

ATM

Anlagen Technik und Maschinenbau GmbH



Consulting . Delivery . Service

Laboratory Furniture General information



- Extensive range of laboratory furniture
- Including; Octagonal tables for maximum of variability and best escape routes from the laboratory
- Safety cabinets
- Gas-bottle cabinets
- Acid-/base-cabinets
- Chemical storage cabinets
- Waste collection containers
- Permanent ventilation on request
- Complies with the applicable International standards -BS, DIN or AFNOR
- Large number of outlets can be provided (horizontally and vertically)
- Totally new air flow and extraction concept
- Precise, digital control of flow speed or volume
- Interchangeable panels allowing upgrading at a later date

Laboratory Furniture

(ATM No.KOT 110)



Laboratory Furniture

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Fume Cupboards

(ATM No.KOT 120)



ATM No.KOT 120

Complete fume cupboard, laboratory fume cupboard type:
General purpose fume cupboard, low design (fume cupboard for low ceilings)
Design:

- * Inside height 1200 mm
- * Two-piece sash (telescopic) with sliding panels made of laminated safety glass
- * Ceramic worktop with funnel-type bowl, both blue-grey (if over 1800 mm wide: central joint required)
- * Air flow monitor with pressure transmitter
- * Interior lighting
- * Services supplied:
- * 4 sockets 230 V/16 A, German
- * 1 x cold water
- * Certified with regard to ventilation to DIN 12924 Part 1

Standard fume cupboards for low room heights, with two-piece sash (telescopic)*

	ATM No.	Width in mm	Number of sliding doors
	KOT 121	1200	2
	KOT 122	1500	3
	KOT 123	1800	3
	KOT 124	2100	4

Complete fume cupboard, laboratory
fume cupboard type;

General purpose fume cupboard,
distillation fume cupboard

Design;

* Interior height 1890 mm

* Two-piece sash (telescopic),
bottom with sliding panels
made of laminated safety glass

* Ceramic worktop, blue-grey
(if over 1800 mm: wide: central
joint required)

* Air flow monitor with pressure transmitter

* Interior lighting

* Services Supplied:

* 4 sockets 230 V/16 A, German

* 1 x cold water

* 1 funnel-type bowl, polypropylene, grey (RAL 7035)

* Certified with regard to ventilation to DIN 12924 Parti 1

* Built on drawers

Distillation fume cupboards with two-piece sash
(telescopic), built on drawers*

	ATM No.	Description	Width in mm
	KOT 125	2 900 mm drawers	1200
	KOT 126	2 1200 mm drawers	1500
	KOT 127	2 600 mm drawers 2 900 mm drawers	1800
	KOT 128	4 900 mm drawers	2100

Fume Hoods

(ATM No. KOT 130)

Larger working areas can be ventilated with fume hoods but
they cannot guarantee complete contaminant discharge, Their
extraction capacity is comparable to that of cooker extraction
hoods. Fume hoods can also be used for extracting warm air from
muffle ovens,

Design:

Material: Epoxy powder coated steel, light grey
(similar to RAL 7035)

Fittings: Fluorescent lamp

Extract spigot diameter: _ 200

Fume hoods

	ATM No.	Description
	KOT 130	Fume hood, 1175 x 500 x 600 mm, Ø 200
	KOT 131	Fume hood, 1175 x 500 x 750 mm, Ø 200

Safety Cabinets

(ATM No. KOT140)



ATM No.KOT 140

special cabinets -for guaranteed safe storage, Gas cylinder cabinets

Safety cabinets (ATM No.KOT 140)

Chemical storage cabinets (ATM No.KOT 150)

Acid and base cabinets (ATM No.KOT 160)

Gas cylinder cabinets (ATM No.KOT 170)

The purpose of the safety cabinets is to protect people in a laboratory in the event of a fire. The insulating sandwich construction of the cabinet protects the stored hazardous substances against heat and flames. Thus combustible fluids do not ignite spontaneously, the staff have enough time to get to safety,

For storage of inflammable hazardous substances,

Tall storage cabinets with folding doors and shelves

Provide minimum obstruction in walkways and convenient access,

Variants:

* Tall storage cabinets in the widths 600, 900, 1200 mm

* Under bench cabinets in the widths 692, 890, 1100, 1400 mm

Tested for safety in accordance with the new EN 14470-1

The safety cabinets are certified according to EN 14470-1 and have a fire resistance of 90 minutes.

The fire resistance is routinely checked by an independent institute

1.Storage of inflammable hazardous substances

Largest possible, admissible storage amount		
Hazard category according to VbF	Maximum storage quantity per cabinet	
	In fragile containers	In other containers
A I	60 L	450 L
A II oder B	200 L	3000 L

2.Tested for safety according to EN 14470-1

3.Tall safety cabinets for combustible fluids

Specifications tall safety cabinets								
Outside dimensions W x H x D (mm)	Air flow (m³/h)	Pressure drop (Pa)	Weight (kg)		Inside dimensions W x H x D (mm)	Drawer dimensions W x H x D (mm)	Weight bearing capacity (kg)	Catchment tray volume (l)
600 x 1968 x 615	4	2	260	3 shelves	450 x 1740 x 520		75 each	22
				4 drawers	450 x 1740 x 520	345 x 50 x 500	25 each	
1200 x 1968 x 615	9	4	420	3 shelves	1050 x 1740 x 520		75 each	33
				4 drawers	1050 x 1740 x 520	840 x 90 x 490	60 each	




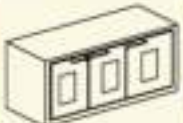

4. Under bench safety cabinets for combustible fluids

Specifications underbench safety cabinets

Outside dimensions W x H x D (mm)	Air flow (m ³ /h)	Pressure drop (Pa)	Weight (kg)		Outside dimensions drawer/door W x H x D (mm)	Inside dimensions drawer B x H x T (mm)	Usable inside height (mm)	Weight bearing capacity (kg)
592 x 690 x 570	2	1	90	1 drawer	470 x 500 x 450	422 x 80 x 442	460	25
890 x 690 x 570	2	1	140	1 drawer	770 x 500 x 450	722 x 80 x 442	460	50
1100 x 690 x 570	2	1	165	2 hinged doors	980 x 500 x 450		440	30
1100 x 690 x 570	2	1	165	1 hinged door left	470 x 500 x 450		440	30
				1 drawer right	470 x 500 x 450	422 x 80 x 442	460	25
1100 x 690 x 570	2	1	165	1 drawer	980 x 500 x 450	930 x 80 x 442	460	50
1100 x 690 x 570	2	1	165	2 drawers	each 470 x 500 x 450	each 422 x 80 x 442	460	25
1400 x 690 x 570	3	1	200	2 hinged doors left	each 385 x 500 x 450		440	30
				1 drawer right	770 x 500 x 450	422 x 80 x 442	460	25
1400 x 690 x 570	3	1	200	1 drawer right	470 x 500 x 450	422 x 80 x 442	460	50
				1 drawer left	770 x 500 x 450	722 x 80 x 442	460	25

All models: extract spigot Ø 75

Underbench safety cabinets

	ATM No.	Description	Dimensions in mm (W x H x D)
	KOT 141	Underbench safety cabinet, 1 drawer	592 x 690 x 570
	KOT 142	Underbench safety cabinet, 1 drawer	890 x 690 x 570
	KOT 143	Underbench safety cabinet, 2 hinged doors, 1 catchment tray	1100 x 690 x 570
	KOT 144	Underbench safety cabinet, 1 hinged door left, 1 drawer right, 1 catchment tray	1100 x 690 x 570
	KOT 145	Underbench safety cabinet, 2 drawers	1100 x 690 x 570
	KOT 146	Underbench safety cabinet, 1 drawer	1100 x 690 x 570
	KOT 147	Underbench safety cabinet, 2 hinged doors left, 1 drawer right, 1 catchment tray	1400 x 690 x 570
	KOT 148	Underbench safety cabinet, 2 drawers	1400 x 690 x 570

Acid And Base Cabinets

(ATM No.KOT 160)

Acids and bases must be stored in ventilated cabinets that avoid polluting the atmosphere within the laboratory or working area. Liquid-tight trays can hold even larger quantities of spillage easily,

Maximum resistance:

The acid and base cabinets are made of solid polypropylene, a material that has extremely good chemical resistance

Variants:

- Tall storage cabinet in the width 600 mm
 - * Under bench cabinets in the widths 600,900,1200 mm
- With integrated fan or for connection to an onsite fume extract system,

Tall storage cabinets

Easy access thanks to smooth running pull-out trays,

Under bench cabinets

The perfect storage solution for fume cupboards,

New:

Drawers guided on resistant Teflon rails,

Design:

Material: Extremely chemical resistant polypropylene

Colour: Light blue (similar to RAL 7035)

Fittings: Double doors, lockable

Pull-out trays seam welded, liquid tight polypropylene, load bearing capacity 30 Kg

Extract spigot 75

Integrated fan (optional): Radial fan, 2600 rpm; 230V/50Hz;

PPS; with visual on/off indicator

Cabinets without a fan must be connected to an external fan or to the onsite fume extract system, The fume extract system (including fan if necessary) has to be designed separately.

Maximally adjustable bottle heights			
	Top drawer (mm)		Bottom drawer (mm)
Underbench cabinet	294		232
Tall storage cabinet	397 (1 drawer)		343 (3 drawers)
Chemical storage cabinets extracted air			
	Width in mm	Extracted air volumetric flow (m³/h)	Pressure drop (Pa)
Underbench cabinet	600	9	5
	900	15	6
	1100	19	6
	1200	20	5
	1400	25	7
Tall storage cabinet	600	23	15

Sample Preparation Machines

Particle size Analysis With the 200 LS-N Air Jet Sieve

(ATM No. ALP 210)

User friendly. Reliable In operation,

Reproducible results,

The 200 LS- N is suitable for the particle size analysis. Dependent on the sieve mesh width and the material, 0,3 - 100 grams can be analyzed without problem. The dispersing properties of the air jet within the unit, can be carried out with micro precision sieves. The machine is in its functional clarity and ensures ease of operation.

Technical specifications 200 LS-N

Electrical Connection: 220 V, 50 Hz or

11 qV, 50/60 Hz Weight; approx. 14 kg Accessories

A- High-performance industrial

B- Small filter

C- Fines collection filter

D- High-efficiency GAZ 125 cyclone

E- This is configuration



ATM No. ALP 210

Particle size Analysis With the 200 LS-AC Air Jet Sieve

Principle of operation

The only thing that moves the material being analyzed is the air flow. As a result, no mechanical intervention in the sieving process (such as tapping or brushing the sieve) is necessary. This in turn means that with the same under pressure and sieving times, it is possible to carry out particle size analyses that can be reproduced accurately every time. The strong air jet exiting the rotating slotted nozzle purges the sieve mesh continuously. This leads to exceptionally short sieving times and ensures that even materials known to cause difficulty can be sieved. The transparent plastic cover permits constant monitoring of the sieving process.

200 LS-N Accessories

A- High-performance industrial

vacuum cleaner to generate the operating air, can be used for all standard sieving tasks.

Vacuum cleaner complete with 2-m suction hose. Filter bag volume approx. 9.75 liters.

B- Small filter

to take the load off the vacuum cleaner if the 200 LS-N is used in continuous operation.

C- Fines collection filter

To recover very small amounts of fines.

D- High-efficiency GAZ 125 cyclone

To recover larger amounts of fines. No product contamination caused by filter fluff.

The cyclone can be dismantled and washed. Fines collected in a glass bottle. Bottle capacity approx. 1 dm³.

E- This is configuration

That optimally covers all laboratory, analysis and testing requirements, especially if the tasks change frequently.

(ATM No. ALP 220)

200 LS AC

New possibilities of an established analysis method The 200LS-AC meet today's demands for automation in the field of particle size analysis. It is a reliable and fast device for extremely accurate, reproducible sieving results with automatic registration of results. The operating mode of the

200LS-AC makes it predestined for the quality control of powders as stipulated in ISO 9000 - 9004. It is equally suitable for individual control sieving, for series analyses, and for the analysis of entire particle size distribution curves. Seen from a processing-technological point of view, it is identical to the 200 LS-N.



ATM No. ALP 220

Cutting Machine

(ATM No.EL 230)

Specification

Dimensions (l x w x h)	1195 x 705 x 1350 mm
Cutting depth with 300 mm diameter blade	
Electrical supply	220-240 V AC, 50 Hz, 1 ph, separate fused power supply and switching required
Rated power	2200 W

Accessories

Diamond Blade wet cutting. Blade diameter 350mm, depth of cut 110 mm

(ATM No. Mat 240)

C350

Specimen cutting machine

Used to cut concrete specimens and any type of construction material like blocks, tiles, pipes, rock cores etc. The machine is equipped of an electro-pump for water cooling, pedal guide for vertical cutting, safety device against breakage of blade. the machine accepts blades up to dia. 450 mm

Supplied "without" blade (see accessories]

Power supply: 400 V 3F 50 Hz 3 Hp

Dimensions: 1220x700x1360 mm

Weight: 125 Kg

(ATM No. MAT 235)

C352

Device For Cylinders And Cores

To clamp and cut cylinders and cores, The device is fixed to the table of the cutting machines mod. C348, C350 ,

Weight 10 Kg

ACCESSORIES:

C350-10 (ATM No. MAT241) ABRASIVE BLADE dia. 350 mm

C350-11 (ATM No. MAT242) ABRASIVE BLADE dia, 400 mm

C350-12 (ATM No. MAT243) DIAMOND BLADE dra. 450 mm

having long life for a faster and more precise cutting operation

C350-13 (ATM No. MAT244) DIAMOND BLADE, dia. 350mm

C350-15 (ATM No. MAT245) DIAMOND BLADE, dia. 500 mm



ATM No. EL 230



ATM No.MAT 240

Semi- Automatic Fusion Machine HAG 12

(ATM No. HER 250)

By means of the HAG 12 crucibles of various dimensions and materials can be used. Crucibles with the following dimensions can be used without modification to the equipment as delivered;

- 1 Graphite cups (Inner diameter 40 mm, Outer diameter 50 mm, Height 10mm)
- 2, Platinum/gold crucibles (Bottom diameter 38,5 mm. Upper diameter 50 mm, Height 30 mm)

The mixture of sample material and flux material is filled into crucibles made of graphite, platinum / gold, etc.

When using flat graphite crucibles the mixture has to be compressed into a pellet before being placed in the crucible. A special HERZOG press, model HAP, produces the necessary pellet form.

Customer pre - selection of the fusion temperature, time and cooling rate provides a programme for the automatic sequential preparation of beads. Should a greater number of samples be required the machine can be connected to a magazine holding a maximum of 300 samples.

After starting the machine all crucibles are conveyed automatically and consecutively into the furnace and then under the cooling device. The constant furnace temperature, up to a maximum of 1500 °C controlled by an electronic regulator in fusion programme provides good sample reproducibility. The fusion process is independent of the operator, thus eliminating errors in the sample preparation.

For graphite crucibles the cooling station is equipped with a suction device which removes any possible gas inclusions through the porous bottom of the crucibles.

A rocking device in the platinum / gold version tilts the crucible from side to side, thus ensuring sample homogeneity and the removal of gas bubbles from the crucible base.

The equipment is completely enclosed giving the operator a safe working environment. The rigid construction combines noise and heat insulation with ease of operation and minimal maintenance.



ATM No.HER 250

Technical Data:

Dimensions:

800 x 880 x 1350 mm

Weight: approx. 355 kg

Electrical power supply and consumption:

400 V, 50 Hz, 3 - phase, or other as required Neutral conductor not required

Power consumption of approx. 7,5 kVA . Compressed air supply and consumption:
ire setting: 6 bar

Options:

- Rocking device
- Graphite crucibles
- Pelletizing press, model HAP
- Automatic sample magazine

Set of spare part is available

Automatic Fusion Machine HAG-S

(ATM No. HER 260)

is a cost-effective solution for the fusion of
oxidic powder samples for which grinding
and pressing methods are unable to yield
the requisite analytical accuracy.

The HAG-S has a sample insertion magazine
with capacity for 10 samples to enable it to be
integrated perfectly into a modern laboratory.
Sample Insertion and discharge by an external
robot is a further option, as is the transport of the
beads to the spectrometer by conveyor belt. The
HAG-S can also be fitted with a second fusion unit
as an option, in order to increase the sample
throughput Two samples can then be processed
simultaneously.

Technical Data;

Dimensions:

880x850x1780 mm

Weight: approx. 450 kg

Electrical power supply and consumption:

400 V, 50 Hz, 3 - phase, or other as required

Neutral conductor not required

Power consumption of approx. 4 kVA

Compressed air supply and consumption:

Pressure setting: 6 bar

Consumption: approx. 400 dm³ / N per sample

Set of spare part is available



ATM No.HER 260

Fully Automatic Fusion Machine HAG-G

(ATM No.HER 270)

For oxidic powder samples where the demanded analysis precision cannot be achieved with the grinding and Palletizing method, the HAG-G fusion machine makes the fusion process quick, reliable, simple and unproblematical for reproducible analytical results in less time and at lower cost.

Full automation of the HAG-G allows both the simultaneous performance of several work steps and complete self monitoring. The HAG-G thus ensures significantly shorter sample preparation times and a trouble free, fully automated long term operation without the need for operating personnel. The HAG-G can thus operate in online or magazine mode 24 hours a day, completely independent and absolutely reliable.

Technical Data:

Dimensions:

1400 x 960 x 2000 mm

Weight: approx. 850 kg

Electrical power supply and consumption:

400 V, 50 Hz, 3 - phase, or other as required

Neutral conductor not required

Power consumption of approx. kVA

Electrical switchgear cabinet:

Programmable controller SIMATIC S7 or Allen Bradley

Degree of protection: IP 44

Insulation class: B

Precision scale:

Weighing range: 210 g

Precision 0.1 mg

Compressed air supply and consumption:

Pressure setting: 6 bar

Consumption: approx. 400 dm³ / N per sample

Gas and wale supply:

Natural gas (Pressure of approx. 80 mbar) Or

Liquid gas (Pressure of approx. 50 mbar)

Oxygen (Pressure of approx. 1.5 bar)

Water (min. 2 bar, max. 10 bar)

Options:

- Insertion magazine for 36 sample cups
- Platinum / gold crucible and mould magazine with up to 36 positions
- 2nd fusion unit
- Linear magazine for 36 prepared samples
- Ultrasonic cleaning bath
- Fluid replacement system with 20 liter storage tank for acid

Set of spare part is available.



ATM No.HER 270

Jaw Crusher BB 51

(ATM No. RET 280)

The Jaw Crusher BB 51 has been specially designed for sample preparation in the laboratory. The space-saving, dust-tight instrument fits on any laboratory bench. Small amounts of sample with large feed sizes are crushed gently and without loss.

Application Examples

basalt, cement clinker, chamotte, coal, construction waste, feldspar, granite, quartz, ores, oxide ceramics, paving stones, silicon, slag, tungsten alloys

Product Advantages

- * compact, space-saving bench top instrument
- * excellent performance and high final fineness ($d_{90} < 0,5 \text{ mm}$)
- * digital gap width display
- * zero-point adjustment for wear compensation
- * neutral-to-analysis size reduction thanks to breaking jaws made from 5 different materials »safe and user-friendly
- * escape-free hopper
- * dust-tight, maintenance-free
- * smooth and quiet operation

Features

Applications: -	coarse and pre-crushing
Feed material: -	medium-hard, hard, brittle, tough
Material feed size*	$< 35 \text{ mm}$
Final fineness	$d_{90} < 0,5 \text{ mm}$
Collector capacity	1 liter
Throughput*	1 liter/batch
Jaw width	40 x 40 mm
Gap width setting	0-10 mm
Gap width display	digital
Zero point adjustment	yes
Hinged hopper	
Dust extraction unit	already dust-tight
Central lubrication	
Process line version	
Power consumption	1100 W
WxHxD	360x510x580 mm
Net weight	approx. 79 kg

*Depending on feed material and instrument configuration/settings.



ATM No. RET 280

Jaw Crusher BB 100

(ATM No. RET 290)

Application Examples

Basalt, cement clinker, chamotte, coal, construction waste, feldspar, granite, quartz, ores, oxide ceramics, paving stones, silicon, slag, tungsten alloys

Product Advantages

- * high throughput, high degree of size reduction
- * high final fineness (down to $d_{90} < 4 \text{ mm}$)
- * continuous gap width setting
- * scale for gap width display
- * zero point adjustment for wear compensation
- * particularly economical
- * breaking jaws made of 4 different materials
- * no-rebound feed hopper with quick-release clamp
- * brake motor with safety switch
- * easy-to-clean crushing chamber



ATM No. RET 290

Features

Applications	coarse and pre-crushing
Feed material	medium-hard, hard, brittle, tough
Material feed size*	$< 50 \text{ mm}$
Final fineness	$d_{90} < 4 \text{ mm}$
Collector capacity	2 liters
Throughput*	200 kg/h
Jaw width	$60 \times 60 \text{ mm}$
Gap width setting	0 - 20 mm
Gap width display	analogue
Zero point adjustment	yes
Hinged hopper	yes
Dust extraction unit	yes
Central lubrication	
Process line version	
Power consumption	750 W
W x H x D	320 x 960 x 800 mm
Net weight	approx. 137 kg

*depending on feed material and instrument configuration/settings ;

Jaw Crusher BB 200

(ATM No. RET300)

Application Examples

basalt, cement clinker, chamotte, coal, construction waste, feldspar, granite, quartz, ores, oxide ceramics, paving stones, silicon, slag, tungsten alloys

Product Advantages

- high throughput, high degree of size reduction
- high final fineness (down to $d_{90} < 2 \text{ mm}$)
- continuous gap width setting
- scale for gap width display
- zero point adjustment for wear compensation
- particularly economical
- breaking jaws made of 4 different materials
- no-rebound feed hopper with quick-release clamp
- brake motor with safety switch
- easy-to-clean crushing chamber
- process line version available
- warranty period 2 years; CE-conforming

Features

Applications	coarse and pre-crushing
Feed material	medium-hard, hard, brittle, tough
Material feed size*	$< 90 \text{ mm}$
Final fineness	$d_{90} < 2 \text{ mm}$
Collector capacity	5 liters
Throughput*	300 kg/h
Jaw width	100 x 100 mm
Gap width setting	0 - 30 mm
Gap width display	analogue
Zero point adjustment	yes
Hinged hopper	yes
Dust extraction unit	yes
Central lubrication	optional
Process line version	available
Power consumption	1500 W
W x H x D	450 x 1160 x 900 mm
Net weight	approx. 300 kg
*depending on feed material and instrument configuration/settings .	



ATM No. RET 300

(Hp-Ca Full Automatic Jaw Breaker

(ATM No.HER 310)

The HP-CA fully automatic jaw breaker machine is a cost-effective solution for the crushing of a range of mineral types: silicates, clinkers, ceramic materials, ores, sinters, slag and other crushable, organic substances,

The automatic jaw breaker, model HP-CA can easily be combined with other modular machines such as feed and discharge magazines, an automatic pulverizing mill, Model HP-MA, an automatic pellet press, Model HP-PA, or an automatic fusion machine, Model HAG-G.

With its comprehensive and complete automation the HP-CA automatic jaw-breaker guarantees precise, reproducible analytical results. All modules are integrated into the machine housing and are easily accessible via doors in the upper part of the housing.

Technical Data:

Dimensions: (L x W x H)

850 x 900 x 1560mm

Weight: approx. 570 kg

Electrical power supply and consumption:

400 V , 50 Hz, 3 - phase, or other as required

Neutral conductor not required

Power consumption of approx. 2,5 kVA

Compressed air supply and consumption:

Pressure setting: 6 bar

Consumption: approx. 1500 DM³/N per sample

Set of spare part is available.



ATM No.HER 310

Semi-automatic Grinding Mills HSM 100

(ATM No.HER 320)

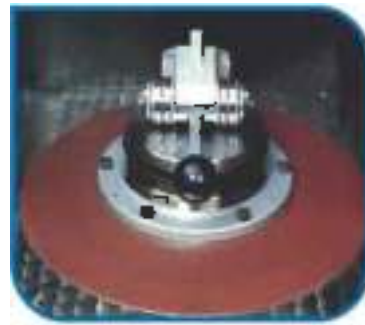
are suitable for the grinding of minerals, slag, ferroalloys, organic substances and other materials. The high speed of the drive motor enables even hard material to be ground with short process times. The robust design with twin eccentric disk bearings enable the grinding mills to achieve a long service life with a minimum of maintenance.



ATM No.HER 320



Grinding vessels for a range of applications, with capacities of 10, 50 and 100 ml (steel and tungsten carbide) and 100 ml (agate) are available.



HSM 100 H: manually operated clamping facility for the grinding vessels



HSM 100 P: pneumatic clamping facility for the grinding vessels

Vibration grinding mills are fully encapsulated, insulated against noise, and have safety cut-outs for operator protection. The dust and noise burden at the workplace is therefore reduced considerably and the safety enhanced

Vibration grinding mills are high-quality, precision engineering products with compact dimensions, and are therefore ideally suited to laboratory requirements

Technical Data:

Available models and grinding vessels

HSM100H: (ATM No. HER 321)

HERZOG grinding mill with manually operated clamping device

Steel and tungsten carbide grinding vessels with capacities of 10 ml, 50 ml and 100 ml can be used

HSM 100 P: (ATM No. HER 322)

HERZOG grinding mill with automatic pneumatic clamping device

Steel and tungsten carbide grinding vessels with capacities of 10 ml 50 ml and 100 ml can be used

HSM100A: (ATM No. HER 323)

HERZOG machine is additionally equipped with pole reversible motor for two speeds 750/1500 rpm) for optional use of agate grinding vessel with pneumatic clamping device.

Electrical power supply and consumption:

400 V 50 Hz, 3 - phase, or other as required

Neutral conductor not required

Power consumption of approx. 1,9 kVA

Pneumatic supply (only for the model HSM 100 P)

Pressure; min. 5 bar; max. 10 bar

Consumption per sample: approx. 10 dm³

Sample types:

A range of materials, e.g. raw cement meal, cement, clinker, slag of different types, ores, ferroalloys, organic materials

Grain size: 10 mm

Hardness: max. 9 Mohs

Temperature: max 100 °C

Set of spare parts is available.

HP-M 100 Semi-automatic Fine Grinding Mill

(ATM No.HER 330)

The fine grinding mill is suitable for the pulverization of different

kinds of sample material, for example silicate, cement, ceramic material, ores, sinter and slag as well as ferro alloys and various other minerals,

The machine is totally enclosed, sound insulated and requires a minimum of operators' time and maintenance,

Safety switches automatically deactivate the machine in case of breakdown.

Messages are shown on the display of the operator panel.

Technical Data:

Dimensions:

1250x700x780 mm

Weight: Approx. 430 kg

Electrical power supply and consumption.

400 V , 50 Hz, 3 - phase, or other as required

Neutral conductor not required

Power consumption of approx. 2.5 kVA

Compressed air supply and consumption:

Pressure setting: min 5 bar, max. 10 bar

Consumption: approx. 10 L / per sample

Processable samples:

Various minerals, cement raw meal, clinker, cement, slag, ores, oxides, ferroalloys

Grain size: max. 10 mm

Hardness: max. 9 Mohs

Temperature: max. 100 C

Set of spare part is available.

HP-M Series Pulverizing Mills

(ATM No.HER 340)

Suitable for grinding minerals such as ferroalloys and organic materials. The high RPM of the drive motor guarantee short grinding processes even with hard materials and the robust construction with, for example, dual bearing support for the eccentric shaft ensure long service lives.

Additional special features of the HP-M series pulverizing mills are automatic emptying of the grinding vessel and availability of the sample material at the discharge point.

Automatic cleaning of the grinding vessel ensures continuous operation even with consecutive preparation of different materials. Cleaning is carried out pneumatically or by wet-grinding followed by drying. Wet-grinding has the particular advantage that even the smallest grinding residues are removed,



ATM No.HER 330



ATM No.HER 340

Model :-**HP-MS Stand-Alone Versio** (ATM No.HER 341)**HP-MR Robot Version** (ATM No.HER 342)**HP-MA Automatic Version** (ATM No.HER 343)

Technical Date:

Dimensions:

850 x 900 x 1558mm

Weight: approx. 610 kg

Electrical power supply and consumption;

400 V , 50 Hz, 3 - phase, or other as required

Neutral conductor not required

Power consumption of approx. 2,5 kVA

Compressed air supply and consumption:

Pressure: min. 5 bar, max. 10 bar

Consumption: approx mple

Processing parameters:

Duration of grinding cycle: 0...999 s

Processing time: approx. 2 min. + preset grinding cycle

Number of processing programs: 8

Sample materials which can be processed:

Various minerals, cement raw meat, clinker.

cement, slag, ores, oxydes, ferroalloys

Grain size: max. 5 mm .Hardness: max. 9 Mohs

Temperature: max, 100 C

OPTION:

Sample input and sample output magazine

Cup magazine with 30 or 60 positions.

sample cups a approx. 100 ml

Set of spare part is available.

Manually Operated Hydraulic laboratory Press (TP 20 TP40 TP60)

(ATM No.HER 350)

This manually operated hydraulic press allows all the compacting operations common in the laboratory to be carried out. A special press tool available as an accessory is used to produce pellets. The hydraulic pump is operated by a hand lever. The direction of movement of the plunger is reversed by switching over the valve to permit simple access to the dies installed. The threaded spindle serves as a counter-bearing to absorb the compacting pressure and to reduce the no-load stroke.



ATM No.HER 350

ATM No.	HER351	HER352	HER353
Available models	TP 20	TP 40	TP 60
maximum pressure (kN)	200	400	600
Max. plunger stroke (mm)	40	40	40
Net weight (kg)	150	170	230
Dimensions (mm)	525x340x610	525x340x610	525x340x610

Set of spare part is available.

Manually Operated hydraulic pelletizing Press

TP40/2D TP60/2D

(ATM No.HER 360-370)



ATM No.HER360-370

By means of this manually operated hydraulic pelletizing press it is possible to produce very easy tablets with different diameters (depending on the spectrometer).

For this purpose a special press tool with the corresponding diameter is inserted into the press and can be filled upon moving back the upper crossbeam. The press tool is delivered as special accessory.

The hydraulic pump is operated by the handle. The direction of motion of the press piston can be reserved by changing over the valve. The threaded spindle is intended for counter piece of the pressure absorption and for the reduction of the idling stroke.

ATM No.	HER360	HER370
Available models	TP 60/2d	TP 40/2d
maximum pressure (kN)	400	600
Max. plunger stroke (mm)	40	40
Net weight (kg)	170	260
Dimensions (mm)	525x340x580	525x340x670

Set of spare part is available.

Semi – automatic Pellet Presses HTP 40 And HTP 60

(ATM No.HER 380)

Offer the full benefits of program - controlled pressing processes for the preparation of samples for x - ray fluorescence analyses. Control by programmable controller results in a substantial improvement in the reproducibility of sample preparation, and consequently optimum analysis results. They possess all the characteristics required to guarantee the homogeneity and stability of each individual pellet. With the high press forces of 400 kn. in the case of the HTP 40 and up to 600 kn. with the HTP 60, a high compression is achieved, even with large sample diameters pellet presses are fully encapsulated, insulated against noise, and have safety cut -outs for operator protection. The dust and noise burden at the workplace is therefore reduced considerably, and the safety enhanced. pellet presses are high-quality, precision engineering products with compact dimensions, and are therefore ideally suited to laboratory requirements.

Technical Data:

Available models:

HTP 40: (ATM No.HER 381) Maximum press pressure of 400 KN

HTP 60: (ATM No.HER 382) Maximum press pressure of 600 KN

Dimensions:

660x620x1250 mm

Weight: approx. 340 kg

Electrical power supply and consumption:

400 V 50 Hz, 3 - phase, or other as required

Neutral conductor not required

Power consumption of approx. 1.9 kVA

Electrical switchgear cabinet:

Programmable controller SIMATIC

Degree of protection: IP 54

Insulation class: B

Control parameters:

Pressure build - up / pressure decrease

Pressure holding time

Press force

Pneumatic supply: Not required

Pressing process and pressing tools:

Pressing in steel rings

Pressing in aluminum shells

Free pressing

A wide range of steel rings, aluminum shells and pressing tools are available
set of spare part is available



ATM No.HER 380



A swing-out cross head makes filling and cleaning of the die easy, simple and safe.



Precision press tools with a range of diameters. And make also permit free pressing, pressing in Aluminum shells, and pressing in steel rings.

HP-P Series Automatic Pellet Presses

(ATM No HER 390)

HP-P series pellet presses are the basis for the manufacture of stable pressed pellets. They offer the properties which are crucial for achieving the desired uniformity and density of each individual pressed pellet. The design of the pellet presses ensures a high degree of reproducibility in sample preparation. The design of the equipment and variability of the pressing parameters ensure uniform optimal quality of pressed pellets from all ground materials. All the parameters which are important for the pellet pressing process such as total pressing force, incremental increase of the pressing force and pressure holding time can be preset. They are controlled directly, reliably and continuously via a program. Errors caused by incorrect handling or adjustment are now a thing of the past. Access to the program parameters is only possible using a password.

Technical Data:

Dimensions:

1050 x 900 x 1558mm Weight: approx. 750 kg

Electrical power supply and consumption: 400 V, 50 Hz, 3 - phase, or other as required.

Neutral conductor not required Power consumption of approx. 2,5KVA

Compressed air supply and consumption: Pressure: min. 5 bar max.

10 bar Consumption: approx. 1200 l/sample Sample materials which can be processed: Various minerals, cement raw meal, clinker,

cement, slag, ores, oxides, ferroalloys Form: powder, dry Grain size: max: 100 µm Hardness: max. 9 fytols

Standard dimensions of steel rings: Outside diameter: 40 mm Inside

diameter: 35 mm Height: 14 mm Or Outside diameter: 51,5 mm

Inside diameter: 35 mm Height: 8,5 mm

OPTION:

Sample input and sample output magazine cup with 30 or 60 positions.

Sample cups approx. 100 ml **Set of spare part is available.**



ATM No.HER 390

Robotized Laboratory

(ATM No.HER 535)

HERZOG AUTOMATION co-operates closely with all major analyser manufacturers in order to ensure that customer requirements are met in every respect.

Over the last ten years, HERZOG has planned, manufactured and commissioned several hundred automation concepts, ranging from the simple linking of modular machines to complex laboratory systems interconnected by robots and embodying a range of analysers, for the steel, non-ferrous metals, cement, mining and food industries and other industrial sectors.

All HERZOG automation systems are planned, tested and commissioned in close co-operation with the customer. Following commissioning, customers throughout the world have access to our technical support and our full range of customer service facilities, such as teleservice, either directly from HERZOG AUTOMATION, or through our local offices.

HERZOG has ISO 9001 certification. All products are manufactured in accordance with the EU Machinery Directive, and the company rigorously pursues the TQM philosophy.



ATM No.HER 535

System description:

Since its introduction, the HERZOG fully automatic robot laboratory has become a high-technology standard item of equipment in many areas of process analysis, and thus makes a substantial contribution towards quality assurance of analysis and production results.

HERZOG robot laboratories are employed in many sectors of the raw materials industry (e.g. in steelmaking, cement works, in the manufacture and processing

All items of laboratory equipment, from sample preparation to the analysis systems employed, are grouped around one or more central industrial robots, which perform all handling operations of the samples to be analysed. The flexibility offered by the industrial robots enables a wide range of different sample types to be handled. The extremely fast travel times of the robot or robots and the facility for integration of a number of sample preparation and analysis devices permits high sample throughput

Laboratory equipment employed:

HERZOG co-operates with all major manufacturers of spectral analysis equipment throughout the world. The equipment is designed in conjunction with customers and integrated into the the robot laboratory system as a whole according to customer requirements.

Robot systems employed:

A high level of flexibility in commissioning, programming and operating cycles is particularly important when robots are employed.

For this reason, HERZOG only uses industrial robots from world-leading robot manufacturers.

Depending upon the task, different robot arrangements may be used, from a central single-robot system to redundant systems employing a number of robots.

Benefits of the system

- Considerable flexibility, thanks to the facility for modification or extension of the arrangement
- Short delivery timeframes, thanks to the use of standard components and standardized commissioning procedures
- Flexibility for future changes in plant operations
- Low operating costs





ATM No. MAT 410

ATM No. MAT 420

Sieve shaker motor operated for sieves dia. 200 mm and 8".

(ATM No. MAT 410)

A060

This simple, and low cost Sieve Shaker is activated by an electric motor. It can hold up to 8 Sieves dia. 200 mm or 8" plus pan and lid, and it is possible to perform also wet sieving tests.

Provided of timer 0-60 minutes.

Power supply 220-240 V 50 Hz 1ph 110W

Dimensions: 320x380x800 mm

Weight: 20 Kg approx.

Sieve shaker motor operated (ATM No. MAT 420)

A060-01

Basically similar to mod. A060 it accepts sieves dia. 200 - 250 - 300 315 mm - 8" - 12". The shaker can hold up to 8 sieves dia. 200 mm or 7 sieves dia. 300 mm, and to perform also wet sieving tests.

Power supply

220-240 V 50 Hz 1ph 110W

Dimensions: 350x400x950 mm

Weight: 24 Kg approx

Electromagnetic sieve shaker

This Sieve Shaker is activated by electromagnetic impulses and thanks to its triple vibrating action (vertical, lateral and rotational) it is recommended to perform sieving tests where high precision and performance are important, and where continual and intense uses are required. It is therefore suggested for accurate sieving tests, also on fine materials. This Electromagnetic Shaker is of simple and sturdy construction, can hold up to 10 sieves and it is also suitable for wet sieving tests.

The separate digital control panel can adjust:

- The sieving time from 1 to 999 minutes
- The vibrating intensity
- The pauses between one vibration and the following one (this is especially indicated for fine material sieving).

Power supply: 220-240 V 50/60 Hz 1ph 450/750W



ATM No. MAT 430

ATM No. MAT 440

Electromagnetic Sieve Shaker

(ATM No.MAT 430)

AQ59-Q2

for sieves dia. 200 - 250 - 300 - 315 8" -12"

Dimensions: 380x440x1080 mm

Weight: 65 Kg

Electromagnetic Sieve Shaker

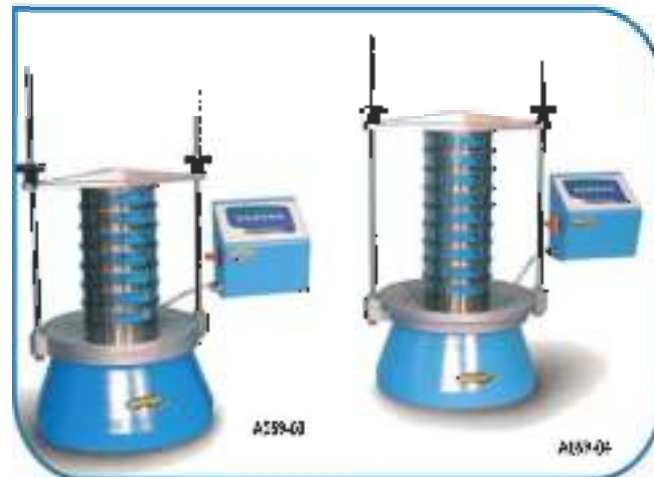
(ATM No.MAT 440)

A059-01

for sieves dia. 200 and 8"

Dimensions: 320x380x850 mm

Weight: 40 Kg



ATM No.MAT 450

ATM No.MAT 460

Electromagnetic Sieve Shaker

(ATM No.MAT 450)

A059-03

for sieves dia. 200 - 250 - 300 - 315

350-400mm -8"-12"

Dimensions: 430x460x1150 mm

Weight: 80 Kg

Electromagnetic Sieve Shaker

(ATM No.MAT 460)

A059-04

for sieves dia, 200 -250-300-315-400-450

mm-8"-12"-18"

Dimensions: 480x500x1150mm

Weight: 85 Kg

High Capacity Sieve Shaker

(ATM No.MAT 470)

A061

Designed for Sieving considerable quantities of any material. The screen shaker accepts up to 30 liters (60 to 70 Kg) of sample. Sturdy made, the machine can hold six screen trays and dust pan.

