MKII Golden Gate™
Single Reflection ATR System

User Manual

2I-10500 Issue 13

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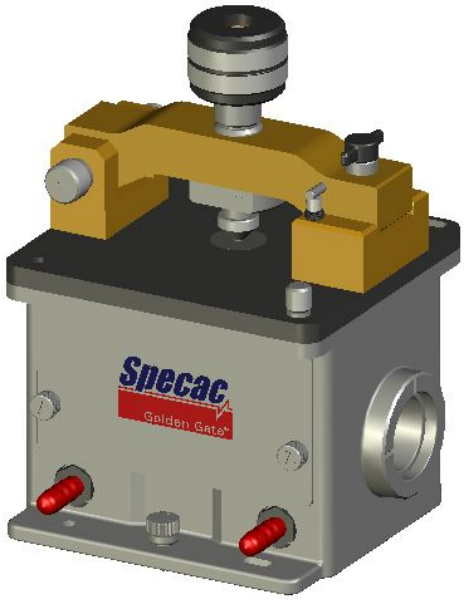
CONTENTS

1 Introduction

Thank you for purchasing a Specac Product.

The MKII Golden Gate™ Single Reflection ATR system is a versatile accessory with a number of different sampling options for the quantitative and qualitative analysis of solids, liquids, pastes and microsamples.



A complete Golden Gate™ ATR system consists of an ATR top plate fixed to an optical beam condensing unit. This is mounted into a spectrometer using a Benchmark™ baseplate. Most of the ATR top plates have a special bridge and clamping mechanism giving excellent and reproducible contact between a solid sample and the single reflection ATR crystal. The different top plates also have a choice of anvils to provide the best possible contact for different sample forms.

The choice of top plates available for the Golden Gate™ system includes:

- Diamond crystal 45° top plate P/N 10563.
- Germanium crystal 45° top plate P/N 10566.
- Heated diamond crystal 45° top plate P/N 10540.
- High Temperature Heated diamond 45° top plate P/N 10640.
- Wire holder diamond crystal 45° top plate P/N 10565.
- Microspecular reflectance top plate P/N 10514.
- Reaction cell diamond crystal 45° top plate P/N 10507.
- Low temperature diamond crystal 45° top plate P/N 10590.
- Supercritical fluid diamond crystal 45° top plate P/N 10585.

The optical beam condensing unit of the Golden Gate™ ATR consists of a combination of mirrors and lenses designed to achieve optimal beam condensation and maximum throughput. The beam condensing lenses can be made from ZnSe or KRS-5. KRS-5 gives a slightly wider range for Mid IR studies, though the throughput is slightly lower than ZnSe.

When pressure is applied the anvil does not rotate against the sample. This ensures that heat is not generated by friction, as heat could change the sample. It also ensures that the sample is not displaced from the correct sampling position.

2. Unpacking and Checklist

The configuration of Golden Gate™ you ordered will determine the items to check on delivery. (Section 3 of this manual is for the specific top plates. Please check this section for your appropriate top plate.)

All Golden Gate systems will include the following:

- 1 Golden Gate™ optical beam condensing unit with beam condensing lenses (ZnSe or KRS-5)
- 1 Benchmark™ baseplate for your FTIR spectrometer
- 1 Ball driver 3.0 mm
- 1 Allen key 2.0 mm
- 2 Purge bellows

Carefully lift your top plate and optical beam condensing unit from the carry case and place onto a flat bench.

Install the top plate (1) by positioning it on to the optical unit (2) and clamping down by turning the two thumb screws (3) clockwise.

Important:

The top plate must be fitted the correct way round. When fitted correctly the sides of the top plate will be flush with the sides of the optical transfer unit.

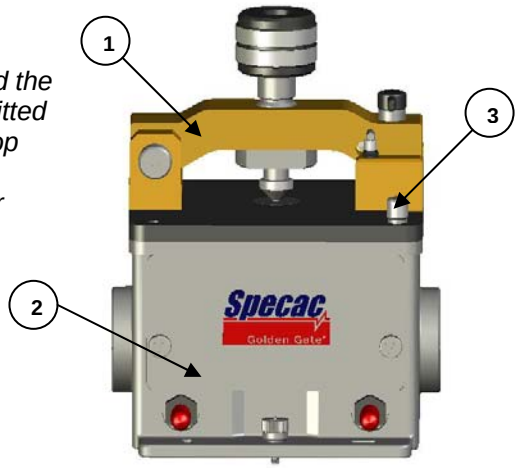


Fig 1: Front View of MKII Golden Gate™ ATR System

3. Top Plates for the MKII Golden Gate™ ATR

There are a variety of top plates for the MKII Golden Gate™ Single Reflection ATR. The top plates can be ordered with a complete Golden Gate system, or separately as upgrades.

MKII Diamond ATR Top Plate (10563)

Please check on delivery that the following have been included:

- 1 MK II Golden Gate™ Diamond 45° ATR Top Plate (Fig 2)
- 1 Sapphire anvil (10531)
- 1 Pellet anvil (10532)
- 1 Volatiles cover (10503)

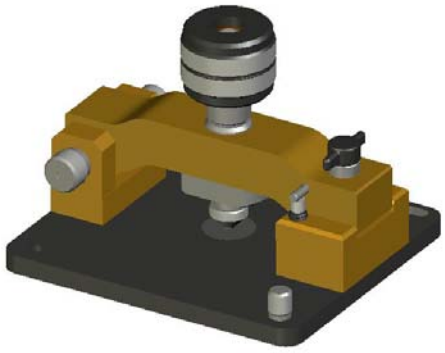


Fig 2: Angled View of Golden Gate™ Diamond ATR Top Plate 10563

Corrosive Samples

The ATR element in the Golden Gate™ is high temperature bonded into tungsten carbide using a metal layer. Tungsten carbide and diamond have exceptional chemical resistance properties; However, Specac cannot guarantee the support disk or bonding material against corrosion from all materials, particularly under hostile conditions of

elevated temperature. We recommend that your sample is confined to the center of the diamond only, if there is a risk of chemical attack upon contact with the other materials of construction.

A sample spot 2 microns deep with a diameter of 600 microns is sufficient. We recommend that a pipette, or similar glass capillary tube is used to apply small sample spots to the center of the diamond only.

The Golden Gate is capable of handling a diverse range of chemically aggressive materials. However, we recommend that in order to protect your accessory, your sample is cleaned off soon after analysis is complete.

MKII Wire Holder Diamond ATR Top Plate (10565)

Please check on delivery that the following have been included:

- 1 MKII Golden Gate™ Wire Holder 45° ATR top plate (Fig 3)
- 1 Grooved anvil - narrow (10547)
- 1 Grooved anvil - wide (10548)
- 1 Stainless steel anvil (10549)

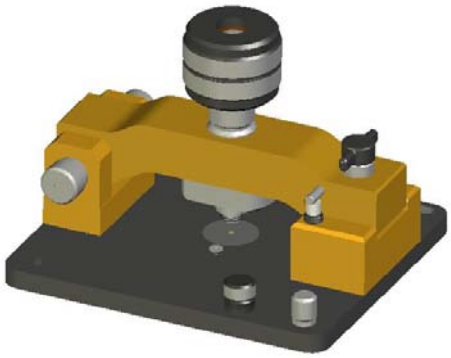


Fig 3. Angled View of Wire Holder Diamond ATR Top Plate 10565

MKII Germanium 45° ATR Top Plate (10566)

Please check on delivery that the following have been included:

- 1 MKII Germanium 45° ATR top plate (Fig 4)
- 1 large stainless steel anvil (10567)
- 1 Volatiles cover (10503)

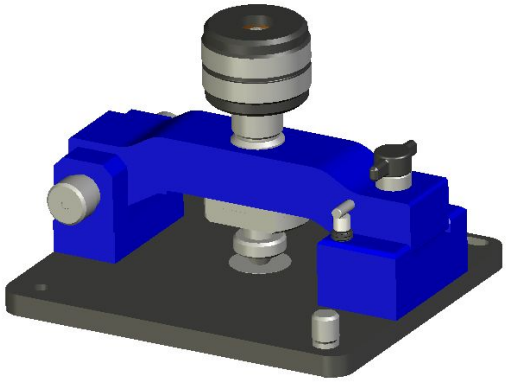


Fig 4: Angled View of Germanium ATR Top Plate 10566

Important Note For Use Of Germanium Crystal

The Germanium crystal does not have the same hardness and chemical resistance as a diamond, and should be treated accordingly. Be careful not to put a point loading on the crystal, particularly with hard or abrasive samples. With samples such as rubber and soft polymers covering the crystal, normal anvil pressures may be used.

Check on the chemical resistance before potentially damaging materials are brought into contact with the crystal. Thin films on plastic substrates can be analyzed, but take care if the substrate is metallic. A good idea is to apply pressure gradually, taking scans to see if the spectra are acceptable.

