

Features include:

- Four channels with real-time data acquisition
- Backlit LCD display
- RS232 interface for computer or printer.
- Nonvolatile test data storage and instrument calibration
- Can be programmed to complete up to 99 shearing cycles automatically using HM-2700SW Software.
- Battery-backed real-time clock
- Auto conversation of instrument calibration between English or Imperial units and SI or metric units
- Test setup and selection via keypad
- Automatic triggering of test logging data
- View logged test data via the LCD display
- Logging rate as fast as 0.1 second/reading
- Humboldt HMTS, Basic, User-Defined Level software included for data acquisition

Pneumatic Direct/Residual Shear Apparatus, 110/220 VAC 50/60Hz— HM-2560A.3F

The Humboldt 25Sixty Shear, Direct/Residual Shear Apparatus, utilizes the pneumatic loading concept for applying the vertical load to the sample. In doing so, this self-contained model eliminates the need for cumbersome loading weights used in dead weight-type systems.

The microprocessor-based system features a stepper motor drive system, large display, touch-sensitive keypad and forward/reverse travel limit switches. Through the use of a built-in 4-channel data acquisition system, the operator can preset the logging condition for the test.

Built to last in the harshest laboratory environments, the vertical/ horizontal loading mechanism and shear box assembly are mounted on a 1.25" (30mm) thick solid aluminum base and heavy-gage enamel painted steel cabinet. The strain rods are manufactured from stainless steel and the shearbox carriage (water chamber) is constructed of anodized cast aluminum for corrosion resistance and long service life. The shearbox is constructed of anodized aluminum for light weight.

The HM-2560A is supplied complete with a 2,000 lbf (10kN) capacity load cell, 1" (25.4mm) horizontal strain transducer, 0.4" (10.2mm) vertical strain transducer and a built-in 4-channel analog data acquisition system. Shearbox assemblies and related accessories are not included and must be ordered separately. Complies with ASTM D3080, AASHTO T236 and BS1377:7 standards.

Replacement Ball, 5/8" 440 Stainless Steel— HM-001076

Specifications	
Horiz. Movement	2" (50.mm) maximum
Horiz. Shear Force	2,000 lbf (10kN)
Vertical Load	2,000 lbf (10kN)
Speed Range	0.00001 to 0.49999 in/min. (0.00001 to 12.99999 mm/min.)
Voltage	110/220 VAC 50/60HZ
Current	6.5 Amps
Analog to Digital	16 bit
Data Storage	4000 Readings
Data Collection Rate	100 ms
Computer Port	RS232
Dimension (W x D x H)	30 x 15.5 x 22" (L x D x H) (760 x 394 x 558mm))
Weight	140 lb (64 kg)
Shipping Weight	168 lb (76 kg) 🚛 🕵

Pneumatic Direct/Residual Shear Typical Setup:

Part #	Qty	Description			
Pneumatic, Computer Control w/ Analog Instrumentation					
HM-2560A.3F	1	25Sixty Shear w/ Analog Inputs			
HM-2701.XX(S/D)	1	Shearbox Assembly			
HM-2702.XX(S/D)	1	Shearbox Cutter			
HM-2703.XX(S/D)	1	Dolly/Tamper			
HM-2700SW	1	HMTS Direct Shear Reporting Software			

Part Numbers ending in .XX require a size code to be entered referring to the sample size to be tested.

For Direct/Residual Shear samples, sizes are: .20 = 2.0"; .242 = 2.42"; .25 = 2.5"; .40 = 4.0"; .50 = 50mm; .60 = 60mm, and .100 = 100mm. NOTE: For Direct/Residual Shear, also, use "S" for square and "D" for round samples.



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HM-2703.60S



Accessory	Model
Cutter	HM-2702.XXS/D
Dolly Tamper	HM-2703.XXS/D
Porous Plate	HM-2704.XXS/D
Calibration Disk, Square	HM-2705.XXS
Calibration Disk, Round	HM-1220.XX.4

Part Numbers ending in .XX require a size code to be entered referring to the sample size to be tested.

