Aimil Ltd.

Instrumentation & Technologies

Soil

Testing Equipment

Automatic Free Fall Hammer

For improving the efficiency and accuracy of penetration tests SPT and DCPT, the Automatic Free Fall Hammer has been developed by the Central Building Research Institute, Roorkee and licensed to Aimil for commercial production. It is designed to deliver equal impact energy in each blow while performing Standard Penetration Test. This is achieved by providing a trigger mechanism to standardise the height of fall and a suitable guide system for maintaining verticality of guide rod and drill rod assembly. The guide system also maintains their alignment throughout the duration of the test. The system is compact and easy to use, provides maximum safety for the operator.

AIM 025

The equipment consist of the following replaceable parts :

AIM 02501	Anvil
AIM 02502	Front Wheel
AIM 02503	Hammer Guide Assembly
AIM 02504	Fall Hammer attached to a flexible rope and drum, operated manually.
AIM 02505	Base Assembly for the hammer system with suitable wheels for moving about when attached to a vehicle.
AIM 016	Split Spoon Sampler
AIM 022	Tripod with Pulley and built-in Ladder
AIM 02402	'A' Drill Rod, 1.0 m long, with adapter 15 Nos.

Ordering Information :

AIM 025 Automatic Free Fall Hammer

Optional Accessories :

AIM 017	Split Spoon Sampler, with Brass liner
AIM 13401	Dynamic Cone plain, 50 mm dia base and cone angle of 60°.
AIM 13402	Cone Adapter with standard threads.
AIM 13403	Dynamic Cone threaded for Type 'A' Rod Coupling.

Sample Preparation

The sample extractors shown in this section meet the requirements of IS, BS, ASTM and AASHTO standards. Soil core specimens can be extracted from sampling tubes with minimum disturbance. Specimens of smaller diameter can also be extracted from larger size samples.

Hand operated Extractor

Hand operated Extractor, for 38 mm dia specimens for extracting soil core specimens of 38 mm dia from sampling tube or from larger size samplers. It can be used in the field also, for taking out samples.

The equipment consist of the following replaceable parts :

AIM 03101	**Sample Extractor Frame** Screw Type with a Wire Sample Trimmer
AIM 03102	**Jarring Link** for driving the Sampling Tube
AIM 03103	**Adapter with locking screw** for fitting the 38 mm dia Sampling Tube to Jarring Link

AIM 03105 **Split Mould**
38 mm dia x 76 mm long, provided with Quick Release Clamps. It can be fitted to AIM 03101 Sample Extractor

AIM 006 **Sampling Tube**
Unrelieved, 38 mm dia x 200 mm long 1 No.

AIM 031

Ordering Information :

AIM 031 Hand Operated Extractor for 38mm dia specimen

AIM 031-S1 Hand Operated Extractor for 38mm dia & 50mm dia specimen

Sampleject-5000

This Extractor has been specially designed to overcome the difficulties faced in extracting specimens from longer sampling tubes.

Salient Features :

- High efficiency hydraulic pump.
- Power pack with quick release couplings.
- Manual operation possible on power failure.
- Ejects soil from sampling tubes and moulds upto 60 cm in length and 38 to 150 mm in diameter by a single operation
- Allows direct transfer of soil from field sampling tubes, Proctor and CBR moulds into 38 mm diameter tubes with minimal disturbance.
- 60 cm piston stroke.
- 50kN pushing force.
- Electrical-cum-hand operated or only hand operated hydraulic system.
- Built-in safety valve to prevent loading beyond 50kN.
- Portable, with facility for floor mounting.
- Lever for selecting up/down movement of piston.
- Top-plate for holding upto 6 sampling tubes of 38 mm dia.

Suitable for operation on 220 V, 50 Hz, single phase, AC supply.

The equipment consist of the following replaceable parts :

AIM 033-101 **Adapter rings/Disk kit** - Adapter rings and ejector discs for 38, 50, 75, 100 & 150 mm dia sampling tubes or moulds, included.

AIM 006 **Sampling Tube,** Unrelieved, 38 mm dia x 200 mm long 3 Pair

AIM 033-1

Ordering Information :

AIM 033-1 Sampleject-5000

Optional Accessories :

AIM 03311 Sampling tube 50mm dia x 200mm long
AIM 03312 Sampling tube 75mm dia x 200mm long
AIM 03313 Sampling tube 100mm dia x 250mm long
AIM 03315 Adaptor Ring for 50mm dia Sampling tube
AIM 03316 Adaptor Ring for 75mm dia Sampling tube
AIM 03317 Adaptor Ring for 100mm dia Sampling tube

Moisture Content

Moisture content of soil is generally measured as a ratio of the weight of water to the weight of solids, expressed as a percentage. As soil behaviour depends on its moisture content, it is one of the basic parameters defining the soil condition.

To a quality control engineer, even a rapid moisture content check is extremely useful, as it gives an indication of the existing characteristics of the soil, which enables him to some extent to decide the pattern of test programme.

A number of procedures have been suggested for carrying out water content tests in IS : 2720 (Part 2); BS : 1377, 1924 and ASTM D2216. The equipment listed below gives a range of suitable apparatus for this purpose.

Speedy Moisture Meter

Ref. Standards: IS:2720 (Part 2), IS:12175

Using a speedy moisture meter, the moisture content of soil, sand and other fine grained material can be obtained quickly with reasonable accuracy. The test technique is based on the fact that water will react with calcium carbide to form acetylene gas and the quantity of gas formed is directly proportional to the water present, leaving a surplus of the chemical used in the test.

The quantity of acetylene gas produced is indicated on a built-in pressure gauge which is calibrated in percentage of moisture on wet weight basis. A conversion formula gives the corresponding moisture content based on dry weight.

The equipment consist of the following replaceable parts :

AIM 03601	Calcium Carbide Reagent	1 No.
AIM 03602	Moisture gauge, 0-25 % × 0.5%	1 No.
or		
AIM 03701	Moisture gauge, 0-50 % × 1%	1 No.
AIM 03603	Digital Balance, 50g	1 No.
AIM 03612	Steel Balls	1 Set
AIM 03611	Scoop	1 No.
AIM 03605	Cleaning Brush	1 No.
AIM 03606	Aluminum Dish	1 No.

AIM 036-1

Ordering Information :

AIM 036-1	Speedy Moisture Meter:		
	Range	:	0 - 25%
	Gauge Division	:	0.5%
AIM 037-1	Speedy Moisture Meter:		
	Range	:	0 - 50%
	Gauge Division	:	1%

Infra-Red Moisture Meter

Ref. Standard: IS:2720 (Part 2)

This moisture meter has been designed for rapid and accurate determination of the moisture content of a wide variety of materials.

It is torsion wire instruments, the torque being applied to one end of the wire be means of a calibrated drum to balance the loss of weight as the test sample dries under infrared radiation. The speed of drying (about 30 min) thus obtained, combined with the frictionless balancing system gives the result as accurate as those obtained by standard oven drying method. Since drying weighing are simultaneous, it is useful specially for determination of moisture in substances that quickly reabsorbs moisture after drying. The infrared radiation is controlled by a voltage regulator and thereby provided excellent heat control. The instrument is provided with an indicator lamp, which glows when the unit is switched on.

The torsion balance has a built-in magnetic damper or reduce pan vibrations that enables quick weighing. The balance scale (drum) is divided in terms of moisture percentage on wet weight basis, which are read directly from it. Graduations are from 0 to 100% in 0.2 % divisions, but readings may be estimated to 0.1% moisture content.

Suitable for operation on 220 V, 50 Hz, Single phase, AC Supply.

Capacity	:	5g approx.
Sensitivity	:	10mg approx.
Range	:	0 to 100% moisture content on wet weight basis.
Reading accuracy	:	± 0.20%
Probable error	:	± 0.25% in the lower range upto compared to 25% and ± 1% for moisture contents
Oven methods	:	above 50%

The equipment consist of the following replaceable parts :

AIM 03801	Infra Red Lamp
AIM 03802	Thermometer (L-shaped)
AIM 03803	Torsion Wire

AIM 038

Ordering Information :

AIM 038 Infra-Red Moisture Meter

Liquid Limit

The liquid limit defined as the moisture content at which the soil passes from plastic state to liquid state, is very helpful for the classification of the potential properties of the soil material. The liquid limit gives a measure of the shearing resistance which a soil has, when mixed with water. The liquid limit of soil can be determined by Casagrande Method or Cone Penetrometer Method.

Casagrande Method

Ref. Standards: IS:2720 (Part 5), IS:9259, BS 1377

Mechanical method known as the Casagrande Method has been a standardised test in Soil Mechanics for many years.

- High quality of design ensures consistency of results
- Satisfies International Standards
- Motorised model with integral blow counter is also available

The Liquid Limit Device consists of a hard rubber base carrying a sliding carriage assembly to which a brass cup is hinged. The cup is raised and allowed to fall through a height of 1 cm on to the hard rubber base, with the help of a lead screw provided at the back of the sliding carriage. Supplied complete with Casagrande Grooving Tool and Gauge Block (Type A of IS : 9259).

Suitable for operation on 220 V, 50 Hz, single phase, AC supply.

AIM 040

AIM 041

Ordering Information :

AIM 040 Liquid Limit Device, motorised

AIM 041 Liquid Limit Device with Counter manually operated

Optional Accessories :

AIM 04102 ASTM Grooving Tool (Type B of IS : 9259)

Note: As per BS/ASTM is also available.

Plastic Limit

The plastic limit test is done to determine plastic limit of soil, as per IS : 2720 (Part V) 1985. The plastic limit of soil is the water content of the soil below which it ceases to be a plastic. It begins to crumble when rolled into threads of 3mm dia.

Ordering Information :

AIM 9831-1 Plastic limit set comprising of glass plate, Brass Rod, Spatula, Moisture Tin & Porcelian Dish.

Note : Balance with 0.1g accuracy, Oven ($110^{\circ}C \pm 5^{\circ}C$) & Sieves can also be supplied, on request as optional extra.

Cone Penetrometer

Cone Penetrometer Method

Ref. Standards IS:2720 (Part 5) BS 1377

Cone Penetrometer method has several advantages over the Casagrande method. It is easier to perform this test and the results are not so dependent on the design of the apparatus or the judgement of the operator. It is applicable to a wider range of soils. The test is based on the relationship between moisture content and the penetration of the cone into the soil sample. The moisture content at a given depth of penetration of the cone is taken as the liquid limit.

As an inferential test, empirical correlations have been developed to assess the shear strength of soils at liquid limit.

- Reduces operator error
- Applicable to a wide range of soils
- Gives reproducible test results
- Provides direct measurement of penetration

Soil Cone Penetrometer

Enables the determination of liquid limit simply and quickly. The unit is supplied complete with a stainless steel penetration test cone 35 mm long with smooth polished surface with an angle of 30°. Facility exists for adjusting cone height in relation to the specimen.

Suitable for operation on 220 V, 50 Hz, Single Phase, AC supply.

The equipment consist of the following replaceable parts :

AIM 04201	Penetration Test Cone
AIM 04202	Penetration Test Cup 55 mm dia x40 mm deep

AIM 042-2

Ordering Information :

AIM 042-2 Soil Cone Penetrometer, Digital Type

Note : For Universal Penetrometer refer page no-G4 of Asphalt Section.

Shrinkage Limit

Shrinkage Limit Method :

Ref. Standards IS : 2720 (Part 6), 10077, ASTM : D 427, BS : 1377, AASHTO T-92

The Shrinkage Limit of a soil is defined as the moisture content after which any further reduction of moisture does not cause volume reduction. The shrinkage of clayey soil can be very significant. A fully saturated soil specimen is allowed to dry in free air and its volume is measured repeatedly by immersing in a mercury bath. From the data obtained from this test, Shrinkage Limit, Shrinkage Ratio, Shrinkage Index and Volumetric Shrinkage can be calculated.

The choice of puddle-clay material is often governed by the results obtained from this test.

Shrinkage Limit Set

The equipment consist of the following replaceable parts :

AIM 04501	Porcelain Evaporating Dish
AIM 04502	Shrinkage Dish
AIM 04503	Glass Cup
AIM 04504	Perspex Plate, with three Metal Prongs
AIM 04505	Perspex Plain Plate
AIM 04506	Spatula
AIM 04507	Glass Cylinder, graduated, 25 ml x 0.5 ml
AIM 04508	Mercury, 750 g
AIM 04509	Straight Edge

AIM 045

Ordering Information :

AIM 045 Shrinkage Limit Set

Specific Gravity

Specific Gravity Method :

Specific Gravity is the ratio of the weight of a given volume of a material in air at a standard temperature to the weight in air of an equal volume of distilled water at the same stated temperature. The equipment mentioned below can be used to test a wide range of materials from clay to sand and gravel, smaller than 10 mm.

Pycnometer

Ref. Standard IS:2386 (Part 3)

Consists of a 1 kg Glass Jar with Brass Cone, Locking Ring and Rubber Seal.

AIM 046

Ordering Information :

AIM 046	Pycnometer

Particle Size Analysis

Sieve Analysis :

Ref. Standards IS:2720 (Part 4), ASTM D 422, AASHTO T 88, BS:1377

The analysis of soil by particle size provides a useful engineering classification system from which a considerable amount of empirical data can be obtained. This helps in ascertaining possible frost action, determining graded filters, selection of grouting materials, designing of cement and asphaltic concrete mixes etc.

Two different procedures are used for coarse and fine soils. Sieving is used for gravel as well as sand size particles and sedimentation procedures are used for finer soils. For soils containing coarse and fine soil particles, it is usual to employ both sieving and sedimentation procedures.

Aimil provides the following range of equipment for performing particle size analysis:

- Sieves, GI Frame of 45 cm diameter
- Sieves, GI Frame of 30 cm diameter
- Sieves, Brass Frame of 20 cm diameter
- Motorised Sieve Shaker

Sieves Set

Ref. Standard IS:460
ISS Perforated Plate GI Frame Sieves

Ordering Information :

Aperture Size, mm	AIM 051 (45 cm dia)	AIM 052 (30 cm dia)
125.00	AIM 05101	AIM 05227
106.00	AIM 05102	AIM 05228
100.00	AIM 05103	AIM 05230
90.00	AIM 05104	AIM 05225
80.00	AIM 05105	AIM 05201
75.00	AIM 05106	AIM 05202
63.00	AIM 05107	AIM 05203
53.00	AIM 05108	AIM 05204
50.00	AIM 05109	AIM 05205
45.00	AIM 05110	AIM 05206
40.00	AIM 05111	AIM 05207
37.50	AIM 05112	AIM 05208
31.50	AIM 05113	AIM 05209
26.5	AIM 05114	AIM 05210
25.00	AIM 05115	AIM 05211
22.40	AIM 05116	AIM 05212
20.00	AIM 05117	AIM 05213
19.00	AIM 05118	AIM 05214
16.00	AIM 05119	AIM 05215
14.00	AIM 05139	AIM 05235
13.20	AIM 05120	AIM 05216
12.50	AIM 05121	AIM 05217
11.20	AIM 05122	AIM 05218
10.00	AIM 05123	AIM 05219
9.50	AIM 05124	AIM 05220
8.60	AIM 05125	AIM 05241
8.00	AIM 05126	AIM 05221
6.70	AIM 05127	AIM 05234
6.30	AIM 05128	AIM 05222
6.00	AIM 05136	AIM 05236
5.00	AIM 05129	AIM 05223
4.75	AIM 05130	AIM 05224
4.00	AIM 05138	AIM 05242
3.35	AIM 05134	AIM 05226
2.80	AIM 05131	AIM 05233
2.36	AIM 05132	AIM 05232
2.00	AIM 05137	AIM 05237
Pan and Cover	AIM 05150	AIM 05250

Brass Sieves, 20 cm dia.

ISS Brass Sieves

APERTURE SIZE	AIM 053 (20 cm dia)
10.00 mm	AIM 05337
5.60 mm	AIM 05301
4.75 mm	AIM 05302
4.00 mm	AIM 05303
3.35 mm	AIM 05304
2.80 mm	AIM 05305
2.36 mm	AIM 05306
2.00 mm	AIM 05307
1.70 mm	AIM 05308
1.60 mm	AIM 05338
1.40 mm	AIM 05309
1.18 mm	AIM 05310
1.00 mm	AIM 05311
850 microns	AIM 05312
710 microns	AIM 05213
600 microns	AIM 05314
500 microns	AIM 05315
425 microns	AIM 05316
355 microns	AIM 05317
300 microns	AIM 05318
250 microns	AIM 05319
212 microns	AIM 05320
180 microns	AIM 05321
160 microns	AIM 05339
150 microns	AIM 05322
125 microns	AIM 05323
106 microns	AIM 05324
90 microns	AIM 05325
80 microns	AIM 05340
75 microns	AIM 05326
63 microns	AIM 05327
53 microns	AIM 05328
45 microns	AIM 05329
38 microns	AIM 05330
Pan & Cover	AIM 05350

Note : In addition, on request we can also supply imported sieves from Endecotts Ltd., UK., which are supplied in accordance with BS EN 9002 Qmas. Endecotts offer wide range of test sieves like woven wire mesh, perforated plate, wet washing sieves etc., Calibration samples for calibration are also available. Endecotts is only company worldwide to have both BSI Kitemark for test sieves and UKAS accreditation.

Motorised Sieve Shaker

To make the process of sieving easier and quicker, electrically operated mechanical Sieve Shakers are offered for dry sieving. The mechanical Sieve Shakers effect a more elaborate and standardised sieving action to produce accurate results and eliminate personal errors involved in manual sieving. On the basis of experience gained in the production of these sieve shakers for more than thirty years, considerable improvement has been made in the design and performance of these units. These Sieve Shakers are popularly used not only in soil laboratories but also in a number of industries where sieving is required; such as for ores, refractory materials, minor aggregates, pigments, powdered coal, soap, cement, roofing materials, plastic moulding powders and pharmaceuticals.

The new design is compact and light weight and can be mounted on a bench top. This eliminates the use of concrete foundation. Noise has been reduced considerably in the new model. A digital timer adjustable from 0-99 minutes is incorporated as an integral part of the equipment.

The Sieve Shaker can carry upto 8 sieves of 20cm dia. It is driven by a ¼ HP geared motor. The Sieve Table is inclined from the vertical axis and the direction of inclination changes progressively in the clockwise direction. In addition to the gyratory motion of the table, there is a tapping motion as well.

Suitable for operation on 220 V, 50 Hz, Single Phase, AC supply.

AIM 054-I

Ordering Information :

AIM 054-1 Motorised Sieve Shaker

Optional Accessories :

AIM 05401 Adapter, for 30 cm dia Sieves.

Sedimentation Analysis

Ref. Standards IS:2720 (Part II), BS:1377

Universally used for the determination of sub-sieve particle size in a soil sample. An analysis of this kind expresses quantitatively the properties by weight of the various sizes of particles present in the soil. It is recommended as standard procedure, to use a dispersion agent to avoid floculation.

Andreasen Pipette Stand

Incorporates a sliding carriage which is operated without transmitting vibrations to pipette or to sedimentation tube when the pipette is inserted and withdrawn from the liquid.

The equipment consist of the following replaceable parts :

AIM 05501 Andreasen Pipette, Glass, 10ml. capacity

AIM 05502 Sedimentation tube, Glass, 500ml. capacity AIM 056

AIM 055

Ordering Information :

AIM 055 Andreasen Pipette Stand

High Speed Stirrer

Ref. Standard IS:2720 (Part 4)

Designed as a compact bench-mounted laboratory Stirrer for the pretreatment stage of soils before particle size analysis. The mixer spindle operates within a dispersion cup which can be fitted with an antisplashing baffle to improve the efficiency of mixing.

Suitable for operation on 220 V, 50 Hz, single phase, AC Supply.

The equipment consist of the following replaceable parts :

AIM 05601 Dispersion Cup
AIM 05602 Baffle

AIM 056-1

Ordering Information :

AIM 056-1 High Speed Stirrer, New Model

Plummet Balance

Ref. Standard IS:2720 (Part 4)

Salient Features :

- Simple operation
- Sinking of Plummet to right depth is all that is required before taking a reading.
- Grain size distribution curve for the entire sub-sieve range of particle size is possible; which is not so with pipette method, where only specific sizes of particles can be determined
- Eliminates computations involved in Hydrometer Method
- Percentage of soil in suspension can be directly read
- Grain size distribution curve can be directly plotted as experiment progresses

The Plummet Balance consists of a vertical rod mounted on a heavy base with levelling screws. A light weight pointer with pointed steel pivots, turning in jeweled bearings moves over a scale graduated in percentage units 0-100 in 2% divisions. The pointer is provided with a hook for hanging plummet.

