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Tritium and Other Beta Emitters Monitoring Solutions

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Mirion Technologies (Premium Analyse)

Since more than 25 years, Mirion Technologies (Premium Analyse) has been one of the leaders on the market of radioactive gases monitoring, and more specially in tritium monitoring. The monitors are mainly focused on the nuclear industry as well as medical industry.

The company is innovation-driven with the permanent objective of developing the products and services portfolio.

The monitors are:

- Manufactured in our workshop
- Designed by our internal R&D team
- Tested and controlled in our conformity lab
- Can be calibrated and verified with tritium gas in our Cofrac-certified laboratory, according to NF EN ISO/CEI 17025:2017 standard (accreditation n° 1-6856*)

Thanks to the complete production line mastery, combined with a long-term acquired know-how, Mirion Technologies (Premium Analyse) has been granted the status of precursor and can handle leading edge technology.

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ESSAIS

** accrediation details available on: www.cofrac.fr/en*

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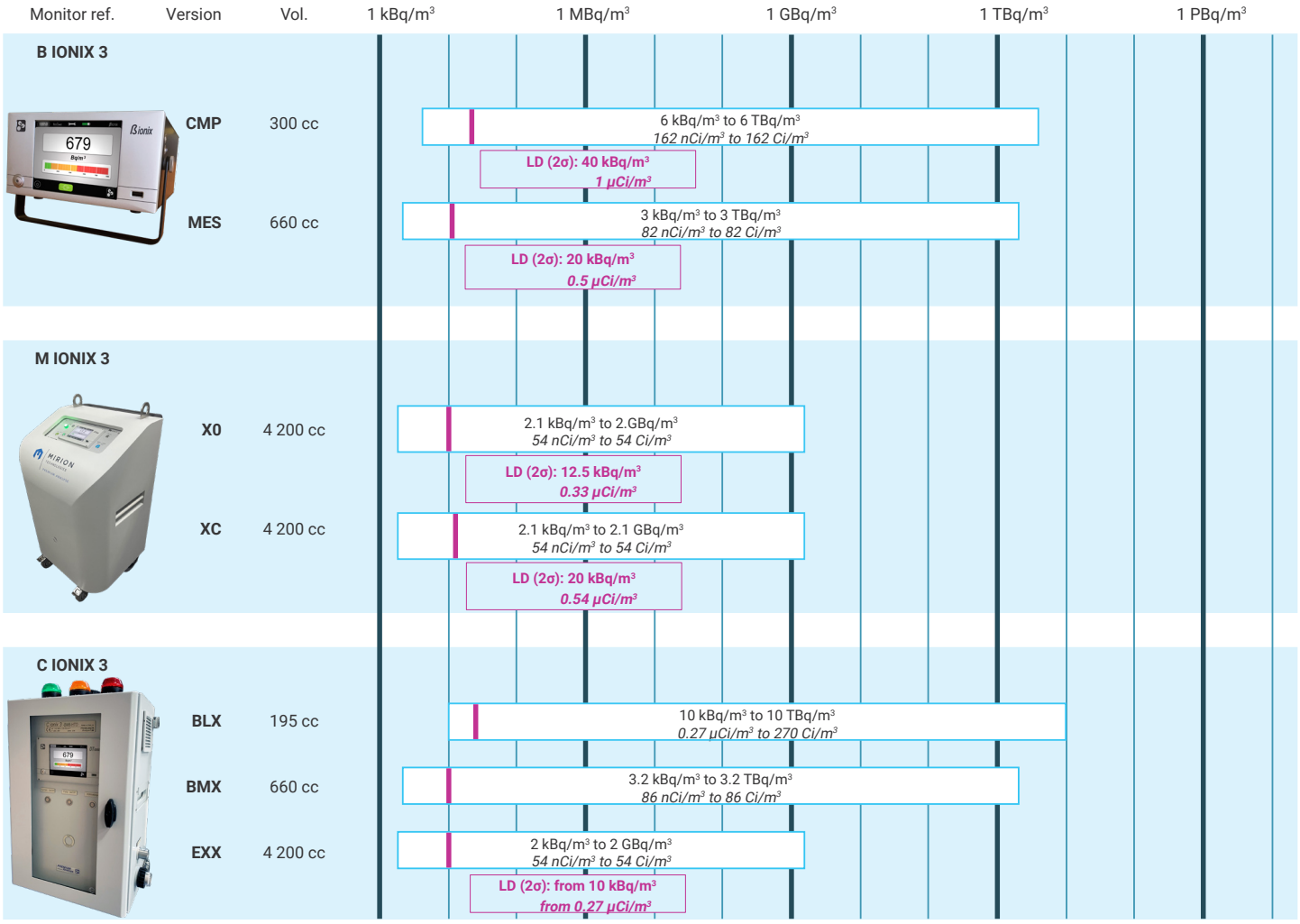
Monitors Range



Samplers Range

HT IONIX 22

HC IONIX 20

The HT IONIX tritium and HC IONIX carbon samplers:

- Are available in 2 and 4 bottles versions
- Offer a touch-sensitive and user friendly interface
- Only need a quick and easy preventive maintenance
- Prevent the formation of condensation outside of the bottles
- Have a limited footprint and a weight reduced to its minimum (<15kg)
- Can communicate with the infrastructures as well as supervision software and be operated from a distance
- Offer very limited liquid loss thanks to an internally-developed advanced system: Relative Humidity Compensation System (RHCS)

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Detectors Range

Monitor ref.	Volume	Preamp associated	1 kBq/m³ – 1 PBq/m³
DT D - MC 10	9.28 cc	DT P - LN - 196 DT P - LN - 1A7 DT P - LN - 1B8	19 MBq/m³ to 19 PBq/m³ *513 µCi/m³ to 513 kCi/m³* 1.9 MBq/m³ to 1.9 PBq/m³ *51.3 µCi/m³ to 51.3 kCi/m³* 190 kBq/m³ to 190 TBq/m³ *5.13 µCi/m³ to 5.13 kCi/m³* **LD (2σ): from 1 MBq/m³ *from 24 µCi/m³***
DT D - MLB	100 cc	DT P - LN - 196 DT P - LN - 1A7 DT P - LN - 1B8	2.1 MBq/m³ to 2.1 PBq/m³ 210 kBq/m³ to 210 TBq/m³ 21 kBq/m³ to 21 TBq/m³ **LD (2σ): from 100 kBq/m³ *from 2.7 µCi/m³***
DT D - BL2	195 cc	Integrated	10 kBq/m³ to 10 TBq/m³ *0.27 µCi/m³ to 270 Ci/m³* **LD (2σ): 45 kBq/m³ *1.22 µCi/m³***
DT D - IC500	500 cc	DT P - LN - 1A7	3.8 kBq/m³ to 3.8 TBq/m³ *103 nCi/m³ to 103 Ci/m³* **LD (2σ): 30 kBq/m³ *0.8 µCi/m³***
DT D - BM8	660 cc	Integrated	3.2 kBq/m³ to 3.2 TBq/m³ *86 nCi/m³ to 86 Ci/m³* **LD (2σ): 20 kBq/m³ *0.54 µCi/m³***
DT D - EXP40	4 200 cc	Integrated	2 kBq/m³ to 2 GBq/m³ *54 nCi/m³ to 54 mCi/m³* **LD (2σ): 12.5 kBq/m³ *0.33 µCi/m³***
DT D - XPR80	8 000 cc	DT P - LN - 1A7	2 kBq/m³ to 2 GBq/m³ *54 nCi/m³ to 54 mCi/m³* **LD (2σ): 10 kBq/m³ *0.27 µCi/m³***

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Contents

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HT ionix™

Tritium Bubblers

The HT ionix Tritium Bubblers provide exceptional trapping efficiency for tritium oxide and gas, combined with user-friendly features like a color touch screen and remote monitoring, making them indispensable for radioprotection, environmental surveillance, and stack release monitoring.

The HT ionix Tritium Bubblers are essential tools for trapping (or sampling) tritium oxide and gas in environments where it is present, such as nuclear facilities and research labs. These bubblers efficiently sample for tritium levels in stack emissions, ventilation systems, and the surrounding air. They come in two models: one for capturing tritium oxide (HTO) and another that can handle both HTO and tritium gas (HT) after oxidizing the gas.

HT ionix Tritium Bubblers stand with a user-friendly design, featuring a simple color touch screen for easy operation, clear visual and audio alerts for any issues, and a straightforward system for installing and removing sampling bottles. Advanced features like remote monitoring and control, a calibrated mass flowmeter, and a humidity compensation system ensure consistent and accurate performance. Lab-tested with a proven trapping efficiency >95% or both HTO (vapor) and HT (gas), these bubblers offer precise, reliable performance.

FEATURES

- High trapping efficiency: >95% for both HTO (vapor) and HT (gas)
- User-friendly with color touch screen and color-coded bottles
- Limited liquid loss, no outside condensation
- Small and light, with rugged design
- Quick and easy setup
- Remote monitoring and control via Modbus
- Meets NF ISO 20045 and NF ISO 20041-1 standards

Specifications

MAIN CHARACTERISTICS

- The HT IONIX bubblers are available in two versions:
  - The HT IONIX 20 bubbler allows sampling of tritium oxide (HTO).
  - The HT IONIX 22 bubbler allows sampling of tritium oxide (HTO) as well as gas (HT) after catalytic oxidation in a furnace.

Main characteristics	HT IONIX 20	HT IONIX 22
Overall dimensions	L 410 x H 315 x D 350 mm	L 510 x H 315 x D 350 mm
Weight (empty)	< 12 kg	< 15 kg
Power supply	100-240 Vac 50-60 Hz	
Max power	240 W	530 W
Electrical protection	Fuses 2 A (220 V) & 10 A (24 V)	
Dry-contact outputs	6 outputs (flow, pump, cooling, electronic, proper functioning, status error)	7 outputs (flow, pump, cooling, electronic, proper functioning, status error, furnace)
Volume of bottles	125 mL	
Recommended liquid volume	100 mL of liquid	
Sampling circuit	100% stainless steel	
Inlet filter	1 µm fiberglass	
Gas I/O	6 mm Swagelok double ring connectors	
Flow rate	Customizable from 50 cc/min to 850 cc/min (3 L/h to 51 L/h)	
Furnace temperature settings	N/A	Recommended 450 °C, max 500 °C

OPERATING CONDITIONS

- Use temperature: +2 °C to +48 °C (+35 °F to +118 °F)
- Storage temperature: -5 °C to +70 °C (+23 °F to +158 °F)
- Use pressure: 850 - 1 150 mbar abs
- Humidity: < 95% (without condensation)
- Protection level: IP40

HT IONIX 20
Two bottles HTO tritium sampler

FEATURES

Gas sample circuit:

- Sampling circuit 100% made in stainless steel
- Color identification of bottles to limit the risk of switching
- Installation and removal of bottles made easy thanks to a standard thread (GL 45)
- Filtration of particles up to 1 micron through a front mounted easily interchangeable filter
- Mass flowmeter, calibrated with a certified standard COFRAC flowmeter over the range of 50 to 850 cc/min (3 to 51 L/h)
- Relative Humidity Compensation system
  - No condensation outside of the bubbler
  - Reduced liquid losses in all bottles even on long measurement period (up to 1 month)
- Self-regulating catalytic oxidation furnace with durable catalyzer
- Reduced water sampling volume (from 60 mL) to limit the dilution of the sample

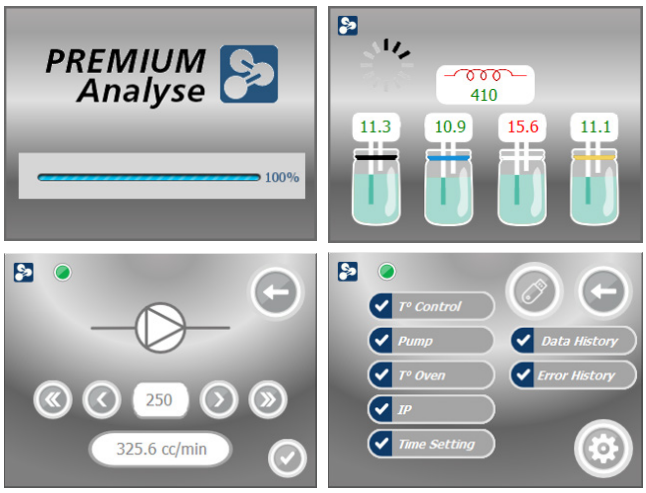
Electronic control:

- Color touch screen
  - Display of the sampling history, real-time errors, sampling status history,...
  - Display of operating and sampling data (standardized flowrate, sampling duration, volume sampled,...)
- Ability to reset the duration and volume sampled before each new measurement campaign on the main screen
- Light and sound alarm
- 4-20 mA input for external flowmeter
- Autotest at startup and permanent self-control
- Remote beacon connector (additional beacon required)
- Modbus Ethernet connection allowing remote visualization of faults and the status of operation as well as unit remote control
- Dry-contact outputs for the transmission of faults (flow, pump, furnace, cooling, electronic, general failure)

Delivered with power supply cable, glass bottles, conformity certificate, user and maintenance manual and Modbus registers.

QUALIFICATIONS

- Tested in Mirion Technologies (Premium Analyse) gas laboratory
- CE conformity
- Test reports available on request.



Software interface

Back of the device

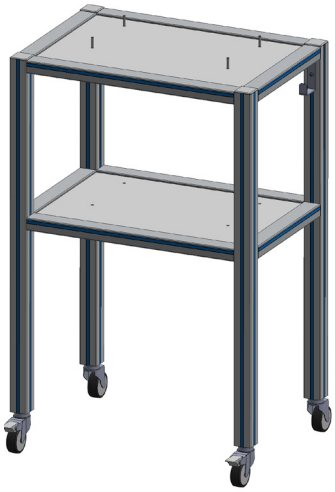
REFERENCES	
HTO tritium bubbler	HT IONIX 20
HTO + HT tritium bubbler	HT IONIX 22

ACCESSORIES	
250 mL conversion kit (4 bottles)	HTI ACC 4F 250
Rolling table for 1 bubbler	HTI ACC TR1
Carrying basket for 4 bottles 250 mL	HTI ACC PT250
Clamp alarm beacon	ACC BAL P
Fixed alarm beacon	ACC BAL F
Transport case with foam block	HTI ACC PEL
Rinsing or decontamiantion system	HTI ACC SRD

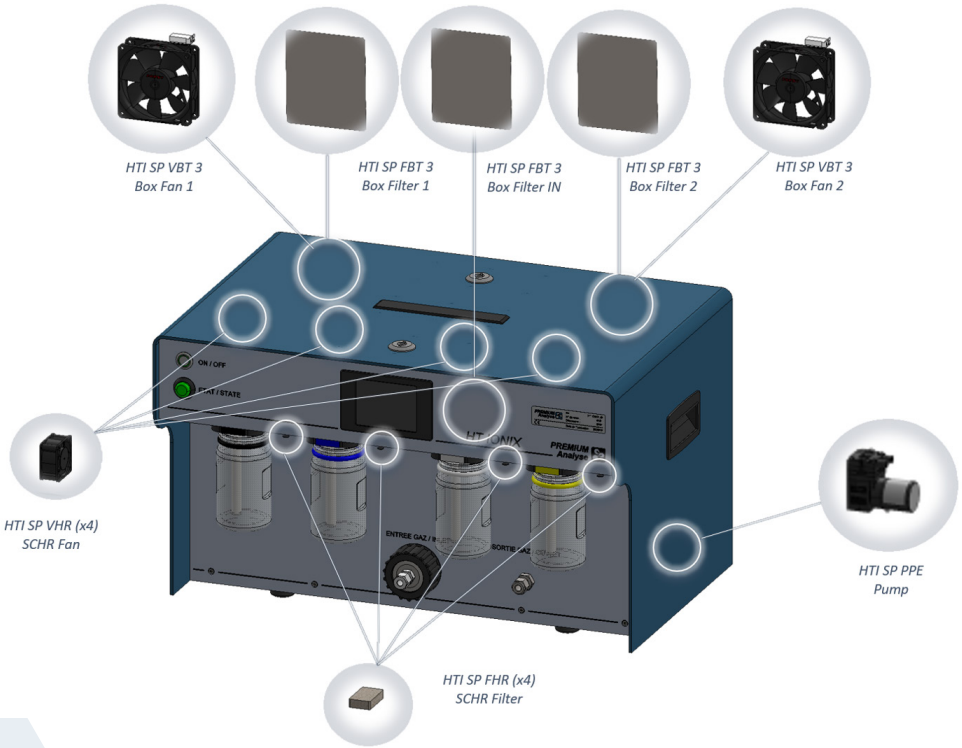
CONSUMABLES	
Sampling filters (pack of 100)	HTI SP FPR
RHCS fan	HTI SP VHR
RHCS fan filter (pack of 12)	HTI SP FHR
Case fan	HTI SP VBT 3
Case fan filter (pack of 6)	HTI SP FBT 3
Pump	HTI SP PPE

SPARE PARTS	
Pack of 4 125 mL bottles	HTI SP 4FL 125
Pack of 4 250 mL bottles	HTI SP 4FL 250
RHCS head	HTI SP SCHR 4
Oxidation furnace	HTI SP FOX
Diving tube for 125 mL bottle	HTI SP TP125 v3
PTH probe	HTI SP PTH
Flowmeter	HTI SP DEB 2
Gaskets kit (pack of 2)	HTI SP JNT
Power fuses (pack of 2)	HTI SP FUS 2A
Main board fuse	HTI SP FUS 10A
Touch screen assembly	HTI SP ECR
RHCS management card	SSP HTI GHR A1
System control card	SSP HTI EPE A3
NTC probe	HTI SP NTC 3

MAINTENANCE	
Annual maintenance kit without pump (FPR + FHR + FBT 3)	HTI MNT KIT 3
Annual maintenance kit with pump (FPR + FHR + FBT 3 + PPE)	HTI MNT KIT PPE 3
Annual maintenance fee	HTI MNT ANN



Rolling table
HTI ACC TR1



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HC ionix™

Carbon-14 Bubblers

The HC ionix Carbon-14 Bubblers are ideal for sampling carbon-14 levels in the air. They are highly effective in capturing carbon-14 in both CO_2 and organic forms, ensuring accurate, reliable results. User-friendly, compact and easy to set up, they are purpose-built for environmental monitoring in stack and ventilation systems and premises surveillance.

With a high trapping efficiency of over 95% for CO_2, validated in laboratory conditions, HC ionix Carbon-14 Bubblers ensure reliable and precise sampling. Featuring a user-friendly color touch screen and color-coded bottles, these systems simplify operation and maintenance and minimize the risk of errors.

Compact and lightweight, the bubblers are easy to set up and require only one annual maintenance, reducing downtime and operational costs. They are equipped with a relative humidity compensation system to prevent condensation, for clear and accurate readings while ensuring a steady level of liquid in the bottles for later Liquid Scintillation Counting measurement.

FEATURES

- High trapping efficiency: CO_2 > 95%, validated in laboratory conditions
- User-friendly design
- Limited liquid loss, no outside condensation
- Quick and easy setup
- Only one annual maintenance required

A self-regulating catalytic oxidation furnace included in the HC ionix 22 model allows for oxidation of organic forms of carbon-14.

Remote monitoring and control via Modbus Ethernet, along with multiple dry-contact outputs for fault transmission, provide real-time alerts and enhance operational efficiency.

Specifications

MAIN CHARACTERISTICS

- The HC IONIX bubblers are available in two versions:
  - The HC IONIX 20 bubbler allows sampling of carbon-14 in the CO2 form,
  - The HC IONIX 22 bubbler allows sampling of carbon-14 in the CO2 form as well as organic form after catalytic oxidation in a furnace.

