360-IREP

Infrared Sensor/Transmitter

INSTRUCTIONS

Installation, Calibration & Maintenance of the AMC-360-IREP Sensor/Transmitter

IMPORTANT:

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

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NOTE

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1 WARRANTY

The AMC-360-IREP transmitter is warranted against defects in material and workmanship for a period of two (2) years from date of shipment (except electrochemical sensor elements, catalytic elements and portable monitors – one (1) year – refer to individual spec sheets for additional exceptions). **Calibration is not warranted.** During the warranty period, Armstrong will repair or replace components that prove to be defective in the opinion of Armstrong Monitoring. The corporation is not liable for auxiliary interfaced equipment, nor consequential damage.

NOTE: Any substitution or tampering with components without expressed, written permission of ARMSTRONG MONITORING may result in intrinsic damage which will cancel the effectiveness of the warranty. Extended warranties are available through the factory. Please contact factory. Service agreements may supersede standard warranty terms.

1.1 LIABILITY

All Armstrong Monitoring systems shall be installed by a qualified technician and maintained according to Armstrong Monitoring Installation and Maintenance Manual instructions.

Armstrong Monitoring shall not be responsible for any liability arising from auxiliary interfaced equipment, consequential damage, the installation, or the operation of this equipment. Armstrong's total liability is contained in the warranty conditions stipulated above. No other acceptance of liability is expressed or implied by Armstrong Monitoring. Except as set forth herein, Armstrong Monitoring makes no warranty, expressed or implied, with respect to the fitness for any particular purpose or use or otherwise of the products or services, or on any parts or components or labour furnished as part of the sale. In no event shall Armstrong Monitoring, its officers, directors, employees, agents or servants be liable to the buyer or any other party for any loss of profit, loss of use, incidental, consequential or special damages arising out of the sale, delivery, servicing, use, loss of use, of the products or of any part thereof, irrespective of whether Armstrong Monitoring or any of its officers, directors, employees, agents or servants has advanced notice of the possibility of such damages. In no event will the total liability to the buyer exceed the sum paid to Armstrong Monitoring by buyer for the products and services.

1.2 PRODUCT RETURN

All products that must be returned for warranty service will be shipped by prepaid freight and will only be accepted with a Returned Materials Authorization (RMA) number issued by ARMSTRONG MONITORING. Goods returned to the client will be by freight collect.

1.3 MODIFICATIONS AND SUBSTITUTIONS

Due to an ongoing development program, Armstrong Monitoring reserves the right to modify the design and substitute components in any of its products without prior notice. All changes are at the sole discretion of Armstrong Monitoring, and the corporation shall not be liable for any cost arising out of such modifications or substitutions that may be incurred by the user.

2 PRODUCT INFORMATION

The AMC-360-IREP sensor/transmitter unit is designed to provide continuous, reliable surveillance of surrounding air for combustible gases. Used with the targeted gas sensor, the unit provides a 4 to 20 mA, variable current signal which is proportional to the gas concentration currently detected. Each sensor/transmitter unit is factory calibrated with its interconnected sensor and is ready for field installation and operation.

2.1 TRANSMITTER

Transmitter Unit Order Number ……..	_____
Transmitter Part Number……..	_____
Transmitter Serial Number …….	_____
Sensor Part Number……..	_____
Sensor Serial Number ……..	_____
Sensor Warranty……..	_____
Power Supply Requirement ……..	12 to 26 VDC @ _____ mA
Signal Output Load ……..	maximum 250 ohms
Operating Temperature……..	–40 to +40 ºC (–40 to +104 ºF)
Operating Pressure……..	Ambient atmospheric pressure
Operating Humidity……..	0 to 99% RH, non-condensing

2.2 FACTORY SETTINGS

Gas Type ……	_____
Air, at 4 mA signal for combustible gases……..	_____
Nitrogen at 4mA signal for Carbon Dioxide	_____
Gas Concentration at 20 mA signal ……	_____
Calibration Adapter Part Number……	_____

Note:

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

Note:

Turn off power supply before removing or replacing the transmitter or sensor.

2.3 HOUSING OPTIONS

The AMC-360-IREP series transmitter units are available in the following housing (see FIGURE 1). The explosion-proof housing is also available with a corrosion resistant finish.

