MODEL 43-98
CYLINDRICAL
GAS PROPORTIONAL DETECTOR

AUGUST 1999

Serial No. PR148499 and Succeeding Serial Numbers

LUDLUM MEASUREMENTS, INC.
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1. GENERAL

The Ludlum Model 43-98 is a cylindrical area gas proportional detector, 1.5 inch in outer diameter. It is designed for alpha and beta survey of pipes and tubing and is compatible with a number of counting instruments.

2. SPECIFICATIONS

- **WINDOW THICKNESS:** 0.8 mg/cm^2 (2 layers of aluminized mylar)

- **WINDOW AREA:**
  170.3 cm^2 active
  Approximately 110 cm^2 open

- **COUNTING GAS:** P-10 (10% methane, 90% argon) is recommended. Other counting gasses are also acceptable.

- **OPERATING VOLTAGE:**
  Typically 1100 - 1400 volts (α)
  Typically 1500 - 1800 volts (β)

- **COUNTER THRESHOLD SETTING:** Typically 3-4 mV

- **BACKGROUND:**
  Alpha - less than 10 counts per minute
  Beta: - Typically less than 250 cpm (in 10μR/hr (0.1μS/h) field)

- **EFFICIENCY (2 pi geometry):**
  30% Tc-99
  15% Th-230

- **SIZE:** 1½" (3.75 cm) OD, 9.5" (24.13cm) overall length (not including fittings), 6" (15.24 cm) active length

- **WEIGHT:** .5 lb (.23 kg)

- **GAS CONNECTORS:** fittings for 1/8" hose

- **SIGNAL CONNECTOR:** Series "C"

3. HOOK-UP

- Connect counting gas output and input lines to detector.

RECOMMENDED EQUIPMENT:

(1) DUAL-STAGE REGULATOR: One stage to show supply pressure; second stage to reduce supply pressure to 1-2 psi.

(2) NEEDLE VALVE between second regulator stage and flowmeter for easier flow adjustment.

(3) FLOW METERS: Range of 0 - 100 cubic centimeters/minute (cc/min).

4. FLUSH

☐ Connect output gas line from detector to output flowmeter.

☐ Connect input and gas lines from main supply through the regulator and input flow meter.

☐ Turn main supply on and flush detector at 100 cc/min for 15 minutes.

✔ NOTE:

A faster flush time can be realized if the output gas line (only) is removed at the output flow meter and the flow rate increased to maximum flow rate. Flush time may be reduced to 10 minutes.

CAUTION

The main supply should be reduced to less than 50 cc/min before the output gas line is reconnected.

☐ After flush is complete, set flow to 50-80 cc/min.

☐ Check output flowmeter. Determine detector leakage to be less than 5 cc/min.

5. DETECTOR PERFORMANCE

- **ALPHA PLATEAU:** Determine the plateau region of the background and alpha source counting curves for the applied voltage range of 1100-1400 volts. Use 50-volt increments and set the counting instrument input sensitivity at 3-4 mV. The operating voltage should be approximately 1250 volts. The background count should be 10 cpm or less. The operating voltage will increase with a higher input sensitivity.

- **BETA PLATEAU:** Determine the plateau region in the background and beta source counting curves for the applied voltage range of 1500 volts to 1800 volts or from 1500 volts to when either the source or background count rate increases dramatically. Use 50-volt increments and leave the input sensitivity at 4 mV. The operating voltage should be between 1650-1750 volts, with the background count as stated in Section "2. Specifications." Setting instrument input sensitivity greater than 4 mV will increase the operating voltage.