Main characteristics	HC IONIX 20	HC IONIX 22
Overall dimensions	L 410 x H 315 x D 350 mm	L 510 x H 315 x D 350 mm
Weight (empty)	< 12 kg	< 15 kg
Power supply	100-240 Vac 50-60 Hz	
Max power	240 W	530 W
Electrical protection	Fuses 2 A (220 V) & 10 A (24 V)	
Dry-contact outputs	6 outputs (flow, pump, cooling, electronic, proper functioning, status error)	7 outputs (flow, pump, cooling, electronic, proper functioning, status error, furnace)
Volume of bottles	250 mL	
Recommended liquid volume	175 mL of liquid	
Sampling circuit	100% stainless steel	
Inlet filter	1 µm fiberglass	
Gas I/O	6 mm Swagelok double ring connectors	
Flow rate	Customizable from 50 cc/min to 850 cc/min (3 L/h to 51 L/h)	
Furnace temperature settings	N/A	Recommended 450 °C, max 500 °C

OPERATING CONDITIONS

- Use temperature: +2 °C to +48 °C (+35 °F to +118 °F)
- Storage temperature: -5 °C to +70 °C (+23 °F to +158 °F)
- Use pressure: 850 - 1 150 mbar abs
- Humidity: < 95% (without condensation)
- Protection level: IP40

HC IONIX 20
Two bottles CO_2 sampler

FEATURES

Gas sample circuit:

- Sampling circuit 100% made in stainless steel
- Color identification of bottles to limit the risk of switching
- Installation and removal of bottles made easy thanks to a standard thread (GL 45)
- Filtration of particles up to 1 micron through a front mounted easily interchangeable filter
- Mass flowmeter, calibrated with a certified standard COFRAC flowmeter over the range of 50 to 850 cc/min (3 to 51 L/h)
- Relative Humidity Compensation system
  - No condensation outside of the bubbler
  - Reduced liquid losses in all bottles even on long measurement period (up to 1 month)
- Self-regulating catalytic oxidation furnace with durable catalyzer
- Connectors for the rinsing system easy to reach on the back panel

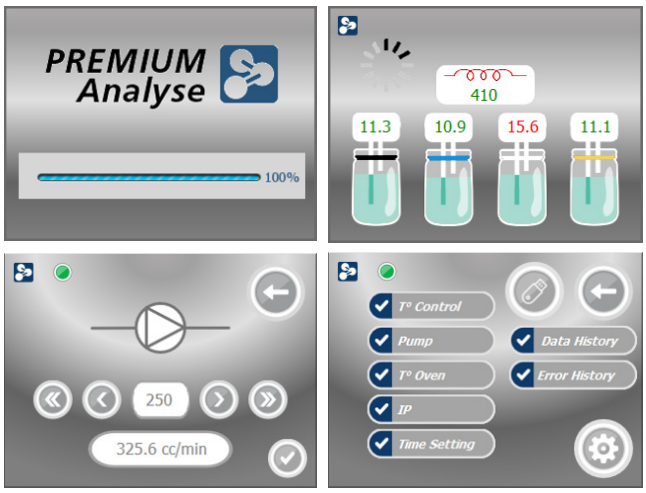
Electronic control:

- Color touch screen
  - Display of the sampling history, real-time errors, sampling status history,...
  - Display of operating and sampling data (standardized flowrate, sampling duration, volume sampled,...)
- Ability to reset the duration and volume sampled before each new measurement campaign on the main screen.
- Light and sound alarm
- 4-20 mA input for external flowmeter
- Autotest at startup and permanent self-control
- Remote beacon connector (additional beacon required)
- Modbus Ethernet connection allowing remote visualization of faults and the status of operation as well as unit remote control
- Dry-contact outputs for the transmission of faults (flow, pump, furnace, cooling, electronic, general failure)

Delivered with power supply cable, glass bottles, conformity certificate, user and maintenance manual and Modbus registers.

QUALIFICATIONS

- Tested in Mirion Technologies (Premium Analyse) gas laboratory
- CE conformity
- Test reports available on request.



Software interface

Back of the device

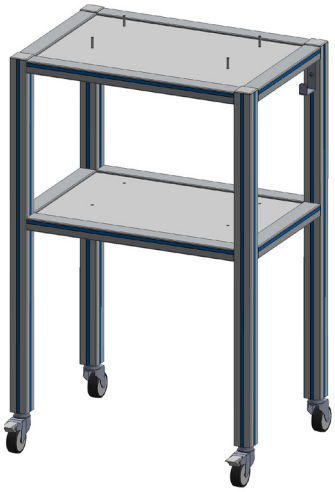
REFERENCES	
CO_2 carbon-14 bubbler	HC IONIX 20
CO_2 + CO carbon-14 bubbler	HC IONIX 22

ACCESSORIES	
125 mL conversion kit (4 bottles)	HTI ACC 4F 125
Rolling table for 1 bubbler	HTI ACC TR1
Carrying basket for 4 bottles 250 mL	HTI ACC PT250
Clamp alarm beacon	ACC BAL P
Fixed alarm beacon	ACC BAL F
Transport case with foam block	HTI ACC PEL
Rinsing or decontamiantion system	HTI ACC SRD

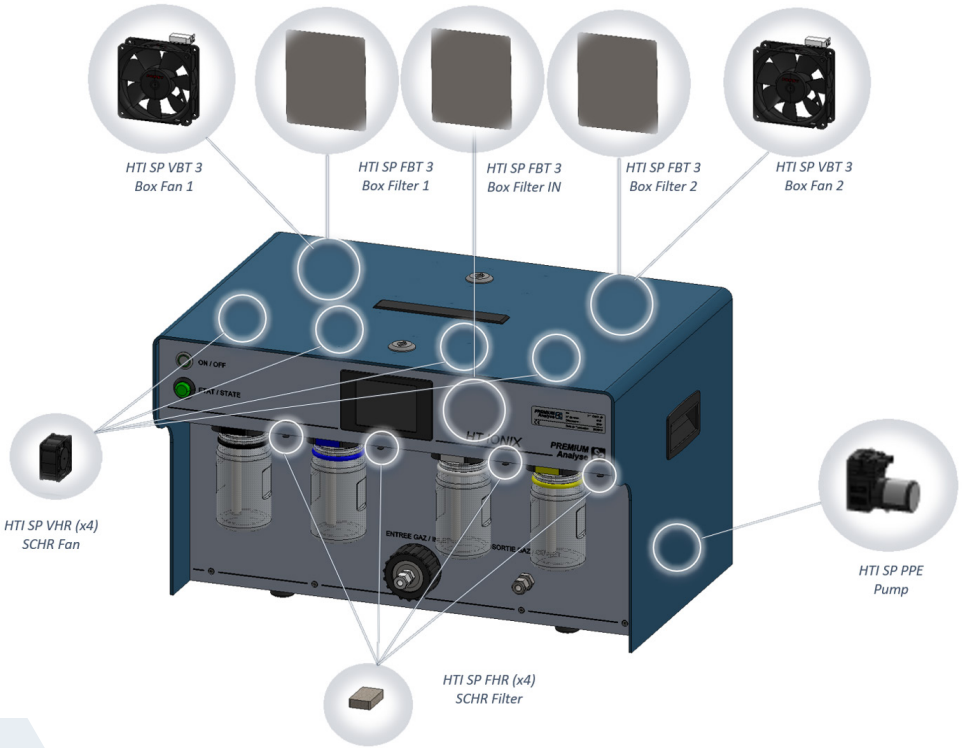
CONSUMABLES	
Sampling filters (pack of 100)	HTI SP FPR
RHCS fan	HTI SP VHR
RHCS fan filter (pack of 12)	HTI SP FHR
Case fan	HTI SP VBT 3
Case fan filter (pack of 6)	HTI SP FBT 3
Pump	HTI SP PPE

SPARE PARTS	
Pack of 4 125 mL bottles	HTI SP 4FL 125
Pack of 4 250 mL bottles	HTI SP 4FL 250
RHCS head	HTI SP SCHR 4
Oxidation furnace	HTI SP FOX
Diving tube for 125 mL bottle	HTI SP TP125 v3
PTH probe	HTI SP PTH
Flowmeter	HTI SP DEB 2
Gaskets kit (pack of 2)	HTI SP JNT
Power fuses (pack of 2)	HTI SP FUS 2A
Main board fuse	HTI SP FUS 10A
Touch screen assembly	HTI SP ECR
RHCS management card	SSP HTI GHR A1
System control card	SSP HTI EPE A3
NTC probe	HTI SP NTC 3

MAINTENANCE	
Annual maintenance kit without pump (FPR + FHR + FBT 3)	HTI MNT KIT 3
Annual maintenance kit with pump (FPR + FHR + FBT 3 + PPE)	HTI MNT KIT PPE 3
Annual maintenance fee	HTI MNT ANN



Rolling table
HTI ACC TR1



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HTI ACC SRD™

Carbon-14 Bubbler Rinsing System

The HTI ACC SRD rinsing system keeps HC ionix™ Carbon-14 Bubblers clean and reliable, ensuring smooth operation and minimal downtime with a quick, water-based rinse.

The HTI ACC SRD rinsing system keeps the HC ionix carbon 14 bubbler in top condition by preventing crystal buildup and contamination. It ensures the device is always ready to use with quick and easy rinsing cycles, using only water for cleaning.

It is simple to use, with a 24V power supply and quick connections to the bubbler. The system performs a leak test before rinsing to ensure everything is sealed properly, then circulates water in both directions to clean the piping and furnace thoroughly. The entire rinsing process takes less than 10 minutes, making it a convenient and efficient solution for maintaining the bubbler.

FEATURES

- Simple and quick rinsing procedure
- Water-only rinse in under 10 minutes
- 24V power supply
- Quick and easy connection
- Bidirectional water circulation
- Pre-rinse leak test
- Thorough cleaning of complete piping and furnace

Specifications

GENERAL CHARACTERISTICS

- Dimensions: 352 x 341 x 280 mm (w x h x d)
- Weight: ~ 10 kg (22 lb)
- Material: aluminum/s. steel/glass
- Buffer tank volume: 2,000 cc
- Recommended liquid volume: 1,800 cc
- Recommended liquid: demineralized water
- Circulation pump : 2 x 14 L/min

HIGH PERFORMANCES RINSING CYCLE

- The rinsing cycle starts by a leak-tightness verification. A pump vacuums the whole piping of the bubbler and the cycle does not go any further until a vacuum threshold has not been reached.
- The rinsing cycle is performed as following :
  1. First counter-flow rinsing with the possibility to empty the bottles (to allow the removal of the maximum of ingress and potentially contamination before going on with the cycle)
  2. Rinsing in the sampling way to allow for the cleaning of the top of the bottles
  3. Injection of air to mechanically remove the remaining ingress
  4. Counter-flow injection of air to purge the circuit and empty the bottles down to 90%
- The complete rinsing cycle (from connection of the HTI ACC SRD accessory until the end of the cycle) is less than 10 minutes.

OPERATING CONDITIONS

- Humidity: 0 to 95% relative, no condensation
- Operating temperature: +0 °C to +60 °C (+32 °F to 140 °F)

The buffer tank rotates, allowing easy fill-in and installation.

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β ionix™

Portable Tritium Monitor

The B ionix Portable Tritium Monitor provides high-sensitivity, real-time monitoring of tritium and other beta emitters, ensuring reliable radiological protection with advanced features such as graphical plotting, data archiving, and remote alarm status display. Available in both manual and automatic gamma compensation versions, it meets a wide range of monitoring needs.

The B ionix Portable Tritium Monitor is a reliable and user-friendly device for detecting tritium and other beta emitters in gases. It is lightweight and rugged, making it suitable for various environments, from labs to decommissioning sites. The monitor provides real-time, continuous measurements with a fast response time, ensuring that any changes in tritium levels are quickly identified. It features a color touch screen with a graphical display, making it easy to read and navigate, and includes customizable units and associated alarm thresholds to alert users to potential risks. Data can be easily archived and extracted via USB for further analysis.

One of the key benefits of the B ionix Portable Tritium Monitor is its high sensitivity, capable of detecting tritium at levels from 20 kBq/m³ (0.5 µCi/m³). This precision is essential for environmental monitoring and laboratory surveillance, helping to ensure the safety of both personnel and the environment.

FEATURES

- High performance with continuous measurement
- Response time from 60 seconds
- Detects tritium from 20 kBq/m³ (0.5 µCi/m³) for reliable and precise monitoring
- User-friendly with a color touch screen and graphical display
- Easy to maintain and commission
- Advanced functionalities including data archiving, remote alarm status display, and data extraction via USB
- Lightweight and rugged

The monitor is available in two versions: a single ionization chamber model for simple and straightforward measurements, and a dual chamber model that compensates for gamma background, enhancing accuracy in more complex scenarios.

Specifications

CAPABILITIES

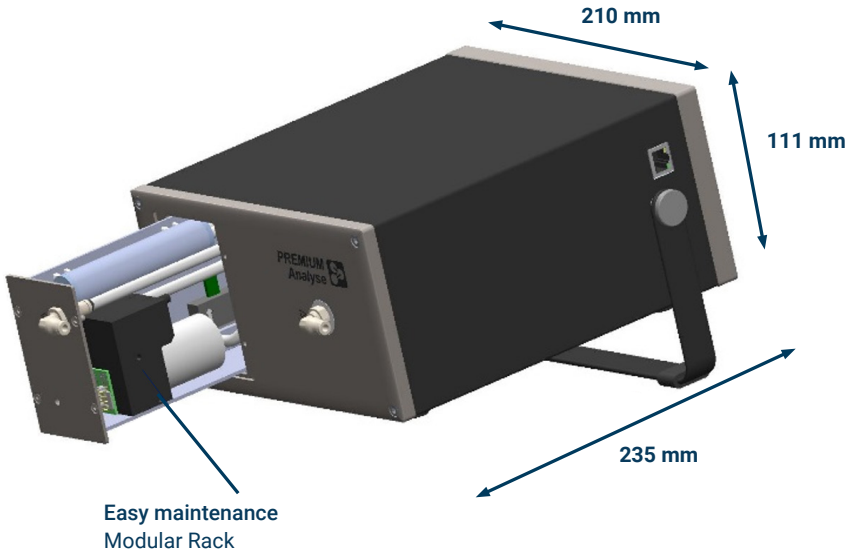
- Two customizable alarm thresholds
- Digital display of volumetric activity
- Ethernet Modbus TCP-IP connectivity
- Archiving of last 32 days of measurements
- Data extraction and system update via USB stick
- Monitoring of the flow rate with low flow detection
- Graphical plotting of measurements and alarm values on a scale from 8 minutes to 8 days
- Choice of volumetric activity among 15 units, with four customizable ones (Bq/m³, RCA, LPCA, Ci/m³...)
- Light and sound signals when pre-alarm (orange) and alarm (red) thresholds are exceeded, as well as good operation default
- Weight: 6 kgs
- Six hours autonomy, recharged in two hours
- Delivered with an external PSU 24V DC - 100W
- An optional transport case and external remote beacon.

OPERATING CONDITIONS

- Use temperature: +0 °C to +40 °C (+32 °F to +104 °F)
- Humidity: < 95% relative, no condensation
- Influence of humidity: ± 1 % of the reading from 10 to 90% relative humidity
- Influence of temperature: 0.3% /°C for an ambient temperature variation < 3°C / hour
- Atmospheric pressure influence: 0.1 %/mbar, hence ± 5 % of the reading from 930 to 1030 mbar.

PERFORMANCES (FOR TRITIUM)

Measurement characteristics in laboratory c onditions	B IONIX 3 - MES Manual gamma compensation	B IONIX - CMP Automatic gamma compensation
Measurement range of electronics	3 kBq/m³ to 3 TBq/m³ (*82 nCi/m³ to 82 Ci/m³*)	6 kBq/m³ to 6 TBq/m³ (*162 nCi/m³ to 162 Ci/m³*)
Limit of detection (2σ) of device	20 kBq/m³ (*0.5 µCi/m³*)	40 kBq/m³ (*1 µCi/m³*)
Precision	5% of measurement ± 20 kBq/m³ (*± 0.5 µCi/m³*)	5% of measurement ± 40 kBq/m³ (*± 1 µCi/m³*)
Maximum deviation	± 20 kBq/m³/year (*± 0.5 µCi/m³/year*)	40 kBq/m³/year (*± 1 µCi/m³/year*)
Noise (2σ)	*± 20* kBq/m³ (*± 0.5 µCi/m³*)	40 kBq/m³ (*± 1 µCi/m³*)
Response time	< 60 sec for 90% of step	< 90 sec for 90% of step
Ionization chamber(s)		
Volume	660 cc	2 x 300 cc
Nominal flow rate	4 L/min	2 L/min
Ionization voltage	160 VDC	



Easy maintenance
Modular Rack

CALIBRATION AND RESPONSE TO TRITIUM

The tests performed in our calibration laboratory are performed according to the NF EN 60761-1 and -5 standards, under 1-6856* COFRAC ISO:17025 certification. The following tests can be performed upon request:

- The estimation of the limit of detection of the measurement chamber which is determined from the signal dispersion in a known environment (over a period of 8 hours)
- The determination of the conversion coefficient (calibration factor) for tritium (Bq/m³)/fA using a standardized tritium gas source
- The verification of the response with a source of standardized tritium gas
- The 3 points linearity verification with a source of standardized tritium gas
- The extended 7 points linearity verification with a source of standardized tritium gas
- The verification of the limit of detection at 8 points with a source of standardized tritium gas
- The estimation of the measurement response time with a source of standardized tritium gas
- The measurement of the response to a ^{133}Ba source used as a reference for the conformity tests performed at the end of manufacturing

Example of the response at 100 kBq/m³ (2.7 µCi/m³)
B IONIX 3 – MES
Volumetric activity measured

Example of the response at 10 MBq/m³ (270 µCi/m³)
B IONIX 3 – CMP
Volumetric activity measured

Mirion Technologies (PREMIUM Analyse) gas laboratory based on the standard NF EN 60761-1 and -5

* Accreditation details available on: www.cofrac.fr/en

SERVICES

Our team is also capable of proposing accessories, making the handling and/or the use of the B ionix portable tritium monitor easier and more convenient. In addition to the gas test services, we can also provide extra deliveries, such as:

- The maintenance of monitors
- The training on the use of the monitors
- The training on the maintenance of the monitors
- The qualification of the devices to specific conditions (Seismic)
- Engineering and design of custom made solutions for specific projects.

ACCESSORIES AND PART NUMBERS

DEVICE REFERENCE	
Portable tritium monitor with manual gamma compensation	B IONIX 3 - MES
Portable tritium monitor with manual gamma compensation	B IONIX 3 - CMP

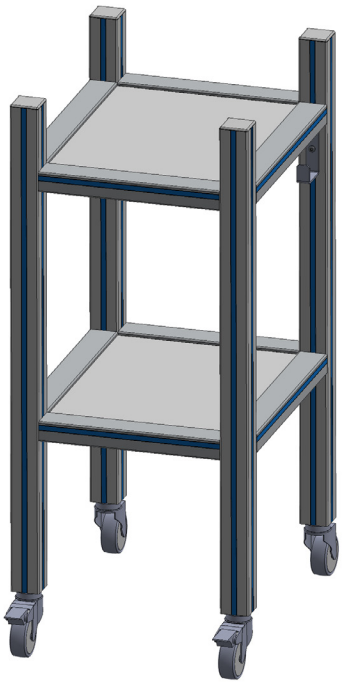
SPARE PARTS	
12V pump for B IONIX 3 - MES	BT3 SP PPE MES
12V pump for B IONIX 3 - CMP	BT3 SP PPE CMP
Spare battery 10.8V - 8.7 Ah	BT3 ACC BAT

CONSUMABLES	
Epoxy filter - 0.9µ (Pack of 5)	ACC FLT 5
Epoxy filter - 0.9µ (Pack of 100)	ACC FLT 100

ACCESSORIES	
Fixed remote alarm beacon	ACC BAL F
Portable remote alarm beacon	ACC BAL P
Transport case	BT3 ACC CASE
Shoulder strap	BT3 ACC STRAP
Rolling table for B IONIX	BTI ACC TAB

SERVICES	
Training for users	BT3 FMT USE
Annual maintenance flat fee	BT3 MNT ANN

ACC BAL F



BTI ACC TAB

ACC BAL P

MIRION TECHNOLOGIES

MIRION TECHNOLOGIES

PREMIUM ANALYSE™

C ionix™ - BXX

Installed Tritium Monitor

The C ionix - BXX Installed Tritium Monitor offers high sensitivity and reliability for real-time and continuous monitoring of tritium and other beta emitters in gases, ensuring safety and compliance in workplace monitoring, decommissioning, and stack release.

