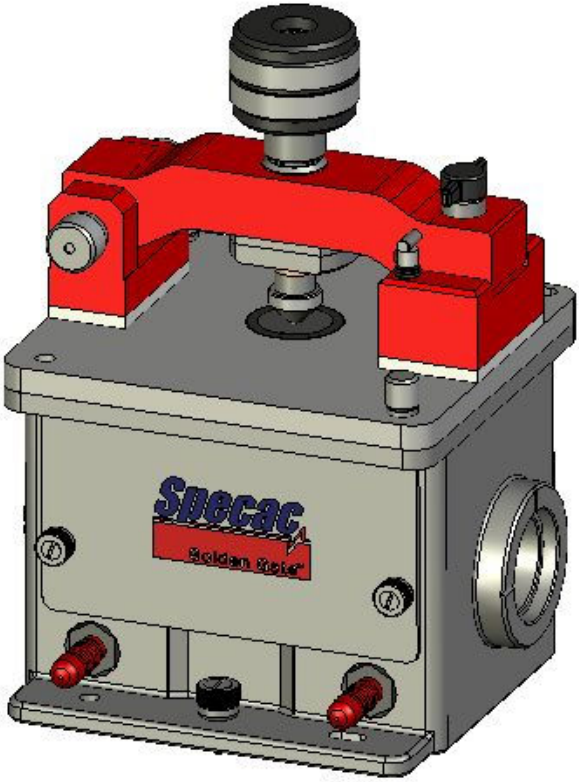
Golden Gate™ High Temperature Heated Diamond ATR Top Plate

User Manual



2I-10640 Issue 5

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1. Introduction

The Golden Gate™ High Temperature Heated Diamond ATR Top Plate (GS10640) is one of a series of top plates that are used on the optical unit of the Golden Gate™ ATR system.

The High Temperature Heated Diamond ATR Top Plate is operable from ambient to 300°C temperature by a dedicated 4000 Series™ Temperature Controller.

The diamond ATR crystal and tungsten carbide support puck is sealed around its edge with silicone resin and a black PEEK™ heat insulation ring as positioned in the stainless steel top-plate. Sealing prevents ingress of any liquid samples or volatile solvent vapours passing through to the optical components within the Golden Gate™ optical unit that supports the High Temperature Heated Diamond ATR Top Plate.

As a key safety feature the High Temperature Heated Diamond ATR Top Plate incorporates a thermal switch which prevents accidental over heating to a sample. If overheating occurs, power will be cut and the switch will reset itself when the temperature has returned to normal.

This particular instruction manual for the High Temperature Heated Diamond ATR Top Plate is to be used in conjunction with the standard Golden Gate™ manual (GS10500 Series) supplied with every Golden Gate™ system and a separate 4000 Series™ Temperature Controller manual.

Warning:

Before powering up the controller make sure that the power/thermocouple lead of the Golden Gate™ High Temperature Heated Diamond ATR Top Plate is connected to the back of the 4000 Series™ Temperature Controller. The plug is push-fit and the knurled ring is rotated to click the position.

2. Unpacking and Checklist

On receipt of the equipment please check that the following have been supplied:

- Golden Gate™ High Temperature Heated Diamond ATR Top Plate (GS10640)
- Golden Gate™ Optical unit with choice of ZnSe or KRS-5 lenses and appropriate Benchmark baseplate (if ordered as GS10642).
- 4000 Series™ Temperature Controller, Power Cable and Manual

Remove the top plate and/or Golden Gate™ optics unit from their packing and install the Golden Gate™ ATR unit and the top plate into the spectrometer (see Golden Gate™ Manual GS10500).

For heating of the Golden Gate™ High Temperature Heated Diamond ATR Top-Plate please follow instructions from the 4000 Series™ Temperature Controller Manual.

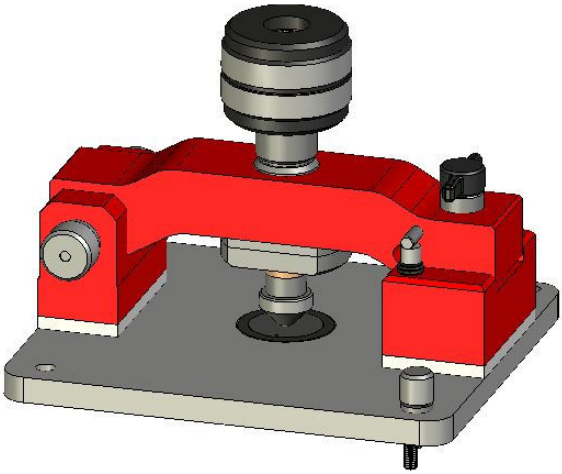

Fig 1. Top View Of High Temperature Heated Diamond ATR Top-Plate

3. Operation Of Golden Gate™ High Temperature Heated Diamond Accessory

It is advisable to operate the Golden Gate™ High Temperature Heated Diamond Accessory in a spectrometer with the sample compartment lid of the spectrometer closed (if possible).

