



1.3

SOIL PENETROMETERS

1.3.1 SOIL PENETROMETERS

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TECNOTEST'S RANGE OF PENETROMETERS

Tecnotest manufactures a complete range of static, dynamic and static/dynamic penetrometers.

The vast experience gained in this field is placed at the disposal of our clients so as to assist them in selecting the apparatus which best satisfies their needs.

STATIC PENETROMETERS

The thrust group, which consists of two hydraulic rams, is used to drive the penetration cone and rod string into the soil. The measuring device indicates the resistance to penetration offered by the soil. The data obtained in such testing lends itself to the rapid and reliable determination of the geometrical characteristics of the soil.

Soft soils with fine and medium grains are well suited to static penetration testing, while deposits of gravel and cemented rocks often represent an impassable barrier to static testing.

	THRUST (κN)	PORTABLE MODEL	TRAILER MODEL
	1	TP 099-TP098	
CPT	100		TP 111
CPT	200		TP 121

DYNAMIC PENETROMETERS

A hammer with constant free fall is used to drive the penetration cone into the soil. The number of blows required to drive the cone through a given depth is recorded.

The test may be continuous, thus carrying out a complete sounding (SPT test), or discontinuous at the bottom of a bore hole (obtained using special equipment). The interpretation of the test data in geomechanical terms is subject to some limitations, particularly in the presence of cohesive soils with low consistency. However, this apparatus has a good probability of passing through hard soil strata.

	HAMMER (kg)	FALL (cm)	OPERATION	PORTABLE VERSION
DCP	8	57.5	manual	TP 215
DCP/LRS	10	50	manual	TP 211
DCP	20	20	manual	TP 221
DCP	30	20	hydraulic	TP 223/S

STATIC/DYNAMIC PENETROMETERS

These machines are fitted with both systems of penetration, thus allowing static testing where this is most appropriate, and dynamic testing in particularly resistant soils for example which do not permit static tests.

The advantage of the combination of two systems in one machine may be readily appreciated when testing in areas with differing geological characteristics.

THRUST (κN)	HAMMER (kg)	FALL (cm)	PORTABLE MODEL	TRAILER MODEL	SELF- PROPELLED TRACK MODEL
25	30	20	TP 311	TP 312	TP 312/T

TECNOTEST

NOTE:

ALL MODELS ARE SUPPLIED WITH A SPECIFIED NUMBER OF ACCESSORIES (CONES, RODS, ETC.) AS STANDARD.

PORTABLE MODELS INCLUDE THOSE THAT MAY BE DISMANTLED FOR TRANSPORTATION IN A NORMAL MOTOR CAR.

TRAILER MODELS MAY BE ATTESTED FOR ROAD CIRCULATION.

"SPECIAL APPLICATIONS" INDICATE THE MOUNTING OF THE PENETROMETER ON THE CLIENT'S VEHICLE, TOGETHER WITH SPECIAL COMPONENTS SUCH AS ANCHORAGE GROUPS, DATA ACQUISITION, ETC.

THE APPARATUS FOR THE STANDARD PENETRATION TEST (ASTM D 1586, AASHTO T 206 STANDARDS) HAS NOT BEEN INCLUDED IN THE LIST OF DYNAMIC PENETROMETERS. SINCE THIS APPARATUS IS NOT AUTONOMOUS BUT AN ACCESSORY TO A DRILLING RIG, IT IS DESCRIBED SEPARATELY AT THE END OF THIS SECTION (SEE TP 241).

PROVING RING PENETROMETER

TP 098

Simple and light instrument for measuring static penetration resistance. The thrust force is provided directly by the operator who, by pushing on the T handle, forces the cone into the soil. The encountered resistance is measured on the fitted load ring. Testing is only possible in soils with good consistency and for short depths.

SPECIFICATIONS:

- 3 cones with 30° cone angle and 1 sq. inch sectional area
- 3 threaded extension rods 300 mm long graduated every 150 mm
- 1 kN (100 kgf) load ring with stem brake unit for max. force reading. Supplied with Tecnotest laboratory calibration certificate and conversion charts
- carrying case

DIMENSIONS: 300 x 100 x 1000 (h) mm.

WEIGHT: 8 kg.

PROVING RING PENETROMETER

TP 099

Identical to TP 098 but provided with official laboratory certificate of the load ring.



