Permeability and Triaxial Shear Test Equipment

ASTM D 5084, D 2850, D 4767
AASHTO T 296, T 297

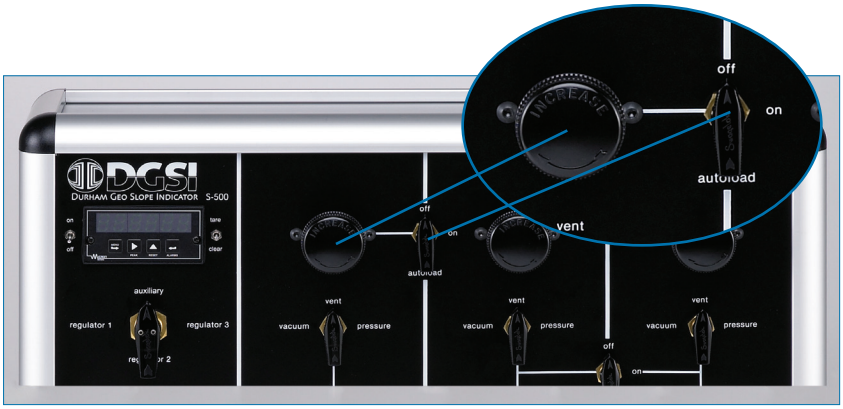
The DGSI permeability and triaxial test panels provide excellent quality for all applicable ASTM tests. They are built with a light-weight, durable aluminum frame. Standard features include acrylic burette housings, plated quick-connect fittings, standard brass compression fittings and pressure-rated poly tubing for all plumbing.

For permeability / triaxial testing you will need the following sources:

- Clean, dry, air
- Water supply
- Drain
- Vacuum

S-500 Master panel for one test cell. Shown with membranes, permeability cell and deairing tank (sold separately).

The S-502 Extension Panel offers two additional test positions (cells) when connected to an S-500 master panel.



Close-up of the differential regulator (E-656) which is unique to the DGSI permeability / triaxial panel.

Answer the following before making your selection.

- What type of test(s) will you be performing?
  - Triaxial?
    - > Unconsolidated Undrained, (UU)?
    - > Consolidated Undrained, (CU)?
    - > Consolidated Undrained, (CU) with pore pressure?
  - Permeability?
  - Triaxial and permeability?
- What size samples will you be testing?
- How many simultaneous tests will you be performing?

Typical equipment / setup for permeability testing

Vacuum

Vacuum Pump, G-402*

*Part number suitable for 110 V, 60 Hz power source. Other models available.

Deairing

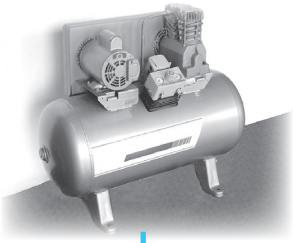
Deairing tank, S-505

Pressure / vacuum

Water in / out

Air Supply Sources

Air Compressor, G-410*



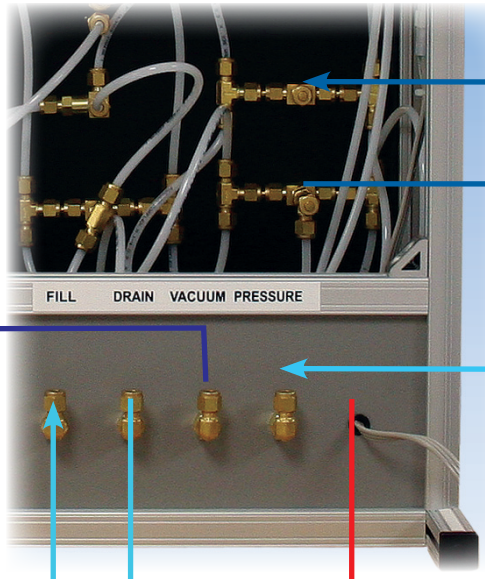
Filter / Regulator, G-41020

Air Dryer, G-420*

*Part number suitable for 110 V, 60 Hz power source. Other models available.

S-500 Permeability Panel

Rear view of S-500 Permeability Panel

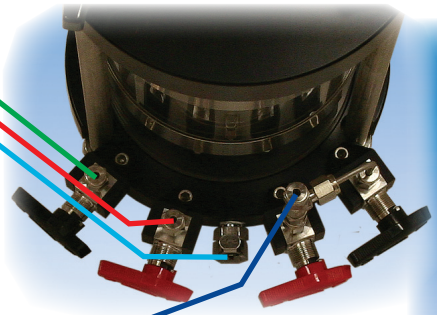


Water in

Water out (drain)

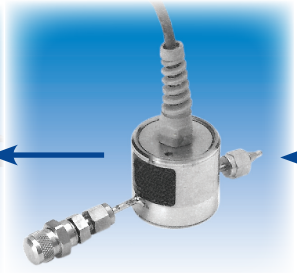
Electrical Outlet

Chamber Water (blue)
Bottom Sample (red)
Top Sample (green)



Top view of Permeability Cell, S-480

Smart Digital Indicator, E-405



Pore Pressure Transducer, E-124

Permeability Cell, S-480

Permeability and Triaxial Test Sets

DGSI Test Sets are available with many different options to accomodate most situations. These sets offer a convenient way to select products as might be the case for new laboratories or new set-ups.

To obtain a quote on one of the following test sets, please first know what size samples you will be testing and what type of test you will be performing.

