

# HgCEMS Hardware Updates

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# HM-1400 TRXC HgCEMS

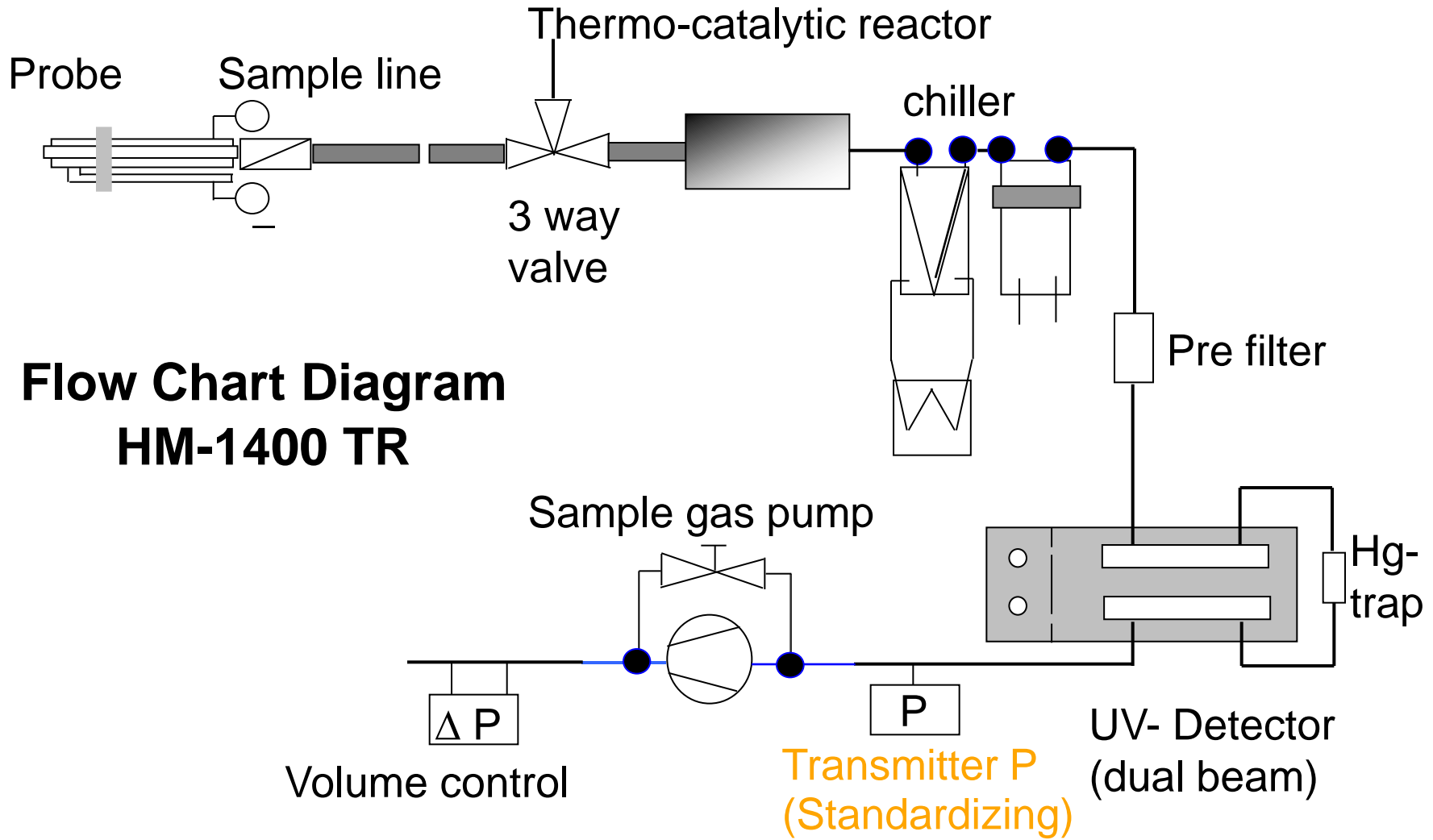


- Extractive principle
- Certified Hg<sup>0</sup> Calibration Gas bottle daily cal-checks
- Detection of Hg<sup>0</sup> by dual beam photometer
- Operation by help of keypad with text messages
- Cabinet design, easy to use, simple exchange of components easy access
- PLC control

