

**MODEL 43-94
CYLINDRICAL
GAS PROPORTIONAL DETECTOR**

AUGUST 1999

**Serial No. PR148474 and Succeeding
Serial Numbers**



LUDLUM MEASUREMENTS, INC.

501 OAK ST., P.O. BOX 810

SWEETWATER, TX 79556

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M43-94 Gas Proportional Detector

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M43-94 Gas Proportional Detector

1. GENERAL

The Ludlum Model 43-94 is a cylindrical area gas proportional detector, 1/2 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/cm² (2 layers of aluminized mylar)
- **WINDOW AREA:**
60.8 cm² active
Approximately 39 cm² 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 1450 - 1750 volts (β)
- **COUNTER THRESHOLD SETTING:** Typically 3-4 mV
- **BACKGROUND:**
Alpha - less than 10 counts per minute
Beta - Typically less than 150 cpm (in 10 μ R/hr (0.1 μ S/h) field)
- **EFFICIENCY (2 pi geometry):**
34% Tc-99
20% Th-230
- **SIZE:** 1/2" (1.25 cm) OD, 8.619" (21.89 cm) overall length (not including fittings), 6" (15.24 cm) active length
- **WEIGHT:** 1.4 lb (.64 kg)
- **GAS CONNECTORS:** fittings for 1/8" hose
- **SIGNAL CONNECTOR:** Series "C"
- **CABLE:** Typically 35 ft

M43-94 Gas Proportional Detector

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 1450 volts to 1750 volts or from 1450 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 approximately 1600 volts, with the background count as stated in Section "2. Specifications." Setting instrument input sensitivity greater than 4 mV will increase the operating voltage.

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6. PARTS LIST

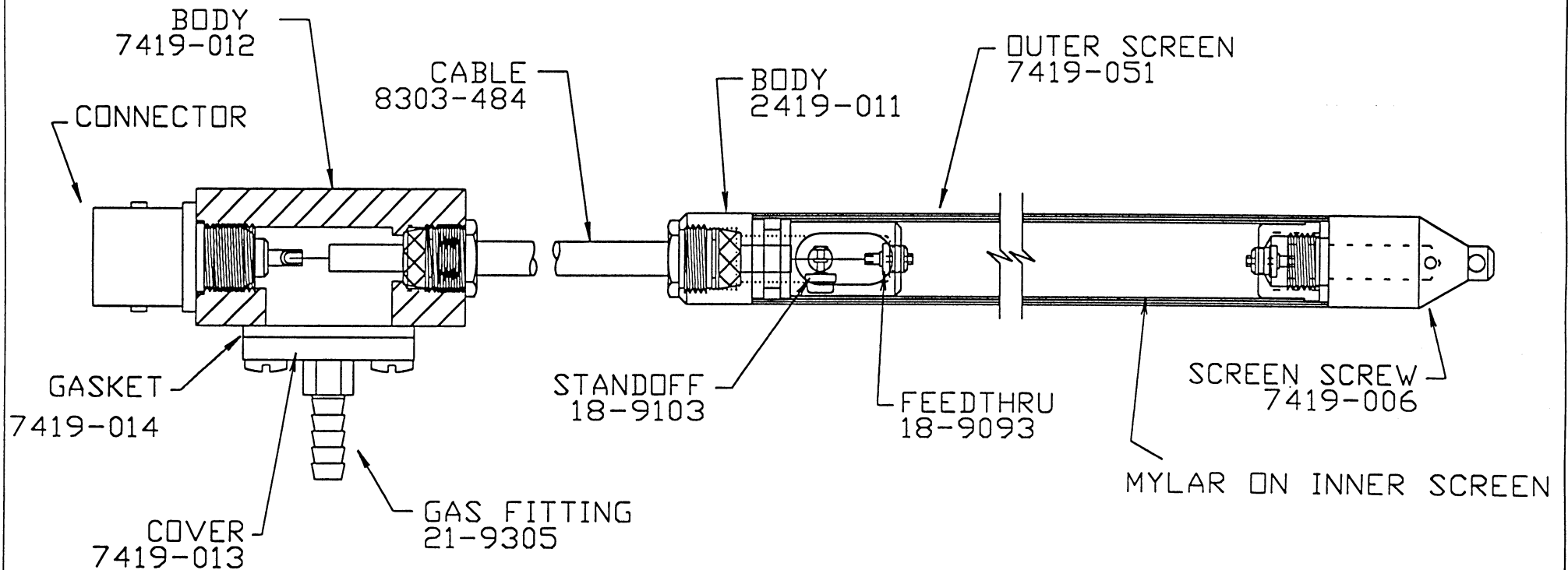
Ref. No.	Description	Part No.
	Completely Assembled M43-94 Gas Probe	47-2569
	Outer Screen	7419-051
	Inner Screen	7419-049
	Gas Adapter	7419-012
	Gas Adapter Cover	7419-013
	Gas Adapter Gasket	7419-014
	Cable (standard length 35 ft)	8303-484
	C Connector	13-7751
2 EA.	Fitting - 1/8 hose	21-9305
2 EA.	O-Ring	16-8301


