



Process Analyzer
Freezing Point Process Analyzer FRP-4

Credible Solutions for the Oil and Gas Industry

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Process Analyzer

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 directly important quality properties in the process.

The freezing point is an important cold property of jet fuels and aviation gasolines. It is the temperature at which paraffin crystals disappear when warming the sample after previously reaching the cloud point temperature.

BARTEC BENKE

Your partner
for innovative
system solutions.



The BARTEC BENKE specialists have many years of experience. They create system solutions that you can rely on: efficient and dependable for decades to come.

ASTM compliant optical measurement

Suitable to also measure cloud point temperature

Typically no chiller required for cloud point applications

Network and fieldbus communication

APPLICATION

The BARTEC BENKE Freezing Point Process Analyzer FRP-4 is a system for the fully automatic determination of the freezing point temperature of aviation fuels. The FRP-4 can be used for both determination of cloud point temperature and freezing point temperature of the sample.

**Special Features:**

- **Cloud Point also measurable**
- **Rugged design of measuring cell**
- **Optimized assembly – easy removal of complete cell**
- **Available communication interfaces:**
 - Modbus/RTU, Modbus/TCP (bidirectional)
 - Remote access via Ethernet (VDSL or FOC is)
- **Integrated failure diagnosis and self monitoring**
- **Validation report for quality assurance**
- **Freely programmable digital and analog inputs**

Norms and Standards:**Compliant with:**

- **ASTM D2386**
- **ASTM D2500**
- **ASTM D1015**
- **DIN ISO 3013**
- **IP 16**

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**



EXPLOSION PROTECTION

Marking ATEX: II 2 G IIB (or IIC) T4 Gb
NEC 500: Class I, Div. 2, Groups B, C and D
NEC 505: Class I, Zone 1, AEx d e ib px IIB or IIB+H2

TECHNICAL DATA

Technology optical turbidity detection
Method compliant with:
ASTM D2386, ASTM D1015, DIN ISO 3013,
ASTM D7153-05, ASTM D7154-05,
ASTM D2500

Measuring range down to -40°C (-40°F)*
down to -70°C (-94°F)
optional: down to -80°C (-112°F)

Repeatability ≤ DIN EN/ASTM
e.g. kerosene typ. 0.2°C at -50°C (-58°F)

Reproducibility ≤ DIN EN/ASTM

Measuring cycle discontinuous,
cycle time 8 to 20 min
depends on freezing point temperature
cycle time 4 to 10 min
depends on cloud point temperature*

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 filtered 50 µm,
free of suspended water
(≤ 37 cSt at inlet temperature)

Consumption approx. 5 to 30 l/h

Pressure at inlet 2 to 3 bar (29 to 43.5 psi)

Temperature at inlet 5 to 15°C (41 to 59°F)
min. 15 K above expected cloud point*

Utilities

■ Instrument air

Consumption
Purge 8 Nm³/h while purging (~12 min)
Operation approx. 1 Nm³/h

Pressure at inlet 2 to 7 bar (29 to 101.5 psi)

Quality humidity class 2 or better acc. to ISO 8573.1

■ Coolant

Consumption* 60 to 100 l/h

Temperature 20 to 40°C (68 to 104°F)

Pressure at inlet 1 to 3 bar (15 to 44 psi)

Quality filtered 50 µm

Signal outputs and inputs

Analog outputs freezing point temperature,
cloud point temperature
(others on request)

Digital outputs Alarm, Ready signal, see options

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

Analog inputs 4 to 20 mA; 160 Ω

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. 1140 x 1900 x 710 mm

Space requirements right: 500 mm / left: 500 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)

* FRP-4 measures only cloud point

Important notice FRP-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.