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

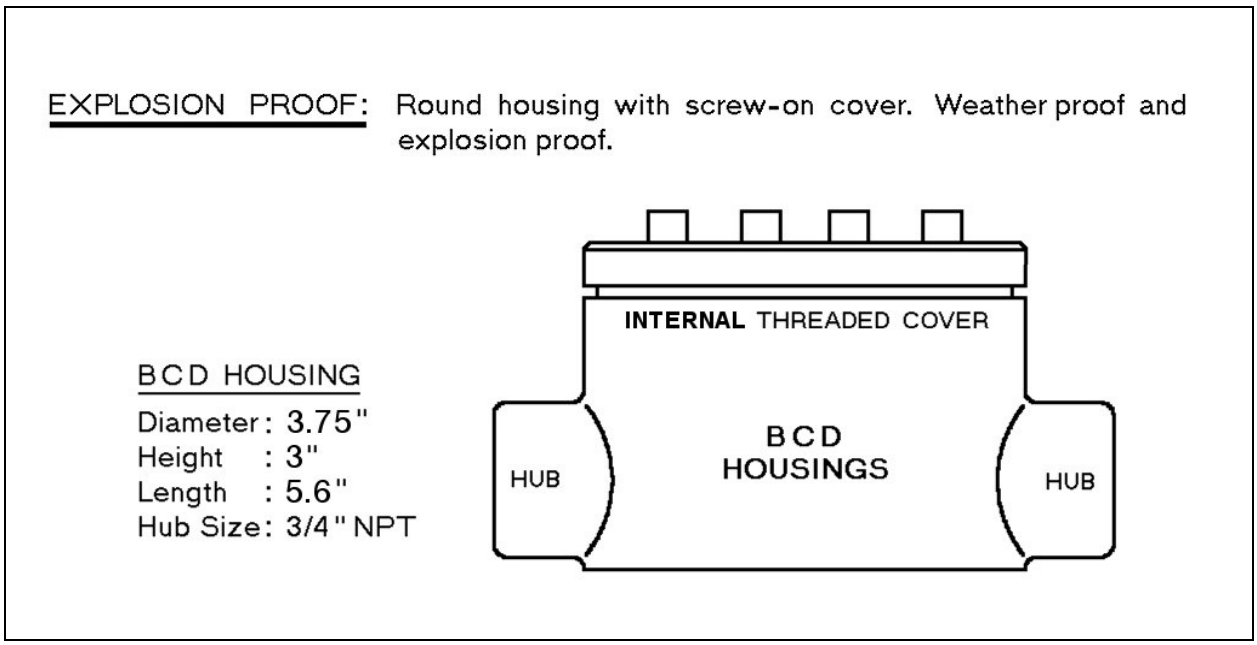

FIGURE 1: Explosion-proof housing options.

3 INSTALLATION

3.1 LOCATION AND MOUNTING

Mount the sensor/transmitter 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. Sensor placement should consider the density of methane being lighter than air and factors relating to optimum installation location (see FIGURE 2).

Note:

Mounting arrangement of transmitter housing depends on location of transmitter and mounting surface. Mounting hardware is not supplied.

Warning:

Qualified personnel should perform the installation according to applicable electrical codes, regulations and safety standards. Ensure correct cabling and sealing fitting practices are implemented.