The balance moves up and down over the vertical rod with the help of rack and pinion arrangement. A chart showing the relationship between K and Temp. of suspension of soils of varying specific gravity from 2.4 to 2.8 to help solve Stoke's equation is provided. Supplied complete with one perspex Plummet, one measuring jar, one rider weight for zero adjustment and one rider weight for adjusting the pointer to 100%.

AIM 057

Ordering Information :

AIM 057 Plummet Balance

Load Frames

Load Frames are Loading devices employed for application of compression and penetration loads required for various tests, such as Unconfined Compression Test, Triaxial Shear Test, California Bearing Ratio Test etc. The load application is effected by advancement of a lead screw secured against rotation by a sliding key and is measured with a Proving ring or Load Cell. Aimil manufactures a wide variety of Electro Mechanical to Microprocessor Load Frames with different designs of frame structure, modes of operation (manual or electrically driven), loading capacities, speeds of travel, so that appropriate selection is possible to meet the requirements of standard methods used for various tests to cover different soil types and sizes of specimens.

AIM 062-1
Load Frame, Motorised, Three Speed

Salient Features:

- Two pillar type.
- Light weight and Sturdy.
- Can also be used in Mobile Laboratories.
- Operational ease.
- Useful for Unconfined and CBR Tests.

This load frame is designed for conducting Unconfined, Triaxial, CBR and other routine tests.

Loading system comprises of a screw jack with detachable handle. The lower platen moves up and down. The top bracket is adjustable for vertical clearance and has an adaptor for connecting standard proving rings or load cells. A dial gauge mounting bracket is provided on one of the two pillars.

Rate of strain : 1.25, 1.5 and 2.5mm/min

Suitable for operation on 220 V, 50 Hz, single phase, AC supply.

Note : As per BS/ASTM is also available.

AIM 062-1

AIM 064
Load Frame, Motorised, 30 speeds

Salient Features:

- Two pillar type.
- Detachable Frame.
- Enclosed Motor and Gear system.
- Jewel Lamps indicating direction of motion.
- Operational ease.
- Useful for Triaxial and CBR Tests.

The Load Frame consists of a cabinet which houses the gear system and motor with sturdy angle iron frame. The loading is done through the bottom loading platen, which is carried on a lead screw, which advances upwards. The top load bracket, which slides over two upright pillars, can be positioned at any desired height and locked. It carries a screw adapter for standard Proving rings and Load Cells.

The loading part of the unit is detachable from the main unit for ease of transport and to avoid damage to the tension rods.

Rates of strain : 30 fixed speeds between 0.00048 mm/min and 6.00 mm/min.

Suitable for operation on 220 V, 50 Hz, single phase, AC supply.

AIM 064

AIM 064-E
Load Frame, Microprocessor Based

Salient Features:

- Microprocessor control
- Large on-board LED screen display
- Direct entry via a touch sensitive keyboard
- Rapid approach and return to datum of platen
- Fully variable speed, 0.00001 to 9.99999 mm/min
- Samples up to 100 mm diameter

Supplied complete with inbuilt Electronic kit for Triaxial Test.

This 50 kN capacity machine, designed primarily for triaxial testing of soil specimens up to 100 mm diameter x 200 mm long. It comprises of a rigid twin column construction with an integral, fully variable microprocessor controlled drive unit and LCD display with a touch sensitive keyboard. The machine is bench mounted for ease of installation and operation.

The use of a microprocessor controlled drive system and keyboard entry provides the Load Frame with a wide variety of features which include pause and speed reset during test, RS232 interface for computer control, operator programming of speed and control functions, self test diagnostics and many other features.

A robustly constructed steel case houses the motor drive system with careful attention being given to the prevention of ingress of water or grit. All operating controls are mounted on the front panel of the machine which is angled and recessed to prevent physical and environmental damage.

Suitable for operation on 220 V, 50 Hz, single phase, AC supply.

Specifications :

Capacity	: 50kN
Drive Mechanism	: Stepper Motor
Drive	Microprocessor controlled
Platen Speed range mm/minute.	: 0.0001 to 9.99999
Fast Forward & Reverse	: 10mm / minute
Rapid Approach Speed	: 25mm / minute
Horizontal clearance	: 364mm
Max. vertical clearance	: 910mm
Max. Platen travel	: 100mm
Specimen dia	: 38mm to 100 mm
Dimensions (L×W×H)	: 600 × 500 × 1440 mm
Weight	: 85 kg. (Approx.)

Integrated Measurement Electronics :

Display	: 3 1/2 digit DPM, for read, load pressure and vertical displacement.

Transducers :

Load Cell	: Universal type load cell, 10kN capacity,	1 No.
Displacement	: LVDT 0-20mm travel	1 No.
Pore Pressure Transducer	: 0-20 bar capacity	1 No.

AIM 064-E

AIM 065
Load Frame, Motorised, 12 speeds

Salient Features :

- Two pillar type
- Enclosed motor and Gear System
- Jewel lamps indicating direction of motion
- Operational ease

The Load Frame is extremely versatile and designed to conduct triaxial shear test on soil and rock specimens.

The instrument consists of a cabinet which houses the gear system and motor with sturdy angle iron frame. The loading is done through the bottom loading platen, which is carried on a lead screw which advances upwards. The top load bracket, which slides over two upright pillars, can be positioned at any desired height and locked. It carries a screw adaptor for standard Proving Rings or Load Cells.

The loading part of the unit is detachable from the main unit for ease of transport and to avoid damage to the tension rods.

Rates of Strain: 12 fixed speeds between 1.25 and 0.0064 mm/min.

Suitable for operation on 415 V, 50 Hz, 3 phase, AC supply.

AIM 066
Load Frame, Motorised, 12 Speeds

Salient Features :

- Two pillar type
- Enclosed motor and Gear System
- Jewel lamps indicating direction of motion
- Operational ease

The Load Frame is designed for conducting triaxial shear tests on rock specimens, but its use can be extended to any field where there is a requirement of the rates of strain of this load frame to be applied. This load frame gives a choice of twelve rates of strain from a maximum of 5 mm/min to 0.000125 mm/min.

It consists of a cabinet housing the electric motor, reduction gear and the turret gear box. Two pillars are fitted on the base over the cabinet. The load is applied by advancement of a lead screw. A suitable adapter is provided for fixing a 500 kN capacity proving ring which is supplied at extra cost. This load frame has a platen of about 25 cm dia to house the high pressure Triaxial Cell for testing rock specimens.

Suitable for operation on 415 V, 50 Hz, 3 Phase, AC supply.

Ordering Information :

AIM 062-1	Load Frame, Motorised Three Speed, 50 kN
AIM 064	Load Frame, Motorised, 30 speeds, 50 kN
AIM 064-E	Load Frame, Motorised, 50 kN Microprocessor Based
AIM 065	Load Frame, Motorised, 12 speeds, 200 kN
AIM 066	Load Frame, Motorised, 12 speeds, 500 kN

Cat. No.	AIM 062-1	AIM 064	AIM 064-E	AIM 065	AIM 066
Capacity	50 kN	50 kN	50 kN	200 kN	500 kN
Types of Operation	Electrical-cum manual	Electrical-cum manual	Micro Processor Based	Electrical-cum manual	Electrical-cum manual
Rates of Strain mm/min	Three Rates 1.25, 1.5 and 2.5mm/min	Thirty Rates 0.00048 to 6.00mm/min	0.00001 to 9.99999mm/min	Twelve Rates 0.0064 to 1.25mm/min	Twelve Rates 0.000125 to 5mm/min
Horizontal Clearance Vertical clearance Maximum Platen dia Maximum Platen Travel Specimen dia	265 mm 700 mm 157 mm 100 mm 38 to 100 mm	300 mm 850 mm 198 mm 100 mm 38 to 100 mm	364 mm 910 mm 133 mm 100 mm 38 mm to 100 mm	300 mm 750 mm 198 mm 100 mm 38 to 100 mm AX, BX, NX cores of rock upto 100 mm dia	545 mm 1200 mm 250 mm 160 mm
Application	Triaxial & CBR	Triaxial & CBR Tests	Triaxial Tests	Triaxial Test on Unconfined rocks, Unconfined Compression Test	Routine tests on Rocks Unconfined on medium & coarse grained stablized soil

Integral Proving Rings

The Proving Rings are made up of special steel, carefully forged to give maximum strength and machined to give high sensitivity commensurate with stability, ensuring long life and accuracy.

All proving rings are integral type viz. the loading (outside) bosses are forged integral with the ring body. This ensures that there is no possibility of abutment shift and consequent loss of accuracy in reading that always exists with bolted abutments.

Repeatability in these Proving Rings is as stipulated in IS:4169. The rings are supplied complete with dial gauge and Works Calibration Chart, individually packed in polished wooden boxes. National Physical Laboratory (NPL), (India)/ National Council for Cement & Building Material (NCCBM)Calibration can also be arranged for any proving ring at an additional cost. Proving rings to meet special requirements are also available on request.

Separate polished and ground pair of Loading Pads for Compression Proving Rings and pair of Shackles for Tension Proving Rings are provided to suit each proving ring.

Proving Rings

Important : Proving Ring must be recalibrated when a replacement dial guage is fitted

Ordering Information :

Compression Proving Rings

Cat. No.	Capacity (kN)	Capacity (kgf)	Cat No. Loading Pads
AIM 261	0.25 kN	25 kgf	AIM 26101
AIM 262	0.5 kN	50 kgf	AIM 26201
AIM 263	1 kN	100 kgf	AIM 26301
AIM 264	2 kN	200 kgf	AIM 26401
AIM 265	2.5 kN	250 kgf	AIM 26501
AIM 266	4 kN	400 kgf	AIM 26601
AIM 267	5 kN	500 kgf	AIM 26701
AIM 268	10 kN	1,000 kgf	AIM 26801
AIM 269	15 kN	1,500 kgf	AIM 26901
AIM 270	20 kN	2,000 kgf	AIM 27001
AIM 271	25 kN	2,500 kgf	AIM 27101
AIM 272	30 kN	3,000 kgf	AIM 27201
AIM 273	40 kN	4,000 kgf	AIM 27301
AIM 274	50 kN	5,000 kgf	AIM 27401
AIM 275	100 kN	10,000 kgf	AIM 27501
AIM 276	200 kN	20,000 kgf	AIM 27601
AIM 277	300 kN	30,000 kgf	AIM 27701
AIM 278	500 kN	50,000 kgf	AIM 27801
AIM 279	1000 kN	100,000 kgf	AIM 27901
AIM 280*	2000 kN	200,000 kgf	AIM 28001
AIM 281*	3000 kN	300,000 kgf	AIM 28101
*supplied with NCCBM Certificate			

Tension Proving Rings*

Cat. No.	Capacity (kN)	Capacity (kgf)	Cat. No. shakles
AIM 290*	0.5 kN	50 kgf	AIM 29001
AIM 291*	1.0 kN	100 kgf	AIM 29101
AIM 292*	2.0 kN	200 kgf	AIM 29201
AIM 293*	2.5 kN	250 kgf	AIM 29301
AIM 294*	5.0 kN	500 kgf	AIM 29401
AIM 295*	10.0 kN	1,000 kgf	AIM 29501
AIM 296*	20.0 kN	2,000 kgf	AIM 29601
AIM 297*	50.0 kN	5,000 kgf	AIM 29701
AIM 298*	100.0 kN	10,000 kgf	AIM 29801
*Without NPL calibration. NPL calibration charges will be extra.			

Tension Compression Proving Rings

Cat. No.	Capacity (kN)	Capacity (kgf)	Cat. No. Shakles
AIM 284	2.0 kn	200 kgf	28401

Shear Strength

Determination of soil shear strength is essential for designing the foundation of structures, soil and soil retaining structures, soil slopes, etc., Shear strength of soil depends on various factors and insitu soil conditions. Therefore, when laboratory tests in soil are performed to evaluate shear strength of soil, the insitu soil conditions and other factors should be simulated for obtaining meaningful results. For example, the Unconsolidated Undrained test on soil will yield the undrained strength, which can be used for finding the immediate stability of an excavation, whereas a consolidated undrained test with measurement of pore pressure can be used to evaluate the effective strength parameters of soil for designing the long term stability of an earth fill dam.

It is well known that the engineering behaviour of soil depends on the effective stress and not the total stress. The effective stress can be calculated by measuring the total stress and substracting the pore water pressure from it.

To cater to the needs of shear strength determination of soil, a range of equipment is offered, as listed in this section.

Unconfined Compression Tester, Proving Ring Type

Ref. Standards IS:2720 (Part 10), AASHTO T208

The equipment consist of the following replaceable parts :

AIM 062-1	Load Frame, Motorised three speed 50 kN.
AIM 07401	Plain Platen with Adapter and Steel Ball.
AIM 264	High sensitivity proving ring capacity 2 kN.
AIM 072	Dial Gauge 25 mm travel, 0.01 mm least count.
AIM 3105	Split Mould 38mm dia × 76mm long
AIM 07506	Rubber Sheath for 38mm dia specimen

AIM 074-1

Ordering Information :

AIM 074-1	Unconfined compression tester with proving ring for load measurement.

Optional Accessories :

AIM 03301	Split Mould 50mm dia × 100mm long
AIM 03303	Split Mould 100mm dia × 200mm long
AIM 07526	Rubber Sheath for 50mm dia specimen
AIM 07562	Rubber Sheath for 100mm dia specimen
AIM 07402	Pair of conical seating

As per ASTM/BS is also available.

Triaxial Shear

Ref: Standard IS : 2720 (Part XII)

The knowledge of stress-strain and strength characteristics of soils is of primary importance for the analysis and design of earth and earth retaining structures and foundations. The triaxial compression test, inspite of its limitation to simulate all combinations of practical stress and strain conditions, occupies at present a fairly dominant position in soil testing.

Triaxial Cells

Aimil Triaxial Cells conform to the requirements of IS:2720 (Part 11) & (Part 12) and are made from corrosion resistant material. Particular attention is paid to the quality of the finish between the stainless steel plunger and the bushing. The cell cylinders are made from acrylic plastic material and those for use upto 20 bar (20 kg/cm^2) are usually reinforced by bands. Each cell has four take-off positions, drilled in the base, for Cell pressure, Pore water pressure, Drainage or back pressure. All valves are of 'no-volume change' type.

Universal triaxial cells accept a range of base adaptors for testing a wide range of specimen sizes.

Triaxial Cells, 38mm and 50mm dia

For testing specimens of size 38 mm dia x 76 mm long and 50 mm dia x 100 mm long.

Triaxial cell comprises of a perspex chamber with an anvil and a loading plunger. The cell is easily split by releasing four tie rods. It is leakproof upto 10 bar (10 kg/cm^2) fluid pressure.

Cells which can withstand the pressure of 20 bar can be made on request.

An oil plug and air vent are provided for introducing a thin layer of oil over water. This provides an effective sealing at the plunger for long duration tests. The cell is also fitted with four ball valves of no-volume change type, at the base.

The equipment consist of the following replaceable parts :

AIM 07501	Top loading pad, Perspex, 38mm dia.	1 No.
AIM 07502	Plain Perspex disc 38mm dia x 6 mm thick	1 pair.
AIM 07503	Porous Stone 38mm dia x 6 mm thick	1 pair.
AIM 07504	Sheath stretcher for 38mm dia specimen	1 No.
AIM 07505	Sand former for 38 mm dia.	1 No.
AIM 07506	Rubber sheath for 38mm dia specimen	12 Nos.
AIM 07507	Drainage tube (short), 38 mm	4 Nos.
AIM 07508	Drainage tube (long), 38 mm	4 Nos.
AIM 07509	'O' rings for 38mm dia specimen	8 Nos.
AIM 07510	Brass pedestal 38 mm dia.	1 No.
AIM 07521	Top loading pad, Perspex, 50mm dia.	1 No.
AIM 07522	Plain Perspex disc 50mm dia x 6 mm thick	1 pair.
AIM 07523	Porous Stone 50mm dia x 6 mm thick	1 pair.
AIM07524	Sheath stretcher for 50mm dia specimen	1 No.
AIM 07525	Sand former for 50 mm dia.	1 No.
AIM 07526	Rubber sheath for 50 mm dia	12 Nos.
AIM 07527	Drainage tube (short), 50 mm	4 Nos.
AIM 07528	Drainage tube (long), 50 mm	4 Nos.
AIM 07529	'O' ring for 50 mm dia-specimen	8 Nos.
AIM 07530	Brass pedestal 50 mm dia.	1 No.
AIM 03105	Split Mould, 38mm Dia x 76mm long	1 No.
AIM 03301	Split Mould, 50mm Dia x 100mm	1 No.
AIM 07540	Top loading pad 38mm (plain)	1 No.
AIM 07541	Top loading pad 50mm (plain)	1 No.

AIM 075

Ordering Information :

AIM 075 Triaxial Cells, 38mm and 50mm dia

Triaxial Cell, Stationary Bushing

Ref Standard: IS : 2720 (Part XII)

For testing specimen of size 38mm dia x 76mm long.

Triaxial Cell consists of Perspex chamber with anvil and loading plunger. The cell is easily split by releasing four type rods. It is leak proof upto 10 bar (10 kg/cm^2) fluid pressure. An oil plug and an air vent are provided for introducing a thin layer of oil over water. This provides effective sealing at the plunger for long duration tests. The cell is fitted with four sleeve packed valves of no volume change type of base.

The equipment consist of the following replaceable parts :

AIM 07501	Top loading pad, Perspex, 38 mm dia.	1 No.
AIM 07502	Plain Perspex disc 38mm dia x 6 mm thick	1 pair.
AIM 07503	Porous Stone 38mm dia x 6 mm thick.	1 pair.
AIM 07504	Sheath stretcher for 38 mm dia specimen	1 No.
AIM 07505	Two way split former for 38 mm dia specimen	1 No.
AIM 07506	Rubber sheath for 38 mm dia specimen	12 Nos.
AIM 07507	Drainage tube (short), 38 mm	4 Nos.
AIM 07508	Drainage tube (long), 38 mm	4 Nos.
AIM 07509	'O' rings for 38mm dia specimen	4 Nos.
AIM 03105	Split Mould, 38mm dia	1 No.
AIM 07540	Top loading pad 38mm (plain)	1 No.

AIM 075-38

Ordering Information :

AIM 075-38 Triaxial Cell, Stationary Bushing, 38mm dia

Universal Triaxial Cell, Stationary Bushing, 10 Bar

For testing specimens of size 38, 50, 75 and 100 mm dia. It consists of a Perspex chamber with anvil and loading plunger. Leak proof upto 10 bar (10kg/cm^2). Fitted with four sleeve packed valves to the base.

