

product catalog

Fully automatic laboratory and field testing technology
for material & advanced soil mechanics



Editor:

Geomation GmbH

Pictures:

All photos are, unless indicated otherwise,
property of the company Geomation GmbH.

Legal Rights:

Reproduction, also in parts, only with the written
approval of the publisher.

Contact:

Geomation GmbH
Heinrich-Heine-Straße 16
D - 01723 Wilsdruff

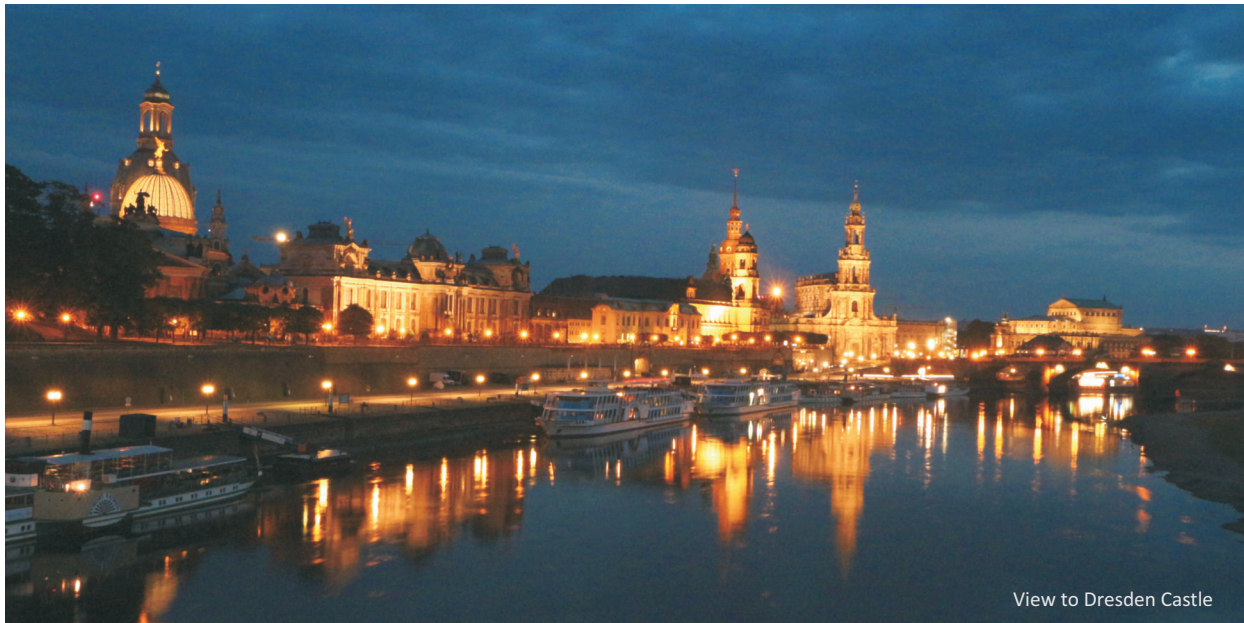
Phone: +49(0)35204 / 78690-0

Fax: +49(0)35204 / 78690-1

Homepage: www.geomation.de

Email: info@geomation.de

Errors, misprints and changes reserved..



View to Dresden Castle

The company GEOMATION GmbH, located on the outskirts of the Saxon capital, develops and produces high-quality testing technology in the field of soil and material testing.

Many years of experience in the development and production of soil mechanical laboratory equipment, material testing equipment and special testing equipment enable us to offer our demanding clients a wide range of high-quality testing technology. With our GeoDESC control software, our customers have an extremely powerful tool to carry out standardized or individually designed experiments.

Our products range from simple bench testers for oedometer tests or direct frame shear tests up to complete dynamic triaxial systems and special test devices. Depending on the requirements of the application, these testers are equipped with pneumatic, electro-mechanical or hydraulic drives.

In international projects there has been a close cooperation of the companies Geomation GmbH and Infratest Prüftechnik GmbH for many years. In 2019 this partnership was strengthened and Geomation GmbH became part of the group of companies of Infratest Prüftechnik GmbH. This cooperation extends

the competence of Infratest Prüftechnik GmbH to the field of "soil mechanics" and enables the international distribution of laboratory and field testing technology of Geomation GmbH.

Our customers' individual requirements and requests are always considered and included in the development process. A customer-oriented solution of the given test task is always our ultimate goal.

This catalog provides an overview of our standard testing equipment and systems as well as our extensive accessories.

Our highly motivated team is happy to assist you with the realization of your individual testing task!



table of content

LABORATORY & FIELD DEVICES *PAGE 5*

OEDOMETER CELLS *PAGE 17*

CBR, UNIAXIAL AND POINT LOAD TESTING *PAGE 21*

SHEAR TESTING *PAGE 28*

SHEAR BOXES AND ACCESSORIES *PAGE 34*

PRESSURE & VOLUME *PAGE 38*

TRIAXIAL TESTING *PAGE 43*

TRIAXIAL CELLS AND ACCESSORIES *PAGE 48*

DATA ACQUISITION *PAGE 60*

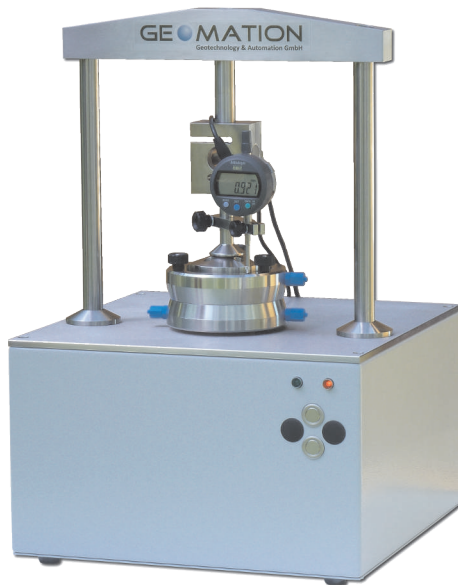
TRANSDUCERS & SENSORS *PAGE 62*

SOFTWARE *PAGE 70*

ACCESSORIES *PAGE 80*

Oedometer up to 2500 kN/m²

PLS5 and PLS10



CHARACTERISTICS

- load up to 10 kN
- position control
- load control
- upgrade to the shear device possible
- settlement measurement on specimen
- fully automatic control via PC
- compact construction
- pneumatic load generation

APPLICATION

- Consolidation test according to DIN EN ISO 17892-5 (formerly DIN 18135) (one-dimensional compression test)
- swelling pressure test
- normal stress up to 2500 kN/m²

DESCRIPTION

The oedometer PLS5 or PLS10 is a laboratory tabletop device for performing consolidation and swelling pressure tests according to DIN EN ISO 17892-5 (formerly DIN 18135). To adapt the measuring range, the device can be supplied with 5 kN load transducer or 10 kN load transducer. With a sample size of 40 cm² (Ø 71.4 mm), normal stresses of 1,250 kN / m² (5 kN normal load) and 2,500 kN / m² (10 kN normal load) can be generated.

TECHNICAL DATA

load	: up to 10 kN
travel	: 50 mm
displ. meas.	: 12.5 mm, resolution 1 µm
sample comp.	: 220x85 (WxH)
operat. pressure	: 5 bar
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz
dimensions	: 350x350x550 mm (WxHxD)
mass	: about 32 kg

ACCESSORIES

- OCX & OCF series consolidation test cell
- digital displacement transducer (dial gauge)
- laboratory compressor
- filter pressure regulator

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Universal testing machine up to 25 kN



ELS25

CHARACTERISTICS

- load up to 25 kN
- load control
- speed control
- position control
- upgrade to the shear device possible
- deformation measurement on specimen
- fully automatic control via PC
- electromechanical load generation

APPLICATION

- consolidation test according to DIN EN ISO 17892-5 (formerly DIN 18135)
- swelling pressure test
- uniaxial compression test (DIN 18136)
- CBR test up to 25 kN
- as load generator (σ_1) for triaxial tests
- shear tests according to DIN 18137-3 with shear box SSD2 or SSD5

DESCRIPTION

Universal and computer-controlled laboratory device is equipped with an electromechanical spindle drive for load-, speed- and displacement-controlled experiments. It is used in soil mechanics for carrying out uniaxial compression tests according to DIN 18136, in load testing according to DIN EN ISO 17892-5, in triaxial tests according to DIN 18137-2 and for CBR experiments according to DIN EN 13286-47. When using a single shear box of the type SSD2 or SSD5, shear tests according to DIN 18137-3 can also be performed.

TECHNICAL DATA

load	: 25 kN
travel	: about 300 mm
speed	: 0-10 mm / min, path resolution 1 μ m
sample comp.	: 350 x 600 (WxH)
drive system	: electromechanical
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz
dimensions	: 400x1500x400 mm (WxHxD)
mass	: about 70 kg

ACCESSORIES

- load measuring systems 0,5 .. 25 kN
- pressure transducer (pore pressure measurement)
- displacement transducer (dial gauges)
- installation kits for triaxial, consolidation and uniaxial compression tests

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Universal testing machine up to 50 kN



ELS50

CHARACTERISTICS

- load up to 50 kN
- load control
- speed control
- position control
- adjustable load stamp
- deformation measurement on specimen
- fully automatic control via PC
- electromechanical load generation

APPLICATION

- consolidation test according to DIN EN ISO 17892-5 (formerly DIN 18135)
- swelling pressure test
- uniaxial compression test (DIN 18136)
- CBR test (DIN EN 13286-47)
- as load generator (σ_1) for triaxial tests
- shear tests according to DIN 18137-3 with shear box SSD2 or SSD5

DESCRIPTION

Universal and computer-controlled laboratory device ELS50 is equipped with a precision drive for load-, speed- and displacement-controlled tests and is used to carry out uniaxial compression tests, CBR experiments and load tests. With appropriate accessories, triaxial and shear tests according to DIN 18137 are possible. The combination of a fully retractable load stamp and slides on the tabletop facilitates the installation of heavy triaxial cells. The triaxial cell is simply put on the tabletop and pushed to the stop in the direction of the load stamp.

TECHNICAL DATA

load	: 50 kN
travel	: about 150 mm
speed	: 0-10 mm / min, path resolution 1 μ m
sample comp.	: 280x600 (WxH)
drive system	: electromechanical
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz
dimensions	: 500x1500x500 mm (WxHxD)
mass	: about 120 kg

ACCESSORIES

- load measuring systems 0.5 bis 50 kN
- pressure transducer (pore pressure measurement)
- displacement transducer (dial gauges)
- installation kits for triaxial, consolidation and uniaxial compression tests

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Dynamic testing machine

ELD50.2



CHARACTERISTICS

- static load up to 50 kN
- dynamic / cyclic load up to 2 kN
- frequency up to 50 Hz
- load, position and speed control
- adjustable load stamp
- deformation measurement on specimen
- fully automatic control via PC
- electromechanical load generation

APPLICATION

- consolidation test according to DIN EN ISO 17892-5 (formerly DIN 18135) (unidimensional compression test)
- uniaxial compression test (DIN 18136)
- as a load generator (σ_1) for triaxial tests
- cyclic and dynamic tests

DESCRIPTION

The laboratory test machine ELD50.2 is equipped with an electromechanical high-performance actuator cylinder for load-, speed- and displacement-controlled tests. The test machine is suitable for performing static and dynamic / cyclic oedometer, uniaxial compression and triaxial tests. The combination of fully retractable load stamps and slides on the tabletop facilitate the installation of heavy triaxial cells. The triaxial cell is simply put on the tabletop and pushed to the stop in the direction of the load stamp. The centering of the triaxial cell is fully automatic.

TECHNICAL DATA

load	: 50 kN (static), 2 kN (dynamic)
travel	: 100 mm (stat.), 150 mm (dyn.)
speed	: 0-100 mm / min, resolution 1 μ m
sample comp.	: 360 x 800 (WxH)
drive system	: electromechanical
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz or ~ 400V / 50Hz
dimensions	: 600 x 1800 x 550 mm (WxHxD)
mass	: about 150 kg

ACCESSORIES

- housing (splinter shield)
- load transducer incl. mechanical adapters
- displacement transducer for static measurement (DMU) and dynamic measurement (IDS)
- pressure transducer

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Dynamic testing machine

ELD50.10



CHARACTERISTICS

- static load up to 50 kN
- dynamic / cyclic load up to 10 kN
- frequency up to 50 Hz
- load, position and speed control
- adjustable load stamp
- deformation measurement on specimen
- fully automatic control via PC
- electromechanical load generation

APPLICATION

- consolidation test according to DIN EN ISO 17892-5 (formerly DIN 18135) (unidimensional compression test)
- uniaxial compression test (DIN 18136)
- as a load generator (σ_1) for triaxial tests
- cyclic and dynamic tests

DESCRIPTION

The laboratory test machine ELD50.10 is equipped with an electromechanical high-performance actuator cylinder for load-, speed- and displacement-controlled tests. The test machine is suitable for performing static and dynamic / cyclic oedometer, uniaxial compression and triaxial tests. The combination of fully retractable load stamps and slides on the tabletop facilitate the installation of heavy triaxial cells. The triaxial cell is simply put on the tabletop and pushed to the stop in the direction of the load stamp. The centering of the triaxial cell is fully automatic.

TECHNICAL DATA

load	: 50 kN (static), 10 kN (dynamic)
travel	: 100 mm (stat.), 150 mm (dyn.)
speed	: 0-100 mm / min, resolution 1 μ m
sample comp.	: 360 x 800 (WxH)
drive system	: electromechanical
interface	: COM port (serial, RS232)
supply	: 3 x 400 V / 50 Hz
dimensions	: 600 x 1800 x 550 mm (WxHxD)
mass	: about 150 kg

ACCESSORIES

- housing (splinter shield)
- load transducer incl. mechanical adapters
- displacement transducer for static measurement (DMU) and dynamic measurement (IDS)
- pressure transducer

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Testing machine up to 100 kN

HLS100



CHARACTERISTICS

- load up to 100 kN
- variable sample attachments
- speed control
- settlement measurement on the specimen
- fully automatic control via PC
- compact construction
- low energy consumption

APPLICATION

- uniaxial compression test (DIN 18136)
- CBR test (DIN EN 13286-47 and TP BF-StB part B 7.1)

DESCRIPTION

The test machine HLS100 is used to carry out test feed-controlled experiments and is, due to its hydraulic drive, especially suitable for the testing of brittle sample material (protective housing available as accessory). A 100 kN load transducer immediately detects the load of the specimen. Alternatively, even smaller transducers can be used. With appropriate adapters (available as accessories), these transducers can be installed and connected to the back of the device. With digital position sensors, deformation of the specimen can be precisely determined.

TECHNICAL DATA

load	: 100 kN
travel	: 140 mm
displ. meas.	: 0-60 mm, resolution 1 µm
sample comp.	: 360x500 (WxH)
drive system	: electrohydraulic
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz
dimensions	: 550x1750x500 mm (WxHxD)
mass	: about 200 kg

ACCESSORIES

- housing (splinter shield)
- load transducer, incl. mechanical adapters
- pressure transducer, digital displacement transducer
- installation kit for CBR and uniaxial compression tests

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Testing machine up to 150 kN

HLS150



CHARACTERISTICS

- load up to 150 kN
- variable sample attachments
- load, position and speed control
- settlement measurement on the specimen
- fully automatic control via PC
- compact construction
- low energy consumption

APPLICATION

- uniaxial compression test (DIN 18136)
- CBR test (DIN EN 13286-47 and TP BF-StB Part B 7.1)
- consolidation test (DIN 18135)
- swelling pressure test

DESCRIPTION

The test machine HLS150 is used to carry out test feed-controlled experiments and is, due to its hydraulic drive, especially suitable for the testing of brittle sample material (protective housing available as accessory). A 150 kN load transducer immediately detects the load of the specimen. Alternatively, even smaller transducers can be used. With appropriate adapters (available as accessories), these transducers can be installed and connected to the back of the device. With digital position sensors, deformation of the specimen can be precisely determined.

TECHNICAL DATA

load	: 150 kN
travel	: 140 mm
displ. meas.	: 0-60 mm, resolution 1 µm
sample comp.	: 360x500 (WxH)
drive system	: electrohydraulically
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz
dimensions	: 550x1750x500 mm (WxHxD)
mass	: about 200 kg

ACCESSORIES

- housing (splinter shield)
- load transducer, incl. mechanical adapters
- pressure transducer, digital displacement transducer
- installation kit for CBR, consolidation and uniaxial compression tests

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Testing machine up to 400 kN

HLS400



CHARACTERISTICS

- load up to 400 kN
- variable sample attachments
- load, position and speed control
- settlement measurement on the specimen
- fully automatic control via PC
- compact construction
- low energy consumption

APPLICATION

- uniaxial compression test (DIN 18136)
- CBR test (DIN EN 13286-47 and TP BF-StB Part B 7.1)
- consolidation test (DIN 18135)
- swelling pressure test

DESCRIPTION

The test machine HLS400 is used to carry out test feed-controlled experiments and is, due to its hydraulic drive, especially suitable for the testing of brittle sample material (protective housing available as accessory). A 400 kN load transducer immediately detects the load of the specimen. Alternatively, even smaller transducers can be used. With appropriate adapters (available as accessories), these transducers can be installed and connected to the back of the device. With digital position sensors, deformation of the specimen can be precisely determined.

TECHNICAL DATA

load	: 400 kN
travel	: 165 mm
displ. meas.	: 0-60 mm (resolution: 1µm)
sample comp.	: 350 x 600 (WxH)
drive system	: electrohydraulically
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz
dimensions	: 550x1800x600 mm (WxHxD)
mass	: about 400 kg

ACCESSORIES

- housing (splinter shield)
- load transducer, incl. mechanical adapters
- pressure transducer, digital displacement transducer
- installation kit for CBR, consolidation and uniaxial compression tests

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

2-channel controller

EPSC



CHARACTERISTICS

- 2-channel controller for pneumatic and electromechanical drives
- automatic device-internal limitation of user-specific characteristic values
- compatible with different sensor types
- compact design
- fully automatic control via PC

APPLICATION

- precise control of pneumatic pressures and electromechanical loads
- retrofitting of multi-axis applications (e.g. combination of pneumatic oedometers with electromechanical shear axis)
- set-up of permeability testing systems and triaxial systems

DESCRIPTION

The universal 2-channel controller of type EPSC can be used anywhere, where very precise pneumatic pressures must be established and regulated in a drive, while in a second drive very precise electromechanical speeds and forces must be established and regulated. Hence, this controller is suitable in particular for retrofitting or conversion of shearing equipment with pneumatic imposed load generation and electromechanical shear axis.