MKII Heated Diamond ATR Top Plate (10540 and 10542)

Please check on delivery that the following have been included:

- 1 MKII Heated Diamond 45° ATR Top Plate (Fig 5)
- 1 4000 Series Temperature Controller for the heated top plate
- 1 Sapphire anvil (10531)
- 1 Pellet anvil (10532)
- 1 Volatiles cover (10503)

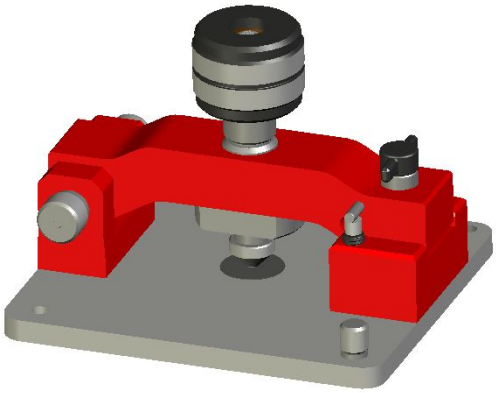


Fig 5: Angled View of Heated Diamond ATR Top Plate 10540

The heated top plate can be used up to 200°C. A separate manual for the 4000 Series temperature controller is included with this top plate option.

Warning: *The diamond mounting plate in the heated top plate has a very small air gap around its edge. This minimizes heat loss to the surrounding top plate and ensures quick warm up. If excessive amounts of solvent are used to clean the diamond it is possible for it to leak past the diamond plate, giving solvent absorption bands and softening the adhesive. For this reason, the diamond should only be cleaned using a tissue moistened with solvent.*

MKII High Temperature Heated Diamond ATR Top Plate (10640 and 10642)

Please check on delivery that the following have been included:

- 1 MKII High Temperature Heated Diamond 45° ATR Top Plate (Fig 5)
- 1 4000 Series Temperature Controller for the heated top plate
- 1 Sapphire anvil (10531)
- 1 Pellet anvil (10532)
- 1 Volatiles cover (10503)

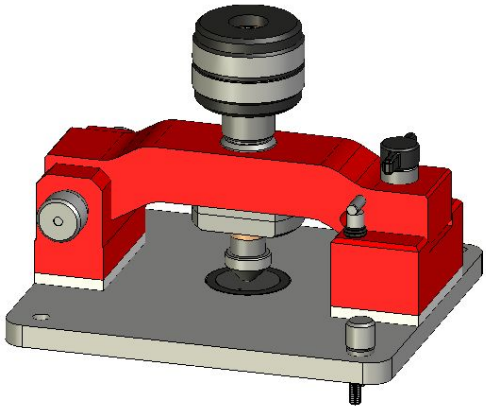


Fig 5: Angled View of High Temperature Heated Diamond ATR Top Plate 10640

The heated top plate can be used up to 300°C. A separate manual for the 4000 Series temperature controller is included with this top plate option.

Note: *The diamond ATR crystal and tungsten carbide support puck in the high temperature heated top plate* ***does not*** *have a small air gap around its edge. The item is sealed around the edge and so protects from the ingress of liquid samples or volatile solvent vapours into the optical unit below.*

Microspecular Reflection Top Plate (10514)

This top plate can be fitted to the Golden Gate™ optical unit to provide a single reflection 45° specular reflectance measurement of microsamples. The top plate slot aperture is 5 mm x 2.5 mm.

Please check on delivery that the following have been included:

- 1 Microspecular reflection top plate (Fig 6)
- 1 Reference mirror

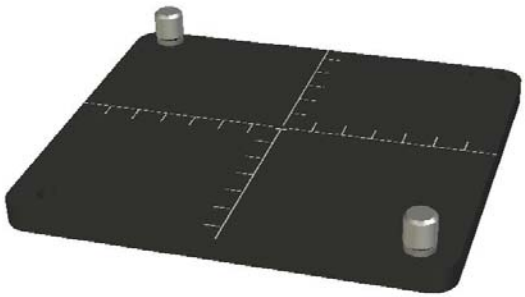


Fig 6: Angled View of Microspecular Reflection Top Plate 10514

Reaction Cell Diamond ATR Top Plate (10507)

This is a specialist top plate that incorporates a 45° diamond crystal within a reaction chamber. It is capable of operating at temperatures up to 200°C and at up to 3000 psi pressure.

A special manual and controlling system is provided for this Golden Gate™ top plate option. There is also an additional stirring mechanism (P/N 10513) in an alternative top pressure plate assembly that can be used with the reaction chamber. (See Fig 7).

Golden Gate™ Reaction Cell Pressure Cap Stirring Mechanism 10513

Golden Gate™ Reaction Cell Top Plate Assembly 10507

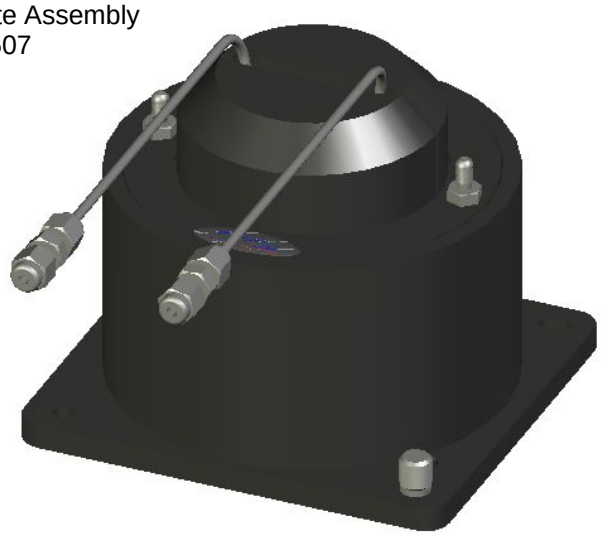


Fig 7: Angled View of Reaction Cell Top Plate Without Stirring Mechanism

Low Temperature Diamond 45° ATR Top Plate (10590 and 10592)

Please check on delivery that the following have been included:

- 1 Low Temperature Diamond 45° ATR Top Plate (Fig 8)
- 1 4000 Series Temperature Controller for the Low Temperature Diamond ATR Top Plate
- Sapphire tipped solids anvil
- Liquid sample injector (insulated hypodermic needle and glass syringe)
- Plastic funnel
- Long T-bar Allen key (5 mm)
- Allen Key (3 mm)
- Glass filled PTFE gaskets (5)
- High thermal transfer gaskets (20)
- Spare Viton o-ring
- Manual for operation of Low Temperature Golden Gate™

Fig 8: Angled View of MKII Low Temperature Diamond ATR Top Plate 10590

The Low Temperature Diamond 45° ATR Top Plate operates over a temperature range of -150°C to + 80°C.

Supercritical Fluid Diamond ATR Top Plate (10585 and 10586)

Please check on delivery that the following have been included:

- 1 Supercritical Fluid Diamond ATR Top Plate (Fig 9)
- 1 4000 Series Temperature Controller for the Supercritical Fluid Diamond ATR Top Plate
- Manual for SCF Top Plate operation
- Open Ended Spanner 1/4” – 5/16 ” (2 off)
- Torque wrench (10504)
- Socket drive 2.5 mm A/F
- Gaskets (10)

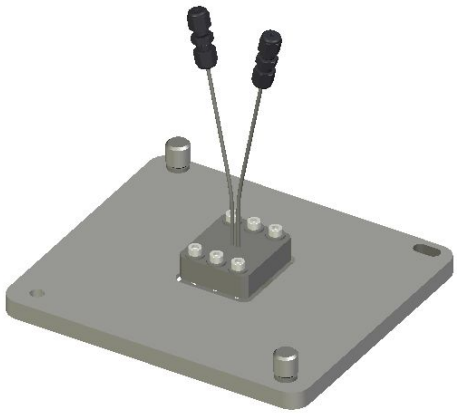


Fig 9: Angled View of Supercritical Fluid Diamond ATR Top Plate 10585

The Supercritical Fluid Diamond ATR Top Plate is specified to operate at pressures up to 6000 psi and temperatures up to 300°C. A separate manual for the temperature controller is included with this top plate option.

4. Installation

The MKII Golden Gate™ Single Reflection ATR is supported on a Benchmark™ baseplate when installed into a spectrometer. The baseplate has three support pillars (one flat one and two at the front with location pins) and a fourth front central pillar into which the fixing thumb screw (4) is tightened.

Note: *It is best to install the Benchmark baseplate in the spectrometer first, before locating the Golden Gate™ ATR accessory.*

Fixing holes and studs in the baseplate will vary dependant on the make and model of your spectrometer. For details on how to install your baseplate and ATR accessory in the spectrometer refer to the relevant section of the Accessory Installation Guide (see section13).