If there were to be any adverse effects from a sample being heated to 300°C, they would initially be contained within the sample compartment area and any risk of spreading into the general laboratory environment is minimized. If the sample compartment lid has to be kept open in operation, you should always wear protective safety spectacles whenever in the vicinity of the accessory.

If the sample compartment volume is small (less than 200mm x 200mm x 200mm), then it is possible the sample compartment lid must be kept open to prevent activation of the safety thermal cut out switches as the local environment gets hot. (When the High Temperature Top Plate is operating in excess of 100°C). Opening of the compartment lid allows for a flow of air to the local environment to keep the unit from overheating.

If the sample compartment lid must be kept closed for safety reasons, then to minimise a build up of heat in the sample compartment, Specac recommend that a flow of N2 gas through the sample compartment as a purge should be established.

Load Limitation to Samples at High Temperature

Note: *When pressing solid samples against the diamond using the sapphire anvil P/N GS10531, the load* ***must*** *be applied from the standard torque mechanism knob assembly. (See use of torque limiter screw item 21 described in Golden Gate™ Manual 10500). If a greater load than standard is applied from the torque wrench and Torx head adapter parts P/N GS10504 and GS10505 respectively, damage will occur to the sapphire tip on the anvil.*

4. Displayable Parameters and Specification

The Golden Gate™ High Temperature Heated Diamond ATR Top Plate is provided with its own dedicated 4000 Series™ Temperature Controller. A separate manual is supplied for specific operation of the 4000 Series™ Temperature Controller.

For operation of the High Temperature Heated Diamond ATR Top Plate the parameters of the 4000 Series™ Temperature Controller have been factory set as shown on the following page. Not all of the displayable parameters can be changed but have been listed for reference purposes. If you ever need to change a parameter or autotune the controller for a particular temperature range certain parameter settings will be altered. You can get back to original factory settings by entering with these original values.

Specifications

Accessory Type P/N's GS10640 or GS10642

Voltage	230V	110V	100V
Frequency	50HZ	60HZ	50/60HZ
Max Power	150W	150W	150W
Fuse Rating	1.5A	3A	3A
Fuse Type	T	T	T

Insulation rating of external circuits (appropriate for single fault condition) = basic insulation and protective (earth) bonding.

Humidity operation range – 20% to 90% relative humidity non-condensing.

Displayable Parameters For High Temperature Heated Golden Gate™ GS10640 with WEST 6100+ (4000 Series™) Controllers

Parameter Display (In Green)	Parameter Name	Parameter Factory Set Value
FiLt	Input Filter Time Constant	3.0
OFFS	Process Variable Offset	0
PP␣␣	Primary (Heat) Output Power	0
Pb_P	Primary Output Proportional Band	5.9
ArSt	Automatic Reset (Integral Time Constant)	1.10
rAtE	Rate (Derivative Time Constant)	0.17
biAS	Manual Reset (Bias)	25
SPuL	Setpoint Upper Limit	300
SPLL	Setpoint Lower Limit	0
OPuL	Primary (Heat) Output Upper Power Limit	100
Ct I	Output 1 Cycle Time	4
PhAl	Process High Alarm	300
AHyl	Alarm 1 Hysteresis	1
PLA2	Process Low Alarm	0
AHy2	Alarm 2 Hysteresis	2
APt	Auto Pre-Tune enable/disable	diSA
PoEn	Manual Control select enable/disable	diSA
SPr	Setpoint Ramping enable/disable	EnAb
rP	Setpoint Ramp Rate Value	600
SP	SP Value	1
SLoc	Set-up Lock Code	10

EC Declaration of Conformity

This is to certify that the:

HIGH TEMPERATURE GOLDEN GATE & 4000 Series TEMPERATURE CONTROLLER 10640/10642

Manufactured by:
SPECAC LIMITED

Conforms with the protection requirements of Council directives 2004/108/EC , relating to the EMC DIRECTIVE,

by the application of:

1) Testing to the following standard:
   EN-61326:2006/8 EMC (Emissions/Immunity) requirements for Electrical Equipment for measurement, control and laboratory use.
2) Supported by SPECAC Technical File No. **TF10640**

and also conforms to the general safety requirements of Council Directives 2006/95/EC , relating to the LOW VOLTAGE DIRECTIVE,

by the application of:

1) EN61010-1:2010, Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory use.
2) Supported by SPECAC Technical File No. **TF10640**

Responsible Person:

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Position: Technical Director
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Name:
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Signature: G. Poulter
Of: Specac Ltd. **Date:** 14th Feb 2013
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