Permeability Test Sets	
S-480-1P	One-Position Permeability Set with S-480 Permeability Cell
S-480A-1P	One-Position Permeability Set with S-480A Permeability Cell
S-480-3P	Three-Position Permeability Set with S-480 Permeability Cells
S-480A-3P	Three-Position Permeability Set with S-480A Permeability Cells
S-480-5P	Five-Position Permeability Set with S-480 Permeability Cells
S-480A-5P	Five-Position Permeability Set with S-480A Permeability Cells

Contents of Permeability Test Sets		S-480-1P	S-480A-1P	S-480-3P	S-480A-3P	S-480-5P	S-480A-5P
E-124	Pore Pressure Transducer, 0-150 psi (1034 kPa)	1	1	1	1	1	1
E-405	Smart Digital Indicator, 5 digits	1	1	1	1	1	1
S-480	Permeability Cell, stainless steel cap and pedestal, 2.8 in (71 mm)	1	-	3	-	5	-
S-480A	Permeability Cell, brass valves, acrylic cap and pedestal, 2.8 in (71 mm)	-	1	-	3	-	5
S-500	Permeability / Triaxial Master Panel, 110 V*	1	1	1	1	1	1
S-502	Permeability / Triaxial Extension Panel	-	-	1	1	2	2
S-505	Deairing Water Tank	1	1	1	1	1	1

Triaxial Shear Test Sets	
S-510-1P	One-Position Triaxial Shear Set with S-510 Triaxial Cell
S-510A-1P	One-Position Triaxial Shear Set with S-510A Triaxial Cell
S-510-3P	Three-Position Triaxial Shear Set with S-510 Triaxial Cells
S-510A-3P	Three-Position Triaxial Shear Set with S-510A Triaxial Cells
S-510-5P	Five-Position Triaxial Shear Set with S-510 Triaxial Cells
S-510A-5P	Five-Position Triaxial Shear Set with S-510A Triaxial Cells

Contents of Triaxial Shear Test Sets		S-510-1P	S-510A-1P	S-510-3P	S-510A-3P	S-510-5P	S-510A-5P
E-124	Pore Pressure Transducer, 0-150 psi (1034 kPa)	1	1	1	1	1	1
E-405	Smart Digital Indicator, 5 digits	1	1	1	1	1	1
S-500	Permeability / Triaxial Master Panel, 110 V*	1	1	1	1	1	1
S-502	Permeability / Triaxial Extension Panel	-	-	1	1	2	2
S-505	Deairing Water Tank	1	1	1	1	1	1
S-510	Permeability Cell, stainless steel cap and pedestal, 1.4 to 2.8 in (36 to 71 mm)	1	-	3	-	5	-
S-510A	Permeability Cell, brass valves, acrylic cap and pedestal, 1.4 to 2.8 in (36 to 71 mm)	-	1	-	3	-	5

* Other voltages available. Contact DGSI for more details.

How To Order

Step 1. Select Permeability and/or Triaxial Cells

ASTM* D 2850, D 4767, D 5084 AASHTO* T 296, T 297

* See Standards Buyer's Guide at www.DGSI.info/3000.

S-480 Permeability Cell shown with a Pore-Pressure Transducer (sold separately).

S-511 Triaxial and Permeability Cell

The DGSI Triaxial and Permeability Cells are designed to accommodate samples with diameters from 1.4 to 12 in (35 mm to 305 mm). They feature no-volume-change valves and removable base pedestals to accommodate various sample sizes and the piston housing features linear bearings for reduced friction. Two top and two bottom drainage lines are provided with through-base-sealing to avoid air traps.

S-480 is the standard model for testing test specimens up to 4-in diameter and about 6-in in length. It is equipped with both 1.4 and 2.8-in cap and pedestal set made of series 303 stainless steel (SS). In addition, the valves are stainless steel and tubing is Teflon. These are for customers that might be testing material where the permeant is corrosive or they need to test both 1.4 and 2.8-in specimens. Finally, the customer may decide on the standard models because the SS valves will not tarnish with age. Note: If the permeant is corrosive the customer will require the S-470 permeant interface device to protect the control panels.

Designed to provide outstanding service and performance. The cells have hard-coated, black anodized aluminum bases and cell tops, while remaining parts are made of stainless steel, brass or acrylic.

Measuring changes of the test specimen length during testing:

- S-500 series triaxial cell equipped with bracket for mounting dial indicator (E-814) or displacement sensor LDT E-311.
- S-480 series triaxial cells do not have that provision. To measure height change during testing, use S-500 series triaxial cells.

⚠ Know the following before making your selection:

- Will you be performing triaxial tests, permeability tests, or both?
- What size samples will you be testing?
- How many simultaneous tests will you be performing?

When using corrosive permeants, always select permeability cells with stainless steel valves. In addition, the Permeant Interface Device, (S-470) is recommended to prevent the permeants from entering the panels. See page 26 for details.

Note: All cells include cap and pedestal set (sizes and type below), one pair of porous stones, two plastic discs, Nylon tubing and O-rings.

Item #	Cell Type		Accessories Supplied	Cap and Pedestal		Valves		Can Accomodate	Shipping Weight
	Permeability	Triaxial	Inches (mm)	Acrylic	Stainless Steel	Brass	Stainless Steel	Inches (mm)	lb
S-480A	✓		2.8 (71)	✓		✓		1.4 to 4.0 (36 to 102)	16
S-483A	✓		3.0 (76) (extended chamber)	✓		✓		1.4 to 4.0 (36 to 102)	21
S-480	✓				✓		✓	1.4 to 4.0 (36 to 102)	16
S-510A	✓	✓	2.8 (71)	✓		✓		1.4 to 2.8 (36 to 71)	21
S-510	✓	✓	1.4 (36), 2.8 (71)	✓			✓	1.4 to 2.8 (36 to 71)	21
S-511	✓	✓	4.0 (102)	✓			✓	1.4 to 4.0 (36 to 102)	35
S-516	✓	✓	6.0 (152)	✓			✓	2.8 to 6.0 (71 to 152)	58
Special Order Products (Contact DGSI for details)									
S-484	✓		6.0 (152)		✓		✓	2.8 to 6.0 (71 to 152)	58
S-485	✓		12.0 (305)		✓		✓	4.0 to 12.0 (102 to 305)	78
S-518	✓	✓	12.0 (305)	✓			✓	4.0 to 12.0 (102 to 305)	78
Resilient Modulus Testing Cell (See p. 26 for more info)									
S-517	✓	✓	6.0 (152)		✓		✓	4.0 to 6.0 (102 to 152)	56
Related Items for Cell Types (optional)									
S-51001	Triaxial Cell Top w/ Loading Rod			S-51050	Resilient Modulus Kit for S-510 cell				
S-51003	Converts S-480/S-480A -to- S-510/S-510A. includes triaxial cell top, chamber (10¾ in long) and tie rods			S-51150	Resilient Modulus Kit for S-511 cell				

Step 2. Choose your panel(s)

Note: Select the type and quantity of each panel based on the number of cells needed for simultaneous testing. One S-500 panel can support up to two S-502 extension panels. The S-502 extension panels cannot operate independently from the S-500. All DGSI panels are built with quality gauges, valves, and fittings. Contact DGSI to request a quote to meet your needs.