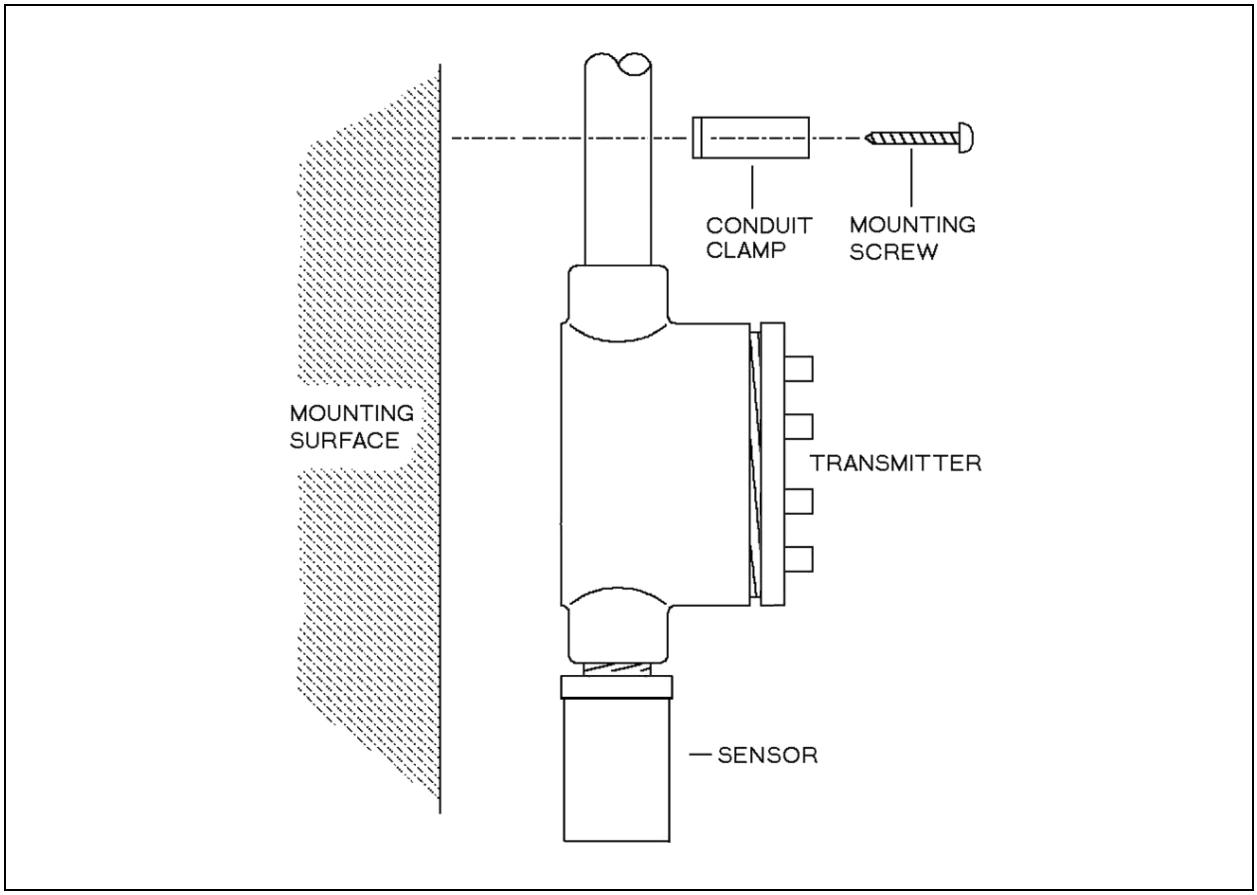

FIGURE 2: Mounting sensor/transmitter unit.

3.2 CABLE SELECTION AND WIRING

Connection should be made using 3-conductor, shielded cable (shield must be grounded at the power supply). See Figure 3 to select cable length and wire gauge according to supply voltage. Run cable through steel conduit for best signal transmission and maximum noise rejection.

