

NOVO-GLOSS LITE™

ACCURATE GLOSS MEASUREMENT MADE SIMPLE

Compliant to international
gloss standards

Fast measurement with
statistical analysis

One touch calibration
with auto-verification



RHOPOINT
INSTRUMENTS

TAKE A CLOSER LOOK AT SURFACE QUALITY

FEATURES

TRUE TRIPLE ANGLE OPERATION

- 20°** High gloss surfaces such as automotive paint finish, polished metals and plastics
- 60°** Universal gloss measurement angle for all applications
- 85°** Matt surfaces such as automotive interiors, architectural paints and wood finishes
- 20°/60°/85°** Measure or calibrate all three angles simultaneously

CONTINUOUS READ

Assess gloss variations on a large surface in seconds

FLEXIBLE CALIBRATION

Calibrate on a standard that matches your sample for improved gloss control. Additional standards available from matt to mirror finish

STATISTICAL ANALYSIS

Automatic calculation of batch statistics

USB DOWNLOAD OF DATA

Download your results to Novo-Soft for further analysis, reporting and storage

EXTRAS

FREE EXTENDED WARRANTY

Register for a two year comprehensive guarantee

FREE LIGHT SOURCE WARRANTY

Guaranteed for the life of the instrument

UKAS CALIBRATION

Instruments and calibration tiles are available with ISO 17025 certification

CALIBRATION AND SERVICE

Fast and economic service via our global network of accredited calibration and service centres

ACCESSORIES

- Integrated BAM traceable calibration standard
- Calibration tile cleaning kit
- Quick-start guide
- USB cable
- Protective instrument case
- 4 x AA high power batteries
- Novo-Soft™ QA software CD
- Full instruction manual in PDF format
- Screwdriver



SPECIFICATIONS

Resolution	0.1GU
Repeatability	0.1%
Reproduceability	0.5%
Battery life	15,000+ readings
Languages	EN, FR, D, NL, ESP, IT, TK, CZ

CONFORMITY

International standards:

- BS EN ISO 2813
- ASTM D523
- ASTM D2457
- DIN 67530
- JIS 8741



Certificate no: FM 29741
BS EN ISO 9001: 2000

LOCAL AGENT



Beeching Road, Bexhill-on-Sea, East Sussex, TN39 3LG, UK
T +44 (0) 1424 214291 F +44 (0) 1424 730600
enquiries@rhopointinstruments.com www.rhopointinstruments.com

FEATURES

AVAILABLE FORMATS

- 20°** High gloss surfaces such as automotive paint finish, polished metals and plastics
- 45°** Speciality finishes such as ceramics, textiles and anodised aluminium
- 60°** Universal gloss measurement angle for all applications
- 20°/60°** Measure all mid to high gloss surfaces with both angles simultaneously

CONTINUOUS READ

Assess gloss variations on a large surface in seconds

FLEXIBLE CALIBRATION

Calibrate on a standard that matches your sample for improved gloss control. Additional standards available from matt to mirror finish

STATISTICAL ANALYSIS

Automatic calculation of batch statistics

DOWNLOAD TO PC

Download your results to Novo-Soft for further analysis, reporting and storage

EXTRAS

FREE EXTENDED WARRANTY

Register for a two year comprehensive guarantee

FREE LIGHT SOURCE WARRANTY

Guaranteed for the life of the instrument

UKAS CALIBRATION

Instruments and calibration tiles are available with ISO 17025 certification

CALIBRATION AND SERVICE

Fast and economic service via our global network of accredited calibration and service centres

ACCESSORIES

- BAM traceable calibration standard
- Calibration tile cleaning kit
- Quick-start guide
- Data cable
- Protective instrument case
- Novo-Soft™ QA software CD
- Full instruction manual in PDF format
- Screwdriver

POWER OPTIONS:

- Battery operated – 5 x AAA high power batteries
- Rechargeable – mains charger



SPECIFICATIONS

Resolution	0.1 GU
Repeatability	0.2%
Reproduceability	0.5%
Battery life	15,000+ readings
Languages	EN, FR, D, NL, ESP, IT, TK, CZ

CONFORMITY

Standards:

20°/60° BS EN ISO 2813 ASTM D523 ASTM D2457 DIN 67530 JIS 8741	45° ASTM C346 BS6161 JIS 8741
--	---



Certificate no: FM 29741
BS EN ISO 9001: 2000

LOCAL AGENT



Beeching Road, Bexhill-on-Sea, East Sussex, TN39 3LG, UK
T +44 (0) 1424 214291 F +44 (0) 1424 730600
enquiries@rhopointinstruments.com www.rhopointinstruments.com

Rhopoint Instruments Ltd

MILLI-OHMETER



- 1 milliohm to 200 ohms
- 0.1% accuracy
- Safe test current - 5mA max

Description

This battery operated digital resistance meter is designed to measure accurately low resistance from 0.001 ohm to 200 ohms, using four-terminal measurement network which eliminates errors caused by test lead resistance.