# HM-1400 TRXC HgCEMS

| Model       | Use  | Description  | Features  |
|-------------|--|--|---|
| HM-1400TRXC | Continuous mercury emissions monitoring for cement, power, industrial or Superfund sites | <p>Direct extraction to a dry cold vapor atomic absorption and UV photometer</p> <p>First HgCEMS to use certified bottled Hg<sup>0</sup> Calibration Gas</p> | Control module interface via MODBUS, TCP/IP; minimal maintenance; EPA protocols for compliance/calibration; switchable ranges |

# HM-1400 TRXC HgCEMS



# HM-1400 TRXC HgCEMS

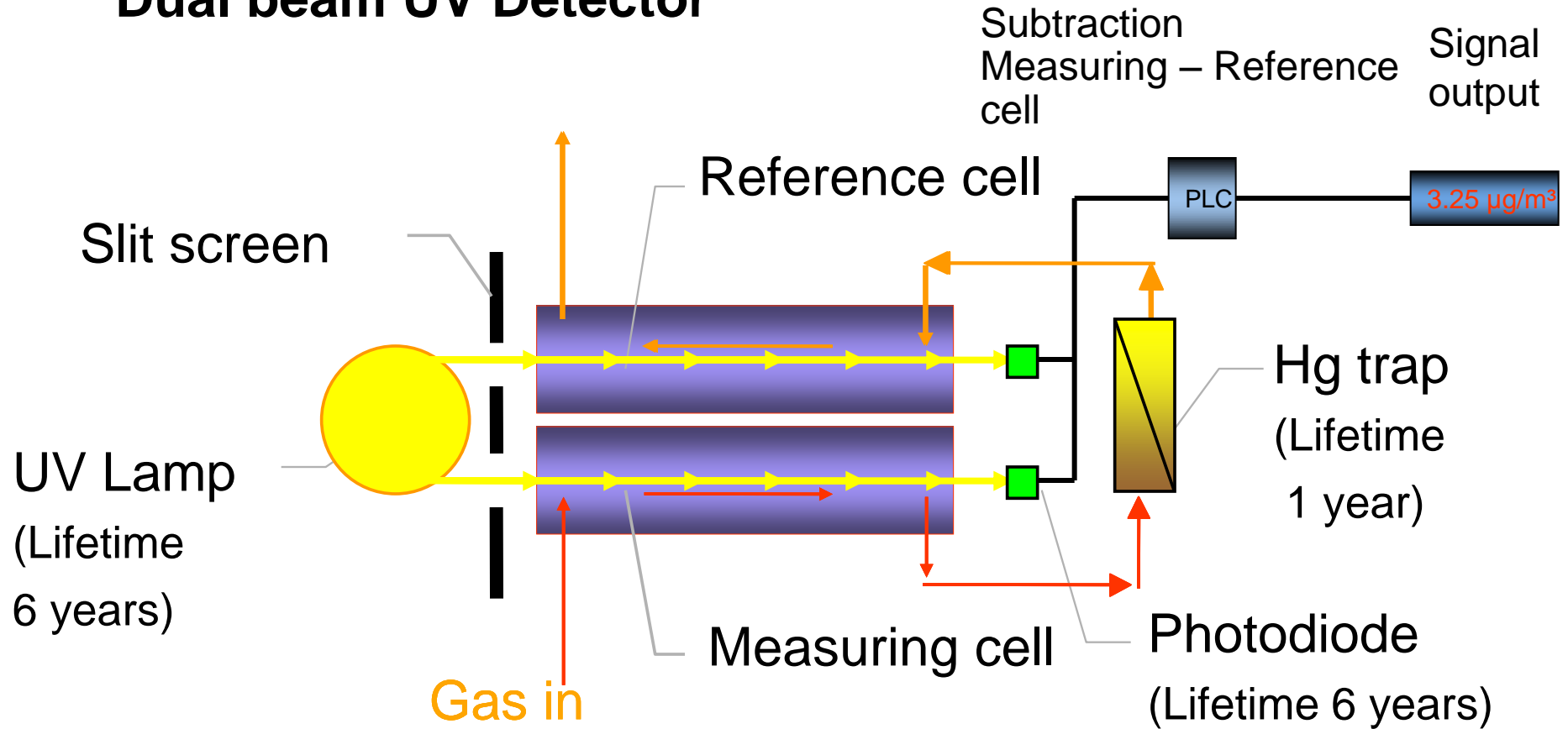
## Photometer



Top View Dual Beam Detector

# HM-1400 TRXC HgCEMS

## Photometer Dual beam UV Detector



## Universal Analyzer Hg Probe System



- 275E Extraction Probe w/
  - SN-316 Stainless Steel w/ SilcoNert® Coating < 400°F (204°C)
  - TK-T/C Only (Type K) For Remote Control
  - 4in Flange
  - Standard "Cannon Shot" Blowback
  - 3in Boot (Standard) - 2.75-2.9 (69.8mm-73.5mm) Dia. Flood Cal (Standard)
  - 115-115 VAC 50/60 Hz
  - Failsafe (Standard) HK-Integrated HPA with Type K T/C for Remote Control
  - Filter Element, Sintered Titanium, (9" Long)