The equipment consist of the following replaceable parts :

AIM 07510	Brass pedestal 38 mm dia.	1 No.
AIM 07530	Brass pedestal 50 mm dia.	1 No.
AIM 07567	Brass pedestal 75 mm dia.	1 No.
AIM 07550	Brass pedestal 100 mm dia.	1 No.
AIM 07501	Perspex loading pad 38 mm dia.	1 No.
AIM 07521	Perspex loading pad 50 mm dia.	1 No.
AIM 07568	Perspex loading pad 75 mm dia.	1 No.
AIM 07569	Perspex loading pad 100 mm dia.	1 No.
AIM 07502	Plain discs, 38 mm dia.	1 Pair
AIM 07522	Plain discs, 50 mm dia.	1 Pair
AIM 07553	Plain discs, 75 mm dia.	1 Pair
AIM 07554	Plain discs, 100 mm dia.	1 Pair
AIM 07503	Porous stone 38 mm dia.	1 Pair
AIM 07523	Porous stone 50 mm dia.	1 Pair
AIM 07555	Porous stone 75 mm dia.	1 Pair
AIM 07556	Porous stone 100 mm dia.	1 Pair
AIM 07504	Sheath Stretcher for 38 mm dia.	1 No.
AIM 07524	Sheath Stretcher for 50 mm dia.	1 No.
AIM 07557	Sheath Stretcher for 75 mm dia.	1 No.
AIM 07558	Sheath Stretcher for 100 mm dia.	1 No.
AIM 07505	Sand former for 38 mm dia.	1 No.
AIM 07525	Sand former for 50 mm dia.	1 No.
AIM 07559	Sand former for 75 mm dia.	1 No.
AIM 07560	Sand former for 100 mm dia.	1 No.
AIM 07506	Rubber sheath for 38 mm dia.	12 Nos.
AIM 07526	Rubber sheath for 50 mm dia.	12 Nos.
AIM 07561	Rubber sheath for 75 mm dia.	12 Nos.
AIM 07562	Rubber sheath for 100 mm dia.	12 Nos.
AIM 07532	Drainage tube (short), 38 mm.	4 Nos.
AIM 07527	Drainage tube (short), 50 mm.	4 Nos.
AIM 07533	Drainage tube (short), 75 mm.	4 Nos.
AIM 07534	Drainage tube (short), 100 mm.	4 Nos.
AIM 07535	Drainage tube (long), 38 mm.	4 Nos.
AIM 07528	Drainage tube (long), 50 mm.	4 Nos.
AIM 07536	Drainage tube (long), 75 mm.	4 Nos.
AIM 07537	Drainage tube (long), 100 mm.	4 Nos.
AIM 07509	'O'ring for 38 mm dia-specimen.	8 Nos.
AIM 07529	'O'ring for 50 mm dia-specimen.	8 Nos.
AIM 07563	'O'ring for 75 mm dia-specimen.	8 Nos.
AIM 07564	'O'ring for 100 mm dia-specimen.	8 Nos.
AIM 07540	Top loading pad (plain) 38 mm	
AIM 07541	Top loading pad (plain) 50 mm	
AIM 07542	Top loading pad (plain) 75 mm	
AIM 07543	Top loading pad (plain) 100 mm	

Ordering Information :

AIM 076 Universal Triaxial Cell, Stationary Bushing, 10 Bar.

Optional Accessories :

AIM 07511 Three part split mould, 38 mm dia with Collar, base plate and hinged clamp with rammer

AIM 07531 Three part split mould, 50 mm dia with Collar, base plate and hinged clamp with rammer

AIM 07565 Three part split mould, 75 mm dia with Collar, base plate and hinged clamp with rammer

AIM 07566 Three part split mould, 100 mm dia with Collar, base plate and hinged clamp with rammer

AIM 03301 Split Mould, 50 mm dia x100mm

AIM 03105 Split Mould 38 mm dia x 76 mm

Pore Pressure Apparatus

The Pore Pressure Apparatus manufactured by Aimil is designed according to the principles outlined in the book "The Measurement of Soil Properties in the Triaxial Test" by A.W. Bishop and D.J. Henkel. This pore pressure measuring apparatus consists of a screw pressure pump, null indicator in perspex, pressure gauge, mercury manometer, volume change burette and the necessary connecting tubes and valves. It is used for measuring pore water pressure and pore air pressure in soils.

It has many features which simplify the operation. The Null Indicator is made from a transparent perspex block. It is a simplified U-Tube Null Indicator, in which water can bypass mercury if null indicator is tilted; thus de-airing process by circulation of water is facilitated. All features enable a visual check to be made during the de-airing operation of apparatus. A mercury manometer and a pressure gauge of Bourdon Tube type are provided on the panel on which the whole equipment is mounted. Very small positive or negative pressures are observed on the manometer. A 50ml burette is clamped to a sliding bracket on one side of the panel. It is used for measuring the volume change in the specimen when subjected to confining pressure in the triaxial cell.

The equipment consist of the following replaceable parts :

AIM 07701 Pressure Gauge Bourdon Tube Type, Graduation : -1.0 to +10 bar in 0.1 bar Divisions (–1 to 10 kg/cm^2) Dia : 200 mm

or

AIM 07801 Pressure Gauge Bourdon Tube type, Graduation : -1.0 to +20 bar in 0.1 bar Divisions. (or -1 to +20 kg/cm^2) Dia : 200 mm

AIM 07702 Manometer Glass U-Tube, measures low positive and negative pore pressure and helps to check zero error of pressure gauge. It is provided with a mercury trap. **(Mercury is supplied at extra cost)**

AIM 07703 Null Indicator Perspex with mercury trap and a cursor to indicate the mercury level

AIM 07704 Burette, 50 ml for measurement of volume change in the soil specimen.

AIM 07705 Pressure Pump fitted with four Ball Valves.

AIM 07706 Copper Coil

AIM 07707 Water Reservoir

All the above parts are fixed on a panel suitable for mounting on the wall.

AIM 077

Ordering Information :

AIM 077 Pore Pressure Apparatus 1000 kPa (10 kg/cm^2) capacity.

AIM 078 Pore Pressure Apparatus 2000 kPa (20 kg/cm^2) capacity.

Constant Pressure Systems

Constant Pressure Systems are meant for maintaining the pressure in the triaxial cell constant by automatically compensating for the fluctuation of cell pressure taking place as a result of volume change occurring in the cell due to expansion of the specimen under high pressure, entry of the loading plunger into the cell, consolidation of specimen, etc. Constant Pressure Systems are usually employed to ensure accurate performance of such types of Triaxial Shear tests (consolidated undrained test on clayey soils and drained test on most of the soils) where maintenance of the set pressure constant over a long period is essential.

Constant Pressure System Oil Water Type

- Use of Mercury is eliminated
- Maintains Constant Pressure continuously
- Pressure Capacity, 10 bar (10kg/cm^2)
- Also suitable for mobile laboratories

Oil Water Constant Pressure System is an extremely versatile apparatus which can be used for a wide range of applications. This system provides an effective alternative to Mercury and Water Constant Pressure system especially where the laboratory head room is insufficient. The apparatus is designed to provide confining pressure upto 16 bar to Triaxial Cells however for safety it has been factory-locked at a max Pressure of 12kg/cm^2.

The system consists of an oil pump, driven by an electric motor during the entire period of operation to maintain the desired pressure.

The unit provides variable pressure upto 16 bar which can be increased or decreased simply by turning a control knob. A transparent oil water interchange vessel is provided to transmit water pressure to the test apparatus.

Range	:	10 kg/cm^2
Resolution	:	0.1 kg/ cm^2
Accuracy	:	± 1%of the indicated pressure

Supplied complete with Pressure Gauge, Flow Valves, connecting Pressure Hose.

Suitable for operation on 220 V, 50 Hz, Single Phase, AC supply.

AIM 081-1-2

Ordering Information :

AIM 081-1 Constant pressure system oil water type

AIM 081-1-2 Constant pressure system oil water type with two cells.

Note : If a higher Confining pressure is desired one can be designed at extra cost.

Constant Pressure System Air Water Type

This Air Water Constant Pressure System is meant for maintaining constant lateral pressure on triaxial test specimens throughout the test periods regardless of the volume changes occurring in the cell due to expansion of specimens under high pressures, leakage, entry of loading plunger into the triaxial cell, distortion of the specimen under load, consolidation etc. The equipment is provided with two air water interface chambers with individual regulators to control the outlet pressure at desired pressure levels.

Constant pressure is maintained in the system by applying air pressure into the cell with the help of a pressure regulator. The apparatus is designed to provide confining pressure upto 10 bar and is a two cell model.

Range : 0 to 10 bar (0 to 10 kg/cm^2)

Resolution : 0.1 bar (0.1 kg/ cm^2)

Accuracy : ± 1% of the indicated pressure

Suitable for operation on 220 V, 50 Hz, Single Phase, AC supply.

AIM 082

Ordering Information :

AIM 082 Air Water Constant Pressure System

Note : Four Cell model can be provided on request. Compressor can also be supplied at extra cost.

Sensitive Volume Change Gauge

This Volume Change Gauge works on the principle of reversing the direction of flow when the limit of the volume change scale is reached. The number of cycles with the volume of fluid handled in each cycle provide the total volume change, whereas the sensitivity is governed by the dia of the polythene tube used. Sensitivity of 0.003 ml/mm with 6 ml volume of fluid per cycle has been realized by this sensitive volume change gauge.

The apparatus consists of a volume measuring polythene tube running along both sides of a scale and connected at both ends to two mercury traps.

These traps are connected to flow reversal valves through a manifold. The length of the polythene tube is enough to measure 6 ml volume of fluid per cycle. A small pallet of mercury is introduced in the circuit to be used as a cursor, and the movement of pallet is measured.

The unit is tested to a pressure of 20 bar (20 kg/cm^2) and is designed for wall mounting.

Ordering Information :

AIM 084 Sensitive Volume Change Gauge

Triaxial Electronic Conversion Kit

- Direct reading of strain, load and pore pressure
- Digital Read-out minimizes operator error
- Reduces operator time and involvement
- Plug-in transducer module system
- Easy to install
- Facility for connecting read-out units to compatible logging or Data Acquisition System

With an external load cell, 10 kN capacity, Pore Pressure Transducer, 20 bar (20 kg/cm^2) capacity, an LVDT (Displacement Sensor) having a range of 0-20mm mm and a 3 - Channel Digital Indicator which has been specially designed to meet the requirements of Triaxial Test.

The equipment consist of the following replaceable parts :

AIM 08501		**Digital Indicator**
Mode of Display	:	Micro controller multi line alpha numeric VFD display for all simultaneous channel (No need for channel selection)
Power supply Voltage	:	220V, 50Hz, Single Phase
AIM 08502		**Load Cell**
Capacity	:	10 kN
Max. overload capacity	:	10% of the rated
Load Cell excitation	:	5 V, DC
Resolution	:	0.01 kN
Sensing element	:	Strain gauges in full bridge configuration
AIM 08503		**Pore Pressure Transducer**
Capacity	:	20 bar (20 kg/cm^2).
Max. overload capacity	:	150% of rated
Pressure Cell Excitation	:	5V, DC.
Resolution	:	0.01 bar (0.01 kg/cm^2).
Sensing element	:	Strain Gauges in full bridge configuration.
AIM 08504		**Displacement Transducer**
Range	:	0-20 mm
Sensing element	:	LVDT

AIM 085

Ordering Information :

AIM 085 Triaxial Electronic Conversion Kit,

Lab-Geosystem (Datalogger)

A microprocessor based versatile datalogging module, designed to serve as a common facility for triaxial, direct shear and consolidation measurement. The digital output data modules of three transducers can be directly plugged into the Datalogger, which has 3 channels and serves the functions listed below. The datalogger is compatible with all the electronic units supplied by Aimil and can be ordered as an accessory to these units.

- 3 channels digital output.
- print-out of values measured by 3 channels as well as print-out of clock time at pre-set time intervals.
- peaks on all channels retained in memory, displayed on demand and printed at end of operation.
- relay for reversing strain direction.
- battery back-up to store readings in case of power failure and print them on resumption.
- easy plug-in connection with Aimil electronic units.
- one unit can be used with one triaxial or one direct shear or three consolidation electronic units as common facility.

Note : For all your Data Acquisition & Analysis needs, we supply 'StarDAQ' & 'GeoStar' - Ref page Nos. 31

Triaxial Test Apparatus

Ref: Standard IS : 2720 (Part XI & XII) BS 1377-7, 1924 -2, ASTM D2850, D4767 AASHTO T296, T297

The settlement of foundations and changes in earth pressure due to movement of retaining walls or other earth supports, the yield of soil caused by application of load, are affected by the stress-strain relationship of soils.

The experimental investigation for determining the stress-strain relationship is usually carried out with the Triaxial Compression test. During the test, the soil samples gradually stressed upto failure. Generally speaking, Triaxial tests are performed to simulate different types of stress and drainage conditions that can occur in the sub-soil for simulating the effect of building construction, excavation, tunneling etc. The Three different triaxial tests are usually performed for total and effective stress measurement.

Note: Computer with following minimum specifications is recommended for the subject product :

- Windows XP loaded
- Pentium Core 2 DUO
- 2 GB RAM
- 120 GB HDD

AIM 096-2

Constituents of Triaxial Test Outfits Motorised

Cat. No.	Sample Dia	Load Frame	Triaxial Cell	Proving Ring	Constant Pressure	Pore Pressure System	Dial Gauge Apparatus	Triaxial Electronic	Data Acquisition System	Analysis Software System	**Test To Be Done
AIM 095-1	38mm	AIM 064	AIM 075-38	AIM265	AIM 081-1-2*	AIM 077	AIM 072	-	-	-	UU, CU, CD
AIM 095-U-1	38-100mm	AIM 064	AIM 076	AIM265	AIM 081-1-2*	AIM 077	AIM 072	-	-	-	UU, CU, CD
AIM 096-4	38mm	AIM 064	AIM 075-38	-	AIM 081-1-2*	-	-	AIM 085	-		UU, CU, CD
AIM 096-U-1	38-100mm	AIM 064	AIM 076	-	AIM 081-1-2*	-	-	AIM 085	-	-	UU, CU, CD
AIM 096-5	38mm	AIM 064	AIM 075-38	-	AIM 081-1-2*	-	-	AIM 085	AIM 101	AIM 10121 AIM 10122 and AIM 10123	UU, CU, CD
AIM 096-5-U	38-100mm	AIM 064	AIM 076	-	AIM 081-1-2*	-	-	AIM 085	AIM 101	AIM 10121 AIM 10122 and AIM 10123	UU, CU, CD
AIM 096-6	38mm	AIM 064-E	AIM 075-38	-	AIM 081-1-2*	-	-	AIM 085 Inbuilt	-	-	UU, CU, CD
AIM 096-6-U	38-100mm	AIM 064-E	AIM 076	-	AIM 081-1-2*	-	-	AIM 085 Inbuilt	-	-	UU, CU, CD
AIM 096-7	38mm	AIM 064-E	AIM 075-38	-	AIM 081-1-2*	-	-	AIM 085 Inbuilt	AIM 101	AIM 10121, AIM 10122 and AIM 10123	UU, CU, CD
AIM 096-7-U	38-100mm	AIM 064-E	AIM 076	-	AIM 081-1-2*	-	-	AIM 085 Inbuilt	AIM 101	AIM 10121, AIM 10122 and AIM 10123	UU, CU, CD

Note : *AIM 082 / AIM 081-1 can be supplied in place of AIM 081-1-2 on request.
**UU - Unconsolidated Undrained
**CU - Consolidated Undrained
**CD - Consolidated Drained

De-Aired Water Apparatus

The equipment has been designed specifically to meet the demand for de-aired water for use with

- Soil Testing Apparatus for reduction of time and labour to consolidate soil samples.
- For simultaneous flushing of many hydraulic Piezometer lines in dams and earth works to considerably reduce labour and disturbance at the top ends.

It is particularly important that only de-aired water is used in the Pore Pressure measurement system. Any dissolved air in the water leads to error in measurement of Pore Pressure, particularly at low pressure.

Salient Features :

- Fully Microprocessor Controlled
- Real Time clock Function included
- Oil Free Vaccum pump
- The unit is fully automatic and shut itself off when the de-airing program is complete

It is compact self contained unit, will de-air quickly and efficiently reduce levels of dissolved oxygen, acceptable for geotechnical test methods.

Air is removed from the water by a vacuum system which continuously circulates the water in the tank.

The unit is supplied with Perspex Water Container which will hold a maximum of 15 ltr of water. Input and output lines are fixed with 4mm (approx.) and 6mm (approx.) ID of plastic tubing respectively.

Suitable for operation on 220 V, 50 Hz, Single phase, AC Supply.

AIM 097-1

Ordering Information :

AIM 097-1 De-Aired Water Apparatus

Optional Accessories :

AIM 09701 Pressurised Storage Tank, capacity 20 litres, Valves and Pressure Gauge (for storing de-aired water to be used in the field).

AIM 09702 Water Pump

StarDAQ Data Acquisition System

Aimil StarDAQ Data Acquisition System for Geotechnical Data Acquisition, which complement the Geotechnical Analysis Software Suite.

System Hardware:

- Up to 16 single ended analog input Channels as Standard
- High Speed USB 2.0 Connectivity
- Accepts an input range of + / - 10V
- Up to 256 ks /s sampling
- Can easily be configured for 8 differential Or 16 single ended channels
- Compatible with complete range of transducers For most of Geotechnical Tests
- Also, available from 8 to 80 channels as per user requirements optionally.
- Also, a WiFi enabled 4 Channel version can be supplied optional.

The StarDAQ data acquisition Software:

The Microsoft® Windows© compatible Aimil "StarDAQ" data acquisition software allows for a variety of calibration methodologies to suit the type of test being conducted and the type of sensor required for conducting a particular test.

The Calibration Methods include the following:

- Linear
- Polynomial
- Map Ranges
- Table

The Data Can be logged based on

- Normally progressing Time
- Logarithm of time
- Square root of Time
- Change in value in any one of Channel to be considered as master channel.

Aimil 'StarDAQ' 16 Channel System

Ordering Information:

AIM 101	StarDAQ Data Acquisition System
AIM 101-1-8	8 Channel Data Acquisition System with StarDAQ Data Acquisition Software, single user license
AIM 101-1-16	16 Channel Data Acquisition system with StarDAQ Data Acquisition Software, single user license
AIM 101-1-32	32 Channel Data Acquisition system with StarDAQ Data Acquisition Software, single user license
AIM 101-1-80	80 Channel Data Acquisition system with StarDAQ Data Acquisition Software, single user license
AIM 101-1-WiFi	4 Channel WiFi Data Acquisition system with StarDAQ Data Acquisition Software, single user license

Note: For multi - User requirements, please send details of total no. of licenses required for pricing.

"GeoStar" the Geotechnical Software for Testing, Analysis and Reporting

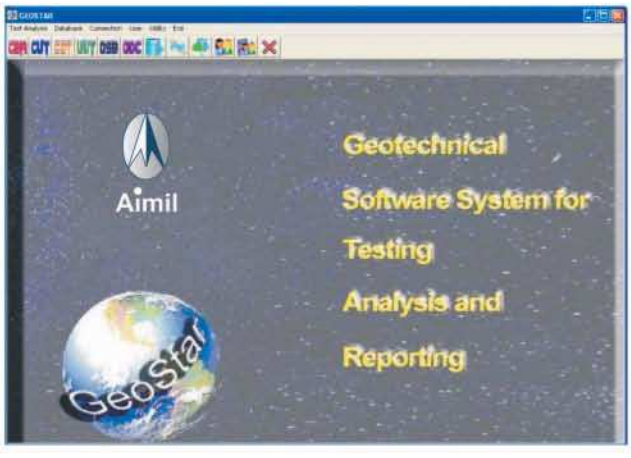
The analysis and reporting of following Tests can be performed

- Unconsolidated Undrained Triaxial Test
- Consolidated Undrained Triaxial Test
- Consolidated Drained Test
- Direct / Residual Shear Test
- CBR Test
- One Dimensional Consolidation Test

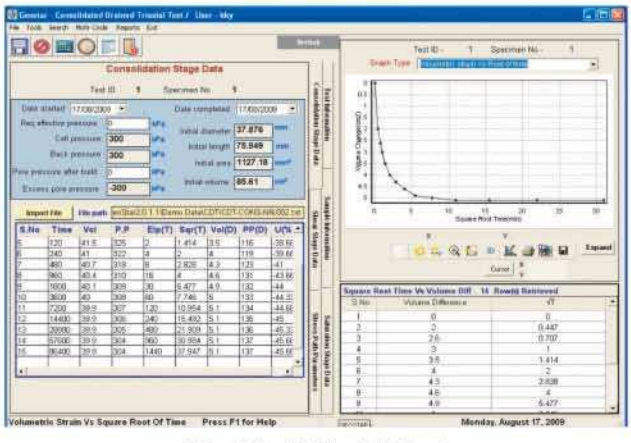
These package of softwares are supplied as required by the purchaser and are accessed by an activation license supplied by Aimil, allowing the customer to build up a suite of software on an "as required basis" depending upon the need.

