

## APPARATUS

CODE	PART NAME	REMARKS
FX-00-010	<b>fxe-400s</b>	EDXRF Sulfur Analyzer
FX-01-001	<b>Control PC</b>	w/ AC Adapter, Dedicated for fxe-400s

## STANDARD ACCESSORIES

CODE	PART NAME	SET	REMARKS
FX-00-163	Sample Cell, Disposable, Cardboard	1	1000 pcs/box
FX-01-165	PET Film	1	Thickness: 2 $\mu$ , W140mm x L1000m roll
FX-01-031	Sample Cell Assembling Jig	1	
FX-01-175	AC Adapter for fxe-400s	1	
FX-01-177	USB Cable	1	Connecting fxe-400s and Control PC

## OPTIONAL ACCESSORIES

CODE	PART NAME	REMARKS
070-00-069	Printer, BS2-80U	w/ AC Adapter and Connecting USB Cable.

## START UP KIT (Necessary when Calibration)

CODE	PART NAME	SET	CODE	PART NAME	SET
RX-02-001	Sulfur Standard Oil, 0.0 mass% level	1	RX-02-004	Sulfur Standard Oil 0.5 mass% level	1
RX-02-009	Sulfur Standard Oil 100 mg/kg level	1	RX-02-005	Sulfur Standard Oil 1 mass% level	1
RX-02-011	Sulfur Standard Oil 500 mg/kg level	1	RX-02-006	Sulfur Standard Oil 2 mass% level	1
RX-02-002	Sulfur Standard Oil 0.1 mass% level	1	RX-02-007	Sulfur Standard Oil 3 mass% level	1
RX-02-003	Sulfur Standard Oil 0.2 mass% level	1	RX-02-008	Sulfur Standard Oil 4 mass% level	1

## SUGGESTED SPARES for 2 YEARS

CODE	PART NAME	SET	REMARKS
FX-00-163	Sample Cell, Disposable, Cardboard	2	Refer to Standard Accessories.
FX-01-165	PET Film	1	Refer to Standard Accessories.
070-00-093	Printing Roll Paper, W80 x D48	5	2 rolls/pack, when Optional Printer is used

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Printed in Japan 1302(E)

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7-10-3 Ayase Adachi-ku, Tokyo 120-0005 JAPAN  
TEL: +81-3-3620-1711 FAX: +81-3-3620-1713  
URL: <http://www.tanaka-sci.com>  
E-mail: [overseas-group@tanaka-sci.com](mailto:overseas-group@tanaka-sci.com)

# TANAKA Automatic Petroleum Analyzer

## EDXRF SULFUR ANALYZER

### fxe-400s



- HIGH PRECISION, LOD=5mg/kg, CONFORMING TO ASTM D4294-10
- X-RAY PASS OPTIMIZATION YIELDS SIGNIFICANT REDUCTION IN BACKGROUND NOISE
- USER FRIENDLY SOFTWARE EMBEDDED IN PC FOR MORE POWER AND RELIABILITY WHILE IMPROVING USER INTERFACE

Model fxe-400s is Tanaka's latest EDXRF sulfur analyzer equipped with an optimized X-ray pass and a high precision preamplifier developed through collaboration with [Japan Atomic Energy Agency \(JAEA\)](#). JAEA's simulation technology and high speed/high precision electronics have been utilized.

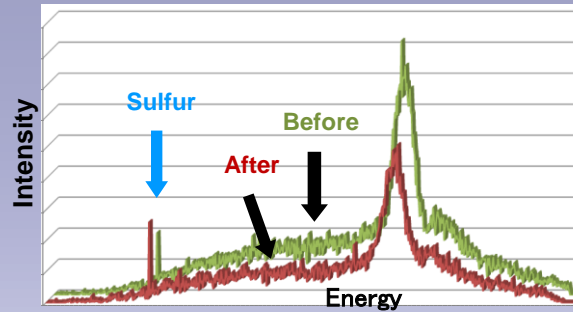
## X-RAY PASS OPTIMIZATION BY SIMULATION

Through a collaboration program with Japan Atomic Energy Agency, X-ray propagation from X-ray tube to the detector has been simulated. By comparing simulation result and experimental result, geometries have been optimized.

The parameters for X-ray pass optimization are:

- X-Ray Source (Power, Spectrum, Radiation Angle)
- Materials used for X-Ray Pass
- Shape/Composition of Sample and Film
- X-Ray Pass Geometry (Length, Angle, Filter, etc.)
- Structure of Detector

Performance attributes to the interaction of each parameter.



Typical Result of Simulation\*

\*Above graph illustrates a typical example of the simulation that we did. A background at lower energy region was reduced and Sulfur peak was increased, thus, measurement resolution was improved.

