

# TOTAL 6 STACK MONITORS ~ GAS, PARTICULATE GROSS BETA-GAMMA ~ IODINE ~ TRITIUM ~ C-14

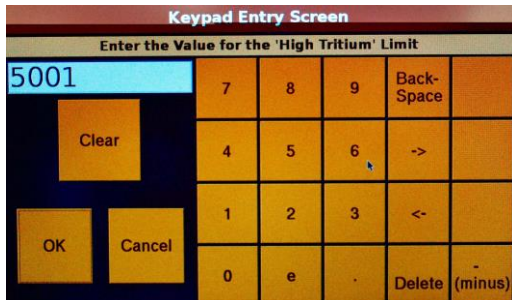
## Model Series TOTAL-6

- Model ~ TOTAL-6-TCI-H<sup>3</sup>      plus Inorganic C-14 (CO<sub>2</sub>)
- Model ~ TOTAL-6-TCO-H<sup>3</sup>    plus Organic C-14
- Model ~ TOTAL-6-TC            Multi-Nuclide System
- Model ~ CAM-33                 Multi-Nuclide System

### FEATURES:

- SIX CHANNEL SIMULTANEOUS MEASUREMENT
- SENSITIVE TO:
  - H-3 10<sup>-7</sup> µCi/cc
  - CO2 10<sup>-8</sup> µCi/cc
  - Organic C-14 10<sup>-7</sup> µCi/cc
- READS DIRECTLY IN µCi/cc or Bq/l
- REAL TIME FLOW MEASUREMENT
- DYNAMIC BACKGROUND COMPENSATION
- ALARM & CAN ACTUATE REMOTE CONTROLS
- CAN OPERATE IN PRESENCE OF OTHER RADIOACTIVE GASES (See Chart)
- MICRO PROCESSOR OPERATION
- DIGITAL ACCURACY
- INCLUDES DATA, ANALYSIS, DATA ARCHIVE & DATA RETRIEVAL
- USB & ETHERNET PORTS
- RUGGED CABINET
- OPTIONAL: CASTER OR SKID MOUNTED CABINET
- IP33

**PWR & BWR Produce Tritium  
10 Curie/Giga-Watts per Year**



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| Model ~ CAM-33                     | Multi-Nuclide System                   |

### APPLICATION:

All six models, the TOTAL-6 Stack Monitors and the CAM-33 are good for Nuclear Power Plants, Stacks, Room Air, etc. They are sensitive, rugged stack or effluent monitors.

- The TOTAL-6 series stresses Tritium and C-14 detection.
- The CAM-33 series stresses particulates, Iodine, and Nobel Gas.
- The CAM-33-6 monitor has the most channels for 6 simultaneous measurements of Gross Beta/Gamma Particulates, Alpha Particulates, Noble Gas, Iodine, Tritium, & C-14.

**NOTE:** See the TOTAL-6 Series Stack Monitor Chart & the flow diagrams included here for details to help you select the detector suite that best serves your need.

See Spec Sheet details for the [CAM-33 Series](#).

Commercial versions are available for research labs, room air, glove boxes and other applicable uses.

### TRITIUM & <sup>14</sup>CO<sub>2</sub> MEASUREMENT DESCRIPTION:

- The subtractive balanced chamber electrometer circuit and optional Radon Rejection decreases background effects to negligible levels.
- The deionized and filtered intake reduces to negligible levels spuriousity based on smokes, dusts, and existing ionization in the air.
- Inlet and outlet hoses provide return of monitored air to source: interiors of fume hoods and exhaust stacks, etc.
- All instruments are calibrated at the factory. Calibration check may be performed in the field with a license exempt µCurie level Beta source

