NANOSECOND PULSE X-RAY
PORTABLE PLASMA CHAMBER®

Model – TBM-IC-PULSE-X

FEATURES:

- PULSED X-RAY RESPONSE
- **PULSE WIDTH RANGE:**
  5 nanoseconds to continuous emission
- FIVE DECADES
- **MEETS 10CFR 34.25 REQUIRMENTS**
- MEETS AND EXCEEDS 100 R/h
  (other ranges available)
- DIGITAL DOSE RATE & TOTAL DOSE READ OUT
- RANGE CHANGE SWITCH:
  6 digit-rate, 8 digit integrate
- LIGHTWEIGHT 26 oz.
- FLAT RESPONSE - SEALED AIR PLASMA CHAMBER
- SEES AXIALLY BELOW 5 KEV GAMMA OR X-RAY
- SEES HIGH ENERGY UP TO 10 MeV & ABOVE
- SEES BETA, GAMMA, X-RAY, POSITRONS
- FAST RESPONSE
- **OPTIONAL:** RS232 SERIAL PORT
- **IP64; CE MARK**

CE **TBM-IC-PULSE-X**

APPLICATION:

Whenever a fast, sensitive instrument is needed, the **TBM-IC-PULSE-X** with **TA's Plasma Chamber®** is the latest in a series. These portable plasma chambers are now smaller and lighter.

Based on stable, essentially drift-free electrometer technology.

Especially useful in **Non-Destructive Testing** or other **Industrial or Medical** applications where **pulsed x-rays** are used.

PULSED X-RAY RESPONSE:

TBM-IC-PULSE-X is the **ONLY** radiology imaging portable plasma chamber that will detect nanosecond pulsed x-rays. It will accurately measure the integrated Total Dose from pulsed x-ray machines over a wide range of pulse widths and repetition rates.

This monitor also measures low energies and short pulses that other survey meters ignore to the detriment of worker health.

DESCRIPTION:

The **TBM-IC-PULSE-X** consists of a 3" diameter plasma chamber coupled to a stable solid state MOSFET input electrometer with built in Analog to Digital converter to read out directly in mR/h or total mR.

Rate range is 0.01 R/h to 50 R/h (0.1 µSv/h to 500 mSv/h) in a single range.
Dose range is 1 mR - 10R (10 µSv to 100,000 µSv/h) in a single range. Other Ranges are also available.

- **MEETS 10CFR 34.25 - FEDERAL REQUIRMENTS FOR RADIATION SURVEY INSTRUMENTS**

***Note**: TA also makes ion chambers that measure up to 10 million R/hr
See ION CHAMBER COMPARISON CHART

CBRN Real - Time Air & Water Specialists
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SPECIFICATIONS:

PULSED X-RAY RESPONSE

Dose Rate Range: 1 mR/h to 50 R/h (0.1 µSv/h to 500 mSv/h)
(8 digits) in a single range
Total Dose: 1 mR to 10 R (6 digits) in a single range
(10 µSv to 100,000 µSv/h)
Pulse Width Range: 5 nano-seconds to continuous emission
Repetition Rates: Single pulse to 1000/second and above
Wide Energy Range: 2 KeV to 10 MeV & above
High Dose Limits: Per customer specification*

User should inform TA of highest-expected: 10-second, total-dose exposure

***Note**: TA also makes TBM plasma chambers that measure up to 10 million R/hr

RATE MODE – GREEN LIGHT

DETECTOR: Sealed Air plasma chamber 3'' dia. Internal volume 50 cc
Inside Wall: Plastic plus graphite lining
Cap: Removable protective cap
Window: 2.3” dia. x 0.5 mg/cm^2 Kapton.

ELECTRONICS:
Readout: LCD 8 digits with backlight
Count Lamp: Green Flashing LED
Over-range: Red LED Indicator
Audio Alarm: User settable anywhere within TBM range
Electrometer: Solid State MOSFET input.
Electronics: Analog to Digital converter LCD drivers.
Batteries: NEDA 15A, 6 ea. (AA)– 200 hour life.
NEDA CR-1220 - 7 years life.

WEIGHT & DIMENSIONS:
Dimensions: 5-1/2'' x 3-1/2'' x 12'' including handle.
Weight: 3 lbs. complete with batteries.

PULSE MODE – RED LIGHT

OPTIONS:

Tablet and Software
Other Rate or Integrated Ranges
Other Readout Units such as Si units: Sv and Sv/h.
Chamber sleeves or Caps; X-Ray-SLV is X-Ray compliance sleeve with 10cm^2 aperture.
RS232 serial port

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NAVY TEST RESULTS TBM-IC-PULSE-X with TBM-IC-MVR Prototype						
INTEGRATE MODE						
X-RAY SOURCE	**PULSES/SEC**	**DISTANCE**	**FIELD TLD mR**	**TBM-IC-MVR - Prototype**	**DEVIATION**	**TBM-IC-Pulse-X**
XR-200	198 198	24” 48”	145 41.2	115.6	-20% -29%	±5%
XR-300	198 198	24” 48”	228 2.28	1.89	-18% -17%	±8%
LR-FLASH	10 10	24” 48”	150 22	123 19	-18% -14%	±8%
BETATRON	7.5 MeV 45 sec	4 meters	61	30.75	-50%	±12%
NOTE: other brands also read low on BetaTron. Navy admits TLD might be at fault.						
			DOSE	**DOSE**		
Cs-137			5 mR	9 mR		
Cs-137			500 mR	500 mR	GOOD	
			1,000 mR	1,060 mR	+6%	
Cs-60			500 mR	500 mR	GOOD	
Cs-60			1,000 mR	1,060 mR	GOOD	
DOSE RATE MODE						
H-100 H-60			100 mR/hr 300 mR/hr 2R/hr	130 390 2.6	+30% +30% +30%	
NAVY COMMENTS / COMPLAINTS						
COMPLAINT			**SOLUTION**			
Microphonics			Protect the window with screen when window is tapped			
TA SUCCESS	ITEM					
	Battery Life		OKAY			
	Weight		OKAY			

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FAQ ~ TBM-IC-PULSE-X.

1) What substantiation and radiation type tests have been carried out on this monitor in the pulsed mode?

Answer) Please see the Navy's test results for Technical Associates instruments in embedded chart in the Data Sheet. Extensive testing was performed on Technical Associates and 3 other instruments including Betatron.

2) What pulse widths have been tested?

Answer) 5 NanoSecond – 100 NanoSecond – 500 NanoSecond – Continuous Emissions

3) Has equipment been tested in single pulse mode at a wide range of pulse widths?

Answer) YES

4) What energy range were the above tests carried out at?

Answer) Please see the attached Spec Sheet chart.

5) Were the results of such testing traceable to reference measurements or national standards, is so what were those references?

Answer) Much of the testing done by the US Navy but traceability and measurement references were not shared.

6) Is the unit CE Marked?

Answer) YES, and is IP64

7) Is there an Operation & Maintenance Manual provided?

Answer) YES, an Operation & Maintenance Manual is sent with the instrument.

8) Are Test reports available to evaluate the monitor's performance?

Answer) Test reports available are linked to the data sheet. See the description in the Alphabetical Product List TBM-IC-PULSE-X.

Also, we send a test data sheet and calibration certificate with the instrument.

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