

**DESCRIPTION**

The P4400 Thermo Scientific GENESYS 30 Spectrophotometer (G30) is a device used to measure the optical absorbance of transparent samples in the spectrum of visible light (VIS). Within the DoseControl dosimetry system, the instrument integrates with the DoseControl software that controls the instrument parameters and user workflow for the application in which it is used.

**APPLICATION**

The G30 is used for the measurement of optical absorbance of dosimeters using a single wavelength in the spectrum, and uses specialized hardware in the sample compartment (sold separately from GEX) to orient the sample to the light that passes through the sample to ensure accurate and repeatable measurements. Specialized hardware from GEX exists for the GEX B3 radiochromic film dosimeters, but the instrument could also be used for measurement of any dosimeter that is analyzed in the VIS spectrum, if proper holders are designed and implemented.

**SPECIFICATIONS**
**Physical Specifications:**

GEX Part No.	Description	Product Dimensions	Packaging Dimensions	Product Weight
P4400-US	Spectrophotometer – Type B plug	34.3 cm L x 38.1 cm W x 20.3 cm H (13.5" L x 15" W x 8" H)	58.4 cm L x 50.8 cm W x 33.0 cm H (23" L x 20" W x 13" H)	10.0 kg (22 lbs.)
P4400-EU	Spectrophotometer – Type F Plug			
P4400-UK	Spectrophotometer – Type G Plug			

\*For a complete list of specifications see the brochures and information from Thermo Scientific.

<b>Material</b>	Molded plastic
<b>Color</b>	Grey and White
<b>Printing</b>	Thermo Scientific logo plate on front
<b>Electrical Supply</b>	100–240 V, 50–60 Hz, selected automatically; 150 W maximum
<b>Optical Design</b>	Single-beam
<b>Spectral Bandwidth(s)</b>	5 nm
<b>Light Source</b>	Tungsten-Halogen lamp
<b>Detector</b>	Silicon Photodiode
<b>Wavelength</b>	Range: 325 –1100 nm Accuracy: $\pm 2$ nm (full range 325 to 1100 nm) Repeatability: $\leq 1$ nm
<b>Photometric</b>	Range: -3A to +3A Accuracy – Instrument: $\pm 0.002$ A (0 – 0.3A) / 0.5% of ABS reading (0.301A – 2.5A) Repeatability: $\pm 0.002$ A Drift (Stability) <0.002 A/hr
<b>Stray Light</b>	<0.1 %T at 340nm and 400nm
<b>Baseline Flatness</b>	<0.003 A
<b>Keypad</b>	Tactile rubber 23 keys with numeric keypad
<b>Display</b>	Touchscreen LCD panel; 800 x 480; 12.7 cm (5 in) diagonal

**Included Components:**

- Plastic insert plate with cuvette holder
- USB thumb drive
- Power cord
- USB interface cord
- Magnetic cuvette insert for sample compartment (not used for GEX Dosimetry Systems).

**Packaging:**

Unit is shipped in a cardboard box with a form-fitting foam enclosure.

**Storage:**

Store the instrument in a cool and dry location.

**PRODUCT PHOTO**



**ACCESSORIES**

GEX Part No.	Description	Purpose
P4220	Spectronic Standards Set	Performance Verification kit
P4401	Lamp Replacement Assembly	Pre-aligned lamp replacement assembly
P4405	G30 Dosimeter holder baseplate	The GEX baseplate for dosimeter holders and accessories
P4410	G30 DoseStix Dosimeter holder	Positioning 50mm x 15mm GEX DoseStix style film dosimeters
P4420	G30 WINdose Dosimeter holder	Positioning 10mm x 10mm film dosimeters

**INSTALLATION**

**Opening the Shipping Box:**

- Keep shipping cartons upright at all times. Damages due to improper moving techniques are not covered by the warranty.
- **CAUTION!** - Whenever the spectrophotometer has been stored or shipped, immediate exposure to room air can cause condensation damage. Move the shipping cartons to the installation location at least 24 hours before installation. This allows the instrument to equilibrate at room temperature before the shipping cartons are opened and protective packaging is removed.

