



# 340

## Transmitter/Sensor

# INSTRUCTION MANUAL

## IMPORTANT:

**Please read these installation and operating instructions completely and carefully before starting.**

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**NOTE**

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**NOTE**

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# 1 WARRANTY

This Armstrong equipment is warranted against defects in material and workmanship from the date of shipment from factory. Please check equipment specifications following this page for particular warranty periods. 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, or 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.

## 1.1 LIABILITY

All AMC products must be installed and maintained according to instructions. Only qualified technicians 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

<b>CHECK TO ASSURE THE WORKING AREA IS FREE FROM HAZARDS DURING INSTALLATION OR WHEN PERFORMING MAINTENANCE, AND USE PROPER PRECAUTIONS.</b>
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## 1.2 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.

## 1.3 PRODUCT RETURN

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



## 2 PRODUCT INFORMATION

### 2.1 TRANSMITTER & SENSOR

Transmitter/Sensor Unit Order Number. ....	_____
Transmitter Part Number.....	_____
Transmitter Serial Number.....	_____
Sensor Part Number. ....	_____
Sensor Serial Number/Warranty.....	_____
Power Supply Requirement. ....	12 to 26 VDC @ 250 mA
Sensor Warranty .....	_____

### 2.2 FACTORY SETTINGS

Gas Type. ....	_____
Clean Air at 4 mA signal.....	_____
Gas Concentration at ____ mA signal.....	_____

**Note:**

All Armstrong Monitoring systems must be installed and maintained according to instructions, to ensure proper operation. Only qualified technicians should install and maintain the equipment.



## 3 PRODUCT DESCRIPTION

### 3.1 GENERAL DESCRIPTION

The AMC-340 transmitter/sensor unit is designed to provide continuous, reliable surveillance of surrounding air for traces of hazardous gases (listed in Factory Settings, page 4. Being capable of detecting a wide variety of toxic or combustible gases, this unit provides a 4 to 20 mA, variable current signal, which is proportional to the gas concentration detected. Each transmitter/sensor unit is factory calibrated and is ready for field installation and operation.

#### 3.1.1 BASIC REQUIREMENTS

OPERATING TEMPERATURE: -30°C to 50°C (-22 °F to 122 °F)

OPERATING PRESSURE: Ambient atmospheric pressure.

HUMIDITY: 0 to 99% RH, non-condensing.

SIGNAL OUTPUT: Linear approximation.

#### 3.1.2 SENSOR SPECIFICATIONS

SENSOR TYPE: Solid state

RESPONSE TIME: Less than 10 seconds.

ACCURACY: Within 8%.

EXPECTED SENSOR LIFE: 10 years (continuous operation).

INITIAL BURN-IN TIME: 24 hours.

### NOTE

Turn off power supply before removing or replacing the transmitter or sensor.
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### 3.2 HOUSING OPTIONS

The AMC-340 transmitter/sensor units are available in the following housings (see Figure 1). The explosion proof housings are also available with a corrosion resistant finish.

- Explosion Proof (rated for Class I, Groups B, C, D)
- Explosion Proof (rated for Class I, Groups A, B, C, D)