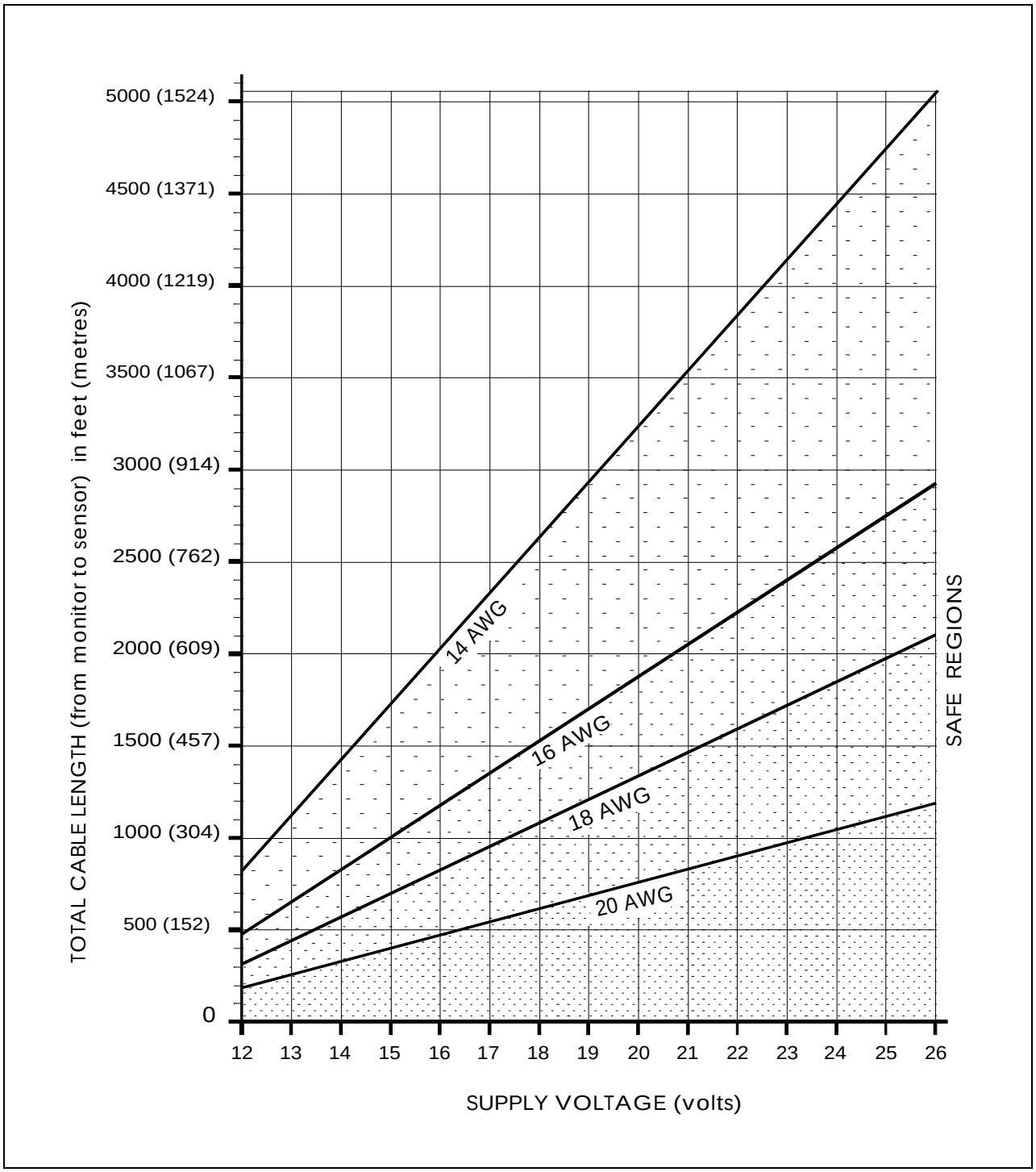

FIGURE 3: Cable selection chart.

3.2.1 TRANSMITTER TO MONITOR WIRING

The transmitter output (–, S, +) terminals connect to the (–, S, +) input terminals on a channel terminal block of the monitor (one transmitter per channel), as shown in Figure 4. Each transmitter MUST BE CONNECTED TO ITS CORRESPONDING CHANNEL to retain factory calibration of the trip points.