TP 098

STATIC PENETROMETERS

TRAILER-MOUNTED VERSION

100 kN STATIC PENETROMETER

TRAILER MOUNTED

TP 111

The machine is mounted on a single axle trailer complete with electric installation, lights, overrun brake (which automatically comes into operation on braking the towing vehicle) and hand brake. The group may be attested for road circulation. Total weight is approx. 1500 kg. During transportation the hydraulic drive ram is lowered between the two vertical support columns and inclined in a horizontal position so as to reduce the total height. Anchorage is provided by the classic system of spiral anchors driven into the ground using a hydraulic wrench which requires the presence of two operators.

SPECIFICATIONS:

MOTOR: 4 stroke, double cylinder, with electric starter and remote central for rpm regulation. **POWER:** 16 hp petrol engine

HYDRAULIC CIRCUIT: oil tank 30 l capacity with filter, 2 hydraulic pumps of differing capacities, 2 hydraulic distribution valves (lever type) for upward movement of test rams at 2 speeds (approach speed and test speed), 1 hydraulic distribution valve (6-lever type) for piloting front and rear levelling system, tilting of penetration assembly and rotation of anchorage system motor reducers, 1 adjustable flow valve, 1 control gauge, 4 locking valves.

THRUST ASSEMBLY: lower cross-beam in which two thrust rams for 100 kN tests are housed. The hydrostatic load cell is located in the central part with relevant extraction device.

LEVELLING ASSEMBLY: 3 hydraulic stabilizers (2 rear and 1 front) all complete with ball-seated foot plates.

ANCHORAGE ASSEMBLY: comprises 2 columns secured at lower ends by a cross beam; 2 hydraulic wrenches comprising two 1.5 kN.m hydraulic motor reducers running the length of the columns. The two guide carriages, in which the two motor reducers are housed, enable anchorage of guides coaxially with respect to thrust assembly. Physical effort on the part of the operator is minimal.

Standard (supplied) equipment includes 4 spiral anchors (2 having 300 mm diameter and 2 having 200 mm diameter) with 2 extension rods 1 metre long as well as 7 continuous spiral anchors 100 mm dia. x 1000 (l) mm.

MEASURING GROUP: hydrostatic load cell with 2 manometers class 0.5, dia. 150 mm with full scale capacities 10 kN and 100 kN with automatic cut-out valve fitted to the low capacity manometer.

ACCESSORIES SUPPLIED AS STANDARD:

- 1 standard M2 cone (Begemann typoe) with tapered double-start screw thread
 - 25 standard sounding tubes external diameter 36 mm (internal diameter 16 mm) x 1000 mm long, with tapered double-start screw thread
 - 2 extraction couplings for sounding tubes
 - 1 set of spanners for operation and maintenance
- All the sounding rods are contained inside 2 metal cases installed on the trailer

DIMENSIONS: reduced height during motion 3700 x 1800 x 1400 (h) mm, fully extended height for testing 3500 x 1800 x 2200 (h) mm

OVERALL WEIGHT: approx. 1500 kg

OVERSEAS PACKED DIMENSIONS: 4000 x 2050 x 1800 (h) mm

PACKED WEIGHT: 1900 kg



1.3.1 SOIL PENETROMETERS

SOME CUSTOM VERSIONS



TECNOTEST

200 kN STATIC PENETROMETER

TRAILER MOUNTED

TP 121

Features similar to those of model TP 111 (100 kN) but anchorage system thrust assembly and hydraulic components are adequately adjusted for higher capacity (200 kN).

ACCESSORIES:

TP 110/006 Hydraulic clamp with lever-operated pump

Allows the safe clamping of rods during extraction.

TP 110/005 Manometers housed in the control panel

The two manometers are housed in the control panel and connected to the cell by flexible hoses. This position is ergonomic, thus allowing easier and more accurate readings.

FOR SPARE PARTS AND FURTHER ACCESSORIES SEE PAGE 99

SPECIAL APPLICATIONS

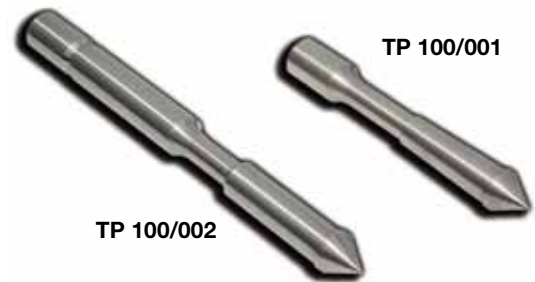
TP 111 and TP 121 can be supplied with some custom features or without the trailer so as to be mounted on the client's vehicle.



