## MACHINES, EQUIPMENT AND ACCESSORIES TO BE SUPPLIED AT HUYE

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| S/N | Name and description | Specifications | Offered specification | Required quantities |
| 1 | Deep Scanning Metal Locator | complete set | Power: Built in batteryScreen:300X240Data transmition: Wifi /USBWeight:0.67 | 1 |
| 2 | Ultrasonic pulse analyzer | 1. Conform to EN 12504-4 | ASTM C597
2. Technical specifications
* 2 MHz sampling rate with 12-bit resolution
* 8 selectable low-pass filter cut frequencies
* Advanced signal processing (Transit time, Wave shape, FFT, SonReb)
* Selectable pulse rate 1, 2, 5 per second
* Transmitter pulse 2500 V
* Transit time up to 16 ms with 0.1 µs resolution
* Slot for memory card to save data
* RS 232 and USB port for real time downloading to PC
* Battery powered by internal rechargeable battery pack (7.2 Ah) up to 9 working hours before recharging
* Dimensions: 264 x 233 x 83 mm (instrument only); 500 x 400 x 140 mm (carrying case)

Weight: 2.6 kg (instrument only); 5 kg (complete outfit) (approx.) |  **Main Features:** Excellent accuracy  Color LCD background changes according to measurement mode Perfect in thick and attentive materials It is possible to connect 2 to 16 transducers Rugged Aluminium case CN 0207 Ultrasonic Pulse Velocity completewith A pair of 54 kHz UT Transducer, RG 58cable with BNC to XTR-9 Connector,Ultrasonic Couplant, Reference Block,Instruction Manual, Portable Aluminum Bag | 1 |
| 3 | Combined steel and concrete tension and compression testing machine with all accessories | 1. Automatic computerized system, for tensile tests up to 500KN 2. Connectable to a second frame up to 5000KN capacity for compression tests on concrete cubes, cylinders and blocks specimens, conforming to EN and ASTM 3. Can also be fifted with accessory for compression test 4. Fully automatic test cycle with closes-loop digital feedback 5. Double stage hydraulic pump with rapid approach and precise oil flow control 6. Adopts the latest ES technology for reduction of power consumption 7. Frame control expandable up to four, with active frame selection via software 8. Full conformity to EN ISO 7500-1, EN ISO 6892-1 and EN 15630-1 (for steel rebars) 9. Advanced data processing by intuitive very compressive software 10. The AUTOMAX control console can also be used for many other tests: flexure and splitting tests on concrete, compression tests on cement samples etc. **Hardware capacity:*** 131,000 points resolutions
* Closed-loop P.I.D. Control
* 4 channels for load sensors (pressure transducers and load cells)
* 6 channels to measure rebars elongation with extensometers
* 4 channels for strain measurement with strain gauges.
* Memorization of the calibration curve enabling sensors to be easily connected and immediately operated.
* Digital linearization of the calibration curve.