For Direct/Residual Shear samples, sizes are: .20 = 2.0"; .24 = 2.42"; .25 = 2.5"; .40 = 4.0"; .50 = 50mm; .60 = 60mm, and .100 = 100mm. NOTE: For Direct/Residual Shear, also, use "S" for square and "D" for round samples.

HMTS Reporting Software, Direct/Residual Shear Module— HM-2700SW

Humboldt Material Testing Software (HMTS) provides a complete solution for the acquisition, recording and presentation of test data, as well as controlling testing operations when used in conjunction with compatible Humboldt testing equipment. HMTS works in conjunction with Microsoft Excel to present test data in easy-to-read Excel workbook format files, which can be evaluated directly or sent to any computer using Microsoft Excel. The Direct/Residual Shear Module provides a simple, test-specific interface to control Shear test operations and automatically record data while also displaying it in real-time tables and graphs. Technicians can be freed-up for other duties with the assurance that all test data is being collected and saved.

- Test Information is stored, and all calculations are performed automatically
- Live tests and live graphing capabilities (real-time)
- Complete test report including all calculations and graphs required for testing
- Review and export tests using Microsoft Excel

See page 84 and 85 for more information on HMTS software.



HM-2751.25D

Shearbox Assemblies for use with HM-2560A.3F and HM-2750.3F Direct Shear Machines

Round Shearbox Assemblies						
Use with:	lse with: HM-2560A.3F HM-2750.3F					
Size	Model	Model				
2.0"	HM-2701.20D	HM-2751.20D				
2.42"	HM-2701.24D	HM-2751.24D				
2.5"	HM-2701.25D	HM-2751.25D				
4.0"	HM-2701.40D	HM-2751.40D				
50mm	HM-2701.50D	HM-2751.50D				
60mm	HM-2701.60D	HM-2751.60D				
100mm	HM-2701.100D	HM-2751.100D				

Shearbox Assemblies include: Sample Box, (2) Porous Plates, (1) Loading Pad, and (1) Grid Plate. All Shearboxes feature mounting screws for use with the HM-2750 ASTM D3080-compliant counter-balance device.

Square Shearbox Assemblies						
Use with:	Use with: HM-2560A.3F HM-2750.3F					
Size	Model	Model				
2.0"	HM-2701.20S	HM-2751.20S				
2.42"	HM-2701.24S	HM-2751.24S				
2.5"	HM-2701.25S	HM-2751.25S				
4.0"	HM-2701.40S	HM-2751.40S				
50mm	HM-2701.50S	HM-2751.50S				
60mm	HM-2701.60S	HM-2751.60S				
100mm	HM-2701.100S	HM-2751.100S				



60

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NEW! Counter-balance device for ASTM D3080 compliance. Not available anywhere else. Also available as a retrofit kit. HM-2560A.1 HMTS Repo Direct/Resi Module— H

HM-2750A.3F

Direct/Residual Shear, Standard Controller, 120/220V 50/60Hz— HM-2750.3F Metric, Direct/Residual Shear, Standard Controller, 120/220V 50/60Hz— HM-2750M.3F Direct/Residual Shear, Analog Controller, 120/220V 50/60Hz— HM-2750A.3F Direct/Residual Shear, Digital Controller, 120/220V 50/60Hz— HM-2750D.3F

HUMBOLDT

The Humboldt HM-2750 Series Direct/Residual Shear Machines are an economical choice for performing direct/residual shear tests utilizing the deadweight method. The HM-2750s come in three different configurations: a standard controller model with load rings and dial gauges; a controller with four analog instrumentation channel inputs, an RS-232 Port and RS-485 Input and Output, including the necessary analog transducers; and, a controller with four Digital instrumentation channel inputs, an RS-232 Port and RS-232 Port and RS-485 Input and Output, including the necessary digital indicators.

