

DiamondProof™

Operating Manual



**PLEASE READ THIS IMPORTANT
INFORMATION PRIOR TO USE**

DISCLAIMER

The intended use of this DiamondProof instrument is expressly limited to that set out in Terms and Conditions for the Supply of DiamondProof instruments, Software and Warranty support services (the "Conditions") and this Operating Manual. Changes to this Operating Manual will be effective once they are published on <https://verification.debeersgroup.com/>. Continued use of the DiamondProof instrument signifies acceptance of these changes.

DISCLAIMER

This is an EMC Class B product. These products may be used in residential/domestic environments and commercial/business/industrial environments.

IMPORTANT NOTICE

**THERE ARE NO USER SERVICEABLE PARTS WITHIN THE INNER
DiamondProof INSTRUMENT COVERS.**

INTELLECTUAL PROPERTY RIGHTS

The DiamondProof instrument is protected by intellectual property rights including the following patent: WO2017001835



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LIMITATIONS OF USE

The DiamondProof instrument

- Is a screening device intended for use in all locations where loose diamonds and diamond-containing jewellery pieces are handled and which meet the environmental conditions specified in the Environmental section.
- Is designed to accept loose diamond and a range of jewellery pieces to verify natural from synthetic diamond and commonly used diamond simulants.
- Is only intended for use with colourless or near-colourless diamonds.
- Will have increased referral rate if used for fancy coloured diamonds.
- Is not intended for use in the classification of other precious gems or diamond simulants, nor to detect the treatment of natural diamonds, e.g. fracture filling, irradiation or high pressure high temperature treatments.
- Does not screen for diamond type.

The diamonds used in the DiamondProof instrument

- Must be placed in the field of view of the camera.
- Must be in direct line of sight of the excitation source.
- Must be completely uncovered i.e. not in bags or located under watch glasses.
- Must be in the following sizes ranges: 0.01 – 10cts (loose)

The jewellery used in the DiamondProof instrument

- Must be placed in the field of view of the camera.
- Must be in direct line of sight of the excitation source.
- Must be completely uncovered i.e. not in bags.
- May need to be manipulated to visualise all set stones.
- Must contain stones in the following sizes ranges: 0.01 – 3cts (mounted)

SAFETY

General safety

The DiamondProof unit should only be used in accordance with the instructions given in this Operating Manual. **Failure to follow these instructions could impair the safety protection that is provided.**

The DiamondProof unit is a Class 1 Ultraviolet (UV) product.

Warning



Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous exposure ultraviolet radiation.

Warning



If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired

UV safety

The DiamondProof has been designed to protect the user from exposure to UV radiation. Internally the UV light path is entirely enclosed and the bottom jewellery chamber forms part of an interlock system.

Prior to using the DiamondProof the condition of the front cover should be inspected.

Warning



UV radiation emitted from this product if casing is opened and/or interlock defeated

In the event that the cover becomes cracked the user should immediately isolate the DiamondProof unit from the mains and return it to the supplier for servicing.

Service warning

Warning



There are no user serviceable part within the inner DiamondProof unit enclosures

Safety information

SAFETY LABELS USED ON THE DIAMONDPROOF INSTRUMENT

The DiamondProof instrument operates from a 20 V D.C. power limited supply unit which is connected to the mains supply using a standard IEC flex supplied by the manufacturer.



The DiamondProof instrument contains a high power pulsed xenon source. Safety interlocks are fitted to prevent exposure of the operator to the source output.

Position of labels



Figure 1 External labels on rear view of the DiamondProof

Power supply

The DiamondProof unit is powered from the mains supply. An external power supply is used to convert the mains supply voltage to that required by DiamondProof unit. The mains supply wall socket must be easily accessible.

The external power supply provided with the DiamondProof unit is designed for use throughout the world and does not require adjustment for use in different countries. It is connected to the mains supply by a standard IEC flex terminated with a plug suitable for use in the country of operation. The power supply is connected to the DiamondProof unit device by means of a power socket located at the rear of the DiamondProof unit.

If the mains power supply shows signs of damage or malfunction the user should immediately stop using the machine, disconnect the power supply from the mains supply and contact the supplier.

Warning



The DiamondProof unit must be used only with the power supply provided by the manufacturer of the DiamondProof unit.

The DiamondProof unit has a power switch at the rear. When not in use the DiamondProof unit should first be shut down via power icon on the main user interface and then once this is complete turned off using this switch. The power supply should then be disconnected from the mains supply.

