

MEASURING Inst

GENERAL LAB

Apparatus

82 Measuring instruments

86 General laboratory apparatus

Testing equipment for the construction industry includes a large number of items that cannot be located in a specific application field such as concrete, cement, asphalt etc. but are for general use or for more than one application.

Furthermore, the ISO 9000 standards concerning Quality Assurance Systems require a number of measuring instruments to be used in central or field laboratories to check the testing equipment and environmental conditions. All these items have been grouped in this large family.

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General laboratory apparatus

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Force verification and calibration apparatus

STANDARD

- EN 12390-4 ► EN ISO 376
- ASTM C39 ► ASTM E4

The procedures detailed in these Standards can be performed with the following equipment:

- Load cell, to be selected according to the maximum capacity of the compression and/or flexural tester. See models 82-E0100/L5 to 82-E0100/500.
- Digital tester for force verification. See model 82-P0801/E with optional accessories.

LOAD CELLS

These high performance cells have been specially designed to meet the stringent requirements of EN, ISO and ASTM standards for calibration of compression testing machines. The cells must be connected to a suitable Digital tester such as the Digimax Plus (82-P0801/E).

Load cells connected to the Digital tester can be supplied complete with an official or traceable calibration certificate.

Specifications

- Accuracy: Class 1 EN ISO 376
- Linearity: $\leq \pm 0.05\%$ F.S.
- Hysteresis: $\leq \pm 0.05\%$ F.S.
- Repeatability:
0°, 120°, 240°: $\leq \pm 0.145\%$
- Reversibility: $\leq \pm 0.240\%$
- Zero: $\leq \pm 0.030\%$ F.S.
- Zero balance: $\leq \pm 1\%$ F.S.
- Supply voltage: 10 V
- Material: stainless steel
- Connector type: MIL-C-5015 7 poles male
- Complete with carrying case

Ordering information

- 82-E0100/L5**
Load cell, 5 kN capacity, complete with spherical loading head.
- 82-E0100/L25**
Load cell, 25 kN capacity, complete with spherical loading head.
- 82-E0100/L30**
Load cell, 30 kN capacity, complete with spherical loading head.
- 82-E0100/5**
Load cell, 50 kN capacity, complete with spherical loading head.
- 82-E0100/L75**
Load cell, 75 kN capacity, complete with spherical loading head.
- 82-E0100/10**
Load cell, 100 kN capacity, complete with spherical loading head.
- 82-E0100/30**
Load cell, 300 kN capacity.
- 82-E0100/50**
Load cell, 500 kN capacity
- 82-E0100/60**
Load cell, 600 kN capacity, complete with spherical loading head.
- 82-E0100/100**
Load cell, 1000 kN capacity.
- 82-E0100/200**
Load cell, 2000 kN capacity.
- 82-E0100/300**
Load cell, 3000 kN capacity.

82-E0100/500

Load cell, 5000 kN capacity.

82-E0100/SIT1

Official ACCREDIA calibration certificate for load cell 30 to 1000 kN capacity, connected to the relevant Digital tester.

82-E0100/SIT2

Official ACCREDIA calibration certificate for load cell 2000 to 5000 kN capacity, connected to the relevant Digital tester.

82-E0100/SIT3

Official ACCREDIA calibration certificate for load cell 5 kN capacity, connected to the relevant Digital tester.

82-E0100/TRC

Traceable calibration certificate for load cells from 5 kN to 5000 kN capacity, connected to the relevant Digital tester.

Note: Load cells of other capacities are available on request.

Model	Capacity kN	Dimensions, mm (dia. x height)	Weight approx., kg
82-E0100/L5	5	57x117*	1.5
82-E0100/L25	25	57x117*	1.5
82-E0100/L30	30	82x149*	4.2
82-E0100/5	50	82x149*	4.2
82-E0100/L75	75	82x149*	4.2
82-E0100/10	100	82x149*	4.2
82-E0100/30	300	129x200	10
82-E0100/50	500	129x200	12
82-E0100/60	600	129x200	12
82-E0100/100	1000	129x200	14
82-E0100/200	2000	129x200	16
82-E0100/300	3000	129x200	18
82-E0100/500	5000	168x200	35

*Including spherical loading head



Load cells from 5 kN to 100 kN complete with spherical loading head



Load cells from 300 kN to 5000 kN



DIGITAL TESTER FOR FORCE VERIFICATION

This system, when connected to any strain gauge load cell, provides data for the force verification of the testing machine. Data can be printed by a standard serial printer such as our model 82-P0172/M, using a serial cable (82-P0172/1, see accessories). Alternatively, data can be downloaded to the PC for processing and, using the relevant MS Excel template (82-P0804/E4, see accessories), for producing a test certificate conforming to the relevant Standard; for example the EN 12390-4 or ASTM C39 for concrete compression testers.

The tester, connected to one of our load cells 82-E0100/L5 to 82-E0100/500 (see Load cells), can be supplied complete with an official or traceable calibration certificate. See ordering information. Each cell must be calibrated separately and the certificate refers to one cell only.

Main features

- High effective resolution: 256,000 points (less than 0.05% of full scale)
- Large graphic display: 240 x 128 pixels
- Language selection

- Large permanent memory
- Two RS 232 serial ports for PC and printer
- Remote control
- MS Excel Template available for producing calibration certificates
- Clock calendar chip
- Dimensions: 250 x 220 x 150 mm
- Weight approx.: 2 kg

Ordering information

82-P0801/E
Digimax Plus, calibration tester, for use with load cells or transducers, 256,000-point effective resolution. 230 V, 50-60 Hz, 1 ph.

82-P0801/EZ
Same as above, but 110V, 60 Hz, 1 ph.

Accessories

82-P0172/M
24-column serial printer. 110-230V, 50-60 Hz, 1 ph.

82-P0800/C
Carrying case for DIGIMAX Plus and printer

82-P0172/1
Serial cable for connection of 82-P0172/M printer

82-Q0800/3
RS 232 serial cable and RS 232 to USB adapter

82-P0804/E4
Force calibration verification MS Excel spreadsheet

STANDARD

► EN 12390-4

STRAIN GAUGED COLUMN AND TESTER FOR LOAD TRANSFER VERIFICATION

To verify:

- Accuracy of force indication
- Self alignment of the upper machine plate
- Alignment of the upper machine plate
- Restraint of movement of the upper plate

These verifications can be performed using the 82-E0105/1 strain gauged cell, connected to the 82-P0804/E tester .

For detailed information please visit our web site



82-P0804/E with 82-E0105/1 and printer



Load cell (from 300 kN up to 5000 kN), digital tester 82-P0801/E and printer 82-P0172/M

Load cell (from 5 kN up to 100 kN)

Automatic calibration and force verification procedure

In order to perform automatic calibration of our compression machines, our external digital readout units (82-P0801/E or 82-P0804/E) can be directly connected on one side to the serial port of the PC controlling the machine via DATAMANAGER software and on the other side to a suitable reference load cell. The software displays the true force both in divisions (bits) and in engineering units (kN). The operator may enter a sequence of load levels and, once the true force levels are reached by reading on the dedicated software window, the corresponding electronic value in divisions will be saved, thus filling automatically the calibration table and creating the calibration curve.

CONTROLS		VERIFICA MACCHINA DI COMPRESSIONE COMPRESSION TESTING MACHINES			
Cliente Client	CONTROLS UK	Indirizzo Site address			
		CERTIFICATO N° - CERTIFICATE No : 1661/2019			
Pressa - Compression machine		Flessimetro - Strain gauge		Indicatore Digitale - Digital indicator	
Costruttore - Manufact.	CONTROLS	Costruttore - Manufact.	CONTROLS	Costruttore - Manufact.	CONTROLS
Tipo - Type	C47200	Tipo - Type	E105/P1	Tipo - Type	E 105
Matricola - Serial no	19004074	Matricola - Serial no	9111N361	Matricola - Serial no	ARE
		Certificato n° - Certificate no. :		K031534	
		Emesso da - Issued by :		LNE 01-apr-2009	
Verificata secondo - Conform to : ISC E105 rev.2 (rif. EN 12390-4:2002)					
RISULTATI DI STABILITA' - STABILITY RESULT					
	Fronte - Front	Retro - Back	Sinis. - Left	Destra - Right	Limiti - Limit
Media rapporto di carico - Mean strain ratio	-0,04	0,03	-0,02	0,03	± 0,10
Max diff. rapporto di carico - Max change in ratio	0,07	0,07	0,08	0,08	0,10
	Fronte / Retro - Front / Back	Sinis. / Destra - Left / Right		Limiti - Limit	
Diff. rapp. di carico - Diff. strain ratio /mm 200kN	0,03	0,05		0,06	
Diff. rapp. di carico - Diff. strain ratio /mm 2MN	0,03	0,04		0,04	
Data verifica - Verification date	Firma collaudatore - Operator signature		Verificato da - Verified by		
12-giu-19					

Load and deformation measurement

STRAIN GAUGE LOAD CELLS, 2.5 TO 100 KN CAPACITY

These load cells provide a very accurate electrical signal that is strictly proportional to the applied load. They can be used for various test applications with low capacity universal testers.

Two versions are available: standard, and complete with a traceable certificate of calibration.

Ordering information

82-P0370
Strain gauge load cell, 2.5 kN capacity.

82-P0373
Strain gauge load cell, 10 kN capacity.

82-P0375
Strain gauge load cell, 50 kN capacity.

82-P0376
Strain gauge load cell, 100 kN capacity.

Note: all models can be supplied, on request, with a traceable calibration certificate. For ordering, add '/C' after the relevant product code (e.g. 82-P0370/C).



