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ABB MEASUREMENT & ANALYTICS

## **MB3000-PH**

FT-IR laboratory analyzer  
for life sciences industry



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## Measurement made easy

**Robustness has always been one of the trademarks of ABB FT-IR instruments. We are proud to continue this heritage with the MB3000-PH, the most reliable FT-IR spectrometer on the market designed for QA/QC, formulation, research and development laboratory applications.**



# MB3000-PH FT-IR spectrometer for the pharmaceutical industry

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01 Pill tab

## Addressing modern laboratory challenges

One of the challenges in the modern laboratory is minimizing the cost of ownership of equipment and ensuring its reliability without compromising its analytical performance. Additionally, as these instruments get more advanced and complex, it is important to make sure they are easy to operate and maintain. They must also allow compliance with current good laboratory practices and regulatory guidelines.

The ABB MB3000-PH FT-IR spectrometer for the pharmaceutical industry has been designed around these key principles. It is the result of more than 35 years' experience in FT-IR spectroscopy and over 10 years' presence in life sciences analytical laboratories.

## Experience and innovation: the winning combination

While the exceptional stability of the wishbone principle with corner cube mirrors ensures reproducible data, the interferometer design has been further refined with the introduction of an innovative double-pivot concept derived from our aerospace technology, offering outstanding robustness. As a result, the permanently aligned optics do not require alignment and the interferometer has a lifetime warranty.

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## Maximum simplicity at a minimum cost of ownership

Whether operating in QA/QC, analytical development, R&D or formulation laboratory, users can enjoy the simplicity and ease of use of the MB3000-PH. Thanks to its universal sampling compartment, the spectrometer is highly versatile and accommodates a wide range of accessories. The new Horizon MB™ FT-IR software suite offers an intuitive and user-friendly interface allowing immediate adaptation for new users.

While the MB3000-PH novel vertical design provides a minimal footprint, it is also the FT-IR spectrometer with the lowest cost of ownership: the pre-aligned source module with electronic stabilization does not require replacement for 10 years, and the new diode laser-based metrology module does not require any scheduled maintenance. These unique features, combined with the extensive built-in health monitoring of the instrument, provide the peace of mind you need to rely confidently on your MB3000-PH.

## Performance matters

Because we know that robustness and ease of use are of little value when they are obtained at the expense of analytical performance, our engineers have paid great attention to ensure that the MB3000-PH delivers the high-quality type of spectra that have contributed to the world-class reputation of ABB spectrometers over the years. As illustrated by the outstanding signal-to-noise specifications of the MB3000-PH, compromising on performance is not an option for ABB.



# Features

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02 Microscope  
and gas cell

## An unrivalled reliability

### Permanently aligned optical system

The innovative double pivot interferometer is designed to ensure increased robustness. The corner cube mirrors are permanently aligned with no need for dynamic alignment. In a highly regulated environment, reproducible spectroscopy is key.

### Minimal components

The MB3000-PH modular design allows integration of dependable components with minimum effort.

### Rugged and durable modules

The MB3000-PH comes with a lifetime warranty against damage or degradation due to moisture and exhibits the best extended analyzer lifetime on the market. With the MB3000-PH, maintenance scheduling is no longer an issue.

## Versatility at a glance

### Standard open sample compartment

The Arid-Zone open sample compartment of the MB3000-PH addresses all the needs of the modern analytical laboratory. It can use a wide variety of easily swappable ABB or third-party accessories that are pinned in place and do not require alignment.

### Multiple sampling options

ABB offers the MIRacle™\* accessory with electronic recognition via USB port, a universal ATR sampling kit to analyze solids, liquids, pastes, gels and intractable materials addressing the most common sampling needs. Other sampling options offered by ABB include a horizontal ATR kit, demountable liquid cells, a diffuse reflectance DRIFT accessory, gas cells, specular reflectance accessories with fixed and variable angles, and micro-sampling with a beam condenser or microscope

## Simple yet efficient

### A focus on ease of use

The MB3000-PH's logical and customizable Horizon MB FT-IR software interface allows you to configure your work environment and select data formats according to your needs. With many import and export options, data conversion is no longer a problem.

## The performance you need

The MB3000-PH meets demanding criteria regarding sensitivity and spectral range. Its outstanding stability sets a world-class standard for FT-IR performance.

## The first maintenance-free FT-IR analyzer

### No consumables

The MB3000-PH components do not wear out. They do not need replacement or adjustment. The spectrometer optics are non-hygroscopic optics, therefore no purge is required.

### Sources with a 10-year average lifetime

With the MB3000-PH, ABB offers the first maintenance-free FT-IR spectrometer with no downtime, a true revolution in the laboratory.

## Compliance made easy

### Secured data handling

The MB3000-PH comes with the Horizon MB Security software module which permits selecting between 2 security levels, ensuring operations in a 21 CFR Part 11-compliant mode.

### Complete validation package

A complete set of cGMP IQ-OQ protocols and templates is included in the package. Because we know what it takes to implement and validate an analyzer in the life sciences industry.



\*MIRacle is a registered trademark of PIKE technologies



# Horizon MB FT-IR software modules

03 MB3000  
spectrometer

## Horizon MB FT-IR (default)

### Intuitive software for daily operations

The HORIZON MB FT-IR module facilitates the acquisition, processing and analysis of samples. With Horizon MB FT-IR, managing analytical results has never been easier.

