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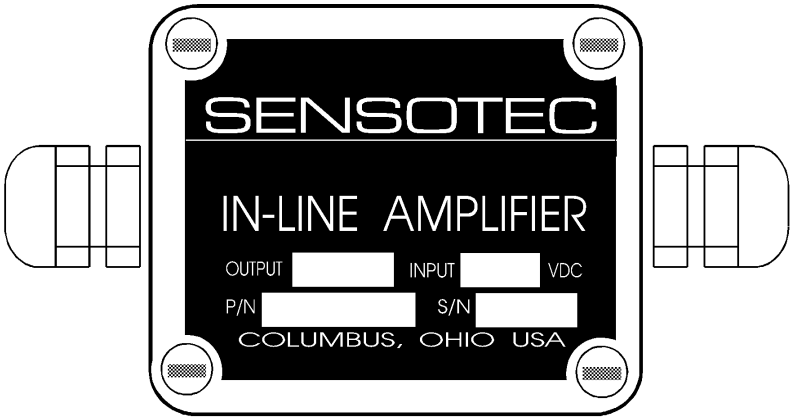
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MODEL U3W
UNIVERSAL IN-LINE TRANSDUCER AMPLIFIER

3-WIRE CURRENT OUTPUT



SENSOTEC

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Model U3W, Universal In-line Transducer Amplifier (3-wire current output)
Document Part Number: 008-0297-00
Rev. B: March, 2002

IMPORTANT! IT IS RECOMMENDED THAT YOU READ THIS DOCUMENT THOROUGHLY BEFORE APPLYING POWER TO THIS UNIT. THIS DOCUMENT CONTAINS INFORMATION ON WIRING, CALIBRATION, AND USE OF FEATURES.

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Chapter 1
INTRODUCTION

1.1 Overview

Sensotec's Universal In-Line Amplifiers are housed in a small plastic package, which is connected between the transducer and a readout instrument. The Model U3W amplifier supplies a highly regulated bridge excitation voltage for the transducer and converts the millivolt signal of the transducer to a 4-20mA signal. The Universal In-Line features include two selectable excitation voltages, programmable gain settings, a wide adjustment range on the zero and a buffered solid-state shunt cal relay for quick calibration.

1.2 Specifications

Power Requirements:	18 - 32 volts DC
Bridge Excitation:	5, or 3 volts DC @ 70 mA (user selectable)
Output Current Range:	4-20 mA (“zero output” can be set at 12 mA for bipolar input signals)
Frequency Response:	DC - 5000 Hz
Zero Balance Range:	+/- 70% coarse, +/- 25% fine adjustment range
Gain Adjustment Range:	Switch selectable (0.5 to 6.6 mV/V), +/- 25% fine adjust
Short Circuit Protection:	(+)Output to (-)Common
Environment Protection:	IP-66 or NEMA4
Shunt Calibration:	Solid-state relay
Long Term Zero Drift:	.1% of Full Scale per 6 months