INTRODUCTION

The DiamondProof is an easy-to-use diamond verification instrument, with zero percent false positives (it will never pass a synthetic/laboratory grown diamond as a natural diamond). Results are displayed on a high-resolution touch-screen, showing a blue result for natural diamonds and yellow for stones requiring further testing.

Jewellery can be measured on the cone, which is for rings and earrings, and loose diamonds on the cradle. There is also an accessory for tennis bracelets.



Figure 2 - Front view with open drawer

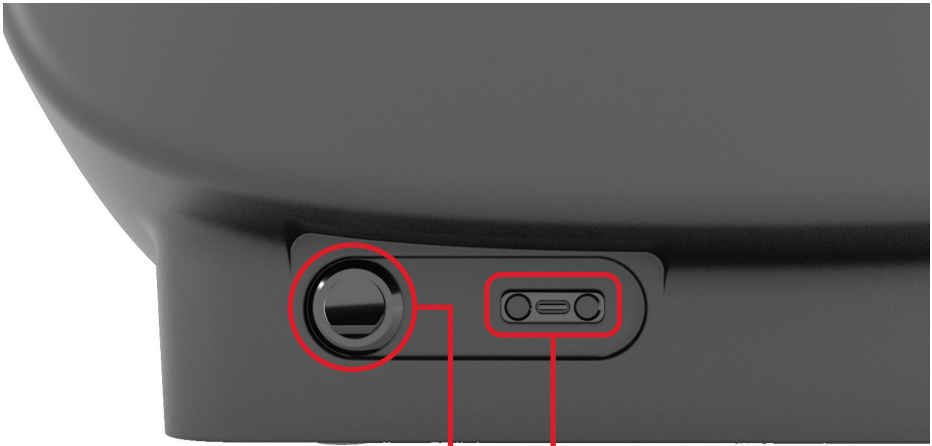


Figure 3 - Rear view of DiamondProof unit

Power Switch

USB-C
Power Input

Power Switch	The power switch is a toggle switch that switches power to the DiamondProof instrument.
USB-C Power Input	The power input takes 20V from the mains power adaptor supplied with the instrument.

INSTALLATION AND COMMISSIONING

Selection of location for installation

DiamondProof is designed for use on a desk, work bench or work top. The desk on which the machine is to be located should be capable of supporting the weight of the machine (>10 kg). The desk should be at least 30cm deeper than DiamondProof to allow space for the cables at the rear and room for the drawer to open.

Care should be taken in choosing a location to ensure that the operator does not adopt a posture which could give rise to discomfort.

It is advisable to position the unit such that bright lights or sunlight cannot affect the visibility of the screen.

DiamondProof should be positioned away from the edge of the desk to ensure that it cannot fall.

The installation location should be chosen for its suitability for handling small diamonds (as well as jewellery); the floor should be tiled rather than carpeted and both floor and the desk on which the DiamondProof is sited should be free from crevices or similar stone traps. The desk should be free from clutter.

The environmental conditions of the chosen location should fall within the limits set out in Section Physical Specifications.

One mains outlet is required for DiamondProof and should be located close to the desk on which the instrument is sited such that the mains lead to the power supply and the power lead from the power supply to the DiamondProof do not create a trip or similar hazard and are not subject to potential damage. It should be possible for the operator to easily isolate the power supply of the DiamondProof from the mains supply.

1. Follow the steps detailed in Section Unpacking And Packing DiamondProof which describes how to unpack and lift DiamondProof.
2. Position the machine in the centre of the desk ensuring there is clear desk in front of the machine. Ensure the DiamondProof is placed in an acceptable position as once the installation is complete the instrument should not be moved installation of DiamondProof is complete it should not be moved
3. Ensure the power switch on DiamondProof is in the off position.
4. Ensure the switch on the mains supply is in the off position.
5. Perform a visual check of the DiamondProof power supply, its lead and the supplied IEC mains lead to ensure they have not been damaged in transit.
6. Plug the DiamondProof power supply into the USB-C socket on the rear of the machine.

Warning



Once installation of DiamondProof is complete it should not be moved

7. Connect the IEC mains lead first to DiamondProof power supply and then to the mains supply.
8. Turn on the mains supply.
9. Turn on DiamondProof using the switch on the rear panel.
10. The instrument will boot up.

WI-FI SETUP

On start-up, the DiamondProof application is loaded and a video is played. Touch the screen to continue.

Wi-Fi

To get remote support from the manufacturer, a Wi-Fi connection is required. Please click the Wi-Fi icon at the top right of the screen. A list of available networks is displayed. Select the network you wish to connect to and provide the required password.