**User interface:*** Fully PC controlled

**Software*** AUTOMAX UTM is supplied complete with UTS Software, specially designed for tensile testing under:
1. Load / stress control
2. Crosshead separation control.
 | CN 0268 Compression Frame 5000KN,ASTM and EN. Fully automatic test cycle withcloses-loop digital feedback, Double stagehydraulic pump with rapid approach andprecise oil flow control, with digital touchscreen, software and PC connection. Fullconformity to EN ISO 7500-1, EN ISO 6892-1and EN 15630-1ST 0101 HYDRAULIC UTM MACHINE 600KN | 1 |
| 4 | Steam cabinet for soundness of building lime | 1. Standards EN 459-2
2. For use with 62-L0025 Le Chatelier moulds, this bath is designed for the determination of the soundness of building lime which is subjected to the continuous action of steam at atmospheric pressure for a period of 180 ±10 minutes.
3. The bath, identical in shape to the 62-L0025/F, has a stainless-steel internal chamber housed in an insulated stainless steel exterior case.
4. Stream cabinet
* Outside dimension: 465\*275\*200 mm (w\*d\*h)
* Weight: 11 kg (approx.)
* Power: 700 W
* 230 V, 50-60 Hz, 1ph.
 | CM 0107Le Chatelier Water Bath, used forthe determination of the soundness of cementpaste and lime samples. By using two heatersunits, the bath is capable of reaching boilingpoint in 30 minutes. Made of stainless steel.Supplied with a rack with 12 mould capacity.220-240V, 50-60Hz, 1ph | 1 |
| 5 | Dropping ball apparatus for consistency of mortar | The instrument comprises a dropping device mounted on a stand, acrylic ball, mould diameter 100x25mm. The base of the stand is machined. Chromed finishing.Weight: 8 Kg approx. | CM 0117 Dropping Ball apparatus completewith a dropping device mounted on a stand,acrylic ball and a 100mm diameter x 25mmdeep mold. The base of the stand ismachined with a chrome finish | 1 |
| 6 | Air Content Meters for mortar | 1. The 64-C0171 model, I liter capacity, is conforming to the EN 459-2 whilst the 64-C0171/A, 0.75 liter capacity is conforming to EN 413-2 standards. Both models can be supplied, on request, in the electric operated version.
2. Dimensions: 320 mm high, 20 mm dia.
3. Weight approx.: 3.5 kg
 | CM 0152 Mortorized Mortar Air ContentMeter, 0.75ltr. With an electricmini-comressor to keep the air pressureconstant | 1 |
| 7 | Chloride and Sulphate test strips | Rapid method (BS 812:117 | ASTM C88 | AASTHO T104 | EN 1367-2)Sulphate test strip, detection range 200 to 1600 mg/l. Useful for preliminary assessment of sulphate ions in aqueous solutions.Weight approx.: 10 g | Chloride and Sulphate test strips | 1 |
| 8 | Soil resistivity meter | 1. Standards: ASTM G57 | BS 1377:3

Used for ground water researches even to great depths, gravel deposit evaluation, geological surveys for the construction of roads, pipelines etc., study and prevention of landslides.1. Specifications
* The system consists of: 1 earth resistivity meter with software (requires external pc, not included), 2 cable reels with 300 m cable, 2 cable reels with 100 m cable, 2 stainless steel electrodes, 2 copper electrodes, 2 1.25 kg mallet
* Dimensions: 270x246x123 mm
* Weight: 2.9 kg Approx..
 | SP 0120: Soil resistivity meterStandards: ASTM G57 | BS 1377:3Used for ground water researches even togreat depths, gravel deposit evaluation,geological surveys for the construction ofroads, pipelines etc., study and prevention oflandslides.Specifications:Soil resistivity (Wenner and Schlumbergermodels)Earth couplingGround potential measurementContinuity/resistance (two-wire or four-wire)Two, three, or four wire testingTesting via two supplied C182 clampsMax resistance range: 0.01Ω to 99k.9ΩGround voltage range: 0.01mV to 65VFrequency range: 41Hz to 5078HzExpert and Automatic operation modeAutomatic input recognitionRejection of interference voltages (<60V)Internal memory for 512 readingsUSB cable and software for data transferCapable of working on pylon earths withCA6474 AdapterIP53-rated casing12-month warranty | 1 |
| 9 | FIELD INSPECTION POCKET VANE SHEAR TESTER | 1. STANDARD: ASTM D 2573
2. Used to determine the shear strength of undrained (CU) cohesive soft soils, to firm non-fissured soils on site.
3. The instrument consists of a T-handle cylindrical body where a torsional spring is housed, and three interchangeable vanes of different sizes, used depending to the expected strength of the soil to be tested.
4. The vane is inserted into the soil for 60 mm approx., and the max. torque value is measured on a collar attached to the shaft. Measuring range: 0 – 240 kPa
5. The unit, all stainless steel made, is supplied calibrated with calibration certificate and conversion table and complete with three vanes dimensions (diameter x height) 16x32, 20x40, 25.4x50.8 mm, extension rod 500 mm long, tools, carrying case.
6. Dimensions: 500x300x100 mm
7. Weight: 4 kg approx.
8. Accessories: extension rod, 500 mm long.
 | SL 0122 Pocket Shear Vane apparatusComplete Vane complete with Standard25mm dia, vane range 0 to 10N/cm2,Sensitive Vane adaptor, range 0 to 2N/cm2,High capacity vane adaptor range 0 to25N/cm2 in a plastic carrying case.Dimensions 240x210x50 mmWeight (approx.) 1,5 kg | 1 |
| 10 | SPT | 63.5kg Standard Penetration Test(SPT) for soil testing/10kg /30kg /50kg SPTFeatures1. The dynamic probing rig SPT-H is a highly functional soil investigation machine, easy to transport due to the folding mast feature.2. It is versatilely suitable for working in confined spaces and is displaced in outdoor terrains by hand.3. It features a three-legged foot with crank legs for solid erection on site. Suitable for perpendicular working in all positions.1. Dynamic Probing DPL, DPM, DPH and PT.
 | SP 0103 Standard Penetration Test(SPT) forsoil testing/10kg /30kg /50kg | 1 |
| 11 | Triaxial testing machine with all accessories | Triaxial test automatic control and processing software. 1. Model: ZME-4317 2. SPECIMEN: dia.61.8 mm\*25mm 3. Capacity: 60 KN 4. Confining pressure: 0-600kPa digital control and display 5. Sear speed: 0.0016-4 mm/min 6. Axial force: 0-6kN 7. Back pressure  8. Pore pressure: water-30kPa-600kPa; air-00-600kPa. 9. clay inlet valve force: S=300kPa, 500kPa 10. Volumetric deformation: V=0-50 cm, minimum resolution: 0.1ml**Test mode**: automatic (PC-controlled) with digital measurement system.**Applications:** 1. Total stress: UU
2. Effective stress: CU, CD
3. Stress path