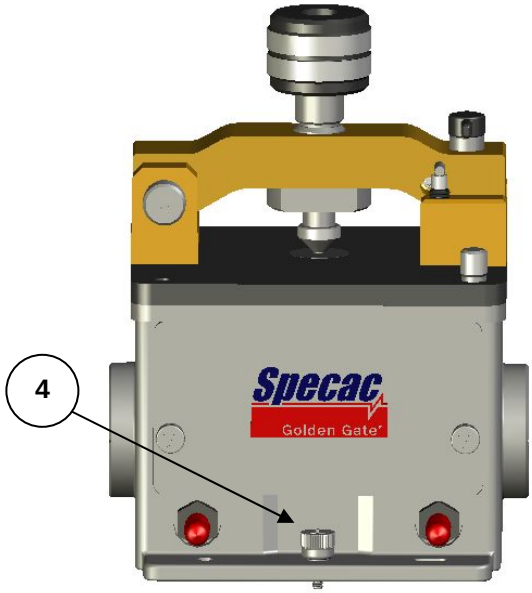


Fig 10: Golden Gate™ ATR Top Plate on Golden Gate™ Optical Unit

5. Alignment

When you have installed the MKII Golden Gate™ Single Reflection ATR and top plate into your spectrometer please check the alignment of the accessory.

The Golden Gate™ ATR is given a preliminary alignment in the factory. On installation some transmitted energy will be recorded by the spectrometer, but for best results adjusting the accessory optics will maximize the optical throughput.

Note: *The throughput varies with spectrometer design features such as 'F' number, 'J' stop etc., but should typically be 6% or more when compared with an open beam. It is important with all accessories, that the maximum throughput is achieved. This ensures optimum analytical performance and signal-to-noise ratio.*

The beam condensing optics unit has six optical components. Two mirrors and one lens make up the input system. An identical set of mirrors and lens form the output system (see Fig 11). Two mirrors (M1 and M4) are fixed while the two larger mirrors (M2 and M3) have rotation and tilt adjustments. The focusing lenses (L1 and L2) are adjustable for focus by moving up and down in their supports.

The beam path diagram shows a Diamond ATR top plate in position, but the principles for alignment are the same for any other top plate. When aligning the Microspecular top plate, its own reference mirror must be placed over the sampling aperture.

It is always best to start alignment from the output mirror (the one nearest the detector).
Note*: In these instructions it is assumed M4 is the output mirror. If your output mirror is M1 follow the instructions taking the optical components in the reverse order to that shown in Fig 11.*

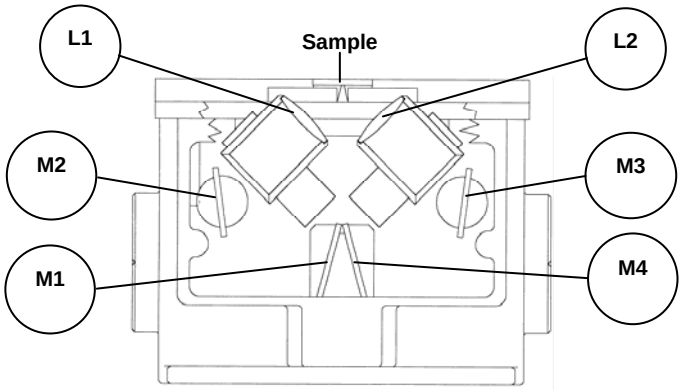


Fig 11: Optical Beam Path of Golden Gate™ ATR System

To adjust the alignment of the MKII Golden Gate™:

1. Loosen the two thumb screws (5) and remove the front cover (6) to reveal the optics (See Figs 12 and 13). The diamond top plate has been removed from Fig 13 for clarity.

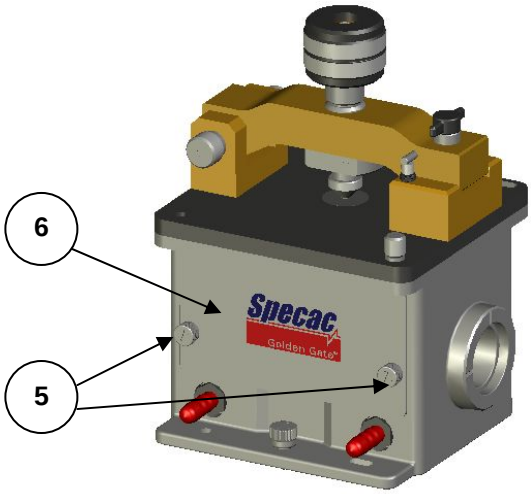


Fig 12: Optics Cover Removal from Golden Gate™ ATR System

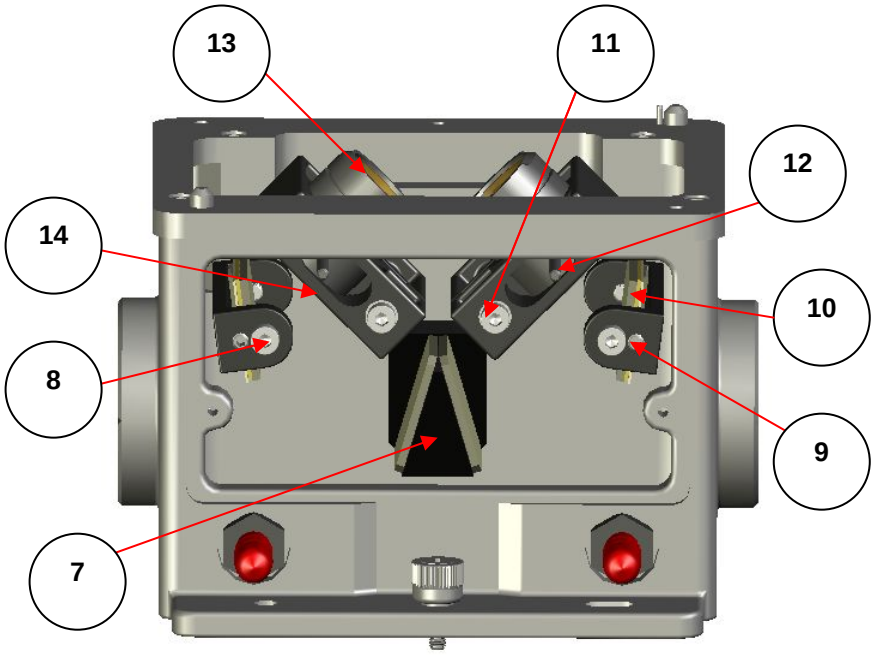


Fig 13: View of Optical Components in the Golden Gate™ ATR System

2. The double mirror mount (7) is fixed. The input side mirror (M1) ensures that the beam is correctly directed to mirror (M2). In the same way the output mirror (M4) needs no adjustment.

3. Where the spectrometer allows the accessory to be moved left to right, move the ATR unit to find the best position where the transmission is at a maximum and firmly secure the base-plate. (In some spectrometers it may be necessary to remove the optical unit before securing the base-plate. Where this is the case, ensure that the baseplate does not move when removing the optical unit).

4. Using the large Allen key in screw (8) of mirror M3 very gently adjust the rotational movement of the mirror to achieve maximum energy.

Tip: *If the energy reading on the instrument monitor goes to zero while making any of the adjustments always bring it back with the same adjustment before proceeding further.*

5. Adjust mirror M3 tilt position by inserting the smaller Allen key into screw (9) and turning to maximize the energy.

Important : *Turning the Allen key too far anticlockwise will cause the screw to dislodge from the back of the mirror (10). If this accidentally happens, turn the Allen key a full circle in the same direction to dislodge the screw further and free it. (Do not remove it). Next, push the spring mounted mirror (10) away from the black anodized mirror mount and turn the Allen key clockwise until the screw (9) is re-set against the rear of the spring*

.

6. The lens focus is adjusted by slightly loosening the locking screw (11) in lens L2. A spring washer ensures there is some friction to hold the lens barrel.

   Hold on to the lens by the tiller bar (12) whilst loosening the locking screw (11) to prevent the lens barrel (13) from sliding down the outer casing (14). Wriggle the tiller bar (12) gently to move the lens barrel assembly up or down to maximize the energy.

7. Tighten the locking screw (11) to secure the lens in the optimum position.

8. Maximize the energy by adjusting the rotation and tilt movement of mirror M2, in the same way as M3 (steps 4 and 5).

9. Complete the alignment procedure by adjusting the lens L1, in the same way as L2 (steps 6 and 7).

10. Repeat the rotation, tilt and focus adjustments as in steps 4 to 9 until maximum energy throughput is achieved and then replace the front cover plate (6).

Corrosive Samples

The diamond ATR element in the Golden Gate™ is high temperature bonded into tungsten carbide using a metal layer. Tungsten carbide and diamond have exceptional chemical resistance properties; However, Specac cannot guarantee the support disk or bonding material against corrosion from all materials, particularly under hostile conditions of elevated temperature.