Measurement Ranges of Optional Detectors	From	4 Decade Model	6 Decade Model
Tritium	10 <sup>-7</sup>	10 <sup>-3</sup>	10 <sup>-1</sup> uCi/cc
Inorganic C-14	10 <sup>-8</sup>	10 <sup>-4</sup>	10 <sup>-2</sup> uCi/cc
Organic C-14	10 <sup>-9</sup>	10 <sup>-5</sup>	10 <sup>-3</sup> uCi/cc
Alpha particulate	5 x 10 <sup>-8</sup>	10 <sup>-4</sup>	uCi/cc



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DETECTOR TYPE	1 MINUTE	1 HOUR	10 HOURS	1 DAY	1 WEEK	TOP OF RANGE
ALPHA	6 x 10 <sup>-10</sup> μCi/ml	1 x 10 <sup>-11</sup> μCi/ml 3.7 x 10 <sup>-7</sup> Bq/ml	1 x 10 <sup>-12</sup> μCi/ml 3.7 x 10 <sup>-8</sup> Bq/ml	6 x 10 <sup>-13</sup> μCi/ml 2.4 x 10 <sup>-8</sup> Bq/ml	1 x 10 <sup>-13</sup> μBq/ml 4 x 10 <sup>-9</sup> Bq/ml	1.0 Bq/ml
PARTICULATE BETA-GAMMA	6 x 10 <sup>-10</sup> μCi/ml	1 x 10 <sup>-11</sup> μCi/ml 3.7 x 10 <sup>-7</sup> Bq/ml	1 x 10 <sup>-12</sup> μCi/ml 3.7 x 10 <sup>-8</sup> Bq/ml	6 x 10 <sup>-13</sup> μCi/ml 2.4 x 10 <sup>-8</sup> Bq/ml	1 x 10 <sup>-13</sup> μBq/ml 4 x 10 <sup>-9</sup> Bq/ml	1.0 Bq/ml
IODINE	3 x 10 <sup>-9</sup> μCi/ml	1 x 10 <sup>-11</sup> μCi/ml 3.7 x 10 <sup>-7</sup> Bq/ml	1 x 10 <sup>-12</sup> μCi/ml 3.7 x 10 <sup>-8</sup> Bq/ml	6 x 10 <sup>-13</sup> μCi/ml 2.4 x 10 <sup>-2</sup> Bq/ml	1 x 10 <sup>-13</sup> μBq/ml 4 x 10 <sup>-9</sup> Bq/ml	0.1 Bq/ml
GAS-STANDARD RANGE	6 x 10 <sup>-7</sup> μCi/ml	1 x 10 <sup>-7</sup> μCi/ml 3.7 x 10 <sup>-3</sup> Bq/ml	2.7 x 10 <sup>-8</sup> μCi/ml 1 x 10 <sup>-3</sup> Bq/ml	1 x 10 <sup>-8</sup> μCi/ml 3.7 x 10 <sup>-4</sup> Bq/ml	2.7 x 10 <sup>-9</sup> μBq/ml 1 x 10 <sup>-4</sup> Bq/ml	10 <sup>15</sup> Bq/ml <b>POST-ACCIDENT</b> 4 X 10 <sup>21</sup> Bq/ml



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 Model ~ CAM-33                 Multi-Nuclide System

**TOTAL 6 SERIES – STACK MONITORS**

Airborne Activity	Model	TOTAL-6-TCI (1)	TOTAL-6-TCO (1)	TOTAL-6-TC	CAM-33-1P	CAM-33	CAM-33-4	CAM-33-6
	<b>Chemical</b>							
Tritium H3	T <sub>2</sub> , HTO T <sub>2</sub> O	YES	YES	YES	OP	NO	OP	YES
Carbon C-14: Inorganic Organic	CO <sub>2</sub> Various	YES —	— YES	YES OP	OP			OP YES
Particulate	Alpha				YES	OP	OP	OP
Particulate	Beta				YES	YES	YES	YES
Iodine				OP	YES	YES	YES	YES
Noble Gas: Gross/All				YES	YES	YES	YES	YES
Argon				OP				OP
Xenon				OP				OP
Krypton				OP				OP
Radon				RX				OP - RX

**Number of Channels:**

YES = Measures Separately

RX = Rejects

OP = Optional

**NOTE:** Models TOTAL-6-TCO & TOTAL-6-TCI work best if no other nuclides are present

**See Spec Sheet details for the CAM-33 series.**



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### SPECIFICATIONS:

See [CAM-33 series](#) Spec Sheet for Details

#### ELECTRONICS:

**Circuit:** Electrometer circuit amplifies net difference between a 2 liter Tritium internal chamber & a background chamber of similar size & configuration.