1.3 Layout

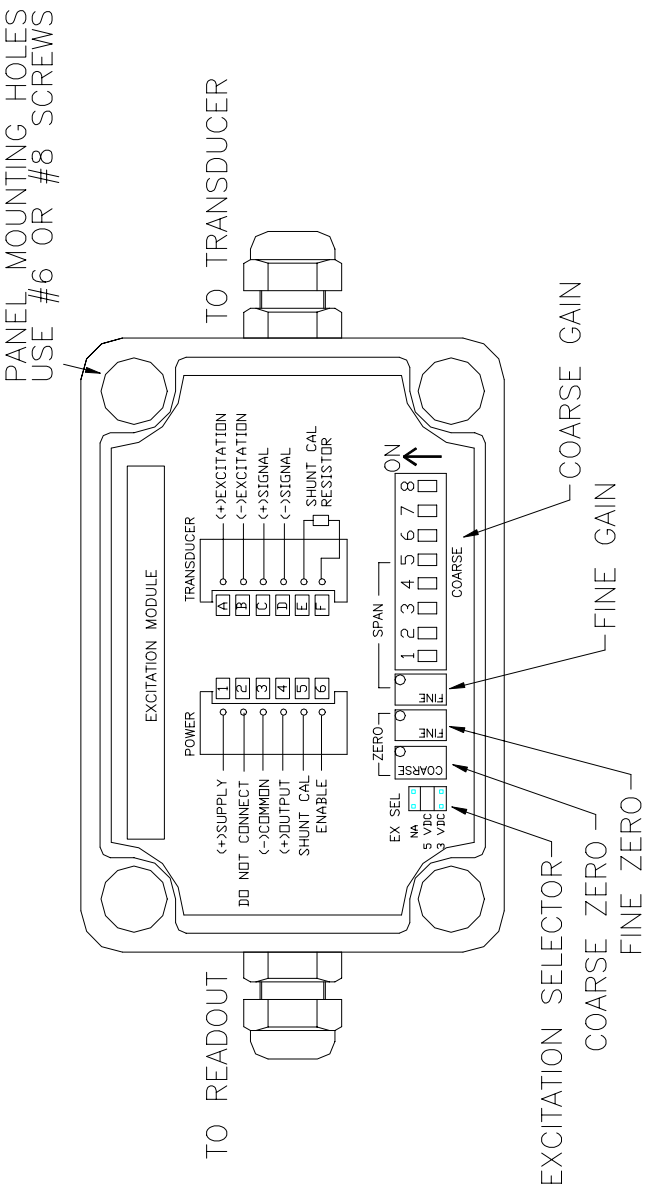


Figure 1-1: Layout of Model U3W In-Line Amplifier

Chapter 2
INSTALLATION / SETUP

2.1 Wiring

The Model U3W Universal In-Line Amplifier (Sensotec p/n 060-6827-03) can be powered from a 18 to 32 volt single voltage supply. The following diagrams show the wiring to the supply and readout.

Cables should be stripped back 3 inches with the wires stripped and tinned 1/2 inch. Connections to the terminal block are made by pressing the orange levers and inserting the wires into the holes next to the levers. The terminal block will accept wire up to AWG 20.

Install a shunt cal resistor with the value specified on the transducer data sheet.

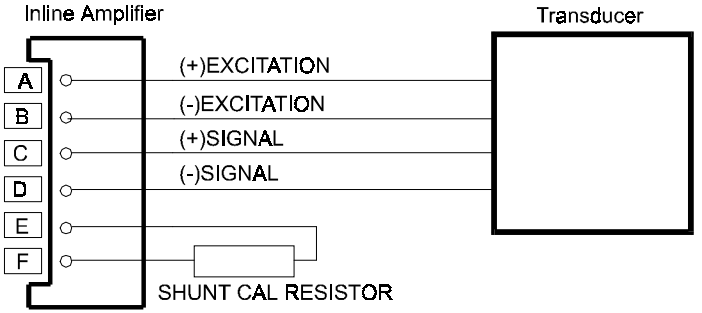


Figure 2-1: Transducer to In-Line Wiring

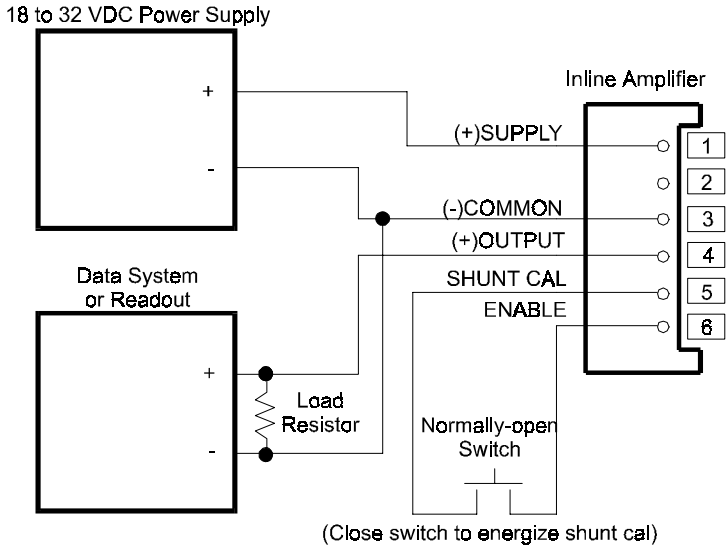


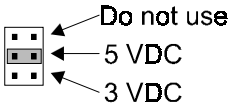
Figure 2-2: Model U3W Universal In-Line Wiring

NOTE: Do not connect anything to pin 2.

2.2 Setup

Use the following procedure for setting up the excitation and the coarse gain:

1. Determine the EXCITATION VOLTAGE required by the transducer being used.
2. Set the EXCITATION SELECT JUMPER as shown below: (See Fig.1-1 for location of jumpers).