Supplied complete with dust pan, but "without" screen trays to be ordered separately.

Power supply: 220-240 V 50 Hz 1ph 750 W

Dimensions: 585x790x850 mm

Weight: 180 Kg approx.



ATM No.MAT 470

High Capacity Sieve Shaker

A061-01 (ATM No.MAT 471)

Same to mod. A061. but equipped with safety device to 89/392/CEE Directive.

High Capacity Sieve Shaker

A061-02 (ATM No.MAT 472)

Same to mod. A061, but complete with steel cabinet with micro switch to 89/392/CEE Directive lined with sound-proofing material for noise reduction.

ACCESSORIES:

A.61-04 Dust Cover

A06103 Tray only without mesh size 457x660x75mm

A061-07/ A061-46

Screen Tray fine mesh, reinforced, size 457x660x75 mm aperture from 0.075 to 5.6 mm (when ordering please specify screen aperture)

Screen Tray Coarse series size 457x660x75 mm, aperture from 6.3 to 125 mm (when ordering please specify screen aperture)

Noise Reduction Cabinet

(ATM No.MAT 480)

A058+A059-03

For the sieve shakers A059 to A060-01 lined internally with sound proofing material for noise reduction to CE Directive.

Sieve Shaker AS 200 Basic

(ATM No.RET 490)

The analytical sieve shakers of the series AS 200 are used in research & development, quality control of raw materials, interim and finished products as well as in production monitoring. The AS 200 basic model is the economical alternative of the series with familiar RETSCH quality and reliability. With analogue adjustment of vibration height and sieving time. **Application Examples:**

Sieving and fractionizing of sand, washing powder, coffee, minerals, chemicals, coal, building materials and fillers, flours, seeds, metal powders, soils, fertilizers and many other -materials **Product Advantages:**

- * sieving with 3D effect
- * for sieves up to 203 mm (8") Dia
- * measuring range 20 µm to 25 mm;
- * analogue adjustment of vibration height and sieving time
- * easy operation, ergonomic design
- * low noise and maintenance-free
- * conforms with CE standards



ATM No.MAT 480



ATM No.RET 490

Applications	separation, fractioning, particle size determination
Feed material	powders, bulk materials, suspensions
Measuring range*	20 µm to 25 mm
Max. batch / feed capacity	3 kg
Max. number of fractions**	9 / 17
Max. mass of sieve stack	4 kg
Amplitude / Adjustment range	analogue / 0 - 3 mm

Sieve acceleration	-
Time display / Adjustment range	analogue / 1 - 60 min
Interval operation	-
Adjustment range	-
Vibration height	analogue
rpm	analogue
Parameter combinations that can be stored	-
Motion of product to be sieved	throwing motion with angular momentum
Suitable for sieving of dry products	yes
Suitable for sieving of wet products	yes
Serial interface	-
Including test certificate / can be calibrated	-
Suitable sieve diameters	100 mm / 150 mm / 200 mm / 203 mm (8")
Height of sieve stack	up to approx. 450 mm
W x H x D	400 x 230 x 350 mm
Net weight	approx. 30 kg

*depending on feed material and instrument configuration/settings

Sieve Shaker As 200 control

(ATM No.RET 500)

Application Examples

Sieving and fractionizing of sand, washing powder, coffee, mineral chemicals, coal, building materials, and fillers flours, seeds powders, soils, fertilizers and many other materials

Product Advantages

- * sieving with 3D effect
- * for sieves up to 203 mm (8") dia
- * measuring range 20 µm to 25 mm
- * digital time display, interval operation
- * analogue adjustment of the vibration height
- * easy operation, ergonomic design
- * low noise and maintenance-free
- * conforms with CE standards



ATM No.RET 500

Features:

Applications	separation, fractioning, particle size determination
Feed material	powders, bulk materials, suspensions
Measuring range*	20 µm to 25 mm
Max. batch / feed capacity	3 kg
Max. number of fractions**	9 / 17
Max. mass of sieve stack	4 kg
Amplitude / Adjustment range	analogue / 0 - 3 mm
Sieve acceleration	-
Time display / Adjustment range	analogue / 1 - 99 min
Interval operation	yes
Adjustment range	10 s (fixed)
Vibration height:	analogue
rpm	analogue
Parameters consistent ones that can be stored	-
Motion of product to be sieved	throwing motion with angular momentum
Suitable for sieving of dry products	yes
Suitable for sieving of wet products	yes
Serial interface	-
Including test certificate / can be calibrated	-

Time display / Adjustment range	digital / 1 - 99 min
Interval operation	yes
Adjustment range	1 - 99 s
Vibration height	controlled
rpm	controlled
Parameter combinations that can be stored	up to 9 programs
Motion of product to be sieved	throwing motion with angular momentum
Suitable for sieving of dry products	yes
Suitable for sieving of wet products	yes
Serial interface	yes
Including test certificate / can be calibrated	yes
Suitable sieve diameters	100 mm / 150 mm / 200 mm / 203 mm (8")
Height of sieve stack	up to approx. 450 mm
W x H x D	400 x 230 x 350 mm
Net weight	approx. 30 kg
*depending on feed material and instrument configuration/settings	

Sieve Shaker As 300 Control

(ATM No.RET 520)

Application Examples

Sieving and fractionizing of sand, washing powder, coffee, minerals, chemicals, coal, building materials and fillers, flours, seeds, metal powders, soils, fertilizers and many other materials

Product Advantages

- * sieving with 3D effect
- * for sieves up to 315 mm dia
- * measuring range 36 μ to 40 mm
- * all sieving parameters - vibration height, time, interval - are set, displayed and monitored digitally
- * sieve acceleration independent of the power frequency
- * comparable and reproducible sieving results worldwide
- * test materials monitoring according to DIN EN ISO 9000
- * microprocessor-controlled measuring and control unit
- * can be calibrated
- * integrated interface
- * 9 parameter combinations can be stored
- * short sieving times with large sieving surface and effective movement of the product to be sieved
- * low noise and maintenance-free
- * high feed quantity
- * conforms with CE standards



ATM No.RET 520

Applications	separation, fractioning, particle size determination
Feed material	powders, bulk materials, suspensions
Measuring range*	36 μ m to 40 mm
Max. batch / load capacity	6 kg
Max. number of fractions**	0 - 17
Max. mass of sieve stack	10 kg
Amplitude / Adjustment range	digital / 0.2 - >2 mm
Sieve acceleration	1.0 - >10 G
Time display / Adjustment range	digital / 1 - 99 min
Interval operation	yes
Adjustment range	1 - 99 s
Vibration height	controlled
rpm	controlled

Parameter combinations that can be stored	up to 9 programs
Motion of product to be sieved	throwing motion with angular momentum
Suitable for sieving of dry products	yes
Suitable for sieving of wet products	yes
Serial interface	yes
including test certificate / can be calibrated	yes
Suitable sieve diameters	100 mm / 150 mm / 200 mm / 250 mm (2") 300 mm (12") / 315 mm
Height of sieve stack	up to approx. 450 mm
W x H x D	400 x 230 x 350 mm
Net weight	approx. 35 kg

*depending on feed material and instrument configuration/settings

Sieve Shaker As 400 Control

(ATM No.RET 530)

Application Examples

Sieving and fractionizing of sand, washing powder, coffee, minerals, chemicals, coal, building materials and fillers, flours, seeds, metal powders, soils, fertilizers and many other materials

Product Advantages

- * sieving with circular sieving motion according to DIN 53477
- * for sieves up to 400 mm dia
- * measuring range 45 µm to 63 mm
- * easy operation, ergonomic design
- * low noise and maintenance-free
- * controlled drive, which is independent of the power frequency »can be recalibrated
- * 9 sieving programs
- * ensures stability even with a high mass of the sieve stack
- * base plate can take very high loads
- * integrated interface
- * versatile use
- * conforms with CE standards



ATM No.RET 530

Applications	separation, fractioning, particle size determination
Feed material	powders, bulk materials
Measuring range*	45 µm to 63 mm
Max. batch / feed capacity	5 kg
Max. number of fractions**	7 / 9 / 17
Max. mass of sieve stack	15 kg
Amplitude / Adjustment range	digital / 50 - 300 min ⁻¹
Sieve acceleration	0.04 - 1.51 g
Time display / Adjustment range	digital / 1 - 99 min
Interval operation	yes
Adjustment range	1 - 99 s
Vibration height	controlled
rpm	controlled
Parameter combinations that can be stored	up to 9 programs
Motion of product to be sieved	horizontal circular motion
Suitable for sieving of dry products	yes
Suitable for sieving of wet products	-
Serial interface	yes
Including test certificate / can be calibrated	yes
Suitable sieve diameters	100 mm / 150 mm / 250 mm / 300 mm (8") / 305 mm (12") / 400 mm
Height of sieve stack	up to approx. 450 mm
W x H x D	400 x 230 x 350 mm
Net weight	approx. 70 kg

*depending on feed material and instrument configuration/settings

Slump Test

(ATM No.EL 560)

EN 12350-2; ASTM C143; AASHTO T119

Test appropriate for concrete mixes of medium and high workability

The test is carried out by filling the slump cone with freshly mixed concrete which is tamped with a steel rod in three layers. The concrete is leveled off with the top of the slump cone, the cone removed, and the slump of the sample is immediately measured.



ATM No.EL 560

Slump Cone:

complying with EN 12350-2, ASTM C143 and AASHTO T119
Tamping Rod steel, 600 mm long x 16 mm dia, hemispherical both ends

Steel Rule Base Plate

Slump Cone Funnel

Slump Test Set BS and ASTM comprising a slump cone, base plate, steel rule, tamping rod and funnel.

Slump Cone Test (ATM No.MAT 580)

STANDARDS: EN 12350/2 - BS 1881:102 - AASHTO T119

ASTM C143 - NF P18 305 P18 451

UNI 7108 - EN 18 - UNE 7108, R3313

For the determination of the consistency, the medium and high workability of fresh concrete.



ATM No.MAT 581

(ATM No.MAT 581)

C180

SLUMP CONE COMPLETE SET including: "stainless steel cone metal part, tamping rod, slump scale with measuring device, cone funnel, all completely protected against corrosion, aluminum scoop
Weight:10 kg

(ATM No.MAT 582)

C182

SLUMP CONE SET, including: galvanized aluminum cone, base plate, tamping rod, aluminum scoop, steel rule 300 mm long



ATM No.MAT 582

Spare Parts:

(ATM No.MAT 583)

C180-01 Slump cone only, "stainless steel"

C180-02 Tamping rod, galvanized dia. 16x600 mm

C180-03 Cone funnel, galvanized steel

C180-04 Base plate for C182 set

V176-01 Steel rule 300 mm long for C182 set

V184 Aluminum scoop, 500 cc capacity

C181 Slump cone only, galvanized steel

K-slump Tester

(ATM No.EL 590)

Used to determine the workability of fresh concrete and the degree of concrete compaction placed in formwork. The apparatus can be used for in-place measurements of concrete in test moulds and forms and may be correlated to the standard slump test. It is simple, economical to use and reduces testing time. No special calibration is required.

Weight 450 g



ATM No.EL 590

K-slump Tester

(ATM No.MAT 600)

C187

STANDARD: ASTM C1362

To determine the degree of compaction and the workability of fresh concrete. Used for in situ measurements or inside test moulds. Test results can be correlated against the slump values

Weight: 500 g.



ATM No.MAT 600

Slump Table Acc. To DIN 1048

(ATM No. 610)

complete with tamper and galvanized slump cone

- limit stop
- reinforced frame
- additional, rear bearing
- guaranteed weight 16 kg \pm 0.5 kg



ATM No. 610

Turbula Shaker- mixer

(ATM No.WAB 620)

used for the homogeneous mixing of powdery substances with differing specific weights and particle sizes.

The product is mixed in its own closed container,

The exceptional efficiency of the TURBULA® shaker-mixer comes from the use of rotation, translation and inversion, according to the schtaz geometric theory.

Mixing dry-wet and wet-wet are also possible,

Principle

The mixing container is set into three-dimensional movement that exposes the product to always changing, rhythmically pulsing motion. The results fulfill the highest requirements and are achieved in a minimum of time.



ATM No.WAB 623

MODEL	ATM No.
T2F:	WAB621
T10B:	WAB622
T50A:	WAB623

Model	Container max.(ØxH)	Motor (kW)	max. Load (kg)	max. Volume (L)
T2F	130x215	0.18	10	2
T10B	250x300	0.37	30	17
T50A	360x560	1.1	75	55



ATM No.WAB 621



ATM No.WAB 622

Chemical Testing Machines

Blaine Air Permeability Apparatus.

(ATM No.EL 630)

EN 196-6,459-2,13286-44:BS 4359-2:ASTM C204

This method has been adopted in Europe as the definitive means of determining the fineness of cement and other 'powder' materials.

The system is supplied complete with stainless steel cell, perforat disc and plunger, manometer U-tube, a spirator, bottle of manometer liquid and a box of filter papers, Weight 2.8 kg

Filter Papers, 12.7mm diameter Box of 1000.

Manometer Liquid (Dibutylphthalate)

Reference Cement

Blaina Air Permeability (Fineness) Apparatus

(ATM No.MAT 640)

STANDARDS: EN 196/6 - ASTM C204 - AASHTO T153

BS 4359/2 - NI 7374 • NF P15:442 -UNE 80106

Used to determine the fineness of Portland cement in terms of the specific surface expressed as total surface area in square centimeters per gram of cement

The apparatus is supplied with glass U-tube manometer with valve, steel stand, test cell with disk and plunger all in stainless steel, rubber aspirator bulb, 1000 filter paper disks, manometric liquid, accessories, Weight: 12 Kg



ATM No.EL 630



ATM No.MAT 640

ACCESSORIES:

E010-02

Standard reference cement 114p to ASTM/SKM/EN to calibrate the Blaine

E055-08

Glass Thermometer -10 to +50° C.

SPARES:

E010-01 U-tube glass manometer complete

E010-03 Manometric liquid 250 ml bottle

E0 10-04 Filter paper (pack of 1000 pieces)

E010-05 Cell body, stainless steel

E0 10-06 Cell plunger, stainless steel

E0 10-07 Cell perforated disk, stainless steel

Semiautomatic Blaine air premeability apparatus (Type: L5B2)

(ATM No.CON 641)

Automatic Blaine Permeabilimeter (ATM No.CON 650)

Automatic Blaine permeabilimeter with control console for measurement of cement specific surface area

REPEATABILITY AND PRECISION OF TESTS ANALYSIS OF RESULTS MEMORIZATION AND FILING

The proposed advantages:

- Time measurements by triggering a stopwatch as a fluid passes in front of optical sensors,
- Drain valve for easier liquid leveling in tube,
- Tightness test at beginning of test to detect unwanted air inlets,
- Automation of calculations after tests,
- Automatic correction of calculations according to temperature,
- Analysis of results as average and diagram,
- Memorization of results obtained and consulting of files.



Ref. L0049

Technical characteristics:

The Blaine automatic permeabilimeter includes:

- a protection frame,
- a glass U-shaped pressure tube filled with pressure liquid,
- 4 optical sensors,
- a pump for drawing in liquid,
- a control console with keyboard and screen for controlling the apparatus,
- a measurement cell on a lapped fitting with:
 - a pierced grill at the back of the cell,
 - 2 special texture paper filter disks,
 - a fitted piston for packing down the cement,
- a cover for protecting the measurement cell.

ATM No.CON 650

Electronic Air Permeability Apparatus

Model 6565

(ATM No. TON 655)

Application

For determination of specific surface (Blaine Value) of Powders, especially suitable for the permanent control of Manufacturing characteristics in the daily laboratory Work. This measuring procedure serves as practice oriented alternative for the standard procedure According to DIN EN 196 as well as ASTM C204

Advantages

- *on alternating operation with two load cells enables a Higher test frequency
- *immediate readout of the specific surface on the Measurement device
- *height adjustable optical sensors for optimal results for The different samples to be tested
- *density, initial weight, porosity and temperature selectable acc. To the specific samples
- *calibration via reference materials
- *five different calibration factors saveable
- *runtime indication resolution :0.01 sec
- *calculation of the blaine values incl. Standard deviation of up to 99 samples
- *connection to balance, dial gauge and printer are available as option
- *improved accuracy as one can select tests as much as desired for one sample, the Average value always calculated by the toniPERM software
- *blaine value calculation is adaptable to the temperature by a built-in sensor
- *the possibility of "Zero" – test avoids measuring errors because of selfcompacting of the powder
- *connection to PC for data exchange to LIMS and other laboratory data recording systems

Product Information Model 6565

Electronic Air Permeability Apparatus

Standard Delivery includes

Electronic air permeability apparatus

Manometer fluid 6565.005 1 bottle, (125 CM3)

Round filters 7207.004 1 box, 13 mm , 500 count

Dust filters 7207.004 1 box, 41 mm , 100 count

Tool 6565.011 for sample preparation and cleaning

Optional Accessories

Software data connection 6565.002

Electronic dial gauge 6565.003 for compensation of the permeability cell volume

Anti-twisting device 6565.004 for fixing the plunger against turning

Second permeability cell 6565.007 to increase the test frequency and for dual testing

Balance 6565.008 special balance for determination of initial weight of sample

Barcode reader 0510.621 for sample identification with laboratory information systems

Special voltage (115v) 6565.015

Standard sand sample I 7207.012 fineness approx. 2800 cm²/g, officially certified

Standard sand sample II 7207.013 fineness approx. 4000 cm²/g, officially certified

Technical Data

Power supply

Voltage V 230(115 optional)

Frequency Hz 50/60

Power VA ca. 15

Volume of permeability cell cm³ 74

Dimensions (measuring device/display unit)

Width mm 240/220

Depth mm 320/330

Height mm 310/380

Weight gross/net kg 25/23

Blaine

(ATM No.ACM 660)

Blaine Permeability Apparatus

BSA1



The Blaine apparatus is used to determine the specific surface area of cements, as well as other powdery products.

Definition and principle:

The method applied determines the fineness of cement (or other products), by measuring the elapsed time for a given quantity of air to pass through a compacted bed of cement.

Features:

- Complying with EN 196-6 standard procedure
- Microprocessor controlled electronics
- Temperature measuring close to the sample
- Tests of various sample porosities can be done (2 .. 0.5)
- Connection to direct output on a printer
- Connection to a PC possible for parameter setting and using the results via RS 232 and RS 485 link

Operation procedure:

- All parameters, such as the type of cement, operator's identification, are typed via the front keyboard
- The built in database calculates and displays the sample mass required according to its density
- Prepare the sample and place into cell position
- The liquid rises in the tube and the cycle starts
- The time difference between the two marked levels is automatically recorded at 1/50 s
- Calculation and possible temperature correction will takes place



automatically and the results

expressed in **Blaine unit (cm²/g)** are displayed

- Audio signal marks the end of the test
- The readout as well as the associated parameters are stored in the memory
- Printout if required

Simplicity:

- Built-in database
- Calculation of the mean value over several tests
- Display by pull-down menu
- Blaine tube easily interchangeable

Quality:

- No intervention by the operator on the measuring
- No mistake in using the nomographs
- No errors on measuring the time
- After 1000 tests (standard 196-6) the device tells you when you have to re-calibrate the instrument
- Access to calibration menu by password
- You can visualize the test continuously to check levels

Specifications:

- Watt hour consumption: 20 W
- Dim. (height): 30x40x30
- Net weight: 15 kgs

ATM No.ACM 660



ATM No. MON 663

Colorimeters Model CR-400

(ATM No. MON 663)

The **NEW CR-400**, an ultramodern, easy to use, compact design colorimeter. Imagine holding sophisticated colorimetric measurement capabilities in just one hand!

With the new CR-400 colorimeter, you can. All the capabilities you need to measure, to compare, and to Pass/Fail up to 100 targets and 1000 samples are engineered into the new lightweight, stand-alone, measuring head. The CR-400 Series is ideal for measuring reflected color and color difference of ingredients, raw materials, finished products, powders, pastes, and opaque liquids. 100% data-compatible with the CR-300 series colorimeters.

The 400 Series measuring head, equipped with Display, function keys, and power supply (or AAA batteries) can be used as "stand-alone" or the head can be connected to a PC, or to Konica Minolta's "PDA" style data processor. The data processor features a large back-lit display for numerical or graphic display of measurement data and a built-in thermal high speed printer.

Several new color spaces and pass/fail formulas have been added to this 400 Series. And the innovative "User Indices" function allows the input of up to six different user or industry-specific equations. Furthermore, the communication can be set for six languages: English, German, French, Italian, Spanish or Japanese.

Color inspect, sort, select, classify, or grade product anywhere – only with the Konica Minolta CR-400 Series of Colorimeters.

Features:

Stand Alone Measuring Head

The measuring head is detachable from the data processor. Now you can take measurements directly with the head alone. You can also connect the measuring head directly to a PC. Simply install our optional software, and your PC can function as the data processor.

User-defined Evaluation Formulas

The CR-400 Series features a Users index function that allows you to configure the evaluation formula and color calculation formula as desired. This feature is intended to meet the needs of color-control applications in which industry specific or customized evaluation formulas are used, instead of the versatile color system and standard evaluation formula such as $L^*a^*b^*$

Color Tester (Whiteness) Double Beam Spectrometer Mcs 522

(ATM No.ZES 665)

BLX - Xenon-Flashlamp

The BLX 500 is a universal xenon flash light source for the UV/visible spectral range, optimized for coupling to fiber light guides. The flash unit is available in two versions.

Benefits

High light efficacy with minimum heat development High lifetime

BLX 500/6

320... 800 nm

Colour measurement with integrating sphere
output energy of 0.6 J/Blitz



ATM No.ZES 665

712 Conducto Meter - Fast And Accurate Conductivity Measurement

(ATM No.MTR 670)

A wide range of uses

- * Conductivity measure merits in the range 0.001 μ Siemens/cm to 20 Siemens/cm with automatic range switching
- * Two lines of 16 alphanumeric characters each are available for the sample identification
- * Measurement ranges specially designed for conductivity titrations with compensation
- * Temperature measurement from -170 °C to 500 °C
- * TDS measurements (Total Dissolved Solids (salinity) 0.5 mg/l ... 300 g/L NaCl)
- * With "Frequency auto", the 712 Conducts meter automatically selects the measurement frequency (300HZ or 2,4 KHZ) best suited to the sample
- * "Auto zero" sets the current conductivity to zero. Changes can thus be followed with a higher resolution
- * The freely selectable reference temperature allows matching to the measurement instructions of many different standards

- * Meets the requirements of USR GLP, ISO 9000



ATM No.MTR 670

703 Laboratory Conductivity

(ATM No.KNI 680)

The requirements for lab measurements become stricter every day. Quality assurance and measurement documentation in accordance with GLP are a must in many areas.

With its numerous safety functions and record printouts at keystroke, the 703 Laboratory Conductivity Meter considerably simplifies this work for you.

Fullcheck®

automatically checks the device functions during power-on. Also during operation, a complete instrument check can be carried out at a single keystroke. Here, also display and keypad are checked besides the electrical characteristics.

Record printouts

With record printouts of the device self-test, the calibration, and the parameter settings, it is possible (as part of quality management to ISO 9000 and GLP) to document the operability and the regular maintenance and calibration of the meter.

Sensoface®

Sensoface® monitors the sensor and measuring equipment and provides information on sensor selection and handling. It reports clock memory loss and requests regular checks in accordance with GLP.

Calibration

Unknown cell constants can easily be determined with a standard calibration. The meter automatically takes the TC of the calibration solution into consideration, calculates the cell constant and displays it. Of course, a known cell constant can also be entered directly.

Analog output

The galvanic isolation of the recorder output prevents the measured values from being influenced by the connected peripherals. Measurement continues unimpaired.

EMC

EMC design protects the meter from electromagnetic interferences, ensuring reliable measurement results even under unfavorable conditions. This makes the Model 703 the first laboratory conductivity meter that completely fulfills the EMC recommendations of NAMUR. The Model 703 offers a wide range of practical features to meet the numerous requirements of everyday measuring tasks.

Automatic switchover to 4-electrode or 2-electrode operation

With the Model 703 you can use either 4-electrode or 2-electrode sensors. The measuring input is automatically switched to the appropriate operating mode.

Temperature compensation manual or automatic

Temperature compensation takes place either automatically with Pt 1000/NTC 30 kOhm temperature probes or manually.

Standard RS 232 Interface

Via the standard RS 232 interface your data can be immediately processed by a computer. Even direct output to a printer is no problem.

GLP records at the press of a key

Records of the parameter setting, calibration, and device diagnostics can be output directly to a printer. This provides you with comprehensive GLP-compatible documentation at the press of a key.

Automatic adjustment of display range

The meter automatically selects the display range with the greatest possible resolution. Of course, the desired display range can also be specified manually.



ATM No.KNI 680

Easy-to read LED display for two measured values

The large, bright LED display allows simultaneous readout of two measured values, such as conductivity and temperature. The 14-segment display can show alphanumeric characters.

Double insulation provides electrical safety in wet locations

The well-designed enclosure has proved successful in practical use. A waterproof membrane keyboard and drain grooves protect the meter from moisture. The robust, stainless steel covered enclosure resists even strong mechanical stress.

Conductivity Measurement 913 Cond

(ATM No.KNI 690)

Pioneering. Remote -controllable. Fit for digital communication

Providing the functional abundance of high-quality bench top meters with easy, icon-guided operation. Compact construction. Comfortable handling.

Versatile. Elaborate. Two versions for reliable conductivity measurement. Robust enclosure. Protected against strong jets of water. Appealing design, Flat Constructed for a firm grip.



ATM No.KNI 690

Applications.

Most versatile hazardous and safe-area applications, such as in industry, in the lab, for environmental protection, food processing, as well as water and waste-water measurements.

The keys

Smooth membrane keypad. Durable. Easy to clean. No sticking or crusty deposits.

The display

Large (15 mm character height). Easy-to-read LC display. Antireflection natural glass. Scratch-proof and resistant to chemicals. Clear icons for operator guidance. Sensoface® sensor diagnostics with "Smileys".

The quiver

Integrated. Replaceable. Protects the sensor. Transparent. Easy to remove.

The enclosure

Blue. Ergonomic. Resistant to impact and chemicals. Diecast chassis. Water-tight (IP 66 protection).

The cover

Protects against dirt and damage. Highly flexible lamellar joint. Can be folded back completely. Instructions on the back.

The hook

Fold-out. For hanging or standing up. Keeps both hands free for handling the sensor.

The carrying strap

Practical. Adjustable. Fixed directly to the meter.

The sockets

Robust. Water-tight. Gold-plated.

The clock

Integrated real-time clock With date

The memory

Manual storage. Direct access via 2 keys. 100 measured values including temperature, memory location number, time, and date.

The data logger

Unique. Automatic recording of measured values over longer periods. Manual (with STO key), interval (e. g. every 30 min.) or event-controlled (based on a measured value difference - this function prevents unnecessary memory consumption). Combined with a PC, the meter can continuously record any amount of data.

The interface

Serial. Either for printer or PC by simply turning the plug around

Saves paper work.

Prevents manual transcription errors. Supplies records for QM documentation (ISO 9000 and GLP). The Model 913 Cond can be completely remote-controlled via interface, e. g. for computer-controlled data acquisition and lab automation.

The software

Convenient. Paraly@ SW 109 transfer software. Transfers measured values to the PC.

Uncomplicated documentation and further processing (e. g. with Microsoft Excel).

Data logger function. Remote control of all device functions.

Flame Photometer

(ATM No.MAT 700)

Standard: EN 196:21 -ASTM C114:17 ~BS 4550

Description: Used to determine the alkali content of cement Supplied complete with sodium (Na) and Potassium (K) filters, fuel and air connections, accessories.

Digital readout:0 to 199 9 ppm

Reading range:K or Na 3 -100 ppm,sens.3 ppm

Reproducibility:1%coefficient of variation for 20 consecutive samples

Operates on propane, butane, natural gas supplies

Air supply:6 liter/min.with pressure of 1 Kg/cm² through specific dry compressor

(see accessories)

Power supply:220-240V 1ph 50 Hz

Dimensions:420x360x300 mm

Accessories :

E063-01 Lithium (Li) filter

E063-02 Barium (Ba) filter

E063-03 Calcium (Ca) filter

E063-04 Natural gas regulator

E063-05 Propane gas regulator

E063-06 Butane gas regulator

E063-07 Dry Compressor; pressure 1 -2 Kg/cm²

(14-30 psi). capacity 6 litre/min. 220-240V 1ph 50Hz



ATM No.MAT 700



ATM No.BS 710

Flame Photometer

(Model PFP7&PFP7A/C)

(ATM No.BS 710)

Common Specifications

Reproducibility <1 % / Coefficient of Variation for 20 consecutive

samples using 10ppm Na set to read 50

Linearity Better than 2% when concentration of 3ppm

Na and K and 5ppm Li are

Size; 420 x 360 x 300mm

Weight: 8Kgs

Model	PFP7	PFP7/c
Ranges	-	120-160 mmom Na (linearity)
-	-	0-10.0 mmom K
Limits of detection	Na < 0.2 ppm	-
	K < 0.2 ppm	-
	Li < 0.25 ppm	Li < 0.25 ppm
	Ca < 15 ppm	Ca < 15 ppm
	Ba < 30 ppm	Ba < 30 ppm

MODEL	ATM No.
PFP7	BS711
PFP7/C	BS712

Flame Photometer

(ATM No.EL720)

EN196-21; ASTM C114, Test 17

Specification

Dimensions (l x w x h) :- 420 x 360 x 300 mm

Readout :- LED three 12.5 mm digits

Range :- 0 to 199.9 ppm

Sensitivity Na 3 to 100 ppm

K 3 to 100 ppm

Ca 5 to 100 ppm (optional filter)

Reproducibility: - 1 % CV for 20 consecutive samples using
10 ppm, set to read 100

Recorder output: - Nominal 1.00 V for a reading of 100.0

Weight: - 8 kg



ATM No.EL 720

Free Lima Water Baths (Model Wb)

(ATM No.MEM730)

Features:

- 6 sizes from 7 up to 45 liters
- temperature range +10°C up to +95°C
- additional boiling mode +100°C (not for model WBU 45 with circulation pump)
- large-area heating on three sides
- electronic PID-controller
- auto diagnostic system
- integrated timer function
- temperature limiter TB protection class 1

The water bath models WB 14 (14 liters) and WB 22 (22 liters) can additionally be provided with shaking device to be inserted in the bath.

WB 14 (14 liters) (ATM No.MEM731)

WB 22 (22 liters) (ATM No.MEM732)



ATM No.MEM 730

Le Chatelier Water

(ATM No.EL 740)

in the bath.

The soundness of cements and limes can be determined by an expansion test using

Le Chatelier Moulds

The method of curing lime differs from that of cements, lime being cured in a steam tank and cements in a water bath. The ASTM method uses a high-pressure steam vessel (Autoclave) to cure the specimens.



ATM No.EL 740

BS 6463;EN 196-3,459-2

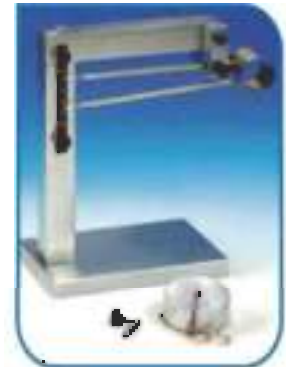
manufactured from corrosion resistant material, complete with a removable rack to hold up twelve moulds. An adjustable controller for the immersion head regulates the water temperature. Weight 5.4 kg.

For 220 - 240 V AC, 50 - 60 Hz, 1 ph.

Testing Device For The La Chatelier moulds Acc, To En 196

(ATM No.750)

for measuring of the volume consistency of cement



ATM No. 750

Le Chatelier Mould

(ATM No.EL 760)

comprising a split cylinder fitted with two indicator stems
The mould is supplied complete with two glass plates and
a weight 100 g \pm 10 g. Three moulds required for each test
Weight 900 g



ATM No.EL 760

Le Chatelier Water Bath E064

(ATM No.MAT 770)

Power supply 220-240V 1ph 60/60 Hz 1800 W

Dimensions: 405x265x205 mm

Weight: Kg. with E065 moulds.



ATM No.MAT 770

Le Chatelier Mould Individually Tested

(ATM No. MAT 771)

E066

Similar to mod. E066, but with pointers bigger sized, granting a higher number of test utilizations (about 10 times more) within the tolerances requested by EN Specifications. The moulds are checked one by one with engraved a serial number for an easier identification of each mould, they perfectly meet EN 196/3 Specification.

Le Chatelier Mould

(ATM No. MAT 780)

E066

Made from a brass spring tensioned split cylinder having internal dia 30 by 30 mm high, with two pointers 150 mm long* Chromed finishing. Used to determine the cement expansion (soundness) either in cold and in boiling water. Weight: 30 g

E066-01 (ATM No. MAT 781)

Glass plate 50x50 mm to cover the mould. Pack of 2 pieces

E066-02 (ATM No. MAT 782)

Weight: 100 g to be placed over the glass plate.

E066-03 (ATM No. MAT 783)

Extensibility of mould apparatus to check the elasticity of the split cylinder of the mould.

Complete with 300 g weight.



Ls Chatelier Digital Water Bath, Automatic, Programmable

(ATM No. MAT 790)

Stainless steel inside chamber, painted exterior cast with double insulation. The digital programmer allows to select and display:

- * the time of total cycle and the boiling time.
- * the bath temperature with 0,1 °C» resolution To select and control:
- * the initial heating time (from 20 to 100C, in 30 +/- 5 minutes)
- * the boiling time (180 minutes)
- * the automatic cut-off at the end of the cycle

The apparatus is supplied complete with:

- * stainless steel removable rack holding up to 12 moulds
- * connectors for direct water inlet and overflow
- * emptied drain cock
- * insulated cover with gasket to minimize water evaporation
- * safety device if the electric heating resistance is not covered by

Water capacity: 13 liars

Power supply: 220*240V 1 ph 50/60/Hz 2200W

Inside dimensions: 320 x 290 x 150 mm

Outside dimensions: 480 x 430 x 280 mm

Weight 11 kg



ATM No. MAT 790

Laser Practical Analyzer Mastersizer 2000 Integrated Systems For Particle Sizing

(ATM No.MAL 800)

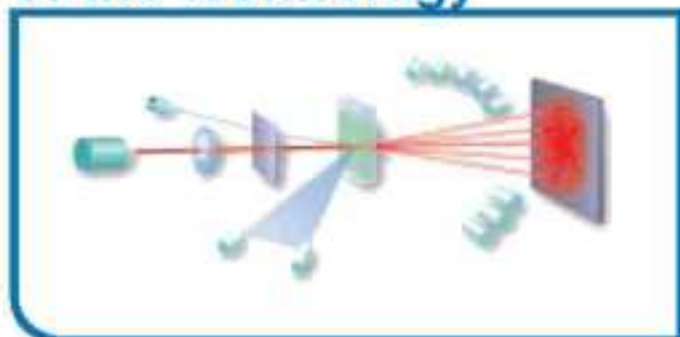


Malvern Mastersizer 2000 Integrated systems for particle sizing

During the laser diffraction measurement, particles are passed through a focused laser beam. These particles scatter light at an angle that is inversely proportional to their size. The angular intensity of the scattered light is then measured by a series of photosensitive detectors. The number and positioning of these detectors in the Mastersizer 2000 has been optimized to achieve maximum resolution across a broad range of sizes. The Mastersizer 2000 Auto sampler delivers the ultimate in laboratory productivity and efficiency. This intelligent sample preparation system completely automates laborious sample preparation tasks enabling true round the clock, unattended operation. This not only increases sample throughput but also frees the user to concentrate on data analysis rather than carrying out routine sample measurements.



Fundamentals of the technology



The Mastersizer 2000's wide dynamic range and flexible operation are achieved through Malvern's capacity to precisely engineer and optimize the system according to the physics of light scattering.

Mastersizer 2000 technical specifications

Optical Unit	Specification
Size range	Materials in the range 0.02µm to 2000µm
Measurement principle	Mie scattering
Detection systems	Red light: forward scattering, side scattering, back scattering Blue light: wide angle forward and back scattering
Light sources	Red light: helium-neon laser Blue light: solid-state light source
Optical alignment system	Automatic rapid align system with dark field optical reticle
Sample dispersion unit interchange	Sample dispersion units automatically recognized, configured and enabled on insertion of measurement cell cassettes into size
Laser system	Mastersizer 2000: Class 1 laser product Autosampler 2000: Class 2 laser product
Software and data processing Minimum Computer Specification	IBM compatible PC, Pentium 166MHz, 32MByte RAM (64MByte recommended) and CD-ROM, SVGA screen with 800 x 600 resolution, 256 colour. At least 100MByte of free hard disk space is required to operate the software. This specification does not take into account the operating system requirements. Please note: The MS2000 Autosampler requires 128MByte of free hard disk space and a 1024 x 768 screen resolution.
Operating Systems	Windows NT v 4.0 (Service Pack 6A or Higher), Windows 2000 Professional (Service Pack 2 or Higher) or Windows XP Professional. Windows 2000 Professional is the recommended operating system.
Database utility	Searching, sorting and filtering by search criteria of data records on all parameters of interest.
Custom report facility	Custom report designer using drag-and-drop selection, positioning and sizing of key report elements.
Creation of SOPs and automation	Set up by means of SOP Wizard with extensive advice at all stages of SOP creation. A library of SOPs for common materials is built into the software as standard.
Operating modes	Automated using SOPs created in the software. Manual, using on-screen controls and hot keys.



Weights and dimensions		
Model	Unpacked weight (kg)	Dimensions (length x depth x height in mm)
Mastersizer 2000 optical bench	31.0	1290 x 255 x 375
Hydro 2000G	13.7	344 x 352 x 330
Hydro 2000S	11.0	352 x 355 x 332
Hydro 2000MU	15.4	320 x 375 x 335/490
Hydro 2000 Micro-Precision	12.1	287 x 253 x 338
Scirocco 2000	11.7	352 x 355 x 332
Autosampler 2000	32.0	550 x 365 x 560

MODEL	ATM No.
2000 OPTICAL	MAL 801
2000 G	MAL 802
2000S	MAL 803
2000MU	MAL 804
2000M P	MAL 805
SCIROCCO 2000	MAL 806
AUTOSAMPLER 2000	MAL 807

765 Laboratory pH Meter

Quality assurance does not stop at your lab door.