**Calibration:** Can be calibrated internally with Tritium (or HTO) & <sup>14</sup>CO<sub>2</sub> gas,  
**OR** on a Gamma calibration course;  
**OR** can be checked at a single point with an external (not provided) Beta source.  
 Organic Carbon Channel can be calibrated with C-14 disk source.

**Alarm:** High Level: Red flashing light plus warbling sound  
 System Fault Alarm: White steady light

**Remote Alarm:** 3 Relays provided for operators use

**Output:** USB Port & ethernet port  
 Optional 0-5 volt or 4-20 mA.

**On-Board Computer:** Data Archive & Data Retrieval

**Background:** Essentially eliminated by subtractive balanced chambers.  
**Optional** - Radon Rejection

**Smoke, Dust & Ion Elimination:** Filter and deionizer reduce effects to negligible levels.

**WEIGHT & DIMENSIONS:**

**Dimensions:** 23"W x 66"H x 36"D

**Shipping Weight:** 635 lbs.

#### OPTIONAL:

<ul style="list-style-type: none"> <li>Interconnection to / from port of other gas or particulate monitors</li> </ul>	<ul style="list-style-type: none"> <li>Remote Alarm (audio &amp; visual) (Model RDX-8) includes 25" of cable. Can be used to 500 feet.</li> </ul>
<ul style="list-style-type: none"> <li>Serial Printer</li> </ul>	<ul style="list-style-type: none"> <li>Casters or Skid Mounted</li> </ul>
<ul style="list-style-type: none"> <li>Higher Tritium Count Rate using Both Proportional Detectors for Tritium Measurement</li> </ul>	<ul style="list-style-type: none"> <li>Additional Lead Shielding for Greater Gamma Rejection</li> </ul>
	<ul style="list-style-type: none"> <li>4-20 mA for computer.</li> </ul>



