

**LUDLUM MODEL 44-213  
FIDLER LOW ENERGY GAMMA DETECTOR  
September 2019**

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FIDLER LOW ENERGY GAMMA DETECTOR  
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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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**Section****1****Introduction**

The Ludlum Model 44-213 detector is used primarily for the detection of low-energy gamma radiation from approximately 10 keV to 200 keV. The word “FIDLER” is an acronym for Field Instrument for the Detection of Low Energy Radiation.

The detector consists of a 12.7 cm (5 in.) diameter by 1.2 mm (0.05 in.) thick CsI scintillator coupled to a photomultiplier tube, with aluminum housing. The window area is approximately 127 cm<sup>2</sup> and is covered by 10.6 mg/cm<sup>2</sup> metallized polyester. It features a black protective cap to protect the thin window when the detector is not being used.

Compatible instruments for use by this detector provide detector high voltage of 500-1200 Vdc and input sensitivity of approximately -10 mV.

The optional handle (part # 4574-066) is adjustable and ergonomic, allowing the user to easily scan while keeping the detector up to 30.5 cm (12 in.) above the floor or ground.



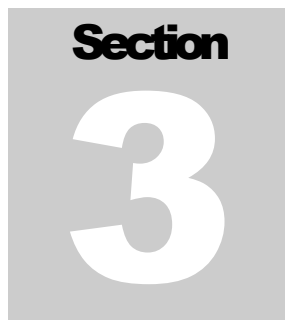
*Model 44-213 FIDLER*

**Section****2****Packing and Unpacking**

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Remove the calibration certificate or detector functional check certificate and place it in a secure location. Remove the detector(s) and accessories (if applicable) and ensure that all items on the packing list are in the carton. If multiple detectors are included, refer to the calibration certificates for the serial number (SN) matches.

To return an instrument or detector for repair or calibration, provide sufficient packing material to prevent damage during shipment and affix appropriate warning labels to promote careful handling. Every returned instrument must be accompanied by an **Instrument Return Form**, which can be downloaded from the Ludlum website at [www.ludlums.com](http://www.ludlums.com). Find the form by clicking the “Support” tab and selecting “Repair and Calibration” from the drop-down menu. Then choose the appropriate Repair and Calibration division where you will find a link to the form.

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## Specifications

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**Voltage Requirements:** 500-1200 VDC

**Input Sensitivity:** -10 mV

**Data Range:** 0 to 1,500,000 cpm

**Window Area:** 127 cm<sup>2</sup> (10.6 in<sup>2</sup>) active and open

**Window Density:** 10.6 mg/cm<sup>2</sup>

**Background (10  $\mu$ R/hr):** <9000 cpm (gross counting)

**Efficiency (4 $\pi$ ):** 13% for <sup>241</sup>Am; 8% natural U

**Recommended Energy Range Operation:** 10 keV to 200 keV gamma

**Energy Response:** energy dependent

**Scintillator:** 12.7 cm (5 in.) diameter by 1.2 mm (0.05 in.) thick CsI crystal

**Photomultiplier Tube:** 12.7 cm (5 in.) diameter; head-on type; magnetically shielded

**Connector:** Standard Series "C" (other types available upon request)

**Construction:** aluminum housing

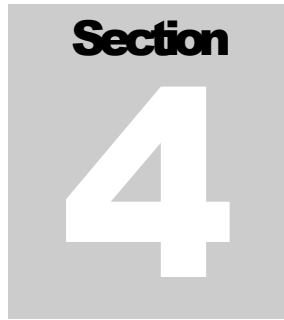
**Size:** 15.2 x 23.6 cm (6 x 9.3 in.) (Dia x L)

**Weight:** 3.2 kg (7 lb)

**Temperature:** -15 to 50 °C (5 to 122 °F); may be certified for operation from -40° to 65°C (-40° to 150°F).

**Pollution:** Pollution Degree 3 (as defined by IEC 664) (Conductive pollution or dry nonconductive pollution that becomes conductive due to condensation occurs. To be found in industrial environment or construction sites (harsh environments).





