



2751

Transmitter with
Electrochemical Sensor

INSTRUCTION MANUAL

IMPORTANT:

Please read these installations and operating instructions completely and carefully before starting.

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The Armstrong Monitoring Corporation
215 Colonnade Road South, Ottawa, Ontario, Canada K2E 7K3
Tel: (613) 225-9531 • Fax: (613) 225-6965 • Canada & U.S. Toll Free: 1-800-465-5777
E-mail: gas@armstrongmonitoring.com • Internet: www.armstrongmonitoring.com



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1 WARRANTY

The AMC-2751 transmitter is warranted against defects in material and workmanship for a period of two years from date of delivery. Maintenance items are not warranted. During the warranty period, *The Armstrong Monitoring Corporation* will repair or replace components that prove to be defective in the opinion of AMC. Any equipment deemed to be defective by the user should be returned to *The Armstrong Monitoring Corporation* for evaluation (see product return below). **Site visits by Armstrong personnel, to evaluate/repair equipment, are not covered by this warranty.** AMC is not liable for auxiliary interfaced equipment, nor for consequential damage. This warranty shall not apply to any product, which has been modified in any way, which has been repaired by any other party other than a qualified technician or authorized AMC representative, or when failure is due to misuse or conditions of use.

Note: extended warranty mail in calibration programs are available (please call 1-800-465-5777).

1.1 LIABILITY

All AMC products must be installed and maintained according to instructions. Only qualified personnel should install and maintain the equipment.

AMC shall have no liability arising from auxiliary interfaced equipment, for consequential damage, or the installation and operation of this equipment. AMC shall have no liability for labour or freight costs, or any other costs or charges in excess of the amount of the invoice for the products.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND SPECIFICALLY THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE THEREOF.

WARNING

CHECK TO ASSURE THE WORKING AREA IS FREE FROM HAZARDS DURING INSTALLATION OR WHEN PERFORMING MAINTENANCE, AND USE PROPER PRECAUTIONS.
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1.2 PRODUCT RETURN

All products returned for warranty or service should be shipped by prepaid freight and will be accepted only with RMA or repair number issued by AMC. All products returned to the client will be shipped by freight collect.

1.3 MODIFICATIONS AND SUBSTITUTIONS

Due to an ongoing development program, AMC reserves the right to substitute components and change specifications at any time without incurring any obligations.



2 PRODUCT INFORMATION

2.1 SENSOR/TRANSMITTER MODULE

Sensor/transmitter unit order number. AMC-2751

Sensor/transmitter serial number..... _____

Transmitter board with display order number _____

Sensor order number..... AMC 91AG

Sensor Date Code..... _____

Power Supply Requirement..... 12 to 24 VDC @ 20 mA

Sensor Warranty..... 3 years

2.2 FACTORY CALIBRATION

Gas Type..... CO

Zero Gas, at 4 mA Signal..... Air

Gas Concentration at 20 mA Signal..... _____

Calibration Adapter Part Number..... _____

Note:

All Armstrong Monitoring systems must be installed and maintained according to instructions to assure proper operation. Only qualified technicians should install and maintain the equipment. For re-calibration extended warranty program information please call 1-800-465-5777.



3 PRODUCT DESCRIPTION

3.1 GENERAL DESCRIPTION

The AMC-2751 sensor/transmitter unit is designed to provide continuous, reliable surveillance of surrounding air for the target gas listed in the Factory Settings (Section 2.2). This unit provides a 4 to 20 mA, variable current signal, which is proportional to the gas concentration detected. Each sensor/transmitter unit is factory calibrated, and is ready for field installation and operation.

3.1.1 SENSOR / TRANSMITTER SPECIFICATIONS

SENSOR ORDER NUMBER	AMC 91AG
SENSOR TYPE & GAS:	Electrochemical cell for carbon monoxide.
GAS RANGES	0-100 ppm CO <input type="checkbox"/> , 0-200 ppm CO <input type="checkbox"/> , 0-300 ppm CO <input type="checkbox"/> , 0-400 ppm CO <input type="checkbox"/>
SENSOR RESPONSE TIME:	Better than 90% step change in 45 seconds @ 20°C
EXPECTED SENSOR LIFE:	Greater than 4 years
SENSOR/TRANSMITTER OPERATING TEMPERATURE:	-20°C to 40°C
SENSOR/TRANSMITTER HUMIDITY RANGE:	15 to 90% RH, non-condensing (constant) 0 to 98% RH, non-condensing (intermittent)
SENSOR/TRANSMITTER SIGNAL:	4 to 20ma
SIGNAL LINEARITY:	Linear to the concentration of gas

3.2 AMC-2751 HOUSING

The AMC-2751 sensor/transmitter unit is enclosed in an ABS housing as shown in Figure 1. This housing is suitable for use in parking and service garages where the unit is not exposed to rain or direct sunlight.