## Universal Analyzer Hg Probe Tube



- Heated Probe Assembly
  - 6SX - 6 FT 316SS Heated Probe, w/ Titanium Inner Tube - (Stack Temp < 750 degF)
  - 4 Inch Flange
  - 115 - 115 VAC 50/60 Hz
  - Remotely Controlled



## Universal Analyzer HMI/PLC Sample System Controller

- PLC Enclosure
  - Probe Temperature Control (Type-K TC Input)
  - Heated Probe Tube Temperature Control (Type-K TC Input)
  - Combustion Chamber Temperature Control (Type-K TC Input)
  - Heated Sample Line Temperature Control (Type-K TC Input) (w/ GFCI Circuit)
  - Blowback Control
    - Includes Associated Solid State Relays

## O'Brian Sample Line

- Pre-insulated sample tube bundle with SV47 jacket
- Heated: Quantity (1) 3/8" x 0.062" and (1) 1/4" x 0.040" wall, PFA tubes
- Unheated: Quantity (3) 1/4" x 0.040" wall, PFA tubes
- 18 watt/ft. zone style constant power density, CPD,
  - cable rated for 208 V nominal (200-216 VAC)
  - Maximum controlled temperature of 400°F/204°C
  - Type K thermocouple located 50 ft. in from the power end
  - Quantity (9) 14 gauge TFE 204C rated wires (color coded)
  - Quantity (4) 18 gauge TFE 204C rated wires (color coded)
  - Quantity (3) 18 gauge type K shielded messengers
- Ambient Conditions
  - LOW Ambient Temp with 25 MPH (40 kph) wind: . . . -20° F
  - HIGH Ambient Temp with 10 MPH (16 kph) wind: . . . 104° F
  - Process Temperature at LOW ambient: . . . . . 388° F
  - Process Temperature at HIGH ambient: . . . . . 597° F
  - Operating Voltage: . . . . . 208 VAC
  - Max Inlet Temperature: . . . . . 400° F
  - Max Current Draw: . . . . . 139/15 Amps



## Universal Analyzer 500 Series Gas Cooler



- Two (2) 5" heat exchangers
  - Glass
- One or two gas streams
- Flow rates from 1 – 5 l/m STP
- Digital display
- Adjustable temperature set point
- Stable dew point
- On-board electronics for liquid sensor

## AirGas Specialty Gas Division

### Cylinders:

- Gases are independent and certified separately by NIST traceable Thermo 80i. The concentration of a gas stays relatively constant.
- Handling the cylinders is the same as handling other low concentration, reactive EPA protocols ( i.e. NO, NO<sub>2</sub>, SO<sub>2</sub>, H<sub>2</sub>S, CO) are now.
- The gas cylinders are easy to transport from site to site. More tests can be performed in a day.
- More cost effective



## AirGas Specialty Gas Division

**Airgas**

**CERTIFICATE OF ANALYSIS**  
Grade of Product: CERTIFIED STANDARD-SPEC

Airgas Specialty Gases  
440 Indian Land Blvd  
Clemmons, NJ 08922  
(800) 526-1978 Fax: (800) 746-6671  
www.airgas.com

Par. Number: X02N199C15A25J3      Reference Number: 82-124389233-1  
Cylinder Number: CO-248666      Cylinder Volume: 142.0 CF  
Laboratory: ASB - Riverton - NJ      Cylinder Pressure: 1950 PSIG  
Analysis Date: Aug 09, 2013      Valve Outlet: 850  
Lot Number: 82-124389233-1

Expiration Date: Feb 09, 2014

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

**ANALYTICAL RESULTS**

| Component | Requested Concentration          | Actual Concentration (Mole %)    | Analytical Uncertainty |
|-----------|----------------------------------|----------------------------------|------------------------|
| MERCURY   | 3,000 micrograms per cubic meter | 2,900 micrograms per cubic meter | ±1-6%                  |
| NITROGEN  | Balance                          |                                  |                        |

Note: Measurement Traceability is directly versus a Thermo 81i Mercury generator certified at NIST as a Vendor Prime, detailed in NIST report B39.03-09-165

*[Signature]*  
Approved for Release

The analytical uncertainty takes into account the traceability to the Thermo 81i Mercury generator certified as a vendor prime.

