



## PREMIUM ANALYSE

# C ionix™ - BXX

Installed Tritium Monitor

Installed tritium monitor for workplace monitoring, decommissioning, stack release or other applications.



## FEATURES

- **Performance**
  - Self-checking
  - Continuous measurement
  - Integrated light and sound alarms
  - Response time below 75 seconds
  - Detection of tritium from  $10 \text{ kBq/m}^3$  ( $0.27 \mu\text{Ci/m}^3$ )
  - Possibility for automatic  $\gamma$  compensation
- **Simple**
  - Ready to install
  - User-friendly interface
  - Transmission and alarms possible by dry contacts, Modbus Ethernet...
- **Easy maintenance**
  - Minimal intervention
  - Quick change components
  - Simple  $\gamma$  source verification of system

## DESCRIPTION

The C ionix monitor is used to measure continuous activity of tritium and other  $\beta$  emitters in gases for all applications of workplace monitoring, decommissioning, stack release or other applications.

Wall mounted, the C ionix monitor contains a complete, compact tritium monitoring channel that can be combined to a compensation channel.

The C ionix completes our range of monitors from the portable  $\beta$  ionix through the mobile M ionix by offering an installed solution ready to be connected in your plant.

As an option, the monitor can be used to separately and continuously measure the HTO activity of gases containing other  $\beta$  emitters such as noble gases. (see dedicated C ionix - HTO spec sheet).

**TECHNICAL CHARACTERISTICS**

The C ionix monitors are available in several versions:

The versions below have been developed for continuous measurement of tritium activity and other  $\beta$  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	10 kBq/m <sup>3</sup> to 10 TBq/m <sup>3</sup> 0.27 $\mu$ Ci/m <sup>3</sup> to 270 Ci/m <sup>3</sup>	3.2 kBq/m <sup>3</sup> to 3.2 TBq/m <sup>3</sup> 86 nCi/m <sup>3</sup> to 86 Ci/m <sup>3</sup>	3.2 kBq/m <sup>3</sup> to 3.2 TBq/m <sup>3</sup> 86 nCi/m <sup>3</sup> to 86 Ci/m <sup>3</sup>
Limit of detection (2 $\sigma$ ) = decision threshold	45 kBq/m <sup>3</sup> (1.22 $\mu$ Ci/m <sup>3</sup> )	10 kBq/m <sup>3</sup> (0.27 $\mu$ Ci/m <sup>3</sup> )	15 kBq/m <sup>3</sup> (0.40 $\mu$ Ci/m <sup>3</sup> )
Limit of detection (4 $\sigma$ )	90 kBq/m <sup>3</sup> (2.43 $\mu$ Ci/m <sup>3</sup> )	20 kBq/m <sup>3</sup> (0.54 $\mu$ Ci/m <sup>3</sup> )	30 kBq/m <sup>3</sup> (0.81 $\mu$ Ci/m <sup>3</sup> )
Precision	5% of the reading $\pm$ 45 kBq/m <sup>3</sup> $\pm$ 1.22 $\mu$ Ci/m <sup>3</sup>	5% of the reading $\pm$ 10 kBq/m <sup>3</sup> $\pm$ 0.27 $\mu$ Ci/m <sup>3</sup>	5% of the reading $\pm$ 15 kBq/m <sup>3</sup> $\pm$ 0.40 $\mu$ Ci/m <sup>3</sup>
Maximum deviation	45 kBq/m <sup>3</sup> / year 1.22 $\mu$ Ci/m <sup>3</sup> / year	10 kBq/m <sup>3</sup> / year 0.27 $\mu$ Ci/m <sup>3</sup> / year	15 kBq/m <sup>3</sup> / year 0.40 $\mu$ Ci/m <sup>3</sup> / year
Noise (2 $\sigma$ )	$\pm$ 45 kBq/m <sup>3</sup> $\pm$ 1.22 $\mu$ Ci/m <sup>3</sup>	$\pm$ 10 kBq/m <sup>3</sup> $\pm$ 0.27 $\mu$ Ci/m <sup>3</sup>	$\pm$ 15 kBq/m <sup>3</sup> $\pm$ 0.40 $\mu$ Ci/m <sup>3</sup>
Response time	< 90 sec at 90% of scale	< 75 sec at 90% of scale	
Ionization chamber(s)			
Volume	2 x 195 cc	1 x 660 cc	2 x 660 cc
Nominal flow	1 L/m	4 L/m	
Ionization voltage	160 VDC		