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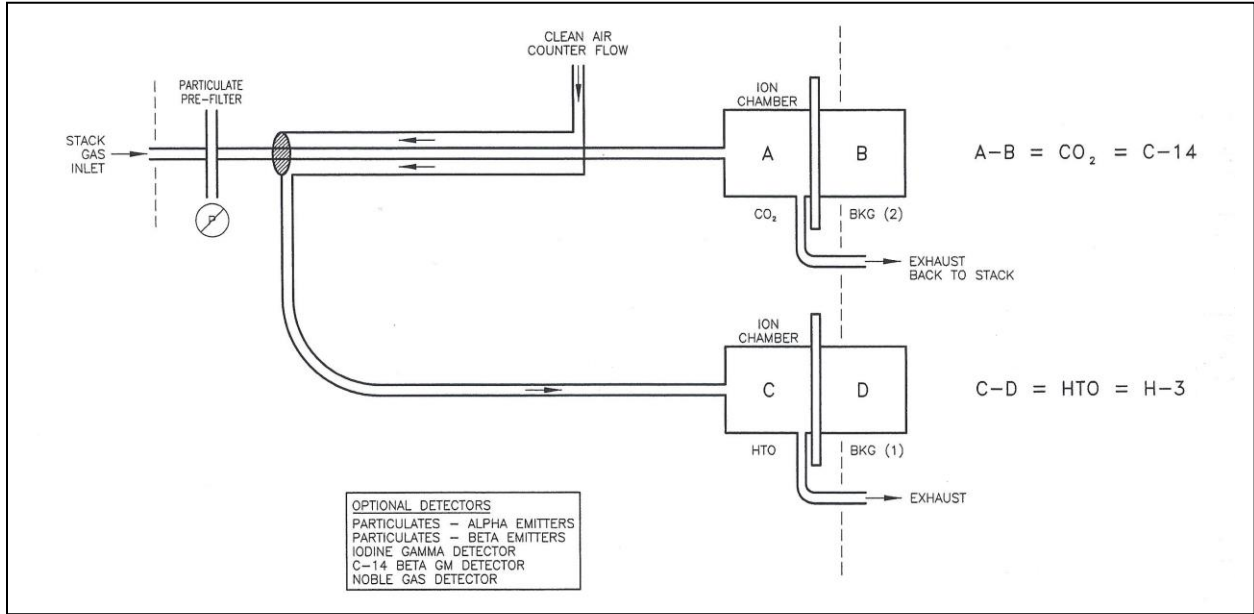
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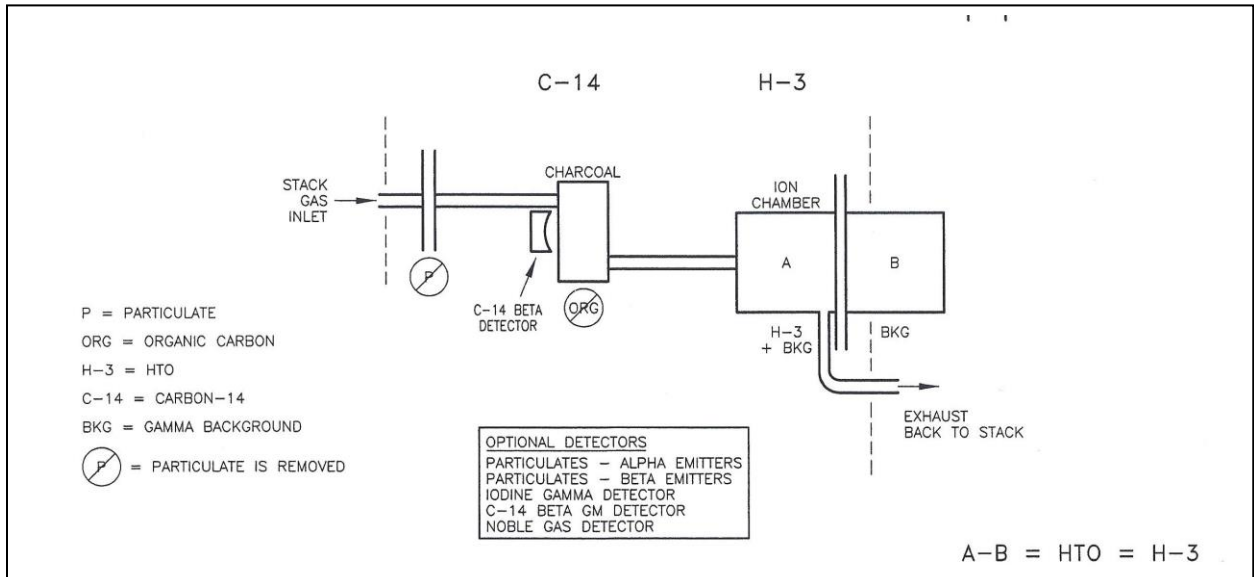
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#### TOTAL-6-TCI-H<sup>3</sup>