The instrument is small and light weight and is used easily in one hand with only an ON button to operate. It has auto-ranging, auto-decimal point and auto-powerdown after three minutes. It has

long battery life and is powered by a single PP3 or MN 1604 battery

Some typical applications

Relay . switch and connector contacts . PC-plated through holes . PC track resistance . Transformer and motor windings . Ring circuit testing . Earth conductor continuity . Wire-wrapped and solder joints . RFI sheilding and coil resistance.

Specification

Ranges (selected automatically)	...	...	...	...	...	...	1.999, 19.99, 199.9 Ohms
Increment	...	...	...	...	...	...	0.001, 0.01, 0.1 Ohms
Accuracy	...	...	...	...	...	...	±0.1% of range
Zero offset	...	...	...	...	...	...	±0.001 Ohms
Test current	...	...	...	...	...	...	5mA Max
Test power	...	...	...	...	...	...	5mW Max
Temp. drift	...	...	...	...	...	...	0.1%°C of lowest range
Operating range	...	...	...	...	...	...	5 to 35°C
Display	...	...	...	...	...	...	3½ digit L.C.D.
Weight	...	...	...	...	...	...	480 gms.
Dimensions							
Approximate weight (instrument only)	...	...	...	...	...	...	170 gms.
(instrument incase with batteries leads M21019A)	...	...	...	...	...	...	510 gms.
Approximate dimensions: Instrument	...	...	...	...	...	...	H: 15cm, w: 8.0cm, D: 3.8cm
Case	...	...	...	...	...	...	H: 15.5cm, w: 14.5cm, D: 4.5cm
Battery	...	...	...	...	...	...	9v (PP3 MN 1604 or equiv.) 1EC6F22

Packing list

SET COMPRISING:

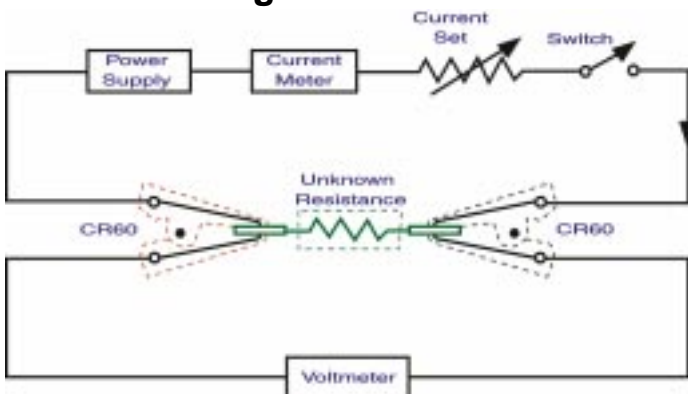
- ONE Milli-ohmeter M210.....M210
- ONE Set standard spring clip connectors and leads.....M210/9A
- ONE Instructions leaflet

OPTIONAL EXTRAS:

- ONE Ever-ready case
- SET Probe and contact connectors.....M210/9B



The Measuring Circuit



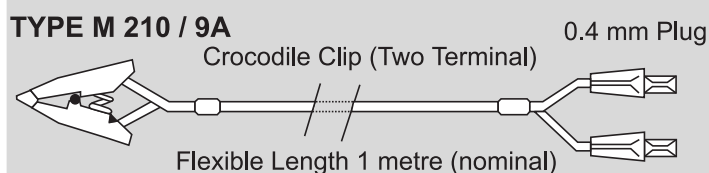
In the four-terminal "Kelvin" configuration four wires are used to connect the circuit under test to the instruments.

One pair of wires carries current generated by the instrument, the other pair connect to the voltage-measuring circuit.

The current circuit is low impedance, the voltage circuit high impedance. When connected a current flows through the component or circuit under test and the voltage drop across the test points is measured.