We recommend that your sample is confined to the center of the diamond only, if there is a risk of chemical attack upon contact with the other materials of construction.

A sample spot 2 microns deep with a diameter of 600 microns is sufficient. We recommend that a pipette, or similar glass capillary tube, is used to apply small sample spots to the center of the diamond only.

The Golden Gate™ is capable of handling a diverse range of chemically aggressive materials. However, we recommend that in order to protect your accessory, your sample is cleaned off soon after analysis is complete.

6. Fitting Accessories to the ATR Unit

When the MKII Golden Gate™ Single Reflection ATR has been installed and aligned in the spectrometer you have the options of fitting a polarizer and/or purging the ATR accessory.

Fitting a Polarizer

The standard Specac polarizers (12000 Series) can be fitted to the apertures (15) of the ATR. The polarizers push fit in these apertures and can be rotated to the desired orientation. The polarizer will transmit at a maximum (perpendicular component of the polarized light) when it is mounted so that the notch slot in the polarizer holder ring is in the vertical plane. Fitting the polarizer to either aperture of the ATR will have the same effect.
There is also a special Benchmark™ Rotatable Polarizer Mount Assembly (including polarizer) P/N 12510 that fits directly to the aperture ports of all Benchmark™ baseplate compatible optical units such as found on the Golden Gate™ ATR accessory. (Please ask Specac for details).

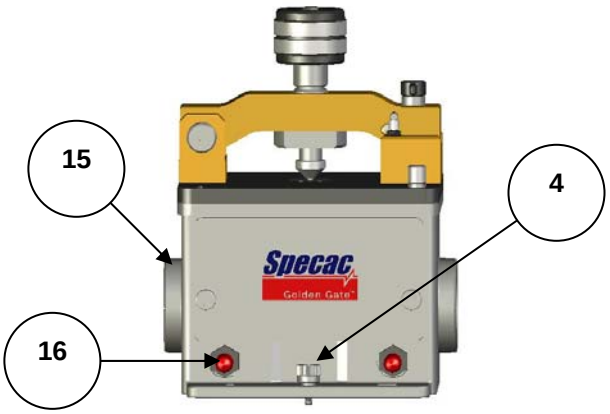


Fig 14: Purge Features of the MKII Golden Gate™ ATR System

Note: *Fit a polarizer where required before purging the system.*

Purging the System

The MKII Golden Gate™ ATR optical unit is fitted with purge ports (16). The protective rubber sealing covers are removed from the purge ports and purge tubing can be connected. To allow the system to be purged efficiently it is necessary to fit the flexible purge bellows (17).

Tip: *It is recommended that purge bellows are fitted during use to help stabilize the instrument background, even if the accessory is not being purged.*

Fitting the Purge Bellows (P/N 10707)

1. With the Benchmark™ base-plate secured, and Golden Gate™ installed, measure the approximate lengths between the spectrometer side walls and the flat end of the ATR unit (Dimension 'X' – see Fig 15).

2. Using a sharp razor, cut lengths of the flexible purge tube which are equivalent to the measured length (X) plus an additional 10 mm for each.

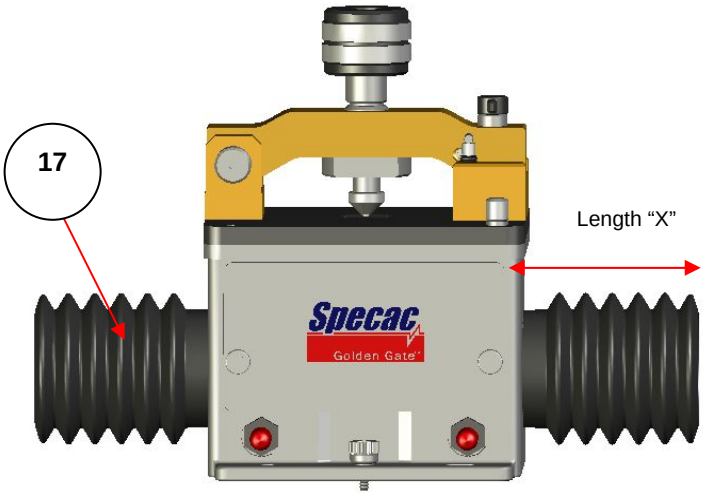


Fig 15: Fitting Purge Bellows to the MKII Golden Gate™ ATR System

Tip: *It is easier to cut the purge tube between the hard ridges.*

3. Unscrew the fixing thumb screw (4) and remove the Golden Gate™ ATR Accessory from the sample compartment.

Note: *Fit a 12000 Series polarizer at this stage if required.*

4. Fit the flexible purge bellows over both end apertures as seen at Fig 15 and compress sufficiently to enable the assembly to fit into the spectrometer.

5. Ensure the bellows are not obstructing the beam and then tighten the accessory fixing thumb screw (4) to secure the Golden Gate™ ATR optical unit back onto the Benchmark™ base-plate.

7. Changing Lenses in the MKII Golden Gate™ Optical Unit

The MKII Golden Gate™ ATR accessory is provided with ZnSe or KRS-5 beam condensing lenses. If you wish to change from one set of lenses to the other they are available as upgrade kits.

10552 ZnSe Lens (2) Upgrade Kit
10508 KRS-5 Lens (2) Upgrade Kit

Removing Lenses

1. The front cover (6) of the optical unit is removed by loosening the thumb screws (5) to gain access to the optics.

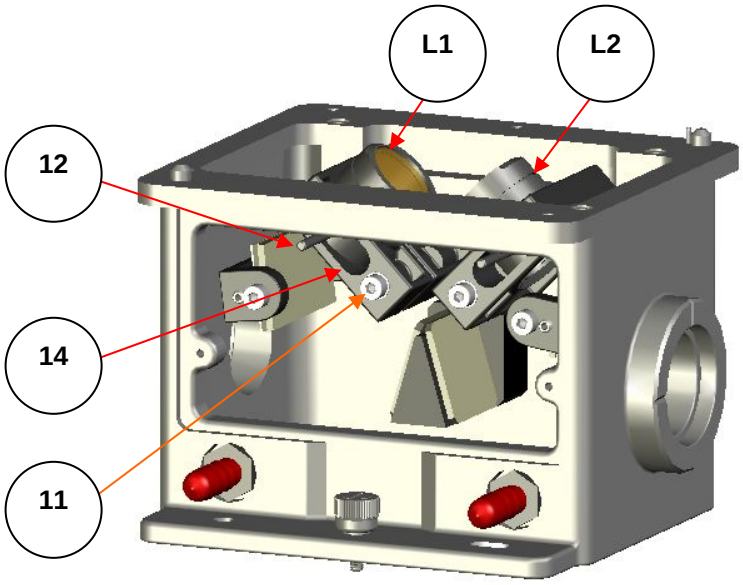


Fig 16: Changing the Lens Assemblies in a MKII Golden Gate™ ATR System

2. Any Golden Gate™ ATR Top Plate being used must be removed from the optical unit. This is achieved by loosening the two thumb screws (3) on the Top Plate and lifting it up and away from the optical unit.

3. The lens assemblies in the optical unit are moved by the tiller bars (12) (see Fig 16). Remove the tiller bars from the lens barrels by unscrewing anticlockwise.

4. Loosen the locking screw (11) making the lens barrel free to move in the outer casing (14).

5. Carefully remove both lens assemblies by pulling up and out of their casings, through the top of the optical unit.

Fitting New Lenses

To fit new lenses the procedure for removal is reversed.

1. Carefully slide the new lenses into the casings through the top of the Golden Gate™ ATR optical unit.

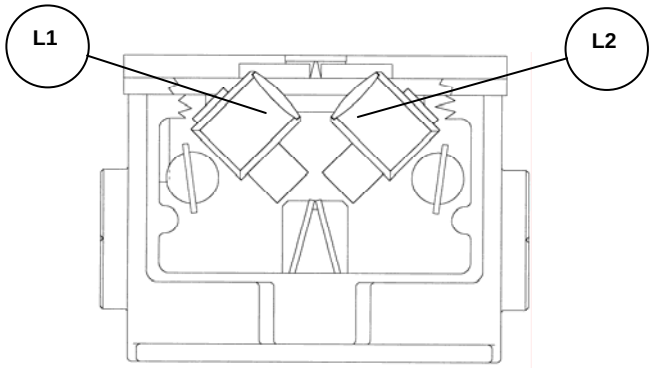


Fig 17: Simplified diagram showing position of lens assemblies L1 and L2 in the MKII Golden Gate™ ATR System. (Note that an ATR Top Plate is also shown in position on top of the optical unit)

Important: *Ensure the holes in the lens barrels that the tiller bars (12) screw into are aligned with the front slots in the casings (14).*

2. Tighten the tiller bars (12) into their holes in the lens barrels (turn clockwise).

3. Adjust the position of the new lenses so that they are approximately midway in their casings and tighten the locking screw (11). See the simple diagram Fig 17 to help indicate approximately where the lens should be positioned and how close they will be to the underside of the Golden Gate™ ATR Top Plate when it is in position on the optical unit.

