



Specialist Process Safety
**& Electrostatic Test
Instrumentation**

Expertise in Explosion & Process Safety

Full Instrumentation

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DEKRA Organisational & Process Safety



The Experts in Process Safety & Electrostatic Measuring Instruments

DEKRA Organisational & Process Safety's (DOPS) expertise in the design, personalisation and supply of advanced, technical laboratory instruments is built on the innovation and high manufacturing standards we have developed over more than 30 years.

At DOPS we know you rely on the very best instrumentation from BAM Fallhammers to Carius Tubes, MIE Apparatus to Resistivity Equipment backed by our practical, technical support and the highest standards of quality, dependability and accuracy.

At DOPS, one of the world's largest professional safety organisations, our Testing Laboratories regularly employ our equipment, ensuring it retains full technical application and reliability for all our challenging testing needs. The instrumentation laboratory liaises closely with our in house test laboratories in order to provide practical solutions for testing problematic test samples.

We are always available to discuss your requirements and ensure your needs are not only exceeded but are fully supported for the long run.

Call us today on +44 (0)23 8076 0722 or contact us:



We provide:

- ▶ A comprehensive range of quality hand-held, portable and laboratory instruments
- ▶ UK based manufacture, design and instrument calibration to recognised EU and global standards
- ▶ Comprehensive servicing
- ▶ In-company GLP-compliant testing and expert process safety consultancy
- ▶ On-site, web-access and bespoke process safety training
- ▶ Regular maintenance and fault finding

Industries we serve:

- ▶ Chemical
- ▶ Aerospace
- ▶ Pharmaceutical
- ▶ Weather Studies
- ▶ Plastics Manufacture
- ▶ Circuit Board
- ▶ Manufacture
- ▶ Universities
- ▶ Research Institutes
- ▶ Quality Assurance
- ▶ Defence
- ▶ Petrochemical & Refining



Compliance with Technical Standards where applicable



CTL Code	Instruments No. Description	Pg No.	US	International	EU	UK	Other
04	MIE Cloud	8	ASTM E2019	ISO/IEC 80079-20-2			
05	MIT Cloud	9	ASTM E1491	ISO/IEC 80079-20-2		EN 50281-2-1	
06	20 Litre Sphere	10	ASTM E1226			EN 14034 -Part 1&4 & Part 2 & 3	
15	Layer Ignition Temperature	13	ASTM E2021	ISO/IEC 80079-20-2		EN 50282-1	
16	Flammability of Solids	14		UN Test N1	A10		
17	Oxidising Solids	15		UN Test O1	A17		
19	AIT Apparatus	16	ASTM E659		A15		DIN 51794
22	BAM Fallhammer	17		UN Test 3(a)(ii)	A14		
23	BAM Friction Test	18		UN Test 3(b)(i)	A14		
24	Koenen Test	19		UN Test 1(b);2(b)	A14		
25	Time Pressure Oxidising Liquids Test	20		UN Test 1(c)(i);2(c)(i) UN Test O.2	A21		
26	Floor Glove & Footwear Kit	21		IEC 61340-4-5		BS EN 60079-32-2	PD CLC/TR 60079-32-1
27	Liquid Conductivity	22		IEC 60079-32-2		BS5958*	
28	Surface Resistivity	23		IEC 60079-32-2		BS5958*	

*Note that this test standard is obsolete. In the case of powder resistivity testing, the test cell fabricated to BS5958 can still be provided because its volume is still useful for R&D purposes where the user wishes to test powder in bulk to obtain indicative order of magnitude values for resistivity. In the case of liquid conductivity testing at voltages greater than 10V, an interlocked enclosure is available. Testing at 100V is hazardous if certain conditions are met unless such an enclosure is purchased. Please discuss your test standard requirements with DEKRA UK prior to purchasing.

CTL01 - 10g Screening Tool (Carius Tube Apparatus - NEW)



An instrument for thermal instability and pressure rate screening to search for exothermic activity and gas generation of powders and liquids

Functional Specification and Deliverables

- ▶ Carius oven - 240 V a.c / 1 kW oven (step up transformer for 100-120V mains supply countries)
- ▶ Temperature controller and oven range 0 - 400 °C (ramp typical 0.5 °C)
- ▶ Temperature accuracy within + / - 1 °C
- ▶ Pressure range 0 - 100 barg. 1/4" transducer connected via 1/16" oil filled pressure link (1/8" tubing if high rate testing)
- ▶ Pressure accuracy within + / - 0.1 barg from 0 - 50 barg and within + / - 0.2 barg above 50 barg
- ▶ Data logging - slow log rate - every 5 sec, fast log rate - every 0.1 sec standard (up to every 1msec - optional high rate)
- ▶ Carius system program and driver discs
- ▶ Miscellaneous cables
- ▶ Set of Carius glass tubes and miscellaneous fittings supplied as standard
- ▶ Traceable calibration for master equipment to national/UKAS standards
- ▶ Tested with known calibration sample prior to delivery
- ▶ RS232 programmer link to pre-set oven heat up program

Optional Extras

- ▶ Higher speed data acquisition measurement options available in order to explore the pressure effects of more energetic materials
- ▶ Spare pressure transducers, temperature sensors, 10 g glass Carius tubes and other accessories available
- ▶ PC with software pre-installed (recommended)
- ▶ Training

Would you like to carry out tests with our CTL01 Screening Tool?
Contact our process safety experts now!

→ Contact us!



The New 10g Carius Screening apparatus

Benefits:

- ▶ Larger 10 g or 15 ml test sample size makes it easier to test a representative multiphase sample compared to other thermal instability measurement techniques
- ▶ The Carius Tube can be re-configured to enable sample addition during the duration of the test
- ▶ Enables permanent measurement of pressure and temperature to determine whether tube pressure is due to vapour pressure or permanent gas generation
- ▶ Useful preliminary screening technique prior to conducting large scale Adiabatic Dewar Calorimeter testing

CTL03 - Gas Burette Apparatus - NEW



An instrument for laboratory quantification of gas evolution rates from chemical processes and decompositions

The principle of the apparatus is very simple. Gas generated by a process displaces the fluid in the U-Tube and causes a pressure increase (directly equivalent to the volume of gas evolved). The pressure increase (measured as the head of a column of liquid in the U-Tube) is recorded by a sensitive transducer mounted on the side of the U-Tube. Once the pressure reaches a pre-determined limit selected and calibrated by the operator, a solenoid valve opens and relieves the pressure by venting the gases. The pressure measured by the transducer, and the number of times the solenoid valve has activated, are recorded by link-up to a data acquisition system thus enabling the total gas evolved from the process to be calculated.

Functional Specification and Deliverables

- ▶ Mains supply: 110 - 120 - or 220-240 V a.c / 2 Amp
- ▶ Accurate data up to approximately 5 cm³.s⁻¹
- ▶ Analogue count output and analogue pressure output (1 V or 10 V full scale selectable)
- ▶ Supplied with electronic control unit, mounting back-board, Gas Burette U-Tube, solenoid outlet valve plus a spare outlet valve, pressure transducer, silicon oil, glass accessories, miscellaneous tubing and cables, 100 ml glass calibration syringe
- ▶ 1 x instruction manual

Optional Extras

- ▶ Additional glassware to enable Test A12 Flammability of Solids – contact with water testing to be performed
- ▶ Miscellaneous sundries
- ▶ Data acquisition card and software for logging gas data
- ▶ Training

Would you like to carry out tests with our CTL03 Gas Burette Apparatus? Contact our process safety experts now!

→ Contact us!



Gas Burette apparatus

Benefits:

- ▶ Permits laboratory quantification of gas evolution rates from chemical processes
- ▶ Simple to use
- ▶ May be connected to a Mettler RC1mx set-up or to any other data acquisition system
- ▶ Volumetric measurement does not require composition of gas to be known
- ▶ Suitable for a wide range of hazardous gases with inert construction materials

CTL04 - MIE Apparatus (MIEIII)



Determines the smallest quantity of energy, as a capacitive or inductive spark discharge, required to ignite a powder dust cloud. Resulting data can be used to assess risks in processing and handling industrial powders.

Functional Specification and Deliverables

- ▶ Mains Supply - 110 - 240 V a.c / 3 A
- ▶ Energy Range: 4 mJ - 2000 mJ (trickle charge method)
- ▶ 29 device capacitance bank (energy selection increments of 1 mJ)
- ▶ 0 - 15 kV adjustable high voltage power supply
- ▶ Arc gap breakdown voltage monitoring unit utilising JCI 140 internal proximity voltmeter
- ▶ New high voltage digital meter (to 3 decimal places) for accurately setting up the breakdown voltage during testing
- ▶ Dust / air dispersion unit with set of acrylic Hartmann tubes with adjustable air regulator facility and rear external air inlet connection
- ▶ 1 x instruction manual
- ▶ 1 x set of accessories

The Following Options Available at an Additional Cost

- ▶ JCI 140 / JCI 148 Voltmeter - for self-checking calibration of high voltage output with the knowledge and confidence that the voltmeter has no detrimental loading effects on the output voltage (accuracy + / - 2%)
- ▶ Chart Recorder
- ▶ Laptop with voltage transient analysis data card and software pre-installed (research tool)

Optional Extras

- ▶ Glass or acrylic Hartmann tubes and electrode spares, other dispersion base spares etc
- ▶ Hot coil tube with hot coil and independent power source for screening powders, that are intended for processing above 110 degC on plant, for thermal sensitivity when dispersed in the form of a dust cloud through a hot ignition source (hot coil temp ca 1000 deg C). Samples with positive results can then be tested within CTL05 MIT Cloud apparatus (page 7)
- ▶ Training

Would you like to carry out tests with our CTL04 MIE Apparatus?
Contact our process safety experts now!



MIE Cloud Apparatus (MIE III)

Benefits:

- ▶ Voltage and capacitance can be controlled in fine increments
- ▶ Arc gaps can be manually adjusted for researching alternative gaps being more conducive to ignition
- ▶ Delivers results to ASTM E2019 and ISO/IEC 80079-20-2 and EN standards
- ▶ Wide range of available accessories

CTL05 - MIT Cloud Test Apparatus - NEW



Measures the lowest temperature at which ignition takes place when a powder product is dispersed in heated air.

The MIT Cloud Apparatus provides an objective way to measure the susceptibility of a dust cloud to auto ignition in a heated environment (e.g. with plant processing temperatures above 110 °C). When most powders are dispersed in heated air, spontaneous combustion will take place provided the air temperature is high enough.

The Minimum Ignition Temperature (MIT) test measures the lowest temperature at which such ignition will take place.



