Viscosity Process Analyzer VISC-4

Credible Solutions for the Oil and Gas Industry
To remain competitive, today’s refiners must employ all optimization and product control techniques available. The use of online physical property analyzers is one of the key features to reach those objectives because they measure important quality properties in the process directly.

All fluids that fulfill the conditions of Newton’s friction law are referred to as Newtonian fluids. Their viscosity is a material constant, which is only dependent on pressure and temperature. The viscosity for incompressible and Newtonian fluids can be derived from the so-called Hagen-Poiseuille law. The fluid is assumed to flow under laminar conditions.

**APPLICATION**

The BARTEC BENKE Viscosity Process Analyzer VISC-4 continuously measures the kinematic viscosity of a product via the capillary method.

Due to the outstanding performance and sample temperature stability of ± 0.02 K the VISC-4 is the best choice for highly accurate viscosity measurements e.g. lube oil production and fuel oil blending. This high level of accuracy results in cost reduction while improving product quality. The VISC-4 is suitable to handle samples with a viscosity of up to 1000 cSt at measurement temperatures of up to 100°C.
Make your decision for a strong partner!

Choose BARTEC GROUP also for:

- Fast Loop Systems
- Sample Conditioning Systems
- Validation Systems
- Recovery Systems
- Chillers
- Air Conditioning Systems/HVAC
- Pre Commissioned Analyzer Shelters/
  Turn–Key Solutions

Special Features:

- Direct and continuous measurement of kinematic viscosity therefore direct comparison with laboratory results without any need for conversion
- Integral measurement of the density therefore calculation and display of the dynamic viscosity
- Minimized maintenance requirements due to temperature control and insulating system without oil bath/pumps
- Compliance of the temperature stability (±0.02 K) as defined in standard ASTM D445
- Necessity of Hagenbach correction is eliminated
- Multi–stream capability
- Automatic rinsing and draining option
- Integrated failure diagnosis and self monitoring
- No atmospheric drain required, backpressure at analyzer outlet permitted (depends on application)
- Available communication interfaces:
  - Modbus/RTU, Modbus/TCP (bidirectional)
  - Remote access via Ethernet (VDSL or FOC is)
- Validation report for quality assurance
- Freely programmable digital and analog inputs

Norms and Standards:

Compliant with:

- ASTM D445
- DIN EN ISO 3104
- IP 71
EXPLORATION PROTECTION

Marking
ATEX: II 2 G IIIC T4 or T3 Gb
NEC 500: Class I, Div. 2, Groups B, C, D, T4 or T3
NEC 505: Class I, Zone 1, Ex IIIB+H2 T4 or T3
CEC Sec. 18: Class I, Zone 1, Ex IIIB+H2 T4 or T3
TR CU Certification available

TECHNICAL DATA

Technology
continuously analyzing kinematic viscosity, capillary-type

Method
compliant with:
ASTM D445, DIN EN ISO 3104, IP 71

Measuring ranges and temperatures
L $T_m^*$: 20 to 60°C (68 to 140°F)
M $T_p^*$: 40 to 60°C (104 to 140°F)
H $T_m^*$: 50 to 100°C (122 to 212°F)
t viscosity 0.7 to 30 cSt
v viscosity 10 to 500 cSt/200 to 1000 cSt

Repeatability
≤ DIN EN/ASTM
formulated oils typ. 0.03 cSt at 100°C (212°F)

Reproducibility
≤ DIN EN/ASTM

Measuring cycle
continuous

Product streams
2 x sample, 1 x validation
(additional hardware required)

Electrical data
Nominal voltage
230 VAC ± 10 %, 1 phase; 50 Hz;
other ratings on request

Maximum power consumption
approx. 500 W

Protection class
IP 54 (NEMA 13)

Ambient conditions
Ambient temperature
operation 5 to 40°C (41 to 104°F)
storage 0 to 60°C (32 to 140°F)

Ambient humidity
operation 5 to 80 % relative humidity,
non-corrosive
storage 5 to 85 % relative humidity,
non-corrosive

Sample Quality
$t$ filtered 10 µm, bubble-free
$v$ filtered 50 µm, bubble-free
max. viscosity = end of measuring range
(technical clarification required)
(sample as coolant ≤ 10 cSt)

Consumption
3.8 to 10 l/h (depends on variant)
3 to 14 bar (43.5 to 203 psi)

Pressure at inlet
Temperature at inlet
for L + M Versions:
$T_p^* - 5 K < T_{inlet}^* < T_p^* + 5 K$
for H Versions:
$T_m^* - 40 K < T_{inlet}^* < T_m^* - 5 K$
depends on application

Utilities

Instrument air
Consumption
Purge
8 Nm³/h while purging (~12 min)
Operation
approx. 1 Nm³/h
Pressure at inlet
Quality
3 to 7 bar (43.5 to 101.5 psi)
Coolant
humidity class 2 or better acc. to ISO 8573.1
Consumption
sample as coolant: 20 to 40 l/h or
plant cooling water: 10 to 30 l/h for
re-cooling of peltier device

Temperature
5 to 50°C (41 to 122°F)
Pressure at inlet
Quality
2 to 7 bar (29 to 101.5 psi)
filtered 50 µm

Signal outputs and inputs
Analog outputs
kinematic viscosity
(others on request)

Digital outputs
Alarm, Ready / Valid

Digital inputs
Stream Selection, Validation Request, Reset

Electrical data of signal outputs and inputs
Analog outputs
max. 8 (4 to 20 mA; 1000 Ω)
active isolated on request

Digital outputs
24 VDC; max. 0.5 A
Digital inputs
high: 15 to 28 VDC / low: 0 to 4 VDC

Auxiliary power supply output
24 VDC; max. 0.8 A

Control unit
Central control unit
Industrial PC
Operating system
Windows Embedded Standard 7®
Control software
PACS

User interfaces
Display
TFT display with touch function
1024 x 768 pixel

Keyboard
virtual keyboard, controlled via
TFT display with touch function

Connections
Tube fittings
Swagelok® 6 mm/12 mm/18 mm
other fittings on request

Vent/Drain
open to atmosphere
backpressure on request

Weight and dimensions
Weight
approx. 250 kg

Dimensions (W x H x D)
approx. 1190 x 1930 x 710 mm

Space requirements
right: 150 mm / left: 100 mm

Optional interfaces
Analog outputs
on request

MODBUS interface
MODBUS/RTU via RS485 or RS422
or FOC is, MODBUS/TCP via FOC is

Remote access
via Ethernet (VDSL or FOC is)

Important notice
VISC-4 is subject to continuous product improvement, specifications are preliminary and may be subject to change without notice.
If your technical data do not comply with existing data, please contact us for technical clarification.