



The precision
behind the process



ATAC 1077L Viscometer⁺

KEY FEATURES

- IECEX & ATEX certified to Zone 1 IIC
- Intuitive software with touchscreen HMI
- Configurable ranges 0-5cP to 0-1000cP
- High precision
- Fast 60 seconds response time
- CAN bus connectivity
- Wireless and Ethernet remote access
- Analogue & digital communications
- Single or Dual bath, Viscosity Index
- Small footprint, wall or floor mounting

Tough, precise, intelligent

ATAC offer the most versatile range of process viscometers available. ATAC are the only manufacturer to offer a process viscometer to measure very high viscosity fluids including multi-range and viscometers suitable for the measurement of both Newtonian and non Newtonian fluids.

The model 1077 Viscometer⁺ can measure the viscosity of all Newtonian fluids. The analysis results of the model 1077L Viscometer⁺ correlate directly to ASTM D-445 test method.

Typical Applications

- Lube oil blending
- Lube oil-de-waxing
- Distillate fuel product specification

Features

Highly responsive touchscreen for ease of operation

The model 1077L Viscometer⁺ features an ultra responsive projective capacitive touchscreen which has a unique IECEx & ATEX Zone 1 IIC rating without the need for air purge. This innovative screen has integral armoured glass which can be operated while coated in grease and with gloved hands.

IECEx & ATEX hazardous area rated

Utilising state of the art Intrinsically Safe devices and an Ex d housed touchscreen, the model 1077L Viscometer⁺ is rated for operation in Zone 1 IIC T3/T4 (application dependent), without the need for purge air.

Principle of Operation

The ATAC 1077 Viscometer⁺ measures the differential pressure across a capillary through which the sample is passed, the differential pressure is proportional to the absolute viscosity of the fluid as described by the Hagen-Poiseuille equation:

$$\mu = \frac{1.45 \times 10^5 \times d^4 P}{QL}$$

Where

μ = absolute viscosity in centipoises (cP)

d = capillary bore (mm)

P = differential pressure across capillary (bar)

Q = sample flow (ml/min)

L = capillary length (mm)

As d , Q and L are constants, the absolute viscosity (μ) is directly proportional to the differential pressure measured across capillary (P). A precision pump meters sample flow and two heat exchangers, fitted either side of the metering pump, ensure the sample metered by the pump is at approximately the same temperature as sample entering the capillary. Input pressure is set so that the metering pump suction pressure is always positive. The sample flows at a constant rate through the capillary across which a differential pressure transmitter is connected.

Optimise your process control

Combining innovative solutions for hazardous area installation and advanced control and diagnostic features with proven analytical methods, the ATAC 1077 Viscometer⁺ sets a new standard.





The analyser control software is organised as a series of menu screens accessed and navigated by touching screen icons. The main screen displays the current viscosity measurement, bath temperature and density (density may be entered as a constant or read as an input from a density meter). Screens are available for setting up of the analyser, viewing system alarms, run & stop functions, security configuration and plotting real time and historical data. The software is easy to use, and there is a full help package accessed from a click on the “Help” button.

CAN bus connectivity

The model 1077L Viscometer⁺ employs the very latest data bus technology enabling extensive diagnostic information to be gathered in real time from all the critical components of the analyser.

Extensive communications protocols

4-20mA inputs & outputs, programmable alarm relays and Modbus serial communications are standard, other protocols are available on request. Networking is simple with Ethernet, Wireless and VPN connectivity for remote access.

Single or Dual bath options

The new lightweight oil bath is temperature controlled at set points from 40-150°C with exceptional precision of +/- 0.002°C. The addition of a second bath enables simultaneous measurement at dual temperatures for Viscosity Index calculation.

High performance capillary viscometer

The model 1077L Viscometer⁺ can be configured for viscosity ranges from 0-5cP up to 0-1000cP. The precision exceeds that of the ASTM method. Response time is less than 60 seconds.

Reduced footprint and improved layout

The new enclosure can be wall mounted or free standing; transport wheels are available for ease of installation. Access to all components is available via the fully opening front door panels; the new lightweight bath can be raised and lowered with a simple jack, all maintenance procedures can be carried out by a single technician.

Extensive diagnostics and alarms capability

The CAN bus system enables all machine devices to be monitored for their operating status, any malfunction is immediately identified and can be addressed to one of 6 alarm outputs.

Performance Specifications	
Configuration	Single narrow bore capillary
Ranges	Maximum 0-1000cP Minimum 0-5cP
Repeatability	± 0.5% FS
Precision	± 1% FS
Response time	<60 seconds
Measurement temperature	Normally 40-150°C (100-300°F), see options
Units of measurement	cP (cSt available with density input)
Temperature bath capacity	28-40 litres of oil (depends on specification), use Shell Thermia B or equivalent oil. Normal maximum working temperature of bath is 150°C (protected by thermal fuse). Sample temperature at capillary outlet is measured by a high precision thermometer
Explosion protection	IECEX & ATEX certified for use in Zone 1 IIC T3/T4 (application dependant)
Dimensions	Width: 912mm - allow service access to left side Depth: 506mm with removeable doors closed (1006mm with doors open) Height: Adjustable: Low Position 1713mm, High Position 1913mm Weight: 300kg

Communications and Networking	
CAN Bus	Local machine highway and remote via ethernet (option)
Networking	Ethernet for remote access via VPN. Zigbee™ wireless networking
Serial	Modbus 485 RTU Slave, other protocols available
Analogue & Digital	3x 4-20mA isolated Outputs, 2x Digital Input
Relays	2x change over, 4x normally open, zero volt isolated
Local display	15" colour projective capacitive touch screen

Utilities & customer connections	
Cooling water	When sample is at high temperature relative to measuring temperature or when measurement temperature is low with respect to ambient temperature, a supply of cool, potable water (9-45 l/hr) should be provided to carry away excess heat. The necessary coil is fitted as standard. If potable water is not available, alternative cooling coil materials can be provided.
Connections	Sample 1/4" O/D Bulkhead Cooling water 1/4" O/D Bulkhead Electrical M20 (power), M20 (signal)
Sample conditions required at inlet	Pressure: within range 0.7-21 bar g (10-305 psig) depending on viscosity of sample Temperature: must be within ± 100°C (212°F) of the required measuring temperature Flow: <100 ml/min
Power supply	Voltage 115V or 230V ± 10% Frequency 50 or 60Hz Consumption 2-3KVA depending on specification

Options	
Viscosity Index	Dual bath Viscosity Index - continuous viscosity measurement at dual temperatures (typically 40°C & 100°C)
Customer connections	Metric adaptors for customer connections
Sample heat tracing	Steam tracing: Steam at low pressure (1 bar max) required for samples having pour point above lowest ambient temperature. Connection is 1/4" o.d. Compression (see options)
Analogue & Digital	2x 4-20mA inputs
CAN Bus Remote	CAN Bus via ethernet

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