MIT Cloud Apparatus

Functional Specification and Deliverables

- ▶ Mains supply: 100 - 120 V or 220 - 240 V inlet / 100-120 V/ 10A output to furnace operation
- ▶ 1 kW furnace capable of heating from ambient to 1000 °C via temperature control unit (normal max operating temperature to 800°C)
- ▶ Supplied with spare glass sealing gaskets and observation glasses, set of thermo couples, new integral control unit complete with furnace temperature controller and inlet pressure meter
- ▶ 1 x instruction manual

Optional Extras

- ▶ Spare observation glasses, gaskets, thermocouples
- ▶ Training

Would you like to carry out tests with our CTL05 MIT Cloud Test Apparatus? Contact our process safety experts now!



Benefits:

- ▶ Simple to use
- ▶ New robust design
- ▶ New control unit displaying on-board temperature of both centre tube thermocouples as well as inlet pressure
- ▶ New 1/4" bsp inlet pressure transducer connection
- ▶ Complies with technical standards: (ISO/IEC 80079-20-2 , EN 50281-2-1 & ASTM E1491)
- ▶ MIT data finds application in the specification of electrical equipment for use in the presence of combustible dusts and also has some application in the specification of safe drying temperature (above 110 °C) on process plant

CTL06 - 20L Sphere Test Apparatus



Determines the explosion severity (maximum pressure and speed of explosion) of a dust cloud under specified test conditions.

The 20 litre sphere test apparatus is used to determine the explosion severity (maximum pressure and speed of the explosion) of a dust cloud under specified test conditions.

The dust is dispersed in the 20 litre explosion chamber by injecting it from a dust container pressurised with air at 20 bar. By preevacuating the explosion chamber, the ignition is initiated by very powerful chemical ignitors (2 x 5 kJ chemical ignitors), at atmospheric pressure. The delay time is the period between start of dispersion and ignition and is chosen to obtain results consistent with the standard 1 m³ vessel.

The pressure-time history is measured and, for each test, the maximum explosion pressure (P_m) and maximum rate of pressure rise ((dP / dt)_m) are established and recorded to a PC.

The resulting data is normalised to a 1 m³ vessel. The test is conducted according to BS EN14034 parts 1, 2 & 3 & ASTM E1226.

Functional Specification and Deliverables

- ▶ Mains supply: 110 - 240 V a.c selectable operation
- ▶ 20 litre sphere for dust explosion testing
- ▶ Data control unit - interfaces with measurement piezoelectric sensors via charge amplifiers and sends pressure and control data to / from PC (PC not supplied)
- ▶ Ignitor initiation unit - sends ignite signal to chemical ignitors and also filters the air and contains air inlet lines.
- ▶ 20L Sphere
- ▶ Set of spare parts
- ▶ 1 x instruction manual

Note: customers outside the UK will, for transport logistics reasons, have to source their own chemical ignitors. Details available on request.

The Following Items are Available at an Additional Cost

- ▶ PC with 20 litre software pre-loaded

Optional Extras

- ▶ Vacuum pump
- ▶ Ignitor storage safe
- ▶ Full commissioning and training package in safety operational aspects and use of 20 litre apparatus (bottom valve overhaul procedure covered)
- ▶ LOC control unit and 20 litre mods to accommodate this unit



20 Litre Sphere Test Apparatus with optional lifting gear shown

Benefits:

- ▶ Data applicable for explosion vent sizing, suppression & containment design
- ▶ Compact size compared to testing with 1 m³ sphere and uses less sample
- ▶ Allows accurate vent sizing calculations for full scale plant
- ▶ Easy to use
- ▶ Automated ignition and data acquisition system
- ▶ Optional accessories eg. seals, simple partial pressure method of controlling via Limiting Oxygen Concentration control unit and optional full commissioning and training package also available from DOPS

Would you like to carry out tests with our CTL06 20L Sphere Test Apparatus? Contact our process safety experts now!



CTL07 - Portable Dust Explosion Demo Kit - NEW



A portable kit demonstrating the hazards that even a small quantity of powder product can pose when dispersed in the form of a dust cloud through an electrostatic spark discharge ignition source

There is no better way than a live demonstration to raise awareness of dust explosion hazards. The DEKRA Process Safety portable dust explosion demonstration kit gives the audience an insight into the hazards that even the smallest quantity of powder product can pose when dispersed in the form of a dust cloud through an electrostatic spark discharge ignition source. The kit is supplied with all accessories in a compact, ready to use, robust case. Typically icing sugar or custard powder may be used for demonstration purposes. However, other products, for example metal powders and photo copier toner, may also be tested (optional glass tube recommended for ease of cleaning in those cases).

Functional Specification and Deliverables

- ▶ Powder dispersion unit with acrylic Hartmann tube
- ▶ Mains supply: 110 - 120 V a.c / 220 - 240 V a.c - 200 W
- ▶ 8.5 kV / 0.25 mA constant arc internal ignition source
- ▶ Hand-held control handset for arc activation and air dispersion
- ▶ Double action hand pump for pre-charging the internal air reservoir
- ▶ Rupture paper disc set
- ▶ Air line
- ▶ Electrodes
- ▶ Built in air regulator - typical default setting 4 barg
- ▶ Lightweight at just 15 kg and packed into robust case
- ▶ 1 x instruction manual

Optional Extras

- ▶ Glass tube
- ▶ Polycarbonate protective screen
- ▶ Spare electrodes
- ▶ Spare rupture discs
- ▶ Training

Would you like to carry out tests with our CTL07 Portable Dust Explosion Demo Kit? Contact our process safety experts now!



Benefits:

- ▶ Impressive visual and audio demonstration of the hazards presented by dust clouds when subjected to an ignition source
- ▶ Allows employers / teachers to simply demonstrate to employees, students and co-workers the dangers that even the smallest quantities of some powders can pose when exposed to, or in the vicinity of, an electrostatic ignition source
- ▶ Compact - all standard accessories pack neatly away in the same case
- ▶ Portable, robust case design facilitates easy transportation

CTL08 - Group A/B Flammability Screening Apparatus



Determines whether a dust is capable of explosion when dispersed as a cloud and exposed to an ignition source

For the Group A/B Classification of a dust cloud of powder product, this method requires a constant arc to be produced through the test sample. An ignition is an observation of flame propagation away from the ignition source. If at any time during the procedure an ignition is observed then the test is complete and the dust is classed as Group A Flammable.

Note that a Group B classification does not imply that the dust cannot be involved in a fire or show exothermic behaviour (selfheating). Other tests must be performed to establish this.

Functional Specification and Deliverables

- ▶ Mains supply: 110 - 240 V a.c / 3 A
- ▶ Dust / air dispersion base complete with steel mushroom for dust cloud optimisation - typically 7 barg service air required
- ▶ 1 litre acrylic Hartmann tube (can be cleaned with warm soapy water and dried)
- ▶ Tube rupture papers (for top tube closure)
- ▶ Brass electrodes for creating arc
- ▶ Constant arc power source
- ▶ Remote handset (arc and air activation)
- ▶ 1 x instruction manual

Optional Extras

- ▶ 1 litre glass hot coil tube and power source for screening of products that are to be processed on full scale plant above 110 °C (comes complete with power source, hot coil holder and wire)

Note: if a result is positive then full testing can be carried out in the MIT Cloud Apparatus CTL04 (see page 9).

- ▶ Spare electrodes
- ▶ Spare rupture discs
- ▶ Other accessories available

Would you like to carry out tests with our CTL08 Group A/B Flammability Screening Apparatus? Contact our process safety experts now!



Group AB Flammability Screening Laboratory Rig

Benefits:

- ▶ Screens for ignition sensitivity to electrostatic spark discharge and / or ignition sensitivity to exposure to a 1000 °C heat source (see options) to represent those ignition sources most commonly encountered in industry
- ▶ Hot coil is relevant for any product processing above 110 °C
- ▶ Small and compact
- ▶ Extremely easy to use
- ▶ Air supply can either be from a standard service air pressure within a laboratory environment or an air cylinder

CTL15 - Layer Ignition Temperature Test Apparatus



Determines the minimum ignition temperature for a given thickness of powder deposited on a hot surface.

The Layer ignition temperature test apparatus permits the determination of the minimum ignition temperature of a given thickness of powder deposited on a hot surface. The method is used for the specification of the 'T' temperature rating of electrical equipment for use in hazardous areas (dusty atmospheres). It is also relevant to other industrial equipment where dust is present on hot surfaces in thin layers exposed to the atmosphere and is manufactured in accordance with IEC 61241-2, EN 50281-2-1 & ISO/IEC 80079-20-2..

Functional Specification and Deliverables

- ▶ Layer Ignition Hotplate (1250 W / 6 A, 220 - 240 V (100 - 120 V via transformer option)) single-phase. Temperature range = 0 - 400 °C (500°C max ASTM standard)
- ▶ Remote controller unit (incorporates PID temperature control). Sample may be ramped in temperature or held isothermally.
- ▶ K-type thermocouple and extension cable for both hotplate and sample
- ▶ 5 mm, 12.5 mm, 15 mm sample retaining rings supplied (100 mm diameter)
- ▶ Data acquisition LIT PC, hardware and software (monitor not supplied)
- ▶ 1 x instruction manual

Optional Extras

- ▶ 200 µm sieve and catchment tray with lid
- ▶ Spare sample retaining rings (rings of any height may be fabricated for you)
- ▶ Spare thermocouples
- ▶ Calibration services
- ▶ Training services in Layer Ignition Temperature testing
- ▶ Custom data acquisition for multiple hotplates



Layer Ignition test apparatus

Benefits:

- ▶ Designed for testing to ISO/IEC 80079-20-2, EN 50281-2-1 & ASTM E2021 for specifying the maximum surface temperature of electrical and nonelectrical equipment
- ▶ Tests can be performed on a range of samples including 5, 12.5 or 15 mm depths (other depths available optionally)
- ▶ Data recording
- ▶ Compact in size
- ▶ Novel sloping edge shield design located under the hotplate surface to permit expanding samples to run down into a drip tray located under the hot-plate unit (drip tray not supplied as standard)

Would you like to carry out tests with our CTL15 Layer Ignition Temperature Test Apparatus? Contact our process safety experts now!