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

Measurement characteristics in laboratory conditions (for tritium)	C IONIX 3 - BLH HTO measurement with automatic gamma compensation	C IONIX 3 - BMH HTO measurement with automatic gamma compensation
Measurement range	10 kBq/m <sup>3</sup> to 10 TBq/m <sup>3</sup> 0.27 $\mu$ Ci/m <sup>3</sup> to 270 Ci/m <sup>3</sup>	3.2 kBq/m <sup>3</sup> to 3.2 TBq/m <sup>3</sup> 86 nCi/m <sup>3</sup> to 86 Ci/m <sup>3</sup>
Limit of detection (2 $\sigma$ ) = decision threshold	60 kBq/m <sup>3</sup> (1.62 $\mu$ Ci/m <sup>3</sup> )	20 kBq/m <sup>3</sup> (0.54 $\mu$ Ci/m <sup>3</sup> )
Limit of detection (4 $\sigma$ )	120 kBq/m <sup>3</sup> (3.24 $\mu$ Ci/m <sup>3</sup> )	40 kBq/m <sup>3</sup> (1.08 $\mu$ Ci/m <sup>3</sup> )
Precision	5% of the reading $\pm$ 60 kBq/m <sup>3</sup> $\pm$ 1.62 $\mu$ Ci/m <sup>3</sup>	5% of the reading $\pm$ 20 kBq/m <sup>3</sup> $\pm$ 0.54 $\mu$ Ci/m <sup>3</sup>
Maximum deviation	60 kBq/m <sup>3</sup> / year 1.62 $\mu$ Ci/m <sup>3</sup> / year	20 kBq/m <sup>3</sup> / year 0.54 $\mu$ Ci/m <sup>3</sup> / year
Noise (2 $\sigma$ )	$\pm$ 60 kBq/m <sup>3</sup> $\pm$ 1.62 $\mu$ Ci/m <sup>3</sup>	$\pm$ 20 kBq/m <sup>3</sup> $\pm$ 0.54 $\mu$ Ci/m <sup>3</sup>
Response time	< 90 sec at 90% of scale	
Ionization chamber(s)		
Volume	2 x 195 cc	2 x 660 cc
Nominal flow	2 L/m	8 L/m
Ionization voltage	160 VDC	

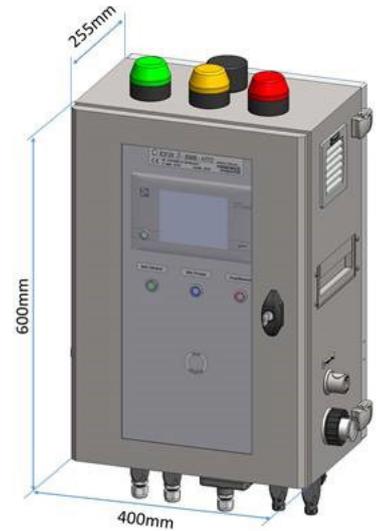
**Operating conditions:**

- Operating temperature: +0°C to +40°C (+32°F to 104°F)
- Influence of temperature: 0.3% /°C for a variation of the ambient temperature < 3°C / hour
- Humidity: 5 to 95% rel.
- Influence of humidity:  $\pm$  1% of the measurement from 10 to 90% of relative humidity
- Influence of atmospheric pressure: 0.1 %/mbar, hence  $\pm$  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:

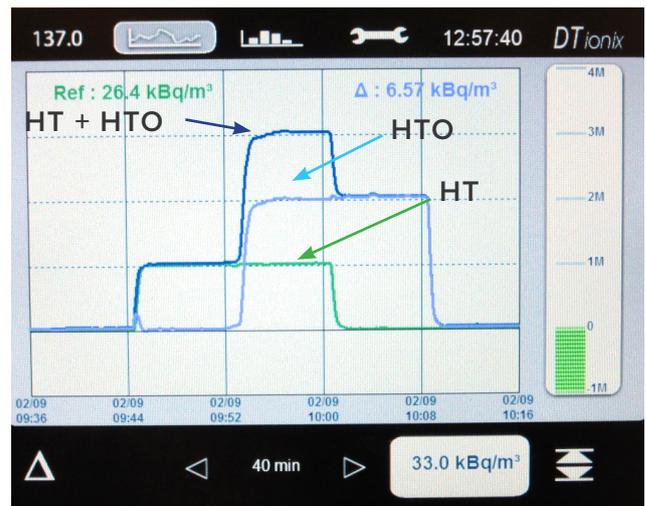
- 4 customizable alarm thresholds
  - Digital display of volumetric activity
  - Archiving of 32 days of measurements
  - Data extraction and system update via USB stick
  - Adjustment and monitoring of the flow rate with low flow detection possible
  - Graphical plotting of measurements and alarm values from 8 minutes to 8 days
  - Choice of volumetric activity among 15 units, with 4 customizable ones (Bq/m<sup>3</sup>, RCA, LPCA, Sv/m<sup>3</sup>...)
  - Light and sound signals when pre-alarm (orange) and alarm (red) thresholds are exceeded, as well as default operation
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- Overall dimensions (with lights): W 475 x h 780 x d 330 mm
  - 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 diffierent circuit breaker 6A curve C
  - Possible options:
    - Remote beacon connection
    - High leak proof (for BMM version)
    - Wall mounting on quick mounting plate
    - Measurement transmission via Modbus Ethernet (x2)
    - Gas I.O via self-sealing STAUBLI or Swagelok fittings
    - Process output with dry contact outputs, 4/20mA outputs...
    - Light and sound signals for alarms and good operation default



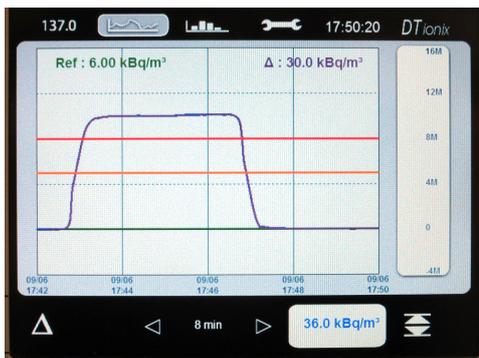
**TRITIUM RESPONSE EXAMPLES - VIEW FROM DT IONIX HMI**



Injection of 100 kBq/m<sup>3</sup> (2.7 μCi/m<sup>3</sup>) in a C IONIX 3 - BMM



Injection of 1 MBq/m<sup>3</sup> (27 μCi/m<sup>3</sup>) of tritium HT then 2 MBq/m<sup>3</sup> (54 μCi/m<sup>3</sup>) of tritium HTO. The injection of HT is then stopped, and the injection of HTO is ceased thereafter.



Injection of 10 MBq/m<sup>3</sup> (270 μCi/m<sup>3</sup>) in a C IONIX 3 - BLC

UNIT CONFIGURATION AND PART NUMBERS

		Monitor configuration & options
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 STAUBLI connectors Fixed system with SWAGELOK INCH connectors Mobile system 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
Version	English French	C IONIX 3 - BXX - X - XX - XX - FA - E C IONIX 3 - BXX - 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
Mobile 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

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

Spare parts	
High leak proof pump assembly	CX3 SP BTR P6000

CONTACT US

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