10D Electrohydraulic Servo Four-ball Friction Testing Machine

Brief Introduction:

The machine is used to evaluate the loading capacity of lubricants in the process of sliding friction on a contact point under very high pressure. The above mentioned capacity including 3 datas to be tested: The maximum load Pb under the unstuck condition, sintered load Pd and comprehensive value of wearing during friction ZMZ.

Standards:

This machine conforms to ASTM D2783 Standard Test Method for Measurement of Extreme-Pressure Properties of Lubricating Fluids (Four-Ball Method).



Specification:

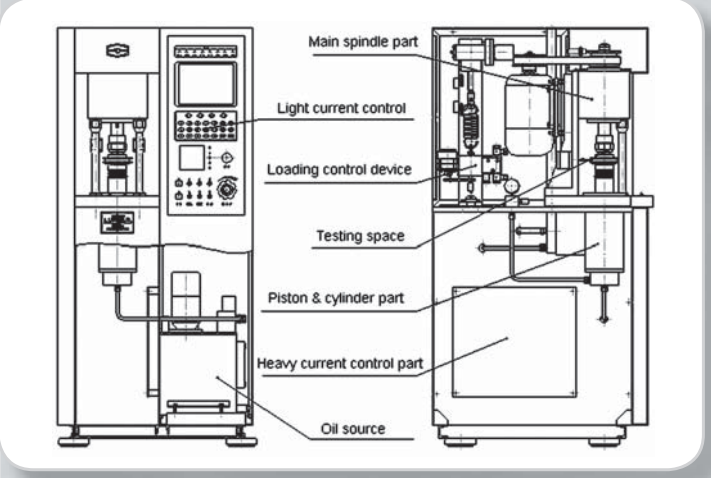
Specification		MR-S10D
Max. test load		10Kn
Load range		40 N～10000N
Relative error of load capacity	> 4% of max. test load	≤±1%
		Relative error of load repeatability ≤1%
	≤4% of max. test load	≤±5N
		Relative error of load repeatability ≤5N
Max. tolerance of test load holding		±0.3%FN
Friction measuring range		0～300N
Relative error of friction		10N～300N ≤±2%
		Relative error of friction repeatability ≤2%
Rotating speed of the main spindle		200 r/min～2000r/min
Relative error of roation rate		±10r/min
The range of heating temperature		room temperature ～200℃
Temperature controlling range		±2℃
Time setting range		1s～9999min
Rotation setting range		1～9999999
Steel ball diameter		ϕ12.7 mm
Dimension (L x W x H)		760×860×1600mm
Net weight		approx. 600kg

Brief Introduction:

The machine is used to evaluate the loading capacity of lubricants in the process of sliding friction on a contact point under very high pressure. The above mentioned capacity including 3 datas to be tested: The maximum load Pb under the unstuck condition, sintered load Pd and comprehensive value of wearing during friction ZMZ."

Standards:

This machine conforms to ASTM D2783 Standard Test Method for Measurement of Extreme-Pressure Properties of Lubricating Fluids (Four-Ball Method).



Specification:

Specification		MR-S10B
Max. test load		10Kn
Load range		40 N～10000N
Relative error of load capacity	> 4% of max. test load	≤±1%
		Relative error of load repeatability ≤1%;
	≤4% of max. test load	≤±5N
		Relative error of load repeatability ≤5N
Max. tolerance of test load holding		±1%FN
Friction measuring range		0～300N
Relative error of friction		10N～300N ≤±3%
		Relative error of friction repeatability ≤3%
Rotating speed of the main spindle		200 r/min～2000r/min
Relative error of roation rate		±10r/min
The range of heating temperature		room temperature ～200℃
Temperature controlling range		±2℃
Time setting range		1s～9999min
Rotation setting range		1～9999999
Steel ball diameter		ϕ12.7 mm
Dimension (L x W x H)		760×860×1600mm
Net weight		600kg

MR-S10G Lever Type Four-ball Friction & Wear Testing Machine

Brief Introduction:

The machine is used to evaluate the loading capacity of lubricants in the process of sliding friction on a contact point under very high pressure. The above mentioned capacity including 3 datas to be tested: The maximum load Pb under the unstuck condition, sintered load Pd and comprehensive value of wearing during friction ZMZ. The machine can carry on abrasive wearing test for a long period in order to appraise friction and obtain the coefficient of friction of the material.