82-P0375 / 82-P0375/C

Technical specifications

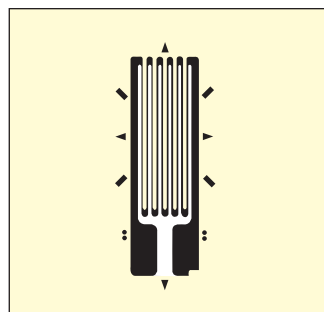
Product code	Capacity (kN)	Top and lower connection thread	Dimensions (mm, dia. x h)	Weight (kg, approx.)
82-P0370	2.5	M20 x 1.5	57 x 80	1.5
82-P0373	10	M20 x 1.5	57 x 80	1.5
82-P0375	50	M20 x 1.5	57 x 80	1.5
82-P0376	100	M30 x 2	82 x 110	4.45

STRAIN GAUGES

Strain gauges provide a very accurate electrical signal which is directly proportional to the deformation of a rock or concrete specimen submitted to an application of load. The gauges can be applied to the specimen surface using a special adhesive-catalyst agent and other accessories, which are all included in the 82-P0399/B Strain gauge application kit.

Up to four ¼ bridge strain gauges and eight ½ bridge gauges can be connected, via one or two 82-P0398 interfaces, to the AUTOMAX Multitest and AUTOMAX PRO-M control unit.

Strain gauges can also be connected, via one or two 82-P0398 interfaces, to a suitable data logger such as the Datalog 82-P9008. For more information see page 209



82-P0399/C



82-P0398

Technical specifications

Product code	82-P0390	82-P0391	82-P0392	82-P0393	82-P0396
Gauge width, mm	0.9	1.2	2.3	1	1
Gauge length, mm	10	20	30	60	120
Resistance, ohm	120	120	120	120	120
Bridge	¼	¼	¼	¼	¼
No. of gauges per pack	10	10	10	10	10

Ordering information

82-P0390
Strain gauges, 10 mm gauge length. Pack of 10.

82-P0391
Strain gauges, 20 mm gauge length. Pack of 10.

82-P0392
Strain gauges, 30 mm gauge length. Pack of 10.

82-P0393
Strain gauges, 60 mm gauge length. Pack of 10.

82-P0396
Strain gauges, 120 mm gauge length. Pack of 10.

82-P0399/1
Connecting terminals, 50-pair sheet.

82-P0399/C

Strain gauge application kit comprising: conditioner, neutralizer, acetone, two tweezers, adhesive and catalyst agent, 100m of bipolar cable, solder, electric welder and carrying case.

82-P0398

Compensation device for up to 4 Wheatstone bridge gauges with ¼ or ½ bridge setup.

Accessories

82-P0399/P22

Adhesive and catalyst agent for gluing strain gauges to the specimen. (Part of kit 82-P0399/B.)

LOAD MEASURING RINGS

Load rings can be used for load measurement and for calibration of testing machines. All model are made from special alloy steel, they are supplied in three versions: analog dial gauge 0.01 mm, analog dial gauge 0.001 mm and digital dial gauge 0.001 mm. All supplied complete with calibration chart.

All models can be fitted with T1000/F (see accessories), a special stem brake unit which maintains the maximum reading after the failure of the specimen.

Load ring can be directly connected to the adapter fit on the crosshead of triaxial frames. Using the 28-WF1049 connector (see accessories) they can be adapted to our complete range of triaxial cells.

Accessories

28-WF1049

Connector for load rings in triaxial applications.

82-T1000/9

Adapter to connect the load rings, 0.5 to 10 kN capacity, to the crosshead of CBR/Marshall, Multispeed and Uniframe 50-100 kN testers.

82-T1000/F

Stem brake unit for load rings.



82-T1000/50M



82-T1000/30M, 82-T1000/F

Technical specifications

Capacity [kN]	Analog Dial Gauge 0.01	Analog Dial Gauge 0.001	Digital Dial Gauge 0.001
0.5	82-T1000/05C	82-T1000/05M	82-T1000/05D
1	82-T1000/1C	82-T1000/1M	82-T1000/1D
2	82-T1000/2C	82-T1000/2M	82-T1000/2D
3	82-T1000/3C	82-T1000/3M	82-T1000/3D
5	82-T1000/5C	82-T1000/5M	82-T1000/5D
10	82-T1000/10C	82-T1000/10M	82-T1000/10D
15	82-T1000/15C	82-T1000/15M	82-T1000/15D
20	82-T1000/20C	82-T1000/20M	82-T1000/20D
30	82-T1000/30C	82-T1000/30M	82-T1000/30D
40	82-T1000/40C	82-T1000/40M	82-T1000/40D
50	82-T1000/50C	82-T1000/50M	82-T1000/50D
60	82-T1000/60C	82-T1000/60M	82-T1000/60D
100	82-T1000/100C	82-T1000/100M	82-T1000/100D

Pressure and displacement measurement

PRESSURE TRANSDUCERS

These provide a very accurate electrical signal that is strictly proportional to the pressure of the hydraulic circuit of the testing machine or apparatus. The transducers use a full Wheatstone bridge circuit and feature fully sealed stainless steel pressure chambers and diaphragms. The 50-Q50/PT model, mainly used for compression testing frames, is supplied complete with U-shaped metal protection. Models 28-WF6300/A to 28-WF6302/A are mainly used for triaxial tests. See page 79

Technical specifications

- Accuracy: $\pm 0.5\%$
- Resolution: infinite
- Operating temperature range: -40 to +100°C
- Sensitivity: 2mV/V applied (nominal)
- Full scale output: 20 mV nominal
- Cable: 4 core PVC insulated, 1 m length
- Connection thread: ¼ BSP
- Weight: 150 g approx.

Ordering information

28-WF6300/A

Pressure transducer, 0 - 10 bar range.

28-WF6301/A

Pressure transducer, 0 - 20 bar range.

28-WF6302/A

Pressure transducer, 0 - 35 bar range.

82-P0050

Pressure transducer, 0 - 50 bar range.



50-Q50/PT, 700 bar pressure transducer complete with protection

82-P0100

Pressure transducer, 0 - 100 bar range.

82-P0200

Pressure transducer, 0 - 200 bar range.

82-P0350

Pressure transducer, 0 - 350 bar range.

82-P0500

Pressure transducer, 0 - 500 bar range.

82-P0700

Pressure transducer, 0 - 700 bar range.

50-Q50/PT

Pressure transducer, 0 - 700 bar range complete with U-shaped metal protection.

82-P0349/ELT

Connecting cable for pressure transducer. Suitable for Smart-Line, Sercomp, MCC, Advantest control consoles and Compact-Line Wizard, Pilot and AUTOMAX compression machines.

Note: all models can be supplied, on request, with a traceable calibration certificate. For ordering, add '/C' after the relevant product code (e.g. 82-P0700/C).



82-P0349/ELT, suitable for Smart-Line, Automax Multitest control consoles and Compact-Line Wizard, Pilot and AUTOMAX compression machines

LINEAR POTENTIOMETRIC TRANSDUCERS

These provide an electrical signal that is proportional to the displacement of the linear shaft, which is housed in a non-corrodible metal case. The extremely low spring force on the shaft and the excellent linearity make these transducers ideal for laboratory use.

Two versions are available: standard, and complete with a traceable certificate of calibration.

Other models are available for use in triaxial tests.

Technical specifications

- Input voltage: 10 V DC
- Output: from 0 to 10 V DC
- Repeatability: better than 0.002 mm
- Accuracy: better than 0.002 mm
- Connector: 6-pin
- Weight: 150 to 220 g approx.

Ordering information

82-P0320

Linear potentiometric transducer, 10 mm travel.

82-P0322

Linear potentiometric transducer, 25 mm travel.

82-P0324

Linear potentiometric transducer, 50 mm travel.

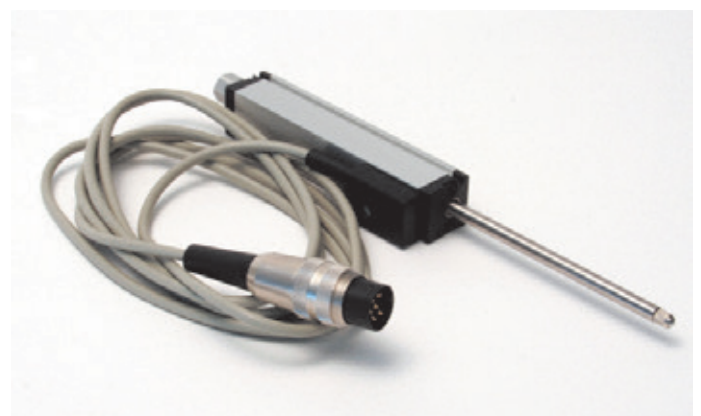
82-P0326

Linear potentiometric transducer, 100 mm travel.

Note: all models can be supplied, on request, with a traceable calibration certificate. For ordering, add '/C' after the relevant product code (e.g. 82-P0320/C).



82-P0700, 700 bar pressure transducer with 82-P0349/ELT connection cable



82-P0324

LINEAR LVDT TRANSDUCERS

These high-precision displacement transducers are controlled by the position of a magnetic core which provides an output of voltage that is proportional to the position of the transducer stem. Two versions are available: standard, and complete with a traceable certificate of calibration.

Technical specifications

- Input voltage: 10 V DC
- Resolution: infinite
- Linearity: 0.30%
- Connector: 6-pin

Ordering information

82-P0331/A
High precision LVDT displacement transducer, 2 mm travel.

82-P0331/B
High precision LVDT displacement transducer, 5 mm travel.

82-P0331/C
High precision LVDT displacement transducer, 10 mm travel.

82-P0331/G
High precision LVDT displacement transducer, 20 mm travel.

Note: all models can be supplied, on request, with a traceable calibration certificate. For ordering, add 'C' after the relevant product code (e.g.82-P0331/C1C).



82-P0331/C



82-P0331/2

Accessories

82-P0331/2
Electronic averaging device for 2 or 3 series 82-P0331/A, B, and C displacement transducers

Clip gauge transducer

Technical specifications
Supply voltage: 2 V
Measuring capacity: 5 (3 to 8) mm
Sensitivity: 1000x10⁻⁶ strain/mm

82-P0331/E⁽¹⁾
High precision transducer for measuring crack tip and crack mouth opening displacement.
(1)To perform tests on FRC-FRP concrete. See page 210 for complete information.