All models include the carriage, stand, vertical load hanger and a balanced lever loading arm with a 10:1 ratio that reduces the weight required to perform tests. The microprocessor-based system features a stepper motor drive system, large display, touch-sensitive keypad and forward/reverse travel limit switches.

All models allow for rapid and easy manual adjustment of shearing force speed rates. The maximum shear force is 2000 lbf (10kN), and, the maximum consolidation force is 2000 lbf (10kN). The carriage accepts shear box squares up to 4.0" (100mm) internal dimension. Forward and reverse measurements permit residual shear testing as standard. A built-in safety feature prevents the overloading of the load measuring system. Complies with ASTM D3080, AASHTO T236 and BS1377:7 standards.



HMTS Reporting Software, Direct/Residual Shear Module— HM-2700SW

The Direct/Residual Shear Module provides a simple, test-specific interface to control Shear test operations and automatically record data while also displaying it in real-time tables and graphs. See page 84 and 85 for more information.

Models A and D Feature:

- Backlit LCD display
- Nonvolatile test data storage and instrument calibration
- Battery-backed real-time clock
- Auto conversation of instrument calibration between English or Imperial units and SI or metric units
- Test setup and selection via keypad
- Automatic triggering of test logging data
- View logged test data via the LCD display
- Logging rate as fast as 0.1 second/reading
- Four channels with real-time data acquisition
- RS-232 interface for computer or printer.
- Humboldt HMTS, Basic, User-Defined Level software included for data acquisition

Specifications	
Horiz. Movement	2" (50.mm) maximum
Horiz. Shear Force	2,000 lbf (10kN)
Vertical Load	2,000 lbf (10kN)
Speed Range	0.00001 to 0.49999 in/min. (0.00001 to 12.99999 mm/min.)
Voltage	110/220 VAC 50/60HZ
Current	6.5 Amps
Analog to Digital	16 bit
Data Storage	4000 Readings
Data Collection Rate	100 ms
Computer Port	RS232
Dimension (W x D x H)	40 x 10 x 45" (L x D x H) (1016 x 254 x 1143mm)
Weight	230 lbs.
Shipping Weight	288lb (131kg) 1998 - 1



Model Configurations

Dead Weight with Manual Control						
Description	Qty	Part #				
Direct Residual Shear Apparatus 10:1	1	HM-2750.3F				
Shearbox Assembly	1	HM-2751.XX (S/D)				
Shearbox Cutter	1	HM-2702.XX (S/D)				
Dolly/Tamper	1	HM-2703.XX (S/D)				
Weight Set, 16 TSF	1	HM-1120*				

Typical setup for HM-2750.3F for Metric version

HM-2750M.3F the dial indicators are in mm

Dead Weight w/ Analog Transducer Data Acquisition					
Description	Qty	Part #			
Direct Shear w/ Analog Inputs	1	HM-2750A.3F			
Shearbox Assembly	1	HM-2751.XX(S/D)			
Shearbox Cutter	1	HM-2702.XX(S/D)			
Dolly/Tamper	1	HM-2703.XX(S/D)			
Weight Set, 16 TSF	1	HM-1120*			
HMTS Direct Shear Reporting Software	1	HM-2700SW			

Dead Weight, w/ Digital Gauge Data Acquisition					
Description	Qty	Part #			
Direct Shear w/ Digital Inputs	1	HM-2750D.3F			
Shearbox Assembly	1	HM-2751.XX (S/D)			
Shearbox Cutter	1	HM-2702.XX (S/D)			
Dolly/Tamper	1	HM-2703.XX (S/D)			
Weight Set, 16 TSF	1	HM-1120*			
HMTS Direct Shear Reporting Software	1	HM-2700SW			

Replacement Ball, 5/8" 440 Stainless Steel— HM-001076



Direct/Residual Shear

61

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Part Numbers ending in .XX require a size code to be entered referring to the sample size to be tested.

