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Metorex C100

An Advanced On-line Element Analyzer

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Element Analysis in Process Streams for improved Efficiency and Profitability

The METOREX C100 in your process control ensures you:

- Consistently high product quality
- Reduced raw material waste
- Elimination of product rework
- Enhanced product control
- Minimal lab analysis
- Implementation of statistical process control

Vital Information for On-line Process Control

The timely information provided by continuous on-line measurements makes it easy to control and optimize your process.

C100 is designed to meet the specialized needs of process industries. It provides quick reliable chemical analyses in a rugged design designed for production environment. With application specific packages the C100 can be configured to meet exact needs of the various industries, for instance:

Petroleum refining	:	S, Cl, V, Ni, Fe etc. in petroleum products
Chemical industry	:	Co, Mn, Br in PTA process, Cl in resins etc.
Pulp & paper industry	:	S, K, Ca in water
Metal plating	:	Zn, Ni, Fe, Sn, Au in plating bath
Waste treatment	:	Pb, Mo, Cd, U in waste water.

Advanced EDXRF

The C100 is based on Energy Dispersive X-ray Fluorescence (EDXRF) technology which is well known as an element measurement technique. EDXRF measures the characteristic X-rays generated by the atoms in the sample. The measurement has the following inherent advantages:

- The measurement is integral over the time of the entire measurement not instantaneous at the beginning of the measurement.
- No oxygen is required. C100 requires only inert purge gas for explosion proof operation.
- No high temperature components are required for operation.
- The measuring head contains a leak detector, which will cause an instantaneous alarm in the case of cell leaks.
- Alarm inputs and outputs, which allow complete shutdown of the system in case of emergency
- No moving parts; very low maintenance required
- With this technology C100 can measure any elements ranging from silicon (Z=14) to uranium (Z=92), from sub-ppm level to over 10%. Concentration range and accuracy are application dependent. Application support is available from Metorex and its partners at any time.

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Proven Metorex technology

The C100 is the third generation of METOREX on-line analyzers. Over 200 streams are monitored by leading Petrochemical and chemical companies all over the world using Metorex on-line analyzers.

From the ground up, this analyzer is a true process analyzer, not modified laboratory instrument. Its reliable fixed position measuring geometry provides durability and ruggedness for installations in harsh process environments.

When it is necessary to analyze an element constituent in a liquid stream, the C100 offers a solution that provides reliability and accuracy with minimum maintenance.

Application specific detectors

Metorex patented detectors give unsurpassed analytical performance for many applications. A variety of detectors are available to optimize performance for each application. The proprietary Metorex detector provides a long lifetime of excellent resolution and a high signal-to-background ratio. When a specific detector is matched with the optimum x-ray tube and sampling cell the lowest detection limit and highest precision are achieved for the analyzed elements.

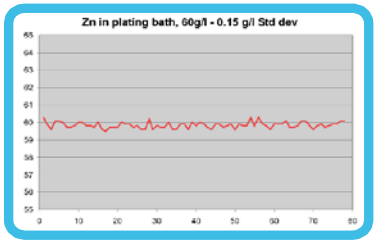
In earlier EDXRF analyzers the detector background was the limiting factor in measuring light element concentrations.
A new revolutionary detector manufactured by Metorex (patented) is able to suppress the background noise by detecting and rejecting the incomplete charge collection events.
This gives new level of sensitivity for light element applications (Si. P, S, Cl, K, Ca).

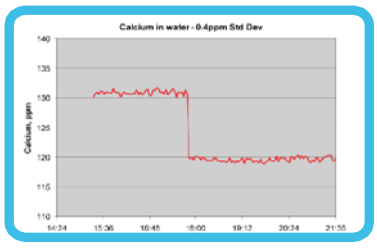
The Probe Electronics (PES)
contains the computer and controls sampling, measurement and data transmission, and performs assay calculations.

The Measurement Head (MHA)
contains the measurement cell and electronics which should be located. close to the stream being measured.

New High Speed Counting Electronics

In addition to the application specific detector, the pulse processing electronics of the C100 include new high speed counting circuitry. This allows the measurement to be made at a substantially higher count rate (up to 50,000 cps) than with traditional EDXRF instruments, which further improves the precision of the measurement. The combination of the high speed counting electronics and the proprietary detector bring a new level of precision to EDXRF. For instance the C100 is capable of measuring calcium in water with a standard deviation of about 0.4 ppm





Easy Low Maintenance Operation

Easy Operation In Routine Use

Fast start-up with automatic stabilization and an optional validation system ensure that the system will operate with minimum attention from the operator. Specially coated application specific cell windows minimize window contamination, which allows longer period of operation without maintenance. During production the operator can view the individual results as well as the process trends on the 15” TFT display. This enables the operator to monitor the process and anticipate process upsets.