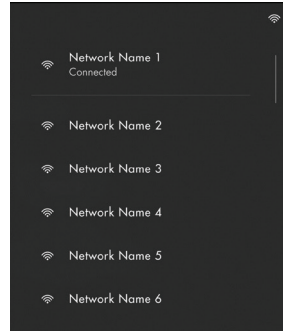


Figure 4 - Wi-Fi network selection

OPERATING DIAMONDPROOF

When HOME screen is displayed. If you select the three dots, top left of the screen, this opens the main menu

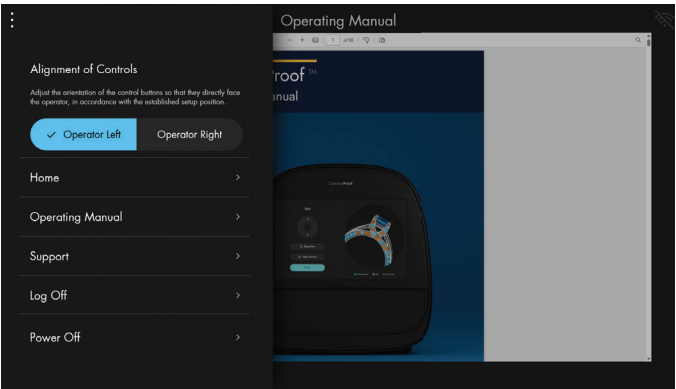


Figure 5 - Main Menu

Menu Options	Description
Alignment of Controls	The control buttons can either be set to the left or the right-hand side of the screen
Home	Takes the user back to the HOLDING AREA screen
Operating Manual	Gives the user access to the operator manual
Support	Remote support is available via TeamViewer.
Log Off	Takes the user back to the login video
Power Off	Closes down the software, the unit should still be switched off by the power switch at the rear of the instrument

Verifying jewellery using the cone

DiamondProof has two methods of holding jewellery. Choose the cone for rings, earrings and the tennis bracelet attachment, or the cradle for loose stones and pendants. The holding area screen allows you to select between the cone and cradle.

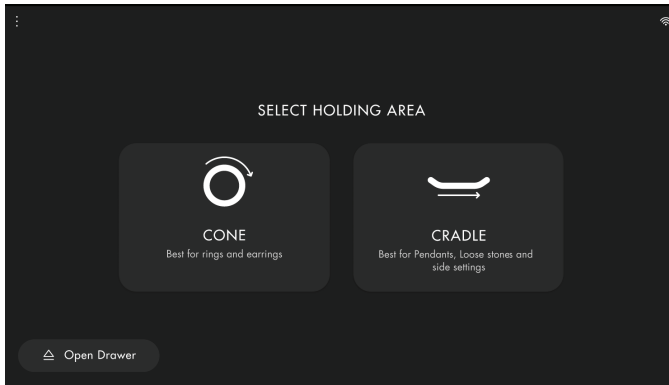


Figure 6 - Holding Page

Press Open Drawer to load the jewellery. The cone can be removed from the drawer for easy access. Place a ring onto the cone with the top of the ring facing up.



Figure 7 - A ring on the cone

Once the jewellery is in place, attach it back into the drawer. The connection is magnetic so the cone will snap into place.

Please see *Figure 8 Positioning the cone*, for an example of a correctly positioned cone.

Close the drawer by pressing the Close Drawer button on the DiamondProof application.

From the jewellery holding area, choose the cone option to verify a ring or earrings.



Figure 8 - Positioning the cone

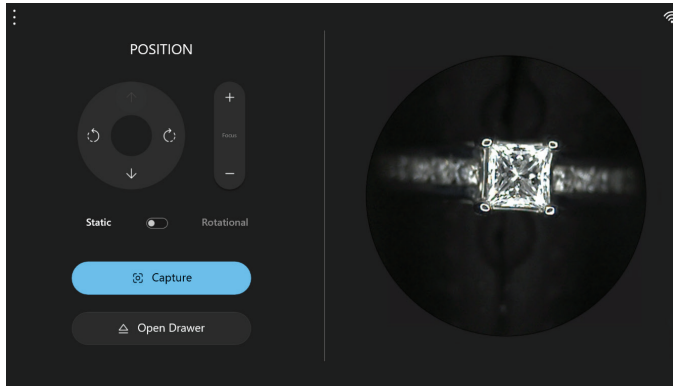


Figure 9 - Ring positioning

The cone position page displays a live display of the jewellery.