CTL16 - Flammability of Solids (Burning Rate test apparatus) (UN) & European Journal (Physical Properties - A Test Series)



Permits testing to the following standards: Flammability of Solids (Test A10), Oxidising Solids (Test A17) and UN Transport of Dangerous Goods Test N1 (for discovering whether the product under test is to be classified into Division 4.1 and determine which packing group the product falls into under UN regulations) – using the Fire Train / mould equipment and accessories

The Flammability of Solids (Burning Rate) apparatus is manufactured in accordance with the "Classification, Packaging and Labelling in the EU – testing methods" publication, test A10 (Flammability of Solids) and also with EU test A17 (oxidising solids) and UN Transport of Dangerous Goods Division 4.1 (burning rate) tests. The test serves to characterise the hazards (if any) arising from materials subjected to given stimuli. The Fire Train Test, for readily combustible solids, checks the ability of a substance to propagate combustion by igniting it and determining the burning time across a given length of that material.

As well as acting as a regulatory test, the Fire Train Test result has uses in process safety in the assessment of fire risk with powders and in helping to predict the consequences of dust fires and explosions. If testing to test A17 then please purchase optional powder cone (see options).



Test Apparatus: Powder 250 mm long train flame transiting length of the sample. The Fire Train mould prepares sample pile in a V-line for the burning rate test

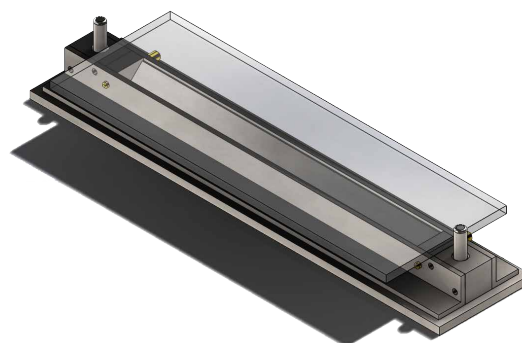
Functional Specification and Deliverables

- ▶ Fire Train forming mould with anodised aluminium 90° Vee groove former, support cradle, base plate and brass holding clamps
- ▶ Test Plate: impervious, non-combustible and low thermal conductivity quartz test plate
- ▶ An ignition source is required but is not supplied due to the documentation and certification required to ship a gas cylinder overseas. A small portable hand held butane or propane cylinder with a nozzle diameter of greater than 5mm is all that is required
- ▶ Metric rule for measuring Fire Train distances High grade nonrusting steel rule marked in millimetres complete with UKAS calibration certificate
- ▶ Laboratory stopwatch for timing combustion and linear burning intervals
- ▶ 1 x instruction manual

Optional Extras

- ▶ Additional fire train moulds, quartz test plates, sundries
- ▶ A small conical sample chamber for forming a powder pile (3.5 cm dia x 2.5 cm height) is available at additional cost to enable preliminary oxidiser screening of samples (Test A17 only)

Note: Preliminary screening of samples is a requirement of test A17 and is performed in the interest of safety to establish whether the solid sample has oxidising properties. If it does then no further testing is required. However, if it does not have oxidising properties then the full fire train test is then carried out.



Benefits:

- ▶ Designed for testing to EU and UN standards
- ▶ Anodised finish means that corrosive samples do not harm the fire train mould
- ▶ Compact size
- ▶ Easy to use

Would you like to carry out tests with our CTL16 Burning Rate Test Apparatus? Contact our process safety experts now!



CTL17 Oxidising Solids Test Apparatus

Tests the potential for burning rates and intensity to increase when two solids are mixed together



The Oxidising Solids Test Apparatus is designed to test for the potential of a solid substance to increase the burning rate, or burning intensity, of a combustible substance when the two are thoroughly mixed. The test is to the UN Transport of Dangerous Goods Manual of Tests and Criteria (Test 0.1) and is used to establish whether a product is an oxidizer of division 5.1 or not and, if so, whether it falls into packing group I, II or III.

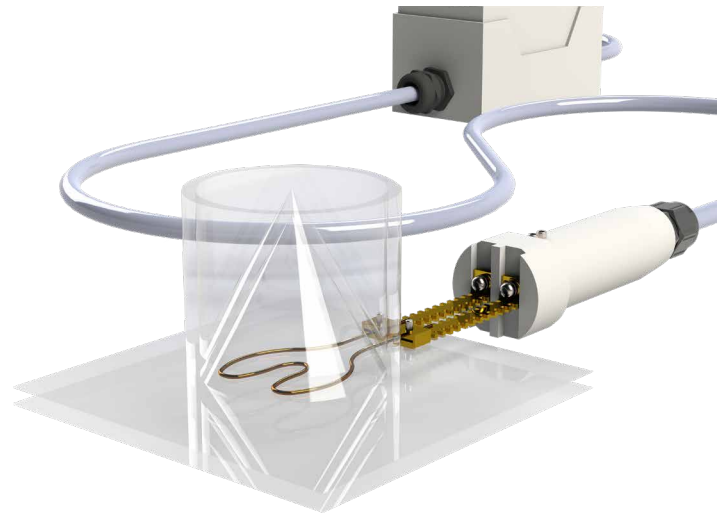
Functional Specification and Deliverables

- ▶ Mains supply: 220 - 240 V or 120V mains inlet / 12 V d.c output 150 W hot coil power source
- ▶ 1 x glass conical sample loading chamber (glass blown with 60° angle for optimal powder cone forming as per test standard requirements)
- ▶ 1 x insulated quartz plate
- ▶ 1 x roll 100 m NiCr wire (0.5 mm diameter)
- ▶ 1 x stop watch
- ▶ 1 x instruction manual

Optional Extras

- ▶ Spare nickel chromium wire
- ▶ Quartz plates
- ▶ Glass sample loading chambers

Would you like to carry out tests with our CTL17 Oxidising Solids Test Apparatus? Contact our process safety experts now!



Oxidising Solids Test Apparatus

Benefits:

- ▶ Tests to the United Nations Transport of Dangerous Goods Manual of Tests & Criteria (Test 0.1)
- ▶ Compact size
- ▶ Nickel Chromium wire easily changed
- ▶ Simple to use

CTL19 Auto Ignition Test Apparatus

Determines hot and cool flame ignition temperatures in chemical liquids and solids



The Auto Ignition Temperature Test is performed to enable determination of hot and cool flame auto ignition temperatures of a liquid chemical (and solid chemicals*) in air at atmospheric pressure in a uniformly heated vessel.

Auto Ignition is defined as the ignition of a material commonly in air as the result of heat liberation due to an exothermic oxidation reaction in the absence of an external ignition source such as a spark or flame.

The following standards (each with slight differences) are applicable to the test:

- ▶ ASTM E659
- ▶ EC test A15
- ▶ DIN 51794
- ▶ Other configurations

* Within certain limitations, the test can also be used to determine the auto ignition of solid chemicals which readily melt and vaporise at temperatures below the test temperature.

Functional Specification and Deliverables

The ASTM Method spec is covered here. For DIN standard apparatus deliverables please contact us.

- ▶ Mains supply: 220 - 240 V 50 Hz single phase furnace
- ▶ 150 - 650 °C PID temperature control (standard operating range)
- ▶ Capable of controlling the flask temperature within + / -1 °C up to 350 °C and + / - 2 °C from 350 °C to 650 °C
- ▶ Temperature uniformity is better than + / - 4 °C measured on the outside of an aluminium clad flask at three positions
- ▶ 10 x round bottom borosilicate flasks
- ▶ AIT Data acquisition PC & hardware/software supplied (monitor not supplied)
- ▶ Supplied with vapour temperature thermocouple, spare thermocouple and sample injection syringe set
- ▶ Pre-calibrated
- ▶ 1 x instruction manual

Optional Extras

- ▶ Spare vessels for ASTM (round bottom) or DIN (conical)
- ▶ Spare syringes
- ▶ Spare thermocouples
- ▶ Spare oven insulation
- ▶ Training services
- ▶ Also available. A fan assisted model of the AIT apparatus capable of 650 °C with fast flask changing capability via a new novel flask holder design.



Auto Ignition Test Apparatus

Benefits:

- ▶ Simple to set up and operate
- ▶ Compact size

Would you like to carry out tests with our CTL19 Auto Ignition Test Apparatus? Contact our process safety experts now!



CTL22 BAM Fallhammer Test Apparatus - NEW



For determining the sensitivity of powders to impact stimuli for assessing transport, packaging and regulatory classification (UN, EC and EMTAP)

Some powders are deliberately manufactured with highly energetic behaviour, but occasionally it is an unexpected property of a new material. For regulatory compliance there are a number of screening tests which have to be performed on new materials in order that they can be safely transported. One such screening is a BAM Fallhammer test, which measures sensitivity to mechanical force and enables testing to UN & EU Regulations.

Functional Specification and Deliverables

- ▶ A solid cast steel base block
- ▶ Main 100 mm diameter anvil
- ▶ A centring ring for locating the intermediate anvil on the main anvil
- ▶ 2 x Intermediate 26 mm diameter anvils
- ▶ 2 x locating rings with orifices for gas release
- ▶ 200 steel cylinders (roller bearings)
- ▶ 50 rubber 'o'rings for steel cylinders (liquid testing only)
- ▶ 100 steel collars for steel cylinders locating
- ▶ An upper to lower cylinder distance gauge for 1 - 2 mm sample gap setting required for liquids
- ▶ A central column with guides (graduated scale) ready set for correct height
- ▶ A 1 kg drop weight carrier assembly
- ▶ A 1 kg weight already fitted to 1 kg drop weight assembly for a 2 kg overall weight
- ▶ A 5 kg drop weight carrier assembly
- ▶ A 5 kg weight already fitted to 5 kg drop weight assembly for 10 kg overall weight
- ▶ A drop weight electromagnetic release device
- ▶ An electromagnetic power supply distribution box together with electromagnet 24V supply cable, 100 - 120 V / 220 - 240 V mains inlet supply cable and remote handset for weight release (power ON = drop, power OFF = hold)
- ▶ Electromagnet safety pin
- ▶ A 40 mm³ sample loading spatula
- ▶ A polycarbonate protective shield
- ▶ 1 x instruction manual

Optional Extras

- ▶ Zone 22 certified power supply control equipment for electromagnet drop mechanism
- ▶ Additional sets of BAM Fallhammer collars and rollers
- ▶ Bespoke custom weights or other requirements may be possible (please enquire)
- ▶ Training



BAM Fallhammer Apparatus

Benefits:

- ▶ Excellent for screening products for sensitivity to impact stimuli in order to determine whether a substance is an impact sensitive explosive
- ▶ Excellent screening tool for classifying a product for transport and EU packaging and labelling classification
- ▶ Simple to use electromagnetic drop weight release mechanism
- ▶ Robust design

Would you like to carry out tests with our CTL22 BAM Fallhammer Test Apparatus? Contact our process safety experts now!