**Standards:** 1. ASTM 2850/4767/D7181/D5084
2. BS 1377:6/7/8
3. CEN-1SO/TSI 17892-8/9/11

**Accessories:**1. Triaxial load frame
* Maximum sample diameter: 150mm
* Minimum testing speed: 0.00001 mm/min
* Maximum testing speed: 99.9999mm/min
* Maximum compression force: 100 KN
* Maximum tensile force: 5 KN
* Minimum vertical clearance: 390 mm
* Maximum vertical clearance: 1140 mm
* Dimensions (h\*w\*d): 1830mm\*600mm\*520mm
* Power: 600 W
* Weight: 120 kg
1. Digital measuring system
* Displacement transducer
* External / submersible load cell
* Pore pressure transducer
1. Triaxial cell with accessories (standard, banded or double-wall unsaturated cell)
2. Pressure/volume controller
3. De-airing system
4. Data acquisition and control units
5. Triaxial test automatic control and processing software.
 | TRIAXIAL SHEAR TEST APPARATUS- FOR 38MM DIA SPECIMEN -WITH DIGITAL READOUTCompliance StandardsIS: 2720 (Part XII)Salient FeaturesI innovatively designed compact Table top loadframeTwo pillar frameEquipped with Stepper Motor & Stepper Drive tooffer various strain ratesAlso equipped with Touch screen HMI & PLC ControllerTouch screen controller with Data logging and USB connection facility. All data can be transferredto pen driveOffers results of mm extension, load and pressure indicationAesthetic exterior appearanceVariable speed from 0.001 mm / min to 9.999 mm / min.Displays load and displacement both on the same screenSaves load and flow data at every 0.5 mm interval.Set up consist of following parts and accessoriesLoad Frame motorized capacity: 50 KN (5000 kgf ) giving different rates of strainLoad cell 2 K N ( 200 kgf ) capacity resolution (1 kgf) strain gauge in full bridge configuration.Pore Pressure transducer : 1 0 bars (10kg / cm2) WITH 0.01 kg/cm2 ACCURACY or 20 bars(optional)LVDT (displacement sensor) having a range of ± 25 mm with resolution of 10 microns (0.001mm).Triaxial cell: Stationary bushing as per IS 2720 part XII for 38 mm dia specimen x 76 mm long.Consisting of Perspex chamber, anvil, loading pressure up to 10.5 kg/cm2 with oil plug, air vent and novolume change type valves and kit. Kit consists of plain Perspex disc pair 38 mm dia x 6 mm thickPerspex top loading pad two way split former pair of porous stones sheath. Stretcher 12 nos Rubbersheaths 8 nos. 'O'rings one drainage connection including. 3 part split former with collar, base plate,hinged clamp. End former for 2 mm bore x 4 mm triaxial cell will be compatible for electronic out fitsystem. Power Supply : 220-240 V, A.C. 50 Hz, single phaseSelf Compensating pressure apparatus oil-water dead weight type. Pressure range 10.5 kg/cm2 in stepsof 0.5 kg/cm2 with indicator.Lateral pressure assembly : 0-10.5 kg/cm2 with pressure chamber, pressure gauge, null indicator,copper coil water reservoir and foot pumpSupplied with software. | 1 |
| 12 | Unconfined compression test machine | Power: ElectronicProduct name: UCS soil unconfined compression test machineMaximum load: 7.5knManual ascent speed: 10 circles/1mmElectric ascent speed: 2.4mm/minScrew disc diameter: 52mmLead screw moving distance: 50mmSpecimen size: 50X50 50X100Weight: 20kgDimensions: 220x340x500mmKeyword: unconfined compression testCOMMENT1. The content of Catalogue is not enough it doesnot show the specific standard to be used