4. The Golden Gate accessory will now need realignment. Follow the instructions for alignment at Section 5 of this manual.

8. Anvil Options for the MKII Golden Gate

Choice of Anvils and their Uses

There are many different compression head anvils that can be used with the Golden Gate Single Reflection ATR top plates. The types and their uses are shown in the following table:-

Anvil P/N	Description	Sample Type Use	Top Plate Use
10531	Sapphire	Solids and Powders	All diamond plates
10532	Pellet	Polymer Beads	All diamond plates
10536	Reactive sample	Air Sensitive Samples	All diamond plates
10547	Grooved narrow	Fibers/Wires	Diamond wire holder
10548	Grooved wide	Fibers/Wires	Diamond wire holder
10549	Stainless steel flat	Solids and Powders	All diamond plates
10567	Large stainless steel flat	Solids and Powders	Germanium top plate
10568	Micro reaction flow cell	Liquids/Supercritical fluids	All diamond plates
10569	View thru anvil/bridge assembly	Solids, Powders and Fibers	All top plates

Sapphire Anvil (10531- Fig 18a)

This anvil can be used with all diamond ATR top plates, for solid or powder samples. The sapphire element on the anvil face is 3.8 mm in diameter.

Fig 18a

Pellet Anvil (10532 - Fig 19)

This anvil is made of stainless steel and has a concave recess designed for round samples such as polymer pellets. It can be used on all diamond ATR top plates and, if the sample is relatively soft, with a Germanium top plate.

Fig 19

Grooved Anvils Narrow (10547) - Wide (10548) (Figs 20a & 20b)

These anvils are made of stainless steel and have a groove cut through the pressing face to position fibers or thin wires in the center of

the ATR crystal. These anvils can be used on all diamond ATR plates and are supplied as standard with the wire holder top plate.

Fig 20a

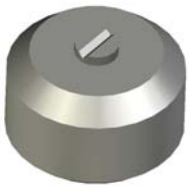


Fig 20b

Stainless Steel Anvils (10549 and 10567 Figs 21a & 21b)

These anvils can be used in place of the sapphire flat anvils if desired. The large stainless steel anvil (10567) should always be used with the germanium top plate, (it is the anvil supplied with this top plate).

Fig 21a

Fig 21b

Reactive Sample Anvil (10536 - Fig 22)

This is a sapphire anvil with an Isolast™ O-ring around the outer edge. When clamped in position an air tight seal is formed around the sample being held in contact against the ATR crystal. Air sensitive samples can be positioned on a top plate in a controlled environment (for example a glove box or fume cupboard). The top plate and anvil can then be taken from the controlled area and placed on the Golden Gate™ optical unit in the spectrometer. This anvil can be used on all diamond ATR top plates and, if the sample is relatively soft, with the germanium top plate.

Fig 22

Micro Reaction Flow Cell Anvil (10568 - Fig 23)

This anvil is made of stainless steel and has 1/16” flow tubes to allow liquids to flow across the ATR crystal. It can be used at pressures up to 1000 psi and temperatures up to 300°C. The internal volume of the cell is 28 microlitres. The micro reaction flow cell can be clamped for use with all diamond ATR plates.

There is also a special “static” (non-flow) version of this anvil which has Luer ports and PTFE plug fittings in place of the standard 1/16” stainless steel flow pipe fittings. Please contact Specac for more details.

Fig 23

View Thru Anvil/Bridge Assembly (10569 - Figs 24a & 24b)

This is a special anvil allowing you to see the sample compressing onto the ATR crystal. The sapphire anvil face doubles as a viewing port. The anvil moves up and down in the clamp bridge by rotation of the viewing lens assembly. This bridge/anvil combination can be used on all ATR top plates, diamond and germanium. The clamp bridge and torque limiter mechanism of the standard ATR top plates must be replaced by the specific bridge and view thru anvil assembly. This is achieved simply by undoing the hinge screw from the bridge pivot hole and removing the standard clamp/bridge assembly.

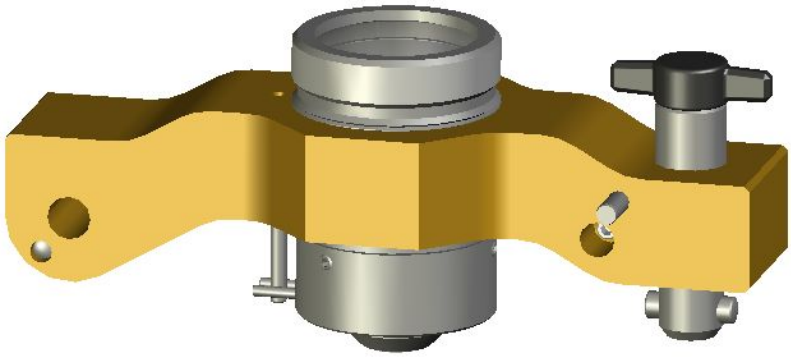


Fig 24: Side View of View-Thru Anvil Bridge Assembly

Important : *When removing the bridge mechanism and replacing with the view thru bridge it is important the stay up catch pin inside the bridge does not fall out of position. If it does fall out just replace.*

Note : *The View-Thru Anvil Bridge Assembly **must not** be used with the High Temperature Heated Golden Gate™ Top Plate P/N GS10640 because of the sample temperatures that this accessory can generate.*

9. Sampling using the Accessory

General Principles

When using the MKII Golden Gate™ Single Reflection ATR accessory the sample is placed onto the crystal area (18) of the top plate. The contact between sample and crystal is improved using the clamp bridge (19) and an appropriate compression head anvil (20).

For diamond top plates, the diamond crystal is brazed into a surrounding support disc of tungsten carbide.The germanium top plate has a germanium crystal glued into a stainless steel support disk. (Specific details for all top plate options can be found in Section 3 of this manual.)

The diamond ATR top plate is used to illustrate sampling in this manual. If using a germanium top plate the stainless steel flat anvil compression head (10567) should be used, where the sapphire anvil (10531) has been shown for the diamond top plate.

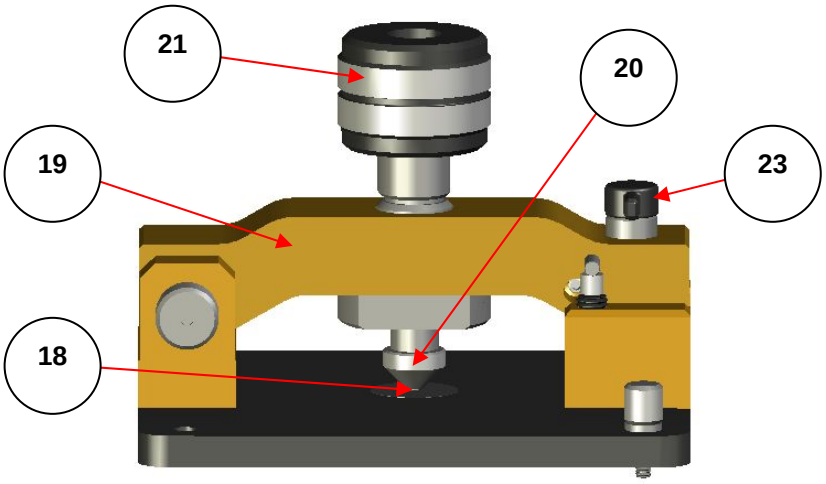


Fig 25: Front View of MKII Diamond ATR Top Plate (Bridge Closed)

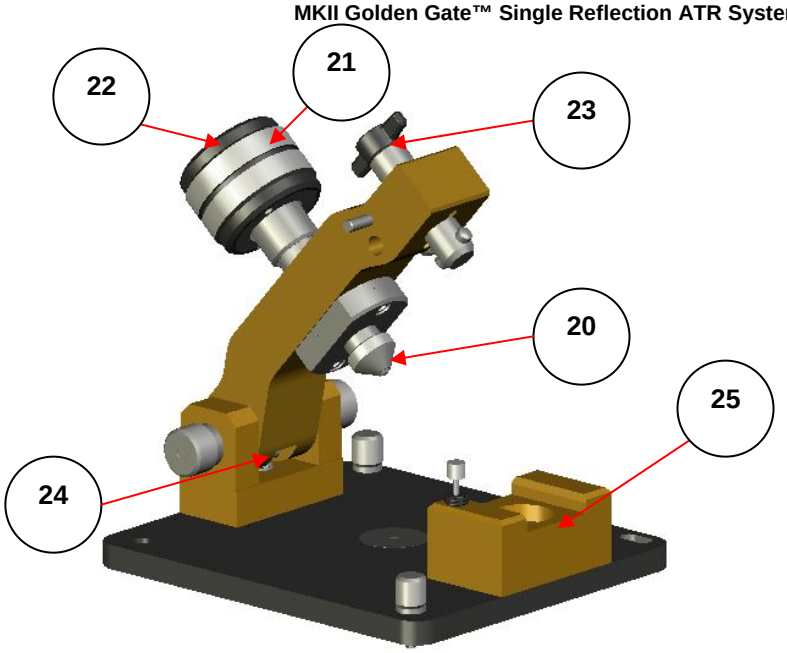


Fig 26: Angled View of MKII Diamond ATR Top Plate (Bridge Open)

Features of the MKII Golden Gate™ Clamp Bridge

Torque Limiter Screw

The MKII Golden Gate™ Single Reflection ATR top plates are provided with a special built in torque limiter screw (21). When the torque limiter screw (21) is turned clockwise it will provide a maximum load of 80lbs (spread over the area of the anvil face) to the sample. After this load has been achieved the screw rotates without increasing the load. This means that there is no need to use a torque wrench for routine sampling. However, a torque wrench with torx head adaptor (10504 and 10505 respectively) can be supplied separately to provide loads up to 160lbs, using the central torx head screw fixing (22). (See Fig 27).

