

## Thank You

Thanks for purchasing an LPU-2428 loop-powered ultrasonic sensor and RST-4101 programming module from us! We appreciate your business and your trust. Please take a moment to familiarize yourself with the products and this manual before installation. If you have any questions, at any time, don't hesitate to call us at 888-525-7300. You can also find a full list of product manuals at: [www.apgsensors.com/resources/product-resources/user-manuals](http://www.apgsensors.com/resources/product-resources/user-manuals).

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## 1 Description

The LPU-2428 loop-powered ultrasonic level sensor provides low-power, non-contact measurement you can count on. The LPU-2428 is certified for installation in hazardous areas in the US and Canada by CSA for Class I, Division 1, Groups C & D and Class I, Division 2, Group environments. The default Application setting for the LPU-2428 is Distance, which will work in a wide variety of settings. Please refer to the full user manual for further configuration settings.

## 2 How To Read Your Label

Each label comes with a full model number, a part number, and a serial number. The model number for the LPU-2428 will look something like this:

▲ SAMPLE: LPU-2428-C6

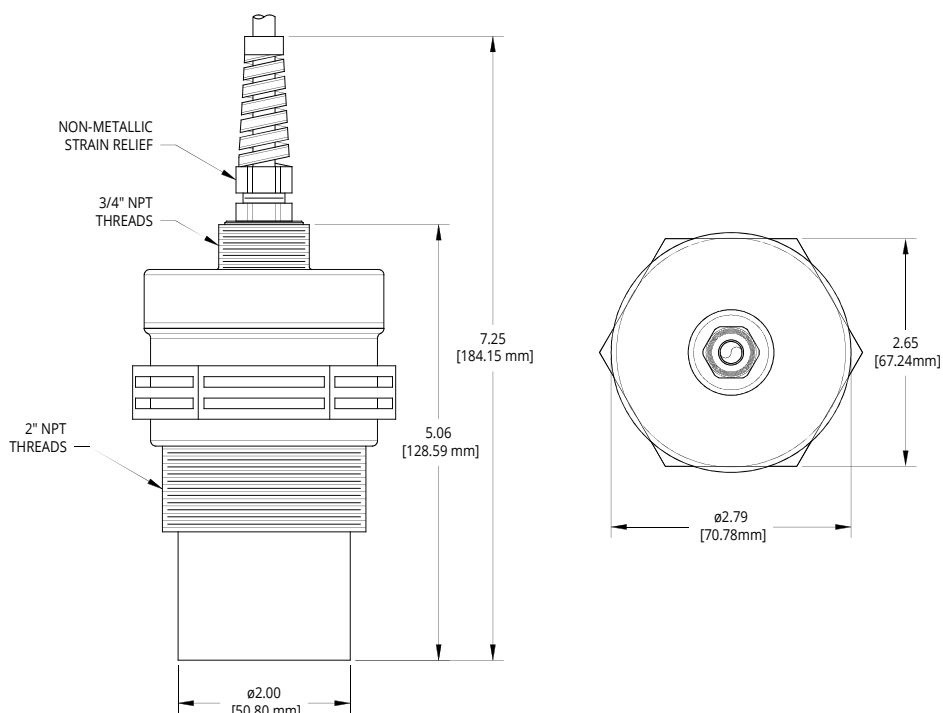
The model number tells you exactly what you have. You can also call us with the model, part, or the serial number and we can help you.

You'll also find all hazardous certification information on the label.

## 3 Warranty

This product is covered by APG's warranty to be free from defects in material and workmanship under normal use and service of the product for 24 months. For a full explanation of our Warranty, please visit [www.apgsensors.com/resources/warranty-certifications/warranty-returns](http://www.apgsensors.com/resources/warranty-certifications/warranty-returns). Contact Technical Support to receive a Return Material Authorization before shipping your product back.