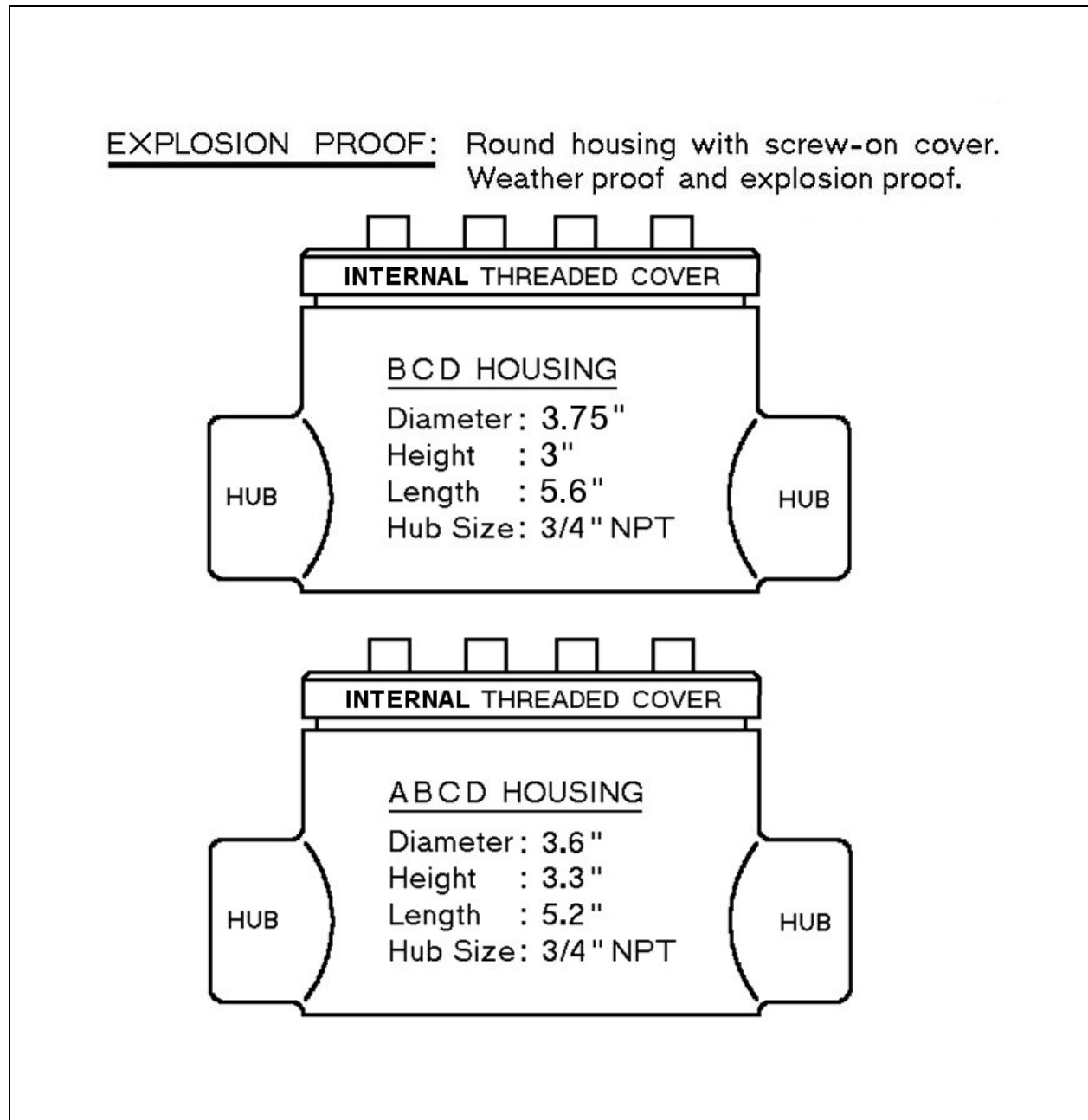


Figure 1: Explosion Proof Housing Options



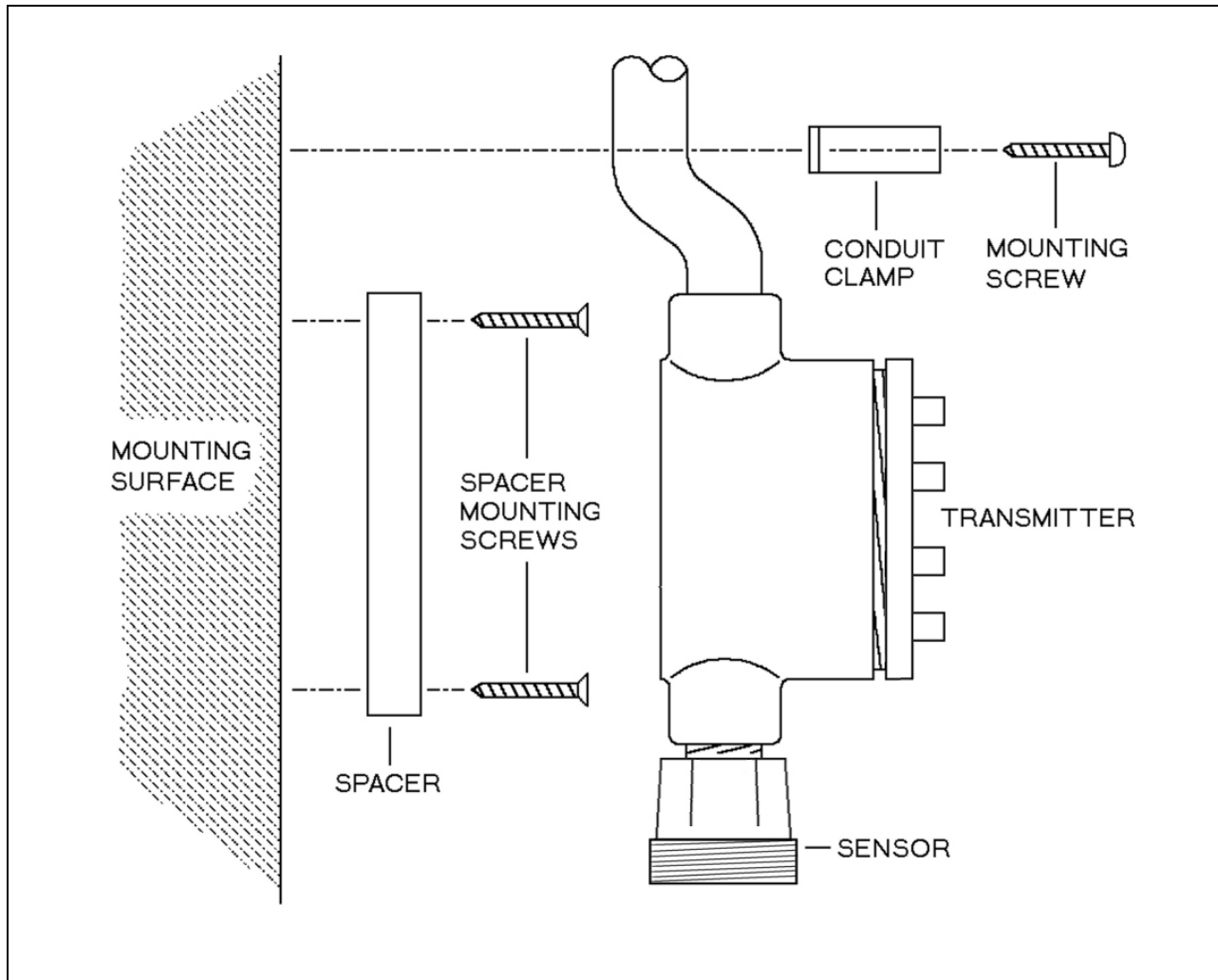
## 4 INSTALLATION

### 4.1 LOCATION AND MOUNTING

Mount the transmitter/sensor unit on a solid, non-vibrating surface or structure in an area where the local concentration of gas is unaffected by the presence of ventilation systems and away from sources of interference gases. The sensor housing **SHOULD NOT** touch the mounting surface. Some cases may require the use of a spacer between the mounting surface and the transmitter housing. (See Figure 2)

**Note:**

**Mounting arrangement of transmitter housing depends on location of transmitter, and mounting surface. Mounting hardware NOT supplied.**



**FIGURE 2: Using spacer to mount transmitter housing.**

## 4.2 CABLE SELECTION AND WIRING

The transmitter output (□, S, +) terminal block connects to the (□, S, +) connections on a channel terminal block of the monitor (one transmitter per channel), as shown in Figure 4. Connection should be made using 3-conductor, shielded cable (shield must be grounded at the monitor). Run cable through steel conduit for best signal transmission and maximum noise rejection. The maximum permissible distance between the transmitter and monitor is dependant on wire gauge as shown in the following **Cable Selection Chart**.