TECHNICAL DATA

pneumatic axis	: Pressure range: 0 .. 1000 kN / m ² Connection: quick release NW5 Accuracy pressure regul.: 0.3% FS
drive	: Electric motors of various designs and power can be connected
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz
dimensions	: 350 x 155 x 470 mm (WxHxD)
mass	: about 6.5 kg

ACCESSORIES

- load measuring systems (KAS, KAD, KAH etc.)
- digital displacement transducer (DMU)
- external transducers, e.g. pore pressure transducer for triaxial applications
- further transducers on request

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Modernization of test equipment

UP.KIT

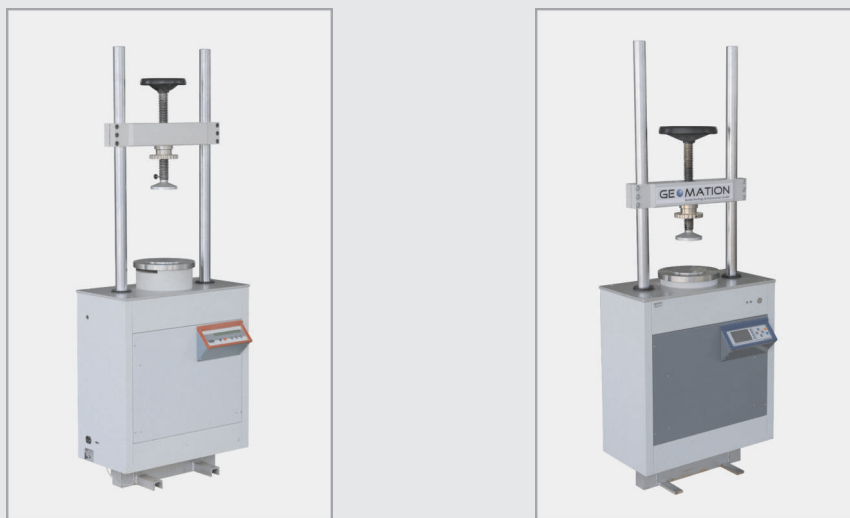
By modernizing older testing machines, they can be adapted to current standards requirements. In addition, the modernization provides a cost effective alternative to keeping the tester when, for instance, electronic components are defective.

In modernization, the following components are usually replaced:

- Control electronics with operating display and power supply
- Stepper motor with stepper motor driver / power amplifier
- Flange to take on the new drive (depending on the test device)
- Communication interface

Other components such as load frames, cases, and drive elements (e.g. ballscrew and gears) are retained and replaced only when necessary.

The new controller is recognized by the PC software GeoDESC and allows a versatile use of the modernized tester. By way of example, the following figures show the conversion of a testing press of the type UP100 (manufacturer GIESA).



Figures: UP100 before modernization (left), UP100 after modernization (right)

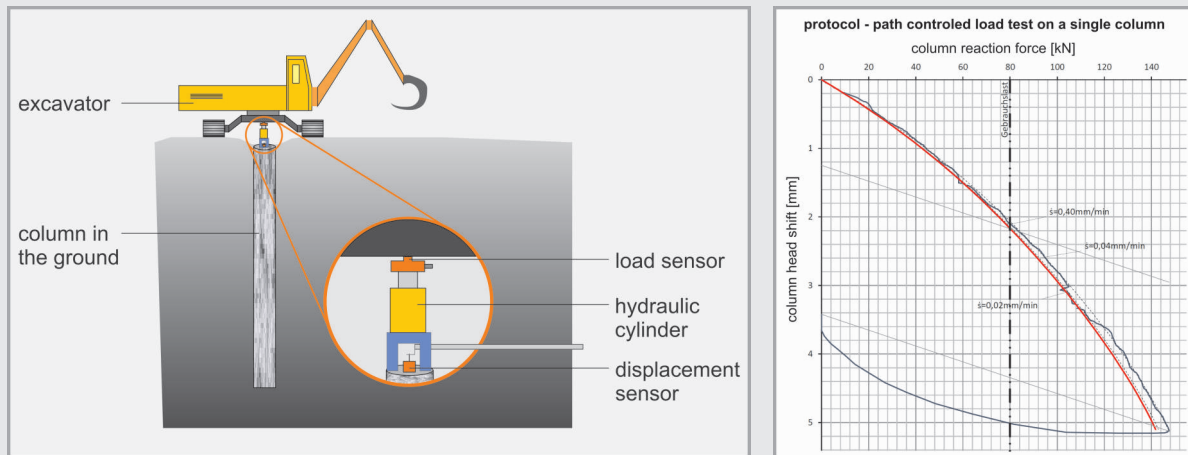
The modernization or conversion is, for example, possible for the following devices:

- test machine UP25 (manufacturer GIESA)
- test machine UP100 (manufacturer GIESA)
- compression device PP5 (manufacturer GIESA)
- test equipment by the company PERO (oedometer stands, shear devices)
- further testing devices per request

Theory & practical knowledge

TESTING OF CSV COLUMNS AND DRY MORTAR PILLARS

In addition to conventional methods (soil replacement and pile foundation), there is another, more cost-effective, alternative for ground improvement - soil stabilization according to the CSV process. In this method, displacement pillars of a small diameter (about 12 to 18 cm) are put into the soil at close intervals with the help of a screw rod.



Figures: Set-up of the CSV test procedure (left), force-settlement diagram (right)

The load capacity test of the above-mentioned pillars for soil stabilization is done in-situ via feed-controlled load tests (CRP tests - constant rate of penetration). In opposite to gradual load to determine the load-settling behavior, the feed-controlled test needs much shorter test times and thus significantly reduced costs.

In cooperation with the company Laumer Bautechnik GmbH and the University of applied sciences Koblenz (German), the GEOMATION GmbH has developed a new mobile hydraulic test device - MHD300 - as well as the associated evaluation software.

For testing, separate test pillars, mostly at the edge of the construction field, are indented with the help of a microprocessor-controlled hydraulic system. All measurement data are recorded on the PC or laptop, and can already be visualized online during the test.

The following device types to perform CSV experiments are offered by the company Geomation GmbH:

- testers of the MHD series

Mobile hydraulic tester

MHD300



CHARACTERISTICS

- mobile hydraulics with measured data acquisition and control
- test load up to the MN range
- compact construction and extremely low weight (about 30 kg)
- precise load, position and speed control
- fully automatic control via PC

APPLICATION

- CSV tests (COPLAN stabilization procedure)
- uniaxial compression test
- consolidation test

DESCRIPTION

The hydraulic units of the MHD series enable the user to perform comfortable CSV tests and analyzes directly on the construction site. Depending on the desired equipment, the MHD series allows for the control or regulation of pressure, force, path and speed. Their compact design and low weight, the units can be easily lifted into a car by one person to be transported to the test center. The additionally installed wheels facilitate the transport of the unit even through difficult terrain. Quick-release couplings for connecting a hydraulic cylinder as well as dust- and rainwater-protected plug connections are standard. Optionally, functions such as controlled unloading or pressure and tensile tests are available. Connecting single-acting or double-acting (optional) hydraulic cylinders is also possible.

TECHNICAL DATA

load	: MN area
power unit	: electrohydraulic
operat. pressure	: 350 bar (optionally 700 bar)
load sensor	: sensor with 0 .. 10V signal
displ. sensor	: digital (IDS)
supply	: ~ 230V / 50Hz
interface	: COM port (serial, RS232)
dimension	: 720 x 420 x 650 mm (W x D x H)
mass	: about 30 kg

ACCESSORIES

- hydraulic cylinders
- incremental displacement transd. (IDSA)
- load transducer, incl. mechanical adapter
- Benkelman-beam
- installation kit CSV test

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

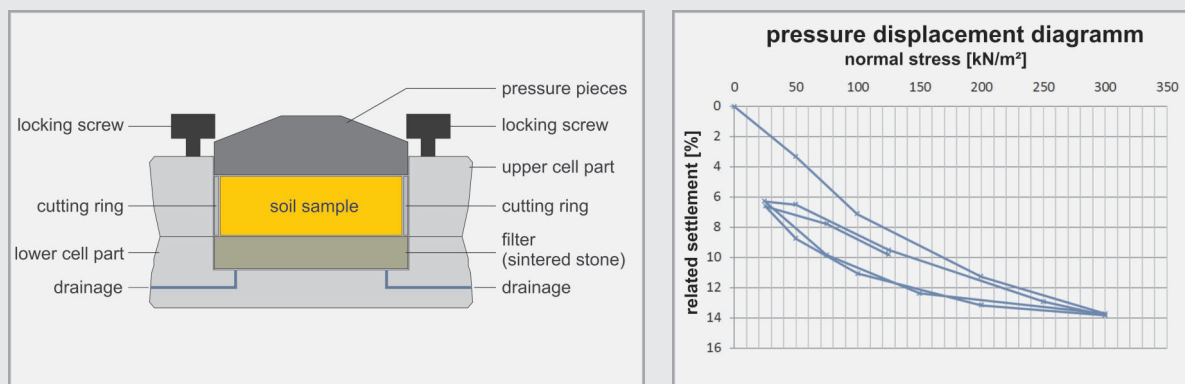
accessories

Theory & practical knowledge

CONSOLIDATION TEST

The consolidation test according to DIN EN ISO 17892-5 (formerly DIN 18135) and ASTM D2435, also called "uniaxial compression test", is a uniaxial pressure test with prevented lateral expansion to determine the settlement behavior of soils.

The test is used in earthworks and foundations to determine the consolidation behavior (squeezing or lifting) of soils. The cylindrical specimen is, with prevented lateral expansion, stepwise vertically axially loaded or relieved in a specially constructed cell (oedometer cell). Through filter discs in the oedometer cell, the specimen can be drained in the axial direction.



Figures: Set-up of the oedometer trial (left), pressure setting diagram (right)

Suitable for are all test machines which allow a gradual load and relief in axial direction. The applied normal stress is to be kept constant with an accuracy of 1% or with a maximal deviation of 1 kPa from the respective setpoint of the load level during the entire experiment. The application of a load level has to take place within 2 seconds, according to standard. To measure the sample according to DIN 18135, deformation transducers or dial gauges with a resolution of 2 μm for settlements up to 10 mm or 10 μm for settlements larger than 10 mm are recommended.

An automatic recording of the load and settlement data through the device or a computer is recommended by the standard and is possible with all of our testing devices! To carry out oedometer tests, the following device types of the company Geomation GmbH are offered:

- testers of the ELS series
- testers of the HLS series
- testers of the PLS series
- testers of the ESD series
- testers of the ELD series

oedometer cell with fixed ring



Series OCX

CHARACTERISTICS

- oedometer cell for one-dimensional compression tests
- stainless steel (complete, incl. filter stone)
- 3 tube connections for drainage
- simple sample insertion and removal
- easy to clean

APPLICATION

- one-dimensional compression test (consolidation test) according to DIN EN ISO 17892-5 (formerly DIN 18135)
- one-dimensional consolidation test according to ASTM D2435
- BS standards

DESCRIPTION

The oedometer cells OCX 40.20 or OCX 79.30 are suitable for the oedometer trial (one-dimensional compression test) according to DIN EN ISO 17892-5. The loading of the sample is carried out via the upper pressure plate and is possible either with or without sphere (allow or prevent tilting of the pressure plate). The sample can be irrigated through the irrigation holes in the pressure plate or, alternatively, through the upper tube connection. Via 2 further tube connections in the base, the lower filter stone can be rinsed and saturated even when the specimen is installed. During the experiment, these connections serve the draining of pore water.

TECHNICAL DATA

sample area	: 40 cm ² or 78.5 cm ²
sample height	: 20 mm or 30 mm
material	: stainless steel
filter stone	: Stainless steel (sintered)
note	: Other sample areas on request

ACCESSORIES

- filter paper

Note:

Suitable as an accessory for the test machines of the series ELS, PLS and the direct shear devices of the series ESD.

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

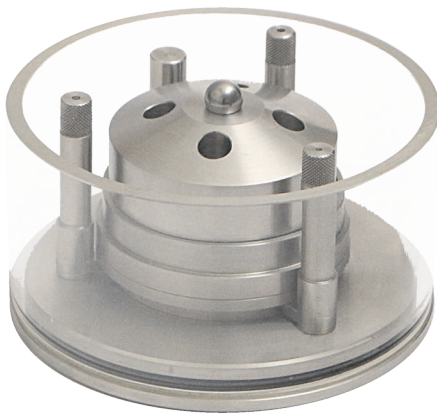
data
acquisition

transducers
& sensors

software

accessories

oedometer cell with floating ring



Series OCF

CHARACTERISTICS

- oedometer cell for one-dimensional compression tests
- reduced wall friction during experiment
- stainless steel (complete, incl. filter stone)
- plastic sheath (sealed)
- simple sample insertion, removal & cleaning

APPLICATION

- one-dimensional compression test with reduced wall friction (consolidation test) for fine-grained material
- BS standards

DESCRIPTION

The oedometer cells OCF 40.20 or OCF 79.30 are suitable to carry out the one-dimensional compression test and are primarily used to examine fine-grained material. Due to the "floating" sample ring, wall friction effects are reduced during the sample loading. In order to install the sample, the "floating" sample ring is held in position by three rotatable bolts. After the application of the first load level, the locking of the sample ring is loosened by simple turning of these bolts and the sample ring begins to "float". A coat of clear plastic can be easily installed on the base of the oedometer cell. This allows for the filling of the oedometer cell with water and thus for an irrigation of the sample.

TECHNICAL DATA

sample area	: 40 cm ² or 78.5 cm ²
sample height	: 20 mm or 30 mm
material	: stainless steel
filter stone	: Stainless steel (sintered)
note	: Other sample areas on request

ACCESSORIES

- filter paper

Note:

Suitable as an accessory for the test machines of the series ELS, PLS and the direct shear devices of the series ESD.

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Oedometer cell (temperature-controlled)



Series OCX-F

CHARACTERISTICS

- temperature-controlled oedometer cell for one-dimensional compression test
- integrated temperature transducer
- integrated pore pressure transducer
- 4 drainage connections for pore water (2 x in the load stamp, 2 x in the base)
- 2 temperature connections in the load stamp

APPLICATION

- one-dimensional compression test (consolidation test) with variable sample temperature
- frost-elevation tests
- BS standards

DESCRIPTION

With the oedometer cell OCX-F, one-dimensional compression tests according to DIN EN ISO 17892-5 can be performed. In addition, the temperature of the sample can be varied. Specifically tempered liquids are led through the upper load stamp to influence the temperature at the top of the sample. A temperature transducer and pressure transducer (optional) is located at the bottom of the oedometer cell (base). As a result, e.g. studies on freezing and frozen samples with simultaneous measurement of the suction pressure (pore pressure) are easily possible. For the irrigation and drainage of the sample, two drainage connections can be found on the load stamp (top of sample) and in the base (bottom of the sample).

TECHNICAL DATA

sample area	: 78.5 cm ²
sample height	: 35 mm
material	: plastic / stainless steel
filter stone	: stainless steel (sintered)
temp. range	: -40 .. +100°C
note	: Other sample areas on request

ACCESSORIES

- filter paper
- pressure transducer of the series SPF
- temperature transducer of the series STD125

laboratory &
field devices

**oedometer
cells**

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

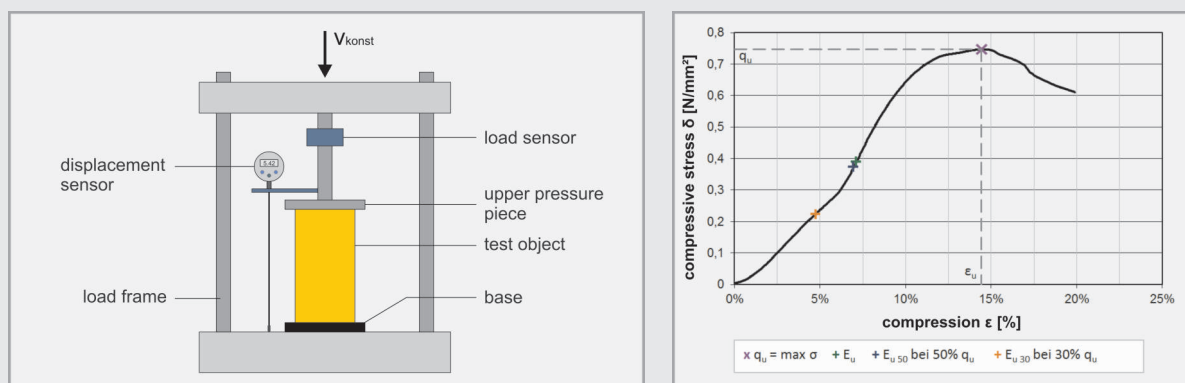
accessories

Theory & practical knowledge

UNIAXIAL COMPRESSION TEST

The uniaxial compression test according to ISO EN 17892-7 (former DIN 18136) is carried out in earthworks and foundations to determine the uniaxial compressive strength q and to determine the modulus of elasticity E_u on cylindrical or prismatic specimens.

The specimen is installed centrally in the test press and pressed in the axial direction at a constant rate of deformation. According to DIN, the recommended test speed is about 1% of the initial height of the specimen per minute. For hydraulic bounded or stabilized soils with an expected failure strain $\epsilon < 4\%$, a feed rate of 0.2% of the initial height of the sample body per minute shall be maintained. The measurement data for load and settlement are to be logged by the device or a computer. The test is finished when the break has occurred, i.e. the measured axial load does not increase any further or when the compression of the sample has reached a value of 20%. For the evaluation, the uniaxial compressive strength q , the associated fracture compression ϵ and the modulus of the uniaxial compression test E are to be determined and recorded from the pressure-compression diagram.



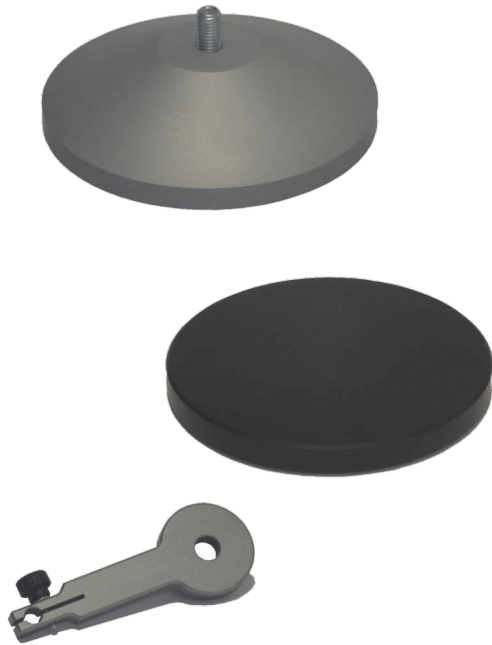
Figures: Set-up of the of uniaxial compression test (left), pressure compression diagram (right)

Test load are required for applying an axial test load at a constant feed rate. According to the standard, the thrust plates of the testing machine must be plane-parallel to each other, perpendicular to the direction of pressure and not tilted during the test.