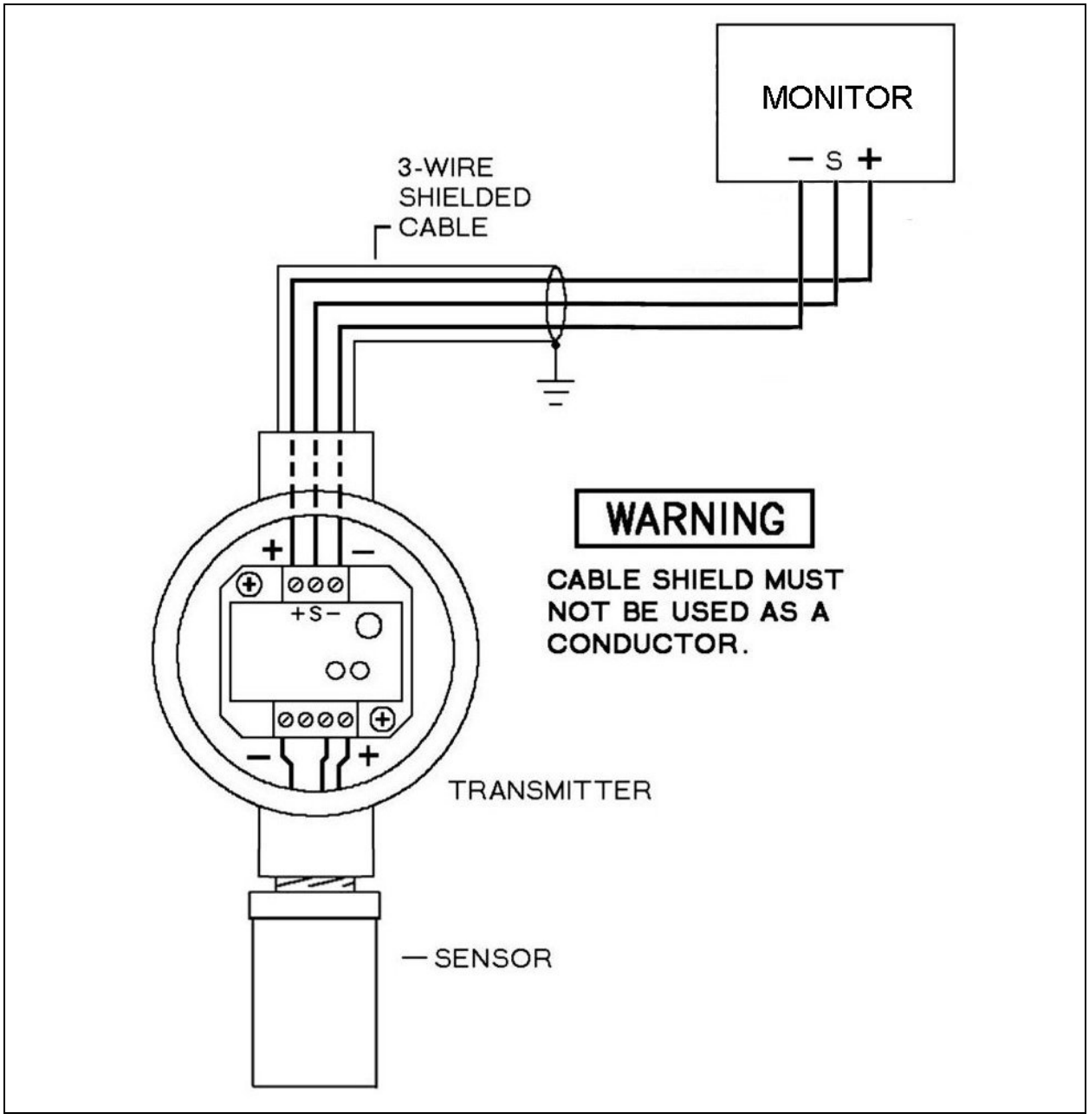

FIGURE 4: Transmitter to monitor wiring layout.

3.2.2 TRANSMITTER INTERFACE TO COMPUTER, DATALOGGER OR NON-AMC SYSTEM

All Armstrong transmitter/sensor units can be interfaced to computers or data loggers through analog-to-digital converters or to non-AMC monitors. The transmitter output (-, s, +) terminal block connects to a filtered, DC power supply through field wiring. (see Figure 5)

The signal output from the transmitter is a 4 to 20 milliamp DC current. This can be measured from the signal wire, or if a voltage measurement is needed, connect a resistor (250 ohms max.) between the transmitter signal output (s) and power supply ground (-).