82-P0331/E1
Spare fixing jigs for 82-P0331/E. 10 pieces.



82-P0340/100, 82-P0340/5



82-D1261/10C with 82-D1261/LINK

LTD Strain gauge transducers

Technical specifications

- Supply voltage: 10 V
- Resolution: <1µm
- Linearity: 0.10 % F.S.
- Connector: 6-pin

Ordering information

82-P0340/100
High precision strain gauge displacement transducer, 100 mm travel.

82-P0340/50
High precision strain gauge displacement transducer, 50 mm travel.

82-P0340/10
High precision strain gauge displacement transducer, 10 mm travel.

82-P0340/5
High precision strain gauge displacement transducer, 5 mm travel.

DIGITAL DIAL INDICATORS

58 mm diameter dial, complete with rear mount and serial output connection with serial cable for PC connection (serial cable to be ordered separately). See accessories.

Ordering information

82-D1262/B
Digital dial indicator, 25.4x0.001 mm with output for PC connection

82-D1261/50C
Digital dial indicator, 50x0.01 mm with output for PC connection

Accessories

82-D1261/LINK
Serial cable for PC connection.

82-D1260
Magnetic holder for dial gauges/ indicators.

MECHANICAL DIAL INDICATORS

58 mm diameter dial with clockwise rotation and includes a rear mount. Weight: 150 g approx.

Ordering information

82-D1250/A
Dial gauge, 5x0.001 mm.

82-D1252
Dial gauge, 10x0.002 mm.

82-D1255
Dial gauge, 10x0.01 mm.

82-D1257
Dial gauge, 30x0.01 mm.

82-D1259/B
Dial gauge, 50x0.01 mm.

Accessories

82-D1260
Magnetic holder for dial gauges/ indicators.



Dial gauges



82-D1260 with dial gauge

DATALOG 8

Data acquisition equipment

82



Data acquisition unit DATALOG 8 model 82-P9008. Laboratory version

DATALOG 8 is a stand-alone data logger for general purpose acquisition, processing and data storage for laboratory applications.

DATALOG 8 records and monitors in real time the measurements requested by different tests, for example:

- Elastic modulus determination with Uniaxial and Triaxial testing systems without in-built channels (rock, concrete, others)
- Determination of axial and circumferential deformations of concrete and rock specimens under compression loading
- Rock shear box apparatus
- Plate bearing test apparatus (Battery operated version)
- In-situ determination of stress, deformability and resistance of masonry walls with flat jacks (Battery operated version)
- ... and many other tests

Available in two versions:

82-P9008

Datalog 8, stand-alone multipurpose data logger, Laboratory version. 110-230 V, 50-60 Hz, 1 ph.
 - Dimensions approx lxdxh [mm]:
 290x195x100 (Display close);
 290x195x241 (Display open)
 - Weight: approx. 2.5 kg

82-P9008/F

Battery operated version for field applications
 - Internal rechargeable sealed battery 12V, 7.2 Ah and built-in battery charger 110-230 V, 50-60 Hz, 1 ph. Power cable is included
 - Battery life: 8 hours in continuous use
 - Dimensions approx lxdxh [mm]:
 265x171x223
 - Weight: approx. 6 kg

Data acquisition unit DATALOG 8 model 82-P9008 and 82-P9008/F - Live readings of the 8 channels



MAIN FEATURES

- » Number of channels: 8
- » Network mode: Up to 8 units (Laboratory version only)
- » Sampling rate: Up to 10 readings per second per channel via USB, up to 500 readings per second per channel via LAN,
- » Real resolution: 131,000 points
- » Communication port: LAN / Ethernet
- » Data storage on removable USB pen drive
- » Excitation (VEXC): from 1 V to 10 V for each couple of channels (up to 4)
- » Input signal : 0-10 V; 0-20 mA
- » Software: Not included, P9008/SOF

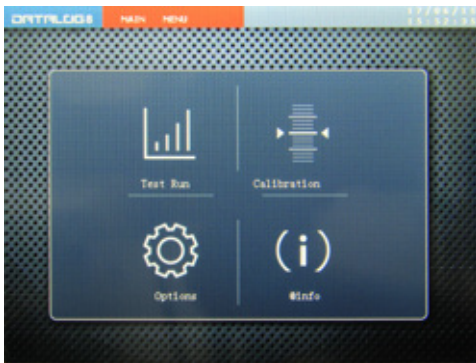


Data acquisition unit DATALOG 8 model 82-P9008/F- Battery operated version designed for in-field applications

82-P9008. Adjustable 6" touchscreen color graphic display



Data acquisition unit DATALOG 8 both versions. Main menu



Data acquisition unit DATALOG 8 model 82-P9008/F - Detail of removable USB pen drive



Data acquisition unit DATALOG 8 model 82-P9008/F - Detail of the 6" touchscreen color graphic display



Data acquisition unit DATALOG 8 model 82-P9008/F Detail of complete set

Accessories (for both versions)

Cables (mandatory)

82-P9008/ELT

Set of four cables for connecting load cells, pressure transducers, strain gauges, LDT / LVDT / potentiometric type displacement transducers to DATALOG 8 (82-P9008) and GEODATALOG 8 (30-WF6008)

82-P0398 (needed for strain gauge use)

Compensation device for up to 4 Wheatstone bridges with 1/4 or 1/2 bridge setup.

26-WF4645

LAN HUB with 8 ports

82-P9008/SOF

DATACOMM 2 data acquisition software and LAN cable for PC connection of DATALOG 8 (82-P9008).

- Up to 8 datalogger (total 64 channels) can be connected to a single PC creating a modular network (LAN hub is required)
- Free user setting of channel groups (nr. and type of channels)
- Numerical and graphical display of the readings
- Fully customizable multi-diagrams function including multi-channels plotted against the same axes and / or one channel plotted in relation to another
- Data export ASCII format
- Possibility to save and recall different calibration files allowing quick transducers swapping

Temperature measurement

DIGITAL THERMOMETERS

The proposed standard models (82-D1226 to 82-D1228), cover all applications in the construction industry as specified in the table.

The Multipurpose 82-D1229 microprocessor-controlled model is for professional use and, fitted with the suitable probe (see Accessories), can be used for monitoring the temperature of asphalt, concrete mortar etc. This high resolution model is dual range and is housed in a rugged ABS case.

Technical specifications

Standard pocket models, 82-D1226 to 82-D1228

Product code	82-D1226	82-D1226/A	82-D1227	82-D1228
Temperature range, °C	-50 to +150	-50 to +150	-50 to +170	-40 to +550
Resolution, °C	0.1	0.1	0.1 1	1
Accuracy, °C	±0.3 -0.5	±0.3 -0.5	±0.3 ±0.4	±2
Probe size, mm (dia. x h)	3 x 105	3 x 160 (1 m cable)	5 x 125	3 x 130 for penetration
Dimensions, mm	66 x 50 x 25	106 x 58 x 19	175 x 41 x 23	175 x 41 x 23
Weight, g	50	80	65	92
Applications	Liquid, air, semi-solids, frozen and granular material	Liquid, air, semi-solids, frozen and granular material. Ideal for concrete	Ideal for industrial applications. Liquid, air, semi-solids	Liquid, air, semi-solids. Ideal for bitumen.

82



82-D1229 with probes



82-D1226, 82-D1227, 82-D1228 and 82-D1226/A

Multipurpose dual range model, 82-D1229

- Ranges: (A) from -50 to +199.9°C; (B) from +200 to +1350°C
- Resolution: (A) 0.1°C; (B) 1°C
- Accuracy: ±0.2% full scale
- Waterproof
- Type of probe: Thermocouple K, (not included)
- Battery type/life: 3 x 1.5 V AA / approx. 1600 hours
- Automatic switch-off
- Dimensions: 150 x 80 x 36 mm
- Weight: 235 g

The 82-D1229 Digital thermometer is supplied without probes, which have to be selected and ordered separately - see Accessories.

Vernier calipers, steel rules and tapes

- 82-D1652**
Vernier caliper 0-150 mm x 0.1 mm
- 82-D1654/A**
Vernier caliper 0-200 mm x 0.01 mm
- 82-D1655/A**
Vernier caliper 0-300 mm x 0.01 mm
- 82-D1694**
Steel rule, 500 mm long, metric
- 82-D1695**
Steel tape, 2 m long

Accessories

Probes for 82-D1229 Digital thermometer

- 82-D1229/1**
Penetration probe, 3 mm diameter, 120 mm long.
- 82-D1229/2**
Surface probe.
- 82-D1229/3**
Air probe.
- 82-D1229/5**
Penetration probe, 5 mm diameter 200 mm long.
- 82-D1229/5S**
Penetration probe, 5 mm diameter, 300 mm long. Conforming to NF.
- 82-D1229/6**
"T" bar probe, 660 mm long, conforming to BS 594.
- 82-D1229/7**
Sword probe, 500 mm long.
- 82-D1229/10**
K-type thermocouple, 5 m long, complete with coupling unit.

Temperature measurement

DIAL THERMOMETERS

Technical specifications

Product code	Range (°C)	Dial dia. (mm)	Stem dimensions (mm, dia. x h)	Weight (g, approx.)
Standard models				
82-D1210	0 to +60	50	3 x 200	35
82-D1211	0 to +100	50	3 x 200	35
82-D1212	0 to +200	50	3 x 200	35
82-D1213	0 to +260	50	3 x 200	35
Pocket size models				
82-D1206	+50 to +260	45	4 x 150	40
82-D1207	-30 to +60	45	4 x 150	40
Long stem model				
82-D1208/5	+50 to +250	100	12 x 750	700
Surface model				
82-D1214	0 to +200	50	-	35



82-D1210 to 82-D1213



82-D1206 / 82-D1207



82-D1214



82-D1208/5



82-D1215

82-D1215

Max/Min thermometer. Range: -30 to +50°C. Weight: 50 g approx.

