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BARTEC BENKE

Process Analyzer

Distillation Process Analyzer DPA–4

Credible Solutions for the Oil and Gas Industry

Distillation Process Analyzer DPA–4

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.

Distillation is a physical method of separating the component substances from a liquid mixture by selective vaporization and re-condensation. Distillation is based on differences in volatilities of the components of the liquid mixture. The distillation curve is one of the most common quality parameters of liquid hydrocarbons such like naphtha, gasoline, kerosene, diesel and gas oil.

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.

- **The only ASTM D86 compliant design with flask – condenser – receiver**
- **Capability to reduce cycle time by Rapid Analysis Mode (RAM)**
- **Complete boiling curve can be measured from IBP to FBP**
- **Suitable for operation at pressure below atmospheric pressure**
- **De–coking feature**
- **Network and fieldbus communication**

APPLICATION

The BARTEC BENKE Distillation Process Analyzer DPA-4 is the only distillation analyzer that is compliant with the master norm ASTM D86. Apart from measurement cycles fully compliant with the norm, the DPA-4 can be operated in the so called Rapid Analyzer Mode (RAM) in which the cycle time can be reduced to approx. 60%. It therefore serves to enhance automatic control of blending processes.

The DPA-4 offers to run the distillation process below atmospheric pressure which prevents samples that are sensitive to temperature (e.g. palm oils) from degradation. It also allows extending the measurement range to higher boiling points.

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Special Features:

- **The complete boiling curve is measured in every cycle (SAM)**
- **Measuring points of interest freely definable by software**
- **Cycle time reduction is possible:** faster determination of distillation points (RAM)
- **Enhances automatic control of blending processes**
- **De–coking**
- **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 D86**
- **DIN EN ISO 3405**
- **IP 123**

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**

oil ■ gas ■ refineries ■ petrochemistry ■ chemistry

Distillation Process Analyzer DPA–4

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EXPLOSION PROTECTION

Marking	ATEX: II 2 G 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 TR CU Certification available

TECHNICAL DATA

Technology	batch distillation
Method	SAM compliant with: ASTM D86, DIN EN ISO 3405, IP 123 RAM correlates with: ASTM D86, DIN EN ISO 3405, IP 123
Measuring range	20 to 420°C (68 to 788°F) output of any temperature/distillate amount via Modbus
Repeatability	≤ DIN EN/ASTM e.g. gasoline typ. T@ 50 % rec. 1°C
Reproducibility	≤ DIN EN/ASTM
Measuring cycle	typical time for gasoline/diesel in SAM (in min) IBP: approx. 24/29 50 % recovered: approx. 36/41 FBP: approx. 45/50 cycle time will be reduced by approx. 40 % in RAM
Product streams	up to 3 x sample, 1 validation sample each (additional hardware required)

Electrical data

Nominal voltage	230 VAC ± 10 %, 1 phase; 50 Hz; other ratings on request
Maximum power consumption	approx. 600 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, bubble-free (≤ 37 cSt at inlet temperature)
Consumption	approx. 10 to 40 l/h (≥ 10 cSt: max. 15 l/h)
Pressure at inlet	1.5 to 2 bar (21.8 to 29 psi)
Temperature at inlet	depends on application, max. 55°C (131°F)

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	max. 60 l/h
Temperature	-10 to 55°C (14 to 131°F)
Pressure at inlet	2 to 7 bar (29 to 101.5 psi)
Quality	filtered 50 µm

Signal outputs and inputs

Analog outputs	temperature at specific distillation batch
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
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: 150 mm / left: 100 mm

Optional interfaces

Analog outputs	on request
Analog inputs	density
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 DPA-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.

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