## 4 Dimensions



# LPU-2428 Loop-Powered Ultrasonic Sensor Installation Guide

For LPU-2428 & RST-4101



Automation Products Group, Inc.  
1025 W 1700 N Logan, UT 84321  
www.apgsensors.com | phone: 888-525-7300 | email: sales@apgsensors.com

Part # 122950-0030  
Doc #9004795 Rev B

## 5 Installation Guidelines

The LPU-2428 should be installed in an area—indoors or outdoors—which meets the following conditions:

- Ambient temperature between -40°C and 60°C (-40°F to +140°F)
- Ample space for maintenance and inspection

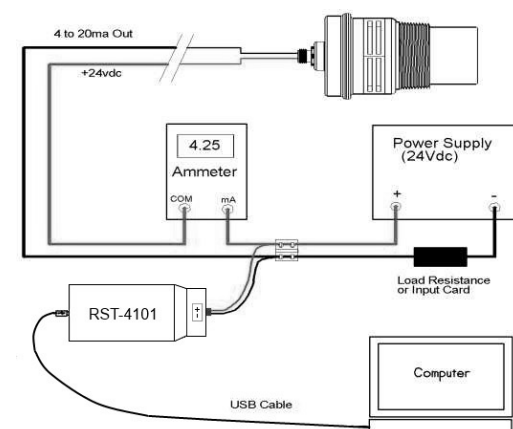
Additional care must be taken to ensure:

- The sensor has a clear, perpendicular sound path to the surface being monitored.
- The sensor is mounted away from tank or vessel walls and inlets.
- The sound path is free from all obvious obstructions and as open as possible for the 9° off axis beam pattern.
- The sensor is tightened by hand to avoid cross-threading.

**\*Important:** For user interface guide and sensor configuration see the full user manual.

## 6 Sensor and System Wiring Diagram

LPU-2428 & RST-4101 Wiring



For normal operation, connect the provided cable to your control system:

- Connect the red wire to +24 VDC.
- Connect the black wire to 4-20 mA input. Circuit load resistance + input resistance must be greater than 150Ω. **249Ω is recommended for optimal signal transmission.**
- Refer to drawing 9002747 (section 10) for Intrinsically Safe installation.
- Refer to drawing 9002745 (section 10) for Hazardous Location installation.

For programming:

- Connect (+) terminal of RST-4101 to +24 VDC supply of sensor (red wire).
- Connect (-) terminal of RST-4101 to 4-20 mA signal from sensor (black wire).
- Ensure that load resistor is between RST-4101 and control network or PLC, rather than between sensor and RST-4101.

**IMPORTANT:** Refer to section 10 for Hazardous Location Wiring.

## 7 LPU-2428 Default Application Setting

The default Application setting for the LPU-2428 is Distance, which will work in a wide variety of settings. The LPU-2428 has several additional Application settings that can be configured to meet your needs.

All of the LPU-2428's adjustable settings are accessible through the LPU-2428A Software, which is available at <https://www.apgsensors.com/support>.

## 8 General Care

Your level sensor is very low maintenance and will need little care as long as it was installed correctly. However, in general, you should periodically inspect your LPU-2428 sensor to ensure the sensor face is free of any buildup that might impede the function of the sensor. If sediment or other foreign matter becomes trapped on the sensor face, detection errors can occur.

If you need to remove the sensor, be sure to store it in a dry place at a temperature between -40° and 180° F.

## 9 Repair Information

If your LPU-2428 ultrasonic sensor or RST-4101 programming module need repair, contact us via email, phone, or online chat on our website. We will issue you an RMA number with instructions.

- Phone: 888-525-7300
- Email: [sales@apgsensors.com](mailto:sales@apgsensors.com)
- Online chat at [www.apgsensors.com](http://www.apgsensors.com)

## 10 Hazardous Location Wiring

Installation in Class I Division 2 Groups C and D  
Class I Zone 2 A EXnA IIB

NON-HAZARDOUS AREA      HAZARDOUS AREA

LPU-2127 / LPU-4127 Ultrasonic Sensor ( 4-20ma Loop Powered )

LPU-2428 / LPU-4428 Ultrasonic Sensor ( 4-20ma Loop Powered )