Standards:

This machine conforms to ASTM D2783 Standard Test Method for Measurement of Extreme-Pressure Properties of Lubricating Fluids (Four-Ball Method).

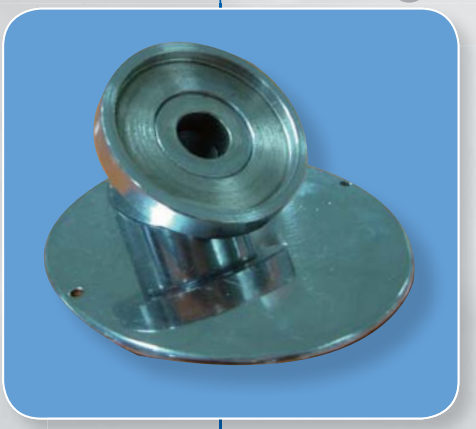
Specification:

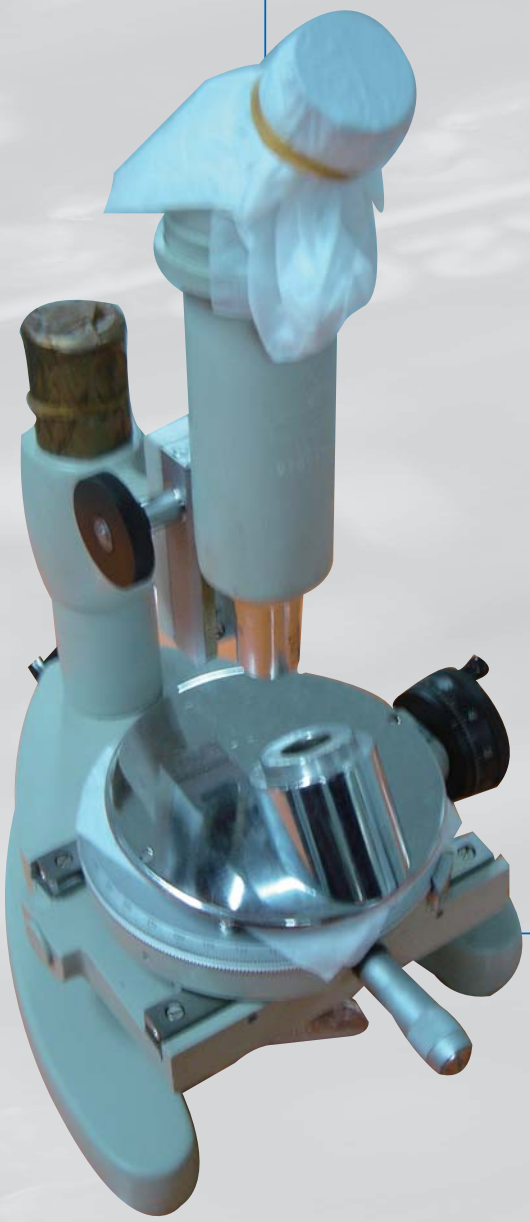
Specification	MR-S10G
Max. test load	10kn
The control mode of loading	Lever loading
Relative error of the load capacity	±1%
The rotating speed of the main spindle	200-2000r/min Stepless
Relative error of the rotation rate	≤±10r/min
The range of heating temperature of the sample being tested	Ambient temperature～250°C
Friction measuring range	1～200N
Dimension (L×W×H)	1300×490×1220mm
The steel ball to be tested	The steel ball to be tested four- ball friction testing machine. Nominal diameter 12.7mm

Application:

It is mainly used for the observation of ball scar after Four-ball test to make further analysis.

The special design is perfectly fit for the ball scar observing.