Common Features for all the tests:

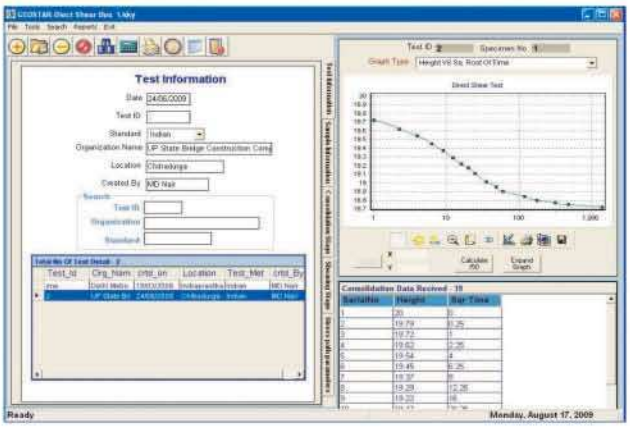
- The Software allows selection of British / Indian Standards for analysis as required.
- Tests can be performed in SI, Imperial or metric Units
- Clear and easy to use. Test information is presented on menu driven screen.
- Each package guides through the test procedure in a very user friendly way.
- A database is set up to store and manage completed analysis records. Currently MS – Access is offered as default database. For other database systems like SQL etc.. such third party license is required to be obtained by the user.
- The software directly reads the data format for analysis from StarDAQ
- An option to enter the data manually and save it in a format understood by "GeoStar" makes the system so flexible for those, who have only the experimental setup without the automatic Data Acquisition or Data logging system.
- Extensive search functions are available based on Date of Analysis, Analysis done by different user accounts, or search based on duration etcc.... For easy retrieval of old data.
- The default reports are generated automatically, in crystal reports and can be printed directly. The reports can also be exported to Word, Excel or pdf formats and the usage is governed by the third party license that are available with the users.
- Customisable Report Header / Footer.
- The inbuilt utilities include Master Unit Converter, Unit conversion Calculator, besides the normal and Scientific system calculators.
- Database back up and restore facilities are available.
- Complete User activity logging is available.



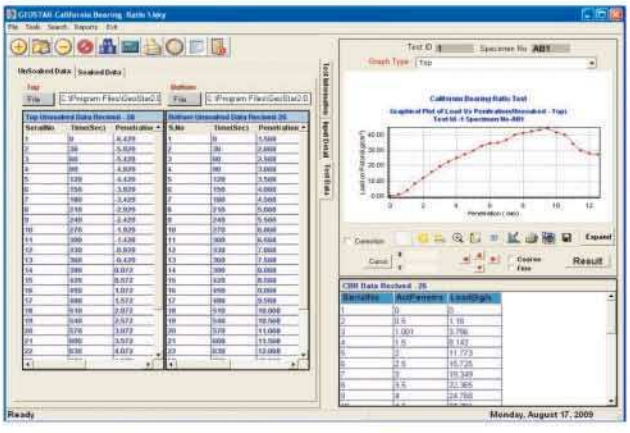
'GeoStar' Welcome Screen



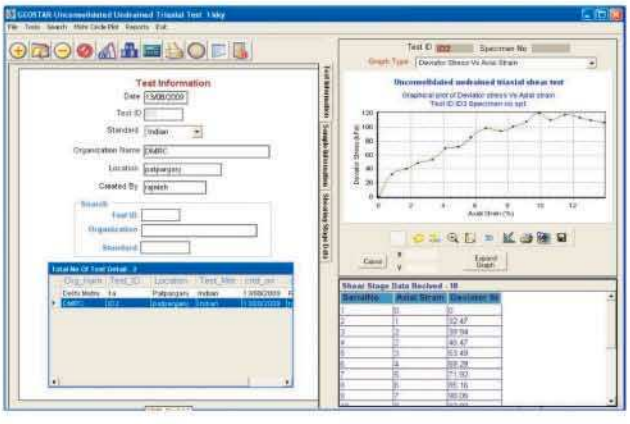
'GeoStar' Triaxial Test



'GeoStar' Direct Shear Test



'GeoStar' CBR Test



'GeoStar' Unconsolidated Undrained Triaxial Test

Analysis and Reporting software module Ordering Information:

AIM 10116 GeoStar Analysis and Reporting software Module for California Bearing Ratio Test for single user license

AIM 10121 GeoStar Analysis and Reporting software Module for Consolidated Undrained Triaxial Test for single user license

AIM1 0122 GeoStar Analysis and Reporting software Module for Unconsolidated Undrained Triaxial Test for single user license

AIM 10123 GeoStar Analysis and Reporting software Module for Consolidated Drained Triaxial Test for single user license

AIM 10124 GeoStar Analysis and Reporting software Module for DirectShear Test for single user license

AIM 10125 GeoStar Analysis and Reporting software Module for One dimensional Consolidation (Odeometer) Test for single user license

Direct Shear

Ref. Standards IS:2720 (Part 13), BS 1377, ASTM D 3080

The Direct Shear test is carried out with an apparatus consisting of a square divided into two halves. The specimen, contained in the box, is subjected to a constant normal load while an increasing horizontal force is applied to one of the sections of the shear box. This force causes a shear failure along the junction between the box sections. The shear force and the normal load are measured directly. The rate of strain is adjusted by the speed of the horizontal force applied. The loading unit has V-strips on which the shear box housing rests. Suitable for specimens of size 60×60×25mm.

The precalibrated load yoke helps counter balance the loading system. The load yoke with direct and through lever system for applying normal load upto 3 kg/cm^2 capacity, fixtures for proving ring, brackets for holding consolidation and strain dial gauges are provided. The lead screw connected to the shear box housing helps application of shear stress.

Suitable for operation on 220V, 50Hz, Single phase, AC Supply.

AIM 104

Models offered are :

AIM 104 Direct Shear apparatus, 2 kN

Ref. Standards IS :11229, 2720 (Part 13)

Type of Shear : Direct / Residual Measurement

Operation : Motorised

Rates of Strain (mm/min) : 1.25, 0.625, 0.25, 0.125, 0.05, 0.025, 0.01, 0.005, 0.002, 0.001, 0.0004, 0.0002

Specimen Size : 60 x 60 x 25 mm

The equipment consist of the following replaceable parts :

AIM 10401 Shear Box Assembly

This assembly comprises of :

AIM 1040101	Halves of the Shear Box	2 Nos.
AIM 1040102	Plane Gripper Plate	2 Nos.
AIM 1040103	Perforated Gripper Plate	2 Nos.
AIM 1040104	Porous Stone	2 Nos.
AIM 1040105	Top Loading Pad	1 No.
AIM 1040106	Base Plate	1 No.

AIM 10402 Shear Box Housing with two linear bearing case with steer — 1 No.

AIM 10405 Specimen Cutter — 1 No.

AIM 10410 Surcharge Weights to attain normal stress of 3 kg/cm^2 — 1 Set

This surcharge weight set comprises of following weights :

0.05 kg/cm^2	:	4 Nos.
0.10 kg/cm^2	:	1 No.
0.20 kg/cm^2	:	1 No.
0.50 kg/cm^2	:	3 Nos.
1.00 kg/cm^2	:	1 No.

AIM 284 Compression - Tension Proving Ring, 2 kN capacity — 1 No.

AIM 072 Dial Gauge 0-25 × 0.01mm — 2 Nos.

AIM 105 Direct Shear Test Apparatus, Electronic, 2kN

Ref. Standards IS:2720 (Part 13), IS:11229

Salient Features :

- Digital readout minimises operator error.
- Reduces operator time and involvement.
- Direct reading in engineering units.
- Pre-calibrated before despatch.
- Plug-in transducer module system.

The apparatus is similar to AIM 104 model but it is supplied with the AIM 10501 Electronic Outfit, in place of Proving Ring and Dial Gauges.

AIM10501 Direct/Residual Shear Electronic Conversion Kit

As per BS/ASTM is also available.

This Kit consists of :

AIM 1050101	**Digital Indicator**		1 No.
Mode of Display	:	Micro controller multi line alpha numeric VFD display for all simultaneous channel (No need for channel selection)	
AIM 1050102	**Load Cell**		1 No.
Capacity	:	2 kN Universal Type, TCPR with 3 meter long cable without hooks.	
Max. overload	:	110% of the rated capacity.	
Sensing element	:	Strain Gauges in full bridge configuration.	
AIM 1050103	**Displacement Sensor**		2 Nos.
Range	:	± 20 mm. Displacement sensor with 3 meter long cable	
Sensing element	:	LVDT	

AIM 105

AIM 105-1 Direct Shear Outfit, Electronic, 2kN, complete with Aimil 'StarDAQ' System.

Type of Shear Measurement:		Direct / Residual.
Operation	:	Motorised.
Rate of Strain	:	12 speeds ranging from 0.002 mm / min. to 1.25 mm /min.
Specimen size	:	60 X 60 X 25 mm

The equipment consist of the following replaceable parts :

AIM 10401	Shear Box.	1 Set
AIM 10402	Shear Box Housing with two linear bearing case with steer ball	1 No.
AIM 10405	Specimen cutter.	1 No.
AIM 10410	Weight set to attain normal strain of 3 Kg / cm^2 .	1 Set
AIM 10501	Direct / Residual Shear, Electronic Conversion kit.	1 Set
AIM 101	StarDAQ & GeoStar.	1 No.
AIM 10124	Direct Shear Test Software.	1 Set

AIM 105-2 Direct Shear Outfit, 2kN, with Microprocessor loading unit, Electronic

Ref: Standard IS : 2720 (Part XIII); ASTM D3080; BS 1377

The Loading head with motor drive system, enclosed in a robust case, contain integral measurement electronics for the measurement of load, vertical and horizontal displacements has been designed for floor mounting. Supplied complete with carriage, loading hanger and 10:1 lever loading device. Suitable for specimens of size 60×60×25mm.

Safety forward and reverse travel limit switches are fitted as standard and monitored through the electronics system control.

The parameter entry through a membrane keypad and the 40×2 LCD display provide the user utmost comfort and simplicity in operation allows the user a host of features, which include pause and speed reset during a test, RS232 for computer control, self diagnostics and many others. A return to start datum provides a positive means of reversing the shear box when either preparing for a new test or continuing with residual testing procedures. The stepper drive mechanism uses a microprocessor to achieve a precision loading rate of 0.00001 to 9.99999mm / minute.

Suitable for operation on 220 V, 50 Hz, Single phase, AC Supply.

Salient Features :

- Microprocessor control
- Large on-board 40×2 line LCD screen display
- Direct data entry via membrane key pad.
- Rapid approach and return to start datum
- Fully variable speed, 0.00001 to 9.99999mm/minute
- Accepts specimen 60mm square

AIM 105-2

Specifications :

Integrated Measurement Electronics :

Mode of Display : Micro controller multi line alpha numeric VFD display for all simultaneous channel (No need for channel selection)

Transducers

Load : Universal type load cell, 2kN capacity 1 No.

Displacements : LVDT with measurement range +/–20mm travel, 2 Nos.

Speed Range

Standard Speeds : 0.00001 to 9.99999 mm / minute

Fast forward/reverse : 10mm / minute

AIM 106 Large Direct Shear Apparatus, Motorised, 50 kN

Ref. Standards IS:2720 (Part 39, Section 1) IS:11593
For testing sands, gravel, gravelly clays and clay gravels for use in rolled fill embankments.

Operation : Motorised
Rates of Strain : 72 speeds ranging from 0.0014 to 10.16 mm/min.
Specimen Size : 30 x 30 x 15 cm
Change gears : 12
Shear Load capacity : 50 kN
Vertical stress : 500 kN/m^2
Suitable for operation on 415V, 50Hz, Three phase, AC Supply.

The equipment consist of the following replaceable parts :

AIM 10601	Shear Box Assembly	1 No.
This assembly comprises of :		
AIM 1060101	Plane Gripper Plate	2 Nos.
AIM 1060102	Perforated Gripper Plate	2 Nos.
AIM 1060103	Perforated Spacer Plate	2 Nos.
AIM 1060104	Base Plate	1 No.
AIM 1060105	Top Loading Pad	1 No.
AIM 10607	Shear Box Housing with two Ball Roller Strips	1 No.
AIM 10605	Surcharge Weights 9 Nos, each to give 50 kN/m^2 (0.5 kg/cm^2) and 2 Nos, each to give 25 kN/m^2 (0.25 kg/cm^2)	1 Set
AIM 272	Proving Ring capacity 50 kN Compression	1 No.
AIM 072	Dial Gauge 25 mm travel, 0.01 mm least count (for Consolidation & Shear Strain)	2 Nos.
AIM 10610	Magnetic Stand for Shear Strain Dial Gauge	1 No.

Ordering Information :

AIM 104	Direct Shear apparatus, 2 kN
AIM 105	Direct Shear Test Apparatus, Electronic, 2kN
AIM 105-1	Direct Shear Outfit, Electronic, , 2kN complete with Aimil 'StarDAQ' System.
AIM 105-2	Direct Shear Outfit, , 2kN, with Microprocessor loading unit Electronic
AIM 105-3	Direct Shear Outfit, , 2kN, with Microprocessor loading unit Electronic with StarDAQ & GeoStar
AIM 106	Large Direct Shear Apparatus, Motorised, 50 kN

As per BS/ASTM is also available.

Vane Shear

Vane Shear Tests are conducted where it is difficult to obtain suitable specimens or where intrusion from a sampling tube may cause too much of a disturbance.

The validity of strength test results carried out on soils which have a shear strength in the order of 15kN/m^2 or lower, is very largely dependent on the care and skill with which the operator conducts the test. Disturbance of these types of soft soil, particularly the sensitive clays, takes place when sampling tubes are pushed into them. Experience has shown that carefully controlled compression test results can be related to figures obtained by pushing a small vane into the soil rotating at the controlled rate and measuring the force required to maintain a maximum reading of resistance.

Laboratory Vane Shear Apparatus, Motorised.

Ref. Standard IS:2720 (Part 30)

Consists of a special motor, adjustable in height by means of a lead screw rotated by a drive wheel to enable the vane to be lowered into the specimen. Rotation of the vane is by means of an electric motor turns the upper end of a calibrated torsion spring to give a rotation of 0.1°/sec. The vane shaft is attached through the hollow upper shaft to a resettable pointer which indicates the angle of torque on a dial graduated in degrees. The dial reading multiplied by spring factor gives the torque.

Rate of rotation : 1/60 rpm

Suitable for operation on 220 V, 50 Hz, Single Phase, AC supply.

AIM 108-1

The equipment consist of the following replaceable parts :

AIM 10801	Container	1 No.
AIM 10802	Set of 4 Springs, (one each of capacity 2 kg-cm, 4 kg-cm, 6 kg-cm and 8 kg-cm)	

Ordering Information :

AIM 108-1 Laboratory Vane Shear Apparatus Motorised.

Optional Accessories :

AIM 10803	Stand for use at the site	1 No.

Compaction

Soil compaction is a fundamental requirement for the construction of earth fill for dams, reservoirs, canal embankments, highways, railways and runways. The relationship between soil moisture content and compacted dry density is very useful for deciding construction specifications and quality control of compacted earthfill. While designing a soil retaining structure, the strength and deformation behaviour of soil is evaluated by testing soil specimen compacted to the density as would be achieved during construction. The construction quality control is essentially to check the density of compacted soil achieved in the field, thereby checking its strength.

Compaction Test Apparatus, Manual

Ref. Standards IS:2720 (Part 7), IS:2720 (Part 8) IS:9198, IS:10074, BS:1377 ASTM D 698, D I557

Various models of manual Compaction Test Apparatus are given in table below :

AIM 110

Compaction Test Apparatus, Manual

Cat. No.	Compaction mould, complete with Collar and Base Plate, made of Gunmetal	Rammer	Remarks
AIM 110 Compaction Test Apparatus for light compaction	AIM 11001 100 mm ID, 127.3 mm height 1,000 ml volume	AIM 11002 2.6 kg x 310 mm fall as per IS: 9198	Ref. Standard IS:10074 (Part VII) for light compaction test
AIM 111 Compaction Test Apparatus for heavy compaction	AIM 11101 150 mm ID, 127.3 mm height 2,250 ml volume	AIM 11102 4.9 kg x 450 mm fall as per IS: 9198	Ref. Standard IS:10074 (Part VIII) for heavy compaction test
AIM 112 Proctor Compaction Apparatus as per BS code	AIM 11201 Proctor Mould 105 mm ID, 115.5 mm height 1,000 ml volume	AIM 11202 2.5 kg x 300 mm fall	Ref. Standard BS:1377 for light compaction test.
AIM 112-H Compaction Apparatus for heavy Compaction as per BS code	AIM 11201-H Proctor Mould 152 mm ID, 127 mm height 2305 ml volume	AIM 11202-H 4.5 kg x 450 mm fall	Ref. Standard BS:1377 for heavy compaction test.
AIM 113-L 698/D1557 Compaction Apparatus for light Compaction as per ASTM code	AIM 11301-L Compaction Mould 101.60 mm ID, 116.40 mm height 944 ml volume	AIM 11302-L 2.49 kg x 305 mm fall	Ref. Standard ASTM D for light compaction test
AIM 113 698/D1557 Proctor Compaction Apparatus as per ASTM code	AIM 11301 Compaction Mould 152 mm ID, 116.4 mm height 2,124 ml volume	AIM 11302 4.54 kg x 457 mm fall	Ref. Standard ASTM D for heavy compaction test

Note: Compaction mould complete with collar, baseplate in mild steel, can also be supplied

Universal Automatic Compactor

Ref Standard IS:2720 (Part 7 & 8)

Invariably in every soil laboratory, compaction and penetration tests on soils are carried out regularly. The electrically operated mechanical compaction process eliminates the tedious hand compaction process and results in a considerable saving of time. Two rammers with two different stroke lengths are provided. This makes the apparatus suitable to carry out all the normal compaction operations required in soil testing laboratories including the CBR tests.

This is a new design motor driven mechanical compactor, useful for soil compaction in 100 mm or 150 mm dia moulds. The rammer travels across the mould and the table rotates the mould in equal steps on a stable base. The number of blows per layer can be set at the beginning of the test.

Rammer - circular faced 50mm dia adjustable to 2.6kg or 4.9kg weight.

Drop - Adjustable to 310mm or 450mm.

Supplied with AIM 11001-MS and AIM 11101-MS

The equipment is suitable for operation on 220 V, 50 Hz, Single Phase, AC supply.

Ordering Information :

AIM 114-1	Universal Automatic Compactor with mild steel compaction mould as per IS, Supplied with AIM-11001-MS & AIM-111001-MS
AIM 114-1-BS	Universal Automatic Compactor with mild steel compaction mould as per BS, Supplied with AIM-11201 & AIM-11201-H
AIM 114-1-ASTM	Universal Automatic Compactor with mild steel compaction mould as per ASTM Supplied with AIM-11301-L & AIM-11301

AIM 114-1

Relative Density

Relative density relates the dry density of cohesionless soil to the maximum and minimum densities. The degree of compaction of cohesionless soil can be stated in terms of relative density.

Suitable for operation on 220 V, 50 Hz, single phase, AC supply.

Relative Density Apparatus

Ref Standard IS: 2720 (Pt XIV)

The equipment consist of the following replaceable parts :

AIM 11501	Vibrating Table	
AIM 11502	Cylindrical Metal Unit Weight Mould, 3000ml capacity	1 No.
AIM 11503	Guide Sleeve with clamp assembly, for AIM 11502	1 No.
AIM 11504	Surcharge base plate for AIM 11502	
AIM 11505	Handle for AIM 11504 & AIM 11509	
AIM 11506	Surcharge Weight for AIM 11502. The total weight together with AIM 11504 & AIM 11505 is equivalent to 140g/cm^2 for the mould being used	
AIM 11507	Cylindrical Metal Unit Weight Mould 15000 ml capacity	1 No.
AIM 11508	Guide Sleeve with clamp Assembly for AIM 11507	1 No.
AIM 11509	Surcharge base plate, for AIM 11507	
AIM 11510	Surcharge weight for AIM 11507. The total weight together with AIM 11509 & AIM 11505 is equivalent to 140g/cm^2 for the mould being used	
AIM 11511	Dial Gauge Holder	1 No.
AIM 11512	Calibration Bar, 75x300x3 mm	1 No.
AIM 072	Dial Gauge 25 mm travel, 0.01 mm least count, with an extension piece	1 No.