The DGSI master panel (S-500) and extension panel (S-502) control the pressure and permeant flow to and from the triaxial or permeability cell. The S-500 contains the main operation panel which includes air and vacuum gauges to monitor the main supply, de-airing tank fill, vacuum, and pressure controls, an auxiliary vacuum port, and a pressure transducer and digital readout with a selector valve for monitoring pressure to each burette.

Each cell being tested requires three individual burette assembly used to monitor the cell pressure, sample bottom pedestal, and sample top cap. The S-500 can supply one cell and the S-502 can supply up to two cells. The S-502 is connected to the S-500 using tee fittings and tubing from the back of the S-500 panel. Pressure readings from the S-502 are displayed on the S-500 readout via momentary switches.

Each burette assembly is constructed with acrylic tube and top and bottom blocks with stand-off fittings for easy removal to clean or service as needed. A standard glass pipette (25 ml with 0.1 ml markings) is supplied inside each burette assembly. Optional pipettes of 10ml, 5ml, or 1ml are available upon request. All pipette markings are factory calibrated.

S-500 Permeability / Triaxial Master Panel

Item	Description	Cells / Panel
Master Panels:		
S-500	Permeability / Triaxial Master Panel, 110 V	1
S-50010	Permeability / Triaxial Master Panel, 220 V	
S-50033	Permeability / Triaxial Master Panel, 300 psi (CE Compliant)	1
Extension Panel:		
S-502	Permeability / Triaxial Extension Panel (S-500 Required)	2
Optional:		
442001	10 ml burette assembly	

Specifications	S-500 and S-50010
Air Regulators:	(3) Precision bleed-type, 0.1 cfm (0.00005 m³/s), 0.2 psi (1.4 kPa) stability. (1) Precision bleed-type differential, 0.1 cfm (0.00005 m³/s), 0.2 psi (1.4 kPa) stability.
Burettes:	(3) Fitted with 25 ml pipettes, 0.1 ml graduations.
Mechanical Gauges:	(1) Vacuum gauge, 0-30 in Hg (0-760 mm Hg), (1) Supply pressure gauge, 0-300 psi (0-2068 kPa)
Digital Readout:	(1) With pressure transducer calibrated to read 0-150 psi (0-1034 kPa), sensitivty to 0.1 psi (0.7 kPa). Sensitivity 0.2%. Self calibrates every 4 secs. Calibration held in non-volatile memory.
Rotary Valve:	(1) 4 positions enables each regulator to be read individually to allow burette pressure setting. 4th position for connecting to the S-502 Extension Panel.
Special Valve:	Allows filling of annulus of burette, pipette or both
Working Pressure:	150 psi (1034 kPa) maximum
Required Utilities:	Air, water, vacuum and drain all provided with ¼-in tubing connectors located on back panel.
Construction:	Durable aluminum frame with sturdy plastic sides. Hard coated aluminum front panel with screen printed text. All valves are no-volume change-type.
Dimensions: (W x D x H)	25 x 7¾ x 37½ in (63.5 x 20 x 95 cm) Footprint: 25¼ x 15.5 in (64 x 39 cm)
Ship. Vol.	15 ft³ (0.425 m³)
Ship Weight:	70 lb (32 kg)

Specifications	S-502
Air Regulators:	(4) Precision bleed-type, 0.1 cfm (0.00005 m³/s), 0.2 psi (1.4 kPa) stability. (2) Precision bleed-type differential, 0.1 cfm (0.00005 m³/s), 0.2 psi (1.4 kPa) stability.
Burettes:	(6) Fitted with 25 ml pipettes, 0.1 ml graduations
Momentary Valves:	(6) Situated above each air regulator to permit pressure to be set and monitored by the S-500 Digital Pressure readout.
Manifold Block:	6-way, with tubing to connect to the S-500 Rotary Valve
Special Valve:	Allows filling of annulus of burette, pipette or both
Working Pressure:	150 psi (1034 kPa) maximum
Required Utilities:	Air, water, vacuum and drain all provided with 1/4-in tubing connectors located on back panel.
Construction:	Durable aluminum frame with sturdy plastic sides. Hard coated aluminum front panel with screen printed text. All valves are no-volume change-type.
Dimensions: (W x D x H)	36.4 x 15.8 x 36.8 in (92.5 x 40 x 93.5 cm)
Ship. Vol.	17 ft³ (0.481 m³)
Ship Weight:	100 lb (45 kg)

Step 3. Select Utilities for Panel

Selection of proper permeability/triaxial support equipment is essential for ensuring proper panel operation and accurate results. DGSI panel setups require a suitable deairing tank, vacuum pump, compressed air and accessories for proper operation. Clean, dry air and vacuum sources are strongly recommended to maintain consistent performance. Consider adding a vacuum pump water trap kit (G-39620), air dryer w/oil extractor (G-420), and a filter regulator (G-41020) to maximize panel efficiency.