25X microscope special for Four-ball machines

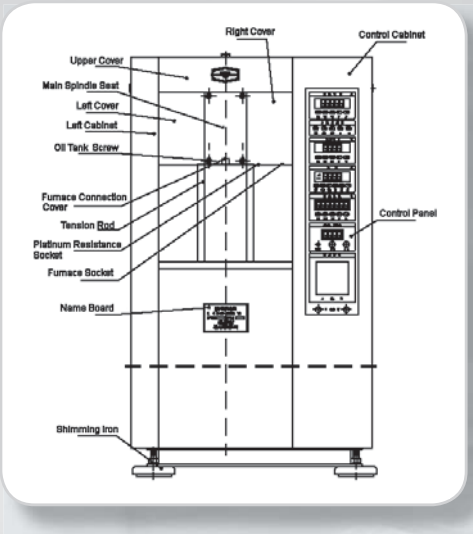
Data Processing System
<Software, Computer and Printer>

MR-H3A High Speed Ring - Block Wear Testing Machine

Brief Introduction:

MR-H3A High Speed Ring-Block Wear Testing Machine is mainly used to evaluate the lubricating capability of kinds of lubricating oil and grease, and is especially suitable for the evaluation of scraping ability of medium and top grade automobile bearing oil. And it can be also used to evaluate the lubricating capability of solid lubricant materials and wearing ability of metal and non-metal materials.

This machine is used widely in the evaluation of medium and top grade automobile bearing oils, tribology field, petrol chemical industry, mechanical, energy resource, metallurgy, space flight, engineering areas, and also be widely used in college and institute etc. for friction and wear studying.



Standards:

This machine conforms to ASTM G77 Standard Test Method for Ranking Resistance of Materials to Sliding Wear Using Block-on-Ring Wear Test.

Specification:

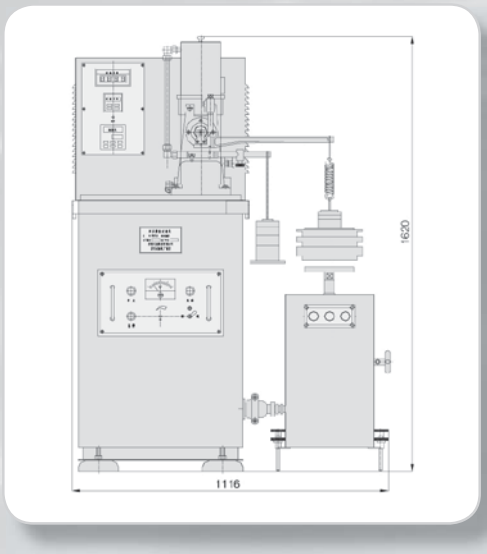
Specification	MR-H3A
Max. test load	3000N
Relative error of test load (≥10% of max. load)	≤±1%
	Relative error of load repeatability ≤1%
Max. tolerance of test load holding	±1% of max. test load
Max. Friction	300N
Relative error of test load (≥10% of max. load)	≤±3%
	Relative error of load repeatability ≤3%
Rotating speed of the main spindle	5~4000 r/min
Relative error of rotation rate	>100 r/min: ≤±10 r/min
	≤100 r/min: ≤±1 r/min
The range of heating temperature	room temperature ~100°C
Temperature controlling range	±2°C
Time setting range	1s~9999min
Rotation setting range	1~9999999
Dimension (L x W x H)	710×840×1690mm
Net weight	approx. 500kg

Brief Introduction:

This machine is mainly applied for simulating evaluation for kinds of lubricant, grease′ s extreme compression capacity and anti-confusion capacity. It can also be used for performance study of anti-friction capacity of aviation kerosene and capacities of all sorts of paint coating, metal and non-metal materials.

Standards:

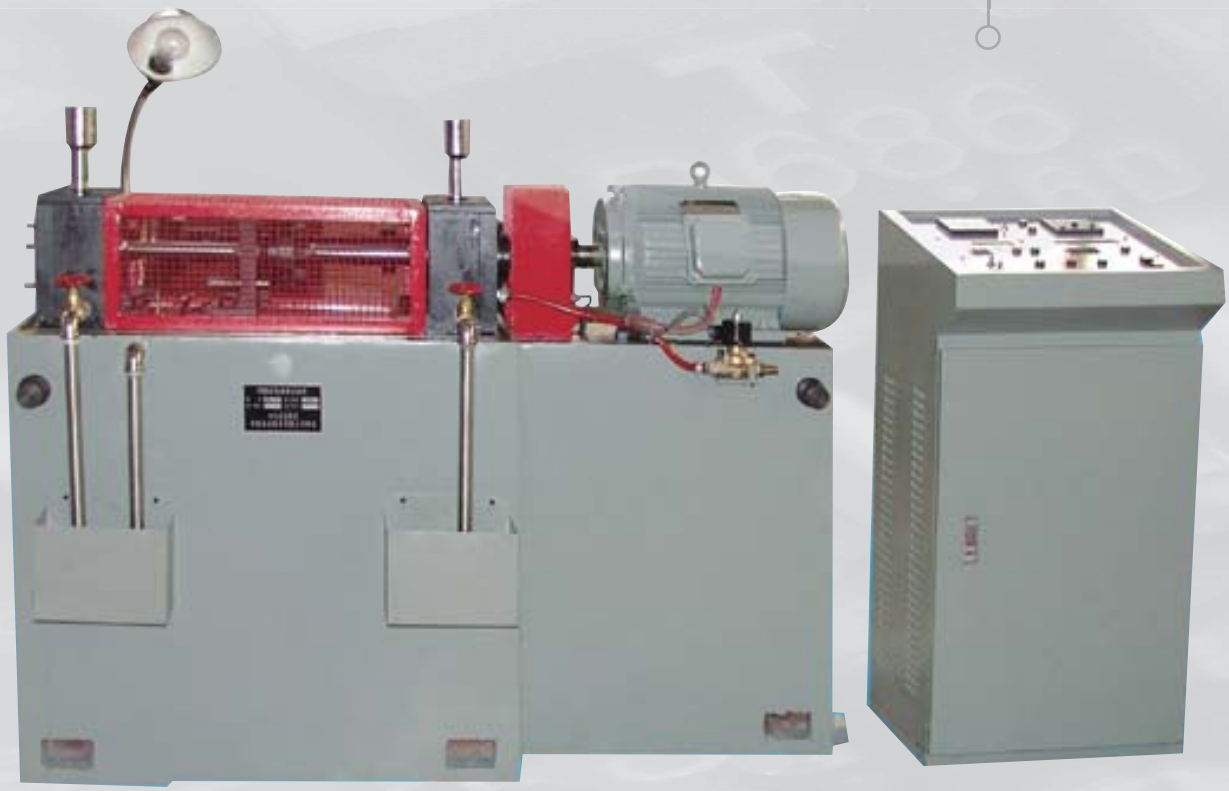
This machine conforms to ASTM D 2782 Standard Test Method for Measurement of Extreme-Pressure Properties of Lubricating Fluids (Timken Method) and ASTM G77 Standard Test Method for Ranking Resistance of Materials to Sliding Wear Using Block-on-Ring Wear Test.



Specification:

Specification		MR-H5A
Max. test force		5000N
Spindle speed range		1～1500r/m
Test force leverage		10：1
Staff gauge scale		0.5N/100mm
Temperature range of test oil		Room temperature～100℃
Test force speed		8.92～13.33N/s
Standard testing ring's dimension（mm）		φ49.22×13.06
Standard testing block's dimension（mm）		12.32×19.05
Overall dimensions（L×W×H）	Mainframe	1140×660×1620mm
	Inflicting force installation	460×460×900mm
Net weight of load frame		600kg

MR-C1
FZG Gear Wear Testing Machine

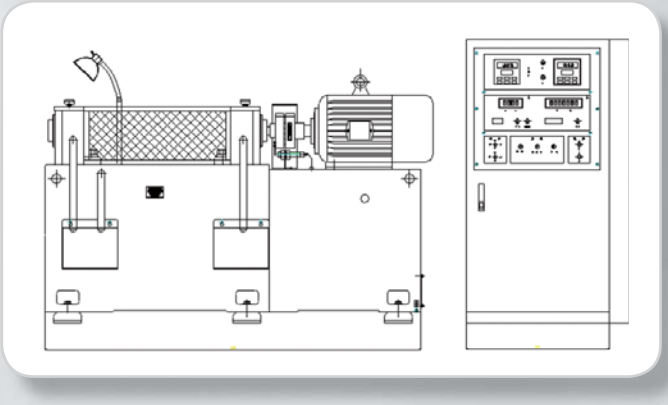


Brief Introduction:

This machine is mainly applied for evaluating the scuffing load capacity of gears and lubricants.