AIM 115-1

Ordering Information :

AIM 115-1 Relative Density Apparatus

Optional Accessories :

AIM 11513 Weight Handling Equipment

California Bearing Ratio

Ref: Standards: IS : 2720 (Part XVI), BS 1377; 1924; EN 13286-47/ASTM D 1883; AASTHO T 193

The California Bearing Ratio test, (usually called CBR test) is an empirical test developed in California, USA for determining the Relative Bearing Ratio and expansion characteristics under known surcharge weight of base, sub-base and sub grade soils for the design of roads, pavements and runways. The CBR test is used extensively in selection of materials and control of subgrades.

The test can be performed in the laboratory on prepared samples or in-situ on location. It is important to appreciate that this test, being of an empirical in nature, is valid only for the application for which it was developed i.e., the design of highway base thickness.

Salient Features :

- Compact, bench top design
- Rapid Platen Adjustment
- Complete with stabilizing bar
- Options for mechanical or electronic measurement

Suitable for operation on 220V, 50Hz, single phase, AC supply.

AIM 120 Laboratory California Bearing Ratio Test Apparatus, Motorised, Three speed

Ref. Standards IS:9669, IS : 2720 (Part XVI), BS 1377; 1924; EN 13286-47/ASTM D 1883; AASTHO T 193

The equipment consist of the following replaceable parts :

AIM 062-1	Load Frame, 50 kN Capacity, Three Speed 1.5, 1.25 & 2.5 mm/min
AIM 12001-GM	Mould-Gun Metal 150mm IDx175 mm H
AIM 12002-GM	Perforated Base Plate - Gun Metal, for AIM 12001 Mould
AIM 12003-GM	Extension Collar - Gun Metal 150 mm ID x 50 mm high
AIM 12004	Penetration Piston 50 mm face dia
AIM 12005	Adjustable Bracket for Penetration Dial Gauge
AIM 12006	Circular Metal Spacer Disc, with detachable handle, 148 mm dia x 47.7 mm high
AIM 12007	Annular Metal Weight 2.5 kg, 147 mm dia with 53 mm dia central hole
AIM 12008	Slotted Metal Weight 2.5 kg, 147 mm dia, with 53 mm dia slot
AIM 12009	Perforated Plate 148 mm dia, with adjustable stem and lock nut
AIM 12010	Metal Tripod for Dial Gauge
AIM 12011	Cutting Collar
AIM 11002	Rammer 2.6 kg, 310 mm controlled drop
AIM 11102	Rammer 4.9 kg, 450 mm controlled drop
AIM 274	Proving Ring Capacity 50 kN
AIM 072	Dial Gauge 25 mm travel, 0.01 mm least count

AIM 120-MS Laboratory California Bearing Ratio Test Apparatus, Motorised, Two Speed With Mild Steel Moulds

The outfit of this equipment is same as AIM 120 except for the moulds. The mould assembly i.e. mould, perforated base plate and extension collar are made out of Mild Steel (Zinc Plated instead of Gun Metal).

AIM 120-MS

AIM 121 Laboratory California Bearing Ratio Test Apparatus, Motorised, Electronic

Similar to AIM 120, but with AIM 12101 in place of AIM 072 & AIM 274

AIM 12101 Electronic outfit for CBR Test

The equipment consist of the following replaceable parts :

AIM 1210101 **Digital Indicator** 1 No.

Mode of Display : Micro controller multi line alpha numeric VFD display for all simultaneous channel (No need for channel selection)

AIM 1210102 **Load Cell** 1 No.

Capacity : 50 kN Compression Type with 3 m long cable

Maximum overload : 110% of the rated capacity

Sensing : Strain Gauges in full bridge configuration

AIM 1210103 **Displacement Transducer** 1 No.

Range : ±10 mm with 3 m long cable

Sensing element : LVDT

AIM 121-1 Laboratory California Bearing Ratio Test Apparatus, Motorised, Electronics with 'Geostar' & 'StarDAQ'

Similar to AIM 121, but with 'GeoStar' & 'StarDAQ'

AIM 101 'StarDAQ' Data Acquisition Hardware / Software

'StarDAQ' is an integrated hardware/software system, with option upto 16 bit Data Acquisition, for IBM-PC or its compatibles, for acquiring of Geotechnical Test Data for a variety of tests viz. Triaxial, CBR, Consolidation, Direct / Residual Shear etc. The USB connectivity makes the system more user friendly in setting up the operation.

Ordering Information :

AIM 120	Laboratory California Bearing Ratio Test Apparatus, Motorised, Three speed (with GM Mould)
AIM 120-MS	Laboratory California Bearing Ratio Test Apparatus, Motorised, Three Speed (with MS Mould)
AIM 121	Laboratory California Bearing Ratio Test Apparatus, Motorised, Three Speed, Electronics
AIM 121-1	Laboratory California Bearing Ratio Test Apparatus, Motorised, Electronics with StarDAQ & GeoStar

Optional Accessories :

AIM 12014	Annular Metal Weight 5 kg, 147 mm dia with 53 mm dia central hole.
AIM 12015	Slotted Metal Weight 5 kg, 147 mm dia with 53 mm dia slot.
AIM 12016	Soaking Tank for 6 Nos. CBR Moulds
AIM 12101	Electronic outfit for CBR Test
AIM 101	Star DAQ GeoStar
AIM 10116	Analysis software for CBR test

As per BS/ASTM is also available.

Cat. No.	AIM 120	AIM 120-MS	AIM 121	AIM 121-1
AIM 062-1 Load Frame,	1	1	1	1
AIM 12001-GM Mould - Gun Metal	1	1 (MS)	1	1
AIM 12002-GM Perforated Base Plate - Gun Metal,	1	1 (MS)	1	1
AIM 12003-GM Extension Collar - Gun Metal	1	1 (MS)	1	1
AIM 12004 Penetration Piston	1	1	1	1
AIM 12005 Adjustable Bracket	1	1	1	1
AIM 12006 Circular Metal Spacer Disc, with detachable handle,	1	1	1	1
AIM 12007 Annular Metal Weight	1	1	1	1
AIM 12008 Slotted Metal Weight	1	1	1	1
AIM 12009 Perforated Plate	1	1	1	1
AIM 12010 Metal Tripod for Dial Gauge.	1	1	1	1
AIM 12011 Cutting Collar	1	1	1	1
AIM 11002 Rammer	1	1	1	1
AIM 11102 Rammer	1	1	1	1
AIM 274 Proving Ring	1	1	---	---
AIM 072 Dial Gauge	1	1	---	---
AIM 12101 2-Channel Digital Indicator	---	---	1	1
AIM 12102 Load Cell	---	---	1	1
AIM 12103 Displacement Transducer	---	---	1	1

StarDAQ

AIM - 101 'StarDAQ' Aimil Data Acquisition System	---	---	---	1
AIM -10116 Geostar Analysis software Module for CBR test	---	---	---	1

Optional Extra

AIM-12014 Annular Metal Weight				
AIM-12015 Slotted Metal Weight				
AIM-12016 Soaking Tank for 6 Nos. CBR Moulds				

Consolidation

Ref. Standards : IS:2720 (Part-XV), IS:12287, BS:1377, ASTM D2435

Consolidation of clay deposit leads to distress in buildings such as cracks and failures. Consolidation is reduction of volume of soil due to expulsion of water from its pore space caused by sustained loading. This phenomenon is time dependent. The one dimensional consolidation test performed on an undisturbed sample of clay is useful for understanding the history of the soil deposit. The test results can be used for calculating the settlement of structures built on clayey soil.

Consolidation Apparatus :

The standard outfit comprises of a fixed ring type of consolidometer cell for testing specimens of 60 mm dia x 20 mm thick, but the unit is so designed that specimens of varying sizes from 50 mm dia to 100 mm dia can also be tested. Besides, the same loading unit can be used with floating ring consolidometer cells, which are supplied at extra cost.

The standard outfit is supplied with a set of weights to give a total pressure of 10 kg/cm^2 (besides a seating load of 0.05 kg/cm^2 on the specimen), but an additional set of weights is required to reach the full capacity of 20 kg/cm^2.

The necessary accessories to perform the permeability test of the 'Varying Head' type can also be provided at extra cost. The outfits for three-gang and six-gang are available in which three / six consolidometers can be mounted on a single frame. The consolidation may be measured by the conventional dial gauges or using the transducers and electronic readout unit.

Electronic Measurement System :

- Digital readout reduces the possibility of operator error.
- Direct reading in mm.
- Plug-in transducer module system.
- Facility for connecting readout unit to compatible logging or printing system.
- Compatible to existing Aimil Models.

Electronic measurement of the vertical consolidation of soil specimen, using a displacement transducer connected to a precalibrated readout unit, offers the operator all the advantages of a digital display without the errors which can occur while reading conventional dial gauges.

The basic equipment for monitoring the test comprises of a readout unit and a transducer module for connection to a consolidation frame. Consolidation is measured by mounting the transducer in the same position as a conventional dial gauge. The movement of the transducer stem performs exactly the same function as would the dial gauge spindle and the output is converted into an electrical signal. The signal is then displayed in true engineering units on the readout unit. For three gang unit or six gang unit, 3 or 6 transducer modules are used, but the readout unit is of three or six channel type.

AIM 125

AIM 126

AIM 125-1

AIM 126-1

Ordering Information :

AIM 125	Consolidation Apparatus, Single gang
AIM 125-1	Consolidation Apparatus, Single gang, New Bench Model, Analogue
AIM 126	Consolidation Apparatus, Three gang
AIM 126-1	Consolidation Apparatus, Three gang, New Bench Model, Analogue
AIM 127	Consolidation Apparatus, Single gang, Electronic
AIM 127-1	Consolidation Apparatus, Single gang, Electronic with StarDAQ & Software
AIM 127-2	Consolidation Apparatus, Single gang, New Bench Model, Electronic
AIM 127-3	Consolidation Apparatus, Single gang, New Bench Model, Electronic with StarDAQ & GeoStar
AIM 129	Consolidation Apparatus, Three gang, Electronic
AIM 129-1	Consolidation Apparatus, Three gang, Electronic with StarDAQ & Software
AIM 129-2	Consolidation Apparatus, Three gang, New Bench Model, Electronic
AIM 129-3	Consolidation Apparatus, Three gang, New Bench Model, Electronic with StarDAQ & GeoStar

As per BS/ASTM is also available.

Optional Extras :

	Specimen Size			
	60mm dia x 20mm thick	50mm dia x 20mm thick	70mm dia x 20mm thick	100mm dia x 25mm thick
Consolidation Cell Assembly : Complete with Fixed Ring, Guide Ring, Pair of Porous Stones, Perforated Pressure Pad, Chanelled Base, Gasket and Flanged Water Jacket	AIM 12502	AIM 12511	AIM 12512	AIM12513
Set of Weights to give 10 kg/cm^2 Pressure (Comprising 29 assorted weights)	AIM 12520	AIM 12521	AIM12522	AIM 12523
Floating Ring type Consolidometer : Consolidation Cell Assembly complete with Fixed Ring and Guide Ring, Pair of Porous Stones, Pressure Pad and Cutting Collar	AIM 12530	AIM 12531	AIM 12532	AIM 12533
Set of Weights to give 10 kg/cm^2 Pressure (Comprising 10 weights of 1.0 kg/cm^2)	AIM 12540	AIM 12541	AIM 12542	AIM 12543
Varying Head Stand Pipe 50 cm long with mm scale	AIM 12550	AIM 12550	AIM 12550	AIM 12550
Water Trough	AIM 12560	AIM 12560	AIM 12560	AIM 12560
Specimen Cutting Ring	AIM 12570	AIM 12571	AIM 12572	AIM 12573

Consolidation Apparatus : The constituents of various models are detailed in the table.

	AIM 125 Single gang	AIM 126 3-gang	AIM 127 Single gang Electronic	AIM 129 3-gang Electronic	AIM 127 - 1 Single gang Electronic with StarDAQ & Software	AIM 129 - 1 3 - gang Electronic with StarDAQ & Software
No. of Loading Units mounted on frame	1	3	1	3	1	1
AIM12502 Consolidation Cell Assembly consists of the following :						
AIM 1250201 Fixed ring with Guide ring	1	3	1	3	1	3
AIM 1250202 Top Porous stone	1	3	1	3	1	3
AIM 1250203 Bottom Porous stone	1	3	1	3	1	3
AIM1250204 Pressure Pad	1	3	1	3	1	3
AIM 1250205 Channelled base with water inlet	1	3	1	3	1	3
AIM 1250206 Gasket	1	3	1	3	1	3
AIM 1250207 Water Jacket	1	3	1	3	1	3
AIM 12503 Set of weights : 7 x 0.05 kg/cm^2 5 x 0.1 kg/cm^2, 6 x 0.2 kg/cm^2, 6 x 0.5 kg/cm^2, 5 x 1.0 kg/cm^2	1	3	1	3	1	3
AIM 12504 Water Reservoir with plastic tube, T - connection and a pinch cock	1	3	1	3	1	3
AIM 070 Dial Gauge, 5 mm travel, 0.002 mm least count	1	3	-	-	-	-
Electronic Instrumentation System						
AIM 12801 Displacement sensor, 0-10mm complete with 3 m long cable (side entry) mounting bracket			1	3	1	3
AIM 12802 Consolidation Indicator, Single channel	-	-	1	-	1	-
AIM 13001 Consolidation Indicator, Three channel	-	-	-	1		1
StarDAQ						
AIM 101 Data Acquisition System		-	-	-	1	1
AIM 10125 Consolidation (Oedometer) Test Software			-	-	1	1

Note : Consolidation Apparatus with six cell will be provided on request.

Permeability

Permeability is a property of soil which permits flow of water through its interconnecting voids. Permeability is an important engineering property which governs the rate of settlement of saturated compressible soil layers and the rate of flow of aquifer. Permeability is taken into account for pumping ground water, spacing well points for de-watering foundation sites for excavation, retention of water in reservoirs, design of dams and selection of soils to be used for various zones of embankments of dams and reservoirs.

Coefficient of permeability can be computed from effective diameter of particles, porosity, specific surface and from consolidation test results. But permeability depends on numerous factors; hence, determination of permeability by direct laboratory method using an apparatus called Permeameter is considered more accurate. Specimen used in a permeameter is small, time taken is less and results obtained are accurate.

There are two types of Permeameters, namely Constant Head Permeameter and Falling Head Permeameter. Falling Head Permeameters are used for testing remoulded or undisturbed fine grained soil having less than 10^{-2} cm/sec coefficient of permeability and Constant Head Permeameters are used for coarse grained cohesion less soils.

Permeability Apparatus :

Ref. Standards IS:2720 (Part 17), IS:11209

Laboratory Permeability Apparatus (Falling Head method)

For testing soil with coefficient of permeability in the range of 10^{-3} to 10^{-7} cm / sec and maximum particle size of 10 mm.

The equipment consist of the following replaceable parts :

AIM 13101 Stand with three glass tubes of 6 mm, 10 mm and 20 mm dia approx.

AIM 13102 Metallic Mould 100 mm dia x 127.3 mm height, 1000 ml volume.

AIM 13103 Extension Collar 100 mm dia x 60 mm height.

AIM 13104 Drainage Base Plate with a recess for Porous Stone and an Outlet Valve.

AIM 13105 Metallic Clamping Ring

AIM 13106 Drainage Cap with recess for a Porous Stone and fitted with Inlet Valve and Air Release Valve.

AIM 13107 Dummy Plate to serve as False Bottom during compaction.

AIM 13108 Porous Stone for Drainage Base Plate.

AIM 13109 Porous Stone for Drainage Cap

AIM 13110 Rubber Connection Tube 3m long, with Pinch Cock

AIM 131

Ordering Information :

AIM 131 Laboratory Permeability Apparatus

Optional Accessories :

AIM 13111 Overhead Tank required for the constant Head method made of steel, approx. 37.5 cm dia and 1m high. It is provided with an inlet port at the top, six outlets at the bottom with cocks, air inlet and water filling tube at the top. An arrangement to indicate the water level is also provided.

AIM 11002 Rammer 2.6 kg X 310 mm controlled fall

AIM 11102 Rammer 4.9 kg X 450 mm controlled fall

As per BS is also available.

Swell Pressure

More than 20% of India's surfacial deposits consist of expansive black cotton soil having swelling pressure, varying from 1 kg/cm^2 to as high as 3.5 kg/cm^2. These soil deposits heave considerably when they get wet and lose shear strength. Thus it is important to know about this property of the swelling soil at a given site specially where projects on roads, railways, irrigation, buildings, etc. are envisaged. Aimil provides the instrument required for determining this parameter.

Swell Test Apparatus

It is designed to determine the swelling pressure developed by soil specimens moulded to desired densities at known moisture contents, when soaked in water. The load applied to restrain the swelling is transferred on to a load measuring proving ring through a perforated swell plate and a load transfer bar. The proving ring is attached to the lead screw of hand operated load frame. A soaking tank is provided for saturating the specimen and the base of the mould provided has channels and radial grooves with connecting holes.

AIM 132

The equipment consist of the following replaceable parts :

AIM 13207	Load Frame, Hand operated, Capacity 5 kN
AIM 11001	Mould 100 mm dia x 127.3 mm height (1,000 ml volume) with base plate and collar.
AIM 265	Proving Ring, 2.5 kN capacity.
AIM 072	Dial Gauge 25 mm travel, 0.01 mm least count.
AIM 13201	Perforated Swell Plate 100 mm dia x 16 mm thick.
AIM 13202	Spacer 100 mm dia x 12.7 mm thick.
AIM 13203	Pair of Porous Stones 100 mm dia x 12.7 mm thick.
AIM 13204	Load Transfer Bar
AIM 13205	Steel Ball
AIM 13206	Soaking Tank, 250 mm dia x 210 mm high

Ordering Information :
AIM 132 Swell Test Apparatus

Standard Penetration

Standard Penetration Test Set

Ref. Standards IS:2131, IS:9640

Standard Penetration Test is a powerful tool for measuring the penetration resistance of the ground and for relating it to the degree of compactness of cohesionless soil and consistency of cohesive soil. The results can be used for design of foundations. SPT is widely used for measuring the undisturbed strength of the soil and for assessing its resistance to liquefaction due to ground vibrations caused by earthquakes or other dynamic forces.

The Standard Penetration Resistance is measured as the number of blows 'N' required to drive a split spoon sampler to a depth of 300 mm using a 65 kg weight falling freely through a height of 750 mm.

The equipment consist of the following replaceable parts :

AIM 016	Split Spoon Sampler 50.8 mm OD and 38 mm ID.	1 No.

This sampler consists of :

AIM 01601	Body split lengthwise.
AIM 01602	Shoe hardened with an inside cutting edge.
AIM 01603	Head fitted with a ball check valve and adapter to connect 'A' type drill rod.

AIM 019 - 1	Drive Weight Cast Iron, 63.5 kg, 78 mm bore ID approx.	1 No.
AIM 021	Guide Pipe Assembly Bore 73 mm OD approx.	1 No.
AIM 022	Tripod with Pulley and built-in Ladder.	1 No.
AIM 02404	'A' Type Drill Rods 0.5 mtrs.	2 Nos.
AIM 13301	Manila Rope 19mm dia 10 m	1 No.

Optional Accessories :

AIM 017	Split Spoon Sampler with Brass Liner, 50.8 mm OD and 35 mm ID

This sampler consists of :

AIM 01701	Body split lengthwise.
AIM 01702	Shoe hardened with an inside cutting edge.
AIM 01703	Head of split spoon sampler with adapter to connect A-type drill rod.
AIM 01704	Brass Liner.

Ordering Information :

AIM 133	Standard Penetration Test Set (with AIM 016, AIM 019-1, AIM 021, AIM 022, AIM 02404 & AIM 13301

Dynamic Cone Penetration

Dynamic Cone Penetration Test Apparatus

Ref. Standard IS:4968 (Part - 1)

For determining the resistance of different types of soil strata to dynamic penetration of a 50 mm cone and thereby obtain an indication regarding their relative strength or density or both. The method helps reconnaissance survey of large area in a short time.

In some cases, especially if the depth is great, it may be difficult to pull out the cone after the completion of the test. Hence the cone without threads should be used in case of deep soundings as it may be left in the ground. For shallow depths, generally upto 15 m, if the conditions permit, the cone with threads may be used.