GLASS THERMOMETERS FOR GENERAL LABORATORY USE

Weight: 50 g approx.

82-D1199

Glass laboratory thermometer, 0 to +50°C, 0.5°C graduations.

82-D1200

Glass laboratory thermometer, -10 to +110°C, 1°C graduations.

82-D1201

Glass laboratory thermometer, 0 to +150°C, 1°C graduations.

82-D1215/1

Glass laboratory thermometer, -35 to +50°C, 1°C graduations.

82-D1203

Glass laboratory thermometer, 0 to +250°C, 1°C graduations.

82-D1204

Glass laboratory thermometer, 0 to +360°C, 1°C graduations.



82-D1199 to 82-D1204

IP AND ASTM MERCURY FREE THERMOMETERS

Weight: 50 g approx.

Product code	IP ref.	ASTM ref.	Range (°C)	Graduation (°C)	Immersion depth (mm)
82-B0100/6MF	38C	-	+23 to +27	0.1	Total
82-B0121/4MF	76C	-	+10 to +55	0.5	93
82-B0122/3MF	8C	-	0 to +44	0.2	65
82-B0158/3MF	42C	-	-38 to +30	0.5	250
82-B0150/10MF	5C	7C	-2 to +300	1	Total
82-B0150/11MF	6C	8C	-2 to +400	1	Total
82-B0135/1MF	15C	9C	-5 to +110	0.5	57
82-B0135/2MF	16C	10C	+90 to +370	2	57
82-B0130/2MF	28C	11C	-6 to +400	2	Total
82-PV0160/10MF	47C	13C	+150 to +175	0.5	Total
82-D1200/1MF	60C	15C	-2 to +80	0.2	Total
82-D1200/2MF	61C	16C	+30 to +200	0.5	Total
82-B0125/2MF	-	17C	+19 to +27	0.1	Total
82-B0125/3MF	23C	18C	+34 to +42	0.1	Total
82-B0125/4MF	-	19C	+49 to +57	0.1	Total
82-B0125/5MF	-	20C	+57 to +65	0.1	Total
82-B0125/6MF	-	21C	+79 to +87	0.1	Total
82-B0125/7MF	-	S22C	+95 to +103	0.1	Total
82-B0121/1MF	-	23C	+18 to +28	0.2	90
82-B0121/2MF	-	24C	+33 to +54	0.2	90
82-B0121/3MF	-	25C	+95 to +105	0.2	90
82-B0138/A1MF	20C	33C	-38 to +42	0.2	50
82-B0138/A3MF	59C	35C	+90 to +170	0.2	50
82-B0116/40MF	35C	47C	+58.6 to +61.4	0.05	Total
82-B0137/A1MF	-	57C	-20 to +50	0.5	Total
82-B0122/4MF	63C	S63C	-8 to +32	0.1	Total
82-B0116/45MF	93C	110C	+133.6 to +136.4	0.05	Total
82-D1200/3MF	89C	113C	-1 to +175	0.5	Total

Note: others models available on request.

Temperature, conductivity and time measurement

82-D1220/A INFRARED NON-CONTACT THERMOMETER

This stick-type infrared thermometer measures surface temperatures without touching the object being measured. The closer the instrument is to the object being measured, the smaller the spot size becomes. This can be as small as 5 mm at a distance of 65 mm.

Technical specifications

- Measuring range: -10 to +300°C
- Resolution: 1°C
- Accuracy: $\pm 2^\circ\text{C}$, $\pm 2\%$
- Display: 20 mm hi-contrast LCD display
- Maximum value: retained for 15 seconds
- Battery type: 9 V battery
- Dimensions: 143x80x38 mm
- Weight: 320 g approx.

Note: a traceable ISO 9000 certificate of calibration is available on request.



82-D1220/A

82-D2230 MULTIRANGE CONDUCTIVITY METER

Ideal for quick measurements of conductivity in soils from 0 to 199.9 $\mu\text{S}/\text{cm}$.

Measuring ranges:

- $\mu\text{S}/\text{cm}$: 0.0 to 199.9, resolution 0.1
- $\mu\text{S}/\text{cm}$: 0.0 to 1999, resolution 1
- $\mu\text{S}/\text{cm}$: 0.0 to 19.99, resolution 0.01
- Accuracy: $\pm 1\%$ full scale
- Temperature compensation: Automatic
- Battery type/life: 1x9 V/ approx. 100 hours of continuous use
- Dimensions: 185x82x45 mm
- Weight: 355 g approx.



82-D2230

82-D2220/A PORTABLE THERMO-HYGROMETER FOR HUMIDITY AND TEMPERATURE MEASUREMENT

Battery operated

Measuring range:

- RH, 5 to 95%
- Temperature: 0 to + 50°C

Resolution:

- RH, 0.1%
- Temperature, 0.1°C



Accuracy:

- RH $\geq 70\%$, $\pm 3\%$, $+1\%RH$
- RH $< 70\%$, $\pm 3\% RH$
- Temperature, $\pm 0.8^\circ\text{C}$
- Dimensions: 177 x 78 x 45 mm
- Weight: 490 g approx..

82-D2220/A

WATCHES, STOPWATCHES AND TIMERS

82-D1230

Stopwatch, nickel chromium case, 0-60 seconds with 0.2 second graduations. Weight 100 g approx.



82-D1230

82-D1231

Digital stopwatch, 1/100th seconds stopwatch. Display of hours, minutes, seconds, actual time and date. Weight 50 g approx.

82-D1240

Digital clock/timer. Time, stopwatch and alarm plus functions to count time up or down to/ from 24 hours. Weight 100 g approx.



82-D1240



82-D1231

Meteorological equipment

82-D3000/A RAIN GAUGE

Made from stainless steel.
Dimensions: 115 mm diameter x300 mm height
Weight: 1 kg approx.



82-D3000/A

82-D3005 ASSOCIATION RAIN GAUGE

Consisting of a zinc container with metal filter.
Supplied complete with graduated cylinder.
Funnel dia.: 226 mm
Surface: 400 cm²
Height: 300 mm
Weight: 3 kg approx.



82-D3005

82-D2024/A HAND ANEMOMETER

Large and easy-to-read display with polyethylene protection foam that makes the unit comfortable to hold.
Range: Instant, maximum and average wind speed (3 s to 24 h)
Display: LCD with backlight.
Propeller: 54 mm
Units: km/h, m/s, fps, knots and bft
Resolution: (≤ 99.9) 0.1; (≥ 100) 1
Precision: $\pm 3\%$ from -10 to +50°C
Measuring range: from 2 to 150 km/h
Dimensions: 65 mm diameter x155 mm height
Weight: 235 g approx.



82-D2024/A

82-D3146 WEATHER STATION

Display of:

- Outdoor temperature and humidity (wireless up to 3 transmitters max. 100 m)
- Indoor temperature and humidity
- Comfort level
- Max-min function
- Weather forecast
- Tendency of atmospheric pressure
- Relative atmospheric pressure
- History for the past 24 hours
- Date
- Moon phase
- Radio controlled clock with alarm and snooze function
- LED backlight
- Measuring ranges:
 - Outdoor: -30 to +70°C (-22 to +158°F)
 - Indoor: -10 to +60°C (+14 to +140°F)
 - Humidity 1 to 99%
- Batteries: (display station) 3x1.5V AA; (transmitter) 3x1.5 V AA
- Dimensions: 230x118x30 mm
- Weight: 545 g approx.



82-D3146

82-D3260 WET AND DRY BULB HYGROMETER

This is a simple unit designed for general purpose use. Two identical thermometers are mounted on a printed plastic scale. Between the thermometers is an independent slide with a pointer, which allows relative humidity to be easily read. The scale is housed in a plastic case, which also holds a reservoir with an anti-frost device.

Accuracy: $\pm 5\%$ to 20% RH
Thermometers: scale length 140 mm, range -5 to +50°C, 1°C graduations
Dimensions: 340x82x45 mm
Weight: 225 g approx.



82-D3260

82-D3281 THERMOHYGROGRAPH

This device simultaneously records temperature and humidity. Supplied complete with 100 charts, 2 pens, and instruction manual.

Temperature range: -35 to +45°C
Humidity range: 0 to 100%
Time scale: 24 hours or 7 days
Overall dimensions: 375x290x230 mm
Weight: 5 kg approx.

Spare parts

82-D3281/1
Spare charts, pack of 50.

82-D3281/2
Spare pens for Thermohygrograph 82-D3281. Pack of 5.



82-D3281

General Laboratory Apparatus

Chemicals

A comprehensive range of laboratory chemicals and reagents is available. Hazardous materials often require special handling and documentation.

CONTROLS cannot accept any responsibility for delays in delivery due to special delivery requirements.

Product code	Description	Hazard class	UN No.	Q.ty
86-D0815	Barium chloride	6.1	1564	1000 g
86-D0800	Calcium chloride "AnalaR"	N/A	-	1000 g
86-D0811	Distilled water	N/A	-	25 L
86-D0806	Glycerine	N/A	-	1000 ml
86-D0808	Hydrochloric acid	8.0	2031	1000 ml
86-D0809	Nitric acid	8.0	2031	1000 ml
86-D0805/G	Paraffin wax	N/A	-	10 kg
86-D0823	Potassium bichromate	N/A	-	1000 g
86-D0819	Silica gel with indicator	N/A	-	1000 g
86-D0820	Silicone grease, tube	N/A	-	100 g
86-D0814	Silver nitrate	N/A	-	500 ml
86-D0802	Sodium hexametaphosphate	N/A	-	1000 g
86-D0801	Sodium hydroxide	8.0	1823	1000 g
86-D0825	Sodium sulphate	N/A	-	1000 g
86-D0810	Sulphuric acid	8.0	1830	1000 ml
86-D0845	Water repellent grease	N/A	-	1000 g



Glassware

GLASS MEASURING CYLINDERS

Graduated with pouring spout

- 86-D1000**
Glass measuring cylinder, 10 ml capacity.
- 86-D1001**
Glass measuring cylinder, 25 ml capacity.
- 86-D1002**
Glass measuring cylinder, 50 ml capacity.
- 86-D1003**
Glass measuring cylinder, 100 ml capacity.
- 86-D1004**
Glass measuring cylinder, 250 ml capacity.
- 86-D1005**
Glass measuring cylinder, 500 ml capacity.