This cylinder was analyzed using a vendor certified mercury gas regulator.

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## AirGas Specialty Gas Division

### Elemental Mercury Gas Specifications

- Concentrations range from 0.2ug/ml<sup>3</sup> to 60ug/ml<sup>3</sup>
- Balance Nitrogen
- Pressure (depending on cylinder size)
  - 300A's = 2000 PSIG (5500 Usable Liters)
  - 150A's = 1800 PSIG (3600 Usable Liters)
- Traceable to NIST certified cylinder mixtures
- Analytical Accuracy  $\pm 5\%$  (currently)

## AirGas Specialty Gas Division

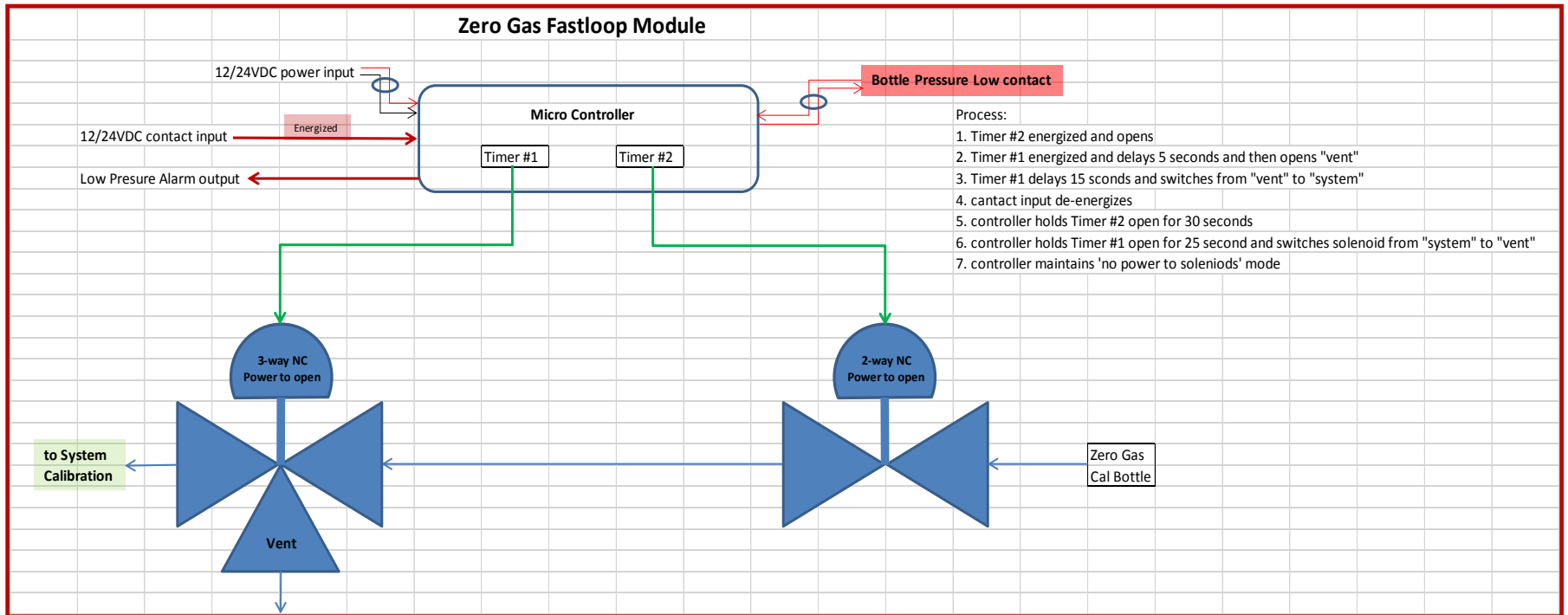
- AirGas developed a standardized regulator and valve treatment.
  - AirGas has perfected a new coated regulator that has eliminated the initial value “creep”
    - Previous systems had approximately an hour of “creep” time initially



Medical grade regulator



## AirGas Specialty Gas Division



Double Block & Bleed Feedback Prevention System