(ATM No.KNI 820)

To make reliable pH measurements easier than ever, Knick has equipped the Model 765 Laboratory pH Meter with an exemplary package of safety functions.

Fullcheck®

automatically checks the device functions during power-on. Also during operation, a complete instrument check can be carried out at a single keystroke. Here, also display and keypad are checked besides the electrical characteristics.

Record printouts

With record printouts of the device self-test, the calibration, and the parameter settings, it is possible (as part of quality management to ISO 9000 and GLP) to document the serviceability and the regular maintenance and calibration of the unit.

Sensoface®

checks the electrode and provides information on the electrode condition. The zero, slope, response time, and glass impedance of the electrode as well as the calibration interval are evaluated.

Calimatic®

automatically recognizes the right buffer. It allows calibration at the stroke of a key, providing easy of use and - above all - safety.

You simply immerse the electrode in two buffers of the selected set, no matter which one you take first, and press the cal key. The meter automatically recognizes the buffer and calibrates itself.

Trueline®

delivers a calibrated analog recorder signal, of course electrically isolated.

This provides you with a true pH signal, calibrated for the electrode and without disturbing quantizing levels, permitting undistorted recording of pH curves.

Sockets

Robust gold plated sockets are standard equipment.

EMC

EMC design protects the meter from electromagnetic interferences, ensuring reliable measurement results even under unfavorable conditions.

Numerous practical features allow comfortable and safe pH measurement.

Manual or automatic temperature compensation

Temperature compensation is either automatic with Pt 100 or Pt 1000 temperature probes or manual, as selected.

Standard RS 232 interface

Via the standard RS 232 interface your data can be immediately processed by a computer. Even direct output to a printer is no problem.

Displaymatic® for easier reading

Displaymatic® facilitates readout. If the measured signal changes rapidly, the running characters are blanked in order to allow easy reading. This allows you to read the currently measured value without problems.

Easy-to-read LED display for two measured values

The large, bright LED display allows simultaneous readout of two measured values, such as pH and temperature. 14-segment display for representation of alphanumeric characters.

Double insulation provides electrical safety in wet locations

The well-designed enclosure has proved successful in practical use. A waterproof membrane keyboard and drain grooves protect the meter from moisture. The robust, stainless steel covered enclosure resists even strong mechanical stress.



ATM No.KNI 820

766 Laboratory Ph Meter The Laboratory Ph Meter With Uncompromising Ease Of Use

(ATM No.KNI 830)

The 766 Laboratory pH Meter is designed for standard applications in everyday lab routines. It combines practical functionality and easy operation with comprehensive safety functions.

Gaincheck®

Gaincheck® performs a complete instrument check. At a keystroke, it not only checks electrical characteristics, but also display and keypad. At power-on, a short check automatically tests device functions. This ensures the device operability, as part of quality management to ISO 9000 and GLP.

Sensoface®

checks the electrode and provides information on the electrode condition. Zero point, slope, response time, and glass impedance of the electrode are evaluated.

Trueline®

delivers a calibrated analog recorder signal, of course electrically isolated. This provides you with a true pH signal, calibrated for the electrode and without disturbing quantizing levels, permitting undistorted recording of pH curves.

Calimatic®

automatically recognizes the right buffer. It allows calibration at the stroke of a key, providing easy of use and - above all - safety. You simply immerse the electrode in two buffers of the selected set, no matter which one you take first, and press the cal key. The meter automatically recognizes the buffer and calibrates itself.

EMC

EMC design protects the meter from electromagnetic interferences, ensuring reliable measurement results even under unfavorable conditions.

Easy operation with five keys

Even with its comprehensive safety functions, the Model 766 remains easy to operate. Just five keys give access to all functions you require for easy and precise routine measurements.

Temperature compensation manual or automatic

Temperature is automatically compensated. A pH/Pt 1000 electrode detects the temperature and the Model 766 automatically calculates it into the measured value. Of course, you can also measure the temperature using a separate sensor or enter it manually.

Easy-to-read LED display for pH and temperature

The large, bright 14-segment LED display for alphanumeric characters allows simultaneous readout of pH/mV and temperature.

Safe and robust enclosure

The well-designed enclosure has proved successful in practical use. A waterproof membrane keyboard and drain grooves protect the meter from moisture. The robust, stainless steel covered enclosure resists even strong mechanical stress.

The 766 Laboratory pH Meter is designed for standard applications in everyday lab routines. It combines practical functionality and easy operation with comprehensive safety functions.



ATM No.KNI 830

7155 Desktop

Model:

DOB Dosing
DIS-R Repetitive Dispensing
DIS-C Cumulative Dispensing
P-P Pipetting
DIL Diluting
CNT Preparation of solutions
with preselected content

Display:

LCD, 16 characters, backlit

Exchange Units:

1, 5, 10, 20, 50 mL

Resolution:

10 000 pulses per 100% of burette
volume

Accuracy and repeatability:

Better than requested by DIN
12550

Dispensing time:

Analog setting 30 s ... 17 min

Digital setting 30 s ... 17 h

Method memory:

Non-volatile

Capacity 10 methods

Flow module:

RS 232 C

Analog output (optional):

Range 0 ... 1000 mV

Resolution 1 mV

Remote control:

RS 232C

Allowed temperature:

+5 ... +40°

Storage temperature:

-40 ... +60°

Safety specifications:

IEC 1010, safety class I

Power supply:

100, 117, 220, 230/240V ± 10%

Frequency 50 ... 60 Hz

Dimensions with Exchange Unit

Width

150 x 150 x 275 mm

Weight with Exchange Unit

715 Desktop

Model:

DOB Dosing
DIS-R Repetitive Dispensing
DIS-C Cumulative Dispensing
P-P Pipetting
DIL Diluting
CNT Preparation of solutions
with preselected content

Display:

LCD, 16 characters, backlit

Exchange Units:

1, 5, 10, 20, 50 mL

Resolution:

10 000 pulses per 100% of burette
volume

Accuracy and repeatability:

Better than requested by DIN
12550

Dispensing time:

Analog setting 20 s ... 17 min

Digital setting 20 s ... 17 h

Method memory:

Non-volatile

Capacity 10 methods

Flow module:

RS 232 C

Analog output (optional):

Range 0 ... 1000 mV

Resolution 1 mV

Remote control:

RS 232C

Allowed temperature:

+5 ... +40°

Storage temperature:

-40 ... +60°

Safety specifications:

IEC 1010, safety class I

Power supply:

100, 117, 220, 230/240V ± 10%

Frequency 50 ... 60 Hz

Dimensions with Exchange Unit

Width

150 x 150 x 275 mm

Weight with Exchange Unit

4 kg

715 Desktop

Model:

DOB Dosing

Display:

LCD, 16 characters, backlit

Exchange Units:

1, 5, 10, 20, 50 mL

Resolution:

10 000 pulses per 100% of burette
volume

Accuracy and repeatability:

Better than requested by DIN
12550

Dispensing time:

Analog setting 30 s ... 17 min

Digital setting 30 s ... 17 h

Method memory:

Non-volatile

Capacity 10 methods

Flow module:

RS 232 C

Analog setting 30 s ... 17 min

Method memory:

Non-volatile

Capacity 10 methods

Laboratory pH Meter Quality assurance
does not stop at your lab door.

Freezing and Thawing apparatus

(ATM No.TON 845)

The slab- tester is a temperature and time controlled frost-thaw system for concrete testing. it allows :freezing and thawing of the concrete specimen according to PrcEN 12390-9 as well as prEN 1339, EN 1367-1 and EN 1340:2002,

Dimensions

Outside w x d x h 77 x 70 x 200 cm

Inside w x d x h 63 x 144 cm

Electrial connection 230V, 50Hz, 0.5Kw

Minimum temperature -30 bC

Maximum temperature -55 bC

Weight 154 kg



765 (ATM No.MTR 840)

776 (ATM No.MTR 841)

775 (ATM No.MTR 842)

The Sulfur Analyzer Cs230

(ATM No.LEC 850-851-852)

Series is Ideal for the **smaller**, lower-volume laboratory looking for a cost-effective solution without sacrificing **precision**, **reliability**; and **accuracy**. Add the optional Windows -based software and fully automatic autoloader to expand usability even further for **higher-volume** laboratories. Each instrument can be

configured to meet your **individual lab** needs including **carbon-only**, **sulfur-only**, **high-carbon/sulfur**; **low carbon/ sulfur**, and **high-sulfur determination**.

(ATM No.LEC 850)

CS230 Carbon/Sulfur Determinator

Not every lab requires **high-end**, multi-element detection instrumentation. For dependable **accuracy** and **precision**, combined with **upgrade flexibility** for carbon and sulfur results, ATM recommends the CS230. This instrument effectively covers ranges from **ppm** to **high weigh %** levels for both carbon and sulfur.

For **more information** request Specification Sheet 209.173.001

(ATM No.LEC 851)

C230 Carbon Determinator

most basic carbon-only determinator for steel, cast iron, **ferroalloys**, and **nonferrous metals**. Results are available in as little as **45 seconds**.

For **more information** request Specification Sheet 209.173.002

(ATM No.LEC 852)

S230 Sulfur Determinator

For **accurate sulfur-only** determination, choose the S230 Series. Measurement by solid-state **infrared** absorption is complete in **less than one minute**. For **more information** request Specification Sheet 209-173 003

Applications

230 Series instruments can easily handle **most sample forms** including **solid pieces**, **powders**, **millings**, and **chips**.

Standard Features

- *Automatic leak check and barometric pressure control
- * Powerful 18 MHz, 2.2 kW furnace
- * Simultaneous carbon/sulfur calibration; blank calculation for each cell and method
- * Cleaning counters for reagent changes
- *System set-up and checks
- * Easy accessibility to calibration, linearization, blank factors, and analysis data
- * Approved, recommended method of analysis



ATM No. LEC 850



ATM No. LEC 850

DSP or Windows-Based Control

The standard DSP software package includes complete on-board diagnostics, alphanumeric entry, and statistical reporting capabilities. As your needs change, you can simply upgrade your instrument to Windows-based control.

This familiar software platform combines easy-to-use program features with advanced database capabilities.

Carbides	Ferro Alloys
Catalysts	Refractory Metals
Cast Iron	Steels
Ceramics/ Sands/ Glass	Mold Powders
Copper Alloys/Brass	Lime/Limestone/Ores
Aluminum Alloys	Inorganic Materials

Typical Results

Instrument	Sample		% Carbon	% Sulfur
CS230	White Iron	Avg.	3.33	0.0150
	NIST 33B	Std. Dev.	0.004	0.0006
	3.33% C	RSD	0.12	4.00
	0.015% S			
	Stainless Steel	Avg.	0.311	0.0354
	NIST 73C	Std. Dev.	0.001	0.0003
	0.310% C	RSD	0.39	0.73
	0.036% S			
C230	Sand	Avg.	0.0309	—
		Std. Dev.	0.0009	—
		RSD	2.9	—
	Tool Steel	Avg.	0.720	—
	NIST 90C	Std. Dev.	0.0014	—
	0.719% C	RSD	0.20	—
S230	Fly Ash	Avg.	—	0.154
	NIST 2690	Std. Dev.	—	0.0006
	0.15% S	RSD	—	0.39
	Clay	Avg.	—	0.0062
		Std. Dev.	—	0.0002
		RSD	—	3.22

Sulfur and Carbon in Organic Samples SC-144DR

(ATM No.LEC 853)

Description

The SC-144DR offers a simple, ASTM-approved technique that measures sulfur and carbon simultaneously or individually. No hazardous chemicals are required, and accurate results are provided in less than three minutes. User-friendly Windows®-based operating software provides enhanced data storage flexibility and customized operation parameters.



ATM No.LEC 853

Features

- Direct combustion and infrared detection for sulphur and carbon in various organic material
- Sample sizes up to 350mg
- Windows-based software
- From ppm levels to high percent concentrations of sulphur and/or carbon
- Concentric design ensures complete oxidation of various matrices

SC-144DR Detection Range Advantage

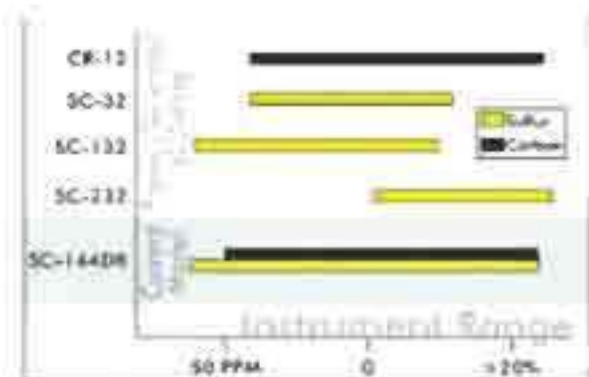
Modularity if the SC-144DR expands the capabilities of previous LECO sulphur/carbon determinators that focused on sulfur-only or carbon-only detection. (Note: range based on a 350 mg nominal sample size).

Options

- Oxygen Regulator
- 4-place Balance

Applications

- Coal
- Coke
- Cement
- Fertilizers
- Nutraceuticals
- Soils

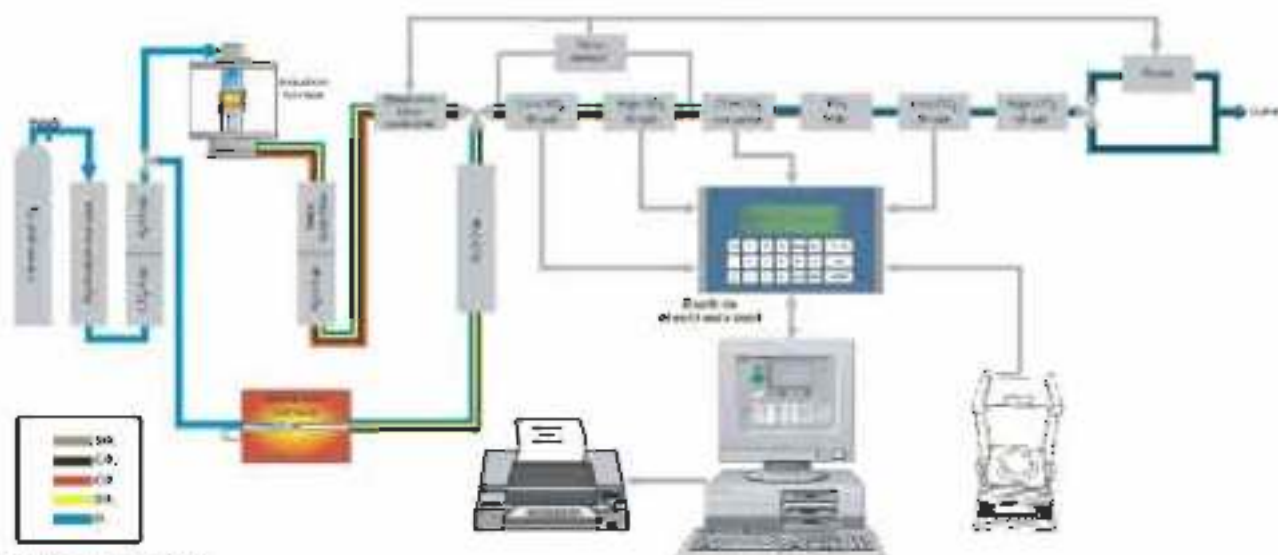


Carbon Sulfur analyser CS 2000

(ATM No. TRA 855)



ATM No. TRA 855



System overview

The CS-2000 automatic analyser incorporates the latest in combustion technology. It is designed for the rapid simultaneous determination of carbon and sulfur in steel, cast iron, copper, alloys, ores, cement, ceramics, carbides, minerals, coal, coke, oil, ashes, catalysts, lime, gypsum, soils, rubber, leaves, soot, tobacco, waste, sand, glass, etc.

The CS-2000 can be supplied with up to four independent infrared cells. The sensitivities of the cells resp. the IR-absorption lengths can be individually selected to offer optimum precision for the analysis of high and low levels of both, sulfur and carbon. The CS-2000 features a 16-bit microprocessor, a high temperature resistance furnace up to 1550° C, an induction furnace and solid state infrared detectors with auto zero and auto range control. Separate cabinets eliminate any influence of temperature between the resistance furnace and the analytical unit. This modular design gives the user flexibility to position the resistance furnace to the left or right of the analyser and also allows the installation of a TIC-module between the two. The modular design makes servicing much easier compared to single cabinet analysers.

Operating technique

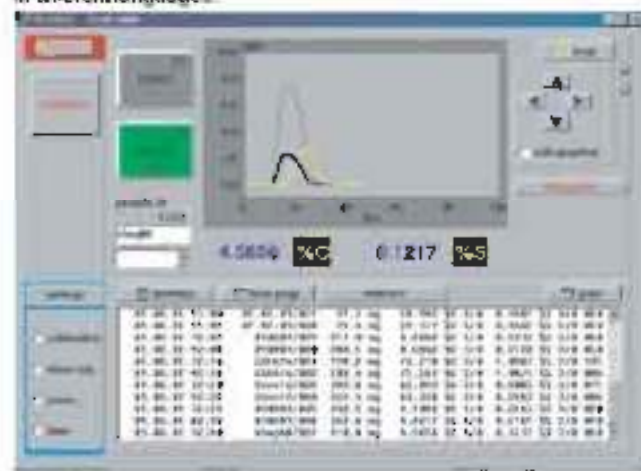
The CS-2000 can be alternatively operated either by using the built-in electronic unit, or by using a connected PC. Samples are accurately weighed on the electronic balance. By pushing a button the sample weight is automatically transferred into the memory. If required, sample weights can also be entered manually. By pressing the start key the analysis cycle begins and the sample is entered into the furnace. Depending on sample weight and material analysed, typical analysis times are 50 seconds for induction furnace operation and 60 to 120 seconds for resistance furnace operation. During the analysis cycle, instructions are displayed to ensure easy and reliable performance. The CS-2000 has minimal maintenance requirements and simple accessibility.



Built-in electronic unit

The built-in electronic unit has a 16 bit microprocessor with interfaces for electronic balance, printer and computer. The printer provides a hard copy of date, time, ID, sample weight, analysis duration and carbon / sulfur results. An external PC can be connected for advanced processing of the results. By pressing the mg key, the sample weight is transferred from the balance to the analyser, and it is shown on the graphic display of the built-in electronic unit. After pressing the Nr. key, a 10 digit sample identification number can be entered, which also appears on the display. By pressing the START key, the analysis begins, and the sample is entered into the furnace. During the analysis, bar graphs appear on the display, and represent the signals of each individual detector. Additionally, during the sample analysis the elapsed time is displayed on the screen. At the end of the analysis, the results are displayed in large figures, followed by % C, resp. % S. The units of the results can be set to %C or %CO₂, resp. %S or %SO₂. Further options like mg C / dm³ are also available.

All messages on the display as well as the whole menu are available in different languages.

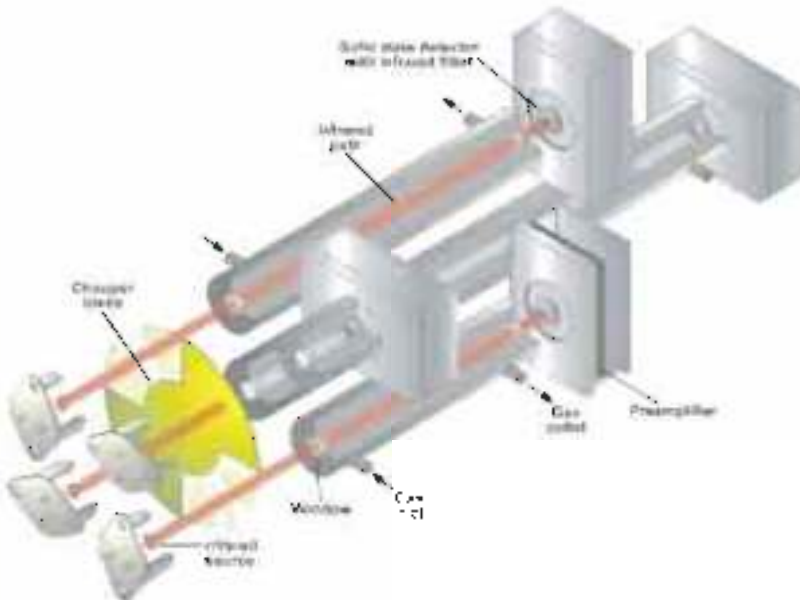


PC control with Windows 95/98/ME/2000/NT software

Although the CS-2000 can provide full operation with the built-in electronic unit, the use of a PC simplifies operation and reporting. External PC control is essential when doing fractional analysis. A lot of information can be displayed on the screen during and after the analysis. The detector peaks are shown on the screen during analysis which aids in method development and confirmation of correct operating parameters. All the final results, together with ID number, date, time, sample weight, duration of analysis etc. are displayed on the screen and stored on the hard disk. A huge number of results can be stored depending upon the hard disk size. The same also applies to the maximum number of sample weights that are stored before analysis. Any result can be recalled and selected for statistical calculations, such as average value and standard deviation. Calibration and diagnostics are just some of the functions in the PLOTCS software. The equipment can be made to work with a LIMS software. For maximum performance, an exchange of technical information between the customer and ELTRA GmbH will be essential. If required, PLOTCS can be supplied in the respective native language.

Infrared cells

The infrared cells of the CS-2000 do not require any manual zero adjustments. The zero and sensitivity adjustments of the infrared cells are permanently and automatically controlled by the electronics. The detectors utilize solid state sensors combined with infrared filters. The sensors are not gas filled, thus eliminating long term problems due to gas leakage. The CS-2000 can be equipped with up to four independent infrared cells.



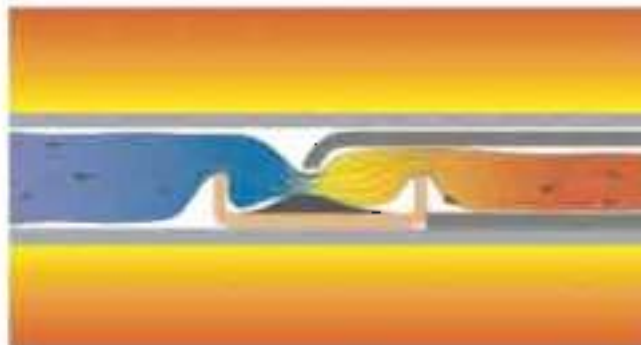
The lengths of all four cells can be individually optimized to obtain maximum precision for the target analysis levels of each customer. Each of the cells can be installed with infrared absorption lengths ranging between 1 mm and 320 mm.

Resistance furnace up to 1550°C

The resistance furnace employs Silicon carbide heating elements. Full electronic control includes current limitation during cold-start conditions to promote long element life. A separate sensor is used to monitor ambient temperature and provide data for automatic reference point compensation ensuring that furnace temperature is not affected by fluctuations of ambient temperature. The furnace requires approximately 10 to 15 minutes to reach operating temperature.

Combustion efficiency

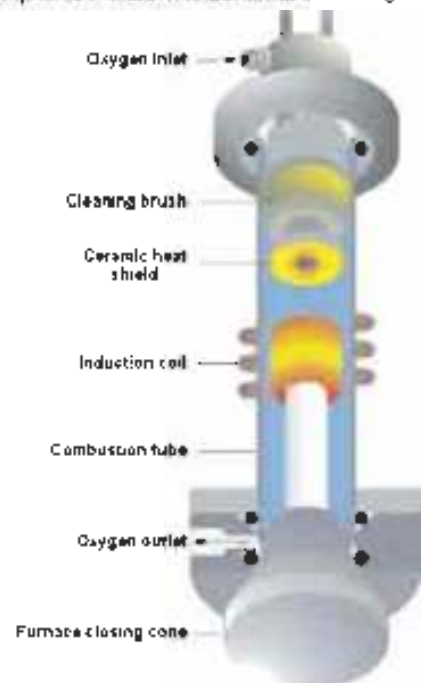
The design of the resistance furnace boat stop ensures that oxygen carrier gas penetrates into the crucible, ensuring efficient combustion. This design eliminates the need for fragile lances and honeycomb boat stops which tend to block easily with ash. Additionally the boat stop protects the combustion tube from the aggressive combustion products, thus extending the life of the tube.



The combustion tube is a simple straight ceramic tube that is robust and inexpensive to replace. The life expectancy of the tube is measured in thousands of analyses and not hundreds as it is the case with other analysers. (protected by German utility model)

Automatic induction furnace cleaning

Users of carbon and sulfur analysers with induction furnaces know that dust accumulates during combustion and forms deposits (mainly of iron and tungsten oxides) in the combustion chamber. The CS-2000 furnace is cleaned automatically after each analysis, thus ensuring repeatable and accurate results without the time consuming and unpleasant task of manual furnace cleaning.



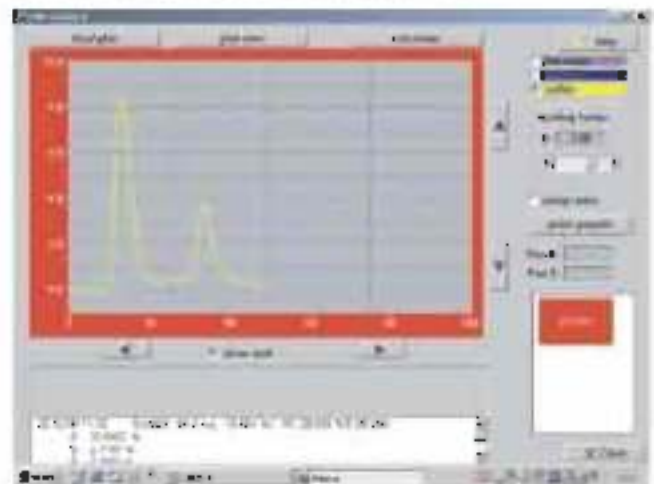
The standard cleaning apparatus is mechanically attached to the furnace open / close system, thus ensuring it is not possible for the cleaning brush to collide with a hot crucible.

The cleaning brushes won't burn!

The efficient design of the cleaning mechanism rules out any possibility of the cleaning brush catching fire. To confirm this fact, ELTRA offers free replacement of each burned cleaning brush during the entire working life of the analyser.

Fractional analysis

Due to the fact that free carbon and sulfur burn at lower temperatures than carbides and sulfates, the CS-2000 can separate and measure free carbon, free sulfur and carbides and sulfates.



After inserting the sample in the combustion boat into the resistance furnace, the boat gradually heats up. The free carbon and sulfur within the sample burn first, while carbides and sulfides burn several seconds later. The peak separation software integrates the individual peaks and then displays the results at the end of the combustion.

TIC-module

Due to the modular design of the CS-2000, a module for total inorganic carbon (TIC) can be placed between the resistance furnace and the analyser. For the TIC determination, the sample is treated with acid in the TIC module. TIC and total carbon (TC) can be alternately analysed without modifications. For TIC analysis the sample is treated with acid in an Erlenmeyer flask inside the TIC-module. The acid decomposes the carbonates in the sample, creating CO_2 . The oxygen flow purges the CO_2 out of the flask, through to the infrared detector. TC is determined when the sample is introduced into the furnace for combustion and IR detection.

Operating procedure:

An empty flask is placed on the balance. The tare button is pressed.
The sample is put into the flask. The sample weight is entered into the analyser by pressing a key.
A magnetic stirrer is placed into the flask. The flask is attached to the TIC-module and the heated platform is raised.
The start key is pressed.
The acid is injected with the magnetic stirrer rotating. The CO_2 is released from the sample.
The infrared cell begins detection. When all the CO_2 has been released from the sample, the detector's signal will return down to the baseline level and the analysis will be terminated.



Electronic flow controller

An essential part of the gas flow system is the electronic flow controller. This provides a stable gas flow by eliminating the known disadvantages of mechanical controllers.

Up to 20 grams of copper sample without accelerators

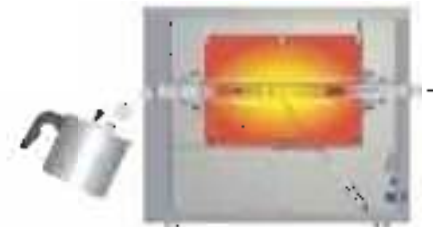
The unique design of the induction furnace combined with intelligent power control electronics enables the analysis of copper samples up to a weight of 20 grams without the need of any accelerators. This is very important in case of samples with extremely low C and S contents, like copper and copper alloys. The higher the weight, the higher the amount of C and S present. The elimination of the need for an accelerator is a breakthrough in the analysis of very low C and S. The use of accelerators can badly affect the results when the very low C and S in the sample is similar to the C and S content of the accelerators (blanks). The CS-2000 eliminates this problem.

Carrier gas conservation

When the CS-2000 has the induction furnace selected and an analysis has not been carried out for a period of time, the analyser will automatically switch to "gas conservation mode." This effectively means the carrier gas flow rate is reduced to a minimum, only allowing a small amount of oxygen to circulate through the IR cells etc. The period of time before the gas conservation is activated, can be modified via the PC software. It is also possible to have carrier gas flow only during combustion.

Preheating crucibles

The ceramic crucibles for the induction furnace can be preheated in the resistance furnace of the CS-2000. The preheating reduces the blank value of the crucibles.



This is important for analysis in the very low ppm range. The crucibles are inserted into the furnace tube and they remain preheated in the tube until needed. Each time a crucible is needed, a new one is inserted into the tube, and a preheated crucible falls out the other end of the furnace tube. The recommended preheating temperature is between 1250 °C and 1350 °C. For preheating crucibles the boat stop is removed.



A variety of combustion boats can be used in the resistance furnace including the reusable ceramic boats (L=57mm, W=22mm, H=13mm). Porcelain or quartz boats are also an option.



The induction furnace and the auto loader use standard ceramic crucibles, which are 1" or 25mm in diameter.



Auto loader for the induction furnace

The CS-2000 can be supplied with an automatic sample loading system. This loading system may also be retrofitted at a later date. Unlike many other auto loaders the ELTRA system can accommodate 130 samples giving hours of unattended operation. On request, the loader can be delivered for more crucibles. The auto loader, which does not occupy any additional bench space, is mounted above the area where the balance, PC, monitor and consumables are normally situated. The crucibles positions in the loader are easily accessible to the operator even from sitting position. The operation of the CS-2000 with an auto loader, requires a PC for easy manipulation of sample weight storage and out of sequence samples. The PC software also includes all features of PLOTCS as described in the second page of this brochure. For installing the auto loader, the resistance furnace should be positioned to the left of the analyser.

CS-2000 Specifications

Induction furnace operation		Resistance furnace operation	
MEASURING RANGES			
Low carbon Up to 0.1% C at 500mg sample resp. up to 0.5mg C ¹⁾		Low carbon Up to 1.25mg C resp. up to 0.25% C at 500mg sample ¹⁾	
High carbon Up to 5% C at 500mg sample resp. up to 25mg C ¹⁾ Indicating range up to 100% C ²⁾		High carbon Up to 100mg C resp. up to 20% C at 500mg sample ¹⁾ Indicating range up to 100% C ²⁾	
Low sulfur 0.3% S at 500mg sample resp. up to 1.5mg S ¹⁾		Low sulfur Up to 10mg S resp. up to 2% S at 500mg sample ¹⁾	
High sulfur 30% S at 150mg sample resp. up to 45mg S ¹⁾ Indicating range up to 100% S ²⁾		High sulfur Up to 100mg S resp. up to 20% S at 500mg sample ¹⁾ Indicating range up to 100% S ²⁾	
SENSITIVITY			
Carbon 0.1 ppm C at 500mg sample resp. 0.05µg C ¹⁾		Carbon 5µg C resp. 10 ppm C at 500mg sample ¹⁾	
Sulfur 0.1 ppm S at 500mg sample resp. 0.05µg S ¹⁾		Sulfur 1µg S resp. 2 ppm S at 500mg sample ¹⁾	
ACCURACY			
Low carbon ¹⁾ ±1ppm C ²⁾ at 1g sample resp. ±1 µg C or ±0.5% of carbon present		Low carbon ¹⁾ ±10µg C ²⁾ resp. ±20ppm C at 500mg sample or ±1% of C present	
High carbon ¹⁾ ±100ppm C ²⁾ at 500mg sample resp. ±50µg C or ±0.5% of C present		High carbon ¹⁾ ±150µg C resp. ±300ppm C at 500mg sample or ±1% of C present	
Low sulfur ¹⁾ ±1ppm S at 1g sample resp. ±1µg S or ±0.5% of sulfur present		Low sulfur ¹⁾ ±2µg S resp. ±4ppm S at 500mg sample or ±1% of sulfur present	
High sulfur ¹⁾ ±0.1% S at 150mg sample resp. ±150µg S or ±0.5% of sulfur present		High sulfur ¹⁾ ±1mg S resp. ±0.2% S at 500mg sample or ±1% of sulfur present	
GENERAL SPECIFICATIONS			
Normal sample weight 0.5g to 1g for steel and cast iron		Normal sample weight 400mg for coal	
Normal analysis time 40 to 50 seconds		Normal analysis time 60 to 120 sec.	
Induction furnace 19.5 MHz 2.2 kVA max with automatic furnace dust cleaning		Furnace temperature Up to 1550 °C adjustable with ± 1°C	
Detection method Solid state infrared absorption for carbon and sulfur			
Chemicals CO ₂ trap sodium hydroxide / H ₂ O trap magnesium perchlorate / catalyst copper oxide			
Gas required Oxygen 99.5% pure 2 to 4 bar (30 to 60 psi) 3 l/min and compressed air 4 to 6 bar (60 to 90 psi)			
Interfaces Balance serial, printer parallel, computer serial			
Power requirements Analyser ¹⁾ 230 V AC ±10% 50/60 Hz max 15 Amps 3450 Watts Resistance furnace 230 V/AC ±10% 50/60 Hz Maximum heat up current 20A			
Dimensions	Width	Height	Depth
Analyser ¹⁾	55 cm (21")	80 cm (31.5")	60 cm (23.5")
Resistance furnace	33 cm (13")	52 cm (20.5")	60 cm (23.5") ¹⁾
TIC-module	33 cm (13")	52 cm (20.5")	60 cm (23.5")
Weights			
Analyser ¹⁾	approx. 110 kg	Resistance furnace	approx. 36 kg
		TIC-module	approx. 28 kg
ACCESSORIES			
Balance 0.0001g to 60 g ± 0.0001 g ¹⁾			
Computer PC with HDD, 3.5" drive, CD-ROM, TFT flat screen and keyboard ¹⁾			
Color printer with automatic cut sheet feed, other options on request ¹⁾			

CS-2000 Typical results

Induction Furnace

Steel

03.01.01 13:05	Steel/008	530.2 mg	0.0233 %C	1/0 93.7 ppmS	3/0 050
03.01.01 13:06	Steel/009	528.5 mg	0.0236 %C	1/0 94.2 ppmS	3/0 050
03.01.01 13:08	Steel/010	537.7 mg	0.0235 %C	1/0 92.6 ppmS	3/0 050
	means:	0.02346	93.5		
	sd:	0.000113	0.6		

Cast Iron

03.01.01 15:00	Cast Iron 38/013	502.0 mg	2.7843 %C	2/0 0.1536 %S	3/0 050
03.01.01 15:01	Cast Iron 38/014	503.0 mg	2.7843 %C	2/0 0.1546 %S	3/0 050
03.01.01 15:03	Cast Iron 38/015	506.5 mg	2.7947 %C	2/0 0.1535 %S	3/0 050
	means:	2.78776	0.1539		
	sd:	0.00577	0.0014		

Copper

04.01.01 14:44	Copper/031	5012.7 mg	52.1 ppm C	1/0 4.3 ppm S	3/1 045
04.01.01 14:49	Copper/032	5132.5 mg	54.7 ppm C	1/0 4.2 ppm S	3/1 047
04.01.01 14:53	Copper/033	4983.1 mg	50.3 ppm C	1/0 4.3 ppm S	3/1 046
	means:	54.4	4.3		
	sd:	1.7	0.0		

Ore

10.01.01 09:52	Ore 25C/026	87.8 mg	1.0146 %C	1/0 5.3059 %S	2/0 041
10.01.01 09:55	Ore 25C/027	85.9 mg	1.0147 %C	1/0 5.1395 %S	2/0 041
10.01.01 09:57	Ore 25C/028	81.5 mg	1.0264 %C	1/0 5.3230 %S	2/0 039
	means:	1.01856	5.25613		
	sd:	0.00522	0.07775		

Cement

11.01.01 09:43	Cement B8/023	183.7 mg	1.0629 %C	1/0 0.5446 %S	2/0 050
11.01.01 09:46	Cement B8/024	181.6 mg	1.0366 %C	1/0 0.5463 %S	2/0 050
11.01.01 09:49	Cement B8/025	181.8 mg	1.0730 %C	1/0 0.5746 %S	2/0 047
	means:	1.0575	0.55518		
	sd:	0.0139	0.01295		

Resistance Furnace

Coal

05.02.01 09:20	Coal/008	346.7 mg	75.029 %C	2/0 2.1331 %S	3/0 085
05.02.01 09:22	Coal/009	356.0 mg	75.169 %C	2/0 2.1237 %S	3/0 080
05.02.01 09:25	Coal/010	339.3 mg	74.905 %C	2/0 2.1350 %S	3/0 083
	means:	75.05433	2.13067		
	sd:	0.13230	0.00544		

Lime

05.02.01 09:49	Lime/014	769.2 mg	11.645 %C	2/0 0.1524 %S	3/0 127
05.02.01 09:52	Lime/015	702.4 mg	11.721 %C	2/0 0.1763 %S	3/0 112
05.02.01 09:55	Lime/016	784.5 mg	11.773 %C	2/0 0.1512 %S	3/0 134
	means:	11.71300	1.15996		
	sd:	0.06300	0.01351		

Slate

06.02.01 14:44	Slate/037	812.3 mg	1.4556 %C	1/0 0.0226 %S	3/2 050
06.02.01 14:49	Slate/038	822.1 mg	1.4691 %C	1/0 0.0236 %S	3/2 050
06.02.01 14:53	Slate/039	805.2 mg	1.4602 %C	1/0 0.0239 %S	3/2 050
	means:	1.46163	0.02336		
	sd:	0.00453	0.00060		

Rubber

06.02.01 16:00	Rubber/020	83.8 mg	58.766 %C	2/0 1.5265 %S	3/0 050
06.02.01 16:02	Rubber/021	79.3 mg	57.945 %C	2/0 1.5206 %S	3/0 051
06.02.01 16:04	Rubber/022	91.5 mg	57.198 %C	2/0 1.5018 %S	3/0 050
	means:	57.97033	1.51937		
	sd:	0.49646	0.01342		

Oil

07.02.01 16:12	Oil/025	79.5 mg	88.235 %C	2/0 0.8981 %S	3/0 050
07.02.01 16:13	Oil/026	67.8 mg	88.923 %C	2/0 0.9135 %S	3/0 050
07.02.01 16:15	Oil/027	64.8 mg	87.325 %C	2/0 0.9248 %S	3/0 050
	means:	88.16100	0.91273		
	sd:	0.63215	0.01203		

798 Mpt Titrino

(ATM No.MTR 860)

Practice-oriented All-rounder!