**Operating Environment:**

- Instrument was designed for use under the following conditions:

Temperature Range*	5°C to 35°C (41°F to 95°F)
Relative Humidity	<20% to 80% noncondensing
Altitude	0m to 200m

\*Operating the instrument outside of this temperature range may cause permanent damage.

- Instrument performance should be verified when operating outside of these ranges. GEX has verified instrument performance at an altitude of approximately 1610m.
- The instrument should be positioned on a surface that is level and free of vibration. Consider all GLP's (Good Laboratory Practices) concerning cleanliness of the area.

**Power:**

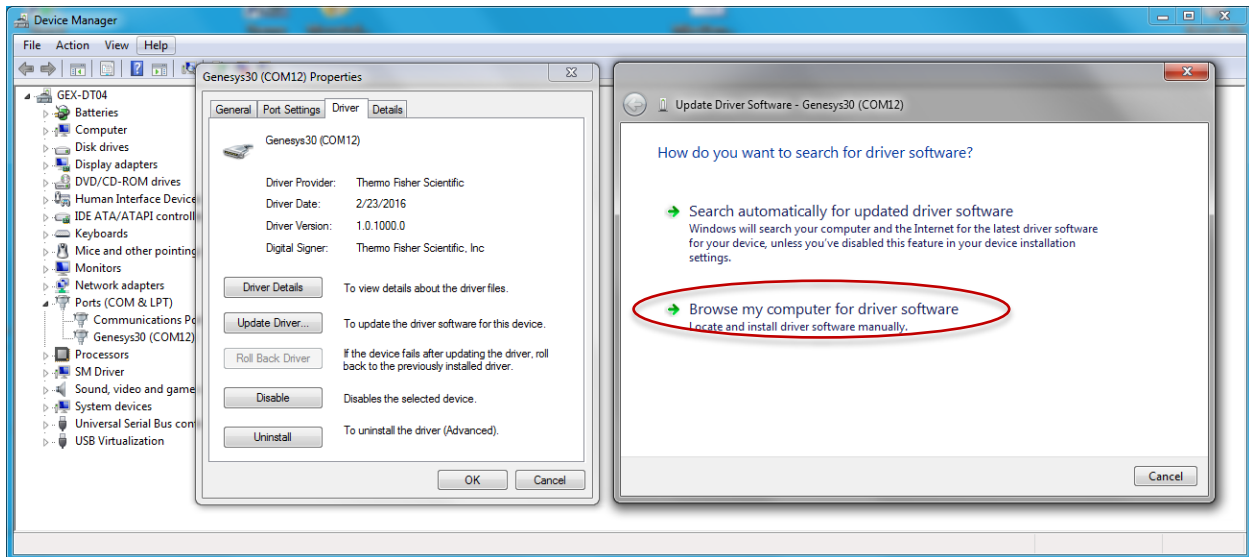
- Connect the power cord from the front, right-side of the instrument to the outlet meeting the electrical supply requirements.
- Use conditioned power whenever possible by connecting via a surge suppression and/or battery backup intermediary.

**Connectivity:**

Integration with GEX’s DoseControl software requires the installation of the Thermo GENESYS 30 driver on the PC to be used. GEX supplies the driver with the DoseControl software. Contact GEX Customer Service for assistance locating the driver.

Follow the procedure below to install the driver and connect to a PC.

1. Connect the USB cable from the port on the front-right side of the instrument to the USB port on the PC.
2. Turn on the PC and login to Windows®.
3. Power ‘ON’ the spectrophotometer using the switch on the front-right side. The instrument will perform a series of self-checks that will take approximately one minute.
4. Search for and open the MS Windows “Device Manager” on the PC.
5. Locate the unidentified device in the “Ports (COM & LPT)” section.
6. Right-click on the unidentified device and select Properties -> Driver and then press the “Update Driver” button.
7. Browse to the GENESYS 30 driver folder provided separately by GEX.
8. Repeat this process twice or until the device is recognized as a COM device in the system and “Genesys30” is the displayed name of the device.
9. See Figure 1 below for a visual description.