The C ionix - BXX is a reliable and efficient tritium monitor designed to ensure environmental safety through continuous and accurate measurement of tritium and beta emitters in gases. It provides real-time alerts and customizable units and associated alarm thresholds, enabling prompt action to address any changes.

Easy to install and use, it fits seamlessly into different settings, from workplace and stack release monitoring to decommissioning sites. The user-friendly interface includes clear digital displays and straightforward data archiving for up to 32 days. Versatile connectivity options, such as remote monitoring and Ethernet Modbus, facilitate integration into existing systems.

Low maintenance requirements, with quick change components and self-checking capabilities, ensure consistent performance. It operates effectively in a wide range of environmental conditions, making it suitable for diverse locations.

FEATURES

- Accurate and continuous monitoring
- Response time from 90 seconds
- Detection of tritium from 20 kBq/m^3 (0.5 µCi/m^3)
- Real-time alerts
- Customizable alarms
- Easy installation, use and maintenance
- User-friendly interface
- Supports remote monitoring and system integration
- Light and sound signals for pre-alarm and alarm conditions
- Operates in a wide range of temperatures and humidity levels

The monitor can optionally automatically adjust to the gamma environment using a compensation detector that can be installed.

Specifications

TECHNICAL CHARACTERISTICS

The C ionix monitors are available in several versions:
The versions below have been developed for real-time and continuous measurement of tritium activity and other β emitters in gases.

Measurement characteristics in laboratory conditions (for tritium)	C IONIX 3 - BLC Measurement with automatic gamma compensation	C IONIX 3 - BMM Measurement without automatic gamma compensation	C IONIX 3 - BMC Measurement with automatic gamma compensation
Measurement range of electronics	10 kBq/m³ to 10 TBq/m³ (0.27 *nCi/m³ to 270 Ci/m³*)	3.2 kBq/m³ to 3.2 TBq/m³ (*86 nCi/m³ to 86 Ci/m³*)	3.2 kBq/m³ to 3.2 TBq/m³ (*86 nCi/m³ to 86 Ci/m³*)
Limit of detection (2σ) of device	45 kBq/m³ (1.22 *µCi/m³*)	10 kBq/m³ (*0.27 µCi/m³*)	20 kBq/m³ (*0.50 µCi/m³*)
Precision	5% of measurement ± 45 kBq/m³ (*± 1.22 µCi/m³*)	5% of measurement ± 10 kBq/m³ (*± 0.27 µCi/m³*)	5% of measurement ± 20 kBq/m³ (*± 0.50 µCi/m³*)
Maximum deviation	*45* kBq/m³/year (*1.22 µCi/m³/year*)	10 kBq/m³/year (*0.27 µCi/m³/year*)	20 kBq/m³/year (*0.50 µCi/m³/year*)
Noise (2σ)	± *10* kBq/m³ (*0.27 µCi/m³*)	± 10 kBq/m³ (*0.27 µCi/m³*)	± 20 kBq/m³ (*0.50 µCi/m³*)
Response time	< 90 sec for 90% of step		
Ionization chamber(s)			
Volume	2 x 195 cc	1 x 660 cc	2 x 660 cc
Nominal flow rate	1 L/min	4 L/min	

The versions below can be used to separately and continuously measure the HTO activity of gases containing other β emitters such as noble gases:

Measurement characteristics in laboratory conditions (for tritium)	C IONIX 3 - BLH HTO measurement with automatic gamma compensation as well as other β emitters such as noble gases	C IONIX 3 - BMH HTO measurement with automatic gamma compensation
Measurement range of electronics	10 kBq/m³ to 10 TBq/m³ (0.27 *nCi/m³ to 270 Ci/m³*)	3.2 kBq/m³ to 3.2 TBq/m³ (*86 nCi/m³ to 86 Ci/m³*)
Limit of detection (2σ) of device	60 kBq/m³ (1.62 *µCi/m³*)	20 kBq/m³ (*0.50 µCi/m³*)
Precision	5% of measurement ± 60 kBq/m³ (*± 1.62 µCi/m³*)	5% of measurement ± 20 kBq/m³ (*± 0.50 µCi/m³*)
Maximum deviation	*60* kBq/m³/year (*1.62 µCi/m³/year*)	20 kBq/m³/year (*0.50 µCi/m³/year*)
Noise (2σ)	± *60* kBq/m³ (*1.62 µCi/m³*)	± 20 kBq/m³ (*0.50 µCi/m³*)
Response time	< 90 sec for 90% of step	
Ionization chamber(s)		
Volume	2 x 195 cc	1 x 660 cc
Nominal flow rate	2 x 1 L/min	2 x 4 L/min

OPERATING CONDITIONS

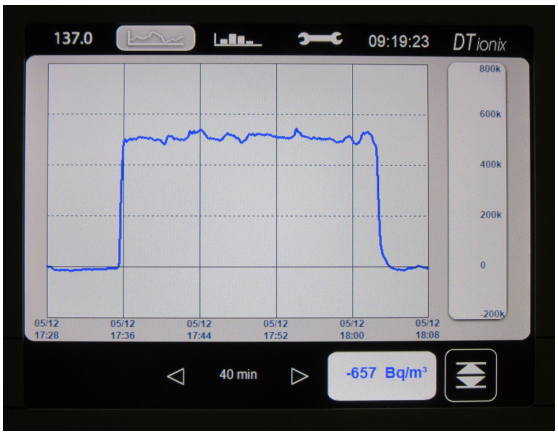
- Humidity: < 95% relative, no condensation
- Operating temperature: +0 °C to +40 °C (+32 °F to 104 °F)
- Influence of humidity: ± 1 % of the measurement from 10 to 90% of relative humidity
- Influence of temperature: 0.3%/°C for a variation of the ambent temperature < 3°C/hour
- Influence of atmospheric pressure: 0.1%/mbar, hence ± 5% of the measurement from 930 to 1030 mbar
- Protection index: IP 54.

POSSIBLE CONFIGURATIONS

Each unit integrates a DT ionix 3 digital touch interface allowing local viewing of data through an intuitive menu:

- Four customizable alarm thresholds
- Digital display of volumetric activity
- Archiving of last 32 days of measurements
- Data extraction and system update via USB stick
- Adjustment and monitoring of the flow rate with low flow detection
- Graphical plotting of measurements and alarm values on a scale from 8 minutes to 8 days
- Choice of volumetric activity among 15 units, with four customizable ones (Bq/m³, RCA, DAC, Ci/m³...)
- Light and sound signals when pre-alarm (orange) and alarm (red) thresholds are exceeded, as well as good operation default
- Overall dimensions (with lights): 475 x 780 x 330 mm (18.7 x 30.7 x 13 in.) (W x H x D)
- Weight (max.): 36 kg (79 lb)
- Power supply, max. power and electrical protection:
  - Option "2": 24 VDC, 60W, 6A fuse
  - Option "V": 85–264 VAC, 50/60 Hz, 80W diffffferential circuit breaker 6A curve C
- Possible options:
  - Remote beacon connection
  - Wall mounting on quick mounting plate
  - Ethernet Modbus TCP-IP Connectivity (x2)
  - Gas I.O via self-sealing Stäubli or Swagelok fittings
  - Process output with dry contact outputs, 4/20mA outputs...
  - High leak-tightness configuration (leak rate < 10^{-9} mbar.L.s^{-1})
  - Light and sound signals for alarms and good operation default

TRITIUM RESPONSE EXAMPLES - VIEW FROM DT IONIX HMI



Injection of 500 kBq/m³ (13.5 µCi/m³) in a C IONIX 3 - BMM

Injection of 10 MBq/m³ (270 µCi/m³) in a C IONIX 3 - BLC

Injection of 1 MBq/m³ (27 µCi/m³) of tritium HT then 2 MBq/m³ (54 µCi/m³) of tritium HTO. The injection of HT is then stopped, and the injection of HTO is ceased thereafter.

UNIT CONFIGURATION AND PART NUMBERS

MONITOR CONFIGURATION AND OPTIONS CHOICE		
Measurement		C IONIX 3 - BLC - 0 - 00 - 00 - FA - F C IONIX 3 - BLH - 0 - 00 - 00 - FA - F C IONIX 3 - BMM - 0 - 00 - 00 - FA - F C IONIX 3 - BMC - 0 - 00 - 00 - FA - F C IONIX 3 - BMH - 0 - 00 - 00 - FA - F C IONIX 3 - BME - 0 - 00 - 00 - FA - F
Power distribution	24V power supply AC power supply	C IONIX 3 - BXX - 2 - XX - XX - FA - F C IONIX 3 - BXX - V - XX - XX - FA - F
Alarms	Without light and sound Local alarms (G / R / O + sound) Remote beacon connector	C IONIX 3 - BXX - X - 0X - XX - FA - F C IONIX 3 - BXX - X - YX - XX - FA - F C IONIX 3 - BXX - X - XB - XX - FA - F
Connections	Process outputs (dry-contacts, 4-20mA, flow input) Modbus TCP-IP	C IONIX 3 - BXX - X - XX - PX - FA - F C IONIX 3 - BXX - X - XX - XM - FA - F
Wall fixing	Fixed system with Stäubli connectors Fixed system with Swagelok connectors Removable without wall plate (with handles & clip fixing) Lock	C IONIX 3 - BXX - X - XX - XX - FA - F C IONIX 3 - BXX - X - XX - XX - IA - F C IONIX 3 - BXX - X - XX - XX - AA - F C IONIX 3 - BXX - X - XX - XX - FA - F
Label	English French	C IONIX 3 - EXX - X - XX - XX - FA - E C IONIX 3 - EXX - X - XX - XX - FA - F
Reference example	C ionix monitor full option with automatic gamma compensation	C IONIX 3 - BMC - V - YB - PM - FA - F

ACCESSORIES	
Wall plate	ACC PLM
Fixed alarm beacon	CX3 ACC BAL F
Gas exhaust with silencer	ACC ARG SIL
RAC SWA 1/4RT gas exhaust + filter	ACC ARG S4F
Gas exhaust for 8 mm hose	ACC ARG S08
Gas exhaust for 6 mm hose	ACC ARG S06
Table frame for 1 C ionix - BXX	CX3 ACC CHM 01
Mobile frame for 2 C ionix - BXX	CX3 ACC CHM 02
Table frame for 1 C ionix - BXX	CX3 ACC CHM TAB

SPARE PARTS	
High leak-tigh pump assembly	CX3 SP BTR P6000

CONSUMABLES	
24V pumps 5.5 Lpm (x1*)	CX3 SP PPE
IP 54 foam filter (x2*)	SP 60715 182
Cabinet fan (x1*)	SP 8414N
DT ionix axial fan (x1*)	SP 412F
DT ionix axial fan mounted on support (x1*)	SP 412F P
2µm PTFE filter (x1*)	CX3 SP FE 4

* quantity needed for annual maintenance of monitor

MIRION TECHNOLOGIES

SPC-182-EN-C_A4 – 03/2026

MIRION TECHNOLOGIES

PREMIUM ANALYSE™

C ionix™ - HTO

Installed Tritium Monitor

The C ionix - HTO Installed Tritium Monitor provides real-time and continuous monitoring of tritium oxide in gases, ensuring safety and compliance with high sensitivity and reliability. Its advanced SAM HTO™ Membrane Separator technology ensures precise measurements without the need for frequent maintenance or replacement, reducing operational costs and environmental impact.

The C ionix - HTO is a state-of-the-art tritium monitor designed to maintain environmental safety and regulatory compliance. It offers real-time and continuous monitoring of tritium oxide in gases with noble gases compensation, providing immediate alerts and customizable alarm settings to quickly address any changes.

The monitor's advanced SAM HTO Membrane Separator technology ensures accurate and reliable measurements, even in complex gas mixes, without the need for frequent maintenance or replacement — minimizing operational downtime and avoiding the creation of contaminated waste.

FEATURES

- ✔ High Sensitivity and Reliability
  - Response time from 90 seconds
  - Detection of tritium from 20 kBq/m³ (0.5 µCi/m³)
- ✔ Automatic gamma compensation
- ✔ Real-Time Alerts
- ✔ Advanced Technology
- ✔ Low Maintenance
- ✔ Versatile Configuration
- ✔ Integrated Light and Sound Alarms
- ✔ User-Friendly Interface
- ✔ Environmental Tolerance

Easy to install and configure, the C ionix - HTO can be set up with various options, and connectivity methods, making it versatile for different environments. It features integrated light and sound alarms for immediate issue identification and a user-friendly interface with clear digital displays. The monitor can operate in a wide range of environmental conditions, ensuring consistent performance in diverse settings.

Specifications

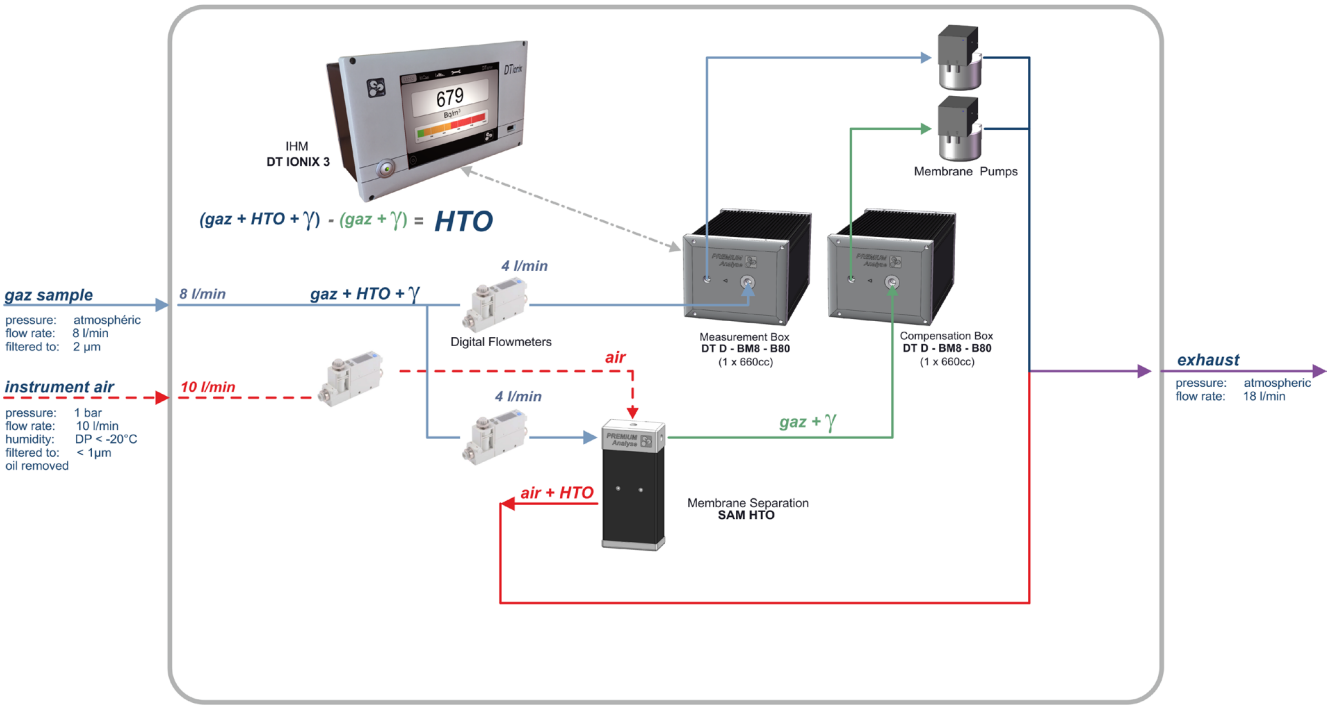
TECHNICAL CHARACTERISTICS

The C ionix monitors are available in several versions:

Measurement characteristics in laboratory conditions (given for tritium)	C IONIX 3 - BLH HTO measurement with automatic gamma compensation	C IONIX 3 - BMH HTO measurement with automatic gamma compensation
Measurement range of electronics	10 kBq/m³ to 10 TBq/m³ (0.27 *nCi/m³ to 270 Ci/m³*)	3.2 kBq/m³ to 3.2 TBq/m³ (*86 nCi/m³ to 86 Ci/m³*)
Limit of detection (2σ) of device	60 kBq/m³ (1.62 *µCi/m³*)	20 kBq/m³ (*0.5 µCi/m³*)
Precision	5% of measurement ± 60 kBq/m³ (*± 1.62 µCi/m³*)	5% of measurement ± 20 kBq/m³ (*± 0.5 µCi/m³*)
Maximum deviation	60 kBq/m³/year (*1.62 µCi/m³/year*)	20 kBq/m³/year (*0.5 µCi/m³/year*)
Noise (2σ)	± 60 kBq/m³ (*1.62 µCi/m³*)	± 20 kBq/m³ (*0.5 µCi/m³*)
Response time	< 90 sec for 90% of step	
Ionization chamber(s)		
Volume	2 x 195 cc	2 x 660 cc
Nominal flow rate	2 x 1 L/min	2 x 4 L/min

OPERATING CONDITIONS

- Humidity: < 95% relative, no condensation
- Operating temperature: +0 °C to +40 °C (+32 °F to 104 °F)
- Influence of humidity: ± 1 % of the measurement from 10 to 90% of relative humidity
- Influence of temperature: 0.3%/°C for a variation of the ambent temperature < 3°C/hour
- Influence of atmospheric pressure: 0.1%/mbar, hence ± 5% of the measurement from 930 to 1030 mbar
- Protection index: IP 54.



POSSIBLE CONFIGURATIONS

Each unit integrates a DT ionix 3 digital touch interface allowing local viewing of data through an intuitive menu:

- Four customizable alarm thresholds
- Digital display of volumetric activity
- Archiving of last 32 days of measurements
- Data extraction and system update via USB stick
- Adjustment and monitoring of the flow rate with low flow detection
- Graphical plotting of measurements and alarm values on a scale from 8 minutes to 8 days
- Choice of volumetric activity among 15 units, with four customizable ones (Bq/m³, RCA, DAC, Ci/m³...)
- Light and sound signals when pre-alarm (orange) and alarm (red) thresholds are exceeded, as well as good operation default
- Overall dimensions (with lights): 475 x 780 x 330 mm (18.7 x 30.7 x 13 in.) (W x H x D)
- Weight (max.): 36 kg (79 lb)
- Power supply, max. power and electrical protection:
  - Option “2”: 24 VDC, 60W, 6A fuse
  - Option “V”: 85–264 VAC, 50/60 Hz, 80W differential circuit breaker 6A curve C
- Possible options:
  - Remote beacon connection
  - Wall mounting on quick mounting plate
  - Ethernet Modbus TCP-IP Connectivity (x2)
  - Gas I.O via self-sealing Stäubli or Swagelok fittings
  - Process output with dry contact outputs, 4/20mA outputs...
  - High leak-tightness configuration (leak rate < 10^{-9} mbar.L.s^{-1})
  - Light and sound signals for alarms and good operation default

SAM - MEMBRANE SEPARATION DEVICE

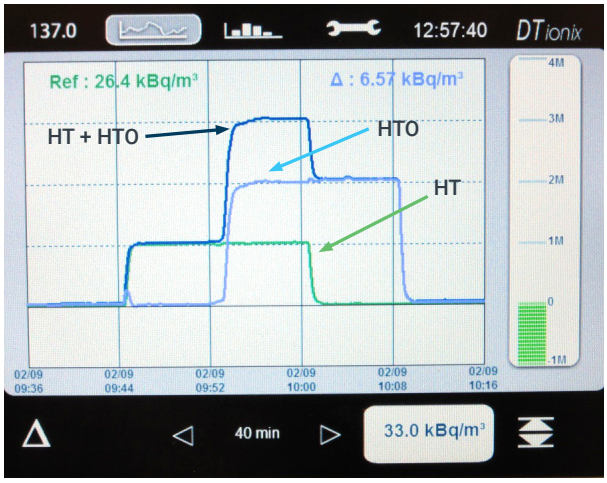
The SAM (Membrane Separator) provides the physical separation of tritium HTO from other gases.