TP 121

**ACCESSORIES AND SPARE PARTS FOR 100 AND 200 kN
STATIC PENETROMETERS:**

TP 100/001	Static M1 cone (Dutch Mantle Cone)
TP 100/002	Static M2 cone (Dutch Friction Sleeve Begemann type)
TP 100/013	Set of 5 sounding tubes internal dia. 16 mm, external dia. 36 mm, 1000 long in special steel. Supplied with couplings.
TP 100/004	Set of 5 inner rods dia. 15 mm x 1000 mm long in special steel
TP 101/002	Static M2 cone with "2p" thread (Dutch friction sleeve - Begemann type)
TP 101/013	Set of 5 sounding tubes with "2p" thread
TP 101/004	Set of 5 inner rods for "2p" tubes dia. 15 mm x 1000 mm long, in special steel
TP 100/005	Short sounding tube with hole enlarger. Supplied complete with inner rod
TP 110/001	0-10 kN manometer for TP 110/003
TP 110/002	0-100 kN manometer for TP 110/003
TP 110/003	100 kN hydrostatic load cell (with manometers)
TP 110/012	Spiral anchor dia. 250 mm with stem for TP 111
TP 110/013	Spiral anchor dia. 300 mm with stem for TP 111
TP 120/001	0-20 kN manometer for TP 120/003
TP 120/002	0-200 kN manometer for TP 120/003
TP 120/003	200 kN hydrostatic load cell (with manometers)
TP 121/002	Spiral anchor dia. 250 mm without stem for TP 121
TP 121/003	Spiral anchor dia. 350 mm without stem for TP 121
TP 100/006	Hydraulic clamp with foot pump for clamping rods during extraction. Suitable for truck-mounted version



TP 100/013 TP 100/004 TP 100/002 TP 100/001



TP 100/006

LIGHT-WEIGHT MANUAL DYNAMIC PENETROMETERS

DYNAMIC CONE PENETROMETER (DCP)

TP 215

8 kg hammer, 57.5 cm. fall

ASTM D 6951-03

Portable, hand-operated equipment.

To obtain a direct evaluation of the "in-situ" strength properties of road pavement layers: the DCP has been correlated with CBR (California Bearing Ratio - Kley 1975).

The pavement DCP consists of:

- Sliding hammer (steel made) weighing 8 kg
- Impact anvil driving rod and clip, falling 575 mm
- Steel rod, diameter 16 mm, up to a depth of 800 mm below the surface
- Supplementary rod, diameter 16 mm (useful length 400 mm)
- N° 3 threaded end cones in tempered steel, 20 mm diameter, 60° cone angle (TP 216)
- Bearing plate and measuring rod with adjustable scale (graduated in mm)
- Wooden carrying case

DIMENSIONS: 1100 x 400 x 300 (h) mm.

TOTAL WEIGHT: 17 kg.

ACCESSORIES AND SPARE PARTS:

TP 216	Set of three cones
TP 216/1	Extension rods: 400 mm (set of three)



TP 215

MANUAL DYNAMIC PENETROMETER

TP 211

10 kg hammer, 50 cm. fall

DIN 4094 LRS10 UNI ENV 1997-3

THE EQUIPMENT COMPRISES:

- Hammer, 10 kg
- Anvil with rod and full travel impact plug, 6 kg
- 11 threaded sounding rods dia. 22 mm x 1000 mm long graduated every 100 mm, unit weight 2 kg
- 5 threaded cones 10 sq. cm section area with 90° cone angle
- Base plate with seating for scale
- Rule graduated in mm, 1 m long
- Lever device for rod extraction
- 2 carrying cases:

DIMENSIONS: 1140 x 160 x 160 / 1100 x 350 x 290 (h) mm

TOTAL WEIGHT: 84 kg

All parts are protected against corrosion.