Permeability / Triaxial Panels require the following:
• Deairing Tank • Vacuum Pump • Water
• Drain • Clean, Dry, Compressed Air

Nold Water Deaerator

The self-contained Nold deairing system deairs six liters of water to less than 0.5 ppb dissolved oxygen in 4 min. It operates by mechanical agitation with the application of a vacuum. The agitation / vacuum system is significantly more efficient than conventional methods using heat-boiling methods. The system uses a 0.02 hp electric motor an is great for labs that have to perform tests quickly. Dimensions: 7.5 in x 7.5 in x 20 in (19 x 19 x 51 cm).

S-530

S-530	Nold Deaerator Water System, 115 V	19 lb
S-530-A	Nold Deaerator Water System, 220 V	19 lb

Deairing Water Tank

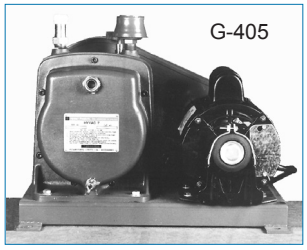
The chamber is 6-in dia. by 16-in high and is made from clear, cast acrylic. The head and base are anodized aluminum and are connected by stainless steel tie rods. The head has two fittings, one to allow a tube to pass through to the bottom of the chamber for filling and extracting water, and the other to allow connection to a vacuum pressure source.

S-505

S-505	Deairing Water Tank	13 lb

Vacuum Pumps

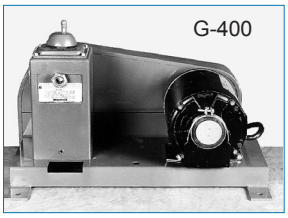
Models G-400 and G-405 are designed for laboratory distillation, filtration, degassing, vacuum deposition and as roughing pumps in high vacuum systems.



G-405

The relatively low pump operating speeds and large oil reservoirs ensure long and trouble-free operation. Both pumps are mounted on rectangular steel base plates and have V-belts and guards. They are supplied with a quart of oil.

G-402



G-400

Specifications:	G-400	G-402	G-405
Drive type	Belt driven	Direct drive	Belt driven
Voltage*	115 V, 60 Hz*	110 V, 60 Hz*	115/230 V, 60 Hz
Vacuum capacity	3 x 10^{-4} Torr	1 x 10^{-4} Torr	1 x 10^{-4} Torr
Free air capacity	0.35 cfm	3 cfm	2.8 cfm
Motor power	1/4 hp	1/3 hp	1/2 hp
Operating speed	350 rpm	1725 rpm	525 rpm
Inlet fitting	3/8 NPT	1/4 barb	7/8 NPT
Oil capacity	1 qt	26.4 oz	1.5 qt
Length	18½ in	15½ in	17¼ in
Width	10 in	6½ in	11½ in
Height	10¾ in	11¼ in	13 in
Weight	44 lb	28 lb	40 lb

(*) Other voltages available

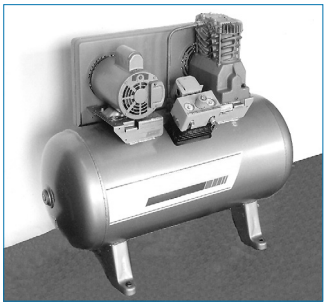
Related Items for Vacuum Pumps (Optional)

Item	Description	Purpose
G-39620	Vacuum Water Trap Kit	Used to keep condensate out of vacuum pump
G-40020	Vacuum Pump Oil, 1 US gallon	Pump maintenance
G-40030	Vacuum Regulator Gauge and Filter Assembly	Used to regulate vacuum flow
G-40050	Vacuum Pump Flushing Oil, 1 US gallon	Pump maintenance
G-409	Vacuum Bleed Valve	To bleed off vacuum on system
G-40910	Tubing, Vacuum, 3/8 in ID x 1/4 in wall (sold per foot)	To connect vacuum pump to panel
G-40911	Tubing, Vacuum, 1/4 in ID x 1/2 in OD (sold per foot)	To connect vacuum pump to panel

Step 3 (Continued). Select Utilities for Panel

Air Compressor

The G-410 air compressor provides 6.2cfm @ 100psi, with a maximum of 10.3cfm. It features a cast iron crankcase and cylinder with needle roller bearings for extended life. The G-410 conforms to CA code 462 (L) (2). See chart for specifications.



G-410

Heavy Duty Air Compressor

The G-414 air compressor provides 17.1cfm @ 175psi, with a maximum of 21.1cfm. It features a gear driven oil pump for long life and low RPM for cooler operation and longer valve life. The tank is provided with three feet that may be anchored. See chart for specifications.

G-414

Air Compressor (Select One)				
	G-410	**G-41010**	**G-414**	**G-415***
Tank Size (gallons)	30, horizontal	30, horizontal	80, vertical	80, vertical
Hp / Voltage	2 Hp, 110 V, 60 Hz	2 Hp, 230 V, 60 Hz	5 Hp, 208-230 V, 60 Hz, 1 ph	5 Hp, 460 V, 60 Hz, 3 ph
Stages	1	1	2	2
Outlet (inches)	1/4 NPT, male	1/4 NPT, male	3/4 NPT, female	3/4 NPT, female
Preset (on/off)(psi)	95/125	95/125	145/175	145/175
Weight	195	195	593	593
Dimensions (inches) (LxWxH)			33 x 25 x 79	33 x 25 x 79
CFM	6.2	6.2	17.1	17.1

*Other voltages available.

Compressed Air Dryer

Remove water vapor and oil from compressed air supplies with this chiller. Non-cycling, 1/6 hp motor operates continuously at 175 psi or less. Comes with power-on and high-air temperature indicators and 3/8-in NPT fittings. Dimensions (HxWxD): 14 x 16 x 15 in. (36 x 41 x 38 cm).

G-420

Extractor with Regulator and Gauge

The G-41020 is mounted in-line with the air compressor to help remove oil and water droplets. Includes a pressure gauge, regulator and a wall mounting bracket.

G-41020

Related Items for Air Supply (Optional)		
Item	**Description**	**Purpose**
G-420	Air dryer with oil extractor	Drops air temp. to - 4 °F, removing moisture and oil particulates.
G-42001	Air dryer only (No oil extractor)	Drops air temp. to - 4 °F, removing moisture.
G-41020	Extractor with regulator, gauge and bracket	Regulates air flow to panel and extracts particulates from the air source.