It allows the activity measurement of tritium oxide HTO in a gas mix of HT + HTO, as well as the activity measurement of tritium oxide HTO in a gas mix of noble gases.

Unlike existing products on the market, it does not require replacement nor any maintenance hence does not create any contaminated waste.

Designed for continuous operation, it only requires dry instrument air to provide a precise and reliable measurement to research facilities as well as heavy water reactor facilities.

Integrated in the cabinet, the presence of this advanced device is transparent for the user. See the SAM HTO spec sheet for more information.



Injection of 1 MBq/m³ (27 µCi/m³) of tritium HT then 2 MBq/m³ (54 µCi/m³) of tritium HTO. The injection of HT is then stopped, and the injection of HTO is ceased thereafter.

UNIT CONFIGURATION AND PART NUMBERS

MONITOR CONFIGURATION AND OPTIONS CHOICE		
Measurement		C IONIX 3 - BLH - 0 - 00 - 00 - FA - F C IONIX 3 - BMH - 0 - 00 - 00 - FA - F
Power distribution	24V power supply AC power supply	C IONIX 3 - BXX - 2 - XX - XX - FA - F C IONIX 3 - BXX - V - XX - XX - FA - F
Alarms	Without light and sound Local alarms (G / R / O + sound) Remote beacon connector	C IONIX 3 - BXX - X - 0X - XX - FA - F C IONIX 3 - BXX - X - YX - XX - FA - F C IONIX 3 - BXX - X - XB - XX - FA - F
Connections	Process outputs (dry-contacts, 4-20mA, flow input) Modbus TCP-IP	C IONIX 3 - BXX - X - XX - PX - FA - F C IONIX 3 - BXX - X - XX - XM - FA - F
Wall fixing	Fixed system with Stäubli connectors Fixed system with Swagelok connectors Removable without wall plate (with handles & clip fixing) Lock	C IONIX 3 - BXX - X - XX - XX - FA - F C IONIX 3 - BXX - X - XX - XX - IA - F C IONIX 3 - BXX - X - XX - XX - AA - F C IONIX 3 - BXX - X - XX - XX - FA - F
Label	English French	C IONIX 3 - EXX - X - XX - XX - FA - E C IONIX 3 - EXX - X - XX - XX - FA - F
Reference example	C ionix monitor full option with automatic gamma compensation	C IONIX 3 - BMC - V - YB - PM - FA - F

ACCESSORIES	
Wall plate	ACC PLM
Fixed alarm beacon	CX3 ACC BAL F
Gas exhaust with silencer	ACC ARG SIL
RAC SWA 1/4RT gas exhaust + filter	ACC ARG S4F
Gas exhaust for 8 mm hose	ACC ARG S08
Gas exhaust for 6 mm hose	ACC ARG S06
Table frame for 1 C ionix - BXX	CX3 ACC CHM 01
Mobile frame for 2 C ionix - BXX	CX3 ACC CHM 02
Table frame for 1 C ionix - BXX	CX3 ACC CHM TAB

SPARE PARTS	
High leak-tigh pump assembly	CX3 SP BTR P6000

CONSUMABLES	
24V pumps 5.5 Lpm (x1*)	CX3 SP PPE
IP 54 foam filter (x2*)	SP 60715 182
Cabinet fan (x1*)	SP 8414N
DT ionix axial fan (x1*)	SP 412F
DT ionix axial fan mounted on support (x1*)	SP 412F P
2µm PTFE filter (x1*)	CX3 SP FE 4

* quantity needed for annual maintenance of monitor

MIRION TECHNOLOGIES

SPC-59-EN-C_A4 – 03/2026

MIRION TECHNOLOGIES

PREMIUM ANALYSE™

SAM HTO™

Membrane Separator

The SAM HTO Membrane Separator offers a maintenance-free, waste-free solution for accurately separating tritium HTO from mixed gases, making it ideal for stack monitoring and process surveillance where a live HT / HTO discrimination is required.

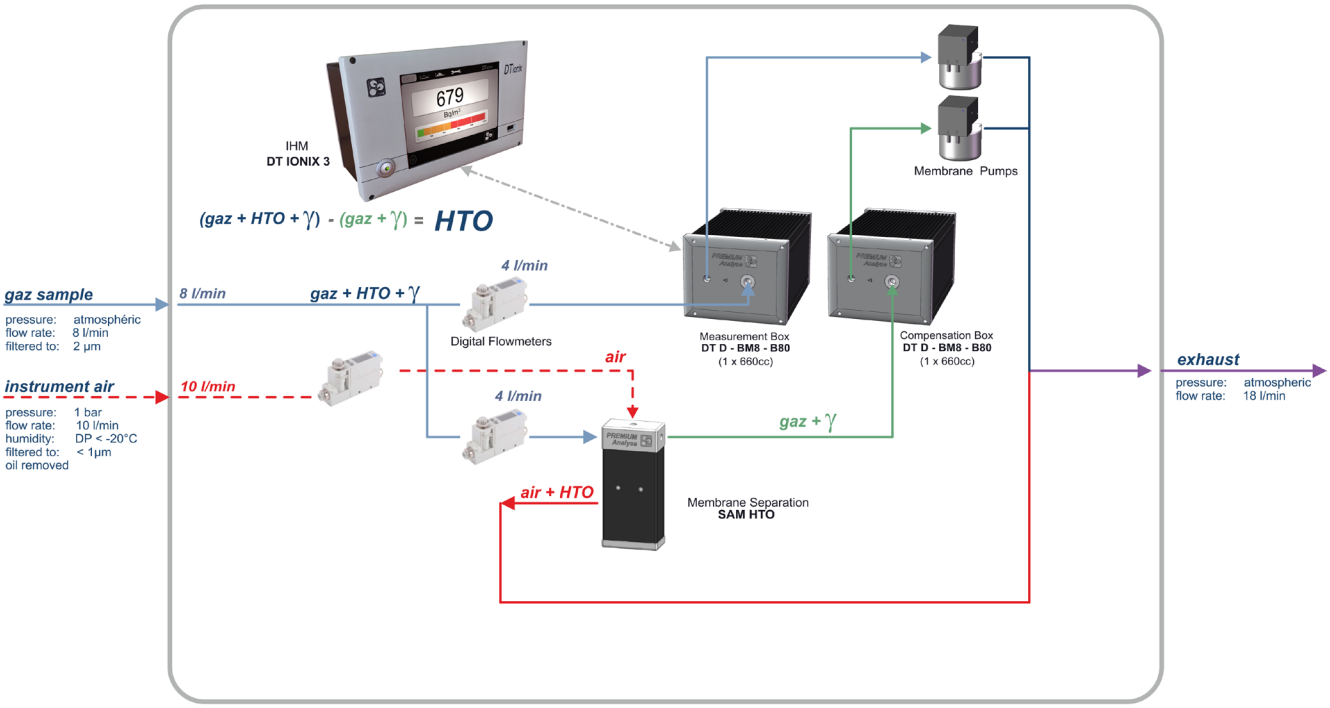
The SAM HTO Membrane Separator is specifically engineered for the physical separation of tritium HTO (Tritiated Water) from other gases. It is particularly useful for measuring tritium activity in the form of HTO in a mixture of HT (Tritium Gas) and / or other beta emitters (such as Fission Product Noble Gases – FPNG) and HTO, or for measuring the activity of noble gases after HTO has been removed.

This separator includes a user-friendly design and integrates seamlessly with Mirion tritium monitors, requiring no user handling. Offering reliable and maintenance-free continuous measurement, the SAM HTO Membrane Separator is a highly valuable and efficient solution for tritium measurement.

FEATURES

- Simple, reliable tritium HTO gas separation
- Seamless integration with tritium monitors
- No user handling required
- Reliable and maintenance-free
- Continuous measurement
- Suitable for stack monitoring and process surveillance

SCHEMATIC DRAWING



Injection of 1 MBq/m³ (27 µCi/m³) tritium in the form of HT, then of 2 MBq/m³ (54 µCi/m³) of tritium in the form of HTO. The injection of HT is then stopped and finally the injection of HTO is stopped.

MIRION TECHNOLOGIES

MIRION TECHNOLOGIES

PREMIUM ANALYSE™

C ionix™ - GN

Installed Noble Gas Monitor with Dynamic HTO Compensation

The C ionix - GN Installed Noble Gas Monitor offers high sensitivity and reliability for real-time monitoring of other beta emitters in gases, ensuring continuous surveillance and safety in research facilities and heavy water reactors.

The C ionix - GN is a robust system for monitoring continuous and accurate measurement of tritium and beta emitters in noble gases. It features self-checking, automatic gamma compensation, a 90-second response time, and integrated light and sound alarms.

The monitor is user-friendly, easy to install, and supports dry contacts and Ethernet Modbus connectivity for seamless integration into existing systems. It uses a SAM HTO™ Membrane Separator to ensure no additional waste is created and no periodical consumable replacement is needed.

FEATURES

Performance:

- ✓ High sensitivity and reliability
- ✓ Self-checking
- ✓ Continuous monitoring capabilities
- ✓ Automatic gamma compensation
- ✓ Response time from 90 seconds
- ✓ Integrated light and sound alarms
- ✓ Simple and ready to install
- ✓ User-friendly interface
- ✓ Dry contacts, Ethernet Modbus connectivity

Easy Maintenance:

- ✓ Minimal intervention
- ✓ Quick change components
- ✓ Simple source verification of system
- ✓ No additional waste creation
- ✓ No need for periodical consumable replacement

Specifications

UNIT CONFIGURATION AND PART NUMBERS

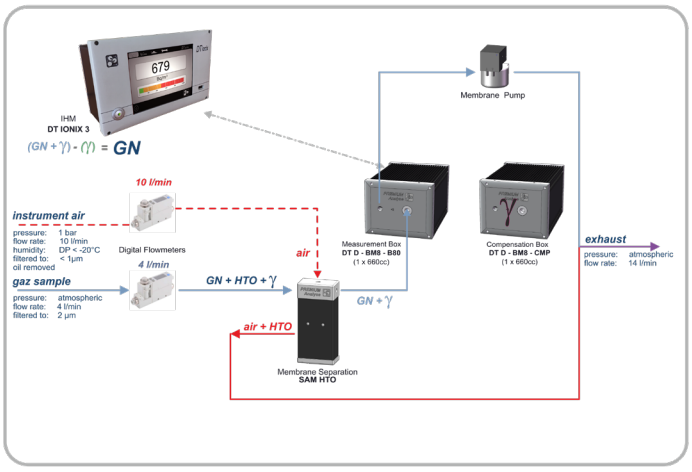
MONITOR CONFIGURATION AND OPTIONS CHOICE		
Measurement monitor		C IONIX 3 - BLG - 0 - 00 - 00 - FA - F C IONIX 3 - BMG - 0 - 00 - 00 - FA - F
Power distribution	24V power supply AC power supply	C IONIX 3 - BXX - 2 - XX - XX - FA - F C IONIX 3 - BXX - V - XX - XX - FA - F
Alarms	Without light and sound Local alarms (G / R / O + sound) Remote beacon connector	C IONIX 3 - BXX - X - 0X - XX - FA - F C IONIX 3 - BXX - X - YX - XX - FA - F C IONIX 3 - BXX - X - XB - XX - FA - F
Connections	Process outputs (dry-contacts, 4-20mA, flow input) Modbus TCP-IP	C IONIX 3 - BXX - X - XX - PX - FA - F C IONIX 3 - BXX - X - XX - XM - FA - F
Wall fixing	Fixed system with Stäubli connectors Fixed system with Swagelok connectors Removable without wall plate (with handles & clip fixing) Lock	C IONIX 3 - BXX - X - XX - XX - FA - F C IONIX 3 - BXX - X - XX - XX - IA - F C IONIX 3 - BXX - X - XX - XX - AA - F C IONIX 3 - BXX - X - XX - XX - FA - F
Label	English French	C IONIX 3 - EXX - X - XX - XX - FA - E C IONIX 3 - EXX - X - XX - XX - FA - F
Reference example	C ionix monitor full option with automatic gamma compensation	C IONIX 3 - BMC - V - YB - PM - FA - F

ACCESSORIES	
Wall plate	ACC PLM
Fixed alarm beacon	CX3 ACC BAL F
Gas exhaust with silencer	ACC ARG SIL
RAC SWA 1/4RT gas exhaust + filter	ACC ARG S4F
Gas exhaust for 8 mm hose	ACC ARG S08
Gas exhaust for 6 mm hose	ACC ARG S06
Table frame for 1 C ionix - BXX	CX3 ACC CHM 01
Mobile frame for 2 C ionix - BXX	CX3 ACC CHM 02
Table frame for 1 C ionix - BXX	CX3 ACC CHM TAB

SPARE PARTS	
High leak-tigh pump assembly	CX3 SP BTR P6000

CONSUMABLES	
24V pumps 5.5 Lpm (x1*)	CX3 SP PPE
IP 54 foam filter (x2*)	SP 60715 182
Cabinet fan (x1*)	SP 8414N
DT ionix axial fan (x1*)	SP 412F
DT ionix axial fan mounted on support (x1*)	SP 412F P
2µm PTFE filter (x1*)	CX3 SP FE 4

* quantity needed for annual maintenance of monitor



MIRION TECHNOLOGIES

MIRION TECHNOLOGIES

PREMIUM ANALYSE™

C ionix™ - EXX

Installed Tritium Monitor

The C ionix - EXX provides real-time, reliable tritium and other beta emitters monitoring with quick response times and integrated alarms, ensuring workplace safety and environmental compliance.

The C ionix - EXX is a reliable tritium monitor that provides real-time and continuous measurements of tritium and other beta emitters in gases. It is designed for easy installation and maintenance, in a compact, wall-mounted form factor. The monitor features integrated light and sound alarms to alert users when pre-alarm and alarm thresholds are exceeded, and a user-friendly digital touch interface for convenient data viewing.

This monitor is well-suited for various applications, such as workplace monitoring, decommissioning, and stack release. It ensures safety and compliance with rapid response time and automatic gamma radiation compensation, making it a valuable tool in environments where tritium levels need to be closely monitored.

The monitor can optionally automatically adjust to the gamma environment using a compensation detector that can be installed.

FEATURES

- ✓ High Sensitivity and Reliability
  - – Response time from three minutes
  - – Detection of tritium from 10 kBq/m³ (0.5 µCi/m³)
- ✓ Real-Time Light and Sound Alerts
- ✓ Advanced Technology
- ✓ Low Maintenance
- ✓ Versatile Configuration
- ✓ User-Friendly Interface
- ✓ Environmental Tolerance

Specifications

TECHNICAL CHARACTERISTICS

The C ionix - EXX monitors are available in several versions:
The versions below have been developed for real-time and continuous measurement of tritium activity and other β emitters in gases:

Measurement characteristics in laboratory conditions (for tritium)	C IONIX 3 - EXM Tritium measurement with manual gamma compensation	C IONIX 3 - EXC Tritium measurement with automatic gamma compensation
Measurement range of electronics	2 kBq/m³ to 2 TBq/m³ *(54 nCi/m³ to 54 Ci/m³)*	2 kBq/m³ to 2 TBq/m³ *(54 nCi/m³ to 54 Ci/m³)*
Limit of detection (2σ) of device	10 kBq/m³ (0.27 *µCi/m³*)	15 kBq/m³ (*0.4 µCi/m³*)
Precision	5% of measurement ± 10 kBq/m³ *(± 0.27 µCi/m³)*	5% of measurement ± 15 kBq/m³ *(± 0.4 µCi/m³)*
Maximum deviation	10 kBq/m³/year (*0.27 µCi/m³/year*)	15 kBq/m³/year (*0.4 µCi/m³/year*)
Noise (2σ)	± 10 kBq/m³ (*0.27 µCi/m³*)	± 15 kBq/m³ (*0.4 µCi/m³*)
Response time	< 3 min at 90% of step	
Ionization chamber(s)		
Volume	4 200 cc	2 x 4 200 cc
Nominal flow rate	20 L/min	

OPERATING CONDITIONS

- Humidity: < 95% relative, no condensation
- Operating temperature: +0 °C to +40 °C (+32 °F to 104 °F)
- Influence of humidity: ± 1 % of the measurement from 10 to 90% of relative humidity
- Influence of temperature: 0.3%/°C for a variation of the ambient temperature < 3°C/hour
- Influence of atmospheric pressure: 0.1%/mbar, hence ± 5% of the measurement from 930 to 1030 mbar
- Protection index: IP 54

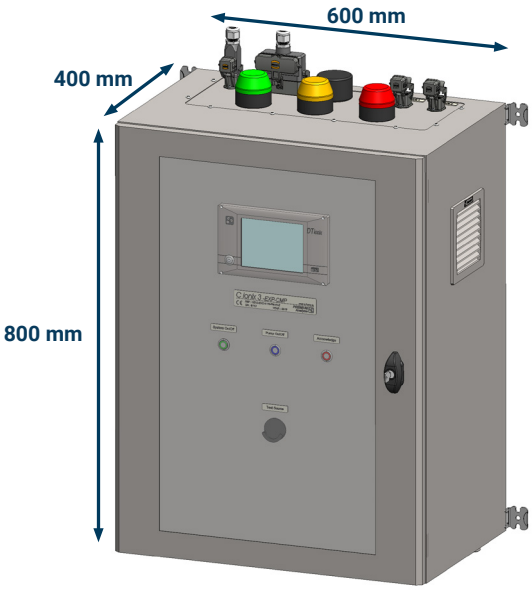
COMMON CHARACTERISTICS

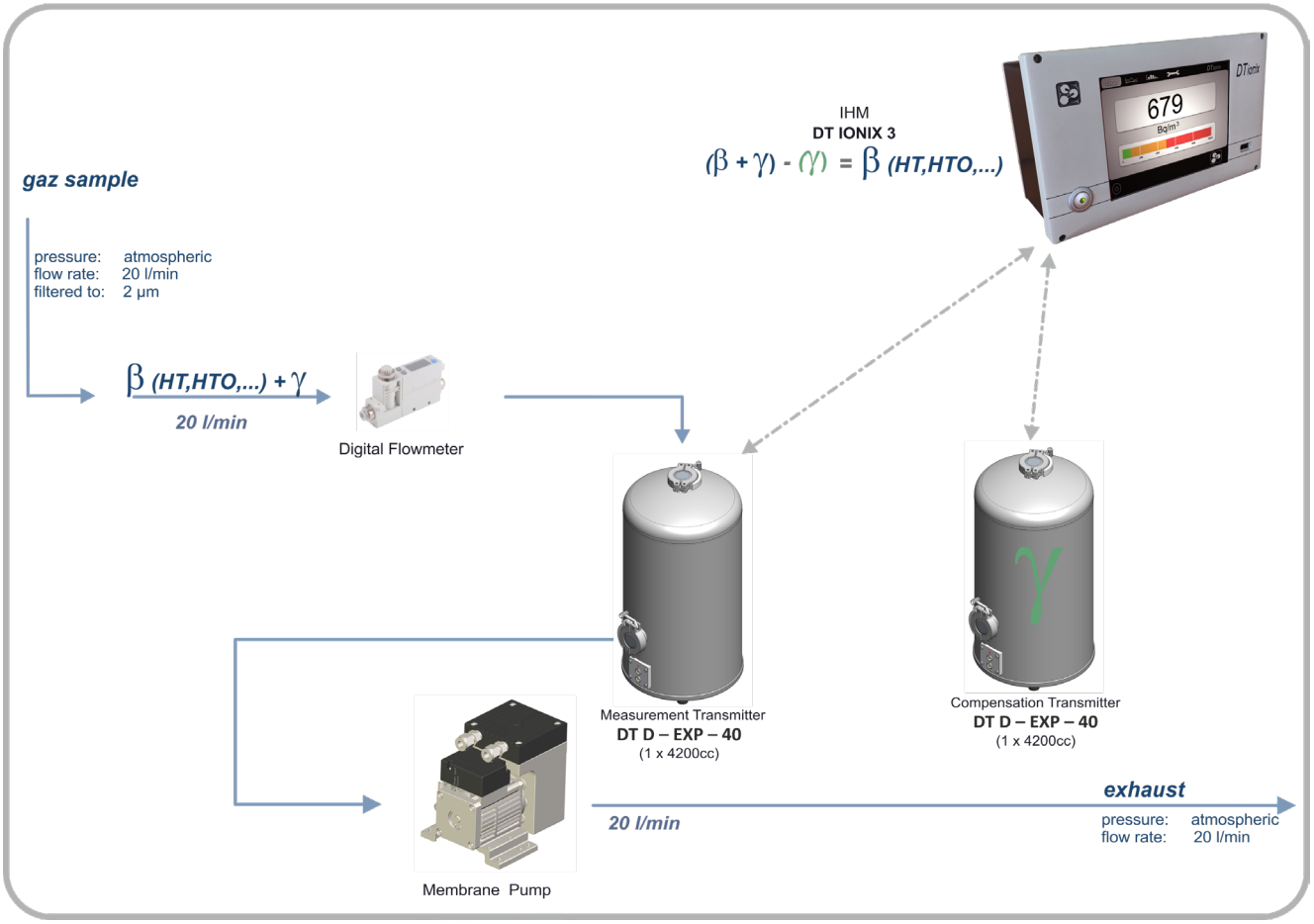
Each unit integrates a DT ionix 3 digital touch interface allowing local viewing of data through an intuitive menu:

- Four customizable alarm thresholds
- Digital display of volumetric activity
- Archiving of last 32 days of measurements
- Data extraction and system update via USB stick
- Adjustment and monitoring of the flow rate with low flow detection
- Graphical plotting of measurements and alarm values on a scale from 8 minutes to 8 days
- Choice of volumetric activity among 15 units, with four customizable ones (Bq/m³, RCA, DAC, Ci/m³...)
- Light and sound signals when pre-alarm (orange) and alarm (red) thresholds are exceeded, as well as good operation default

POSSIBLE CONFIGURATIONS

- Overall dimensions (with lights): 600 x 800 x 400 mm (23.6 x 31.5 x 15.7 in.) (W x H x D)
- Weight (max.): 80 kg (177 lb)
- Power supply, max. power and electrical protection:
  - Option “2”: 24 VDC , 120W, 6A fuse
  - Option “V”: 85–264 VAC, 50/60 Hz, 120W differential circuit breaker 6A curve C
- Possible options:
  - Remote beacon connection
  - Wall mounting on quick mounting plate
  - Ethernet Modbus TCP-IP Connectivity (x2)
  - Process output with dry contact outputs, 4/20mA outputs...
  - Light and sound signals for alarms and good operation default





Fluid schematic for a C IONIX 3 - EXC

UNIT CONFIGURATION AND PART NUMBERS

MONITOR CONFIGURATION AND OPTIONS CHOICE		
Measurement	Manual gamma compensation Automatic gamma compensation	C IONIX 3 - EXM - 0 - 00 - 00 - FA - F C IONIX 3 - EXC - 0 - 00 - 00 - FA - F
Power distribution	24V power supply AC power supply	C IONIX 3 - EXX - 2 - XX - XX - FA - F C IONIX 3 - EXX - V - XX - XX - FA - F
Alarms	Without light and sound Local alarms (G / R / O + sound) Remote beacon connector	C IONIX 3 - EXX - X - 0X - XX - FA - F C IONIX 3 - EXX - X - YX - XX - FA - F C IONIX 3 - EXX - X - XB - XX - FA - F
Connections	Process outputs (dry-contacts, 4-20mA, flow input) Modbus TCP-IP	C IONIX 3 - EXX - X - XX - PX - FA - F C IONIX 3 - EXX - X - XX - XM - FA - F
Label	English French	C IONIX - EXX - X - XX - XX - FA - E C IONIX - EXX - X - XX - XX - FA - F
Reference example	C ionix monitor full option with automatic gamma compensation	C IONIX 3 - EXX - V - YB - PM - FA - F

ACCESSORIES	
2µ anti-dust filter + Stäubli	ACC F2T S
2µ anti-dust filter + Silencer	ACC F2T
Installed alarm beacon	CX3 ACC BAL F
Gas connector with silencer	ACC ARG SIL
Gas connector for 8 mm hose	ACC ARG S08
Mobile support 1 C ionix - EXX	CEX3 ACC CHM 01

CONSUMABLES	
Maintenance kit for pump (*x1/2)	SP KIT N838
Spare pump (*x1/2)	CEX3 SP PPE
DT ionix axial fan (x1*)	SP 412F
DT ionix axial fan mounted on support (x1*)	SP 412F P
Cabinet fan (x1*)	SP 4314
IP55 filter (*x2)	SP 60715 187
HEPA filter (*x1)	SP CFL THE
2µ filter (*x1)	SP 90F0002
O-ring (*x1)	SP 90F0040
Flat seal (*x1)	SP 90F0048

* quantity needed for annual maintenance of monitor

MIRION TECHNOLOGIES

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PREMIUM ANALYSE™

ACC CMD™

Remote Measurement Case

The ACC CMD Remote Measurement Case provides high-sensitivity, real-time monitoring of tritium and other beta emitters, essential for critical applications like workplace monitoring and decommissioning. Its compact design, integrated alarms, and user-friendly interface ensure easy installation and immediate alerts, enhancing safety and operational efficiency.

The ACC CMD Remote Measurement Case is a high-sensitivity and reliable device specifically designed for the real-time monitoring of tritium and other beta emitters in gases. It features a compact and wall-mountable design, making it suitable for various applications including workplace monitoring, decommissioning, and stack release. The device includes a 304L stainless steel ionization chamber with a volume of 660 cc as well as a sampling membrane pump, ensuring robust and accurate measurements.

The integrated DT ionix™ 3 digital touch interface provides a user-friendly way to view local data, set customizable alarm thresholds, and access data archiving for the last 32 days.

FEATURES

- Self-checking and continuous measurement
- Integrated light and sound alarms
- Fast response time: from 90 seconds
- High sensitivity
- User-friendly interface
- Customizable alarm thresholds
- Data archiving
- Compact and wall-mountable

With a response time from 90 seconds and a tritium sensitivity from 15 kBq/m^3 (0.4 µCi/m^3) the ACC CMD Remote Measurement Case is a powerful tool for environmental and safety monitoring, requiring minimal maintenance and intervention.

Specifications

GENERAL CHARACTERISTICS

- Dimensions: 400 x 300 x 200 mm (w x h x d)
- Weight: 12 kg
- Gas connection: Swagelok 6 mm

PERFORMANCES (FOR TRITIUM IN AIR, LAB CONDITIONS)

Characteristics	
Measurement range of electronics	3.2 kBq/m³ to 3.2 TBq/m³ (*86 nCi/m³ to 86 Ci/m³*)
Limit of detection (2σ) of device	15 kBq/m³ (*0.4 µCi/m³*)
Precision	5% of measurement ± 15 kBq/m³ (*± 0.4 µCi/m³*)
Maximum deviation	15 kBq/m³/year (*0.4 µCi/m³/year*)
Noise (2σ)	15 kBq/m³ (*0.4 µCi/m³*)
Response time	< 90 sec for 90% of step
Nominal flow rate	4 L/min

COMMON CHARACTERISTICS

Each unit integrates a DT ionix 3 digital touch interface allowing local viewing of data through an intuitive menu:

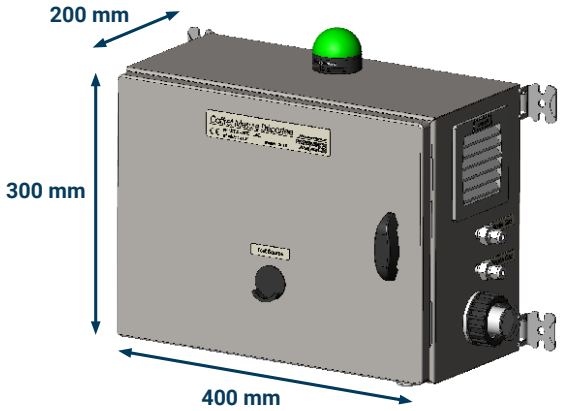
- Four customizable alarm thresholds
- Digital display of volumetric activity
- Archiving of last 32 days of measurements
- Data extraction and system update via USB stick
- Adjustment and monitoring of the flow rate with low flow detection
- Graphical plotting of measurements and alarm values on a scale from 8 minutes to 8 days
- Choice of volumetric activity among 15 units, with 4 customizable ones (Bq/m³, RCA, DAC, Ci/m³...)
- Light and sound signals when pre-alarm (orange) and alarm (red) thresholds are exceeded, as well as good operation default

IONIZATION CHAMBER

- Material: 304L stainless steel electropolished
- Volume: 660 cc

OPERATING CONDITIONS

- Humidity: < 95% relative, no condensation.
- Operating temperature: +0 °C to +40 °C (+32 °F to 104 °F)
- Influence of humidity: ± 1 % of the measurement from 10 to 90% of relative humidity
- Influence of temperature: 0.3% /°C for a variation of the ambient temperature < 3°C / hour
- Influence of atmospheric pressure: 0.1 %/mbar, hence ± 5 % of the measurement from 930 to 1030 mbar



MIRION TECHNOLOGIES

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PREMIUM ANALYSE™

M ionix 3™

Mobile Tritium Monitor

The M ionix 3 Mobile Tritium Monitor offers reliable real-time monitoring of tritium and other beta emitters in gases across applications including radioprotection, process monitoring, environmental monitoring, laboratory use, and decommissioning job surveillance. With continuous surveillance and light and sound alarms, it bolsters radiological protection for personnel.

Designed for reliable operation, the M ionix 3 Mobile Tritium Monitor is easy to install, user-friendly and requires minimal intervention. It offers high sensitivity with tritium detection from 20 kBq/m^3 (0.5 µCi/m^3). This monitor is ideal for use during construction, dismantling or as a temporary replacement of a fixed monitor.

Advanced features like a HEPA filtration system, a digital touchscreen interface, and a beta activity transmitter with a low noise preamplifier, further enhance its performance and user experience. A mobile design, including lifting rings, carrying handles, and a rugged aluminum casing, makes it easy to deploy and transport.

FEATURES

- Self-checking and continuous measurement
- Response time <3 minutes
- Integrated light and sound alarms
- Capability for automatic gamma compensation
- Tritium detection from 20 kBq/m^3 (0.5 µCi/m^3)
- Easy install, with minimal intervention needs
- Easily mobile with lifting rings and carrying handles
- Rugged and user friendly

Integrated light and sound alarms, data archiving, and graphical plotting capabilities enable real-time alerts for quick response and effective measurements analysis. Whether used as a temporary replacement for fixed monitors or for critical surveillance during decommissioning, the M ionix 3 is a practical and reliable solution for maintaining safety in environments where tritium is present.

Specifications

TECHNICAL CHARACTERISTICS

The mobile M ionix 3 monitors are available in several versions.
The versions below are intended for real-time and continuous measurement of tritium activity and other β emitters in gases:

Measurement characteristics in laboratory conditions (for tritium)	M IONIX 3 - XC Measurement with automatic gamma compensation	M IONIX 3 - X0 Measurement without automatic gamma compensation
Measurement range of electronics	2.1 kBq/m³ to 2.1 TBq/m³ *(54 nCi/m³ to 54 Ci/m³)*	2.1 kBq/m³ to 2.1 TBq/m³ (*54 nCi/m³ to 54 Ci/m³*)
Limit of detection (2σ) of device	20 kBq/m³ *(0.5 µCi/m³)*	20 kBq/m³ (*0.5 µCi/m³*)
Precision	5% of measurement ± 20 kBq/m³ (*± 0.5 µCi/m³*)	5% of measurement ± 20 kBq/m³ (*± 0.5 µCi/m³*)
Maximum deviation	20 kBq/m³/year (*0.5 µCi/m³/year*)	20 kBq/m³/year (*0.5 µCi/m³/year*)
Noise (2σ)	± 20 kBq/m³ (*0.5 µCi/m³*)	± 20 kBq/m³ (*0.5 µCi/m³*)
Response time	< 3 min for 90% of step	
Ionization chamber(s)		
Volume	4 200 cc	2 x 4 200 cc
Nominal flow rate	20 L/min	

OPERATING CONDITIONS

- Humidity: < 95% relative, no condensation
- Operating temperature: +0 °C to +40 °C (+32 °F to 104 °F)
- Influence of humidity: ± 1 % of the measurement from 10 to 90% of relative humidity
- Influence of temperature: 0.3%/°C for a variation of the ambient temperature < 3°C/hour
- Influence of atmospheric pressure: 0.1 %/mbar, hence ± 5 % of the measurement from 930 to 1030 mbar.

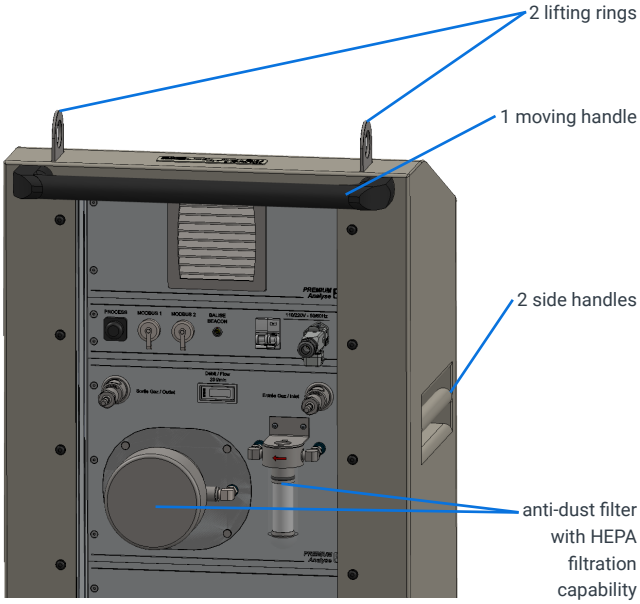
COMMON CHARACTERISTICS

Each unit integrates a DT ionix 3 digital touch interface allowing local viewing of data through an intuitive menu:

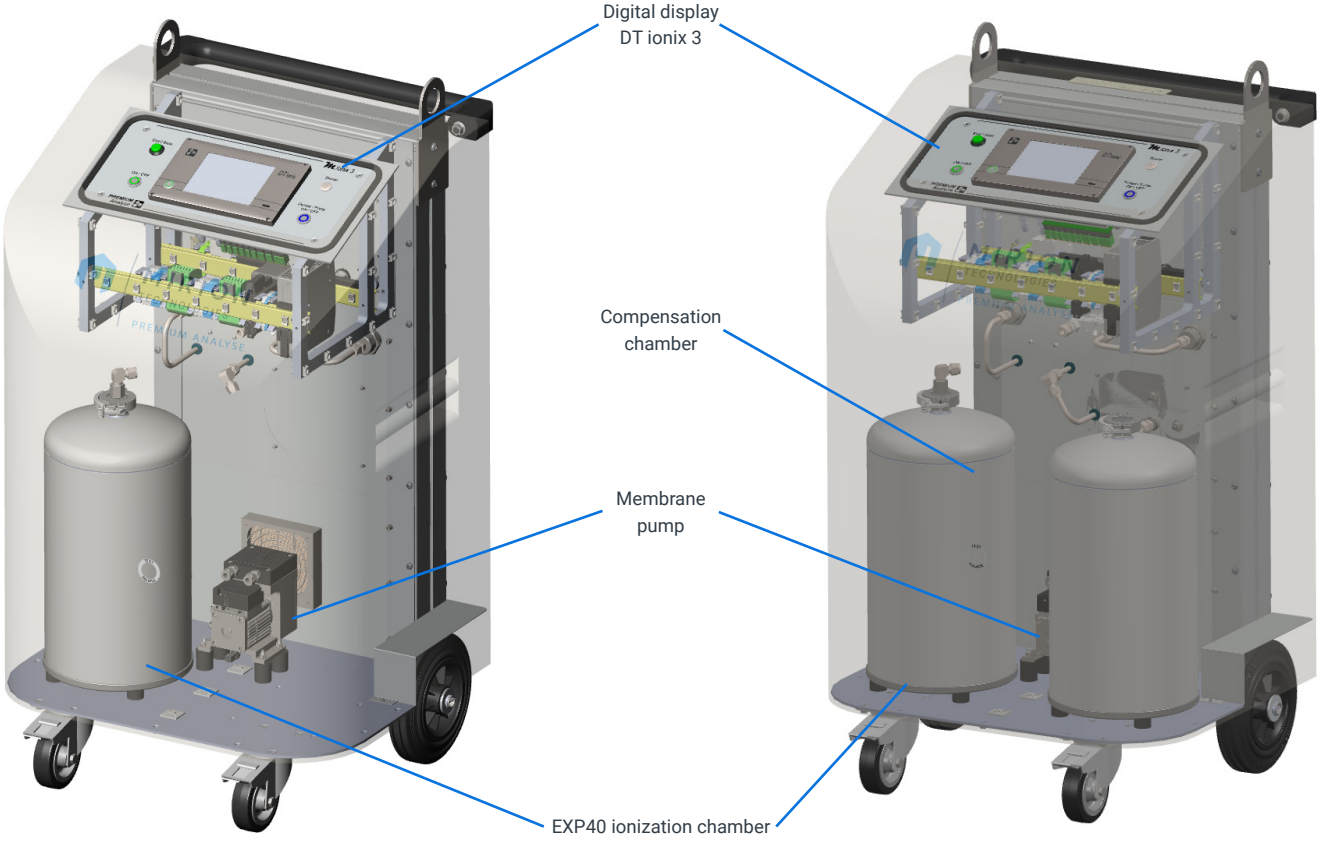
- Low flow detection
- Four customizable alarm thresholds
- Digital display of volumetric activity
- Archiving of last 32 days of measurements
- Data extraction and system update via USB stick
- Graphical plotting of measurements and alarm values on a scale from 8 minutes to 8 days
- Choice of volumetric activity among 15 units, with four customizable ones (Bq/m³, RCA, DAC, Ci/m³...)
- Light and sound signals when pre-alarm (orange) and alarm (red) thresholds are exceeded, as well as good operation default.