- 86-D1006**
Glass measuring cylinder, 1000 ml capacity.
- 86-D1007**
Glass measuring cylinder, 2000 ml capacity.

Conical flasks

- Erlenmeyer, borosilicate glass, wide mouth
- 86-D1030**
Erlenmeyer conical flask, 100 ml capacity.
- 86-D1031**
Erlenmeyer conical flask, 300 ml capacity.
- 86-D1032**
Erlenmeyer conical flask, 500 ml capacity.
- 86-D1033**
Erlenmeyer conical flask, 1000 ml capacity.
- 86-D1034**
Erlenmeyer conical flask, 2000 ml capacity.

PYKNOMETERS

Borosilicate glass pyknometers

Conforming to EN 1097-6: Tests for mechanical and physical properties of aggregates.

- 86-D1037**
Pyknometer, 500 ml capacity.
- 86-D1038**
Pyknometer, 1000 ml capacity.
- 86-D1039**
Pyknometer, 2000 ml capacity.

Pyknometers, 27 mm mouth, with stopper

- 86-D1040**
Pyknometer, 500 ml capacity.
- 86-D1041**
Pyknometer, 1000 ml capacity.
- 86-D1042**
Pyknometer, 2000 ml capacity.

Pyknometers, 50 mm mouth, with stopper

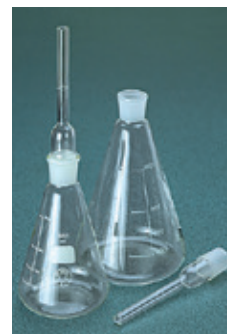
- 86-D1040/S**
Pyknometer, 500 ml capacity.
- 86-D1041/S**
Pyknometer, 1000 ml capacity.
- 86-D1042/S**
Pyknometer, 2000 ml capacity.



Glass measuring cylinder, 86-D1000 to 86-D1007



Conical flasks, 86-D1030 to 86-D1034



Pyknometers, 86-D1040 to 86-D1042, right, 86-D1037 to 86-D1039



Pyknometers, 86-D1040/S and 86-D1041/S

FILTER FLASKS**86-D1044**

Filter flask, 500 ml capacity.

86-D1044/1

Perforated bung with glass tube, for 86-D1044.

86-D1045

Filter flask, 1000 ml capacity.

VOLUMETRIC FLASKS**Unstoppered and stoppered****86-D1051**

Volumetric flask, unstoppered, 500 ml capacity.

86-D1052

Volumetric flask, unstoppered, 1000 ml capacity.

86-D1058

Volumetric flask, stoppered, 50 ml capacity.

86-D1059

Volumetric flask, stoppered, 100 ml capacity.

86-D1060

Volumetric flask, stoppered, 250 ml capacity.

86-D1061

Volumetric flask, stoppered, 500 ml capacity.

86-D1062

Volumetric flask, stoppered, 1000 ml capacity.

86-D1063

Volumetric flask, stoppered, 2000 ml capacity.

GLASS BEAKERS**Borosilicate glass, with pouring spout****86-D1072**

Beaker, 100 ml capacity.

86-D1073

Beaker, 250 ml capacity.

86-D1074

Beaker, 600 ml capacity.

86-D1075

Beaker, 1000 ml capacity.

86-D1075/1

Beaker, 2000 ml capacity.

REAGENT BOTTLES**86-D1092**

Reagent bottle, 1000 ml capacity.

86-D1093

Reagent bottle, 500 ml capacity.

86-D1094

Reagent bottle, 250 ml capacity.

DROPPING BOTTLE**86-D1096**

Dropping bottle, 100 ml capacity.

WEIGHING BOTTLES**86-D1100**

Weighing bottle, 50 x 30 mm (dia. x h).

86-D1101

Weighing bottle, 25 x 40 mm (dia. x h).

86-D1102

Weighing bottle, 70 x 40 mm (dia. x h).

86-D1103

Weighing bottle, 40 x 60 mm (dia. x h).

PETRI DISH, WATCH GLASSES (BEAKER COVERS) AND TEST TUBES**86-D1105**

Petri dish, 100 mm diameter.

86-D1108

Test tube, 16 x 160 mm (dia. x h).

86-D1106

Watch glass (beaker cover), 100 mm diameter.

86-D1106/1

Watch glass (beaker cover), 125 mm diameter.

DESICCATORS

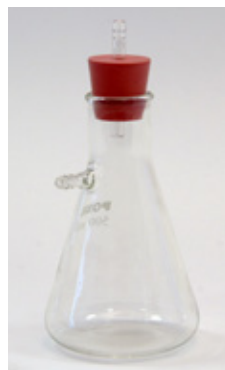
Made from glass, complete with desiccator plate. Safety cage for vacuum desiccators are also available - see Accessories. For an alternative to the standard desiccators see the Desiccator cabinet.

Standard non-vacuum desiccators**86-D1110**

Desiccator, 200 mm diameter, complete with plate.

86-D1111

Desiccator, 300 mm diameter, complete with plate.



Filter flasks 86-D1044 with 86-D1044/1



Volumetric flasks, 86-D1051 to 86-D1063



Glass beakers, 86-D1072 to 86-D1075/1

DESICCATORS WITH VACUUM ATTACHMENT**86-D1112**

Desiccator, 200 mm diameter with vacuum attachment and plate.

86-D1112/A

Desiccator, 250 mm diameter with vacuum attachment and plate.

86-D1113

Desiccator, 300 mm diameter with vacuum attachment and plate.

Accessories**86-D1113/1**

Safety cage for vacuum type desiccators.

86-D0819

Silica gel with indicator. 1000 g.

19-D1113/A

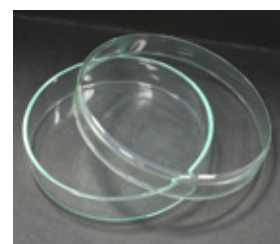
Desiccator cabinet, 450x480x450 mm, complete with 2 shelves. For more information see page 35



Reagent bottles, 86-D1092 to 86-D1094, top right, Dropping bottle 86-D1096



Weighing bottles, 86-D1100 to 86-D1103



Petri dish, 86-D1105



Desiccators, 86-D1113 and 86-D1110



Desiccator cabinet, 19-D1113/A



86-D1113/1 with desiccator

SPECIFIC GRAVITY BOTTLES

Hubbard-Carmick specific gravity bottles, conforming to ASTM D70, EN ISO 3838

- 86-D1115**
Specific gravity bottle, Hubbard-Carmick cylindrical type, 24 ml capacity
- 86-D1120**
Specific gravity bottle, Hubbard-Carmick conical type, 25 ml capacity.

Gay Lussac specific gravity bottles

- 86-D1125**
Gay Lussac specific gravity bottle, 25 ml capacity.
- 86-D1126**
Gay Lussac specific gravity bottle, 50 ml capacity.
- 86-D1127**
Gay Lussac specific gravity bottle, 100 ml capacity.
- 86-D1128**
Gay Lussac specific gravity bottle, 250 ml capacity.

ROUND BOTTOMED FLASKS

- 86-D1135**
Round bottomed flask, 500 ml capacity.
- 86-D1136**
Round bottomed flask, 1000 ml capacity.

PIPETTES AND BURETTES

Measuring pipettes, Mohr type, graduated

- 86-D1151**
Measuring pipette, 5 ml x 0.1 ml divisions.
- 86-D1152**
Measuring pipette, 10 ml x 0.1 ml divisions.
- 86-D1153**
Measuring pipette, 25 ml x 0.1 ml divisions.
- 86-D1154**
Measuring pipette, 50 ml x 0.1 ml divisions.

Bulb pipette

- 86-D1157**
Bulb pipette, 100 ml capacity.

Burettes, graduated

- 86-D1160**
Graduated burette, 25 ml capacity x 0.1 ml divisions.
- 86-D1161**
Graduated burette, 50 ml capacity x 0.1 ml divisions.
- 86-D1162**
Graduated burette, 100 ml capacity x 0.1 ml divisions.

GLASS FUNNELS

- 86-D1163/A**
Glass funnel, 25 mm diameter.
- 86-D1163/1**
Glass funnel, 50 mm diameter.
- 86-D1163**
Glass funnel, 100 mm diameter.
- 86-D1164**
Glass funnel, 150 mm diameter.
- 86-D1164/1**
Glass funnel, 200 mm diameter.

GLASS MARKING PENCILS

- 86-D1165**
Glass marking pencils, pack of 12.

GLASS STIRRING RODS

- 86-D1190**
Glass stirring rods, 8 x 250 mm (dia. x h). Pack of 6.

Porcelain

EVAPORATING DISHES

Evaporating dishes, porcelain, low form with pouring spout

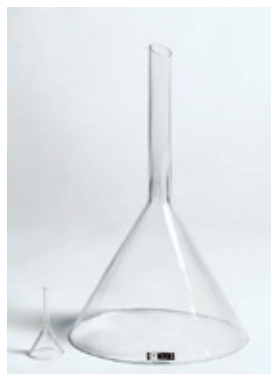
- 86-D1170**
Evaporating dish, 100 mm diameter, 25 mm high.
- 86-D1171**
Evaporating dish, 120 mm diameter, 32 mm high.
- 86-D1172**
Evaporating dish, 160 mm diameter, 40 mm high.
- 86-D1173**
Evaporating dish, 210 mm diameter, 60 mm high.
- 86-D1174**
Evaporating dish, 245 mm diameter, 55 mm high.