Geomatic GmbH offers the following device types for carrying out uniaxial compression tests:

- testers of the ELS series
- testers of the HLS series
- testers of the ELD series
- direct shear device ESD10.5

Accessories uniaxial compression test



SET.UNIAXIAL

CHARACTERISTICS

Installation accessories for carrying out uniaxial compression tests consisting of:

- lower compression plate (POM)
- upper compression plate (aluminum anodized)
- dial gauge holder with clamping shaft 8 h6 (aluminum made)
- optional: sample adapter (galv. steel)

APPLICATION

- Implementation of uniaxial pressure tests with the test presses of the ELS, ELD and HLS series.
- BS standard
- ASTM D2166

DESCRIPTION

Installation accessories for carrying out uniaxial compression tests with the test machine of the ELS-ELD and HLS series. The maximum sample diameter for the standard installation accessory is 160mm. Accessories for other sample dimensions are available on request.

TECHNICAL DATA

samples dim.	: max. 160mm
lower compression plate	: POM, black
upper compression plate	: anodized aluminum
dial gauge holder	: anodized aluminum
sample comp. adapter	: galvanized steel

ACCESSORIES

Installation accessories for sample diameter greater than 160mm on request.

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

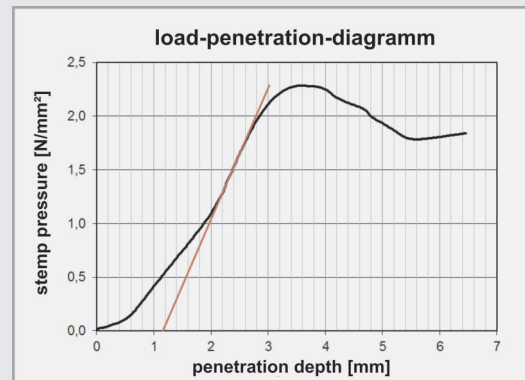
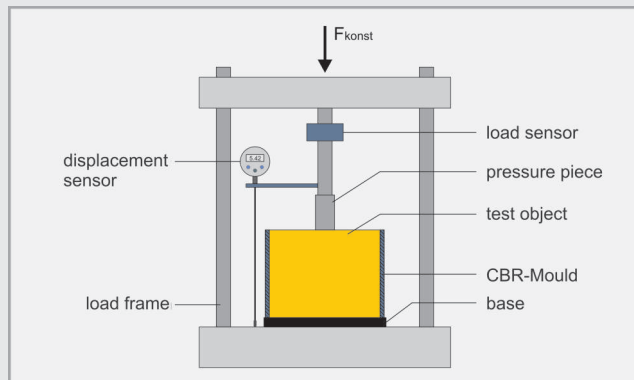
accessories

Theory & practical knowledge

CBR-TEST

The CBR test according to DIN EN 13286-47 or TP BF - StB Part B 7.1 is a laboratory test used to assess the bearing capacity of ground. It is primarily used in road and traffic route construction. The basis for this are empirically determined values of a known subsoil (mixture of substances), with which the material that is to be tested (possibly prepared subsoil) is compared. The test result - the CBR value - is therefore given as a percentage.

The analysis is carried out in a CBR mould, while the grain size of the material to be tested must not exceed 22.4 mm. After the sample has been prepared (compaction etc.), a certain storage time must be observed, depending on the instructions.



Figures: Set-up of an CBR test (left),

The CBR mould (with sample) is centered in a test machine. A plunger ($d = 50$ mm), whose pressure surface consists of hardened steel, moves into the sample at a constant speed. The resulting forces are measured and logged in such a way that at least a load value per 0.5 mm penetration depth (penetration) is achieved.

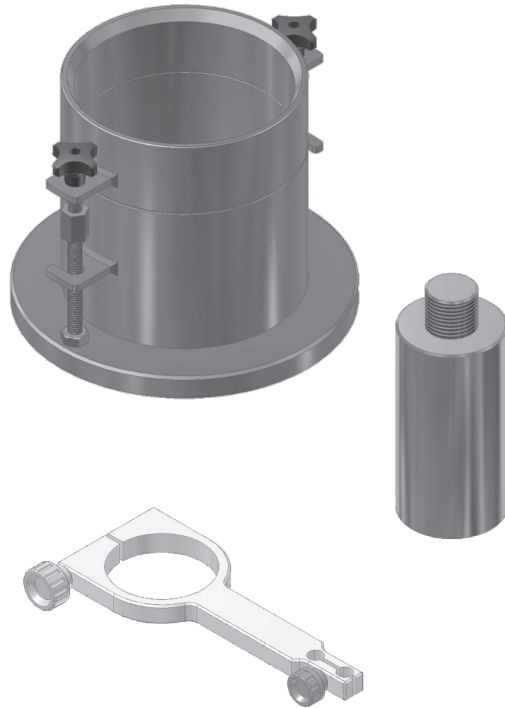
The CBR value for a penetration depth of 2.5 mm or 5.0 mm is given in percent. Both values are specified in the protocol, with the higher percentage being used to assess the penetration depth or bearing index. An automatic recording of the load and settlement data by the device or a computer is recommended by standard. This is assured with all testing devices of the company Geomation GmbH!

To carry out CBR tests, Geomation GmbH offers the following devices:

- testers of the ELS and ELD series
- testers of the HLS series
- direct shear device ESD10.5

Accessories CBR test

SET.CBR



CHARACTERISTICS

Installation accessories for carrying out CBR tests consisting of:

- CBR form 150 (CBR cylinder, galvanized steel, $\varnothing_a = 175$ mm, $\varnothing_i = 150$ mm, $h = 175$ mm)
- compression stamp $\varnothing 50$ mm (stainl. steel)
- dial gauge holder with clamping shaft 8 h6 (aluminum anodised)

APPLICATION

- CBR set for carrying out the test according to TP BF-StB Part 7.1 "Technical Test Instructions for Soil and Rock in Road Construction, CBR Test" and DIN EN 13286-47 with test machines of the ELS, ELD and HLS series.
- ASTM D1883
- BS 1377-9

DESCRIPTION

Installation accessories CBR set to carry out the test according to TP BF-StB Part 7.1 "Technical Test Instructions for Soil and Rock in Road Construction, CBR Test" with test machines of the ELS, ELD and HLS series.

TECHNICAL DATA

samples dim.	: $\varnothing 150$ mm; height max. 175 mm
CBR form	: galvanized steel
load stamp	: stainless steel
dial gauge holder	: anodized aluminum

ACCESSORIES

- no accessories necessary

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

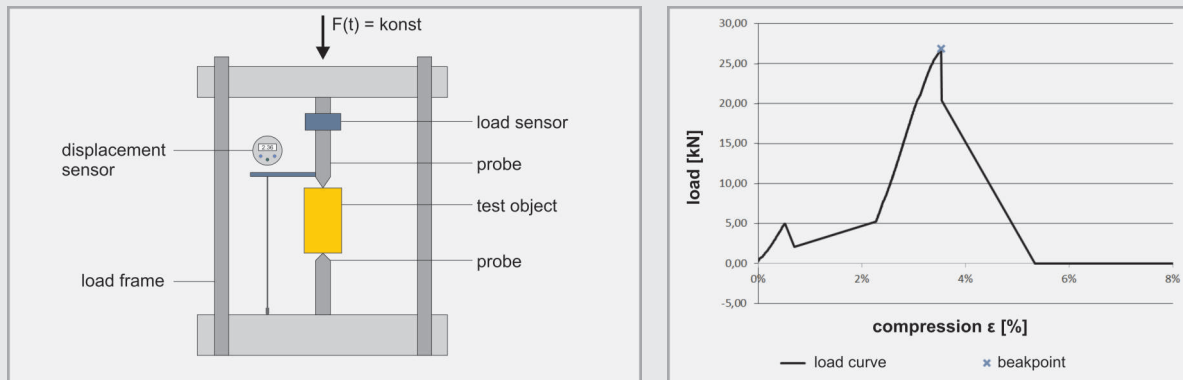
software

accessories

Theory & practical knowledge

POINT LOAD TEST

The point load test according to recommendation no. 5 of the working group AK3.3 "Testing Technology Rock" of the DGGT and the ASTM D5731 is a uniaxial compression test on rock samples to determine the strength of a rock. The point load test determines a strength index by loading cylindrical, cuboid or irregularly shaped rocks between two hardened tips until sample failure.



Figures: Set-up of a point load test (left), force-compression diagram (right)

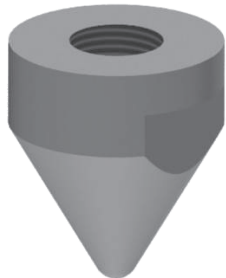
Testing machines for applying the axial test force at constantly increasing load are necessary. According to the recommendation of the DGGT, the test frame with probes must be designed in a way that the load application points during the test procedure are coaxial to each other.

The sample (rock) is installed as centric as possible between the conical plates. The distance of the load introduction points is read or determined by the testing machine. The testing machine increases the load as evenly as possible after the test start until the rock breaks.

For carrying out point load tests, the Geomation GmbH offers the following device types:

- testers of the HLS series
- test machine ELS50

Accessories point load test



SET.POINTLOAD

CHARACTERISTICS

Installation accessories for carrying out point load tests consisting of:

- lower point load cone
- upper point load cone

APPLICATION

- Conducting point load tests to determine the point load resistance with HLS series hydraulic test machines.
- ASTM D5731
- standard AK3.3

DESCRIPTION

Installation accessories for carrying out point load tests in accordance with the recommendation no. 5 of Working Group AK3.3 "Test Technique Rock" of the DGGT. The installation accessories are compatible with the hydraulic test machines of the HLS series. The use of a splinter shield / housing is recommended to protect the operator from splintering sample parts.

TECHNICAL DATA

diameter	
point load cone	: Ø50 mm
probe angle	: 60°
probe radius	: 5 mm
hardness	: HRC 58
material	: tempering steel

ACCESSORIES

- housing (splinter shield)
- sample compartment

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Accessories point-load test



PL.FRAME

CHARACTERISTICS

Test frame for carrying out point load tests with uniaxial test presses of the series ELS or HLS.

- low-friction control
- variable sample compartment

APPLICATION

Test frame for carrying out point load tests in accordance with the recommendation no. 5 "Spot Load Tests on Rock Samples" of the AK 3.3 of the German Geotechnical Society and ASTM D5731 for the determination of the point load index at cylindrical, parallelepipedal, or irregularly shaped rock bodies.

DESCRIPTION

The test frame is placed or screwed centrally underneath a suitable test machines (series ELS or HLS). Via the test press, the required load increase rate or feed rate is generated and the breaking strength and the load point distance are measured. The recorded data are evaluated with the GeoDESC software and the test control EXL.POINT. The use of a housing is recommended to protect the operator against splintering sample parts.

TECHNICAL DATA

max. load point	
distance	: 260 mm
free sample	
compartm. space	: 160 (width)
max. test load	: 150 kN (optional 400 kN)
dimensions	: 280 x 200 x 440 mm
mass	: 10.5 kg

ACCESSORIES

- housing (splinter shield)
- sample compartment adapter
- installation accessories (SET.POINTLOAD)

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

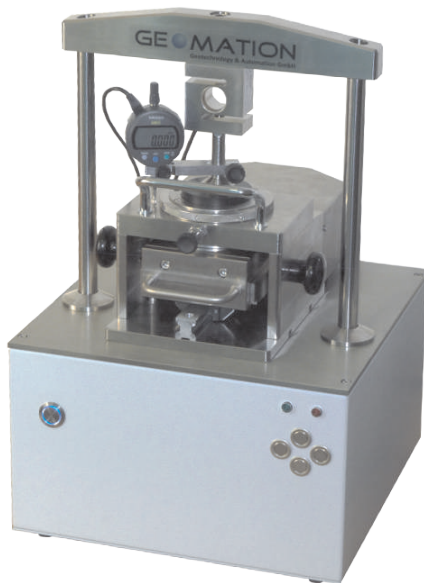
transducers
& sensors

software

accessories

Direct shear device

ESD5.2



CHARACTERISTICS

- compact direct shear device
- shear stress up to 2 kN / load 5 kN
- integrated load transducer
- changeable shear box
- non-dilatancy shearing
- shearing speed: 0.001-10 mm / min
- fully automatic control via PC

APPLICATION

- direct shear test according to DIN 18137-3
- consolidation test according to DIN EN ISO 17892-5 (formerly DIN 18135) (accessories required)
- swelling pressure test (accessories required)
- ASTM D3080

DESCRIPTION

The compact direct shear device type ESD5.2 is a laboratory tabletop device for the execution of direct shear tests according to DIN 18137-3. The shear axis is equipped with a precision electromechanical drive for speed-controlled experiments. The load generation is carried out electropneumatically (compressed air connection necessary!). The integration of the control electronics of the shear cell and loading device in a tabletop housing allows for this space-saving design.

TECHNICAL DATA

normal load	: 5 kN
shear stress	: 2 kN
displ. meas.	: 12.5 mm (solution: 1 µm)
shear path	: 22 mm
interface	: COM port (serial, RS232)
op. pressure	: 3.5 bar
supply	: ~ 230V / 50Hz
dimensions	: 350 x 550 x 350 mm (WxHxD)
mass	: about 58 kg

ACCESSORIES

- shear frame / shear box:
Ø 71.4 mm; Ø 56.4 mm; □ 60 x 60 mm
- compressed air connection / laboratory compressor
- oedometer cell for tests acc. to DIN 18135
- filter pressure regulator

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Direct shear device Option: simple shear

ESD10.5



CHARACTERISTICS

- compact direct shear device
- shear stress up to 5 kN / load 10 kN
- load transducer changeable
- various shear inserts available
- shear box separable
- shearing speed: 0.001-10 mm / min
- fully automatic control via PC

APPLICATION

- direct shear test acc. to DIN 18137-3
- cyclic shear test (WIENER)
- simple-shear-test (see picture)
- consolidation test (DIN EN ISO 17892-5)
- uniaxial compression test (DIN 18136)
- CBR test up to 25 kN
- as a load generator (σ_1) for triaxial tests
- ASTM D3080

DESCRIPTION

This universal and computer-controlled laboratory device is equipped with an electromechanical spindle drive for power- and path-controlled experiments. The shear box can easily be removed from the load frame. Thus, the vertical load device can be used as an uniaxial test press for triaxial tests or for the load-settlement test (oedometer). The shear box is available in many different types: circular, square or simple-shear design. Due to the variable structure with removable shear box, this laboratory device can be used with the appropriate accessories for a variety of test methods.

TECHNICAL DATA

normal load	: 25 kN (10 kN with shear box)
shear stress	: 5 kN
displ. meas.	: 60 mm (solution: 1 μ m)
shear path	: 30 mm
interface	: COM port (serial, RS232)
drive system	: electromechanical
supply	: ~ 230V / 50Hz
dimensions	: 400 x 1500 x 400 mm (WxHxD)
mass	: about 110 kg

ACCESSORIES

- various shear boxes
- sample installation tool
- set consolidation test
- set uniaxial compression test
- set triaxial trial
- displacement transducers (dial gauges)
- various load and pressure transducers

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

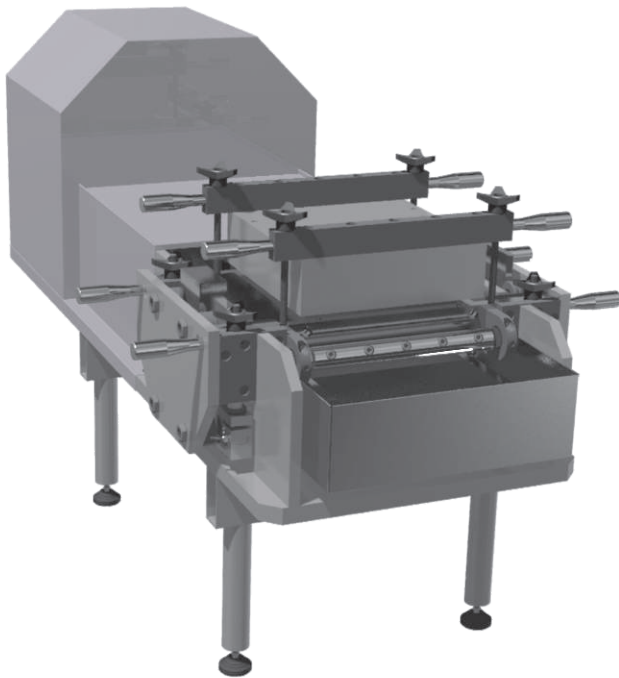
transducers
& sensors

software

accessories

Large shear box device

ESD60.60



CHARACTERISTICS

- compact large shear box device
- shear stress up to 60 kN / load 60 kN
- execution of shear tests and pull-out tests (geosynthetics)
- shearing speed: 0-50 mm/min
- adjustable shearing gap
- compensation of wall friction
- fully automatic control via PC

APPLICATION

- frame shear test acc. to DIN 18137-3
- examination of the shear bond geotextile soil and geotextile geotextile according to DIN EN ISO 12597-1
- pull-out-test according to DIN 60009
- friction tests
- for grain sizes up to Ø 40 mm
- ASTM D3080 and ASTM 06243; BS 1377-7

DESCRIPTION

The large-capacity shear device of the type ESD60.60 is used for the examination of bulk material, earth and geotextiles (power- and distance-controlled). The generation of the normal voltage is pneumatic with this special device. Via an electromechanical spindle drive, shear stresses up to 60 kN can be generated. The standard shear box size is 300x300x200 mm (WxDxH). Other sizes are available on request. The shear gap is freely adjustable in the range between 0 and 35 mm.