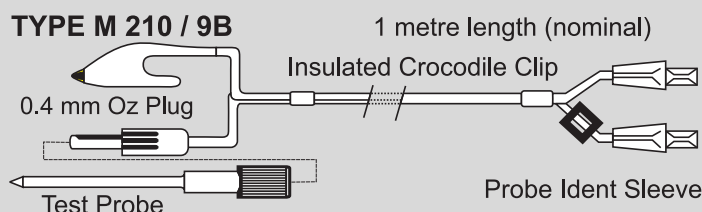
Instructions for use

Using standard clip leads M210/9A (Supplied as Standard)



1. Plug either black plug into either black socket in the top of the instrument and red plugs into red sockets.
2. Clip leads to circuit or component to be tested. Ensure that both faces of clip make good electrical contact.
3. Press the ON button to read resistance.

Using probe and contact connectors clip leads M210/9B (Optional Extras)



1. Insert plugs into their respective sockets as illustrated. The outer plugs form the current circuit via the clips. The inner plugs (with yellow bands) connect the probes in the voltage measuring circuit.
2. Clip leads to circuit under tester.
3. Press ON button to read resistance when probes are in contact with the circuit.

Interpreting the display

1. The Milli-ohmmeter will read directly in ohms or milli-ohms.
2. Fluctuating readings displayed. Check that the clips are making good contact with the circuit under test, then look for the cause of intermittency, e.g. dry solder joint, oxidised or corroded terminals; slight mechanical movement of the component(s) in the circuit under test should quickly reveal the source of the problem.
3. Flashing "1" indicates that resistance in circuit exceeds

200 ohms.

4. "LO-BAT" displayed indicates low battery.

Battery Replacement

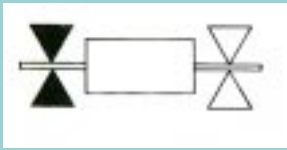
Slide down the cover at the rear, bottom of the instrument. Fit new battery 9 volt pp3 (MN1604 or equivalent). Replace cover.

The ratio between the current and the voltage drop is calculated by the instrument using Ohm's law ($R=E/I$) to display the result in ohms.

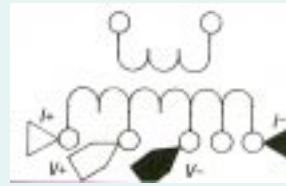
Four clips would normally be required for connection but this could be tedious so a form of clip is used with the Milli-ohmmeter. The jaws are moulded in robust plastic and inset into each jaw face is a copper / silver inlay contact; these are insulated from each other by the plastic mouldings. One contact face on each clip is connected to the current-generating circuit, the other face is connected to the voltage-measuring circuit. In this way four wires are connected instantly by two clips. The resistance of the connecting wires plays no part in the measuring so no "backing-off" is required as would be the case if a multi-meter were to be used for the same measurement.

Test procedures

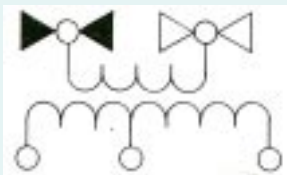
Using standard lead set for dhecking



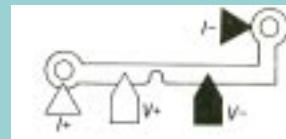
1. Checking continuity value and mechanical stability of resistive components. Also used to measure resistance/temperature coefficient. $R_2 - R_1 \times 100 R_1$ (t2- t1)



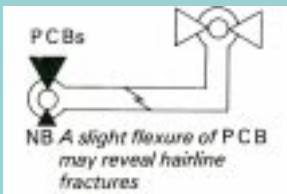
7. Multi-tapped transformers are quickly checked and the tapping points identified on an unknown transformer or coil assembly.



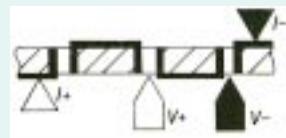
2. Testing the resistance of windings to determine continuity, good electrical connection to tails, and to ascertain resistive imbalance in centre-tapped transformers.



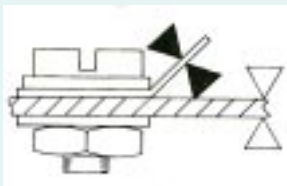
8. Etching defects show up as an unexpected variation in track resistance.



3. Checking the electromechanical stability of printed circuits and mounted components. Dry solder joints can be located by connecting one clip to the track, the other clip to the component tail or tag.



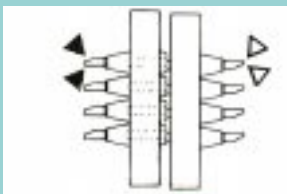
9. Through hole plated tracks on a P C B are checked for continuity and unexpectedly high resistance.