The 798 MPT Titrino is a compact titrator equipped with a screen display. It masters all titration methods that are needed for practical titration. The memory card opens up additional possibilities for the transfer and backup of methods. The 798 MPT Titrino is (ideal for routine analyses with or without a sample changer and can be integrated into PC-controlled titration networks.

Many tried and tested methods are supplied on a memory card: ready to start straight away!

Method collections available: Oil PAC for petrochemical applications, Surf PAC for surfactant analysis, Pharm PAC for the analysis of pharmaceutical ingredients and Wine PAC for the analysis of wine and must.

Personal memory card as method memory

GLP functions and GLP-compliant documentation

Seven dialog languages

PC keyboard and barcode reader can be connected

Extensive automation

Expansion to a titration network with TiNet

Results at a glance

The result of the titration can be displayed in detail or in short form, in small or large font.

In the MEAS mode, the screen displays the measured value as a function of time. In all operating modes of the Titrino, the temperature is measured continuously and used for temperature compensation of the pH value if a Pt 1000 or Pt 100 temperature sensor is connected.

TIP stands for "titration procedure" and is one of the outstanding features of the 798 MPT Titrino. With TIP, you can freely compile sequences of up to 30 steps; each of the individual steps may relate to the following components:

methods,

pauses,

automatic stirrer control,

status conditions of two different lines of the "Remote" interface for activating valves, pumps, heaters and other auxiliary devices,

any messages or prompts with up to 16 characters.

TIP is a powerful tool offering many capabilities for configuring automated titration runs.



ATM No.MTR 860

835 Titrindo

(ATM No.MTR 870)

High-end titrator with built-in buret drive. Dynamic (DET) and monotonic (MET) titration, endpoint titration (SET), enzymatic and pH-STAT titrations (STAT), Karl Fischer titration (KFT), measurements with ion-sensitive electrodes (MEAS CONC), dosing functions with monitoring (DOS), liquid handling. With four MSB connections, two galvanically separate measuring interfaces USB connection.

*Potentiometric and Karl Fischer titration

* STAT titration

* Monitored dosing in synthesis lab

* Interruption-free dosing in tandem operation

* Intelligent closing elements

* Sample Processor control

* Lab Link for intranet and Internet

* Liquid handling with the unique Dosino

* Complies with GMP GLP and FDA regulations such as 21 CFR Part 11

* USB interfaces for sample changer, printer, PC keyboard, reader,...

* Machine-readable PC/LIMS report

* Client-server database thanks to tiamo™

* Parallel titration with tiamo™

*Automatic reagent exchange with the unique Dosino



ATM No.MTR 870

Tifropackage – Economical Automation

(ATM No.MTR 875)

the economical Tifropackage consists of the 785 DMP Titrimo, the 760 Sample Changer and the Vesuv 3.0 database software and offers:

- Compact routine titrator with real-time curve display .
- Easy automation for up to 15 samples in one operation .
- Data archiving method backup.

The comprehensive accessories supplied facilitate installation.

A large number of established methods, combined with extremely easy operation, allows inordinate use of the setup, which requires no demanding configuration, no prolonged operation training and no tedious optimization of methods.

The sample changer automates the determinations and frees the user from time-consuming routine operations.

The Vesuv PC software renders the archiving of results and methods extremely simple



ATM No. MTR 875

Physical and Mechanical testing Machines

Air Entrainment Meter



ATM No. MAT 880

Air entrainment meter 1 liter capacity E027

STANDARDS: EN 413/2 - DIN 1164
with range 0-50%.

A built-in operated air pump is also included.

Dimensions: dia. 200x320 mm

Weight: 4 Kg

(Accessory : Filling Hopper)

Air entrainment for cement Type 38-2900

(ATM No. TON 895)

Air entrainment meter 1 L capacity to determine the air content of mortar according to DIN 18555 and EN 459 2

• Feeding ring Type 38-2920

Fitting to air entrainment meter 1 L and 0.75 L content

Air entrainment meter 5 litres capacity

(ATM No. MAT900)

C195

STANDARDS: EN 12350/7 - BS 1881:106 - UNI 6395

ASTM

C231 type A- NF P18-353 - UNE 7141 Air content range

0-8% • div. 0,1%

Dimensions: dia* 250x700 mm.

Weight: 13 Kg

Accessory :

C195 : Calibration Cylinder to check

And calibrate the air meter mod C195



ATM No. MAT 890

Air entrainment meter E028

Same as mod. E027, but with Incorporated an electric mini-compressor giving air pressure and keeping it constant all along the test.

Power supply: 220-240V 1ph 50 Hz

Weight: 6 Kg



ATM No. MAT 900



ATM No.MAT 910

ATM No.MAT 920

C196 Air entrainment meter 8 liters capacity

STANDARD: DIN 1048 -ASTM C231
type B

Air content range:

0+10% div, 0,1% up to 8% and 0,5%
over

Dimensions:

dia. 250x450 mm

C197 Air entrainment meter 8 liters capacity

STANDARD: DIN 1048 - ASTM C231

type B Identical to mod. C196 but with
built in automatic electric air compressor
giving air pressure, and keeping it
constant all along the test. Power supply:
220-240 V 1ph 50 Hz

Dimensions: dia 256x450mm

Weight: 14 Kg

Accessory: C197-01 Filling hopper

Air entrainment meter! cap* 8 liters

(ATM No.930)

acc. to DIN 1048, ASTM
C 231, BS1881 for freshly
mixed mortar with
hand operated pump,
direct readout in %

Air entrainment for concrete 8 Litre Capacity

(ATM No.TON 935)

Type 30-0140X

Air entrainment Meter 8 L capacity to determine the
air content of fresh concrete according to DIN 1048,
pi, EN 12350-7, ASTM C 231, 88 1881

* Feeding ring Type 30-0150

Feeding to air entrainment meter 8 L content



ATM No. 930

Autoclave For Soundness Tests

(ATM No.MAT 940)

E070

Description:

The control panel encloses: "digital thermometer" to visualize the boiler temperature, pressure gauge scale 0 ~ 600 psi with built in pressure regulator and power switches.

Supplied complete with safety valves, rack for holding the specimens. Not sellable on CE market.

Power supply: 230 V 1ph 50/60 Hz 3500 W 295 psi

Dimensions : 450x475x1080 mm

Weight: 75 Kg



ATM No.MAT 940

Autoclave To Ce Safety Directive

(ATM No.MAT 950)

E071

Basically similar to mod. E070, capacity 8 litres, max. pressure 25 bar (2,5N/ mm²), Inclusive security test

certificate to CE Safety Directive, Power supply:220-240 V

Dimensions:dia.550x1120 mm Weight: 80 Kg



ATM No.MAT 950

Autoclave

(ATM No.EL 955)

provides high pressure steam curing of the specimens. The unit conforms to the requirements of ASTM. Supplied complete with safety valve, pressure gauge and thermostat controlled heater unit,

Special Note:

This unit draws a current up to 20 amps.

Autoclave as specified. Weight :108 kg

For 220 - 240 V AC, 50 - 60 Hz, 1 ph

Accessories

Two-gang Prism Mould

Inserts

Spares

Lid Sealing Gasket

Heating Element, 220-110 VAC

K1 Spares Kit, 220 VAC, for Autoclave



ATM No.EL 955

MOULDS FOR SOUNDNESS (EXPANSION) AND SHRINKAGE TESTS

(ATM No.MAT 960)

E072(ATM No.MAT 961)

STANDARD: ASTM C490

Two gang prism mould to produce 25x25x250 mm specimens for expansion tests in autoclave.

Complete with 4 steel Inserts.

Weight: 6 Kg

E073 (ATM No.MAT 962)

STANDARD: BS 1881, 6073

Two gang prism mould to produce 75x75x254 mm specimens.

Complete with 4 steel Inserts. Weight 9 Kg

E072-01 (ATM No.MAT 963)

Spare stainless steel inserts for E072 and E073 moulds.

Pack of 10 pieces

E074 (ATM No.MAT 964)

STANDARDS: UNI 6687 ASTM C348 Three gang prism mould to produce 40x40x160 mm specimens. Made from Cr/Ni steel, harness 60 HRG. ALL surfaces are grinded with tolerances within 0,1 mm, Complete with 6 Inserts, Weight: 12,7 Kg

E074-01 (ATM No.MAT 965)

Spare stainless steel inserts for E074 mould. Pack of 12 pieces.

E107 (ATM No.MAT 966)

STANDARDS: NF P15-434 - DIN 1164 Three gang prism mould to produce 40x40x160 mm specimens, Made from steel 55 HRB. Complete with 6 inserts. Weight: 8 Kg

E113 (ATM No.MAT 967)

STANDARD: NF P18-427 Three gang prism mould to produce 70x70x280 mm specimens. Made from steel 55 HRB, Complete with 6 inserts. Weight: 17 Kg

E107-01 (ATM No.MAT 968)

Spare steel inserts for E107 and E113 moulds. Pack of 12 Pieces



Compression machines

1. Machines are supplied ready for testing 300 mm long clinders (Not applicable on Auto Test 250 machines)
3. Auto Test 2000 and 3000 machines supplied with distance pieces
3. All BS 1881 Mashines supplied with self- centring lower platen for 150 mm and 100 mm cubes.
4. distance pieces with BS 1881 machines are supplied with traceable works certificates of compliance
5. For distance piece configurations
Range of optional accessories includes:
Flexurai frames up to 100 kN capacity.
Ball-seat assemblies for flexural frames; designed to test mortar cubes up to 100 square
Compression jig assemblies to test 40mm and 50mm cubes.

Compressive Strength

Strength of concrete is one of the most common tests to be performed in a concrete laboratory

Concrete specimens are manufactured, cured and stored under controlled conditions for a specified period then crushed in a Compression machine

The type and size of specimen vary depending upon a number of factors and specifications.

Generally cubes and cylinders are tested in compression although parts of beams may also be tested.

Compressive strength is determined from the calculation:

$$\text{Compressive Strength (N/mm}^2\text{)} = \frac{\text{Load}}{\text{Cross-sectional area of specimen}}$$

Where load is in kN and area in mm²
1000

The maximum compression capacity of a machine is determined from the calculation:

$$\text{Compressive Strength (N/mm}^2\text{)} = \frac{\text{Maximum Machine capacity (kN)}}{\text{cross sectional area of specimen to be tested}}$$

For a given machine capacity: increasing the cross-sectional area to be tested decreases the maximum strength which can be determined

ADR-Auto 250 Compression Machine

(ATM No. EL 980)

BS 3892-1, 4551-1f EN 196-

1, 459-2, 144-1, 1015-11,

13454-2; ASTM C109, AS2350

250 KN maximum capacity

* Calibration accuracy to BS

EN ISO 7500-1; ASTM E4

* Automatic loading cycle

* Optional 25 kN low capacity frame

* Tests a wide variety of specimen sizes

* Tests mortar, lime, cement and Fly Ash

* Supplied with Windows download software as

ADR-Auto 250/25 Compression Machine

250/25 KN capacity, supplied as

EL39-6150 with 25 kN

capacity frame fitted. For 220 -

240 VAC, 50 hte, 1 ph



ATM No.EL 980

TYPE	ATM No.
ADR-Auto 250	EL 980
ADR-Auto 250/25	EL 981

Specification

	ADR-Auto 250	ADR-Auto 250/25
Overall dimensions (mm): (l x w x h)	520 x 650 x 1255	520 x 650 x 1255
250 KN frame		
Max vertical clearance	230 mm	230 mm
Max horizontal clearance	225 mm	225 mm
Upper and lower platens	150 mm diameter	150 mm diameter
25 KN frame		
Max vertical clearance	-	230 mm
Max horizontal clearance	160 mm	
Upper and lower platens	-	150 mm diameter
Max ram travel	15 mm	15 mm
Rated power	1600 W	1600 W
Weight	640 kg	700 kg

Compression Testing Machine Combination Rt 2000/200-2 D

(ATM No. 990)



ATM No. 990

Class 2, acc to DIN 51223, EN ISO 7500-1, EN 10002- 2 with digital display, electro-pump and manual pressure valve.

Accessories: Printer

Technical data

P max.: 2000 kN
Piston stroke: 50 mm
Measuring range:
200...2000 kN
Pressure platens distance:
320 mm
Pressure platens:
260 x 420 mm

Technical data

P max.: 200 kN
Piston stroke: 50 mm
Measuring range:
20...200 kN
Pressure platens distance:
215 mm
Pressure platens:
210 x 210 mm
elect. power:
3 x 400 V + N + PE

Automatic Compression and Bend Test Plant (ATM No.TON 991)

The automatic compression is constructed according to DIN EN1961 , ISO679, ASTM C 349, ASTM C 109, DIN51220 as well as DINEN ISO 7500 1 as an automatic, Servo hydraulic machine of the accuracy class 1

Advantages

- * full automatic test plant with microprocessor and Servo hydraulic control
- * Delivery as operative, space-saving compact unit: "installation, connection, testing"
- * Connection of a third load frame is possible, e.g. 3000 kN test load for testing concrete
- * Full automatic, software controlled switch-over between the different load frames
- * Up to 99 test sequences storable
- * Two selectable indications, e.g. stability and strength
- * Extremely simple programming and operation
- * Future proof by retrofit able software options according Product description model 0510
- * Software and printer for automatic raw data printing



ATM No.TON 991

{Option}, Alternatively, PC with evaluation program Test Xpert or connection to LIMS through software ToniOAT

ATM No. Technical Data	TONIPRAX	TON 991 1543.0300	TON 992 1644.0010
max. Test load	KN	300	10
measuring range Class 1	KN	3.0...300	0.1 ...10
distance between columns	MM	210	155
pressure plates (standar)	MM	40x40	-
option pressure plates	MM	see pricelist	see pricelist
distance between pressure plates	MM	65	-
vertical distance support/edge	MM	-	50
support distance	MM	-	100
support length	MM	-	45
support diameter	MM	-	10
piston stroke	MM	60	30
electric connection	V/Hz/KW	3-230/400//50//1.8	
working height / total height	approx. Mm		1300/1650
required space Incl. Control unit WxD	MM		1200x550
weight gross / net incl. Control unit approx	G		750

Compression Test Plant Toninorm

(ATM No. TON 993)

series accuracy class 1, EN ISO 7500-1 for efficient quality control on building materials

The best plant consists of the following components; Special features:

- Consistent unit construction system, freely combinable basic components
- pragmatic and rigid construction in high quality
- Digital measuring and control system TonfTROL
- Servohydraulic control with push button operation
- Easily expandable with hardware and software extensions
- Very simple and clear operation

Design in accordance with DIN 51220: EN

ISO 7500-1

600 kN max. load capacity

Compression Test plant ToniPACT II

(ATM No. TON 995)

2000 KN max. load capacity, without pressure plates. For efficient

quality control on building materials on construction materials, preferably for quality control tasks on

concrete specimens. Design in accordance with DIN 51220 and DIN EN ISO 7500-1,

Optional EN 123904.

Compression testing machine combination RT 3000/300-2 servo

(ATM No. 994)

Class 2, acc. to DIN 51223,

EN ISO 7500-1 and

EN 10002-2. With digital

Display, electropump and

Servo-controlled drive unit.

Accessories : According

to requirements

Technische Daten Technical data	Technische Daten Technical data
P max.: 3000 kN	P max.: 300 kN
P max.: 3000 kN	P max.: 300 kN
Kolbenhub: 50 mm	Kolbenhub: 50 mm
Piston stroke: 60 mm	Piston stroke: 60 mm
Messbereich: 300...3000 kN	Messbereich: 30...300 kN
Measuring range: 300...3000 kN	Measuring range: 30...300 kN
Druckplattenabstand: 320 mm	Druckplattenabstand: 320 mm
Pressure plates distance: 320 mm	Pressure plates distance: 320 mm
Druckplatten w: 300 mm	Druckplatten w: 230 mm
Pressure plates a: 300 mm	Pressure plates a: 230 mm
	elektr. Anschluss: 3 x 400 V + N + PE
	elect. power: 3 x 400 V + N + PE



ATM No. 994

Double Distillatory (ATM No.GF 1000)



ATM No.GF 1000

Specifications and Features

*excellent distillate quality: conductivity of mono distillate approx. 2.2 µs / cm at 20 °C; conductivity of bi-distillate approx. 1.6 µs / cm at 20 °C

*evaporator and baffle of the mono stage are easily accessible by lifting the condensers. Material: stainless steel, material no. 1.4301

*condensers (coolers): 1st stage made of stainless steel, material no. 1.4301; 2nd stage including baffle made of Duran glass D 50

*heating elements made of stainless steel, material no. 1.4876

*water supply through built-in solenoid valve with connection for water pressure hose 1/2 inch (inner Ø 12.7 mm)

*required cooling water pressure: > 3 bar to max. 7 bar. After switching on the main switch the solenoid valve opens the water supply

*cooling water outlet with hose connection 3/4 inch (inner Ø 19 mm). Water that has not been condensed flows off through the cooling water outlet

*energy-saving through distillation of the heated cooling water

*distillate withdraws: stop valve made of Duran glass D 50 with Teflon plug for mono distillate, outlet with dust guard shield made of Duran glass D 50 for bi-distillate

*low water cut-off float switch and thermostatic over-temperature cut-out

*an electronic impurity detector

switches the unit off in case of high degree impurities in the 1st stage evaporator; the red pilot lamp 'Clean' will glow

*degassing of carbon dioxide through vent on the condensers

*main switch and pilot lamps to monitor both distillation stages are on the front of the unit

*top part housing made of electrolytically galvanized sheet steel, electrically powder coated with epoxy resin, upper part easily removable through quick-release catches

*power connection through connection cable

Technical data

Model	Capacity l / h	Cooling water requirement l / h approx.	Exterior dimensions mm approx.			Electrical connection*	Weight kg approx.		Packing volume approx. m³
			Width	Depth	Height		net	gross cardboard box	
2102	2	72	200	200	170	230 V / 50...60 Hz / 2.5 kW	10	28	0.26
2104	4	120	350	280	170	400 V / 3 / N / PE / 50...60 Hz / 5.5 kW three-phase current	23	35	0.34
2108	8	198	700	380	160	400 V / 3 / N / PE / 50...60 Hz / 11.5 kW three-phase current	38	55	0.62

* Special voltages available on request

TYPE

2102
2104
2108

ORDER NO.

GF 1001
GF 1002
GF 1003

DOUBLE DISTILLATION WATER. STILLS A4000D

(ATM No.BS 1010)

Produces 4 liters/hour double distilled water for higher purity levels.

The first stage distillation is carried out in a glassware set mounted

at the front of the cabinet allowing easy access for descaling. The

distilled water is fed to a second set of glassware mounted at the

rear and distilled a second time. The rear glassware is fitted with a

level sensor to ensure the heater is only activated when there is

sufficient water in the boiler.

- * Fully automatic operation
- * High purity pyrogen free output
- * Low temperature distillate
- * Operates from any raw water supply
- * Reservoir level control
- * Simple conversion to pre-treated feed
- * Supplied with wall mounting bracket
- * Safety features allow unattended operation
- * Simple to clean



ATM No.BS 1010

Technical specification

Output, l/hr: - 4, double PH: 5.0 - 6.5

Conductivity, $\mu\text{S/cm}$: 1.0 - 1.5

Resistivity, mohm-cm : 0.7 - 1.0

Pyrogen: Pyrogen

Content free

Water supply: 2L /min

3-100 psi

(20-700 kPa)

Electrical supply: 220 or 240V, 50-60HZ, single phase

Max. Power: 6 kW

Dimensions (wxdxh) : 550x410x410 mm

* care is required to produce pyrogen free water and the output should be tested before use,

* A4000D Aquatron water still, 4 l/hr, double distilled, 240V

* A4000D/220 Aquatron water still, 4 l/hr; double distilled, 220V

Flow Tables

(ATM No. MAT 1020)

For flow and workability tests of mortar and lime

STANDARDS: ASTM C230 BS 4551:1 -

EN 459/2 - EN 1015-3 - UNI 7044 NF P18-585 -

UNE 7205. 83258 To perform this test, a

specimen contained in a cone mould is

placed on a metal surface which is then

raised and dropped from a known

height, after releasing the specimen from

the mould The equipment

consists of a circular top table with spindle,

tripod, bronze flow mould

and tamper; The apparatuses to EN 459-2

Standard are equipped also of

a filling hopper. Motorized models foresee an

automatic digital drop counter.

Power supply (motorized models): 220-240 V

1ph 50 Hz 150 W

Weight: 20÷50 Kg

TYPE	ATM No.
E084	MAT 1021
E085	MAT 1022
E086	MAT 1023
E087	MAT 1024
E088-01	MAT 1025
E089-01	MAT 1026
E090	MAT 1027
E090-01	MAT 1028
E090-02	MAT 1029
E090-03	MAT 1030

Model	Standard	Hand Operated	Motorized	Table dia. mm	Drop height mm	Spare mould	Spare tamper
E084	UNI 7044	•		300	0	E085-05	E085-06
E085	UNI 7044		•	300	0	E085-05	E085-06
E086	ASTM C230 BS455	•		224	27	E087-05	E087-06
E087	ASTM C230 BS455		•	224	27	E087-05	E087-06
E088-01	NF P 18-585	•		300	70	E088-07	E088-08
E089-01	NF P 18-585		•	250	20	E088-07	E088-08
E090	EN 459-2	•		300	0	E085-05	E085-06
E090-01	EN 459-2		•	300	0	E085-05	E085-06
E090-02	EN 1015-3	•		300	0	E085-05	E085-06
E090-03	EN 1015-3		•	300	0	E085-05	E085-06



ATM No. 1021



ATM No. 1023



ATM No. 1027



ATM No. 1022



ATM No. 1024



ATM No. 1028

ACCESSORIES :

E087-01 (ATM No. 1024. 1)

FLOW CALLIPER to ASTM and BS Standards, for measuring

the **diameter of the sample**,

Brass made. Weight: 450 g.

E090-11 (ATM No. 1027. 1)

TOP CIRCULAR TABLE, complete with spindle, conforming to EN1015-3 Specifications.

Accessory for mod. E090 E090-01

E090-12 (ATM No. 10271. 2)

TOP CIRCULAR TABLE, complete with spindle and filing hopper conforming to EN459-2 Specifications.

Accessory for mod. E092-02 E092-03

NOTE:

The frame of models E090, E090 01 E090-02, E090-03 is identical, and it is interchangeable with the top circular tables to EN459-2 and EN1015-3 Specifications

Flow of Mortars and Hydraulic Cement

(ATM No.EL 1032) BS 4551-1,3892-1 ;

Flow Table Top manufactured from cast bronze as specified in BS and ASTM C230. Complete with spindle .Weight 4.1 kg

Tripod for Flow Table manufactured from cast iron.

Weight 8.6 kg **Flow Mould** manufactured from bronze as specified in BS and ASTM C230. Weight 900 g

Baseplate for fixing the flow table tripod to a concrete plinth.

Manufactured from steel, 25 mm thick x 254 mm square
Weight 13kg

ASTM Callipers for measuring the diameter of the sample
Weight 450 g

Motorising Unit for use with Operates the cam at a speed of 100 rpm. For 220-240 V AC. 50 Hz, 1 ph. Weight 5 kg

Plastic Tamper

EN flow Table

(ATM No.EL 1033)

Flow of Mortar

EN 1015-3, 1015-9, 13395-1

Manufactured to satisfy EN requirements. this unit is supplied complete with flow table tripod. Tests are performed by placing a sample on the flow table surface which is then raised and dropped through a known height.

Comprising Flow Table and Tripod

Motorizing Unit operates Flow Table cam at a speed of 60 rpm.

For use on 220 - 240 V, 50 Hz, 1 ph

EN flow Mould, truncated, 100 mm Ld. at base x 60 mm high

Tamper 40 mm dia x approx. 200 mm long

Vernier Caliper

Trowel

Trimming Knife

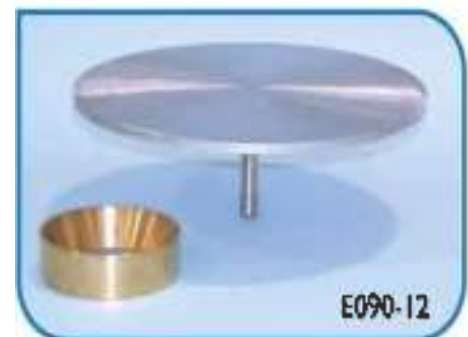
BS Flow Table. Tripod, Mould and Baseplate



E087-01



E090-11



E090-12



ATM No.EL 1033

JOLTING APPARATUS "HIGH PERFORMANCE"

(ATM No.MAT 1035)

Used to compact cement mortar prisms
40,1 x 40 x 160 mm in the three gang mould.

Mechanical Specifications:

- Frame, materials, oversized components and treatments manufactured to grant the top performance with intensive use in heavy conditions.
- Machining and couplings are extremely accurate.
- Articulated jolting group, strut lifting the table and cam shaft are on ball bearings.
- Table hammer and anvil are hardened over 500 HV.
- Cam hardness over 400 HV.
- Table holding the mould equipped with aluminium hopper to collect the material outcoming from the mould.
- Hammer/anvil and cam zone have a protection case to CE Safety Directive.
- The drop height (15,0 mm) and the table level are adjustable to keep them always correct also after intensive uses.
- The table and the arms are quickly removable to easily inspect them.
- Both table and arms have engraved effective weight (accurate for each single piece).

Working Specifications:

- Three-phase motor fed by a single-phase 220V inverter for a perfect adjustment of the motor rotation speed also with different loads; this solution grants the keeping of 60 revolutions per minute in any condition.
- Accurate and reliable control electronics to select and personalize the test cycles.
- The display and keyboard, protected against powder and sprays, set the operator interface.
- A sensitive and sturdy sensor surveys the table position counting the revolutions without any error possibility.

The use of top quality components, the accurate machinings with strict tolerances,

the oversized components get the Matest E131 Jolting Apparatus in the "HIGH PERFORMANCE"

range of the test-ing equipment.

Standard: EN 196-1

Power supply: 230V 1ph 50Hz 500W

Dimensions: 1070 x 380 x h 510 mm

Weight: 93 Kg



ATM No.MAT 1035

Jolting apparats

(ATM No. MAT 1040)

Standards: EN 196/1 - NF P15-413 - ISO 679 -
BS 3892 UNE 80101 -D.M. 3/6/68

Used to compact cement mortar prisms
40x40x160 mm in the three gang mould as requested
by the above specifications. The
apparatus, consists of a table holding the mould seated
on a rotating cam driven at 60 revolutions per minute.
The jolting group is connected to the table by bayonet
joints for quick checking of the weights.
The drop height (15,0 mm) is adjustable to keep it
correct also after intensive uses , the apparatus is
supplied with separate control
panel including main switch, automatic digital drop
counter; start/stop push button.

Power supply: 220-240 V

lph 50 Hz 500W

Dimensions: 1000x380x420 mm

Weight: 65 Kg



ATM No. MAT 1040

Jolting Table

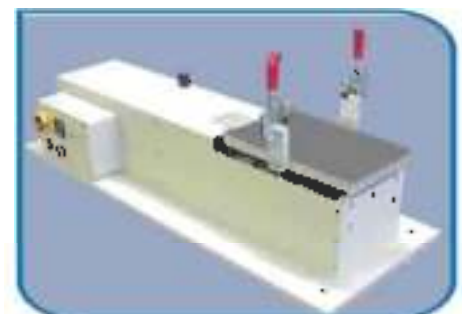
(ATM No. TON 1050)

Compaction of mortar specimens
40 x 40 x 160 mm in triple-
gang moulds. Model 6135 is a standard product

Jolting table with counter ace. to EN 196

(ATM No. 1060)

- * 60 strokes per minute
- * with main switch, counter and START/STOP switch
«incl. feeding hopper
- * measurements: W/D/H 1060 x 260 x 370 mm
- * elect, power: 400 V, 50 HZ, Or 25 KW



ATM No. TON 1050



ATM No. 1060

Automatic programmable mortar mixer

(ATM No.MAT 1070)

E092 STANDARDS; EN 196-1, EN 196-3, EN 480-1, EN/ISO 679,
DIN 1164-5, DIN 1164-7, ASTM C305, NF P15-404.NF P15-3
NF P15-436

Design

- Very sturdy and durable construction for intensive laboratory use.
 - Planetary transmission for silent and Low maintenance operation
 - Automatic sand dispenser having dimensions and geometry to grant the correct sand insertion, without residual and disaggregation between fine and coarse portions
 - Transparent CE-conform protection of the mixing area, to allow the mixture checking during the test and to check the rotation speed through an optical revolution counter
 - Complete with stainless steel polished mixing bowl and beater
 - Easy and fast bowl insertion and removal
- firmware**
- Different automatic programmable mixing cycles conforming to am Standards
 - The operator can also program up to 3 automatic personalized mixing cycles
 - Synchronised acoustic signals with cycle steps
 - Large high resolution and contrast LCD display (negative blue) visualizing the state of the different functions, relevant times etc.
- Power supply: 220-240V 50Hz 1ph
Dimensions: 620 x 450 x 620 mm approx.
Weight: 80 kg approx.

ACCESSORY FOR MIXMATIC MOD. E092 :

(ATM No.MAT 1071)

E092-05

DISPENSER (supplementary) with hopper to ease the manual introduction of water, additives etc. into the bowl also during the mixing phase

E092-10 (ATM No.MAT 1072)

BOWL, polished stainless steel, 4,7 liters capacity

E095-04 (ATM No.MAT 1073) BEATER, polished stainless steel

E097 (ATM No.MAT 1074)

Reference sand, size 0,082 mm to EN 196/1 Standard. Bag of 1350 g.

SPARE PARTS FOR E093, E094, E095 MIXERS:

E095-01 Stainless steel bowl

E095-05 Bajonet coupling between beater and shaft



ATM No.MAT 1070



Automatic mortar mixer

(ATM No. MAT 1080)

E093 EN 196/1, EN 196/3 and EN 480/1

This very robust is expressly for the efficient Mixing of cement pastes and mortar; with "three" automatic sequence mixing cycle, **Specifications:-**

Bowl capacity is 4,7 liters

Two speeds can be selected:

140 or 285 rpm for the revolving action

62 or 125 rpm for the planetary action

It is possible to select the manual working, or one of the two

automatic programs,

The unit is equipped of an automatic sand dispenser which fills the

sand into the mixing bowl for a period of 30sec (only

EN 196/1 program). Complete with safety door

conforming to 89/392/CEE Directive, if opened it automatically stops the machine,

Supplied complete with steel bowl, but "without beater"

which has to be ordered separately,

Power supply; 220-240 V 1ph 50 Hz

Dimensions: 340x460x700 mm Weight: 45 Kg



ATM No. MAT 1080

Mortar mixer

(ATM No. MAT1090)

E094 STANDARDS: EN 196/1, 196/3, 413/2, 459/2 -

D.M. 3/6/68 NF P15-413 -

DIN 1164 - UNE 80801, 83258 -

EN/ISO 679 - EN 480/1 Equiparable

also to ASTM C305 -

AASHTOT162-BS3892

Basically similar to mod E093, but not equipped of automatic program, sand dispenser and safety door

This mixer can be supplied only to extra CEE markets

Dimensions: 340x460x500 mm

Weight: 40 Kg



E094

ATM No. MAT 1090

Automatic/Manual Mortar Mixer Capacity 5 liter nominal

(ATM No.EL 1100)

BS 3892-1, 3892-3, 6463-103,4551 -1, ISO 679,
EN 196-1,196-3.413/2,459/2, 1744-1,
13279-2,1015-2.13395-13454-2

- * Microprocessor Control.
- * Choice of automatic mixing cycles
- * Sand and water dispenser options

This mixer is designed to mix mortars and cement pastes to the requirements of the above standards.

The mixing paddle

has a planetary motion and is driven by a motor with a microprocessor based speed and program controller.

The mixer can be operated either

in an automatic or manual mode. When the mixer is used in the manual mode, the two mixing speeds can be changed by means of a rocker switch, without switching off the motor.

In the automatic mode

any one of the pre-set mixing programmes may be selected.

Specification

Dimensions (l x w x h) :- 530 x 350 x 580 mm

Speeds (rpm): - Paddle Mixing Head

Low 140 \pm 5 62 \pm 5

High 285 \pm 10 125 \pm 10

Rated power:-180 W

Bowl capacity: - 5 liters (approx)

Weight: -54 kg

Automatic/Manual 5 litre nominal capacity Mortar Mixer

Complete with bowl and paddle.

For 220 - 240 V AC, 50 - 60 Hz. 1 ph

Automatic/Manual 5 litre (nominal) Mortar Mixer with Accessorie

Accessories

Water Dispenser comprising a pipette and mounting bracket. Dispenses water in to the mixing bowl to an accuracy of \pm 1 ml. Weight 900 g

Automatic Sand Dispenser. Thirty seconds after start of the mixing sequence sand is automatically discharged into the mixing bowl. The dispenser is designed to allow for a discharge time of approximately 30 seconds. Only for use with

Mixers, power is supplied from the mixer. Weight 5 kg

Bowl Cover

Scraper plastic 200 mm long. Pack of 5



ATM No.EL 1100

Mortar mixer with programme control and automatic sand dispenser

(ATM No. 1120)

acc to DIN 1164 T5 + T7, EN 196 T1 + T3
(ISO R/679, ASTM C 305, BS 450). For
the standard production of cement mortar
and cement paste.

- * Stainless steel bowl 5 liters
- * Stainless steel stirrer
- Weight: approx. 90 kg
- Measurements: approx.:
W/D/H 300 x 630 x 750 mm
- Electrical power: 380 V, 3 - phase, 0.75 KW



ATM No. 1120

Mortar Mixer

(ATM No. TON 1121)

Application

Preparation of standard prisms with automatic mixing procedure
including water feeding in accordance with EN 196 T1 und T3,
ISO 679, DIN 1164, ASTM C305 and other standards.

Advantages :

- Sturdy and durable housing
- Wear-resistant and precise stirrer
- Low-noise operation.
- Consistent program sequences for all standards.
- Special programs by request.
- Water-resistant operating devices.
- Dust extraction system included.
- Proven CE-conformity.
- standard power supply 1 : automatic mixing procedure
(option) : anytime with listed accessories expandable
- automated mixing with up to 6 programs reproducible
start of mixer after water feeding
- Special programs available on request
- reproducible distilled water can be used as in the
standard required.

Option control unit 6210.40

For automated mixing in accordance with EN 196 T1
und T3, ISO 679, ASTM C 305.

Other standards can be programmed on request

The controller is completely built-in the housing and is
designed as an industrial control with protective system
IP54



ATM No. TON 1121

Optional Accessories

Test set 1551.48

Including ring and test tool

Special worktable 5522

With 2 doors.

BxTxH900x775x900 mm

Standard sand 9850.010

For tests acc. to DIN EN 196

Signal generator 6210.61

For acoustic warning notices

Design

This mixer is a very sturdy construction for laboratory use. The newly developed housing is made of light cast alloy. With a durable toothed belt drive and a planetary transmission for silent and low maintenance operation. The speed of the motor is controlled electronically, other speed settings on request. A compulsory separative switch at the door guarantees an CE-conform protection of the mixing area.

A water dosage device for 225 ml (other water volumes by request), an automatic sand supply device for standard tests and therefor required control unit are additionally available

Working Principle

The standardized mixing bowl is made of stainless steel and tested on absolute roundness. The high reliable standardized stainless steel paddle performs both a revolving and a planetary motion in accordance with the standards. The paddle is fixed high-precisely and free from play. A quick clamping device allows a comfortable change of the paddle. The lever operated lift supported by springs can be used for easy removal and insertion of the mixing bowl. The gap between paddle and mixing bowl is constant and factory-tested. Most of the essential parts are taken from the predecessor mixer no. 1551. After selecting the program with an water protected button the program according to the standard is performed. A flashing light at the end of the rest period warns that the program is to be continued. The stop button cancels the program and resets the control unit to 0

The control unit triggers the automatic sand feeding device. The water can be admixed alternatively befor or after dosing of cement by means of a precision pump. The dosing accuracy of the water is ± 1 ml.

Option water dosage device 6210.41

(Control unit 6210.40 required)

For automatic dosing of the gauging water in accordance with EN 196 und ISO 679.

The water dosage device is integrated in the housing.

The water reservoir can be placed in, under or beside the worktable. A pump lifts the water into an measuring cylinder with an overflow of 225 ml.

If the measuring cylinder is filled, an display shows the operational readiness. The run down of the water is activated by the control unit.

Option autom. sand supply 6210.20

(Control unit 6210.40 required)

Automatic supply of the standard sand without remains j during the mixing period.

Technical Data Basic Device		ToniMIX 6210
Paddle Speed		
low gear		
revolving speed	U/min	140 ± 5
planetary speed	U/min	62 ± 5
high gear		
revolving speed	U/min	285 ± 10
planetary speed	U/min	125 ± 10
required space		
surface / height	mm	500 x 700 / 800
Max. power consumption	kW	0.4
Weight gross/net	kg	110/89
Shipping dimensions w x d x h	mm	800 x 600 x 800
Technical Data Water Dosage Device (Option)		6210.41
Dosing quantity	ml	225 ± 1
Volume of the water reservoir	l	12

Concrete Mixer type: 30-0185

(ATM No UEZ 1126)

Laboratory Compulsory Mixer LZ 75/100

For the preparation of freshly mixed concrete

Mixing output 75l, graining up to 32mm

discharging through

segment slide 380V, 50Hz, 4.0 Kw

Water connection for mortar mixer ace. To EN 196

(ATM No.1130)

* Automatic water dosing system

* 225 g quantity of water +/-1 g accuracy

* Mounted with software extension



ATM No.1130

Vicat apparatus

(ATM No.MAT 1140)

E055

for setting time and consistency of cement

STANDARDS: EN 196:3-ASTM C187,

C191 -AASHTOT129.

T131 DIN 1164 - BS 4550 - NF P15-414 - DM. 3/6/68

UNE 80102

Dimensions: 160x200x300 mm

Weight: 5 Kg

The instrument consists of a metallic frame, graduated scale with

index, sliding probe of 3009 consistency

plunger dia, 10 mm, glass base plate,

The needle and conical mould are not

included and have to

be ordered separately (see accessories) \

Manual vicat

(ATM No.EL1150)

This procedure is used to determine

the quantity of. water

required to produce a cement paste of standard consistence.

Complete with consistency plunger, 10 mm

diameter. Requires one initial or final set needle

to make up test weight to 300 g Weight 1.3 kg

Accessories

(ATM No.EL 1151-1156)

EN Initial Set Needle 1.13 mm diameter Weight 9 g.

(ATM No.EL 1151)

EN Final Set Needle 1.13 mm diameter With

special footing Weight 9 g.

(ATM No.EL 1152)

ASTM Initial Set Needle 1 mm diameter. Weight 9 g

(ATM No.EL 1153)

Vicat Mould manufactured from brass and supplied complete with a ring and glass base plate.