TECHNICAL DATA

normal load	: 60 kN
shear stress	: 60 kN
shear frame	: 300x300x200 (WxHxD)
displ. meas.	: 60 mm (solution: 1 µm)
shear path	: 100 mm
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz
dimensions	: 800 x 800 x 12000 mm (WxHxD)
mass	: about 300 kg

ACCESSORIES

- sample installation tool
- digital displacement sensors (dial gauges)
- laboratory compressor
- filter pressure regulator (type FDRx)

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

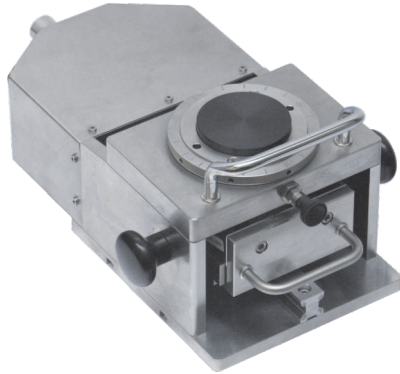
transducers
& sensors

software

accessories

automatic shear box

SSD2



CHARACTERISTICS

- single compact shear box (completely made of stainless steel)
- external control electronics
- shear stress up to 2 kN
- integrated load transducer
- adjustable shear gap 0-2 mm
- speed: 0.001-10 mm/min
- fully automatic control via PC

APPLICATION

- upgrading conventional load devices to shear device
- direct shear test acc. to DIN 18137-3
- ASTM D3080

DESCRIPTION

The shear box SSD2 is a laboratory accessory used to upgrade any load devices and test machines to a direct shear device. The shear box is placed centrally in the loading device just like an oedometer or triaxial cell. The electronically controlled drive is powered by external electronics that contain all the data acquisition with PC interface for the measured shear force, shear path and settling. Various shear inserts (circular, square) are available for this shear box.

TECHNICAL DATA

shear stress	: 2 kN
shear path	: 22 mm
displ. meas.	: internally
shear area	: max. □ 36 cm ² ; ○ 40 cm ²
drive system	: electromechanical
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz
dimensions	: 173 x 120 x 380 mm (WxHxD)
mass	: about 25 kg

ACCESSORIES

- shear frame / shear box: Ø 71.4 mm; Ø 56.4 mm; □ 60 x 60 mm
- tool for sample installation

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

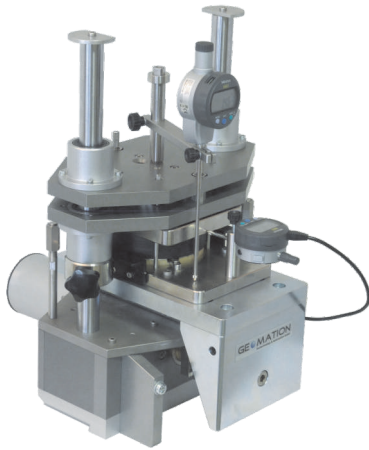
data
acquisition

transducers
& sensors

software

accessories

Automatic shear box option: simple shear



SSD5

CHARACTERISTICS

- single compact direct shear box (all parts touching ground made of stainless steel)
- external control electronics
- shear stress up to 5 kN
- integrated load transducer
- adjustable shear gap
- speed: 0.001-10 mm/min
- fully automatic control via PC

APPLICATION

- upgrading conventional load devices to direct shear device
- direct shear test acc. to DIN 18137-3
- cyclic shear test (WIENER)
- simple-shear-test
- ASTM D3080

DESCRIPTION

The shear box SSD5 is a laboratory accessory used to upgrade any load devices and test machines to a direct shear device. The shear box is placed centrally in the loading device just like an oedometer or triaxial cell. The electronically controlled drive is powered by external electronics that contain all the data acquisition with PC interface for the measured shear force, shear path and settling. Various shear inserts (circular, square and simple-shear) are available for this shear box.

TECHNICAL DATA

shear stress	: 5 kN
shear path	: 30 mm (resolution 1µm)
displ. meas.	: 25 mm (resolution 1µm)
shear area	: max. 100 cm ²
drive system	: electromechanical
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz
dimensions	: 280 x 300 x 280 mm (WxHxD)
mass	: about 40 kg

ACCESSORIES

- various shear boxes
Ø 56.4 mm; Ø 71.4 mm; Ø 79.8 mm
Ø 94.4mm; □ 60x60mm; □ 100x100 mm
- tool for sample installation
- digital displacement transducer

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

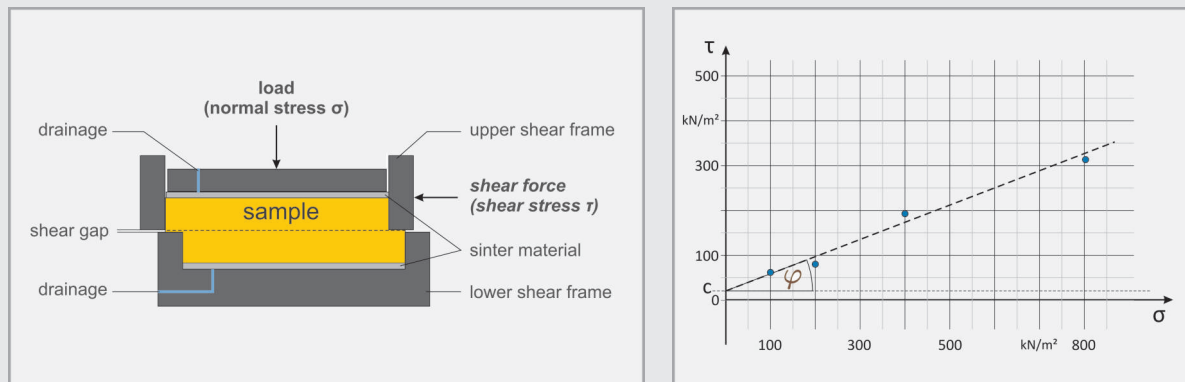
accessories

Theory & practical knowledge

DIRECT SHEAR TEST

A direct shear test according to DIN 18137-3 is used in earthworks and foundations for the determination of shear strength and residual shear strength.

In the direct shear test (DSR), a rectangular or circular specimen is installed in a frame that consists of two parts. By moving one of the two frame parts against the fixed frame, a shear surface is generated, in which shear stress builds up. The lateral expansion of the sample is prevented by the shear frame. The normal stress is applied vertically to the shear surface. To determine the shear parameters, the maximum shear stresses from at least three individual tests exceeding the applied normal stress are taken or put into a diagram. With the resulting regression line (shear line), the cohesion as well as the effective friction angle can be determined.



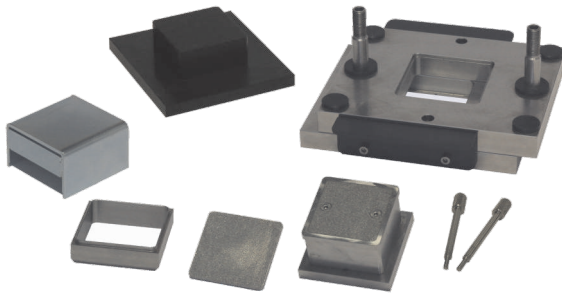
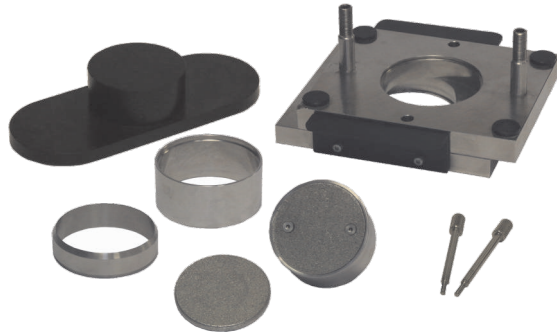
Figures: Set-up of the frame shear test (left), shear plane (right)

The frame shear test is divided in two parts, the consolidation process and the actual shearing process. Here, the normal or consolidation voltage and the shear rate must be adapted to the soil type, preload and the construction project. The shearing process is carried out at a constant feed rate. In the experiment, the settlement, the shear path and the shear force are measured and recorded.

For carrying out frame shear tests, the Geomation GmbH offers the following device types:

- direct shear devices of the ESD series
- direct shear boxes of the SSD series

shear box



SBC / SBR

SHEAR BOX ROUND

shear frame set round (various sizes); sample height 20 mm; consisting of:

- upper and lower shear box
- upper and lower filter disc (stainless steel), incl. O-rings
- stamp (POM)
- sample cutter, round (stainless steel)
- sample discharging device (POM)

SHEAR BOX SQUARE (SBR)

shear frame set square (various sizes); sample height 20 mm; consisting of:

- upper and lower shear frame
- upper and lower filter disc (stainless steel), incl. O-rings
- stamp (POM)
- sample cutter, square (stainless steel)
- sample discharging device (POM)

DESCRIPTION

Shear box for direct shear devices SSD2 and SSD5 in round or square version. Shear box round available for sample diameter of Ø56.4 mm; Ø71.4 mm; Ø79.8 mm and Ø94.4 mm. Shear box square available for sample dimensions of □60x60 mm and □100x100 mm. Shear frame inserts for larger sample dimensions on request.

TECHNICAL DATA

dim. round	: Ø(56.4; 71.4; 79.8; 94.4) mm
dim. square	: □60x60 mm; □100x100 mm
shear frame	: stainless steel
filter disc	: stainless steel, sintered stainl. steel
stamp	: stainless steel
sample cutter	: stainless steel
sample dis- charging device	: POM

ACCESSORIES

- locking screws for the scissor frame parts

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

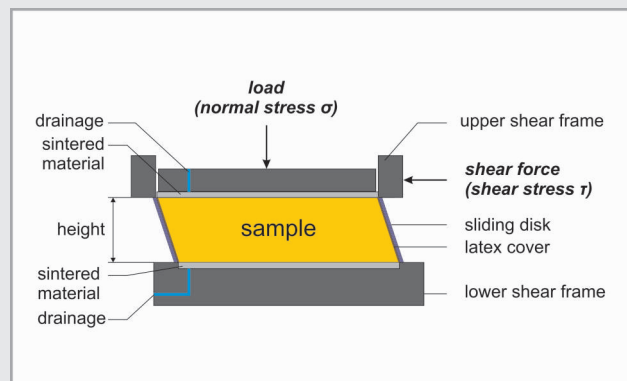
Theory & practical knowledge

SIMPLE SHEAR TEST

The Simple Shear Test is a laboratory test according to ASTM D6528-07 to determine the shear modulus of soils under saturated and partially saturated conditions.

The "Direct Simple Shear Trial" is used in earthworks and foundations to determine the shear strength and deformation parameters under load conditions. In the case of cyclic loading, the test can also be used to assess the liquefaction potential of sands.

The simple shear test has the advantage of establishing a nearly uniform shear stress condition. The stress concentrations that form during the shear test in the forced shear gap are thus avoided.



Figures: Set-up of the Simple Shear Trial

In line with the frame shear test, the simple shear test is divided in two parts, the consolidation process and the actual shearing process. Here, the normal and the consolidation voltage as well as the shear rate must be adapted to the type of soil, the preload and the construction project. The shearing process is carried out at a constant feed rate. In the trial, the setting, the shear path and the shear force are measured and recorded.

To carry out simple shear experiments on cylindrical samples, the Geomation GmbH offers the following device types:

- direct shear devices of the ESD series
- direct shear box SSD5

The sample cell consists of several thin, superimposed metal rings, enclosing the sample that is wrapped in a latex covering.

Shear fram simple shear

SBC.SimpleShear



CHARACTERISTICS

simple shear insert round 70 cm², $\varnothing = 94,4$ mm; consisting of:

- shear box upper and lower part (stainless steel); including filter disc
- Teflon-coated sample rings
- loading piston; including filter disc
- installation accessories for cohesive soils
- installation pad (POM)

APPLICATION

- performing simple shear tests with ESD10.5 or SSD5 shearing devices in accordance with ASTM 06528-07

DESCRIPTION

Combined with the shear devices SSD5 and ESD10.5 the shear frame SBC.SimpleShear is used to perform simple shear tests (direct simple shear test). Simple shear tests are used in soil mechanics to determine drained and undrained shear strength at constant and cyclic shear loads. In comparison to the direct shear test, the simple shear test has the advantage that a homogeneous, unforced shear band can be formed.

TECHNICAL DATA

sample dim.	: $\varnothing 94,4$ mm
shear frame	: stainless steel
sample rings	: Stainless steel, Teflon-coated
pressure stamp	: stainless steel
installation	
accessories	: stainless steel
installation	
pad	: POM

ACCESSORIES

- latex membranes TCS.LH
- 4 centering pins for precise installation of the sample rings
- 4 locking screws for fixing the shear frames and sample rings
- 30 sample rings ($h = 0.75$ mm)

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

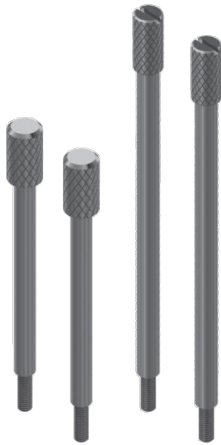
data
acquisition

transducers
& sensors

software

accessories

Accessories



SB.AS - LOCKING SCREWS

Locking screws for the shear boxes of the direct shear devices SSD5 and ESD10.5. The locking screws (shear pins) fix the two shear box halves together, thus ensuring an easy installation of the sample.

TECHNICAL DATA

thread	: M4 und M6
grip	: Ø10 mm, knurled
shaft	: Ø6 mm
overall length	: 96 mm, 101 mm, 106 mm, 129 mm
material	: stainless steel

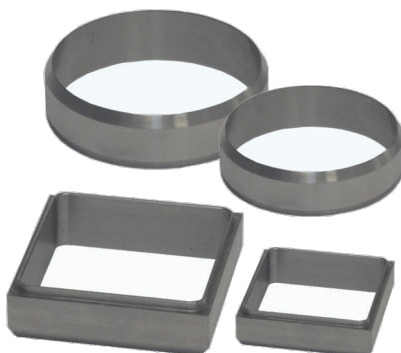


SB.ZS - CENTRING PINS

Centering pins for the simple shear box of the SSD5 and ESD10.5 shear devices. The centering pins keep the shear rings as well as the upper attachment of the simple shear box in centric position and thus allows an easy installation of the sample.

TECHNICAL DATA

thread	: M5
grip	: Ø5 mm, knurled
shaft	: Ø5 mm
overall length	: 118 mm
material	: stainless steel



SB.ATx - CUTTING TOOLS

Sample cutting tool for the shear boxes of the direct shear devices of the SSD and ESD series. Special sizes are available on request.

TECHNICAL DATA

dimensions	: Ø56.4 mm; Ø71.4 mm; Ø79.8 mm; Ø94.4 mm □60x60 mm; □100x100 mm further on request
height	: 20 mm, 25 mm
material	: stainless steel

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Automatic burette system with volume change measurement



Series PPD.A

CHARACTERISTICS

- digital precision pressure regulator
- integrated control electronics
- regulated pressure up to 1400 kN/m²
- level sensor
- burette tube easily exchangeable
- available volumes: 10-250 ml
- fully automatic control via PC
- volume replenishment pos. during trial

APPLICATION

- as radial tension or pore water pressure regulator for triaxial systems
- consolidation stage
- permeability test

DESCRIPTION

With the burette of type PPD.A, accurate water volume measurements under controlled pressure are possible. The total volume of the burette is 50 ml by standard. The integrated precision pressure regulator allows the comfortable setting of the desired pressure either directly on the display or via a connected PC. Refilling or emptying the measuring burette is always possible (also during the experiment). The two-line display shows the current pressure and filling level (PPD.A only). The PPD.A is designed so that compressed air supply, water supply and drainage are always connected. Filling and emptying of the system happens via the ball valves on the front of the device.

TECHNICAL DATA

adj. pressure	: 1000 or 1400 kN / m ² (10 or 14 bar)
resolution	: 1 kN / m ²
supply	: max. 14 bar (compressed air)
volume	: 50 ml (or see accessories)
connection	: pneumatic NW5
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50 Hz
dimensions	: 240x730x240 mm (WxHxD)
mass	: about 10 kg

ACCESSORIES

- burette tubes: 10, 50, 100, 200, 250 ml
- filter pressure regulator
- laboratory compressor

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Automatic burette system with optical level indicator



Series PPD.M

CHARACTERISTICS

- digital precision pressure regulator
- integrated control electronics
- regulated pressure up to 1400 kN/m²
- burette tube easily exchangeable
- available volumes: 10-250 ml
- fully automatic control via PC
- volume replenishment possible during trial

APPLICATION

- as radial tension or pore pressure regulator for triaxial systems
- consolidation stage
- permeability test

DESCRIPTION

With the burette of type PPD.M, accurate water volume measurements under controlled pressure are possible. The total volume of the burette is 50 ml by standard. The integrated precision pressure regulator allows the comfortable setting of the desired pressure either directly on the display or via a connected PC. Refilling or emptying the measuring burette is always possible (also during the experiment). The two-line display shows the current pressure (setpoint and actual value). The filling level is read visually on the burette tube. The PPD.M is designed so that compressed air supply, water supply and drainage are always connected. Filling and emptying of the system happens via the ball valves on the front of the device.

TECHNICAL DATA

adj. pressure	: 1000 or 1400 kN / m ² (10 or 14 bar)
resolution	: 1 kN / m ²
supply pressure	: max. 14 bar (compressed air)
volume	: 50 ml (or see accessories)
connection	: pneumatic NW5
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50 Hz
dimensions	: 240x730x240 mm (WxHxD)
mass	: about 10 kg

ACCESSORIES

- burette tubes: 10, 50, 100, 200, 250 ml
- filter pressure regulator
- laboratory compressor

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Volume Pressure Controller

EPD2000



CHARACTERISTICS

- digital precision pressure generator
- pressure regulator up to 2000 kN/m²
- volume flow controller up to 10 ml/min
- integrated volume measurement
- available volume: approx. 1100 ml
- fully automatic control via PC
- recording of a stress-strain curve for the entire hydraulic system

APPLICATION

- as radial tension or pore pressure regulator for triaxial systems
- consolidation stages
- permeability test
- for sample saturation
- working with degassed water

DESCRIPTION

The electromechanical pressure controller EPD2000 can be installed in a variety of experimental facilities, which pressures must be controlled precisely, volumes are supposed to flow in a certain amount of time, or in which these pressures and volumes are to be measured. The main areas of application are cell pressure and pore water pressure generation in triaxial trials, the indirect measurement of the sample volume change in triaxial systems and the pressure generation and volume measurement in permeability systems.