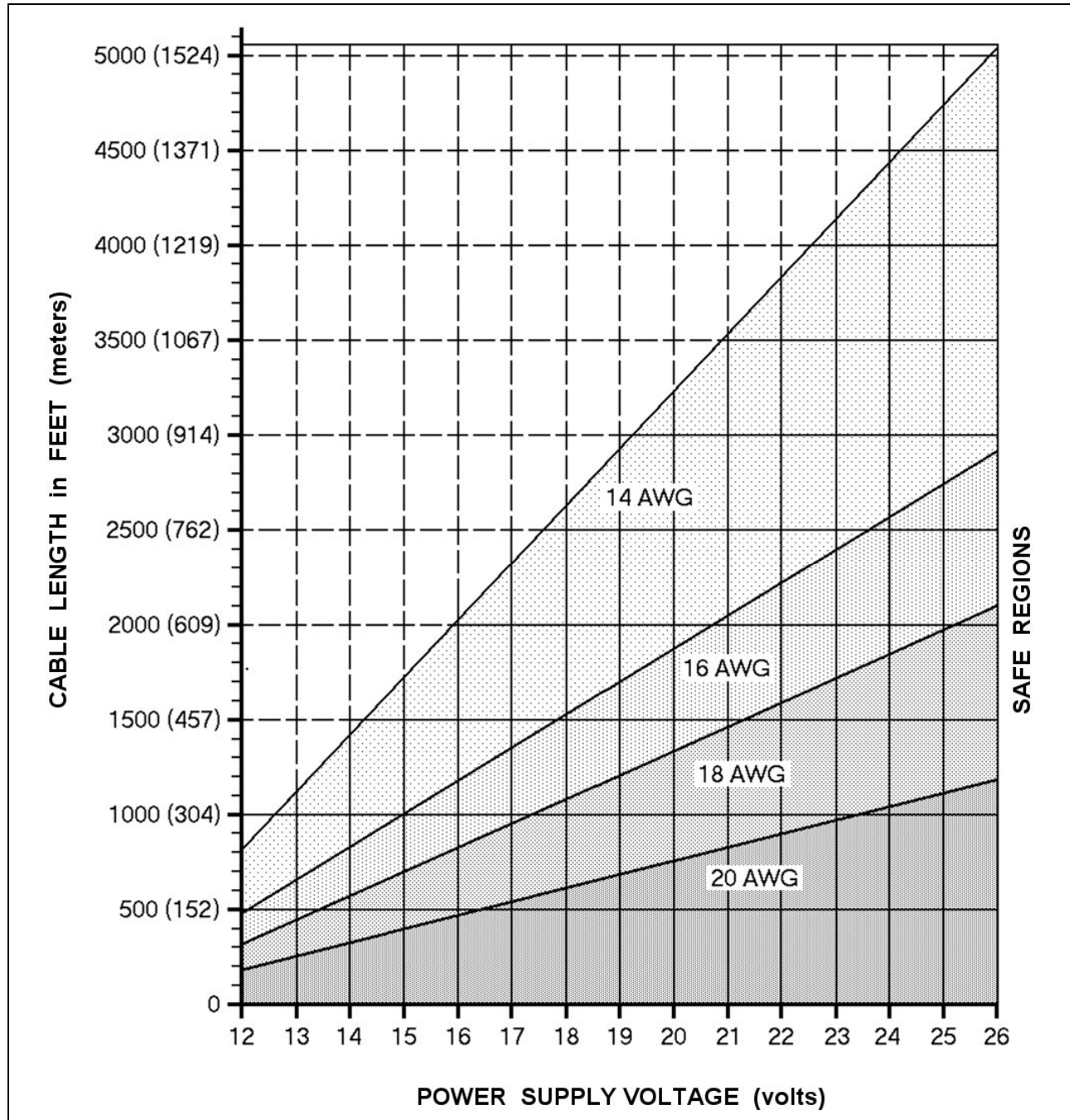


FIGURE 3: Cable selection chart

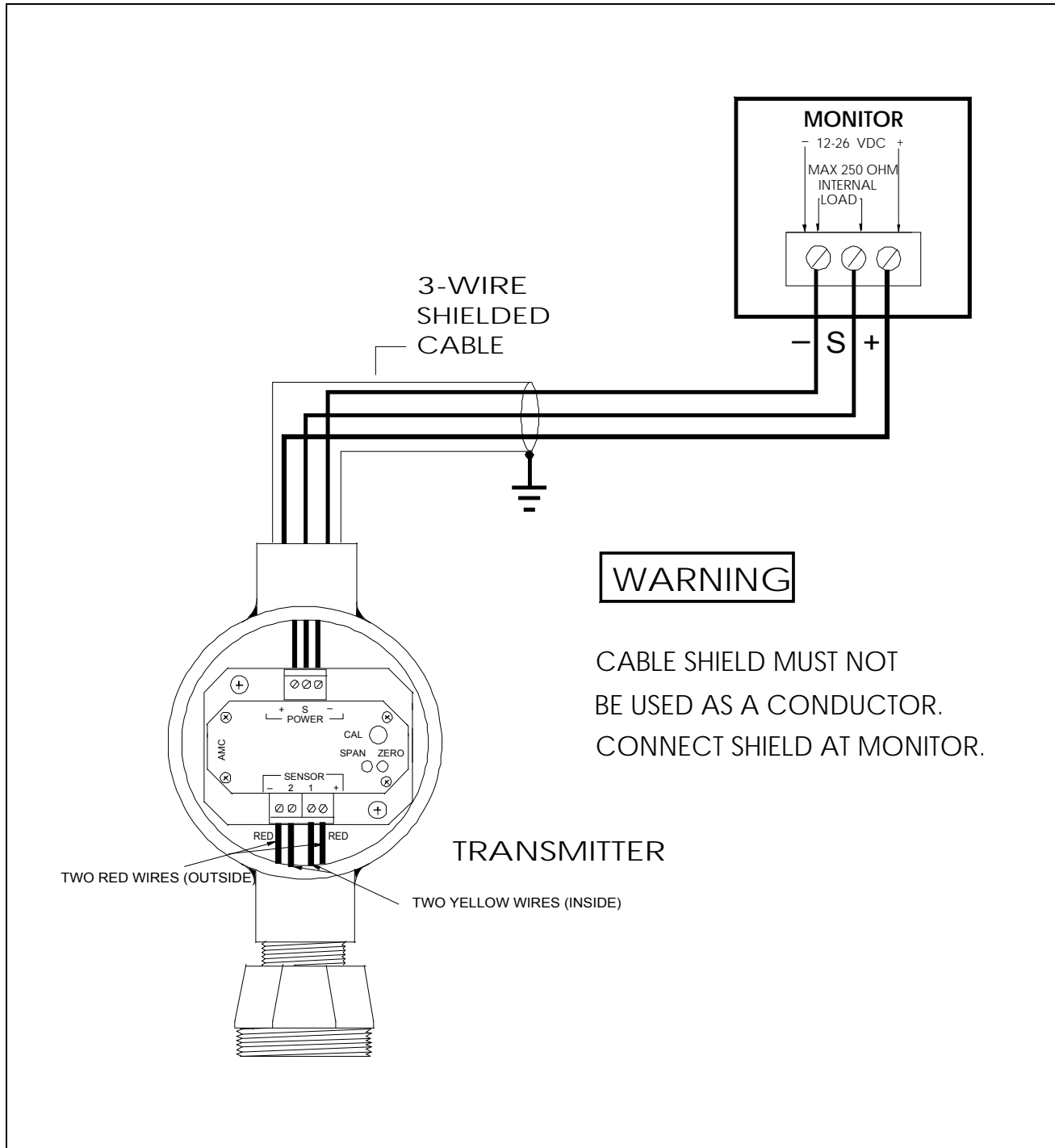


FIGURE 4: Transmitter/sensor wiring layout.



## 5 OPERATION AND CALIBRATION

### 5.1 OPERATION

The AMC-340 transmitter/sensor unit is factory calibrated for the gas listed in Factory Settings (page 2) at the beginning of this manual. The unit should not need recalibration when first installed and powered-up, but a test for correct operation is recommended. All testing should be done after a stabilization period of 24 hours.

In general, after the stabilization period, the transmitter should be sending (in a clean air environment) a signal of approximately 4 mA to the monitor or controller. However, there are a few situations where a slightly higher or lower than normal signal may be noticed. In many facilities there are residual background gases (including the gas being detected) in the air at all times. These can cause a minor response from the sensor, normally causing a rise in signal. Other causes for minor signal variations include extremes in temperature. In the case of large signal variations (in a clean air environment), check for an installation issue, EMI-RF interference or the possibility of an interference gas being present. The application of a clean air sample will verify if the elevated signal is from background gas or equipment calibration error.