Missing: accessoriesMoulds: EN 13286-53 and BS 1924:2 test sets or NF P 94-100 test set* EN/BS stabilized soil set for fine and medium grained soils – specimen size Ø 50 x 50 mm (diameter x height), EN 13286-53 and BS 1924:2
* EN/BS stabilized soil set for fine and medium grained soils – specimen size Ø 50 x 100 mm (diameter x height) , EN 13286-53 and BS 1924:2
* EN/BS stabilized soil set for fine and medium grained soils – specimen size Ø 100 x 100 mm (diameter x height) – EN 13286-53 and BS 1924:2
* EN/BS stabilized soil set for fine and medium grained soils – specimen size Ø 100 x 200 mm (diameter x height) – EN 13286-53 and BS 1924:2 All above sets include a mould, set of 2 end plugs, set of 2 plug displacing collars with 3 different heights, one demoulding plunger and specimen collector All components can be purchased separately Approx weight: 10 kg (34-T0123/A), 12 kg (34-T0123/B), 20 kg (34-T0124/A) and 53 kg (34-T0124/B)
 | SP 0105 Unconfined Compression Tester Unconfined compression tester for soil includes uniaxial compression test in which the test specimen is provided with no lateral support while undergoing vertical compression. The test measures the unconfined compression strength of a cylinder of cohesive or semi-cohesive soil and indirectly shearing strength. The shearing strength of the soil is generally taken to be one-half of the unconfined compression strength. The unconfined compression test apparatus is used normally on an undisturbed sample with its natural moisture content. It may also be performed on remolded samples to evaluate the consequences of disturbances and remolding. Unconfined compression tester frame with Compression Platens, hand operated used to perform uniaxial and unconfined compression tests on rock and soil. Supplied complete with ball seating assembly and manual pressure adjustment screw loading type. Platens 76mm dia. With concentric grooves for centring specimen. Specimen up to 275 mm. Load Ring Plated steel complete with dial indicator and calibration charts Strain Indicator 20mm range x 0.01mm graduations | 1 |
| 13 | Calorimeter | Power supply: 230V 1ph 50Hz 150WDimensions: 350x250x680 mmWeight: 12 kg approx.NEEDED ACCESSORIESE062-04 DIGITAL THERMOMETER. Resolution: 0.01 °C. Complete with probe, or:E062-04N DIGITAL THERMOMETER. Resolution: 0.001 °C. - Memory for 10000 readings - Displays, stores and prints:min, max, mean values, delta T - Alarm if limit values are exceeded - Battery operatedE061-11 PROPELLER, conforming to ASTM C186 Specifications, or:E061-12 PROPELLER, conforming to EN 196-8 Specifications. | CM 0125 Heat of hydration apparatuscomplete with a Dewar flask housed in aninsulated box, an electric stirrer, a filler funneland a high-resolution thermometer. Completewith probe, or:E062-04N DIGITAL THERMOMETER.Resolution: 0.001 °C.- Memory for 10000 readings- Displays, stores and prints:min, max, mean values, delta T- Alarm if limit values are exceeded- Battery operatedPROPELLER, conforming toASTM C186 Specifications, or:PROPELLER, conforming toEN 196-8 Specifications. | 1 |