Standards:

This machine conforms to GB/T 13672-92 Standard Test Method for Scuffing Load Capacity of Gears and SH/T 0366-1992 Lubricant Carrying Capacity Test Method (CL-100 Gear Machine Method)

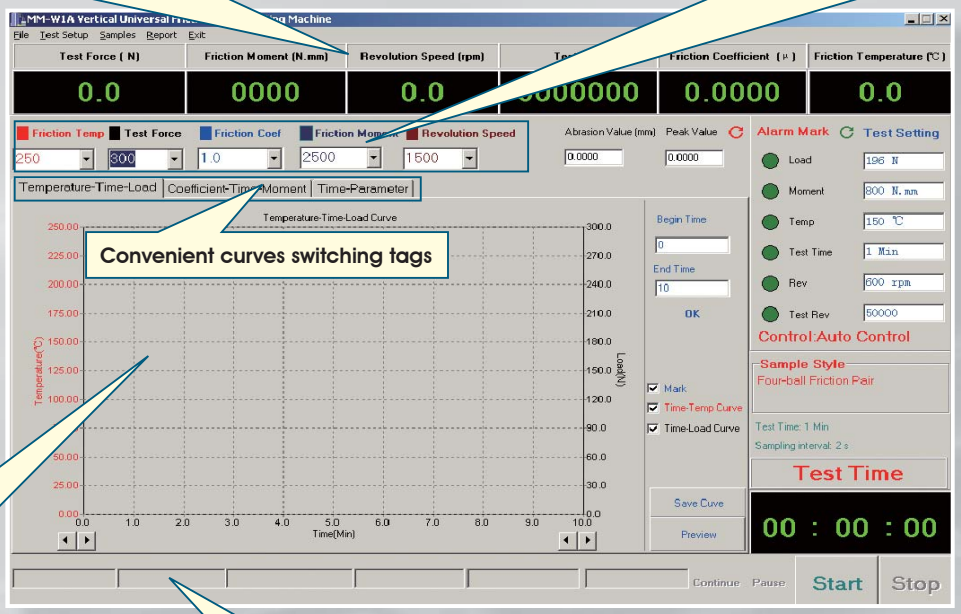


Specification:

Specification	MR-C1
Max. torque	1kN.m
Max. loading class	13 classes
Temperature control accuracy	±2 ℃
Motor power	6.5/8kw
Motor speed	1450/2880 r/min
Gear box volume	1.25L
Heating power	0.5 x 3 = 1.5kw
Dimensions	1390 × 750 × 1082mm

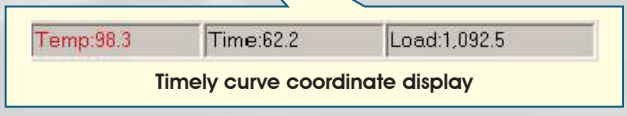
Main testing parameters timely display.