### 5.2 CALIBRATION

The transmitter is equipped with a remote calibration feature allowing one-man calibration at the transmitter/sensor location. The transmitter output is measured using a plug-in type "Remote Calibration Lead" (P/N CK2003-01) designed to be adaptable to most multimeters. Zero and Span adjustments are made at the transmitter. Recalibration is necessary when replacing the sensor. Verification of calibration should be done at least once every 6 months for safety reasons and for highly demanding applications, monthly verification is recommended.

Factory or on-site calibration services, customer training, and/or calibration kits can be provided. Specify the transmitter/sensor type and gas when requesting any of the above.

#### Caution:

**Only qualified personnel should perform the actual calibration. Users are advised to consult the Armstrong Monitoring Corporation as to the recommended calibration gas concentration for the application, and any other questions.**

#### 5.2.1 EQUIPMENT REQUIRED

- Digital multimeter
- Remote Calibration Lead; P/N CK2003-01 (provided with the transmitter)
- Trimmer Adjustment Tool
- Calibration Kit
- Calibration gas(es)



## 5.2.2 TRANSMITTER CALIBRATION/VERIFICATION SET-UP PROCEDURE

The calibration procedure may cause the monitoring equipment to give a false alarm; therefore appropriate precautions should be taken. Instructions for introducing the gas sample are included with every Calibration Kit or available separately on request (depending on type of gas or application). Refer to Figure 5 for the following procedure.

1. Remove cover from transmitter housing
2. Connect "Remote Calibration Lead" to multimeter.  
  
BLACK lead to negative or common (-)  
  
RED lead to positive (+).
3. Switch ON multimeter and select a DC milliamp range greater than 20 mA full scale.
4. Insert plug end of "Remote Calibration Lead" fully into CAL jack on transmitter cover plate. This will block the outgoing signal, causing a "fail" at the monitor.
5. Ensure the space is free and clear of any background gasses (clean air). After the signal reading has stabilized (approx 1 min) check for a stabilized ZERO signal of 4.0 mA. Set ZERO trimmer to 4.0mA.
6. Apply a Span gas sample (Refer to the Calibration Kit Instruction Manual for set-up and procedure). Since the transmitter output range is 4 to 20 mA, the gas concentration and output current should match what is listed in Factory Settings, Section 2.2.

## 5.2.3 ADJUSTMENTS

For full recalibration adjustments, follow the above steps 1 to 6 inclusive. There are two adjustments to be made for recalibration, Zero and Span.

Zero: When there is no target gas present (clean air), the transmitter signal should be 4 mA. This is obtained by adjusting the Zero trimmer on the transmitter. It is possible with certain conditions that the "Zero" current will go below 4 mA.

Span: When the sensor is exposed to the calibration gas sample, adjust the span trimmer on the transmitter to set the output current proportional to the gas concentration applied.