CTL23 BAM Friction Test apparatus - NEW



Measures a substance's susceptibility to friction from sliding or rubbing contact for transport, packaging and regulatory classification (UN, EC and EMTAP)

Some powders are deliberately manufactured with highly energetic behaviour, but occasionally it is an unexpected property of a new material. For regulatory compliance there are a number of screening tests which have to be performed on new materials so they can safely be transported. One such screening is the BAM Friction test, which measures sensitivity to sliding (rubbing) contact and permits determination of whether the substance is too dangerous to transport in the form tested, or to classify in terms of its explosivity and labelling etc.

This apparatus is defined in the United Nations Handbook "Recommendations on the Transport of Dangerous Goods - Manual of Tests and Criteria" and also in the European Commission Handbook "Classification, Packaging and Labelling of Dangerous Substances in the European Union Part 2 - Testing Methods". This apparatus also appears in the Defence Ordnance Safety Group, Energetic Materials Testing and Safety Policy Committee Manual of Tests Vol.1 Test 43 A (EMTAP).

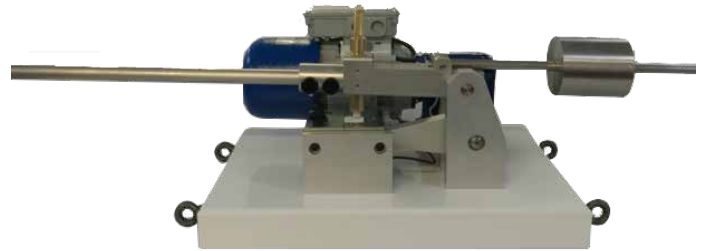
Functional Specification and Deliverables

The apparatus and accessories supplied are as follows:

- ▶ 1 x Friction Tester assembly complete with base plate, cam assembly with sliding carriage, motor drive (220 / 240 V / 50 Hz or 100 / 120 V / 60 Hz), peg locating device, counterbalance arm and operating switch box
- ▶ 1 x loading arm with weight location positions (hook supplied)
- ▶ 1 set (400 pce) porcelain pegs
- ▶ 1 set (100 pce) porcelain plates
- ▶ 9 x load weights with eyes (to cover 5 - 360 N load range)
- ▶ 1 x counterbalance weight
- ▶ 1 x instruction manual
- ▶ 1 set calibration graphs for load weight locations
- ▶ All apparatus supplied by DEKRA Process Safety is provided with a warranty (excluding consumables)

Optional Extras

- ▶ Other load weights available at extra cost
- ▶ Additional sets of porcelain pegs and plates



BAM Friction Apparatus

Benefits:

- ▶ Excellent for screening products for sensitivity to sliding/rubbing stimuli in order to determine whether a substance is a friction sensitive explosive
- ▶ Excellent screening tool for classifying a product for transport and EU packaging and labelling classification
- ▶ Simple to use hook on weight location method
- ▶ Robust design

Would you like to carry out tests with our CTL23 BAM Friction Test Apparatus? Contact our process safety experts now!



CTL25 Combined Time-Pressure / Oxidising Liquids Test Apparatus



Examines the ability of a substance to propagate a deflagration, as well as the oxidising potential of a liquid to increase the burning rate of a combustible substance when the two are mixed. For UN and EMTAP classification of explosives.

The Time / Pressure apparatus is designed to examine the effect of an ignition on substances under confinement and in particular, the possibility that ignition might lead to a deflagration with explosive violence at pressures which can be attained with substances in normal commercial packages. The testing is conducted according to the UN Transport of Dangerous Goods Recommendations Manual of Tests and Criteria Test 1 (c) (i), Test 2 (c) (i) or Test C.1 and also to the EMTAP Manual of Tests Volume 1. Testing of Oxidising properties is also possible using the newly supplied integral control unit and software package to UN/EC test standards.

Functional Specification and Deliverables

- ▶ Time Pressure / Oxidising Liquids Control Unit with remote handset push button initiation of ignition following commencement of logging of data. Complete with changeover switch to enable either time pressure testing or oxidising liquids testing to be undertaken
- ▶ Time Pressure Vessel and Stand
- ▶ Pressure Transducer (0-25 barg / 0-362.5 psig)
- ▶ Ignitor output cable
- ▶ USB Data communication cables
- ▶ TP PC supplied as standard (monitor not supplied)
- ▶ Torque Spanner for vessel end cap maintenance
- ▶ Vessel and end cap maintenance stands
- ▶ 1 x set aluminium burst discs (100 pcs)
- ▶ 1 x set lead washers (200 pcs)

Optional Extras

- ▶ Spare burst discs
- ▶ Spare lead washers
- ▶ Spare pressure transducer
- ▶ Oxidising liquids Nickel Chromium wire for hot coil ignition source*

*Note: Due to transport restrictions, primed cambric or fuse heads are not supplied as standard. These are used in conjunction with each other to form the ignition source for time pressure testing. These components must therefore be sourced locally by the customer.



Time / Pressure Test Apparatus

Benefits:

- ▶ Simple to use
- ▶ Automated ignition / monitoring set-up
- ▶ Test software / hardware: graphical display showing time vs pressure trace
- ▶ High speed logging of raw data (up to 10kHz)

Would you like to carry out tests with our CTL25 Oxidising Liquids Test Apparatus? Contact our process safety experts now!



CTL26 Floor, Glove and Footwear Test Kit



For testing flooring resistance and personnel glove and footwear resistance.

Suitable for testing flooring resistance and personnel glove and footwear resistance, the DEKRA Process Safety Floor, Glove & Footwear Test Kit enables portable testing to follow BS5958 guidelines, IEC 60079-32-1:2015 and IEC 61340-4-5.

Flooring material and associated coatings can contribute to a buildup of electrostatic charge as a result of the motion of people, trolleys, pallet and packaging lifting devices and general furniture; for example workbenches, chairs etc. Abrupt discharge of the static charges can cause discomfort to personnel and, in extreme cases, ignition of process products if the ignition energy of the electrostatic spark discharge is above the minimum ignition energy of the product. It is possible, in such cases for products, when present in the atmosphere in the form of a dust layer or dust cloud, to ignite.

Other areas where electrostatic build-up is of concern is electronic equipment where it is possible for malfunctions to arise due to electrostatic spark discharge. It is clear that not only is flooring resistance important, but also the resistance of personnel - particularly with respect to gloves and footwear as well as garments being worn.

Functional Specification and Deliverables

- ▶ Resistance meter – Maximum range > 200 GΩ (Calibration Certificate supplied)
- ▶ Brass hand electrode with pre-fitted 10 KΩ safety resistor installed, 25 mm diameter x 160 mm
- ▶ 2 x stainless floor electrodes with conductive rubber pads each 63.5 mm dia x 105 mm = 2.5 Kg
- ▶ Integral Aluminium floor plate with fixed PTFE backing sheet
- ▶ 1 GΩ calibration check resistor
- ▶ 5 metre earth lead
- ▶ Miscellaneous other leads (for resistance meter)
- ▶ Instruction manual

Optional Extras

- ▶ JCI 140 portable static proximity voltmeter (0 - 20 kV Accuracy + / - 2 % no drift). Measures surface voltage without contact with the target.
- ▶ Humidity meter (with temperature read-out) – typically within RH + / - 5 % and temp + / - 0.5 °C (important because resistivity properties are known to change with varying humidity)

- ▶ JCI 148 which, when combined with a JCI 140 meter, can measure accurately the voltage on a body or conductor to 20kV directly without experiencing detrimental loading effects due to the JCI 148's very high input impedance properties (ask for a datasheet on the JCI 140/JCI 148 if these products are of interest)
- ▶ Ohm square surface resistivity test cell (can be used in conjunction with the supplied resistance meter if desired)
- ▶ Additional sets of leads
- ▶ Other resistor values for instrument checking available
- ▶ Calibration services
- ▶ Custom floor electrodes to other standards not listed here
- ▶ Additional cut outs may be incorporated into case supplied (where possible) to cater for individual needs).



Floor, Glove and Footwear Test Kit (static measuring options available)

Benefits:

- ▶ Compact kit within a portable hard carry case
- ▶ Simple to use
- ▶ Optional additional accessories available for a variety of on-site safety assessments including JCI 140 static monitor

Would you like to carry out tests with our CTL26 Floor, Glove and Footwear Test kit? Contact our process safety experts now!



CTL27 Liquid Conductivity Test Apparatus



For accurate measurement of the conductivity / resistivity of liquids and other applications.

The liquid conductivity test apparatus is used to assess a liquid's conductive properties by measuring the current flowing through the material when a known 10 V is applied across it with reference to ground. A heptane reference sample is used to check the equipment prior to conducting a test on liquid sample with no known conductivity data. The equipment permits testing in general accordance with BS5958. The test cell also complies to IEC 60079-32-2.

Functional Specification and Deliverables

- ▶ 10 V d.c power supply (resolution 0.1 V, accuracy + / - 2 %)
- ▶ Picoammeter (2 nA to 20 mA ranges) - 2 nA range has 10 fA resolution + / - 400 fA. Noise 20 fA. Instrument calibration certificate supplied
- ▶ Custom manufactured liquid conductivity test cell
- ▶ Miscellaneous cables
- ▶ Instruction manual

The Following Items are Available at an Additional Cost

- ▶ The JCI 155v6 Charge Decay Analyser together with a JCI 173 liquid sample support insert for testing charge decay time of liquids may also prove to be beneficial when performing R&D into various liquid properties or for assessing electrostatic risks with processing and handling the product.
- ▶ Alternative measuring meters may also be specified to meet customers individual requirements

Would you like to carry out tests with our CTL27 Liquid Conductivity Test Apparatus? Contact our process safety experts now!



Liquid Conductivity Test Apparatus

Benefits:

- ▶ Simple to use
- ▶ Simple assembly / disassembly of test cell. This is especially important since cleaning of the test cell regularly between test samples is essential when performing liquid conductivity tests
- ▶ Close interference fit machined surfaces for excellent sealing when testing liquids

CTL28 Powder Resistivity Test Apparatus - NEW



For measurement of conductivity / resistivity of powder samples to enable identification of highly insulating powders which may create electrostatic ignition risks.

Powders will nearly always acquire electrostatic charge during processing, the level of charge being largely determined by the violence of the process. BS5958, now discontinued, nevertheless gave ranges of charge levels which might be expected from different processes. Other standards similarly give typical ranges of charge level but perhaps not in as much detail. The BS5958 test cell is now only sold as an optional extra and can be purchased additionally by those companies who wish to use a generalized measurement cell to aid their research and development programs. The test cell(s) of choice for measuring resistivity now allows testing to the newer BS EN/IEC 60079/80079-2 test standards.

