



# AMC 2701

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## INSTRUCTIONS

### INSTALLATION AND OPERATING INSTRUCTIONS FOR THE AMC-2701 TRANSMITTER WITH INTEGRAL, LOW COST ELECTROCHEMICAL CARBON MONOXIDE SENSOR

## IMPORTANT:

PLEASE READ THESE INSTRUCTIONS  
CAREFULLY BEFORE BEGINNING  
INSTALLATION AND/OR OPERATION OF  
THIS EQUIPMENT.

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## 1 WARRANTY

The AMC-2701 sensor/transmitters are warranted against defects in material and workmanship for a period of three years from date of delivery. During the warranty period, The *Armstrong Monitoring Corporation* will repair or replace components that prove to be defective in the opinion of AMC. We are not liable for auxiliary interfaced equipment, or 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 such 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.

### 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 service will be by prepaid freight and they will only be accepted with an R.M.A number issued by AMC. All products returned to the client will be freight collect.



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## 2 PRODUCT INFORMATION

### 2.1 SENSOR/TRANSMITTER MODULE

Sensor/Transmitter Unit Order Number ..... \_\_\_\_\_

Transmitter Serial Number ..... \_\_\_\_\_

Sensor Part Number ..... \_\_\_\_\_

Sensor Serial Number ..... \_\_\_\_\_

Sensor Type ..... Electrochemical cell

Response Time ..... 90% response in less than 20 seconds

Linearity ..... < 3% of scale deviation

Range ..... 0-200 ppm

Signal Output ..... 4-20 mA

Operating Temperature Range ..... -10°C TO 50 °C

Operating Humidity ..... 15 to 90% continuous, 0 to 99% intermittent (non-condensing)

Expected Sensor Life ..... greater than 3 year(s)

Warranty Period ..... 3 years

Power Supply Requirement ..... 12 to 30 VDC

Installation wiring ..... twisted pair shielded cable

Enclosure Material ..... PVC

### 2.2 FACTORY CALIBRATION

Gas Type ..... Carbon Monoxide

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 ensure proper operation. Only qualified technicians should install and maintain the equipment.



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## 3 PRODUCT DESCRIPTION

This section provides a general product description of the AMC-2701 sensor.

### 3.1 GENERAL DESCRIPTION

The AMC-2701 series sensor/transmitter unit is designed to provide continuous, reliable surveillance of surrounding air for traces of carbon monoxide. This unit provides a 4 to 20 mA, variable current signal that is proportional to the gas concentration detected. Each sensor/transmitter unit is factory calibrated and is ready for field installation and operation.



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## 4 INSTALLATION

This section discusses topics relating to the proper installation of the AMC-2701 unit.

### 4.1 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 potential interference.

### 4.2 CABLE SELECTION AND WIRING

Connection should be made using 2-conductor, shielded cable. For best signal transmission and maximum noise rejection, run the cable through steel conduit (cable must be grounded at the monitor or power supply). Supply voltage can be measured at the transmitter (-,+) connections at the supply source. For basic cable selection between the source and transmitter, using a 250 ohm load resistance, use Table 4-1 Cable Selection Guide

Table 4-2 Cable Selection Guide

WIRE GAUGE	AWG	22	20	18	16
MAXIMUM DISTANCE IN FEET AND (metres)	@12 VDC	1000 (305)	1500 (457)	2500 (762)	3800 (1158)
	@ 24 VDC	15000 (4572)	23000 (7010)	38000 (11582)	57000 (17373)

For applications not covered by the above table, use the graph in Figure 2.1 Resistance/Supply Voltage graph.