The equipment consist of the following replaceable parts :

AIM 13401	Dynamic Cone plain 50 mm base dia and cone angle of 60°
AIM 13402	Cone Adapter which fits on AIM 13401 Cone, with standard threads for type 'A' drill rod coupling
AIM 13403	Dynamic Cone threaded for type 'A' rod coupling, 60° cone angle, 50 mm base dia
AIM 13404	Stand for keeping the rods vertical
AIM 022	Tripod with built-in ladder- 1No.
AIM 019	Drive Weight Steel 65 kg Bore 45 mm ID approx. 1No.
AIM 021 - 1	Guide Pipe Assembly 43 mm OD approx. 1No.
AIM 02402	'A' Type Drill Rods 1mtr
AIM 13301	Manila Rope 19mm dia 10m

AIM 019-1 & AIM 021

Ordering Information :

AIM 134	Dynamic Cone Penetration Test Apparatus

Static Cone Penetration

Dutch Sounding Methods

Ref. Standard IS:4968 (Part 3)

- Provides essential information for Foundation Engineers.
- Reduces cost of expensive boring and sampling.
- Precise control for sounding speed (Engine Driven Model).

Extensive use of Static Cone Penetrometers originated in Holland where buildings are constructed in areas mostly reclaimed from the sea-bed. In the recent past, a number of research projects in the country have been undertaken in order to correlate Static Cone Test results with the Standard (Dynamic) Penetration Test results, resulting in widely different correlation factors depending upon local geological history.

The Static Cone Penetration Test is also found to be a handy tool for predetermining the length and estimating the load carrying capacities of piles passing through soft compressible strata and resting upon hard clays, sands or gravel. The penetration resistance of the cone has nearly the same value as the load which can be carried by the actual pile per unit area of the pile tip. By using the additional friction jacket with the standard equipment, identification of various soil types is also possible.

To use the Static Cone Penetrometer, a truncated steel cone (60° angle, 10 cm^2 at base) is forced vertically into the soil by static thrust, required to cause a bearing capacity failure of the soil immediately surrounding the point where measurements are required to be made.

Such measurements made at suitably desired intervals, provide a continuous bearing capacity profile and hence a shear strength profile of the soil at the sounding location.

The cone point is advanced with a two rod system. The outer casing protects the inner rod from soil friction and buckling. The protected inner rod advances the cone during the sounding operation and the pressure is measured on pressure gauges. The friction jacket helps in obtaining additional information like static soil friction (skin friction) against the steel sleeve. Two types of mantle tubes each 1 m long are available.

The mantle tube with uniform dia of 36 mm enables the determination of total cumulative skin friction of the soil in addition to the cone resistance. If cone resistance is the main requirement and cumulative skin friction is not to be measured, then mantle tubes of non-uniform dia are to be used.

The judicious combination of both types of tubes would be an ideal one, the number of each depending upon local geological history.

AIM 135

Static Cone Penetrometer 30 kN (3,000 kgf) Capacity, Hand Operated

Ref. Standard IS:4968 (Part-3)

The drive is made possible with the help of a rack and pinion driven manually through a gearing arrangement. The gear box and pinion are fixed on two handles. sprockets and chain arrangement. The movement of the rack is guided by a bracket (attached on the rack) and two pillars. The penetration resistance i.e. the pressure, is indicated on hydraulic gauges through a hydraulic measuring head. Two pressure gauges of 15 cm dia dial and capacities 0-160 kg/cm^2 are provided. An automatic cut-off valve, to protect the low capacity gauge from being overloaded, is also provided. The valve can be adjusted and locked at desirable values between 20 to 60 kg/cm^2.

A provision is made to anchor the unit to the ground (with the help of four anchors supplied with the unit) and there is also a provision for lateral movement of the unit, so that subsequent tests can be performed without shifting the entire anchorage. A 10 cm^2 penetration cone with friction jacket is provided along with fifteen mantle tubes (non-uniform) having an effective length of I m each with sounding rods for finding out the cone (point) resistance or jacket friction.

The equipment consist of the following replaceable parts :

AIM 13501	Penetration Cone steel, 60° angle, 10 cm^2 base area, with friction jacket	1 No.
AIM 13502	Mantle Tube non-uniform 36 mm OD at the two ends and reduced dia in between with sounding rod, working length 1m	15 Nos.
AIM 13504	Load Measuring Head with Automatic Cut-off Valve, and Oil Can without Pressure Gauges	1 No.
AIM 13505	Pressure Gauge 0-160 kg/cm^2	1 No.
AIM 13506	Pressure Gauge 0-60 kg/cm^2	1 No.
AIM 13507	Screw Anchor with Bolt	4 No.
AIM 13508	Anchor Driving Handle	1 No.
AIM 13509	T-Rod	1 No.
AIM 13510	Spanner	1 No.
AIM 13511	Extension Pipe 0.5 m long for Anchor Driving Handle	1 No.

Note : Mantle Tubes with uniform diameter can be ordered at extra Cost.

Ordering Information :

AIM 135 Static Cone Penetrometer 30 kN (3,000 kgf) Capacity, Hand Operated

Static Cone Penetrometer Capacity 100 kN (10,000 kgf) (Engine Driven)

Ref. Standard IS:4968 (Part 3)

For reaching greater depths and to facilitate easy and constant rate of penetration of 1 to 2.5 cm/sec of the cone, the engine-driven Static Cone Penetrometer of 100 kN (10,000 kgf) capacity is preferable.

The equipment consists of a hydraulic pump driven by a Diesel Engine. The whole system is mounted on a towable trolley fitted with pneumatic wheels. The pumping unit and ram are connected by means of flexible pipes through a direction control valve. The hydraulic ram moves on a two pillar stand mounted on a trolley.

The equipment consist of the following replaceable parts :

AIM 13601	Penetration Cone steel, 60° cone angle, 10 cm^2 base area, with friction jacket -	1 No.
AIM 13602	Mantle Tube 36 mm uniform OD with Sounding Rod working length 1 m	30 Nos.
AIM 13603	Load Measuring Head with Automatic Cut-off Valve, and Oil Can without Pressure Gauges	1 Nos.
AIM 13604	Pressure Gauge 0-600 x 5 kg/cm^2	1 Nos.
AIM 13605	Pressure Gauge 0-100 x 1 kg/cm^2	1 Nos.
AIM 13606	Trusses	2 Nos.
AIM 13607	Screw Anchor 45 cm	6 Nos.
AIM 13608	Screw Anchor 30 cm	6 Nos.
AIM 13609	Screw Anchor 20 cm	6 Nos.
AIM 13610	Screw Anchor Rod with Cone	6 Nos.
AIM 13611	Driving handle for Screw Anchor	1 No.
AIM 13612	Extension Pipe for Handle	4 Nos.
AIM 13613	Clamping Screw with Nuts	6 Nos.
AIM 13614	Extractor Tube with Connector	1 No.
AIM 13615	Tool Box	1 No.

AIM 136

Ordering Information :

AIM 136 Static Cone Penetrometer Capacity 100 kN (10,000 kgf) (Engine Driven)

Static Cone Penetrometer Capacity 200 kN (20,000 kgf) (Engine Driven)

20 ton capacity static cone penetrometer machine with standard accessories for 30 meter depth. Digital read out for load and displacement. 12 volt electronics operated sensors and transducers. Hydraulic Operated anchor driving system provided.

Technical Specifications :

It is trailor mounted machine with two wheel properly aligned and can be towed with any vehicle to field area.

It has 8 points anchoring system with independent hydraulic motor driving control valve fitted on movable driving assembly.

PRIME MOVER: 20 HP air cooled diesel engine from Kirloskar model DA-20 mounted on anti vibration pad.

HYDRAULIC CYLINDERS: Two cylinders having 100mm ID and 1100 mm stroke working simultaneously. To achieve optimum load required.

MASTER CONTROL PANEL: Located at front of the cylinders and driving unit. It has digital read out panels for Load applied on cone and displacement in mm along with directional control valves, pressure relief valves and pressure gauges.

DISPLACEMENT SYSTEM: It is digital system to check the travelling of cone in the soil in millimeters. The whole electronics system is operated by 12 volt DC battery provided with engine.

The equipment consist of the following replaceable parts :

AIM 136-2001	Mantle tube with sounding rod 1 mt. length	30 Nos.
AIM 136-2002	Hyd. motorised Anchor driving Assly	1 No.
AIM 136-2003	Anchors 150 mm dia	8 Nos.
AIM 136-2004	220 mm dia	8 Nos.
AIM 136-2005	350 mm dia	8 Nos.
AIM 136-2006	Anchor pipes	8 Nos.
AIM 136-2007	Anchors bottom shoe bolt.	8 Nos.
AIM 136-2008	Locking Bolts	8 Nos.
AIM 136-2009	Mantle tube extractor assembly	1 No.
AIM 136-2010	Penetration Cone with friction jacket	1 No.
AIM 136-2011	Pin for Static load checking	1 No.
AIM 136-2012	Tarpauline cover	1 No.
AIM 136-2013	Load cell with digital indicator	1 No.

AIM 136-20

Ordering Information :

AIM 136-20 Static Cone Penetrometer Capacity 200 kN (20,000 kgf) (Engine Driven)

AIM 136-2010 Penetration Cone with friction jacket.

Optional Accessories :

AIM 136 2010 Penetration Cone Steel, 60^0 Cone angle, $10cm^2$ base area, with friction jacket.

AIM 136 2001 Mantle Tube, 36 mm uniform OD with Sounding Rod, working length 1 m

Field Vane Shear

Ref. Standard IS:4434

This apparatus is designed for conducting in-situ Vane Shear test from the bottom of bore hole in saturated cohesive deposits, for determining their in-place shearing resistance.

The equipment consists of a torque applicator assembly mounted on a base. A gear wheel, which is marked in degrees, holds a torque ring and is geared to a crank.

The torque ring has a section cut from it and deforms as torque is applied and the resultant deformation is indicated by a dial gauge. A pointer is provided for registering the rotation of the vane.

A detachable stand is provided to anchor the instrument. An attachment to securely hold the string of rods is provided.

A calibration curve to convert the dial gauge readings to kg-cm of torque is also supplied.

AIM 138

The equipment consist of the following replaceable parts :

AIM 13801	Torque Applicator Assembly, Capacity 2,000 kg-cm. Complete with stand	1 No
AIM 13802	Vane (with Vane Rod), 37.5 mm dia x 75 mm high	1 No
AIM 13803	Vane (with Vane Rod), 50 mm dia x 100 mm high	1 No.
AIM 13804	Torque Rod (Square cross section) 60 cm long	1 No.
AIM 13805	Rods (Quick coupling type) I m long	25 Nos.
AIM 13806	Rods (Quick coupling type) 0.5 m long	10 Nos.

Ordering Information :

AIM 138	In-situ Vane Shear Test Apparatus

Optional Accessories :

AIM 13808	Vane (with Vane Rod), 65 mm dia x 130 mm high
AIM 13809	Vane (with Vane Rod), 75 mm dia x 150 mm high
AIM 13810	Vane (with Vane Rod), 100 mm dia x 200 mm high
AIM 13811	Guide with ball bearing arrangement, for alignment of the string of rods, for use with 10 cm casing pipe
AIM 13812	Guide with ball bearing arrangement, for alignment of the string of rods, for use with 15 cm casing pipe

The drilling equipment and casing for borehole and jacking arrangement which are required for performing the test, do not form part of the above outfit.

Deformation Modulus

Pressuremeter :

Conventional methods, like Standard Penetration Test, Static Cone Test, Dynamic Cone Test, etc. are well established and do reflect the maximum strength of a given layer of soil, but they give no idea of stress deformation behaviour of the concerned layer. Pressuremeter test fills this void.

Description :

The pressuremeter is an instrument for "in-situ" measurements of soil load / deformation parameters.

It consists of two main components :

Probe

A cylindrical metal body covered over its whole length by a radially deformable cover after initially covering the central section with a rubber membrane, thus forming three independent cells.

The central cell or measuring cell is filled with water under controlled pressure from the volumeter whilst the other two guard cells are inflated with gas automatically maintained at a slightly lower pressure.

Volumeter :

A fibre glass box with a front panel, on which are fixed various regulators, pressure gauges, valves, etc. Within the box is the volumeter which contains the central measuring cell; the volume variations during the test are read on the sight tube. The range of pressure is 0 to 80 bar. The pressure is supplied from a compressed gas cylinder.

The Volumeter is connected to the probe by what appears to be a single flexible plastic tubing which in fact contains two coaxial tubings.

Procedure :

The Probe is placed within a previously drilled borehole at the desired elevation. However, in certain types of soil below the water table, it can be driven directly provided it is protected by a special "slotted pipe".

Pressure is then applied in equal increments and the corresponding volume variations noted at 30 and 60 sec. By plotting volumes at each increment versus pressure, an in-situ stress-strain curve is obtained.

The test is fully described in the Ponts and Chaussees manual 'Test Procedure n* MS IS:2' (French equivalent to ASTM) and in IS:1892.

Results :

The 'limit pressure P_L' or pressure at which failure occurs, reflects directly on the bearing capacity; with 'modulus of deformation E', the settlements can be calculated.

Applications :

An efficient and economical tool for the evaluation of most ground engineering problems and in particular :

- bearing capacity of shallow and deep foundations, piles or caissons
- settlement calculations of all foundations
- determination of earth pressures on retaining structures
- behaviour of laterally loaded piles

Pressuremeter type 'GA' 80 bar capacity (AX Probe Outfit)

The equipment consist of the following replaceable parts :

AIM 14101	Control Panel complete with 100 bar pressure Gauges and Pressure Regulator	1 No.
AIM 14102	Coaxial Connector	1 No
AIM 14103	Coaxial High Pressure Hose with End Connectors (for pressure upto 80 bar)	1 No.
AIM 14104	Coaxial Nylon Hose with End Connectors (for pressure upto 25 bar)	1 No.
AIM 14105	Connecting Rod	1 No.
AIM 14106	Drill Rod, 1 m long	15 No.
AIM 14107	Pressure Inlet Hose with End Connectors	1 No.
AIM 14108	Bentonite Pump hand operated complete with Hoses	1 No.
AIM 14109	Swivel Handle	1 No.
AIM 14110	Thumb Spanner	2 Nos.
AIM 14111	Wheel Top	2 Nos.
AIM 14112	Plate Jig	1 No.
AIM 14113	AX Probe without rubber parts	1 No.
AIM 14114	Inner Membrane for AX Probe	3 Nos.
AIM 14115	Metallic Cover for AX Probe	3 Nos.
AIM 14116	Rubber Cover for AX Probe	3 Nos.
AIM 14117	'O' Ring for AX Probe (Pair)	3 Nos.
AIM 14118	AX Probe Crown	1 No.
AIM 14119	AX Size Auger	2 Nos.
AIM 14120	Plain Pressure Testing Pipe for AX Probe	1 No.
AIM14121	Perforated Pressure Testing Pipe for AX Probe (Set)	1 No.

AIM 141

Ordering Information :

AIM 141 Pressuremeter type 'GA'
80 bar capacity (AX Probe Outfit)

Optional Accessories : (To be ordered extra)

AIM 14125 Casing Pipe for AX Probe, 1.5 m long (10 Nos. required)

AIM 14126 Casing Shoe for AX Casing

AIM 14128 Carbon-Dioxide Cylinder 4.5 kg

Pressuremeter type 'GA' 80 bar Capacity (BX Probe Outfit)

The equipment consist of the following replaceable parts :

AIM 14101	Control Panel complete with 100 bar Pressure Gauges and Pressure Regulator	1 No.
AIM 14102	Coaxial Connectors	1 No.
AIM 14103	Coaxial High Pressure Hose with End Connectors (for pressure upto 80 bar)	1 No.
AIM 14104	Coaxial Nylon Hose with End Connectors (for pressure upto 25 bar)	1 No.
AIM 14105	Connecting Rod	1 No.
AIM 14106	Drill Rod 1 m long	15 Nos.
AIM 14107	Pressure Inlet Hose with End Connectors	1 No.
AIM 14108	Bentonite Pump hand operated, complete with Hoses	1 No.
AIM 14109	Swivel Handle	1 No.
AIM 14110	Thumb Spanner	2 Nos.
AIM 14111	Wheel Top	2 Nos.
AIM 14112	Plate Jig	1 No.
AIM 14201	BX Probe without rubber parts	1 No.
AIM 14202	Inner Membrane for BX Probe	3 Nos.
AIM 14203	Metallic Cover for BX Probe	3 Nos.
AIM 14204	Rubber Cover for BX Probe	3 Nos.
AIM 14205	'O' Ring for BX Probe (Pair)	3 Nos.
AIM 14206	BX Probe Crown	1 No.
AIM 14207	BX Size Auger	2 Nos.
AIM 14208	Plain Pressure Testing Pipe for BX Probe (Set)	1 No.
AIM 14209	Perforated Pressure Testing Pipe for BX Probe (Set)	1 No.

Ordering Information :

AIM 142 Pressuremeter type 'GA'
80 bar Capacity (BX Probe Outfit)

Optional Accessories : (To be ordered extra)

AIM 14212 Casing Pipe for BX probe 1.5 m long (10 Nos. required)

AIM 14213 Casing Shoe for BX Casing

AIM 14128 Nitrogen Cylinder 4.5 kg

AIM 14130 Nylon Cap with Mild Steel Ring for metallic cover for AX or BX or NX probe outfit

AIM 14202 Inner Membrane for BX Probe

Pressuremeter 'GA' 80 bar Capacity (AX and BX Probe Outfit)

The equipment consist of the following replaceable parts :

AIM 14101	Control Panel complete with 100 bar Pressure Gauges and Pressure Regulator	1 No.
AIM 14102	Coaxial Connector	1 No.
AIM 14103	Coaxial High Pressure Hose with End Connectors (upto 80 bar capacity)	1 No.
AIM 14104	Coaxial Nylon Hose with End Connectors (for pressure upto 25 bar)	1 No.
AIM 14105	Connecting Rod	1 No.
AIM 14106	Drill Rod 1 m long	15 Nos.
AIM 14107	Pressure Inlet Hose with End Connectors	1 No.
AIM 14108	Bentonite Pump hand operated, complete with Hoses	1 No.
AIM 14109	Swivel Handle	1 No.
AIM 14110	Thumb Spanner	2 Nos.
AIM 14111	Wheel Top	2 Nos.
AIM 14112	Plate Jig	1 No.
AIM 14113	AX Probe without rubber parts	1 No.
AIM 14114	Inner Membrane for AX Probe	3 Nos.
AIM 14115	Metallic Cover for AX Probe	3 Nos.
AIM 14116	Rubber Cover for AX Probe	3 Nos.
AIM 14117	'O' Rings for AX Probe (Pair)	3 Nos.
AIM 14118	AX Probe Crown	1 No.
AIM 14119	AX size Auger	2 Nos.
AIM 14120	Plain Pressure Testing Pipe for AX Probe	1 No.
AIM 14121	Perforated Pressure Testing Pipes for AX Probe (Set)	1 No.
AIM 14201	BX Probe without rubber parts	1 No.
AIM 14202	Inner Membranes for BX Probe	3 Nos.
AIM 14203	Metallic Cover for BX Probe	3 Nos.
AIM 14204	Rubber Cover for BX Probe	3 Nos.
AIM 14205	'O' Rings for BX Probe	3 Pair
AIM 14206	BX Probe Crown	1 No.
AIM 14207	BX size Auger	2 Nos.
AIM 14208	Plain Pressure Testing Pipe for BX Probe	1 No.
AIM 14209	Perforated Pressure Testing Pipe for BX Probe (Set)	1 No.

Pressuremeter 'GA' (AX Probe Outfit, Low Capacity)

The outfit is similar to AIM 141 but with a pressure capacity of 25 bar. AIM 14103, AIM 14115 and 100 bar Pressure Gauges are not supplied with the unit.

Pressuremeter 'GA' (BX Probe Outfit, Low Capacity)

The outfit is similar to AIM 142 but with a pressure capacity of 25 bar. AIM 14103 AIM 14203 and 100 bar Pressure Gauges are not supplied with the unit.