Cost Effective Analysis with Minimum Maintenance

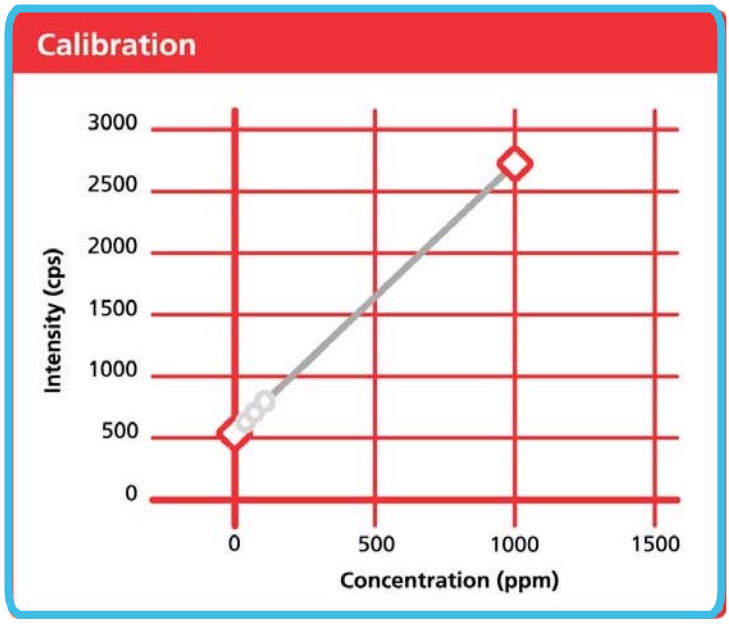
The sampling system will be customized to best fit your process stream. The sample is automatically transported to the flow through cell of the analyzer and measured. Measurement is truly non-contact and there is no need for special operations such as volume measurements, environmentally hazardous reagents or burning. Minimum maintenance and simple, quick repair means continuous operation without long and expensive production interruptions.

Cell Cleaning/Calibration Validation

In some systems, it may be necessary to clean the cell and revalidate the calibration. The Metorex
C100 can be supplied with an automatic system for just this function. This system automatically, on user- defined timing, flushes the cell and
introduces a known standard. Based on the measurement of this standard, the C100 can automatically adjust the calibration and continue to provide accurate results without operator intervention.

Safe Calibration by Linearity

The response of the C100 is very linear over a wide range of concentrations. In this example the sulfur analyzer was calibrated using a blank and a 1000 ppm standard. Using this calibration, samples of 10, 20 and 100 ppm were measured. In all these cases, the reported value falls within about one standard deviation of their true value.