TECHNICAL DATA

pressure range	: up to 2000 kN / m ² (20 bar)
pressure resolution	: 1 kN / m ²
volume	: 1100 ml
connection	: NW5 quick release
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz
dimensions	: 120 x 730 x 120 mm (WxHxD)
mass	: about 24 kg

ACCESSORIES

- Tripod

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Dynamic volume pressure controller



EPD2000DYN

CHARACTERISTICS

- dynamic precision pressure generator
- pressure regulator up to 2000 kN/m²
- volume flow controller up to 10 ml/min
- integrated volume measurement
- available volume: approx. 1100 ml
- fully automatic control via PC
- recording a stress-strain curve for the entire hydraulic system

APPLICATION

- dynamic / static radial tension or pore pressure regulator for triaxial systems
- consolidation stages
- permeability test
- for sample saturation
- working with degassed water

DESCRIPTION

The electromechanical pressure generator EPD2000DYN can be integrated in a variety of experimental facilities where pressures must be controlled precisely, volumes are supposed to flow in a certain amount of time, or where these pressures and volumes are to be measured. Due to its highly dynamic drive, it is predestined for the generation of dynamic cell and pore water pressures. Further fields of application are the indirect measurement of the sample volume change in triaxial systems and the pressure generation and volume measurement in permeability systems.

TECHNICAL DATA

pressure range	: up to 2000 kN / m ² (20 bar)
dynamics	: up to 50 Hz
pressure res.	: 1 kN / m ²
volume	: 1100 ml
connection	: NW5 quick release
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz
dimensions	: 120 x 730 x 120 mm (WxHxD)
mass	: about 30 kg

ACCESSORIES

- tripod
- high-pressure tubes

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Air Flow Controller

EPC.LSC



CHARACTERISTICS

- digital precision pressure generator
- compact design, actuator system (valve system) integrated in device
- automatic device-internal limitation of the pressure
- precise settlement measurement with digital dial gauge
- fully automatic control via PC

APPLICATION

- precise regulation of pneumatic pressures
- upgrade of consolidation levels (pneumatic oedometers)
- set-up of permeability testing systems and triaxial systems

DESCRIPTION

The automatic electropneumatic pressure control of the type EPC can be used anywhere, where very precise pneumatic pressures must be adjusted and regulated. As controlled variable, a force signal or way or settling signal can be involved. Thus, this pressure control is suitable especially for the expansion or conversion of pneumatic loading devices, e.g. consolidation levels, loaders / oedometers.

TECHNICAL DATA

pressure range	: up to 1000 kN / m ² (10 bar)
accuracy	: 0.1% of v. E
connection	: quick release NW5
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz
dimensions	: 260 x 150 x 360 mm (WxHxD)
mass	: about 5 kg

ACCESSORIES

- various load measuring systems (1 kN, 2 kN, 5 kN, 10 kN)
- digital set gauges from 12.5 mm to 60 mm measuring path (type DMU)
- external transducers, e.g. pore pressure transducers for triaxial applications

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Theory & practical knowledge

TRIAXIAL TESTS

Triaxial tests according to DIN 18137-2, ASTM D4767-11, ASTM D7181-11 and ASTM D2890-15 are used in earthworks and foundations to determine the shear strength of soils. One differentiates the following test types:

- UU trial (unconsolidated & undrained),
- CU trial (consolidated & undrained),
- D trial (consolidated & drained),
- CCV trial (consolidated & drained, with volume held constant)
- K0 test (drained test with prevented radial expansion)

Triaxial systems typically consist of the following components:

- triaxial cell
- test machine
- pressure generator / pressure regulator with volume measurement

To carry out the experiment, a cylindrical specimen in a triaxial cell is loaded on all sides (axial and radial). This triaxial cell is designed in a way that the cell pressure influences the radial load ($\sigma_{2/3}$) of the sample and varies its axial load (σ_1) via the load stamp. A membrane (rubber/latex) prevents the penetration of cell water into the specimen. Via the corresponding drainage pipes one can influence the water content or the pore water pressure (pressure of the water in the pores) of the specimen. Depending on the trial type, these channels must be opened or closed.

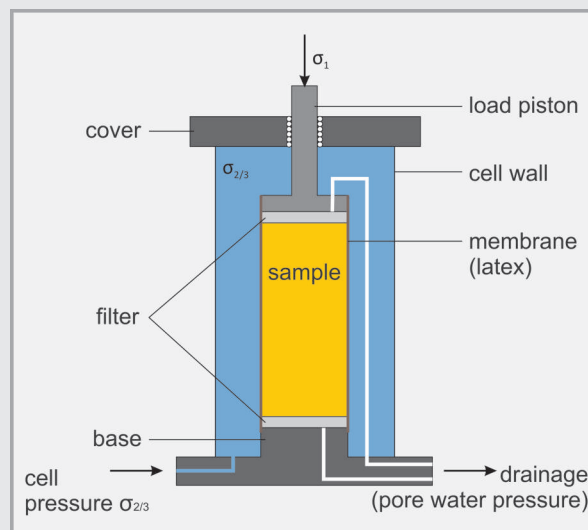


Figure: Set-up of triaxial trial

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Theory & practical knowledge

TRIAXIAL TRIALS

After proper preparation of the specimen (installation, saturation, B-test), the sample is isotropically loaded ($\sigma_1 = \sigma_2 / 3$). Then, the shearing begins with the load stamp "squeezing" the sample at constant speed and a subsequent continuous increase of σ_1 . The resulting forces are measured (recorded) and the corresponding breaking load (maximum value of σ_1) is determined. With the help of Mohr's circle, the internal tensions of the sample can be determined. The trial ends as soon as a distinct break in the recorded readings becomes apparent or as soon as the compression of the sample is 20%.

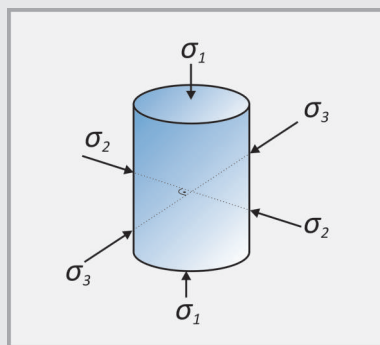


Figure: Loading of a cylindrical test specimen in a triaxial system

Depending on the type of experiment, preparation, implementation and evaluation differ. For the determination of the shear parameters (shear angle ϕ and cohesion c), at least three sub-tests at different initial load on the same sample material should be performed, similar to the frame shear test.

To carry out triaxial trials, the Geomation GmbH offers the following device types:

- triaxial cells of the TCS series
- test machines of the ELS and ELD series
- pressure generators / pressure regulators with volume measurement: EPD2000 series and PPD series

For further explanations of the test types of a triaxial test, please refer to the section "Theory and practical knowledge" on www.geomation.de.

Triaxial test device

TTS



CHARACTERISTICS

- static test load up to 400 kN
- settlement measurement up to 60 mm
- pressure regulator up to 2000 kN/m²
- volume flow controller up to 10 cm³/min
- sample diameter up to 100 mm
- deformation measur. on the test spec.
- fully automatic control via PC
- load generation electrom. / hydraulic

APPLICATION

- triaxial trials (UU, CU, D, CCV) acc. to DIN 18137-2
- ASTM
- BS

DESCRIPTION

Triaxial testing machines are systems for carrying out tests according to DIN 18137-2 (UU, CU, D, CCV) and can be flexibly combined from various components of Geomation GmbH. For normal voltage generation, testing machines from the ELS or HLS series are used (depending on the load range). For radial voltage generation (cell pressure) and pore pressure measurement, the PPD series pressure generators or the EPD2000 volume pressure controller are used as needed.

TECHNICAL DATA

load	: up to 400 kN
travel	: up to 300 mm
displ. meas.	: 0-60 mm, resolution 1 µm
sample dim.	: max. d=50 mm, h=150 mm
drive system	: electromechanical/hydraulic
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50Hz
dimensions	: depending on the configuration
mass	: depending on the configuration

ACCESSORIES

- tripod for EPD2000
- see accessories TCS50.ZU / TCS100.ZU
- see accessories ELS / HLS series

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Tester for determining the water permeability of soils



PERM-CH

CHARACTERISTICS

- control desk as a stand-alone housing with possibility for wall mounting
- for the construction of water permeation systems with constant filling height
- simple and free adjustment of the constant filling level or the potential difference Δh_w between the upper and lower water
- continuous supply of upper water from a storage tank with circulation pump

APPLICATION

Determination of the (water) permeability or the permeability coefficient k_f from permeable to highly permeable, non-cohesive soils (k_f about 10^{-2} .. 10^{-5} m / s, for example sand and gravel) according to DIN 18130-1 and ASTM D5084. Experimental arrangement: DIN18130-ZY-MS-MZ

DESCRIPTION

The control panel consists of a module for setting the constant pressure height / filling height between inlet and outlet (potential difference Δh_w between upper and lower water) and the module for indicating the resulting hydraulic resistance of the flowed through sample with the standpipe connections to the permeability cell. Not shown in the picture are the reservoir with the circulation pump and the permeability cell for non-binding samples.

TECHNICAL DATA

standpipe	
filling height	: 2 x $\varnothing 8$ x 1000 mm
standpipe hydr.	
resistance	: customer-specific
dimensions	: 800x360x1100 mm (WxHxD)
mass	: about 25 kg

ACCESSORIES

- permeability test cell for non-cohesive soils
- measuring cup for leaking water
- reservoir / water tank with pump

laboratory &
field devices

oedometer
cells

CBR uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Tester for determining the water permeability of soils



PERM-FH-10.6.A

CHARACTERISTICS

- control desk as a stand-alone housing with possibility for wall mounting
- for the construction of water permeation systems with constant filling height
- 3 independent prec. pressure regulators
- bypass between pore-water pressure 1 and pore-water pressure 2 possible
- pressure indicator via precision pressure gauge
- filling and emptying by means of needle valve (under pressure during experiment)

APPLICATION

Determination of the (water) permeability or the permeability coefficient of cohesive and nonbinding, saturated and unsaturated soils in triaxial cells and soil sample rings according to DIN 18130-1 and ASTM D5084. Experimental arrangement: DIN18130-TX-DE-ST

DESCRIPTION

Modular control panel consisting of a control module with up to 3 independent precision pressure regulators and a burette module for determining the inflowing and outflowing amount of water. The burette modules can be equipped with different measuring burettes: Low pressure measuring burettes up to 2.5 bar, measuring burettes up to 10 bar (with and without electronic level measurement) as well equipment combinations from the available measuring burettes.

TECHNICAL DATA

Adj. pressure available	: 0.0 to 1000 kPa
volumes	: 10, 50, 100, 200 ml
Compressed air demand	: external filter (pore size <40 µm)
connections	
(Air + water)	: quick-lock coupling NW5
dimensions	: 800x360x1100 mm (WxDxH)
mass	: about 30 kg

ACCESSORIES

- permeability test cells and triaxial test cells for cohesive and non-cohesive soils
- different burette modules
- laboratory compressor
- filter pressure regulator

laboratory & field devices

oedometer cells

CBR uniaxial & point load

shear testing

shear boxes

pressure & volume

triaxial testing

triaxial cells

data acquisition

transducers & sensors

software

accessories

Triaxial cell

TCS50



CHARACTERISTICS

- robust triaxial test cell (stainless steel)
- transparent cylinder with stainless steel strap
- for sample diameters up to 50 mm
- connections for cell pressure, upper and lower pore pressure system in the base
- connections for ventilation in the lid
- piston lock for external consolidation
- incl. dial gauge holder on the piston rod

APPLICATION

- Triaxial trials (UU, CU, D, CCV) acc. to DIN 18137-2
- ASTM
- BS

DESCRIPTION

The triaxial test cell TCS50 carry out various triaxial test types (UU, CU, D, CCV). Depending on the accessories, samples with a diameter of 50 mm or 38 mm can be tested. Because of the banded transparent cylinder, the sample can be easily observed at any time, thus providing the prerequisite for correctly interpreting the test results. The ports for the pore water pressure system and the cell pressure are equipped with ball valves and arranged so that this test cell can be integrated into very compact test presses.

TECHNICAL DATA

test pressure	: 2100 kN / m ² (21 bar)
sample dim.	: max. d=50 mm, h=125 mm
material	: stainless steel, acrylic glass
dimensions	: d=170mm, h=420mm
mass	: about 14 kg

ACCESSORIES

- adapter set TCS50.ZU
- head plates TCS.TP
- cutter cylinder TCS.AZ
- sample former TCS.ZPF
- latex membranes TCS.LH

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Triaxial cell

TCS100



CHARACTERISTICS

- robust triaxial test cell (stainless steel)
- transparent cylinder with stainl. st. strap
- for sample diameters up to 100 mm
- connections for cell pressure, upper and lower pore pressure system in the base
- connections for ventilation in the lid
- incl. dial gauge holder on the piston rod
- additional sensors can be integrated

APPLICATION

- triaxial trials (UU, CU, D, CCV) acc. to DIN 18137-2; ASTM; BS

Optional:

- temperature-dependent tests with temperature control system in base and top plate

DESCRIPTION

The triaxial test cell TCS100 serves to carry out various triaxial test types (UU, CU, D, CCV). Depending on the accessories, it can be used to test samples with a diameter of 38 - 100 mm. Because of the banded transparent cylinder, the sample can be easily observed at any time, thus providing the prerequisite for correctly interpreting the test results. The connections for the pore water pressure system and the cell pressure are equipped with ball valves. Due to the size of the cell, the integration of additional sensors (internal load transducer, temperature sensors, strain sensors) or temperature control systems is optionally possible.

TECHNICAL DATA

test pressure	: 2100 kN/m ² (21 bar)
sample dim.	: max. d=100 mm, h=250 mm
material	: stainless steel, acrylic glass
dimensions	: d=270 mm, h=570 mm
mass	: about 40 kg

ACCESSORIES

- adapter set TCS100.ZU
- head plates TCS.TP
- cutter cylinder TCS.AZ
- sample former TCS.ZPF
- temperature control system
- latex membranes TCS.LH

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Volume-compensated triaxial cell



TCS100VK

CHARACTERISTICS

- volume-compensated, robust triaxial test cell made of stainless steel
- transparent cylinder with stainless steel strap
- for sample diameters up to 100 mm
- connections for cell pressure, upper and lower pore pressure system in the base
- connections for ventilation in the lid
- incl. dial gauge holder on the piston rod
- additional sensors can be integrated

APPLICATION

- triaxial trials (UU, CU, D, CCV) acc. to DIN 18137-2; ASTM, BS

Optional:

- temperature-dependent tests with temperature control system in base and top plate

DESCRIPTION

The TCS100VK triaxial test cell is used to perform various triaxial test types (e.g. UU, CU, CD, CCV) to determine the shear strength and stress-strain behavior of soils. The test cell has a volume-compensated piston rod guide. By constructive measures, the volume change caused by the moving piston rod (change of σ_1) has no influence on the radial stress $\sigma_2/3$. All connections, e.g. for the pore pressure and cell pressure system, are equipped with ball valves. Due to the size of the cell, the integration of additional sensors (internal force sensor, temperature sensors, etc.) or temperature control systems is optionally possible.

TECHNICAL DATA

test pressure	: 2100 kN/m ² (21 bar)
sample dim.	: max. d=100 mm, h=250 mm
material	: stainless steel, acrylic glass
dimensions	: d=270 mm, h=650 mm
mass	: about 53 kg

ACCESSORIES

- adapter set TCS100.ZU
- head plates TCS.TP
- cutter cylinder TCS.AZ
- sample former TCS.ZPF
- temperature control system
- latex membranes TCS.LH

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Adapter set for triaxial cell TCS50



TCS50.ZU.38

Adapter set for testing 38 mm diameter triaxial specimens in a TCS50 triaxial cell. The set consists of:

- base (stainless steel)
- top plate (plastic)
- sphere for load guidance
- 2 x filter discs (stainless steel, sintered)
- 4 x O-rings (attachment of the latex case)



TCS50.ZU.50

Adapter set for testing 50 mm diameter triaxial specimens in a TCS50 triaxial cell. The set consists of:

- base (stainless steel)
- top plate (plastic)
- sphere for load guidance
- 2 x filter discs (stainless steel, sintered)
- 4 x O-rings (attachment of the latex case)

DESCRIPTION

This set is necessary for installation a sample in a TCS50 triaxial cell. The base is made of stainless steel. The head plate is made of plastic and contains a drainage system with tube connection, which is connected via a tube line with the bottom plate of the TCS50. The O-rings serve to seal the latex case that separates the cell pressure system and the pore pressure system.

TECHNICAL DATA

base	: stainless steel with drainage system
head plate	: plastic with tube connection
filter discs	: stainless steel (sintered)
O-rings	: plastic

ACCESSORIES

- filter paper
- latex membranes TCS.LH

Note:

Suitable for use in triaxial cell TCS50.

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Adapter set for triaxial cell TCS100



TCS100.ZU.70

Adapter set for testing 70 mm diameter triaxial specimens in a TCS100 triaxial cell. The set consists of:

- base (stainless steel)
- top plate (plastic)
- sphere for load guidance
- 2 x filter discs (stainless steel, sintered)
- 4 x O-rings (attachment of the latex case)



TCS100.ZU.100

Adapter set for testing 100 mm diameter triaxial specimens in a TCS100 triaxial cell. The set consists of:

- base (stainless steel)
- top plate (plastic)
- sphere for load guidance
- 2 x filter discs (stainless steel, sintered)
- 4 x O-rings (attachment of the latex case)

DESCRIPTION

This set is required to install a sample in a TCS100 triaxial cell properly. The base is made of stainless steel. The head plate is made of plastic and contains a drainage system with tube connection, which is connected via a tube connection to the bottom plate of the TCS100. The O-rings seal the latex case, which separate the cell pressure system and the pore pressure system.

TECHNICAL DATA

base	: stainless steel with drainage system
head plate	: plastic with tube connection
filter discs	: stainless steel (sintered)
O-rings	: plastic

ACCESSORIES

- filter paper
- latex membranes TCS.LH

Note:

Suitable for use in triaxial cell TCS100.

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Accessories



TCS.BP - SAMPLE BASE

The sample bases are used for the intake of the respective sample size in a triaxial test cell and have two independent drainage channels via which the pore water system at the bottom of the triaxial test cell is led to the outside. Available for the triax cell TCS50 and TCS100.

TECHNICAL DATA

material	: stainless steel
diameter	: 38mm, 50mm, 70mm, 100mm further on request
weight	: 250g



TCS.FD - FILTER DISCS

The sintered stainless steel filter discs are required for performing drained triaxial tests. Via the fine-pored / highly permeable sintered material, pore water is conducted into the drainage system or water is supplied at the sample saturation.