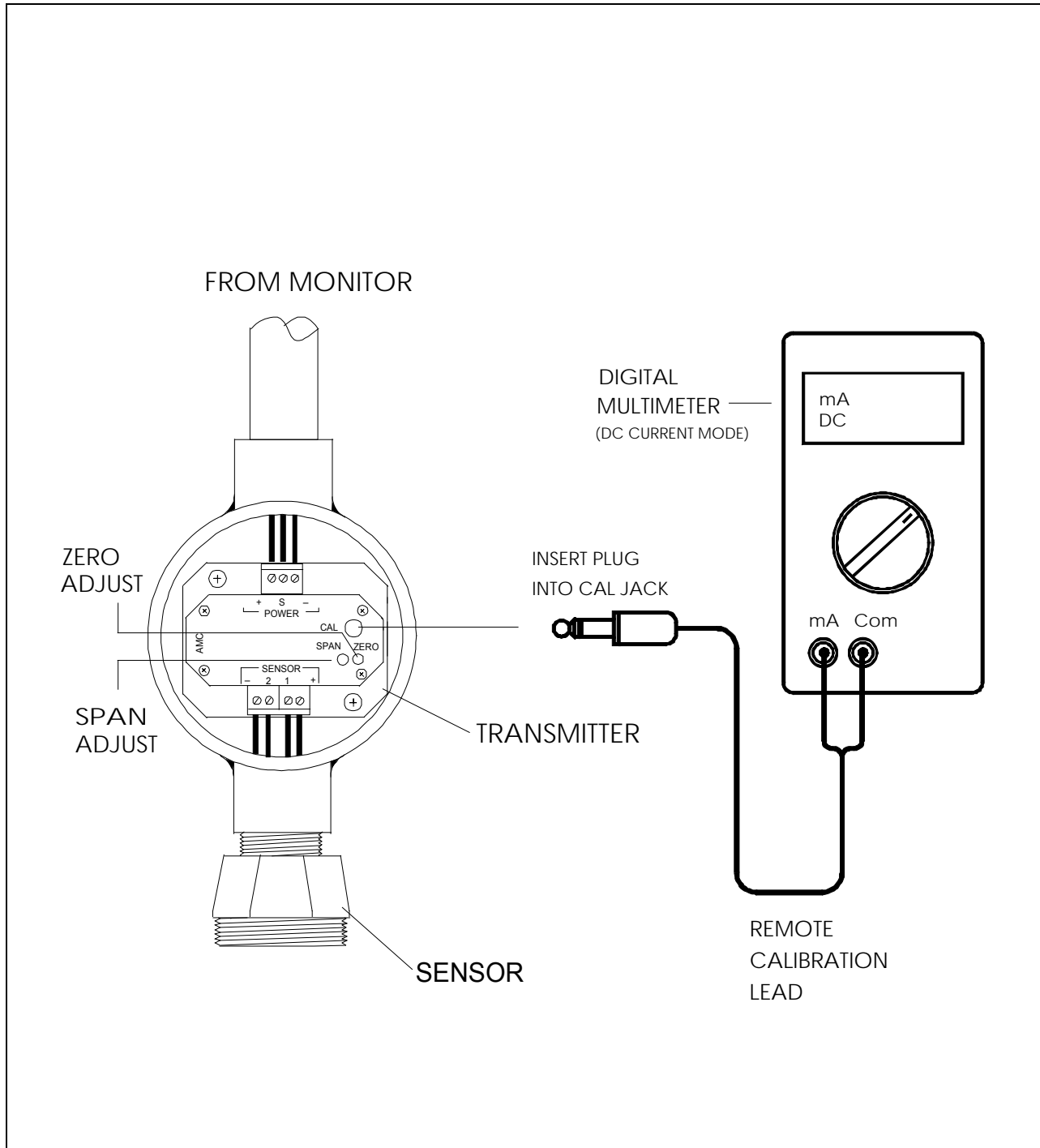


Figure 5: Calibration/verification set-up procedure.



## 6 PREVENTIVE MAINTENANCE

### 6.1 GENERAL

The transmitter/sensor unit should be brushed or wiped clean once a year or more, of any dust or dirt, which settles on it, depending on the accumulation.

The unit SHOULD NOT be submerged in water or other liquids. Also, hosing and other conditions that could cause a liquid to enter the transmitter or sensor should be avoided.

### 6.2 VERIFICATION OF OPERATION

To verify the operation of the transmitter/sensor unit, make sure that it is still responding to gas. This test should be performed every few months, but for more demanding applications, verification should be performed on a weekly basis.

### 6.3 SENSOR REPLACEMENT

**CAUTION:**

**Turn off power supply before attempting the following.**

Sensor life is in excess of 10 years. When the sensor needs replacing, reorder Part No. listed in Product Information sec 2. The sensor should be replaced under the following conditions:  
See Figure 6 for sensor replacement procedure.

1. When the sensor element becomes an open circuit, the transmitter outputs a fixed 1 mA signal.
2. When the sensor no longer responds to the presence of gas or has an unstable zero signal.

**Explosion-Proof Sensor Replacement:** Remove the transmitter cover, unscrew the sensor wiring from the terminals, remove the sensor assembly, replace with a new sensor assembly, connect the sensor wiring to the terminal block and replace the transmitter cover.

