

## Model 7613 Colour Monitor

The ATAC Model 7613 is a completely automatic process stream colour monitor. Standard colour ranges include ASTM D1500, Saybolt ASTM D156 and Hazen ASTM D1209; custom ranges are also available.

- In-line stainless steel cell suitable for high process stream temperatures and pressures
- Rapid validation facility for quick & simple operational check
- Fibre optic technology for improved precision
- Differential light absorption unaffected by opacity
- Single unit installation - no separate safe area controller required
- ATEX certified for hazardous area installation

### TYPICAL APPLICATIONS

#### **Fuel monitoring**

Transportation fuels may be coloured to ensure they are allocated correctly. Mistakes, such as putting the wrong fuel into a tank, can therefore be avoided.

#### **Dying of gas oil**

The same fuel can be taxed by governments at different levels depending on their application, so different coloured dyes are used to distinguish them.

#### **On-line blending**

Model 7613 can be used to check the colour of a product during blending.

#### **Interface detection**

Liquids of very similar density, alternately using a common pipeline, can be identified and directed to the correct storage tank.

#### **Oil heat exchanger breakthrough**

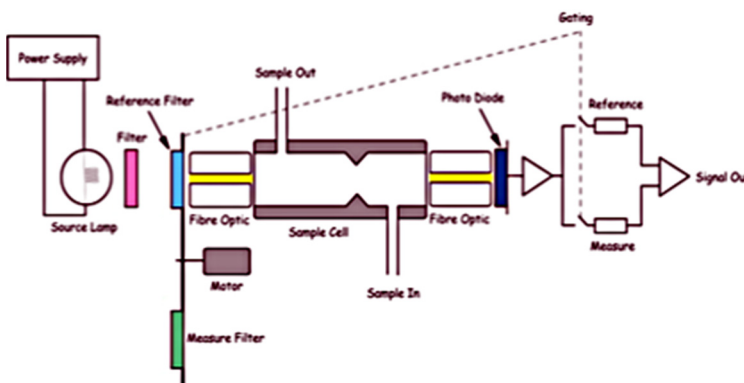


Figure 1: Model 7613 schematic



### PRINCIPLE OF OPERATION

A schematic of the Model 7613 is shown in figure 1. The unit responds to colour changes by measuring the differential light absorption at two wavelengths and the ratio of these absorptions.

The standard sample cell is made of stainless steel with fibre optic connections.

A source of filtered light from a tungsten lamp is modulated by a mechanical chopper which has two coloured filters.

The reference filter is chosen so that the light beam produced is minimally absorbed regardless of colour changes in the sample.


The other measurement filter is chosen so the light beam produced is appreciably absorbed as the sample colour changes (e.g. ordinary oil will absorb blue light quite strongly as oil becomes more yellow).

The emergent light is passed via the sample cell onto the photocell. The rotation of the chopper is co-ordinated so that alternative outputs from the photocell (reference - measurement) are amplified, individually stored and then compared to each other.

If the comparison shows the sample is more than a predetermined amount darker than selected, the alarm operates.

Alternatively, by means of links in the electronics, the alarm can operate where the sample is lighter than selected. The only external control is a self re-setting twist-to-test facility which enables the light beams to be unbalanced in order to test the system. A continuous 4 to 20 mA floating output is generated based on the ratio of the two beams. This can be calibrated in terms of % transmission of light. There are internal controls for the alarm level, zero and span.

## Specification

<b>Colour ranges</b>	ASTM: 0 to 3, 0 to 6, 0 to 7, 0 to 8 (ASTM D 1500) SAYBOLT: +30 to -16, +30 to 0, +30 to +12, +30 to -10, 0 to -10 or 0 to -15 (ASTM D 156) HAZEN: 0 to 100, 0 to 200, 0 to 300 or 0 to 500 (ASTM D 1209) Dye in gasoil Other ranges and special ranges available on request
<b>Check facilities</b>	Externally mounted spring loaded knob providing twist-to-test, (standard feature). This may be changed to twist-to-calibrate on ASTM colour ranges - see options.
<b>Precision</b>	Within the requirements of the ASTM method corresponding to the range in use i.e. ASTM D156 or D1500 or D1209
<b>Output signal (Relay contact)</b>	Alarm: 1 fully adjustable alarm point having 2 c/o contacts rated at 250V, 5A, 100VA non-inductive. Transition to light or dark operation available by selection of interlinks, reversal of the twist-to-test facility and minor adjustments of internal controls.
<b>Output signal (analogue)</b>	Range 4 - 20 mA (isolated) into 500 ohms maximum
<b>Sample conditioning required at inlet</b>	Pressure: 80 bar maximum continuous Temperature: -20°C to +150°C Flow: 1 litre/minute (recommended)
<b>Sample conditioning</b>	Complete systems can be supplied to pre-condition process sample to the conditions required at the analyser
<b>Sample disposal</b>	Return to process or recovery system. Sample recovery systems can be supplied.
<b>Power supply</b>	Voltage 110/127V or 200/250V ±10%, single phase Frequency 50Hz or 60Hz (±5Hz) Consumption 20 W
<b>Standard connections</b>	Sample inlet: ¼" NPT(female) Sample outlet: ¼" NPT(female) Electrical: 20mm conduit (2 off) Earth: M6 screws on bottom of case
<b>Explosion protection</b>	The analyser is ATEX certified  II 2G EEx d IIB T6 (T <sub>amb</sub> +55) for use in zone 1 hazardous areas. Certificate no. DEMKO 04 ATEX 136616
<b>Environmental protection</b>	IP54, 0°C to +55°C
<b>Dimensions and weight</b>	Width: 475 mm Depth: 185 mm Height: 420 mm Weight: 23 kg
<b>Access dimensions</b>	Length 875 mm Depth 800 mm Height 750 mm
<b>Options</b>	Twist-to-calibrate facility (for ASTM ranges only) Configuration for CSA local approval Steam-traced sample cell Sample cell in special materials e.g. PTFE Addition of a separate local digital indicator Metric Adaptor Kit