Weight 800 g

(ATM No.EL 1154)

EN Vicat Mould manufactured from a hard rubber compound and supplied complete with a glass

base plate. Weight 500 g

(ATM No.EL 1155)

ASTM Vicat Mould manufactured from non-absorbent plastic and supplied complete with a glass

base plate. Weight 200 g

(ATM No.EL 1156)



ATM No.MAT 1140



ATM No.EL 1150

NEEDED ACCESSORIES:

E046 Needle dia. 1, 13 mm
(EN - BS - NF - DIN - UNI - UNO)

E046-01 Needle dia. 1 mm
(ASTM - AASHTO) **E046-03** "Hardened"
needle dia. 1, 13 mm (EN - BS - NF
DIN - UNI - UNE)



CONICAL MOULDS:

E055-10 Conical plastic mould dia. 70/80 h 40 mm (EN - NF)

E055-05 Conical plastic mould dia. 60/70 h 40 mm (ASTM - AASHTO)

E055-04 Conical plastic mould dia. 80/90 h 40 mm (Standard: UNI)

E055-13 Conical plastic mould dia. 65/75 h 40 mm (Standard: DIN)

E055-11 Conical brass mould dia. 80/90 h 40 mm (Standard: BS)

E055-12 Conical brass mould dia. 80/90 h 40 mm in two halves
with ring (Standard: BS)

ACCESSORIES:

E055-06 Additional weight 700 g to the sliding probe (EN - NF)

E042 Final needle dia. 1, 13 mm (EN - NF - BS - DIN - UNI - UNE)

E042-01 Final needle dia. 1 mm (Standards: ASTM - MSHTO)

E055-08 Glass thermometer -10 to +50° C.

SPARE PARTS:

E055-07 Glass base plate dia. 120 mm

E055-03 Consistency plunger dia. 10 x 50 mm

Vicat set needle unit EN 196 for testing of cement

(ATM No. 1160)

consisting of:

- Initial-set needle dia. 1,13 mm
- Final-set needle dia. 1,13 mm with special footing
- Conical hard rubber ring, 65/75 mm
- Glass base plate 110x110x3 mm
- Consistency plunger dia. 10 mm

Automatic Vicat Needle Apparatus PA8

(ATM No. ACM 1170)

MEASUREMENT OF INITIAL AND FINAL SETTING-TIME OF CEMENTS, PLASTERS AND MORTARS

SIMULTANEOUS TESTS AT 1 TO 8 TOTALLY INDEPENDANT POSTS

SYSTEM BASED ON A VICAT NEEDLE FITTED WITH AN ELECTRONIC MEASURING DEVICE

The total automation of its movements means that the PA8 automatic setting tester carries out the tests autonomously, and that it is immediately operational and reliable.



ATM No. 1160



ATM No. ACM 1170

100% AUTONOMOUS

"Start the tests, the machine does the rest"

The tests can be started in any order, at any desired time. the machine carries out the measurements all by itself. The measurements are carried out following a pre-defined grid designed to make maximum use of the surface of the sample while conforming to standards. The results are recorded in a data-base and memorized on the computers hard disk.

Adaptable levels of usage

For real simplicity of operation..."

You carry out repetitive tests... use a **GENERIC TEST**

The data to be entered is extremely simple: number of the generic test (already programmed in accordance with one of the measurement modes below), operator's name, zero time... Then start the test, the machine will run it automatically.

and with two measurement modes available"

You are not familiar with the product you are testing

use the **SEMI-AUTOMATIC** mode

You can select the start delay (no measurement during this period), a slow measurement period', . a fast measurement period. and the depth of change of period (the fast measurement period takes the place of the period at this depth)

You want to be in complete control of your test...

use the **MANUAL** mode. You choose the number of penetrations and their timing. To within a minute

100% OPERATIONAL

***Simplicity / user-friendliness** user-friendly program with menu, window and help list. Use of generic tests to avoid tiresome and repetitive parametering. Recording of measurements in a data-base. Automatic saving while test is running

*** Reliability**

Small number of parts in the measurement head. Overall design aimed at simplification. On-line help and breakdown tests available to user

*** Standards totally respected**

Apparatus entirely conforming to the European standards in force (EN 196-3, DIN 1184...) Tests carried out with water circulation

Automated cleaning

Cleaning of needle carried out automatically by spraying

Test zone entirely contained within an easy-clean stainless trough

*** Calibration**

A special mode (code-protected) permits the user to calibrate the machine

*** Maintenance * diagnostic help**

A special mode (code-protected) enables the user to check and test correct functioning of the machine ! * Modular construction. Main parts accessible

100% DEPENDABLE

*** A laboratory machine**

Movement of the needle controlled by precision electronics

Mechanical architecture aimed at precision of measurement

*** Perfect repeatability**

Tests entirely carried out by the machine. Total control of the test frequency and conditions

Tests perfectly comparable from one to another

• Traceability ensured

Memorization in a data-base of the whole of the conditions of a test and its results.

Automatic allocation of number, date and time of test (manual programming possible)

May be exported to a statistical treatment program.

and with two measurement modes available" You are not familiar with the product you are testing**, use the SEMI-AUTOMATIC mode You can select the start delay

(no measurement during this period), a slow measurement period!, a fast measurement period, and the depth of change of period (the fast measurement period takes the place of the period at this depth) may be to a statistical treatment program

Technical specifications:

- | | | |
|--|-------------------|--|
| - Total weight (without micro-computer): | 60 kg | - Complies with the CE Machines standard |
| - Speed of movement in X and Y: | 6 cm/s | - Supply voltage: 220 V AC / 50 cycle |
| - Maximum water volume: | 10 + 6 liters | - Consumption: 400 W |
| - Connection to micro computer: | ACMEL 15 662 card | - Dimensions: Length 750 x Depth 550 x Height 600 mm |

Vibrating machine for 70,7 mm cube moulds

(ATM No. MAT 1180)

STANDARD: BS 4550

The mould is mounted on a vibration platform with excentric Mechanism, The Machine is supplied complete with separate control panel with timer but "without cube moulds" to be ordered separately.

Power supply : 20-240v 1ph 50 Hz 250 W

Weight: 100 Kg



ATM No. MAT 1180

Vibrating table for three gang mould acc. to DIN and EN 196-1

(ATM No. 1190)

Vibrating table W/D/H 1000 x 900 x 1400 mm
for compacting of cement and mortar prisms acc.
to. DIN and EN 196-1

- * Housing and desk assembly made of stainless steel
- * Digital display for oscillation width (mm), vibration time (s), as well as pilot-lamps (over and under oscillation width) are installed in the desk housing
- * Weight without concrete filling ca. 290 kg



ATM No. 1190

Vibrating Machine

(ATM No.EL 1200)

for 70.7 mm cube moulds. The mould is mounted on a vibration platform with an eccentric mechanism the machine is supplied complete with drive cover, time switch and a starter control mounted on a rigid steel frame. Supplied without cube moulds, Weight 100 kg For 220 - 240 VAC, 50 Hz, 1 ph.



ATM No.EL 1200

70.7 mm Cube Mould:- manufactured from steel to dimensions specified in the relevant British Standard, Supplied complete with baseplate. Three moulds required for each test Weight 2.9 kg



ATM No. 1210

Vibrating table 9000 UPM

- Housing, laquered
- Vibrating plate, galvanized
- ON-OFF buttons
- Timer
- Table plate 350 x 550 mm
- Weight: 35 kg
- Elect. power: 230 V, 50 Hz

ATM No. 1220

Vibrating table 3000 UPM

- Housing, laquered
- Vibrating plate, galvanized
- Pedal switch
- Table plate: 350 x 350 mm
- Weight: 28 kg
- Elect. power: 230 V, 50 Hz

General Equipment

Abrasion Test for cement

(ATM No. MAT 1230)

C129

Standard :
EN 1338 : 2004/En 1339, 1340
13882-3 / DIN 52108

Description :

The instrument measures a volume loss in a specimen under abrasion test and it's used in tests such as:

- paving stone
- Concrete slabs
- Slabs made of natural rocks
- Natural stone slabs



ATM No.MAT 1230

The test is performed by positioning a specimen to be verified in a abrasion tester apparatus on the test track on which has been spread normalized abrasive; the grinding wheel it's made rotate and the specimen submitted to the abrasive load of 294 N for a certain number of cycles. Before doing a test, establish the specimen's bulk density by measuring weight and thickness. Perform the test for 15 cycles composed of 22 turn each, calculating at the end a worn as a average loss in volume and weight, the apparatus is basically composed of:

- * cast iron horizontal disc with a speed of 30 rpm and a diameter of 750mm
- * turn shoe of a 200mm test track to position a specimen
- * revolution counter with automatic stop after 22 revolutions
- * specimen's holder
- * adjustable charger used to produce a force of 294 N \pm 3 N on a specimen

Power supply: 230 V 50 Hz ~ Ph Dimension : 1500 x 1000 xh 830 mm Weight: 250 Kg

A075-02

Los Angeles abrasion machine
same model A075, but equipped with steel cabinet and safety microswitch to EN6092 CEE
Directive: lined with sound proofing material for noise reduction.
Dimensions: 1100x1180x1250 mm
Weight: 400 Kg



NEEDED ACCESSORY:

A076-01

Set of 12 ABRASIVE CHARGES to meet ASTM C131 - AASHTO
T96 - UNE 83116 - UNI 8520 - NLT 325 - CNR N°34 Standards



A076-02

Set of 12 ABRASIVE CHARGES to meet ASTM C131 - AASHTO
Standards

Balance

(ATM No.MTL MODEL)








	Specifications			
	Model	Readability (mg)	Weighing capacity (g)	Pan size (mm)
	Analytical balances			
	LA310S	0.1	310	Ø 90
	LA230S	0.1	230	Ø 90
	LA120S	0.1	120	Ø 90
	LA230P	0.1 0.2 0.5	60 120 210	Ø 90
	LA130S-F	0.0001	150	208 x 264
	Precision balances			
	LA1200S	0.001	1,200	Ø 130
	LA620S	0.001	620	Ø 130
	LA220S	0.001	220	Ø 130
	LA620P	0.001 0.002 0.005	120 240 620	Ø 130
	LA2000P	0.001 0.01	1,000 2,000	Ø 130
	LA5200D	0.001 0.01	1,000 5,200	Ø 130
	LA3200D	0.001 0.01	1,000 3,200	Ø 130
	LA8200S	0.01	8,200	216 x 200
	LA6200S	0.01	6,200	216 x 200
	LA4200S	0.01	4,200	216 x 200
	LA2200S	0.01	2,200	216 x 200
	LA820	0.01	820	216 x 200
	LA420	0.01	420	216 x 200
	LA2200P	0.01 0.02 0.05	400 800 2,200	216 x 200
	LA5200P	0.01 0.02 0.05 0.1	1,200 2,400 3,800 5,200	216 x 200
	LA8200P	0.01 0.02 0.05	2,000 4,000 8,200	216 x 200
	LA64001S	0.1	64,000	400 x 300
	LA34001S	0.1	34,000	400 x 300
	LA16001S	0.1	16,000	400 x 300
	LA12000S	0.1	12,000	216 x 200
	LA6200	0.1	6,200	216 x 200
	LA4200	0.1	4,200	216 x 200
	LA2200	0.1	2,200	216 x 200
	LA34001P	0.1 0.2 0.5	8,000 16,000 34,000	400 x 300
	LA12000P	0.1 0.2 0.5	3,000 6,000 12,000	216 x 200
	LA34000	1	34,000	400 x 300

Except for LA130S-F, LA 2000P, LA 3200D, LA 5200D, LA420, LA 4200 and LA 64001S, all models are also available in verified versions for use in legal metrology in the European Economic Area.

Note : all Balance accessories are available

Balance

(ATM No.STR MODEL)

	Specifications			
	Model	Readability (mg)	Weighing capacity (g)	Pan size (mm)
	Microbalances			
	CP2P**	0.001 0.002 0.005	0.5 1 2	Ø 20
	CP2P-F**	0.001 0.002 0.005	0.5 1 2	Ø 20 Ø 125 filter pan
	Semi-microbalance			
	CP225D	0.01 0.1	80 220	Ø 80*
	Analytical balances			
	CP324S	0.1	320	Ø 80*
	CP224S	0.1	220	Ø 80*
	CP124S	0.1	120	Ø 80*
	CP64	0.1	64	Ø 80*
	Model	Readability (g)	Weighing capacity (g)	Pan size (mm)
	Precision balances			
	CP423S	0.001	420	Ø 110*
	CP323S	0.001	320	Ø 110*
	CP323P	0.001 0.002 0.005	80 160 320	Ø 110*
	CP153	0.001	150	Ø 110*
	CP4202S	0.01	4,200	190 x 204
	CP3202S	0.01	3,200	190 x 204
	CP3202P	0.01 0.02 0.05	800 1,600 3,200	190 x 204
	CP2202S	0.01	2,200	190 x 204
	CP622***	0.01	620	Ø 154*
	CP8201	0.1	8,200	190 x 204
	CP6201	0.1	6,200	190 x 204
	CP4201	0.1	4,200	190 x 204
	CP2201	0.1	2,200	190 x 204
	CP34001S	0.1	34,000	400 x 300
	CP34001P	0.1 0.2 0.5	8,000 16,000 34,000	400 x 300
	CP16001S	0.1	16,000	400 x 300
	CP12001S	0.1	12,000	400 x 300
	CP34000	1	34,000	400 x 300



* Triangular weighing pan shape; Ø = diameter of the inner circle; the shaded area is available for additional sample use.
All models can be supplied in verified versions for use in legal metrology in the European Economic Area (except for CP4201)

** Specifications are for a 20 mm Ø weighing pan

*** Pan size on verified models 190 x 204 mm

Note : all Balance accessories are available

Balance

(ATM No.STR MODEL)

Specifications			
Model	Readability (g)	Weighing capacity (g)	Pan size (mm)
TE214S	0.0001	210	Ø 90
TE124S	0.0001	120	Ø 90
TE64	0.0001	60	Ø 90
TE313S	0.001	310	Ø 100
TE313S-DS*	0.001	310	Ø 100
TE153S	0.001	150	Ø 100
TE153S-DS*	0.001	150	Ø 100
TE3102S	0.01	3,100	174 x 143
TE1502S	0.01	1,500	174 x 143
TE612	0.01	610	Ø 116
TE412	0.01	410	Ø 116
TE212	0.01	210	Ø 116
TE6101	0.1	6,100	174 x 143
TE4101	0.1	4,100	174 x 143
TE2101	0.1	2,100	174 x 143
TE601	0.1	610	174 x 143
TE12000	1	12,000	174 x 143
TE6100	1	6,100	174 x 143
TE4100	1	4,100	174 x 143

* Standard-equipped with an analytical draft shield chamber

Note : all Balance accessories are available

Calorimeter Heat Of Hydration Of Cement

(ATM No. MAT 1261)

Standard: EN 196-8, ASTM C186

UNE 80102, 7105, DIN 1164, UNI 7208

Description:
Used to determine the heat of hydration of low heat Portland and hydraulic cement. The

apparatus consists of a Dewar flask contained in an insulated material and housed in a wooden box which is hinged so that the flask

can be easily removed or replaced. A "second" hinged wooden box contains the first one, granting a better insulation, as expressly requested by the standards.

The Calorimeter is supplied complete with a constant speed electric stirrer, Beckman centesimal thermometer, filler glass funnel. The standard supply "does not include the propeller" which must be ordered separately, selecting it from the specific Standard

(see accessories) Power supply: 230V 1ph 50Hz 150

W Dimensions: 350 x 250 x 680 mm

Weight: 12 kg approx.



ATM No. MAT 1261

ACCESSORY:

V300-19 (ATM No. MAT 1262)

Paraffin wax with melting point at 55 °C to coat the glass parts which are in contact with the hydrofluoric acid.

Pack of 5 Kg

SPARE PARTS:

EQ62-G1 Dewar flask (ATM No. MAT1263)

E062-02 Beckman thermometer (ATM No. MAT1264)

Heat of Hydration ToniCAL Trio Mode! 7339

(ATM No. TON 1266)

The ToniCAL TRIO Model 7339 is a computer-controlled heat flow calorimeter (differential scanning calorimeter) for the continuous determination of the total hydration heat of binding agents, especially cement. With online computer operation the device allows to directly determine the rate of heat development (dig) depending on the time. The intended application is the efficient control as alternative method according to EN 196-8.

Three measuring cells in one calorimeter vessel offset by 120°, with identical thermal insulation. Parallel, independent, timely varying use of the three measuring cells in all operation modes as self calibration, determination of the background noise, measurement. Rigid, long-life measuring system for industrial and laboratory applications with external input for DKD calibration of the indications and check of the self calibration unit. High measuring sensitivity by switching over to three measuring ranges for different types of cement. Test procedure with detection of the initial peak at high expressiveness and very good reproducibility. Temperature difference between working area and environment. Later injection of additives is possible. Evaluation of the results at the computer with numeric and/or graphic output.



ATM No. TON 1266

Heat Of Hydration

(ATM No. TAM 1267)

TAM Air is an eight channel microcalorimeter designed for sensitive heat flow measurements in the milliwatt range. JAM Air is the ideal tool for research and development of new formulations as well as a tool for quality control during cement and concrete manufacture and preparation. calorimetric channels are of twin type, consisting of a sample and a reference vessel, each with a volume of 20 ml. The thermostat uses circulating air and an advanced temperature regulating system to keep the temperature very stable within ± 0.02 K. The high accuracy and stability of the thermostat makes the calorimeter well

suited for heat flow measurements over extended periods of time, e.g. weeks. Samples are usually prepared by external mixing - by hand or in a

mixer - to achieve a homogeneous sample. Alternatively, the dry constituents of the cement sample can be loaded into a micro reaction system with stirring facilities, positioned in a channel of TAM Air. A known amount of water is then added by the use of a syringe and the sample is stirred inside the calorimeter in order to initiate the hydration process. As a result of the hydration process, heat is formed and the rate of heat production is continuously monitored as a function of time.



ATM No. TAM 1267

Applications:

- * Cement hydration process
- * Setting time and premature stiffening of cement
- * Effect of contaminated aggregate on the hydration process of cement
- * Influence of sulfate carrier content

Bomb Calorimeter C 2000 basic version 1

(ATM No.IK 1265)

Consisting of:

- C 2000 basic
- C 5010 Decomposition vessel, standard 230 V
50/60Hz



ATM No. IK 1265

Large Capacity Curing Cabinet

(ATM No. MAT 1270)

STANDARDS: EN 196/1 - ASTM-C87, C109, C190, C191 - UNE-80102 For curing large quantities of

mortar and concrete specimens, Aluminum and polycarbonate made, it is complete with precision digital thermostat and four shelves. The humidity from 90% to saturation is maintained through water equalizers activated by compressed air*

and the temperature by an immersion heater and refrigerator unit (accessory) Temperature range: from ambient to +30 °C, accuracy ± 1 °C. The cabinet requires a compressed air source, (see accessory) inside

dimensions: 1090x470x1200 mm over all dimensions: 1370x540x1490 mm

Power supply 220-240 V 1ph 50 Hz 2000 W Weight: 100 Kg



ATM No. MAT 1270

ACCESSORY for mod. EI 38:

V206

Air Compressor air displacement: 240 litres/min.

Tank capacity: 50 litres Suggested for daily use

V206-01

Air Compressor air displacement: 250 litres/min.

Tank capacity: 100 litres

Recommended for intensive use

V206-02 Air Compressor,

air displacement: 400 litres/min.

Tank capacity: 200 litres

Recommended for continuous use

E134-11

Pan, 240x300x70 mm, polythene made, it accepts up to six 40.1 x 40 x 160 mm prisms for curing in water.



CONCRETE PERMEABILITY TESTER

(ATM No. MAT 1525)

C435

Water impermeability tester

STANDARDS: DIN 1048 - EN 12364,

EN 12390/8 - ISO 7031 UNI 9533

Apparatus at 3 points to determine the depth of penetration of the water into the concrete (impermeability) under known time and pressure.

The unit accepts up to 3 concrete cubic, cylindrical or prismatic specimens having max. dimensions of 200x200x200 mm.

The specimen is put into the test chamber, clamped with suitable flanges and gaskets, and then a known water pressure is applied on the specimen's surface for a time as requested by Standard, by using a suitable air compressor (accessory) having at least 5 bar pressure capacity.

The water penetrated is measured by breaking the specimen, or by reading the water permeated through the graduated burette fixed on the front panel.

Dimensions: 1400x750x1700 mm

Weight 280 Kg

ACCESSORY:

V206

Laboratory air compressor.



ATM No. MAT 1525



ATM No.EL 1280-1290

Large Curing Tank with Set of Upper Racks And Small Curing Tank

Large Curing Tank (ATM No.EL1280)

BS 3892-3; EN 12390-2
This curing tank will accept up to 64 x 150 mm concrete cubes. It is supplied complete with a recirculating pump and immersion heater designed to maintain the temperature at 20 ± 2 C, providing that the ambient temperature does not fall below 15 C or rise above 20 C.

Specification
Internal dimensions
815 x 1650 x 530 mm (l x w x h)
Recirculation
1800 litres per hour rate of pump
Rated power 750 W
Weight 74 kg

Large Curing Tank supplied without racks.
For 220 - 240 V AC, 50 - 60 Hz, 1 ph.

Accessories
Model number Description
Weight
• Steel Stand 29 kg
• Removable Lower Rack 5 kg
• Set of Eight Upper Racks 41 kg

Small Curing Tank (ATM No.EL1290)

This curing tank provides an economic method for curing 150 mm and 100 mm cubes. It will also accept approximately 105, 70.7 mm mortar cubes. The tank is supplied complete with stand, internal tray, immersion heater and thermostat. A circulation pump is not fitted to this unit.

Small Curing Tank dimensions
610 mm square x 508 mm deep.
Weight 55 kg
For 220 - 240 V AC, 50 Hz, 1 ph.

Curing Tank Unit Heating and Coding System Controlab

550 L Curing Tank (ATM No.CON 1300)

750 L Curing Tank (ATM No.CON 1308)

1100 L Curing Tank (ATM No.CON 1309)

In green polyester reinforced with glass fiber

Using temp, : -30 to + 40o C

Thickness: 3 to 5 mm

Infernal dimensions: 830 x 1180 x (h) 620 mm

Cover

In grey polyester reinforced with glass fiber

Dimensions

*55DL: 1320x970 mm

* 750 L 970 * 1320 * 800 mm

* 1100 L 1190 x 1620 x 800 mm

INTG1T19 Cooling system (ATM No.CON1301)

Frigedor immersion cooler type 43000778 for curing tank with sealed

compressor and ventilated condenser for tempratyre up to -20°C

AlSi 304 spiral cooling coif with SOOmm line length Cooling

power: 276 w at -20°C Consumption: 285 w

Power Supply: 230 V» 50 Hz



ATM No.CON 1302

INTCLB11 Circulator system

To hold water of a curing tank at +20°C

Adjustable temperature switch

Flow max: 850 L/H

Consumption: 2100 w

Power Supply: 220 V, 50 Hz

Size: 600 X 250 x (h) 40mm



ATM No.CON 1301



ATM No.CON 1303

Large Capacity Drying Ovens

(ATM No.EL 1310-20)

This range of ovens is designed for drying large quantities of soils and aggregate samples and maintains temperature in accordance with BS 1377 The ovens are constructed of mild steel with a coated exterior and an aluminium coated steel chamber. The 225 and 425 litre units are fitted with a thermostatic control and versions are also available with LED temperature display. All models are fan-circulated and have a safety overheat thermostat and indicator which are pre-set to 105 °C

Specification:

ATM No.	(EL 1310)	(EL 1320)
Capacity	225 liters	425 liters
Dimensions l x w x h (mm)		
External	540 x 1040 x 940	740 x 1040 x 1120
Internal	440 x 920 x 600	640 x 920 x 760
Temperature range	40 to 200°C	40 to 200°C
Fluctuation	±0.75°C	±0.75°C
Rated power heater elements	2000 W	3000 W
Shelves supplied	3	4
Shelf positions	4	5
Weight	80 kg	150 kg

225 Liter Drying Oven (ATM No.EL 1310)

For 220 - 240 VAC, 50 Hz, 1 ph

225 liter Drying Oven with LED temperature display

For 220 * 240 VAC, 60 Hz, 1 ph (ATM No.EL 1311)

425 liter Drying Oven

For 220 - 240 VAC, 50 Hz, 1 ph (ATM No.EL 1320)

425 liter Drying Oven with LED temperature display

For 220 - 240 VAC, 50 Hz, 1 ph (ATM No.EL 1321)

Accessory

Dial Thermometer

(ATM No. EL 1322)

0 – 300 °C 40 mm

diameter dial, with collar fixing for door,

(ATM No.EL 1310)



ATM No.EL 1310



SERIES 6000 HEATING AND DRYING OVENS

the right choice for your application

(ATM No. HRS 1330)



ATM No.HRS 1330

TECHNICAL DATA

Ovens			T 6030	T/UT 6060	T/UT 6120	T/UT 6200	T/UT 6420	T/UT 6760
Dimensions			see page 15					
Outer casing	T _h	mm	535	535	535	715	715	715
	B _h	mm	552	744	695	895	744	1200
	H _h	mm	552	552	695	816	1707	1707
Height footroller (mm)	H _f	mm	24	24	24	24	106	106
Depth, door handle (mm)	T _l	mm	50	50	50	50	50	50
Width, control box (mm)	B _l	mm	149	149	149	149	149	149
Depth, control box (mm)	T _z	mm	400	400	400	580	580	580
External diameter								
Fresh/exhaust air connections	D _h	mm	40	40	40	40	40	40
Inner casing								
Total volume	I		30	57/52	107/94	196/180	409/375	751/689
Vapour space	I		43	76	136	240	489	861
Internal dimensions			see page 15					
	t	mm	370	370/339	370/323	550/503	550/522	550/522
	b	mm	352	400	554	554	544	1000
	h	mm	231	380	524	644	1366/1319	1366/1319
	h _h	mm	100	100	100	100	100	100
	A _h	mm	276	302	377	377	372	600
	A _z	mm	273	124	124	134	371	371
	Z _h	mm	100	100	100	109	109	109
Shelves								
Standard number			1	2	2	2	2	2
Max. number possible			4	9	14	18	39	39
Dimensions, T-ovens	WxD	mm	336x365	367x365	536x365	536x545	528x541	964x541
Dimensions, UT-ovens	WxD	mm	-	367x335	536x318	536x496	528x513	964x513
Weights								
Total permissible load	kg		50	50	50	75	75	150
Point load/shelf	kg		15	15	15	20	20	20
Distributed load/shelf	kg		20	20	20	40	40	40
Empty weight	kg		40	50/53	65/75	92/100	153/163	223/241
Individual window, No. of windows for door window option			-	1	1	2	3	6
Temperature								
Temperature range ¹⁾	°C		300	300	300	300	300	300
Spatial temperature deviation ²⁾	at 70 °C	± °C	1.5	2/1	2/1	2/1	3/1.5	3/2
	at 150 °C	± °C	3	4/3	4/3	4/3	3.5/3	5/4
	at 300 °C	± °C	6	5/7	5/7	5/6	4/6	6/7
Temp. deviation over time	± °C		± 0.5	± 0.5	± 0.5	± 0.5	± 0.5	± 0.5
Times								
Heating-up times to 95 % of	70 °C	min ³⁾	15	15/8	10/10	20/7	40/10	55/12
	150 °C	min ³⁾	30	25/18	20/20	30/23	35/30	55/30
	300 °C	min ³⁾	75	60/55	60/60	65/65	70/60	80/65
Recovery time³⁾								
to 95 % of the initial value	at 70 °C	min	2	4/1	4/1	5/2	6/1	3/1
	at 150 °C	min	6	6/4	4/5	5/4	11/6	5/6
	at 300 °C	min	10	12/8	9/11	10/11	18/10	8/11
Air exchange max. no. of air exchanges 1/h (air flap open)								
	at 70 °C	1/h	14	7/6	19/32	11/29	11/20	10/18
	at 150 °C	1/h	34	12/36	21/29	15/28	16/20	14/18
	at 300 °C	1/h	33	14/33	25/27	21/20	21/21	12/12
Fresh air flow (air flap open)								
	at 70 °C	m³/h	0.6	0.5/2.7	2.6/4.4	2.6/7.0	5.6/9.8	8.6/15.0
	at 150 °C	m³/h	1.45	0.9/2.7	2.9/4.0	3.6/6.7	7.8/9.8	12.0/15.5
	at 300 °C	m³/h	1.4	1.1/2.5	3.4/3.7	5.0/4.8	10.3/10.3	10.3/10.3
Max. flow of circulating air (bin capacity) at 20 °C								
	m³/h		-	2.0	5.5	5.2	5.9	6.2
Electrical data								
Rated voltage (50/60 Hz) ⁴⁾	V		230-	230-	230-	230-	400.3-/N	400.3-/N
Rated power	kW		0.8	1.6/1.65	2.2/2.4	2.7/2.8	4.1/4.2	6.1/6.3
Heat emission	Wh/h		55	75/165	85/265	120/325	210/420	280/520
	at 70 °C	Wh/h	150	200/410	265/580	350/695	610/1100	890/1250
	at 150 °C	Wh/h	415	550/900	780/1280	1000/1570	1800/2500	2600/3300

¹⁾ Control range T: electronic controller from T_{ambient} +10 °C to 300 °C, control range UT: electronic controller from T_{ambient} +20 °C to 300 °C

²⁾ The values stated apply to the unloaded oven in conjunction with wire mesh trays (measurement according to DIN 12880, Part 2), air flap closed.

³⁾ Door open for 60 s

Other voltages on request

ORDERING INFORMATION

STANDARD MODELS		Models	6030	6060	6120	6200	6420	6760
Volume of work space (l)	T	30	57	107	196	409	751	
Order No.			51013448	51015264	51015265	51015266	51013301	51015267
Volume of work space (l)	UT	-	52	94	180	375	689	
Order No.			-	51014393	51012499	51014889	51015272	51015273
OPTIONS		Models	6030	6060	6120	6200	6420	6760
Temperature controller¹⁾								
Thermicon [®] P			51900003	51900062	51900062	51900062	51900004	51900004
Digicon [®] S with analog interface			51900048	51900049	51900049	51900049	51900050	51900050
Eurotherm 2404/P4 with RS 232 interface			51900297	51900297	51900297	51900297	51900297	51900297
Eurotherm 2404/P4 with RS 422/485 interface			51900298	51900298	51900298	51900298	51900298	51900298
Temperature regulation								
Adjustable upper temperature limit controller			51900167	51900168	51900168	51900168	51900167	51900167
Adjustable upper and lower temperature limit controller			51900163 ¹⁾	51900164 ¹⁾	51900164	51900164	51900163	51900163
Temperature sensor²⁾								
Temperature recorder			51900090	51900090	51900090	51900090	51900090	51900090
PT 100 - connection for external temperature recorder			51900009	51900010	51900010	51900010	51900009	51900009
NI-Cr-Ni - connection for external temperature recorder			51900046	51900047	51900047	51900047	51900046	51900046
Digital recording of sample temperature with display (Please select sensor as accessory)			51900054	51900055	51900055	51900055	51900054	51900054
Timers³⁾								
Daily program timer			51900109	51900100	51900100	51900100	51900109	51900109
Weekly program timer			51900007	51900008	51900008	51900008	51900007	51900007
Digital weekly program timer			51900161	51900162	51900162	51900162	51900161	51900161
Fresh air fan								
with speed setting only for UT ¹⁾	UT	-	-	51900285	51900285	51900285	51900285	51900285
Inner casing version with conditional gas-tightness⁴⁾								
with inert gas connection	T	51900100	51900101	51900102	51900103	on request	on request	
with inert gas connection	UT	-	51900106	51900107	51900108	on request	on request	
incl. throttle valve	T	51900261	51900262	51900263	51900264	on request	on request	
incl. throttle valve	UT	-	51900265	51900266	51900267	on request	on request	
Door version								
Left-hinged door		50027652	50027652	50027652	50027652	-	-	
Lockable door		51900059	51900059	51900059	51900059	51900059	51900059	
Door window incl. internal lighting	T	-	51900011	51900012	51900013	51900014	51900015	
Door window incl. internal lighting	UT	-	51900016	51900017	51900018	51900019	51900020	
Connection for central monitoring								
			51900063	51900064	51900064	51900064	51900063	51900063

¹⁾ Not available for 100-127 V¹⁾ Only one option from this group possible

TYPE	ATM No.
T 6030	HRS 1331
T/UT 6060	HRS 1332
T/UT 6120	HRS 1333
T/UT 6200	HRS 1334
T/UT 6420	HRS 1335
T/UT 6760	HRS 1336

1400°C, 1500°C & 1600°C Laboratory chamber furnaces (RHF)

(ATM No.CRB 1350)

- * Maximum operating temperatures of 1400°C 1500°C&1600°C
- * Chamber of 3,8,15 & 35 liters
- * Powerful silicon carbide elements located on both sides of the chamber ensure good thermal uniformity
- * Silicon carbide allotments can withstand the of everyday operation and provide good longevity
- * Hardwearing refractory brick in chamber entrance and hearth provide good resistance to abrasion



ATM No.CRB 1350

Elsewhere, lightweight ceramic fiber insulation is used which ensures good energy efficiency and rapid heating
 Vertical counter-balanced door keeps hot door insulation away from operator
 Positive break door safety switch isolates chamber from power supply, when the door is opened
 Double skinned construction allows convection air flow to cool the outer case, to conform to EN61010 safety standard
 Choice of PID controller or programmers
 Applications in general industry include sintering alumina, smelt trials and checking Al₂O₃ content in alumina
 Applications in the ceramics industry include disintegration, testing and analysis of cement samples, refractory porosity tests, long term high temperature tests and firing & sintering of ceramic samples
 Applications in the semi-conductor industry include annealing silicon, silicon carbide & nitride samples and solid state synthesis

TYPE	ATM No.
RHF 14/3	CRB 1351
RHF 14/8	CRB 1352
RHF 14/15	CRB 1353
RHF 14/35	CRB 1354
RHF 15/3	CRB 1355
RHF 15/8	CRB 1356
RHF 15/15	CRB 1357
RHF 15/35	CRB 1358
RHF 16/3	CRB 1359
RHF 16/8	CRB 1360
RHF 16/15	CRB 1361
RHF 16/35	CRB 1362

Technical specification information for carbolite RHF 1400 - 1600C range of furnaces

Model	Maximum operating temperature (°C)	Volume (litres)	Internal dimensions (mm - h x w x d)	External dimensions (mm - h x w x d) with door closed	Heat up time to 100°C below maximum temperature (mins)	Maximum power (kw)	Holding power (kw)
RHF 14/3	1400	2.9	120 x 120 x 200	655 x 435 x 610		4.5	1.9
RHF 14/8	1400	7.8	170 x 170 x 270	705 x 505 x 675	33	8.1	3.2
RHF 14/15	1400	14.8	220 x 220 x 305	810 x 690 x 780	22	10.0	2.9
RHF 14/35	1400	35	250 x 300 x 465	885 x 780 x 945	35	16.0	6.0
					38		
RHF 15/3	1500	2.9	120 x 120 x 200	655 x 435 x 610		4.5	2.0
RHF 15/8	1500	7.8	170 x 170 x 270	705 x 505 x 675	45	8.0	3.5
RHF 15/15	1500	14.8	220 x 220 x 305	810 x 690 x 780	40	10.0	3.0
RHF 15/35	1500	35	250 x 300 x 465	885 x 780 x 945	45	16.0	6.2
					46		
RHF 16/3	1600	2.9	120 x 120 x 200	655 x 435 x 610	55	4.5	2.3
RHF 16/8	1600	7.8	170 x 170 x 270	705 x 505 x 675	60	8.0	4.0
RHF 16/15	1600	14.8	220 x 220 x 305	810 x 690 x 780	60	10.0	3.5
RHF 16/35	1600	35	250 x 300 x 465	885 x 780 x 945	90	10.0	5.0

Crucible Furnace VCF 12/5/E301

(ATM No. CRB 1363)

MAX TEM L : 1200°C

HxWxD 260x155x130 MM

5.2 LITTER, DIGITAL PID-REGLER E301 WITH TIMER



ATM No. CRB 1363

Laboratory Furnaces

(ATM No. LIN 1370)

Laboratory furnaces for universal application Easy operation, fast heating - and cooling cycles. Stainless steel housing for corrosive environment. standard PID controller with 1 heating ramp.



VMK Tmax 1200 °C

Model	liters	inside dimensions mm	KW	ATM No.
VMK10	1,0	100 x 100 x 100	0,53	LIN 1371
VMK22	2,2	130 x 170 x 100	0,9	LIN 1372
VMK39	3,9	180 x 200 x 110	1,3	LIN 1373
VMK80	7,7	210 x 230 x 160	2,1	LIN 1374
VMK135	13,5	250 x 300 x 180	2,6	LIN 1375
VMK250	25,0	250 x 400 x 250	3,75	LIN 1376

VMK

(ATM No. LIN 1377)

Fiber insulated high temperature furnaces for research, laboratory and production. Thyristor controlled, fast heating- and cooling- cycles, low energy consumption. low weight, stainless steel housing.

Model	liters	inside dimensions mm	Tmax	kw	ATM No.
VMK 1400	6,9	170 x 270 x 150	1400	3,5	LIN 1377
VMK 1600	6,9	170 x 270 x 150	1600	3,5	LIN 1378
VMK 1600	G 9,0	150 x 330 x 180	1600	5,0	LIN 1379
VMK 1800	4,0	150 x 240 x 110	1800	4,0	LIN 1380
VMK 1800	G 9,0	150 x 330 x 180	1800	5,0	LIN 1381



ATM No. LIN 1385 - 1397



ATM No. LIN 1377

VMK-S Tmax 1100°C

(ATM No. LIN 1390)

Protective gas furnaces with Tmax, 1050 °C, optional 1100 °C, Heat resistant gas-tight muffle for operation under protective gas. Water cooled door, controller standard PID with 1 heating ramp.

Model	liters	inside dimensions mm	kw	ATM No.
VMK-S39	2,6	150 x 180 x 95	1,9	LIN 1391
VMK-S80	5,2	180 x 210 x 140	2,1	LIN 1392
VMK-S135	9,2	220 x 280 x 150	3,0	LIN 1393
VMK-S250	15,0	200 x 360 x 210	5,0	LIN 1394

LM 312, 412, 512 Tmax 1340 °C

Muffle furnaces for heat treatment. Various temperature controllers available.
(ATM No. LIN 1395-1397)

Model	liters	inside dimensions mm	KW	ATM No
LM312	5,0	175x300x95	2,8	LIN1395
LM412	7,9	175x300x150	3,2	LIN1396
LM512	18,5	200 x 400 x 230	6,0	LIN 1397

Precision Hotplate Digital Electronic

(ATM No. GET 1400)

Temperature range 20...450 °C
with special switching stage for
temperature drop-offs



TYPE	ATM No.
PZ 44/230	GET 1401
PZ 44/400	GET 1402

ATM No. GET 1400

Best.-Nr.	PZ 44/230	PZ 44/400	Model
Spannung	230-240 V, 50-60 Hz	2 x 400 V, N+PE	voltage
Leistung	3300 Watt		performance
Plattengröße	440 mm x 290 mm		plate size
Temperaturvorwahl	20°C ...450°C		Temperature range
Schalt-differenz	±1 K		Constant temperature
Breite x Tiefe	310 mm x 475 mm		width and depth
Höhe	205 mm		height
Gewicht	26 kg		weight
Zubehör	Best.-Nr. /	Accessories	
Kabel mit Stecker für Temperatur-Sicherung, Schaltuhr oder Kontaktthermometer	S 3 P		Cable with plug for temperature-fuse, timeswitch or contact-thermometer
Temperatur-Sicherungen (± 5°C) 82-128-156-170-182-212-228-254°C (Mindestabnahme 5 Stück)	TS... Wert bitte einsetzen Please ...		Temperature-fuse (± 5°C) 82-128-156-170-182-212-228-254°C

Constant Climates

(ATM No. WEI 1404-1408)

WK 111 Series of Climate Test

Chamber Basic design.