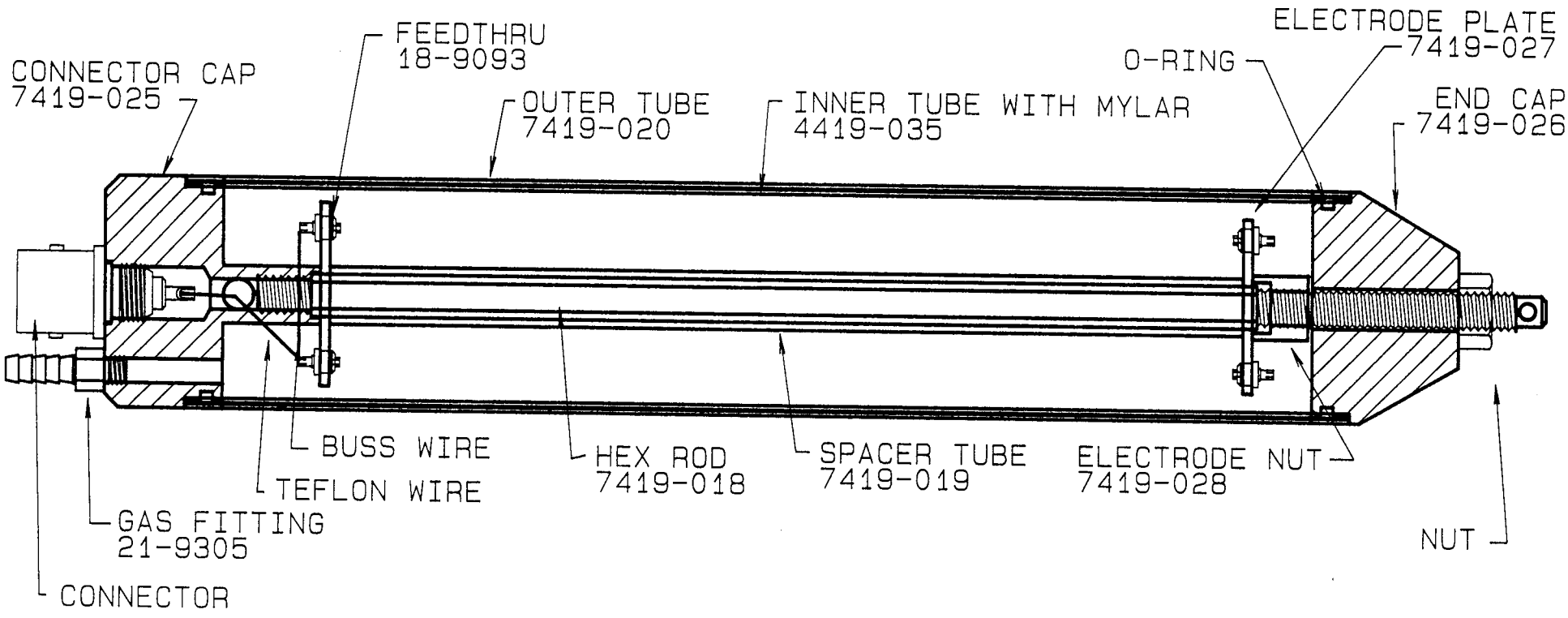
6. PARTS LIST

Ref. No.	Description	Part No.
	Completely Assembled M43-98 Gas Probe	47-2596
	Outer Tube	7419-020
	Inner Tube W/Mylar	4419-035
	Output End Cap	7419-026
	Connector Cap	7419-025
	Hex Rod	7419-018
	C Connector	13-7751
2 EA.	Fitting - 1/8 hose	21-9305
2 EA.	O-Ring	16-8362

DRAWINGS & DIAGRAMS

Assembly Instructions, Drawing 419 x 6
M43-98 with Dimensions, Drawing 419 x 11

ASSEMBLY INSTRUCTIONS FOR M 43-98



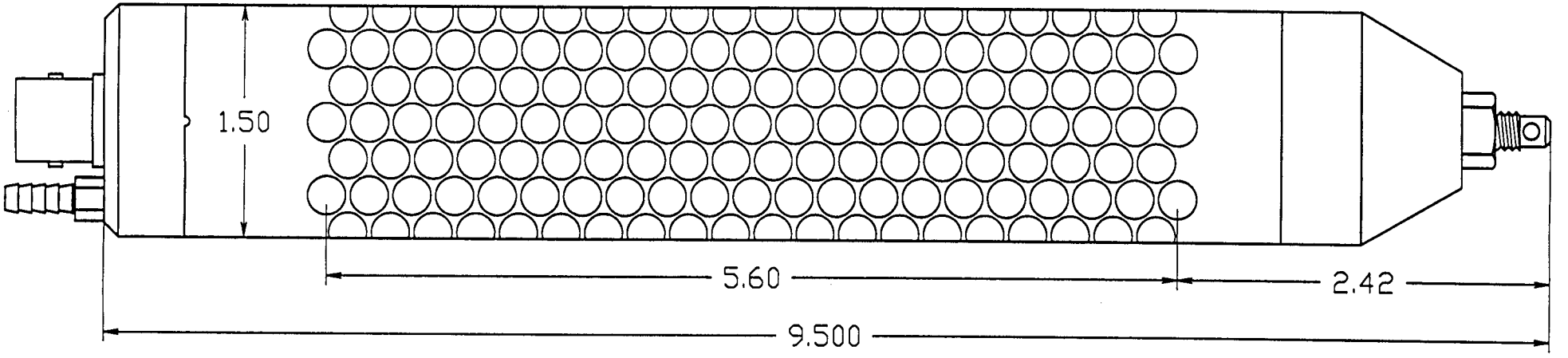
NOTE:

THE HOLES IN ELECTRODE PLATES MUST LINE UP

CHG	NO.				DWN	CHK	APP
DWN GW	DATE 12-5-94	CHK	DATE 8-25-99	APP	DATE		
TOL: SHOP STD ☐ OTHER		SCALE: FULL ☒ OTHER					
TITLE M 43-98							
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 419		SHEET 6			

LUDLUM
MEASUREMENTS, INC.
SWEETWATER, TEXAS

MODEL 43-98 1.5" CYLINDRICAL GAS PROBE



CHG	NO.		DWN	CHK	APP
	DATE	CHK DATE	APP	DATE	
GW	8/4/98	7-4-98			
TOL: SHOP STD ☐ OTHER		SCALE: FULL ☒ OTHER			
TITLE M 43-98					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556		SERIES 419	SHEET 11		