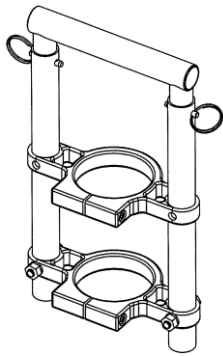
**Section**  
**4**

## Parts List

	<u>Reference</u>	<u>Description</u>	<u>Part Number</u>
<b>Model 44-213 FIDLER Csl Gamma Scintillator</b>	UNIT	Completely Assembled Model 44-213 FIDLER Gamma Scintillator	47-4134
	<b>Assembly View, Drawing 574 x 101</b>	* Crystal-5 inch Csl(Na) FIDLER	01-5965
	*	CAPLUG SC-7/8	03-5292
	*	O-Ring-2-012 UG706	16-8302
	6 ea	SCREW 4-40 X 1/4	17-9397
	*	LUG-1497	18-8766
	*	Nut-3/8-32x1/2 PNL UG706	20-9176
	*	Receptacle UG706/U "C"	4478-011
	4 ea.	Sponge	7002-029-05
	*	Connector "C" End Cap	7574-086
<b>2 inch Tube Socket Board, Drawing 2 x 359</b>	BOARD	Completely Assembled 2 inch Voltage Divider Board	5002-571
	CAPACITORS	C111	0.01 $\mu$ F, 2kV
RESISTORS	R001-R004	4.75M, 250mW, 1%	12-7995
	R5	4.75M, 250mW, 1%	12-7995
	R011-R013	4.75M, 250mW, 1%	12-7995
	R101-R104	4.75M, 250mW, 1%	12-7995
	R111	4.75M, 250mW, 1%	12-7995
MISCELLANEOUS	W1	SILICONE WHITE #22 HV WIRE	21-8543
	W2	22GA JSF22/168-BLACK GND WIRE	21-9154

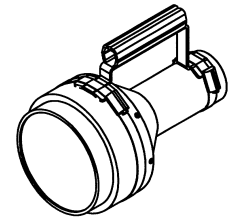
**Section****5****Optional Assemblies**

There are two optional handle assemblies and a tripod assembly for the Model 44-213 FIDLER. Each of these assemblies can make using the detector easier and more versatile, depending on how and where the detector is used.

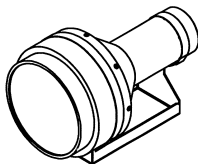


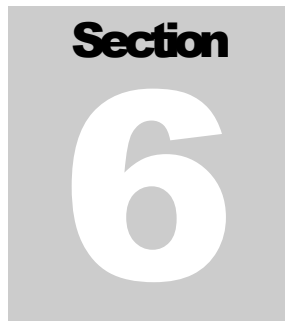
The first is the vertical handle (part # 4574-066). It is an adjustable and ergonomic handle that allows the user to more easily scan while keeping the detector up to 30.5 cm (12 in.) above the floor or ground. See top, left drawing.

There is also a horizontal handle (part # 4574-097), which is fixed horizontally on top of the detector and allows the user to carry the detector while pointing it outward. See drawing at right.



Finally, there is a tripod assembly (part # 4574-099). This includes an attachment and a tripod stand, which allows the detector to sit on a flat surface on its own. See the drawing bottom, left.