Specific gravity bottles, 86-D1125, 86-D1126, 86-D1127, 86-D1115, 86-D1120



Measuring pipettes 86-D1150 to 86-D1154, 86-D1157



Glass funnels, 86-D1163/A to 86-D1164/1



Round bottomed flasks 86-D1135 to 86-D1136

Evaporating dishes, porcelain, shallow form with pouring spout

- 86-D1170/A**
Evaporating dish, 100 mm diameter, 40 mm high.
- 86-D1171/A**
Evaporating dish, 120 mm diameter, 50 mm high.
- 86-D1172/A**
Evaporating dish, 168 mm diameter, 58 mm high.
- 86-D1173/A**
Evaporating dish, 206 mm diameter, 64 mm high.
- 86-D1174/A**
Evaporating dish, 250 mm diameter, 80 mm high.



Evaporating dishes, 86-D1170 to 86-D1174



Evaporating dishes, 86-D1170/A to 86-D1174/A

Silica evaporating dish

- 86-D1169**
Silica evaporating dish, 100 mm diameter, 25 mm high.



Silica evaporating dish, 86-D1169

PESTLE AND MORTARS**Iron mortar****86-D1176**

Iron mortar 150 mm diameter with pestle.

Porcelain pestle and mortars**86-D1180/1**

Soil mortar, 125 mm diameter.

16-D1179/A

Rubber headed pestle for soil mortar conforming to ASTM D421, BS 1377:2 and BS 1924:1.

86-D1180/A

Pestle and mortar, porcelain, 125 mm diameter.

86-D1181/B

Pestle and mortar, porcelain, 175 mm diameter.

86-D1181/C

Pestle and mortar, porcelain, 200 mm diameter.

FUNNELS AND CRUCIBLES**Funnels****86-D1182**

Buchner funnel, size N° 5 for use with 110 mm diameter filter paper, complete with rubber bung to fit filter flask 86-D1045.

86-D1183

Filter funnel, 90 mm inside diameter, for use in particle analysis test conforming to BS1377.

Crucibles**86-D1184**

Platinum crucible, 20 ml capacity.

86-D1185

Silica crucible, 25 ml capacity.

86-D1187

Porcelain crucible complete with lid, 25 ml capacity.

86-D1188

Gooch crucible, top diameter 40 mm, bottom diameter 35 mm.

Accessories**86-D1189**

Filter funnel tube for 40 mm crucible diameter.

86-D1189/1

Perforated rubber bung for 86-D1189 funnel.

86-D1188/1

Rubber ring for 86-D1188 Gooch crucible.

86-D1188/2

Filter discs, fiberglass, 25 mm diameter. Pack of 100.

Plasticware**STACKING PLASTIC BOXES****86-D1501**

Stacking plastic box, 380x280x 200 mm, 20 liter capacity.

86-D1502

Stacking plastic box, 580x330x 250 mm, 46 liter capacity.

86-D1503

Stacking plastic box, 660x400x 300 mm, 72 liter capacity.

BUCKETS**86-D1510**

Graduated plastic bucket, 7 liter capacity.

86-D1511

Graduated plastic bucket, 11 liter capacity.

86-D1512

Graduated plastic bucket, 15 liter capacity.

86-D1516

Plastic bucket, 9 liter capacity.

STORAGE BOTTLES**Polythene****86-D1520**

Polythene storage bottle, 250 ml capacity, 36 mm diameter mouth.

86-D1521

Polythene storage bottle, 500 ml capacity, 36 mm diameter mouth.

86-D1522

Polythene storage bottle, 1000 ml capacity, 50 mm diameter mouth.

86-D1523

Polythene storage bottle, 2000 ml capacity, 50 mm diameter mouth.

86-D1525

Polythene bottle, 5 liter capacity.

86-D1526

Polythene bottle, 10 liter capacity.



Iron mortar, 86-D1176



Pestle and mortars, 86-D1180/A



Pestle and mortars, 86-D1180/1 with 16-D1179/A



86-D1187, 86-D1182



Buckets, 86-D1510 to 86-D1517



Stacking plastic boxes, 86-D1501 to 86-D1503



Storage bottles, 86-D1520, D1522, 86-D1528, 86-D1525



Plastic wash bottles, 86-D1535 - 86-D1538, 86-D1545, 86-D1547

PLASTIC WASH BOTTLES**86-D1535**

Plastic wash bottle, 100 ml capacity.

86-D1536

Plastic wash bottle, 250 ml capacity.

86-D1537

Plastic wash bottle, 500 ml capacity.

86-D1538

Plastic wash bottle, 1000 ml capacity.

PLASTIC CONTAINERS WITH AIRTIGHT LID AND HANDLES

- 86-D1527**
Airtight plastic container, 5 liter capacity.
- 86-D1528**
Airtight plastic container, 15 liter capacity.

PLASTIC FUNNELS

- Standard and wide mouth
- 86-D1539**
Plastic funnel, 65 mm diameter.
- 86-D1540**
Plastic funnel, 100 mm diameter.
- 86-D1541**
Plastic funnel, 140 mm diameter.
- 86-D1542**
Plastic funnel, 210 mm diameter.
- 86-D1545**
Wide mouth plastic funnel, 80 mm diameter x 15 mm mouth.
- 86-D1546**
Wide mouth plastic funnel, 120 mm diameter x 30 mm mouth.
- 86-D1547**
Wide mouth plastic funnel, 150 mm diameter x 35 mm mouth.

PLASTIC MEASURING CYLINDERS

Plastic measuring cylinders, tall form with pouring spout

- 86-D1020**
Plastic measuring cylinder, 25 ml capacity.
- 86-D1021**
Plastic measuring cylinder, 50 ml capacity.
- 86-D1022**
Plastic measuring cylinder, 100 ml capacity.
- 86-D1023**
Plastic measuring cylinder, 250 ml capacity.
- 86-D1024**
Plastic measuring cylinder, 500 ml capacity.
- 86-D1025**
Plastic measuring cylinder, 1000 ml capacity.
- 86-D1026**
Plastic measuring cylinder, 2000 ml capacity.

Plastic measuring cylinders, short form with pouring spout

- 86-D1022/A**
Plastic measuring cylinder, 100 ml capacity.
- 86-D1023/A**
Plastic measuring cylinder, 250 ml capacity.
- 86-D1024/A**
Plastic measuring cylinder, 500 ml capacity.
- 86-D1025/A**
Plastic measuring cylinder, 1000 ml capacity.
- 86-D1026/A**
Plastic measuring cylinder, 2000 ml capacity.

Miscellaneous

BURNER, TRIPODS AND LABORATORY TONGS

- Burner**
- 86-D1420**
Bunsen burner, universal.
- Tripods**
- 86-D1430**
Tripod, 100 mm ID x 150 mm high.
- 86-D1431**
Tripod, 150 mm ID x 230 mm high.
- Iron wire gauzes**
- 86-D1440**
Iron wire gauze with ceramic centre, 150 mm square.
- 86-D1441**
Iron wire gauze with ceramic centre, 200 mm square.

Laboratory tongs

- 86-D1455**
Stainless laboratory tongs.
- 86-D1456**
Small tongs.



Plastic funnels, 86-D1539



Measuring cylinders, 86-D1020 to 86-D1026



Measuring cylinders, 86-D1020/A to 86-D1026/A



Support stands, 86-D1445, D1446



Sleeves and clamps, 86-D1450, D1451, D1453

SUPPORT STANDS, SLEEVES AND CLAMPS

Support stands

- 86-D1445**
Support stand, 200x130 mm with rod 10 mm diameter, 500 mm long.
- 86-D1446**
Support stand 310x 200 mm with rod 12 mm diameter, 800 mm long.

Sleeves and clamps

- 86-D1450**
Double sleeve metal/metal.
- 86-D1451**
Double sleeve metal/glass.
- 86-D1452**
Clamp, small size.
- 86-D1453**
Clamp, large size.



Laboratory tongs, 86-D1456, D1455, D1430, D1431, D1441, D1440, D1422, D1420

GLOVES

86-D1529

High temperature-resistant gloves, up to 450°C.

86-D1530

Heat resistant gloves.

86-D1531

Neoprene gloves.

86-D1532

Cotton gloves.

86-D1533

Soft leather gloves

86-D1534

Rubber PVC gloves.

SAMPLE BAGS

86-D1550

Heavy-duty plastic sample bag, 40x70 cm.

86-D1551

Heavy-duty plastic sample bag, 25x45 cm.

86-D1552

Heavy-duty plastic sample bag, 15x30 cm.

86-D1553

3-ply paper sack, 50x90 cm.

86-D1554

Heavy-duty polythene sack, 50x 90 cm.

Laboratory hardware

MIXING BOWLS

Mixing bowls, stainless steel

86-D1290

Stainless steel mixing bowl, 145 mm diameter.

86-D1291

Stainless steel mixing bowl, 225 mm diameter.

86-D1292

Stainless steel mixing bowl, 255 mm diameter.

Mixing bowls, stainless steel, hemispherical, with handles

86-D1300

Stainless steel, hemispherical mixing bowl, 160 mm diameter.

86-D1301

Stainless steel, hemispherical mixing bowl, 240 mm diameter.

86-D1302

Stainless steel, hemispherical mixing bowl, 300 mm diameter.