* Separate digitally adjustable temperature limiter for t_{min} and t_{max}

* Control and program control MinCON/32

* Touch panel, adjustable in height

* Serial interface RS 232 C

* Parallel printer interface for HP desk jet color and Epson printer

* Automatic water replenishment

50 and 125 mm Ø ports

One shelf

Calibration: of 2 temperature values

(+4°C and +90°C)

Calibration

of 2 climate values

(+ 25 °C/60 % r. h. and 40 °C/75 % r. h.)

Potential-free contact

Air-cooled refrigeration unit



ATM No. WEI 1404-1408

The advantages at a glance...

- . Low power consumption
- . Extremely low sound pressure level
- . Factory-calibrated
- . Designed for extreme climates
- . Environmental friendly refrigerant
- . Water reservoir with level indicator and possibility of connection to central water supply for humidification water
- . High and low temperature monitoring with separate sensors
- . Easy-to-clean test space of high gloss stainless steel
- . Psychrometric humidity measuring with self-cleaning humidity sensor
- . Graphics compatible touch panel with simple, menu-guided operation
- . no knowledge of programming required
- . Single-phase connection
- . Wide humidity range

Options...

- . Software package 5'MPATI.
- . Laptop control station with software
- . printer for connection to the
- . interface for documentation
- . of actual values
- . Configuration modules for interface standards analog measuring
- . Separate measuring sensors
- . Capacitive humidity sensor
- . Mobile design
- . Door with window
- . Additional port
- . Additional shelves
- . Different mains voltage and frequencies
- . Water demineraliser
- . Networking of max. 32 systems
- . Integration with old systems
- . Annual calibration
- . Qualification documentation

Technical Data

Model			WK 111-180	WK111-340	WK 111-600	WK 111-1000	WK 111-1500
Test space volume	I	approx.	190	335	600	990	1540
Test space dimensions	Height	approx.	750	750	960	950	950
in mm	Width	approx.	580/540 ⁽¹⁾	580/540 ⁽¹⁾	800/750 ⁽¹⁾	1100/1050 ⁽¹⁾	1100/1050 ⁽¹⁾
	Depth	approx.	450	765	800	950	1475
Exterior dimensions ⁽¹⁾ in mm	Height	approx.	1775	1775	1975	1975	1975
	Width	approx.	780	780	1000	1300	1300
	Width ⁽²⁾	approx.	870	870	1090	1390	1390
	Depth ⁽³⁾	approx.	1165	1480	1660	1855	2380
	Depth ⁽⁴⁾	approx.	1375	1690	1870	2065	2090
Temperature-working range	°C		-10 ... +90	-10 ... +90	-5 ... +90	0 ... +90	+10 ... +90
Climate working range			← +10 ... +90 °C →				
Temperature deviation – in time			← ±0.1 ... ±0.3 K →				
Temperature deviation – spatial			← ±0.5 ... ±1.0 K →				
Dewpoint temperature range			← +4 ... +89 °C →				
Humidity working range			← 10 ... 98 % r.h. →				
Humidity deviation			← ±1 ... ±3 % r.h. →				
Heating rate ⁽⁵⁾ K/min	approx.		0.6	0.6	0.5	0.4	0.4
Cooling rate ⁽⁶⁾ K/min	approx.		0.3	0.3	0.2	0.2	0.2
Heat compensation at +20 °C			← 200 watt →				
Electrical connection			← 1/N/PE AC 230 V ± 10 %/50 Hz →				
			← shock-proof plug →				
Protection class			← IP 54/IP 22 →				
max. installed load	kW		← 2.3 →				
max. current consumption	A		← 10 →				
Sound pressure level, free-standing							
1 m from the unit	dB (A)		← <47 →				
Condenser			← air-cooled →				
Weight	kg		380	410	540	760	830

The performance data refer to an ambient temperature of +25 °C, 230 V nominal voltage, without specimens.

TYPE	ATM No.
WK111-180	WEI 1404
WK111-340	WEI 1405
WK111-600	WEI 1406
WK111-11000	WEI 1407
WK111-1500	WEI 1408

Length gauge (Elongation Index)

(ATM No.TON 1409)

Grain shape caliper 1:3, DIN 52114, EN 933-4

Made of stainless steel

Thermal Balance L81-II with 2 furnaces

(ATM No. LNS 1410)

The Balance system L81-II is built up with a compensation balance principle. Each change of weight which is resulting in a position change of the balance arm, is detected through an inductive sensor and compensated to zero deflection. This compensation signal is the measuring signal, which leads to a maximum resolution on 1 µg. The built in actuator coils could also be used at the same time for the electronic tare of the balance. There are different measuring systems available for measurements of YG signals only or for simultaneous measurement of TG/DTA or TG/DSC.

Measurements can be made under different atmospheres, reducing, oxidizing or vacuum measurements are possible. A maximum vacuum of 10E-3 mbar can be reached.

In order to measure more samples during one day the well proven balance system L81-II was further enhanced by the use of a dual furnace mounting. With this option there are two furnaces available, which leads to the possibility of up to 8 sample measurements per day.

The system includes the automatic switching of the furnace control, as soon as furnace 1 or furnace 2 is in measuring position*.



ATM No. LNS 1410



Galaxy 5000 - 20 to 120 KVA

(ATM No. MGE 1420)

A new dimension of performance
Ideal protection for medium power data centers and industrial applications
centers: server rooms, communications centers, data storage units, network equipment,

Telecommunications:

PSTN/ISDN infrastructure, cell phone MSCs and OMCs, internet service providers, transmitters, control rooms, editing studios.
industrial: critical continuous processes (mirrors, speed controllers) clean rooms, paint booths, instrumentation, monitoring, controls, safety systems.



ATM No. MGE 1420

High availability

(ATM No. MGE 1430)

- UPS and battery fully replaceable on-line: no interruption of the power supply to the protected equipment during replacement of the UPS or the battery.
- No demand on the batteries over a wide range of input voltages (325 to 445 Volts).
- The UPS can be connected to two independent electrical systems (1/2 common or separate systems).
- Redundancy: with its ability to operate in sequential redundancy mode, the Comet S 31 can be used to control two levels of availability.
- Enhanced protection with the Battery
 - ▷ recharging cycle adjusted to the temperature of the room,
 - ▷ protection against full discharges,
 - ▷ precise measurement of the battery Monitor: capacity,
 - ▷ periodic and automatic tests



ATM No. MGE 1430

Efficiency

Comet S 31, the efficient solution for the centralised protection of multi-user, server-based systems:
can be integrated into any environment,
high mobility: low weight, 4 castors, 4 locking guides.
straightforward connection: high capacity, easily accessible terminal blocks,
simplified operation and indicator system: just 2 ON/OFF buttons with a mimic diagram on the front panel.



Technical characteristics

Comet S 31	5 kVA	7,5 kVA	10 kVA	15 kVA	20 kVA
Active power output (kW)	4	6	8	12	16
Technology	On-line double conversion				
AC power supply input/output					
Input voltage range	315-445 Volts, input 3-phase + neutral, power supply 1 and power supply 2 common or separate				
Input frequency range	47-64 Hz, frequency converter as standard function				
Output voltage/frequency	200/208/230/240/230 Volts/50/60 Hz				
Performance					
Efficiency	91/89	92/89	91/89	93/92	95/92
mains mode / battery mode					
Overload capacity	1.3 to 1.5 in for 10 seconds 1.1 to 1.3 in for 1 minute 1.05 to 1.1 in for 10 minutes				
Permissible crest factor	5:1				
Distortion factor	4 %				
Operating temperature	40°C for 8 hours; 35°C for 24 hours; 0°C to 30°C continuous				
Noise level (dB(A))	45		46		50
Battery discharge times **					
Standard discharge time at 100 % load, integral UPS and batteries *	3 minutes		15 minutes		
Communication					
Port	Sub-D 15 port for LAN communication				
Slot	3 slots for the S 31 communications interface ES232/U-Talk card, GTC card (D-BUS, Monitor Plus terminal)				
Options					
Enhanced filtering	Filtering option **				
Electrical insulation	Optional isolation transformer *				
Standards and certifications					
Performance and topology	EN 50091-3				
EMC	EN 55011/022 level A				
Certification	CE; TÜV				
Design and manufacture	ISO 9001				
Connection to input/output terminal block (optional PDU terminal strip)					
Flexible cables	4 mm²		10 mm²		35 mm²
Rigid cables	6 mm²		16 mm²		35 mm²
Dimensions of the modules, H x L x D (mm)					
UPS with integral batteries	790 x 560 x 420	910 x 420 x 550		1055 x 560 x 480	
Weight (kg) of UPS with integral batteries					
Without packaging	61	175	205	370	450
With packaging	94	191	221	418	476

Vacuum Pumps

(ATM NO. EL 1480)

Specification

type: VT4 , 4W, 220-240 V, 4....4.7m³/ h.

-0,85 bar/ max. + 1 bar, 50/60 Hz

1,65 A, IP 54, Isk. F, 0,18/0,21 kW

With exhaust valve.

With vacuum regulating valve.



Unit weight measures

(ATM No. MAT 1485)

STANDARDS: ASTM C29, C138 - AASHTO T19 - UNI 6394
UNE 7286 - BS 812, 1881 - EN 1097/3 Made from heavy steel sheet, protected against corrosion, they are used to determine the weight per cubic metre of freshly mixed and compacted concrete, and as per ASTM Standards also the air content of fresh concrete* Used also for the determination of loose bulk density and voids of aggregates.



ATM No. MAT 1485

Models	Capacity Litres	Inside diameter mm	Useful height mm	Sheet thick mm	Weight Kg
C200	1	108,3	108,6	3	2
C201	2	108,3	217,1	3	3
C201-01	3	160	149,2	3	3,5
C202	5	187,7	180,7	3	4
C202-01	7	187,7	253	3	5
C203	10	265	181,3	4	7
C204	14	265	253,8	4	9
C204-01	15	265	272	4	12
C205	28	345,6	298,5	5	14
C205-01	30	345,6	319,8	5	15

TYPE	ATM No.
C200	MAT 1486
C201	MAT 1487
C201-01	MAT 1488
C202	MAT 1489
C202-01	MAT 1490
C203	MAT 1491
C204	MAT 1492
C204-01	MAT 1493
C205	MAT 1494
C205-01	MAT 1495

Concrete penetrometer

(ATM No. MAT 1500)

C213

Standards: ASTM C 403 »AASHTO T197 ~
UNI 7123, 7927 Used to determine the setting time
of the mortar fraction in concrete mixes with slump
greater than zero, by testing mortar sieved from mix.
The apparatus consists of a spring penetrometer
(capacity 100 Kgf precision 1 Kgf) and six interchan-
geable stainless steel needle pointers of
16 32 65-160-325-650 mm² area.
A sliding ring indicates the reached load on the
handle of the penetrometer. Supplied
complete with carrying case.
Dimensions: 450x160x70 mm. Weight: 5 Kg



ATM No. MAT 1500

Concrete pocket penetrometer

(ATM No. MAT 1510)

C194

STANDARDS: UNI 7123 ASTM C403 - AASHTO

T197 Used for the evaluation of the initial set of the concrete mortar. The penetration plunger has a tip area of 32 sq/mm. It is plunged into the mortar to a depth of 25,4 mm, indicated on the plunger. The resistance expressed in Kpa and lbf/sq in is shown on the marked direct-reading scale.

Dimensions: dia. 25x210 mm Weight 400 g



ATM No. MAT 1510

Lightweight dynamic penetrometer

acc. to DIN 4094

(ATM No. 1520)

consisting of:

- * Guiding rod with rubber handle
- * Rammer with anvil
- * Base plate with shot extractor and pullout tool
- * 6 sounding rods a 1 m, 22 mm
- * Drive point 90° 5 cm
- * 7 threaded nipples M16
- * 2 flat spanner SW19
- * 1 socket wrench SW 8
- * In wooden case



ATM No. 1520

Concrete permeability Tester

(ATM No. TON 1530)

Water impermeability test in compliance with

EN 12390-8, DIN 01048, ISO 7031 and ENV 206 with quantitative measurement of water penetration for concrete specimens 200x200x200mm and 200x200x120mm up to max. 10 bar working pressure. Compact design with three test places.

Quick clamping of the specimens with central threaded spindle mounted at the top. Separate locking for each test place possible. Clamping spindles, clamping plate and water collecting basin in stainless steel. Special knop ring sealing for tightening the places, W x T x working height: 1200 x 500 x 935 mm

* compressor, low noise up to 8 bar, permanent 8 bar 230 V, 50 Hz

General Requirements

Chemicals

(ATM No.2000) according to the requirement

Crucible Made Of Pt5Au

(ATM No.1556)

Glasses

(ATM No.WTG 3000) according to the requirement



Agate Mortars with pestle
, standard quality



Beakers



Griffin beakers



Brushes



Crucible



Desiccators
Desiccators "NOVUS",



Desiccators plates,



Erlenmeyer flask



Funnels
Filter funnels,
Hirsch funnels



Buechner funnels,
with slit sieves.



Filter funnels,
Hirsch funnels



Evaporating dishes,



Rubber
Rubber stoppers,



Rubber rings,
new, with rim for
improved placement.



scoops

Complete Kit Of Organic Impurities In Fine Sggregates For Concrete

(ATM No. MAT 1565)

S138

ORGANIC MATTER TEST SET.

STANDARD: BS 1377

Formed by different bottles, reagents and accessories to perform about 50 tests for each of the soil factors on the following tests: pH - pH Nitrate - Ammonia - Nitrate Nitrogen etc.

Cube Mould

(ATM NO. MAT 1570)

cast iron. 5 parts

sample size: 150 x 150 x 150 mm

Cube Mould 70,7 Mm

(ATM No. MAT 1571)

E133

STANDARD: BS 4550

Made from steel with dimensions as specified by above Standar Complete with base plate (three moulds required for each test).

Weight: 3 Kg

(ATM No. MAT 1572)

E 114

Standard; Uni 8148

Three gang prism mould to produce 80x80x240 mm specimens for the determination of restrained expansion of a concrete containing the expansive agent.

Complete with three screwed rods and six restrained end plates, Weight: 15 Kg

(ATM No. MAT 1573)

E114-02

Restrained end plate 80x80 mm; spare to the E114 mould.

(ATM No. MAT 1574)

E115

STANDARD: UNI 8147

Three gang prism mould to produce 50x50x250 mm specimens for the determination of restrained expansion of a mortar containing the expansive agent, and the effect of the aggregates on the drying shrinkage of concrete.

Complete with three screwed rods and six restrained end plates, Weight 10 Kg

(ATM No. MAT 1575)

E 115-01

Steel screwed rod 280 mm long; spare to the E114 and E115 moulds

(ATM No. MAT 1576)

E115-02

Restrained end plate 50x50 mm; spare to the E115 mould.



(ATM No. MAT 1576-1)

E112

Three gang mould for prisms

70x70x280 mm

STANDARD: NF P18-401

Made from steel, it conforms to the above mentioned Specification. Weight: 17 Kg



(ATM No. MAT 1577)

E111

Briquette mould

STANDARDS: ASTM C190, C307 - AASHTO T132

Accurately machined It conforms to the above Specifications and is easily collapsible. Complete with base, Weight: 3 Kg

(ATM No. MAT 1578)

E110

50 mm three gang cube mould

standard : ASTM C109 - ASHTO T106

Made from steel, hardness 55 HRB, it can be also used for soil and other materials. Weight: 7 Kg

MOULDS FOR SOUNDNESS (EXPANSION) AND SHRINKAGE TESTS

Available models:

(ATM No. MAT 1579)

E106 FEED HOPPER, used to fill the mould E100, E102, E103, E104, E105 when it is mounted on the jolting machine E130. Made from cast aluminum. Weight: 1 Kg.

(ATM No. MAT 1580)

E102-02 LARGE AND SMALL SCRAPER to EN 190/1

(ATM No. MAT 1581)

E200-11 STRAIGHT EDGE 300 mm. long

(ATM No. MAT 1582)

E102-03 GLASS PLATE 220x190x6 mm to cover the mould

(ATM No. MAT 1583)

E100

Three gang mould for prisms 40x40x160 mm

STANDARDS: UNI 6009 - DM, 3/6/68 - UNE 80101, 83258

Made from Cr/Ni steel, hardness 60 HRC,

It is supplied complete with base, stop lever and safety catch to avoid disengagement during the Jolting operation. All parts are marked with an identification number for a correct assembling; surfaces are grinded and tolerance is held within 0,1 mm. as requested by Standards,

Weight: 12,7 Kg



Three gang mould for prisms

(ATM No. MAT 1584)

E102

40,1 x 40 x 160mm STANDARD: EN 196/1

Manufactured from steel with hardness over 200 HV, it meets the dimensional tolerances to EN 196/1 Standard. all surfaces are grinded and all parts are marked with an identification number for a correct assembling. A part-number is engraved on each mould and a Certificate of Conformity is supplied along with. Weight 8560 g.

Three gang verified mould for prisms

(ATM No. MAT 1585)

E104

40,1 x 40 x 160mm

"Ital cement model "STANDARD: EN 196/1 Similar to mod

E103, but with:-

Larger base 240 x 245 mm-Weight: 11,850 Kg Manufactured expressly for "Italcementi Group" cement factory.

Three gang mould for prisms

(ATM No. MAT 1586)

E105

40x40x160 mm

STANDARDS: NF P15-413 -ASTM C348 - DIN 1164, 1060Made from steel, hardness 55 HRB, it conforms to the above mentioned specifications

Weight 8 Kg



Sieves

(ATM NO. MAT4000)

STANDARDS: ASTM E 11 - AASTHO T27 - BS 410 - NF X11-504 - ISO 3310 - DIN 4187/1 - EN 933-1, 933-2 - UNI 2331, 2333 - UNE 7050

All Sieves are made with stainless steel woven wire and frame and meet International Specifications. The Sieves are available in the following diameters* 200 - 250 - 300 - 315 - 400 - 450 mm and 8-12

*.HOW TO BUY WOVEN WIRE MESH SIEVES The available openings of the woven wire mesh sieves are listed in the next pages and are coded from n° 01 to 77. The buyer has to add to this number:

A052-... for the frame dia. 200 mm
A051-... for the frame dia. 250 mm
A053-... for the frame dia. 300 mm
A054-... for the frame dia. 315 mm
A055-... for the frame dia. 400 mm
A044-... for the frame dia. 450 mm
A050-... for the frame dia. 8"
A043-... for the frame dia. 12"

HOW TO BUY PERFORATED PLATE SIEVES. "Square Hole" STANDARDS: ASTM E11 - BS 410 - ISO 3310 - DIN 4187/1 EN 933-2

The available openings of the perforated plate square hole sieves are listed in the next page, and are coded from n° 01 to 31
The buyer has to add to this number:

The buyer has to add to this number:

A031-... for the frame dia. 200 mm
A032-... for the frame dia. 300 mm
A033-... for the frame dia. 400 mm
A034-... for the frame dia. 450 mm

NOTE: EN 933-2 Standard specifies that "sieves with opening 4 mm and over shall be perforated plate square hole". Below 4 mm they shall be woven wire.

HOW TO BUY PERFORATED PLATE SIEVES, "Round Hole" STANDARD:

UNI 2334The available openings of the perforated plate round hole sieves are listed in the next page, and are coded from n° 01 to 33The buyer has to add to this number

A037-... for the frame dia. 200 mmA038-... for the

frame dia. 300 mmA041 "NAMAS" certificate for "MASTER" Sieves,

All Sieves can be supplied with NAMAS certificate so to be classified "MASTER SIEVE".



NOTE:

It is possible to test approx. 1000 g, of material by using 200 mm dia sieves;
and 3000 g with
300) mm dia sieves.



Table for the woven wire mesh sieves:

Aperture Size mm	ASTM Number	Frame Dia. 200 mm	Frame Dia. 8"	Frame Dia. 300 mm	Frame Dia. 400 mm	Frame Dia. 450 mm
0.030	400	A052-01	A050-01	A053-0	A055-01	A044-0
0.040	-	A052-02	A050-02	A053-02	A055-02	A044-02
0.045	325	A052-03	A050-03	A053-03	A055-03	A044-03
0.050	-	A052-04	A050-04	A053-04	A055-04	A044-04
0.053	270	A052-05	A050-05	A053-05	A055-05	A044-05
0.063	230	A052-06	A050-06	A053-06	A055-06	A044-06
0.075	200	A052-07	A050-07	A053-07	A055-07	A044-07
0.080	-	A052-08	A050-08	A053-08	A055-08	A044-08
0.090	170	A052-09	A050-09	A053-09	A055-09	A044-09
0. 09	-	A052-10	A050- 0	A053-10	A055-10	A044-10
0. 09	140	A052-11	A050- 1	A053-1	A055-11	A044-1
0. 25	120	A052-12	A050- 2	A053-12	A055-12	A044-12
0. 50	100	A052-13	A050- 3	A053-13	A055-13	A044-13
0. 60	-	A052-14	A050- 4	A053-14	A055-14	A044-14
0. 80	80	A052-15	A050- 5	A053-15	A055-15	A044-15
0.200	-	A052-16	A050- 6	A053-16	A055-16	A044-16
0.212	70	A052-17	A050- 7	A053-17	A055-17	A044-17
0.250	60	A052-18	A050- 8	A053-18	A055-18	A044-18
0.300	50	A052-19	A050- 9	A053-19	A055-19	A044-19
0.315	-	A052-20	A050- 20	A053-20	A055-20	A044-20
0.360	-	A052-21	A050-21	A053-2	A055-21	A044-2
0.365	45	A052-22	A050-22	A053-22	A055-22	A044-22
0.400	-	A052-23	A050-23	A053-23	A055-23	A044-23
0.425	40	A052-24	A050-24	A053-24	A055-24	A044-24
0.500	35	A052-25	A050-25	A053-25	A055-25	A044-25
0.600	30	A052-26	A050-26	A053-26	A055-26	A044-26
0.630	-	A052-27	A050-27	A053-27	A055-27	A044-27
0.710	25	A052-28	A050-28	A053-28	A055-28	A044-28
0.800	-	A052-29	A050-29	A053-29	A055-29	A044-29
0.850	20	A052-30	A050-30	A053-30	A055-30	A044-30
1.000	18	A052-31	A050-31	A053-3	A055-31	A044-3
1. 30	16	A052-32	A050-32	A053-32	A055-32	A044-32
1.250	-	A052-33	A050-33	A053-33	A055-33	A044-33
1.400	14	A052-34	A050-34	A053-34	A055-34	A044-34
1.600	-	A052-35	A050-35	A053-35	A055-35	A044-35
1.700	12	A052-36	A050-36	A053-36	A055-36	A044-36
2.000	10	A052-37	A050-37	A053-37	A055-37	A044-37
2.360	8	A052-38	A050-38	A053-38	A055-38	A044-38
2.500	-	A052-39	A050-39	A053-39	A055-39	A044-39
2.800	7	A052-40	A050-40	A053-40	A055-40	A044-40
3. 50	-	A052-41	A050-41	A053-4.	A055-41	A044-4
3.360	6	A052-42	A050-42	A053-42	A055-42	A044-42
4.000	5	A052-43	A050-43	A053-43	A055-43	A044-43
4.750	4	A052-44	A050-44	A053-44	A055-44	A044-44
5.000	-	A052-45	A050-45	A053-45	A055-45	A044-45
5.600	3.5	A052-46	A050-46	A053-46	A055-46	A044-46
5.350	1-4"	A052-47	A050-47	A053-47	A055-47	A044-47
6.700	0.265"	A052-48	A050-48	A053-48	A055-48	A044-48
7. 00	-	A052-49	A050-49	A053-49	A055-49	A044-49
8.000	5-16"	A052-50	A050-50	A053-50	A055-50	A044-50

ATM 1100 - 1100 1100

Aperture Size mm	ASTM Number	Frame Dia. 200 mm	Frame Dia. 8"	Frame Dia. 300 mm	Frame Dia. 400 mm	Frame Dia. 450 mm
9,500	3-8"	A052-51	A050-5	A053-51	A055-51	A044-51
10,0	-	A052-52	A050-52	A053-52	A055-52	A044-52
11,2	7-16"	A052-53	A050-53	A053-53	A055-53	A044-53
12,5	1-2"	A052-54	A050-54	A053-54	A055-54	A044-54
13,2	0,530"	A052-55	A050-55	A053-55	A055-55	A044-55
14,0	-	A052-56	A050-56	A053-56	A055-56	A044-56
16,0	5-8"	A052-57	A050-57	A053-57	A055-57	A044-57
19,0	3-4"	A052-58	A050-58	A053-58	A055-58	A044-58
20,0	-	A052-59	A050-59	A053-59	A055-59	A044-59
22,4	7-8"	A052-60	A050-60	A053-60	A055-60	A044-60
25,0	-	A052-61	A050-6	A053-61	A055-61	A044-61
25,4	1"	A052-62	A050-62	A053-62	A055-62	A044-62
26,5	1,06"	A052-63	A050-63	A053-63	A055-63	A044-63
28,0	-	A052-64	A050-64	A053-64	A055-64	A044-64
31,5	1 1/4"	A052-65	A050-65	A053-65	A055-65	A044-65
37,5	1 1/2"	A052-66	A050-66	A053-66	A055-66	A044-66
40,0	-	A052-67	A050-67	A053-67	A055-67	A044-67
45,0	1 3/4"	A052-68	A050-68	A053-68	A055-68	A044-68
50,0	2"	A052-69	A050-69	A053-69	A055-69	A044-69
53,0	2,12"	A052-70	A050-70	A053-70	A055-70	A044-70
63,0	2 1/2"	A052-71	A050-7	A053-71	A055-71	A044-71
75,0	3"	A052-72	A050-72	A053-72	A055-72	A044-72
80,0	-	A052-73	A050-73	A053-73	A055-73	A044-73
90,0	3 1/2"	A052-74	A050-74	A053-74	A055-74	A044-74
100,0	4"	A052-75	A050-75	A053-75	A055-75	A044-75
106,0	4,24"	A052-76	A050-76	A053-76	A055-76	A044-76
125,0	5"	A052-77	A050-77	A053-77	A055-77	A044-77

A048-15 (ATM No.MAT 4904)

Gauge for aggregate Flatness index

STANDARD: UNI 8520 part. 18

Used to determine the volume of each circumscribed sphere.
Made in heavy brass sheet.



A048-15

ATM No.MAT 4904

Flakiness sieves (ATM No.MAT 4900)

STANDARD: BS 812

Used to determine if aggregate is flaky, i.e. if thickness is less than 0.6 of nominal size. Manufactured from heavy steel sheet, they have dimensions as specified by Standards and are available in the following size openings:



A049

ATM No.MAT 4900

A049 Complete set of n°7 flakiness sieves.
Weight: 15 Kg

Model	Slot width mm	Slot length mm
A049-01	4,9	30
A049-02	7,2	40
A049-03	10,2	50
A049-04	14,4	60
A049-05	19,7	80
A049-06	26,3	90
A049-07	33,9	100

A071

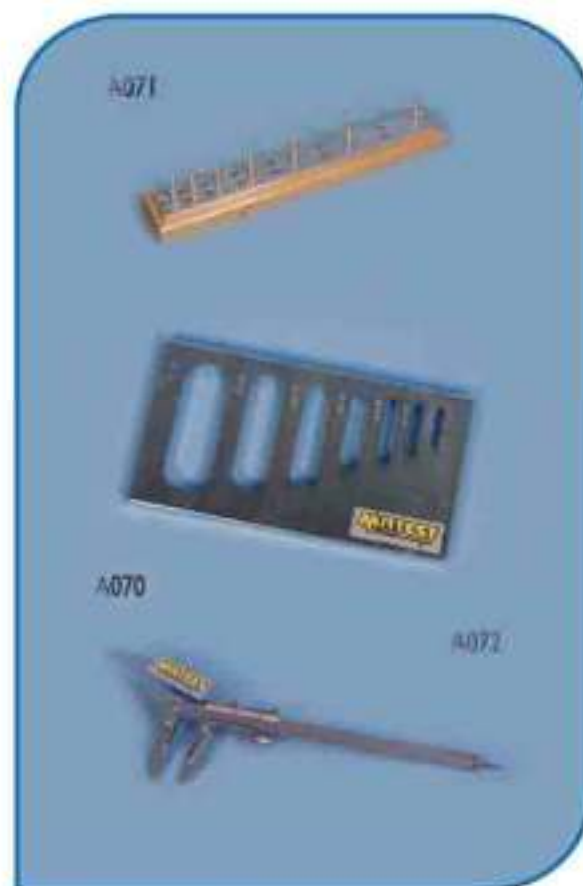
Length gauge (ATM No.MAT 4901)

STANDARD: BS 812

To determine if aggregate is elongated, i.e. if length is more than 1,8 of nominal size.

Mounted on a hardwood base.

Weight: 1 Kg



A071

A070

A072

A070

Flakiness/thickness gauge

STANDARD: BS 812

To verify if aggregate is flaky, i.e. if its thickness is less than 0.6 of its nominal size.

Constructed of heavy gauge stainless steel sheet.

Weight: 600 g

A072

Shape gauge

STANDARDS: EN 933-4 - DIN 4226 - CNR 95 - ISO 3310-1-2

For measuring the length/thickness ratio of individual particles.

Weight: 500 g

ATM No.MAT 4901-2-3

Transportation System

Air Tube Systems for Sample Transport

(ATM No.HER 5600)

Air tube systems are commonly used in basic industries for the transport of powder- and metal samples. The samples are taken from the process in the plant and send to the laboratory for preparation and analysis.

Pressurized air drives the transport carriers through the transport tubes. HERZOG uses steel tubing with a smooth inner surface, and carriers made of steel or a synthetic material that do not require a leather end cap seal. The transportation speed is a direct function of carrier back pressure and change in vertical elevation.



Airtube components

In simple systems the sample is placed into the carrier and the introduction of the carrier into the system is manually. HERZOG supplies manually operated sending- and receiving stations of a robust design for industrial use.



Manual station HR-HSK/B

The tubes from two or three separate sending stations in the plant can be joined by means of tube diverters to one tube and one receiving station in the laboratory. The diverters are gear motor driven integrated in a closed steel housing and can be installed in areas of difficult environmental conditions.



Two way diverter HR-W2

In more complex automated systems samples are taken automatically from the process stream. HERZOG supplies different types of in-line samplers for various applications.



Screw sampler HR-SN

The output of the samplers is connected to an automatic sending station. These stations are available with integrated mixers, sample splitters and dosing devices and can have a built-in compressor for the control air to be independent from the plant air. Optional integrated heaters allow for installation in areas of low temperatures.



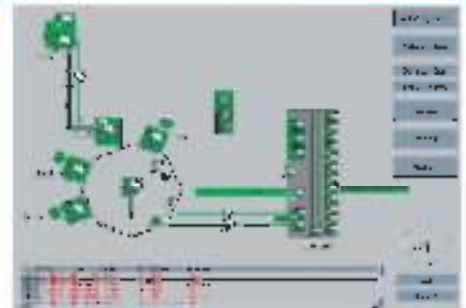
Plant station HR-BM

Especially designed for automated steel plant and cement plant laboratories and robot laboratories receiving stations with multiple incoming lines are available. The samples are automatically unloaded from the carriers and transported to the preparation machines.



Lab station HR-LD6

To keep track of all samples in the system and to arrange priorities between samples special control software HERZOG-Prepmaster has been developed



Prepmaster

Environmental Equipment

Ambient Air Dust SHC500, Gravimat

(ATM No.SCK 6010)

Mobile dust measuring system

For control and gravimetric comparison measurements on dust concentration monitors. A partial gas flow is sucked off isokinetically via a filter head probe (control in real time). The dust content is determined by weighting the dust collector mass before and after extraction.

Measuring values	Dust concentration in mg/m ³ (operation state, standard state)
Measuring range	0 ... 50,000 mg/m ³
Measurement principle	Gravimetry
Compliance	VDI Guideline 2066, ISO 9096, EN 13284-1, EPA method 17
Protection category	IP 54 (automatic unit open; closed IP 65)
Interface	RS232
System modules	Filter head probe, case with set of dust collectors, automatic unit, (laptop)
Test function	Self-testing function
Remarks	<p>Compact measuring system, easy to transport</p> <p>No dust loss at the handling by patented dust sampling system. Allows high measuring precision also at low dust concentrations.</p> <p>Automatic test value recording, system control and measurement storage.</p> <p>Real time isokinetic control</p> <p>Measurement results are immediately available after dust sampling (type) dependent also automat</p>

Dust collector

LC collectors for low

(0.1 ... 200mg/m³)

HC collectors for high

(50 ... 50,000 mg/m³)

filter head probe GS5

Probe head with integrated support for the dust collector, pressure measuring openings for isokinetic control of the extraction process, and a PT100 sensor for precise measurement of the exhaust gas temperature



ATM No. SCK 6010

AMBIENT AIR DUST

(ATM NO. TS 6015)

The DUSTTRAK™ Aerosol Monitor is a portable, battery-operated laser photometer with real-time mass concentration readout and data logging capability. The monitor provides reliable exposure assessment by measuring particle concentrations corresponding to respirable size, PM10, PM2.5 or PM1.0 size fractions.

Suitable for clean office settings as well as harsh industrial workplaces and outdoor applications, the aerosol monitor detects potential problems with airborne contaminants such as dust, smoke, fumes and mists. The DUSTTRAK aerosol monitor is easy to use. You can perform quick spot checks or program the advanced logging modes for long-term unattended sampling



ATM NO. TS 6015

Features and Benefits

- Integrated pump allows use of size-selective aerosol inlet conditioners
- Measure particle concentrations corresponding to respirable, PM10, PM2.5 and PM1.0 size fractions
- Displays real-time concentration (mg/m³) during sampling
- Display statistics: max, min. and average readings and elapsed time
- Alarm setpoint from 0.002 to 100 mg/m³
- Analog output allows remote access to real-time particle concentration data
- Sheath air system keeps optics chamber clean for improve reliability and low maintenance
- Preprogram, analyze data, print graphs and create report with TRAKPRO™ Data Analysis Software

Applications

- Ambient/work area monitoring
- Site perimeter monitoring/environmental sampling
- Indoor air quality studies
- Trending/screening
- Engineering studies

Included Items

- DUSTTRAK Aerosol Monitor
- 10-mm Dorr-Oliver cyclone and impactor kits
- TRAKPRO™ software CD and RS-232 computer cable
- Zero filter, sample tube and misc. service tools
- Power supply
- Analog and alarm outputs and connector cable
- Carry case
- Alkaline batteries
- Calibration certificate
- Operation and Service Manual

Gas Analyser MCS100EHW

(ATM No. SCK 6020)

Complete multi-component analysis system with the MCS100 E

System variants

MCS100 E-HW with high-temperature measuring technology for refuse incineration plants
MCS100 E-PD with gas dryer (permeation dryer)

for recording extremely small measuring ranges MCS100 E-CD with gas cooler for power stations.

Applications

Stack gas monitoring at waste incineration plants, power plants, steel plants, cement plants and industrial processes.

Technical specification

Measuring components	MCS100 E-HW: HCl, SO ₂ , CO, NO, NH ₃ , H ₂ O, CO ₂ , O ₂ MCS100 E-PD: HCl, SO ₂ , CO, NO ₂ , CO ₂ , O ₂ MCS100 E-CD: SO ₂ , CO, NO, NO ₂ , CO ₂ , O ₂ , N ₂ O, CH ₄ . etc.
Number of components	According to customer's specification, max. 8 plus O ₂ , FID possible
Ambient temperature	5 °C ... 35 °C
Approvals	MCS100 E-HW: Federal German Pollution Control Act (13th/17th Implementing Ordinance)EPA MCS100 E-PD: Federal German Pollution Control Act (13th/17th Implementing Ordinance)
Protection category	IP 54
Interfaces	optional RS232, Modbus-Protocol, Modem-Connection
Measured value output	0/4 ... 20 mA optional
Status / control signals	Maintenance, Error. Other as option
System structure	MCS100 E-HW: Hot measurement technique MCS100 E-PD: with permeation dryer MCS100 E-CD: with gas cooler
Dimensions (W x H x D)	800 mm x 2100 mm x 600 mm
Remarks	System engineering: we do not only supply the systems, but even provide engineering solutions from the measurement of industrial processes to complex emission monitoring systems. This includes turnkey solutions such as personnel accessible containers



ATM No. SCK 6020

GA 40Tplus Flue gas analyser

(ATM No. MAD 6030)

Operating data

Power supply 230V, 50 Hz or 110V, 60 Hz.

Up to 4 hours from

the Internal rechargeable battery

Battery charging time 10 hours

Operating temperature range 10 °C to 50 °C

Storage temperature range -20 °C to +55 °C

Dimensions 485 x 295 x 205 mm

Weight 10 kg



ATM No. MAD 6030

Options

external ambient air temperature sensor with connection cable gas flow velocity measurement two analogue outputs (0/4 20 mA)

Value	Measuring method	Range	Resolution
O - oxygen	electrochemical cell	0..25%	0.01%
CO 2 carbon dioxide	calculated	0..25%	0.01%
CO - option 2 carbon dioxide	IR sensor	0..100%	0.01%
CO - carbon monoxide	electrochemical cell	0..20000ppm	1ppm
NO/NO x nitric oxide	electrochemical cell	0..5000ppm	1ppm
CH4- methane - option	IR sensor	0..5%	0.01%
NO2, SO2, H2S - option	electrochemical cell	sensor dependent	1ppm
Smoke determination	Bacharach's comparative method	0...9	1
T - gas Flue-gas temperature	thermocouple	0..1600°C	1°C
T - amb Ambient temperature	thermistor	0..100°C	1°C
Lambda - Excess air number	calculated	1..50	0.01
SL - Stack loss	calculated	0..100%	0.1%
Eta - Efficiency	calculated	0..120%	0.1%
Draught / pressure / differential pressure	piezoresistive bridge sensor	50hPa..+50hPa	0.1Pa
V - gas flow velocity	Pitot tube	1..30m/s	0.1m/s

GAS ANALYSER Dx-4000N (ATM No. GAS 6035)



Portable Multi Component FTIR Gas Analyzer

GASMET ON-SITE SERIES includes portable multi component gas analysers for demanding applications. The GASMET Dx-4000N incorporates a Fourier Transform Infrared, FTIR spectrometer, a temperature controlled sample cell, and signal processing electronics. The analyzer offers versatility and high performance for all users.