A gray square graphic containing the word "Section" in a bold, black, sans-serif font at the top, and a large, white, bold, sans-serif number "6" in the center.**Drawings**

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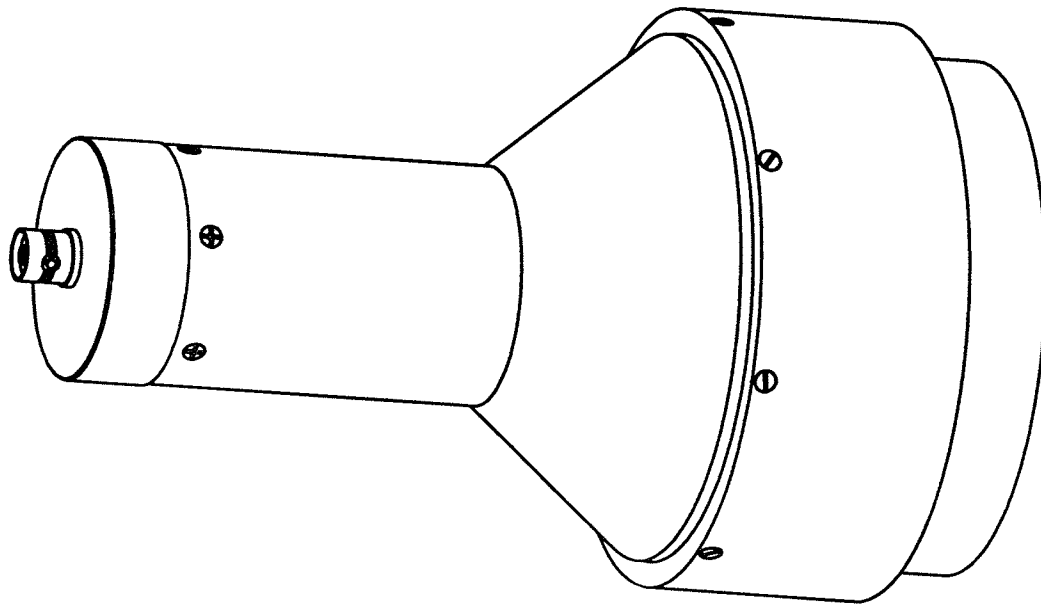
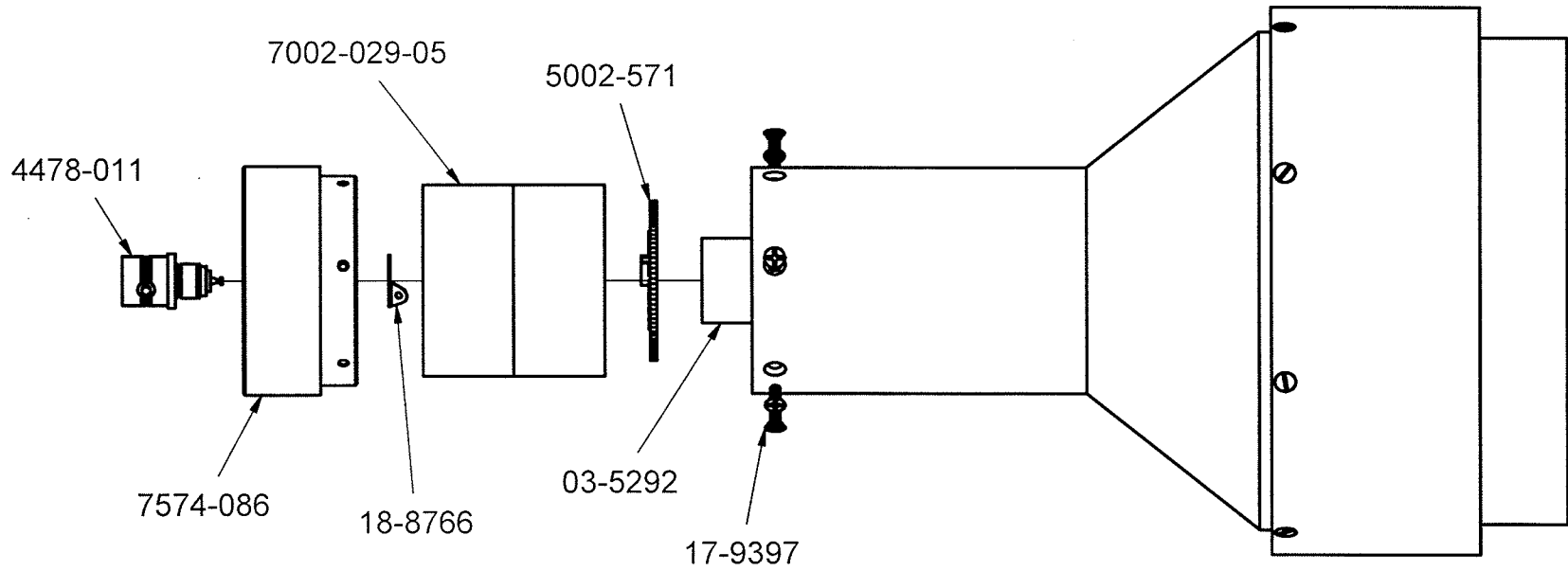
Assembly View, Drawing 574 x 101