TECHNICAL DATA

material	: stainless steel (sintered)
diameter	: 38mm, 50mm, 70mm, 100mm further on request
weight	: 200g



TCS.TP.DU - TOP PLATES SET

Top plate without vertical guide for performing drained triaxial tests. The top plates have a drainage spiral at the bottom with a lateral tube connection. Depending on the size, the load is transferred via a sphere to load distribution plate. Available to suit the sets TCS100.ZU or TCS50.ZU.

TECHNICAL DATA

material	: plastic (top plate), stainless steel (load stamp)
diameter	: 38mm, 50mm, 70mm, 100mm further on request
weight	: 200g

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Accessories



TCS.TP.KD - TOP PLATES SET

Top plate with vertical guide for carrying out drained triaxial tests including guide punch. The top plates have a drainage spiral at the bottom with a lateral tube connection. Available to suit the sets TCS100.ZU or TCS50.ZU.

TECHNICAL DATA

material	: plastic (top plate), stainless steel (guiding stamp)
diameter	: 38mm, 50mm, 70mm, 100mm further on request
weight	: 250g



TCS.TP.UU - TOP PLATES SET

Top plate for performing unconsolidated and undrained triaxial tests including guide stamp. Available to suit the sets TCS100.ZU or TCS50.ZU.

TECHNICAL DATA

material	: plastic (top plate), stainless steel (guiding stamp)
diameter	: 38mm, 50mm, 70mm, 100mm further on request
weight	: 250g



TCS.TP.DU.2 - TOP PLATES

Unguided top plate with drainage and two drainage connections at the top. In this top plate type, the pore water drainage is designed as a double spiral for a better circulation of the drainage channels. Available to suit the sets TCS100.ZU or TCS50.ZU.

TECHNICAL DATA

material	: plastic
diameter	: 38mm, 50mm, 70mm, 100mm further on request
weight	: 200g

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Accessories



TCS.CR - BUSHING RING

Cable bushing ring for the pressure-proof installation of additional sensors in a triax cell TCS100 or directly on the sample. If necessary, the bushing ring is installed between the cell socket and cell jacket. Unused bushings are closed with sealing bolts.

TECHNICAL DATA

number of	
bushings	: maximum 9
diameter	
bushings	: Ø14.1 mm
material	: stainless steel

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Suction device for sample installation

TCS.IN



CHARACTERISTICS

- cylinder for sample installation
- tube connection for applying vacuum
- different sizes available

APPLICATION

- installation aid for inserting a cohesive sample in a latex cover
- for sample diameter:
100 mm, 70 mm, 50 mm, 38 mm

DESCRIPTION

This installation tool for cohesive samples is used for inserting cylindrical specimens (triaxial samples) into a suitable latex membrane. For this, the latex membrane is passed through the cylinder and wrapped around the top and bottom of the cylinder. The tube connection creates a vacuum that expands the latex membrane. The installation aid with attached latex membrane can thus be pulled over a sample. As soon as the vacuum stops, the latex membrane closely wraps around the sample.

TECHNICAL DATA

internal diam.	: ca. sample diameter plus 5 mm
height	: 2.0 or 2.5 x sample diameter
tube connection	: 6/4 mm
material	: galvanized steel

ACCESSORIES

- vacuum generator
- latex membranes TCS.LH
- tube and tube clamp

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Cutting tool

TCS.AZ



CHARACTERISTICS

- cutter cylinder for cohesive samples
- stainless steel
- different sizes available

APPLICATION

- cylinder for cutting out cohesive samples
- for sample diameter:
100 mm, 70 mm, 50 mm, 38 mm

DESCRIPTION

This TCS.AZ cutting cylinder is used to make cylindrical samples from existing cores or the like. It is suitable for cohesive samples and available in the sizes 100 mm, 70 mm, 50 mm and 38 mm. Other sizes are available on request.

TECHNICAL DATA

internal diam.	: sample diameter
height	: 2.0 or 2.5 x sample diameter; others on request
material	: stainless steel

ACCESSORIES

- hydraulic discharge devices

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Sample former

TCS.ZPF



CHARACTERISTICS

- two-part sample former for cohesionless / non-binding samples
- aluminium
- tube connection for vacuum
- various sizes available

APPLICATION

- preparation of samples for triaxial tests of cohesionless material
- as installation aid for triaxial cells of type TCS

DESCRIPTION

The TCS.ZPF sample former allows an easy installation of cohesionless samples into a TCS type triaxial cell. For this purpose, a latex membrane is attached to the sample base of the triax cell. The sample former is placed over the sample base of the cell and the latex membrane is pulled through the sample former and turned over at the top. A vacuum is applied via the hose connection. The sample can now be filled to the top of the sample former. After placing the upper filter stone and the top plate, the latex membrane is placed around the top plate and fixed with an O-ring. By loosening the clamping ring, the sample former can be disassembled in two parts from the sample.

TECHNICAL DATA

internal diam.	: sample diameter
height	: 2.0 or 2.5 x sample diameter
tube connection	: 6/4 mm
material	: aluminum

ACCESSORIES

- vacuum generator
- latex membranes TCS.LH
- tube and tube clamp

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Latex membranes

TCS.LH



CHARACTERISTICS

- durable latex membranes for different sample diameters
- length 250 mm or 300 mm
- thickness 0.5 mm
- cut smooth on both sides

APPLICATION

- accessories for triaxial tests (UU, CU, D, CCV) according to DIN 18137-2

DESCRIPTION

The durable latex membranes TCS.LH serve as a separation membrane between sample (pore water pressure system u) and cell pressure σ_2/σ_3 , when carrying out triaxial shear tests according to DIN 18137-2. They ensure a uniform load on the sample with the main stress and at the same time prevent the penetration of cell water into the soil sample. By default, latex membranes are available for sample diameters of $\varnothing 38$ mm, $\varnothing 50$ mm, $\varnothing 70$ mm and $\varnothing 100$ mm. Other sizes are available on request.

TECHNICAL DATA

diameter	: $\varnothing 38$ mm; $\varnothing 50$ mm; $\varnothing 70$ mm; $\varnothing 100$ mm (other sizes on request)
length	: 250 mm (for $\varnothing 38$ mm and $\varnothing 50$ mm) 300 mm (for $\varnothing 70$ mm and $\varnothing 100$ mm)
thickness	: 0.5 mm
material	: latex

ACCESSORIES

- no accessories necessary

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Data acquisition for digital transducers

DLS8.0



CHARACTERISTICS

- 8 Digimatic-inputs for connection of dial gauges with Digimatic protocol
- resolution 1 µm
- support of externally powered sensors
- serial interface for connection to PC
- ASCII protocol (optional)
- compact design
- data recording via PC (cycle time 1 s)

APPLICATION

- Upgrading of conventional test benches (oedometer, shear benches)

DESCRIPTION

The data acquisition system DLS8.0 allows the connection of 8 path sensors with digital interface (Digimatic protocol) on a PC or notebook, and is particularly suitable for the upgrading of conventional soil-mechanical test equipment, at which precise path detection is required (shear benches). Communication takes place via an RS232 interface (COM port), either by means of "geomation protocol" or open "ASCII protocol". Hence, the device can be easily integrated into existing applications and can create a customer-specific evaluation.

TECHNICAL DATA

input	: 8x Digimatic (10pol.)
interface	: COM-Port (serial, RS232)
supply	: ~230V / 50 Hz
dimensions	: 130 x 60 x 140 mm (BxHxT)
mass	: < 1 kg

ACCESSORIES

- Digital path transducers type DMU
12.5 mm, 25 mm, 60 mm

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Data acquisition for analog and digital transducers



DLS

CHARACTERISTICS

- customer-specific data acquisition system
- analog transducers (e.g. force, pressure)
- digital transducers (e.g. path, temperature)
- serial interface for connection of PC
- compact design
- data recording via PC (cycle time 1s)
- long-term data recording

APPLICATION

- upgrade of conventional test benches (oedometer, shear benches)
- extension of measuring and testing systems through additional transducers

DESCRIPTION

The data acquisition system DLS is modular and allows the connection of analog and digital sensors. Depending on the requirements, appropriate modules are integrated into this device to capture the desired sensor data. The data are processed and sent to a PC or laptop via an interface. With the appropriate software, the data can be stored in a database. Thus, triaxial systems, for example, can easily be extended with additional pressure, temperature, path or strain sensors.

TECHNICAL DATA

input	: analog, digital (customer-specific)
interface	: COM port (serial, RS232)
supply	: ~ 230V / 50 Hz
dimensions	: 250 x 110 x 330 mm (WxHxD)
mass	: about 1 kg

ACCESSORIES

- handles
- pressure transducers
- load transducers
- displacement transducers
- temperature transducers

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

load transducers



KAS - LOAD TRANSDUCER

The KAS series of load measuring clamps have an integrated amplifier and are used to measure static loads. The design as a "Z-measuring clamp" is available up to a measuring range of 50 kN.

TECHNICAL DATA

measuring range	: 1, 2, 5, 10, 15, 20, 25, 50 kN (others on request)
accuracy	: from 0.05% FS, standard: 0.2% FS
protection	: up to IP67
measuring signal	: ± 10 V DC
material	: stainless steel
thread	: M8, M12, M20, M25 (dep. on the meas. range)

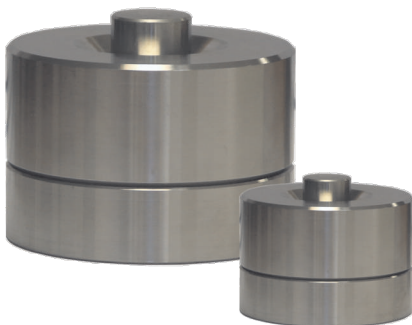


KAD - LOAD TRANSDUCER

The KAD series of load measurement clamps have an external amplifier (limit frequency up to 10 kHz) and are used to measure dynamic loads. The design as a "Z-measuring clamp" is available up to a measuring range of 50 kN.

TECHNICAL DATA

measuring range	: 1, 2, 5, 10, 15, 20, 25, 50 kN (others on request)
accuracy	: 0.2% FS
protection	: up to IP67
measuring signal	: ± 10 V DC
material	: stainless steel
thread	: M8, M12, M20, M25 (dep. on the meas. range)



KAH - LOAD TRANSDUCER HIGH LOAD RANGE

The KAH series of load measuring clamps has an internal amplifier and is used to measure static loads. This type is available up to a measurement range of 1.5 MN.

TECHNICAL DATA

measuring range	: 1 .. 1.5 MN
accuracy	: 0,1 .. 0,5% FS (dep. on the meas. range)
protection	: up to IP67
measuring signal	: ± 10 V DC
material	: stainless steel
thread	: M12, M24, M36, M45 (dep. on the meas. range)

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Digital dial gauges



DMU12,5/1000 - DIGITAL DIAL GAUGE

High-precision digital dial gauge for shear path and settlement measurements as well as general path and deformation measurements. The measured data can be processed by all GEOMATION testing devices.

TECHNICAL DATA

measuring range	: 12.5 mm
reading	: 1 µm
accuracy	: 0.003 mm
protocol	: digimatic
supply	: battery or optional external power supply
clamping shaft	: Ø 8 h6



DMU25/1000 - DIGITAL DIAL GAUGE

High-precision digital dial gauge for shear path and settlement measurements as well as general path and deformation measurements. The measured data can be processed by all GEOMATION testing devices.

TECHNICAL DATA

measuring range	: 12.5 mm
reading	: 1 µm
accuracy	: 0.003 mm
protocol	: digimatic
supply	: battery or optional external power supply
clamping shaft	: Ø 8 h6



DMU60/1000 - DIGITAL DIAL GAUGE

High-precision digital dial gauge for shear path and settlement measurements as well as general path and deformation measurements. The measured data can be processed by all GEOMATION testing devices.

TECHNICAL DATA

measuring range	: 60 mm
reading	: 1 µm or 0.5 µm (switchable)
accuracy	: 0.0025 mm
protocol	: digimatic
supply	: external power supply unit 230 V AC
clamping shaft	: Ø 8 h6

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Incremental transducer

IDS



CHARACTERISTICS

- incremental transducers up to 50 mm
- very high resolution (from 1 μm)
- very high accuracy
- high sampling rate
- digital output signal

APPLICATION

- shear and settlement measurement especially with high demands on the sampling rate (for example in dynamic processes)

DESCRIPTION

High-precision incremental transducer for shear path and settlement measurements. The advantage over digital gauges lies in the high sampling rate. The IDS is predestined for path measurement tasks that place a high demand on the sampling rate (measurement in dynamic or cyclic processes). The IDS can be connected to all devices with corresponding incremental input (eg ELD50 series) and does not require an external power supply.

TECHNICAL DATA

measuring range	: max. 50 mm
resolution	: from 5 μm
accuracy	: $\pm 1 \mu\text{m} / 50 \text{ mm}$
power supply	: internally

ACCESSORIES

- display and evaluation unit

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Settlement transducer for field testing

IDSA



CHARACTERISTICS

- transducers up to 1250 mm
- very high resolution
- very high accuracy
- analog or digital output signal

APPLICATION

- settlement measurement in the outdoor area (for example in column testing)
- settlement measurement especially for high demands on the sampling rate (for example in dynamic processes)

DESCRIPTION

High-precision path sensor for settlement measurements in harsh environments. Depending on the version, the sensor delivers an analog or digital output signal and offers the advantage of a high sampling rate over digital dial gauges. The IDSA is predestined for outdoor measurement tasks (for example in-situ testing of stabilization columns). The IDSA can be connected to all devices with corresponding incremental input and requires no external power supply. The sensor is preferably used in conjunction with devices of the MHD300 series.

TECHNICAL DATA

measuring range	: max. 1250 mm
output	: analog or digital
resolution	: analog or from 10 µm (digital sensor)
linearity	: from ±0.05% FS
power supply	: internally
temp. range	: -20 .. +85 °C
mass	: 550 g

ACCESSORIES

- display and evaluation unit

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Magnetic incremental transducer

MIS



CHARACTERISTICS

- Magnetic incremental length measuring system
- extremely high resolution
- very high accuracy
- very high measuring range (up to 3000 mm)
- absolute value transducer
- digital output signal

APPLICATION

- measurement of shear path and settlement
- detecting slow, uniform movements over a long distance

DESCRIPTION

The new transducer of the MIS series combine a wide measuring range (up to 3000 mm) with high precision (resolution up to 0.05 μm). They are particularly suitable for applications in which slow, uniform movements (for example 1 μm / min) are to be detected over a long distance. Its robust construction makes it easy to use in large-scale test facilities and outdoors. All transducers provide the path signals digitally. An appropriate evaluation unit can be used to extend existing systems.

TECHNICAL DATA

measuring range	: customer-specific, max. 3000 mm
resolution	: from 0.05 μm
accuracy	: from 4 μm
power supply	: internally

ACCESSORIES

- display and evaluation unit

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

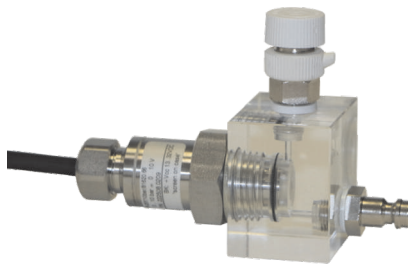
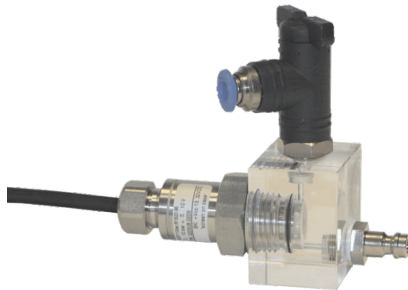
transducers
& sensors

software

accessories

Pressure transducer for cell and pore water pressure

DGxx



CHARACTERISTICS

- large measuring range (up to 16 bar)
- high linearity
- very low temperature error
- pre-calibrated
- ready for connection with quick-release coupling
- ventilation via hose connection (DGxx-HC) or needle valve (DGxx-NV)

APPLICATION

- pressure transducer for cell pressure or pore water pressure measurement on a triaxial cell
- measuring the pore water pressure in the oedometer trial

DESCRIPTION

The DGxx pressure sensors were designed for a connection to the standard testing machines of the series ELS, HLS, ELD and PLS, and are used to measure the cell and pore water pressure in triaxial tests or the pore water pressure in the oedometer trial. The pre-calibrated transducers are delivered ready for connection in the ventilation body. The ventilation takes place via a hose connection or a needle valve.

TECHNICAL DATA

measuring range	: 6, 10 and 16 bar
linearity	: 0.25% FS
signal	: 0 .. +10 V
mech. connection	: coupling plug NW5
housing material	: acrylic glass

ACCESSORIES

- ventilation screw with and without hose connection

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Frost-resistant pressure transducer

SPF



CHARACTERISTICS

- high pressure range (up to 10 bar)
- high linearity
- wide temperature range (-20°C to +40°C)
- electrical connection with free conductor ends or customized

APPLICATION

- frost-resistant pressure transducer for pore water and cell pressure measurement (eg directly below the sample in an oedometer cell)

DESCRIPTION

The pressure transducer of type SPF was specifically developed for the pore pressure measurement on freezing or frosted samples. Its sturdy membrane is designed so that forces created by freezing water will not damage the transducer and preserve the calibration curve. This allows the placement of the transducer exactly where the pore pressures are to be detected. A typical application is the use as a pore pressure transducer in oedometer cells, in which samples are (also) examined under freezing conditions.

TECHNICAL DATA

measuring range	: max. 10 bar (relative)
linearity	: 0.25% FS
signal	: 0 .. +10 V, 3-wire system
mech. connection	: G1/2", front-flush membrane, SW 27
elec. connection	: free conductor ends,
housing material	: customer-specific stainless steel

ACCESSORIES

- mounting base for oedometer cells to place the transducer below the sample

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Temperature transducer

STD125



CHARACTERISTICS

- digital temperature transducer
- wide temperature range
(- 50 ° C .. + 100 ° C)
- high resolution
- operation with data acquisition system
DLS possible

APPLICATION

- general temperature measurement
- temperature measurement directly on samples in the oedometer cell type OCF-X
- temperature measurement in triaxial cells in the sample socket and in the top plate

DESCRIPTION

The STD125 transducer is used in OCF-X type oedometer cells and TCS100 type triaxial cells for direct temperature measurement on the sample. Its digitized measurement data can be processed directly by the data acquisition system DLS and transmitted to the PC. The temperature transducer is cast in a housing made of high-performance plastic with low thermal conductivity. As a result, measuring influences that couple in via the housing are minimized. The measurement is carried out via a probe tip thermally coupled to the transducer, protruding from the housing.