#### TOTAL-6-TCO-H<sup>3</sup>



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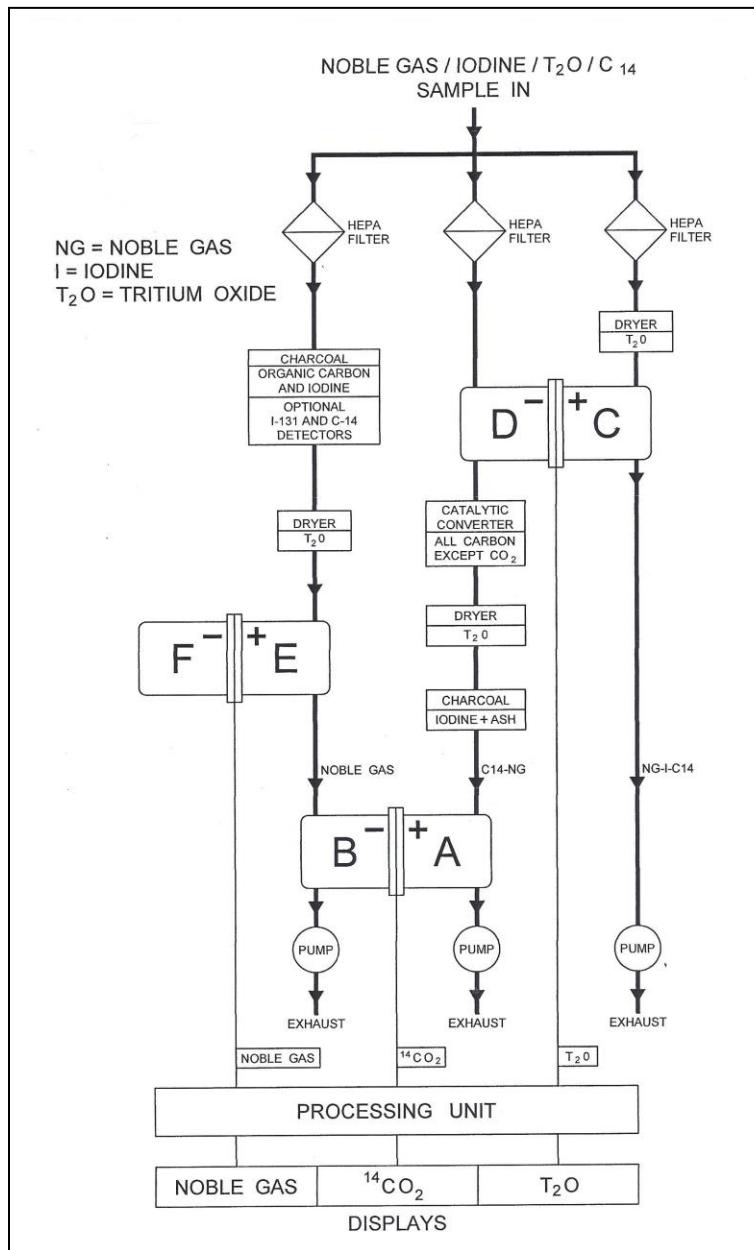
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**TOTAL-6-TC**