2-inch Voltage Divider Board, Drawing 2 x 359

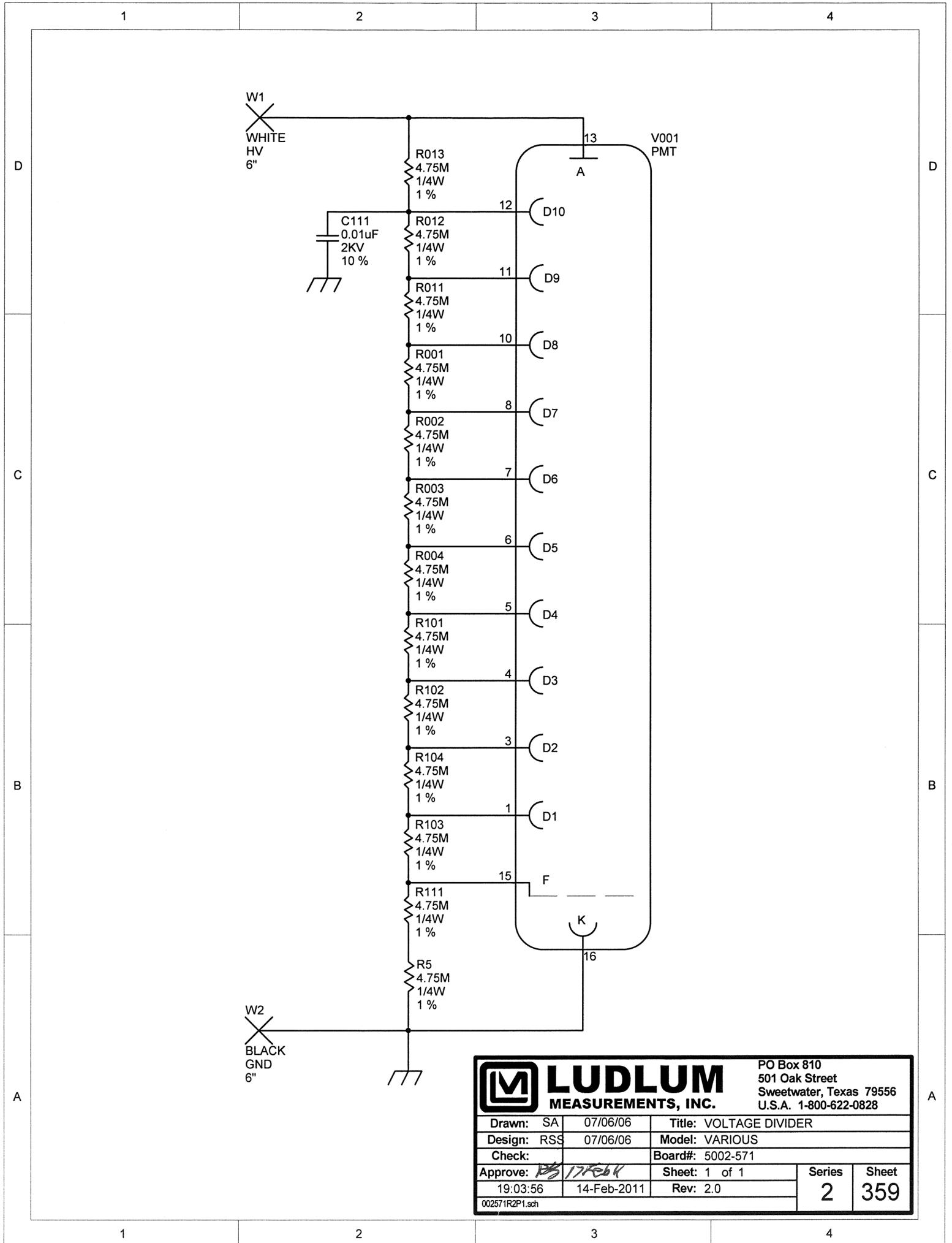
2-inch Voltage Divider Board Component Layout, Drawing 2 x 359