ACCESSORIES AND SPARE PARTS:

TP 211/001	Set of 10 threaded cones 10 sq. cm section area with 90° cone angle
TP 211/002	Set of 5 threaded cones 5 sq. cm section area with 90° cone angle



TP 211

MANUAL DYNAMIC PENETROMETER

TP 221

20 kg hammer, 20 cm. fall**THE EQUIPMENT COMPRISES:**

- Hammer, 20 kg
- 2 anvils (one spare) with guide rod and full travel impact plug, 2.7 kg
- 11 threaded sounding rods dia. 20 mm x 1000 mm long graduated every 100 mm, unit weight 2.4 kg
- 2 left threaded cone holders for fixed cones
- 2 right threaded cone holders for lost cones
- 10 left threaded fixed cones 10 sq. cm section area with 60° cone angle
- 10 right threaded lost cones 10 sq. cm section area with 60° cone angle
- 2 carrying cases:
- All parts are protected against corrosion.

DIMENSIONS: 1140 x 160 x 160 / 600 x 350 x 250 (h) mm

TOTAL WEIGHT: 66 kg

To complete the penetrometers TP 215 and TP 221, which do not have the rod extraction system supplied as standard, we recommend the following items:

MANUAL LEVER ROD EXTRACTION DEVICE TP 220/012

A special clamp automatically grips the rod when the lever is pressed down, and releases rods when raised.

This enables the rod string to be extracted by a simple lever movement. The absence of teeth in the clamp and the vertical extraction ensures that no damage is caused to the rods during extraction. Made of steel protected against corrosion.

Suitable for extracting 20 mm diameter rods (for TP 221 and TP 223/S).

DIMENSIONS: 450 x 300 x 1000 (h) mm

WEIGHT: 19 kg.

LEVER ROD EXTRACTION DEVICE TP 220/215

TP 220/215

Identical to TP 220/012 but suitable for extracting 16 mm diameter rods (for TP 215).

**MOTORIZED HYDRAULIC ROD EXTRACTION DEVICE TP 226
5 t capacity**

This device enables rod strings to be extracted from the ground rapidly and effortlessly. Capacity 260 mm travel.

Besides the HYDRAULIC POWER PACK of the EXTRACTION FRAME (TP 226/2), the equipment also comprises a PAIR OF EXTRACTION ROLLERS (TP 226/1) suitable for rod string diameter.

The power pack comprises:

- Briggs & Stratton 3 hp petrol engine
- Hydraulic pump
- Hydraulic fluid tank

DIMENSIONS: 500 x 400 x 500 (h) mm

WEIGHT: 35 kg

Should a motorized dynamic penetrometer (TP 223/S) already be available, only the frame and the rollers need be purchased.

FRAME FOR ROD EXTRACTION

TP 226/2

The frame comprises:

- Base
- 2 hydraulic jacks with 260 mm travel and developing a
- Total force of 5000 kg
- Reverse gear control
- Upper crosspiece with housing for rollers

DIMENSIONS: 400 x 400 x 600 (h) mm.

WEIGHT: 38 kg.



TP 221



TP 220/012



TP 226

PAIR OF ROD EXTRACTION ROLLERS

TP 226/1

With a choice of measurements to be decided upon ordering.

In order to extract the rod string, alternately activate the jacks in both directions. The rollers and their housing are specially shaped to enable the rod string to be clamped securely during extraction upwards and effortlessly released downwards during the reverse operation.

LIGHT-WEIGHT MOTORIZED DYNAMIC PENETROMETER “PENNY”



TP 223/S

The “light-weight dynamic penetrometer” is generally intended, in Italy, as one with a 30 kg hammer having a 20 cm fall and cones with 10 sq. cm² section. Tecnotest manufactures the model TP 223/S.

30 kg DYNAMIC PENETROMETER

TP 223/S

The drive unit slides along a guide bracket mounted on a robust foot plate. The support frame has an overall weight of around 30 kg and may be disassembled so as to reduce size for transport. In particular, size of various elements fitted to the anvil (guide, hydraulic motor, support, safety device, etc.) has been reduced so that the whole assembly weighs only 10.6 kg.

SPECIFICATIONS:

- Hammer: 30 kg
- Fall: 20 cm
- Operation: hydraulic motor connected to anvil with cam for lifting hammer
- Power pack: 4 stroke Briggs & Stratton petrol engine 3 hp; with pump and hydraulic fluid tank
- Controls: 1 pedal
- Support frame: 2 piece guide with 4 adjustable supports
- Mechanism to lift drive unit: manual winch
- Standard supply:
 - N. 13 Rods \varnothing 1000 x 20 mm (L x dia.) (TP 220/005)
 - N. 5 Kit “Lost cone” kits dia. 35.7 mm (TP 220/001) total 50 cones
 - N. 2 cone holders (TP 220/003)
 - N. 2 impact plugs for rods (TP 220/007)
 - Kit of spanners and bubble level
 - Carrying case for rods and cones

