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Universal Material Testing Machine

Introduction: BGD 570/571 Universal Material Tensile Machine is a new type of material machine which combines the electronic technology and mechanical transmission. It has wide accuracy acceleration and test force range, not only measuring and controlling the load and displacement in higher accuracy and sensitively, but also doing the control test by automatically of isokinetic load and displacement. It operates easily and conveniently, especially applied in inspect instruments which is used for controlling products of produce line. This series of tensile machine is mainly suit for non-metal and metal test with test load less than 20KN (BGD 570) or 50KN (BGD 571) .

The electronic universal material testing machine is mainly suitable for testing metal and non-metal materials, such as rubber, plastic, wire and cable, optical fiber cable, seat belt, safety belt, leather belt composite material, PVC, waterproof coiled material, steel pipe, copper material, section bar, spring steel, bearing steel, stainless steel (and other high hardness steels), castings, steel plates, steel belts and non-ferrous metal wires. To test their functions which include stretching, compression, bending, shearing, stripping, tearing, two-point extension (additional extension meter is required) etc.

Features:

- ◆ Standards: ISO 527, ISO 604, ISO 178, ISO 1209, ASTM D 638, ASTM D 903
- ◆ High precision sensor (use high precision ball screw as driving mechanism)
- ◆ Frequency of collecting data: 200 times/second.
- ◆ Can store many testing results of referenced points, calculate average value automatically, grab automatically max. Value, force value at break.
- ◆ Set range of break point proportion: 0~99%, and can set freely according to different samples, accomplish stopped status at different position.
- ◆ Safety Device: Over loading, Emergency shut down, limitation device for above travel and under travel.
- ◆ Collect date synchronously, conversable full 24 bits AD codes, resolution arrives 1/500,000, surpass all competitors.
- ◆ More than one thousand clamps and grippers for selection.
- ◆ Support multi-sensors, can equip with a few sensors at the same time for different range.
- ◆ User can calculate elastic modulus, yield point, constant residual strength, constant elongation, constant force deformation and maximum strength. There are other special professional calculations, such as the calculation of belt stripping and the elongation at yield point.
- ◆ Optional measure and control system of professional test machine, which can realize the closed loop of force value, deformation and position, so that the tensile machine can carry out curve control tests freely, such as low frequency cycle (fatigue) test, step test and force value holding (creep) test.

Measure and Control System→ Function ↓	Standard open-loop control system (standard configuration)	Standard close-loop control system (optional)
Position (displacement speed)	✓	✓
Force (force value speed)	×	✓
Deformation	×	✓
Multiple Control (position, force, deformation control exchange)	×	✓
Cycle control	×	✓

Software

- ◆ Operating interface attached with graph, image: intuitive and convenient to use, and it will decrease the operation error by voice mentioned, improving the reliability at the same time.
- ◆ MS-ACCESS database technology and SQL technology: it is not only applied for data preservation and processing standardization, but also convenient for connecting to Intranet or Internet. It can also connect Word or Excel etc software easily. User can read original test data just through standard database.
- ◆ Modular programming: VBScript can enlarge the user's reporter and parameter program by automatic calculation. User can develop by secondary, it can realize stretching, compression, bending, tearing, stripping, shearing etc test functions except for software bag.
- ◆ The curve graph function: through modular programming, real-time curve graphs will be displayed during the test, and parameter types can be selected for the coordinate axis of curve graphs. In theory, there are 169 kinds of graphs, from which parameters can be displayed.
- ◆ Multi-sensor support: it can support 5 force value sensors, 5 deformation sensors + large deformation + displacement, which expanded the test range greatly.

NOTE: The minimum requirements of PC: Windows 7/Windows 8/Windows 10 operating system, USB2.0/ USB3.0 interface, CPU 3.0 Ghz, 4 GB of memory, 100 GB of hard disk, wide screen color display (the minimum resolution: 1366×768) .

