





Featuring 3rd generation X-ray transmission technology, the Rigaku NEX XT represents the next evolution of process gauge for sulfur measurement (0.02% to 6% S) of crude, bunker fuel, fuel oils, and other highly viscous hydrocarbons, including residuums.

Refineries and pipelines

This versatile, compact and robust X-Ray transmission (XRT) process gauge was specifically optimized for the sulfur analysis needs of refineries, pipelines, blending operations, heavy oil upgrading, bunkering terminals and other storage facilities. Applications include bunker fuel blending and monitoring to meet MARPOL Annex VI sulfur restrictions, interface detection of different grade fuels delivered via pipelines, crude oil and refinery feedstock blending and monitoring, and the quality monitoring of crude at remote collection and storage facilities.

On-line monitoring of sulfur concer

MARPOL regulations

IMO ship pollution rules are contained in the "International Convention on the Prevention of Pollution from Ships," known as MARPOL 73/78. On 27 September 1997, the MARPOL Convention was amended by the "1997 Protocol," which includes Annex VI titled "Regulations for the Prevention of Air Pollution from Ships." MARPOL Annex VI sets limits on NOx and SOx emissions from ship exhausts and prohibits deliberate emissions of ozone depleting substances. The Rigaku NEX XT is the perfect tool to monitor marine bunker fuels to ensure regulatory compliance.

Superior 3rd generation technology

The new Rigaku NEX XT system is faster, more sensitive and far more compact than competitive systems, and provides continuous, reliable detection of sulfur at pressures up to 1480 psig. Rigaku NEX XT can operate as a stand-alone analyzer or provide real time closed loop control when tied into a blending or plant wide automation system.

Among its other key features are a simplified user interface, reduced standards requirement, automatic density compensation, password protection, and standard platform for communicating sulfur and density to a plant-wide DCS. Due to its unique design and robust construction, sample conditioning and recovery systems are typically not required.

Key features and benefits

- Measure sulfur (S) from 200 ppm to 6 wt%
- Simple user interface
- Analysis time as short as 1 second
- Up to 1480 psig
- Up to 200°C in custom configurations
- Live calibration updates
- No sample conditioning or recovery system (typically)
- No analytical impact due to window fouling
- No dangerous radioisotopes
- No routine maintenance
- No injectors to plug

stration in crude oil, marine bunker fuel and for blending operations



Schematic of NEX X1 operation, illustrating the attenuation of transmitted X-rays by the sulfur content of an oil stream

XRT technique

Employing the X-ray transmission measurement technique, the Rigaku NEX XT continuously measures a process hydrocarbon stream that passes through an internal flow cell. In the flow cell, the stream is illuminated from one side using a low power X-ray tube. A detector on the opposite side of the flow cell measures transmitted X-rays. The resulting signal intensity is negatively correlated to the sulfur concentration. Unlike older generation XRT sulfur analyzers, the Rigaku system contains no radioisotope sources and requires no routine maintenance.

Backed by Rigaku

Since its inception in 1951, Rigaku has been at the forefront of analytical and industrial instrumentation technology. Today, with hundreds of major innovations to our credit, the Rigaku Group of Companies are world leaders in the field of analytical X-ray instrumentation. Rigaku employs over 1,400 people worldwide in operations based in Japan, the U.S., Europe, South America and China.



NEXT

Elemental analysis by X-ray transmission



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Specifications

Sulfur range:

• 0.02 - 6 wt%

Measurement precision:

±13 ppm @ 0.12 wt% S (time = 60 s)

Instrument configuration:

- X-ray tube source
- High count rate scintillation detector
 up to 250,000 cps
- X-ray transmission/absorption method

Process conditions:

- Stream pressures to 100 bar (1480 psig)
- Stream temperatures to 200°C (392°F)
 consult Rigaku for available configurations
- Consult Rigaku for available configurations
 Flow rates up to 200 l/m (53 gal/m)

Required inputs:

4 – 20 mA raw density

• precision of ±0.0001 or better

Optional inputs:

- 4 20 mA process temperature
- For density corrected to 15°C / 59°F
- 4 20 mA water concentration
- 4 20 mA flow
- For loss of flow warning
 4 20 mA remote calibration selection

Process connection:

- Two 1 inch 600 # ANSI flanges
- Approvals:

GOST, CSA

Area classifications:

- · Class 1 Div 1, Class 1 Div 2
- ATEX zone 1 (pending), ATEX zone 2

Ambient conditions:

- 0 35°C (32 95°F)
 - Consult Rigaku for other temperature ranges

Communications:

- Sulfur results: 4 20 mA output
- Density results: 4 20 mA output
- · General warning: dry contact
- · General alarm: dry contact
- PROFINET or MODBUS 485

Air supply (NEMA 4 configuration):

- Purge
 - 4.1 8.3 bar (60 120 psig) air pressure
 - 115 225 l/m (4 8 scfm) rapid exchange
- Leakage compensation (application specific)
- Optional vortex cooler
 - 710 990 l/m (25 35 scfm) dry oil free air
 - 6.9 8.3 bar (100 120 psig) air pressure

Power requirements:

- 115/230 V, 2.8/1.4 A (47 63 Hz)
 - Dedicated supply







Units of measure in inches [millimeters]

Elemental analysis by X-ray transmission

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