TOTAL WEIGHT: 157 kg

ACCESSORIES:

TP 220/012	MANUAL LEVER ROD EXTRACTION DEVICE
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in alternative:

TP 226/1+TP 226/2	PAIR OF ROD EXTRACTION ROLLERS AND FRAME EXTRACTION DEVICE
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ACCESSORIES AND SPARE PARTS:

(FOR TP 221 - TP 223/S)

TP 220/002	Set of 5 left threaded cones
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TP 220/001	Set of 10 “lost” cones
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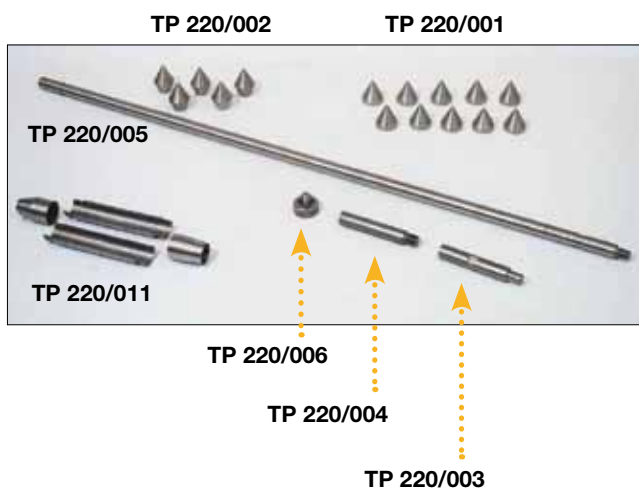
TP 220/004	Left threaded cone holder
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TP 220/003	Cone holder for “lost” cones
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TP 220/005	Threaded sounding rod dia. 20 mm x 1000 mm long, graduated every 100 mm
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TP 220/007	Impact plug for rods (for TP 223/S)
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TP 220/006	Impact plug for rods (for TP 224 - TP 223 - TP 225)
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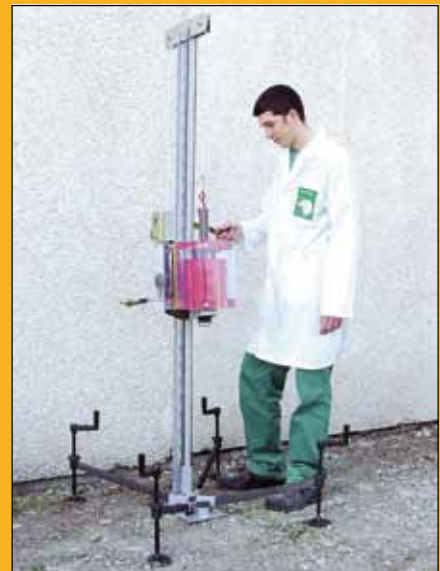
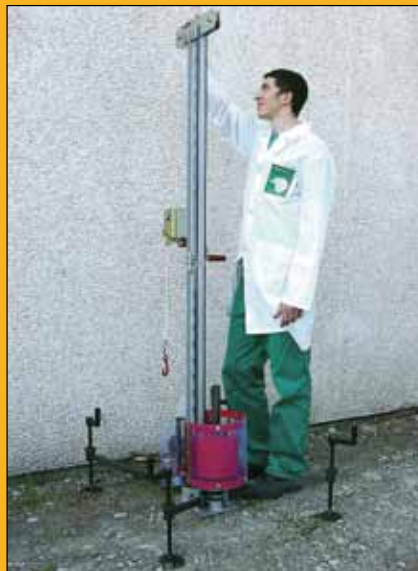


SPLIT SAMPLER

TP 220/011

For application to sounding rod, takes samples diameter 27.5 x 160 mm long. TP 220/002 and TP 220/004 are also needed.

PENNY, THE LIGHT-WEIGHT PENETROMETER, WITH SUPPORTING FEET TP 223/S



**MAY BE TRANSPORTED BY CAR AND
TAKES A SINGLE OPERATOR ONLY 5
MINUTES TO ASSEMBLE WITHOUT TOOLS**

LIGHT-WEIGHT STATIC/DYNAMIC SELF-ANCHORING PENETROMETER “DINASTAR”

This instrument is able to make both static and dynamic penetrometric tests. To pass from one test to another, it is only necessary to change the cone.

