

# Continuous monitoring of solvent purity

## PUV3402 Multiwave process photometer



Continuously measure the quality of ethylene glycol and other organic compounds.

**Measurement made easy**

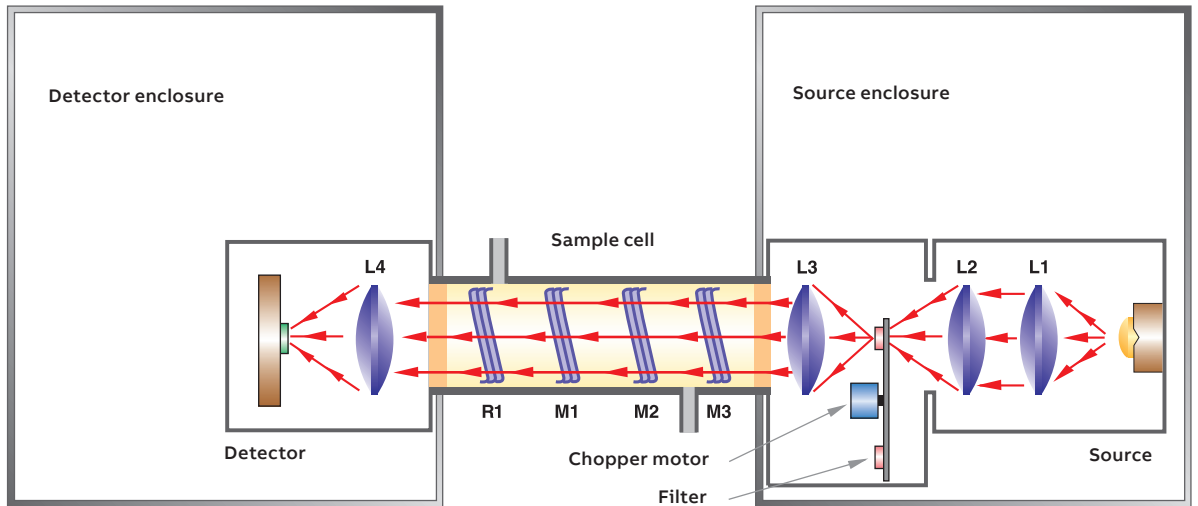
— PUV3402 UV process photometer

### Introduction

For solvent manufacturers, the measurement of ultraviolet absorption to ensure that the product meets purity specifications represents an important quality control parameter. Absorbance measurements are made at several wavelengths in the ultraviolet (UV) spectral region. The UV region, which covers wavelengths from 200 to 400 nanometers (nm), is a high-energy region where electronic transitions are observed. Aromatic compounds, unsaturated compounds and chromophores such as carbonyls are examples of UV absorbing species. Solvent purity has traditionally been tested by taking grab samples followed by analysis on a laboratory spectrophotometer. Using on-line photometers provides for the continuous monitoring of solvent purity. Ultraviolet photometers feature excellent sensitivity, which allows for the measurement of trace levels of UV absorbers in solvents.

### The Analyzer

Photometers make measurements at selected discrete wave-lengths. Narrow bandpass optical filters pass light at reference and measure wavelengths in photometers. The reference wavelength is usually selected where none of the components in the stream absorb radiation. Measurement wavelength filters are chosen to match the absorption band of the component being analyzed. The analyzer used for solvent purity analysis is the PUV3402 Multiwave process photometer, whose optical schematic is shown on the next page.



Optical schematic

**Discussion**

Quality control specifications for ethylene glycol require transmittance (%T) measurements at the following wavelengths.

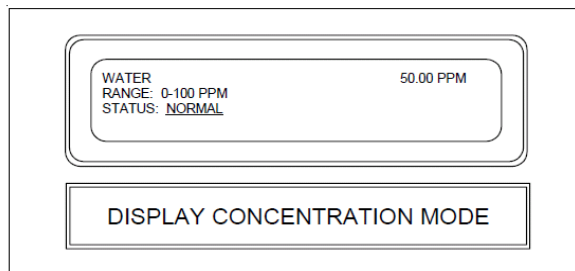
Wavelength	%Transmittance Range
220 nm	100 to 70
250 nm	100 to 90
275 nm	100 to 90
350 nm	100 to 90

Deionized water is used as the zero sample in this method. The PUV3402 UV process photometer has an automatic zero capability that provides periodic zero calibration. This photometer uses a filter wheel

configuration that has eight optical filters. The response of the %T measurements is linearized with a linearizer circuit, with results of the four %T measurements being communicated to the process control computer via four isolated 4 to 20 mA output signals. Corrective action can be taken immediately to avoid shipping off-specification ethylene glycol.

**Conclusions**

Using the PUV3402 UV process photometer allows for the continuous monitoring of the quality of ethylene glycol. This photometer is also useful for monitoring the quality of other organic compounds such as alcohols, aromatic compounds, and saturated hydrocarbons.



Front panel display