3. Determine the sensitivity of the transducer in mV/V from the transducer calibration sheet.
4. Set the COARSE GAIN SWITCH (See Fig.1-1 for location of switch) to the nearest mV/V setting in the corresponding excitation column in Table 1.

Table 1: Coarse Gain Setup

SWITCH POSITION(S) ON	EXCITATION (VDC)	
	5	3
1	.5 mV/V	.83 mV/V
2, 4, 8	.75 mV/V	1.25 mV/V
2	1.0 mV/V	1.6 mV/V
3, 6	1.25 mV/V	2.1 mV/V
3	1.5 mV/V	2.5 mV/V
5, 6, 8	1.75 mV/V	2.9 mV/V
4	2.0 mV/V	3.3 mV/V
6, 7	2.25 mV/V	3.75 mV/V
5	2.5 mV/V	4.1 mV/V
6	3.0 mV/V	5.0 mV/V
7	3.5 mV/V	5.8 mV/V
8	4.0 mV/V	6.6 mV/V

2.3 Panel Mounting Template

The Universal In-Line Amplifier can be easily mounted to a panel by using the template below for marking the holes in the panel. The cover must be removed to get access to the mounting holes. Use # 6 or # 8 screws for mounting box to panel.

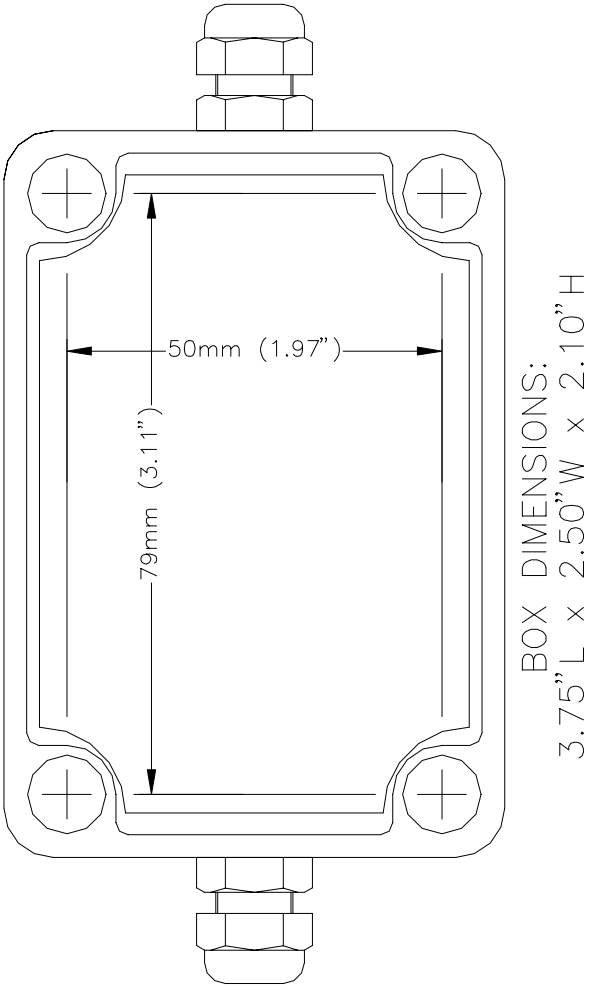


Figure 2-3: Panel Mounting Template

Chapter 3
CALIBRATION

3.1 Calibration

Step 1. Apply power and allow unit to stabilize for 10 minutes.

Step 2. With zero load or pressure on the transducer, adjust the ZERO potentiometers to indicate zero on the readout instrument connected to the output.

Step 3. Apply full scale pressure or load to the transducer and adjust the SPAN potentiometer to indicate full scale on the readout instrument.

Step 4. Re-check zero and full scale (repeat steps 2 & 3).

3.2 Using Shunt Calibration

Sensotec transducers feature a calibration technique called shunt calibration. This method applies a known resistance across one leg of the transducer, which simulates an output as if a load or pressure was applied to the transducer. When performing shunt calibration, the transducer should be at ZERO pressure or load. The full scale output and shunt cal output is found on the TRANSDUCER CALIBRATION SHEET. This information can be used to calibrate the amplifier's output current and the readout's display with the following equations.