In the static form, no preliminary operation to anchor the machine to the ground is necessary because the special DINASTAR cone is self-anchoring; between one static reading and the next, the sounding rod advancement is achieved by percussion.

In the dynamic configuration, normal fixed or “lost” cones (with diameter larger than the sounding rods) are used. If the hole wall is unstable, the parasitic friction that generates along the rod string may be eliminated by the injection of liquids (with optional extra TP 310/018).

The functioning of the DINASTAR is fully hydraulic both during the driving and extraction phase.

It has twin (lever/pedal) controls.

The total weight of the portable instrument (TP 311) is approx. 250 kg and it can be readily dismantled for transportation in a normal motor car.

The trailer-mounted version (TP 312) has a total weight of approx. 560 kg.

The instrument can be easily removed from the trailer to allow its use in areas which are inaccessible to the trailer.

The track-mounted version (TP 312/T) has a total weight of approx. 530 kg.



TP 311

TP 311 30/2500 kg STATIC/DYNAMIC PENETROMETER

(completely disassemblable version for transport)

SPECIFICATIONS:

FRAME

- Support base with 3 reversible, adjusting stabilizing feet
- Guide rods in ground steel with transverse holes every 100 mm (used to check driving depth and for rod extraction). Each guide rod can be dismantled into two parts for transportation
- Upper bridge with spacer plate and roller for rope
- Double pulley system with rope
- Total height: 2820 mm
- Total weight: 34 kg

ELEMENTS FOR THE EXTRACTION OF ROD STRING

- Connection pin hammer/ram
- 2 hammer blockage pins
- Rod clamp. Quick action (hand-operated) lever system,

WEIGHT: 2.9 kg

DRIVING HEAD

- 30 kg hammer with 20 cm fall. The hammer is lifted by a variable speed hydraulic motor. The same motor, in reverse, drives the lifting winch of the drive head
- Double acting hydraulic ram with 25 kN max. thrust and 250 mm travel with variable speed control from 0 to 5 cm/sec. The hydraulic ram is used to drive the static cone and as a high-powered extractor to extract the rod string after testing
- Total weight (with hammer): 56 kg

SOUNDING RODS AND CONES

- Hollow steel sounding rods ext. dia. 28 mm, int. dia. 14 mm x 1000 mm useful length, square threaded. Unit weight 3.6 kg
- Steel push rods dia. 13 mm x 1000 mm. Unit weight 1 kg N.B. The hollow rods and push rods are used for static tests, only the hollow rods are used for dynamic tests
- Static cone dia. 35.7 mm with the same dimensions as the standard Dutch Mantle Cone
- Anchorage sleeve with three extension pieces for total surface areas of 500, 700 and 900 sq. cm. Weight of static cone with 1 sleeve (500 sq. cm) 6.7 kg
- Fixed or “lost” dynamic cones dia. 35.7 mm with 90° cone angle

HYDRAULIC POWER PACK

- 5 hp, 4 stroke Briggs & Stratton heavy duty motor with silencer
- Hydraulic gear pump, operating pressure 200 bar 12 litre capacity metal for hydraulic fluid with filter
- Dimensions: 530 x 400 x 450 (h) mm
- Weight (with fuel, hydraulic fluid and lube): approx.22 kg

HYDRAULIC CONTROL UNIT

- Distributors with dual pedal/lever control
- Continuous flow valve
- Circuit pressure manometer
- High pressure flexible connection hoses
- High pressure quick couplings
- Dimensions: 400 x 400 x 600 (h) mm
- Weight: 15 kg

LOAD MEASUREMENT INSTRUMENT

- Pressure transducer
- Mains/battery powered, microprocessor based electronic power pack (Monotronic) complete with battery charger.

This instrument, besides displaying load in digital form or point resistance (qc) directly, can also be programmed via the keyboard to maintain peak value for a specific duration after which it automatically resets.

It has sufficient autonomy to last a complete working day; time taken to re-charge is roughly equal to that spent working.

An auxiliary, 12 V power intake (car battery) may be used in an emergency.