Ordering Information :

AIM 143	Pressuremeter 'GA' 80 bar Capacity (AX and BX Probe Outfit)
AIM 144	Pressuremeter 'GA' (AX Probe Outfit, Low Capacity)
AIM 145	Pressuremeter 'GA' (BX Probe Outfit, Low Capacity)

Optional Accessories : (To be ordered extra)

AIM 14125	Casing Pipe for AX Probe 1.5 m long (10 Nos. required)
AIM 14126	Casing Shoe for AX Casing
AIM 14212	Casing Pipe for BX Probe 1.5 m long (10 Nos. required)
AIM 14213	Casing Shoe for BX Casing
AIM 14128	Nitrogen Cylinder 4.5 kg
AIM 14130	Nylon Cap with Mild Steel Ring for metallic cover for AX or BX or NX probe outfit
AIM 14114	Inner Membrane for AX Probe

Pressuremeter 'GA' 80 bar Capacity (NX Probe Outfit)

The outfit has a pressure capacity of 80 bar.

The equipment consist of the following replaceable parts :

AIM14101	Control Panel complete with 100 bar Pressure Gauges and Pressure Regulator	1 No.
AIM 14102	Coaxial Connector	1 No.
AIM 14103	Coaxial High Pressure Hose with end connectors (upto 80 bar)	1 No.
AIM 14104	Coaxial Nylon Hose, with End Connectors (for pressure upto 25 bar)	1 No.
AIM 14105	Connecting Rod	1 No.
AIM 14106	Drill Rod 1 m long	15 Nos.
AIM 14107	Pressure Inlet Hose with End Connectors	1 No.
AIM 14108	Bentonite Pump hand operated, complete with Hoses	1 No.
AIM 14109	Swivel Handle	1 No.
AIM 14110	Thumb Spanner	2 Nos.
AIM 14111	Wheel Top	2 Nos.
AIM 14112	Plate Jig	1 No.
AIM 14601	NX Probe without rubber parts	1 No.
AIM 14602	Inner Membrane for NX Probe	3 Nos.
AIM 14603	Metallic Cover for NX Probe	3 Nos.
AIM 14604	Rubber Cover for NX Probe	3 Nos.
AIM 14605	'O' Rings for NX Probe	3 Pair
AIM 14606	NX Probe Crown	1 No.
AIM 14607	NX size Auger	2 Nos.
AIM 14608	Plain Pressure Testing Pipe for NX Probe	1 No.
AIM 14609	Perforated Pressure Testing Pipe for NX Probe (Set)	1 No.

Pressuremeter 'GA' 25 Bar Capacity (NX Probe Outfit)

The outfit is similar to AIM 146, but is provided with a pressure capacity of 25 bar. AIM 14104 is supplied in place of AIM 14103.

AIM 146

Ordering Information :

AIM 146	Pressuremeter 'GA' 80 bar Capacity (NX Probe Outfit)
AIM 147	Pressuremeter 'GA' 25 bar capacity (NX Probe Outfit)

Optional Accessories : (To be ordered extra)

AIM 14612	NX size Casing Pipe 1.5 m long (10 Nos. required)
AIM 14613	Casing Shoe for NX size Casing Pipe
AIM 14128	Nitrogen Cylinder 4.5 kg
AIM 14130	Nylon Cap with Mild Steel Ring for metallic cover for AX or BX or NX probe outfit
AIM 14602	Inner Membrane for NX Probe

Field California Bearing Ratio

California Bearing Ratio Test Apparatus, Field Type

Ref. Standard IS:2720 (Part 31)

The use of the in-situ CBR apparatus in large road construction projects has increased considerably in the recent years.

This apparatus, mounted on a rolled steel joist cantilevered from the back of the truck or fitted to the underside of a mobile
frame, can be used to determine the bearing ratio (generally known as the California Bearing ratio) of soils quickly and efficiently for the evaluation of strengths of sub-grade & bases for roads & runway pavements.

This method of testing in-situ, using piston penetration, is useful for determining the load carrying capacity in the field, when the in-place density and water contents are such that the degree of saturation is 80% or greater, when the material is coarse grained and cohesionless so that it is not affected by changes in the water content when the material has been in-place.

The equipment consist of the following replaceable parts :

AIM 15501 Loading Jack with U-bracket, capacity 50 kN. This is specially designed for use with Field CBR test apparatus. It consists of a hand operated, two speed, screw jack fitted with a U-bracket. A hexagonal adapter is provided to fix a proving ring. A thrust bar, which passes through the U-bracket, is screwed on to a proving ring (supplied at extra cost) which protects the proving ring when the loading is eccentric.

AIM 15502 Swivel Head for the Loading Jack.

AIM 15503 Penetration Piston 50 mm dia threaded at the upper end, to connect to the various lengths of extension sleeves, through a connector.

AIM 15504 Extension Set consisting of 1 length of 5 cm, 2 lengths of 10 cm, 1 length of 30 cm, 1 length of 50 cm and One length of 100 cm used as spacers between the proving ring and penetration piston. The lengths are machined from steel tubing.

AIM 15505 Connector Set consists of eight connectors for coupling the penetration piston and proving ring assembly, either directly or through extension pieces.

AIM 15506 Datum Bar Assembly consisting of two stands and 1 m long Bar.

AIM 15507 Adjustable Bracket for mounting the Dial Gauge.

AIM 15508 Annular Metal Weight5 kg, 250 mm dia with 53 mm dia central hole.

AIM 15509 Slotted Metal Weight 5 kg, 215 mm to 250 mm dia with 53 mm dia slot - 2 Nos.

AIM 15510 Slotted Metal Weight 10 kg, 215 mm to 250 mm dia with 53 mm dia slot - 2 Nos.

Ordering Information :

AIM 155 California Bearing Ratio Test Apparatus, Field Type w/o Proving Ring & dial gauge

Optional Extras:

AIM 072 Dial Gauge 0.01x25 mm

AIM 274 Proving Ring 50 kN capacity

AIM 155

Plate Bearing Test

The Plate Bearing Test is essentially a model test of foundations. It gives the load deformation characteristics for determining the ultimate bearing capacity of foundations. This test is a standard technique for determining bearing capacity of soils and the results of other methods are compared and calibrated with the values obtained with plate bearing test. In this method, a steel plate is subjected to a gradual increment of load and the corresponding settlement is noted. The Ultimate Bearing Capacity is taken as the load at which the settlement increases at a rapid rate.

Plate Bearing Test Apparatus

Ref. Standard IS:1888

The equipment consist of the following replaceable parts :

AIM 46801	Hand Operated Hydraulic Jack, Capacity 500 kN (50,000 kgf)	1 No.
AIM 475	Hydraulic Hand Operated Pump with 200mm Dia Load Gauge capacity 500 kN (50,000 kgf).	1 No.
AIM 47503	High Pressure Flexible Metallic Pipe 5 m long.	1 No.
AIM 15702	Ball and Socket Arrangement consisting of two steel plates, with one steel ball in-between the plates.	1 No.
AIM 15703	Extension Rod long, 12 mm dia x 25 cm for taking Dial Gauge readings.	16 Nos.
AIM 15704	Magnetic base with female thread on top, for holding extension rod.	4 Nos.
AIM 15705	Top End Plate 50 mm dia with male thread, for fitting on to the Extension Rods and positioning the Dial Gauge Plunger.	4 Nos.
AIM 15706	Column 15 cm dia x 25 cm long, with flanges, complete with four bolts and nuts.	2 Nos.
AIM 15707	Column 15 cm dia x 50 cm long, with flanges, complete with four bolts and nuts.	1 No.
AIM 15708	Datum Bar	

light weight, portable, total span 5m height approx. 30 cm, mounted on two removable legs.

(It is made in two parts. Provision exists for Datum Bar of 2.5m span to be used. A spare leg is provided for the purpose. Complete with two quick release clamps for positioning and holding the dial gauge brackets). 2 Nos.

AIM 15709	Anchor Spikes	10 Nos.
AIM 15711	Quick Release Clamp for positioning dial gauge bracket	
AIM 072	Dial Gauge 25 mm travel, 0.01 mm least count	4 Nos.

Note : As a wide range of bearing plates are manufactured, the customer is advised to select the plates from the following list according to his specific requirements.

Ordering Information :

AIM 157 Plate Bearing Test Apparatus

Optional Accessories :

AIM 15715	Grooved MS Plate 30 cm x 30 cm square x 25 mm thick
AIM 15716	Grooved MS Plate 45 cm x 45 cm square x 25 mm thick
AIM 15717	Grooved MS Plate 60 cm x 60 cm square x 25 mm thick
AIM 15718	Grooved MS Plate 75 cm x 75 cm square x 25 mm thick
AIM 15721	Plain MS Plate 30 cm x 30 cm square x 25 mm thick
AIM 15722	Plain MS Plate 45 cm x 45 cm square x 25 mm thick
AIM 15723	Plain MS Plate, 60 cm x 60 cm square x 25 mm thick
AIM 15724	Plain MS Plate 75 cm x 75 cm square x 25 mm thick

AIM 157

Note :

1. Grooved and plain plates of circular shape can be supplied on request.
2. When a plate bigger than 30 cm square is used, a series of smaller plates should be used concentrically in order to reduce the deflection of the edges of plate resting on the soil and ensure proper distribution of the load on the bottom plate.
3. For carrying out actual tests on site, load trusses and soil anchors may be needed. These will be supplied at an extra cost.

Load Truss

This truss is of welded I-Girder construction in two halves which can be bolted together when required. The lower chord, the cross pieces for holding the truss down and the vertical thrust members are all of welded box type construction with two channels enclosed and welded to an I-girder.

The anchorages are of a design tried out and perfected at the Central Building Research Institute, Roorkee. They consist of semi-cylindrical pieces, each held down by 1 m long steel spikes, driven in through holes drilled in the semi cylinder. The spikes enter the ground at about 60° horizontally, four from each side spaced along the length of the anchorage. The cross pieces are moored to the anchorages by channel straps and bolts. Eight such anchorages are supplied with 200 kN Truss. Guy wires with turn-buckles are supplied to keep the Truss errect.

Supplied complete with anchorages, guy wire and spikes as described above.

The equipment consist of the following replaceable parts :

Description	AIM-158	AIM-159	AIM-160
1. Trusss	2 parts	2 parts	2 parts
2. Joists	2 parts	2 parts	2 parts
3. Anchor spikes	102	150	200
4. Semi-cylindrical anchors	8	12	16
5. Bolts with nuts for anchor straps	16	24	32
6. Anchor straps	8	12	16
7. Guy wires with six turn buckles	6	6	6
8. Top Flange splice plate	1	1	1
9. Small bolts with nuts for item (8)	8	8	8
10. Jointing bolts with nuts	8	8	8
11. Bolts with nuts for bottom splice plate	6	6	6
12. Sledge hammer	1	1	1
13. Spanners	2	2	2

Ordering Information :

AIM 158 Load Truss, Capacity 200 kN
AIM 159 Load Truss, Capacity 300 kN
AIM 160 Load Truss, Capacity 500 kN

In-Situ Density

For quality control of compacted earthfill, the measurement of in-situ density is essential. All types of earthwork constructions like embankments, dams, roads, airfields and trenches need density determination. Equipment for quick determination of density are listed here.

Core Cutter Method

Core Cutter

Ref. Standard IS:2720 (Part 29)

Core Cutter of known volume is driven into the soil by a rammer. The core cutter is dug out, trimmed and the soil inside weighed and dried for moisture and density check.

The equipment consist of the following replaceable parts :

AIM 16101 Cylindrical Core Cutter made of steel, 100 mm dia x 130 mm long
AIM 16102 Steel Dolly 25 mm high and 100 mm dia, fitted with a lip, to enable it to be located on top of the Core-Cutter
AIM 16103 Rammer with Steel Rod

AIM 161

Ordering Information :

AIM 161 Core Cutter

Optional Accessories :

AIM 16104 Cylindrical Core Cutter 100 mm dia x 175 mm long
AIM 16105 Cylindrical Core Cutter 100 mm dia x 250 mm long
AIM 16106 Cylindrical Core Cutter 150 mm dia x 300 mm long
AIM 16107 Dolly for AIM16106
AIM 16108 Rammer with steel rod for AIM16106

As per BS/ASTM is available.

Sand Replacement Method

Sand Pouring Cylinder Apparatus,

Ref. Standard IS:2720 (Part 28)

This Apparatus is used for determination of the dry density of compact, fine, medium grained soils and for layers not exceeding 50 cm thickness. A circular hole is dug into the ground, all the soil from within it collected, weighed and dried, and the hole back-filled with a standard uniform sand or fine gravel, poured from a calibrated container for calculating the volume of hole.

The equipment consist of the following replaceable parts :

AIM 16201	Sand Pouring Cylinder fitted with Conical Funnel and Shutter, capacity 3 litre	1 No.
AIM 16202	Cylindrical Calibration Container 100 mm ID x 150 mm height	1 No.
AIM 16203	Metal Tray size 30 x 30 x 4 cm, with 10 cm central hole	1 No.

AIM 162

Ordering Information :

AIM 162 Sand Pouring Cylinder Apparatus

Sand Pouring Cylinder Apparatus, Large

Ref. Standard IS:2720 (Part 28)

This is used for the in-place determination of the dry density of natural or compact soil containing stones, fine, medium grained soils for layer exceeding 15 cm but not exceeding 25cm thickness. It may also be used for measuring the density of base materials.

The equipment consist of the following replaceable parts :

AIM 16301	Large sand Pouring cylinder, 16.5 ltr. capacity fitted with conical funnel and shutter
AIM 16302	Cylindrical calibrating container, internal diameter 200 mm and internal depth 250mm
AIM 16303	Metal tray size, 45x45x5 cm deep with hole

Ordering Information :

AIM 163 Sand Pouring Cylinder Apparatus, Large,

Optional Accessories :

AIM 16301	Standard sand grade II (Pack of 25kg)
AIM 16302	Standard sand grade I (Pack of 25kg)
AIM 16303	Standard sand grade III (Pack of 25kg)
AIM 16204	Metal Tray size 30 x 30 x 4 cm, without central hole
AIM 16304	Metal Tray 45cm square and 5cm deep without hole.
AIM 29-4000	100 mm Sand Pouring Cylinder as per BS standard
AIM 29-4020	100 mm Calibrating Container 100 mm inside diameter x 150 mm deep with 200 mm diameter rim
AIM 29-4040	Metal Tray 300 mm square x 40 mm deep with a 100 mm diameter hole
AIM 29-4100	150 mm Sand Pouring Cylinder as per BS standard
AIM 29-4120	150 mm Calibrating Container 150 mm deep with 250 mm diameter rim
AIM 29-4140	Metal Tray 300mm square x 40 mm diameter hole
AIM 29-4200	200 mm Sand Pouring Cylinder as per BS standard
AIM 29-4220	200 mm Calibrating Container 200mm inside diameter x 250 mm deep with a 350 mm diameter rim
AIM 29-4240	Metal Tray 500 mm x 50 mm deep with 200 mm dia hole

Note : For BS models, it is recommended that sand pouring cylinders, metal tray & Calibrating Container Should be ordered together only

Proctor Penetration Method :

Proctor Penetrometer

Ref. Standard ASTM D 1558

Compaction control in the field is exercised by determining the moisture content and dry density. Quick evaluation of this is done by developing curves in the laboratory, showing the relationship between moisture content versus dry density and penetration resistance, using Proctor Needles while conducting the Standard Compaction tests.

Consists of a body housing a spring a plunger calibrated to read 0-40 kg x 1 kg and a handle. Two stems are provided, a larger stem and a shorter stem, both graduated at 12.5 mm intervals, to indicate the depth of penetration.

The larger stem and the smaller stem are used with needles of larger and smaller areas respectively.

The equipment consist of the following replaceable parts :

AIM 16401 Needle Point Set comprising one each of 0.25, 0.5, 1.0, 2.0, 3.5 & 6cm^2 Cross sectional area and a Tommy Pin Complete as above in a carrying case.

AIM 164

Ordering Information :

AIM 164 Proctor Penetrometer

As per BS/ASTM is also available.

Drilling Rigs

Special Features :

- Pneumatic/Hydraulic.
- Compact Design.
- Clutch system for safer control.
- Vehicle/Trailer/Skid Mounted/Crawler (options available).
- Heavy duty gear/vane pump control.
- Four speed transmission for forward and reverse operations.

Applications

- Fulfills the need to reach shallow and medium depths up to 700 meters.
- Provides necessary facilities for conducting Vane Shear test, Pressuremeter test.
- Increases efficiency of site investigation, soil sampling, SPT, DCPT, auger boring for locating water wells, etc.
- Makes shallow prospecting for minerals and ores more profitable.

The Aimil-Swak Drill is designed as a compact, moderately priced, fully mechanically hydraulically-controlled drill to handle complete drilling requirements in shallow and medium depth ranges. These can be installed on a wide range of medium or heavy duty vehicles and exhibits a remarkably low maintenance cost as compared to mechanically driven rigs.

Aimil-Swak Drill can be used for a variety of purposes in geotechnical engineering including boring (Power Auger Boring, Rotary Drilling, Diamond Core Drilling), Sounding (SPT, DCPT, SCPT) and Sampling.

Design Features

Engine

Skid / vehicle / trolley mounted, four piston, water cooled / air cooled, diesel engine with transmission gear box, 12 V battery operated starting system.

Pulldown and Retract

Fast and slow speeds provided by single / double cylinder feed system connected with base frame and rotary drive with the help of pulley and wire rope.

Feed regulator allows infinite adjustment of downfeed speed and unrestricted retract speed.

Hydraulic System

Hydraulic system is powered by flange mounted, heavy duty geared pumps, which are directly connected with power unit. Rated capacity of the pump varies from 40 litres / min to 110 litres / min. Both circuits of the gear pumps are protected by precision check valves and direct operation pressure relief valves.

A 260 litres capacity hydraulic oil tank is designed with radiator cooling system and the return flow, through a 25 micron replaceable element filter. Wire braided hoses are used in all hydraulic circuits.

Emergency Shut-off System

Clutch system is provided at control panel to disengage main power unit from the power take off unit, halting the drilling operation.

Drill Head Assembly

Featuring oil bath lubrication with spiral bevel gear drive for drill head rotation connected with hydraulic motor through a heavy duty four speed transmission. All transmission rates may be used for either forward or reverse spindle rotation.

Drilling Capacities

Vary according to sub-surface conditions.

Casing Handling System

It is a double drum friction clutch type hoist line connected through heavy duty spiral gears powered mechanically. This system is facilitated with a braking arrangement.

Water Pump

Positive displacement type single/double acting duplex/ triplex horizontal reciprocating pump with capacity 70 litres / min to 400 litres / min and pressure of 25 kg/cm^2 to 70 kg/cm^2 capable of handling clear water, mud, slurry etc.

Mechanical Power

The pump is equipped with pulsation dampner, pressure release valve, pressure gauge, suction and delivery with pump engage and disengage system.

Gasoline (Petrol) Powered Portable Tinyman Rig

Application:

- Prebid drilling for general construction, earth and rock moving.. Test drilling for structural foundations, roads and runways.
- Drilling in concrete and soils for installation of guard rails, fences, drainage and well points.
- Concrete/asphalt core drilling.

Technical Specifications :

Engine

Briggs & Stratton/ Honda make Power: 6.5 HP and 10 HP

AIM 029-G

Skid Mounted Man Portable Drilling Rig

Application:

- Geo technical drilling for general construction, earth and rock. Test drilling for structural foundations, roads and runways.
- Drilling in concrete and soils for installation of guard rails, fences, drainage and well points.
- Angular drilling facility available with anchor foundation system for rig itself.
- Drilling rig shall be dismantled in five to six modules to carry in deep forest, high terrain where mobility is not possible and can be assembled in few minutes.

AIM 029-SP

Transmission:

1st Gear	:	3.57 : 1
2nd Gear	:	1.74 :1
3rd Gear	:	1:1
Reverse	:	3.57:1

Torque

Maximum torque	:	300 ft. lbf (41.47 kgf.m)
Maximum Spindle RPM	:	1200

Drilling Depth

Auger 3" Dia. (76.2 mm)	:	10 meter
4" dia. (101.6 mm)	:	08 meter

Core Drilling

AX	:	12 meters
NX	:	10 meters

Concrete/Asphalt

Dia. 1" (25.4) to 8" (203.2 mm)

Dimensions

Height	:	58" (1473.2 mm)
Width	:	30" (762.0 mm)
Length	:	27" (685.8 mm)
Weight	:	90 kg (Approx.)