## Horizon MB Library (default)

### A powerful search engine

The HORIZON MB Library module is designed for efficient multiple library searches. It offers spectrum and full-text search capabilities.

## Horizon MB Security (default)

### Enabling 21 CFR Part 11 compliance

The HORIZON MB Security module offers 2 selectable security setting levels ('Computer' or 'Windows'). It provides distinctive access control to software functions based on permission schemes, hierarchical access control based on data access roles, electronic signatures, activity logging and traceability of all data manipulations.

## Horizon MB Professional (option)

Advanced features for demanding users.

The HORIZON MB Professional module includes enhanced mathematical functions, 3-D capabilities and extended import/export functions. It also includes a regulatory module for auto-mated execution and reporting of the instrument verification tests described in pharmacopoeia guidelines.

## Horizon MB Quantify (option)

### The modern chemometrics toolbox

The HORIZON MB Quantify module incorporates univariate and multivariate algorithms for data analysis and quantification. It also includes the Horizon MB Professional module.

## Horizon MB Scripting (option)

### Functionality customization

The HORIZON MB Scripting module allows users to develop their own routines and functions using the powerful SAX basic scripting engine.

## Horizon MB RX (option real-time chemical reaction analysis)

The Horizon MB RX module is designed to create chemical reaction analysis templates and perform real-time trending.

It enables the following operations:

- Intuitive set-up using the Reaction Wizard with multi-window layout
- Quick reaction execution from available templates
- Simple real-time and off-line editing of reaction profiles
- Evaluation of what-if scenarios and comparison of active run with reference ('golden batch')
- New template creation from optimized what-if scenarios.
- Possibility of performing off-line reprocessing for chemical run data

## Horizon MB IR Interpretation (option)

### Spectra interpretation and functional group analysis

The Horizon MB IR Interpretation module allows for the identification of functional groups in molecules and the interpretation of complex spectra based on automated peak table search against a reference library. It is an essential tool in a spectroscopist's toolkit for routine analysis and chemical research applications.

## Horizon QA (option)

### Modern software for routine analysis and QA/QC

The Horizon QA module makes running QA/QC and routine applications simple and reliable for laboratory staff by providing intuitive workflow along with integrated spectrometer and accessory control. The software guides the user in every step from collecting reference data to designing QA/QC applications and implementing turnkey methods. Horizon QA also enables plant connectivity by automatically generating a tab-separated file with detailed results and parameter information for each sample analysis performed with a procedure. This can file can then be imported by a LIMS system.



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# Technical specifications

## Spectroscopic performance

### (typical at 25 °C [77 °F] with DTGS detector)

- Spectral range: 485 to 8500  $\text{cm}^{-1}$
- Resolution: better than 0.7  $\text{cm}^{-1}$
- Apodized resolution: adjustable from 1 to 64  $\text{cm}^{-1}$ , in increments of 2
- Maximum signal-to-noise ratio (root-mean-square, 60 s, 4  $\text{cm}^{-1}$ , at peak response): 50000:1
- Signal sampling: 24-bit ADC
- Short-term baseline instability: <0.09 %
- Temperature stability: <1 % per °C
- Frequency repeatability @ 1918  $\text{cm}^{-1}$ : <0.001  $\text{cm}^{-1}$
- Frequency accuracy @ 1918  $\text{cm}^{-1}$ : <0.06  $\text{cm}^{-1}$

## Application software (computer not included)

- Operating system compatibility: Windows XP Pro
- Standard software:
  - Horizon MB FTIR + Horizon MB Library
- +Horizon MB Security
- Optional add-on modules: Horizon MB Professional, Horizon MB Quantify, Horizon MB Scripting, Horizon MB RX, Horizon MB IR Interpretation, Horizon QA.

## Optical bench

- Beamsplitter material: ZnSe (non-hygroscopic)
- Interferometer mechanism: high-throughput double pivot Michelson, with protective cover (patent-pending)
- Optical path fully purgeable
- Source: ceramic Globar with electronic stabilization, expected half life, 10 years
- Metrology: solid-state laser (no scheduled maintenance required)
- Detector module: DTGS
- Open sample compartment configuration:
  - Arid-Zone, center focus
- Sample compartment dimensions: 20 x 14 cm (7.9 x 5.5 in) plate, 8.7 cm (3.1 in) beam height
- Sample compartment mounting: 3-point positioning guide or 3-point kinematic adjustable

## Data communication

- Hardware port: Ethernet, 10/100 Mbps
- Connection: direct-connect or LAN

## Instrument enclosure

- Casting: rugged all-metal with integrated handles
- Size (WxDxH): 43.5 x 28 x 37.2 cm (17 x 11 x 14.6 in)
- Weight: 24 kg

## Environmental

- Universal power supply: 120 to 240 VAC, 50/60 Hz
- Power consumption: 65 W
- Operating temperature: 10 to 35 °C (50 to 95 °F)
- Operating relative humidity: 5 % to 80 %, non-condensing
- Regulatory certification and compliance: TUV and CE

## Documentation

- cGMP IQ-OQ protocol templates
- User manual
- Quick-start guide





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