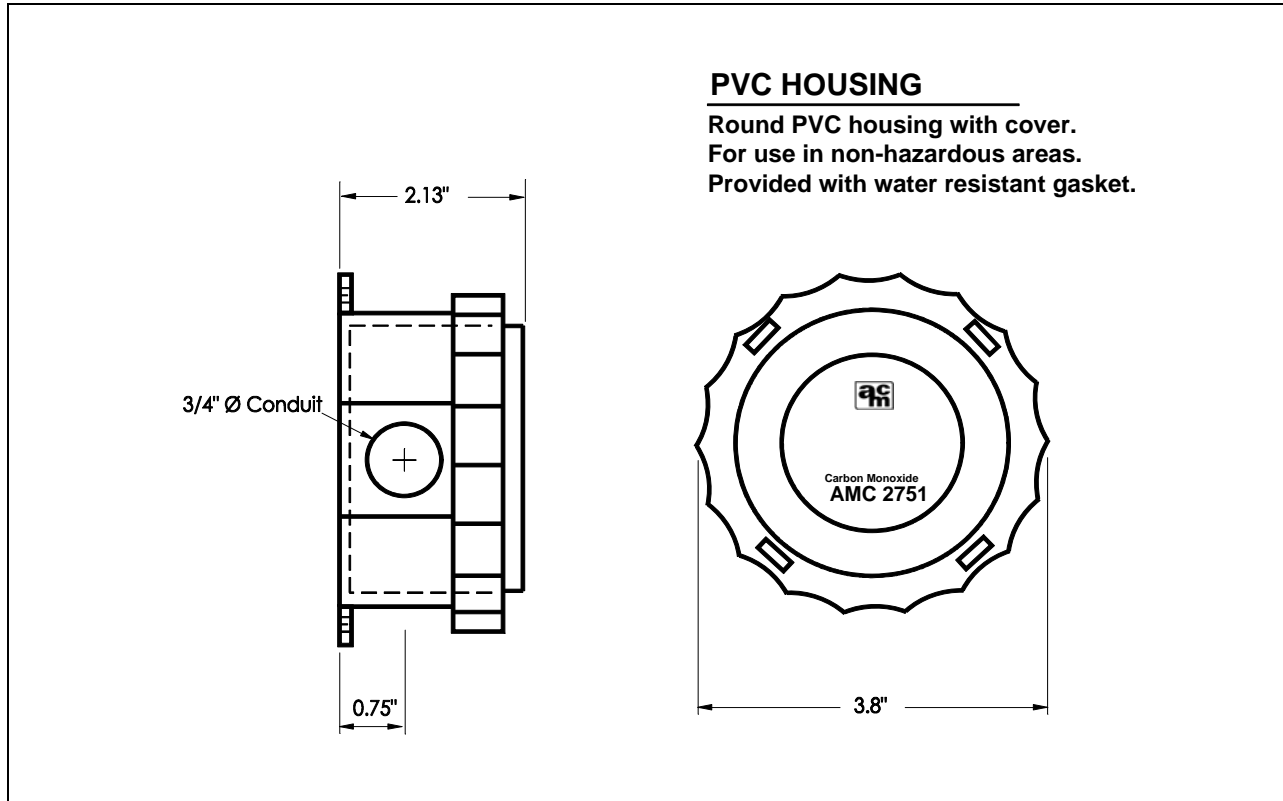


FIGURE 1: AMC-2751 Housing

4 INSTALLATION

4.1 LOCATION AND MOUNTING

Mount the AMC-2751 sensor/transmitter on a solid, non-vibrating surface or structure in an area where the ambient concentration of gas is not directly affected by the presence of clean air supply, ventilation systems, blockage by surrounding articles and sources of interference gases. Reading will be affected by presence of hydrogen gas, ethanol and nitrogen dioxide (500 ppm of hydrogen will cause 200 ppm CO reading, 2000 ppm of ethanol will cause less than 30 ppm CO reading, 30 ppm of nitrogen dioxide will cause less than 10 ppm CO reading). Please, refer to local codes for further sensor/transmitter installation information.