REVISION HISTORY

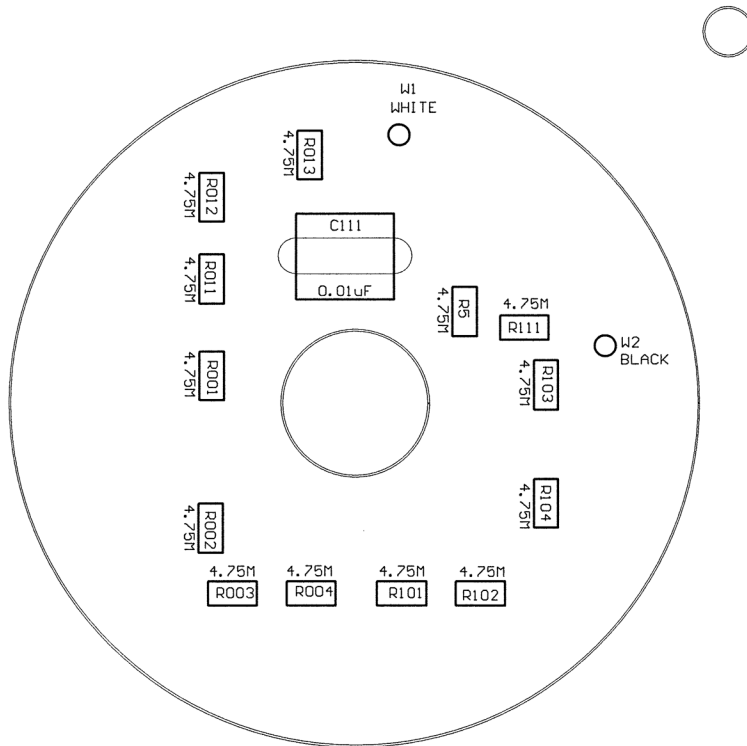
REV	DESCRIPTION	DATE	BY
1	VALID	7/13/17	WJM



DWN	DATE	CHK	DATE	APP	DATE
WJM	7/13/17			WJM	7-13-17
DWG NUM: 4574-101				SCALE: 1/2	
TITLE M 44-213 ASSEMBLY					
 LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556			SERIES	SHEET	
			574	101	



		<b>LUDLUM</b>		PO Box 810		
		<b>MEASUREMENTS, INC.</b>		501 Oak Street		
				Sweetwater, Texas 79556		
				U.S.A. 1-800-622-0828		
Drawn:	SA	07/06/06	Title:	VOLTAGE DIVIDER		
Design:	RSS	07/06/06	Model:	VARIOUS		
Check:			Board#:	5002-571		
Approve:	<i>RS</i>	<i>17Feb</i>	Sheet:	1 of 1	Series	
19:03:56		14-Feb-2011	Rev:	2.0	Sheet	
002571R2P1.sch					<b>2</b>	<b>359</b>



Drawn: SA	07/06/06	Title:			
Design: RSS	07/06/06	VOLTAGE DIVIDER			
		Model: VARIOUS			
Approve: <i>RSS</i>	<i>17 Feb 11</i>	Board#: 5002-571			
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