Technical Specifications :

Engine

- Briggs & Stratton / Honda make Power: 20/22 HP (Engine Weight- 52 Kg)
- (ii) Diesel Operated air cooled engine 16 HP (Engine Weight-105 Kg)

Transmission

1st Gear	:	3.57 : 1
2nd Gear	:	1.74 :1
3rd Gear	:	1:1
Reverse	:	3.57:1

Hydraulic Driven by pump and powerful rotation motor.

Torque

Maximum torque	:	510 ft. lbf (70.51 kgf.m)
Maximum Spindle RPM	:	1200

Drilling Depth

Auger 3" Dia. (76.2 mm)	:	20 meter
4" Dia. (101.6 mm)	:	14 meter
6" Dia. (152.4 mm)	:	10 meter

Core Drilling

AX	:	30 meter
NX	:	22 meter

Dimensions (Approx.)

Height	:	90" (2286 mm)
Width	:	30" (762 mm)
Length	:	52" (1320.8 mm)
Weight	:	300-340 kg (Approx.)

Pick up Van Mounted Hydraulic Powered Drilling Rig

- It is compact, lightweight drill rig impress drillers with its high power to weight ratio and low maintenance requirements. Highlighting simplicity of operation and proven hydraulic durability, this machine continues to prove its value over wide range of drilling job.
- Drillig rig can be mounted on any type of LCV, Utility vehicle like TATA 207/407, Eicher Mahindra jeep etc easily.

Technical Specifications :

Engine

Air cooled Diesel Engine of "Kirloskar make model" HA 294/394 of power 23.6 HP and 38.5 HP respectively.

Hydraulic System:

Retract Force	:	12,500 kgf
Pull Down Force	:	10,700 kgf
Cylinder Stroke	:	1.5 meter / 3.0 meter

Rotary Drive Assly.

Rotary Torque	:	4480 Nm (max)
Rotary Speed	:	700 RPM (max)

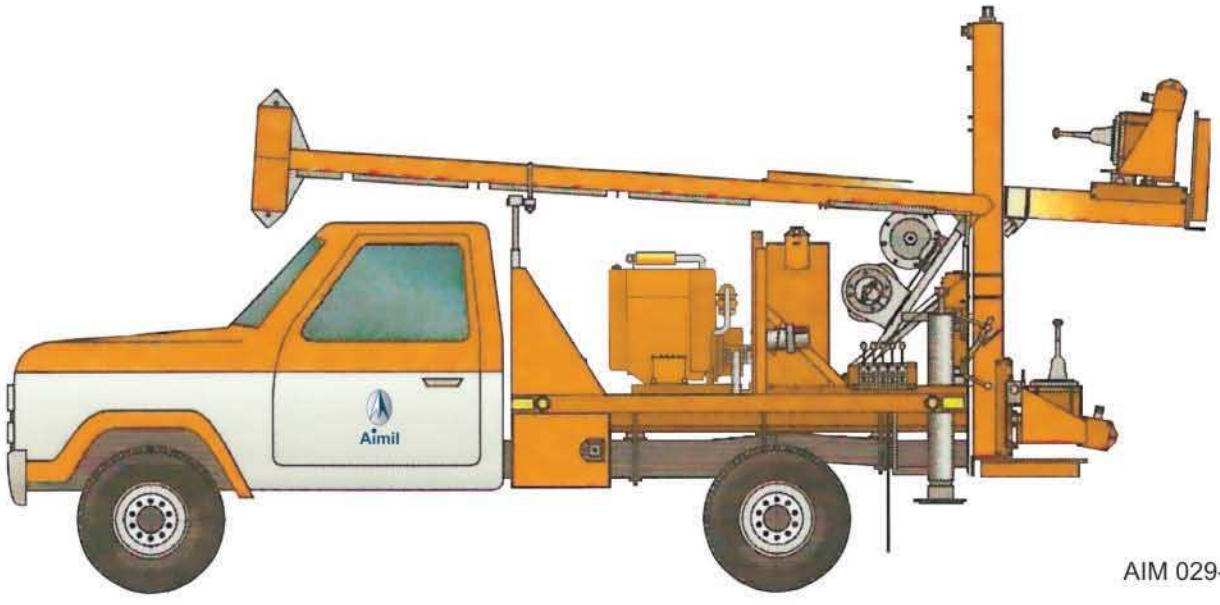
Operational Capabilities :

Dry Auger Drilling	:	35 meter 6" dia. (152.4 mm)
Mud Drilling	:	150 meter 4"dia. (101.6 mm)
Core Drilling	:	100 meter NX size. (54.74 mm)

Following optional features also available on request

- Hydraulic operated Wire line winch for wire line drilling.
- Hydraulic self centered chuck.
- Digital RPM Indicator.

Note : Customer will be required to arrange for the pick up van. Overall length of the same should be approximately 5000 mm (TATA 207 or equivalent).



AIM 029-P

Skid Mounted Heavy Duty Core Drilling Rig

Application:

- Geotechnical drilling for general construction, earth and rock. Test drilling for structural foundations, roads and runways. Foundation and earth anchoring drilling for bridges.
- Mineral exploration, Rock and concrete coring in dam gallery.
- Angular drilling facility available with anchor foundation system for rig itself.

Technical Specifications :

Engine

Air cooled,diesel engine of kirloskar Make.

Model: HA 294/394/494/694

Power: From 23 HP to 75 HP and 130 HP

Optional

Water cooled Ashok Leyland engine of 150 HP

Transmission:

1st Gear	:	7.96 : 1
2nd Gear	:	5.48 :1
3rd Gear	:	3.83:1
4th Gear	:	1.74:1
5th Gear	:	1:1
Reverse	:	7.96:1

Torque

Maximum torque	:	5424 ft. lbf (750 kgf.m)
Maximum Spindle RPM	:	1000

Main Spindle Drive

Through gear box, propeller shaft and crown pinion assembly.

Cat Head

Top mounted cat head can be engaged/disengaged with independent lever.

Drilling Feed Stroke

650/750mm.

Drilling Depth

Auger 4" Dia.(101.6 mm)	:	50 meter
6" Dia. (152.4 mm)	:	30 meter

Mud Drilling

6" Dia.	:	150 meter

Core Drilling

AX	:	300 meter
NX	:	110 meter - 1000 meter

Drilling Angle

0 to 360 Degree with 1 degree calibration in one plane.

Hydraulic Retraction : 450 mm

Dimensions

Length	:	88.58" (2250 mm)
Width	:	49.21" (1250 mm)
Height	:	76.77" (1950 mm)
Weight	:	1800-1900 kg (Approx.)

AIM 029-SH

Following optional features also available on request

- Hydraulic operated Wire line winch for wire line drilling.
- Hydraulic self centered chuck.
- Digital RPM Indicator.

Trailor Mounted Heavy Duty Core Drilling Rig

Application

- Drilling rig can be towed by any light weight four wheel vehicle like Jeep, Tata/Eicher vehicle.
- Geotechincal drilling for general construction, earth and rock. Test drilling for structural foundations, roads and runways. Foundation and earth anchoring drilling for bridges.
- Mineral exploration, Rock and concrete coring in dam gallery.
- Angular drilling facility available with anchor foundation system for rig itself.

Technical Specifications :

Engine

Air cooled,diesel engine of kirloskar Make.

Model: HA 294/394/494/694

Power: From 23 HP to 75 HP and 130 HP

Optional

Water cooled Ashok Leyland engine of 150 HP

Trailor Size

2450 mm Length X 1250 mm Width

Tyres

750 X 16PLY

Transmission

1st Gear	:	7.96 : 1
2nd Gear	:	5.48 :1
3rd Gear	:	3.83:1
4th Gear	:	1.74:1
5th Gear	:	1:1
Reverse	:	7.96:1

Torque

Maximum torque	:	5424 ft. lbf (750 Kgf.m)
Maximum Spindle RPM	:	1000

Main Spindle Drive

Through gear box, propeller shaft and crown pinion assembly.

Cat Head

Top mounted cat head can be engaged/disengaged with independent lever.

Drilling Feed Stroke

650/750mm.

Drilling Depth

Auger4" Dia.	:	50 meter
6" Dia	:	30 meter

Mud Drilling

6" Dia.	:	150 meter

Core Drilling

AX	:	300 meter
NX	:	110 meter

Drilling Angle

0 to 360 Degree with 1 degree calibration in one plane.

Hydraulic Retraction : 450 mm

Dimensions

Length	:	2750 mm
Width	:	1250 mm
Height	:	2350 mm
Weight	:	2,400 kg (Approx.)

AIM 029-T

Following optional features also available on request

- Hydraulic operated Wire line winch for wire line drilling.
- Hydraulic self centered chuck.
- Digital RPM Indicator.

Truck Mounted Hydraulic Powered Multi Purpose Drilling Rig

- Swakdrill offers drilling rig backed by quality synonymous. This rig is top drive hydraulic operated, designed to handle wide range of drilling like, Geotechnical , water well , Micro piling, Earth anchoring by mud drilling or Air Hammer or High speed Diamond coring etc.
- The top drive swings open hydraulically to provide access to the bore hole for the casing installation.
- The rig can be powered from the main engine of the vehicle through Power Take Off Assembly.

AIM 029-TH

Technical Specifications :

Engine

Air cooled Diesel Engine of "Kirloskar make model" HA 494 / HA 694 of power 70 HP and 115 HP respectively.

Water cooled engine of Ashok Leyland of 140 BHP also available on request.

Hydraulic System

Retract Force : 16,500 kgf
Pull Down Force : 13,700 kgf
Cylinder Stroke : 1.5 meter / 3.0 meter / 6.0 meter

Rotary Drive Assembly

Rotary Torque : 9250 Nm (max)
Rotary Speed : 1200 RPM (max)

Operaional Capabilities

Dry Auger Drilling : 100 meter 6" dia.
Mud Drilling : Up to 500 meter 4"dia.
Core Drilling : Up to 1000 meter NX size.

Following optional features also available on request:

- Hydraulic operated Wire line win h for wire line drilling.
- Hydraulic self centered chuck.
- Digital RPM Indicator.

Note : Customer will be required to arrange for the pick up van. Overall length of the same should be approximately 5000 mm (TATA 207 or equivalent).

Crawler Mounted Core Drilling and Multi Purpose Drilling Rig.

It is heavy and robust drill rig for soil sampling, environmental investigation, water well drilling and for mineral exploration.

This rig is mounted on steel reinforced rubber track and steel track which becomes more helpful in rough area, paddy fields and the place where transportation by vehicle is not possible. Track is operated by hydraulic system.

Specifications:

Tracks

Steel reinforced rubber / steel tracks

Engine

Kirloskar air cooled diesel engine of model HA 394/494/694 from38 HP to 130 HP.

Optional

Deutz (Germany) air cooled engines of model F3l912 to F6L912 from 40 HP to 260 HP Turbo charged.

Wire Line system

A separate wireline drum operated by hydraulic motor having 5mm dia. Wire of maximum 1000 meter length is provided.

Hydraulics Pumps

Axial piston pumps of 350 Bar pressure with heavy duty gear pumps for hydraulic cylinders.

Rotary Head Assembly

Axial Piston Motors of 400 bar pressure capacity to ensure heavy torque and smooth drilling with minimum effort.

Torque

Max. 6148 ft. lbf (850 kgf.m)

Drilling RPM

From 0 to 1250 RPM. RPM varies according the types of drilling and type of soil and rock strata.

Drilling Capacity

- Dry Drilling : 150 cm (59.05") Up to 50 meter
- Mud Drilling : Up to 500 meters
- NQ wireline coring : Up to 1000 meters

Following optional features also available on request:

- Hydraulic operated wire line winch for wire line drilling.
- Hydraulic self centered, spring closed chuck of HQ size.
- Digital RPM Indicator.

AIM 029-CM

Ordering Information :

AIM 029-G	Gasoline (Petrol) Powered Portable Tinyman Rig
AIM 029-SP	Skid Mounted Man Portable Drilling Rig
AIM 029-P	Pick Up Van Mounted Hydraulic Powered Drilling Rig
AIM 029-SH	Skid Mounted Heavy Duty Core Drilling Rig
AIM 029-T	Trailor Mounted Heavy Duty Core Drilling Rig
AIM 029-TH	Truck Mounted Hydraulic Powered Multi Purpose Drilling Rig
AIM 029-CM	Crawler Mounted Core Drilling and Multi Purpose Drilling Rig

Essential Accessories :

Soil Drilling Accessories

AIM 029SD01	Flight Auger 6" (152.4mm) dia. X 1.5 m long
AIM 029SD02	Flight Auger 4" (101.6mm) dia. X 1.5m long
AIM 029SD03	Flight Auger 3" (76.2mm) dia. X 1.5 m long
AIM 029SD04	Flight Auger Bit 6" (152.4mm) Dia.
AIM 029SD05	Flight Auger Bit 4" (101.6mm) Dia.
AIM 029SD06	Flight Auger Bit 3" (76.2mm) Dia.
AIM 029SD07	Three wings/Four wings Drag Bit for Mud drilling 3 / 4 ¾"/ 5 ¾ / 8" dia.

Drill Rods

AIM 029DR01	HW Drill Rods x 3.0 m long
AIM 029DR02	HW Drill Rods x 1.5 m long
AIM 029DR03	NW Drill Rods x 3.0 m long
AIM 029DR04	NW Drill Rods x 1.5 m long
AIM 029DR05	'N' Drill Rods x 3.0 m long
AIM 029DR06	BW Drill Rods x 3.0 m long
AIM 029DR07	BW Drill Rods x 1.5 m long
AIM 029DR08	AW Drill Rods x 3.0 m long
AIM 029DR09	AW Drill Rods x 1.5 m long
AIM 029DR10	AW Drill Rods x 1.0 m long
AIM 029DR11	AW Drill Rods x 0.6 m long
AIM 029DR12	AW Drill Rods x 0.3 m long
AIM 029DR13	2 3/8" Drill Rod with API Thread x 3.0 m long
AIM 029DR14	HWY Drill rod x 3.0 m long
AIM 029DR15	HWY Drill rod x 1.5 m long

Casings

AIM 029C01	PW/PX casing x 3.0 m long
AIM 029C02	PW/PX casing x 1.5 m long
AIM 029C03	PW/PX casing x 1.0 m long
AIM 029C04	HW/HX casing x 3.0 m long
AIM 029C05	HW/HX casing x 1.5 m long
AIM 029C06	NW/NX casing x 3.0 m long
AIM 029C07	NW/NX casing x 1.5 m long
AIM 029C08	BW/BX casing x 3.0 m long
AIM 029C09	BW/BX casing x 1.5 m long

Sampling Accessories

AIM 029SA01	S.P.T. Sampler.
AIM 029SA02	Guide Rod assly.
AIM 029SA03	Monkey Hammer 63.5 kg weight
AIM 029SA04	UD 100/75 sampling tubes for UDS test.

Rock Coring Accessories

AIM 029RC01	HWF/HWG Single/Double Tube Core Barrel x 3.0 m long
AIM 029RC02	HWF/HWG Single/Double Tube Core Barrel x 1.5 m long
AIM 029RC03	NWF/NWG Single/Double Tube Core Barrel x 3.0 m long
AIM 029RC04	NWF/NWG Single/Double Tube Core Barrel x 1.5 m long
AIM 029RC05	BWF/BWG Single/Double Tube Core Barrel x 3.0 m long
AIM 029RC06	BWF/BWG Single/Double Tube Core Barrel x 1.5 m long
AIM 029RC07	T.C.T. Rock Bits. HX/HW/HWG/HWF
AIM 029RC08	T.C.T. Rock Bits NX/NW/NWG/NWF
AIM 029RC09	T.C.T. Rock Bits BX/BW/BWG/BWF
AIM 029RC10	Surface Diamond Bits HX/HW/HWG/HWF
AIM 029RC11	Surface Diamond Bits NX/NW/NWG/NWF
AIM 029RC12	Surface Diamond Bits BX/BW/BWG/BWF
AIM 029RC13	Impregnated Diamond Bits HX/HW/HWG/HWF
AIM 029RC14	Impregnated Diamond Bits NX/NW/NWG/NWF
AIM 029RC15	Impregnated Diamond Bits BX/BW/BWG/BWF
AIM 029RC16	Diamond Reaming shell HX/HW/HWG/HWF

AIM 029RC17	Diamond Reaming shell NX/NW/NWG/NWF
AIM 029RC18	Diamond Reaming shell BX/BW/BWG/BWF
AIM 029RC19	Diamond Casing Bits (All sizes)

Misc. Accessories

AIM 029MA01	Water Swivel Assembly.
AIM 029MA02	Triplex Horizontal Reciprocating Pump
AIM 029MA03	Special types of wrenches for drill rods/casings

Percussion Accessories For Boulders

AIM 029PA01	DTH Hammer 4"& 5" dia.
AIM 029PA02	Eccentric Bit for 4" & 5" dia Bore Hole.
AIM 029PA03	DTH button Bit 4" & 5" dia.
AIM 029PA04	DTH Odex Bit 4" & 5" dia.

Wireline Drilling Accessories :

AIM 029WD01	PQ Wireline double tube corebarrels 3.0 m long.
AIM 029WD01	PQ Wireline double tube corebarrels 1.5 m long.
AIM 029WD01	HQWireline double tube corebarrels 3.0 m long.
AIM 029WD01	HQ Wireline double tube corebarrels 1.5 m long.
AIM 029WD01	NQ Wireline double tube corebarrels 3.0 m long.
AIM 029WD01	NQ Wireline double tube corebarrels 1.5 m long.
AIM 029WD01	BQ Wireline double tube corebarrels 3.0 m long.
AIM 029PA04	BQ Wireline double tube corebarrels 1.5 m long.
AIM 029PA04	PQ/HQ/NQ/BQ Wireline Diamond Coring Bits.
AIM 029PA04	PQ/HQ/NQ/BQ Wireline diamond Reaming shell.
AIM 029PA04	PQ/HQ/NQ/BQ Special types pipe wrenches.

Drill Rods.

AIM 029WDR01	PQ /HQ/NQ/BQ Wireline Drill Rods. 3.0 m Long.
AIM 029WDR02	PQ/HQ/NQ/BQ Wireline Drill Rods 1.5 m long.
AIM 029WDR03	Stationary Hydraulic clamps for drilling rods.

Drilling accessories specifications as per BS 4019-1974

'W' Design Drill Rod Specifications

Size	O.D. Inch	O.D. mm	I.D. Inch	I.D.mm	T.P.I.
EW	1-3/8	34.9	15/16	23.8	3
AW	1-3/4	44.5	1-1/4	31.8	3
BW	2-1/8	53.9	1-3/4	44.4	3
NW	2-5/8	66.6	2-1/4	57.1	3
HW	3-1/2	88.9	3-1/6	77.8	3
E	1-5/16	33.3	7/8	22.2	3
A	1-5/8	41.3	1-1/8	28.6	3
B	1-7/8	47.6	1-1/4	31.7	5
N	2-3/8	60.3	2	50.8	4
N-3TPI	2-3/8	60.3	2	50.8	3

'W/X' Design Casing Specifications

Size	O.D. Inch	O.D. mm	I.D. Inch	I.D.mm	T.P.I.
EW	1-13/16	46.0	1-1/2	38.1	4
AW	2-1/4	57.1	1-29/32	48.4	4
BW	2-7/8	73.0	2-3/8	60.3	4
NW	3-1/2	88.9	3	76.2	4
HW	4-1/2	114.3	4	101.6	4
PW	5-1/2	139.7	5	127.0	3
SW	6-5/8	168.2	6	152.4	3
UW	7-5/8	193.6	7	177.8	2
ZW	8-5/8	219.0	8	203.2	2

Swivel type 'WG' Double Tube Core Barrels Specifications

Size	Hole Dia. Inch	Hole Dia. mm	Core Dia. Inch	Core Dia. mm	Outer Tube Dia.Inch	Outer Tube Dia.mm
EWG	1-1/2	38.1	7/8	21.5	1-7/16	36.5
AWG	1-7/8	47.6	1-1/8	30.0	1-13/16	46.0
BWG	2-3/8	60.3	1-5/8	42.0	1-29/32	57.9
NWG	2-15/16	71.4	2-1/8	54.7	2-29/32	73.8
HWG	3-29/32	99.2	3	76.2	3-3/4	95.3