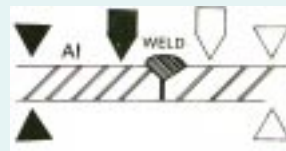
4. Ensuring that earth points make good electrical contact to earthing strip or chassis. Looking for defects due to rust, corrosion or defective plating and anodic films.



10. Clipping the leads to the probes makes for an easy-to-use continuity tester which is accurate.



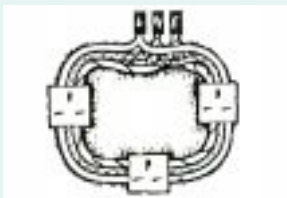
5. Plugs and sockets of all types rely on friction contact between mating surfaces. Looking for defects due to oxydisation, grease or dirt.



11. Welded joints which are imperfect have a high resistance. Aluminium welds over 0.7 ohms are rejected. Small variations in resistance may indicate inclusions or voids in the weld.



6. Testing ring mains circuits to meet Appx. 15 1 EE wiring regulations. The resistance in the ring, including the resistance of the protective conductor are checked before and after connection.



RHOPOINT INSTRUMENTATION LTD

RHOPOINT INSTRUMENTATION LTD
Beeching Road, Bexhill-on-sea
East Sussex, TN39 3LG

email: instrumentation@rhopoint.co.uk

RHOPOINT™

NOVO-CURVE Glossmeter



UNIQUE instrument which gives hands free operation to measure **GLOSS** on:

- **CURVED** as well as **FLAT** surfaces
- Any finish from **MATT** to **MIRROR**
- **TINY** objects as well as **LARGE**

SAMPLE APPLICATIONS

- **PAINTS**– domestic appliances, pens, pencils, toys, etc.
- **WOOD**– natural, varnished, laminated
- **AUTOMOBILE PARTS**– steering wheel, dashboard, trim, etc.
- **PLASTICS**– extruded and moulded parts such as window frames, bottles, mobile phones, etc.
- **FURNITURE**– wood, plastic or metal
- **GLAZED CERAMICS**– mugs, bathroom furniture, tiles
- **TUBES & CYLINDERS** – pipes, bottles, soft drinks cans
- **ELECTROPLATING**– jewellery, door knobs, handles, taps, buttons
- **CAMOUFLAGE** – ultra low gloss finish on military binoculars, firearms, etc.
- **COIN BLANKS**
- **FROSTED GLASS BOTTLES** – perfumes, whisky, etc.

FEATURES

- **SAMPLES** to be measured are simply placed over aperture in centre of top plate
- Four adjustable **JIGGING POSTS** allow consistent readings on a series of like objects
- **INSTANT READINGS** may be captured using a **FOOT SWITCH** which frees both hands for ease of measurement
- If preferred, the instrument may be operated by pressing a **BUTTON** on front panel instead of the foot switch
- Alternatively **CONTINUOUS READING** allows rapid assessment of finish variation by moving sample with foot switch/button held down
- **DOWN LOADING** of data into a PC or directly to on-line printer
- Windows™ **SOFTWARE** for analysis and permanent data storage supplied

TECHNICAL DETAILS

- Measurements are made at the industry standard angle of 60°
- Square measurement area of 2 x 2 mm
- Memory storage of up to 999 readings
- Automatic calculation of max., min., mean and coefficient of variation
- RS 232 computer/on-line printer interface
- Aluminium block gives optical bench precision and reliability

SPECIFICATIONS

Conforms to	: ASTM D523
Weight	: 2.5 kg
Dimensions	: 260 x 220 x 100 mm
Mains	: 110–120 V AC or 220–240 V AC

ACCESSORIES

NOVO-CURVE comes supplied with certified BAM traceable calibration standards, Windows™ PC software, mains lead, RS 232 interface cable.

ORDER CODES

Part	Order Code
NOVO-CURVE	ALG60C

Instrument display available in English, Français, Deutsch, Italiano, Español and Nederlands. Initially set to English unless otherwise specified when ordering.

ORDERING

To order, or for further information, please contact:

RHOPOINT INSTRUMENTATION LTD
Beeching Road, Bexhill-on-Sea,
East Sussex, TN39 3LG, UK

Tel: +44/0 1424 214291

Fax: +44/0 1424 730600

Email: instruments@rhopoint.co.uk

Local Agent

Due to continuous development, **RHOPOINT INSTRUMENTATION LTD** reserve the right to modify specifications without prior notice.