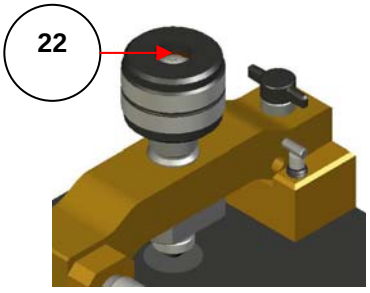


Figure 27: Torque limiter screw showing torx screw fixing

Quick Lock and Release Mechanism

The clamp bridge (19) has a quick lock and release mechanism (23). When pressure needs to be applied to a solid sample the bridge must be closed (see Fig 25). The quick lock and release screw is pushed down and turned clockwise 90° to lock the bridge closed. To release the bridge the screw is pushed down and turned anticlockwise 90°.

Important : *When closing the clamp bridge ensure that the anvil is retracted so that it will not crash down on the crystal or sample.*

Stay up Device

At the hinge point of the Golden Gate™ clamp there is a spring ball bearing device (24) that prevents an open bridge from accidentally falling back down to its closed position on the bridge support (25). When sampling liquids there is no need to use the bridge as the sample will be in intimate contact with the crystal. This device allows the bridge to stay open for convenience when sampling liquids (see Fig 26).

Preparing the Accessory for Analysis

For the Diamond ATR the active sampling area is about 1.0 mm diameter, in the center of the diamond. Samples smaller than this should be placed centrally on the diamond for optimum results.

9.1 Undo the bridge quick lock screw (23) and lift the clamp bridge (19) up past the stay up catch (24). The anvil (20) does not have to be in contact with the diamond (18) crystal face to record a background spectrum.

9.2 Ensure the diamond is clean and record a background spectrum.

Note: *If it is necessary to clamp the Sapphire Anvil (20) (10531 or 10522) directly onto the diamond without a sample, (e.g. to*

check for contamination) care should be taken to ensure that the anvil is level to the diamond crystal. This can be done by rotating the anvil (20) slightly before applying pressure. Only a small amount of pressure should be needed to check for contamination. It is not advisable to apply the maximum pressure loading without a sample.

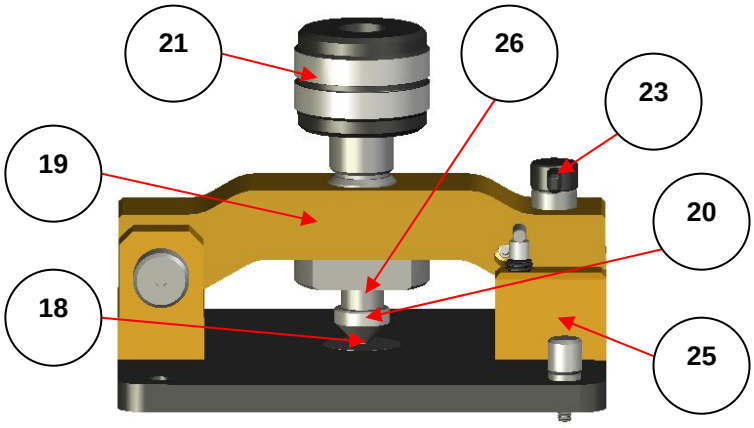


Fig 28: Closed Bridge MKII Golden Gate™ Diamond ATR Top Plate

Using for Different Sample Types

Important: *Golden Gate™ elements are selected for their freedom from natural structural flaws using optical test methods. It is possible to over-stress the diamond element by applying excessive point loads at the extreme corners.*

If you suspect that your sample may contain exceptionally hard particles, ensure that only a small amount of sample is used and is placed centrally on the diamond. ***Do not apply maximum loading immediately.*** *Use a torque wrench set to 20 cNm (approx 33 lbs). Acceptable spectra may be obtained without the requirement for the full load of 100 cNm (160 lbs).*

Powders

1. Prepare the accessory for analysis by collecting a background spectrum. (See 9.1 to 9.2, page 33).
2. Ensure the sapphire anvil (20) is firmly fitted to the end of the sample screw clamp (26) by pushing the hollow end over the retaining ‘0’ ring. Position the anvil to be parallel to the bridge.

Note: *When fitted, some movement of the sample compression head (20) is allowed to adjust to the sample shape during compression. This movement enables even pressure to be applied across the contact area.*

3. Apply the powder to the surface of the diamond (18).
4. Gently clamp down the bridge (19) using the bridge quick lock screw (23), ensuring that the anvil is clear of the sample.
5. Screw down the anvil (20) via the torque limiter screw (21). When a load of 80lbs is achieved the screw will rotate freely. The sample is now compressed between the diamond and sapphire anvil. Record the spectrum of the sample.
6. To remove or change the sample, release the pressure on the sample by first unscrewing the torque limiter screw (21) before undoing the bridge quick lock thumb screw (23). Rest the bridge up past the stay up catch (24).
7. Clean the powder from the diamond and wipe any powder off the sapphire anvil (20) of the compression head.

Flat Solid Samples

Flat solid samples are analyzed in the same way as powders, placing the sample face down on the diamond.

Pellets

Pellets are analyzed in the same way as powders, except that the pellet anvil is used. The pellet should be placed centrally on the diamond.

Ensure the conical recessed stainless steel pellet anvil (10532) (20) is firmly fitted to the end of the sample screw clamp (26) by pushing the hollow end over the retaining '0' ring.

Notes: *The conical recess head ensures that the sample is retained safely under the anvil during compression. Pellets of 1.5mm in diameter or less are not suitable for the recessed head. These are best analyzed with careful manipulation using the flat sapphire anvil.*

Fibers

Fibers are analyzed in the same way as powders. Lay the fiber centrally across the diamond crystal surface and tape down the ends out side the diamond crystal surface if necessary.

Note: *The fiber may be taped across a support frame and laid on the ATR top-plate with the sample centrally across the diamond. For larger wires or fibers the Wire Holder diamond ATR Top Plate (10565) can be used with an appropriate narrow or wide Grooved Anvil (10547) or (10548).*

Liquids and Pastes

1. Prepare the accessory for analysis. (See 9.1 to 9.2, page 33)

Note: *There is no need to use an anvil and the bridge clamp. The bridge can remain open past the stay up catch (24). (See as Fig 26).*

2. Apply a small quantity of the sample, sufficient to cover the diamond surface (only a thin covering is required).
3. If the liquid is volatile place the volatiles cover 10503 (Fig 29) over the sample to prevent evaporation.
4. Record the spectrum of the sample .
5. To remove the sample wipe the diamond and tungsten carbide surface with a cloth and suitable solvent.

Fig 29: Volatiles Cover (10503)

Corrosive Samples

The diamond ATR element in the Golden Gate™ is high temperature bonded into tungsten carbide using a metal layer. Tungsten carbide and diamond have exceptional chemical resistance properties; However, Specac cannot guarantee the support disk or bonding material against corrosion from all materials, particularly under hostile conditions of elevated temperature.

We recommend that your sample is confined to the center of the diamond only, if there is a risk of chemical attack upon contact with the other materials of construction.

A sample spot 2 microns deep with a diameter of 600 microns is sufficient. We recommend that a pipette, or similar glass capillary tube, is used to apply small sample spots to the center of the diamond only.

The Golden Gate™ is capable of handling a diverse range of chemically aggressive materials. However, we recommend that in order to protect your accessory, your sample is cleaned off soon after analysis is complete.

Pressure on Sample (Load)

The table on page 39 gives a guide to recommended loads for different sample types. The optimum load requirements for some typical samples are determined by recording spectra at increasing loads until the desired result is obtained. The optional Torque Wrench (10504) with Torx Adapter (10505), not supplied with the MKII Golden Gate, should be used for these settings (see Fig 30).