TRANSDUCER CALIBRATION DATA

Full Scale Output =	_____	mV/V.
Shunt Resistor Value of	_____	Ohms
Shunt Cal Output =	_____	mV/V.

The following equations are used to calculate output current and display units:

FORMULA TO CALCULATE OUTPUT CURRENT

$$\left(\frac{\text{SHUNT CAL OUTPUT}}{\text{FULL SCALE OUTPUT}} \times 16\text{ mA}\right) + 4\text{ mA} = \text{OUTPUT CURRENT}$$

$$\left(\frac{_____}{_____} \times 16\text{ mA}\right) + 4\text{ mA} = _____$$

FORMULA TO CALCULATE DISPLAY UNITS

$$\frac{\text{SHUNT CAL OUTPUT}}{\text{FULL SCALE OUTPUT}} \times \text{FULL SCALE UNITS} = \text{DISPLAY UNITS}$$

$$\frac{_____}{_____} \times _____ = _____$$

Step 1. Apply power and allow the amplifier to warm up.

Step 2. With zero load or pressure on the transducer, adjust the ZERO potentiometer to indicate zero on the readout instrument.

Step 3. Connect a jumper across PINS 5 & 6 of the power terminals (See Fig. 1-1) or wire in a switch as shown in wiring section. Adjust the SPAN potentiometer to the calculated current or calculated units on the readout instrument.

Step 4. Disconnect the shunt cal jumper or release the shunt cal switch and repeat steps 2 & 3 if needed.

Chapter 4
WARRANTY / REPAIR POLICY

4.1 Limited Warranty on Products

Any of our products which, under normal operating conditions, proves defective in material in workmanship within one year from the date of shipment by SENSOTEC, will be repaired or replaced free of charge provided that you obtain a return material authorization from SENSOTEC and send the defective product, transportation charges prepaid with notice of the defect, and establish that the product has been properly installed, maintained, and operated within the limits of rated and normal usage. Replacement product will be shipped F.O.B. our plant. The terms of this warranty do not extend to any product or part thereof which, under normal usage, has an inherently shorter useful life than one year. The replacement warranty detailed here is the buyer's exclusive remedy, and will satisfy all obligations of SENSOTEC whether based on contract, negligence, or otherwise. SENSOTEC is not responsible for any incidental or consequential loss or damage which might result from a failure of any SENSOTEC product. This express warranty is made in lieu of any and all other warranties, express or implied, including implied warranty of merchantability or fitness for particular purpose. Any unauthorized disassembly or attempt to repair voids this warranty.

4.2 Service Under Warranty

Advanced authorization is required prior to the return to SENSOTEC. Before returning the items, either write to the Customer Service Department c/o SENSOTEC, Inc., 2080 Arlingate Lane, Columbus, Ohio 43228, or call (800) 848-6564 with: 1) a part number; 2) a serial number for the defective product; 3) a technical description* of the defect; 4) a no-charge purchase order number (so products can be returned to you correctly); and 5) ship and bill addresses. Shipment to SENSOTEC shall be at Buyer's expense and repaired or replacement items will be shipped F.O.B. our plant in Columbus, Ohio. Non-verified problems or defects may be subject to an evaluation charge. Please return the original calibration data with the unit.

4.3 Non-Warranty Service

Advance authorization is required prior to the return to SENSOTEC. Before returning the item, either write to the Customer Service Department c/o SENSOTEC, Inc., 2080 Arlingate Lane, Columbus, Ohio 43228, or call (800) 848-6564 with: 1) a model number; 2) a serial number for the defective product; 3) a technical description* of the malfunction; 4) a purchase order number to cover SENSOTEC's repair cost; and 5) ship and bill addresses. After the product is evaluated by SENSOTEC, we will contact you to provide the estimated repair costs before proceeding. Shipment to SENSOTEC shall be at Buyer's expense and repaired items will be shipped to you F.O.B., our plant in Columbus, Ohio. Please return the original calibration data with the unit.

4.4 Repair Warranty

All repairs of SENSOTEC products are warranted for a period of 90 days from date of shipment. This warranty applies only to those items which were found defective and repaired, it does not apply to products in which no defect was found and returned as is or merely recalibrated. Out of warranty products may not be capable of being returned to the exact original specifications or dimensions.

* Technical description of the defect: In order to properly repair a product, it is necessary for SENSOTEC to receive information specifying the reason the product is being returned. Specific test data, written observations on the failure and the specific corrective action you require is needed.

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