
**LUDLUM MODEL 120
GAS PROPORTIONAL DETECTOR
August 2011**

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LUDLUM MEASUREMENTS, INC
501 OAK STREET, P.O. BOX 810
SWEETWATER, TEXAS 79556
325-235-5494, FAX: 325-235-4672

STATEMENT OF WARRANTY

Ludlum Measurements, Inc. warrants the products covered in this manual to be free of defects due to workmanship, material, and design for a period of twelve months from the date of delivery. The calibration of a product is warranted to be within its specified accuracy limits at the time of shipment. In the event of instrument failure, notify Ludlum Measurements to determine if repair, recalibration, or replacement is required.

This warranty excludes the replacement of photomultiplier tubes, G-M and proportional tubes, and scintillation crystals which are broken due to excessive physical abuse or used for purposes other than intended.

There are no warranties, express or implied, including without limitation any implied warranty of merchantability or fitness, which extend beyond the description of the face there of. If the product does not perform as warranted herein, purchaser's sole remedy shall be repair or replacement, at the option of Ludlum Measurements. In no event will Ludlum Measurements be liable for damages, lost revenue, lost wages, or any other incidental or consequential damages, arising from the purchase, use, or inability to use product.

RETURN OF GOODS TO MANUFACTURER

If equipment needs to be returned to Ludlum Measurements, Inc. for repair or calibration, please send to the address below. All shipments should include documentation containing return shipping address, customer name, telephone number, description of service requested, and all other necessary information. Your cooperation will expedite the return of your equipment.

**LUDLUM MEASUREMENTS, INC.
ATTN: REPAIR DEPARTMENT
501 OAK STREET
SWEETWATER, TX 79556**

**800-622-0828 325-235-5494
FAX 325-235-4672**

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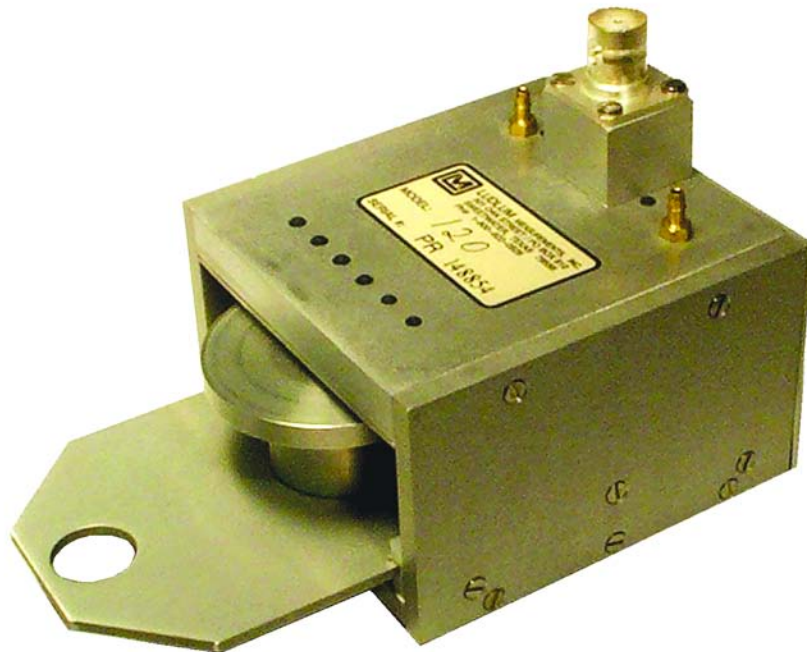
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Section

1

General

The Ludlum Model 120 consists of a sample holder and proportional detector with a 6.4 cm (2.5 in.) diameter window. The 5.1 cm (2 in.) diameter sample holder is mounted on a turntable type mechanism and is adjustable in height.



Section

2

Specifications

Window: 0.4 mg/cm² metallized polyester

Window Area: active and open 32 cm² (5 in²)

Sample Size: maximum 5.1 cm (2 in.) diameter

Sample Tray: adjustable height from 0-0.9 cm (0-0.35 in.)

Efficiency: 10% for ¹⁴C; 42% for ⁹⁰Sr/⁹⁰Y; 35% for ²³⁰Th; less than 1% for gamma

Recommended Counting Gas: P-10 gas

Operating Voltage: alpha is 900-1300 V; beta/gamma is 1300-1700 V

Counter Threshold Setting: typically 2-5 mV

Connector: Series C

Gas Connector: brass fitting hose connectors for 0.32 cm (0.13 in.) of tubing and outlet

Electrode Wire: 0.0025 cm (0.001 in.) diameter platinum tungsten alloy

Size: 11.4 x 10.2 x 13.9 cm (4.5 x 4 x 5.5 in.) (H x W x L)

Weight: 0.9 kg (2 lb)