RHOPOINT INSTRUMENTATION LTD also manufacture **NOVO-GLOSS™** (hand-held glossmeters), **NOVO-SHADE** (reflectometer), **NOVO-PAC** (opacity meter) and **NOVO-HAZE** (hazemeter).



MINIMUM FILM-FORMING TEMPERATURE BAR



- **Self - Contained bench-top instrument for the determination of the minimum film - forming temperatures of synthetic latices, emulsions, polymers & adhesives**
- **Electrically - controlled heating & cooling with integral air processor**

MINIMUM FILM-FORMING TEMPERATURE BAR

Specification

Platen	Copper, dull nickel plated (other options available).
Platen dimensions	483mm X 235mm.
Parallel tracks	Using 1" cube applicator supplied: max 10.
Weight	38kg. (851b).
Dimensions	550mm wide x 350mm high x 610mm deep.
Temperature sensing	10 points on centreline at width intervals 37mm.
Display	Point temperature and temperature differential between adjacent points.
Sensor accuracy	0.1 degrees C+.070C
Indication	Lamps: Instrument ON, heating, cooling.
Alarms	Audible and visual for water flow failure.



Hinged transparent cover plate raised allows clear access for track laying and cleaning.

Services required

Mains	220-240 volts a.c. 110-115 volts a.c.
Air	4 litres/min @ 100 psig
Water	Normal mains supply
Water drain	Gravity



MFFT DETERMINATION:

One continuous track displays the evenness of the heating, cooling and air flow.

A photographic record of the performance of every instrument is made before despatch.

Complete Instrument Comprises

- MFFT Instrument
- Mains cable
- Air connector
- Water connectors
- Roving temperature sensor
type 166-177 C.
- Cube applicator. 75 μ x 1" cube
- Guide bar
- Quantity - Dessicant
- Quantity - Indicator crystals
- 5 Hypodermic type dispensers
- Spatula
- Spare fuses
- Instruction book

Special options

Extended range by the addition of three programmes, 43-70, 53-80, 63-90 deg C.

Unplated copper platen

Unit for nitrogen supply, no air processor fitted

Optional extras

Additional cube applicators

Frame for up to 5 applicators

MINIMUM FILM-FORMING TEMPERATURE BAR

The “minimum film-forming temperature” has been described as “the minimum temperature at which a water-borne synthetic latex or emulsion will coalesce when laid on a substrate as a thin film. When this process occurs, in the absence of pigmentation or other opacifying materials, a clear transparent film is formed. At lower temperatures than the minimum, a white, powdery, cracked film will result”.

The minimum film-forming temperature is usually closely related to the glass transition temperature

T_g but not synonymous with it; whilst the T_g may be determined by predicted calculation, the minimum film-forming temperature is best determined by the use of a MFFT Bar; the basic principles of which are described in ASTM D2354. Early instruments were usually cumbersome, inaccurate and slow to achieve equilibrium. I.C.I. plc devised a simple integrated instrument which was able to achieve the desired results quickly and efficiently. The initial development was carried out in I.C.I. Paints’ laboratories.

PRINCIPLE OF OPERATION

A nickel plated copper platen is electronically cooled at one end and warmed at the other end. Air or nitrogen is caused to flow over the surface, from cool end to warm end as a uniform blanket. To achieve the required degree of uniformity the air or gas is delivered via a carefully designed sintered metal distribution block; the design is such that freezing does not take place at the inlet.

For use with air, a drying system is incorporated into the housing together with a flow controller. The air dryer contains indicator crystals which are clearly visible in a transparent container. The complete air conditioning system is readily accessible at the side of the instrument.

Water at normal mains pressure removes the excess heat from the coolers. Quick release couplings are provided. Water is normally drawn from a laboratory tap and the outlet is run to drain by gravity. Alarms, both audible and visual are actuated in the event of cooling water supply failure.

Temperature sensors are mounted at intervals under the surface of the platen. These are used to control the temperature of the platen in accordance with the chosen programme. They are also used to indicate the platen temperatures down the length of the bar, or they can be switched to indicate differential temperatures between adjacent sensing points, so providing an instantaneous indication of temperature gradient.

A roving probe temperature sensor is provided to facilitate temperature measurement at every point on the platen, it also serves to check the static sensors.