TECHNICAL DATA

measuring range	: -50°C .. +100°C
resolution	: 9 .. 12 bits
interface	: suitable for data acquisition system DLS

ACCESSORIES

- mechanical installation adapter
- special top plate for triaxial cells with integrated temperature transducer

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

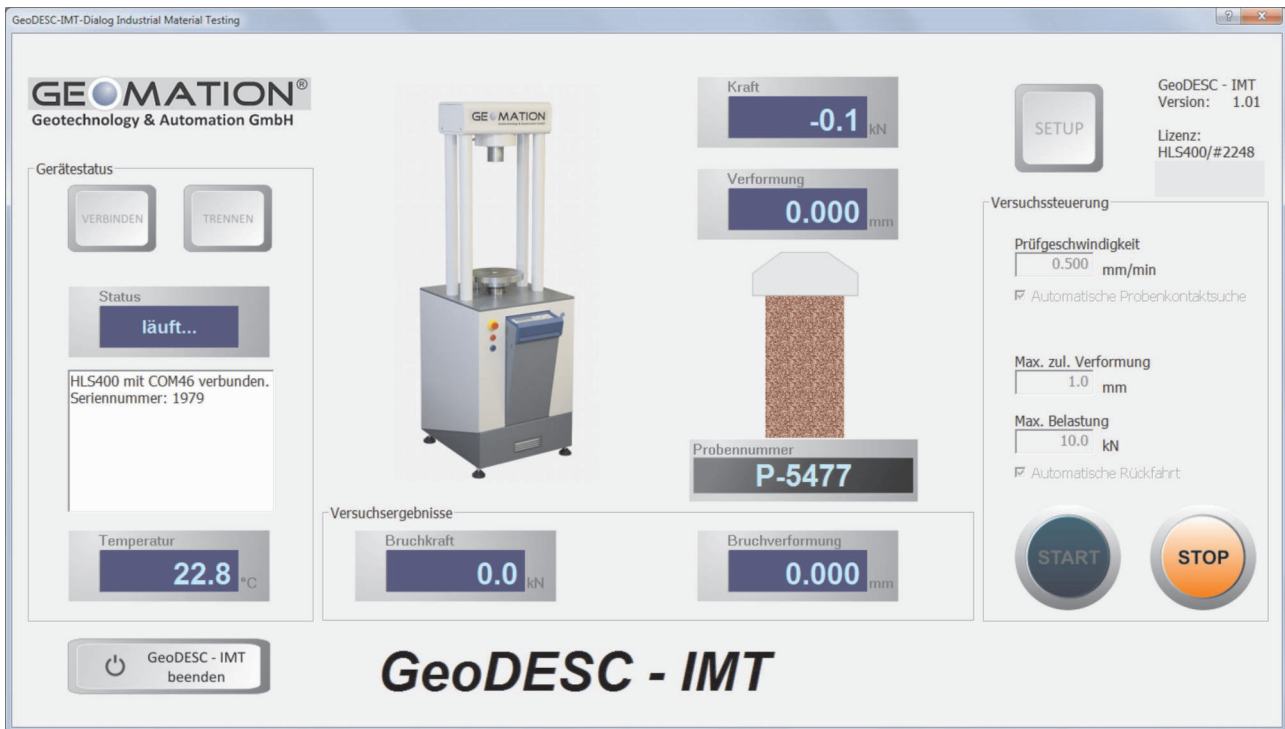
transducers
& sensors

software

accessories

Control software for testing machines and systems

GeoDESC-IMT



DESCRIPTION

The software GeoDESC-IMT is in use to control testing machines and is also suitable for the use in industrial environment, in which a high number of test cycles per time is required. All important parameters and system status are clearly shown on large displays. Predefinable test methods and parameters provide the user with a comfortable and time-optimized test procedure. All results can be exported fully automatically and can be made available to QM systems, databases or other applications. The input of the test item ID can optionally be done by keyboard or barcode scanner.

SYSTEM REQUIREMENTS

hardware	: PC / notebook, 4GB RAM, Free HDD capacity at least 1 GB
operating system	: Windows 7, Windows 10
interface	: at least 1 free COM port (RS232) Ethernet
language	: German, English Others on request

CHARACTERISTICS

- performing of material testing
- intuitive operation
- ASCII data export
- QM system connection
- suitable for panel PC with touchscreen

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

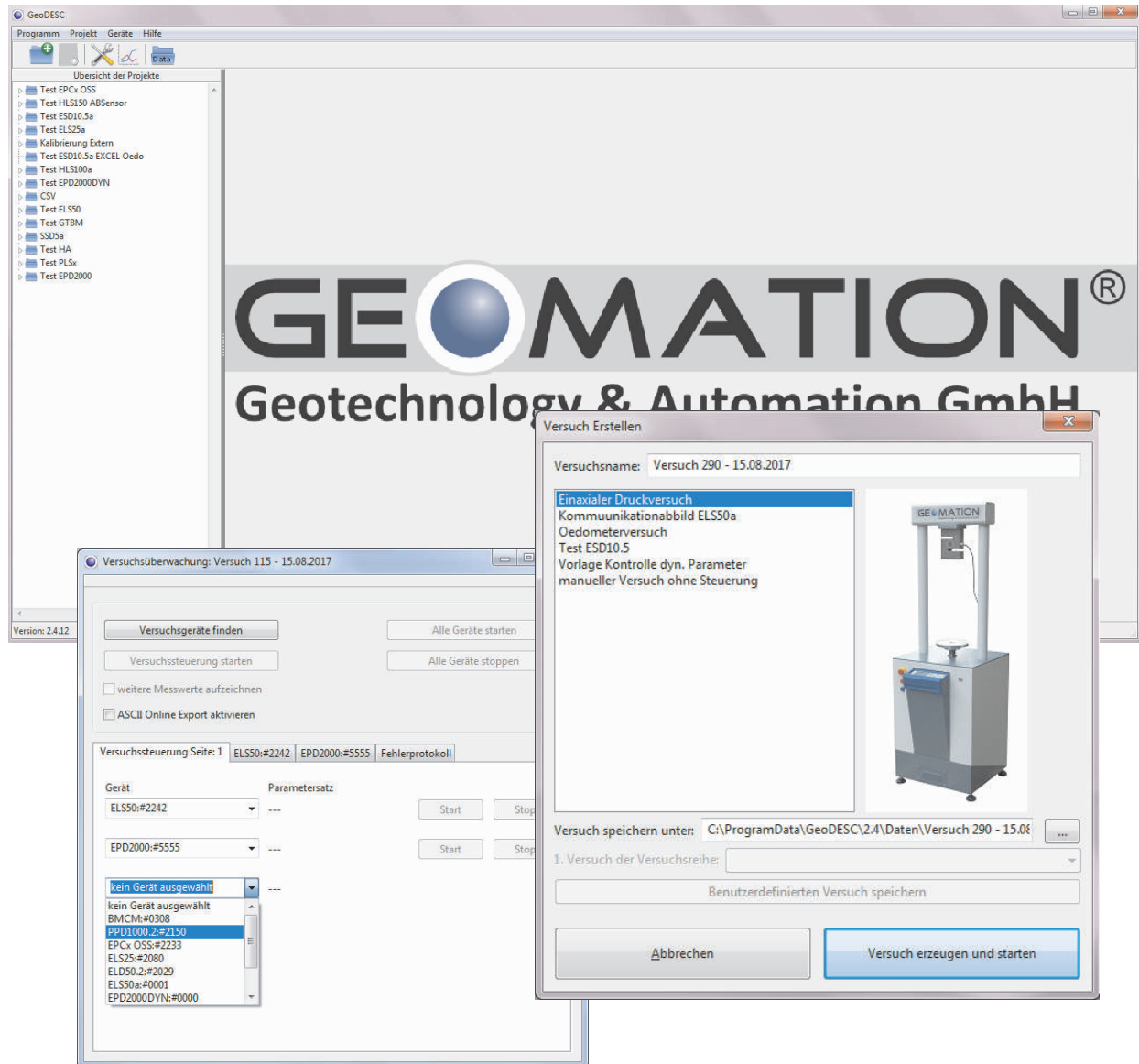
data
acquisition

transducers
& sensors

software

accessories

Control software for testing machines and systems



DESCRIPTION

The GeoDESC software is used to control test equipment and belongs to the scope of delivery of our standard product range. In addition to the classic functions like test controlling, GeoDESC offers new functions to make experiment design even easier. Experiment data can be displayed in real-time in the easy-to-use chart area. Additionally, GeoDESC features an import and export function for the conversion and archiving of your measurement data.

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

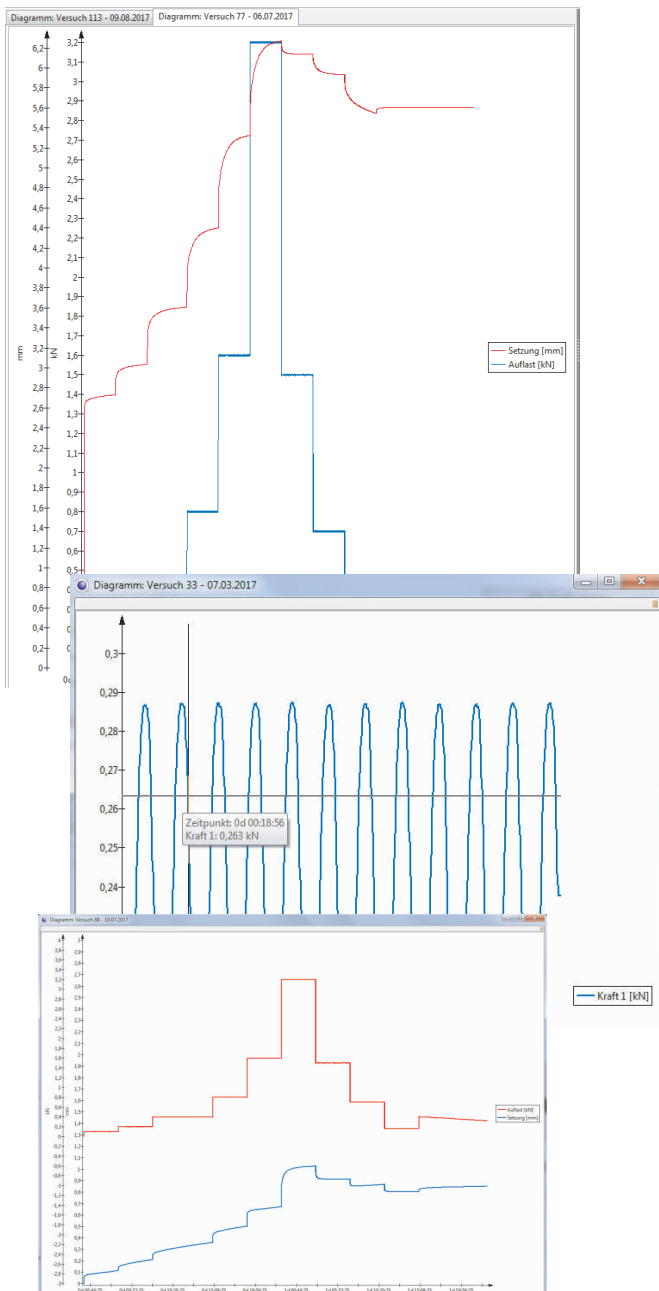
data
acquisition

transducers
& sensors

software

accessories

GeoDESC



SYSTEM REQUIREMENTS

hardware	: PC / notebook, 4GB RAM, Free HDD capacity at least 1 GB
operating system	: Windows 7, Windows 10
MS Office	: MS Office 2010 or 2013
interface	: at least 1 free COM port (RS232)
language	: German, English, Russian Others on request

CHARACTERISTICS

- controlling and data recording of several test instruments via a PC
- configurable test regimes
- integrated database
- data import/ export functions
- data export in ASCII/ CSV format
- drag & drop operation
- online interface to MS-Excel
- user friendly

APPLICATION

- controlling and data recording of test equipment from Geomation GmbH
- preconfigurable test controls for standardized test procedures
- freely programmable device control, data logging and online calculations through OLE interface to MS-Excel

ACCESSORIES

MS-Excel test control sheets according to DIN for:

- uniaxial compression test
- consolidation test
- CBR test
- direct shear tests
- triaxial tests and much more

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Excel template consolidation test



EXL.OEDO

CHARACTERISTICS

- EXCEL template for controlling compression devices via GeoDESC
- gathering and display of all device-specific measured values
- tabular evaluation
- calculation according to DIN EN ISO 17892-5 (form. DIN 18135); ASTM; BS
- automatic report

APPLICATION

- EXCEL test control for carrying out and evaluating consolidation tests

DESCRIPTION

The Excel template EXL.OEDO is a test control for carrying out consolidation tests and is used to control compression devices via the GeoDESC software. The template realizes the acquisition and display of all device-specific measured values as well as the tabular evaluation and calculation according to DIN EN ISO 17892-5 (formerly DIN 18135), ASTM and BS. Specific test parameters can be specified by the user. The creation of a test report is fully automatic.

SYSTEM REQUIREMENTS

hardware	: PC / notebook, 4GB RAM, Free HDD capacity at least 1 GB
operating system	: Windows 7, Windows 10
MS-Office	: MS Office 2010 or 2013
control software	: GeoDESC must be installed
language	: German, English, Russian Others languages on request

ACCESSORIES

- no accessories necessary

laboratory &
field devices

oedometer
cells

CBR uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

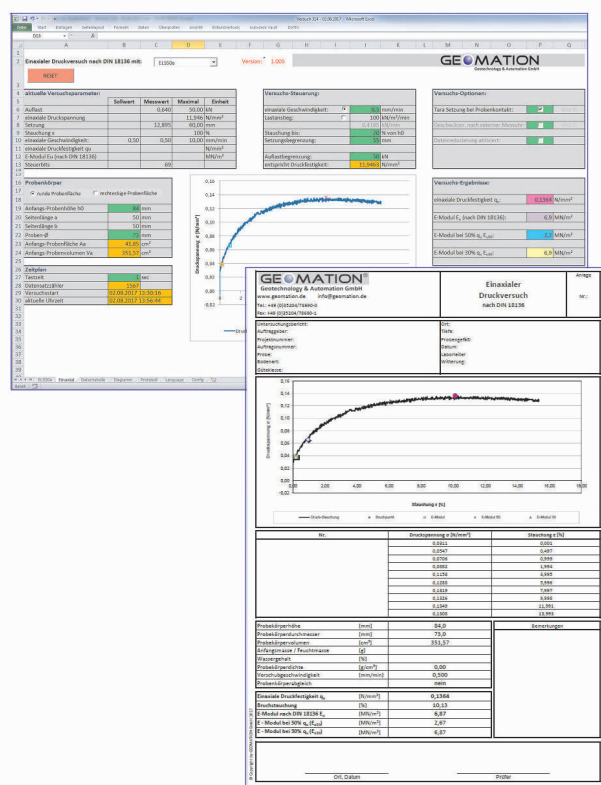
data
acquisition

transducers
& sensors

software

accessories

*Excel template uniaxial
compression test*



EXL.EINAX

CHARACTERISTICS

- EXCEL template for controlling test presses via GeoDESC
- gathering and display of all device-specific measured values
- tabular evaluation
- calculation according to DIN 18136; ASTM, BS
- automatic report

APPLICATION

- EXCEL test control for carrying out and evaluating uniaxial compression tests

DESCRIPTION

The Excel template EXL.EINAX is a test control for carrying out uniaxial compression tests and is used to control test machines via the GeoDESC software. The template realizes the acquisition and display of all device-specific measured values as well as the tabular evaluation and calculation according to DIN 18136, ASTM and BS. Specific test parameters can be specified by the user. The creation of a test report is fully automatic.

SYSTEM REQUIREMENTS

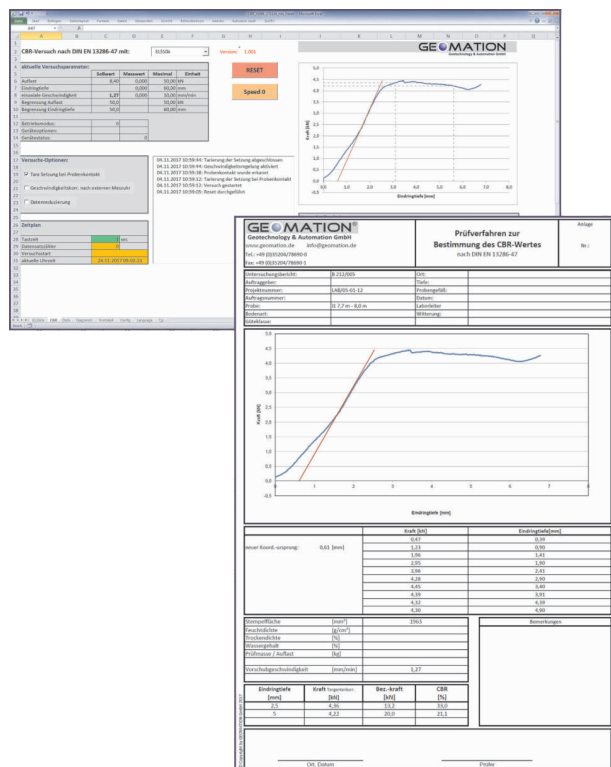
hardware	: PC / notebook, 4GB RAM, Free HDD capacity at least 1 GB
operating system	: Windows 7, Windows 10
MS-Office	: MS Office 2010 or 2013
control software	: GeoDESC must be installed
language	: German, English, Russian Others languages on request

ACCESSORIES

- no accessories necessary

Excel template CBR trial

EXL.CBR



CHARACTERISTICS

- EXCEL template for controlling test presses via GeoDESC
- gathering and display of all device-specific measured values
- tabular evaluation
- calculation according to DIN EN 13286-47 and TP Bf-StB Part 7.1; ASTM; BS
- automatic report

APPLICATION

- EXCEL test control for carrying out and evaluating CBR tests

DESCRIPTION

The Excel template EXL.CBR is a test control for carrying out CBR tests and is used to control test machines via the GeoDESC software. The template realizes the acquisition and display of all device-specific measured values as well as the tabular evaluation and calculation according to DIN EN 13286-47 and TP Bf-StB Part 7.1, ASTM and BS. Specific test parameters can be specified by the user. The creation of a test report is fully automatic.