Optional Torque Wrench

There is a torx screw fixing (22) inside the top of the torque limiter screw (21). The torx head adapter piece of the torque wrench fits in to this torx screw fixing in order to turn the torque limiter screw. Loads from 33 lbs up to 160 lbs (20 cNm to 100 cNm as shown on the torque wrench) can then be applied to the sample.

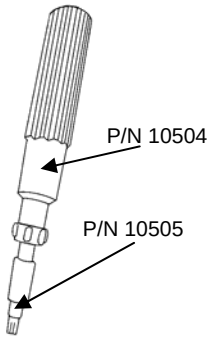
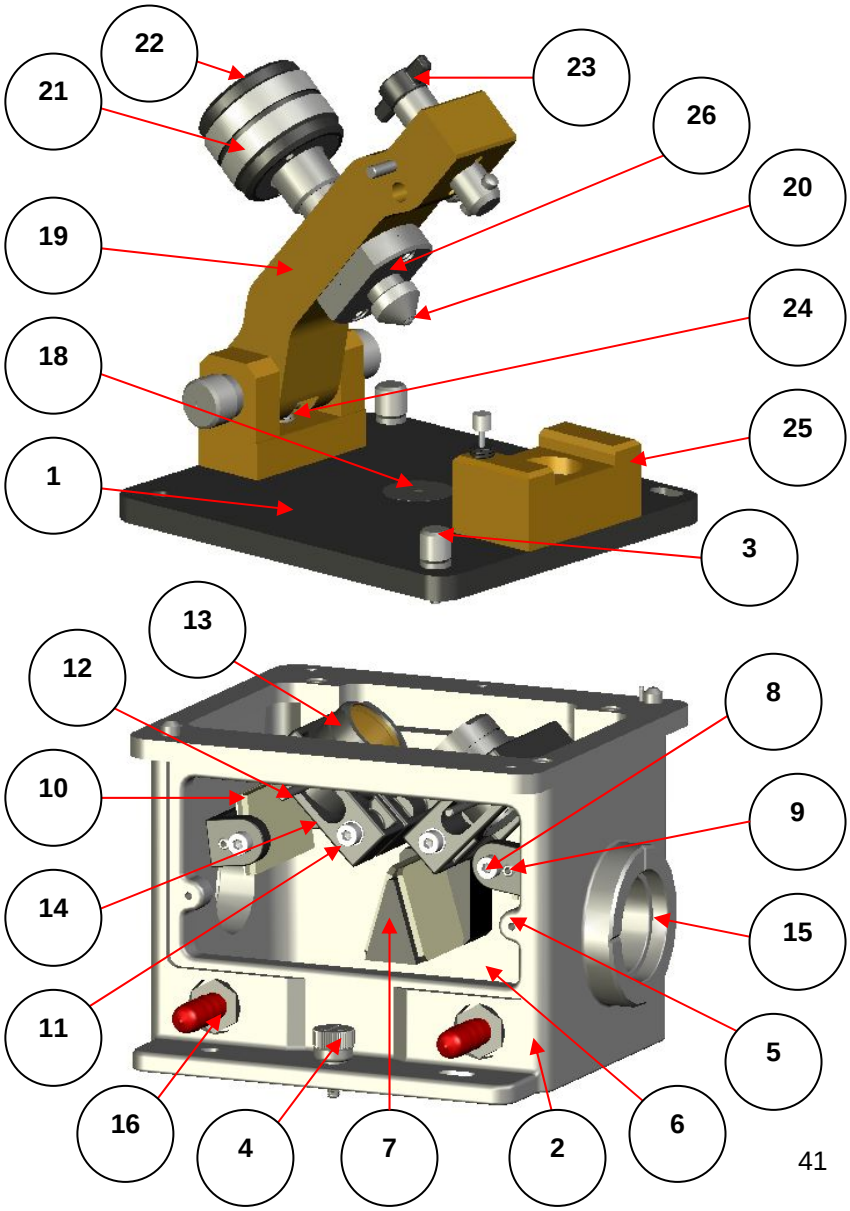


Fig 30: Optional Torque Wrench with Torx Head Adapter

Type of Sample	Torque Setting (cNm)	Approx. Load (lbs)
Powders - soft	20 - 60	33 - 100
Powders - hard	40 - 80	67 - 133
Films and Plastic fragments	40 - 80	67 - 133
Polymer pellets - soft	20 - 60	33 - 100
Polymer pellets - hard	60 - 100	100 - 160
Fibers	40 - 80	67 - 133
Liquids and Pastes	Nil	Nil

10. Legend



(1) Top plate
(2) Optical unit
(3) Thumb screw
(4) Thumb screw
(5) Thumb screw (position for thumb screw - thumb screw not shown)
(6) Optics cover (optics cover not shown in Legend diagrams)
(7) Double mirror mount
(8) Adjustment screw
(9) Adjustment screw
(10) Spring mounted mirror
(11) Locking screw
(12) Tiller bar
(13) Lens barrel
(14) Outer casing
(15) Aperture
(16) Purge port
(17) Bellows (not shown)
(18) Crystal
(19) Clamp bridge
(20) Compression head anvil
(21) Torque limiter screw
(22) Torx head screw fixing
(23) Quick lock and release mechanism
(24) Stay up device
(25) Bridge support
(26) Sample screw clamp

11 Spare Parts for MKII Golden Gate™ ATR

For details of upgrade options and spares for your Golden Gate™ diamond ATR unit, please contact your local Specac office.

MKII Golden Gate™ Top Plate Upgrades

10563 Diamond 45° ATR Top Plate
10565 Wire Holder Diamond 45° ATR Top Plate
10566 Germanium 45° ATR Top Plate
10540 Heated Diamond 45° ATR Top Plate and Temperature Controller (specify voltage – 110 V or 220 V).
10640 High Temperature Heated Diamond 45° ATR Top Plate and Temperature Controller (specify voltage – 110 V or 220 V).
10514 Microspecular Reflection Top Plate
10507 Reaction Cell Diamond 45° ATR Top Plate and Temperature Controller (specify voltage – 110 V or 220 V).
10590 Low Temperature Diamond 45° ATR Top Plate and Temperature Controller (specify voltage – 110 V or 220 V)
10585 Supercritical Fluid Diamond 45° ATR Top Plate and Temperature Controller (specify voltage – 110 V or 220 V)

Spare Lenses

10508 KRS-5 Lens Upgrade Kit
10552 ZnSe Lens Upgrade Kit

Anvil Options

10503 Volatiles Cover
10522 Forensic Sapphire Anvil
10531 Sapphire Anvil
10532 Pellet Anvil
10536 Reactive Sample Anvil
10547 Grooved Anvil - Narrow
10548 Grooved Anvil - Wide
10549 Stainless Steel Flat Anvil
10567 Large Stainless Steel Flat Anvil (for Germanium Top Plate)
10568 Microreaction Flow Cell Anvil
10569 View Thru Anvil/Bridge Assembly

Spares

10504 Torque Wrench
10505 Torx Adapter for Torque Wrench
10509 Torque Wrench and Torx Adapter Head (combined).
10707 Purge Bellows

12. Technical Specification

ATR Crystal	Diamond Type IIIa Diamond 45° 2 mm x 2 mm	Germanium Ge 45° 4 mm x 4 mm
Accessory Transmission Range	6500 -600 cm^{-1} (with ZnSe lenses) 6500 - 400cm^{-1} (with KRS-5 lenses)	5200 – 650 cm^{-1} (with ZnSe lenses or KRS-5 lenses)
Refractive Index at 1000 cm^{-1}	2.4	4.0
ATR Plate	Diamond brazed into Tungsten Carbide Disc	Germanium glued into Stainless Steel disc
Active Sampling Area (50% of Transmitted Energy)	0.8 mm diameter	0.8 mm diameter
Maximum Applied Force	100 cNm (torque) 160 lbs or 1.78 Kbar	80 cNm (torque) 128 lbs or 0.36 KBar
Depth of Penetration	2.0µm (For sample of Refractive Index 1.5 @ 1000 cm^{-1})	0.7µm (For sample of Refractive Index 1.5 @ 1000 cm^{-1})

13. Installation of the Benchmark Baseplate into the Spectrometer

The following is a description of how to fit a Benchmark baseplate into your spectrometer system. In most cases it is best to fit the Benchmark baseplate into the spectrometer sample compartment first and then fix the accessory to the installed baseplate.

Analect FX6200, RFX40/65, Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

The baseplate locates via a blade and dowel pin and is retained by tightening of the 6-32UNC screws supplied.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Biorad FTS7, 40, 60, 65, 100, 135, 155, 165, 175, 185, Excalibur, Scimitar
Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the two dowel pins on the underside of the baseplate locating into the spectrometer dowel holes in the floor of the instrument.