For Direct/Residual Shear samples, sizes are: .20 = 2.0"; .242 = 2.42"; .25 = 2.5"; .40 = 4.0"; .50 = 50mm; .60 = 60mm, and .100 = 100mm. NOTE: For Direct/Residual Shear, also, use "S" for square and "D" for round samples.

*For Metric applications, use HM-1122, Weight Set, 32kg.

Individual Weights and Sets—							
TSF Weight	0.125 (1/8)	0.25 (1/4)	0.50 (1/2)	1.0	2.0	4.0	
Model No.	HM-1120.125	HM-1120.250	HM-1120.500	HM-1120.1	HM-1120.2	HM-1120.4	
KGF Weight	0.5 kg	1.0 kg	2.0 kg	4.0 kg	5.0 kg	8.0 kg	10.0 kg
Model No.	HM-1122.05	HM-1122.1	HM-1122.2	HM-1122.4	HM-1122.5	HM-1122.8	HM-1122.10

Weight Set	Set Includes	Model No.
16 TSF Set	includes: (2) .125 TSF, (1) .25 TSF, (1) .50 TSF, (1) 1.0 TSF, (1) 2.0 TSF, (3) 4.0 TSF weights	HM-1120
32 TSF Set	includes: (2) .125 TSF, (1) .25 TSF, (1) .50 TSF, (1) 1.0 TSF, (1) 2.0 TSF, (7) 4.0 TSF weights	HM-1121
32 kgf Set	includes: (4) 1 kg, (3) 4 kg, (2) 8 kg weights	HM-1122
50 kgf Set	includes: (3) 1 kg, (1) 2 kg, (1) 5 kg, (4) 10 kg weights	HM-1125
64 kgf Set	includes: (4) 1 kg, (5) 4 kg, (5) 8 kg weights	HM-1123
88 kgf Set	includes: (4) 1 kg, (5) 4 kg, (8) 8 kg weights	HM-1124



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Humboldt Triaxial Testing Systems-

Humboldt provides an extensive line of triaxial testing equipment solutions for today's soil labs. At the heart of our triaxial testing equipment is the Humboldt Concept of providing a modular system of interchangeable, stand-alone components that when combined create highly-versatile systems. This modular concept allows you to easily create a custom solution for your needs, as well as having the ability of taking advantage of upgrades and new technology, while not being locked into an obsolete proprietary system.

Presented below and on the following pages are three triaxial systems based around our HM-3000 and HM-2900 load frames, our HMTS software with triaxial-specific software modules and three different pressure control solutions.

Automated Pressure Control Triaxial System—

Designed for those who want the ultimate in control of their triaxial testing, Humboldt's Automated Pressure Control Triaxial System is a computercontrolled system specifically designed for soil testing laboratories conducting UU, CU and CD Triaxial tests, as well as Unconfined Compression. It is perfect for large, high-volume labs, as well as those who want to utilize technology to increase staff efficiencies and testing accuracy. This system provides complete control of the testing process including data acquisition.

Available in one or three-cell configurations, our automated control panels can handle your testing needs in stride. And, if you want to increase the number of simultaneous tests you can run, Humboldt's HMTS software can easily handle a multitude of tests. All you need to do is add cells and the other appropriate equipment to handle your needs. With the HMTS you will be able to monitor up to 64 sensor signals from a single computer.

Humboldt's Automated Pressure Control Triaxial System is built around the HM-2450A Stand-alone Pressure Controller, our HMTS test-specific software, which monitors, controls and reports the test data, and, the highly-regarded HM-3000 Load Frame, with its built-in, 4-channel data acquisition for stress, strain, pore water pressure and volume change measurement. The system can



UU-Triaxial Test Typical Cell Setup



CU-Triaxial Test Typical Cell Setup



Triaxial