Balston Filter

Designed to remove oil and water droplets as well as solid particles. Allows a flow of 20 scfm at 100 psig with a pressure drop of <1 psi. Filter retention efficiency 93% at 0.1 micron.

G-425

G-425	Balston Filter with automatic float drain	2 lb
Related Item		
G-42520	Replacement filter elements, box of 10	

Moisture Absorbent (Desiccant)

Model G-430 is a blue desiccant material that turns pink when spent. User can replace or revive the granular material by drying at 200 °C for one hour. Net weight of 5 lb (2.3 kg).

Model G-435 Desiccant Air Dryer provides in-line drying of gas or air at pressures up to 90 psig. Unit is a plastic canister with 1/4-in NPT fitting near the top and bottom. Canister is 2⅝-in (67 mm) diameter by 11⅜-in (289 mm) long.

G-430	Desiccant, 5-lb container	5 lb
G-435	Desiccant Canister, 90 psig maximun	5 lb

Step 4. Select Triaxial Load Frame

S-600 Triaxial Load Frame

ASTM* D 2850, D 4767 AASHTO T 296, T 297

* See Standards Buyer's Guide at www.DGSI.info/3000.

The electronically-controlled Triaxial Load Frame has a compression capacity of 10,000 lbf (45 kN). The user friendly Interface/Controller allows the user to set speed and distance of travel and observe actual platen position during the test. The display may be configured in the engineering units of choice and is used to simplify set-up by using screen prompts. Modular construction enhances the reliability of the system and keeps service and maintenance to a minimum. Belt driven for smooth load rates.

Standard features:

- Precision DC motor for vibration-free operation
- Motor and reduction box grease-packed for long life
- Micro-switch protection to prevent overtravel
- Microprocessor based Controller provides:
  - Visual LCD display for data and screen prompts
  - Set speed from 0.0001 to 0.2 in/min
  - Set travel distance to stop automatically
  - Display of platen position in engineering units during test
  - Visual overtravel alarms
- All exposed parts are either painted or plated. Cover, base and cross beam are texture painted
- Two auxiliary power sockets provided for accessories

Note: Model S-600, S-60010 and S-6100E Triaxial Load Frames includes the frame and controller only. Test cells, transducers and readouts must be purchased separately.

S-600	Triaxial Load Frame, 110 V, 60 Hz* Min. Speed: 0.0001 in/min.	200 lb
S-60010	Triaxial Load Frame, 220/240 V, 50/60 Hz* Min. Speed: 0.0001 in/min.	200 lb
S-6100E	S-610 Load Frame, 110 V, 60 Hz* with extended strain rods for triaxial shear testing. Min. Speed: 0.005 in/min.	200 lb

Specifications	Value
Load Capacity:	10,000 lbf (44.5 kN)
Speed Range:	S-600: 0.0001 to 0.2 in/min (0.00254 - 5 mm/min) S-6100E: 0.005 to 0.2 in/min (0.127 - 51 mm/min)
Platen:	6.25 in (159 mm) diameter
Piston:	2 in (51 mm) diameter
Piston Travel:	3 in (76 mm) maximum
Speed Control:	Microprocessor based electronic controller
Column Distance:	11.75 in (298 mm)
Daylight:	35 in (889 mm) without load measurement device
Strain Rods:	1.25 in (32 mm) diameter, Acme threaded for adjustment
Cross Beam:	2.5 x 3.5 x 16-in steel (63 x 89 x 406 mm), adjustable, with center hole drilled 0.75 in (19 mm)

*Other voltages available.

S-600 shown with S-type Load Cell and EZ-Daq data acquisition system (sold separately).

Note: For reading transducers, two alternatives are offered:

- EZ-Daq (E-8000E or E-8000M)
- Smart Digital Indicator (E-405) with optional WinSAS collection software (E-40521).

Accessories	
E-124	Pore Pressure Transducer, 0-150 psi (1034 kPa)
E-212	S-Type Load Cell, 2500 lbf (11 kN) capacity
E-312	Linear Displacement Transducer, 2-in (50 mm) range
E-344	Adaptor, LDT-to-S-510 Triaxial Cell
E-281	Adaptor, 3/4-in 16 female-to-1/2-in 20 male
E-282	Triaxial Loading Piston-to-Small Load Cell
E-8000E	EZ-Daq 8-Channel Data Acquisition System, English units
E-8000M	EZ-Daq 8-Channel Data Acquisition System, SI units
Related Products	
E-405	Smart Digital Indicator, 5 digits
E-40521	WinSAS™ Software

See full listing of transducers and readouts on p. 44-48.
See data acquisition options on p. 42.

For caps and pedestals, porous stones, membranes and more, visit **www.DGSI.info/3090**

Step 5. For Triaxial, Choose Transducers and Readout Options

Skempton's Value or "B" Value is an important value used in permeability and triaxial testing. DGSI's sensors and readouts are used to monitor pore water pressure within the sample being tested. The end result is used to calculate and determine sample saturation values ("B" Value).

Each DGSI transducer requires a subordinate readout device to display the output signal.

⚠ The EZ-Daq is recommended when...

- Three or more sensors / readouts are needed.
- When multiple tests (sensors) are being run simultaneously. (WinSAS software does not support simultaneous testing.)

EZ-Daq, (E-8000E or E-8000M), shown with an S-type load cell, two (2) linear displacement transducers and a pressure transducer. Transducers sold separately.

Transducer, load cell and indicator options.