The installer is required to provide any mounting hardware that may be required.

The AMC-2751 sensor/transmitter circuit board with sensor is removable from the enclosure for ease of installation.

Important Notes:

Mount enclosure with the sensor located as per figure 2. This will ensure correct orientation. Where possible it is recommended to turn off supply power before removing or replacing the transmitter or sensor.

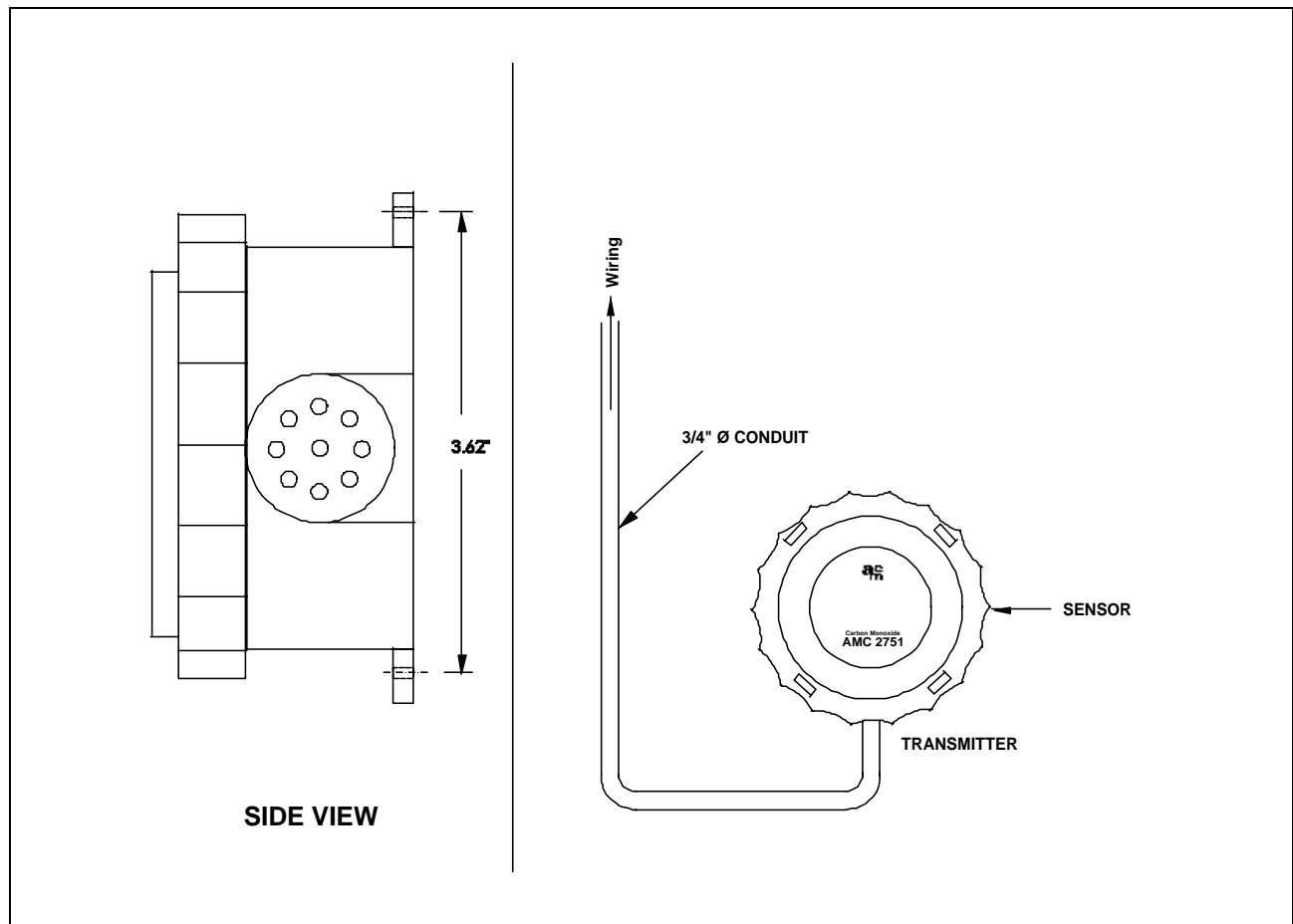


FIGURE 2: Mounting of AMC-2751 Sensor/Transmitter Unit



4.2 CABLE SELECTION AND WIRING

To pass the 4 to 20mA signal from the AMC-2751 sensor/transmitter to the monitor, a two conductor, shielded cable is recommended. Note that the same wire pair can be used for both signal and power due to the low power current loop design of the AMC-2751. For best signal transmission and maximum noise rejection, it is recommended to run the cable through steel conduit (the cable must be grounded at the monitor or power supply).

The AMC-2751 minimum stated voltage requirement of 12 VDC is based on the use of a 250 ohm load resistor to covert the current signal into a voltage signal. The maximum Cable Distance Chart (Figure 3) assumes the use of a 250 ohm load resistor, and a safety margin of .5 VDC. It gives absolute maximum cable lengths for a range of wire gauges. Note that the user must take responsibility for the selection of wire gage, power supply voltage and load resistor used as the values shown may not be suitable for all applications.

WIRE GAUGE	AWG R/1000 ft	22 16.2 ohms	20 10.3 ohms	18 6.5 ohms	16 4.3 ohms
MAXIMUM DISTANCE IN FEET (METERS)	@12VDC	400 (120)	700 (210)	1000 (300)	1500 (4500)
	@24VDC	10000 (3000)	16000 (4800)	Over 20000 (6000)	Over 20000 (6000)

FIGURE 3: Cable Selection Chart (Based on 250 Ohm Load Resistor & $V_{SM} = .5 V$)

4.2.1 SENSOR/TRANSMITTER TO MONITOR WIRING

The AMC-2751 sensor/transmitter should be connected to the monitor, as shown in Figure 4, by a twisted pair cable for the conduction of the 4 to 20 mA signal.

See the following connections going from the AMC-2751 to the monitor for each channel:

AMC-2751 Terminal (+) ----- goes to----- Monitor Channel Terminal (+)

AMC-2751 Terminal (-) ----- goes to----- Monitor Channel Terminal (SIG)