Use the up and down arrows to position the jewellery in the centre of the image. The clockwise and anti-clockwise rotation buttons allow you to rotate the cone and the ring. The rotation feature allows verification of any diamond on the ring.

Bring the jewellery into sharp focus by using the plus and minus focus buttons.

Switch between **Static** (single view capture) and **Rotational** (360-degree view) to choose your preferred capture option.

Press Capture to start the capture process. If at any point the rotational capture process needs to be stopped, press cancel button.

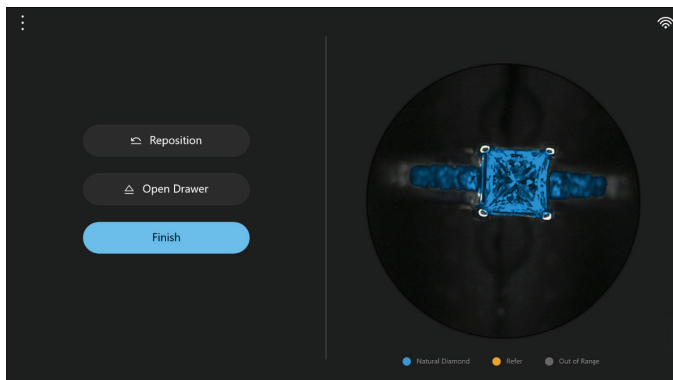


Figure 10 - Results Page

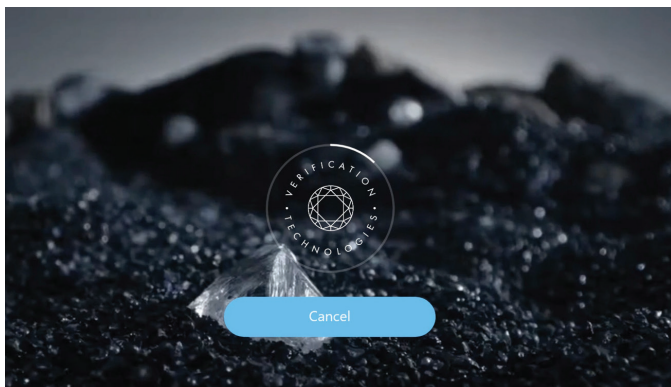


Figure 11 - Cancel button, Rotation Capture

The DiamondProof displays the verified jewellery image. Natural diamonds are coloured blue. If further testing is required, the individual stone is coloured yellow. If the DiamondProof does not receive a strong enough signal, the diamond will be left colourless (Out of Range).

If the rotational toggle was selected before the verification, additional views are available by selecting the clockwise and anticlockwise rotation buttons.

If the image is out of focus or the diamond you wish to verify is not visible then clicking Reposition restarts the verification process, allowing you to change the ring's position and focus.

Jewellery and loose stones verification using the cradle

To verify loose stones, diamonds on the side of a ring or pendants, use the cradle option.

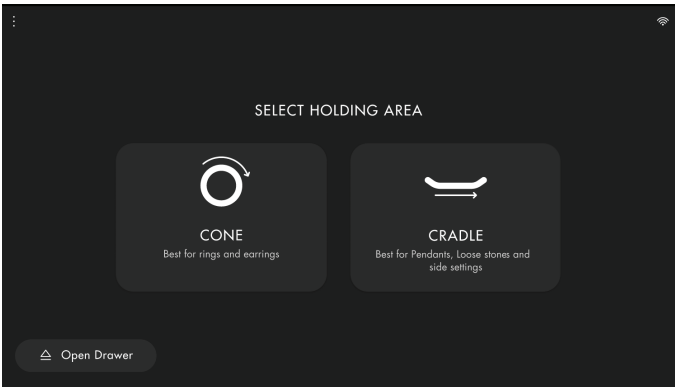


Figure 12 - Holding area

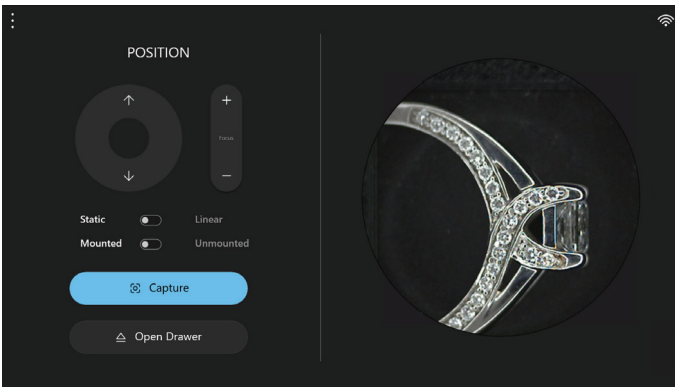


Figure 13 - Jewellery positioned on the cradle

Open the drawer and place the jewellery or loose diamonds on the cradle. Figure 13 and 14 show jewellery and loose diamonds position on the cradle. Ensure they are positioned within the recessed circle and with minimum separation gap of 3mm between them.