REVISIONS					
ZONE	REV	DESCRIPTION	CHANGE ORDER	DATE	APPROVED
-	D2	Add French Warning	CO-	2260	3-22-15 K. REID

Non-Incendive Wiring for Installation in  
Class I Division 2 Groups C and D, Max. Temp. 60°C

NON-HAZARDOUS AREA      HAZARDOUS AREA

Certified Associated Non-Incendive Field wiring Apparatus

4 to 20 ma Out  
12 to 28Vdc

- $V_{max} = 28VDC$ ,  
 $I_{max} = 200ma$ ,  
 $C_i = 0nF$ ,  $L_i = 0$
- $V_{max} \geq V_{oc}$ ,  
 $C_a \geq C_{cable} + C_i$   
 $L_a \geq L_{cable} + L_i$

- Install in accordance with Section 18 of the CEC or Article 500 of the NEC.
- CSA listed or NRTL/UL listed conduit seal at location A & B as required by Local Authority.
- The cable is terminated in the sensor and runs continuously from the sensor through the Hazardous area and into the Non-Hazardous area.
- Electrical equipment connected to associated apparatus should not generate more than 250 V rms.
- Tampering or replacement with non-factory components may adversely affect the safe use of the system.

- WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD - Clean with only with a damp cloth  
AVERTISSEMENT - surface non conductrice du boîtier peuvent être facturés par MEDIA non conductrice , CLEAN avec un chiffon humide
- DO NOT DISCONNECT WHILE CIRCUIT IS ALIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS  
AVERTISSEMENT-NE PAS DEBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION, A MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX

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UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
AND TOLERANCES ARE AS FOLLOWS:  
TOLERANCE ON ANGLE:  $\pm 1^\circ$   
2 PLACES:  $\pm .01$   
3 PLACES:  $\pm .005$   
INTERPRET DIMENSIONS AND TOLERANCES  
PER ASME Y14.5-2009

THIRD ANGLE PROJECTION

APPROVALS		DATE
DRWN	KNR	12-8-03
CHKD	Travis B	12-10-03
APVD	K. REID	12-10-03

CONTRACT

MATL N/A

FINISH H/A

**APG**  
AUTOMATION PRODUCTS GROUP, INC.  
1025 West 1700 North  
Logan, Utah USA  
888.525.7300

Hazardous Installation Drawing For  
LPU-2127, LPU-4127, LPU-2428 & LPU-4428

SIZE	CAGE CODE	PART NO	DOCUMENT NO	REV
B	52797	125xxx-xxxx	9002745	D2

SCALE NONE DO NOT SCALE DRAWING SHEET 1 OF 1

Installation in Class I Division 1 Groups C and D  
Class I Zone 0 EX Ia IIB; AEx Ia IIB T3

NON-HAZARDOUS AREA      HAZARDOUS AREA

Circuit Diagram 1  
Dual Channel Safety Barrier

Circuit Diagram for  
Supply and Return Safety Barriers

REVISIONS					
ZONE	REV	DESCRIPTION	CHANGE ORDER	DATE	APPROVED
-	A2	Add French Warning	CO-	2260	3-22-15 K. REID

• Install in accordance with CEC, NEC articles 504, 505 and ISA RP12.6 Recommended Practice for the Installation of Intrinsically Safe Circuits.

• WARNING: EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR AREA IS KNOWN TO BE NONHAZARDOUS  
AVERTISSEMENT - DE DECONNECTER L'EQUIPEMENT, COUPER LE COURANT DU S' ASSURER QUE L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX.

• WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD - Clean only with a damp cloth  
AVERTISSEMENT - surface non conductrice du boîtier peuvent être facturés par MEDIA non conductrice , CLEAN avec un chiffon humide

• WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY  
AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SECURITE INTRINSEQUE

- $V_{max}, U_i = 28 \text{ vdc}$   
 $I_{max}, I_i = 150 \text{ mA}$   
 $P_i = 0.5 \text{ W}$   
 $C_i = 0 \text{ nF}$   
 $L_i = 100 \mu \text{ H}$
- $V_{max}, U_i = 28 \text{ vdc}$   
 $I_{max}, I_i = 150 \text{ mA}$   
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