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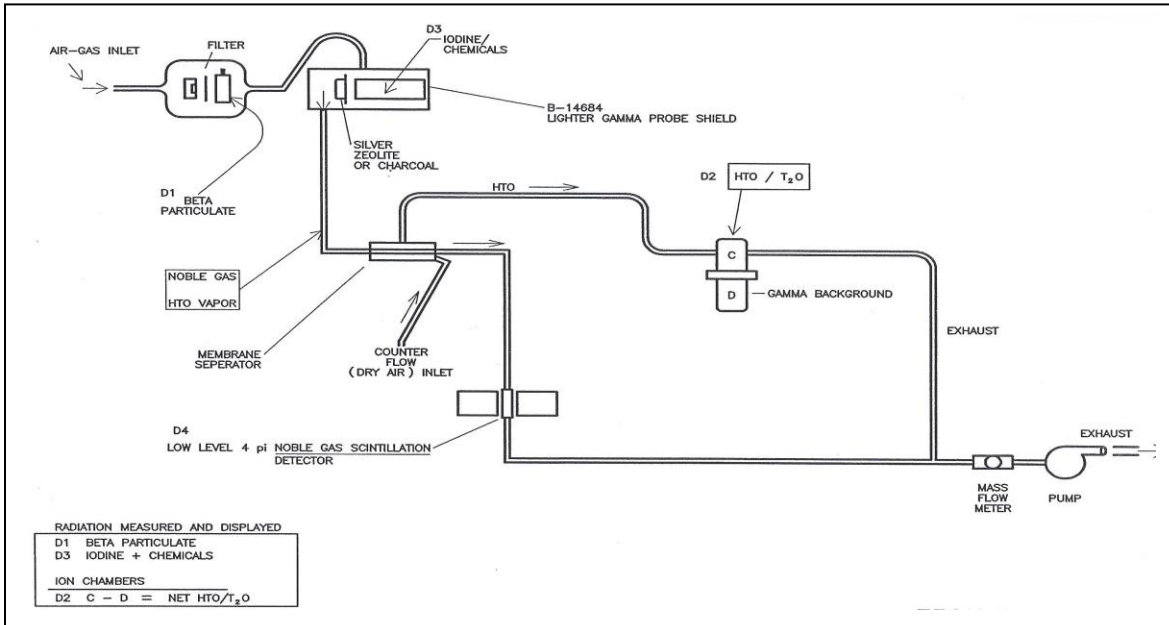
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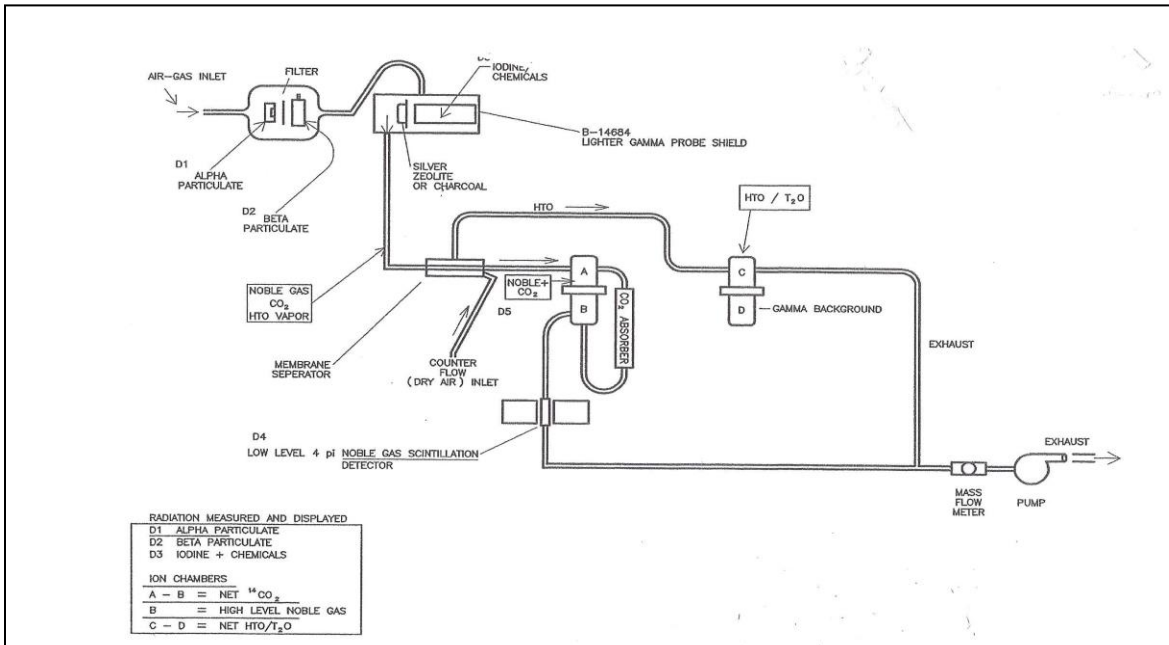
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Model ~ TOTAL-6-TC Multi-Nuclide System

Model ~ CAM-33 Multi-Nuclide System



**CAM-33-4**



**CAM-33-6**



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