POSSIBLE CONFIGURATIONS

- Global characteristics:
  - Dimensions: 600 x 1000 x 500 mm (23.6 x 39.4 x 19.7 in.) (W x H x D)
  - Weight (approx.): 70 kg (154 lb)
  - Gas I/O via self-sealing Stäubli connectors
  - Alarms: 2 beacon outputs (24 V / 80 mA per signal)
  - Network: Ethernet Modbus connection via RJ45 connector
  - Process: dry-contacts available
- Electrical characteristics:
  - Max power: 120 W
  - Power supply: 85 - 264VAC, 50/60Hz
  - Electrical protection: 6A differential breaker with C curve
- Optional feature:
  - Remote alarm beacon
- Filtration:
  - “FX”: 20µ anti-dust filtration
  - “TX”: High efficiency HEPA filtration
- Measurement:
  - “X0”: With flowmeter and simple measurement
  - “XC”: With flowmeter and compensation chamber for automatic γ compensation



TX Version



X0 Version

XC Version

ACCESSORIES AND PART NUMBERS

MONITOR CONFIGURATION AND OPTIONS CHOICE		
Measurement		**M IONIX 3 - X0** **M IONIX 3 - XC**
Filtration	Anti-dust filter HEPA filter	**M IONIX 3 - FX** **M IONIX 3 - TX**
Label	With direct measurement With compensation chamber	**M IONIX 3 - X0** **M IONIX 3 - XC**
Reference example	M ionix mobile tritium monitor with anti-dust filtration, gamma compensation, pump, integrated digital flowmeter and compensation chamber	**M IONIX 3 - FC**

ACCESSORIES	
Portable alarm beacon	**ACC BAL P**
Gas connector for 8 mm hose	**ACC ARG S08**
5 m sampling hose	**MIX ACC TUY 05 S**
10 m sampling hose	**MIX ACC TUY 10 S**

CONSUMABLES	
M ionix 3 pump	**MX3 SP PPE**
Maintenance kit for pump	**SP - KITMAINT N838**
Teflon filter 2 µ	**SP 90F0002**
Viton o-ring type 26	**SP 90F0040**
HEPA filter	**SP 32051100**
Ventilation filter	**SP 0715 187 (x 2 required)**
DT ionix axial fan	**SP 412F**
DT ionix axial fan mounted on support	**SP 412F P**
Case fan	**SP 4314**

MIRION
TECHNOLOGIES

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PREMIUM ANALYSE™

DT ionix 3™

Human-Machine Interface

The DT ionix 3 provides a user-friendly and advanced interface for real-time tritium detection, offering efficient data management, customizable alarms, and versatile connectivity options, making it an indispensable tool for both mobile and fixed tritium monitoring systems.

The DT ionix 3 Human-Machine Interface manages and analyzes signals from all Mirion tritium monitors to enable precise and reliable detection of tritium in various environments. Equipped with a color touchscreen and intuitive menus, it offers a user-friendly experience that simplifies navigation and interaction for all users.

The interface provides real-time monitoring of volumetric activity, displaying tritium levels instantly to enable quick and informed decision-making. The device supports multiple connectivity options, including Modbus TCP/IP, 4-20mA inputs/outputs, and USB.

The DT ionix 3 features a robust data archiving system, capable of storing up to 32 days of measurement data — ensuring that historical records are readily available for analysis and reporting.

The interface also includes customizable alarm thresholds with clear visual and auditory signals, allowing operators to set specific alert levels and reduce false positives. The ability to adjust and monitor flow rates, along with differential measurement to compensate for external influences like gamma radiation, further enhances the accuracy and reliability of tritium activity readings.

Whether used in mobile or installed applications, the DT ionix 3 is a versatile and efficient tool that meets the demanding needs of continuous tritium monitoring.

FEATURES

- User-friendly color touchscreen with intuitive menus
- Real-time tritium activity display and remote data monitoring
- 32 days of archived measurement data
- Customizable alarms with light and sound signals
- Manual offset for gamma compensation and external influences
- Histogram and graphic plotting of measurements
- Flow rate adjustment and differential measurement
- Multiple connectivity options: 2 Modbus / TCP-IP Ethernet, 4/20mA I/O, and 5 dry-contact outputs
- Front panel USB for data extraction and system updates

Specifications

CHARACTERISTICS

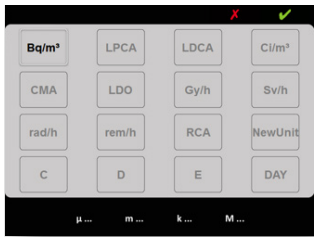
- Weight: 1.8 kg (4 lb)
- Dimensions: 9½” drawer (213 mm) x 3U (128.42 mm) x 81 mm
- Power supply: 9 to 36Vdc – 30W
- Mains connector: 110/220V – 50/60Hz – 12VDc – 180W (supplied)
- Humidity: < 95% relative, without condensation
- Temperature of use: from -10 to +40 °C (14 to 104 °F)
- Axial fan, 8 m^3/h, easily replaceable

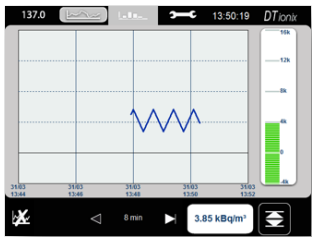
FEATURES

- Four customizable alarm thresholds
- Digital display of volumetric activity
- Color touchscreen with intuitive menus
- 32 days of measurement data archived in spreadsheet format
- Data extraction and system update via USB
- Display of volumetric activity with bar chart showing alarm thresholds
- Possibility for manual offset for gamma compensation and external influences
- Graphic plotting of measurements and alarm values from 8 minutes to 8 days
- Adjustment and monitoring of the flow rate with capability to detect low flow
- Capability for differential measurement (with reference or gamma compensation detector)
- Choice of volumetric activity among 15 units, with four customizable ones (Bq/m^3, RCA, DAC, Ci/m^3...)
- Light and sound signals when pre-alarm (orange) and alarm (red) thresholds are exceeded, as well as a default operation
- Histogram of integrated activities, on 1h, 1 day, 1 month taking the flow in consideration, triggered locally of from the supervision
- Configuration, visualization of state and testing detector, alarms, inputs/outputs etc via Modbus protocol (two independent connections)

INPUTS/OUTPUTS

- Connection for 1 or 2 high resolution preamplifier (power supply and communication)
- 2 x 4-20 mA analogue inputs customizable
- 2 x 4-20 mA analogue outputs customizable
- 5 dry-contact 24V/1A outputs (4 alarm thresholds, one proper functioning)
- 4 output signals 24V/100mA for the management of G/Y/R and sound alarms
- 2 pump control outputs
- Data extraction via front panel USB port
- 2 Modbus / TCP-IP Ethernet connections





MIRION TECHNOLOGIES

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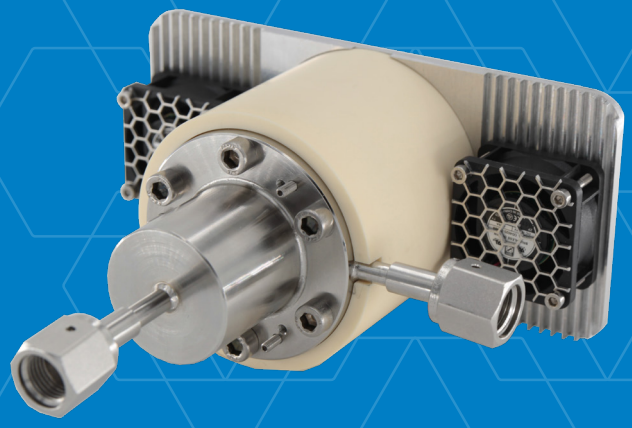
PREMIUM ANALYSE™

DT D - MC10™

10 cc Tritium Detector



The DT D - MC10 10-cc Tritium Detector offers reliable and precise high tritium activity measurement, essential for research and process monitoring. Its robust design ensures performance in challenging environments. It is ideal for laboratory research and civil and military research applications, including nuclear fusion, that require measurement of high tritium activity.

The DT D - MC10 Tritium Detector is a high-performance ionization chamber designed for continuous and precise measurement of high tritium activities in dry gases. It measures a wide range of tritium activities, from 1 MBq/m³ (27 µCi/m³), and responds quickly with a 90% step response in under 90 seconds.

Constructed from electropolished 316L stainless steel, it is durable and can be decontaminated by baking at temperatures up to 500°C.

The detector can handle mechanical pressures and operation in a dry carrying gas environment within a wide temperature range (+0 °C (+32 °F) to +40 °C(+104 °F)). It can connect to the DT ionix 3™ touchscreen interface via a preamplifier, offering advanced features like graphical data plotting, data extraction via USB, Modbus communication, and dry contact outputs.

FEATURES

- Continuous measurement for real-time monitoring
- Fast response time from 90 seconds
- Small-size ionization chamber (10 cc)
- No maintenance
- Quick and easy setup
- Reliability with decontaminable properties
- Precise and stable measurements
- Enhanced functionality when connected to the DT ionix 3™ interface via preamplifier

Device manufactured under exploitation license for CEA patent - L26218
Device registered as dual-use n°1B231 regulation (CE) 2021/821 Appendix IV

Specifications

GENERAL CHARACTERISTICS

- Dimensions: 200 x 80 x 200 mm (w x h x d)
- Weight: 1,800 g
- Gas connection 1/4” VCR, silver plated gaskets.
- Leak rate less than 1.10-11 mbar.L.s^{-1}

HEATING RESISTANCE

- Heating resistance: 220V - 400 W
- Thermocouple connector: female connector for type J thermocouple on regulator
- Power supply: 220V / 50Hz IEC baseplate C14, integrated mains filter, 2x2A 5x20mm fuses for shortcut protection
- Heating resistance connector: 3 pins Ampenol baseplate. Delivered with additional connectors for extension cable
- Fan on dissipator powered by ACC ALIM 24V E (supplied):

OPERATING CONDITIONS

- Humidity: dry carrying gas
- Baking temperature: up to 500°C continuously
- Operating temperature: +0 °C to +40 °C (+32 °F to 104 °F)
- Influence of humidity: ± 1% of the measurement from 10 to 90% of relative humidity
- Influence of temperature: 0.3%/°C for a variation of the ambient temperature < 3°C/hour
- Influence of atmospheric pressure: 0.1%/mbar, hence ± 5% of the measurement from 930 to 1030 mbar

IONIZATION CHAMBER

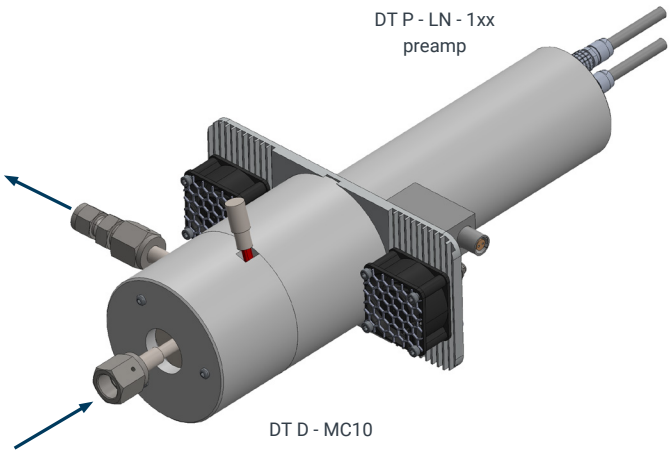
- Material: electropolished 316L stainless steel
- Ionizing volume: 9.28 cc
- Circulation chamber: 48 cc
- Mechanical pressure: 10 bars abs

PERFORMANCES *(For tritium in air, lab conditions)*

Associated preamp	DT P - LN - 1B8	DT P - LN - 1A7	DT P - LN - 196
Measurement range of electronics	190 kBq/m³ to 190 TBq/m³ *(5.13 µCi/m³ to 5.13 Ci/m³)*	1.9 MBq/m³ to 1.9 PBq/m³ *(51.3 µCi/m³ to 51.3 Ci/m³)*	19 MBq/m³ to 19 PBq/m³ *(56.7 µCi/m³ to 56.7 kCi/m³)*
Limit of detection (2σ) of device	1 MBq/m³ *(27 µCi/m³)*	5 MBq/m³ (135 *µCi/m³*)	40 MBq/m³ (*1.1 mCi/m³*)
Precision	5% of measurement ± 1 MBq/m³ *(± 27 µCi/m³)*	5% of measurement ± 5 MBq/m³ *(± 135 µCi/m³)*	5% of measurement ± 40 MBq/m³ *(± 1.1 mCi/m³)*
Maximum deviation	1 MBq/m³/year (*27 µCi/m³/year*)	5 MBq/m³/year (*135 µCi/m³/year*)	40 MBq/m³/year (*1.1 mCi/m³/year*)
Noise (2σ)	1 MBq/m³ (*27 µCi/m³*)	5 MBq/m³ (*135 µCi/m³*)	40 MBq/m³ (*1.1 mCi/m³*)
Response time	< 90 sec for 90% of step		
Nominal flow rate	250 cc/min		

INTEGRATION OF DETECTOR IN MEASUREMENT CHANNEL

ACC BRT
Thermal regulation box



DT P - LN - 1xx
preamp

DT D - MC10

DT IONIX 3
HMI interface

MIRION TECHNOLOGIES

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PREMIUM ANALYSE™

DT D - MLB™

Small Tritium Detector

The DT D - MLB Tritium Detector provides high-performance, continuous tritium activity measurement with a wide range and quick response time. It enables measurement of high tritium activity — ideal for laboratory research and control of glovebox ambiance. It also supports civil and military research applications, including nuclear fusion, requiring measurement of high tritium activity.

The DT D - MLB Tritium Detector is a dependable and straightforward device for measuring tritium levels in gases, with reliable tritium measurements from 100 kBq/m³ (2.7 µCi/m³). It provides continuous and accurate readings with a fast response time, making it easy to monitor tritium levels in real-time.

The detector is simple to install on a leak-tight feedthrough, and it can be easily connected to a user-friendly interface for convenient data analysis and retrieval. This makes it a practical choice for various research settings, whether in civil or military contexts.

FEATURES

- Continuous measurement for real-time monitoring
- Rapid response time from 60 seconds
- Small size ionization chamber (100 cc)
- Easy maintenance and quick setup
- Reliable and precise measurements

Due to its construction and design, this detector is especially insensitive to the marking effect, making it an excellent choice for measuring critical activities. Thanks to its mounting it can be easily installed on a glovebox outlet. Additionally, it often does not require an extra pump, as it can be directly integrated into the gas flow to be analyzed.

Device manufactured under exploitation license for CEA patent - L26218
Device registered as dual-use n°1B231 regulation (CE) 2021/821 Appendix IV

Specifications

GENERAL CHARACTERISTICS

- Dimensions: Ø 43 x 100 mm
- Weight: 30 g

MOUNTING

- Mounting on leak-tight feedthroughs:
  - Flanged (ref: DT PE - B160L/DT PE - B180L)
  - Adjustable (ref: DT PE - BTE)
  - Straight (ref: DT PE - BTD)
- Mounting in circulation chamber:
  - 380 cc (ref: MLB ACC CC2)
  - 785 cc (ref: ACC CCG 800)
  - 1 400 cc (ref: ACC CCG 1400)

OPERATING CONDITIONS

- Humidity: < 95% relative, no condensation
- Operating temperature: +0 °C to +40 °C (+32 °F to 104 °F)
- Influence of humidity: ± 1% of the measurement from 10 to 90% of relative humidity
- Influence of temperature: 0.3%/°C for a variation of the ambient temperature < 3 °C/hour
- Influence of atmospheric pressure: 0.1%/mbar, hence ± 5% of the measurement from 930 to 1030 mbar

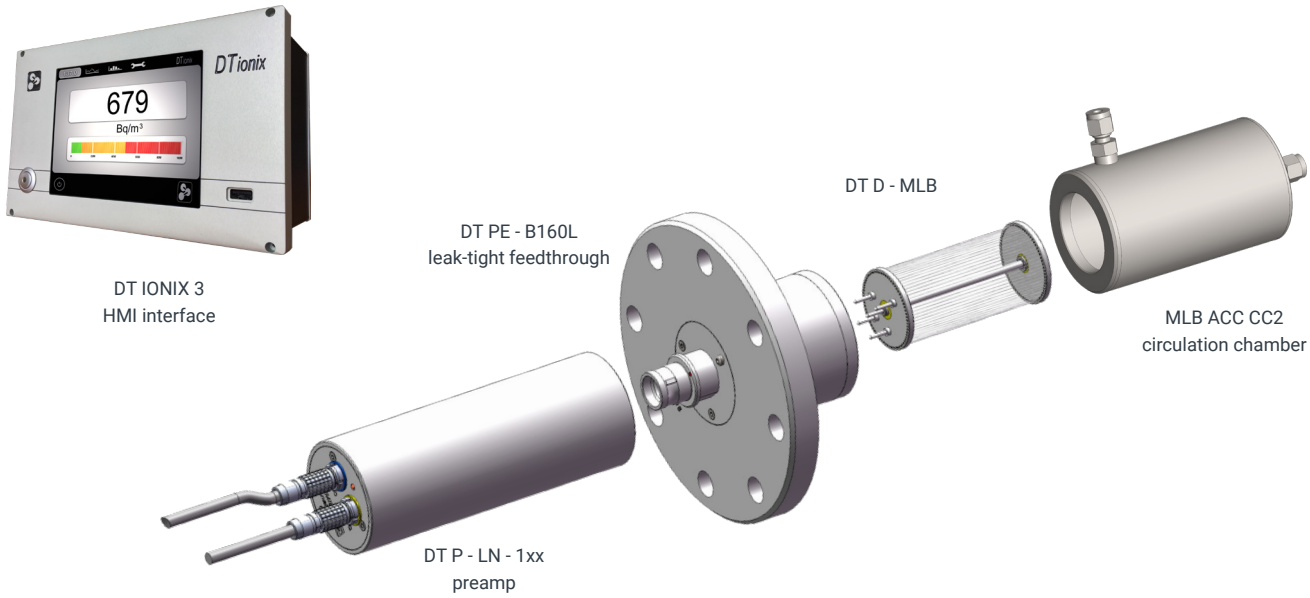
IONIZATION CHAMBER

- Materials: 316L stainless steel - ceramic - teflon
- Ionization volume: 100 cc
- Circulation volume: depending on mounting

PERFORMANCES *(For tritium in air, lab conditions)*

Associated preamp	DT P - LN - 1B8	DT P - LN - 1A7	DT P - LN - 196
Measurement range of electronics	21 kBq/m³ to 21 TBq/m³ *(0.57 µCi/m³ to 567 Ci/m³)*	210 kBq/m³ to 210 TBq/m³ *(5.67 µCi/m³ to 5.67 Ci/m³)*	2.1 MBq/m³ to 2.1 PBq/m³ *(56.7 µCi/m³ to 56.7 kCi/m³)*
Limit of detection (2σ) of device	100 kBq/m³ *(2.7 µCi/m³)*	250 kBq/m³ *(6.7 µCi/m³)*	3 MBq/m³ *(81.1 µCi/m³)*
Precision	5% of measurement ± 100 kBq/m³ *(± 2.7 µCi/m³)*	5% of measurement ± 250 kBq/m³ *(± 6.7 µCi/m³)*	5% of measurement ± 3 MBq/m³ *(± 81.1 µCi/m³)*
Maximum deviation	100 kBq/m³/year *(2.7 µCi/m³/year)*	250 kBq/m³/year *(6.7 µCi/m³/year)*	3MBq/m³/year *(81.1 µCi/m³/year)*
Noise (2σ)	100 kBq/m³ *(2.7 µCi/m³)*	250 kBq/m³ *(6.7 µCi/m³)*	3 MBq/m³ *(81.1 µCi/m³)*
Response time	< 90 sec for 90% of step		

INTEGRATION OF DETECTOR IN MEASUREMENT CHANNEL (Example of integrations)



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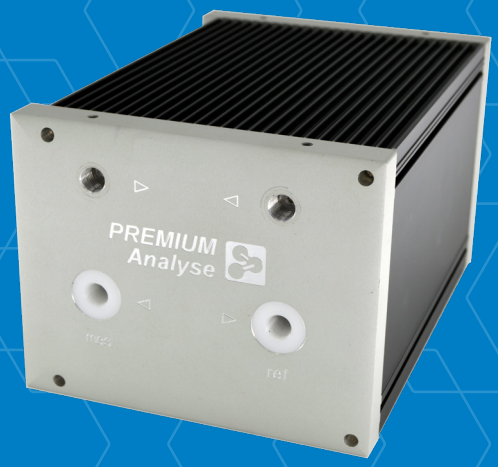
DT D - BL2™

2 x 195 cc Tritium Detector



The DT D - BL2 2 × 195 cc Tritium Detector offers reliable and accurate real-time monitoring for radioprotection and environmental monitoring and process surveillance.

The DT D - BL2 Tritium Detector is designed to provide high-performance, maintenance-free monitoring for radioprotection, environmental safety, and process surveillance. With a tritium detection from 50 kBq/m^3 (1.35 µCi/m^3) and quick response time of less than 90 seconds, it enables real-time monitoring, immediate alerts and rapid decision-making.