Figure 14 - Loose diamonds on the cradle

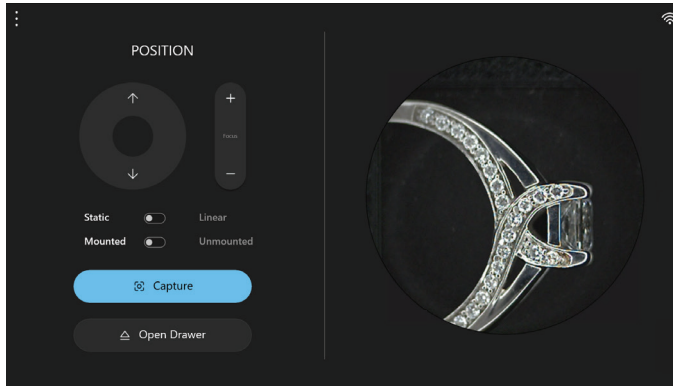


Figure 15 - Cradle positioning

Press Close Drawer to close the drawer and from the Holding Area screen select the cradle option. Use the up and down arrows to position the jewellery in the centre of the image.

Switch between **Static** (single view capture) and **Linear** (Y-axis line scan) to choose your preferred capture option. Then select between mounted (jewellery) and unmounted (loose) accordingly.

Press Capture to start the capture process.

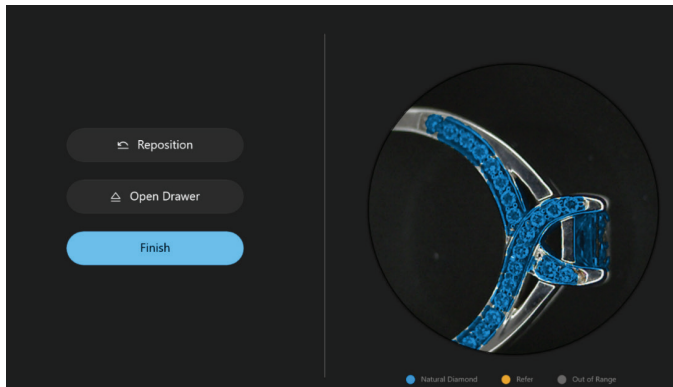


Figure 16 - Results page

The DiamondProof displays the verified jewellery image. Natural diamonds are coloured blue. If further testing is required, the diamond is coloured yellow. If the DiamondProof does not receive a strong enough signal, the diamond will be left colourless.

If the linear toggle was selected before verification, additional views are available by selecting the up and down buttons.

If the image is out of focus or the diamond you wish to verify is not visible then clicking Reposition restarts the verification process, allowing you to change the ring's position and focus.

Verifying jewellery using the tennis bracelet accessory

DiamondProof can be used to verify a tennis bracelet using the tennis bracelet accessory. To verify a tennis bracelet, choose the cone option from the holding area.

Use in accordance with the instructions supplied with the tennis bracelet accessory.

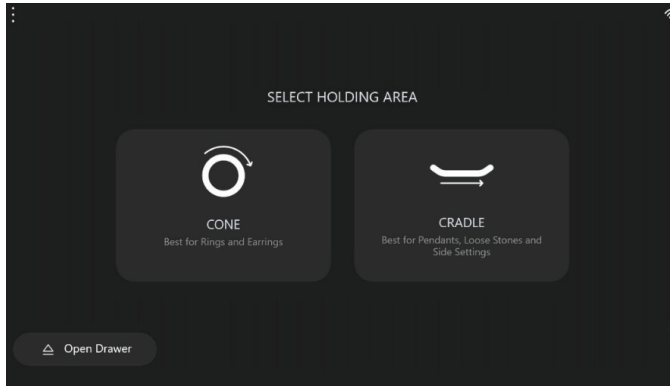


Figure 17 - Holding page

Press Open Drawer to load the jewellery. If the cone is fitted, please remove it. Wrap the tennis bracelet around the tennis bracelet accessory. Hook the ends of the bracelet into the catches and gently twist to make sure the bracelet is held correctly.

Once the bracelet is securely fastened to the accessory attach it to the drawer. The connection is magnetic so the accessory will snap into place.