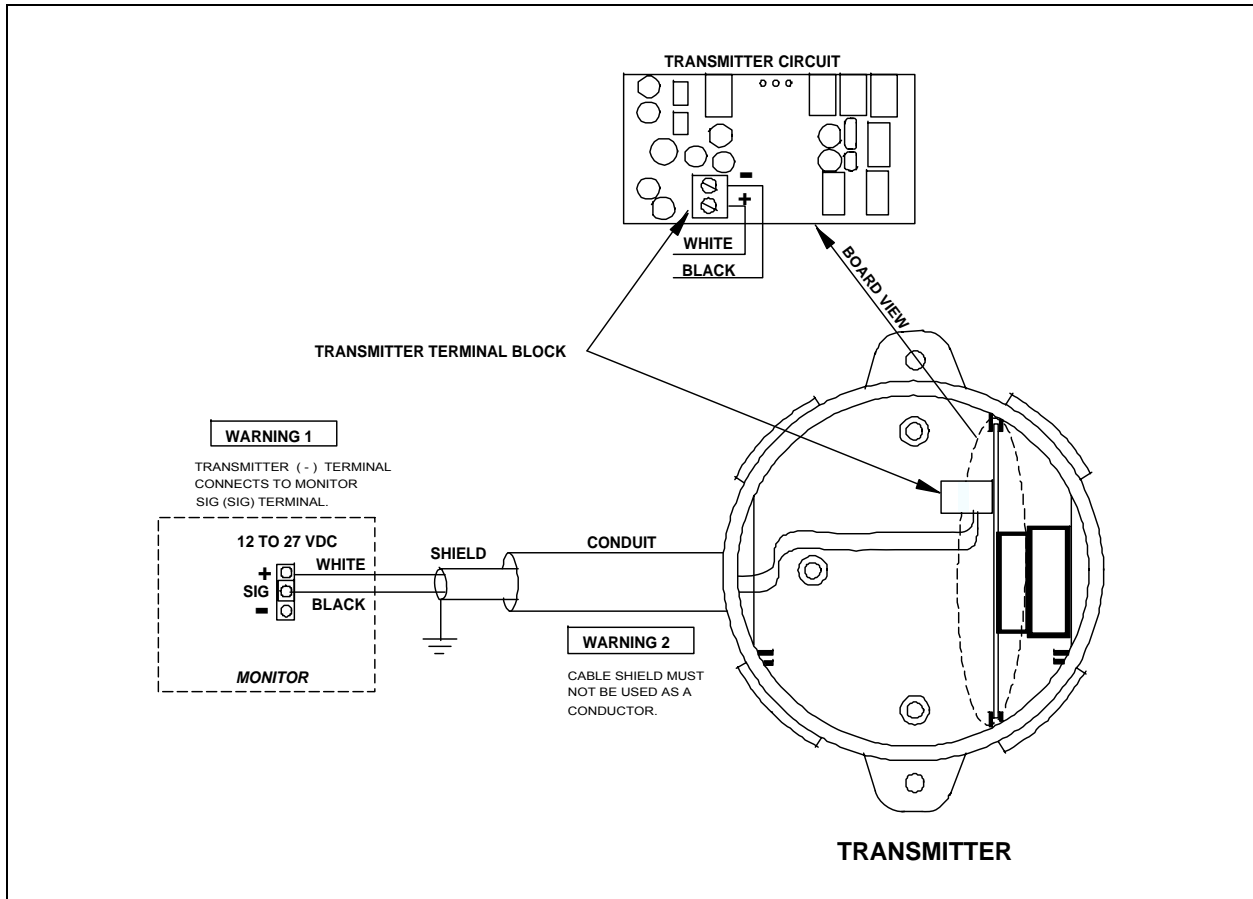


FIGURE 4: Sensor/Transmitter to Monitor Wiring Layout

4.2.2 INTERFACING TO COMPUTER OR DATALOGGER

The signal output of the AMC-2751 sensor/transmitter is a 4 to 20 mA DC current, therefore it can be connected to computers or data-loggers equipped with an analog-to-digital converter.

In many cases a load resistor is required to convert the 4 to 20 ma current signal to a voltage signal, as shown in Figure 5.