The GASMET Dx-4000N is designed for on site measurements at low concentrations. It is an ideal tool to measure trace concentrations of pollutants in wet, corrosive gas streams. The sample cell can be heated up to 180 °C. Sample cell absorption path length is selected according to the application.

The GASMET Dx-4000N allows simple calibration using only single component calibration gases. The user can easily configure the analyzer for a new set of compounds.

General parameters

Measuring principle:	Fourier Transform Infrared, FTIR
Performance:	simultaneous analysis of up to 50 gas compounds
Response time, T_{90} :	typically < 120 s, depending on the gas flow and measurement time
Operating temperature:	short term: $20 \pm 20^\circ\text{C}$ long term: $15 - 25^\circ\text{C}$ non condensing
Storage temperature:	$-20 - 60^\circ\text{C}$, non condensing
Power supply:	100-115 or 230 V / 50-60 Hz
Power consumption:	300 W

Spectrometer

Resolution:	recommended 8 cm^{-1} or 4 cm^{-1}
Scan frequency:	10 scans / s
Detector:	Peltier cooled MCT
Source:	SiC, 1550 K
Beamsplitter:	ZnSe
Window material:	ZnSe
Wavenumber range:	$900 - 4\,200\text{ cm}^{-1}$

Sample Cell

Structure:	Multi-pass, fixed path length 5.0 m
Material:	100 % Rhodium coated aluminium
Mirrors:	fixed, protected gold coating
Volume:	0.5 l
Connectors:	Swagelok (6 mm in, 8 mm out)
Gaskets:	Viton® O-rings
Temperature:	180 °C, maximum
Window material:	BaF ₂

Measuring parameters

Zero point calibration:	24 hours, calibration with nitrogen (4.0 or higher N ₂ recommended)
Zero point drift:	< 2 % of measuring range per zero point calibration interval
Sensitivity drift:	none
Linearity deviation:	< 2 % of measuring range
Temperature drifts:	< 2 % of measuring range per 10 K temperature change
Pressure influence:	1 % change of measuring value for 1 % sample pressure change. Ambient pressure changes measured and compensated

Electrical Connectors:

Digital interface:	9-pole D-Connector for RS-232 Analyzer is connected to an external computer via RS-232C cable. The external computer controls the GASMET. Remote control connection for Portable sampling unit
Power connection:	Standard plug CEE-22

Gas Inlet and Outlet Conditions

Gas temperature:	non-condensing, the sample gas temperature should be the same as the sample cell temperature
Flow rate:	120 - 600 l per hour
Gas filtration:	filtration of particulates (2µ) required
Sample gas pressure:	ambient
Sample pump:	external, not included

Electronics

A/D Converter:	dynamic range 95 dB
Signal Processor:	32-bit floating point DSP 120 MFLOPS speed
Computer:	external, not included

Analysis Software (for external PC)

Operating system:	Windows XP
Analysis software:	CALCMET for Windows

Options

Sample Cell:	Multi-pass, fixed path length 5.0 m, or 2.5 m or 9.8 m
Analog Signals (ext PC):	PCMCIA card for 8 analog inputs
Sample cell gaskets:	Teflon® coated Viton® or Kalrez®
Connector:	Remote Control of Sampling System (Pump, Zero Valve) or 12 V DC input (cell temp. max 50 °C)
Trolley:	Wheeled cart for the analyzer and laptop computer

Enclosure

Material:	Aluminium
Dimensions (mm):	39 * 16 * 45 cm
Weight:	13.9 kg
CE - Label:	according to EMI guideline 89/336/EC



GAS PRESSURE AND TEMPERATURE DEVICE

(ATM No.DEL 6040)



ATM No.DEL 6040

MICROMANOMETER - THERMOMETER HD2114.0, HD2114.2, HD2134.0, HD2134.2, HD2164.0, HD2164.2 BAROMETER - THERMOMETER HD2114B.0, HD2114B.2

These are portable instruments with a large LCD display. They measure absolute, relative and differential pressure, as well as temperature.

Pressure is measured using an internal module which is differential with respect to the atmosphere with fixed full scale. With the PP471 module acting as an interface, the instrument can use all the TP704 and TP705 series Delta Ohm probes to perform the measurements. The HD2114B.0 and HD2114B.2 internal module measures the barometric pressure.

The temperature is detected using immersion, penetration, contact or air probes, with SiCRAM module or direct 4 wire probes. The sensor can be a Pt100, Pt1000 or Ni1000. The temperature probes are fitted with a SiCRAM module, with the factory calibration settings already being logged inside. On being turned on the instrument automatically detects these settings.

The HD2114.2, HD2134.2, HD2164.2 and HD2114B.2 instruments are **data-loggers**. They memorize up to 36,000 samples which can be transferred from the instrument connected to a PC via the multi-standard RS232C serial port and USB 2.0. The storing interval, printing, and baud rate can be configured using the menu. They are also fitted with an RS232C serial port and can transfer the acquired measurements to a PC or to a portable printer in real time.

The Max, Min and Avg function calculates the maximum, minimum or average values. The Peak function can be activated with external probes connected to the module PP471 and detects the presence of pressure peaks. Other functions include: the relative measurement REL, the HOLD function, and the automatic turning off which can also be disabled.

The instruments have IP67 protection degree.

INSTRUMENT TECHNICAL CHARACTERISTICS

Instrument

Dimensions (Length x Width x Height)	185x90x40mm
Weight	470g (complete with batteries)
Materials	ABS, rubber
Display	2x4 1/2 digits plus symbols Visible area: 52x42mm

Operating conditions

Working temperature	-5...50°C
Storing temperature	-25...65°C
Working relative humidity	0...90%RH without condensation
Protection degree	IP67

Power

Batteries	4 1.5V type AA batteries
Autonomy	200 hours with 1800mAh alkaline batteries

Power absorbed with instrument off	20µA
Mains - models HD21...4.2	Output mains adapter 9Vdc / 250mA

Measuring unit	°C - °F - Pa - hPa - kPa - mbar - bar atm - mmHg - mmH ₂ O - kgf/cm ² - PSI inchHg
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Security of logged data	Unlimited, independent of battery charge conditions
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Time	
Date and time	Schedule in real time
Accuracy	1min/month max departure

Measured values storage - models HD21...4.2	
Type	2000 pages containing 18 samples each
Quantity	36000 samples [pressure - temperature]
Storage interval	1s...3600s (1hour)
Serial interface RS232C - models HD21...4.2	
Type	RS232C electrically isolated
Baud rate	Can be set from 1200 to 38400 baud
Data bit	8
Parity	None
Stop bit	1
Flow Control	Xon/Xoff
Serial cable length	Max 15m
Immediate print interval	1s...3600s (1hour)

USB interface - models HD21...4.2	
Type	1.1 - 2.0 electrically isolated

Connections	
Input modules for the probes	2 quick couplings Ø 5mm
Serial and USB interface models HD21...4.2	8-pole MiniDin connector
Mains adapter - models HD21...4.2	2-pole connector (positive at centre)



HD2110CSNM



	HD2114.0	HD2134.0	HD2164.0	HD2114B.0	HD2114.2	HD2134.2	HD2164.2	HD2114B.2
Full scale	±20mbar	±200mbar	±2000mbar	600...1100mbar	±20mbar	±200mbar	±2000mbar	600...1100 mbar
Barometer	-	-	-	YES	-	-	-	YES
Datalogger	-	-	-	-	YES	YES	YES	YES
RS232C-USB	-	-	-	-	YES	YES	YES	YES
External power supply	-	-	-	-	YES	YES	YES	YES

PRESSURE PROBE TABLE								
Full scale pressure	Maximum overpressure	Resolution	ORDER CODES			Accuracy From 20 to 25°C	Functioning temperature	Connection
			Differential pressure	Relative pressure (compared to atmosphere)	Absolute pressure			
			NON insulated membrane	Insulated membrane	Insulated membrane			
10.0 mbar	20.0 mbar	0.001 mbar	TP705-10MBD			0.50 % FSO	0...60°C	Tube Ø 5mm
20.0 mbar	40.0 mbar	0.001 mbar	TP705-20MBD			0.50 % FSO	0...60°C	Tube Ø 5mm
50.0 mbar	100 mbar	0.001 mbar	TP705-50MBD			0.50 % FSO	0...80°C	Tube Ø 5mm
100 mbar	200 mbar	0.01 mbar	TP705-100MBD			0.25 % FSO	0...60°C	Tube Ø 5mm
200 mbar	400 mbar	0.01 mbar	TP705-200MBD			0.25 % FSO	0...60°C	Tube Ø 5mm
				TP704-200MBGI		0.25 % FSO	0...80°C	¼ BSP
500 mbar	1000 mbar	0.01 mbar	TP705-500MBD			0.25 % FSO	0...60°C	Tube Ø 5mm
				TP704-500MBGI		0.25 % FSO	0...80°C	¼ BSP
1.00 bar	2.00 bar	0.1 mbar	TP705-1BD	TP705BARO		0.25 % FSO	0...60°C	Tube Ø 5mm
				TP705-1BGI		0.25 % FSO	0...80°C	¼ BSP
2.00 bar	4.00 bar	0.1 mbar	TP705-2BD			0.25 % FSO	0...60°C	Tube Ø 5mm
				TP704-2BGI	TP704-2BAI	0.40 % FSO	0...80°C	¼ BSP
5.00 bar	10.00 bar	0.1 mbar		TP704-5BGI	TP704-5BAI	0.40 % FSO	0...80°C	¼ BSP
10.0 bar	20.0 bar	0.001 bar		TP704-10BGI	TP704-10BAI	0.40 % FSO	0...80°C	¼ BSP
20.0 bar	40.0 bar	0.001 bar		TP704-20BGI	TP704-20BAI	0.40 % FSO	0...80°C	¼ BSP
50.0 bar	100.0 bar	0.001 bar		TP704-50BGI	TP704-50BAI	0.40 % FSO	0...80°C	¼ BSP
100 bar	200 bar	0.01 bar			TP704-100BAI	0.40 % FSO	0...80°C	¼ BSP
200 bar	400 bar	0.01 bar			TP704-200BAI	0.40 % FSO	0...80°C	¼ BSP
500 bar	750 bar	0.01 bar			TP704-500BAI	0.40 % FSO	0...80°C	¼ BSP

	ATM No. 6040		ATM No. 6045	
	HD2114.0 HD2114.2	HD2134.0 HD2134.2	HD2164.0 HD2164.2	HD2114B.0 HD2114B.2
Full scale	±20mbar	±200mbar	±2000mbar	600...1100mbar
Maximum overpressure	±300mbar	±1bar	±6bar	3bar
Resolution	0.001mbar	0.01mbar	0.1mbar	0.1mbar
Accuracy @ 23°C	±0.3% s.s.	±(0.1% s.s. + 0.1% measurement)		±0.3mbar
Working temperature	0...60°C			
Connection	quick couplings Ø5mm			
Compensation temperature	0...60°C			
Drift on zero	±1% s.s.	±0.5% s.s.	±0.5% s.s.	±0.3% s.s.
Drift on span	±1% s.s.	±0.5% s.s.	±0.5% s.s.	±0.3% s.s.
Fluid contacting the membrane	non corrosive air and gas			

Measurement of temperature by instrument

Pt100 measurement range	-200...+650°C
Pt1000 measurement range	-200...+650°C
Ni1000 measurement range	-50...+250°C
Resolution	0.1°C
Instrument accuracy	±0.1°C
Drift after 1 year	0.1°C/year

TECHNICAL DATA OF PROBES AND MODULES EQUIPPED WITH INSTRUMENT

Pressure measurement by module PP471

All TP704 and TP705 series Delta Ohm probes can be connected to the PP471 module. See the table below for the technical specifications of the individual probes.

Technical specifications of the PP471 module

Accuracy	±0.05% of full scale
Peak duration	≥ 5ms
Peak accuracy	±0.5% of full scale
Peak dead band	± 2% of full scale

Pt100 sensor temperature probes using SICRAM module

Model	Type	Application range	Accuracy
TP472i	Immersion	-196°C...+500°C	±0.25°C (-196°C...+350°C) ±0.4°C (+350°C...+500°C)
TP472L0	Immersion	-50°C...+400°C	±0.25°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP472P0	Penetration	-50°C...+400°C	±0.25°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP474C0	Contact	-50°C...+400°C	±0.3°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP475A0	Air	-50°C...+250°C	±0.3°C (-50°C...+250°C)
TP472L5	Immersion	-50°C...+400°C	±0.3°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP472L10	Immersion	-50°C...+400°C	±0.3°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)

Common characteristics

Resolution	0.1°C
Temperature drift @ 20°C	0.003%/°C

4 wire Pt100 and 2 wire Pt1000 Probes without SICRAM module

Model	Type	Application range	Accuracy
TP47.100	Pt100 4 wires	-50...+400°C	Class A
TP47.1000	Pt1000 2 wires	-50...+400°C	Class A

Common characteristics

Resolution	0.1°C
Temperature drift @ 20°C	
Pt100	0.003%/°C
Pt1000	0.005%/°C

ORDER CODES

HD2114.0K: The kit is composed of the HD2114.0 with built-in 20mbar full scale probe, 4 1.5V alkaline batteries, operating manual, case. Other probes must be ordered separately.

HD2114.2K: The kit is composed of the HD2114.2 datalogger with built-in 20mbar full scale probe, connection cable HD2101/USB, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. Other probes must be ordered separately.

HD2134.0K: The kit is composed of the HD2134.0 with built-in 200mbar full scale probe, 4 1.5V alkaline batteries, operating manual, case. Other probes must be ordered separately.

HD2134.2K: The kit is composed of the HD2134.2 datalogger with built-in 200mbar full scale probe, connection cable HD2101/USB, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. Other probes must be ordered separately.

HD2164.0K: The kit is composed of the HD2164.0 with built-in 2000mbar full scale probe, 4 1.5V alkaline batteries, operating manual, case. Other probes must be ordered separately.

HD2164.2K: The kit is composed of the HD2164.2 datalogger with built-in 2000mbar full scale probe, connection cable HD2101/USB, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. Other probes must be ordered separately.

HD2114B.0K: The kit is composed of the HD2114B.0 with 600...1100mbar range barometric sensor, 4 1.5V alkaline batteries, operating manual, case. Other probes must be ordered separately.

HD2114B.2K: The kit is composed of the HD2114B.2 datalogger with 600...1100mbar range barometric sensor, connection cable HD2101/USB, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. Other probes must be ordered separately.

HD2110CSNM: 8-pole connection cable MiniDin - Sub D 9-pole female for RS232C.

HD2101/USB: Connection cable USB 2.0 connector type A - 8-pole MiniDin.

DeltaLog9: Software for download and management of the data on PC using Windows 98 to XP operating systems.

AF209.60: Stabilized power supply at 230V_{ac}/1V_{dc}-300mA mains voltage.

S'print-BT: On request, portable, serial input, 24 column thermal printer, 58mm paper width.

PRESSURE MEASUREMENT PROBES

PP471: SICRAM interface module between instrument and TP704 and TP705 series Delta Ohm probes. Cable length 2 metres. The list of pressure probes is outlined in the PP471 module technical data table.

TEMPERATURE PROBES COMPLETE WITH SICRAM MODULE

TP4721: Pt100 sensor immersion probe. Stem Ø 3 mm, length 300 mm. Cable length 2 metres.

TP4721.6: Pt100 sensor immersion probe. Stem Ø 3 mm, length 230 mm. Cable length 2 metres.

TP473P.6: Pt100 sensor penetration probe. Stem Ø 4mm, length 150 mm. Cable length 2 metres.

TP474C.6: Pt100 sensor contact probe. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable length 2 metres.

TP475A.6: Pt100 sensor air probe. Stem Ø 4mm, length 230mm. Cable length 2 metres.

TP472L5: Pt100 sensor immersion probe. Stem Ø 6mm, length 500 mm. Cable length 2 metres.

TP472L10: Pt100 sensor immersion probe. Stem Ø 6mm, length 1,000mm. Cable length 2 metres.

TEMPERATURE PROBES WITHOUT SICRAM MODULE

TP47.100: Direct 4 wire Pt100 sensor immersion probe. Probe's stem Ø 3mm, length 230mm. 4 wire connection cable with connector, length 2 metres.

TP47.1000: Pt1000 sensor immersion probe. Probe's stem Ø 3mm, length 230mm. 2 wire connection cable with connector, length 2 metres.

TP47: Only connector for probe connection; direct 4 wire Pt100, 2 wire Pt1000 and Ni1000.



PP471



Iso Kinetic Dust Load STE 4

(ATM No. JWE 6050)

The STE 4 may be used in accordance with European Guideline (VDI 2066, BS 6069).

It consists of a complete package for the isokinetic sampling of particulates from gasstreams or stacks. Included with this system are devices for the measurement of temperature, gas velocity, pressure, and gas volume. A dust loading range of 0,1 mg to 100g is achieved by using different filter heads. The STE 4 may be expanded to the STE 4 GA for the measurement of gases and heavy metals.



ATM No. JWE 6050

Multi function Device

(ATM No, DEL 6060)



PORTABLE MULTIFUNCTION DATA-LOGGER INSTRUMENT DO 9847

DO9847 is a multifunctional handheld board instrument and datalogger. It is provided with a 128x64 pixel (56x38 mm) graphic display and three independent inputs. Each input can be connected to one channel or two channel dual probes (i.e. two thermocouples, relative humidity/temperature, etc.). The instrument automatically acknowledges SICRAM probes connected to the input (memory equipped and configurable intelligent probe). Functions: watch, hold, max., min., average, record, immediate or deferred start record logging, difference between the two inputs, relative measures, three input channel measurement and inside reference temperature display. Sampling time: one per second input. Probe calibration through SICRAM module: calibration data permanent storage inside the probe. Storage capacity: 32,000 readings per input. Storage interval and printing can be configured between one second and 1 hour. RS232C serial output: from 300 up to 115,200 baud rate. Immediate or deferred print-out. Stored data can be displayed and stored data blocks can be deleted. Automatic shut-off after 8 minutes can be disabled. Units of measurement can be selected according to the physical quantity of the connected probe. Firmware update through RS232C serial port. Different types of SICRAM modules or probes can be connected to the input: Platinum sensor temperature, thermocouple, relative humidity/temperature, Discomfort index, continuous voltage ($\pm 20V$), current (0...24mA), pressure, air speed and light.

Technical data of the instrument DO 9847

- Power supply:
 - Battery: 4 x 1.5V AA alkaline batteries; operating time with high quality batteries: about 60 hours.
 - Mains: through 9Vdc: 250mA external power supply, 2 pole connector.
- Operating conditions:
 - Working temperature: -10...+50°C. Storage temperature: -25...+65°C.
 - Relative Humidity: 0...90%RH, not condensing.
- LCD display: 128x64 pixel (56x38 mm) graphic LCD.
- Keyboard: 18 multifunction keys and 3 function keys.
- Recorded data safely: independently from batteries charging conditions.
- Measured values storage: on 16 files divided into 16-sample pages.
- Quantity: 32,000 samples per input channel.
- Storage interval: 1 s...1 h. Time and date, real time.
- Accuracy: 1 minute/month maximum error margin.
- Serial interface:
 - RS232C type galvanically insulated. SUB D9 male connector.
 - Baud rate: 300...115,200 baud. Data bit: 8.
 - Parity: none. Stop bit: 1.
 - Flow control: Xon/Xoff. RS232C cable max. length: 15 m.
- Immediate printing interval: 1 s...1 h.
- Firmware can be updated through PC using the instrument serial port.
- Probes connections: n° 3 DIN45326 8 pole connectors.
- Dimensions and weight: 245x100x50 mm - 300 gr.
- Case: ABS - Protection: rubber.

DO 9847 - Characteristics of SICRAM modules

When the instrument is used together with the available SICRAM modules, its accuracy and resolution are stated in the section where these modules are described.

SICRAM modules for DO 9847

TP471	Temperature measure through PRT Platinum sensor
PRT resistance values @ 0°C	25 Ω , 100 Ω , 500 Ω
temperature range Pt25, Pt100	-200°C...+650°C
temperature range Pt500	-200°C...+500°C
Accuracy with Pt25, Pt100 sensor	$\pm 0.3^\circ\text{C}$ up to 350°C
	$\pm 0.3^\circ\text{C}$ up to 850°C
Accuracy with Pt500 sensor	$\pm 0.5^\circ\text{C}$ up to 500°C
Resolution	0.01°C from -200°C to 350°C
	0.1°C from 350°C to 800°C
Temperature drift @20°C	0.002%/°C
Excitation current	400 μA impulse, length=100ms, time=1s

TP47100 - Temperature measure for thermocouple with cold joint inside ice at 0°C

TP47101 - Temperature measure for 1 input thermocouple

TP47101 - Temperature measure for 2 input thermocouple

VP472 module to connect pyranometers or albedometers. The measurements produced during the time by a pyranometer or an albedometer can be taken, verified and stored. The signal produced by the thermopile can be read in mV or in W/m², the net radiation of the albedometer is read in W/m². The thermopile sensitivity can be set from 5000 to 30000 mV/(W/m²) that is between 5 and 30 $\mu\text{V}/(\text{W/m}^2)$.

VP473 module for reading the continuous voltage. When connected to the output of a transmitter with voltage signal it can read and take the relevant value. Measuring range: $\pm 20Vdc$. Input impedance: 1M Ω .

IP472 module for mA reading of continuous current. When connected to the output of a transmitter with current signal, it can read and take the relevant value. Measuring range: 0...24mA. Input impedance: 25 Ω .

PP471 module for measuring absolute, relative and differential pressure. It can be connected with pressure probes **TP704** and **TP705** series. It measures the instantaneous value and peak value of pressure. The module is complete with 2m cable and DIN 45326 8 pole female connector.

Accuracy: $\pm 0.05\%$ of full scale. Peak time: $\geq 5ms$.

Peak accuracy: $\pm 0.5\%$ f.s. Peak dead band: $\approx 2\%$ f.s.

Probes complete with SICRAM module

Pt100 sensor temperature probes

TP472i wire Pt100 immersion probe. Tube \varnothing 3 mm, length 300 mm. 4 wire cable 2m long.

Working range: -196°C...+500°C.

Accuracy: $\pm 0.25^\circ\text{C}$ (-196°C...+350°C) / $\pm 0.4^\circ\text{C}$ (+350°C...+500°C)

TP473P wire Pt100 pointed probe. Tube \varnothing 4 mm, length 150 mm. 4 wire cable 2m long.

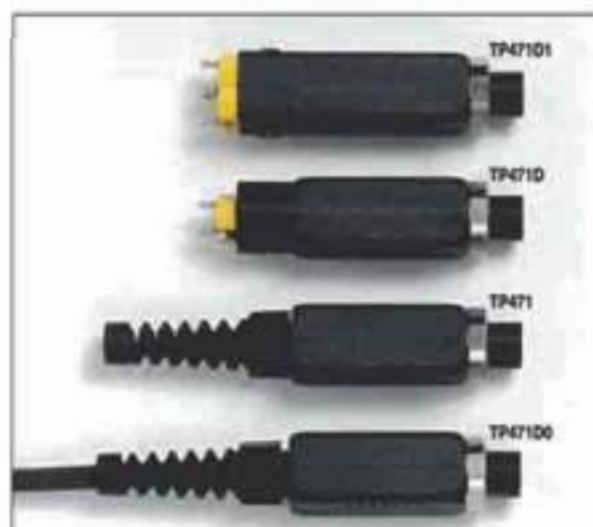
Working range: -100°C...+400°C.

Accuracy: $\pm 0.25^\circ\text{C}$ (-100°C...+350°C) / $\pm 0.4^\circ\text{C}$ (+350°C...+400°C)

TP474C Thin film Pt100 contact probe. Tube \varnothing 4 mm, length 230 mm, contact surface made of silver \varnothing 5 mm. 4 wire cable 2m long.

Working range: -50°C...+400°C.

Accuracy: $\pm 0.2^\circ\text{C}$ (-50°C...+350°C) / $\pm 0.4^\circ\text{C}$ (+350°C...+400°C)



Accuracy of the instrument with SICRAM module for TC

TC type	Measuring range	Accuracy	Resolution
K	-200°C ... 1370°C	±0.1°C up to 600°C / ±0.2°C above 600°C	0.05°C from scale beginning to 350°C 0.1°C from 350°C to full scale
J	-100°C ... 750°C	±0.05°C up to 400°C / ±0.1°C above 400°C	
T	-200°C ... 400°C	±0.1°C	
E	-200°C ... 750°C	±0.05°C up to 300°C / ±0.08°C above 300°C	
N	-200°C ... 1300°C	±0.1°C up to 600°C / ±0.2°C above 600°C	
R	+200°C ... 1480°C	±0.25°C	
S	+200°C ... 1480°C	±0.2°C	
B	+300°C ... 1800°C	±0.35°C	0.1°C all over the scale

N.B.: The accuracy regards the instrument complete with module, the probe's error is not included

Relative humidity and temperature combined probes

Typical characteristics of module of relative humidity and temperature probes

Relative Humidity

Sensor	Me-33 capacitive
Typical capacity @30%RH	300pF±40pF
Probe temperature working range	-40°C...+150°C
Working range	0 ... 100%RH
Accuracy	±1%RH in the range 20 ... 90%RH ±2%RH in the range 10 ... 99%RH
Resolution	0.1%RH
Temperature drift @20°C	0.02%RH/°C
%RH response time at constant temperature	10sec (10→80%RH, air speed=2m/s)

Temperature

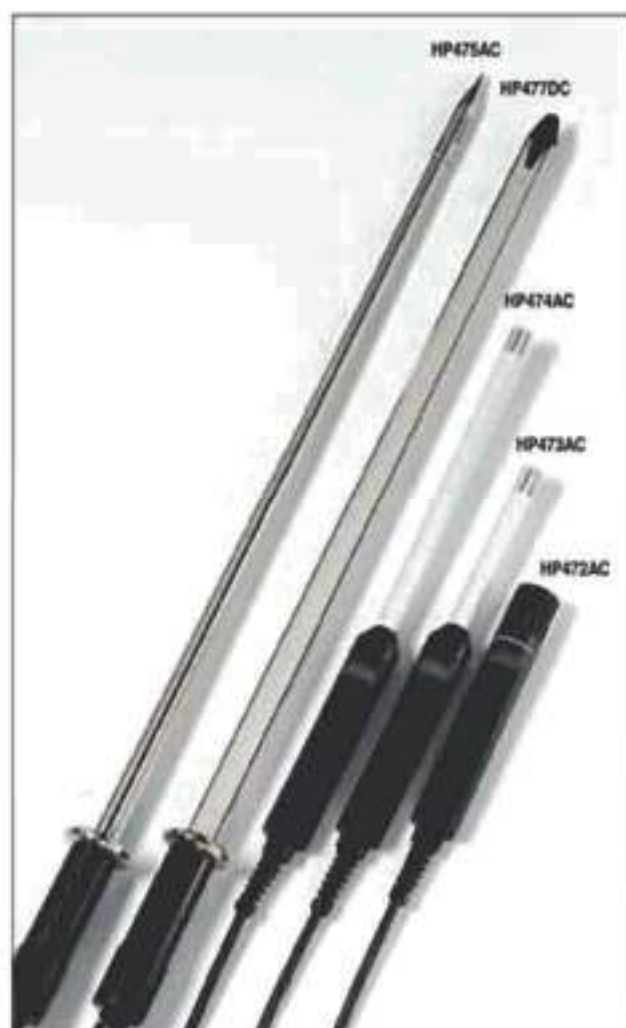
Temperature sensor	Pt100 (100Ω @ 0°C)
Working range	-50°C...+200°C
Accuracy	±0.1°C
Resolution	0.1°C
Temperature drift @20°C	0.003%/°C
Temperature sensor (HP572AC)	K thermocouple
Working range	-50°C...+200°C
Accuracy	±0.5°C
Resolution	0.05°C
Temperature drift @20°C	0.02%/°C

HP472AC RH% and temperature combined probe, dimensions Ø 26x170 mm, Connecting cable: 2m long Working range: -20°C ... +80°C, 5 ... 98% RH, RH% accuracy ±2% °C accuracy ±0.30°C.

HP572AC RH% and K thermocouple temperature combined probe Dimensions Ø 26x170 mm, Connecting cable: 2m long, Working range: -20°C...+80°C, 5...98% RH, UR% accuracy ±2% °C accuracy in: ±0.5°C.

HP473AC RH% and temperature combined probe, Handle Ø 26x130 mm, Probe Ø 14x110 mm, Connecting cable: 2m long, Working range: -20°C...+80°C, 5...98% RH, RH% accuracy ±2% °C accuracy ±0.30°C.

HP474AC RH% and temperature combined probe, Handle Ø 26x130 mm, probe Ø 14x210 mm, Connecting cable: 2m long, Working range: -40°C...+150°C, 5...98% RH, RH% accuracy ±2.5% °C accuracy ±0.30°C.



MF-4

HP475AC RH% and temperature combined probe. Handle Ø 26x110 mm. Stainless steel tube Ø12x560 mm. Terminal tip Ø 13,5x75 mm. Connecting cable: 2m long.
Working range: -40°C...+150°C, 5...98% RH.
RH% accuracy: ±2.5% °C accuracy: ±0.35°C

HP477DC %RH and temperature sword combined probe, handle Ø 26x110 mm. Tube 18x4 mm. Length: 520 mm. Connecting cable: 2m.
Working range: -40°C...+150°C, 5...98% RH.
RH% accuracy: ±2.5% °C accuracy: ±0.35°C

Pressure Probes

PP472 Probe for measuring barometric pressure.
Working range: 600 ... 1100mbar Resolution: 0.1mbar
Accuracy @ 20°C: ±0.3mbar Temperature range: -10 ... +60°C

TP704-705 Probes to couple to the **SICRAM PP471** module to measure the absolute, relative or differential pressure.

PP473 S1...S8 Differential pressure probes:

Working range	S1: f.s. 10mbar	S2: f.s. 20mbar	S3: f.s. 50mbar
	S4: f.s. 100mbar	S5: f.s. 200mbar	S6: f.s. 500mbar
	S7: f.s. 1bar	S8: f.s. 2bar	
Maximum over-pressure	S1, S2, S3: 200mbar	S4: 300mbar	S5, S6: 1bar
	S7: 3bar	S8: 6bar	
Accuracy @ 25°C	±0.5% f.s. (10, 20, 50mbar)		±0.25% f.s. (200, 500, 1000, 2000mbar)

Temperature range: -10 ... +60°C

Fluid in contact with the membrane: non-corrosive and dry gas or air

Connection: tube Ø 5mm

Full Scale Pressure	Maximum over-pressure	Differential Pressure	Relative Pressure (with respect to the atmospheric pressure)	ABSOLUTE Pressure	ACCURACY from 20 to 25°C	Working Temperature	Connection
		NON- isolated membrane	isolated membrane	isolated membrane			
10.0 mbar	20.0 mbar	TP704-10MBO			±0.5% FS	0 ... 80°C	Tube Ø10mm
20.0 mbar	40.0 mbar	TP705-20MBO			±0.5% FS	0 ... 80°C	Tube Ø10mm
50.0 mbar	100 mbar	TP704-50MBO			±0.5% FS	0 ... 80°C	Tube Ø10mm
100 mbar	200 mbar	TP704-100MBO			±0.5% FS	0 ... 80°C	Tube Ø10mm
200 mbar	400 mbar	TP705-200MBO			±0.5% FS	0 ... 80°C	Tube Ø10mm
			TP704-200MBO		±0.5% FS	0 ... 80°C	1/8 BSP
500 mbar	1000 mbar	TP705-500MBO			±0.5% FS	0 ... 80°C	Tube Ø10mm
			TP704-500MBO		±0.5% FS	0 ... 80°C	1/8 BSP
1.00 bar	2.00 bar	TP705-100			±0.5% FS	0 ... 80°C	Tube Ø10mm
			TP705-100		±0.5% FS	0 ... 80°C	1/8 BSP
2.00 bar	4.00 bar	TP705-200			±0.5% FS	0 ... 80°C	Tube Ø10mm
			TP704-200	TP704-25A	±0.5% FS	0 ... 80°C	1/8 BSP
5.00 bar	10.00 bar	TP704-500		TP704-50A	±0.5% FS	0 ... 80°C	1/8 BSP
10.0 bar	20.0 bar	TP704-1000		TP704-100A	±0.5% FS	0 ... 80°C	1/8 BSP
20.0 bar	40.0 bar	TP704-2000		TP704-200A	±0.5% FS	0 ... 80°C	1/8 BSP
50.0 bar	100.0 bar	TP704-5000		TP704-500A	±0.5% FS	0 ... 80°C	1/8 BSP
100 bar	200 bar			TP704-1000A	±0.5% FS	0 ... 80°C	1/8 BSP
200 bar	400 bar			TP704-2000A	±0.5% FS	0 ... 80°C	1/8 BSP
500 bar	1000 bar			TP704-5000A	±0.5% FS	0 ... 80°C	1/8 BSP



Probes for air speed measurements

Vane probe: AP472 S1 - AP472 S2 - AP472 S4

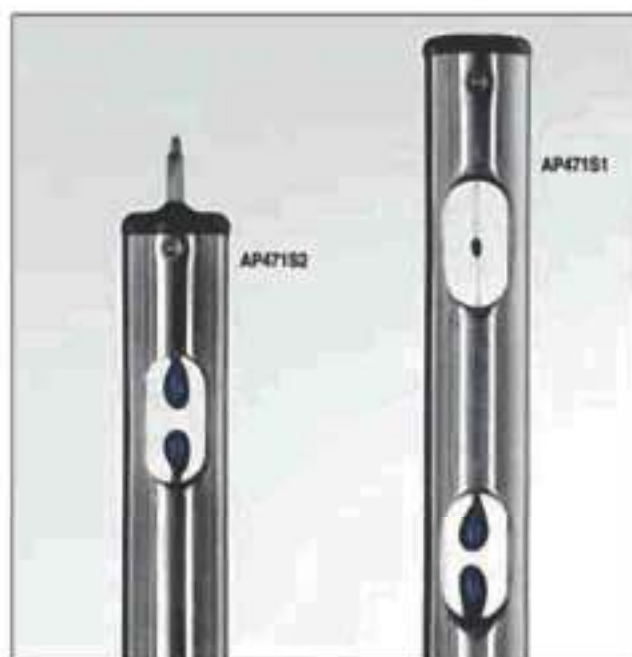
Hot-wire probes: AP471 S1 - AP471 S2 - AP471 S3 - AP471 S4 - AP471 S5

	AP471 S1 - AP471 S3	AP471 S2	AP471 S4 AP471 S5
Kind of measure	Air velocity, calculated flow, air temperature		
Working range			
Speed	0...40 m/s	0...5 m/s	
Temperature	-30...+110°C	-30...+110°C	0...+80°C
Resolution			
Speed	0.01 m/s (0.1 km/h) 1.5/min 0.1 mph 0.1 knots	0.01 m/s (0.1 km/h) 1.5/min 0.1 mph 0.1 knots	
Temperature	0.1°C	0.1°C	
Accuracy			
Speed	±0.05 m/s (0...9.99 m/s) ±0.2 m/s (100...9.99 m/s) ±0.6 m/s (1000...40.00 m/s)	±0.02 m/s (0...9.99 m/s) ±0.1 m/s (100...5.00 m/s)	
Temperature	±0.4°C	±0.4°C	
Minimum Speed	0 m/s		
Air temperature compensation	0...80°C		
Unit of Measurement			
Speed	m/s - km/h - ft/min - mph - knots		
Flow	kg - m³/s - m³/min - ft³/s - ft³/min		
Duct section for flow calculation	100...100.000 cm²		
Cable length	0.01...10 m		

	AP472 S1	AP472 S2	AP472 S3	AP472 S4	AP472 S5
Type of measurements	Air speed, calculated flow, air temperature	Air speed, calculated flow	Air speed, calculated flow	Air speed, calculated flow, air temperature	Air speed, calculated flow, air temperature
Diameter	100 mm	60 mm	16 mm		
Type of measurement					
Speed	Vane	Vane	Vane		
Temperature	T _o K	—	—	T _o K	T _o K
Measuring range					
Speed	0.5...20 10...30	0.25...20	0.5...20	10...50	
Temperature (°C)	-25...+80	-25...+80 (*)	-25...+80 (*)	-30...+120 (*)	-25...+80 (*)
Resolution					
Speed	0.01 m/s - 0.1 km/h - 1 ft/min - 0.1 mph - 0.1 knots				
Temperature	0.1°C	—	—	0.1°C	—
Accuracy					
Speed	±0.1 m/s - 1.5 ft/s	±0.1 m/s - 1.5 ft/s	±0.2 m/s - 1.0 ft/s		
Temperature	±0.5°C	—	—	±0.5°C	±0.5°C
Min. speed	0.5 m/s - 10 m/s	0.25 m/s	0.5 m/s	10 m/s	10 m/s
Unit of measurement					
Speed	m/s - km/h - ft/min - mph - knots				
Flow	kg - m³/s - m³/min - ft³/s - ft³/min				
Duct section for flow calculation	100...100.000 cm²				
Cable length	0.01...10 m				

(*) The indicated value refers to the vane working range

(**) The temperature range refers to the probe head where the vane and the temperature sensor are located and not the handle, the cable and the telescopic shaft which can withstand up to a temperature of 80°C.