Close the drawer by pressing the Close Drawer button on the DiamondProof application.

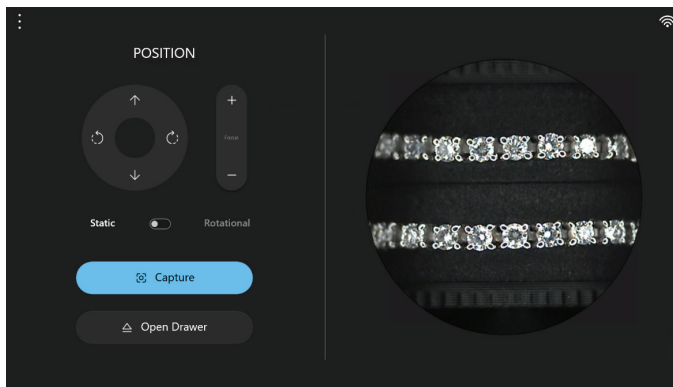


Figure 18 - Tennis bracelet positioning

The cone position page displays a live display of the jewellery.

Use the up and down arrows to position the jewellery in the centre of the image. The clockwise and anticlockwise rotation buttons allow you to rotate the tennis bracelet.

Bring the jewellery into sharp focus by using the plus and minus focus buttons.

Select the Rotational toggle to capture a 360° measurement of the bracelet. Press Capture to start the capture process.

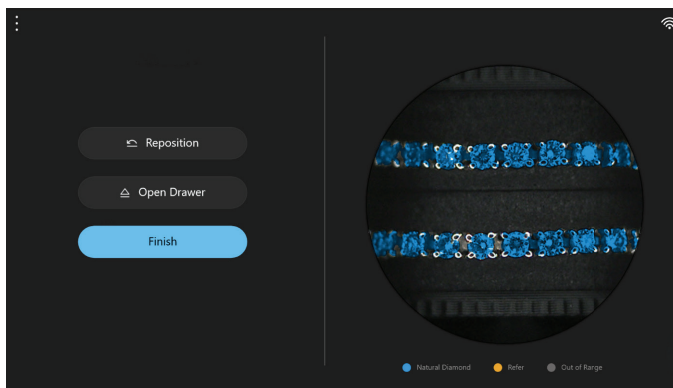


Figure 19 - Tennis bracelet result page

The DiamondProof displays the verified jewellery image. Natural diamonds are coloured blue. If further testing is required, the diamond is coloured yellow. If the DiamondProof does not receive a strong enough signal, the diamond will be left colourless (Out of Range).

Additional views of the tennis bracelet are available by selecting the clockwise and anticlockwise rotation buttons. This allows you to verify all the diamonds on the tennis bracelet.

If the image is out of focus or the diamond you wish to verify is not visible then clicking Reposition restarts the verification process, allowing you to change the bracelet's position and focus.

RESULTS

This section shows examples of results from the DiamondProof instrument.

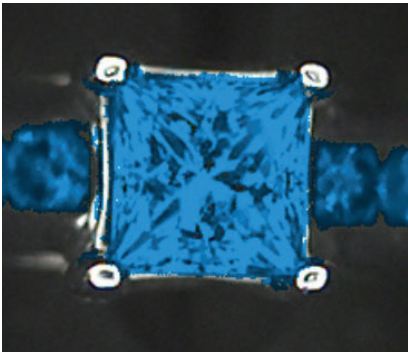
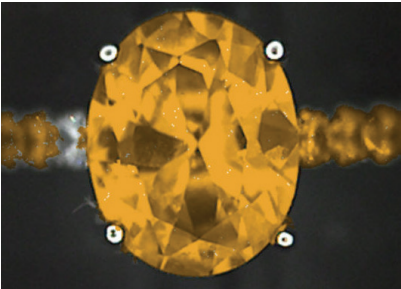
Natural Diamond Result Only solid blue colouration denotes a natural diamond. This category will only contain natural diamonds.	
Refer Referred stones appear as yellow. The category will contain synthetic diamonds, diamond simulants and a small percentage of natural diamonds. These can be identified by tests typically carried out in a gemmological laboratory.	
Out of range Stones that appear out of range have a very low signal. These should have additional testing as per the 'Refer' category	

Figure 20 - Examples of results

SUPPORT

Press Support on DiamondProof’s menu for details on how to get help from the manufacturer