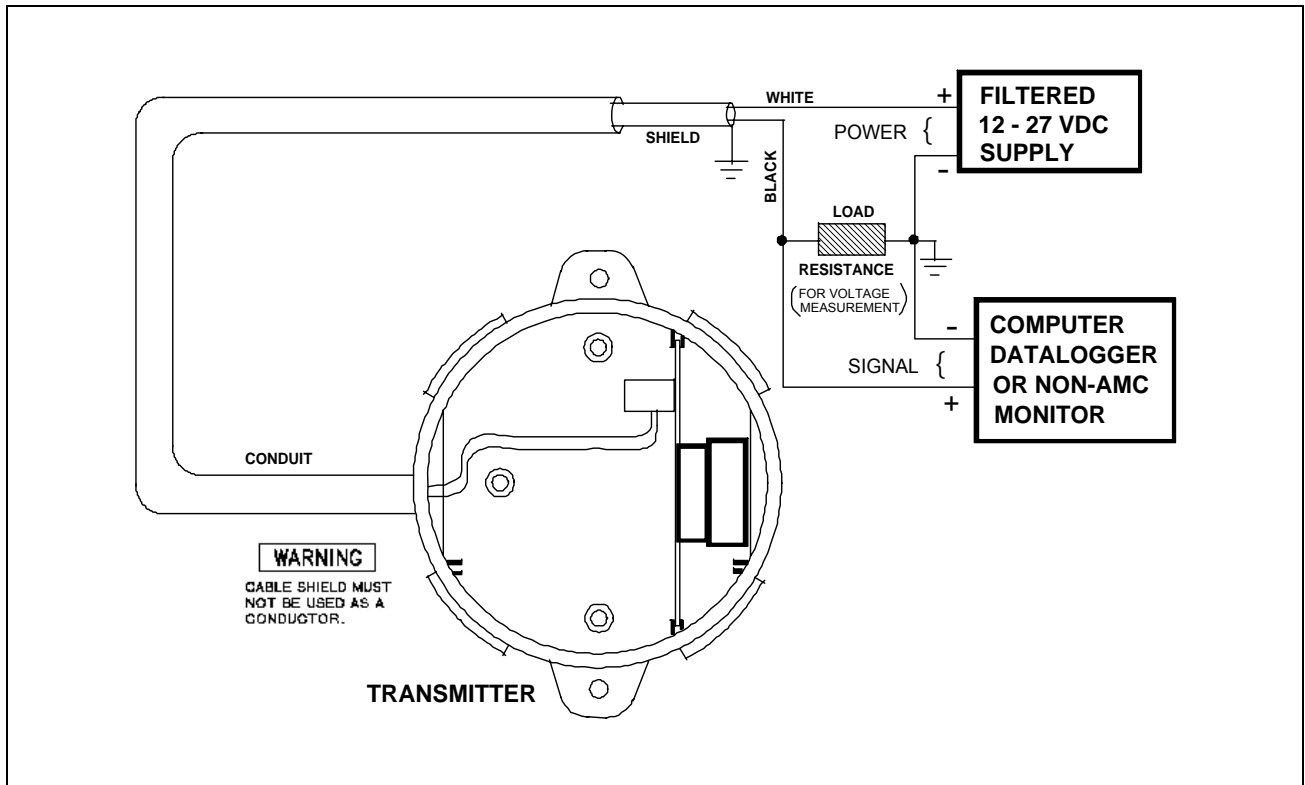


FIGURE 5: Interfacing to Computer or Data-logger



5 OPERATION AND CALIBRATION

5.1 OPERATION

The AMC-2751 sensor/transmitter is factory calibrated for the gas listed in the Product Information (Section 2) at the beginning of this manual. The sensor/transmitter should not require re-calibration when first installed and powered up, but a test for correct operation is recommended after a stabilization period of 30 minutes.

In clean air, after the stabilization period, the transmitter should be sending a signal of approximately 4 mA to the monitor or controller. It can be expected, in most cases, that presence of CO will be indicated. Background air contains 1-3 ppm of CO typically.

Although the electrochemical sensors are very selective, there are some interference gases, which can also cause a response from the sensor. See section 4.1 for list of interference gases.

In the case of large signal variations (in a clean air environment), check for an installation problem or the possibility of an interference gas being present.

5.2 CALIBRATION

Every AMC-2751 sensor/transmitter is factory calibrated, so each unit should be ready for operation after installation and a 30 minute stabilization time.

Subsequent calibration is required as a part of regular maintenance, and when replacing the sensor. See the maintenance section of this manual for the recommended calibration schedule.

Caution:

- Only qualified personnel should perform the actual calibration.
- Users new to gas calibration are advised to consult with Armstrong Monitoring

The Armstrong Monitoring Corporation offers the following plans:

1. Factory pre-calibrated replacement sensor/transmitter units
2. On site installation and calibration by Armstrong Monitoring
3. On site calibration by Armstrong Monitoring
4. Training by Armstrong Monitoring
5. Extended warranty calibration program