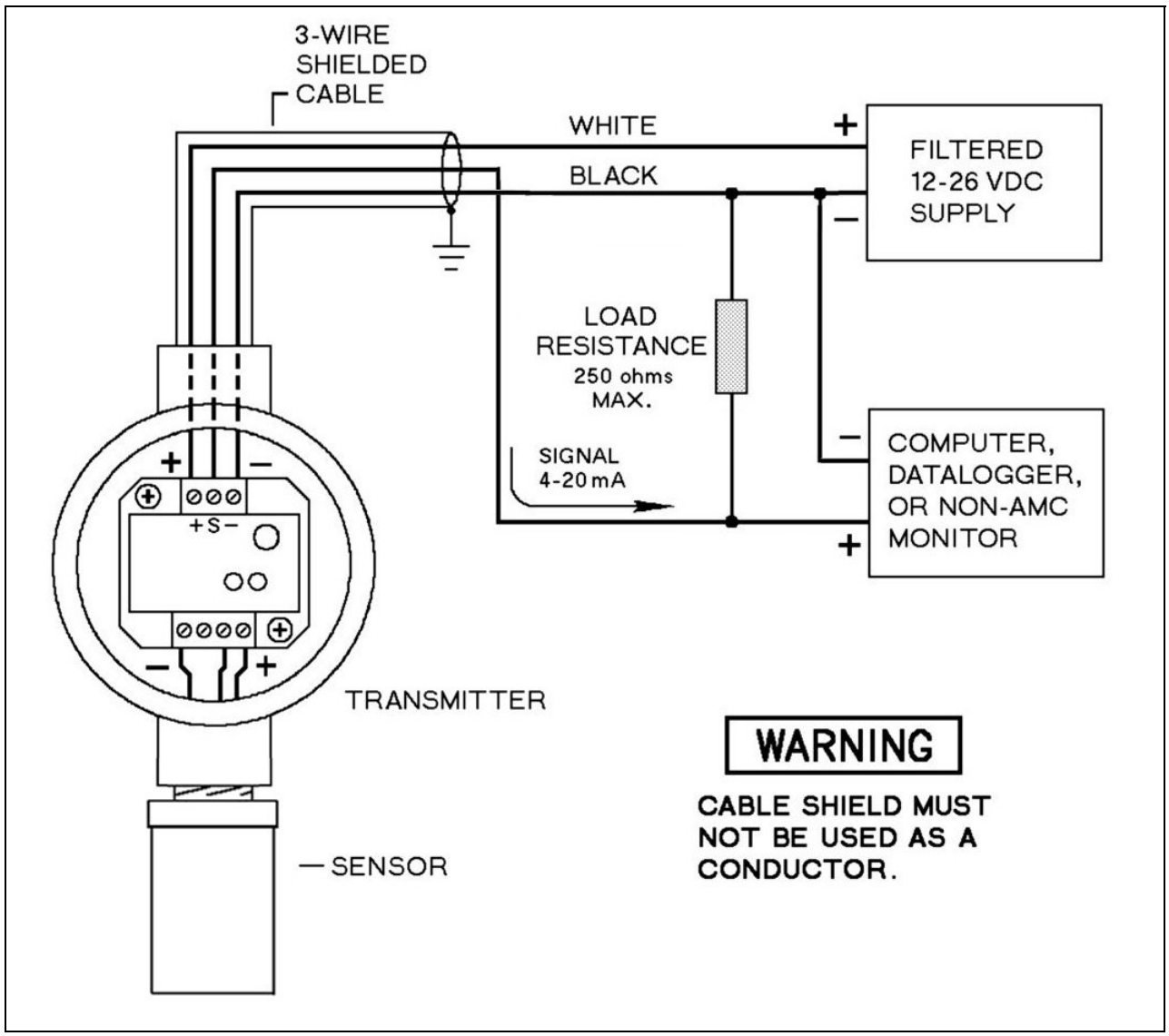

Figure 5: Computer or Data logger interface wiring layout.

4 OPERATION AND CALIBRATION

4.1 OPERATION

The AMC-360-IREP series transmitter/sensor unit is factory calibrated for the gas listed in section 2.2. 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 20 seconds.

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 environment), check for an installation problem, RF interference or the possibility of an interference gas being present. The application of clean air from a clean source as defined in section 4.2.2 step 5 will verify if the elevated signal is from background gas or equipment calibration error.

4.2 CALIBRATION

The transmitter is equipped with a remote calibration feature allowing one-man calibration at the transmitter location. The transmitter output is measured using a “plug-in” type “Remote Calibration Lead” (P/N 2900-01) designed to be adaptable to most multimeters. Zero and span adjustments are made at the transmitter. Recalibration is necessary when replacing the sensor. Scheduled calibration should be done at least once every 6 months for safety reasons and for highly demanding applications more frequent calibration is recommended.

Caution:

- Only qualified personnel should perform the actual calibration.
- Users are advised to consult The Armstrong Monitoring Corporation as to the calibration procedure and recommended gas concentration for the application.

For some exotic gases, calibration standards needed for field calibration are not readily available. The Armstrong Monitoring Corporation offers the following calibration 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

For all above options, please contact AMC for details.

4.2.1 EQUIPMENT REQUIRED

- Digital multimeter with a minimum display range of 20.0 mA.
- Remote calibration lead provided with the transmitter, available from AMC.
- Miniature screwdriver trimmer adjustment tool.
- Calibration adapter, available from AMC.
- Zero & Span gases and regulator (Contact AMC for information).

4.2.2 TRANSMITTER CALIBRATION SET-UP PROCEDURE

The remote calibration lead is required to measure the transmitter output signal. The insertion of the calibration lead plug into an AMC 3-wire model transmitter cal jack will disable the transmitter output signal. This will result in a FAIL ALARM condition at the monitor or controller during the calibration procedure.

Zero and Span adjustment terminals are provided to set the zero and span while the sensor is exposed to known concentration sample gas mixtures. It is always best to calibrate the transmitter with the intended gas to be detected. When this is neither possible nor practical, theoretical cross sensitivity calibration may need to be used.

Refer to Figure 6 to perform the following calibration 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 the DC milliamp range of 20 mA or greater 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 or controller.