**Note:**

**Allow 24 hours for new sensor element to stabilize (burn-in) before recalibration, and then follow instructions in calibration section 5.2 of this manual.**

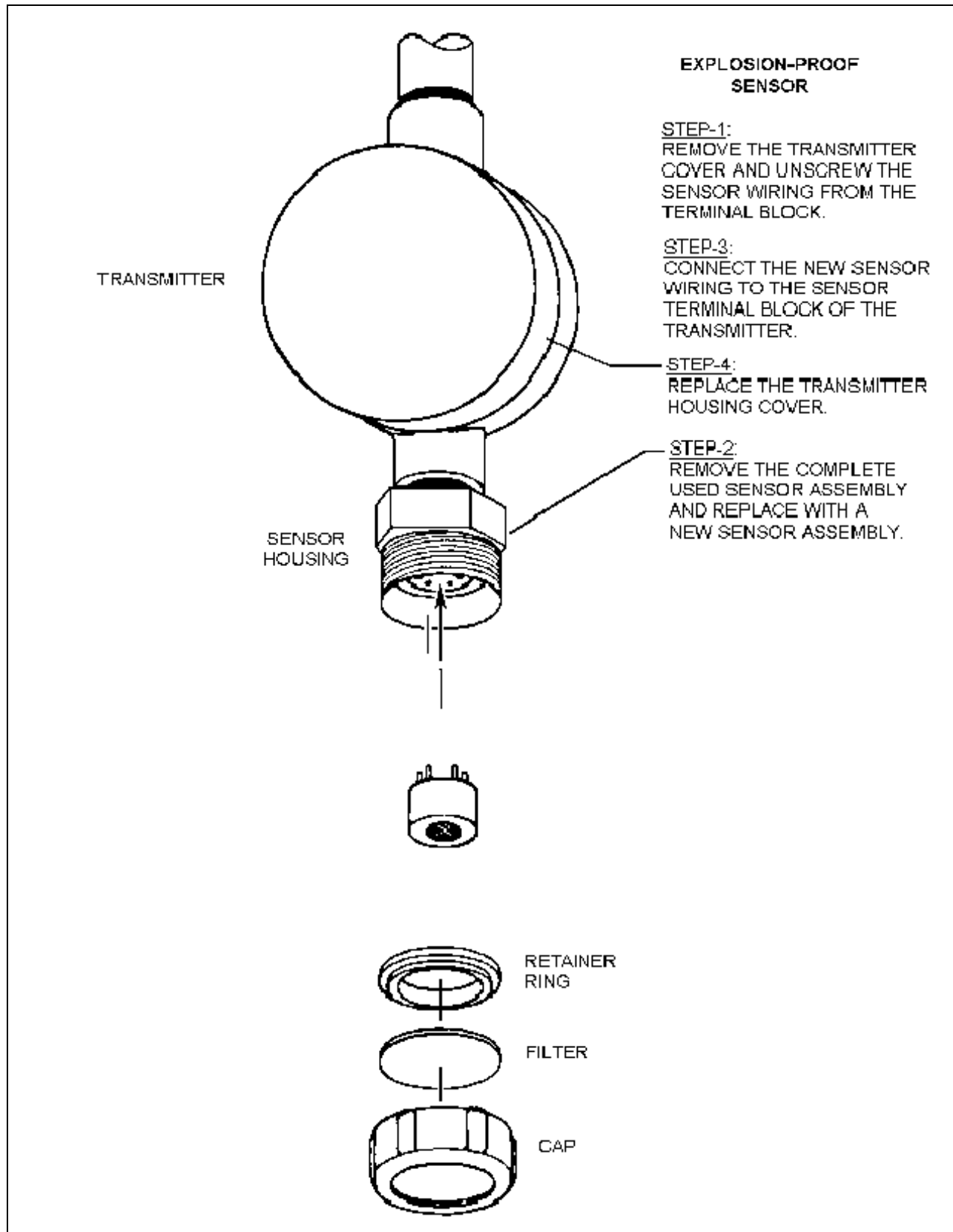


Figure 6: Sensor replacement procedure.