Whether or not charge levels prove to be a problem, or indeed whether they can be observed at all, depends largely upon the rate at which the charge is dissipated, particularly from the bulked powder. If the bulked powder is ohmic (that is, electric current through the powder is directly proportional to applied voltage for all voltages) an indication of the severity of electrostatic problems to be expected can be obtained by measuring the resistivity of the powder. Please also refer to details of our JCI 155v6 Charge Decay Time Analyser which is the best measuring device for monitoring charge decay parameters of products that have non-exponential as well as those that have exponential charge decay times. The powder charge decay times (time to $1/e$) of many powder products are non-exponential in nature and therefore, it is important to appreciate both powder resistivity and charge decay data, in conjunction with one another, when considering electrostatic risks or when indeed applying the data to develop new products.

Functional Specification and Deliverables

- ▶ New style custom manufactured power supply with 100V, 500 V, 1 kV, 2 kV, 3 kV (fixed settings). Mains 220-240V / 1A
- ▶ Custom manufactured test cell to IEC 80079 and 60079
- ▶ Pico-ammeter for measurement of current through or across the test sample (2nA to 20mA ranges) - 2nA range has 10fA resolution +/- 400fA. Noise 20fA. Mains 220-240V / 1A
- ▶ Miscellaneous cables
- ▶ In line transorb over voltage protection unit (for protecting the sensitive pico-ammeter from over voltage)
- ▶ BS EN / IEC 80079-20-2 and BS EN / IEC 60079-32-1 calibration test cells supplied as standard
- ▶ Powder resistivity apparatus instruction manual

Optional Extras

- ▶ Discontinued older BS5958 test cell and calibration test cells

The Following Items are Available at an Additional Cost

- ▶ JCI 155v6 Charge Decay Analyser with JCI 173 Powder Sample support insert for testing charge decay time of powders. (JCI 176 sample support base is included in this optional package)



Powder Resistivity Test Apparatus

Benefits:

- ▶ Simple to use
- ▶ BS EN / IEC 80079-20-2 and BS EN / IEC 60079-32-1 test cells for assessing material properties to current explosive atmospheres test standards
- ▶ Calibration test cells for checking accuracy of the measurement system used for the IEC 80079-20-2 and IEC 60079-32-1 test apparatus
- ▶ New interlocked enclosure (isolates power supply when open)
- ▶ An optional BS5958 Test cell is available at additional cost. This test cell sits on a support base in a precise position so that uniform and reliable pressure is applied to the top of the test substance for every test.
- ▶ Optional calibration check test electrode for older discontinued BS5958 test cell cross checking only (value 10Meg ohms and/or 1Gohm - other test values may be possible) giving confidence in system operation.

Would you like to carry out tests with our CTL28 Powder Resistivity Test Apparatus? Contact our process safety experts now!



CTL56 Burning Behaviour Test Apparatus (VDI Method) - NEW



Determines whether a fire will propagate in a dust layer once started by an external ignition source.

The DOPS Burning Behaviour apparatus allows testing to VDI 2263 and BS EN 17077. It determines if, and to what degree, a fire will propagate in a dust-layer once started by an external ignition source. The result is either given by a "combustion number" or the rate of propagation of the fire.

The test equipment comprises an electrically heated glowing platinum wire at approx. 1000 °C (diameter: 1 mm, length 86 mm, current 30 A). A drying oven is also required for this test but not supplied as standard (see options).

Functional Specification and Deliverables

- ▶ 1 x platinum hot coil current control unit
- ▶ 1 x heater power handset (pre-wired into the control unit)
- ▶ 1 x insulating block
- ▶ 1 x glass tube
- ▶ 1 x 100 mm length of platinum wire
- ▶ 100 - 200 V / 220 - 240 V - 6 A input
- ▶ Fine coil output current control (optimum 29 to 31 A. Control derived from low voltage d.c output)
- ▶ 1 x instruction manual

Optional Extras

- ▶ Spare platinum wire
- ▶ Spare glass tubes
- ▶ Spare insulating blocks

The Following Items are Available at an Additional Cost

- ▶ A drying oven

Would you like to carry out tests with our CTL56 Burning Behaviour Test Apparatus? Contact our process safety experts now!



Burning Behaviour Test Apparatus

Benefits:

- ▶ New power supply with overcurrent protection device
- ▶ Ultra fine control of 30A current flow through the platinum wire with the inline remote hot-wire voltage control
- ▶ New handset lending itself to easy changing of the platinum wire
- ▶ Set of accessories included

DEKRA's Electrostatic Range of Instrumentation



The Experts in Laboratory Instrumentation

DEKRA's JCI Electrostatic instrumentation range of products are market leading in the field of electrostatic properties measurement determination. Companies purchase this range primarily because they are looking for the highest accuracy instruments on the market. This is important for progressing development programs and ensuring manufacturing quality of their new and existing products and processes. As part of DEKRA, one of the world's largest safety organisations, we consult, train, test and manufacture widely in the fields of electrostatic measurement and process safety globally.

Our GLP compliant Industrial Explosion Hazards laboratories and Electrostatic testing humidity controlled laboratory undertake material property determinations which, in conjunction with expert advice from our Consultant Engineers, provide a single source for tailored solutions in the field of electrostatics.

Call us today on +44 (0)23 8076 0722 or contact us:

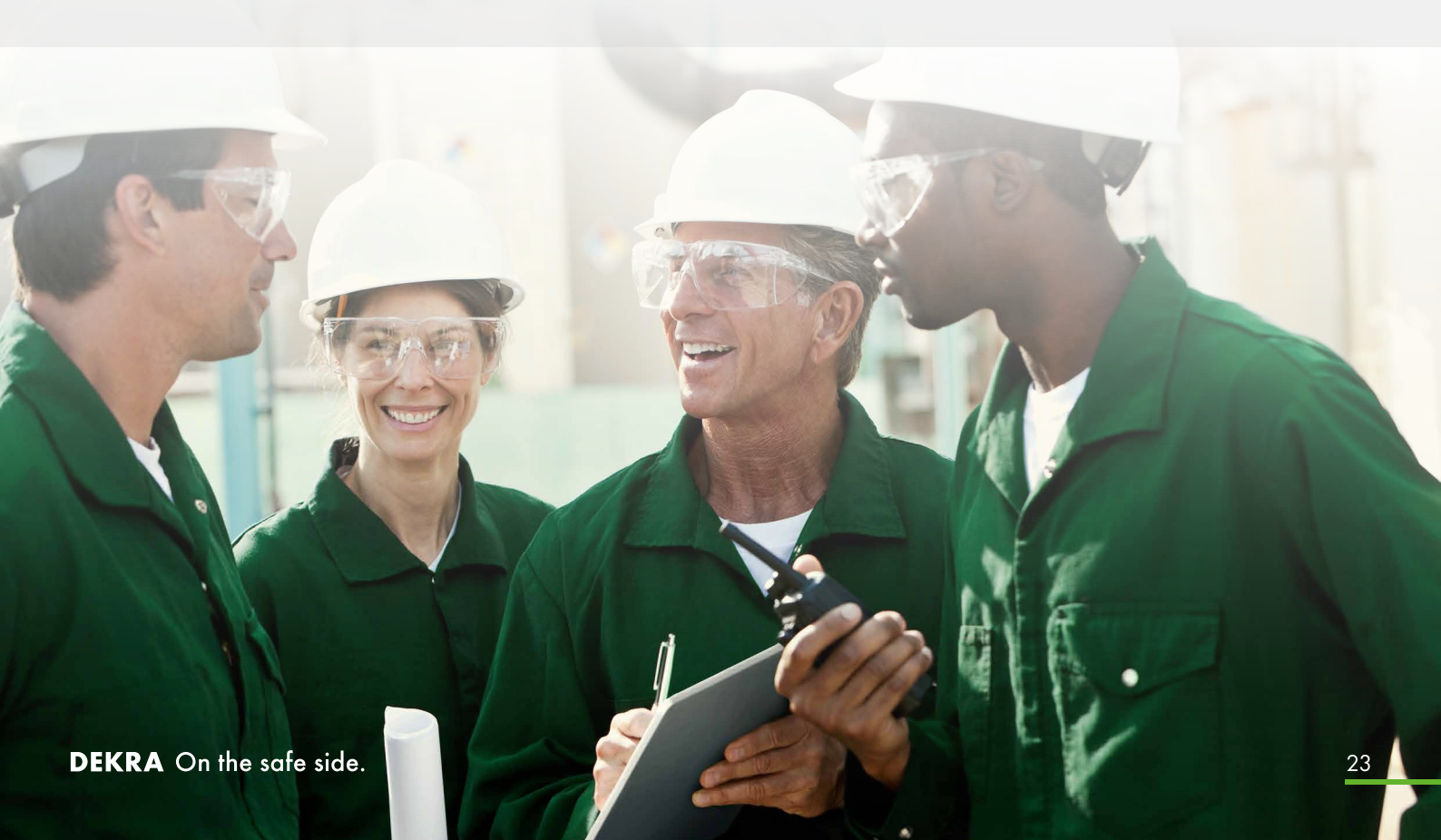


We provide:

- ▶ A comprehensive range of quality hand-held, portable and laboratory instruments
- ▶ UK based manufacture, service and instrument calibration
- ▶ Comprehensive after sales support from UK based engineers.
- ▶ In-company GLP-compliant testing and expert process safety consultancy
- ▶ On-site, open-access and bespoke process safety training, from our consultancy team.
- ▶ Routine maintenance and fault finding.

Industries we serve:

- ▶ Aerospace
- ▶ Pharmaceutical
- ▶ Meteorological
- ▶ Manufacturing
- ▶ Automotive
- ▶ Universities/Research Institutes
- ▶ Quality Assurance
- ▶ Defence
- ▶ Textiles
- ▶ Coatings
- ▶ Films
- ▶ Chemicals



JCI 140 Static Monitor

Including the JCI 140F, JCI 140X and JCI 140XF



The JCI 140 is a compact instrument for easy detection and measurement of static electricity and for assessment of risks in practical situations.

The JCI 140 Static Monitor is a compact, easy to use instrument for direct non-contact measurement of surface voltage. It is available in 3 options: F - Fast Response, X - Extended Range & XF - Fast Response Extended Range. From a distance of 100 mm the 3½ digit liquid crystal display indicates surface voltage to a resolution of 1 Volt (standard version) on the most sensitive range. This makes it particularly easy to find even low levels of static charge and to make measurements with confidence.