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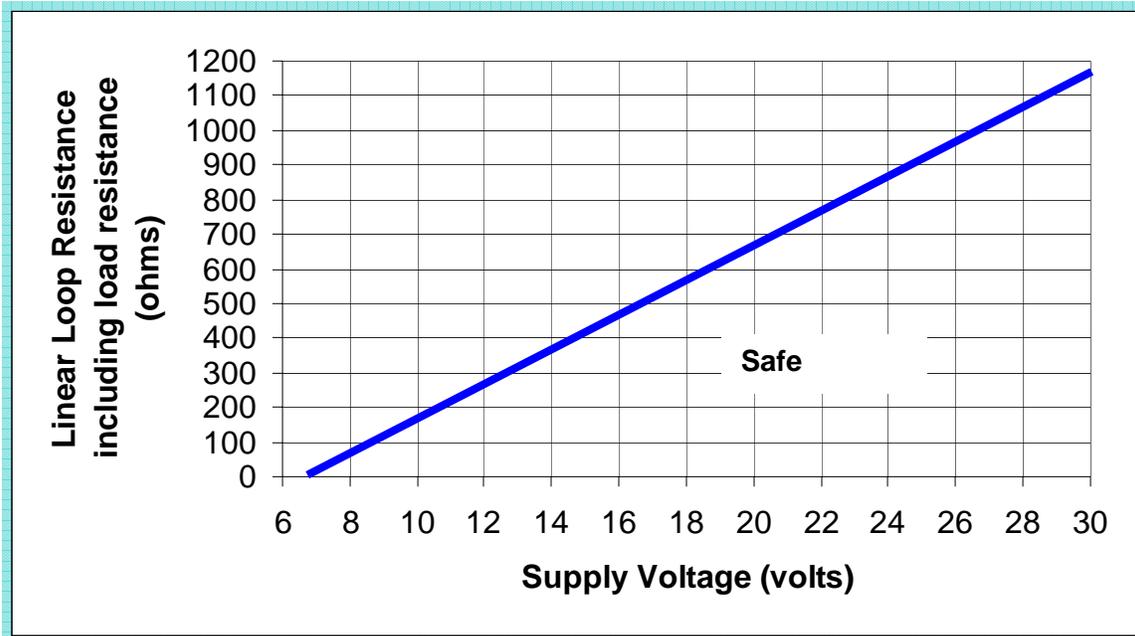


Figure 4-1 Resistance/Supply Voltage Graph

## 4.2.1 INTERFACING TO COMPUTER, DATALOGGER, OR NON-AMC MONITOR

All Armstrong sensor/transmitters can be connected to computers or dataloggers through analog-to-digital converters, or to non-AMC monitors. The transmitter output (-,+) terminals connect to a filtered 12 to 30 VDC power supply, through field wiring.

The signal output from the transmitter is a 4 to 20 milliamp DC current. This signal can be measured or recorded anywhere in the supply loop if required. Alternatively, if a voltage measurement is needed a resistor can be connected, between the transmitter's negative (-) output terminal and the negative or common (-) of the power supply.



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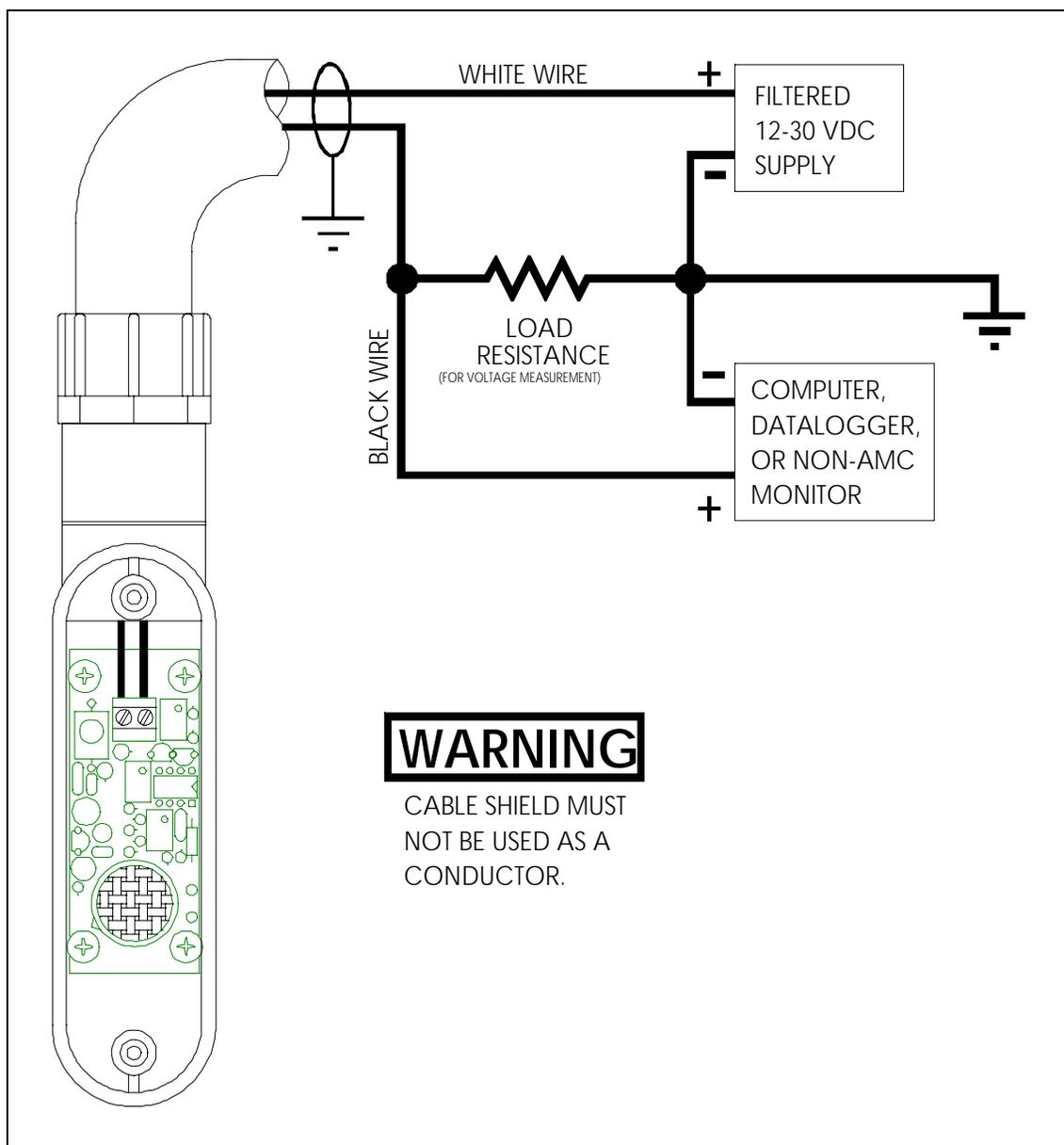