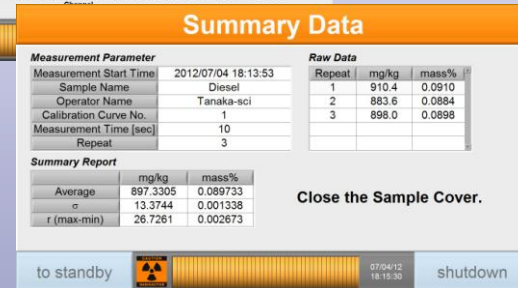
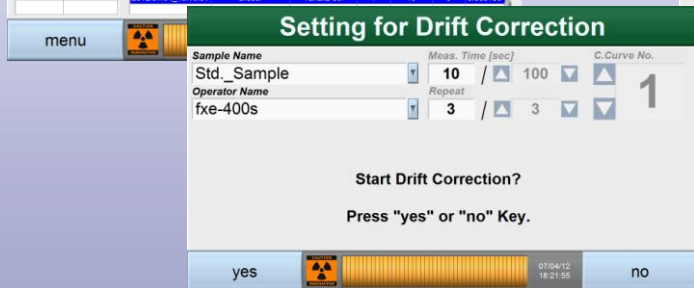
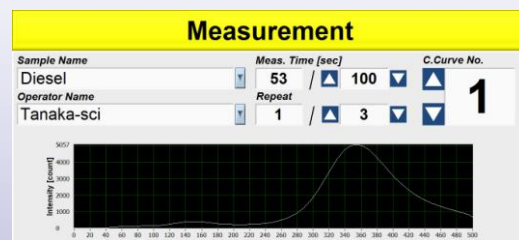
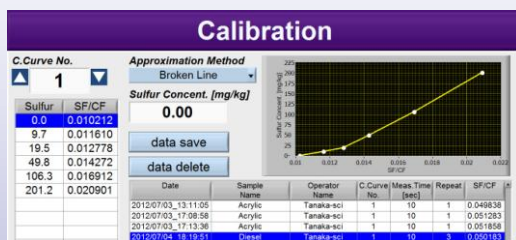
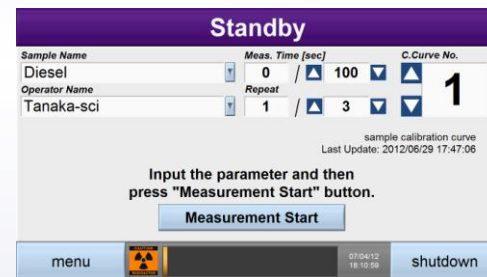
## HIGH PRECISION

Thanks to the simulation, optimum filter for unwanted signal from X-ray tube was found. Together with the adaption of newly-designed low background proportional counter, S/N ratio of the sulfur signal area improved spectacularly. The fxe-400s attained 5 mg/kg of LOD with lower power X-ray source.

## EASY OPERATION

Interactive computer program and wide color LCD screen help intuitive operation and accurate result can be obtained without any special training.

Ergonomically color-coordinated display enhances visibility.



## SPECIFICATIONS of fxe-400s

<b>TYPE</b>	Bench top type total sulfur analyzer for petroleum products by energy-dispersive X-ray fluorescence method
<b>TEST STANDARDS</b>	ASTM D4294-10, ISO 8754 / 20847, JIS K2541-4
<b>LIMIT OF DETECTION</b>	5 mg/kg (3σ: 3 times the reproducibility standard deviation) when He purge
<b>MEASURING RANGE</b>	15 mg/kg to 6 mass% (when He Gas is Used)
<b>MEASURING TIME</b>	10 to 990 sec (300 sec is recommended)
<b>X-RAY SOURCE</b>	Air Cooled X-Ray Tube (rated 1.3W)
<b>X-RAY DETECTOR</b>	Gas Filled SPC (Sealed Proportional Counter)
<b>X-RAY PASS</b>	He Gas (>99.9%) or N2 Gas (>99.9%)
<b>CORRECTION</b>	C/H Correction, Temperature Correction
<b>SAMPLE CELL</b>	Disposable Paper Cell (Cardboard)
<b>SAMPLE SUPPORT</b>	2μPET Film
<b>SAMPLE VOLUME</b>	Approx. 5 ml
<b>CALIBRATION CURVE</b>	Upto10 Points, Linear, Quadratic curve or Broken Line. 10 x Calibration Curve can be stored
<b>X-RAY LEAKAGE</b>	0.6 μSv/Hr or less on instrument surface
<b>SAFETY</b>	Interlock mechanism against accidental X-ray leakage
<b>POWER SOURCE</b>	DC12V (100-240V AC Adapter provided)
<b>POWER CONSUMPTION</b>	22VA MAX
<b>PURGE GAS CONSUMPTION</b>	200ml/min during measurement
<b>OPERATING TEMP. RANGE AND HUMIDITY</b>	10°C to 35°C, RH to be within 80%
<b>DIMENSIONS &amp; WEIGHT</b>	360mm (W) x 410mm (D) x 135mm (H), Approx. 12.5kg

## SPECIFICATIONS of Control PC

<b>TYPE</b>	Note PC (Touch screen model may be available. Please ask)
<b>OPERATION SOFTWARE</b>	Windows 7 Embedded
<b>DIMENSIONS &amp; WEIGHT</b>	340 x 230 x 33 mm 2.1kg (Typical)