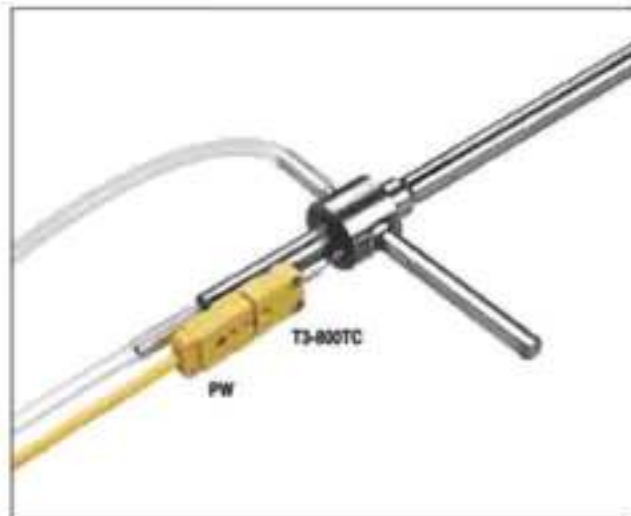
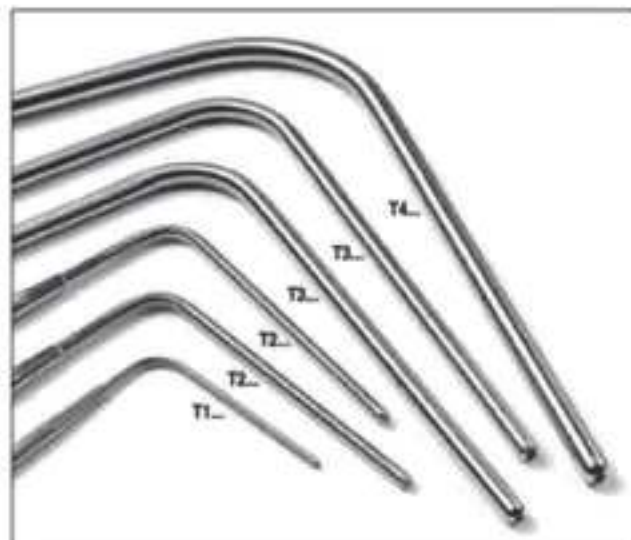


MF4

Pilot tube air speed probes: AP473 S1 - AP473 S2 - AP473 S3 - AP473 S4

	AP473 S1	AP473 S2	AP473 S3	AP473 S4
Type of measure	Air speed, calculated flow, differential pressure, air temperature			
Measuring range	10 mbar/s	20 mbar/s	50 mbar/s	100 mbar/s
Speed (°)	2 ... 40 m/s	2 ... 55 m/s	2 ... 90 m/s	2 ... 130 m/s
Temperature	-200 ... +600 °C	-200 ... +600 °C	-200 ... +600 °C	-200 ... +600 °C
Resolution	0.1 m/s - 1 km/h - 1 ft/min - 1 mph - 1 knots			
Speed	0.1 °C			
Temperature	0.1 °C			
Accuracy	±0.4% d.s. of pressure			
Speed	±0.25% d.s. of pressure			
Temperature	±0.1 °C			
Minimum speed	2 m/s			
Compensation of air temperature	-200 ... +600 °C (if K thermocouple is connected to the module)			
Unit of measure				
Speed	m/s - km/h - ft/min - mph - knots			
Flow	l/s - m³/s - m³/min - ft³/s - ft³/min			
Section of the pipe for flow calculation	100 ... 100000 cm²			
	0.01 - 10 m²			

(°) At 20 °C, 1013 mbar and Ps negligible.



Photometric / Radiometric Probes

LP 471 PHOT Probe for measuring the ILLUMINANCE

Measuring range (lux):	0.01 ... 199.99	1999	19.99 × 10³	199.9 × 10³
Resolution (lux):	0.01	1	0.01 × 10³	0.1 × 10³
Spectral range:	according to the photopic standard curve V(λ)			
Calibration uncertainty:	±4% Class C (CIE n°69 - UNE 111542)			
Working temperature:	0 ... 50 °C			

LP 471 LUM 2 Probe for measuring the LUMINANCE

Measuring range (cd/m²):	1 ... 1999	19.99 × 10³	199.9 × 10³	1.999 × 10⁴
Resolution (cd/m²):	0.1	0.01 × 10³	0.1 × 10³	0.001 × 10³
Field of view:	2°			
Spectral range:	according to the photopic standard curve V(λ)			
Calibration uncertainty:	±5% Class C (CIE n°69 - UNE 111542)			
Working temperature:	0 ... 50 °C			



LP 471 RAD Probe for measuring the IRRADIANCE

Measuring range (W/m ²):	0.1 × 10 ⁻¹ 1.999	19.99	199.9	1999
Resolution (W/m ²):	0.1 × 10 ⁻¹ / 0.001	0.01	0.1	1
Spectral range:	400nm...1090nm			
Calibration uncertainty:	<5%			
Working range:	0...50°C			

LP 471 PAR Quantum-radiometric probe for measuring the photon flow in the PAR chlorophyll field

Measuring range (μmol/m ² s):	0.01 19.99	199.9	1999	9.99 × 10 ³
Resolution (μmol/m ² s):	0.01	0.1	1	0.01 × 10 ³
Spectral range:	400nm...700nm			
Calibration uncertainty:	<3%			
Working range:	0...50°C			

LP 471 UVA Probe for measuring the IRRADIANCE

Measuring range (W/m ²):	0.1 × 10 ⁻¹ 1.999	19.99	199.9	1999
Resolution (W/m ²):	0.1 × 10 ⁻¹ / 0.001	0.01	0.1	1
Spectral range:	315nm...400nm (Peak 365nm)			
Calibration uncertainty:	<5%			
Working range:	0...50°C			

LP 471 UVB Probe for measuring the IRRADIANCE

Measuring range (W/m ²):	0.1 × 10 ⁻¹ 1.999	19.99	199.9	1999
Resolution (W/m ²):	0.1 × 10 ⁻¹ / 0.001	0.01	0.1	1
Spectral range:	290nm...315nm (Peak 305nm)			
Calibration uncertainty:	<5%			
Working range:	0...50°C			

LP 471 UVC Probe for measuring the IRRADIANCE

Measuring range (W/m ²):	0.1 × 10 ⁻¹ 1.999	19.99	199.9	1999
Resolution (W/m ²):	0.1 × 10 ⁻¹ / 0.001	0.01	0.1	1
Spectral range:	220nm...280nm (Peak 260nm)			
Calibration uncertainty:	<5%			
Working range:	0...50°C			

Ordering codes

DO 9847K: The kit is provided with multifunctional instrument, 9CPRS232 serial output cable, 4 1.5V alkaline batteries, instruction manual and carrying case. Modules and probes have to be ordered separately.

9CPRS232: Female/female sub D 9 pole extension cable for RS232C (null modem).

DeltaLog3: Software for downloading and PC data management.

SICRAM modules for DO9847

TP471: Module for PRT sensors. 4 wire input, the user can connect Pt 25, 100, 500 Platinum sensor temperature probe. The probe Callendar - Van Dusen parameters can be stored and the probe can be calibrated.

TP471D0: Module for thermocouple sensors. 1 input, without compensation of cold joint. 2 wire copper made output cable, length 1.5m for connection with thermocouple, cold joint at 0°C inside ice. Thermocouples type K-J-E-T-N-R-S-B can be connected.

TP471D: Module for thermocouple with 1 MINIATURE connector. Thermocouples type K-J-E-T-N-R-S-B can be connected.

TP471D1: Module for thermocouple with 2 MINIATURE connector. Two thermocouples type K-J-E-T-N-R-S-B can be connected, same kind of thermocouple, even if different shape. 'K' probes available in the price-list can be connected to TP471D0, TP471D and TP471D1 SICRAM modules.

VP472: Module for connecting pyranometers or albedometers

VP473: Module for reading continuous voltage ±20Vdc. Input impedance: 1MΩ.

IP472: Module for reading continuous current 0...24mA. Input impedance: 25Ω.

PP471: Module for measuring pressure. All the TP704 and TP705 series probes can be connected.

Probes equipped with SICRAM modules

TEMPERATURE PROBES

TP472: Immersion probe, Pt100 sensor. Tube Ø 3 mm, length 300 mm, 4 wire cable, length 2 m.

TP473P: Penetration probe, Pt100 wire sensor. Tube Ø4 mm, length 150 mm, 4 wire cable, length 2 m.

TP474C: Contact probe, Pt100 thin film sensor. Tube Ø4 mm, length 230 mm, contact surface Ø 5 mm, 4 wire cable, length 2 m.

All temperature probes fitted, with SICRAM module at the series TP47... may be connected.

RELATIVE HUMIDITY AND TEMPERATURE PROBES

HP472AC: Combined relative humidity and temperature probe. dimensions Ø 26x170 mm, 2m connecting cable.

HP572AC: Combined relative humidity and temperature probe, K thermocouple sensor. Dimensions Ø 26x170 mm, 2 m connecting cable.

HP473AC: Combined relative humidity and temperature probe. Handgrip size Ø 26x130 mm, probe Ø 14x110 mm, 2 m connecting cable.

HP474AC: Combined relative humidity and temperature probe. Handgrip size Ø 26x130 mm, probe Ø 14x210 mm, 2 m connecting cable.

HP475AC: Combined relative humidity and temperature probe. 2 m connecting cable. Handgrip size Ø 26x110 mm, Stainless steel tube Ø 12x560 mm. Terminal tip Ø 13.5x75 mm.

HP477DC: Combined relative humidity and temperature sword probe. 2 m connecting cable. Handgrip size Ø 26x110 mm. Tube 18x4 mm, length 520 mm.



PRESSURE PROBES

PP472: Barometric probe, measuring range 600...1100mbar.

TP704.../TP705... Probes to connect to **SICRAM** module **PP471** for measuring relative, absolute or differential pressure.

ORDER CODE					
Full scale pressure	Maximum over pressure	Differential pressure	Relative pressure (with respect to the atmospheric pressure)	Absolute pressure	Connection
		102V-absolute	isolated	isolated	
		102V-absolute	isolated	isolated	
10.0 mbar	20.0 mbar	TP705-10M80			Tube 1/16mm
20.0 mbar	40.0 mbar	TP705-20M80			Tube 1/16mm
50.0 mbar	100 mbar	TP705-50M80			Tube 1/16mm
100 mbar	200 mbar	TP705-100M80			Tube 1/16mm
200 mbar	400 mbar	TP705-200M80			Tube 1/16mm
500 mbar	1000 mbar	TP705-500M80			Tube 1/16mm
			TP704-200M80		1/8" G
			TP704-500M80		1/8" G
1.05 bar	2.20 bar	TP705-180			Tube 1/16mm
			TP704-180		1/8" G
2.08 bar	4.30 bar	TP705-280			Tube 1/16mm
			TP704-280	TP704-280A	1/8" G
9.05 bar	18.10 bar	TP705-480			1/8" G
18.10 bar	36.20 bar	TP705-960			1/8" G
28.15 bar	56.30 bar	TP705-1920			1/8" G
56.30 bar	112.60 bar	TP705-3840			1/8" G
112.60 bar	225.20 bar	TP705-7680			1/8" G
225.20 bar	450.40 bar	TP705-15360			1/8" G
450.40 bar	900.80 bar	TP705-30720			1/8" G

PP473 S1: Differential pressure probe, Full scale 10mbar

PP473 S2: Differential pressure probe, Full scale 20mbar

PP473 S3: Differential pressure probe, Full scale 50mbar

PP473 S4: Differential pressure probe, Full scale 100mbar

PP473 S5: Differential pressure probe, Full scale 200mbar

PP473 S6: Differential pressure probe, Full scale 500mbar

PP473 S7: Differential pressure probe, Full scale 1bar

PP473 S8: Differential pressure probe, Full scale 2bar

PROBES FOR AIR SPEED MEASUREMENT

HOT-WIRE PROBES

AP471 S1: Hot-wire telescopic probe, measuring range: 0...40m/s. Cable length 2 metres.

AP471 S2: Omnidirectional hot-wire probe, measuring range: 0...5m/s. Cable length 2 metres.

AP471 S3: Hot-wire telescopic probe with terminal tip for easy position, measuring range: 0...40m/s. Cable length 2 metres.

AP471 S4: Omnidirectional hot-wire telescopic probe with base, measuring range: 0...5m/s. Cable length 2 metres.

AP471 S5: Omnidirectional hot-wire telescopic probe, measuring range: 0...5m/s. Cable length 2 metres.

VANE PROBES:

AP472 S1L: Vane probe with thermocouple, Ø 100mm. Speed from 0.6 to 20m/s; temperature from -25 to 80°C. Cable length 2 metres.

AP472 S1H: Vane probe with thermocouple, Ø 100mm speed from 10 to 30m/s; temperature from -25 to 80°C. Cable length 2 metres.

AP472 S2: Vane probe, Ø 60mm. Measurement range: 0.25...20m/s. Cable length 2 metres.

AP472 S4L: Vane probe, Ø 16mm. speed from 0.6 to 20m/s. Cable length 2 metres.

AP472 S4LT: Vane probe with thermocouple, Ø 16mm, speed from 0.6 to 20m/s; Temperature from -30 to 120°C with thermocouple K sensor. Cable length 2 metres.

AP472 S4H: Vane probe, Ø 16mm speed from 10 to 50m/s. Cable length 2 metres.

AP472 S4HT: Vane probe with thermocouple, Ø 16mm speed from 10 to 50m/s; Temperature from -30 to 120°C with thermocouple K sensor. Cable length 2 metres.

PITOT TUBE PROBES

AP473 S1: Pitot tube probe, 10mbar f.s. differential pressure. Air speed from 2 to 40m/s. The Pitot tubes have to be ordered separately.

AP473 S2: Pitot tube probe, 20mbar f.s. differential pressure. Air speed from 2 to 55m/s. The Pitot tubes have to be ordered separately.

AP473 S3: Pitot tube probe, 50mbar f.s. differential pressure. Air speed from 2 to 90m/s. The Pitot tubes have to be ordered separately.

AP473 S4: Pitot tube probe, 100mbar f.s. differential pressure. Air speed from 22 to 130m/s. The Pitot tubes have to be ordered separately.

PROBES FOR PHOTOMETRIC/RADIOMETRIC MEASUREMENTS

LP 471 PHOT: Probe for measuring ILLUMINANCE. Measuring range: from 0.01 lux to 200.000 lux.

LP 471 LUM 2: Probe for measuring LUMINANCE. Measuring range: from 0.1 cd/m² to 1.999×10⁴ cd/m².

LP 471 RAD: Probe for measuring IRRADIANCE. Measuring range: from 0.1×10⁻¹ W/m² to 1999 W/m².

LP 471 PAR: Quantum-radiometric probe for measuring chlorophyll photons flow. Measuring range: from 0.01 µmol/m²s to 9.99×10⁴ µmol/m²s.

LP 471 UVA: Probe for measuring IRRADIANCE in the UVA spectral range 315 nm...400 nm, peak at 360 nm. Measuring range: from 0.1×10⁻¹ W/m² to 1999 W/m².

LP 471 UVB: Probe for measuring IRRADIANCE in the UVB spectral range 280 nm...315 nm, peak at 305 nm. Measuring range: from 0.1×10⁻¹ W/m² to 1999 W/m².

LP 471 UVC: Probe for measuring IRRADIANCE in the UVC spectral range 220 nm...280 nm, peak at 260 nm. Measuring range: from 0.1×10⁻¹ W/m² to 1999 W/m².

LP BL: Base for supporting and leveling of the probes.



Noise Measuring Device

Pro DLX (ATM No. QUE 6070)

Common Specifications

Measurement Range:	40 to 110 dB RMS, 70 to 140 dB RMS, 115 to 143 dB Peak
Dynamic Range:	70 dB RMS, 20 dB Peak
Amplitude Resolution:	0.1 dB
Dose Resolution:	0.001% to 9999%, auto-scaling always shows 4 digits
Statistical Distribution Resolution:	0.1 dB increments for Fast & Slow
Number of Channels:	(1) RMS, (1) Peak
Frequency Weighting per channel:	RMS A or C, Peak A, C or Z
Time Constant per dosimeter:	Slow or Fast for each or Impulse for all
Exchange Rate per dosimeter:	3, 4, 5 or 6 dB
Criterion Level per dosimeter:	40 to 140 dB in 1 dB increments
Criterion Time per dosimeter:	1 to 24 hours in 1 hour increments
Personal Noise Exposure Level Times per dosimeter:	1 to 18 hours in 1 hour increments
Threshold Level per dosimeter:	40 to 140 dB in 1 dB increments
Upper Limit Value per dosimeter:	40 to 140 dB in 1 dB increments
Ceiling Limit Value per unit:	(1) FastMax and (1) Slow Max, 40 to 140 dB
Data Labels:	ISO/IEC or ANSI (U.S.) nomenclature
# of Setup Files in Memory:	(5) Factory-defined and (4) User-defined
Date & Time:	DD/MMM/YYYY; HH:MM:SS AM/PM or 24-hr clock
Data Available Via Display:	Setup Filename, Pre-calibration date & time, Post-calibration date & time, SPL, Leq/Leq, Peak, SlowMin, SlowMax, FastMin, FastMax, TWA, Projected TWA, Dose, Projected Dose, SEL, Exposure, Run Time
Keypad Combination Lock:	(2) User-defined 4-digit codes, (1) for Run/Stop Access, (1) for Setup Access
Display:	Backlit 128 x 64 pixel graphical LCD
Languages:	English, Spanish, German, French & Italian
Size:	2.7" x 5" x 1.5" (68.6mm x 127mm x 38.1mm)
Weight:	14 oz., (395g)
Power:	Optimally (70) hrs from (2) AA disposable alkaline batteries
Mechanical:	Industrial-grade cast aluminum, IP-65 rated case. Removable belt clip with tripod mounting adapter.
Operating Temperature Range:	-10 to +50 C, +14 to +122 F
Storage Temperature Range:	-25 to +60 C, -13 to +140 F
Humidity Range:	0 to 95% non-condensing
Intrinsic Safety Agency Listing:	UL, cUL, Ex, ATEX, MSHA (pending), SMTA (pending)
Product Standards:	CE Mark, EN 61252, ANSI S1.25
Software Compatibility:	QuestSuite® Professional
Optional Features:	Vibrating Alarm Belt Clip and Boom Microphone

For Noisepro DLX, add:

- Up to 4 Virtual Dosimeters in one
- Infrared Retrieval of Data from other NoisePro Monitors
- Expanded Time History Data
- Programmable Twice Daily Or Up to (4) one-time scheduled Runs



ATM No. QUE 6070

Sound Level Analyser

(ATM No. DEL 6080)



ATM No. DEL 6080

SOUND LEVEL ANALYSER HD2010

HD 2010 is an integrating portable sound level meter performing either spectral or statistical analysis. The 80 dB wide dynamic range, optionally upgradable to 110 dB, and the simultaneous measurement with different time and frequency weightings, allow speeding up and simplifying surveys.

Using an HD2010 you can analyse a sound sample programming 3 measuring parameters with the most complete freedom of choice of temporal or frequency weightings.

If an undesired sound event produces an over-load indication, or simply alter the result of an integration, its contribution can be excluded using the Back-Erase function.

Together with the logging of the 3 parameters, the spectral analysis is carried out in real time, by octave bands and optionally by third octave bands. The HD 2010 calculates the spectrum of the sound signal twice a second and integrates it linearly up to 99 hours. Spectra are displayed together with an A, C or Z wideband level.

As a statistical analyser, the HD 2010 samples the sound signal, with A frequency weighting and FAST constant, 8 times a second and analyses it statistically in 0.5 dB classes. Up to 4 percentile levels, selectable between L_1 and L_{99} , can be displayed.

The HD 2010, with the optional application for the reverberation time measurement, calculates 32 spectra a second allowing to measure reverberation times using either the interruption of the sound source or the impulsive source techniques. The analysis is run simultaneously either wideband or with octave and third octave bandwidths. The sound decay analysis, with any frequency weighting, can be directly carried out with the sound level meter.

All these data can be automatically recorded in the wide non-volatile memory combined with a numeric marker, containing the recording number, date and time. The "Data Logger" option allows to log either the 3 programmed parameters twice per second or the A-weighted sound level with FAST time constant 8 times per second. Recordings can be searched in memory and viewed on the graphic display using the "Replay" function, which reproduces the time trend of the sound trace.

Shouldn't the supplied memory, expandable to 4MB, be enough, that is in case of lengthy recordings, you can activate the "Monitor" function independently with respect to the recording. This function allows to send to a PC, via the RS232 serial interface, part of displayed data, to be directly stored on the PC memory.

The HD 2010 sound level meter can be completely controlled by a PC through the RS232 serial interface by using a proper communication protocol. Through the RS232 interface, the HD 2010 sound level meter can also be controlled via a modem.

The un-weighted LINE output allows to record, for further analysis, the sound sample either on tape or in a PC equipped with acquisition board.

The calibration of a HD 2010 can be made either using the provided acoustic calibrator (type 1 according to IEC 60942 when combined with MK221 microphone) or the built-in reference generator. The electric calibration, using a charge partition technique of which the special preamplifier is equipped, checks the response of the measuring channel, including the microphone. A protected area in the wide non-volatile memory is reserved to factory calibration, used as a reference in the user's calibrations, allowing to keep instrument drifts under control and preventing the instrument from wrong calibrations.

The check of the complete HD 2010 functionality can be made directly by the user, on site, thanks to a diagnostic program.

The microphone preamplifier can be connected to the HD 2010 body through an extension cable up to 10m long. The preamplifier HD2110P, coupled with the option "Extended Range", allows to stretch the length of the extension cable up to 100m.

Attention has been paid to the possibility of implementing new programs or upgrading the instrument performances. The firmware can be upgraded directly by the user via the serial port and DeltaLog5 program, supplied with the instrument.

The HD 2010 sound level meter complies with the following standards: IEC 61672-1 of 2002, IEC 60651 and IEC 60804. The constant percentage bandwidth filters meet IEC 61620 standard, while microphone and acoustic calibrator comply with IEC 61094-4 and IEC 60942, respectively.

Applications

- Workplace noise.
- Acoustic pollution and environmental noise evaluation in general.
- Identification of noise sources either impulsive or with tonal components.
- Evaluation of noise emissions from machines or equipments.
- Insulation efficiency evaluation.
- Acoustics in buildings.
- Noise monitoring, even by remote control via PC.

Technical specifications of base version

Integrating type 1 sound level meter according to IEC 61672, IEC 60651 and IEC 60804.

Microphone:

- **MK221**, 1/2" condenser polarized (200V) for free-field measurements, high stability, type **WS2F class 1** according to IEC 61094-4
- **UC-52**, 1/2" condenser pre-polarized for free-field measurements, **class 2** according to IEC 61672.

Sound level measurements in diffuse-field conditions with random incidence software corrector.

Spectrum analyzer for octave bands type 1 according to IEC 61260.

Statistical analyzer of sound level with A weighting and FAST time constant, getting 8 samples per second in 0.5 dB classes, with calculation of four percentile levels programmable from L_1 to L_{99} .

Dynamic range for the measurement of either wideband or constant percentage bandwidth weightings: 20+140dBA on five ranges of 80dB (20+100dBA, 30+110dBA, 40+120dBA, 50+130dBA and 60+140dBA). Dynamic range is 30+140dBA with microphone UC-52.

3 RMS measurement channels (A, C and Z) and 2 simultaneous channels for peak level measurement (C and Z).

Simultaneous time weightings: FAST, SLOW and IMPULSE.

Max and Min pressure levels.

DOSE calculation with programmable parameters.

Programmable integration time from 1 s up to 99 hours with Back-Erase function.

Parallel real time octave filters from 16 Hz up to 16 kHz.

Average spectra from 1s up to 99 hours.

Wide graphic display with 128x64 pixels.

Octave spectra, displayed in graphic format.

Display in numerical format of 3 parameters selected as preferred.



Data logging with 2 MB "not volatile" memory (corresponding to more than 500000 samples, equal to 17 logging hours at 8 samples per second). Memory expandable to 4MB upon request.

Calibrations: acoustic with sound source or electrical with internal generator.

PC Software interface (for Windows operating systems) for stored data downloading and management (DeltaLog5).

Optional PC Software (for Windows operating systems) for sound level monitoring and sound level meter remote control even via modem (DeltaLog5Monitor).

Optional PC Software (for Windows operating systems), performing all the calculations needed to evaluate room acoustics according to ISO standards. (DeltaLog5Building).

Optional PC Software (for Windows operating systems), for environmental noise analysis (DeltaLog4Ambiente).

Direct printing of acquired parameters by a single key stroke.

Continuous printing (monitor).

Automatic switch off.

Diagnostic program.

Tripod holder.

Wind screen.

Option 1 "Third Octave"

Spectrum analyzer for third octave bands type 1 according to IEC 61260.

With "Third Octave" option a sound source spectrum can be analysed in real time by third octave bands from 16 Hz up to 20 kHz. The audibility of a pure tone component can be evaluated thanks to the possibility to calculate the isophone curves using the PC interface program DeltaLog5.

Option 2 "Data Logger"

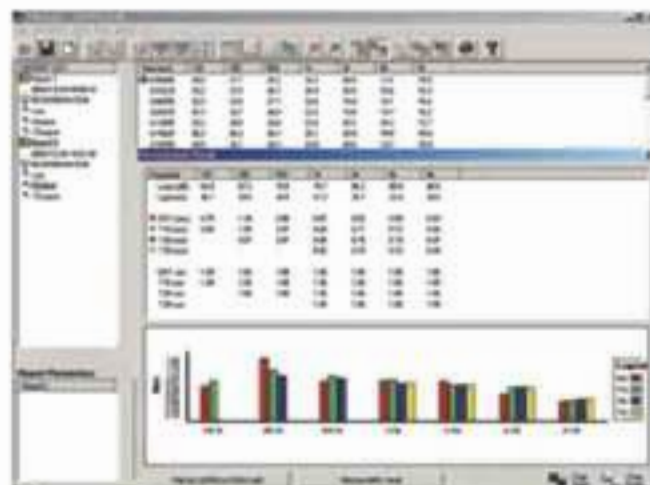
Recording of either the 3 programmed parameters twice per second and or the A-weighted sound level with FAST time constant 8 times per second.

The "Data Logger" option allows the HD 2110 to work as a sound level logger able to store 4 parameters for more than 10 hours at the maximum speed (with the provided memory bank). With this option the A-weighted sound level, with FAST time constant, is recorded 8 times per second together with the 3 programmed parameters. The identification of impulsive events is easy thanks to the possibility to analyse the profile of the A-weighted level with FAST time constant at 8 samples per second. With the "Data Logger" option HD 2010 can also perform the measurements required to evaluate environmental noise. The identification of impulsive events is easy thanks to the possibility to analyse the profile of the A-weighted level with FAST time constant at 8 samples per second. All measuring parameters can be stored for subsequent analysis. When measuring traffic noise, near airports, railways and roads, the HD 2010 sound level meter can be used as a multi-parameter sound recorder combined with statistic analyser performances.

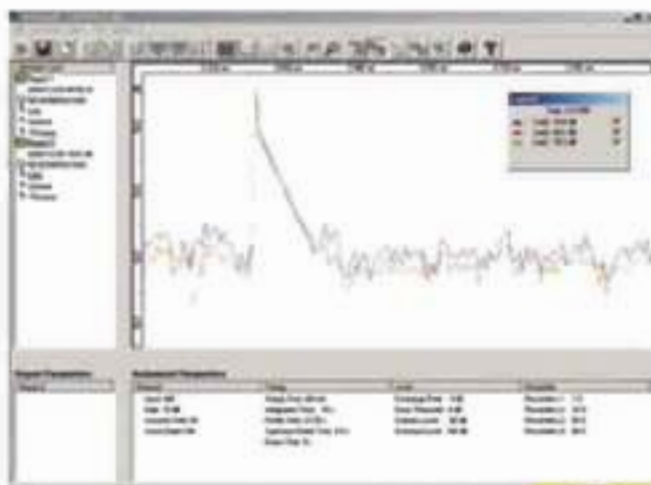
Option 3 "Extended Range"

Dynamic range for the measurement of either wideband or constant percentage bandwidth weightings: 20+140dBA on two ranges of 110dB (20+130dBA and 30+140dBA).

Thanks to the high measuring range, long integrations can be carried out with a minimum possibility that any event could cause under- or over-range indications. The HD 2110 allows to make measurements over a dynamic range exceeding



Reverberation time of octave band



Decay profile of sound level

110 dB and limited downwards by the instrument intrinsic noise. For example, if you set the measuring range upper limit at 140 dB, you can carry out measurements at the typical sound levels of a quiet office, being able to measure accurately, without over-load indications, peak levels up to 143 dB.

Option 4 "Reverberation time"

Reverberation time measurement either using the sound source interruption or the impulsive source techniques.

Reverberation time measurement simultaneously for wideband and for octave bands from 125 Hz up to 8 kHz and for third octave bands from 100 Hz up to 10 kHz (with "Third Octave" option). Sampling interval equal to 1/32 s.

Automatic calculation of estimated reverberation times: EDT, T10, T20 and T30 with any weighting.

Inputs and outputs

DC output of A-weighted sound level with FAST time constant updated 8 times per second (jack \varnothing 2.5mm).

LINE output unweighted (jack \varnothing 3.5mm).

RS232C standard serial port, according to EIA/TIA574. Baud Rate from 300 to 57600 baud.

External DC power supply (jack \varnothing 5.5mm).

Software:

DeltaLog5

The DeltaLog5 program allows to easily interface the sound level meter with a PC. The main characteristics are:

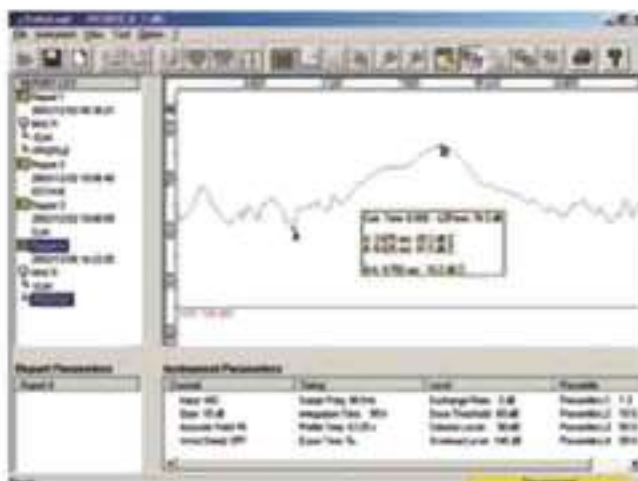
- Downloading of stored data from sound level meter memory to PC.
- Display in graphic and tabular format of stored data.
- Data export to Excel.
- Third octave spectra comparison with isophonic curves (with "Third Octave" option).
- Acquisition control via PC.
- Setup management of sound level meter.
- Upgrade of sound level meter.

Documenting the sound level meter measurements is an easier task thanks to the possibility to copy graphs or tables displayed by DeltaLog5 into other Windows applications.

DeltaLog5Monitor

The DeltaLog5Monitor program, besides many of the DeltaLog5 functions, allows to fully control the sound level meter via PC. Additional functions are:

- Modem connection to the sound level meter.
- Monitor function management.
- Calibration and diagnostic function management.
- Scheduling of recording and monitoring.
- Real time display of acquired data in graphic and tabular format.



Spectrum of octave band



Spectrum of octave band

DeltaLog5Ambiente

- The DeltaLog5Ambiente program allows to analyse the data acquired by the sound level meter by making easier the compilation of measuring reports. The main functions are:
- Automatic identification of impulsive components
- Automatic identification of tonal components (available only with sound level meter HD2110)
- Statistical analysis
- Management of measure data file
- Recalculation of the equivalent level with mask function.
- Display of acquired data in tabular or graphic format

DeltaLog5Building

The DeltaLog5Building program, using the HD2010 measurements, performs all the calculations needed to evaluate room acoustics according to ISO standards. Available calculations are:

- Reverberation time averaging
- Equivalent sound absorption area and sound absorption coefficient (ISO 354)
- Airborne sound insulation between rooms: indexes R , R' and D_{st} (ISO 140/III and IV)
- Airborne sound insulation of facades and facade elements: indexes $D_{st,w}$ and R (ISO 140/V)
- Impact sound insulation of floors: indexes L_n , DL_n , $L'_{n,w}$ and $L'_{n,w}$ (ISO 140/VI, VII and VIII)

In order to calculate the most of the indexes the "Reverberation Time" option is needed.

Reference standards

- IEC 60851:2001, Class 1 (Class 2 with microphone UC-52)
- IEC 60804:2000, Class 1 (Class 2 with microphone UC-52)
- IEC 61672-1:2002, Class 1 Group X (Class 2 with microphone UC-52)
- IEC 61260:1995 Class 1
- ANSI S1.4-1983, Type 1 (Class 2 with microphone UC-52)
- ANSI S1.43-1997, Type 1 (Class 2 with microphone UC-52)
- ANSI S1.11-1986 Order 3, Type 1-D, Extended range

Operating conditions

Storage temperature: -25+70°C.
Operating temperature: -10+50°C.
Operating relative humidity: 25+90%RH, non-condensing.
Operating static pressure: 65+108kPa.
Protection grade: IP64.

Power supply

Four 1.5V AA alkaline batteries alkaline. Battery life: ~10 hours of continuous use.
Mains power supply with DC voltage from 9 to 12 Vdc/300mA.
Weight and dimensions: 445x100x50mm including the preamplifier, 740g (with batteries).

Accessories

Supplied:

- Windscreen.
- HD9101 calibrator class 1 according to IEC60942:1988 (combined with microphone MK221).
- HD9102 calibrator class 2 according to IEC60942:1988 (combined with microphone UC-52).
- DeltaLog5 program for PC running Windows.
- RS232 null-modem serial cable with 9 pole connector HD2010/CSNM.

Optional:

- DC power supply for 230Vac mains voltage.
- 3m extension cable for microphone (different measures are available upon request).
- Weatherproof microphone unit with rain-shield and bird spike.
- Tripod.
- Holder HD2010/SA to fix the preamplifier to the tripod.
- Portable serial printer.
- DeltaLog5Monitor program for PC running Windows.
- DeltaLog5Building program for PC running Windows.

Order codes

HD2010 kit 1: the kit includes HD2010 sound level meter, carrying case, HD2010PN preamplifier, HD9101 calibrator, MK221 microphone, HD2110/CSNM null-modem serial cable, HD SAV windshield, DeltaLog5 program for PC interfacing.

HD2010 kit 2: the kit includes HD2010 sound level meter, carrying case, HD2010PNE2 preamplifier, HD9102 calibrator, UC-52 microphone, HD2110/CSNM null-modem serial cable, HD SAV windshield, DeltaLog5 program for PC interfacing.

HD2010 kit 3: sound level meter with weatherproof microphone unit: the kit includes HD2010 sound level meter with option 2 "Data logger", weatherproof microphone unit HD.WME950N, HD9101 calibrator, carrying case, HD2110/CSNM null-modem serial cable, DeltaLog5 program for PC interfacing.

Options and spare parts

Option 0: 2MB memory expansion.

Option 1 "Third Octave": Real time third octave spectrum from 16 Hz up to 20 kHz.

Option 2 "Data Logger": Automatic recording.

Option 3 "Extended Range": Measurement dynamic range extended to 110 dB.

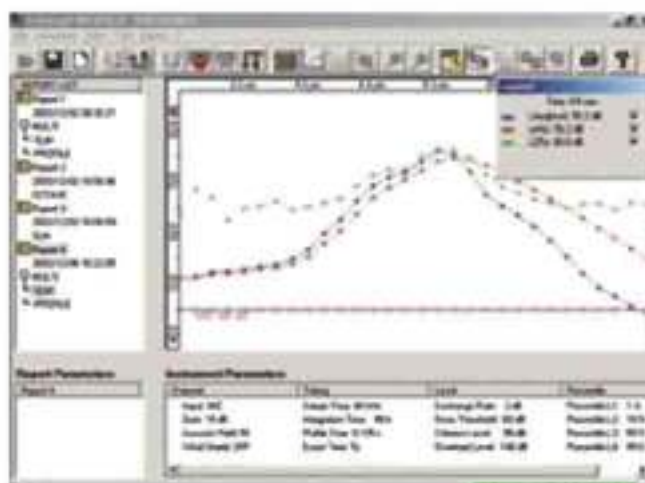
Option 4 "Reverberation time": Reverberation time measurement either using the sound source interruption or the impulsive source techniques.

HD9101: class 1 calibrator according to IEC60942:1988. 1000Hz frequency, 94dB/114dB sound levels.

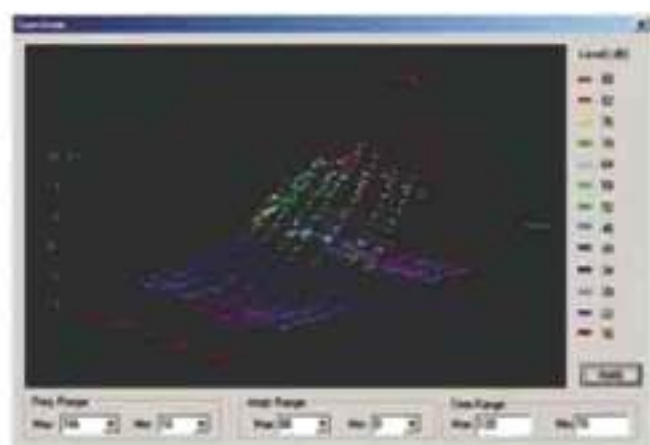
HD9102: class 2 calibrator according to IEC60942:1988. 1000Hz frequency, 94dB/114dB sound levels.

HD SAV: windshield for 1/2" microphones.

HD SAV2: windshield with bird spikes for weatherproof microphone unit HD.WME950.



Spectrum of octave band



Spectrum of octave band

HD SAVP: rain shield for weatherproof microphone unit HD.WME950.
HD2110/CSNM: null-modem serial cable with standard DB9 connector.
HD2110/CSM: serial cable for modem with standard DB25 connector.
HD2110/CSP: serial cable for printer with standard DB9 connector.
HD2010PNE2: microphone preamplifier for 1/2" pre-polarized microphones. It is equipped with the CTC function for electric calibration.
HD2010PN: microphone preamplifier with standard connector for 1/2" microphones. It is equipped with the CTC function for electric calibration.
HD2110P: microphone preamplifier with standard connector for 1/2" microphones. It is equipped with the CTC function for electric calibration and with a cable driver for extensions up to 100m.
HD2010PNW: heated microphone preamplifier for weatherproof microphone unit HD.WME950N with standard connector for 1/2" microphones. It is equipped with the CTC function for electric calibration.
HD2110PW: heated microphone preamplifier for weatherproof microphone unit HD.WME950 with standard connector for 1/2" microphones. It is equipped with the CTC function for electric calibration and with a cable driver for extensions up to 100m.
MK223: class 1 microphone with coated membrane for free-field measurements type WS2F according to IEC 61094-4:1995.
MK221: class 1 microphone for free-field measurements type WS2F according to IEC 61094-4:1995.
MK231: class 1 microphone for diffuse-field measurements type WS2D according to IEC 61094-4:1995.

UC-52: class 2 microphone for free-field measurements, type WS2F according to IEC 61094-4:1995.
HD.WME950N: weatherproof microphone unit including: MK223 1/2" condenser microphone, HD2010PNW heated preamplifier, wind and rain shields, bird spike, 5m connecting cable (other lengths on request).
HD.WME950: weatherproof microphone unit combined with option 3 "Extended Range" including: MK223 1/2" condenser microphone, HD2010PW heated preamplifier, wind and rain shields, bird spike, 5m connecting cable (other lengths on request).
AF209.60: DC mains power supply with Vin=230Vac and Vout=9Vdc/300mA.
CPA/3: 3m extension cable for microphone.
CPA/5: 5m extension cable for microphone.
CPA/10: 10m extension cable for microphone.
CPA/20: 20m extension cable for microphone, combined with option 3 "Extended Range".
CPA/50: 50m extension cable for microphone, combined with option 3 "Extended Range".
VTRAP: tripod, max height 1550mm.
HD2010/SA: support to fix the preamplifier to tripod.
S'print-BT: portable serial printer.
DeltaLog5Monitor: program for PC running Windows 95/98/ME/2000/XP for sound monitoring and remote control.
DeltaLog5Ambiente: program for PC running Windows 95/98/ME/2000/XP for analysis and processing of the acquired data.
DeltaLog5Building: program for PC running Windows 95/98/ME/2000/XP for room acoustics evaluation.



HD.WME950



HD2110/CSNM



AF209.60



ATM

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