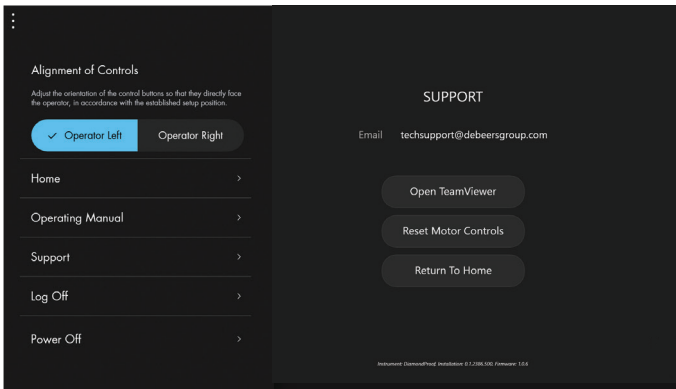


Figure 21 - DiamondProof menu

Remote support is available via TeamViewer. Click Open TeamViewer from the Support menu. The TeamViewer application is displayed. Click Connect with TeamViewer ID and provide the ID and Password to the support team.

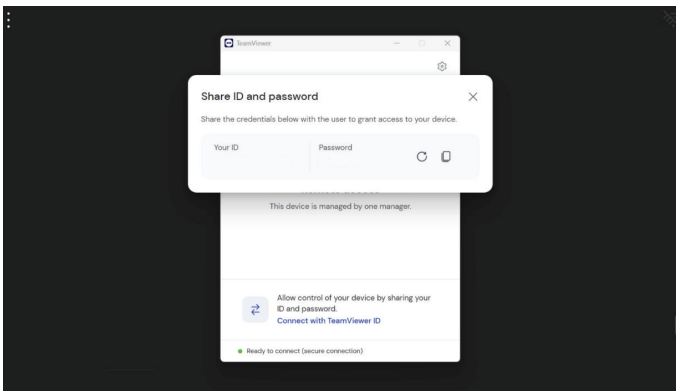


Figure 22- TeamViewer

UNPACKING AND PACKING DIAMONDPROOF

Unpacking the DiamondProof

Warning



Appropriate manual handling procedures should always be followed whilst moving the DiamondProof

- Ensure the box is the correct way up before removing the external packing tape. Open the box.
- The ancillary items will now be accessible. Carefully remove all the items from the box.
- Remove the top layer of packing foam from the box.
- Remove the accessories, power supply and packing foam.
- The DiamondProof can now be removed from the packaging.
- Ensure the desk surface where the machine is to be placed is clear and the path between the machine and the desk is unobstructed.
- Lift the machine clear of the box and gently place it on the desk.
- The packaging should be retained in case it is necessary to return the DiamondProof to the supplier for servicing or repair work.

Packing the DiamondProof

Warning



Appropriate manual handling procedures should always be followed whilst moving the DiamondProof.

If the DiamondProof is not returned to the supplier in the correct transit case then damage in transit is highly likely. Remedial work to correct such damage will be at the expense of the customer.

1. Position the DiamondProof transit box suitably close to the DiamondProof to avoid having to carry the device too far.
2. Disconnect the DiamondProof from its power supply. If these are to be returned, they may be placed in the recess in the top section of the transit case.
3. Lift the machine and lower it into the transit box base.
4. Fit the top section of the DiamondProof packing foam (note that this will fit only one way).
5. Insert any ancillary items that are also being return with the machine.
6. Place the top layer of foam and tape the box shut.

Packing list

In addition to this manual, be certain that you have the following items:

- DiamondProof instrument.
- USB C Mains power adapter cable (with country specific plug).
- Cone (Ring Holder).
- Tennis bracelet accessory.
- Tennis bracelet accessory reference guide.
- Quick reference guide.
- User manual.

If any item is missing or damaged, please contact your supplier for assistance.

Specification

Model Number: 3710

Instrument: DiamondProof

Manufacturer: De Beers UK Belmont Road Maidenhead SL6 6JW United Kingdom

ENVIRONMENTAL

The DiamondProof instrument is designed for indoor use only. It operates from a supply voltage of 20 V D.C. and fused at a maximum current of 5.0 A.

Warning



The DiamondProof instrument must only be used with the power supply provided

The DiamondProof instrument is designed for use in a non-industrial electromagnetic environment. Under certain electromagnetic conditions it is possible that the DiamondProof instrument will require to be restarted in order to continue to operate.

This equipment is marked in compliance with EU directives 2012/19/EU and EN50419.