Built with a robust stainless steel construction, the DT D - BL2 is durable and designed to withstand challenging environmental conditions, including varying temperatures, humidity, and atmospheric pressure. This stability ensures long-term performance and reliability, reducing the need for frequent maintenance or recalibration. When connected to the DT ionix 3™ Human Machine Interface, the detector also includes advanced features such as graphical data plotting, and data extraction via USB.

FEATURES

- Continuous measurement for real-time monitoring
- Fast response time < 90 seconds
- Medium-size ionization chamber (2 x 195 cc)
- Robust stainless steel construction
- Stable performance under varying environmental conditions (temperature, humidity, and atmospheric pressure)
- Enhanced functionality when connected to the DT ionix 3™ interface via preamplifier

Specifications

GENERAL CHARACTERISTICS

- Dimensions: 140 x 111 x 197 mm (W x H x D)
- Weight: 3 kg (6.6 lb)

OPERATING CONDITIONS

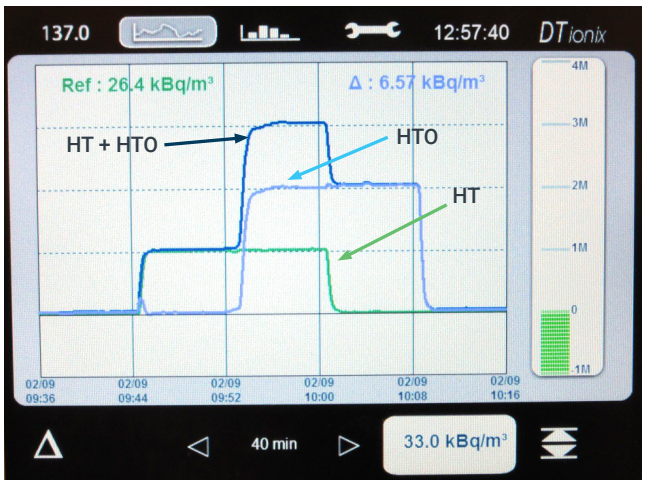
- Temperature of use: +0 °C to +40 °C (+32 °F to +104 °F)
- Influence of temperature: 0.3%/°C for a variation of ambient temperature < 3°C/hour
- Humidity: < 95% relative, no condensation
- Influence of humidity: ± 1% of the measurement from 10 to
- 90% relative humidity
- Influence of atmospheric pressure: 0.1%/mbar, hence ± 5% of the measurement from 930 to 1030 mbar

IONIZATION CHAMBER

- Material: 304 L stainless steel electropolished
- Volume: 2 x 195 cc

PERFORMANCES *(For tritium in air)*

Configuration	CMP (dynamic γ compensation)	DIF (ex: with SAM H TO)
Measurement range of electronics	10 kBq/m³ to 10 TBq/m³ (*0.27 nCi/m³ to 270 Ci/m³*)	10 kBq/m³ to 10 TBq/m³ (*0.27 nCi/m³ to 270 Ci/m³*)
Limit of detection of the device (2σ) = decision threshold	45 kBq/m³ (*1.22 µCi/m³*)	60 kBq/m³ (*1.62 µCi/m³*)
Precision	5% of measurement ± 45 kBq/m³ (*± 1.22 µCi/m³*)	5% of measurement ± 60 kBq/m³ (*± 1.62 µCi/m³*)
Maximum deviation	45 kBq/m³/year (*1.22 µCi/m³/year*)	60 kBq/m³/year (*1.62 µCi/m³/year*)
Noise (2σ)	45 kBq/m³ (*1.22 µCi/m³*)	60 kBq/m³ (*1.62 µCi/m³*)
Response time	< 90 sec for 90% of step	
Nominal flow rate	2 x 1 L/min	



Injection of 1 MBq/m³ (27 µCi/m³) tritium in the form of HT, then of 2 MBq/m³ (54 µCi/m³) of tritium in the form of HTO. The injection of HT is then stopped and finally the injection of HTO is stopped.

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DT D IC500™

500 cc Tritium Detector

The DT D - IC500 500-cc Tritium Detector offers precise and continuous tritium activity measurement in gases. It enables measurement of high tritium activity — ideal for laboratory research and control of glovebox ambiance. It also supports civil and military research applications, including nuclear fusion, requiring measurement of high tritium activity.

The DT D - IC500 Tritium Detector is a medium-sized detector for continuous, real-time monitoring of high tritium activities in gases, with a wide theoretical measurement range of the electronics with 1B8 preamp from 40 kBq/m^3. The detector's fast response time from 30 seconds allows for timely and precise measurements, which is critical in dynamic environments.

The detector is simple to install on a leak-tight CF100 flange feedthrough, and it can be easily connected to a user-friendly interface for convenient data analysis and retrieval. This makes it a practical choice for various research settings, whether in civil or military contexts.

Due to its construction and design, this detector is especially insensitive to the marking effect, making it an excellent choice for measuring critical activities. Thanks to its mounting on leak-tight feedthroughs, it can be easily installed on a glovebox outlet. Additionally, it often does not require an extra pump, as it can be directly integrated into the gas flow to be analyzed.

FEATURES

- Continuous measurement for real-time monitoring
- Tritium detection from 30 seconds, depending on associated preamp
- Medium-sized ionization chamber (500 cc)
- No maintenance
- Quick and easy setup
- Precise and stable performance

The detector is connected to a DT ionix 3™ touchscreen interface via a preamplifier, offering advanced features such as graphical data plotting, data extraction via USB, and Modbus communication. These features enhance data management and make the detector a reliable and efficient tool for researchers and operators.

Specifications

GENERAL CHARACTERISTICS

- Dimensions: Ø 67 x 157 mm
- Weight: 300 g

MOUNTING

- Mounting on leak-tight feedthroughs:
  - Flanged (ref: DT PE - B160L/DT PE - B180L)
  - Adjustable (ref: DT PE - BTE)
  - Straight (ref: DT PE - BTD)
- Mounting in circulation chamber:
  - 1 400 cc (ref: ACC CCG 1400)

OPERATING CONDITIONS

- Humidity: < 95% relative, no condensation
- Operating temperature: +0 °C to +40 °C (+32 °F to 104 °F)
- Influence of humidity: ± 1% of the measurement from 10 to 90% of relative humidity
- Influence of temperature: 0.3%/°C for a variation of the ambient temperature < 3 °C/hour
- Influence of atmospheric pressure: 0.1%/mbar, hence ± 5% of the measurement from 930 to 1030 mbar

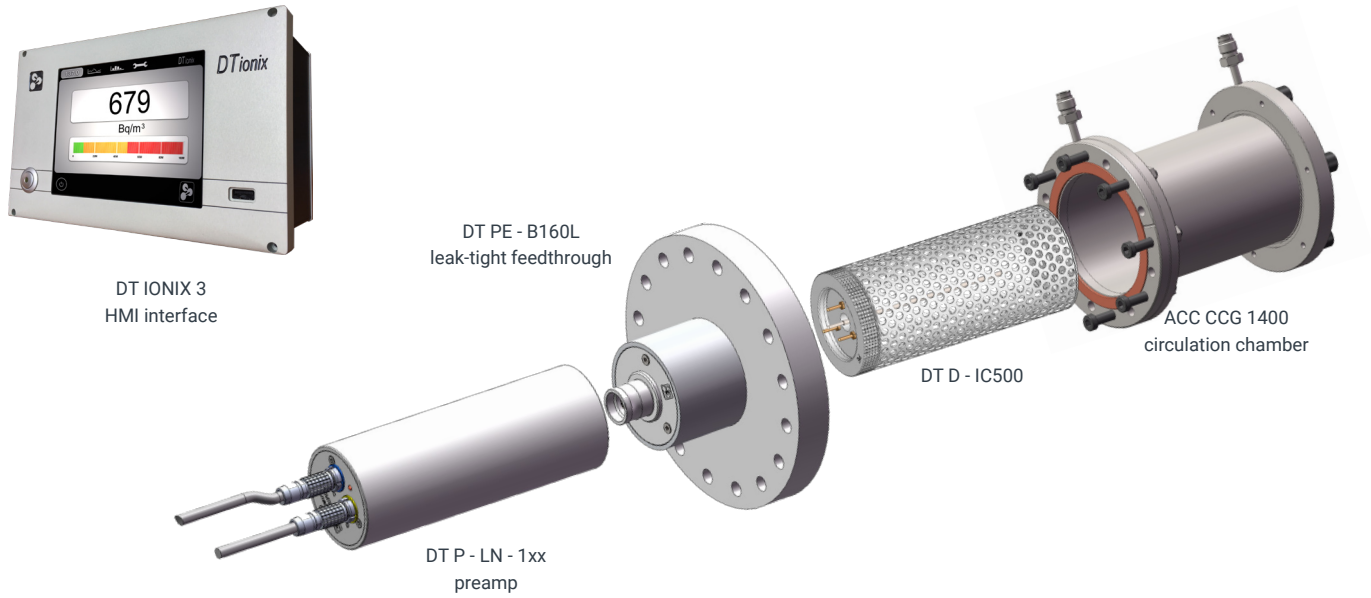
IONIZATION CHAMBER

- Materials: 316L stainless steel - DELRIN - brass
- Ionization volume: 500 cc

PERFORMANCES *(For tritium in air, lab conditions)*

Associated preamp	DT P - LN - 1B8	DT P - LN - 1A7	DT P - LN - 196
Measurement range of electronics	3.8 kBq/m³ to 3.8 TBq/m³ *(103 µCi/m³ to 103 Ci/m³)*	210 kBq/m³ to 210 TBq/m³ *(5.67 µCi/m³ to 5.67 Ci/m³)*	2.1 kBq/m³ to 3.2 TBq/m³ *(56.7 µCi/m³ to 56.7 Ci/m³)*
Limit of detection (2σ) of device	30 kBq/m³ *(0.8 µCi/m³)*	100 kBq/m³ *(2.7 µCi/m³)*	1 MBq/m³ *(27 µCi/m³)*
Precision	5% of measurement ± 30 kBq/m³ *(± 0.8 µCi/m³)*	5% of measurement ± 100 kBq/m³ *(± 2.7 µCi/m³)*	5% of measurement ± 1 MBq/m³ *(± 27 µCi/m³)*
Maximum deviation	30 kBq/m³/year *(0.8 µCi/m³/year)*	100 kBq/m³/year *(2.7 µCi/m³/year)*	1 MBq/m³/year *(27 µCi/m³/year)*
Noise (2σ)	30 kBq/m³ *(0.8 µCi/m³)*	100 kBq/m³ *(2.7 µCi/m³)*	1 MBq/m³ *(27 µCi/m³)*
Response time	< 120 sec for 90% of step	< 120 sec for 90% of step	< 30 sec for 90% of step

INTEGRATION OF DETECTOR IN MEASUREMENT CHANNEL (Example of integrations)



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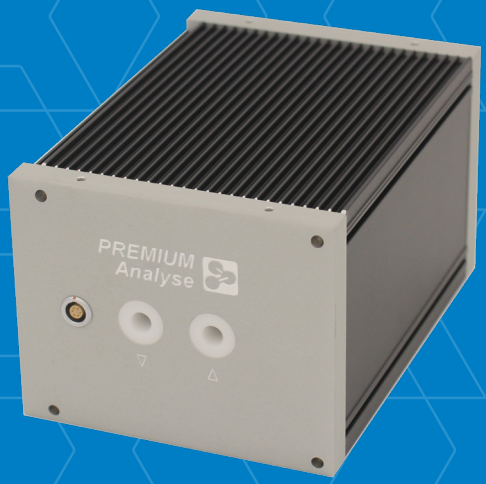
DT D - BM8™

660 cc Tritium Detector



The DT D - BM8 Tritium Detector is a reliable, easy-to-use device that continuously measures tritium levels in the air with a wide detection range and quick response time, ensuring timely and accurate data for safety and compliance in the field or for radioprotection, environmental monitoring and process surveillance applications.

The DT D - BM8 660 cc Tritium Detector is a high-performance, maintenance-free ionization chamber for continuous and precise measurements of tritium in air and in laboratories. It offers a wide measurement range, capable of detecting tritium levels from 20 kBq/m^3 (0.5 µCi/m^3). With a rapid response time of less than 90 seconds, it provides timely and reliable data, which is crucial for effective radioprotection and environmental monitoring. Constructed with 304L stainless steel electropolished materials, the detector is built to withstand various operating conditions, ensuring long-term stability and reliability.

It can be seamlessly connected to the DT ionix 3 touchscreen interface, enabling advanced data visualization, extraction, and communication, even over long distances. This versatility makes the DT D - BM8 suitable for both laboratory and industrial settings, offering a reliable, efficient, and high-precision solution for monitoring tritium levels, enhancing safety and compliance in critical applications.

FEATURES

- Fast response time from 90 seconds
- Medium-sized ionization chamber (660 cc)
- Robust and durable design
- Advanced functionalities when connected to DT ionix 3™ touchscreen interface

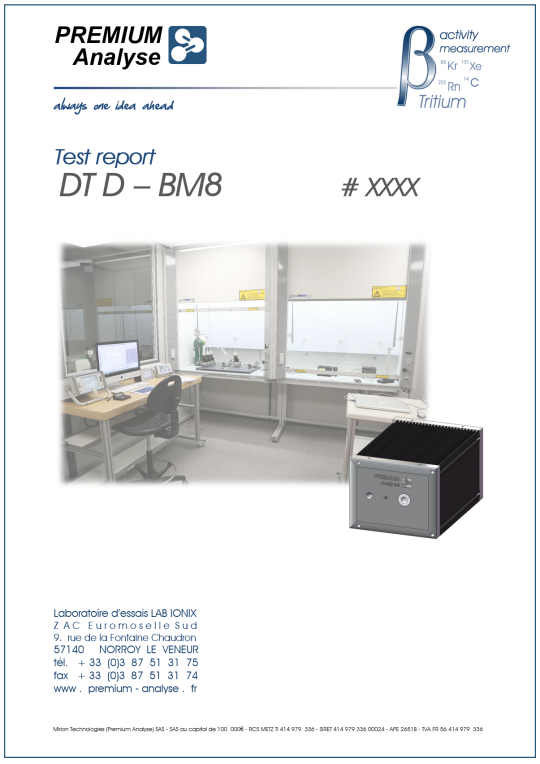
Specifications

GENERAL CHARACTERISTICS

- Dimensions: 139 x 112 x 140 mm (w x h x d)
- Weight: approx. 4 kg

PERFORMANCES *(For tritium in air, lab conditions)*

Characteristics	BM8
Measurement range of electronics	3.2 kBq/m³ to 3.2 TBq/m³ (86 *µCi/m³ to 86 Ci/m³*)
Limit of detection of the device (2σ)	20 kBq/m³ (0.5 *µCi/m³*)
Precision	5% of measurement ± 20 kBq/m³ (± *0.5 µCi/m³*)
Maximum deviation	20 kBq/m³/year (*0.5 µCi/m³/year*)
Noise (2σ)	20 kBq/m³ (*0.5 µCi/m³*)
Response time	< 90 sec for 90% of step
Nominal flow rate	4 L/min


PREMIUM Analyse
always one idea ahead
activity measurement
Kr Xe Rn C Tritium
Test report
DT D – BM8
XXXX
Laboratoire d'essais LAB IONIX
Z A C E u r o m o s e l l e S u d
9, rue de la Fontaine Chaudron
57140 NORROY LE VENEUR
tél. + 33 (0)3 87 51 31 75
fax + 33 (0)3 87 51 31 74
www . premium - analyse . fr

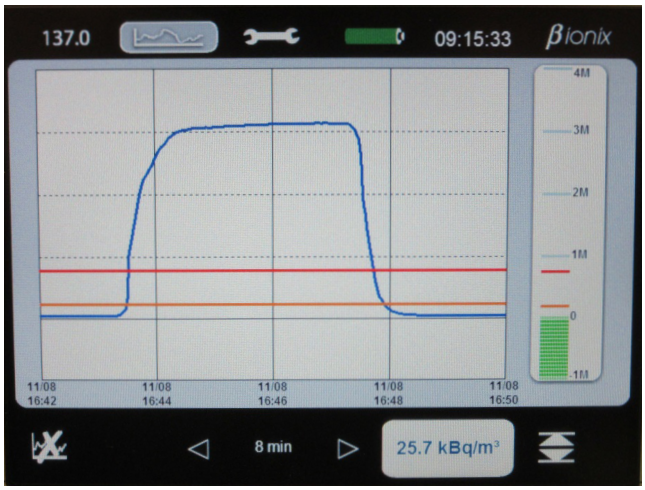
Calibration reports available.
Gas calibration made upon request.

OPERATING CONDITIONS

- Humidity: < 95% relative, no condensation
- Operating temperature: +0 °C to +40 °C (+32 °F to 104 °F)
- Influence of humidity: ± 1% of the measurement from 10 to 90% of relative humidity
- Influence of temperature: 0.3%/°C for a variation of the ambient temperature < 3 °C/hour
- Influence of atmospheric pressure: 0.1%/mbar, hence ± 5% of the measurement from 930 to 1030 mbar

IONIZATION CHAMBER

- Material: 304 L stainless steel electropolished
- Volume: 660 cc



Response to a 3 MBq/m³ (81 µCi/m³) gas injection

Response to a 1.6 MBq/m³ (43 µCi/m³) gas injection

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SPC-65-EN-C_A4 – 03/2026

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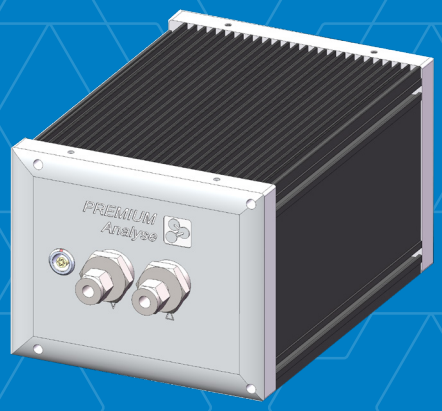
DT D - BM8™ - HE



660 cc Leak-Resistant Tritium Detector

The DT D - BM8 - HE tritium detector offers a wide measurement range and superior leak-resistance, ensuring reliable and accurate tritium monitoring with minimal maintenance and quick response times in the field or for radioprotection, environmental monitoring and process surveillance applications.

The DT D - BM8 - HE tritium detector is a high-performance, maintenance-free detector designed for continuous and accurate measurement of tritium levels. It features a wide measurement range, from 20 kBq/m³ (0.5 µCi/m³), precise and stable readings, and a fast response time — making it ideal for various monitoring applications, from low-level field measurements to high-activity process control.

The detector is constructed from 304L stainless steel and is electropolished for robustness and durability. It can operate under challenging environmental conditions, including humidity up to 95% relative (no condensation) and temperatures ranging from 0°C to 40°C.

The detector's high leak-tightness and ability to account for the effects of humidity, temperature, and atmospheric pressure on measurements further enhance its reliability and accuracy.

FEATURES

- High performance and versatility
- Fast response time from 90 seconds
- Medium-sized ionization chamber (660 cc)
- Maintenance-free operation and quick commissioning
- High leak-tightness
- Advanced functionality when connected to a DT ionix 3™ interface
- Precise, stable measurements under varying environmental conditions

When connected to a DT ionix 3 touchscreen interface via a preamplifier, the detector offers advanced functionalities such as graphical data plotting, data extraction via USB, Modbus communication, and dry contact outputs, making it a versatile and user-friendly solution for tritium monitoring.