Section

3

Operation

- A. Connect counting gas to unit and output to flowmeter. Flush 30 minutes at 50 cc/min. Flush time and rates can vary accordingly. Higher flush rates can be achieved with the output hose disconnected. Reduce the higher flush rates prior to reconnecting output.
- B. Check the window to ensure no output restriction.
- C. Compare input flow to output flow for less than 5 cc/min leakage.
- D. Connect detector to any Ludlum scaler or equivalent instrument. Set scaler input sensitivity between 2-10 mV.
- E. Expose detector to the source and determine voltage-versus-count plateau. For P-10 counting gas, the alpha plateau is typically 1000-1100 V. For beta/gamma, the plateau is typically 1400-1500 V. Other nuclear counting gases may be used, however the operating voltage would probably change.
- F. After the appropriate flush time, the flow may be reduced to 15-25 cc/min.

Section

4

Overhaul

1. Remove main body (detector portion) from the rest of the unit.
2. Replace window.
 - a. Remove window face from main body.
 - b. Remove ALL metalized polyester from window face.
 - c. Clean old adhesive off window face.
 - d. Apply diluted contact cement to window face.
 - e. Stretch 0.4 mg/cm² metalized polyester over window face. Trim as required.
 - f. Check O-ring for any damage that may cause a poor seal. Replace O-ring if necessary.
3. Replace electrode wire.
 - a. Remove window face from main body.
 - b. Remove ALL broken wire(s) from the stand-offs. Clean the top of stand-offs.
 - c. Stretch 1 mm wire across stand-offs. Solder one end to the wire stand-off. Apply approximately 62.2 g (2 oz) of tension to the wire before soldering wire to other stand-off.
 - d. Clip the wires so no exposed tips are sticking out of the solder. The electrode wire should not sag or have any kinks.
4. Remove hose fittings.
 - a. Remove window face from main body.

- b. Remove fittings. Clean fitting and main body hole threads.
- c. Clean inside the detector or chamber for loose adhesive particles and trash.
- d. Replace fittings using pipe sealant or adhesive on the fitting threads.
- e. Clean inside the detector chamber for excess pipe sealant or adhesive.
- f. Check O-ring and replace if required.
- g. Reassemble window face to main body. Reassemble unit.

Section

5

Recycling

Ludlum Measurements, Inc. supports the recycling of the electronics products it produces for the purpose of protecting the environment and to comply with all regional, national, and international agencies that promote economically and environmentally sustainable recycling systems. To this end, Ludlum Measurements, Inc. strives to supply the consumer of its goods with information regarding reuse and recycling of the many different types of materials used in its products. With many different agencies – public and private – involved in this pursuit, it becomes evident that a myriad of methods can be used in the process of recycling. Therefore, Ludlum Measurements, Inc. does not suggest one particular method over another, but simply desires to inform its consumers of the range of recyclable materials present in its products, so that the user will have flexibility in following all local and federal laws.

The following types of recyclable materials are present in Ludlum Measurements, Inc. electronics products, and should be recycled separately. The list is not all-inclusive, nor does it suggest that all materials are present in each piece of equipment:

- | | | |
|-------------------|----------|------------------------------|
| G. Batteries | Glass | Aluminum and Stainless Steel |
| H. Circuit Boards | Plastics | Liquid Crystal Display (LCD) |

Ludlum Measurements, Inc. products that have been placed on the market after August 13, 2005 have been labeled with a symbol recognized internationally as the “crossed-out wheellie bin.” This notifies the consumer that the product is not to be mixed with unsorted municipal waste when discarding; each material must be separated. The symbol will be placed near the AC receptacle, except for portable equipment where it will be placed on the battery lid.

The symbol appears as such:

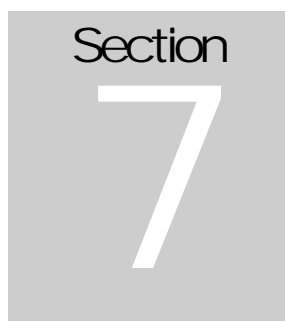


Section

6

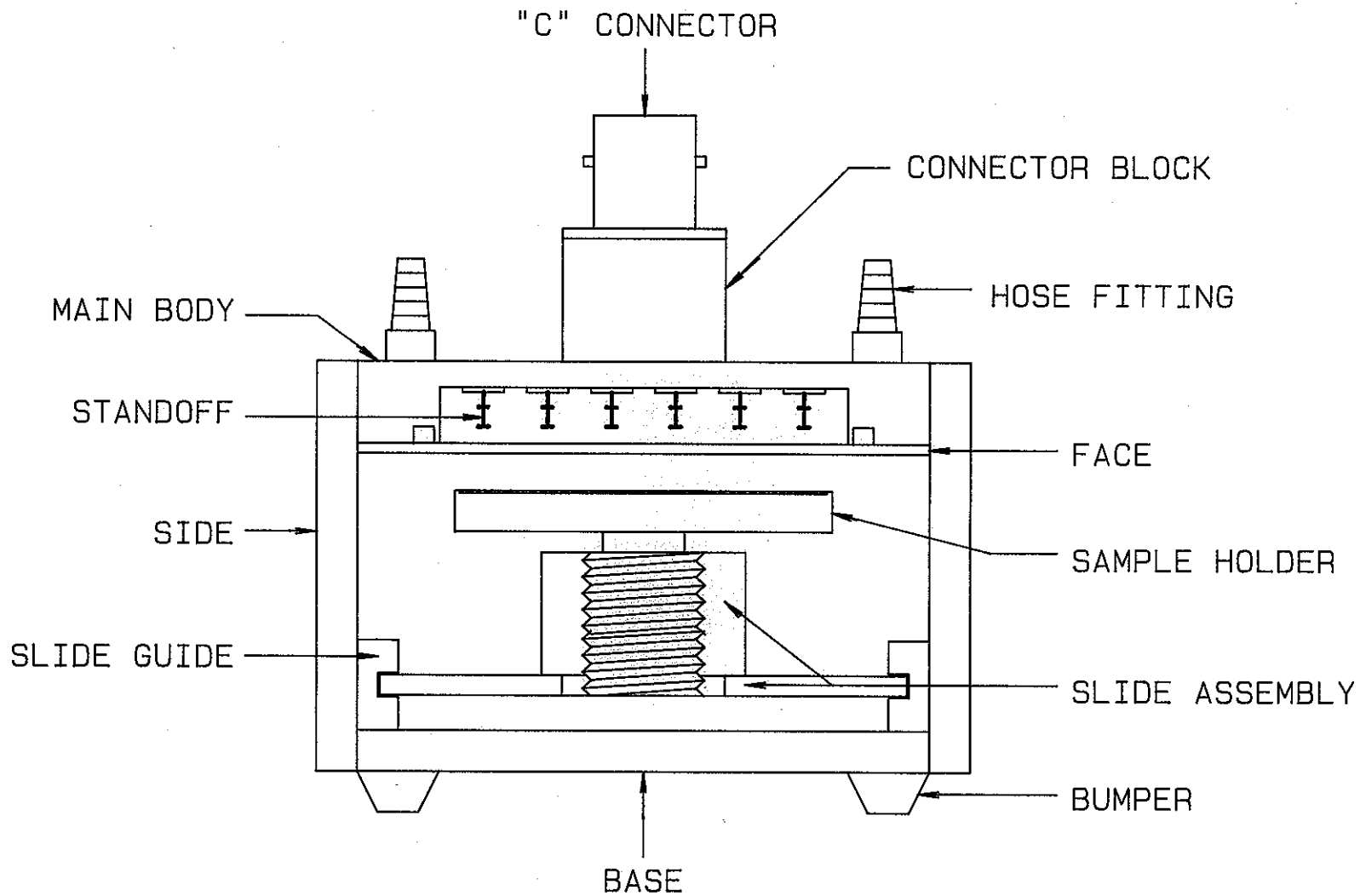
Replacement Parts List

<u>Part No.</u>	<u>Description</u>	<u>Qty.</u>
2317-011	Model 129 Slide Assembly	1
7317-001	Model 120 Main Body	1
7317-002	Model 120 Face	1
7317-003	Model 120 Side	2
7317-004	Model 120 Back	1
7317-005	Model 120 Base	1
7317-006	Model 120 Connector Block	1
7317-008	Model 120 Slide Guide	2
7317-012	Model 120 Sample Holder	1
13-7752	Receptacl-UG56 8/U Panel C	1
18-8813	Stand-offs-11 02-17-0519	12
21-9305	Fitting 1/8 Hose 5454K12	2
21-9376	Bumper-Blk 3M SJ 5018	4
21-9327	Wire-Bare .001 479PT	19 in.
22-9514	Vinyl Tubing 59002	3 in.
22-9631	Cord-Neoprene Sponge	15 in.




Drawings

Model 120 Gas Proportional Assembly View, Drawing 317 x 5



DESC: ASSEMBLY VIEW	
MODEL: 120	
PART #: 4317-013	
DWN: BK	DATE: 2-23-89
DSGN:	DATE:

CHG NO.		DWN	CHK	APP
DWN DATE	CHK DATE	APP	DATE	
BK	2-23-89			
TOL: SHOP STD <input type="checkbox"/>		SCALE: FULL <input type="checkbox"/>		
OTHER		OTHER		
TITLE: M120 GAS PROPORTIONAL DET				
 LUDLUM MEASUREMENTS, INC. 924 OAK STREET SWEETWATER, TEXAS 75088		SERIES	SHEET	
		317	5	