Figure 4-2 INTERFACING TO A COMPUTER, DATALOGGER OR NON-AMC MONITOR



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## 5 OPERATION AND CALIBRATION

This section covers instructions for the proper operation and calibration of the AMC-2701 units. The operation principles are described in further detail, followed by different types of periodic adjustments that might be required throughout the lifetime of the equipment.

### 5.1 OPERATION

The AMC-2701 series sensor/transmitter unit is factory calibrated as listed in Product Information (pg. v) 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 after a stabilization period of 10 minutes.

In general, after the stabilization period, the transmitter should be sending (in zero gas) 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 minor signal variations as can extremes in temperature.

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.

Although the electrochemical sensors are very selective, there are some interference gases which can cause a response from the sensor. These gases are listed on the detailed Specification sheet pertaining to the sensor in use.

### 5.2 CALIBRATION

The transmitter is equipped with a remote calibration feature allowing one-man calibration at the transmitter location. 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.



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Factory on-site calibration services, customer training, and/or calibration adapter can be provided. Refer to section 2.2 FACTORY CALIBRATION for the specific calibration adapter. Specify the sensor/transmitter type and gas when requesting any of the above.

## 5.2.1 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 on introducing the gas sample are included with the calibration kit or available separately.

### NOTE:

**WHEN APPLYING GAS, A FLOW RATE OF 0.5 TO 1 LITRE PER MINUTE IS RECOMMENDED.**

Calibration procedure is as follows:

1. Remove cover from transmitter housing.
2. Insert plug end of "Remote Calibration Lead" fully into CAL jack on the transmitter. Connect the BLACK lead to negative or common (-) and the RED lead to positive (+) of the "Remote Calibration Lead" to a multimeter and select DC milliamp range to read greater than 20 mA full scale.
3. Apply a Zero gas sample, or with the sensor in clean air, adjust the 4 mA trimmer for a stabilized reading of 4 mA DC if required.
4. Apply a Span gas sample. The span gas sample need not be the full scale concentration but could be a fraction of this. Since the transmitter output range is 4 to 20 mA, a full scale concentration should register 20 mA after a few moments exposure. A half scale concentration, accordingly, should provide 12 mA and so on.
5. Adjust Span for appropriate output.



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## 6 MAINTENANCE

This section covers topics related to the maintenance of the AMC-2701 units. A general description of maintenance to be carried out is followed by a verification of operation and then details about the sensor replacement.

### 6.1 GENERAL

The sensor/transmitter unit should be brushed or wiped clean once a year or more, of any dust or dirt that settles on it, depending on the accumulation. The unit **SHOULD NOT** be submerged or placed under conditions where water or other liquids would be able to enter the transmitter.

### 6.2 SENSOR REPLACEMENT

Signal from the sensor will be greatly reduced when its replacement is required. The sensor should be replaced when it no longer responds to the presence of gas or has an unstable zero signal.

When the sensor needs replacing, re-order the Part Number listed in Product Information (pg.v). When sensors are shipped, some sensor leads may be shorted together. This is done to provide rapid stabilization of the sensor signal after installation.

### NOTE:

**ALLOW 10 MINUTES FOR THE NEW SENSOR TO STABILIZE BEFORE RECALIBRATION, THEN FOLLOW THE INSTRUCTIONS IN CALIBRATION OF THIS MANUAL.**