5) Apply Zero air @ .5L/min to sensor used for detecting combustible gases or apply Nitrogen gas @ .5L/min if alternate sensor used is for detecting Carbon Dioxide (CO2) 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. Since the transmitter output range is 4 to 20 mA, a full-scale concentration should register 20 mA after a few moments exposure. Proportionately, a half-scale concentration of gas should register 12 mA, and so on.

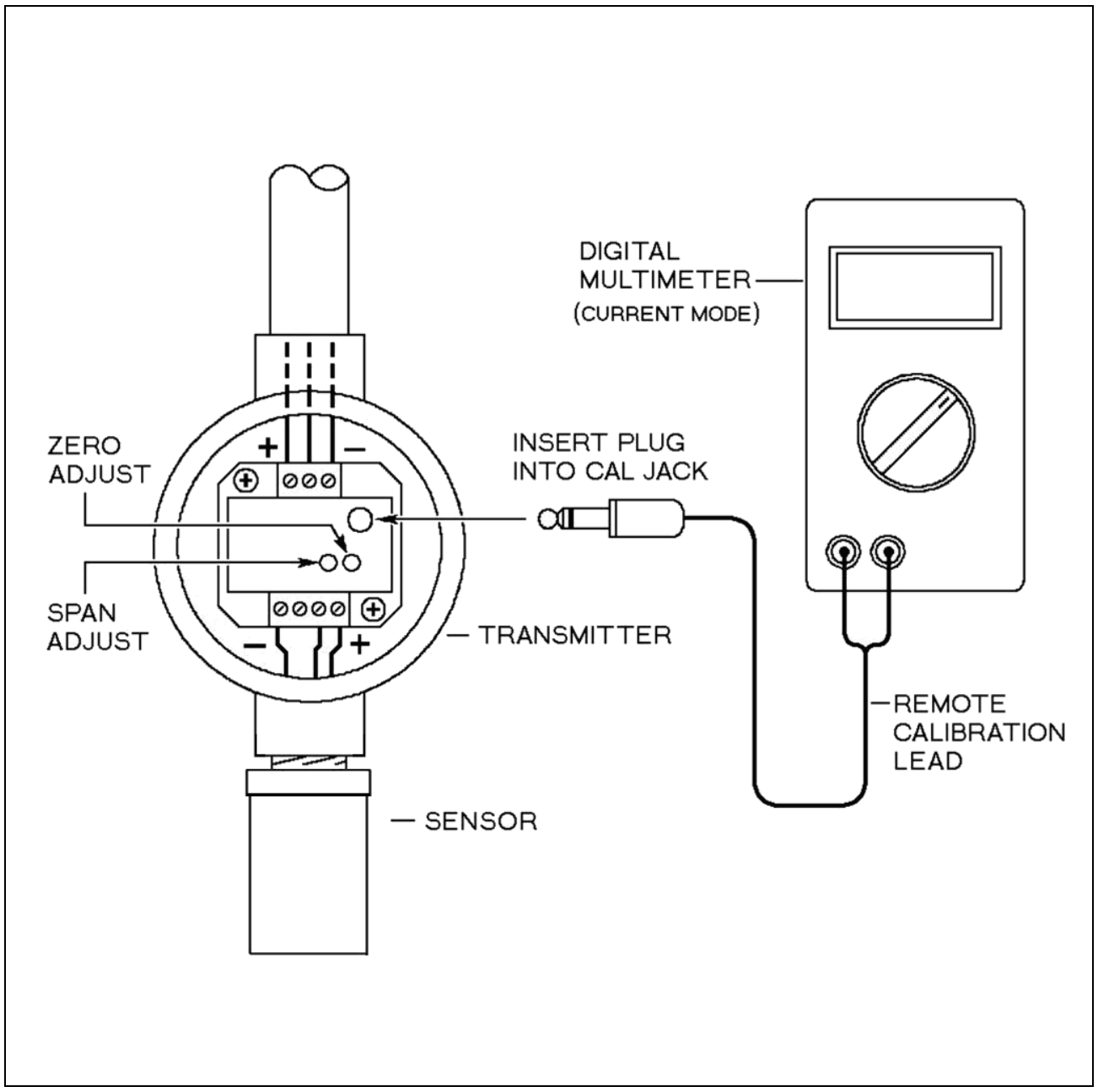

Figure 6: Calibration/verification set-up procedure.

5 PREVENTIVE MAINTENANCE

5.1 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 enclosure should be avoided.

5.2 SCHEDULED CALIBRATION

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

It is recommended that the sensor/transmitter be calibrated a minimum of twice a year. For more demanding applications, verification should be performed on a monthly basis.