5.2.1 ON SITE CALIBRATION EQUIPMENT REQUIRED

For qualified personnel, the following is a recommended list of calibration equipment required.

- A digital multi-meter with a range of 20.0 mA or more and 200 mV or more.
- A “Remote Calibration Lead” (P/N 2900-01) for the above meter (available from AMC)
- A set of leads with clip on probes for the above meter
- Miniature screwdriver trimmer adjustment tool
- Calibration adapter, available from AMC
- Zero & Span gases (contact AMC for information)
- Clean, low static cloth or tissue to cover sides of sensor during calibration

5.2.2 CALIBRATION PROCEDURE

The transmitter is equipped with a remote calibration feature allowing for one-man calibration at the transmitter location. The transmitter output is measured using the plug-in type “Remote Calibration Lead”. In most cases it is only Zero and Span adjustments that are made in field calibrations.

Note:

The calibration procedure may cause false alarm and or fail signal. Appropriate precautions may be required.

Refer to Figure 6 to perform the following calibration procedure:

- 1) Remove cover from transmitter housing.
- 2) Attach and set the multi-meters as shown.
- 3) Cover the sides of sensor with a clean cloth or similar to prevent a draft on the sensor.
- 4) Apply a Zero gas sample, with a calibration adapter cup firmly and completely over the sensor opening on side of AMC-2751 for 2 minutes with a flow rate of .5 liters per minute.
- 5) At 2 minutes adjust the Zero trimmer for a zero current of 4.00 mA +/- .1ma. Note that the zero current may give a signal representing a gas concentration as high as 2ppm depending on the zero gas used.
- 6) Apply the Span gas sample, with a calibration adapter cup firmly and completely over the sensor opening on side of AMC-2751 for 2 minutes with a flow rate of .5 liters per minute.
- 7) At 2 minutes adjust the Span trimmer for the Span current reading of 20 ma +/- .16 mA.