Measurement	Typical Option
Pore Pressure	■ E-124 Pore Pressure Transducer, 0-150 psi
	■ E-405 Smart Digital Indicator *or* ■ E-8000E or E-8000M EZ-Daq 8-Channel Data Acquisition System
Axial Load	■ E-210 S-Type Load Cell, 500 lbf *or* ■ E-212 S-Type Load Cell, 2500 lbf
	■ E-405 Smart Digital Indicator *or* ■ E-8000E or E-8000M EZ-Daq 8-Channel Data Acquisition System
Axial Deformation	■ E-311 Displacement Transducer, 1.0 in* *or* ■ E-312 Displacement Transducer, 2.0 in*
	■ E-405 Smart Digital Indicator *or* ■ E-8000E or E-8000M EZ-Daq 8-Channel Data Acquisition System

E-344, Adaptor for Linear Displacement Transducer (LDT) may be needed with permeability cell depending on your set up.

See full listing of transducers and readouts on p. 44-48.
See data acquisition options on p. 42.

Smart Digital Indicator, E-405 and Pore Pressure Transducer, E-124. Transducers sold separately.

Pore Pressure Equipment

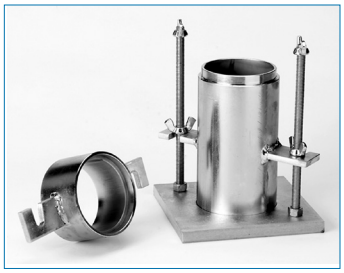
Item	Description
E-124	Pore Pressure Transducer, 0-150 psi range x 0.1 readability
E-8000E	EZ-Daq 8-Channel Data Acquisition System, English units
E-8000M	EZ-Daq 8-Channel Data Acquisition System, SI units
Optional Equipment	
E-405	Smart Digital Indicator

Step 6. Select Sample Preparation Tools

When choosing accessories for permeability / triaxial testing, be sure that consideration has been taken regarding which type of soil or materials are being tested. See the chart below for general recommendations.

Accessory Item:	Soil Type:		
	Cohesive • Clays • Silty Clays	Cohesionless • Sands • Silty Sands	Undisturbed Samples
Compaction Mold	✓		
Split Compaction Mold	✓		
Split Vacuum Mold		✓	
Split Miter Box	✓		✓
Soil Lathe	✓	✓	
Wire Saw	✓		✓
Sliding Weight Hammer	✓	✓	
Gauge Block	✓	✓	
Sample Extractor	✓		✓
Membrane Stretcher	✓	✓	✓

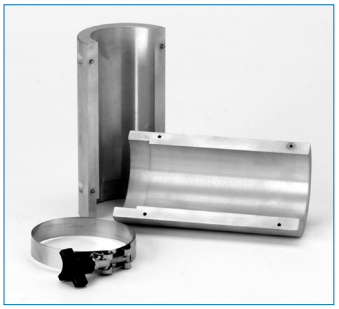
2.875 in x 6 in Compaction Mold


S-57729

The 2.875-in diameter x 6-in Compaction Mold is used to remold cohesive soil samples for permeability and triaxial testing. Made of plated steel and includes the mold body, base and top collar. Cohesive soils are compacted into the mold with either the S-575 Kneading Compactor, S-577 Sliding Weight Hammer or the S-57728 Gauge Block and Rubber Mallet. Samples are extruded from the mold using the S-329 Sample Ejector with the S-32924 adapter.

S-57729	2.875 x 6 in Compaction Mold, Base and Collar	10 lb
Accessories		
S-577	Sliding Weight Hammer	8 lb
S-57730	Aluminum Spacer Plug for S-57729, 2.85 dia. x 2 in	4 lb
S-57728	2.8 in Gauge Block with 1 in increments	4 lb
S-57728M	2.8 in Gauge Block with 25.4 mm increments	4 lb
S-575	Kneading Compactor	20 lb
S-329	Sample Ejector, 4 and 6 in	
S-32924	2.8 in adapter plate for sample ejector	

Split Compaction Mold


S-57528

Machined aluminum molds for remolding test specimens from cohesive soils. Molds are designed to fit directly over the pedestals of our triaxial cells. These molds may be used either with or without collars.

Triaxial Specimen Preparation - Split Molds*				
Diameter		Compaction**	Miter Box	Vacuum
(in)	(cm)			
1.4	3.5	S-57514	S-57414	S-57214
2.0	5	S-57520	S-57420	S-57220
2.5	6.3	S-57525	S-57425	S-57225
2.8	7.1	S-57528	S-57428	S-57228
3.0	7.6	S-57530	N/A	N/A
4.0	10.2	S-57540	S-57440	S-57240

*Other sizes available **Collar available as special order

Split Vacuum Mold


S-57228 & S-57214

Machined aluminum molds for remolding sands and other cohesionless soils. Designed to fit directly onto the DGSI triaxial cell pedestal. A vacuum line is supplied to apply vacuum to the membrane while the test specimen is being molded. The base of mold has space for the membrane and “O” rings while being attached to the pedestal.

Split Miter Box


S-57428

Machined aluminum miter boxes for trimming ends square on undisturbed samples of clays and other cohesive soils.

Step 7. Select Parts and Accessories for Triaxial and Permeability Testing

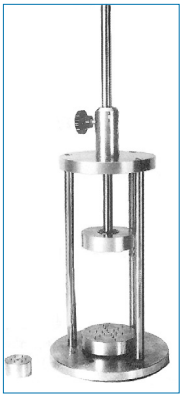
Permeability and Triaxial Accessories

Diameter		Latex Membrane		Membrane	"O" Ring	Porous Stone	Cap and Pedestal			Glass Filter	Plastic Disc
(in)	(mm)	.012 in	.025 in	Stretcher	(set of 4)		Acrylic	Stainless Steel	Wt.		
1.4	36	S-54014	S-54114	S-57014	S-53014	S-55014	S-52014	S-52114	1.0 lb	S-56114	S-56014
1.5	38	S-54015	S-54115	S-57015	S-53015	S-55015	S-52015	S-52115	2.0 lb	Cut to size	S-56015
1.875	48	S-54018	S-54118	S-57018	S-53018	S-55018	S-52018	S-52118	2.0 lb	Cut to size	S-56018
2.0	51	S-54020	S-54120	S-57020	S-53020	S-55020	S-52020	S-52120	2.5 lb	Cut to size	S-56020
2.5	63	S-54025	S-54125	S-57025	S-53025	S-55025	S-52025	S-52125	3.5 lb	Cut to size	S-56025
2.8	71	S-54028	S-54128	S-57028	S-53028	S-55028	S-52028	S-52128	4.5 lb	S-56128	S-56028
3.0	76	S-54030	S-54130	S-57030	S-53030	S-55030	S-52030	S-52130	5.0 lb	S-56130	S-56030
4.0	102	S-54040	S-54140	S-57040	S-53040	S-55040	S-52040	S-52140	6.0 lb	S-56140	S-56040