**FIGURE 1**

**Dosimeter Holder System:**

Install the holder system according to *GEX Doc# 100-168 - GENESYS 30 Dosimeter Holder System*.

**QUALIFICATION**

See *GEX Doc# 100-267 - Implementation Guide for DoseControl Dosimetry Systems* for detailed information on IQ, OQ, and PQ for this instrument as part of a complete dosimetry system.

**NOTE:** An IQ/OQ Protocol is available from GEX and on-site installation, IQ/OQ, and training on the GENESYS 30 and DoseControl system are available. Contact GEX customer service for more information.

For more information on qualification services email a request to [cs@gexc corp.com](mailto:cs@gexc corp.com) or visit our website to submit a request online at <http://www.gexc corp.com/support.html>.

## CALIBRATION / PERFORMANCE VERIFICATION

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### Calibration:

A Calibration Certificate is not provided by Thermo Scientific. The GENESYS 30 is tested at the factory, but ultimately is the end-user's responsibility to verify the instrument performance after installation at the user's site.

### Performance Verification:

See *GEX Doc# 100-270 – GENESYS 30 Performance Verification* for complete details.

The term 'Performance Verification' replaces the older term 'Calibration Verification' but the intent of either is the same; to determine if the instrument is performing within the manufacturer specifications. The user may conduct Performance Verification (P.V.) using a wide variety of available options including:

- Thermo Scientific and GEX recommended P.V. methods including but not limited to:
  - Verification using the *GEX Part# P4220 Thermo Spectronic Standards Set*.
  - User determined verification in compliance with GLP or equivalent using standards and methods not dictated by Thermo Scientific or GEX.

## USAGE

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### Sample Compartment Lid:

The user may keep the sample compartment lid open during measurements. The lid should be closed when not in use or during any Performance Verification (P.V) testing.

### Startup Procedure:

Follow the procedure below to startup the instrument in preparation for use:

1. Ensure the instrument's sample chamber is empty; this includes removing the P4420 Film dosimeter holder (for B3 WINdose) with the 2.5mm aperture.
2. Power 'ON' the spectrophotometer using the switch on the front-right side.
  - a. If the instrument is powered on with the 2.5mm aperture film holder or any dosimeter in the sample compartment, simply turn the unit off, clear the obstruction and turn the instrument power back on.
3. The instrument will perform a series of self-checks that will take approximately one minute.
4. The instrument must be allowed to warm up for a minimum of 30 minutes before use otherwise measurement accuracy and repeatability may be affected.
5. To make the connection to a PC, select 'Settings -> Connect to PC' and the instrument will display "Connected to computer". See Figure 2 below.
6. The instrument is designed to be powered on for long periods and no special procedure is necessary to turn the instrument off after use; simply turn off the power switch at any time.



FIGURE 2

7. The instrument should be rebooted at least once per week so that the self-checks noted in step 3 can be performed.

**With GEX DoseControl Software:**

The instrument is typically used as part of the DoseControl System and is completely controlled and interfaced with using the DoseControl Software. Refer to *GEX Doc# 100-266 DoseControl Software User Guide* for details.

**Fixed Wavelength / Scanning Measurements without DoseControl Software:**

Refer to the *Thermo Scientific GENESYS 30 User Guide* for details on using the instrument without the DoseControl software.

**CARE & MAINTENANCE**

**Cleaning:**

The instrument’s exterior and the sample compartment should be periodically cleaned as part of a Preventative Maintenance program along with the dosimeter holder system. An instrument that is maintained and cared for will perform better and have a longer life. Complete cleaning instructions which include the proper materials can be found in the *GENESYS 30 User Guide*.