As a field mill instrument there is no need to switch-on in a static free environment, no need for measurements to be made within a limited time and no need to worry about the influence of air ionisation - which are all concerns with simple 'induction probe' type instruments. The novel mode of operation of the JCI 140, with no earthing of the rotor (the instrument must still be earthed), provides quiet, stable operation with long operational life.

The JCI 148 is a compatible modular voltmeter adaptor for use with the JCI 140. This device enables direct measurement of voltages on live conductors using a probe. The JCI 140, when used with the JCI 148, can measure voltages up to 20kV dc. The very high input resistance of the JCI 148 eliminates the loading effects suffered by many high voltage voltmeters and high voltage adapters for multimeters. The JCI 147 is a compatible modular Faraday Pail adaptor for use with the JCI 140. It allows direct measurement of charge (in nano Coulombs) on items placed in the Faraday Pail up to 20nC.



Benefits:

- ▶ Indicates surface voltage
- ▶ Extended range version available for higher voltages
- ▶ Fast version available for AC fields (-3dB at 400Hz)
- ▶ Field mill technology avoids the zeroing required for Induction Probe Type Monitors
- ▶ Full scale of 19.99kV (standard version) with 1V resolution on the most sensitive range.

Specification

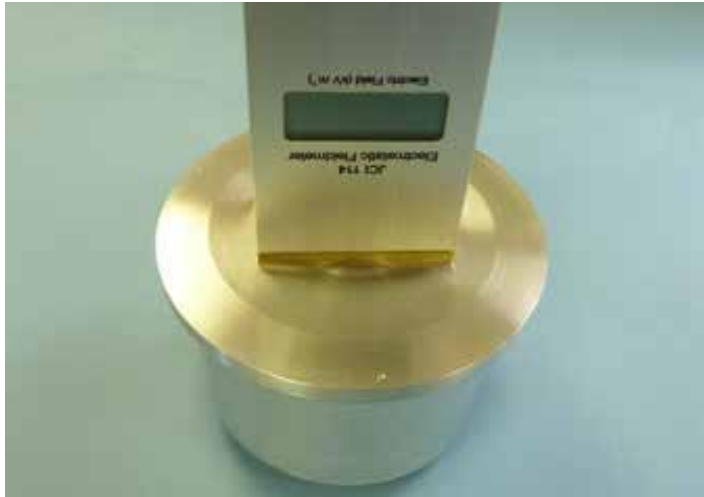
Ranges:	2kV & 20kV full scale 1V and 10V resolution at 100mm (JCI 140 / JCI140F only) *JCI 140/F versions only (20kV & up to 50kV for JCI 140X / XF, with precautions as per the manufacturer's instructions)
Response:	-3dB at ~ 120Hz (±2.5% Hz) for standard JCI 140/X -3dB at ~ 400Hz (±2.5% Hz) for JCI140F/XF
Zero Stability:	Within ±10V on 2kV range (JCI 140 / JCI140F only)
Accuracy:	Within ±2% FSD
Linearity:	Within ±1% FSD
Display:	3½ digit LCD indicating surface voltage in kilovolts at 100mm with polarity and 'LO BATT' Audio indication
Audio alarm:	Pulsing audio output when reading above user set alarm level
Signal outputs:	Via 8 pin miniature DIN socket
Power Supply:	PP3 Battery or JCI142 external mains adapter
Dimensions:	34x66x150mm overall. Weight: 320g.

JCI 140 Static Monitor

Including the JCI 140F, JCI 140X and JCI 140XF



The JCI 140 is a compact instrument for easy detection and measurement of static electricity and for assessment of risks in practical situations.



JCI 140 on the JCI 125 Zero Check Chamber

Optional Extra Accessories & Services

- ▶ JCI 143 Analogue Output Cable
- ▶ JCI 142 External Mains Adapter
- ▶ JCI 169 Permanent Mounting Feet
- ▶ Digital USB Oscilloscope & Data Logger
- ▶ Basic and enhanced calibration available to BS7506: Part 2:1996
- ▶ E-field cross calibration also available
- ▶ JCI 125 Zero Check Chamber



JCI 140 with the JCI 169 Feet

Compatible Modular Instruments

- ▶ JCI 148 Electrostatic Voltmeter Adapter
- ▶ JCI 147 Faraday Pail Adapter

Would you like to carry out tests with our JCI 148 Electrostatic Voltmeter Adapter? Contact our process safety experts now!



JCI 148 Electrostatic Voltmeter Adapter -

Compatible with JCI 140 Static Monitor



The JCI 148 can be used for accurate measurement of DC voltages with negligible current drain.

The JCI 148 Electrostatic Voltmeter comprises a shielding enclosure in which an electrode, connected to the input, is supported by high quality insulation in a well-defined and stable geometric arrangement relative to the sensing aperture of a JCI 140 Static Monitor. The geometry is such that the numbers shown on the display correspond directly to the applied voltage input in kV.

The attraction of an electrostatic voltmeter based on the JCI 140 Static Monitor is the near zero current drain (limited only by insulation leakage not less than 10^{14} Ohms at up to 20kV), the high sensitivity (1V resolution in 2kV range), the low internal capacitance (about 7pF), high input time constant and the linearity of response. The JCI 148 is not suitable for use with the JCI 140X/ XF versions of the JCI 140

Specification

Ranges:	2kV & 20kV full scale. 1V and 10V resolution
Accuracy & linearity:	Within $\pm 2\%$ FSD on JCI 140 display and analogue output signal
High voltage connection:	Special JCI HV protective connector
Maximum input voltage:	± 20 kV

Benefits:

- ▶ Indicates surface voltage
- ▶ Extended range version available for higher voltages
- ▶ Fast version available for AC fields (-3dB at 400Hz)
- ▶ Field mill technology avoids the zeroing required for Induction Probe Type Monitors
- ▶ Full scale of 19.99kV (standard version) with 1V resolution on the most sensitive range.

Accessories & Services

- ▶ Basic and enhanced calibration available to BS7506: Part 2:1996

Required Instrument

- ▶ JCI 140 Static Monitor

Would you like to carry out tests with our JCI 148 Electrostatic Voltmeter Adapter? Contact our process safety experts now!



JCI 155v6 Charge Decay Time Analyser



The JCI 155v6 is a benchtop instrument for the measurement of a material's ability to dissipate static electricity, and in conjunction with the JCI 176, to assess whether significant voltages will arise from practical amounts of charge transferred to the surface.

The JCI 155v6 is a laboratory instrument for easy, direct measurement of a material's ability to dissipate static electricity and, when used with the JCI 176, to assess whether significant voltages will arise from practical amounts of charge transferred to the surface. The version 6 is the latest in our highly successful and unique range of Charge Decay Time Analysers. A high voltage corona discharge deposits a patch of charge on the surface of the subject material and a fast response electrostatic fieldmeter measures the voltage generated by this charge. It also measures how quickly this voltage falls as the charge migrates away. Corona charging is a simple way to simulate practical charging events, allowing control of initial surface voltage and charge polarity. It is applicable to all types of surfaces - whether uniform or with localised conducting features and provides consistent, reproducible results that are not affected by corona exposure.

An intuitive, user friendly display now includes a large LCD screen for both textual and graphical presentation of results using just 5 menu driven active operator keys.

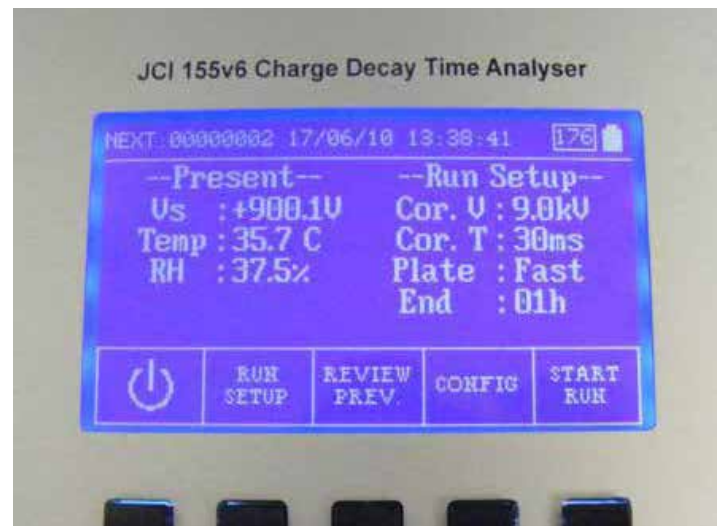
Full versatility in setting configuration and test parameters is provided by the instrument firmware and display and the analyser may be used independently or connected via USB link to a PC running our proprietary associated JCI Graph software.

Benefits:

- ▶ User friendly interface with simple setup of run parameters & settings
- ▶ On instrument graphical LCD display with dimmable back light
- ▶ Calculation and display of capacitance loading (in conjunction with JCI 176)
- ▶ Portable, can be used with or without a PC
- ▶ Download test data to JCI Graph software for further analysis.

Accessories & Services

- ▶ JCI Graph Software
- ▶ JCI 170 & JCI 172 Sample Support
- ▶ JCI 166 Sample Support
- ▶ JCI 176 Sample Support
- ▶ JCI 255 Calibration Unit
- ▶ JCI 173 Powder/Liquid Support Insert
- ▶ Calibration



JCI 155v6 Charge Decay Time Analyser



The JCI 155v6 is a benchtop instrument for the measurement of a material's ability to dissipate static electricity, and in conjunction with the JCI 176, to assess whether significant voltages will arise from practical amounts of charge transferred to the surface.