Soil Lathe (Sample Trimmer)

Specifically designed for trimming samples to precise diameters using a fine wire trimming knife. Adjustable in ranges from 1 to 4-in in diameter by simply changing the top platens.

Model S-57628 includes a 1.4-in and a 2.8-in platen with a 3.0 inch pedestal. Models S-57629 and S-57630 require selection of top platens from the table below. We can also handle special requests for sizes not shown.



S-57628

S-57628	Soil Lathe w/ 1.4 and 2.8 in platens	15 lb
S-57629	Soil Lathe w/ 3.0 in bottom platen (specify top platen size)	15 lb
S-57630	Soil Lathe w/ 4.0 in bottom platen (specify top platen size)	15 lb

Top Platens

S-57601	1.0 in	S-57605	2.5 in
S-57602	1.4 in	S-57606	2.8 in
S-57603	1.875 in	S-57607	3.0 in
S-57604	2.0 in	S-57608	4.0 in

Other sizes available upon on request.

Accessories

G-295	Open-end wire saw w/ replacement wires, pack of 6
G-29501	Replacement wire, pack of 6

Permeant Interface Device (Bladder Accumulator)

Used in permeability or triaxial testing when a corrosive fluid is the permeant. It is installed between the permeability cell and the panel. Consists of a flexible bladder to prevent the permeant from entering the panel or escaping into the atmosphere. It also eliminates the possibility of compressed air dissolving into the permeant. All liquid contacting parts are made of 316 stainless steel, Teflon® or Viton®. The Permeant Interface Device is supplied with both Buna-N and Viton® Membranes.
The cylinder has an inside diameter of 2 in (51 mm). 185 ml.

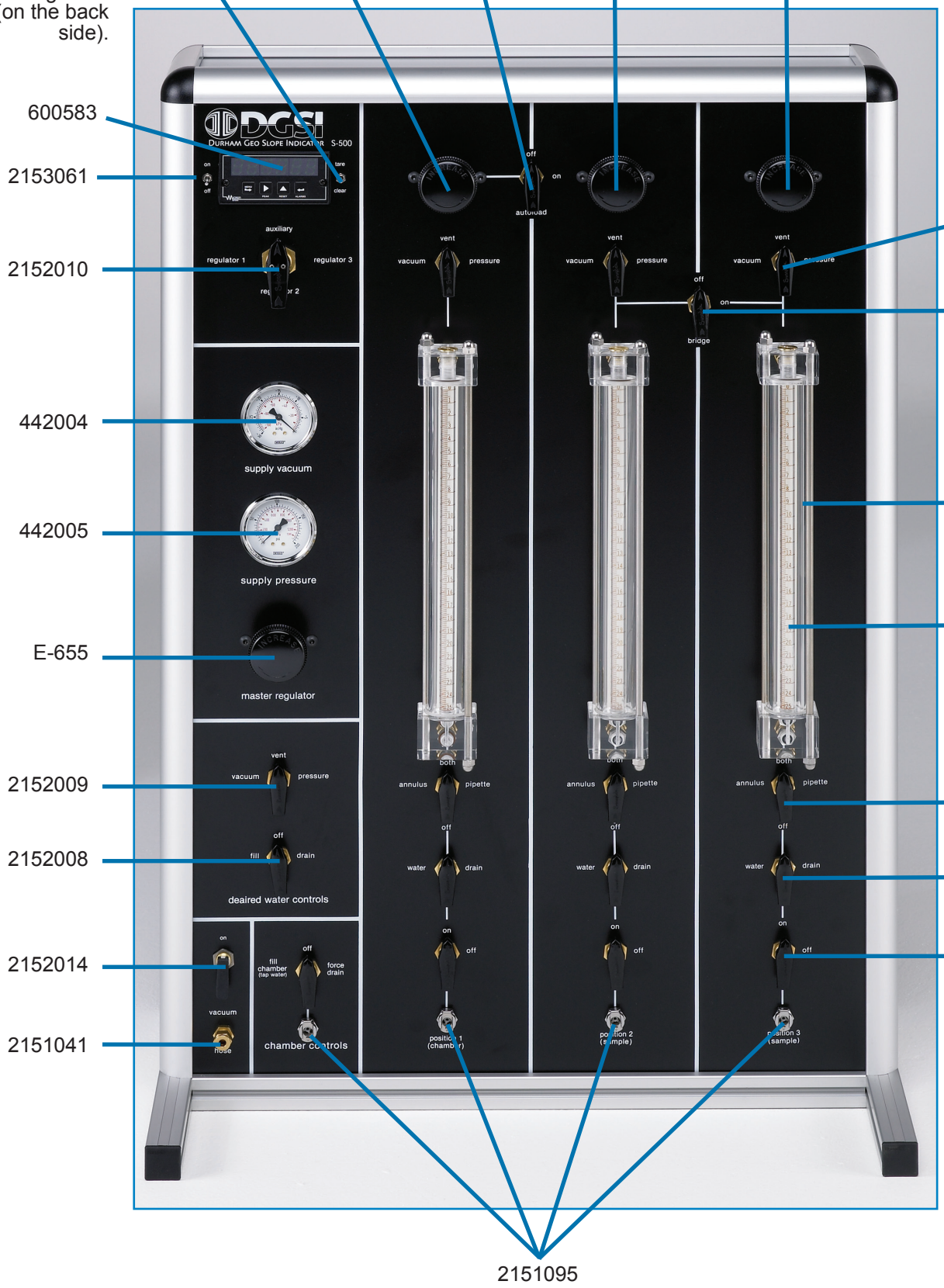
S-470

S-470	Permeant Interface Device (with 2 membranes)