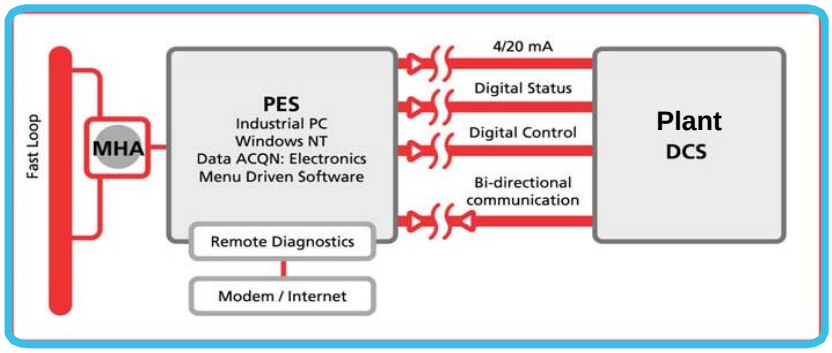
Fast, Precise and Stable Measurements

Modern User Interface

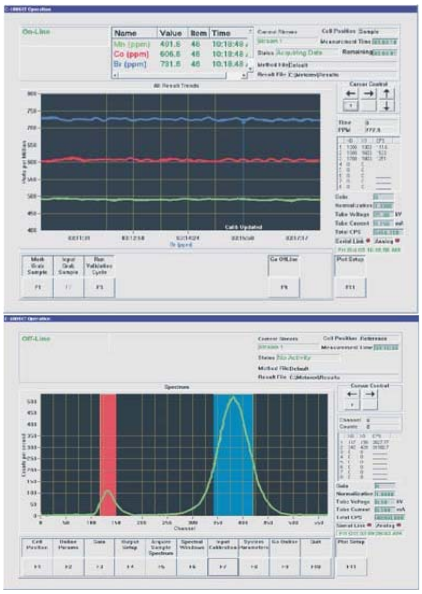
The MetorexC100 is based on a built-in industrial grade PC with the Windows embedded operating system. The analyzer contains a 15" TFT color display and complete sealed keyboard. The operator can interact with the analyzer using easy to use menu driven software to set-up and control the analyzer and to receive information regarding the process.

The software allows the operator to setup the analyzer to measure with almost any protocol desired. The system is capable of controlling multiple streams, each with its own calibration

- Verifying calibrations through grab samples or automatic validation
- Displaying individual results or trends
- Displaying both hardware and software error messages
- Transferring data to the refinery central DCS
- Logging all the data within the analyzer for later review
- Interacting with the DCS to control the analysis sequence
- Providing control over external equipment



Safety First



The C100 is designed with safety first. The analyzer is designed with dual windows between the sample and the detector electronics. If the flowcell window breaks, the second window ensures that no sample reaches the inside of the analyzer.

Additionally, a leak detector instantaneously stop the measurement, turn off the sample valve and give contact alarms. Simultaneously detector electronics moves to the safe position. During routine maintenance, the flowcell may be removed for cleaning and window replacement. In these instances, a proximity sensor detects the movement of the cell and automatically turns off the analyzer.

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Turn-Key solutions

Hobre Instruments bv and its sales partners can offer turnkey solutions for the unique requirements of each customer. This ranges from design and fabrication of the sampling system to tailor made analyzer for specific application.

The goal of each project is to provide a customized system, which is optimized to the specific process. This means that at the completion of installation system will be ready for use and provide a system, which requires a minimum maintenance and service.

C100 can measure any element ranging from silicon (Z=14) to uranium (Z=92), from sub-ppm level to over 10% depending on the application.

													Si	P	S	Cl
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At
Fr	Ra	Ac														

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U											

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Technical Specifications of MetorexC100

Analytical

Principle of the measurement	:	X-Ray fluorescence, Energy Dispersive. Source: X-ray tube, application specific detector
Element range	:	Si to U (Z= 14 to 92)
Measurement range	:	From 0.5 ppm to % level (application specific)
Accuracy	:	Depends on application, from ppm to % level
Stability	:	Usually better than 0.5% (Automatic drift correction)
Calibration	:	Using standards in the measurement range. Easy calibration sample feed and lab grab sample option. For sensitivity a N2 purge is recommended for low level analysis of light elements (Si, P, S, K, Ca, Cl).

Central Processing and Controlling unit

Industrial PC	:	Windows Embedded operation system 15" TFT LCD Color display Complete ASCII keyboard Multiple screens (optional)
Communications	:	Isolated 4-20 mA analog outputs (up to 4)

Measurement head

X-ray detector	:	High-resolution, low background proportional counter
HV power supply	:	4-30 kV, 1 mA
Source	:	9W X-Ray tube
MCA	:	2048 channel
Cable length	:	5 m between MHA and PES

Certificates and Regulations

IEC	:	IP55 Can operate in hazardous environments by purge
EMC	:	EN61000-6-4 (emission), EN61000-6-2 (immunity) CE approved
ATEX	:	Zone 1 and Zone 2
NEC	:	Class 1, Div. 1, Div. 2

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Environmental Parameters

Climatic conditions	:	IEC 654-1 class C1
Environmental temperature	:	-0ºC - +45ºC, 32ºF - 115ºF (depending on sample temperature)
Power requirements	:	90-264 VAC, 45-65 Hz
External cooling water supply	:	Not needed

Sampling

Customized sampling systems

Control	:	Directly from the analyzer (application based)
Number of streams	:	Up to 4 (using sample multiplexer)
Type	:	Continuous fast loop
Sample return	:	Atmospheric return to recovery tank or drain

Sample cell conditions

Sample form	:	Liquid
Recommended sample flow rate	:	0.7 - 1 l/min
Temperature	:	0-80ºC, 32-176ºF (depending on environmental temperature)
Pressure	:	Max 0.3 Bar (4 psig)
Viscosity	:	<100CS at sample cell temperature