Specification

Display: Large Interactive LCD Display (112x60mm)

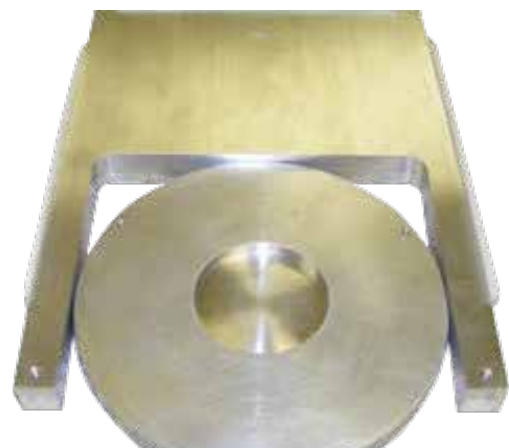
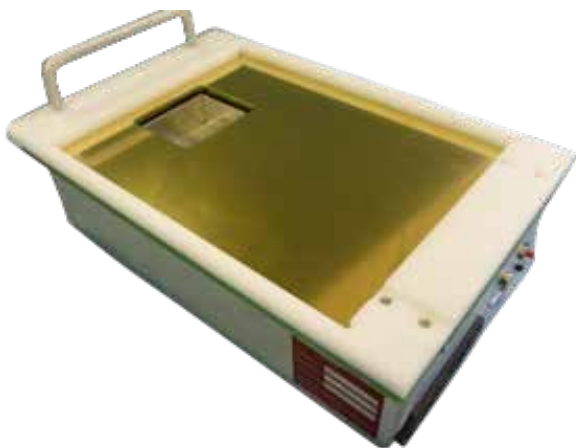
Test area: 45x54mm aperture in instrument baseplate

Sample:

- ▶ The unit may be placed directly on a surface or area of sample material
- ▶ Where the optional sample support unit is purchased this provides a simple support for open and earthed backing tests of films & textiles
- ▶ JCI 176 Charge Measuring Sample Support provides open and earthed backing support for film & layer samples up to 5mm thick with measurement of the corona charge received by the sample (earthed and unearthed backing tests are also possible in the JCI 176 when testing films)
- ▶ Powders and liquids may be studied using a JCI 173 in the JCI 176.

Using a JCI 155v6 with a JCI 176 Charge Measuring Sample support allows measurement of the corona charge received by the sample and calculation of the 'Capacitance Loading' experienced by charge on the surface. A high Capacitance Loading can mean relatively low surface voltages for a given amount of charge, which will often be indicative of a less problematic material.

Powder samples are presented using the JCI 170 Powder Sample Support with the JCI 155v6 supported by a JCI 172 Support Plate. The JCI 170 can be easily put in place and removed so that the base plate of the JCI 155v6 stands off a few millimetres to reduce risk of powder dispersal to the air by action of the air dam.



Would you like to carry out tests with our JCI 155v6 Charge Decay Time Analyser? Contact our process safety experts now!

[→ Contact us!](#)

JCI 176 Capacitance Loading Sample Support -

Compatible with the JCI 155v6 Charge Decay Time Analyser



Sample support providing direct measurement of the quantity of charge transferred with corona charge deposition, allowing the JCI 155v6 to calculate and display capacitance loading.

The JCI 176 Capacitance Measuring Sample Support provides opportunity to measure how much corona charge is received by the sample during corona charge decay testing with JCI 155v6 Charge Decay Test Unit.

Such measurements enable calculation of the 'capacitance loading' experienced by charge on materials. This is relevant to assessment of the suitability of materials in terms of the surface voltages likely to arise and for how long.

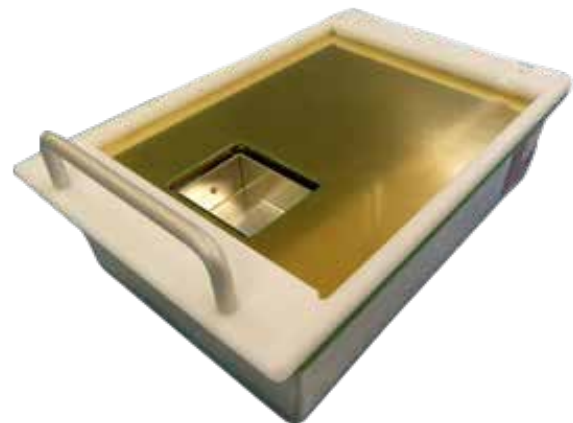
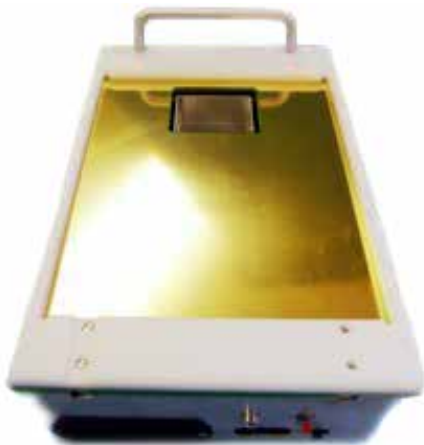
Further to this the JCI 173 powder support is also available as a cost-effective adapter for the JCI 176 facilitating studies of powders or liquids using the JCI 155v6 instrument. Power Supply: By direct cable connection to JCI 155v6

Benefits:

- ▶ Enables effective Capacitance Loading measurements to be made
- ▶ An optimal support and presentation of fabric and film samples
- ▶ Enables open and closed back measurements
- ▶ Can be used for powder & liquid studies using the JCI 173 Insert.

Accessories & Services

- ▶ JCI 173 Powder/Liquid Support Insert



Would you like to carry out tests with our JCI 176 Capacitance Loading Sample Support? Contact our process safety experts now!



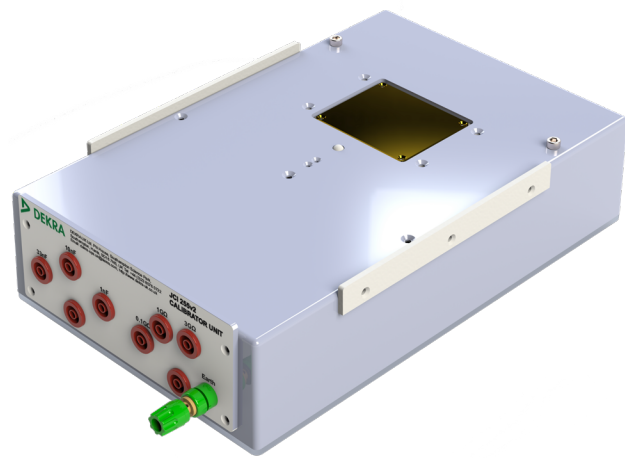
JCI 255 Calibrator Unit

For checking performance and for formal calibration of JCI 155v6 and JCI 155v5



JCI 155v6 and JCI 155v5 Charge Decay Test Unit instruments should be formally calibrated every 12 months to confirm the performance for surface voltage and decay time measurement. The JCI 255 Calibrator unit enables these two aspects of calibration to be carried out conveniently to the procedure set out in BS 7506: Part 2:1996 [1] using measurements whose accuracy is traceable to National Standards. The JCI 255 can also be used to spot check for correct operation of charge decay measuring instruments. Such spot checks should not be needed more frequently than every 3 months, or if operation of the instrument has potentially suffered from poor handling or internal exposure to powders or liquids.

The basic arrangement for calibration of JCI 155 instruments is to mount an isolated flat metal plate close up across the area of the test aperture of the JCI 155. To this plate calibrated voltages are applied for calibrating the fieldmeter response in terms of a uniform voltage across the whole test aperture area. Combinations of calibrated good quality, high voltage resistors and capacitors are connected between the plate and earth to provide defined values of RC decay time constants.



JCI 255 Calibrator Unit

The JCI 255, as illustrated in figure 2, is a diecast aluminium box with side and end location guides provided to define a location for a JCI 155 Charge Decay Test Unit resting on its upper surface, as shown above. The JCI 155 is positioned so its test aperture is over the test plate. The earth bonding point of the JCI 155 is connected to the earth (green) terminal on the JCI 255. Two bayonet pin connector sockets at the front end of the unit are mounted in good quality insulation. The upper socket is connected directly to the test plate and the lower one to the two common (centre of arc, unlabelled) socket positions in the insulation on the back plate. The back plate mounts connectors to three calibration resistors on the right-hand side (nominally 10, 100 and 1000M).

On the left side there are four calibration capacitors (nominally 1, 10, 100 and 1000nF). These resistors and capacitors are connected by the jumper connector leads to the common bayonet pin socket mounted at the centre of the arcs of sockets and connected to the test plate by the jumper between the two connectors on the front end of the unit. For voltage calibration: a calibrated high voltage supply, 0 - +1000V, is connected directly to test plate via the upper of the two sockets on the front of the unit with the lower socket left unconnected.

For decay time calibration: the two sockets on the front plate are linked together and connection jumpers are used as links between the two common sockets and one resistor and one capacitor socket position. The high voltage corona charging capability of the JCI 155 is used to put sufficient charge to the resistor/capacitor combination that a suitable initial peak voltage is achieved for decay time calibration. The corona voltage and duration are adjusted to achieve suitable initial peak voltages for calibration.

An earthing connector is provided in the middle of the back-plate insulation for earthing the JCI 255 unit when making voltage calibrations using an external high voltage supply. Decay time values (in milliseconds) are given by the product of the values of resistors (in meg-ohms, M) and capacitors (in Nano-Farads, nF) $\tau = R C$. Thus, a nominal 1nF capacitor and 1000M resistor will give a decay time around 1000 milliseconds = 1 second. Exact decay time values will be the product of the actual calibrated resistor and capacitor values.

**Would you like to carry out tests with our JCI 255 Calibrator Unit?
Contact our process safety experts now!**



JCI 178 Charge Measuring Unit -

Including the JCI 178X Extended Range Charge Measuring Unit



For general measurement of small quantities of charge and, with the JCI 179, measurement of charge transfer in static discharges.

The JCI 178 is a compact instrument for the sensitive measurement of charge in the range 10pC to 200nC. A special low sensitivity version, the JCI 178X, can be custom manufactured giving the operator the capability to measure up to 20µC.

For measurement of charge transfer in electrostatic discharges the unit can be fitted with a JCI 179 Spark Discharge Probe. This ensures that observations can be interpreted with confidence and valid judgments made on the risk of ignition presented in relation to quantities of charge transferred.

Specification

Sensitivity range: ▶ 20nC & 200nC FSD for JCI 178
▶ 2µC & 20µC FSD for JCI 178X

Power supply: ▶ PP3 replaceable battery
▶ JCI 142 External Mains Adapter

Accuracy and linearity: Within ±5%FSD.

Benefits:

- ▶ Hand held with full scale to 200nC (standard version)
- ▶ Highly portable with mounting feet option for permanent installation
- ▶ Single coaxial connection to JCI 150 faraday pail
- ▶ Battery or mains powered via JCI 142 External Mains Adapter
- ▶ Resolution 10pC (standard version)
- ▶ Extended range version available with a full scale of 20µC.

Optional Extra Accessories & Services

- ▶ JCI 142 External Mains Adapter
- ▶ JCI 143 Analogue Output Cable
- ▶ JCI 169 Permanent Mounting Feet
- ▶ Basic & enhanced calibrations available
- ▶ Digital USB Oscilloscope & Datalogger
- ▶ JCI 150 Faraday Pail
- ▶ JCI 179 Spark Discharge Probe



JCI 179 Spark Discharge Probe

Would you like to carry out tests with our JCI 178 Charge Measuring Unit?
Contact our process safety experts now!