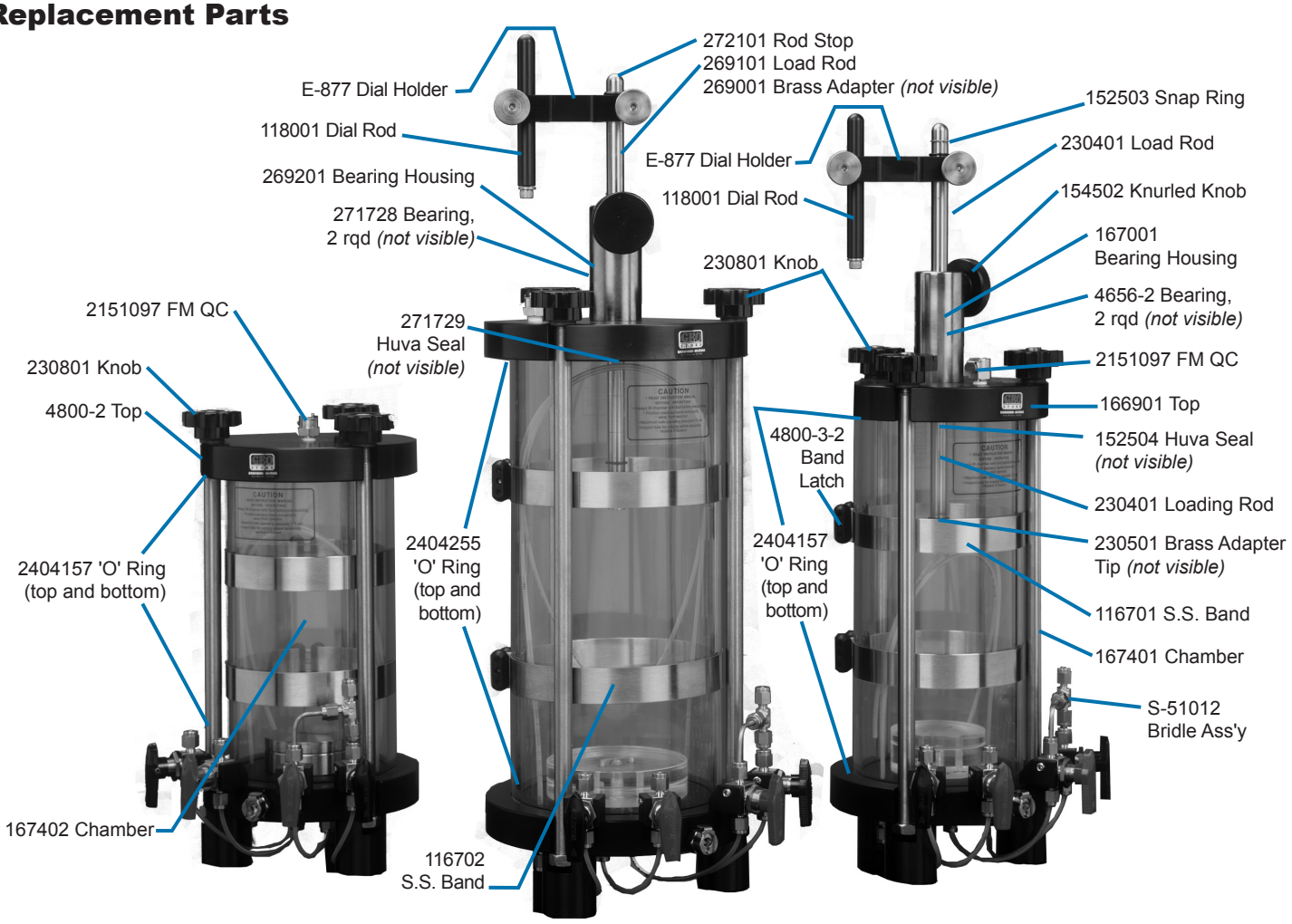
Related Items

S-47010	Viton Flexible Bladder
S-47020	Buna-N Flexible Bladder
G-52608	Teflon® Tubing, 1/8-in dia. 10 ft. long

Replacement Parts



Replacement Parts



S-480 or S-480A Permeability Cell 1.4 to 4.0 in

S-511 Triaxial Cell 1.4 to 4.0 in

S-510 or S-510A Triaxial Cell 1.4 to 2.8 in

Replacement Pressure Regulators

Bleed-Type Pressure Regulators are recommended for maximum sensitivity and stability against upstream supply pressure changes. All regulators are designed to accept supply pressures up to 250 psi. The supply pressure should always be at least 20 psi above the maximum regulated pressure and the regulator capacity should match the gauge or pressure transducer capacity. These regulators have a sensitivity of less than 1/4 in. of water. Differential pressure regulators are used to maintain a preset pressure difference between two pressures even if the pressure is raised or lowered.

Bleed-Type Pressure Regulators		
E-651	0-10 psi output for S-450	2 lb
E-655	2-150 psi output for S-500, S-502 and S-450	2 lb
E-656	2-150 psi differential output for S-500 and S-502	2 lb
E-658	3-200 psi output for S-500	2 lb
2152020	Deairing Regulator for S-500, 0-15 psi	2 lb

Tubing for Permeability Panels

G-52508	Tubing, 1/8 in (sold per foot)	
G-52504	Tubing, 1/4 in (sold per foot)	
Related Item		
S-50045	Male quick-connect to ⅛ in tubing	

Burette Assembly (as replacement)

442001	Burette Assembly, 10 ml	1 lb
442003	Burette Assembly, 25 ml	1 lb