**Manufacturer Service:**

If the device requires service for any reason, there are two options:

**1. Depot Service:**

For customers in the USA and Canada, the GENESYS 30 needs to be sent to Thermo Scientific in Madison, WI, U.S.A. for repair or other services. Please contact GEX Customer Service at [cs@gexc corp.com](mailto:cs@gexc corp.com) for more information if service is required.

**2. On-site Service:**

On-site service may be available in some countries. Contact GEX Customer Service at [cs@gexc corp.com](mailto:cs@gexc corp.com) or your local Thermo Scientific representative for details.

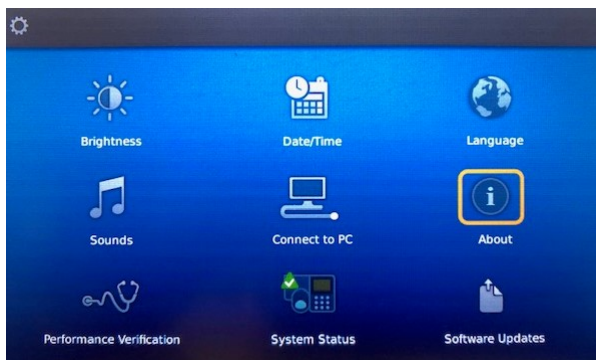
**Lamp Life Status:**

To view status information regarding the tungsten-halogen lamp, select the “Settings” menu item and the “About” item on the GENESYS 30’s display using the soft button keypad. The hours of the lamp are displayed. See Figures 3 and 4 below.

The lamp should be replaced before 1000 hours if the user wishes to avoid increased risk of lamp failure during the dosimeter measurement process.

**Lamp Replacement:**

See *GEX Doc# 100-169, GENESYS 30 Replacement Lamp - Product Specifications and Usage (PSU)* for complete details about the lamp.



**FIGURE 3**



**FIGURE 4**

**PRECAUTIONS**

Please refer to the Thermo Scientific Site and Safety User Guide for additional information and the full listing of precautions.

- Keep shipping cartons upright at all times. Damages due to improper moving techniques are not covered by the warranty.
- Connect the spectrophotometer to a suitable uninterruptable power supply to minimize line current fluctuations that may alter the measurement or damage the spectrophotometer.

- Keep the top cover closed and latched as much as possible. Minimize exposure of the spectrophotometer to airborne contaminants like smoke, dust, oil vapor, or chemical fumes.

**WARRANTY/GUARANTEE**

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**Warranty:**

Please refer to the Thermo Scientific GENESYS 30 Warranty Information document for details.

**Guarantee:**

1 year GEX satisfaction guarantee. Product may be returned to GEX within one year from the date of delivery for any customer dissatisfaction.

**RELATED DOCUMENTS**

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- Thermo Scientific GENESYS 30 User Guide
- GEX Doc #100-168, GENESYS 30 Dosimeter Holder System - Product Specifications and Usage (PSU).
- GEX Doc #100-169, GENESYS 30 Replacement Lamp - Product Specifications and Usage (PSU).
- GEX Doc #100-266, DoseControl Software User Guide
- GEX Doc #100-267, DoseControl Dosimetry System Implementation Guide
- GEX Doc #100-269, Spectrophotometer Performance Verification Form
- GEX Doc #100-270, GENESYS 30 Performance Verification Procedure
- GEX Doc #100-280, IQQQ Plan and Protocol for DoseControl System

**REVISION HISTORY**

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DATE	CHANGE DESCRIPTION	REVISION
05/12/17	Initial release.	A
10/03/18	Complete major revision of all sections except the specifications, which had some information removed. Reflected newly released G30 PV documents (#100-269 and #100-270). ECO 70403.	B
05/23/19	Standardized layout and information with 100-156, Evolution 220 Spectrophotometer and to add many references to related documents. Removed procedural information related to performance verification and usage to 100-270. Startup procedure remains in this document. Revised almost all sections for language and simplicity. ECO 70444.	C

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