JCI 147 Faraday Pail - Compatible with JCI 140 Static Monitor



The JCI 147 Faraday Pail is an accessory for use with the JCI 140 Static Monitor.

The JCI 147 Faraday Pail is an accessory for use with the JCI 140 Static Monitor.

Together they make a sensitive instrument for precise and reliable measurement of electrostatic charge placed in the pail, with a resolution down to 1pC. The maximum measurement at this resolution is 2nC, however a 20nC range is available in the same instrument at the flick of a switch. The unit comprises a Faraday Pail mounted on high quality insulation in a

well-defined location relative to the sensing aperture of the JCI 140 Static Monitor. Objects or materials placed in the pail raise the voltage of the pail according to its capacitance. This increase in voltage is measured by the JCI 140 and quantified as nC on the display.

Specification

Sensitivity:

- ▶ 2 and 20nC full scale with 1pC resolution (2nC range)
- ▶ Sensitivity selected by rear panel switch or external control signal

Power supply: Within $\pm 5\%$ FSD on display and analogue output

Accuracy and linearity: Overall 180 x 180mm baseplate, 335mm high Pail 50mm diameter, 75mm high, 50mm aperture in shield.

Benefits:

- ▶ Measures charge on materials inserted into pail
- ▶ 1pC resolution (2 nC range)
- ▶ JCI 140 instrument is removable for independent surface voltage measurements
- ▶ Assess electrostatic charge properties of pharmaceuticals and other powders
- ▶ Net charge measurement.

Services

- ▶ Basic & enhanced calibrations available



Would you like to carry out tests with our JCI 147 Faraday Pail?
Contact our process safety experts now!



JCI 147 shown with the JCI 140 Monitor (sold separately)

JCI 150 Faraday Pail -

Compatible with JCI 178 Charge Measuring Unit



A compact unit for measurement of electrostatic charge on components and small quantities of materials when connected to the JCI 178.

The JCI 150 Faraday Pail is a low profile Faraday pail for reliable measurement of net electrostatic charge on powders, liquids and small items. Charge received into the pail is measured using a JCI 178 Charge Measuring Unit with 20 and 200nC ranges of sensitivity. Charge is measured with a resolution down to 10pC. (Alternative sensitivity ranges for the JCI 178 are available).

Readings are zeroed by a 'Zero' button on the JCI 178 or via a remote push button. The JCI 150 unit comprises a Faraday Pail supported on high quality insulation. Connection from the pail to a virtual earth charge measurement unit is made via cable connection to the BNC connector.

The charge appearing on the outside of the pail is equal to the net quantity of charge placed into the pail. It is not necessary that the charge introduced actually conducts to the pail, so measurements are equally applicable to insulating materials and conducting components placed into the pail. The shield over the pail ensures that measurements are little affected by nearby static charges on people or surfaces.

Benefits:

- ▶ Range of net charge measurement 0-200nC
- ▶ Compact and easy to use
- ▶ Single coaxial connection to JCI 178 charge measurement device
- ▶ Suitable for powders, liquids & solids.
- ▶ Required Instrument JCI 178

Specification

Sensitivity with JCI 178:	20 & 200 nC full scale 10pC resolution (20nC range)
Zero stability:	Noise within $\pm 10\text{pC}$. Zero stable to $\pm 100\text{pC}$
Accuracy and linearity:	Within $\pm 5\%$ FSD on JCI 178 display and analogue output
Dimensions:	130mm dia base plate 95mm high 60mm dia pail, 38mm high. 60mm aperture in shield.



Would you like to carry out tests with our JCI 150 Capacitance Loading Sample Support? Contact our process safety experts now!



JCI 131 Adverse Conditions Fieldmeter - Including the JCI 131F fast response version



The JCI 131 is a 'field mill' type Electrostatic Fieldmeter for precise, high resolution, continuous measurement of electric fields in adverse environmental conditions.

The JCI 131 Electrostatic Fieldmeter is a robust instrument for the precise measurement of electric fields in adverse environmental conditions. It is particularly suitable for long term continuous monitoring of atmospheric electric fields - such as those associated with thunderstorms, volcanic activity or power-lines.

Electric field measurement sensitivities of 2, 20, 200 and 2000 kV/m are provided with high precision (<1.5%), low noise and a stable zero. When used as a potential probe, well away from nearby structures, the sensitivity is about 10 kV/m for 1kV of local space potential, although critical applications should be underwritten by in-situ calibration.

The JCI 131 and JCI 131F (fast response version) of electrostatic fieldmeter may be used in conjunction with a JCI 234 Base Station which digitally displays the magnitude of the DC electric field at the sensing aperture and also displays the AC field component in the range 50-60Hz separately from the DC field component when used with the "F" version for accurate measurement of electric fields near power lines.



Benefits:

- ▶ Enables long term external measurement of electrostatic fields
- ▶ Durable stainless steel case
- ▶ High accuracy and designed to withstand direct precipitation
- ▶ Can be used to determine ambient electric field
- ▶ Can be used as a local potential probe
- ▶ Fast response version can be used for field measurements near power lines.

Accessories & Services

- ▶ 100m Cable
- ▶ JCI 137 Support Pole Assembly
- ▶ JCI 152 Zero Check Chamber
- ▶ Manufacturers standard calibration

Compatible Instruments

- ▶ JCI 234 base station

Specification

Sensitivity ranges:	2, 20, 200 and 2,000kV/m full scale Sensitivity selected automatically or by external control signals.
Accuracy & Linearity:	Within $\pm 1.5\%$ FSD of each operating range
Response:	-3dB at about 3Hz for JCI 131, Response flat to 70Hz for JCI 131F
Environments:	0-40°C, 0-100%RH including direct precipitation

Would you like to carry out tests with our JCI JCI 131 Electrostatic Fieldmeter? Contact our process safety experts now!



JCI Calibration Services

For JCI 114, 131, 140, 147, 148, 155, 178 & 255 Instrumentation



At DEKRA UK we calibrate our JCI instrumentation with methods based on BS7506: Part 2: 1996 or using proprietary methods, providing a high level of accuracy with uncertainties stated.

DEKRA UK recommends that all JCI measuring instrumentation be calibrated typically every 12 months.

In fact it is a requirement of many in-house quality procedures that formal measurements be taken using instruments with a valid calibration certificate.

Benefits:

- ▶ Calibration is conducted in our Southampton manufacturing base with a strong focus on responsiveness to our customers needs
- ▶ High level of accuracy
- ▶ In-house calibration equipment with accuracy traceable to national standards.



Commissioning & Training Services



Choosing the right process safety instrumentation, whether for an R&D laboratory or to carry out your own on-site testing, is a complex task. Our clients require a helpful, professional service, value-for-money and equipment widely proven in laboratory applications. They are entitled to complete, easy-to-follow instruction manuals, efficient after-sales support and comprehensive equipment warranties and accessories. DEKRA Organisational & Process Safety has built our business on these key factors for more than 30 years. At the end of this catalogue you will find contact addresses and email addresses for DEKRA local support services available in China, France, Italy, India, The Netherlands, Spain and USA.

Training

We at DEKRA Organisational & Process Safety (DOPS) recognise that people developing their own process safety facilities benefit from our knowledge and assistance so staff can operate safely, competently and in accordance with set standards and protocols. We therefore provide tailored training to meet individual client requirements delivered either in our fully equipped process safety laboratories, at a client's site or increasingly, through remote access video based support.

Test Standards

Our instrumentation complies with relevant national and international standards including BS, IEC, ISO, ASTM, VDI, DIN, UN and European Union regulations such as CLP (Classification, Labelling and Packaging) and REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals). Through their in-depth understanding of industry needs gained over more than a quarter of a century, DOPS's consultant engineers are frequently engaged with international standards committees and are well placed to help our customers to define the details of their testing requirements, whilst offering expertise in the interpretation and application of the data. For more details on our test standard compliance, please see p5.

Custom Manufacture

DEKRA Organisational & Process Safety may also be able to adapt or custom fabricate a product to meet your requirements. Please enquire to see if we can help with your requirements.

Warranty

Full 12 month warranties are supplied with all equipment. Extended warranties are also possible. Commissioning & Maintenance : In addition to our comprehensive commissioning service, DOPS can also support you with contracts for repairs, maintenance, calibration and certification of our equipment consistent with a full range of quality programmes, including Good Laboratory Practice (GLP).

Calibration Services - Process Safety Test Equipment



Regular calibration of test apparatus is integral to ensuring that equipment returns reliable, high quality results critical to the characterisation of materials and safe operation of processes.

Using a range of master test equipment, DOPS provides calibration services traceable to nationally recognised standards for our range of process safety test apparatus. In circumstances where no formal calibration certificate with multipoint data is required, we offer a manufacturer's standard performance check certificate to ensure dependable data.

Where applicable, service contracts are also available where equipment is tested against known data test samples. With the option for on-site calibration or return to our UK based service centre, whether it be formal calibration, performance check or routine maintenance and servicing, DOPS offers peace of mind through our comprehensive, professional support package for all of our process safety test apparatus.



Benefits:

- ▶ Master calibration equipment is traceable to either UKAS or National Standards
- ▶ High level of accuracy and where possible and requested, verification against known test samples can be undertaken and documentation supplied accordingly

DEKRA Organisational & Process Safety

DEKRA Organisational and Process Safety are a behavioural change and process safety consultancy company. Working in collaboration with our clients, our approach is to assess the process safety and influence the safety culture with the aim of 'making a difference'.

In terms of behavioural change, we deliver the skills, methods, and motivation to change leadership attitudes, behaviours and decision-making among employees; supporting our clients in creating a culture of care and measurable sustainable improvement of safety outcomes is our goal.

The breadth and depth of expertise in process safety makes us globally recognised specialists and trusted advisors. We help our clients to understand and evaluate their risks, and work together to develop pragmatic solutions. Our value-adding and practical approach integrates specialist process safety management, engineering and testing. We seek to educate and grow client competence to provide sustainable performance improvement; partnering with our clients we combine technical expertise with a passion for life preservation, harm reduction and asset protection. We are a service unit of DEKRA SE, a global leader in safety since 1925 with over 45,000 employees in 60 countries and 5 continent. As a part of the world's leading expert organisation DEKRA, we are the global partner for a safe world.

We have offices throughout North America, Europe, and Asia.

For more information, visit www.dekra-uk.co.uk/en/dekra-organisational-and-process-safety/

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