A hinged perspex cover over the platen provides thermal insulation whilst allowing visual inspection of the determination as it progresses. A transparent cursor is mounted on the cover to simplify the identification of the exact minimum film-forming temperature.

Programmes

Standard model MFFT-60

Degrees C.

Cool end (Left)	-5	0	+5	+15	+23	+33
Warm end (Right)	+13	+18	+23	+33	+50	+60

Extended range model MFFT 90

Additional programmes

Cool end	+43	+53	+63
Warm end	+70	+8	+90

OPERATION

In practice the instrument is switched on and the programme chosen, air and water having been connected. An equilibrium condition is noted after about 20 minutes (the time may be less dependant on the programme chosen). At equilibrium the heating cooling lamps illuminate at very low frequency. Several tracks are laid down in quick succession using an applicator, normally a 75 micron (3 mil.) cube applicator. The tracks may be laid down left to right or right to left, but the most common form is a U horizontal, with the track starting and finishing at

the right, warm end. Two tracks are normally laid down last as a control, using an emulsion of known MFFT.

A clearly defined limit of coalescence will show in about 80 minutes and the cursor may then be used to read off the MFFT temperature. Pigmented emulsions may be tested but the determination is more difficult to see. Most operators, however, find that they can readily discern the determination temperature. This can be proven by gently scraping the surface of the film using a wooden spatula.



Alarm and ON Module

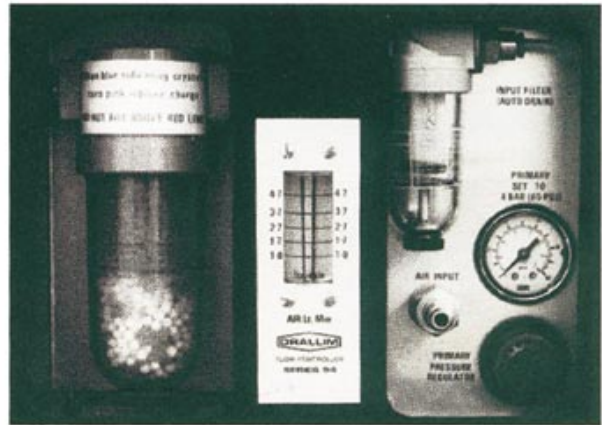
- 1 Mains switch -On/ Off
- 2 Coolant failure alarm
- 3 Coolant failure lamp
- 4 Heating lamp indicator
- 5 Cooling lamp indicator

Indication Module

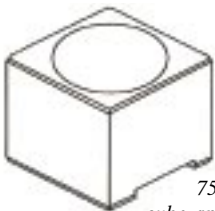
- 6 Temp. display
- 7 Probe socket
- 8 Temp. mode switch
- 9 Temp. sensor selector

Control Module

- 10 Heating LED
- 11 Cooling LED
- 12 Programme selector



The air conditioning and control unit, showing the air connection



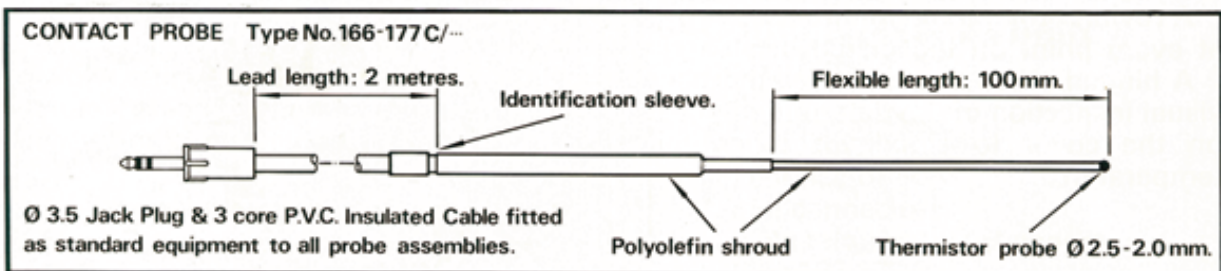
75 micron cube applicator



75 micron ring applicator

Shipping Details

Carton dimensions.. 29" x 18.5" x 26"
 737mm x 470mm x 661mm
 Gross Weight..... 106lb, 48kg



The roving probe

The MFFT Bar is manufactured under licence to I.C.I.plc

RHOPOINT INSTRUMENTATION LTD

RHOPOINT INSTRUMENTATION LTD
 Beeching Road, Bexhill-on-sea
 East Sussex, TN39 3LG

email: instrumentation@rhopoint.co.uk