Hardware

- ◆ Three-way independent simulant input channel, 24 bits AD converter, gain amplifier controlled by program.
- ◆ Use USB 2.0 insulated photoelectricity to connect computer, reduce disturb and increase reliability.
- ◆ Unit for testing force uses the newest high-speed, high resolution, high precision, no dividual grade AD converter which can arrive $\pm 500,000$ fractionized codes. It's superior to six grades amplifier and reach or approach advanced international standards.
- ◆ Unit for testing big distortion: this system use high-speed circuit system to accomplish four-quadrant collection of photoelectric encoder, solve all influence to testing results because of dithering under low speed and redirection thoroughly, and increase four times resolution to big distortion of test machine big distortion.
- ◆ Unit for testing displacement: use high-speed circuit system to accomplish four-quadrant collection of photoelectric en-coder, solve all influence to testing results because of dithering under low speed and redirection thoroughly, and increase four times resolution to big distortion of test machine big distortion.
- ◆ Unit for controlling speed: full digital controlling unit and its speed regulation ratio arrive 1:500000, namely 0.001~ 500mm/min (precision : 0.1%) , and can be tested under the whole range.

Optional Clamp:



Wedge Clamp
for Metal



Wedge Clamp
for Hard Plastic



Eccentric
Wheel Clamp



Plane Clamp



Film Clamp





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Main Technical Parameters

Ordering Information → Technical Parameters ↓	BGD 570 Universal Material Tensile Machine	BGD 571 Universal Material Tensile Machine
Max. range (optional)	100N, 200N, 500N, 1KN, 2KN, 5KN, 10KN, (can be extended to 20KN)	50N, 500N, 5KN, 10KN, 20KN, 50KN
Precision Grade	Grade 1	
Measuring Range of Test Force	1% ~ 100 FS (full range)	
Display Error of Test Force	Within ± 1% (indicating value) / Within ± 0.5% (indicating value)	
Resolution of Test Force	± 1/500,000 of max. force (There is no grade in the whole process, and keep the constant resolution throughout the whole process.)	
Load Sensor	Standard configured one tension and pressure sensor (maximum load) ; Up to 5 sensors can be added.	
Valid Test Width	380mm	450mm (can be widened as required)
Valid Tensile Space (excludes clamp)	1100mm (can be lengthen as required)	1000mm (can be lengthen as required)
Test Speed	0.001–500mm/min	0.001–400mm/min
Display Error of Displacement	Within ± 0.5% (Indicating Value) / Within ± 0.2% (Indicating Value)	
Control System of Deformation (Optional)	A. Large deformation measure system: the minimum gauge distance is 10mm, the deformation range is 800mm. B. Small deformation measure system: gauge distance: 25mm, 50mm, 100mm; deformation range: 5mm, 10mm, 25mm	
Control Accuracy of Deformation Speed	Within ± 0.5% of indicating value (large deformation or small deformation can be selected by customers)	
Safety Device	Electronic limit protection	
Lifting Device of Working Platform	Fast/slow speed automatic control, can move by yourself	
Return Function	Manual or automatic. After the test is completed, it returns to the initial position at the highest speed.	
Overload Protection	If the maximum load exceeds 10%, the machine will be automatically stopped.	
Clamp	A set of clamp (special clamps can also be designed according to the customers sample specifications.	
Overall Size (L×W×H)	700mm × 530mm × 2200mm	880mm × 530mm × 1800mm
Power System	Servo machine + ZNT high accuracy ball screw	Servo machine + transmission + high accuracy ball screw
Power Supply	220V, 50HZ	
Weight	300KG	380KG
Power	0.4KW	1.0KW



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Optional Accessories

BGD 570/K---Low temperature tensile test chamber

BGD 1530---Bond strength pulling head (40mm × 40mm)

BGD 1531---Bond strength pulling head (50mm × 50mm)

BGD 1550/B---Elongation Device (Also call big deformation device, measure breaking elongation, see NOTE)

BGD 1551---Tensile small range sensor ($\leq 500\text{KG}$))

BGD 1552---Tensile big range senso ($\geq 500\text{KG}$))

BGD 1553---Pneumatic Cutting Machine Used to cut different type samples)

BGD 1554---Cutter for dumb-bell sample For tensile strength)

BGD 1555---Cutter for right angle tear sample For tear strength)

BGD 1700----Plane clamp

BGD 1701----Eccentric wheel clamp

BGD 1702----Wedge clamp for metal

BGD 1703----Wedge clamp for hard plastic

BGD 1704----Film clamp



NOTE: About the elongation of test materials

The displacement measure system, which is contained in tensile machine, only measures the moving distance of the crossbeam. If you need to measure the elongation of materials, such as elastic coatings or rubber products, additional large deformation device is required.