As mentioned, Armstrong Monitoring offers a number of different maintenance plans to suit your requirements see section 4.2.

5.3 SENSOR REPLACEMENT

CAUTION:

TURN OFF THE POWER BEFORE ATTEMPING THE FOLLOWING.

The sensor should be replaced under the following conditions:

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.

When its signal is greatly reduced or unstable, the sensor/transmitter replacement is required; see section 2.1 for replacement sensor P/N.

See Figure 7 for sensor replacement and wiring procedure.

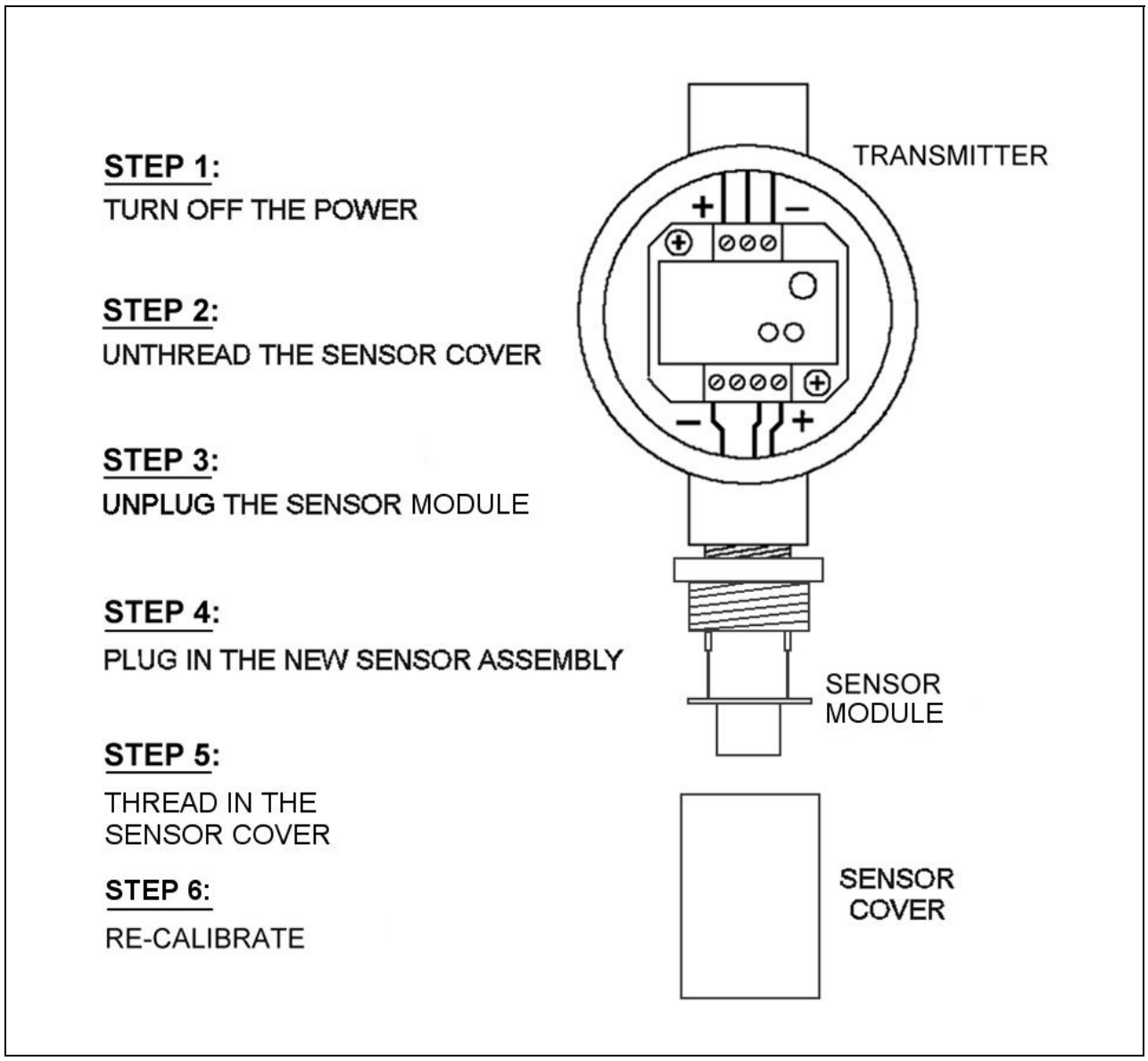

Figure 7: Sensor replacement.