

NIRS Explosion Proof Analyzers



Safe operation in hazardous areas: good practice with
Metrohm Process Analytics expertise

Analyzer solutions for online and inline analysis in hazardous environments

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Eliminate exposure to hazardous environments

Where high concentrations of flammable gases, harmful vapors, or dust occur, it is vital that instruments be safe to operate and do not initiate an explosion. Explosion-proof process analyzers are configured to comply with explosion-proof electrical area classifications. (ATEX, ClassI Div2/ ClassI Div1...) For such environments, Metrohm Process Analytics offers fully automated (online or inline) solutions for wet chemistry (e.g. titration) and spectroscopy (e.g. near-infrared spectroscopy, «NIRS»).

Several parameters – with just one measurement

NIRS is a robust and extremely versatile method, which enables simultaneous, «real-time» monitoring of diverse process parameters with a single measurement. The use of fiber-optics means that the process analyzer and measuring cell can be spatially separated – even by hundreds

of meters if required. This is a huge advantage in environments with challenging explosion protection requirements.

Metrohm Process Analytics – we are there for you

Metrohm Process Analytics stands for more than just the implementation of process analyzers. We provide tailored solutions to your needs, by offering multiple services from application feasibility and consultation to commissioning and preventive maintenance of your analyzers. This brochure presents how Metrohm Process Analytics successfully implements NIRS process projects in hazardous environments.

Project flow to implement online/inline NIRS explosion proof analyzer systems from Metrohm Process Analytics:





Metrohm Consulting – expert advice to make the right decision

Decades of experience have given Metrohm Process Analytics a unique applications know-how. We have more than 50 subsidiaries worldwide, and at each location we have project engineers as well as product and application specialists to help you find the best possible solution for your project. Nobody understands the requirements of the desired solution better than you do. Be assured that we listen to your needs before we make any system recommendations.

Detailed feasibility check

For all of our projects, we perform a feasibility study to determine which analysis method is most suitable for your needs. Simply provide us with a few typical samples which we will analyze in our application laboratory, or at

your laboratory with the proposed system. In other words, we offer you an **application guarantee**.

Complete consultation for your project needs

Consulting has a very precise meaning to us. We sit down together, you explain the details of your application, we visit the sampling point, and based on your specifications, we recommend the system solution best-suited for your requirements.

Several applications conducted with Metrohm process analyzers have already been documented in numerous **Metrohm Process Application Notes**. We offer you unlimited access to this rich collection of knowledge, gathered over decades. Whatever the challenge, we'll offer you a safe and efficient solution.

Selection of Process Application Notes for Hazardous Areas

- Inline process monitoring of moisture content in propylene oxide
[AN-PAN-1051](#)



- Online process monitoring of octane number during catalytic reforming by NIRS following ASTM D2699 and ASTM D2700 [AN-PAN-1052](#)



- Monitoring of DOTP production via esterification with inline analysis
[AN-PAN-1053](#)





Decision making – tailored solutions for your process

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Metrohm Process Analytics offers the NIRS XDS Process Analyzer, available as either a single point instrument or in a multiplexer configuration with which up to 9 sampling points can be measured sequentially. This economical means of performing remote measurements enables the analyzer to be installed in an unrestricted area, reducing installation and operation costs.

Importance of sampling

In online and inline analysis, where the most representative analytical data is collected right at the process point, sampling and sample preparation are at least as impor-

tant as the analyzer itself. Metrohm Process Analytics has vast experience in this area, capable of offering custom-made sampling systems from pressure reduction and filtering to degassing and cooling.

At Metrohm Process Analytics, our qualified engineers advise you about the best analysis method and sampling practice during the consultation. After visiting the sampling point(s), an overview of the project will be transmitted together with a commercial offer.

Instrument	Protection	Zones	Benefits
NIRS XDS Process Analyzer	«op is» Inherently safe optical radiation EN IEC 60079-28	<i>Sampling point:</i> 0, 1, or 2 <i>Instrument:</i> outside explosion zone	<ul style="list-style-type: none"> • Easy access to the instrument without «hot work permits»
NIRS XDS Process Analyzer – with purge and vortex cooling system	«op is» Inherently safe optical radiation EN IEC 60079-28 «p» Pressurized enclosure Ex p EN IEC60079-2(G)	<i>Sampling point:</i> 0, 1, or 2 <i>Instrument:</i> 2	<ul style="list-style-type: none"> • Easy installation directly into the process



NIRS XDS Process Analyzer – for installation outside the Explosion area



NIRS XDS Process Analyzer with purge and vortex cooling system – for installation inside the Explosion area



Explosion proof certification – know your options

Each instrument is manufactured according to customer specifications. Once produced, each individual instrument is sent to the notifying body to proceed with its explosion-proof certificate.

Responsibility of the equipment

In cases of self-certification, the possibility of unsafe equipment being specified and subsequently used in Zone 2 areas could increase. The responsibility weighs more on the end user who must confirm the suitability of the product for the application. The end user must have a full understanding of the various protection techniques

available and understand the application of these techniques for hazardous locations.

Certify your explosion-proof analyzer

Upon request, all of our analyzers are sent to a third party company to opt for the explosion proof certificate, in compliance with the Essential Health and Safety Requirements, which follows the 2014/34/EU directive and has been insured in compliance with:

- **EN 60079-0 : 2012 + A11 : 2013**
- **EN 60079-2 : 2014**
- **EN 60079-28 : 2015**

Reasons to use third party company for explosion-proof certification



Employee safety

According to ATEX 153 of the ATEX 2014/34/EU directive, employers must improve the safety and health protection of workers potentially at risk working in hazardous locations.



Fraud

With self-certification, some instrument manufacturers could take shortcuts, bend the rules, or bias results to be able to ensure a sale. Self-certification is often **not accepted** by Fortune 500 companies.



Installation and Commissioning – correct measurements right from the start

Installation and commissioning

Proper installation and commissioning of a new NIRS process analyzer is critical to ensure the quality of your analytical results.

All the installation and commissioning of our NIRS systems are performed by trained Metrohm engineers according to **EN-IEC60079-14**. Additionally, the ATEX certificate from a third party notifying body is delivered at the time of the installation.

Only when installation and commissioning are professionally done in accordance with the manufacturer's specifications by trained personnel, can you be sure that the system will perform safely and properly from day one.

Installation Record

Offered as a basic service included with every installation, the installation is documented and inspected using a predefined checklist. Furthermore, the newly installed system is tested for error-free operation.

Analytical Instrument Qualification (AIQ)

Metrohm's Analytical Instrument Qualification meets all requirements mandated by many regulators. AIQ is more commonly known as «IQ/OQ».

In regulated environments such as the pharmaceutical and food industries, commissioning and use of analytical process analyzers in accordance with applicable regulations is mandatory. However, meeting these requirements systematically can be challenging.

Metrohm can assist you with this process. We have developed a modular system for the installation and qualification of your Metrohm process analyzers in strict accordance with the current regulations and can provide documentation as required.



Maintenance and Support – prevent problems before they arise

Maintenance pays off

Regularly maintained analyzers experience less downtime, provide more precise results, and generally perform better. A regularly maintained analyzer will have a longer lifespan than one that does not receive the same level of care.

Electrical installations in hazardous areas possess features specially designed to render them suitable for operations in such atmospheres. It is essential for safety reasons in those areas that, throughout the life

of such installations, the integrity of those special features is preserved, and therefore **EN-IEC60079-17** is followed.

Support throughout the entire lifecycle

Metrohm Process Analytics supports users from the first consultation across the entire life time of the device. You receive the analysis systems and services tailored to your requirements.



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