Stainless steel pans, 0.5 mm thick

86-D1308/1

Stainless steel pan with handles 200x140x45 mm

86-D1308/2

Stainless steel pan with handles 250x190x50 mm

86-D1308/3

Stainless steel pan with handles 300x220x55 mm

86-D1308/4

Stainless steel pan with handles 320x320x55 mm

86-D1308/5

Stainless steel pan with handles 350x260x60 mm

86-D1308/6

Stainless steel pan with handles 360x360x60 mm

86-D1308/7

Stainless steel pan with handles 400x280x65 mm

86-D1308/8

Stainless steel pan with handles 450x320x85 mm

86-D1308/9

Stainless steel pan with handles 500x360x93 mm

86-D1308/10

Stainless steel pan with handles 600x400x95 mm

Mixing trays, steel nesting type

86-D1305/2

Steel mixing tray, nesting type, 460x460x50 mm

86-D1305/5

Steel mixing tray, nesting type, 610x610x63 mm

86-D1306/3

Steel mixing tray, 910x910x76 mm

86-D1306/4

Steel mixing tray, 1040x1040x76 mm

Aluminum pan

86-D1322/M¹

Aluminum pan, 600x400x100 mm
¹ Ponts et Chaussées model



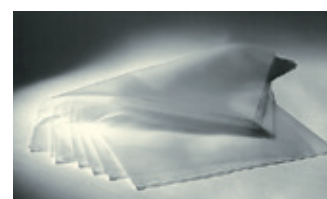
Gloves, 86-D1529



Gloves, 86-D1530



Gloves, 86-D1531



Sample bags, 86-D1550



Mixing bowls, 86-D1290 to 86-D1292



Mixing bowls, 86-D1300 to 86-D1302



Stainless steel pans, 86-D1308/1 - 86-D1308/10



Aluminum pan, 86-D1322/M



Mixing trays, 86-D1305/2

MOISTURE CONTENT TINS

86-D1329

Moisture content tin, 75 x 30 mm (dia. x h).

86-D1329/A

Moisture content tins, 75 x 30 mm (dia. x h), pack of 6.

86-D1330

Moisture content tin, 55 x 35 mm (dia. x h), aluminum.

86-D1330/A

Moisture content tins, 55 x 35 mm (dia. x h), aluminum, pack of 6.

86-D1331

Moisture content tin, 55 x 65 mm (dia. x h), aluminum.

86-D1331/A

Moisture content tins, 55 x 65 mm (dia. x h), aluminum, pack of 6.

86-D1332

Moisture content tin, 75 x 50 mm (dia. x h), aluminum.

86-D1332/A

Moisture content tins 75 x 50 mm (dia. x h), aluminum, pack of 6.

ALUMINUM FIELD CANS

86-D1341

Aluminum field can, 3 liter capacity.

86-D1342

Aluminum field can, 5 liter capacity.

LEVER LID TINS

86-D1345

Lever lid tin, 0.5 liter capacity.

86-D1346

Lever lid tin, 1 liter capacity.

86-D1347

Lever lid tin, 2.5 liter capacity

86-D1348

Lever lid tin, 5 liter capacity.

86-D1349

Lever lid tin, 10 liter capacity.

SLIP-ON LID TIN (BISCUIT)

86-D1355

Slip-on lid tin, 212x225x120 mm.

SCOOPS

Aluminum scoops, round

86-D1601

Round aluminum scoop, 245x80 mm, 325 ml capacity.

86-D1602

Round aluminum scoop, 335x120 mm, 1000 ml capacity.

86-D1603

Round aluminum scoop, 420x160 mm, 2600 ml capacity

Aluminum scoops, flat

86-D1605/1

Flat aluminum scoop, 210x70 mm, 140 ml capacity.

86-D1605/2

Flat aluminum scoop, 290x105 mm, 440 ml capacity.

86-D1605/3

Flat aluminum scoop, 350x120 mm, 675 ml capacity. Conforming to EN 12697-27.

86-D1612

Flat aluminum scoop, 400x155 mm, 1550 ml capacity.

TROWELS

86-D1619

Trowel, 90x115x165 mm, conforming to EN 12350-4.

86-D1620

Trowel 60x140 mm.

86-D1621

Trowel, 100 mm, pointed type.

86-D1622

Cement trowel.

86-D1625

Rectangular trowel, 120x250 mm.

SPATULAS

Stainless steel flexible spatulas

86-D1630

Stainless steel flexible spatula, 100 mm blade length.

86-D1631

Stainless steel flexible spatula, 160 mm blade length.

86-D1632

Stainless steel flexible spatula, 200 mm blade length.

86-D1633

Stainless steel flexible spatula, 280 mm blade length.



Moisture content tins, 86-D1329



Moisture content tins, 86-D1330 to 86-D1332



86-D1341, D1347, D1346



Aluminum scoops, 86-D1601 to 86-D1603



Aluminum scoops, 86-D1605/1 to 86-D1605/3



86-D1625, 86-D1622, 86-D1620 and 86-D1621



Rigid spatulas, 86-D1641



Stainless steel flexible spatulas, 86-D1630 to 86-D1633

Rigid spatulas

86-D1640

Rigid spatula, 20 mm blade width.

86-D1641

Rigid spatula, 50 mm blade width.

86-D1642

Rigid spatula, 70 mm blade width.

86-D1643

Rigid spatula, 100 mm blade width.

BRUSHES

86-D1670
Wire brush, No. 26 gauge.

86-D1671
Fine wire brush.

86-D1672
Soft hair brush, 3 mm diameter, conforming to BS 812.

86-D1673/G
Brass sieve brush.

86-D1673/G1
Double-ended brass/nylon sieve brush.

86-D1675
Round bristle brush, 33 mm diameter.

86-D1680
Flat bristle brush, 60 mm wide.

86-D1685
Nylon sieve brush 33 mm diameter.

86-D1685/G
Double ended nylon sieve brush.

86-D1686
Table brush.



86-D1685, D1675, D1672, D1673/G1, D1685/G



86-D1686, 16-D1691



86-D1699

GENERAL TOOLS

86-D1699
General purpose tool kit.
Weight 7 kg approx.

86-D1645
Shovel.

86-D1646
Pick mattock.

16-D1691
Trimming knife

86-D1692
Absorbent cloths, 750x450 mm, pack of 3.



86-D1646



86-D1645



86-D1680, D1670, D1673/G, D1671

TROLLEYS / CARTS

86-D1700
Sample cart.
Useful for handling concrete samples or moulds in the laboratory. Constructed from steel with rubber wheels mounted on bearings.
Base size: 610x910x860 mm
Weight: 18.6 kg approx.

86-D1701
Laboratory trolley.
Useful for general laboratory use.
Shelf size: 400x800 mm, total height 870 mm.
Weight: 15 kg approx.

86-D1705
Wheelbarrow with pneumatic wheel



86-D1700



86-D1701

Vacuum pumps and air drying system

VACUUM PUMPS

Vacuum pumps are used for a number of applications, primarily in systems requiring de-aired water.

If water vapour is present in the air being sucked by the vacuum pump, it mixes with the pump oil, producing an emulsion which, in notable concentrations, may cause serious damage to the pump. For this reason it is important, for water de-airing applications, to use a suitable drying system such as the Air drying unit 86-D2005 filled with Silica gel desiccant 86-D0819.

The pumps can be fitted with a Vacuum gauge with a pin regulating valve and bleed valve, such as our model 86-D2004/5 (see Accessories), unless the equipment to be connected already has a similar gauge (for example the large size pyknometer 75-D1122).

For more details about de-airing systems see typical system configurations on page 432

We offer two vacuum pump models: 86-D2001 and 86-D2001/Z (110 V), for ultimate vacuum of 0.1 mbar 86-D2003 and 86-D2003/Z (110 V), for ultimate vacuum of 0.01 mbar

Ordering information

86-D2001

Portable vacuum pump, free air displacement 75 L/min, ultimate vacuum 0.1 mbar. 230 V, 50-60 Hz, 1 ph.

86-D2001/Z

As above but 110 V, 60 Hz, 1 ph.

86-D2003

Portable vacuum pump, free air displacement 75 L/min, ultimate vacuum 0.01 mbar. 230 V, 50-60 Hz, 1 ph.

86-D2003/Z

As above but 110 V, 60 Hz, 1 ph.



Vacuum pumps, 86-D2001 and 86-D2003

Technical specifications

Product code	86-D2001 86-D2001/Z	86-D2003 86-D2003/Z
Free air displacement, L/min	75	75
Ultimate vacuum, mbar	0.1	0.01
Power, W	180	240
Dimensions, mm (approx.)	300 x 150 x 240	300 x 150 x 240
Weight, kg (approx.)	8.5	9.5

VACUUM GAUGES

There are two models available: 86-D2004/5- 80 mm diameter dial, complete with pin regulating valve and sintered filter, suitable for direct connection to the on top of the vacuum pump as illustrated. 86-D2004/3- 60 mm diameter dial in glycerine bath, with base, complete with pin regulating valve.

Ordering information

86-D2004/5

Vacuum gauge, range 0-100 kPa, complete with pin regulating valve and bleed valve. For direct connection to the top of the pump. Resolution 0.01 bar
Weight 0.4 kg.

86-D2004/3

Vacuum gauge, range 0-760 mm/hg (0-1 bar), with base, complete with pin regulating valve.
Resolution, 10mm/hg (0.02 bar)
Weight 0.5 kg.

OIL AND RUBBER TUBES

86-D2001/1

Special oil for vacuum pumps. 500 cc can.

86-D2064

Rubber tube, ID 6.5 mm x OD 16.5 mm, 2 m length.



86-D2004/5



86-D2004/3



86-D2004/5 fitted on top of the pump



86-D2064

OUTLET MIST FILTER

86-D2001/3

Outlet mist filter. Optional. To collect oil vapour coming from the oil reservoir during operation. Recommended in case of heavy continuous use.

DIGITAL VACUUM REGULATOR

Fine regulation and monitoring of vacuum are required by certain tests, such as Binder recovery by rotary evaporation conforming to EN 12697-3, to ensure that the requirements of the Standard are satisfied. See the Typical system configurations table. The regulator consists of a metal case housing a high precision vacuum regulator valve and digital display unit. Range of regulation: 0 to 760 mm/hg Resolution of digital display: 0.001 bar Overall dimensions: 250 x 250 x 280 (h) mm
Weight: 7 kg approx.