Secure the baseplate by screwing the thumb screw at the back of the baseplate into the instrument floor. (A long flat head screwdriver may be of help).

Locate the accessory onto the installed baseplate and secure using the captive thumb screw.

Bomem M100 Series (110, 120),Beam direction: Left to Right

Remove the spectrometer cover and 3” x 2” sample mount to gain access to the sample compartment.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

Fix the Benchmark baseplate to the spectrometer platform with the two 10-32UNC screws supplied.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Bomem MB100 Series (155, 157), Beam direction: Left to Right

Remove the spectrometer cover and 3” x 2” sample mount to gain access to the sample compartment.

Locate the Benchmark Baseplate onto the kinematic mount of the spectrometer with the three support pillars in a straight line to the front of the compartment. This involves placing the screws on the underside of the baseplate on three location features (a conical countersink, a ‘V’ slot and a plain flat) on the floor of the spectrometer.

The Benchmark baseplate screws can be adjusted for height and leveling.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Bomem DA3, DA8, Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer.

Undo the securing screw in the Benchmark baseplate to loosen the clamping bar underneath.

Install the Benchmark baseplate by locating the inverted ‘V’ slot and the flat recess on either ends of the baseplate on the two sliding bars on the spectrometer floor.

Tighten the screw to pull the clamping bar against the two slide bars to secure the assembly.

Note: *The accessory can be finely aligned by sliding the baseplate along the slide bars before tightening the securing screw.*

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Bruker IFS 25, 45, 55, 48, 66, 85, 88, Vector22, Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer from the Bruker baseplate.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

The two fixing screws and dowel pins of the Benchmark plate are passed through the larger hole ends of the slots on the Bruker baseplate and the Benchmark plate is slid from right to left to centralize it on the Bruker plate.

The two screws are then turned anti-clockwise to tighten the plates together.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Bruker Tensor 25 and Quicklock 33, Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer from the spectrometer sample compartment.

Place the Benchmark Quicklock™ baseplate into the sample compartment with the two location pins and tapped hole on the front edge of the support plate to the front of the compartment. The baseplate locates securely by connection to the rear with the electric plug sockets and a push clip at the front.

Bruker IFS113, Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer from the Bruker baseplate.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

The two fixing screws and dowel pins of the plate are passed through the slots of the Bruker plate and the two screws are turned anti-clockwise to tighten the plates together.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Jasco (All Jasco models), Beam direction: Left to Right

Remove the spectrometer cover and 3” x 2” sample mount to gain access to the sample compartment.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.
Secure the baseplate in position using the two cap head M4 screws supplied.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Mattson Alpha, Polaris, Cygnus, Sirius, Beam direction: Left to Right

There are two sets of pillars supplied with the baseplate for Mattson spectrometers.(Long pillars (1.5”) for Galaxy Series and short pillars (0.5”) for Genesis Series). Use the 1.5” long pillars with these spectrometers.

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment and such that the dowel pins on the underside of the baseplate locate into the floor of the spectrometer.

Secure the baseplate in position using the two cap head 8-32UNC screws supplied.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Mattson Galaxy Series 1000, 1020 (As Unicam Analytical (Philips) 9600), Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.
The Benchmark baseplate is held in the spectrometer by the instruments kinematic mounting system which incorporates three pin/stud locations and a central magnetic attachment mechanism.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Mattson Galaxy Series 2000, 3000, 4000, 5000, 6000, 7000, Genesis Series, RS, Infinity, Beam direction: Right to Left

There are two sets of pillars supplied with the baseplate for Mattson spectrometers.(Long pillars (1.5”) for Galaxy Series and short pillars (0.5”) for Genesis Series).

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment and such that the dowel pins on the underside of the baseplate locate into the floor of the spectrometer.

Secure the baseplate in position using the two cap head 8-32UNC screws supplied.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Mattson 8000(Old) (3” beam height), Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment and such that the dowel pins on the underside of the baseplate locate into the floor of the spectrometer.

Secure the baseplate in position using the two cap head 8-32UNC screws supplied.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Mattson 8000(New) (3.5” beam height), Beam direction: Left to Right

There are two sets of pillars supplied with the baseplate for Mattson spectrometers.(Long pillars (1.5”) for Galaxy Series and short pillars (0.5”) for Genesis Series).

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment and such that the dowel pins on the underside of the baseplate locate into the floor of the spectrometer.
Secure the baseplate in position using the two cap head 8-32UNC screws supplied.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Midac (All Midac models), Beam direction: Left to Right

Remove the spectrometer cover and 3” x 2” sample mount to gain access to the sample compartment.
Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

Secure the baseplate in position using the two cap head 10-32UNC screws supplied.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Nicolet 500, 700, 710, 740, 800, 5PC, 5SXC, Magna, Protege, Avatar, Nexus, Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

Secure the baseplate in position using the two cap head 8-32UNC screws supplied.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Nicolet 6000, 60DX, 60SX, 60SXB, 170SX, Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

Secure the baseplate in position using the two cap head 8-32UNC screws supplied. Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Nicolet 205, Beam direction: Left to Right

Remove the spectrometers complete baseplate/sample mount from the sample compartment by pulling it up to release it from the ball catches.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

The baseplate is secured in the spectrometer by the kinematic mount employing three pin/stud locations and four ball catches on three sides of the baseplate edges.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Nicolet 5DX, 5SX, 1MX, 5MX,10DX, Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the two location pins and tapped hole in a straight line to the front of the compartment.

Secure the baseplate in position using the two cap head 8-32UNC screws supplied.

Install the accessory onto the two Benchmark location pins and secure using the captive thumb screw into the tapped hole at the front.

Nicolet Impact 400, Beam direction: Left to Right

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

Secure the baseplate in position using the two cap head 8-32UNC screws supplied.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Perkin Elmer PE1700, PE1800, Beam direction: Left to Right

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

The baseplate is held in position by two location pins into the front support rail of the spectrometer and by tightening of the pull down thumb nut (supplied) to the instruments own fixing screw that passes through the slot at the front of the baseplate.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Perkin Elmer PE1700 with Shuttle, Beam direction: Left to Right

The shuttle should be removed before installing the accessory.
Follow instructions as for the PE1700

Perkin Elmer PE2000 , Spectrum2000, GX, Beam direction: Left to Right

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

The baseplate is held in position by two location pins into the front support rail of the spectrometer and by tightening of the pull down thumb nut (supplied) to the instruments own fixing screw that passes through the slot at the front of the baseplate.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Perkin Elmer PE2000 , Spectrum2000, GX, Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

The baseplate is held in position by two location pins into the front support rail of the spectrometer and by tightening of the pull down thumb nut (supplied) to the instruments own fixing screw that passes through the slot at the front of the baseplate.
Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Perkin Elmer PE1600 Series, Paragon, Spectrum 1000, BX, RX, Beam direction: Left to Right

Remove the sliding baseplate floor from the sample compartment by pulling it firmly forward. The catch mechanism at the rear will release automatically.

Install the accessory onto the Benchmark baseplate support bar and pillar and secure using the captive thumb screw into the tapped hole in the support bar.

Slide the complete accessory and Benchmark baseplate assembly into the sample compartment. The catch mechanism and Velcro type strips secure the assembly in position.

Perkin Elmer PE Spectrum One, Spectrum 100, Beam direction: Left to Right

Remove any 3” x 2” mount plate used in the spectrometer.

Slide the Benchmark baseplate into position along the side edges of the sample compartment with the three support pillars in a straight line to the front of the compartment.

The baseplate locates into the spectrometer by engagement of the 15pin connector at the back of the plate into the spectrometer and by guidance clips on the underside of the plate.

The lilac colored pivoting handle on the underside of the plate is pulled towards you when you need to remove the plate from the spectrometer.
Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Shimadzu 8000, 8100, 8200, 8300, 8500, Prestige 21, Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer.
Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

Make sure that the bar on the underside of the baseplate locates in the slot in the spectrometer sample compartment floor.

Move the baseplate from side to side until the location pins in the spectrometer enter the holes in the bar.

Secure the baseplate by screwing the two cap head M5 screws through the baseplate into the spectrometer sample compartment floor.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Unicam Analytical (Philips) 9600 (As Mattson 1000 series), Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer.

Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

The Benchmark baseplate is held in the spectrometer by the instruments kinematic mounting system which incorporates three pin/stud locations and a central magnetic attachment mechanism.
Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Unicam Analytical (Philips) 9800 (As Nicolet 500 series etc), Beam direction: Right to Left

Remove any 3” x 2” mount plate used in the spectrometer.
Place the Benchmark baseplate into the sample compartment with the three support pillars in a straight line to the front of the compartment.

Secure the baseplate in position using the two cap head 8-32UNC screws supplied.

Install the accessory onto the four Benchmark baseplate pillars and secure using the captive thumb screw into the small central pillar at the front.

Any other Spectrometers

For advice concerning spectrometers not included in this manual please consult your nearest Specac representative.

Notes

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