

# Measuring Water in Alcohol

## Model 58T Photometric Transmitter

CST offers a low cost, fiber optic based, NIR photometric transmitter and sample interface for monitoring the amount of water in alcohol. The system incorporates state of the art electronics connected to fiber optic based insitu probes or extractive flow cells. The transmitter can be packaged for lab or restricted process area classifications. The transmitter operates continuously with no moving parts and can be supplied as an integrated package with products such as; flow, temperature and pressure transmitters.

### Defining the Problem

If during the process of making alcohols (ethanol, methanol, etc.) water enters the process it can have significant impacts on final product quality and value. Laboratory analysis utilizing Carl Fisher titration is time consuming and not performed on a real time basis. Production facilities need a means of continuously monitoring the quality of the produced alcohol to meet product specifications and maintain process control.

### The CST Solution

CS&T offers both in situ probes and extractive flow cell for this measurement. Both the insitu and extractive fiber optic accessory separates the sample from the electronics via safe, non conductive fiber optic cables. All components in contact with the sample are 316SS, Quartz, and inert o-ring materials. Temperature control of the extractive flow cells are offered as an option if the sample displays significant temperature swings.

### CST Photometric Transmitter

The Custom Sensors & Technology photometric transmitter displays engineering units (AU, ppm, g/l, % etc.) and retransmits a 4-20mA signal that is proportional to the amount of optical density in the sample being measured. This reading is based on the amount of optical attenuation from the absorbed sample as compared to a reference signal. The unit is supplied with a window fouling circuit and a calibration span filter which provides the user with important diagnostic information about the transmitter's health. The calibration span filter allows the user to (either manually or automatically) employ a referenced optical filter to the measuring beam. Calibration by standard addition is a proven technique that allows a reference check of the flow cell or probe and transmitter without mixing solutions or running samples to a lab. In addition, this technique can be performed without shutting down the process. All span/calibration filters are calibrated against a primary reference filter.

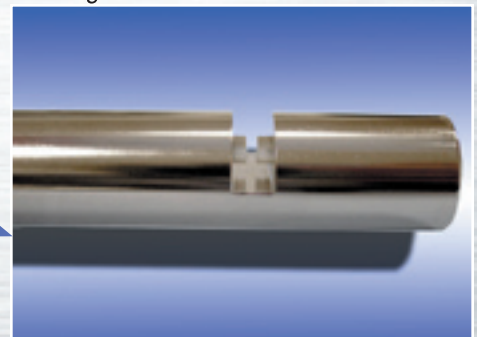
NIR Transmitter, Tungsten Halogen lamp, in purged CID2 Enclosure



Extractive flow cell with heated SHS, pressure regulation, and calibration



Single-sided Transmission Probe



Alcohol transmitter can be connected to either an extractive flow cell or in situ single sided transmission probe

# Product Specifications

## Transmitter

Measured parameter	Water
Temperature Range	-10°C to +55°C
Response time	< 1 sec
Maximum Zero shift	0.05AU (over 65°F range)
Long term output drift	<2% signal loss/month
Repeatability	1% of full scale range
Range	Pathlength and Wavelength dependent, 190-200 proof typical
Source	Tungsten Halogen
Wavelength range	NIR
Detectors	NIR optimized
Calibration	Manual or automatic

## User Display & control

Type of display	LED display
Display numerical format	3-1/2 digits in user defined engineering units

## Electrical

Power requirement	24V DC (9-32VDC)
Power consumption	0.48 Watts
Analog outputs	4-20mA isolated
Analog loop resistance	500 Ohms, maximum @ 24V
Certification	CE (Available upon request)

## Mechanical

Analyzer weight	1.5 lbs
Enclosure construction	Extruded Aluminum, Nema 4X, Optional 8" x 3-7/8" x 1.5" (HWD")

## Probe/Flow Cell

Materials	316SS, other material available, please consult factory
Temperature rating	315.5°C (600°F)
Pressure rating	250 psig for flow cell, 5,000 psig for probe

Probe options:

1. 6, 12, or 24" in length

Transmitter options;

1. Industrial Packaging (Nema or Ex-Proof enclosures)
2. NBS Traceable Span Filter
  - a. Manual
  - b. Automatic (remote trigger)
3. 110/220 to 24VDC power supply

\* Custom Sensors & Technology is a full service supplier. In addition to the NIR Water transmitter we also supply; Oxygen transmitters, photometric/fluorescence transmitters, Scale Deposition transmitters, fiber optic probes and flow cells, sample handling systems, and services that include; application engineering, commissioning & start-ups.