Ordering information

86-D2004/1D

Digital vacuum regulator complete with digital display unit, 0.001 bar resolution. 110-230 V, 50-60 Hz, 1 ph.



86-D2001 with 86-D2001/3



86-D2004/1D

**86-D2005
AIR DRYING UNIT**

This unit can be installed between the vacuum pump and the apparatus to be de-aired (e.g. Pyknometers) to avoid/limit water vapour mixing with the oil in the pump, which, in significant concentrations, may cause serious damage to the pump. The unit has to be filled with a suitable desiccant (e.g. Silica gel desiccant 86-D0819).

- Plastic frame with acrylic cylinder
- Desiccant capacity: 500 g approx.
- Overall dimensions: 185x300(h) mm approx.
- Weight: 1 kg approx. (empty)



86-D2005 with 86-D0819

Accessories

86-D0819

Silica gel desiccant, 1000 g bottle. The desiccant changes color when saturated. It can be recovered by drying it in an oven.



Typical application of 86-D2005 during the determination of the maximum density of bituminous mixtures using the large size pyknometer 75-D1122

TYPICAL DE-AIRING SYSTEM CONFIGURATIONS

The following table summarizes the most common tests that require de-airing systems and vacuum apparatus. These recommendations are our interpretation of the most efficient way to perform the test. If in doubt we are at your disposal to give you all the necessary information.

Test no.	Standards	Test / determination
1)	ASTM, BS, EN, NF	De-airing water system for triaxial tests
2)	ASTM, BS, EN, NF	Falling head permeability (cell 38-T0185/1)
3)	EN 12697-4	Recovery of binder by the fractionating column method
4)	EN 12697-3	Binder recovery by rotary evaporation
5)	EN 12697-1, BS 598:102	Binder recovery by vacuum pump method
6)	ASTM D2041	Specific gravity and density of bituminous mixtures



86-D2010

**86-D2010
Aspirator pump**

Used with flowing water to produce a moderate vacuum. It can be used in all water pressures from approx. 0.7 kg/cm².
Weight: 100 g approx.

Product code	Description	Test no.					
		1)	2)	3)	4)	5)	6)
86-D2001	Vacuum pump, Single stage	●	●	-	-	●	-
86-D2003	Vacuum pump, Double stage	-	-	P	P	-	P
86-D2004/5	Vacuum gauge with valve	-	-	P	-	P	-
86-D2064	Rubber tubes	● (2)	● (2)	●	● (2)	● (2)	● (2)
86-D2005	Air drying unit	●	●	-	-	-	●
86-D0819	Silica gel desiccant	● (2)	● (2)	-	-	-	● (2)
86-2004/1D	Vacuum regulator	-	-	-	●	-	-

AIR COMPRESSORS AND ACCESSORIES

We offer several different models which should satisfy all requirements relating to the different applications in soil, concrete and asphalt fields.

Product Code	86-D2015	86-D2015/A	86-D2018*	76-PV0250/7
Continuous/max. pressure, bar	8/10	8/10	14	10
Capacity, L	50	200	8	10
Air delivery, L/min	230	550	87	130
Power, W	1500	4000	600	750
Dimensions, mm	850x355x675(h)	1600x520x1050 (h)	510x270x400(h)	370x410x650(h)
Weight, kg	44	125	21	27

*The capacity can be increased using the 86-D2018/1 Auxiliary 50 L reservoir.



86-D2018 with 86-D2018/1

Ordering information

86-D2015

Laboratory air compressor, 10 bar maximum working pressure, 8 bar for continuous use. 50 liter capacity. 230 V, 50 Hz, 1 ph.

86-D2015/Y

As above but 220 V, 60 Hz, 1 ph.

86-D2015/Z

As above but 110 V, 60 Hz, 1 ph.

86-D2015/A

Laboratory air compressor, 10 bar maximum working pressure, 8 bar for continuous use. 200 liter capacity. 400 V, 50 Hz, 3 ph.

86-D2015/AZ

As above but 220 V, 60 Hz, 3 ph.

86-D2018

Laboratory air compressor, 14 bar maximum working pressure. 8 liter capacity. 230 V, 50 Hz, 1 ph.

86-D2018/Z

As above but 110 V, 60 Hz, 1 ph.

86-D2018/1

Auxiliary reservoir for 86-D2018 air compressor, 50 liter capacity, 14.5 bar maximum pressure.

76-PV0250/7

Low-noise air compressor, 10 bar maximum working pressure, 10 liter capacity. 230 V, 50 Hz, 1 ph.

76-PV0250/7Y

As above but 220 V, 60 Hz, 1 ph.

76-PV0250/7Z

As above but 110 V, 60 Hz, 1 ph.

Accessories

28-WF2016/2

Air filter/water trap for air compressors.

86-D2019

Air treatment unit for the dehumidification of air, comprising air dryer, 5 µm particle filter, 1M oil filter and 0.01M coalescence filter. 230 V, 50-60 Hz, 1 ph.
Dimensions: 220 x 560 x 460 mm
Weight: 24 kg

86-D2019/Z

As above but 110 V, 60 Hz, 1 ph.

RUBBER TUBES AND STOPPERS

86-D2060

Rubber tube, 5 mm ID x 13 mm OD, 2 m long.

86-D2062

Rubber tube 8 mm ID x 12 mm OD, 6 m long.

86-D2064

Rubber tube for vacuum, 6.5 mm ID x 16.5 mm OD. 2 m long.

86-D2070

Rubber stopper set: from 15/10 to 60/50 mm.



86-D2015



86-D2015/A



86-D2064, 86-D2062 and 86-D2060



76-PV0250/7



86-D2070



28-WF2016/2



28-D2019

**86-D2104
WATER STILL**

Water still, producing 7.5 liters per hour.

Used to prepare distilled water for laboratory use. An automatic device keeps the water at a constant level. If there is a shortage of water an automatic switch cuts off the current and switches it on again when the level returns to normal.

- 230 V, 50-60 Hz, 1 ph.
- Capacity: 7.5 L/hour
- Power: 6 kW
- Overall dimensions: 260x260x610 mm
- Weight: 16 kg approx.

FILTER PAPER**86-D1800**

Whatman paper (or equivalent) No 1x150 mm diameter medium grade. Pack of 100

86-D1801

Whatman paper (or equivalent) No 5x150 mm diameter medium grade. Pack of 100

86-D1802

Whatman paper (or equivalent) No 40x150 mm diameter medium grade. Pack of 100

86-D1803

Whatman paper (or equivalent) No 44x110 mm diameter medium grade. Pack of 100

86-D1805

Whatman paper (or equivalent) No 50x110 mm diameter medium grade. Pack of 100

86-D1806

Whatman paper (or equivalent) No 54x150 mm diameter medium grade. Pack of 100

86-D1809

Whatman paper (or equivalent) No 54x400 mm diameter medium grade. Pack of 100

86-D1810

Whatman paper (or equivalent) No 5, 270 mm diameter with 33 mm diameter hole at centre. Pack of 100

86-D1801/A

Whatman paper (or equivalent) No 5x400 mm diameter medium grade. Pack of 100

86-D1801/B

Whatman paper (or equivalent) No 5x450 mm diameter medium grade. Pack of 100

86-D1801/C

Whatman paper (or equivalent) No 5x100 mm diameter medium grade. Pack of 100

**86-D2250
ELECTRIC GENERATOR**

Portable petrol engine driven single-phase generator. Ideal for site use with electrically operated core drilling machines and other apparatus when mains current is not available 5 kVA, 230 V, 50 Hz.

Main features

Low oil level cut out device
2 x 230 V – 50 Hz, single-phase Schuko outlets protected by circuit breaker
1 x 12V DC battery charger outlet protected by fuse

Technical specifications

AC Generator 50 Hz, synchronous,
Single-phase, 5 kVA, 230 V
Petrol engine – 3000 RPM
Air cooling system
Manual recoil starting system
Fuel tank capacity: 6 L
Fuel consumption @ 75%: 2.2 L/hour
Dimensions: 720 x 480 x 515 mm (w x d x h)
Weight: 63 kg approx.

**UPS
(UNINTERRUPTIBLE POWER SUPPLY)****86-D2300**

UPS interactive system

A UPS is used to protect electrical items from fluctuations in the power supply and to provide emergency power for a limited time when the mains power source fails. 2000 VAi. 230 V, 50-60 Hz, 1 ph.

Specifications

- Input voltage: 230 Vac
- Input frequency: 50/60 Hz
- Output voltage: 230 Vac
- Dimensions: 147x 234 x 360 mm (wx d x h)
- Weight: 16 kg approx.



86-D2104



86-D1800 to 86-D1809



86-D2250



86-D2300

Mobile laboratories

In many cases, the mobile laboratory is the first equipment to arrive on the job-site and a smart, efficient, well equipped unit is the best introduction for a contractor. CONTROLS manufactures a complete line of mobile laboratories designed to meet all possible requirements for rugged use in distant and isolated areas in cold or tropical weathers. Each model is available in both standard and tropicalized versions. A wide range of accessories makes the laboratory completely independent and self-sufficient.

The range of CONTROLS mobile laboratories covers mainly three types:

Autolab, van mounted

used where extreme mobility and manoeuvrability are requested.

Trailab, trailer mounted

specially recommended for survey over large areas, such as road construction projects.

Contalab, container mounted

used for long term testing at one site, as well as for road construction.



Example of AUTOLAB for road testing. On the left our Gyrotory compactor.

Design Service

CONTROLS can design the mobile laboratory conforming to your requirement. We give here some examples of the mobile laboratory recently produced. Please feel free to ask



Example of CONTALAB trailer mounted



Example of CONTALAB trailer mounted

CONTALAB mobile laboratory for Cement and Concrete testing. Internal view with Automatic concrete testing system for compression and flexural tests, Mortar mixer etc.



CONTALAB mobile laboratory for Cement and Concrete testing. Internal view with Cement mixer, Automatic Vicat apparatus, Sand equivalent shaker, Water bath and cabinets.