M43-94 Gas Proportional Detector

DRAWINGS & DIAGRAMS

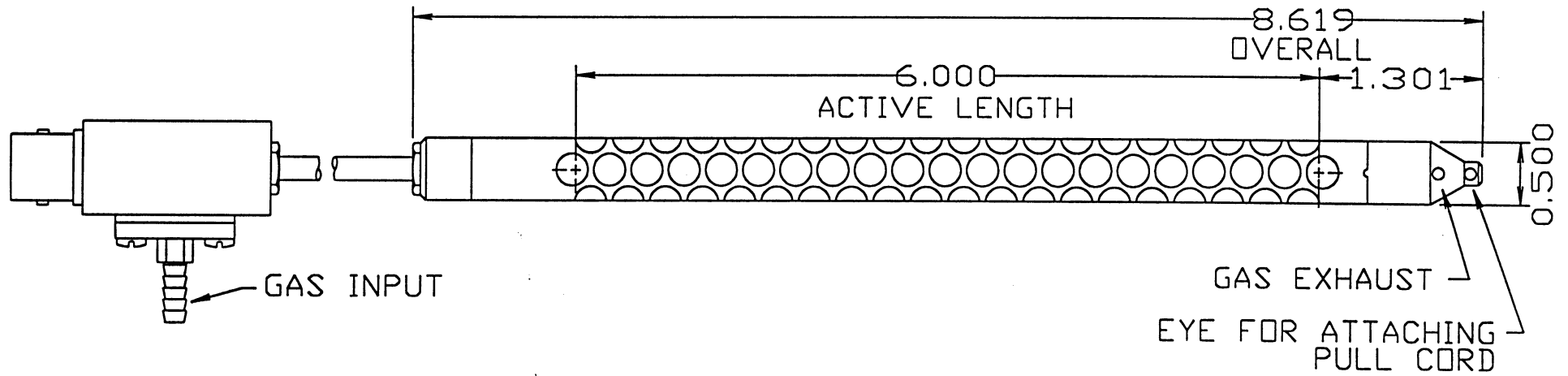
Assembly Instructions, Drawing 419 x 5
M43-94 with Dimensions, Drawing 419 x 9


ASSEMBLY INSTRUCTIONS FOR MODEL 43-94



CHG NO.		DWN	CHK	APP
DWN DATE	CHK DATE	APP DATE		
GW 12-1-94	W 8-4-98	W 8-2-98		
TOL: SHOP STD <input type="checkbox"/>	SCALE: FULL <input type="checkbox"/>	OTHER 12=10		
TITLE M 43-94				
	LUDLUM MEASUREMENTS, INC. 301 OAK STREET SWEETWATER, TEXAS 79556	SERIES 419	SHEET 5	

MODEL 43-94 1/2" CYLINDRICAL GAS PROBE



CHG NO.		DWN	CHK	APP
DWN DATE	CHK DATE	APP DATE		
NG 8/25/95	8-4-98	8-4-98		
TOL: SHOP STD <input type="checkbox"/>	SCALE: FULL <input type="checkbox"/>	OTHER 8=10		
TITLE M 43-94				
	LUDLUM MEASUREMENTS, INC. 501 DAK STREET SWEETWATER, TEXAS 75556	SERIES	SHEET	
		419	9	