STANDARD DINASTAR CONFIGURATION

- 12 sounding rods
- 12 inner rods
- 1 static Dutch Mantle Cone with anchorage sleeve, first rod and relative inner rod
- 2 fixed dynamic cones, section 10 sq. cm, 90° cone
- 50 "lost" cones, section 10 sq. cm, 90° cone
- 2 "lost" cone holders
- 1 set of spanners
- 2 cases for sounding rods, cones etc.
(each case measures 1200 x 170 x 160 (h) mm)

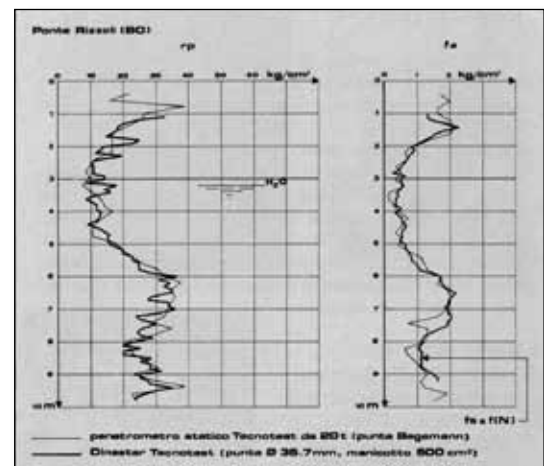
ACCESSORIES AND SPARE PARTS:

AD 009	Monotronic display/readout unit, battery run
TP 310/001	Standard Dinastar cone (10 sq.cm2)
TP 310/002	Spare tip for Dinastar cone TP 310/001
TP 310/004	Elements of anchorage sleeve
TP 310/005	Set of extensions for anchorage sleeve
TP 310/006	Fixed dynamic cone, section area 10 sq. cm, 90° cone angle
TP 310/007	"Lost" dynamic cone, section area 10 sq. cm, 60° cone angle
TP 310/008	"Lost" dynamic cone, section area 10 sq. cm, 90° cone angle
TP 310/009	"Lost" dynamic cone, section area 10 sq. cm, 60° cone angle
TP 310/010	"Lost" cone holder
TP 310/011	Coupling for anvil-push rod
TP 310/012	Sounding rod dia. 28 x 1000 mm long
TP 310/013	Inner rod dia. 13 x 1000 mm long
TP 310/014	First rod for static cone
TP 310/015	Inner rod for TP 310/014
TP 310/018	Complete system for liquid injection

LIQUID INJECTION SYSTEM

TP 310/018

- Manual injection pump with permanent suction piston (max. pressure 10 bar) brass body with stainless steel ball valves
- Brass pressurization tank
- Intake tube with metal filter
- Connection head to rod string in galvanized steel with rotating coupling, tap and rubber feed tube



COMPARISON BETWEEN THE PENETRATION TEST RESULTS OBTAINED WITH DINASTAR AND A 20 t DUTCH TYPE PENETROMETER



TP 310/006



TP 310/008



TP 310/010



TP 310/011



TP 310/001

STANDARD PENETRATION TEST

ASTM D 1586 AASHTO T 20

The Standard Penetration Test (SPT) consists of driving a special sampler for 1.5 feet at the bottom of a sounding hole. The penetration energy is supplied by a 140 lb hammer that drops in a continuous cycle from a height of 30 inches.

The N_{spt} result is the number of blows during the last foot of penetration.

The apparatus necessary for the tests consists of a drop hammer assembly and sampler. **Naturally, to perform tests a drilling rig is also necessary. Such rigs are not produced by Tecnotest.**

SPT DROP HAMMER ASSEMBLY TP 241

With 140 lb (63.5 kg) hammer, anvil and hammer guide rod with automatic release mechanism giving 30" (76 cm) free fall.

WEIGHT: 118 kg.

SPT SAMPLER TP 241/001

Consists of a tube split longitudinally into two parts, the upper end is fitted to the rod coupling, whilst a cutting shoe is fitted to the lower end.

The rod coupling contains a ball valve to prevent sample washing during extraction.

DIMENSIONS OF SAMPLING TUBE: int. diameter 35 mm, ext. diameter 50.8 mm x 610 mm long.

WEIGHT: 7.2 kg

ACCESSORIES AND SPARE PARTS:

TP 241/002 Spare cutting shoe for TP 241/001

TP 241/003 Cone for hard or cemented soils

TP 241/004 Rod dia. 50 mm x 1500 mm long in N80 steel.
Weight: 10.6 kg

TP 241/005 Rod dia. 50 mm x 3000 mm long in N80 steel.
Weight: 21.3 kg

TP 241/006 Nipple for dia. 50 mm rod.
Weight: 1.3 kg

TP 241/007 Lifting head for dia. 50 mm rod