It is marked with the recycling symbol as shown. It means that at the end of the life of the equipment it must not be placed in the normal domestic unsorted waste stream. Please return it to the manufacturer at the address below for appropriate recycling and disposal:

De Beers UK
Belmont Road
Maidenhead
Berkshire
SL6 6JW



The DiamondProof instrument should only be used in accordance with the instructions given in this Operating Manual. Failure to follow these instructions could impair the safety protection that is provided.

The DiamondProof instrument contains a short wave ultraviolet source. The safety aspects of this potential hazard are also discussed in section UV Safety.

Caution



Use of controls or adjustments or performance of procedures other than those specified herein may result in exposure to hazardous ultraviolet radiation

PHYSICAL SPECIFICATION

ENVIRONMENTAL	
Operating Altitude	2000 meters maximum
Temperature Range (Operating)	Indoors* 15 °C to 28 °C
Temperature (Storage)	Indoors* 0 °C to 70 °C
Humidity	Indoors* 45% to 65% non-condensing
Pollution	Pollution Degree 2
Over Voltage Category	2
IP Rating	IP20
ELECTRICAL	
Rated Voltage	20Vdc +/- 5%.
Rated Current	5 Amp
Rated Power	100 Watt
SUPPLIED MAINS ADAPTOR	
Power requirements	100-240 Vac @ 2.0A 50-60Hz
Maximum voltage fluctuation	+/-10%
OPERATIONAL	
Lifetime	5000 cycles
OPTICAL	
UV Source	20W Filtered Broadband Source
Enclosure Classification	Class 1
MECHANICAL	
DiamondProof Weight	10.4 kg
Shipping Weight	15 kg
DIMENSIONS	
Depth	270 mm
Width	400 mm
Height	415 mm

DiamondProof is unsuitable for use or storage in outdoor conditions or any environment which exposes it to wet or cold environments.

EC DECLARATION OF CONFORMITY

[OFFICIAL]

LIFECYCLE: IN DESIGN

Official

3710-4810

DiamondProof EC Declaration of Conformity

DE BEERS GROUP

REVISION 01.4

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EC Declaration of Conformity

We hereby declare that the following machinery complies with:

Radio Equipment Directive	(RED)	2014/53/EU
Low Voltage Directive	(LVD)	2014/35/EU
Electromagnetic Compatibility Directive	(EMC)	2014/30/EU
Restriction of use of certain Hazardous Substances in electrical and electronic equipment Directive	(RoHS)	2011/65/EU
Waste of Electronic and Electrical Equipment Directive	(WEEE)	2012/19/EU

Machine or Assembly machines:

Type of Equipment: DiamondProof
Serial Number: 3710
Machine Manufacturer: De Beers UK Ltd
Address: De Beers UK Ltd,
Belmont Road,
Maidenhead,
Berkshire,
SL6 6JW
UK

The following harmonised standards have been used to design the machinery:

EN 61326-1:2021:	Electrical equipment for measurement, control and laboratory use – EMC requirements.
BS EN 61010-1:2010+A1:2019	Safety requirements for electrical equipment for measurement, control, and laboratory use
IEC 60825-1:2014:	Safety of laser products. Equipment classification and requirements
ETSI EN 301 489-1 V2.2.3 2019:	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services. Part 1: Common technical requirements.
ETSI EN 301 489-17 V3.2.4 2020:	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services Part17; Specific conditions for Broadband Data Transmission Systems.

The person nominated to assemble the technical file if it required is:

Name:.....Julian Salazar.....Position:.....Mechanical Engineer.....

Location: Maidenhead, Berkshire

I, the undersigned, hereby declare that the equipment specified above conforms to the above directives and standards.

Name: Laura Hutton Position: Vice President - Technology

Signature: L A Hutton Date: 18/12/2024

Location: Maidenhead, Berkshire

LIFECYCLE: IN DESIGN
3710-4811
REVISION 01.2
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Confidential
DiamondProof FCC Supplier's Declaration of Conformity

DE BEERS GROUP

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Supplier's Declaration of Conformity
47 CFR part 15 Radio Frequency Devices

Machine or Assembly machines:

Type of Equipment: DiamondProof
Serial Number: 3710
Machine Manufacturer: De Beers UK Ltd
Address: De Beers UK Ltd,
Belmont Road,
Maidenhead,
Berkshire,
SL6 6JW
UK

FCC Compliance Statement:

FCC Part 15 subpart B and ICES-003 Unintentional Radiators.
Radio FCC 15.247 & ISSED RSS-247 Radiated spurious emissions and band edge at 2.4GHz.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Name: Laura Hutton Position: Vice President - Technology
Signature: *L. A. Hutton* Date: 18/12/24
Location: Maidenhead, Berkshire