Test Time & Curve Coordinate Regulation Bar

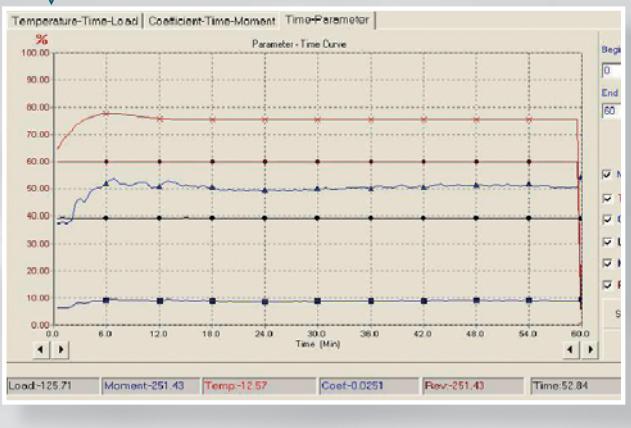


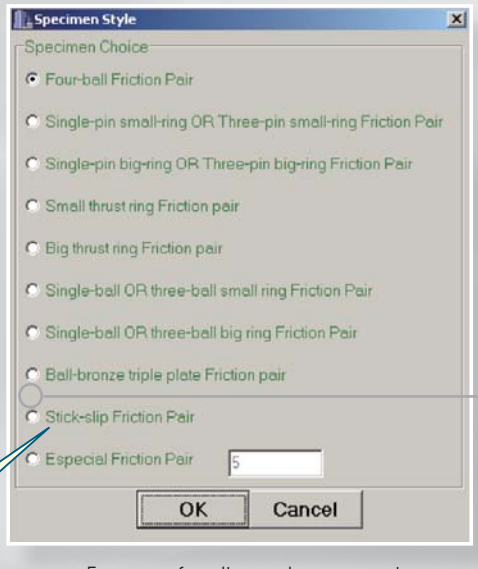
Convenient curves switching tags

Area for curves display



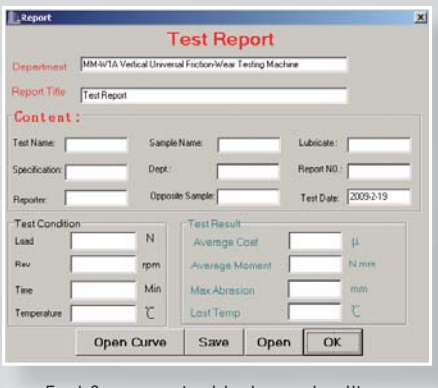
Timely curve coordinate display



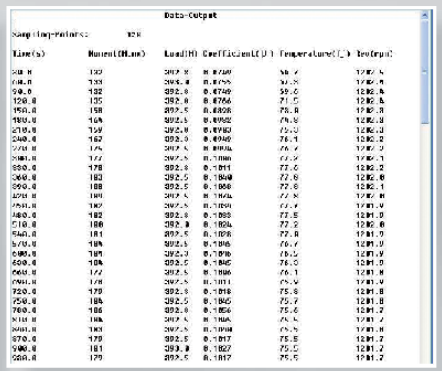


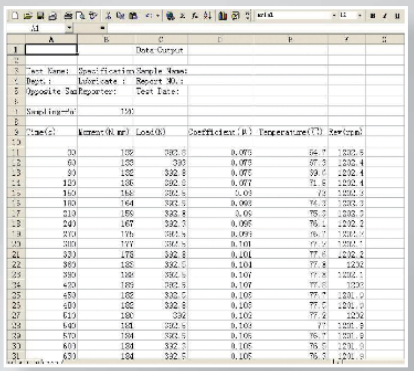
Multi-Specimen styles choice for different kinds of frictions

For more functions, please enquiry our sales manager.



Fast & convenient test report setting



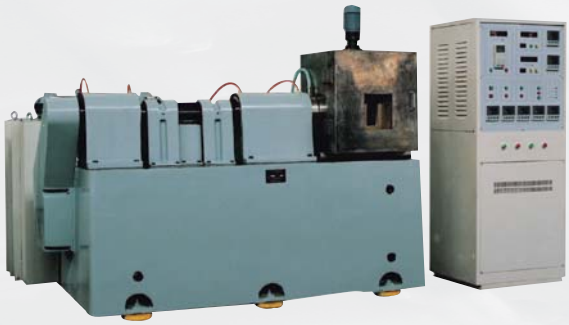


Coordinate points test report; all the parameters could be saved as Excel directly for further editing.

Other Friction and Wear Testing Machines

Screen Display Material End Surface High Temperature Friction and Wear Testing Machine

Aviation Fuel Lubricity Simulation Testing Machine



High Temperature High Speed Pin-Disc Friction & Wear Testing Machine

High Speed Plate-Pin-Ring Friction & Wear Testing Machine

Screen Display PV Friction Testing Machine

Metal Machining Fluid Tapping Torque Simulation Evaluation Testing Machine

Microcomputer Controlled Electro-Hydraulic servo Bearing testing Machine