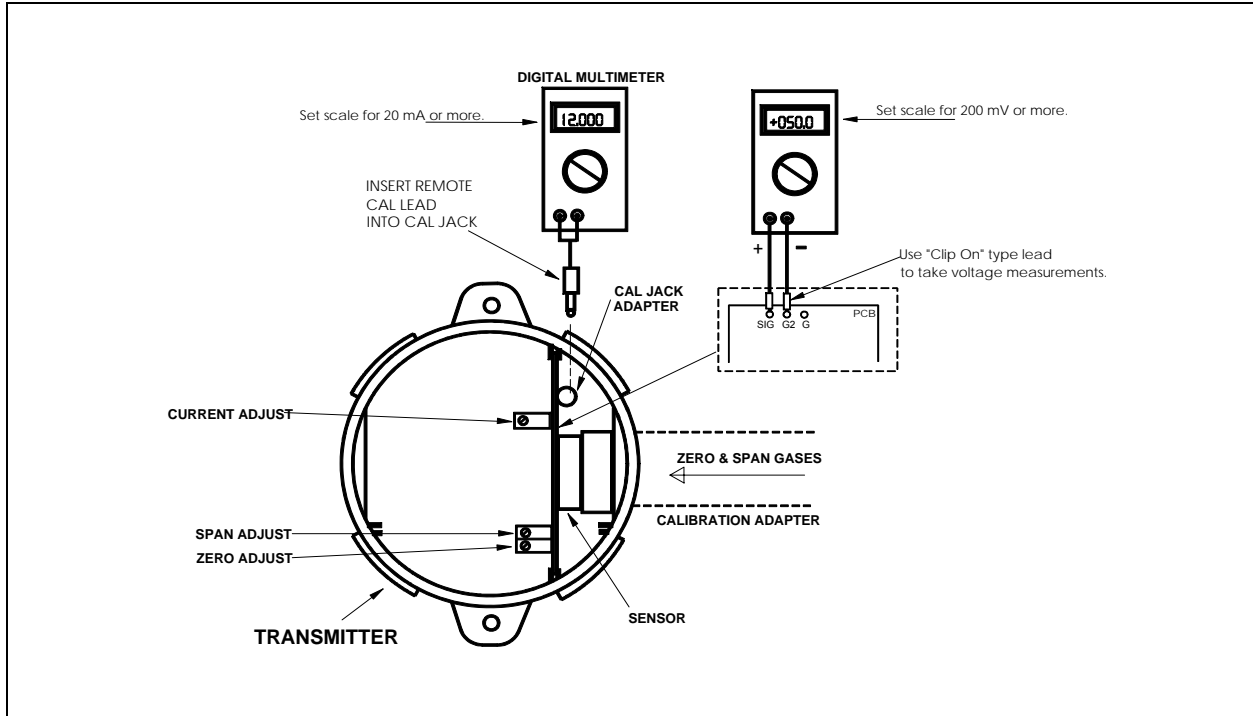


FIGURE 6: Calibration Procedure



6 MAINTENANCE

6.1 GENERAL

The AMC-2751 sensor/transmitter unit should be brushed or wiped as required, depending on the rate of accumulation of any dust or dirt.

To avoid sensor damage, the unit **MUST NOT** be submerged in any liquids. Hosing or splashing of the unit with any liquids must also be avoided.

6.2 SCHEDULED CALIBRATION

Scheduled calibration is critical in maintaining proper function of gas sensor/transmitters.

It is recommended that the AMC-2751 be calibrated a minimum of twice a year.

As mentioned, Armstrong Monitoring offers a number of different maintenance plans to suit your requirements.

6.3 SENSOR/TRANSMITTER REPLACEMENT

The sensor life of the AMC-2751 is typically over 4 years. When its signal is greatly reduced or unstable, the sensor replacement is required.

Please note that the sensor itself is not replaceable. To replace the circuit card with the sensor, please contact the factory.

Caution:

It is recommended to turn off the power to the sensor transmitter before replacing the board.

Note:

**15 minutes (minimum) is required for a new sensor to stabilize before calibration.
30 minutes to 1 hour is recommended.**