SYSTEM REQUIREMENTS

hardware	: PC / notebook, 4GB RAM, Free HDD capacity at least 1 GB
operating system	: Windows 7, Windows 10
MS-Office	: MS Office 2010 or 2013
control software	: GeoDESC must be installed
language	: German, English, Russian Others languages on request

ACCESSORIES

- no accessories necessary

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

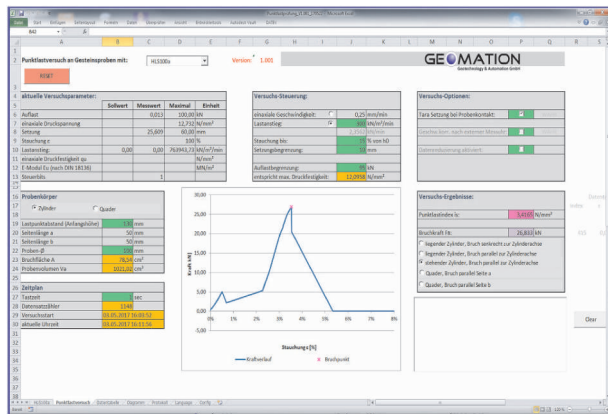
data
acquisition

transducers
& sensors

software

accessories

Excel template point load test



EXL.POINT

CHARACTERISTICS

- EXCEL template for controlling test presses via GeoDESC
- gathering and display of all device-specific measured values
- tabular evaluation
- calculation acc. to rec. no. 5 of working group AK3.3 of the DGGT; ASTM; BS
- automatic report

APPLICATION

- EXCEL test control for carrying out and evaluating point load tests

DESCRIPTION

The Excel template EXL.POINT is a test control for carrying out point load tests and is used to control test machines via the GeoDESC software. The template realizes the acquisition and display of all device-specific measured values as well as the tabular evaluation and calculation according to the recommendation no.5 of the work group AK3.3 "Rock Testing Technology" of the DGGT, ASTM and BS. Specific test parameters can be specified by the user. The creation of a test report is fully automatic.

SYSTEM REQUIREMENTS

hardware	: PC / notebook, 4GB RAM, Free HDD capacity at least 1 GB
operating system	: Windows 7, Windows 10
MS-Office	: MS Office 2010 or 2013
control software	: GeoDESC must be installed
language	: German, English, Russian Others languages on request

ACCESSORIES

- no accessories necessary

laboratory &
field devices

oedometer
cells

CBR uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Excel template frame shear trial



CHARACTERISTICS

- EXCEL template for controlling direct shear devices via GeoDESC
- gathering and display of all device-specific measured values
- tabular evaluation
- calculation according to DIN 18137-3; ASTM; BS
- automatic report

APPLICATION

- EXCEL test control for carrying out and evaluating direct shear tests

DESCRIPTION

The Excel template EXL.SHEAR is a test control for carrying out direct shear tests and is used to control direct shear devices via the GeoDESC software. The template realizes the acquisition and display of all device-specific measured values as well as the tabular evaluation and calculation according to DIN 18137-3, ASTM and BS. Specific test parameters can be specified by the user. The creation of a test report is fully automatic - after the recording of at least 3 sub-tests.

SYSTEM REQUIREMENTS

hardware	: PC / notebook, 4GB RAM, Free HDD capacity at least 1 GB
operating system	: Windows 7, Windows 10
MS-Office	: MS Office 2010 or 2013
control software	: GeoDESC must be installed
language	: German, English, Russian Others languages on request

ACCESSORIES

- no accessories necessary

laboratory &
field devices

oedometer
cells

CBR uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Excel template triaxial test



EXL.TRIAX

CHARACTERISTICS

- EXCEL template for controlling shear devices via GeoDESC
- gathering and display of all device-specific measured values
- tabular evaluation
- calculation according to DIN 18137-2; ASTM; BS
- automatic report

APPLICATION

- EXCEL test control for carrying out and evaluating triaxial pressure tests

DESCRIPTION

The Excel template EXL.TRIAX is a test control for carrying out triaxial tests and is used to control test machines via the GeoDESC software. The template realizes the acquisition and display of all device-specific measured values as well as the tabular evaluation and calculation according to DIN 18137-2, ASTM and BS. Specific test parameters can be specified by the user. The creation of a test report is fully automatic - after the recording of at least 3 sub-tests.

SYSTEM REQUIREMENTS

hardware	: PC / notebook, 4GB RAM, Free HDD capacity at least 1 GB
operating system	: Windows 7, Windows 10
MS-Office	: MS Office 2010 or 2013
control software	: GeoDESC must be installed
language	: German, English, Russian Others languages on request

ACCESSORIES

- no accessories necessary

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Excel template vane shear tests

EXL.EVT



CHARACTERISTICS

- EXCEL template for controlling field vane tester via GeoDESC
- gathering and display of all device-specific measured values
- tabular evaluation
- calculation according to DIN 4094-4
- automatic report

APPLICATION

- EXCEL test control for carrying out and evaluating vane shear tests

DESCRIPTION

The Excel template EXL.EVT is a test control for carrying out vane shear tests and is used to control field vane tester via the Software GeoDESC. The template realizes the acquisition and display of all device-specific measured values as well as the tabular evaluation and calculation according to DIN 4094-4. Specific test parameters such as blade geometry and shear rate can be specified by the user. The creation of a test report is fully automatic.

SYSTEM REQUIREMENTS

hardware	: PC / notebook, 4GB RAM, Free HDD capacity at least 1 GB
operating system	: Windows 7, Windows 10
MS-Office	: MS Office 2010 or 2013
control software	: GeoDESC must be installed
language	: German, English, Russian Others languages on request

ACCESSORIES

- no accessories necessary

Laboratory compressor

Compressor



CHARACTERISTICS

- oil-lubricated compressor
- very quiet
- suitable for laboratory use
- output pressure adjustable
- compact design
- integrated heat-protection

APPLICATION

- provision of pressure-loss supply for pneumatic testers of the PLS and ESD series and burettes of the type PPD.A and PPD.M.

DESCRIPTION

The laboratory compressor is available as an accessory for pneumatic test equipment of the PLS, ESD and PPD series. Due to its low noise (quiet as a whisper), the compressor is ideally suited for laboratory use. By default, our compensators are equipped with quick-release couplings NW5.

TECHNICAL DATA

output pressure	: max. 8 bar (adjustable)
volume	: 15 l
flow capacity	: 37 l / min at 8 bar
medium	: filtered air
connections	: quick-release coupling NW5
sound emission	: 45 db (A) / m
supply	: ~ 230V / 50Hz
dimensions	: 380 x 550 x 380 mm (WxHxD)
mass	: about 30 kg

ACCESSORIES

- piping material
- quick-release couplings NW5
- filter pressure regulator

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Accessories



FDRx - FILTER PRESSURE REGULATOR

The filter pressure regulators of the FDR series are reversible pressure regulators (with secondary ventilation) with condensate separator. Equipped with additional filtering by the centrifugal principle and sintered filter. The condensate discharge of the regulator works semi-automatically: as soon as the inlet pressure drops below the min. inlet pressure, the drain valve opens automatically. Tightening the drain plug can prevent the opening of the semi-automatic drain valve.

TECHNICAL DATA

inlet pressure	: up to 16 bar
control range	: 0.2 .. 6 bar (FDR6; 0.2 .. 10 bar (FDR10)
pore-wide filter	: <40 µm
air consumption	: without
condensate container	: polycarbonate
condensate discharge	: semiautomatic
media	: compressed air, neutral gases



VAC - VACUUM GENERATOR

The single-stage inline vacuum generator is suitable for providing a vacuum for the sample installation tools of a triaxial installation. The compact element works according to the ejector principle and can be easily placed in a compressed air line through the quick plug connections.

TECHNICAL DATA

max. vacuum	: -85 kPa
max. inlet pressure	: 450 kPa
air consumption	: 19 l/min
tube connection	: Ø6 mm
dimensions	: Ø13 mm; length 66 mm

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

control PC



PC

CHARACTERISTICS

- control PC for PC-based experiments
- system prepared and checked for testing
- GeoDESC control software preinstalled and configured

APPLICATION

- carrying out PC-supported laboratory tests with the control software GeoDESC

DESCRIPTION

PC-system configured according to customer requirements and prepared for laboratory use. This service includes the installation of the operating system as well as the associated service packs and security updates, driver download and installation. Furthermore, we carry out the installation of GeoDESC, and parameterize and test the control software with your application (laboratory device).

TECHNICAL DATA

hardware	: customer-specific; minimum requirement for GeoDESC
operating system	: Windows 7, Windows 8 on request
MS-Office	: MS Office 2010 or 2013

ACCESSORIES

- keyboard and mouse
- display device (monitor)
- interface card
- software (GeoDESC, Excel templates)

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Protocol translator

GPC



CHARACTERISTICS

- Translation of communication protocols to a format that can be processed by the GeoDESC software

APPLICATION

- Connection of devices (also from other manufacturers) to the control and evaluation software GeoDESC

DESCRIPTION

The device enables the implementation of a device-specific interface protocol (e.g. from test equipment of other manufacturers) to the communication protocol required by the PC software GeoDESC. Thus, "old devices" can be integrated into the current laboratory software GeoDESC of the GEOMATION GmbH. The protocol converter is installed between PC and testing machine instead of the RS232 connection cable.

TECHNICAL DATA

function display	: 4-fold LED
connections	: 2 x RS232 Sub-D 9pol.
supply	: ~ 230 V / 50 Hz (ext. power supply)
dimensions	: 50 x 20 x 35 mm (WxHxD)

ACCESSORIES

- no accessories necessary

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Equipment tripod

GSVx



CHARACTERISTICS

- mobile tripod for holding EPD2000 series volume pressure controllers
- holds up to 4 pressure generator
- casters with brakes
- stable execution

APPLICATION

- comfortable hanging of EPD2000 series volume pressure controllers (wall mounting not required)
- easy positioning due to mobile tripod and thus flexible handling of the pressure generator in the laboratory

DESCRIPTION

The mobile tripod holds up to 4 volume pressure controllers of the EPD2000 series. The stable design of the statives ensures a secure state of the system and allows great flexibility in the use of the pressure controllers (no wall mounting).

TECHNICAL DATA

material	: castors (plastic)
	frame (aluminum)
design	: 1s and 4s
dimensions	: from 440 x 440 x 2200 mm (WxDxH)
mass	: about 5 kg (1s); about 10 kg (4s)

ACCESSORIES

- no accessories needed

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Accessories path sensors

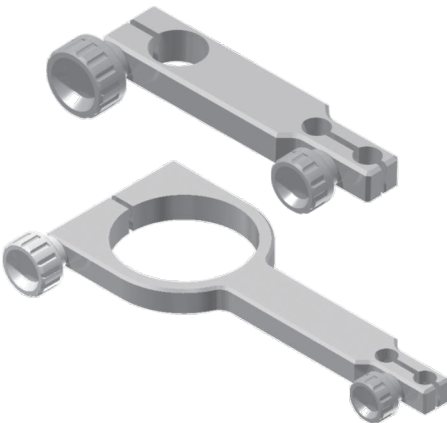


MMS250 - MAGNETIC STAND

Mechanical magnetic stand with mechanical center clamp for the intake of DMU and IDS path sensors. The magnet stand consists of a magnetic base with a rotary switch and three joints that can steplessly be clamped with a rotary handle.

TECHNICAL DATA

length of articulated arm	: 223 mm
clamping shaft	: M8
adhesive force	: 1300 N
max. load	: 20 kg
dim. magn. base	: 60 x 50 x 55 mm (LxWxH)

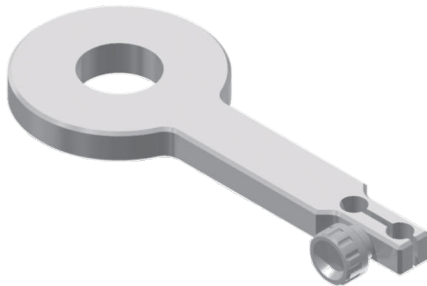


MHSS - DIAL GAUGE HOLDER

Dial gauge holder with clamping shaft for the intake of DMU and IDS path sensors. The dial gauge holder is available in different diameters and lengths.

TECHNICAL DATA

clamping shaft	
device side	: Ø16 mm, Ø20 mm, Ø30 mm, Ø40 mm, Ø80 mm
length	: 60 .. 110 mm
clamping shaft	
path sensor	: Ø 8 h6
material	: aluminium



MHZK - DIAL GAUGE HOLDER

Dial gauge holder with intermediate clamping for the intake of DMU and IDS path sensors. The dial gauge holder is available in different diameters and lengths.

TECHNICAL DATA

diameter	
intake	: Ø12.5 mm, Ø24.5 mm
length	: 92 .. 180 mm
clamping shaft	
path sensor	: Ø 8 h6
material	: aluminium

laboratory &
field devices

odometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

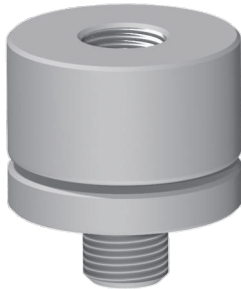
data
acquisition

transducers
& sensors

software

accessories

Accessories

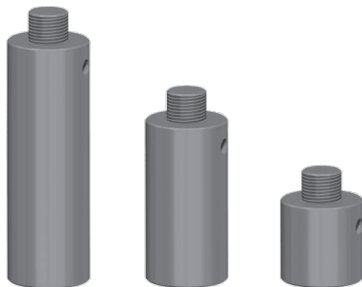


SCRAP.M24 - SPHERICAL SEAT

The SCRAP.M24 spherical seat is used as an accessory for the ELS50 test machine and HLS series hydraulic test machines. The calotte allows for the tiltable assembly of the upper thrust plate on the load transducer.

TECHNICAL DATA

diameter	: Ø60 mm
effective length	: 45 mm
swivel range	: about 4°
thread	: M24 x 2
material	: Q&T steel (gas nitrided)

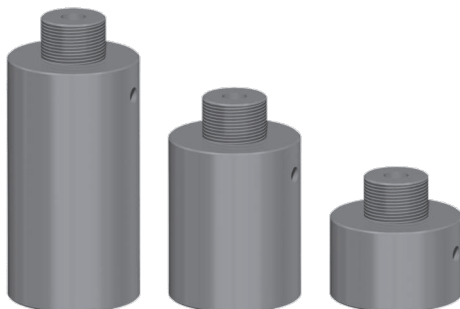


PRA50 - SAMPLE COMPARTMENT ADAPTER

The sample compartment adapters of the PRA50 series serve as accessories for the test machine ELS50. They reduce the sample compartment for smaller specimens and are available in different lengths.

TECHNICAL DATA

diameter	: Ø50 mm
effective length	: 50 mm, 100 mm, 150 mm
thread	: M24 x 2
material	: galvanized steel



PRA80 - SAMPLE COMPARTMENT ADAPTER

The sample compartment adapters of the PRA80 series serve as accessories for the hydraulic test machines of the HLS series. They reduce the sample compartment for smaller specimens and are available in different lengths.

TECHNICAL DATA

diameter	: Ø80 mm
effective length	: 50 mm, 100 mm, 150 mm
thread	: M39 x 2
material	: galvanized steel

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

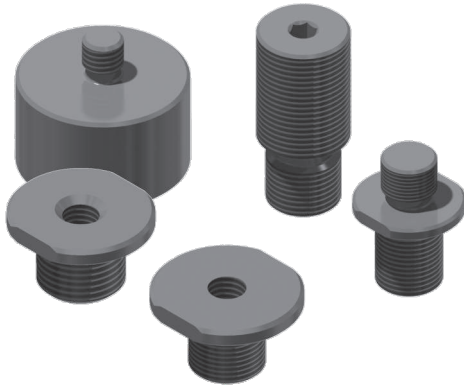
data
acquisition

transducers
& sensors

software

accessories

Accessories



GA- THREAD ADAPTERS

The thread adapters of the GA series are used for the assembly of various components and transducers. The adapters can be used individually and adapted to the requirements of the respective test task.

TECHNICAL DATA

primary thread	: M8, M12, M20, M24, M30, M39, M45
secondary thread	: M8, M12, M20, M24, M30, M39, M45
type primary thread	: internal thread or external thread
type secondary thread	: internal thread or external thread
material	: galvanized steel, stainless steel



DSx - LOAD STAMP

The load stamps of the DSx series are used as a load guidance component. All load stamps are compatible with the recordings of the Geomation test equipment.

TECHNICAL DATA

type	: straight
diameter	: Ø16 mm, Ø30 mm, Ø40 mm, Ø50 mm, Ø80 mm
length	: 40 .. 110 mm
material	: galvanized steel

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

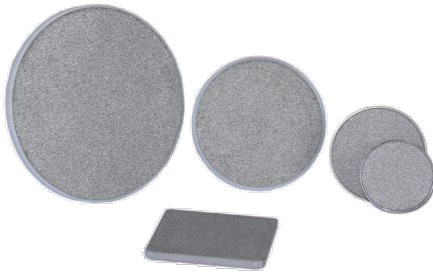
data
acquisition

transducers
& sensors

software

accessories

Accessories



FDX - FILTER DISCS

The sintered stainless steel filter discs are required to perform soil mechanics studies. Through the fine-pored / highly permeable sintered material, pore water is conducted into the drainage system and water is supplied at the sample saturation.

TECHNICAL DATA

material	: stainless steel (sintered)
dimensions	: Ø38 mm; Ø50 mm; Ø70 mm; Ø100 mm □ 60x60 mm; □ 100x100 mm others on request
weight	: 200 g



FPX - FILTER PAPER

Highly purified filter paper for qualitative analysis. The filter paper is used as an accessory in the execution of soil mechanical investigations and is available in different diameters.

TECHNICAL DATA

diameter	: Ø40.5 mm; Ø55 mm; Ø70 mm; Ø110 mm
material	: papier
packaging	
size	: 100 piece per PU

laboratory &
field devices

oedometer
cells

CBR, uniaxial
& point load

shear
testing

shear
boxes

pressure &
volume

triaxial
testing

triaxial
cells

data
acquisition

transducers
& sensors

software

accessories

Geomation GmbH

... testing technology from a single source

- soil mechanical testing systems
- static test machines
- dynamic testing machines
- shear apparatus
- extensive accessories
- control and evaluation software
- and much more ...

GEOMATION®

Geomation GmbH
Heinrich-Heine-Straße 16
D - 01723 Wilsdruff
Tel.: +49 (0)35204 78690 0
Fax: +49 (0)35204 78690 1

info@geomation.de
www.geomation.de

 **infraTest®**
TESTING SYSTEMS

infraTest Prüftechnik GmbH
Wiesenbachstraße 15
D - 74336 Brackenheim-Botenheim
Tel.: +49 (0)7135 9500 0
Fax: +49 (0)7135 9500 20

info@infraTest.net
www.infraTest.net