Specifications

GENERAL CHARACTERISTICS

- Dimensions: 139 x 112 x 140 mm (w x h x d)
- Weight: approx. 4 kg

PERFORMANCES *(For tritium in air, lab conditions)*

Characteristics	BM8
Measurement range of electronics	3.2 kBq/m³ to 3.2 TBq/m³ (*86 µCi/m³ to 86 Ci/m³*)
Limit of detection of the device (2σ)	20 kBq/m³ (*0.5 µCi/m³*)
Precision	5% of measurement ± 20 kBq/m³ (*± 0.5 µCi/m³*)
Maximum deviation	20 kBq/m³/year (*0.5 µCi/m³/year*)
Noise (2σ)	20 kBq/m³ (*0.5 µCi/m³*)
Response time	< 90 sec for 90% of step
Nominal flow rate	4 L/min

Calibration reports available.
Gas calibration made upon request.

OPERATING CONDITIONS

- Humidity: < 95% relative, no condensation
- Operating temperature: +0 °C to +40 °C (+32 °F to 104 °F)
- Influence of humidity: ± 1% of the measurement from 10 to 90% of relative humidity
- Influence of temperature: 0.3%/°C for a variation of the ambient temperature < 3 °C/hour
- Influence of atmospheric pressure: 0.1%/mbar, hence ± 5% of the measurement from 930 to 1030 mbar

IONIZATION CHAMBER

- Material: 304 L stainless steel electropolished
- Volume: 660 cc

Leak rate < 1 .10-6 mbar.L.s-1 (He)

Response to a 3 MBq/m³ (81 µCi/m³) gas injection

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DT D EXP40™

4,200 cc Tritium Detector

The DT D - EXP40 4,200 cc Tritium Detector provides accurate and rapid tritium detection over a wide range, ensuring reliable monitoring in the field or for radioprotection, environmental monitoring, decommissioning and process surveillance applications.

The DT D - EXP40 Tritium Detector is a high-performance, compact device for measuring tritium activities in gases, with a wide measurement range from 20 kBq/m³ (0.5 µCi/m³).

It offers high accuracy, fast response times, and easy maintenance, making it ideal for real-time monitoring in various settings such as environmental, laboratory, and decommissioning surveillance.

The detector integrates seamlessly with M ionix or C ionix - EXX systems for dynamic gamma compensation and connects to a DT ionix 3™ touchscreen interface, which supports advanced data management features like graphical plotting and Modbus communication.

FEATURES

- Continuous measurement for real-time monitoring
- Fast response time < 3 minutes
- Large volume: 4,200 cc
- Easy maintenance
- User-friendly interface
- Quick and easy commissioning
- Precise and stable performance
- Integrates with M ionix™ or C ionix™ - EXX systems for gamma compensation

Specifications

GENERAL CHARACTERISTICS

- Dimensions: Ø 224 x 438 mm
- Weight: 13 kg
- Gas connection: DN 25KF coupling

PERFORMANCES *(For tritium in air, lab conditions)*

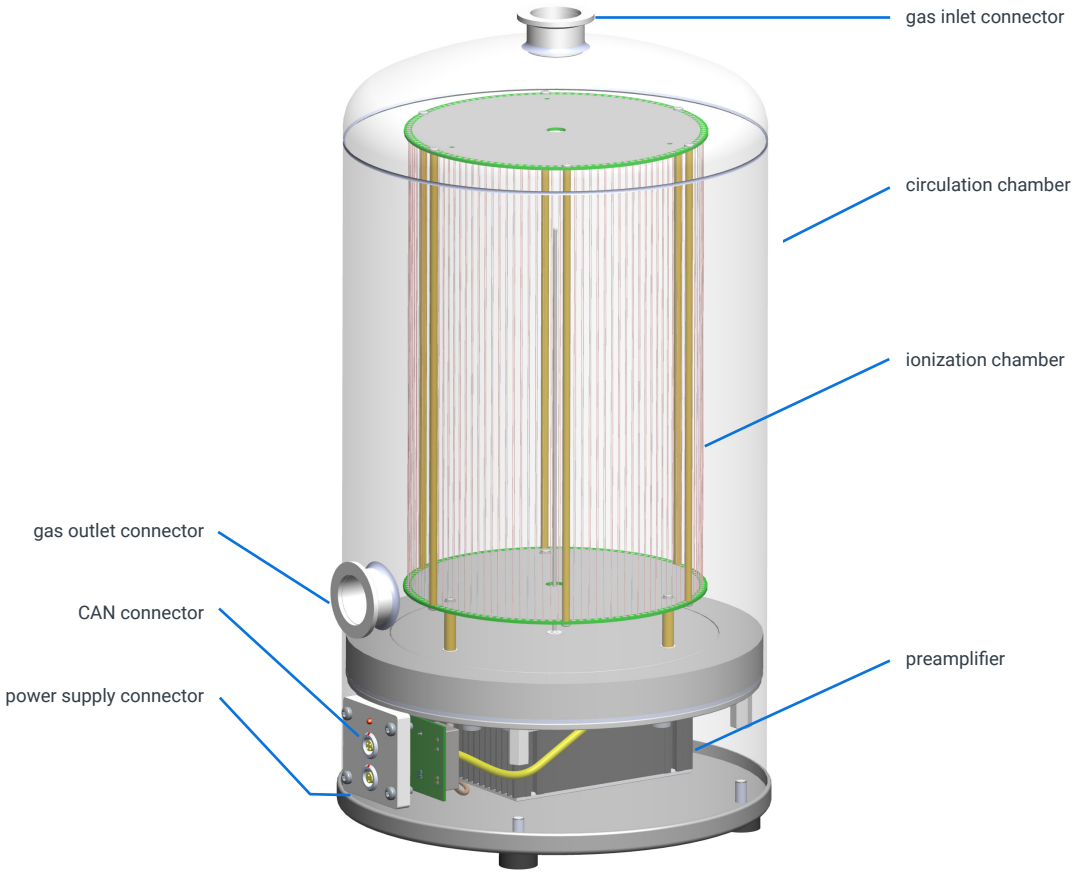
Characteristics	BM8
Measurement range of electronics	2 kBq/m³ to 2 TBq/m³ (*54 µCi/m³ to 54 Ci/m³*)
Limit of detection of the device (2σ)	20 kBq/m³ (*0.5 µCi/m³*)
Precision	5% of measurement ± 20 kBq/m³ (*± 0.5 µCi/m³*)
Maximum deviation	20 kBq/m³/year (*0.5 µCi/m³/year*)
Noise (2σ)	20 kBq/m³ (*0.5 µCi/m³*)
Response time	< 3 min for 90% of step
Nominal flow rate	15-20 L/min

OPERATING CONDITIONS

- Humidity: < 95% relative, no condensation
- Operating temperature: +0 °C to +40 °C (+32 °F to +104 °F)
- Influence of humidity: ± 1% of the measurement from 10 to 90% relative humidity
- Influence of temperature: 0.3%/°C for a variation of ambient temperature < 3°C/hour
- Influence of atmospheric pressure: 0.1%/mbar, hence ± 5% of the measurement from 930 to 1030 mbar

IONIZATION CHAMBER

- Material: 304L microblasted s. steel - brass
- Volume: 4 200 cc
- Circulation chamber: 12 000 cc



MIRION TECHNOLOGIES

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DT D - XPR80™

Inline 8L Tritium Detector

The DT D - XPR80 Inline 8L tritium detector offers precise and stable tritium activity measurement with a fast response time and wide detection range, ensuring reliable monitoring in various environments. Its compact and efficient design, along with easy maintenance and a gas heating system to prevent condensation, makes it an ideal choice for both field and laboratory process surveillance.

The DT D - XPR80 tritium detector is a sophisticated device for the accurate and continuous measurement of tritium activity in gases. With a high-volume ionization chamber of 8,000 cubic centimeters, it offers a wide measurement range, from 15 kBq/m³ (0.4 µCi/m³) ensuring it can detect even trace amounts of tritium while maintaining precision and stability. The detector's response time is less than 3 minutes, making it highly efficient for real-time monitoring.

To prevent condensation, which can affect measurement accuracy, the device includes a gas heating system and an interchangeable particle filter, ensuring reliable operation in environments with humidity levels up to 95% relative and temperatures ranging from +0°C to +40°C.

The DT D - XPR80 offers user convenience with an externally located preamplifier for easy maintenance and system stability. It can connect to the DT ionix 3 touchscreen interface, which supports advanced features like graphical data plotting, USB data extraction, Modbus communication, and dry contact outputs, ensuring comprehensive monitoring and analysis. The interface can be connected over several hundred meters away from the detector, offering flexible installation options.

It can also be connected to a flange circulator for generating a gas stream in the detector.

FEATURES

- Continuous measurement for real-time monitoring
- Precise and stable tritium activity measurements
- Fast response time from 3 minutes
- High-volume ionization chamber (8,000 cc)
- Easy maintenance
- Customizable configurations and filtration systems
- Interchangeable particle filter and gas heating system prevents condensation
- Advanced functionalities when connected to DT ionix 3™ touchscreen interface

Specifications

GENERAL CHARACTERISTICS

- Dimensions: Ø 215 x 626 mm
- Weight: 21 kg (with filter, no circulator)

PERFORMANCES *(For tritium in air, lab conditions)*

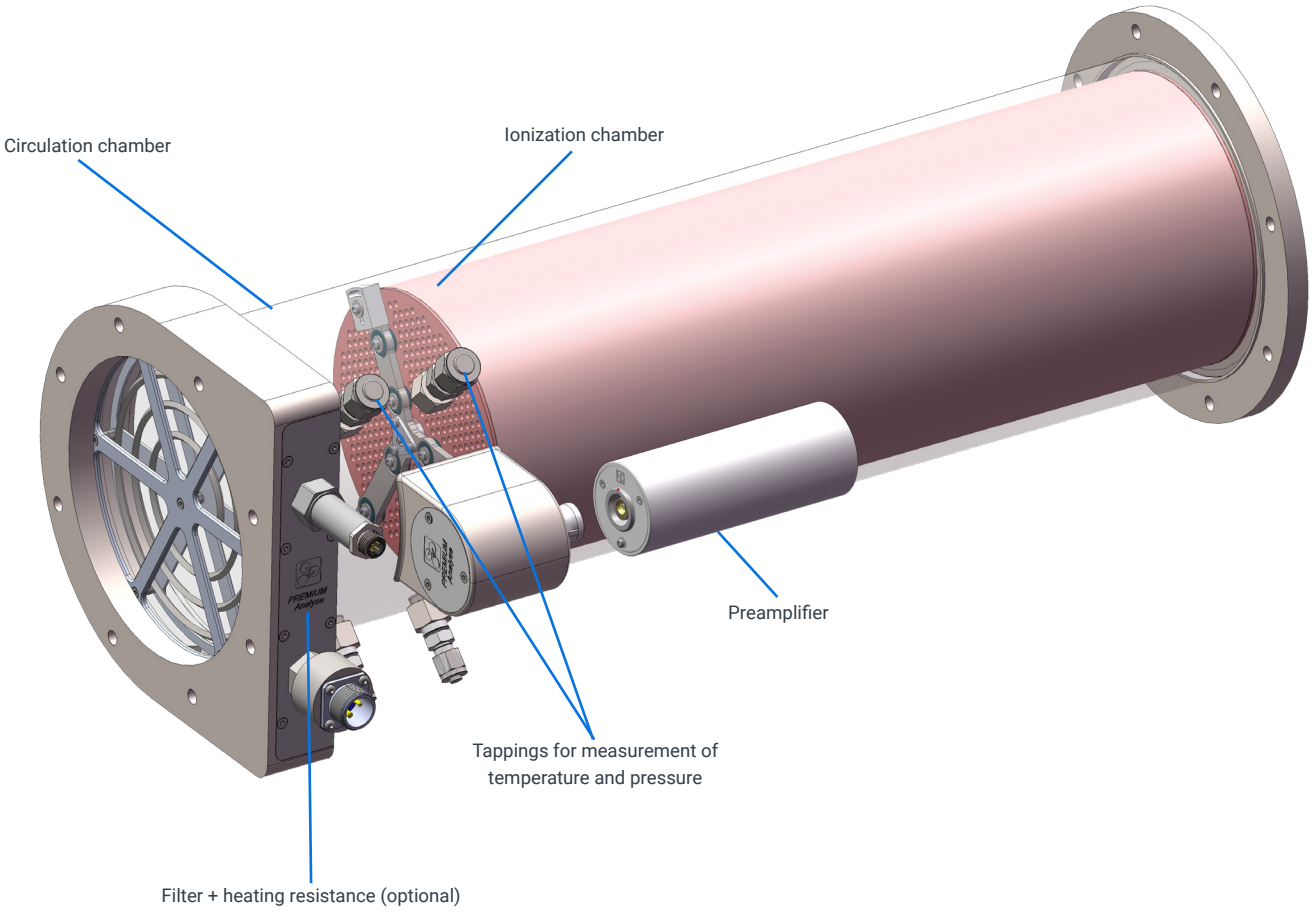
Characteristics	XPR80 (connected to a DT P - LN - 1A7 preamp)
Measurement range of electronics	2 kBq/m³ to 2 TBq/m³ *(54 µCi/m³ to 54 Ci/m³)*
Limit of detection of the device (2σ)	10 kBq/m³ (0.27 *µCi/m³*)
Precision	5% of measurement ± 10 kBq/m³ (± *0.27 µCi/m³*)
Maximum deviation	10 kBq/m³/year (*0.27 µCi/m³/year*)
Noise (2σ)	10 kBq/m³ (*0.27 µCi/m³*)
Response time	< 3 min sec for 90% of step
Nominal flow rate	70 L/min

OPERATING CONDITIONS

- Humidity: < 95% relative, no condensation
- Operating temperature: +0 °C to +40 °C (+32 °F to +104 °F)
- Influence of humidity: ± 1% of the measurement from 10 to 90% relative humidity
- Influence of temperature: 0.3%/°C for a variation of ambient temperature < 3°C/hour
- Influence of atmospheric pressure: 0.1%/mbar, hence ± 5% of the measurement from 930 to 1030 mbar

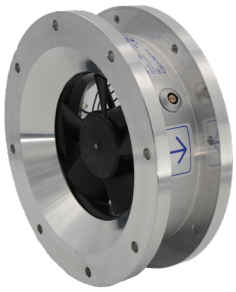
IONIZATION CHAMBER

- Material: 304L stainless steel electropolished.
- Ionization volume: 8000 cc
- Circulation volume: 12 000 cc
- Design pressure: 10 bars abs



DT D - XAC - CIRCB

- Flanged circulator, to be mounted after the ionization chamber
- Nominal flow 70 L/min
- Allows the creation of a gas glow

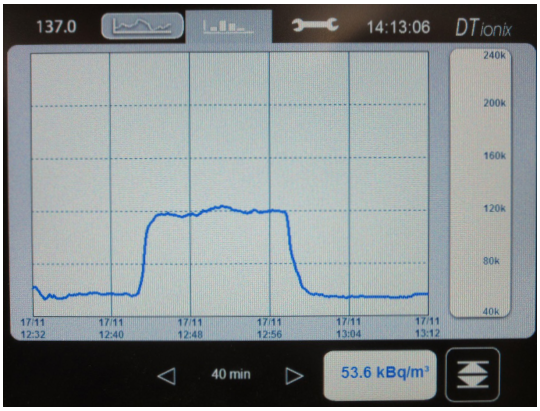


XPR ACC TFL CF4

- Filter unit with heating resistance
- 400W power
- Prevents the condensation of gas

GAS CALIBRATION

Thanks to our internal laboratory, we are able to calibrate all of our detectors thanks to standard gas samples generated.
Tests are made according to NF EN 60761-1 and -5 standards.



Response to a 120 KBq/m³ (3.2 µCi/m³) injection

Response to a 2 MBq/m³ (0.5 mCi/m³) injection

Response to a 70 MBq/m³ (1.9 mCi/m³) injection


PREMIUM Analyse

always one idea ahead

activity measurement
^{85}Kr ^{133}Xe ^{222}Rn ^{14}C Tritium

Tritium calibration report

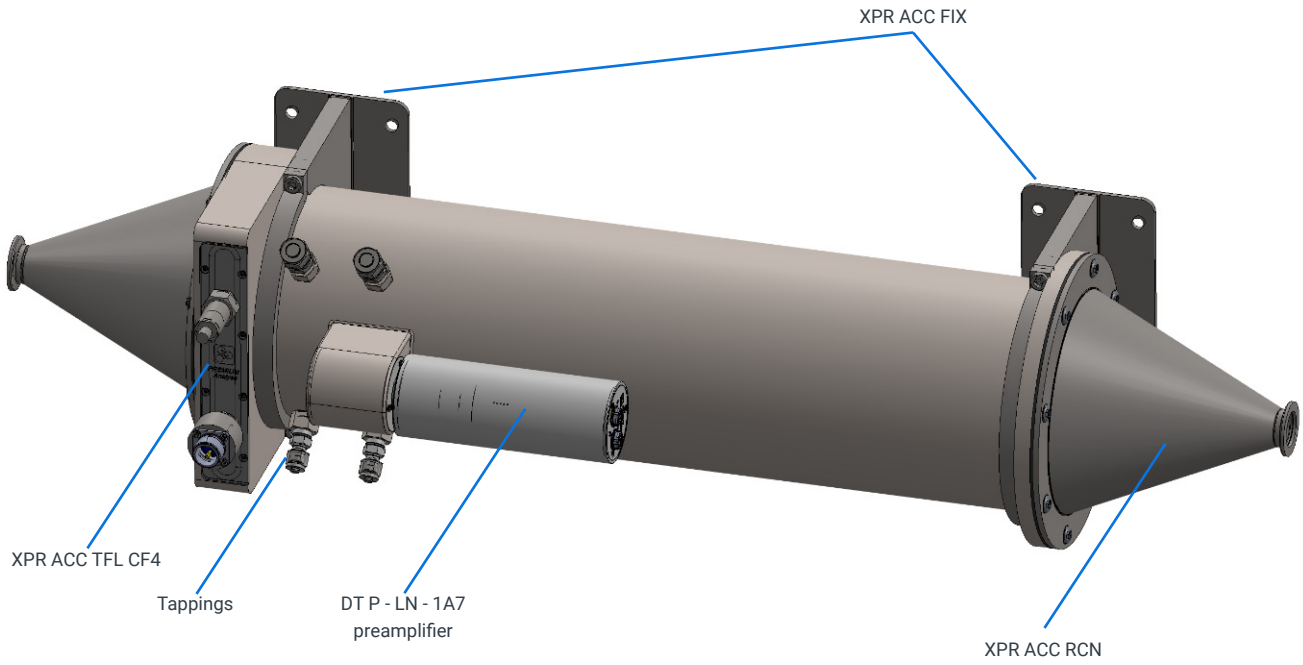
DT D – XPR 80 *#XXX*

Test Laboratory LAB IONIX
Z A C E u r o m o s e l l e S u d
9, rue de la Fontaine Chaudron
57140 NORROY LE VENEUR
tél. + 33 (0)3 87 51 31 75
fax + 33 (0)3 87 51 31 74
www . premium - analyse . fr

Calibration report.

REFERENCES	
Inline activity detector 4 tappings, aluminum filter	**DT D XPR - 80 - FA0**
Inline activity detector 4 tappings, heating filter, PT100 3 cables probe	**DT D XPR - 80 - FC0**
Inline activity detector 4 tappings, heating filter, PT100 4-20mA probe	**DT D XPR - 80 - FCA**
Inline activity detector 4 tappings with SWA 6-10mm connector, heating filter, PT100 4-20mA probe	**DT D XPR - 80 - 018**
Inline activity detector Heating filter, PT100 4-20mA probe	**DT D XPR - 80 - 137**

ACCESSORIES	
Flanged circulator 60 L/min	**DT D - XAC - CIRCB**
Ambiance circulator 60 L/min	**DT D - XAC - CIRCA**
Heating regulation box	**DT D - XCE - 10100 - 000 - 018**
Conical reducer	**XPR ACC RCN**
Installation system	**XPR ACC FIX**
Aluminum filter	**XPR ACC TFA**
Heating filter with PT100 probe	**XPR ACC TFL CFG**
Heating filter with 4-20mA probe	**XPR ACC TFL CF4**
Vertical mounting accessory for preamp	**XPR ACC PLN FIX**



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